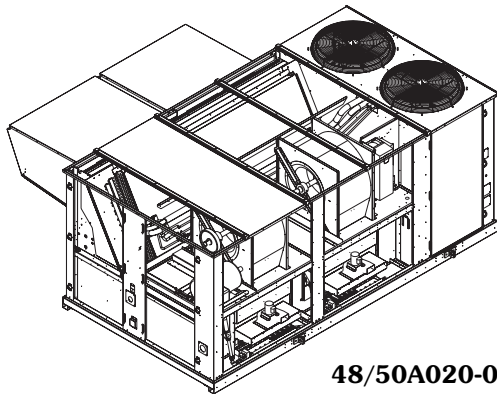




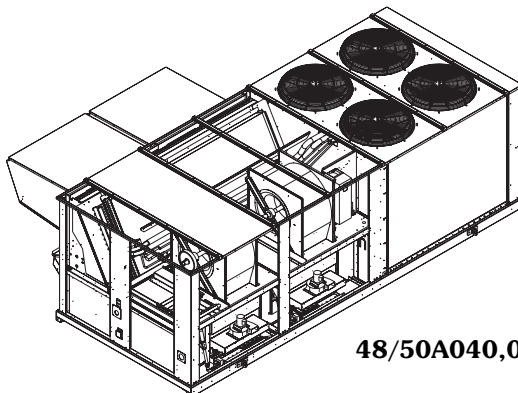
# Product Data

## WEATHERMAKER® 48/50A2,A3,A4,A5020-060 Single-Package Gas Heating/Electric Cooling Rooftop Units and Electric Cooling Rooftop Units with Optional Electric Heat with COMFORTLINK™ Controls and PURON® Refrigerant (R-410A)

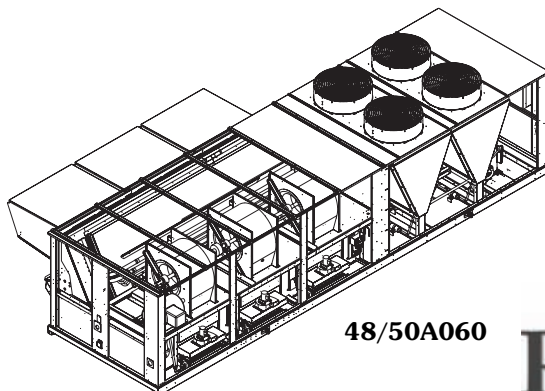
20 to 60 Nominal Tons



48/50A020-035



48/50A040,050



48/50A060



Carrier's 48/50A Series commercial packaged rooftops offer:

- Puron (R-410A) environmentally sound refrigerant
- Novation® heat exchanger technology with microchannel coil
- An easy-to-use, plain language display on the *ComfortLink* controls
- EERs (energy efficiency ratios) meet ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) Standard 90.1-2007 (effective 1/1/2010)
- Meets ASHRAE Standard 62
- Constant or variable volume
- Communicating controls
- Accurately match building loads with up to 5 steps of capacity
- VFD (variable frequency drive) on all VAV (variable air volume) units
- Mechanical cooling operation at outdoor ambient temperatures as low as 32 F (-20 F with optional Motormaster® V fan speed control)

## Features/Benefits

**Carrier's 48/50A commercial packaged unit offers design flexibility, quality, reliability, and *ComfortLink* controls.**

### Design flexibility

Dedicated vertical supply/return units (A2,A3) are ideal for new construction or retrofit to existing installations. The low unit profile is maintained when the unit is installed on the accessory roof curb. The ducts are attached directly to the roof curb to allow all ductwork to be completed before the unit is positioned.

# Features/Benefits (cont)



Dedicated horizontal units (A4,A5) are ideal for replacement or applications such as through-the-wall where sound must be attenuated before the duct penetrates the roof. Ducts connect directly to the unit. Horizontal units may be curb or slab mounted.

## ComfortLink™ controls

Factory-installed *ComfortLink* controls provide the capability for free standing operation or it may be linked with a more extensive system. Factory-installed and programmed BACnet\* communication capability provides simple integration with the building HVAC system (e.g. terminal devices), an i-Vu® Open Control System or a BACnet building automation system. The *ComfortLink* controls also have the capability to communicate with the Carrier Comfort Network® (CCN) system. This communication flexibility allows simple system integration as well as data collection, trending, monitoring and alarm displays.

The 48/50A Series may also be configured to communicate via MODBUS† or LonWorks\*\* protocols if required by the application.

The *ComfortLink* controls are your link to a world of simple and easy to use rooftop units that offer outstanding performance and value. When used with a space temperature sensor, the *ComfortLink* controls maintain control over the economizer and condenser fans and help optimize the performance of the multiple refrigeration circuits as conditions change, resulting in the following features:

- higher part load efficiency
- better control of temperature and humidity
- superior reliability
- redundant refrigeration systems
- high ambient cooling operation at 115 F
- Low ambient cooling operation at 32 F as standard (optional Motormaster® V inverter fan speed control for operation down to -20 F)

The *ComfortLink* scrolling marquee display is very easy to use. Messages are displayed in easy to understand English. No decoding is required. A scrolling readout provides detailed explanations of control information. Only four, large, easy-to-use buttons are required to maneuver through the entire menu. The readout is designed to be visible even in the brightest sunlight. A hand-held Navigator™ accessory can be used for added service flexibility.

The *ComfortLink* controls provide unparalleled service diagnostic information. Temperature and pressure can be read from the display with no need for separate gages. Other data, such as compressor cycles, unit run time hours, current alarms, can also be accessed. A history of alarms is also available for viewing.

Service run test can be very helpful when troubleshooting. The user can run test major components to help determine the root cause of a problem. The unit can be run-tested before an installation is complete to support a satisfactory start-up.

To further support reliability, the *ComfortLink* controls prevent reverse compressor rotation.

No laptop computers are required for start-up. Time schedules are built in and the scrolling marquee display provides easy access to set points.

The *ComfortLink* controller accepts input from a CO<sub>2</sub> sensor and a smoke detector. Both are available as factory-installed options or as field-installed accessories.

The unit-mounted terminal strip allows control of the unit with a standard thermostat. Expensive interface devices are not required.

## Environmentally sound

Carrier's unique Puron® refrigerant (R-410A) enables you to make an environmentally responsible decision. Puron refrigerant is an HFC refrigerant that does not contain chlorine that is damaging to the ozone layer. Puron refrigerant is unaffected by the Montreal Protocol. Puron refrigerant is a safe, non-toxic, efficient and environmentally sound refrigerant for the future.

## Quality and reliability

Excellent full and part load efficiencies are achieved by using multiple scroll compressors and indoor coils with intertwined dual refrigerant circuits. The compressors are equipped with crankcase heaters and protected by electronic sensors and logic to control minimum on and off times and reverse rotation. The refrigerant circuits are both electrically and mechanically independent, to provide standby capability should one circuit require service.

Totally enclosed outdoor-fan motors are designed for many years of trouble-free operation.

Positive-locking bearings for the indoor fan reduce vibration of the supply fan assembly and remain locked during the life of the bearing.

## Variable frequency drive (VFD) and unit unloading

Variable air volume (VAV) units utilize state of the art variable frequency drive (VFD) to control duct static

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\*Sponsored by ASHRAE (American Society of Heating, Refrigerating, and Air Conditioning Engineers).

†Registered trademark of Schneider Electric.

\*\*Registered trademark of Echelon corporation.



pressure for optimum supply fan energy savings.

The VAV units have up to 5 stages of capacity control to match the load requirements of the conditioned space.

Other VAV features include:

- control of cooling and heating (if equipped with heat) in both occupied and unoccupied mode
- support of optional space temperature sensor
- control of modulating economizer to provide free cooling when outdoor conditions are suitable
- support of IAQ (indoor air quality) sensor
- support linkage to ComfortID™ VAV systems

Constant volume units come equipped with 2 stages of capacity. Optional configuration is available to increase this up to 5 stages of operation. Unit operation will closely match the load and maintain comfort in the most energy-efficient manner.

### Factory-installed economizer

An optional integrated economizer permits cooling utilizing an outdoor air sensor. The direct gear driven, low leakage blades eliminate conventional inter-blade linkages and the associated adjustments.

The economizer operates in conjunction with mechanical cooling when required and is factory-installed for either vertical or horizontal operation. The factory-supplied and field-installed rain hood/filter assembly is designed to prevent moisture or objects from entering the unit.

Exhaust air relief is available for all units:

- barometric relief (CV [constant volume] or VAV)
- power exhaust
- high capacity power exhaust

Field-adjustable set points on modulating power exhaust prevent space pressurization problems. Factory-installed relief options are unit mounted on downflow units. Accessories must be duct mounted for horizontal applications.

### Novation heat exchanger technology

The Novation heat exchanger design with microchannel condenser coil is a robust, cost effective alternative to

traditional coil design for standard applications. Microchannel coils are also sturdier than other coil types, making them easier to clean without causing damage to the coil.

Due to the compact all aluminum design, microchannel coils reduce overall unit operating weight. The streamlined microchannel coil also reduces refrigerant charge by up to 40%.

Microchannel coils are not recommended by Carrier for marine, coastal, or industrial environments unless Carrier-approved coating is applied.

### Gas heating units Integrated gas unit controller (IGC) (gas heating units only) —

All ignition components are contained in the compact IGC which is easily accessible for servicing. The IGC control board, designed and manufactured exclusively for Carrier rooftop units, provides built-in diagnostic capability. An LED (light-emitting diode) simplifies troubleshooting by providing visual fault notification and system status confirmation.

The IGC also contains an anti-cycle protection for gas heat operation. After 4 continuous cycles on the unit high-temperature limit switch, the gas heat operation is disabled, and an error code is issued. This feature greatly improves reliability of the rooftop unit.

The IGC also contains burner control logic for accurate and dependable gas ignition. This LED fault-notification system reduces service person troubleshooting time and minimizes service costs. The IGC can also increase heating efficiency by controlling evaporator fan on and off delays.

### Efficient, dependable operation —

Tubular, dimpled gas heat exchangers optimize heat transfer for improved efficiency. The tubular design permits hot gases to make multiple passes across the path of the supply air. The dimpled design creates a turbulent gas flow to increase heating efficiency. The extra thick Alumagard™ heat exchanger coating provides corrosion resistance to lengthen coil life. An optional stainless steel heat exchanger is also available.

The unsightly appearance of flue stacks is eliminated and the effects of wind on heating operations are diminished by the induced draft combustion

system. The inducer fan draws hot combustion gas through the heat exchanger at the optimum rate for the most effective heat transfer. Induced draft heating systems are safer than positive pressure, forced draft heating systems. With the induced draft heating system, the heat exchanger operates under negative pressure, preventing flue gas leakage into the indoor supply air.

During the Heating mode, the evaporator-fan relay automatically starts the evaporator fan after the heat exchanger warms up to a suitable temperature. To increase efficiency and comfort, the 30-second fan delay prevents cold air from entering the supply duct system when the conditioned space is calling for heat.

The direct-spark ignition system saves operating expense when compared to pilot ignition systems. No crossover tube is required, therefore no sooting or pilot fouling problems can occur.

All 48A standard units are designed for natural gas. An accessory LP (liquid propane) conversion kit is available.

**Safety is built in —** All 48A units have a flame rectification sensor to quickly sense the burner flame and ignite burners almost immediately. The controls are designed to shut down the unit during any flame outage or circuit failure. The flame sensor reacts quickly to these events. In the event of a shutdown, an error code is issued at the IGC board.

The heating safety controls will shut down the unit if they detect a problem. If excessive temperatures develop, limit switches shut off the gas valve. After 4 continuous short cycles of the high-temperature limit switch, the IGC board locks out the gas heat cycle to prevent any further short cycles. This safety feature is provided exclusively on Carrier rooftop units. The rollout switch also deenergizes the gas valve in the event of a flame rollout.

Support of fire and smoke control is included with an optional ComfortLink™ controls expansion module (CEM).

### Staged gas unit heating

The staged gas control option adds the capability to control the rooftop unit's gas heating system to a specified



# Features/Benefits (cont)



supply air temperature set point for purposes of tempering a cool mixed-air condition, or for reheat when the mechanical cooling is being used for dehumidification. The gas heating system employs multiple heating sections. Each section is equipped with a two-stage gas valve. The gas valves are sequenced by a factory-installed staged gas controller (SGC) as required to maintain the user-specified supply air set point. Up to eleven stages of heating control are available, based on quantity and heating capacity sizes of the individual heat exchanger sections provided in the base unit. In addition to providing system control for tempering and reheat operation, the SGC also provides Demand Heating control for the first stage (W1 or low-heat) heating mode. The heating capacity will always go to 100% for second stage (W2 or high-heat) operation.

Tempering of supply air is desirable when rooftop units are operating in ventilation mode (economizer only operation) at low outdoor temperatures.

At low outdoor temperatures, the mixed-air temperature (combination of return-from-space temperature and outdoor/ventilation air temperature) may become too low for the comfort of the occupants or for the terminal reheat systems. The tempering function adds incremental steps of heat capacity to raise the temperature of the mixed air up to levels suitable for direct admission into the occupied space or to levels consistent with reheat capabilities of the space terminals.

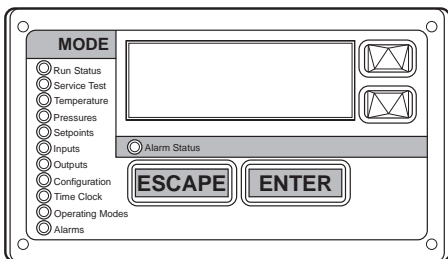
## Installation/serviceability

Dedicated design (vertical or horizontal) requires no alteration time to convert in the field. Single point electrical connections are standard on all units. Electrical service access can be made through roof curb or side of unit.

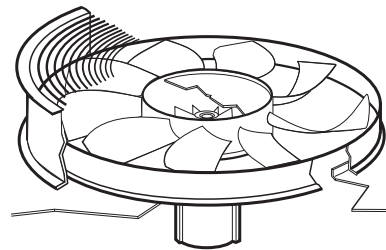
All units are equipped with the *ComfortLink* control system as standard. The *ComfortLink* control system has a fully alpha-numeric

display and keypad. The display has expandable text messages that eliminate the need to look up coded display information. Unit also supports the use of the enhanced multiple line display that can be connected through a phone jack connection at either end of the unit. The standard microprocessor controls replace the need for field-installed anti-short cycle timers. The controls are compatible with either a room sensor or conventional thermostat with no need to install an accessory interface. In addition, no special tools are required to run the unit through its operational steps. The unit can be run-tested before an installation is complete to ensure satisfactory start-up.

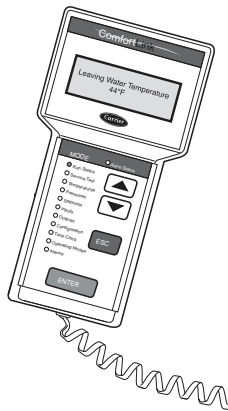
Hinged access panels are located for easy access to standard serviceable components for maintenance. No fasteners need to be removed, which reduces servicing time and helps prevent roof leaks caused by discarded screws. Color coded wiring permits easy tracing and diagnostics.



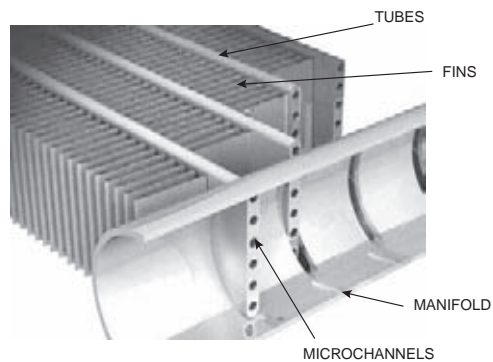
**SCROLLING MARQUEE DISPLAY**



**LOW-NOISE AEROACOUSTIC™ FAN (48/50A060 Only)**



**NAVIGATOR™ DISPLAY**

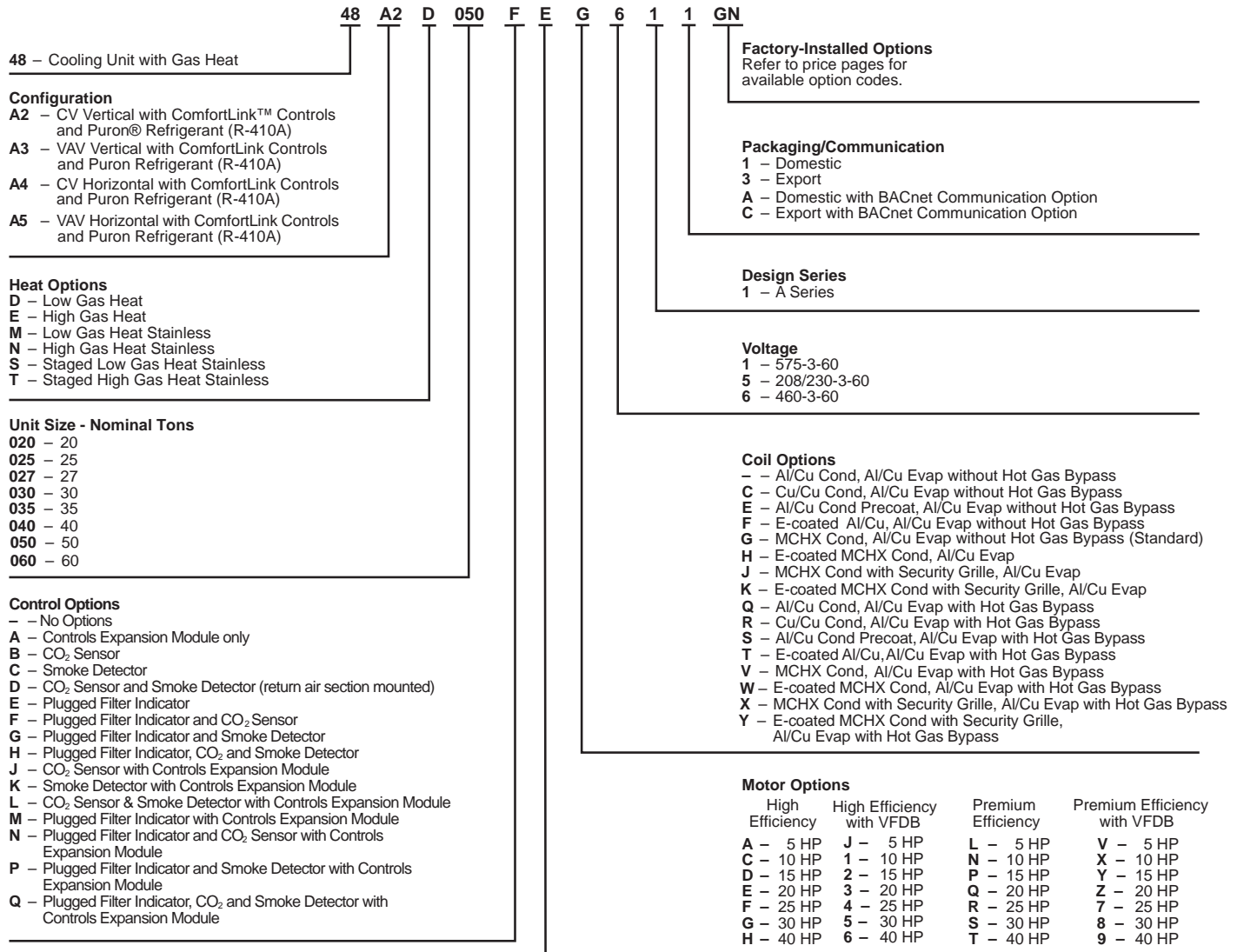


**NOVATION® HEAT EXCHANGER TECHNOLOGY WITH MICROCHANNEL COILS**

# Model number nomenclature



## 48A2,A3,A4,A5 UNITS



### LEGEND

- Al** — Aluminum
- Cu** — Copper
- CV** — Constant Volume
- MCHX** — Microchannel Heat Exchanger
- VAV** — Variable Air Volume
- VFDB** — Variable Frequency Drive Bypass

### NOTES:

1. VAV models (A3,A5) are equipped with a supply fan motor variable frequency drive (VFD).
2. Premium-efficiency motors are not available in 575-3-60.
3. All indoor-fan motors meet the minimum efficiency requirements as established by Energy Policy Act (EPACT).

### Quality Assurance

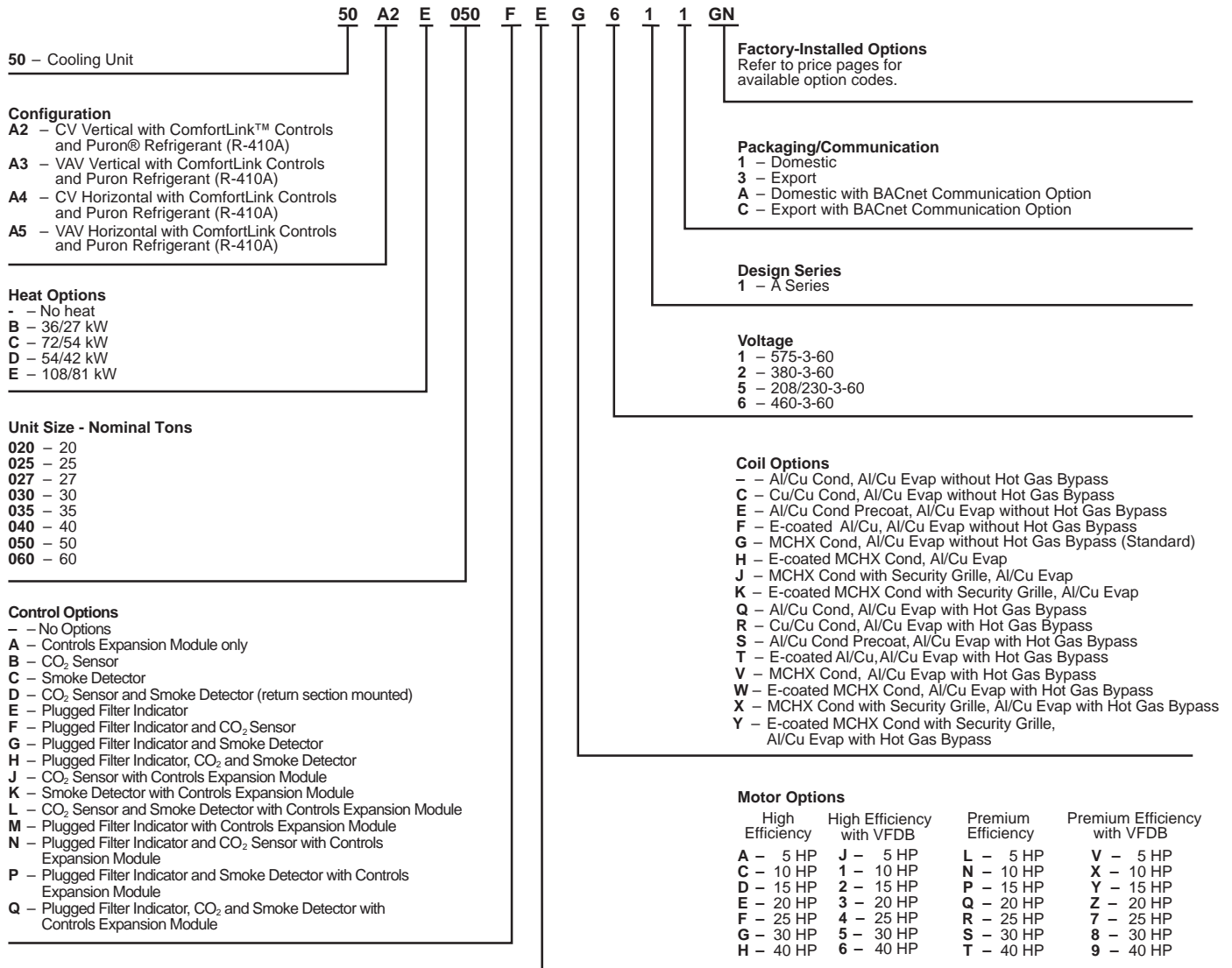
Certified to ISO 9001:2000



# Model number nomenclature (cont)



## 50A2,A3,A4,A5 UNITS



### LEGEND

- Al** — Aluminum
- Cu** — Copper
- CV** — Constant Volume
- MCHX** — Microchannel Heat Exchanger
- VAV** — Variable Air Volume
- VFDB** — Variable Frequency Drive Bypass

### NOTES:

1. VAV models (A3,A5) are equipped with a supply fan motor variable frequency drive (VFD).
2. Premium-efficiency motors are not available in 575-3-60.
3. All indoor-fan motors meet the minimum efficiency requirements as established by EPACT.

### Quality Assurance

Certified to ISO 9001:2000



# Ratings and capacities



## ELECTRIC RESISTANCE HEATER DATA

UNIT 50A2,A3,A4,A5	HEATER kW				HEATER STAGES	% HEAT PER STAGE	DESIGN RANGE	
	Unit Voltages						Min CFM	Max CFM
	208	230	460	575				
020-035 LO HEAT	27	36	36	36	1	100	6,000	15,000
020-035 HIGH HEAT	54	72	72	72	2	50/100	6,000	15,000
040,050 LO HEAT	27	36	36	36	1	100	10,500	20,000
040,050 HIGH HEAT	54	72	72	72	2	50/100	10,500	20,000
060 LO HEAT	41	54	54	54	1	100	15,000	27,000
060 HIGH HEAT	81	108	108	108	2	50/100	15,000	27,000

NOTE: Due to the open design of the electric heaters, the airside pressure drop is negligible.

## COOLING CFM OPERATING RANGE

UNIT	MIN CFM	MAX CFM*
48/50A2,A4020	6,000	10,000
48/50A3,A5020	4,000†	10,000
48/50A2,A4025	7,000	12,500
48/50A3,A5025	5,000†	12,500
48/50A2,A4027	8,100	13,500
48/50A3,A5027	5,400†	13,500
48/50A2,A4030	9,000	15,000
48/50A3,A5030	6,000†	15,000
48/50A2,A4035	10,500	17,500
48/50A3,A5035	7,000†	17,500
48/50A2,A4040	12,000	20,000
48/50A3,A5040	8,000†	20,000
48/50A2,A4050	13,500	20,000
48/50A3,A5050	10,000†	20,000
48/50A2,A4060	18,000	27,000
48/50A3,A5060	12,000†	27,000

\*Operation at these levels may be limited by entering evaporator air wet bulb temperatures. See Cooling Capacities tables on pages 39-46 for further details.

†Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by ebd and ewb conditions.

## GAS HEATING CAPACITIES AND EFFICIENCIES STANDARD UNITS

UNITS 48A2,A3,A4,A5	INPUT (Btuh)		MAXIMUM OUTPUT (Btuh)	TEMPERATURE RISE (F)	STEADY-STATE EFFICIENCY (%)	DESIGN RANGE	
	Stage 1	Stage 2				Min Cfm	Max Cfm*
020-030 LO HEAT	262,500	350,000	283,500	15 to 45	81	5,900	15,000
020-030 HIGH HEAT	394,000	525,000	425,250	35 to 65	81	6,100	11,400
035 LO HEAT	262,500	350,000	283,500	15 to 45	81	5,900	15,000
035 HIGH HEAT	600,000	800,000	648,500	30 to 60	81	10,100	20,200
040,050 LO HEAT	300,000	400,000	324,000	10 to 40	81	7,600	22,500
040,050 HIGH HEAT	600,000	800,000	648,000	30 to 60	81	10,100	20,200
060 LO HEAT	582,000	776,000	636,320	10 to 40	82	11,000	27,000
060 HIGH HEAT	873,000	1,164,000	954,480	30 to 60	82	14,700	27,000

## UNITS WITH STAGED GAS OPTION

UNITS 48A2,A3,A4,A5	STAGES OF GAS CONTROL (% of Full Heat Output)	MIN. OUTPUT (Btuh)	MAX. OUTPUT (Btuh)	DESIGN RANGE	
				Min Cfm	Max Cfm*
020-030 LO HEAT	38, 50, 75, 88, 100	107,730	283,500	5,900	15,000
020-030 HIGH HEAT	25, 33, 50, 67, 75, 83, 100	106,313	425,250	6,100	11,400
035 LO HEAT	38, 50, 75, 88, 100	107,730	283,500	5,900	15,000
035 HIGH HEAT	38, 50, 75, 88, 100	246,240	648,000	10,100	20,200
040,050 LO HEAT	38, 50, 75, 88, 100	123,120	324,000	7,600	22,500
040,050 HIGH HEAT	38, 50, 75, 88, 100	246,240	648,000	10,100	20,200
060 LO HEAT	19, 25, 38, 44, 50, 56, 63, 75, 88, 94, 100	120,901	636,320	11,000	27,000
060 HIGH HEAT	25, 33, 50, 58, 67, 75, 83, 92, 100	238,620	954,480	14,700	27,000

\*In some cases, maximum cfm may be limited by maximum cooling airflow value.

### NOTES:

- Ratings are approved for altitudes to 2000 feet. At altitudes over 2000 ft, ratings are 4% less for each 1000 ft greater than 2000 ft above sea level.
- At altitudes up to 2000 ft, the following formula may be used to calculate air temperature rise:

$$\Delta t = \frac{\text{Output capacity}}{1.10 \times \text{air quantity}}$$

- At altitudes above 2000 ft, the following formula may be used:

$$\Delta t = \frac{\text{Output capacity}}{(.24 \times \text{specific weight of air} \times 60) (\text{air quantity})}$$

- On standard gas heat with aluminized heat exchangers, the minimum allowable mixed air entering the heat exchanger during half-rate (first stage) operation is 50 F. There is no minimum limitation for full-rate operation.
- Total unit design is listed by ETL Testing Laboratories Inc.



# Ratings and capacities (cont)



## CAPACITY CONTROL STAGING OPTIONS

APPLICATION	UNIT	DEMAND SOURCE	COOLING CONTROL METHOD	COMPRESSOR SEQUENCE			
				SIZE 020-027 UNITS		SIZE 030-060 UNITS	
VAV	48/50A3,A5	RAT	Multiple Stage EDT	Table C	Table D	Table E	Table F
		SPT	Multiple Stage EDT	Table C	Table D	Table E	Table F
CV Sensor	48/50A2,A4	SPT	2 Stage Demand	Table A	NA	Table B	NA
			Multiple Adaptive Demand	Table C	Table D	Table E	Table F
CV, Mech Thermostat		Y1,Y2	2 Stage Demand	Table A	NA	Table B	NA
			Multiple Adaptive Demand	Table C	Table D	Table E	Table F

### LEGEND

- CV — Constant Volume
- EDT — Evaporator Discharge Temperature
- RAT — Return Air Temperature
- SPT — Space Temperature
- VAV — Variable Air Volume

**CAPACITY CONTROL STAGING OPTIONS TABLE A**  
48/50A020-027 UNITS — CV 2-STAGE SEQUENCE

STAGE	SEQUENCE 1			SEQUENCE 2		
	0	1	2	0	1	2
	Thermostat Inputs			Thermostat Inputs		
Y1	OPEN	CLOSED	CLOSED	OPEN	CLOSED	CLOSED
Y2	OPEN	OPEN	CLOSED	OPEN	OPEN	CLOSED
COMP	Compressor Status			Compressor Status		
A1	OFF	ON	ON	OFF	OFF	ON
A2	OFF	OFF	ON	OFF	ON	ON
B1	OFF	OFF	ON*	OFF	OFF	ON
UNIT	Capacity 48/50A			Capacity 48/50A		
020	0%	30%	100%	0%	30%	100%
025	0%	33%	100%	0%	33%	100%
027	0%	33%	100%	0%	33%	100%

**CAPACITY CONTROL STAGING OPTIONS TABLE B**  
48/50A030-060 UNITS — CV 2-STAGE SEQUENCE

STAGE	SEQUENCE 1			SEQUENCE 2		
	0	1	2	0	1	2
	Thermostat Inputs			Thermostat Inputs		
Y1	OPEN	CLOSED	CLOSED	OPEN	CLOSED	CLOSED
Y2	OPEN	OPEN	CLOSED	OPEN	OPEN	CLOSED
COMP	Compressor Status			Compressor Status		
A1	OFF	ON	ON	OFF	OFF	ON
A2	OFF	OFF	ON	OFF	ON	ON
B1	OFF	ON	ON	OFF	OFF	ON
B2	OFF	OFF	ON*	OFF	ON	ON
UNIT	Capacity 48/50A			Capacity 48/50A		
030	0%	50%	100%	0%	50%	100%
035	0%	50%	100%	0%	50%	100%
040	0%	50%	100%	0%	50%	100%
050	0%	50%	100%	0%	50%	100%
060	0%	50%	100%	0%	50%	100%

**CAPACITY CONTROL STAGING OPTIONS TABLE C**  
48/50A020-027 UNITS VAV AND ADAPTIVE CV STAGING SEQUENCE WITHOUT HOT GAS BYPASS

STAGE	SEQUENCE 1				SEQUENCE 2			
	0	1	2	3	0	1	2	3
COMP	Compressor Status				Compressor Status			
A1	OFF	ON	OFF	ON	OFF	OFF	ON	ON
A2	OFF	OFF	ON	ON	OFF	ON	OFF	ON
B1	OFF	OFF	ON	ON	OFF	OFF	ON	ON
UNIT	Capacity 48/50A				Capacity 48/50A			
020	0%	30%	70%	100%	0%	30%	70%	100%
025	0%	33%	67%	100%	0%	33%	67%	100%
027	0%	33%	67%	100%	0%	33%	67%	100%





**CAPACITY CONTROL STAGING OPTIONS TABLE D**  
**48/50A020-027 UNIT VAV AND ADAPTIVE CV STAGING SEQUENCE WITH HOT GAS BYPASS**

STAGE	SEQUENCE 1					SEQUENCE 2				
	0	1	2	3	4	0	1	2	3	4
<b>COMP</b>	<b>Compressor Status</b>					<b>Compressor Status</b>				
A1	OFF	ON*	ON	OFF	ON	OFF	OFF	OFF	ON	ON
A2	OFF	OFF	OFF	ON	ON	OFF	ON*	ON	OFF	ON
B1	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	ON	ON
<b>UNIT</b>	<b>Capacity 48/50A</b>					<b>Capacity 48/50A</b>				
020	0%	10%	30%	70%	100%	0%	10%	30%	70%	100%
025	0%	17%	33%	67%	100%	0%	17%	33%	67%	100%
027	0%	17%	33%	67%	100%	0%	17%	33%	67%	100%

\*Hot gas bypass activated.

**CAPACITY CONTROL STAGING OPTIONS TABLE E**  
**48/50A030-060 UNITS VAV AND ADAPTIVE CV STAGING SEQUENCE WITHOUT HOT GAS BYPASS**

STAGE	SEQUENCE 1					SEQUENCE 2				
	0	1	2	3	4	0	1	2	3	4
<b>COMP</b>	<b>Compressor Status</b>					<b>Compressor Status</b>				
A1	OFF	ON	OFF	OFF	ON	OFF	OFF	ON	ON	ON
A2	OFF	OFF	ON	ON	ON	OFF	ON	OFF	ON	ON
B1	OFF	OFF	ON	ON	ON	OFF	OFF	ON	ON	ON
B2	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
<b>UNIT</b>	<b>Capacity 48/50A</b>					<b>Capacity 48/50A</b>				
030	0%	25%	50%	75%	100%	0%	25%	50%	75%	100%
035	0%	20%	50%	80%	100%	0%	20%	50%	70%	100%
040	0%	25%	50%	75%	100%	0%	25%	50%	75%	100%
050	0%	25%	50%	75%	100%	0%	25%	50%	75%	100%
060	0%	25%	50%	75%	100%	0%	25%	50%	75%	100%

**CAPACITY CONTROL STAGING OPTIONS TABLE F**  
**48/50A030-060 UNITS VAV AND ADAPTIVE CV STAGING SEQUENCE WITH HOT GAS BYPASS STAGING SEQUENCE**

STAGE	SEQUENCE 1						SEQUENCE 2					
	0	1	2	3	4	5	0	1	2	3	4	5
<b>COMP</b>	<b>Compressor Status</b>						<b>Compressor Status</b>					
A1	OFF	ON*	ON	OFF	OFF	ON	OFF	OFF	OFF	ON	ON	ON
A2	OFF	OFF	OFF	ON	ON	ON	OFF	ON*	ON	OFF	ON	ON
B1	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	ON	ON	ON
B2	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
<b>UNIT</b>	<b>Capacity 48/50A</b>						<b>Capacity 48/50A</b>					
030	0%	10%	25%	50%	75%	100%	0%	10%	25%	50%	75%	100%
035	0%	7%	20%	50%	80%	100%	0%	7%	20%	50%	70%	100%
040	0%	14%	25%	50%	75%	100%	0%	14%	25%	50%	75%	100%
050	0%	16%	25%	50%	75%	100%	0%	16%	25%	50%	75%	100%
060	0%	18%	25%	50%	75%	100%	0%	18%	25%	50%	75%	100%

\*Hot gas bypass activated.

**ALTITUDE COMPENSATION — 48A2,A3,A4,A5 UNITS**

ELEVATION (ft)	SIZES 020-035		SIZES 040-060	
	Natural Gas Orifice Drill Bit Size*	Liquid Propane Orifice Drill Bit Size*	Natural Gas Orifice Drill Bit Size*	Liquid Propane Orifice Drill Bit Size*
0-2,000	34	43	31	41
2,001- 3,000	7/64"	44	32	3/32"
3,001- 4,000	36	45	33	43
4,001- 5,000	37	45	33	43
5,001- 6,000	38	45	34	44
6,001- 7,000	39	47	36	44
7,001- 8,000	40	47	36	45
8,001- 9,000	41	48	37	45
9,001-10,000	3/32"	48	38	45
10,001-11,000	42	49	39	47
11,001-12,000	43	49	40	5/64"
12,001-13,000	43	50	41	48
13,001-14,000	44	50	3/32"	49

\*Orifices available through your local Carrier distributor.

# Physical data — 48A2,A3,A4,A5 units



UNIT 48A2,A3,A4,A5	020D/E	025D/E	027D/E	030D/E
NOMINAL CAPACITY (tons)	20	25	27	30
BASE UNIT OPERATING WEIGHT (lb)	See Unit Weights Table			
COMPRESSOR Quantity ... Type (Ckt 1/Ckt 2) Number of Refrigerant Circuits Oil	2 ... ZP67/1...ZP90 2 Precharged	2 ... ZP90/1...ZP90 2 Precharged	2 ... ZP90/1...ZP90 2 Precharged	2...ZP72, 2...ZP72 2 Precharged
REFRIGERANT TYPE Operating Charge (lb-oz) Circuit 1 Circuit 2	R-410A			
MCHX CONDENSER* Quantity Total Face Area (sq ft)	1 32.9	1 32.9	1 32.9	1 32.9
CONDENSER FAN Nominal Cfm Quantity... Diameter (in.) Motor Hp	Propeller Type			
	19,500 2 ... 30 1	19,500 2 ... 30 1	19,500 2 ... 30 1	19,500 2 ... 30 1
EVAPORATOR COIL Tube Size (in.) Rows ... Fins/in. Total Face Area (sq ft)	Cross-Hatched Copper Tubes, Aluminum Plate Fins with Intertwined Circuits			
	<sup>3</sup> / <sub>8</sub> 3 ... 15 31.7	<sup>3</sup> / <sub>8</sub> 4 ... 14 31.7	<sup>3</sup> / <sub>8</sub> 4 ... 15 31.7	<sup>3</sup> / <sub>8</sub> 4 ... 15 31.7
EVAPORATOR FAN Quantity ... Size (in.) Type Drive Nominal Cfm Motor Hp Motor Frame Size Motor Bearing Type Maximum Allowable Rpm Motor Pulley Pitch Diameter Nominal Motor Shaft Diameter (in.) Fan Pulley Pitch Diameter (in.) Nominal Fan Shaft Diameter (in.) Belt Quantity Belt Type Belt Length (in.) Pulley Center Line Distance (in.) Factory Speed Setting (rpm)	Centrifugal Type			
	2 ... 20 X 15 Belt 8,000 5 10 15 184T   215T   254T Ball 1200 4.8 4.4 5.7 1 <sup>1</sup> / <sub>8</sub> 1 <sup>3</sup> / <sub>8</sub> 1 <sup>5</sup> / <sub>8</sub> 12.4 8.6 9.1 1 <sup>15</sup> / <sub>16</sub> 1 2 2 BX56 BX50 5VX530 56 63 53 16.0- 15.6- 15.0- 18.7 18.4 17.9 717 924 1096	2 ... 20 X 15 Belt 10,000 5 10 15 184T   215T   254T Ball 1200 5.2 6.1 5.5 1 <sup>1</sup> / <sub>8</sub> 1 <sup>3</sup> / <sub>8</sub> 1 <sup>5</sup> / <sub>8</sub> 12.4 11.1 8.7 1 <sup>15</sup> / <sub>16</sub> 1 1 2 BX56 5VX570 5VX530 56 57 53 15.6-18.4 15.6-18.4 15.0-17.9	2 ... 20 X 15 Belt 11,000 10 15 20 215T   254T   256T Ball 1200 4.4 4.9 5.9 1 <sup>3</sup> / <sub>8</sub> 1 <sup>5</sup> / <sub>8</sub> 1 <sup>5</sup> / <sub>8</sub> 9.4 8.1 8.7 1 <sup>15</sup> / <sub>16</sub> 2 2 2 BX50 5VX500 5VX530 50 50 53 15.6-18.4 15.0- 15.0- 17.9 17.9 848 1059 1187	2 ... 20 X 15 Belt 12,000 10 15 20 215T   254T   256T Ball 1200 4.4 5.7 5.9 1 <sup>3</sup> / <sub>8</sub> 1 <sup>5</sup> / <sub>8</sub> 1 <sup>5</sup> / <sub>8</sub> 9.0 9.1 8.7 1 <sup>15</sup> / <sub>16</sub> 2 2 2 BX50 5VX530 5VX530 50 53 53 15.6- 15.0- 15.0- 18.4 17.9 856 1096 1187
FURNACE SECTION Supply Line Pressure Range Rollout Switch Cutout Temp (F)† Burner Orifice Diameter (in. ...drill size) Natural Gas Std Liquid Propane Alt Thermostat Heat Anticipator Setting Stage 1 (amps) Stage 2 (amps) Gas Input (Btuh) Stage 1 (Low Heat/High Heat) Stage 2 (Low Heat/High Heat) Efficiency (Steady State) (%) Temperature Rise Range Manifold Pressure (in. wg) Natural Gas Std Liquid Propane Alt Gas Valve Quantity	5.0-in. wg min/13.5-in. wg max.			
	225 .111 ... 34 .089 ... 43 0.1 0.1 262,500/394,000 350,000/525,000 81 15-45/35-65 3.5 3.5 2	225 .111 ... 34 .089 ... 43 0.1 0.1 262,500/394,000 350,000/525,000 81 15-45/35-65 3.5 3.5 2	225 .111 ... 34 .089 ... 43 0.1 0.1 262,500/394,000 350,000/525,000 81 15-45/35-65 3.5 3.5 2	225 .111 ... 34 .089 ... 43 0.1 0.1 262,500/394,000 350,000/525,000 81 15-45/35-65 3.5 3.5 2
HIGH-PRESSURE SWITCH (psig) Cutout Reset (Auto.)	650 500	650 500	650 500	650 500
MIXED-AIR FILTERS Quantity ... Size (in.) Standard Pleated	10 ... 20 x 24 x 2 5 ... 20 x 20 x 4 5 ... 20 x 24 x 4	10 ... 20 x 24 x 2 5 ... 20 x 20 x 4 5 ... 20 x 24 x 4	10 ... 20 x 24 x 2 5 ... 20 x 20 x 4 5 ... 20 x 24 x 4	10 ... 20 x 24 x 2 5 ... 20 x 20 x 4 5 ... 20 x 24 x 4
OUTDOOR-AIR FILTERS Quantity...Size (in.)	8...16 x 25 x 2 4...20 x 25 x 2			
POWER EXHAUST Motor, Quantity...Hp Fan, Diameter...Width (in.)	Direct Drive, Single-Phase Motors (Factory-Wired for High Speed Operation), Forward-Curved Fan Wheels with Backdraft Dampers on Each Fan Housing 4...1 11 x 10			

LEGEND  
Al — Aluminum  
Cu — Copper  
MCHX— Microchannel Heat Exchanger

Size 060: Circuit A uses the two MCHX coils near the bulkhead, Circuit B uses the two MCHX coils near the control box.  
†Rollout switch is manual reset.

\*Sizes 020 to 027: Circuit 1 uses the lower portion of condenser coil, Circuit 2 uses the upper portion.  
Sizes 030 and 035: Circuit 1 uses the upper portion of condenser coil, Circuit 2 uses the lower portion.

Sizes 040 and 050: Circuit 1 uses the left condenser coil, Circuit 2 the right.



UNIT 48A2,A3,A4,A5	035D/E	040D/E	050D/E	060D/E
<b>NOMINAL CAPACITY (tons)</b>	35	40	50	60
<b>BASE UNIT OPERATING WEIGHT (lb)</b>	See Unit Weights Table			
<b>COMPRESSOR</b>				
Quantity ... Type (Ckt 1/Ckt 2)	2 ... ZP67/2...ZP103	2...ZP103/2...ZP103	2...ZP120/2...ZP120	2...ZP154/2...ZP154
Number of Refrigerant Circuits	2	2	2	2
Oil	Precharged	Precharged	Precharged	Precharged
<b>REFRIGERANT TYPE</b>	R-410A			
Operating Charge (lb-oz)				
Circuit 1	18-0	25-8	29-11	30-10
Circuit 2	26-11	26-0	29-11	38-5
<b>MCHX CONDENSER*</b>				
Quantity	1	2	2	4
Total Face Area (sq ft)	32.9	65.8	65.8	105.2
<b>CONDENSER FAN</b>				
Nominal Cfm	19,500	32,000	35,000	40,000
Quantity... Diameter (in.)	2 ... 30	4 ... 30	4 ... 30	4...30.5
Motor Hp	1	1	1	1
<b>EVAPORATOR COIL</b>	Cross-Hatched Copper Tubes, Aluminum Plate Fins with Intertwined Circuits			
Tube Size (in.)	1/2	1/2	1/2	1/2
Rows ... Fins/in.	6 ... 16	4 ... 17	6 ... 16	4...17
Total Face Area (sq ft)	31.3	31.3	31.3	48.1
<b>EVAPORATOR FAN</b>	Centrifugal Type			
Quantity ... Size (in.)	2 ... 20 X 15	2 ... 20 X 15	2 ... 20 X 15	3 ... 20 X 15
Type Drive	Belt	Belt	Belt	Belt
Nominal Cfm	14,000	16,000	18,000	24,000
Motor Hp	15	15	20	25
Motor Frame Size	254T   20   25	254T   20   25	256T   25   30	284T   30   40
Motor Bearing Type	256T	256T	284T	286T
Maximum Allowable Rpm	Ball	Ball	Ball	Ball
Motor Pulley Pitch Diameter	1300	1300	1300	1200
Nominal Motor Shaft Diameter (in.)	5.1   5.7   6.2	5.3   5.7   7.5	5.7   6.2   6.7	5.3   5.9   6.5
Fan Pulley Pitch Diameter (in.)	1 5/8   1 5/8   1 7/8	1 5/8   1 5/8   1 7/8	1 5/8   1 7/8   1 7/8	1 7/8   1 7/8   2 1/8
Nominal Fan Shaft Diameter (in.)	8.7   8.7   8.7	9.5   9.5   11.1	9.5   9.5   9.5	9.1   9.5   9.5
Belt Quantity	2   2   2	2   2   2	2   2   2	3   3   3
Belt Type	5VX500	5VX530	5VX550	5VX530
Belt Length (in.)	50	53	55	53
Pulley Center Line Distance (in.)	15.0-17.9	15.0-17.9	14.6-17.6	15.2-17.2
Factory Speed Setting (rpm)	1025	1147	1247	1087
<b>FURNACE SECTION</b>				
Supply Line Pressure Range	5.0-in. wg min/13.5-in. wg max.			
Rollout Switch Cutout Temp (F)†	225	225	225	225
Burner Orifice Diameter (in ...drill size)				
Natural Gas	Std .111 ... 34 (low)/.120 ... 31 (high)	.120 ... 31	.120 ... 31	.120...31
Liquid Propane	Alt .089 ... 43	.096 ... 41	.096 ... 41	.096...41
Thermostat Heat Anticipator Setting				
Stage 1 (amps)	0.1	0.24	0.1	0.1
Stage 2 (amps)	0.1	0.13	0.1	0.1
Gas Input (Btuh) Stage 1 (Low Heat/High Heat)	262,500/600,000	300,000/600,000	300,000/600,000	582,000/873,000
Stage 2 (Low Heat/High Heat)	350,000/800,000	400,000/800,000	400,000/800,000	776,000/1,164,000
Efficiency (Steady State) (%)	81	81	81	82
Temperature Rise Range	15-45/30-60	10-40/30-60	10-40/30-60	10-40/30-60
Manifold Pressure (in. wg)				
Natural Gas	Std 3.5	3.5	3.5	3.3
Liquid Propane	Alt 3.5	3.5	3.5	3.3
Gas Valve Quantity	2	2	2	3
<b>HIGH-PRESSURE SWITCH (psig)</b>				
Cutout	650	650	650	650
Reset (Auto.)	500	500	500	500
<b>MIXED-AIR FILTERS</b>				
Quantity ... Size (in.) Standard Pleated	10 ... 20 x 24 x 2 5 ... 20 x 20 x 4 5 ... 20 x 24 x 4	10 ... 20 x 24 x 2 5 ... 20 x 20 x 4 5 ... 20 x 24 x 4	10 ... 20 x 24 x 2 5 ... 20 x 20 x 4 5 ... 20 x 24 x 4	16...20 x 24 x 2 8...20 x 20 x 4 8...20 x 24 x 4
<b>OUTDOOR-AIR FILTERS</b>				
Quantity...Size (in.)	8...16 x 25 x 2 4...20 x 25 x 2	8...16 x 25 x 2 4...20 x 25 x 2	8...16 x 25 x 2 4...20 x 25 x 2	12...16 x 25 x 2 6...20 x 25 x 2
<b>POWER EXHAUST</b>	Direct Drive, Single-Phase Motors (Factory-Wired for High Speed Operation), Forward-Curved Fan Wheels with Backdraft Dampers on Each Fan Housing			
Motor, Quantity...Hp	4...1	4...1	4...1	6...1
Fan, Diameter...Width (in.)	11 x 10	11 x 10	11 x 10	11 x 10

LEGEND

- Al — Aluminum
- Cu — Copper
- MCHX — Microchannel Heat Exchanger

†Rollout switch is manual reset.

\*Sizes 020 to 027: Circuit 1 uses the lower portion of condenser coil, Circuit 2 uses the upper portion.  
 Sizes 030 and 035: Circuit 1 uses the upper portion of condenser coil, Circuit 2 uses the lower portion.  
 Sizes 040 and 050: Circuit 1 uses the left condenser coil, Circuit 2 the right.  
 Size 060: Circuit A uses the two MCHX coils near the bulkhead, Circuit B uses the two MCHX coils near the control box.

# Physical data — 50A2,A3,A4,A5 units



UNIT 50A2,A3,A4,A5	020	025	027	030
NOMINAL CAPACITY (tons)	20	25	27	30
BASE UNIT OPERATING WEIGHT (lb)	See Unit Weights Table			
COMPRESSOR Quantity ... Type (Ckt 1/Ckt 2) Number of Refrigerant Circuits Oil	2 ... ZP67/1...ZP90 2 Precharged	2 ... ZP90/1...ZP90 2 Precharged	2 ... ZP90/1...ZP90 2 Precharged	2...ZP72, 2...ZP72 2 Precharged
REFRIGERANT TYPE Operating Charge (lb-oz) Circuit 1 Circuit 2	R-410A			
MCHX CONDENSER* Quantity Total Face Area (sq ft)	1 32.9	1 32.9	1 32.9	1 32.9
CONDENSER FAN Nominal Cfm Quantity... Diameter (in.) Motor Hp	Propeller Type			
EVAPORATOR COIL Tube Size (in.) Rows ... Fins/in. Total Face Area (sq ft)	Cross-Hatched Copper Tubes, Aluminum Plate Fins with Intertwined Circuits			
EVAPORATOR FAN Quantity ... Size (in.) Type Drive Nominal Cfm Motor Hp Motor Frame Size Motor Bearing Type Maximum Allowable Rpm Motor Pulley Pitch Diameter Nominal Motor Shaft Diameter (in.) Fan Pulley Pitch Diameter (in.) Nominal Fan Shaft Diameter (in.) Belt Quantity Belt Type Belt Length (in.) Pulley Center Line Distance (in.) Factory Speed Setting (rpm)	Centrifugal Type			
HIGH-PRESSURE SWITCH (psig) Cutout Reset (Auto.)	650 500			
MIXED-AIR FILTERS Quantity ... Size (in.) Standard Pleated	10 ... 20 x 24 x 2 5 ... 20 x 20 x 4 5 ... 20 x 24 x 4			
OUTDOOR-AIR FILTERS Quantity...Size (in.)	8...16 x 25 x 2 4...20 x 25 x 2			
POWER EXHAUST Motor, Quantity...Hp Fan, Diameter...Width (in.)	Direct Drive, Single-Phase Motors (Factory-Wired for High Speed Operation), Forward-Curved Fan Wheels with Backdraft Dampers on Each Fan Housing 4...1 11 x 10			

**LEGEND**

- Al — Aluminum
- Cu — Copper
- MCHX — Microchannel Heat Exchanger

\*Sizes 020 to 027: Circuit 1 uses the lower portion of condenser coil, Circuit 2 uses the upper portion.  
 Sizes 030 and 035: Circuit 1 uses the upper portion of condenser coil, Circuit 2 uses the lower portion.  
 Sizes 040 and 050: Circuit 1 uses the left condenser coil, Circuit 2 the right.  
 Size 060: Circuit A uses the two MCHX coils near the bulkhead, Circuit B uses the two MCHX coils near the control box.  
 †Rollout switch is manual reset.



UNIT 50A2,A3,A4,A5	035	040	050	060
NOMINAL CAPACITY (tons)	35	40	50	60
BASE UNIT OPERATING WEIGHT (lb)	See Unit Weights Table			
COMPRESSOR	R-410A			
Quantity ... Type (Ckt 1/Ckt 2)	2 ... ZP67/2...ZP103	2...ZP103/2...ZP103	2...ZP120/2...ZP120	2...ZP154/2...ZP154
Number of Refrigerant Circuits	2	2	2	2
Oil	Precharged	Precharged	Precharged	Precharged
REFRIGERANT TYPE	R-410A			
Operating Charge (lb-oz)				
Circuit 1	18-0	25-8	29-11	30-10
Circuit 2	26-11	26-0	29-11	38-5
MCHX CONDENSER*				
Quantity	1	2	2	4
Total Face Area (sq ft)	32.9	65.8	65.8	105.2
CONDENSER FAN	Propeller Type			Shrouded Axial Type
Nominal Cfm	19,500	32,000	35,000	40,000
Quantity... Diameter (in.)	2 ... 30	4 ... 30	4 ... 30	4...30.5
Motor Hp	1	1	1	1
EVAPORATOR COIL	Cross-Hatched Copper Tubes, Aluminum Plate Fins with Intertwined Circuits			
Tube Size (in.)	1/2	1/2	1/2	1/2
Rows ... Fins/in.	6 ... 16	4 ... 17	6 ... 16	4...17
Total Face Area (sq ft)	31.3	31.3	31.3	48.1
EVAPORATOR FAN	Centrifugal Type			
Quantity ... Size (in.)	2 ... 20 X 15		2 ... 20 X 15	
Type Drive	Belt		Belt	
Nominal Cfm	14,000		16,000	
Motor Hp	15	20	20	30
Motor Frame Size	254T	256T	256T	284T
Motor Bearing Type	Ball		Ball	
Maximum Allowable Rpm	1300		1300	
Motor Pulley Pitch Diameter	5.1	5.7	6.2	6.7
Nominal Motor Shaft Diameter (in.)	1 5/8	1 5/8	1 7/8	1 7/8
Fan Pulley Pitch Diameter (in.)	8.7	8.7	8.7	9.1
Nominal Fan Shaft Diameter (in.)	1 15/16		1 15/16	
Belt Quantity	2	2	2	3
Belt Type	5VX500	5VX530	5VX550	5VX570
Belt Length (in.)	50	53	55	57
Pulley Center Line Distance (in.)	15.0-	15.0-	15.0-	15.2-
Factory Speed Setting (rpm)	17.9	17.9	17.9	17.5
HIGH-PRESSURE SWITCH (psig)				
Cutout	650	650	650	650
Reset (Auto.)	500	500	500	500
MIXED-AIR FILTERS				
Quantity ... Size (in.)	10 ... 20 x 24 x 2	10 ... 20 x 24 x 2	10 ... 20 x 24 x 2	16...20 x 24 x 2
Standard	5 ... 20 x 20 x 4	5 ... 20 x 20 x 4	5 ... 20 x 20 x 4	8...20 x 20 x 4
Pleated	5 ... 20 x 24 x 4	5 ... 20 x 24 x 4	5 ... 20 x 24 x 4	8...20 x 24 x 4
OUTDOOR-AIR FILTERS				
Quantity...Size (in.)	8...16 x 25 x 2	8...16 x 25 x 2	8...16 x 25 x 2	12...16 x 25 x 2
	4...20 x 25 x 2	4...20 x 25 x 2	4...20 x 25 x 2	6...20 x 25 x 2
POWER EXHAUST	Direct Drive, Single-Phase Motors (Factory-Wired for High Speed Operation), Forward-Curved Fan Wheels with Backdraft Dampers on Each Fan Housing			
Motor, Quantity...Hp	4...1	4...1	4...1	6...1
Fan, Diameter...Width (in.)	11 x 10	11 x 10	11 x 10	11 x 10

LEGEND

- Al — Aluminum
- Cu — Copper
- MCHX— Microchannel Heat Exchanger

\*Sizes 020 to 027: Circuit 1 uses the lower portion of condenser coil, Circuit 2 uses the upper portion.  
 Sizes 030 and 035: Circuit 1 uses the upper portion of condenser coil, Circuit 2 uses the lower portion.  
 Sizes 040 and 050: Circuit 1 uses the left condenser coil, Circuit 2 the right.  
 Size 060: Circuit A uses the two MCHX coils near the bulkhead, Circuit B uses the two MCHX coils near the control box.  
 †Rollout switch is manual reset.



# Physical data (cont)



## 48/50A020-060 UNIT WEIGHTS BASE UNIT WEIGHTS\* (lb)

UNIT	020	025	027	030	035	040	050	060
48A2D,A3D	3825	3961	3961	3992	4340	4770	4914	7066
48A2E,A3E	3905	4041	4041	4072	4500	4930	5074	7306
48A4D,A5D	3865	4001	4001	4032	4380	4810	4954	7106
48A4E,A5E	3945	4081	4081	4112	4540	4970	5114	7356
50A2,A3	3625	3761	3761	3792	4025	4455	4599	6826
50A4,A5	3703	3839	3839	3870	4218	4648	4792	7041
OPTIONS/ACCESSORIES (WEIGHT ADDERS) (lb)								
Barometric Relief	300	300	300	300	300	300	300	450
Non-Modulating Power Exhaust	450	450	450	450	450	450	450	675
Modulating Power Exhaust	500	500	500	500	500	500	500	725
Electric Heat	110	110	110	110	110	110	110	165
Cu Tube/Aluminum Fin Condenser Coil	100	100	100	150	150	187	317	26
Cu Tube/Cu Fin Condenser Coil	263	263	263	370	370	512	751	677
OA Hood Crate/Packaging (Less Hoods' Weight)	45	45	45	45	45	45	45	45
(Packaging Only)								
Outdoor Air Hoods/Filters (included with unit)	170	170	170	170	170	170	170	255
Hail Guards	73	73	73	73	73	146	146	219
Roof Curb (14-in.)	365	365	365	365	365	410	410	540

### CV MOTOR WEIGHTS (lb)

MOTOR HP	UNIT VOLTAGE	HIGH EFFICIENCY IFM	PREMIUM EFFICIENCY IFM
5 HP	230/460	78	94
	575	78	92
10 HP	230/460	118	164
	575	118	156
15 HP	230/460	150	217
	575	150	220
20 HP	230/460	212	250
	575	212	258
25 HP	230/460	240	309
	575	240	319
30 HP	230/460	283	355
	575	283	359
40 HP	230/460	372	415
	575	372	410

### VAV MOTOR WEIGHTS (lb)

MOTOR HP	UNIT VOLTAGE	HIGH EFFICIENCY IFM	PREMIUM EFFICIENCY IFM
5 HP	230/460	136	152
	575	147	161
10 HP	230/460	187	233
	575	187	225
15 HP	230/460	249	316
	575	249	319
20 HP	230/460	347	385
	575	311	357
25 HP	230/460	375	444
	575	375	454
30 HP	230/460	418	490
	575	418	494
40 HP	230/460	507	550
	575	507	545

#### LEGEND

<b>Cu</b>	—	Copper
<b>CV</b>	—	Constant Volume
<b>FIOP</b>	—	Factory-Installed Option
<b>HP</b>	—	Horsepower
<b>IFM</b>	—	Indoor-Fan Motor
<b>OA</b>	—	Outdoor Air
<b>VAV</b>	—	Variable Air Volume
<b>VFD</b>	—	Variable Frequency Drive

\*Outdoor-air hoods and filters included in base unit weights; indoor-fan motors are NOT included.

#### NOTES:


1. Base Unit Weight includes OA hoods (economizer or outdoor air damper); does not include an indoor-fan motor. ADD indoor motor, FIOPs and Accessories for TOTAL operating weight.
2. VAV Motor Weights include the indoor motor and the VFD, optional VFD bypass, VFD transducer and associated wiring.

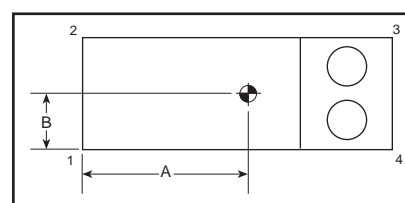


**CENTER OF GRAVITY AND CORNER WEIGHTS**  
**48/50A2,A4 CONSTANT VOLUME UNITS**

UNIT	WEIGHT (lb)	CENTER OF GRAVITY (in.)		CORNER WEIGHT (lb)			
		A	B	1	2	3	4
50A2020	4500	97.4	44.7	906	937	1348	1310
48A2D020	4590	96.3	44.2	950	962	1346	1333
48A2E020	4670	95.7	43.9	981	979	1352	1358
50A4020	4078	97.5	44.7	820	850	1223	1186
48A4D020	4130	96.3	44.3	853	866	1213	1198
48A4E020	4210	95.8	44.0	883	883	1221	1224
50A2025	4636	98.0	44.5	920	963	1379	1374
48A2D025	4726	96.9	44.0	964	988	1377	1397
48A2E025	4806	96.3	43.7	995	1005	1383	1423
50A4025	4214	98.1	44.5	834	876	1255	1250
48A4D025	4266	97.0	44.1	867	892	1244	1263
48A4E025	4346	96.4	43.8	897	909	1252	1288
50A2027	4674	97.2	44.1	958	963	1379	1374
48A2D027	4764	96.1	43.7	1002	988	1377	1397
48A2E027	4844	95.6	43.4	1033	1005	1383	1423
50A4027	4252	97.2	44.1	872	876	1255	1250
48A4D027	4304	96.1	43.7	905	892	1244	1263
48A4E027	4384	95.6	43.4	935	909	1252	1288
50A2030	4705	95.1	44.4	987	1006	1369	1343
48A2D030	4795	94.0	44.0	1032	1032	1366	1366
48A2E030	4875	93.5	43.7	1063	1049	1372	1392
50A4030	4283	94.9	44.4	901	918	1244	1220
48A4D030	4335	93.8	44.0	935	935	1232	1232
48A4E030	4415	93.3	43.7	966	952	1239	1258
50A2035	4999	95.9	41.5	1107	988	1367	1537
48A2D035	5204	94.8	41.0	1181	1034	1393	1596
48A2E035	5364	94.2	40.7	1235	1067	1417	1645
50A4035	4692	95.8	41.5	1040	928	1282	1442
48A4D035	4744	94.7	41.0	1078	944	1269	1454
48A4E035	4904	94.1	40.7	1131	976	1294	1503
50A2040	5429	121.7	41.4	1245	1110	1444	1629
48A2D040	5634	120.3	41.0	1324	1159	1466	1686
48A2E040	5794	118.8	40.7	1392	1202	1477	1723
50A4040	5122	121.6	41.4	1177	1049	1361	1536
48A4D040	5174	120.0	41.0	1219	1067	1343	1546
48A4E040	5334	118.6	40.7	1284	1108	1357	1584
50A2050	5613	119.3	41.7	1310	1188	1472	1644
48A2D050	5818	117.9	41.3	1390	1237	1491	1700
48A2E050	5978	116.5	41.0	1459	1281	1501	1738
50A4050	5306	119.0	41.7	1243	1127	1387	1550
48A4D050	5358	117.4	41.3	1287	1146	1366	1559
48A4E050	5518	115.9	40.9	1354	1189	1378	1598
50A2060	8176	184.9	43.4	1683	1637	2393	2463
48A2D060	8251	177.5	41.3	1879	1666	2206	2500
48A2E060	8491	170.4	39.2	2126	1718	2067	2580
50A4060	7666	184.7	43.4	1580	1537	2242	2307
48A4D060	7566	177.3	41.3	1727	1531	2019	2290
48A4E060	7816	170.1	39.2	1961	1585	1898	2373

NOTES:

- Center of gravity .
- The weight distribution and center of gravity information are representative of a standard unit and include the impact of factory-installed options such as electric heat (50A only), economizer, and modulating power exhaust.



# Physical data (cont)




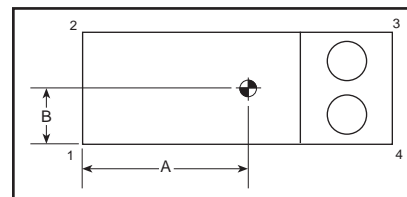
## CENTER OF GRAVITY AND CORNER WEIGHTS (cont)

### 48/50A3,A5 VARIABLE AIR VOLUME UNITS

UNIT	WEIGHT (lb)	CENTER OF GRAVITY (in.)		CORNER WEIGHT (lb)			
		A	B	1	2	3	4
50A3020	4599	98.0	44.9	905	963	1385	1347
48A3D020	4689	96.8	44.5	949	989	1382	1370
48A3E020	4769	96.3	44.2	980	1006	1388	1396
50A5020	4177	98.1	45.0	818	876	1261	1223
48A5D020	4229	96.9	44.6	852	893	1249	1235
48A5E020	4309	96.4	44.2	882	910	1257	1261
50A3025	4735	98.5	44.7	918	989	1416	1411
48A3D025	4825	97.4	44.3	963	1015	1414	1434
48A3E025	4905	96.9	44.0	994	1032	1419	1460
50A5025	4313	98.7	44.8	832	902	1292	1287
48A5D025	4365	97.5	44.3	866	919	1281	1300
48A5E025	4445	97.0	44.0	896	936	1288	1325
50A3027	4801	97.2	44.1	984	989	1416	1411
48A3D027	4891	96.1	43.7	1029	1015	1414	1434
48A3E027	4971	95.6	43.4	1060	1032	1419	1460
50A5027	4379	97.2	44.1	898	902	1292	1287
48A5D027	4431	96.1	43.7	932	919	1281	1300
48A5E027	4511	95.6	43.4	962	936	1288	1325
50A3030	4832	95.2	44.4	1013	1032	1407	1380
48A3D030	4922	94.1	44.0	1058	1058	1403	1403
48A3E030	5002	93.6	43.7	1090	1075	1408	1428
50A5030	4410	95.0	44.4	927	944	1282	1257
48A5D030	4462	93.9	44.0	962	962	1269	1269
48A5E030	4542	93.4	43.7	993	979	1276	1295
50A3035	5134	95.9	41.5	1137	1014	1405	1579
48A3D035	5339	94.8	41.0	1211	1061	1430	1637
48A3E035	5499	94.2	40.7	1266	1093	1453	1687
50A5035	4827	95.8	41.5	1070	954	1320	1484
48A5D035	4879	94.7	41.0	1108	970	1305	1495
48A5E035	5039	94.1	40.7	1161	1003	1330	1545
50A3040	5564	121.8	41.4	1276	1137	1481	1671
48A3D040	5769	120.3	41.0	1355	1186	1502	1727
48A3E040	5929	118.8	40.7	1423	1229	1513	1764
50A5040	5257	121.6	41.4	1207	1076	1398	1577
48A5D040	5309	120.1	41.0	1250	1094	1379	1587
48A5E040	5469	118.6	40.7	1316	1136	1393	1625
50A3050	5744	119.5	41.7	1338	1214	1509	1684
48A3D050	5949	118.1	41.3	1419	1264	1527	1740
48A3E050	6109	116.6	41.0	1489	1308	1536	1777
50A5050	5437	119.1	41.7	1271	1153	1423	1590
48A5D050	5489	117.5	41.3	1316	1172	1402	1599
48A5E050	5649	116.1	40.9	1384	1215	1413	1638
50A3060	8311	184.9	43.4	1710	1663	2433	2504
48A3D060	8386	177.6	41.3	1909	1693	2243	2541
48A3E060	8626	170.4	39.2	2159	1745	2100	2622
50A5060	7801	184.8	43.4	1608	1564	2282	2349
48A5D060	7701	177.3	41.3	1757	1558	2056	2331
48A5E060	7951	170.1	39.2	1994	1611	1932	2414

NOTES:

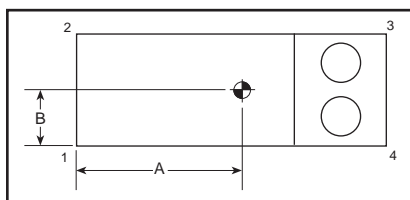
- Center of gravity .
- The weight distribution and center of gravity information are representative of a standard unit and include the impact of factory-installed options such as electric heat (50A only), economizer, and modulating power exhaust.





### FIOP AND ACCESSORY CORNER WEIGHT ADJUSTMENTS

UNIT	WEIGHT (lb)	CORNER WEIGHTS (lb)			
		1	2	3	4
<b>48/50A 020-027</b>					
Barometric Relief	300	2	185	111	1
Non Mod. Power Exhaust	450	3	278	167	2
Mod. Power Exhaust	500	4	309	186	2
Electric Heat	110	59	10	6	35
Al/Cu Cond coil	100	1	1	49	49
Cu/Cu Cond Coil	263	2	2	129	129
Hail Guards	73	0	0	36	36
<b>48/50A 030,035</b>					
Barometric Relief	300	2	185	111	1
Non Mod. Power Exhaust	450	3	278	167	2
Mod. Power Exhaust	500	4	309	186	2
Electric Heat	110	59	10	6	35
Al/Cu Cond coil	150	1	1	74	74
Cu/Cu Cond Coil	370	3	3	182	182
Hail Guards	73	0	0	36	36
<b>48/50A 040</b>					
Barometric Relief	300	2	211	86	1
Non Mod. Power Exhaust	450	4	317	128	1
Mod. Power Exhaust	500	4	352	143	2
Electric Heat	110	67	12	5	27
Al/Cu Cond Coil	187	2	2	92	92
Cu/Cu Cond Coil	512	5	5	252	252
Hail Guards	146	0	0	73	73
<b>48/50A 050</b>					
Barometric Relief	300	2	211	86	1
Non Mod. Power Exhaust	450	4	317	128	1
Mod. Power Exhaust	500	4	352	143	2
Electric Heat	110	67	12	5	27
Al/Cu Cond Coil	317	34	34	124	124
Cu/Cu Cond Coil	751	80	80	295	295
Hail Guards	146	0	0	73	73
<b>48/50A 060</b>					
Barometric Relief	450	4	319	126	1
Non Mod. Power Exhaust	675	6	479	189	2
Mod. Power Exhaust	725	6	514	203	2
Electric Heat	165	101	17	7	40
Al/Cu Cond Coil	26	0	0	13	13
Cu/Cu Cond Coil	677	72	72	266	266
Hail Guards	219	0	0	109	109



# Options and accessories



ITEM	FACTORY-INSTALLED OPTIONS				FIELD-INSTALLED ACCESSORIES			
	A2	A3	A4	A5	A2	A3	A4	A5
<b>GAS HEAT OPTIONS (48A Only)</b>								
Low Gas Heat - Aluminized	X	X	X	X				
High Gas Heat - Aluminized	X	X	X	X				
Low Gas Heat - Stainless Steel	X	X	X	X				
High Gas Heat - Stainless Steel	X	X	X	X				
Staged Gas Heat - Low - Stainless Steel	X	X	X	X				
Staged Gas Heat - High - Stainless Steel	X	X	X	X				
LP Conversion Kit					X	X	X	X
<b>ELECTRIC HEAT (50A Only)</b>								
Low Electric Heat	X	X	X	X				
High Electric Heat	X	X	X	X				
<b>INDOOR AIR QUALITY</b>								
2-inch Filters	X	X	X	X				
4-inch Filters	X	X	X	X				
Return Air CO <sub>2</sub> Sensor	X	X	X	X	X	X	X	X
CO <sub>2</sub> Space Sensor					X	X	X	X
CO <sub>2</sub> Aspirator Box					X	X	X	X
<b>ECONOMIZER</b>								
Manual Outside Air Self-Closing Damper	X	X	X	X				
Modulating Economizer	X	X	X	X				
Outdoor or Return Humidity Sensor (Enthalpy)					X	X	X	X
<b>EXHAUST AIR CONTROL</b>								
Barometric Relief	X	X			X	X	X	X
Non-Modulating Power Exhaust	X				X	X	X	X
Staged Power Exhaust	X	X			X	X	X	X
Building Pressure Control Board (ECB2)					X		X	
Building Pressure Control Sensor					X	X	X	X
<b>CONDENSER AND EVAPORATOR COIL OPTIONS</b>								
Al/Cu Condenser and Evaporator	X	X	X	X				
Al/Cu Pre-Coat Condenser and Al/Cu Evaporator	X	X	X	X				
Al/Cu E-Coat Condenser and Al/Cu Evaporator	X	X	X	X				
Cu/Cu Condenser and Al/Cu Evaporator	X	X	X	X				
Hot Gas Bypass - Circuit A (includes ECB2)	X	X	X	X				
Condenser Coil Hail Guard Assembly					X	X	X	X
Galvanized Drain Pan	X	X	X	X				
Stainless Drain Pan	X	X	X	X				
<b>CONTROLS</b>								
Controls Expansion Module (CEM)	X	X	X	X	X	X	X	X
BACnet Communications	X	X	X	X				
System Pilot™ Interface					X	X	X	X
Touch Pilot™ Interface					X	X	X	X
Navigator™ Display					X	X	X	X
Return Air CO <sub>2</sub> Sensor	X	X	X	X	X	X	X	X
Return Air Smoke Detector	X	X	X	X				
Filter Switch	X	X	X	X	X	X	X	X
Fan Status Switch (requires CEM)					X	X	X	X
T55 Thermostat					X	X	X	X
T56 Thermostat					X	X	X	X
T58 Sensor					X	X	X	X
Space Temperature Sensor with CO <sub>2</sub> Override					X	X	X	X
Space Temperature Sensor Setpoint and CO <sub>2</sub> Override					X	X	X	X
Thermostats (Temp System)					X		X	
Thermostats (Debonair®)					X		X	
Thermostats (Slimline)					X		X	
Thermostats (Corporate)					X		X	
MODBUS Carrier Translator					X	X	X	X
LonWorks Carrier Translator					X	X	X	X
<b>POWER CIRCUIT</b>								
GFI Convenience Outlet (powered)	X	X	X	X				
GFI Convenience Outlet (not powered)	X	X	X	X				
Power Terminal Block	X	X	X	X				
Non-Fused Disconnect	X	X	X	X				
<b>INDOOR MOTOR OPTIONS</b>								
Low HP, High Eff	X	X	X	X				
Medium HP, High Eff	X	X	X	X				
High HP, High Eff	X	X	X	X				
Low HP, Premium Eff	X	X	X	X				
Medium HP, Premium Eff	X	X	X	X				
High HP, Premium Eff	X	X	X	X				
Bypass on IFM VFD		X		X				
<b>PACKAGING</b>								
Domestic	X	X	X	X				
Export	X	X	X	X				
<b>MISCELLANEOUS OPTIONS</b>								
14-inch Roof Curb					X	X	X	X
Full-perimeter Roof Curb					X	X	X	X
Security Grille (60 Ton Unit Only)	X	X	X	X	X	X	X	X
Motormaster® V Control					X	X	X	X

LEGEND

- Al — Aluminum
- Cu — Copper
- GFI — Ground Fault Circuit Interrupter
- IFM — Indoor Fan Motor
- LP — Liquid Propane
- VFD — Variable Frequency Drive



# Base unit dimensions — 48A2,A3020-035



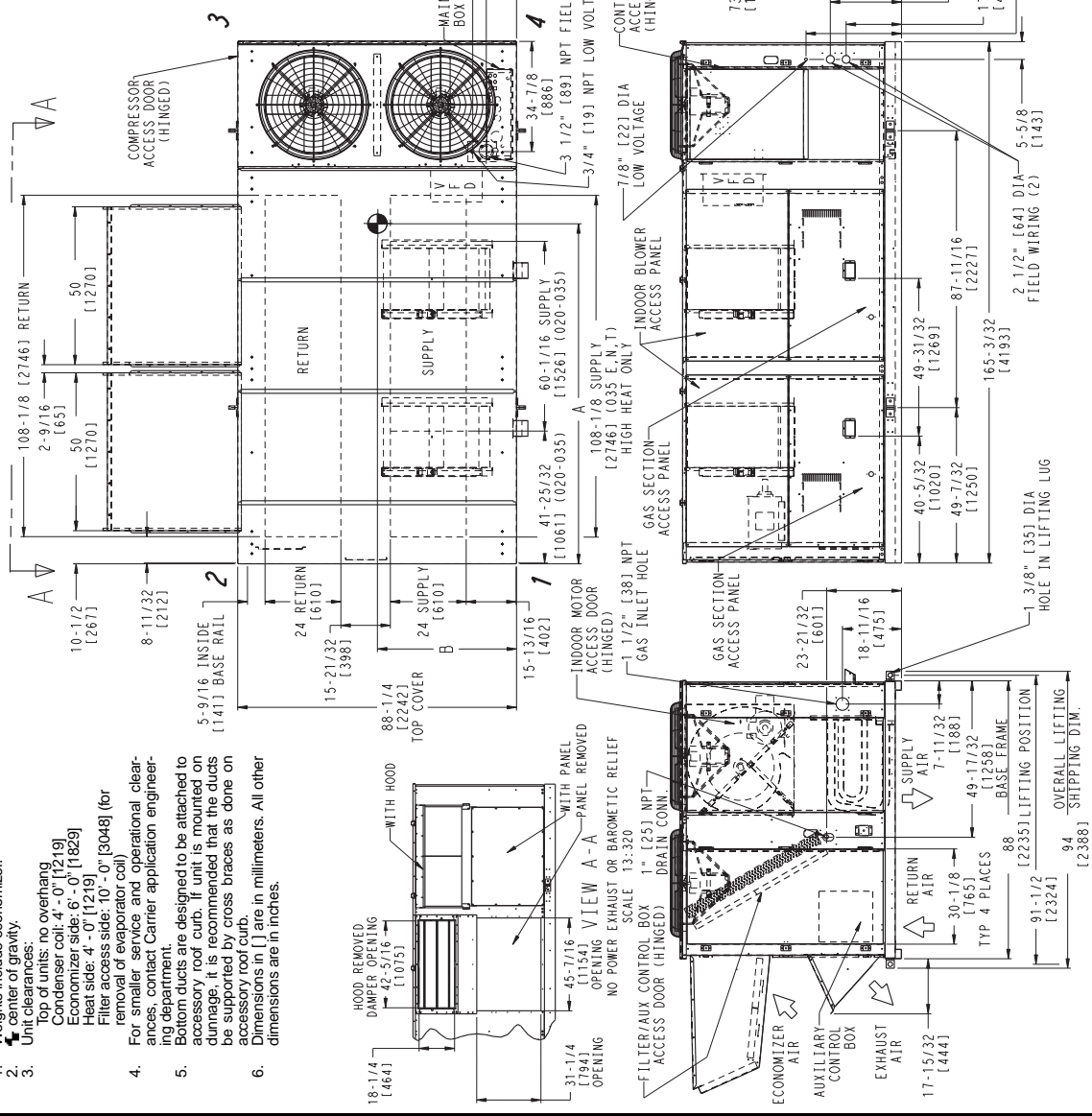
**NOTES:**

1. Weights include economizer.
2. Center of gravity.
3. Unit clearances:
4. For smaller service and operation engineering department.
5. Bottom ducts are designed to be attached to accessory roof curb. If unit is mounted on ductage, it is recommended that the ducts be supported by cross braces as done on accessory roof curb.
6. Dimensions in [ ] are in millimeters. All other dimensions are in inches.

UNIT SIZE	OPERATING WEIGHT (LBS)		CORNER WEIGHTS (LBS)					
	WEIGHT	★	A	B	1	2	3	4
48A2/A3 (D.M.S.) 020	4169	2127	8'-0" 1/8"	3'-8" 1/2"	849	989	1382	1370
48A2/A3 (E.N.T.) 020	4169	2127	8'-0" 1/4"	3'-8" 1/8"	860	1006	1388	1346
48A2/A3 (D.M.S.) 025	4825	2225	8'-0" 3/8"	3'-8" 1/4"	963	1015	1414	1434
48A2/A3 (E.N.T.) 025	4825	2225	8'-0" 1/8"	3'-7" 3/4"	964	1032	1419	1460
48A2/A3 (D.M.S.) 027	4891	2240	8'-0" 1/8"	3'-7" 3/4"	1029	1015	1414	1434
48A2/A3 (E.N.T.) 027	4891	2240	7'-11" 5/8"	3'-7" 3/8"	1060	1032	1419	1460
48A2/A3 (D.M.S.) 030	4922	2253	7'-10"	3'-8"	1058	1058	1403	1403
48A2/A3 (E.N.T.) 030	4922	2253	7'-10"	3'-8"	1058	1058	1403	1403
48A2/A3 (D.M.S.) 035	5332	2422	7'-10" 1/4"	3'-8" 1/4"	1170	1065	1426	1426
48A2/A3 (E.N.T.) 035	5332	2422	7'-10" 1/4"	3'-8" 1/4"	1170	1065	1426	1426
48A2/A3 (E.N.T.) 035	5449	2494	7'-10" 1/4"	3'-4" 3/4"	1266	1093	1453	1488

UNIT SIZE	OPERATING WEIGHT (kg)		CORNER WEIGHTS (kg)					
	WEIGHT	★	A	B	1	2	3	4
48A2/A3 (D.M.S.) 020	1886	968	2466	1130	430	448	621	621
48A2/A3 (E.N.T.) 020	1886	968	2466	1122	445	456	630	633
48A2/A3 (D.M.S.) 025	2189	1000	2474	1125	437	460	641	651
48A2/A3 (E.N.T.) 025	2225	1032	2460	1117	451	468	644	662
48A2/A3 (D.M.S.) 027	2219	1029	2440	1110	467	460	641	651
48A2/A3 (E.N.T.) 027	2253	1060	2440	1102	480	468	656	656
48A2/A3 (D.M.S.) 030	2253	1032	2376	1110	495	468	639	648
48A2/A3 (E.N.T.) 030	2422	1093	2408	1043	549	481	649	743
48A2/A3 (E.N.T.) 035	2494	1266	2393	1035	574	496	659	765

\*Operating weight includes largest indoor fan motor, micro-channel heat exchanger, modulating power exhaust (variable air volume units), and variable frequency drive (variable air volume units).



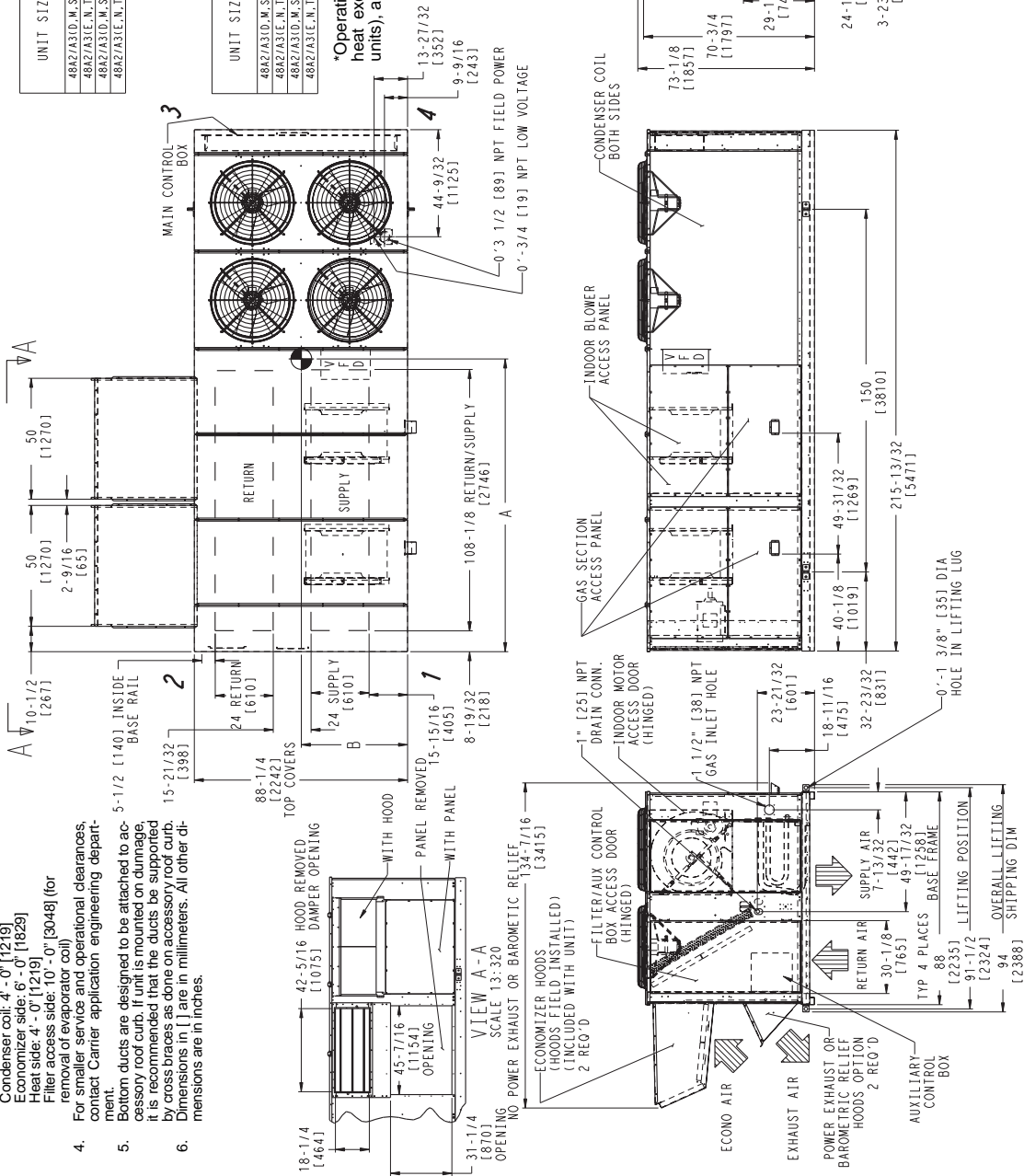
# Base unit dimensions — 48A2,A3040,050



UNIT SIZE	OPERATING WEIGHT (LBS)	A FT/IN	B FT/IN	CORNER WEIGHT (LBS)
48A2/A3040, M.S.1040	5169	10'-0 3/8"	3'-5"	1345
48A2/A3040, N.17040	5929	8'-10 7/8"	3'-4 3/4"	1423
48A2/A3040, M.S.1050	5949	8'-10 7/8"	3'-5 1/4"	1419
48A2/A3040, N.17050	6109	9'-8 5/8"	3'-5"	1489

UNIT SIZE	OPERATING WEIGHT (kg)	A MM	B MM	CORNER WEIGHT (kg)
48A2/A3040, M.S.1040	2617	3056	1041	615
48A2/A3040, N.17040	2890	3016	1034	646
48A2/A3040, M.S.1050	2899	2992	1040	644
48A2/A3040, N.17050	2771	2962	1040	675

\*Operating weight includes largest indoor fan motor, microchannel heat exchanger, modulating power exhaust (variable air volume units), and variable frequency drive (variable air volume units).

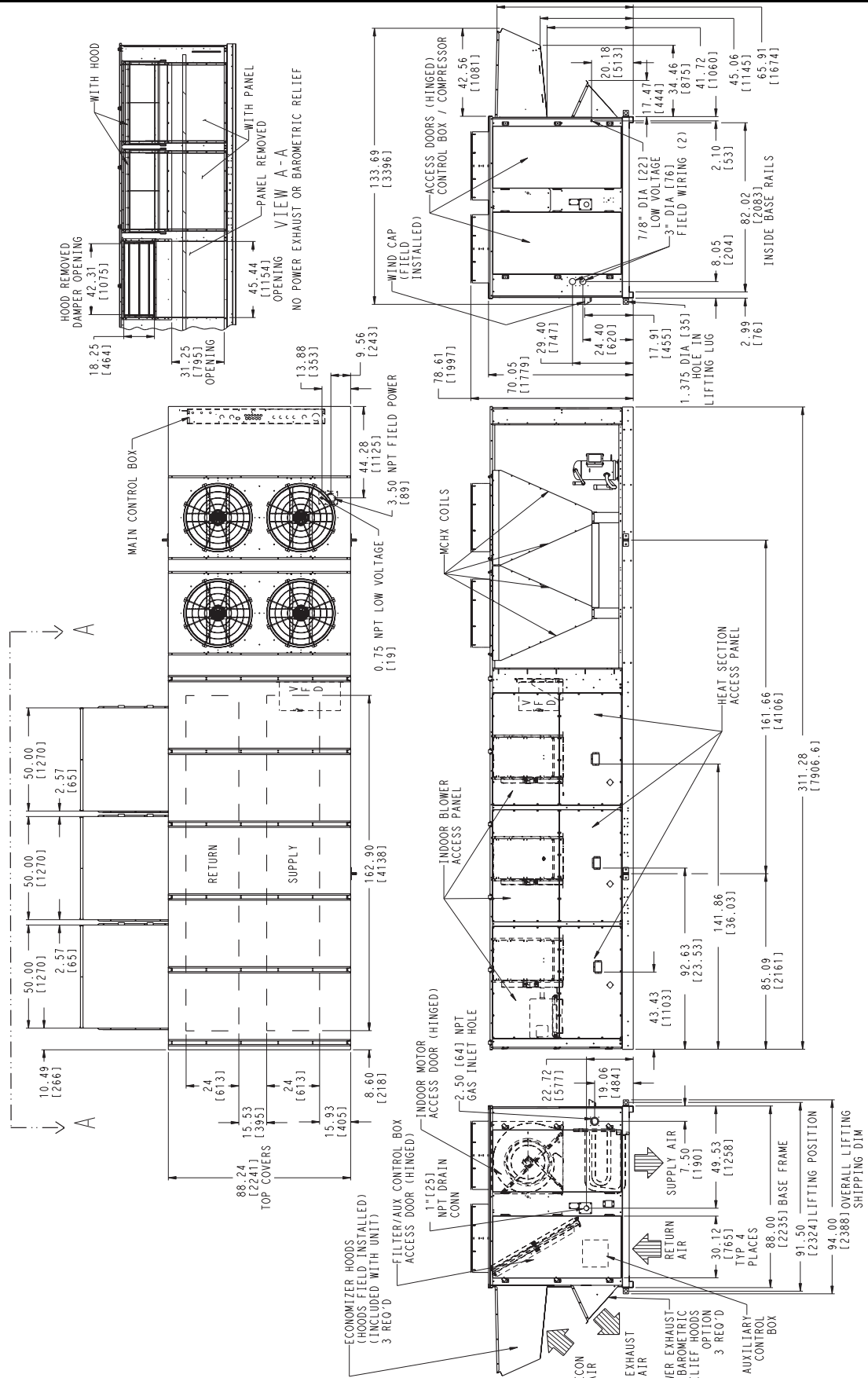


- NOTES:**
- Weights include economizer.
  - Center of gravity.
  - Unit clearances:
  - For smaller service and operational clearances, contact Carrier application engineering department.
  - Bottom ducts are designed to be attached to accessory roof curb, if unit is mounted on downpipe, it is recommended that the ducts be supported by cross braces as done on accessory roof curb. Dimensions in [ ] are in millimeters. All other dimensions are in inches.

# Base unit dimensions — 48A2,A3060



FOR CENTERS OF GRAVITY,  
OPERATING AND CORNER  
WEIGHTS, SEE PAGE 25



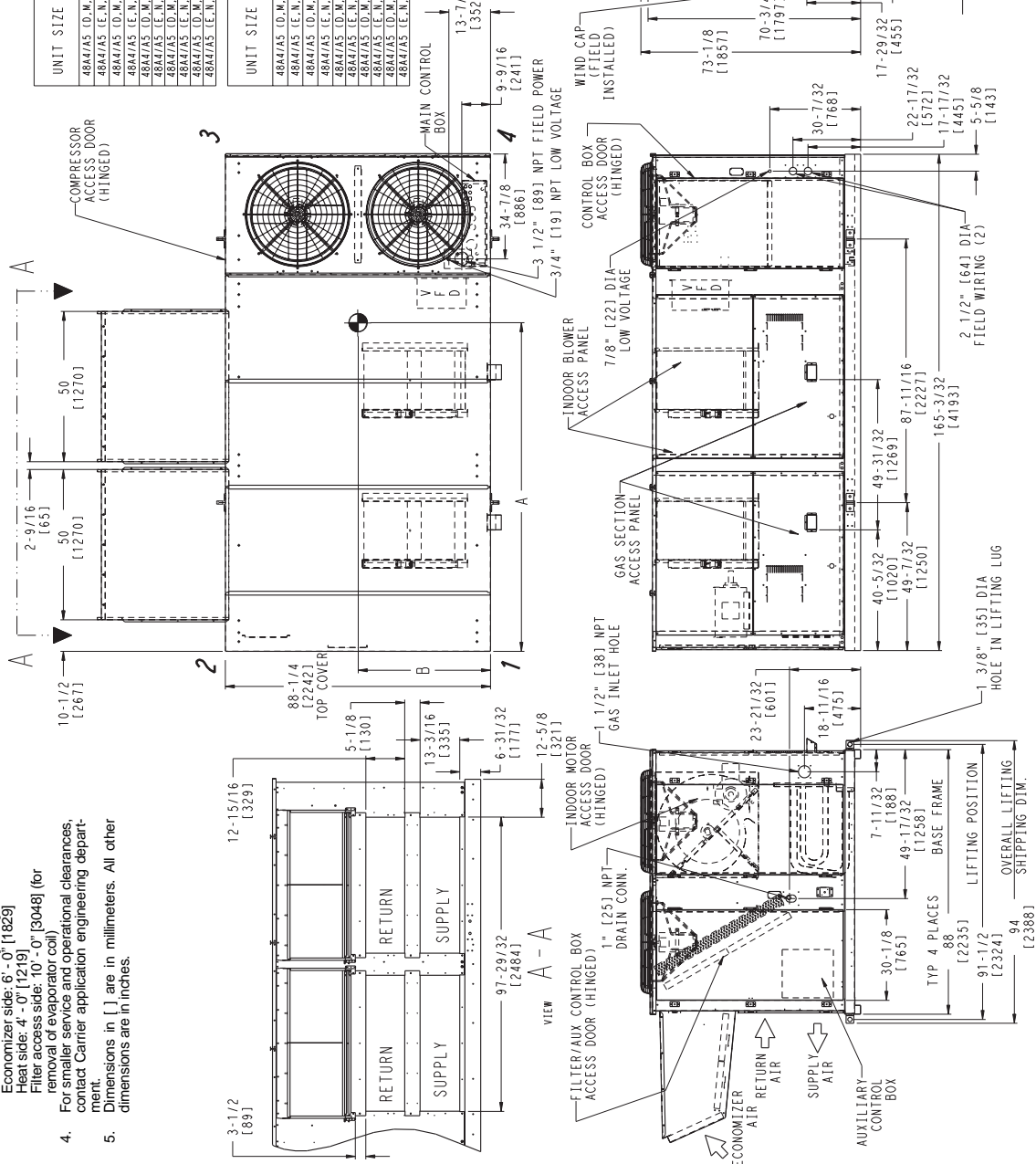
# Base unit dimensions — 48A4,A5020-035



UNIT SIZE	OPERATING WEIGHT		CORNER WEIGHT (LBS)	
	LBS	KG	1	2
48A47AS (D.M.S.) 020	4723	2145	855	1300
48A47AS (E.M.T.) 020	4809	2182	886	1328
48A47AS (D.M.S.) 025	4865	2207	883	1328
48A47AS (E.M.T.) 025	4945	2243	924	1382
48A47AS (D.M.S.) 027	5011	2273	939	1414
48A47AS (E.M.T.) 027	5091	2303	962	1471
48A47AS (D.M.S.) 030	5042	2280	966	1455
48A47AS (E.M.T.) 030	5142	2332	996	1486
48A47AS (D.M.S.) 035	5379	2440	1112	1651
48A47AS (E.M.T.) 035	5539	2513	1165	1741

UNIT SIZE	OPERATING WEIGHT		CORNER WEIGHT (kg)	
	LBS	KG	1	2
48A47AS (D.M.S.) 020	4723	2145	388	545
48A47AS (E.M.T.) 020	4809	2182	402	553
48A47AS (D.M.S.) 025	4865	2207	394	557
48A47AS (E.M.T.) 025	4945	2243	408	564
48A47AS (D.M.S.) 027	5011	2273	424	557
48A47AS (E.M.T.) 027	5091	2303	438	564
48A47AS (D.M.S.) 030	5042	2280	452	584
48A47AS (E.M.T.) 030	5142	2332	458	598
48A47AS (D.M.S.) 035	5379	2440	504	676
48A47AS (E.M.T.) 035	5539	2513	528	688

\*Operating weight includes largest indoor fan motor, microchannel heat exchanger, modulating power exhaust (variable air volume units), and variable frequency drive (variable air volume units).



- NOTES:**
- Weights include economizer, center of gravity.
  - Unit clearances:
  - Top of units: no overhang.  
Condenser coil: 4" - 0" [1219]  
Economizer side: 6" - 0" [1829]  
Heat side: 4" - 0" [1219]  
Filter access side: 10" - 0" [3048] (for removal of evaporator coil)
  - For smaller service and operational clearances, contact Carrier application engineering department.
  - Dimensions in [ ] are in millimeters. All other dimensions are in inches.

# Base unit dimensions — 48A4,A5040,050

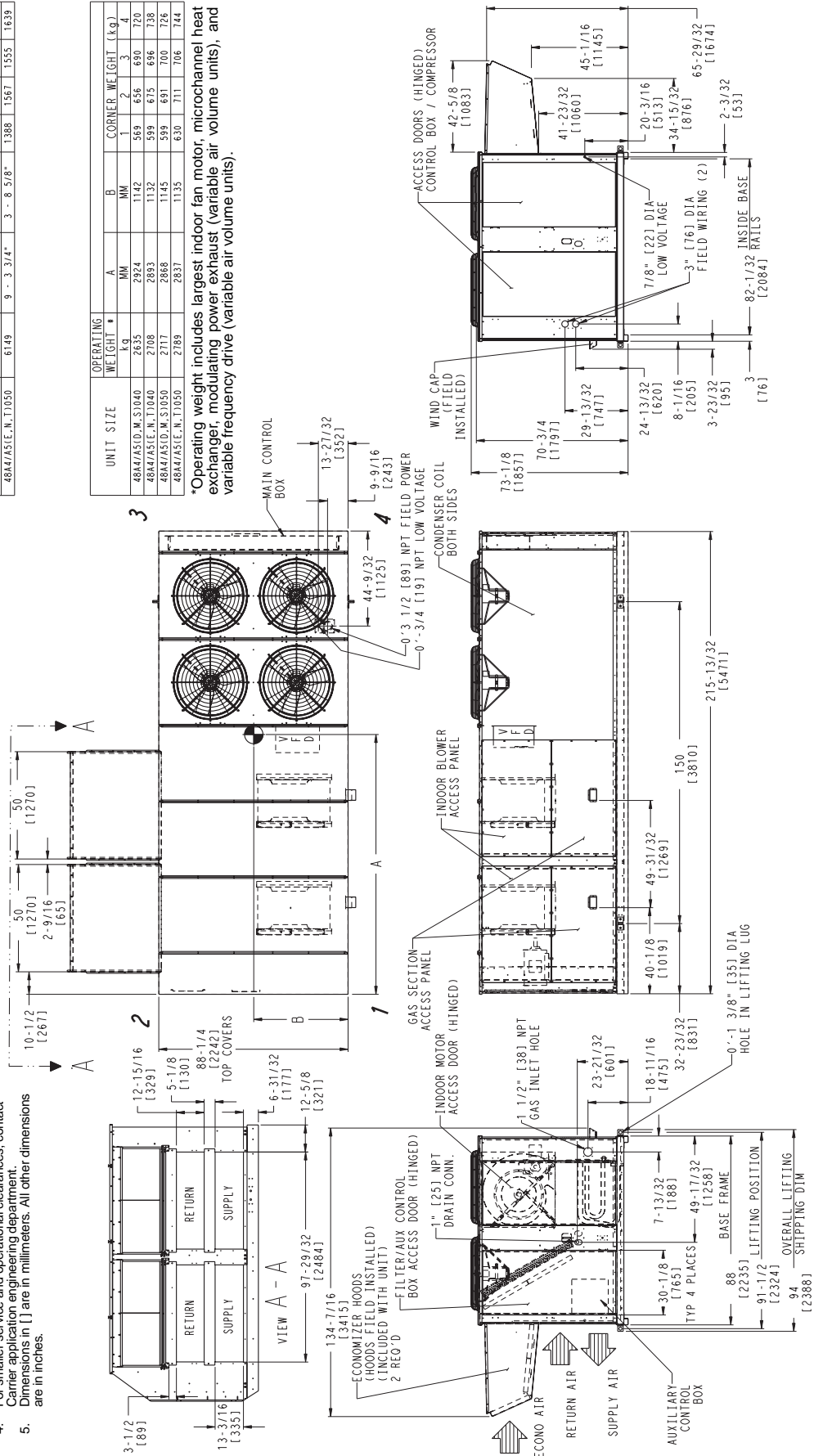


UNIT SIZE	OPERATING WEIGHT (LBS)		CORNER WEIGHT (LBS)	
	WT	HT	WT	HT
48A4/A5040, N, S1040	5893	8'-7 1/8"	1354	14.5
48A4/A51E, N, S1040	5893	8'-5 1/8"	1320	14.88
48A4/A51E, N, S1050	5893	9'-4 1/8"	1320	15.24
48A4/A51E, N, S1050	6149	9'-3 3/4"	1388	15.61

UNIT SIZE	OPERATING WEIGHT (kg)		CORNER WEIGHT (kg)	
	WT	HT	WT	HT
48A4/A5040, N, S1040	2635	2424	656	6.50
48A4/A51E, N, S1040	2635	2383	593	6.75
48A4/A51E, N, S1050	2635	2888	630	6.91
48A4/A51E, N, S1050	2789	2837	630	7.11

\*Operating weight includes largest indoor fan motor, microchannel heat exchanger, modulating power exhaust (variable air volume units), and variable frequency drive (variable air volume units).

- NOTES:**
- Weights include economizer.
  - Center of gravity.
  - Unit clearances:
- Top of units: no overhang
  - Condenser coil: 4" - 0" [1219]
  - Economizer side: 6" - 0" [1829]
  - Heat side: 4" - 0" [1219]
  - Filter access side: 10" - 0" [3048] (for removal of evaporator coil)
- For smaller service and operational clearances, contact Carrier application engineering department.
  - Dimensions in [ ] are in millimeters. All other dimensions are in inches.

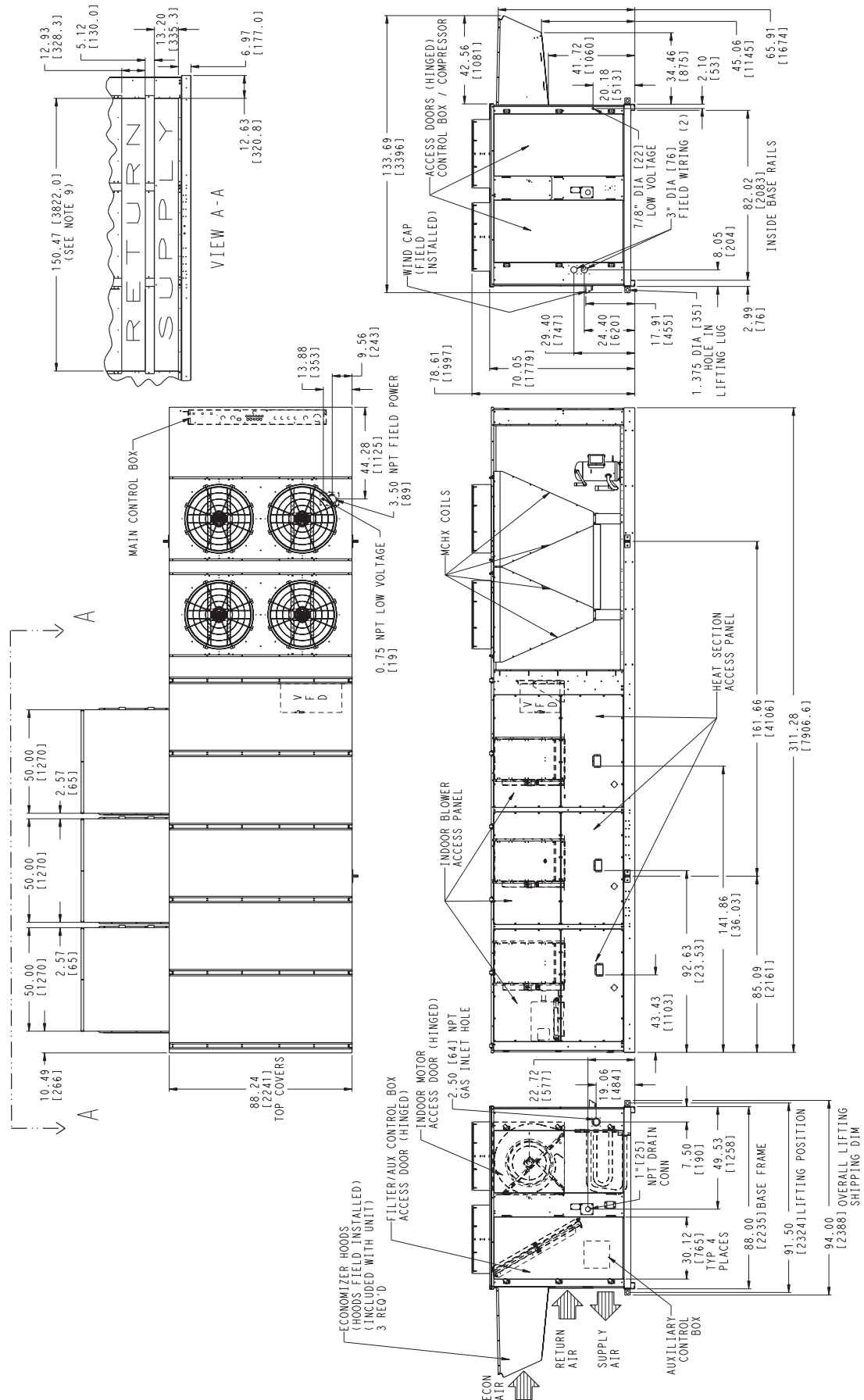




# Base unit dimensions — 48A4,A5060



FOR CENTERS OF GRAVITY,  
OPERATING AND CORNER  
WEIGHTS, SEE PAGE 25



## CENTER OF GRAVITY AND WEIGHTS — 48A2,A3,A4,A5060

**NOTES:**

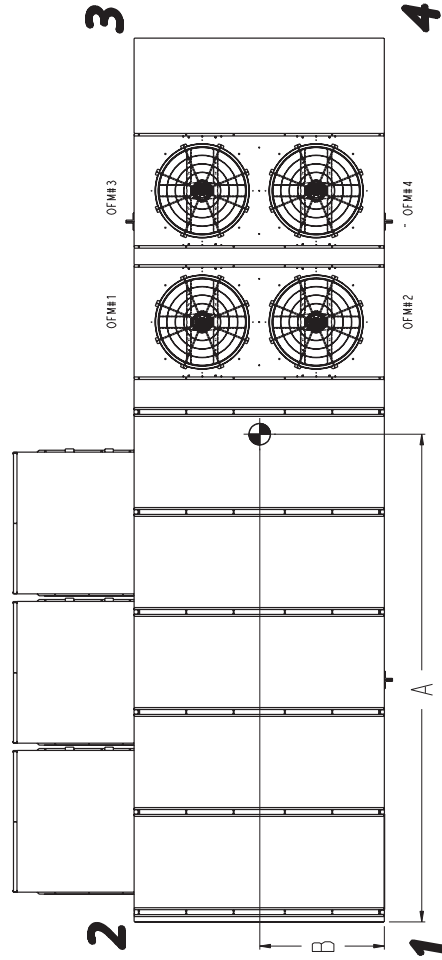
1. Weights include economizer or outdoor air damper.
2. Center of gravity.
3. Unit clearances:  
 Top of units: no overhang  
 Condenser coil: 4'-0" [1219]  
 Economizer side: 6'-0" [1829]  
 Heat side: 4'-0" [1219]  
 Filter access side: 10'-0" [3048] (for removal of evaporator coil)
4. For smaller service and operational clearances, contact Carrier application engineering department.
5. Bottom ducts are designed to be attached to accessory roof curb. If unit is mounted on downguts, it is recommended that the ducts be supported by cross braces as done on accessory roof curb.
6. Base unit weights include outdoor air hoods and filters (indoor fan motor is not included). Add indoor fan motor, FLOPs, and accessories for total operating weight.
7. VAV motor weights include indoor motor, VFD, VFD transducer, and associated wiring.
8. Dimensions in [ ] are in millimeters. All other dimensions are in inches.
9. For side-supply/return applications, a single return and supply ductwork connection is recommended for covering all three return and all three supply openings. The entire area around the duct openings is available for a 1.5" duct flange attachment.

BASE UNIT WEIGHTS (SEE NOTE 6)	
	LBS. (Kg)
	060
48A2D/A3D	7066 (3205)
48A2E/A3E	7306 (3314)
48A4D/A5D	7106 (3223)
48A4E/A5E	7356 (3337)
OPTIONS / ACCESSORIES (SEE NOTE 6)	
BAROMETRIC RELIEF	450 (204)
NON MOD. POWER EXHAUST	675 (306)
MOD. POWER EXHAUST	725 (329)
CU TU/AL FIN COND COIL	26 (12)
CU TU/CU FIN COND COIL	677 (307)

UNIT SIZE	OPERATING WEIGHT* (lb)	CENTER OF GRAVITY (ft.-in.)		CORNER WEIGHTS (lb)			
		A	B	1	2	3	4
48A2,A3 (D, M, S) 060	8386	14 - 9 5/8	3 - 5 1/4	1909	1693	2243	2541
48A2,A3 (E, N, T) 060	8626	14 - 2 3/8	3 - 3 1/4	2159	1745	2100	2622
48A4,A5 (D, M, S) 060	8426	14 - 1 5/8	3 - 9 1/4	1763	2072	2259	2333
48A4,A5 (E, N, T) 060	8676	13 - 7 1/4	3 - 7 1/4	2000	2126	2134	2417

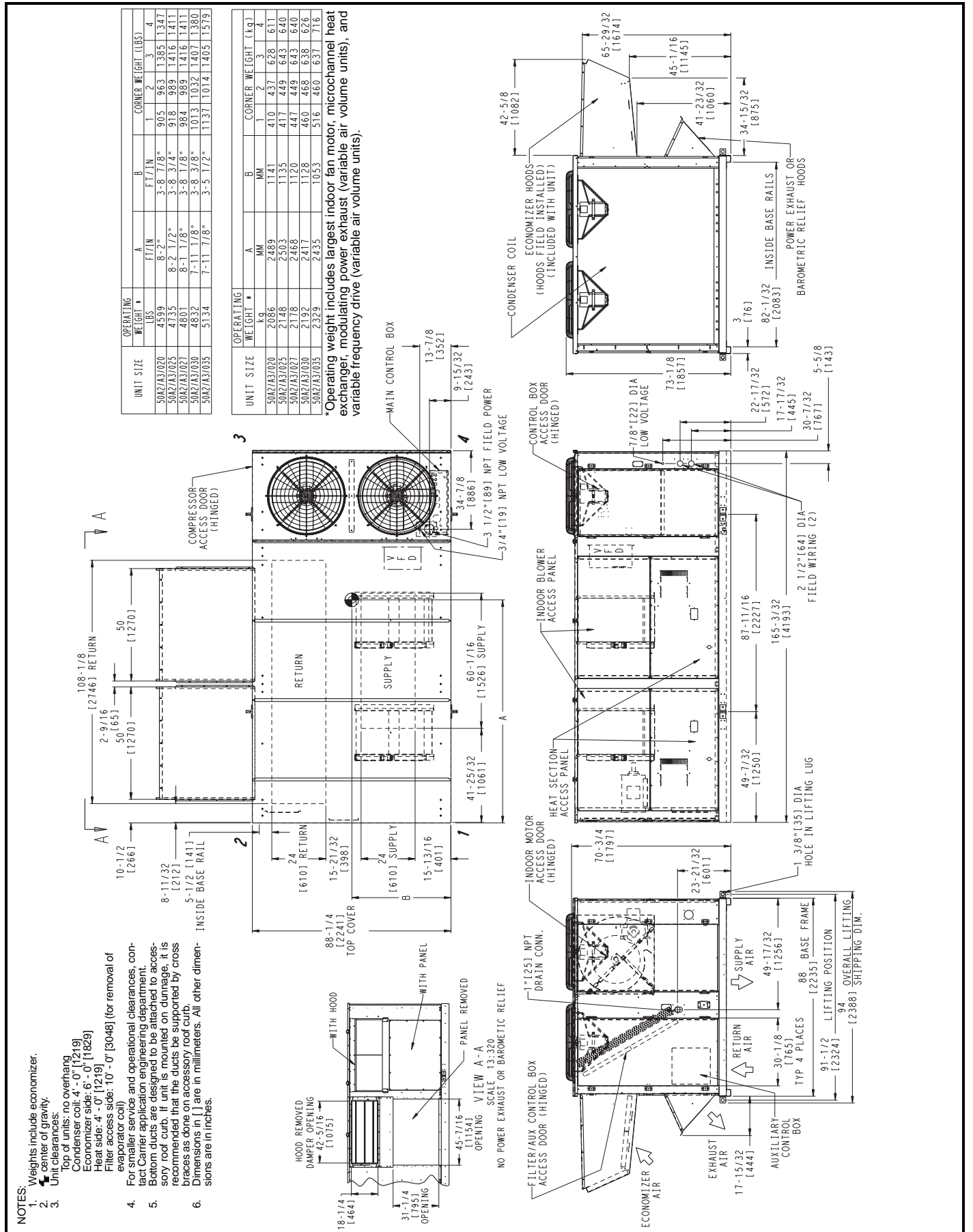
UNIT SIZE	OPERATING WEIGHT* (kg)	CENTER OF GRAVITY (mm)		CORNER WEIGHTS (kg)			
		A	B	1	2	3	4
48A2,A3 (D, M, S) 060	3804	4514	1048	866	768	1017	1153
48A2,A3 (E, N, T) 060	3913	4329	997	979	792	953	1189
48A4,A5 (D, M, S) 060	3822	4310	1150	800	940	1024	1058
48A4,A5 (E, N, T) 060	3936	4146	1099	907	964	968	1096

\*Operating weight includes largest indoor fan motor, microchannel heat exchanger, modulating power exhaust (variable air volume units), and variable frequency drive (variable air volume units).

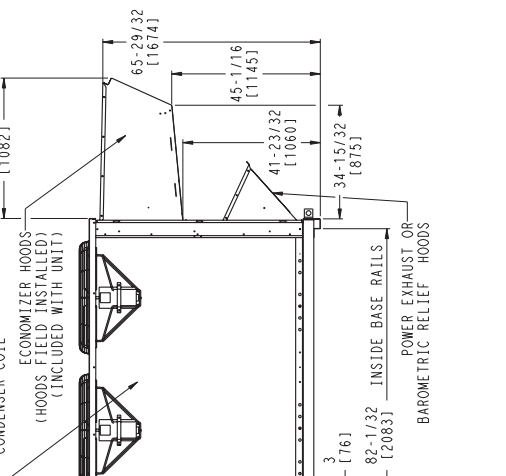
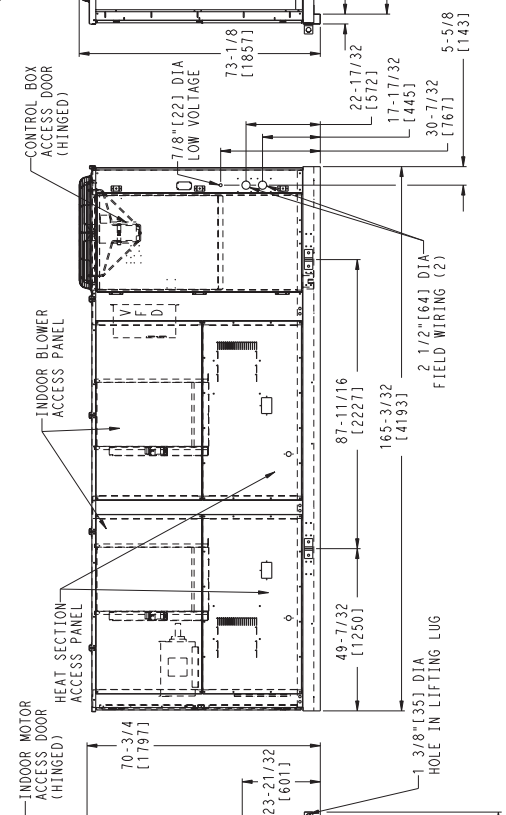
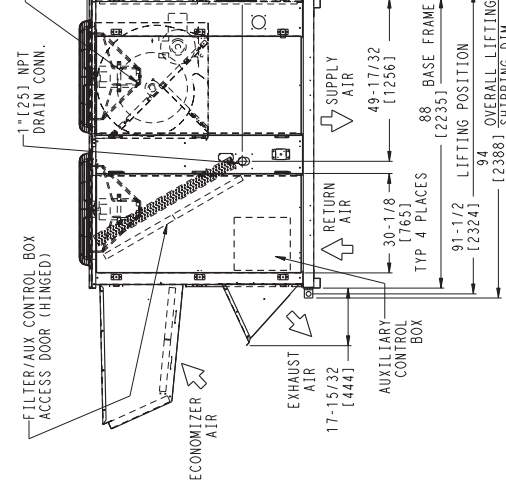
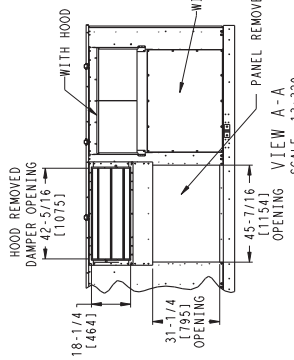


	CV MOTOR WEIGHTS LBS. (Kg)		VAV MOTOR WEIGHTS LBS. (Kg) (SEE NOTE 7)	
	HIGH EFFCY IFM	PREMIUM EFFCY IFM	HIGH EFFCY IFM	PREMIUM EFFCY IFM
25 HP (18.65 Kw)	230/460 575	240 (109) 309 (140)	375 (170) 375 (170)	444 (201) 454 (206)
30 HP (22.38 Kw)	230/460 575	283 (128) 355 (161)	418 (190) 418 (190)	490 (222) 494 (224)
40 HP (29.84 Kw)	230/460 575	372 (169) 415 (188)	507 (230) 507 (230)	550 (249) 545 (247)

# Base unit dimensions — 50A2,A3020-035



- NOTES:**
- Weights include economizer.
  - Center of gravity.
  - Unit clearances:
    - Top of units: no overhang
    - Condenser coil: 4" - 0" [1219]
    - Economizer side: 6" - 0" [1829]
    - Heat side: 4" - 0" [1219]
    - Filter access side: 10" - 0" [3048] (for removal of evaporator coil)  - For smaller service and operational clearances, contact Carrier application engineering department.
  - Bottom ducts are designed to be attached to accessory roof curb, if unit is mounted on downpipe, it is recommended that the ducts be supported by cross braces as done on accessory roof curb.
  - Dimensions in [ ] are in millimeters. All other dimensions are in inches.



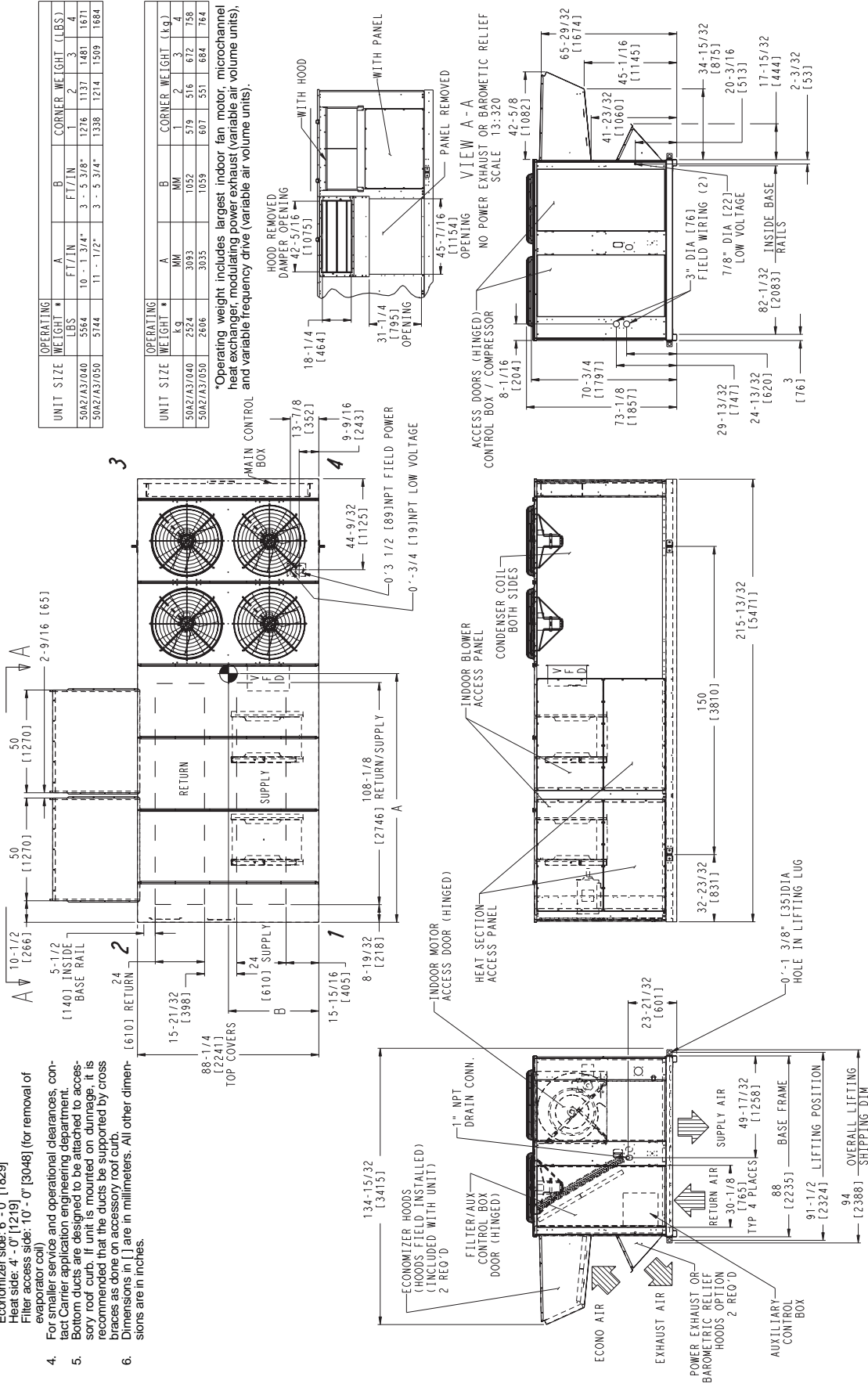
# Base unit dimensions — 50A2,A3040,050



UNIT SIZE	OPERATING WEIGHT *		CORNER WEIGHT (LBS.)	
	LBS	FT/IN	FT/IN	LBS
50A2/A3/040	584	10 - 1 3/4"	3 - 5 3/8"	1276
50A2/A3/050	574	11 - 1/2"	3 - 5 3/4"	1338

UNIT SIZE	OPERATING WEIGHT *		CORNER WEIGHT (kg)	
	kg	MM	MM	kg
50A2/A3/040	262	2833	1052	516
50A2/A3/050	260	3035	1059	607

\*Operating weight includes largest indoor fan motor, microchannel heat exchanger, modulating power exhaust (variable air volume units), and variable frequency drive (variable air volume units).



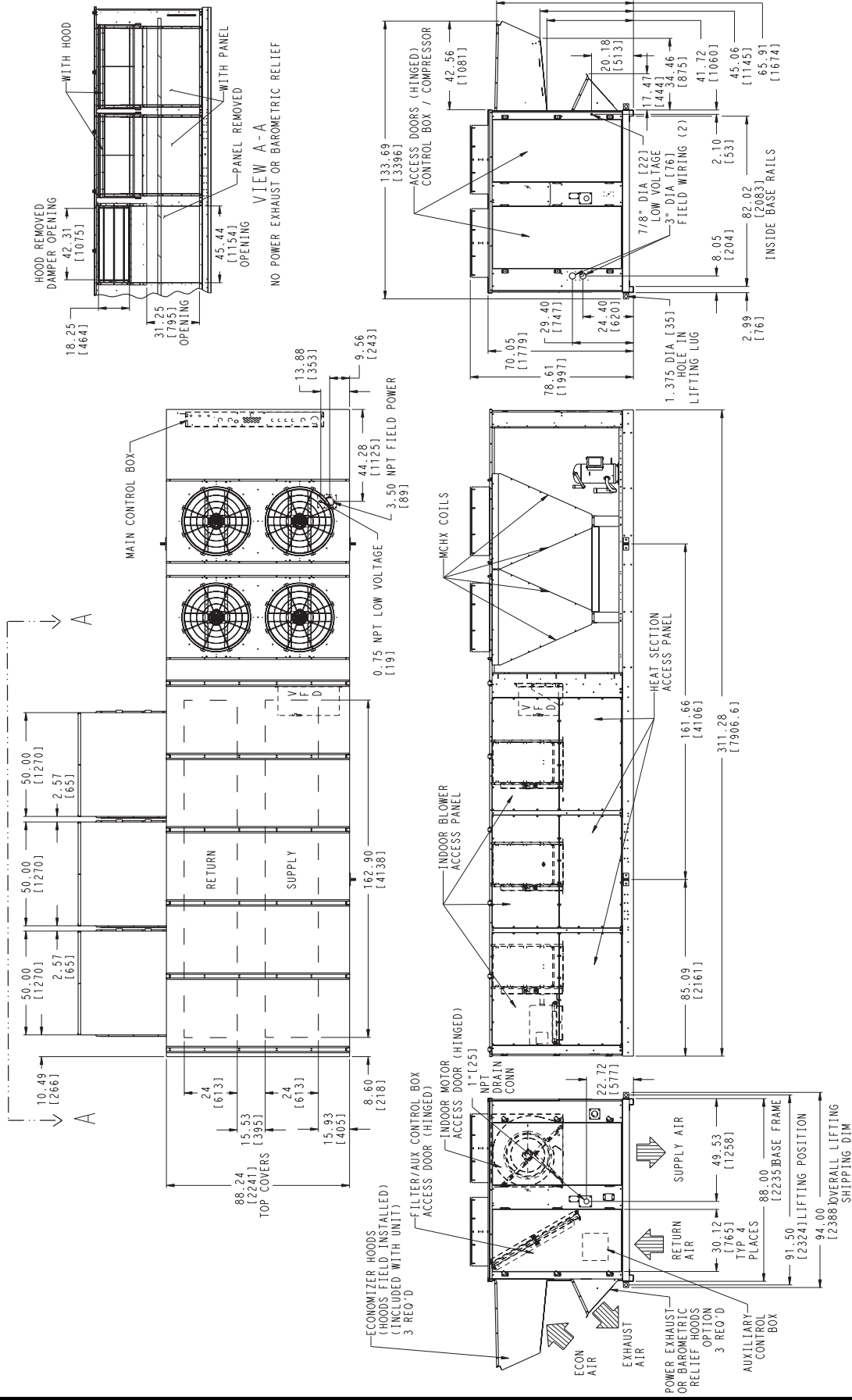
**NOTES:**

- Weights include economizer.
- Center of gravity.
- Unit clearances:
  - Top of units: no overhang.
  - Condenser coil: 4" - 0" [1219]
  - Economizer side: 6" - 0" [1829]
  - Heat side: 4" - 0" [1219]
  - Filter access side: 10" - 0" [3048] (for removal of evaporator coil)
- For smaller service and operational clearances, contact Carrier application engineering department.
- Bottom roof curb is designed to be attached to accessory roof curb. If unit is mounted on downgage, it is recommended that the ducts be supported by cross braces as done on accessory roof curb.
- Dimensions in [ ] are in millimeters. All other dimensions are in inches.

# Base unit dimensions — 50A2,A3060



FOR CENTERS OF GRAVITY,  
OPERATING AND CORNER  
WEIGHTS, SEE PAGE 32



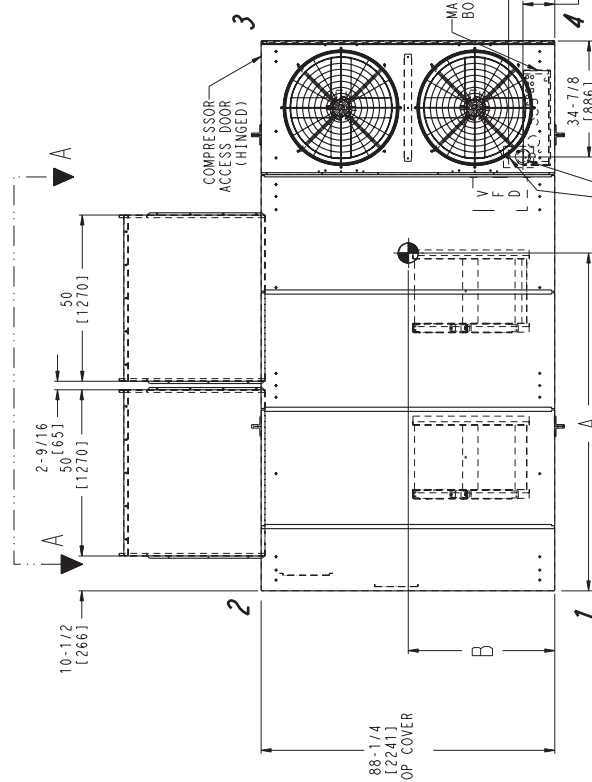
# Base unit dimensions — 50A4,A5020-035



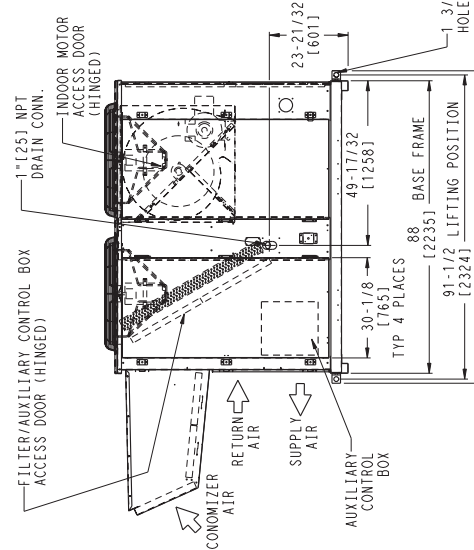
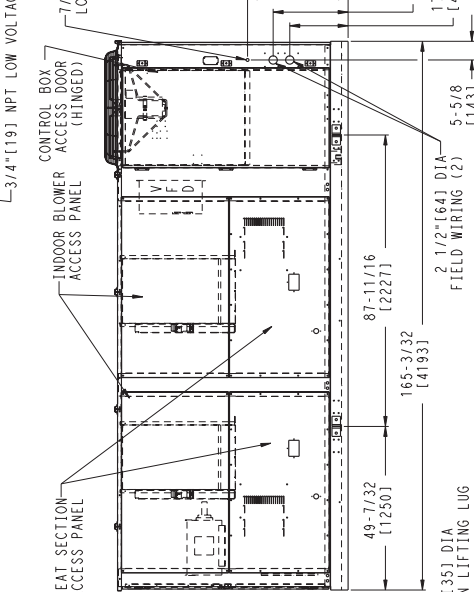
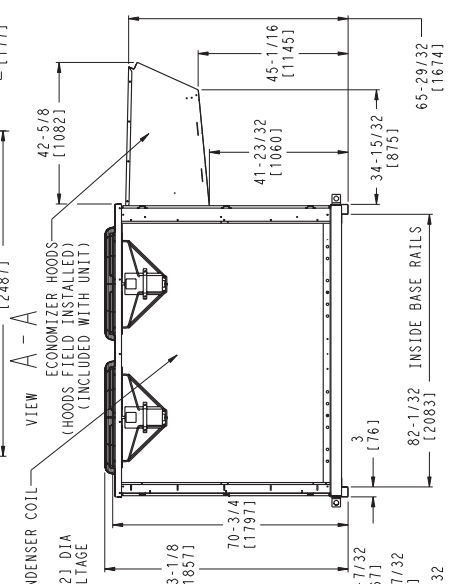
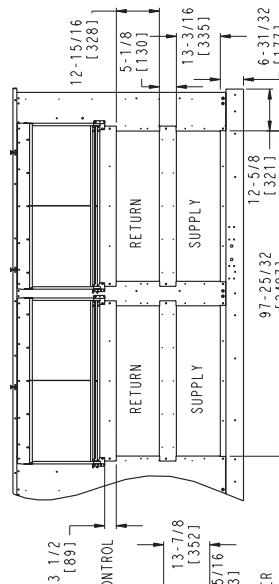
UNIT SIZE	OPERATING WEIGHT *		CORNER WEIGHT (LBS.)	
	LBS.	FT./IN.	A	B
50A4/A5020	4677	7 - 10 1/4"	4 - 1 1/2"	821
50A4/A5025	4813	7 - 10 3/8"	4 - 1 1/4"	835
50A4/A5030	4818	7 - 9 5/8"	4 - 0 1/2"	903
50A4/A5035	4910	7 - 7 3/8"	4 - 0 3/4"	931
50A4/A5035	5321	7 - 8 3/8"	3 - 9 3/4"	1013

UNIT SIZE	OPERATING WEIGHT *		CORNER WEIGHT (kg.)	
	kg.	MM	A	B
50A4/A5020	2122	2394	1257	373
50A4/A5025	2183	2410	1248	379
50A4/A5030	2213	2377	1232	409
50A4/A5030	2227	1238	422	568
50A4/A5035	2416	2353	1161	487

\*Operating weight includes largest indoor fan motor, microchannel heat exchanger, modulating power exhaust (variable air volume units), and variable frequency drive (variable air volume units).



- Weights include economizer, center of gravity.
- Unit clearances:
- Top of units: no overhang  
Condenser coil: 4" - 0" [1219]  
Economizer side: 6" - 0" [1829]  
Heat side: 4" - 0" [1219]  
Filter access side: 10" - 0" [3048] (for removal of evaporator coil)
- For smaller service and operational clearances, contact Carrier application engineering department.
- Dimensions in [ ] are in millimeters. All other dimensions are in inches.





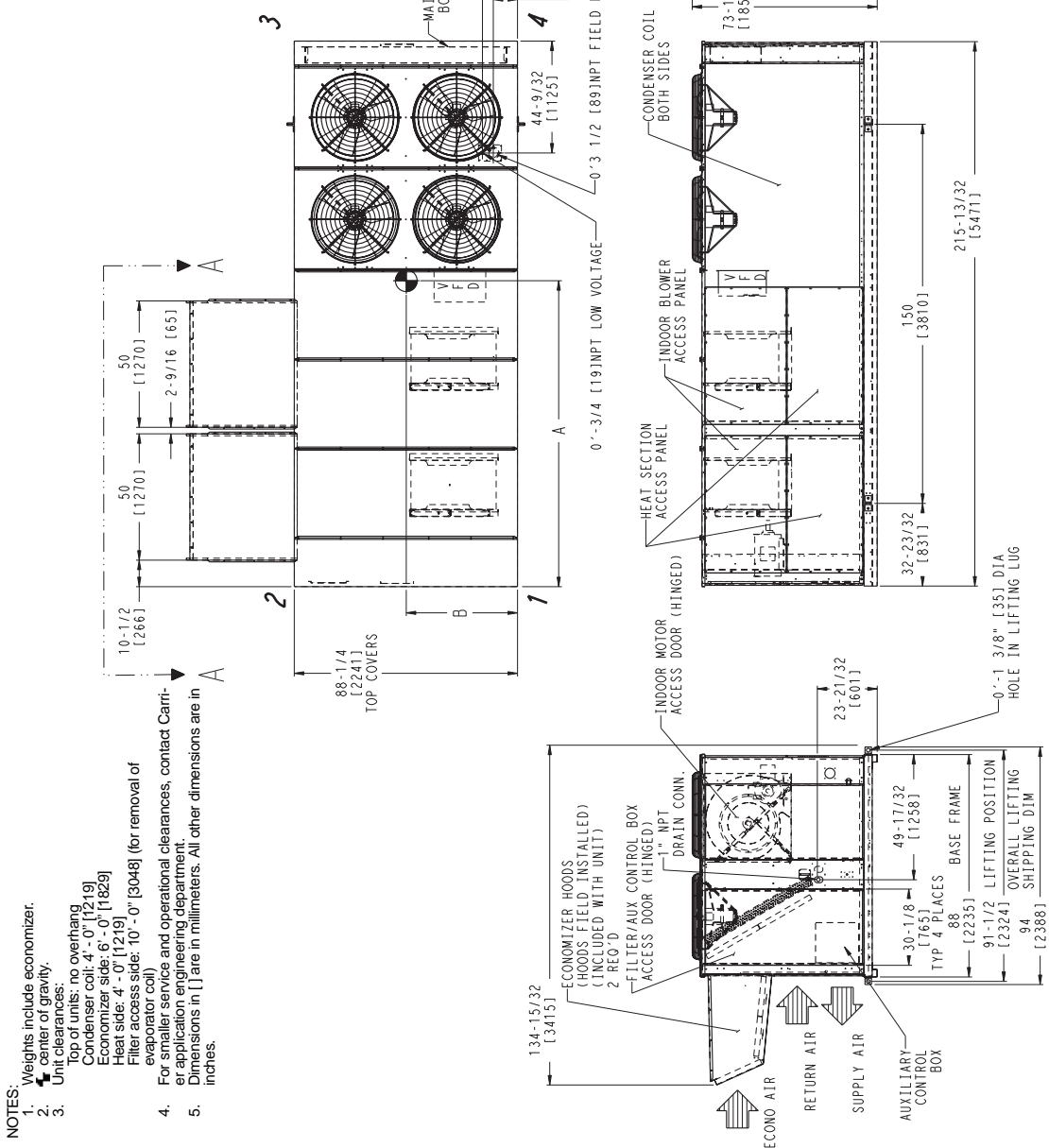
# Base unit dimensions — 50A4,A5040,050



UNIT SIZE	OPERATING WEIGHT *		CORNER WEIGHT (LBS.)	
	LBS	FT./IN	B	
50A4/A5/040	5757	9-8 1/2"	1211	1428 1540 1578
50A4/A5/050	5937	9-6 1/4"	1276	1505 1566 1591

UNIT SIZE	OPERATING WEIGHT *		CORNER WEIGHT (kg)	
	kg	MM	B	
50A4/A5/040	2612	2958	549	648 699 716
50A4/A5/050	2693	2904	579	683 710 722

\*Operating weight includes largest indoor fan motor, microchannel heat exchanger, modulating power exhaust (variable air volume units), and variable frequency drive (variable air volume units).

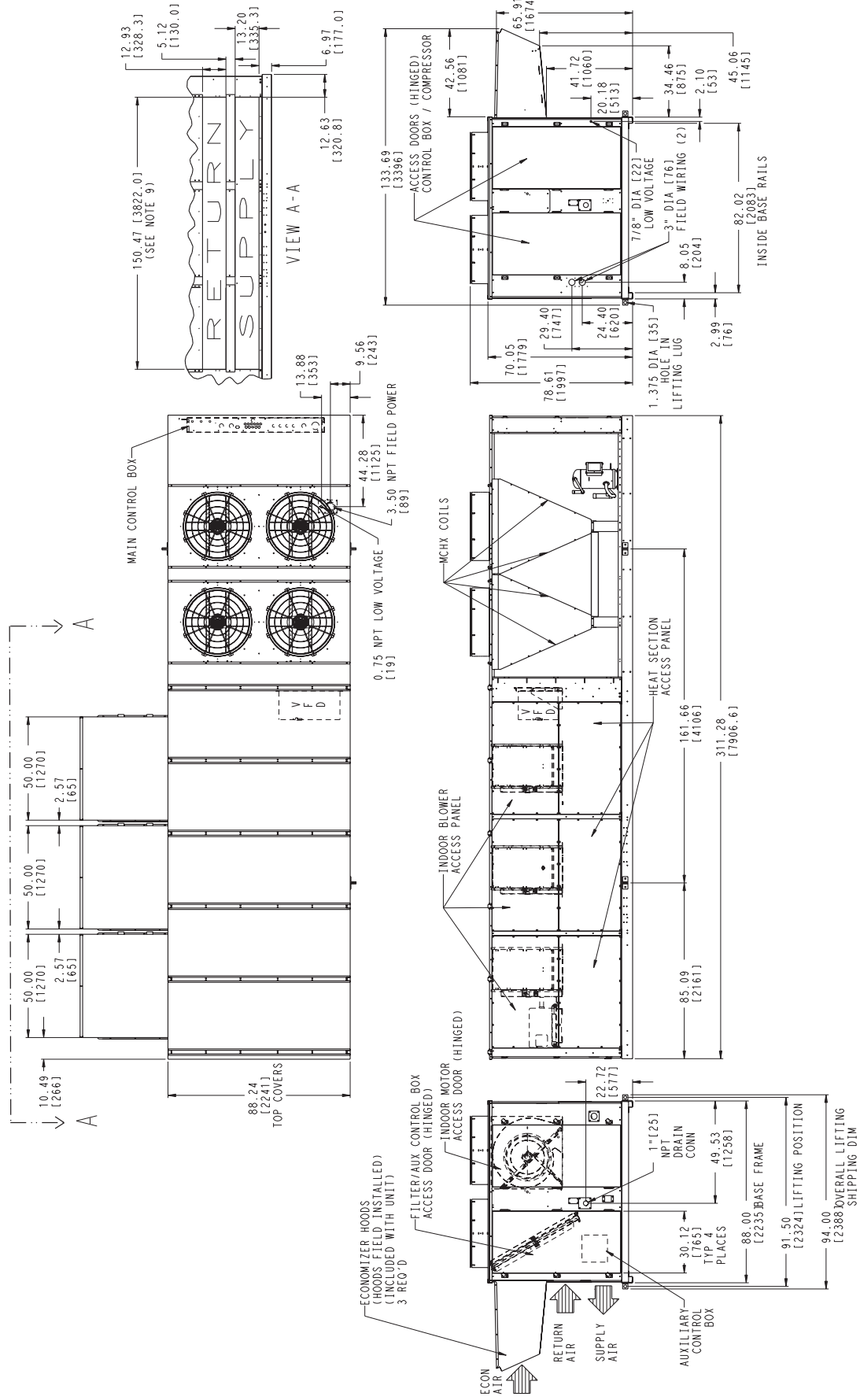


- NOTES:**
- Weights include economizer, center of gravity.
  - Unit clearances:
  - Top of units: no overhang  
Condenser coil: 4'-0" [1219]  
Economizer side: 6'-0" [1829]  
Heat side: 4'-0" [1219]  
Filter access side: 10'-0" [3048] (for removal of evaporator coil)
  - For smaller service and operational clearances, contact Carrier application engineering department.
  - Dimensions in [ ] are in millimeters. All other dimensions are in inches.

# Base unit dimensions — 50A4,A5060



FOR CENTERS OF GRAVITY,  
OPERATING AND CORNER  
WEIGHTS, SEE PAGE 32



# Base unit dimensions (cont)



## CENTER OF GRAVITY AND WEIGHTS — 50A2,A3,A4,A5060

BASE UNIT WEIGHTS (SEE NOTE 6)	
UNIT SIZE	WEIGHTS (LBS. / KG)
50A2/A3	6826 (3096)
50A4/A5	7041 (3194)
OPERATING WEIGHTS (SEE NOTE 6)	
BAROMETRIC RELIEF	450 (204)
NON MOD. POWER EXHAUST	675 (306)
MOD. POWER EXHAUST	725 (329)
ELECTRIC HEAT	165 (75)
CU TU/AL FIN COND COIL	26 (12)
CU TU/CU FIN COND COIL	677 (307)

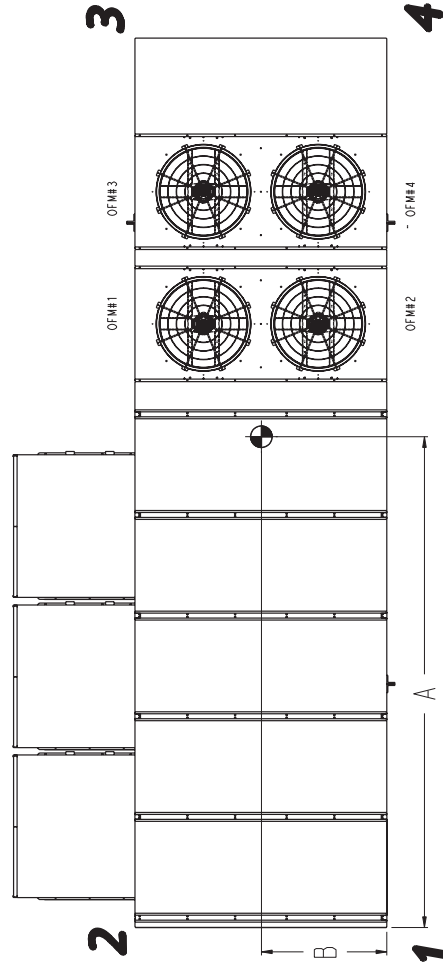
UNIT SIZE	OPERATING WEIGHT* (lb)	CENTER OF GRAVITY (ft-in.)				CORNER WEIGHTS (lb)			
		A	B	1	2	3	4		
50A2,A3,060	8311	15 - 5	3 - 7 3/8	1710	1663	2433	2504		
50A4,A5,060	8526	15 - 8 1/2	3 - 11 1/8	1613	2078	2484	2351		

UNIT SIZE	OPERATING WEIGHT* (kg)	CENTER OF GRAVITY (mm)				CORNER WEIGHTS (kg)			
		A	B	1	2	3	4		
50A2,A3,060	3770	4699	1101	776	755	1104	1136		
50A4,A5,060	3868	4788	1197	732	942	1127	1066		

\*Operating weight includes largest indoor fan motor, microchannel heat exchanger, modulating power exhaust (variable air volume units), and variable frequency drive (variable air volume units).

- NOTES:
- Weights include economizer or outdoor air damper.
  - Center of gravity.
  - Unit clearances:  
Top of units: no overhang  
Condenser coil: 4" - 0" [1219]  
Economizer side: 6" - 0" [1829]  
Heat side: 4" - 0" [1219]  
Filter access side: 10" - 0" [3048] (for removal of evaporator coil)
  - For smaller service and operational clearances, contact Carrier application engineering department.
  - Bottom ducts are designed to be attached to accessory roof curb. If unit is mounted on a dunnage, it is recommended that the ducts be supported by cross braces as done on accessory roof curb.
  - Base unit weights include outdoor air hoods and filters (indoor fan motor is not included). Add indoor fan motor, FIOFs, and accessories for total operating weight.
  - VAV motor weights include indoor motor, VFD, VFD transducer, and associated wiring.
  - Dimensions in [ ] are in millimeters. All other dimensions are in inches.
  - For side-supply/return applications, a single return and supply ductwork connection is recommended for covering all three return and all three supply openings. The entire area around the duct openings is available for a 1.5" duct flange attachment.

	CV MOTOR WEIGHTS (LBS. / KG)			VAV MOTOR WEIGHTS (LBS. / KG) (SEE NOTE 7)		
	HIGH EFFC-Y IFM	PREMIUM EFFC-Y IFM	PREMIUM EFFC-Y IFM	HIGH EFFC-Y IFM	PREMIUM EFFC-Y IFM	PREMIUM EFFC-Y IFM
25 HP (18.65 kW)	230/460	240 (109)	309 (140)	375 (170)	444 (201)	444 (201)
30 HP (22.38 kW)	575	240 (109)	319 (145)	375 (170)	454 (206)	490 (222)
40 HP (29.84 kW)	575	283 (128)	355 (161)	418 (190)	494 (224)	550 (249)
	230/460	372 (169)	415 (188)	507 (230)	550 (249)	545 (247)
	575	372 (169)	410 (186)	507 (230)	545 (247)	545 (247)



# Accessory dimensions

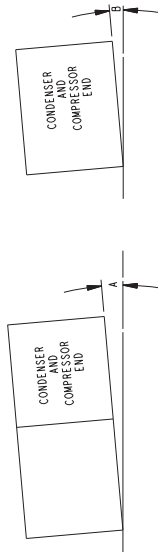


## ROOF CURB SIZES 020-035

**NOTES:**

1. Unless otherwise specified, all dimensions are to outside of part.
2. Roof curb accessory CRRFCURB005A00 is shipped disassembled.
3. All roof curb parts are to be 14 ga. galvanized steel.
4. Units with electric heat must be installed with a 90° elbow on the supply duct prior to any supply take offs or branches.
5. Dimensions in [ ] are in millimeters. All other dimensions are in inches.

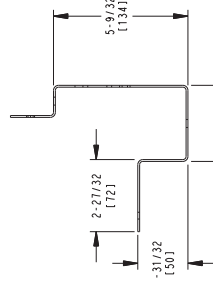
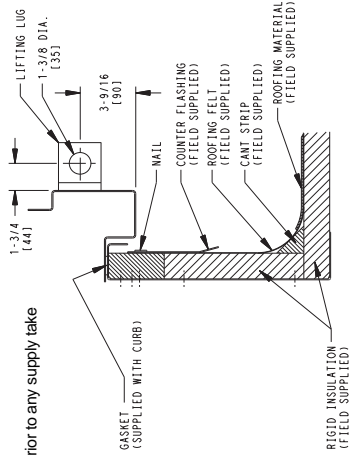
NOTE: TO PREVENT STANDING WATER IN THE DRAIN PAN OF THE INDOOR SECTION, AND THE HEAT EXCHANGERS UNIT CAN ONLY BE PITCHED AS SHOWN.



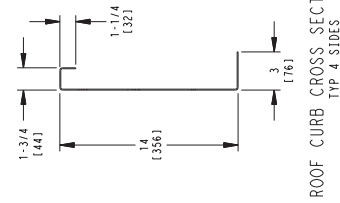
DIMENSIONS (DEGREES AND INCHES)

A	B
DEG. IN.	DEG. IN. mm
1.0 2.9	73 .50 .75 19

UNIT LEVELING TOLERANCES  
\*FROM EDGE OF UNIT TO HORIZONTAL

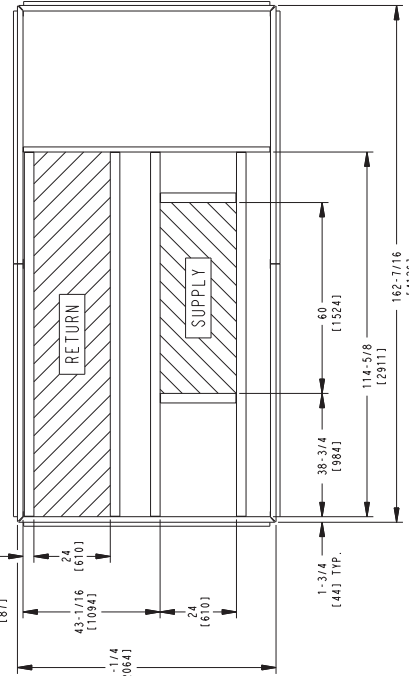
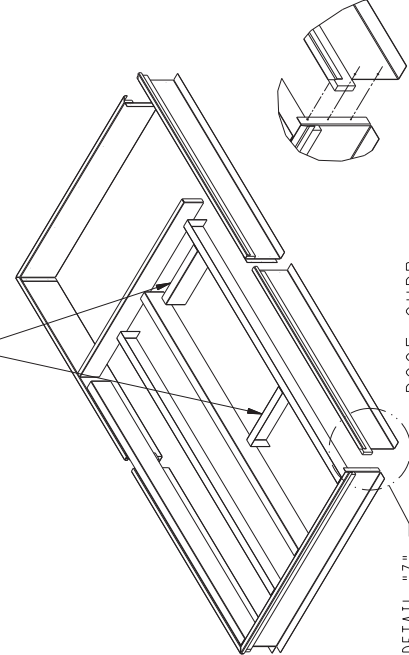


BASE RAIL CROSS SECTION  
TYP 2 SIDES

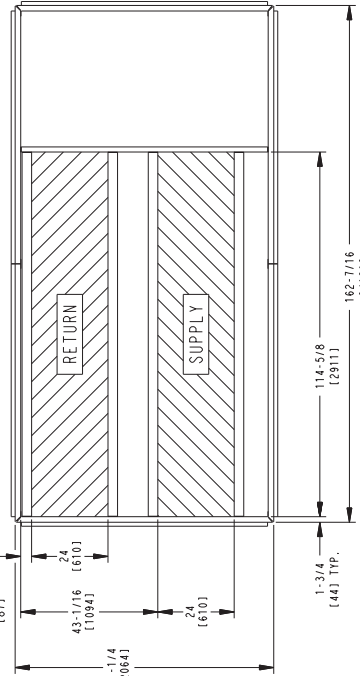


ROOF CURB CROSS SECTION  
TYP 4 SIDES

DO NOT USE CROSSUNITS WITH 48A2/A3-035 HIGH GAS HEAT UNITS (SEE ROOF CURB DETAIL "B")



ROOF CURB DETAIL "A"  
(ALL OTHERS)



ROOF CURB DETAIL "B"  
(48A2/A3-035 HIGH GAS HEAT ONLY)

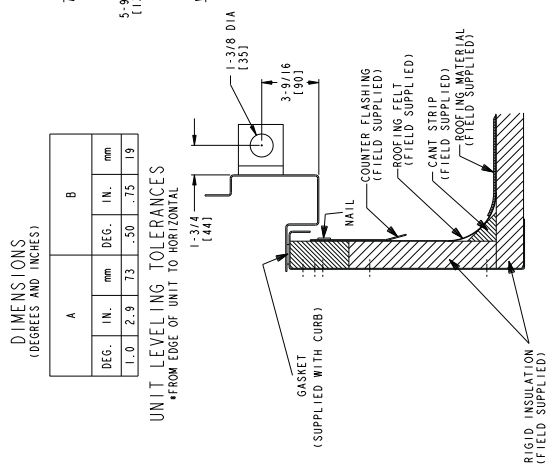
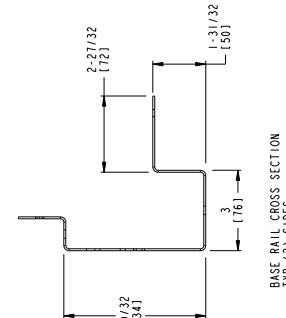
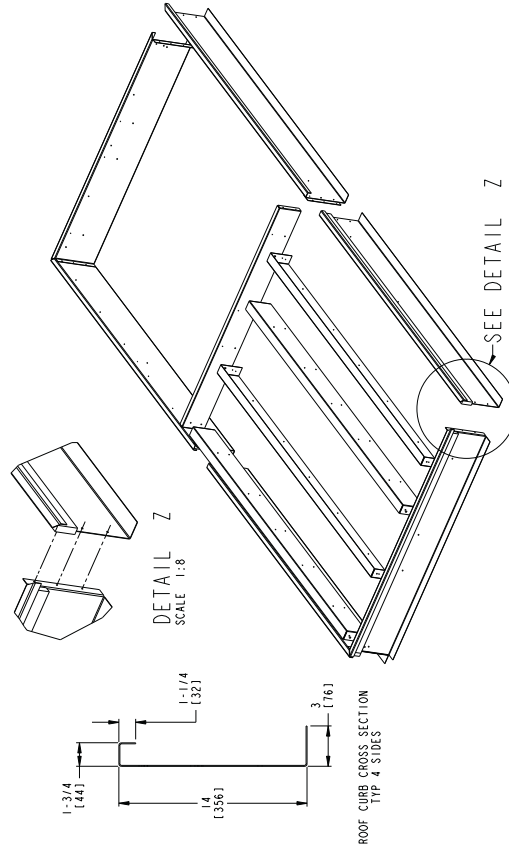
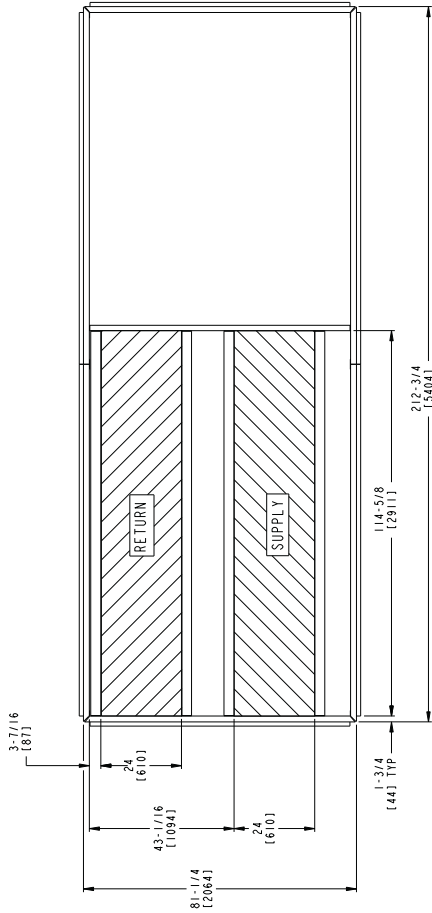
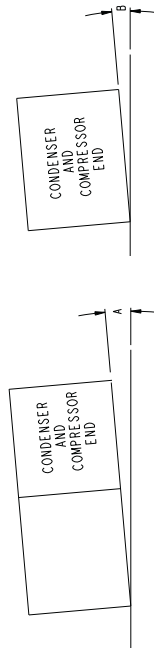
# Accessory dimensions (cont)



## ROOF CURB SIZES 040 AND 050

- NOTES:**
1. Unless otherwise specified, all dimensions are to outside of part.
  2. Roof curb accessory CRPFCURB06A00 is shipped disassembled.
  3. All roof curb parts are to be 14 ga. galvanized steel.
  4. Units with electric heat must be installed with a 90° elbow on the supply duct prior to any supply take offs or branches.
  5. Dimensions in [ ] are in millimeters. All other dimensions are in inches.

**NOTE:**  
PREVENT STANDING WATER IN THE DRAIN PAN OF THE INDOOR SECTION, AND THE HEAT EXCHANGERS UNIT CAN ONLY BE PITCHED AS SHOWN.



**DIMENSIONS (DEGREES AND INCHES)**

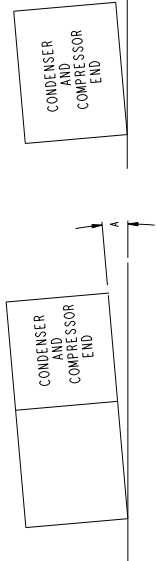
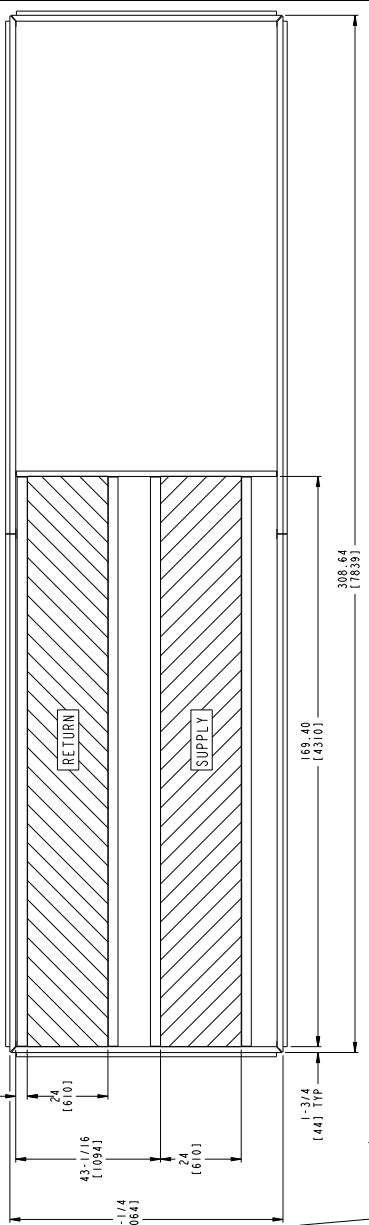
A		B	
DEG.	IN.	DEG.	IN.
1.0	2.9	7.3	.50
			.75
			1.9

# ROOF CURB 48A2,A3060/UNIT SUPPORT 48/50A4,A5060

**NOTES:**

1. Unless otherwise specified, all dimensions are to outside of part.
2. Roof curb accessory CRFCURB014A00 is shipped disassembled.
3. All roof curb parts are to be 14 ga. galvanized steel.
4. Dimensions in [ ] are in millimeters. All other dimensions are in inches.

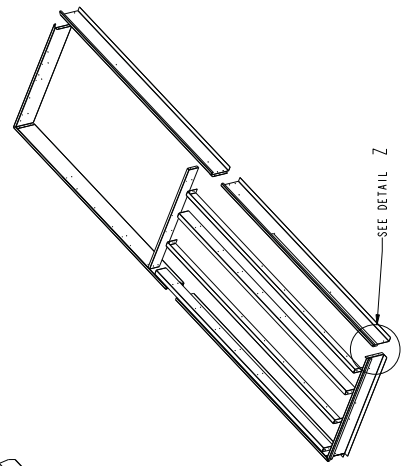
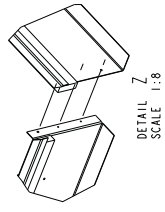
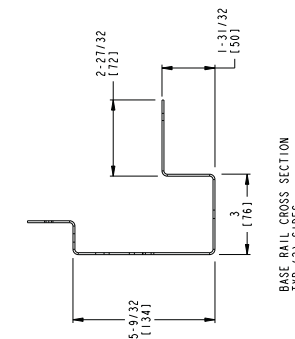
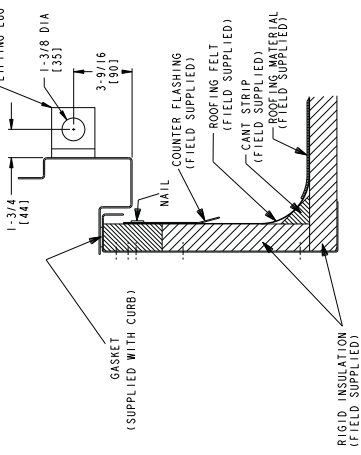
NOTE:  
TO PREVENT STANDING WATER IN THE DRAIN PAN OF THE  
INDOOR SECTION, AND THE HEAT EXCHANGERS  
UNIT CAN ONLY BE PITCHED AS SHOWN.



**DIMENSIONS**  
(DEGREES AND INCHES)

A		B	
DEG.	IN.	DEG.	IN.
T.0	5.43	138	.50
			.75
			19

**UNIT LEVELING TOLERANCES**  
\*FROM EDGE OF UNIT TO HORIZONTAL



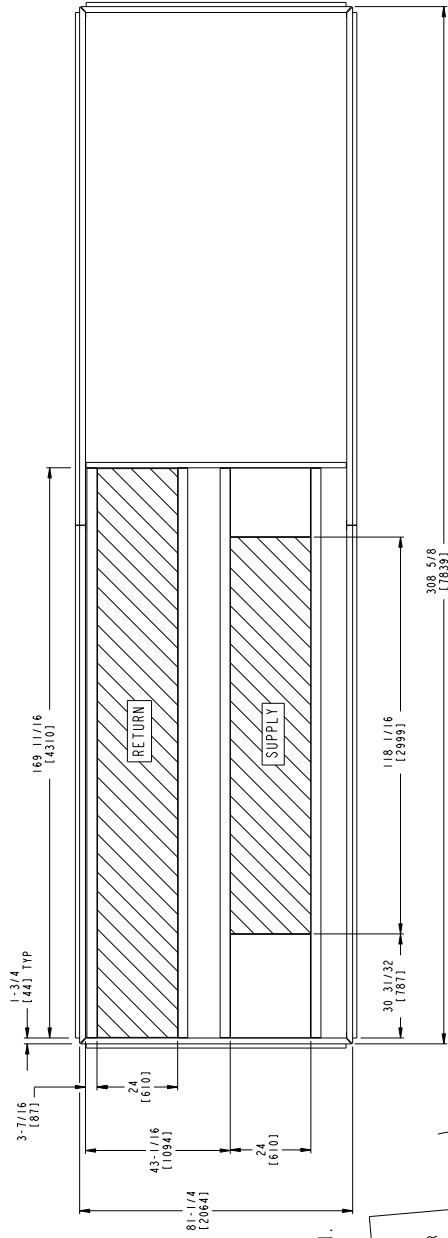


# Accessory dimensions (cont)

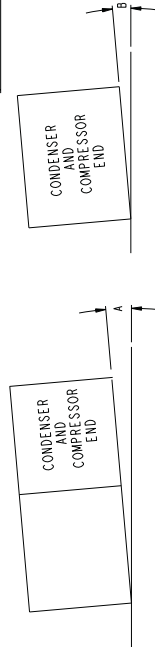


## ROOF CURB 50A2, A3060

- NOTES:
1. Unless otherwise specified, all dimensions are to outside of part.
  2. Roof curb accessory CRRFCURB009A00 is shipped disassembled.
  3. All roof curb parts are to be 14 ga. galvanized steel.
  4. Units with electric heat must be installed with a 90° elbow on the supply duct prior to any supply take offs or branches.
  5. Dimensions in [ ] are in millimeters. All other dimensions are in inches.



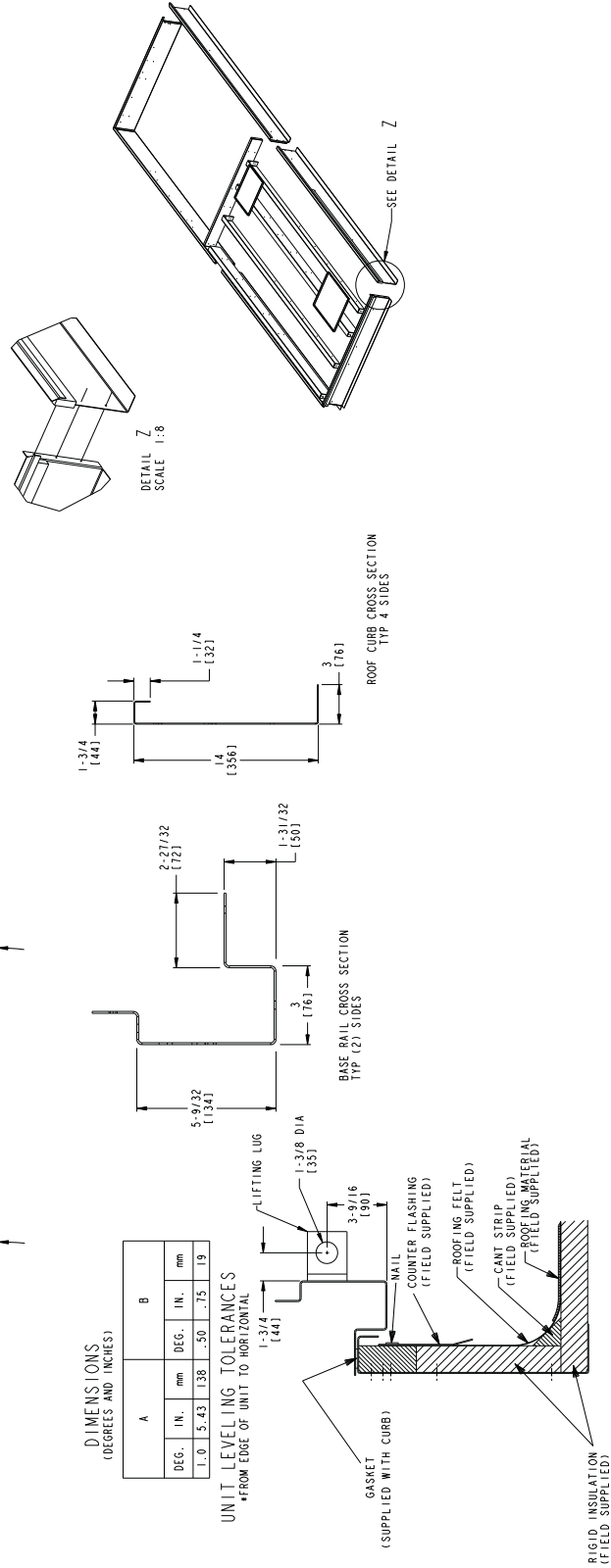
NOTE:  
TO PREVENT STANDING WATER IN THE DRAIN PAN OF THE  
INDOOR SECTION, AND THE HEAT EXCHANGERS  
UNIT CAN ONLY BE PITCHED AS SHOWN.



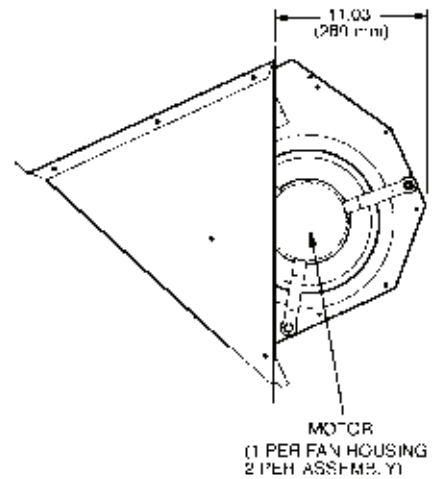
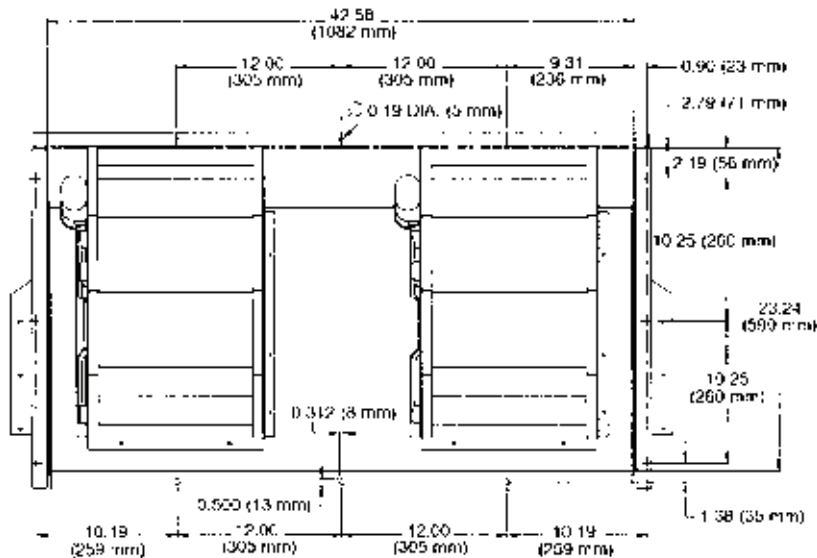
### DIMENSIONS (DEGREES AND INCHES)

A		B	
DEG.	IN.	DEG.	IN.
1.0	5.43	.50	.75
	[138]		[19]

### UNIT LEVELING TOLERANCES \*FROM EDGE OF UNIT TO HORIZONTAL



### POWER EXHAUST AND BAROMETRIC RELIEF



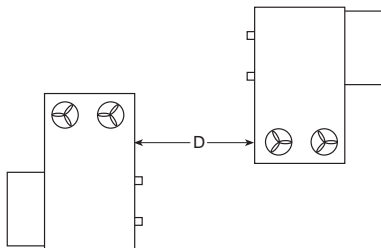
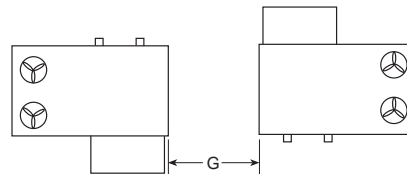
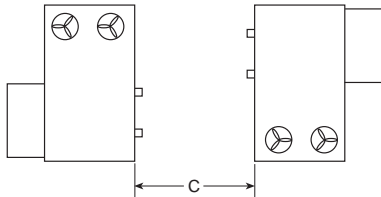
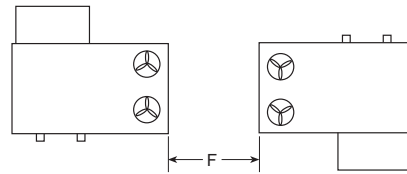
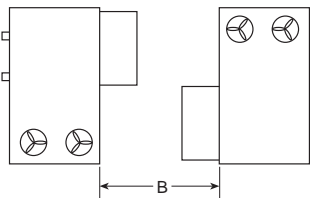
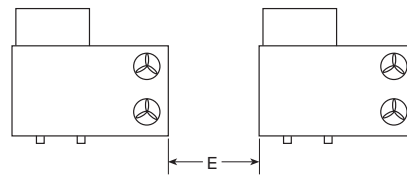
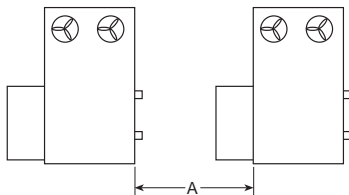
**LEGEND**

∅ — Diameter

**NOTES:**

1. Unless otherwise specified, all dimensions are to outside of part.
2. Dimensions are in inches.
3. Unit sizes 020-050 have 2 fan assemblies. Unit size 060 has 3 fan assemblies.
4. For 48/50A4,A5 units, the accessory power exhaust or barometric relief must be mounted in the field-supplied return ductwork.

### MULTIPLE UNIT APPLICATION SPACING



MINIMUM SPACING (FT)

UNIT	A	B	C	D	E*	F	G*	UNIT	A	B	C	D	E*	F	G*
48A2,A3,A4,A5020	15	8	4	4	10	8	10	50A2,A3,A4,A5020	8	8	4	4	10	8	10
48A2,A3,A4,A5025	15	8	4	4	10	8	10	50A2,A3,A4,A5025	8	8	4	4	10	8	10
48A2,A3,A4,A5027	15	8	4	4	10	8	10	50A2,A3,A4,A5027	8	8	4	4	10	8	10
48A2,A3,A4,A5030	15	8	4	4	10	8	10	50A2,A3,A4,A5030	8	8	4	4	10	8	10
48A2,A3,A4,A5035	15	8	4	4	10	8	10	50A2,A3,A4,A5035	8	8	4	4	10	8	10
48A2,A3,A4,A5040	15	8	4	8	10	4	10	50A2,A3,A4,A5040	8	8	4	8	10	4	10
48A2,A3,A4,A5050	15	8	4	8	10	4	10	50A2,A3,A4,A5050	8	8	4	8	10	4	10
48A2,A3,A4,A5060	15	8	4	8	15	4	15	50A2,A3,A4,A5060	8	8	4	8	15	4	15

\* Required for coil removal. Can reduce to 6 ft if coil removed from top.

# Selection procedure (with example)



## I Determine cooling and heat requirements at design conditions.

Given:

Type Application . . . . . VAV  
Required Cooling Capacity (TC) . . . . 480,000 Btuh  
Sensible Heat Capacity (SHC) . . . . 338,000 Btuh  
Required Heating Capacity . . . . . 300,000 Btuh  
Design Outdoor Air db Temperature . . . . . 95 F  
Design Outdoor Air wb Temperature . . . . . 67 F  
Climate Type (as per ASHRAE 90.1 Table D) . . Dry  
Indoor-Air Temperature . . . . . 80 F edb, 67 F ewb  
Evaporator Air Quantity . . . . . 16,000 cfm  
External Static Pressure . . . . . 1.4 in. wg  
Electrical Characteristics (V-Ph-Hz) . . . . . 460-3-60  
Unit Type . . . . . Gas Heating Vertical Discharge

## II Select the unit based on required cooling capacity.

Entering Cooling Capacity table at air condenser entering temperature of 95 F. Unit 48A3D040 at 16,000 cfm and 67 F ewb will provide the total capacity of 485,000 Btuh and a SHC of 380,000 Btuh. Calculate SHC correction, if required, using notes under cooling capacity table.

## III Select heat capacity of unit to provide design condition requirements.

In the Gas Heating Capacities and Efficiencies table note that unit 48A3D040 will provide 324,000 Btuh with an input of 400,000 Btuh.

## IV Select supply fan to provide design condition requirements.

Tabulated fan performance includes 2-in. throw-away filters, wet evaporator coil, economizer, cabinet losses, and roof curb. Find fan rpm and bhp at 1.4 in. wg and 16,000 cfm on 48A3D040 Fan Performance table for vertical applications. Find that the fan speed is 1063 rpm and the power required is 19.06 bhp. Refer to the Motor Limitations table which shows the 20 hp motor is required.

## V Select unit that corresponds to the power source available.

The electrical data table shows that a 460-3-60 unit is available.

## VI Select the options and accessories.

As per the ASHRAE 90.1 requirements this unit is located in a dry climate and therefore is required to have an economizer. As this is a dry climate either differential dry bulb changeover, outdoor air changeover or differential enthalpy should be used. Outside air enthalpy can not be used.

Select the options and model number using the options summary and model number charts in the price pages.

Note as an alternative a computerized selection program, *RTUBuilder*, is available for use in selecting and optimizing the unit for your application.



# Performance data (cont)



## COOLING CAPACITIES (cont)

### 48/50A2,A3,A4,A5025 (25 TONS)

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm																			
		5,000					6,250					7,500					8,750				
		Evaporator Air — Ewb (F)																			
		75	72	67	62	57	75	72	67	62	57	75	72	67	62	57	75	72	67	62	57
75	TC	318	305	281	260	239	335	320	296	274	253	347	331	307	284	268	354	339	315	292	280
	SHC	128	142	173	201	226	133	154	190	224	251	138	165	205	242	268	145	175	220	264	280
	KW	18.7	18.4	17.9	17.6	17.2	19.0	18.7	18.2	17.8	17.4	19.3	18.9	18.4	18.0	17.7	19.4	19.1	18.6	18.1	17.9
	BF	0.00	0.00	0.18	0.13	0.11	0.00	0.11	0.16	0.13	0.16	0.00	0.22	0.17	0.15	0.24	0.13	0.21	0.17	0.16	0.32
85	TC	308	295	274	253	232	324	309	287	266	248	334	319	297	275	261	341	327	305	283	273
	SHC	124	139	170	197	222	127	151	186	220	248	135	161	202	242	261	141	170	216	260	273
	KW	20.8	20.5	20.1	19.8	19.5	21.1	20.8	20.3	20.0	19.6	21.3	21.0	20.5	20.1	19.9	21.5	21.2	20.7	20.3	20.1
	BF	0.00	0.00	0.17	0.12	0.12	0.00	0.10	0.16	0.13	0.18	0.00	0.21	0.16	0.15	0.26	0.11	0.20	0.17	0.16	0.33
95	TC	298	286	265	244	224	312	300	278	257	241	321	309	288	266	254	328	316	295	273	265
	SHC	119	136	166	193	217	124	147	182	216	241	131	157	198	236	254	137	166	212	255	265
	KW	23.1	22.8	22.5	22.3	22.0	23.4	23.1	22.8	22.5	22.2	23.6	23.4	23.0	22.6	22.4	23.8	23.5	23.1	22.7	22.6
	BF	0.00	0.00	0.15	0.12	0.12	0.00	0.24	0.15	0.13	0.20	0.13	0.20	0.16	0.15	0.28	0.26	0.19	0.17	0.17	0.35
105	TC	289	277	256	235	214	302	290	268	247	231	311	298	277	255	245	318	304	283	262	257
	SHC	116	133	162	188	208	121	144	178	211	228	128	153	193	231	245	134	163	208	249	257
	KW	25.7	25.6	25.3	25.1	24.9	26.0	25.9	25.6	25.3	25.0	26.2	26.0	25.8	25.5	25.3	26.4	26.2	25.9	25.5	25.4
	BF	0.00	0.00	0.14	0.11	0.12	0.00	0.21	0.15	0.13	0.22	0.11	0.18	0.15	0.15	0.30	0.24	0.18	0.17	0.17	0.37
115	TC	278	266	245	224	207	289	278	256	236	223	298	285	264	243	236	305	290	270	250	247
	SHC	111	128	157	183	203	117	139	173	205	223	124	149	188	225	236	130	158	203	242	247
	KW	28.7	28.6	28.5	28.6	28.3	29.0	28.9	28.7	28.7	28.5	29.2	29.1	28.9	28.7	28.5	29.4	29.1	28.9	28.7	28.6
	BF	0.00	0.09	0.13	0.11	0.16	0.00	0.19	0.14	0.13	0.24	0.26	0.17	0.15	0.15	0.33	0.22	0.17	0.16	0.18	0.40

### 48/50A2,A3,A4,A5025 (25 TONS) (cont)

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm														
		10,000					11,250					12,500				
		Evaporator Air — Ewb (F)														
		75	72	67	62	57	75	72	67	62	57	75	72	67	62	57
75	TC	361	346	321	297	291	367	351	326	303	300	372	355	330	309	307
	SHC	152	184	234	281	291	158	192	248	295	300	163	201	261	305	307
	KW	19.6	19.2	18.7	18.2	18.1	19.7	19.3	18.8	18.4	18.3	19.8	19.4	18.9	18.5	18.4
	BF	0.28	0.20	0.18	0.19	0.38	0.25	0.21	0.19	0.21	0.43	0.25	0.22	0.20	0.26	0.48
85	TC	348	332	310	288	283	353	337	315	294	291	357	341	318	299	299
	SHC	148	179	230	275	283	153	188	244	288	291	159	197	257	296	299
	KW	21.6	21.3	20.8	20.4	20.3	21.8	21.4	20.9	20.5	20.4	21.8	21.5	21.0	20.6	20.6
	BF	0.25	0.20	0.18	0.19	0.40	0.24	0.21	0.19	0.23	0.45	0.24	0.21	0.20	0.26	0.49
95	TC	335	321	300	278	275	340	325	304	284	283	343	330	308	290	290
	SHC	144	175	226	270	275	150	184	240	281	283	155	192	253	290	290
	KW	23.9	23.6	23.2	22.8	22.7	24.0	23.7	23.3	22.9	22.9	24.1	23.8	23.4	23.0	23.0
	BF	0.24	0.19	0.18	0.19	0.41	0.23	0.19	0.19	0.24	0.46	0.23	0.21	0.20	0.29	0.50
105	TC	323	310	288	268	266	328	314	292	275	274	331	318	296	280	280
	SHC	140	172	222	260	266	146	180	235	268	274	151	188	248	280	280
	KW	26.6	26.3	26.0	25.5	25.5	26.7	26.4	26.0	25.6	25.7	26.8	26.5	26.1	25.8	25.8
	BF	0.22	0.18	0.18	0.22	0.43	0.22	0.20	0.19	0.27	0.48	0.22	0.21	0.20	0.31	0.52
115	TC	309	297	275	256	255	313	300	278	263	263	317	303	281	269	269
	SHC	136	167	217	254	255	142	175	230	261	263	147	184	243	269	269
	KW	29.6	29.4	29.0	28.7	28.7	29.7	29.4	29.1	28.8	28.8	29.8	29.5	29.1	28.9	28.9
	BF	0.21	0.19	0.18	0.23	0.46	0.21	0.20	0.19	0.30	0.50	0.21	0.21	0.20	0.34	0.54

See legend on page 43.



**COOLING CAPACITIES (cont)**

**48/50A2,A3,A4,A5027 (27 TONS)**

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm																			
		5,500					6,875					8,250					9,625				
		Evaporator Air — Ewb (F)																			
		75	72	67	62	57	75	72	67	62	57	75	72	67	62	57	75	72	67	62	57
75	TC	339	324	297	273	251	356	340	312	288	268	368	351	323	298	283	377	359	331	305	296
	SHC	138	154	186	215	242	145	168	204	240	265	153	180	222	263	283	161	190	238	284	296
	KW	19.0	18.7	18.3	17.9	17.6	19.4	19.0	18.5	18.1	17.8	19.6	19.3	18.7	18.3	18.1	19.8	19.4	18.9	18.5	18.3
	BF	0.00	0.00	0.15	0.11	0.11	0.00	0.07	0.14	0.12	0.19	0.11	0.19	0.15	0.13	0.26	0.27	0.18	0.16	0.15	0.34
85	TC	329	313	289	265	243	344	329	303	279	262	355	339	313	289	276	364	346	321	295	288
	SHC	134	151	182	211	237	141	164	201	236	262	149	175	218	262	276	156	186	234	279	288
	KW	21.1	20.8	20.4	20.1	19.8	21.5	21.2	20.7	20.4	20.1	21.7	21.4	20.9	20.5	20.3	21.9	21.5	21.1	20.6	20.5
	BF	0.00	0.09	0.13	0.11	0.11	0.00	0.21	0.14	0.12	0.20	0.09	0.18	0.14	0.14	0.28	0.24	0.17	0.15	0.16	0.36
95	TC	319	305	280	256	235	333	319	293	270	254	344	328	303	278	268	352	335	309	285	280
	SHC	130	148	178	207	230	137	160	196	234	254	145	172	214	254	268	153	182	230	273	280
	KW	23.5	23.3	23.0	22.7	22.4	23.8	23.6	23.3	23.0	22.6	24.1	23.8	23.4	23.1	22.9	24.3	24.0	23.6	23.1	23.1
	BF	0.00	0.08	0.13	0.10	0.13	0.13	0.19	0.13	0.12	0.22	0.08	0.17	0.14	0.13	0.30	0.23	0.17	0.15	0.16	0.37
105	TC	309	294	269	246	228	322	307	282	258	244	332	316	290	266	258	339	323	297	274	270
	SHC	125	144	173	202	226	133	156	192	226	244	142	168	209	248	258	149	178	225	264	270
	KW	26.3	26.1	25.9	25.7	25.4	26.6	26.4	26.2	25.9	25.7	26.9	26.7	26.3	26.0	25.8	27.0	26.8	26.4	26.0	26.0
	BF	0.00	0.07	0.12	0.10	0.16	0.10	0.17	0.13	0.12	0.24	0.25	0.16	0.14	0.14	0.33	0.20	0.16	0.15	0.18	0.40
115	TC	296	281	257	235	220	309	293	269	246	235	317	302	277	254	249	324	308	282	262	259
	SHC	120	139	168	196	218	129	151	186	221	235	137	162	203	242	249	144	172	219	254	259
	KW	29.3	29.3	29.4	29.5	29.3	29.7	29.6	29.5	29.5	29.4	30.0	29.8	29.6	29.5	29.4	30.2	29.9	29.7	29.4	29.4
	BF	0.00	0.20	0.12	0.10	0.19	0.08	0.15	0.12	0.12	0.27	0.21	0.15	0.13	0.14	0.35	0.19	0.16	0.15	0.20	0.42

**48/50A2,A3,A4,A5027 (27 TONS) (cont)**

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm														
		11,000					12,375					13,750				
		Evaporator Air — Ewb (F)														
		75	72	67	62	57	75	72	67	62	57	75	72	67	62	57
75	TC	384	365	337	311	307	389	371	342	319	316	394	375	346	324	324
	SHC	168	201	254	301	307	174	210	269	309	316	181	219	284	324	324
	KW	19.9	19.6	19.0	18.6	18.5	20.0	19.7	19.1	18.7	18.7	20.1	19.8	19.2	18.8	18.8
	BF	0.23	0.18	0.17	0.18	0.40	0.22	0.19	0.18	0.24	0.45	0.22	0.20	0.19	0.27	0.49
85	TC	370	353	326	302	299	375	358	331	309	307	380	362	334	315	315
	SHC	163	196	250	294	299	170	206	265	301	307	176	215	279	315	315
	KW	22.0	21.7	21.2	20.8	20.7	22.1	21.8	21.3	20.9	20.8	22.2	21.9	21.3	21.0	21.0
	BF	0.22	0.18	0.17	0.19	0.41	0.21	0.19	0.18	0.26	0.46	0.21	0.20	0.19	0.29	0.51
95	TC	358	342	315	292	290	363	346	319	299	298	368	350	322	306	305
	SHC	160	192	245	284	290	166	202	260	295	298	173	211	275	306	305
	KW	24.4	24.1	23.7	23.3	23.2	24.5	24.2	23.8	23.4	23.4	24.7	24.3	23.8	23.5	23.5
	BF	0.21	0.18	0.16	0.22	0.43	0.20	0.19	0.18	0.27	0.48	0.21	0.19	0.19	0.31	0.52
105	TC	345	328	301	281	280	350	332	305	288	288	353	336	308	295	295
	SHC	155	188	240	275	280	162	197	255	285	288	168	206	269	295	295
	KW	27.2	26.9	26.5	26.1	26.1	27.4	27.1	26.6	26.2	26.3	27.5	27.1	26.6	26.4	26.4
	BF	0.20	0.17	0.16	0.24	0.45	0.20	0.18	0.18	0.28	0.50	0.20	0.20	0.19	0.35	0.54
115	TC	329	312	287	268	268	333	316	290	276	276	336	320	293	283	282
	SHC	151	183	235	268	268	157	192	250	276	276	163	201	263	283	282
	KW	30.4	30.0	29.7	29.5	29.5	30.6	30.2	29.7	29.5	29.5	30.7	30.3	29.8	29.6	29.6
	BF	0.19	0.16	0.16	0.23	0.47	0.19	0.18	0.17	0.31	0.52	0.19	0.19	0.19	0.37	0.56

See legend on page 43.



# Performance data (cont)



## COOLING CAPACITIES (cont)

### 48/50A2,A3,A4,A5030 (30 TONS)

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm																			
		6,000					7,500					9,000					10,500				
		Evaporator Air — Ewb (F)																			
		75	72	67	62	57	75	72	67	62	57	75	72	67	62	57	75	72	67	62	57
75	TC	370	354	325	298	272	389	371	342	314	293	401	384	354	325	309	411	392	362	334	323
	SHC	151	169	203	234	263	157	184	224	262	287	167	196	243	288	309	176	208	261	311	323
	KW	20.2	19.9	19.5	19.2	18.8	20.6	20.3	19.8	19.4	18.9	20.9	20.6	20.1	19.6	19.3	21.1	20.7	20.2	19.8	19.5
	BF	0.00	0.00	0.12	0.10	0.10	0.00	0.19	0.12	0.11	0.20	0.13	0.16	0.13	0.12	0.26	0.22	0.16	0.14	0.14	0.34
85	TC	362	345	316	288	263	379	361	332	303	276	391	373	343	314	300	400	381	351	322	315
	SHC	147	166	199	230	257	154	180	219	257	276	164	193	238	282	300	172	204	256	305	315
	KW	22.8	22.5	22.1	21.8	21.4	23.2	22.9	22.5	22.1	21.6	23.5	23.2	22.7	22.3	22.0	23.7	23.4	22.9	22.4	22.2
	BF	0.00	0.00	0.12	0.09	0.10	0.00	0.17	0.12	0.11	0.13	0.26	0.16	0.13	0.12	0.28	0.21	0.16	0.14	0.14	0.35
95	TC	351	334	305	278	255	367	349	320	292	274	379	360	330	302	291	387	368	338	310	305
	SHC	143	162	194	225	250	151	176	214	252	274	160	188	233	277	291	168	200	251	298	305
	KW	25.7	25.5	25.1	25.1	24.7	26.1	25.9	25.5	25.3	25.0	26.4	26.2	25.8	25.4	25.1	26.7	26.3	25.9	25.4	25.3
	BF	0.00	0.10	0.11	0.09	0.12	0.00	0.16	0.12	0.10	0.21	0.23	0.15	0.13	0.12	0.30	0.19	0.15	0.14	0.15	0.37
105	TC	339	322	293	267	247	353	336	307	280	265	364	346	317	290	281	372	353	324	297	294
	SHC	138	157	189	219	242	147	171	209	246	265	155	183	228	271	281	163	195	246	291	294
	KW	29.0	28.9	29.0	29.3	28.7	29.3	29.3	29.4	29.6	29.1	29.8	29.5	29.4	29.3	29.0	30.1	29.6	29.5	29.2	29.1
	BF	0.00	0.20	0.11	0.09	0.15	0.13	0.15	0.11	0.10	0.24	0.20	0.14	0.12	0.12	0.33	0.18	0.14	0.14	0.16	0.40
115	TC	326	309	281	256	237	339	322	294	268	256	349	331	303	277	271	356	338	309	286	283
	SHC	132	153	184	214	235	142	166	204	241	256	150	178	222	264	271	158	190	240	280	283
	KW	32.8	33.1	33.8	34.3	34.3	33.3	33.4	33.8	34.2	34.0	33.8	33.5	33.8	34.0	33.8	34.1	34.0	33.8	33.5	33.7
	BF	0.00	0.16	0.10	0.08	0.16	0.24	0.13	0.11	0.10	0.26	0.18	0.13	0.12	0.13	0.35	0.17	0.14	0.13	0.19	0.42

### 48/50A2,A3,A4,A5030 (30 TONS) (cont)

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm														
		12,000					13,500					15,000				
		Evaporator Air — Ewb (F)														
		75	72	67	62	57	75	72	67	62	57	75	72	67	62	57
75	TC	419	399	369	340	336	426	406	374	347	346	430	411	379	356	354
	SHC	183	219	278	330	336	191	229	294	343	346	198	240	310	351	354
	KW	21.3	20.9	20.4	19.9	19.7	21.4	21.0	20.5	19.9	19.9	21.5	21.1	20.6	20.1	20.1
	BF	0.20	0.16	0.15	0.17	0.40	0.20	0.18	0.16	0.22	0.45	0.20	0.18	0.17	0.28	0.49
85	TC	408	388	357	329	326	414	394	362	338	336	418	398	366	344	345
	SHC	180	215	273	322	326	187	226	290	331	336	194	236	305	337	345
	KW	23.9	23.5	23.0	22.5	22.4	24.0	23.7	23.1	22.6	22.6	24.1	23.8	23.2	22.7	22.8
	BF	0.19	0.16	0.15	0.19	0.41	0.19	0.17	0.16	0.26	0.46	0.19	0.18	0.17	0.28	0.50
95	TC	394	375	344	318	316	399	380	348	328	326	403	384	352	334	334
	SHC	175	211	268	312	316	182	221	284	320	326	189	231	300	334	334
	KW	26.9	26.6	26.0	25.4	25.5	27.0	26.7	26.1	25.6	25.6	27.2	26.8	26.2	25.8	25.8
	BF	0.18	0.16	0.15	0.21	0.43	0.18	0.17	0.16	0.28	0.48	0.19	0.18	0.17	0.31	0.52
105	TC	378	359	329	307	305	383	364	334	314	314	387	367	337	322	322
	SHC	170	205	262	301	305	177	215	278	314	314	184	225	294	322	322
	KW	30.3	30.0	29.6	29.0	29.2	30.5	30.1	29.6	29.3	29.3	30.7	30.2	29.7	29.4	29.3
	BF	0.17	0.16	0.15	0.24	0.45	0.18	0.17	0.16	0.28	0.50	0.18	0.18	0.17	0.34	0.54
115	TC	361	343	314	295	293	366	347	318	302	302	369	351	321	310	309
	SHC	165	200	257	290	293	172	210	272	302	302	179	220	288	310	309
	KW	34.4	34.2	33.9	33.4	33.6	34.7	34.3	33.9	33.6	33.6	34.9	34.4	33.9	33.7	33.7
	BF	0.17	0.16	0.15	0.26	0.47	0.17	0.17	0.16	0.31	0.52	0.18	0.18	0.18	0.36	0.56

See legend on page 43.



## COOLING CAPACITIES (cont)

### 48/50A2,A3,A4,A5035 (35 TONS)

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm																			
		7,000					8,750					10,500					12,250				
		Evaporator Air — Ewb (F)																			
75	72	67	62	57	75	72	67	62	57	75	72	67	62	57	75	72	67	62	57		
75	TC	442	423	394	366	338	459	440	410	383	363	471	452	421	395	383	479	460	430	403	399
	SHC	179	206	250	291	329	189	222	275	327	363	199	237	299	359	383	208	252	323	389	399
	kW	24.8	24.3	23.6	23.2	23.1	25.3	24.7	24.0	23.4	23.2	25.6	25.1	24.3	23.6	23.4	25.8	25.3	24.5	23.8	23.7
BF	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.01	0.01	0.10	0.01	0.01	0.01	0.02	0.21	0.01	0.02	0.02	0.04	0.29	
85	TC	428	412	384	354	326	444	426	399	372	352	455	437	410	384	374	463	444	417	393	389
	SHC	174	201	245	285	322	184	217	270	321	352	193	231	294	354	374	203	246	318	384	389
	kW	27.8	27.3	26.9	26.7	27.0	28.2	27.7	27.1	26.8	26.7	28.5	28.0	27.3	26.9	26.8	28.8	28.2	27.5	27.0	26.9
BF	0.00	0.00	0.01	0.01	0.02	0.00	0.00	0.01	0.01	0.13	0.01	0.01	0.01	0.03	0.23	0.02	0.02	0.02	0.05	0.31	
95	TC	417	400	371	341	312	432	415	387	358	341	441	424	397	370	362	447	431	405	380	378
	SHC	170	197	239	279	312	179	212	265	314	341	188	227	289	348	362	197	241	313	376	378
	kW	31.3	31.1	30.8	31.3	32.9	31.6	31.2	30.9	30.8	31.2	31.9	31.4	31.0	30.8	30.7	32.1	31.6	31.0	30.8	30.8
BF	0.00	0.00	0.01	0.01	0.03	0.00	0.00	0.01	0.01	0.16	0.01	0.01	0.02	0.03	0.25	0.02	0.02	0.02	0.05	0.33	
105	TC	403	385	356	325	308	417	400	372	343	328	427	410	381	355	349	433	417	389	365	365
	SHC	165	191	232	271	308	174	207	258	307	328	184	222	283	340	349	193	236	307	365	365
	kW	35.5	35.4	36.0	37.7	39.3	35.7	35.5	35.5	36.7	37.4	35.9	35.5	35.3	35.8	36.1	36.0	35.6	35.3	35.5	35.5
BF	0.00	0.00	0.01	0.01	0.12	0.00	0.01	0.01	0.02	0.19	0.01	0.01	0.02	0.03	0.28	0.02	0.02	0.02	0.07	0.35	
115	TC	380	364	337	—	—	391	376	351	—	—	398	384	360	335	332	403	389	366	347	347
	SHC	156	182	224	—	—	165	198	250	—	—	174	213	274	330	332	183	227	298	347	347
	kW	39.4	39.7	40.9	—	—	39.5	39.5	40.1	—	—	39.5	39.4	39.8	40.9	41.1	39.6	39.4	39.6	40.2	40.2
BF	0.00	0.00	0.01	—	—	0.00	0.01	0.01	—	—	0.01	0.01	0.02	0.04	0.31	0.01	0.02	0.02	0.12	0.39	

### 48/50A2,A3,A4,A5035 (35 TONS) (cont)

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm														
		14,000					15,750					17,500				
		Evaporator Air — Ewb (F)														
75	72	67	62	57	75	72	67	62	57	75	72	67	62	57		
75	TC	485	466	436	412	411	490	471	442	422	422	—	475	446	432	432
	SHC	217	266	347	411	411	226	281	369	422	422	—	295	391	432	432
	kW	26.0	25.5	24.7	24.0	24.0	26.1	25.6	24.8	24.3	24.3	—	25.7	24.9	24.5	24.5
BF	0.02	0.02	0.03	0.09	0.36	0.03	0.03	0.04	0.17	0.42	—	0.04	0.05	0.23	0.46	
85	TC	469	451	422	402	401	—	455	426	411	411	—	459	431	419	419
	SHC	212	261	341	402	401	—	275	363	411	411	—	290	384	419	419
	kW	29.0	28.4	27.6	27.1	27.1	—	28.6	27.7	27.3	27.3	—	28.7	27.8	27.5	27.5
BF	0.02	0.02	0.03	0.11	0.38	—	0.03	0.04	0.19	0.43	—	0.04	0.05	0.26	0.48	
95	TC	—	436	410	391	390	—	439	414	401	400	—	443	418	409	408
	SHC	—	256	336	391	390	—	270	358	401	400	—	284	379	409	408
	kW	—	31.7	31.1	30.9	30.9	—	31.8	31.2	31.0	31.0	—	31.9	31.3	31.1	31.1
BF	—	0.02	0.03	0.13	0.39	—	0.03	0.04	0.21	0.45	—	0.04	0.06	0.27	0.49	
105	TC	—	421	394	377	377	—	425	399	387	386	—	428	403	395	395
	SHC	—	251	330	377	377	—	265	352	387	386	—	279	373	395	395
	kW	—	35.7	35.3	35.3	35.3	—	35.7	35.3	35.2	35.2	—	35.8	35.3	35.3	35.3
BF	—	0.03	0.03	0.16	0.42	—	0.03	0.04	0.24	0.47	—	0.04	0.06	0.30	0.51	
115	TC	—	393	371	358	358	—	396	375	367	367	—	399	378	374	374
	SHC	—	242	321	358	358	—	256	342	367	367	—	270	362	374	374
	kW	—	39.4	39.4	39.7	39.7	—	39.5	39.4	39.5	39.5	—	39.5	39.3	39.4	39.4
BF	—	0.02	0.03	0.21	0.45	—	0.03	0.05	0.28	0.49	—	0.04	0.07	0.34	0.54	

#### LEGEND

- BF — Bypass Factor
- Edb — Entering Dry Bulb
- Ewb — Entering Wet Bulb
- kW — Compressor Motor Power Input
- SHC — Sensible Heat Capacity (1000 Btuh)
- TC — Total Capacity (1000 Btuh) Gross
- VAV — Variable Air Volume

**Boldface** — VAV Units Only

#### NOTES:

- Direct interpolation is permissible. Do not extrapolate.
- The following formulas may be used:

$$t_{db} = t_{edb} - \frac{\text{sensible capacity (Btuh)}}{1.10 \times \text{cfm}}$$

t<sub>lwb</sub> = Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h<sub>lwb</sub>)

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: h<sub>ewb</sub> = Enthalpy of air entering evaporator coil.

- The SHC is based on 80 F edb temperature of air entering evaporator coil.  
Below 80 F edb, subtract (corr factor x cfm) from SHC.  
Above 80 F edb, add (corr factor x cfm) to SHC.

BF	ENTERING AIR DRY-BULB TEMP (F)					
	79	78	77	76	75	under 75
	81	82	83	84	85	over 85
Correction Factor						
<b>.05</b>	1.04	2.07	3.11	4.14	4.18	Use formula shown below.
<b>.10</b>	.98	1.96	2.94	3.92	4.91	
<b>.20</b>	.87	1.74	2.62	3.49	4.36	

Interpolation is permissible.  
Correction Factor = 1.10 x (1 - BF) x (edb - 80).

- Cooling capacities are gross and do not include deduction for indoor fan motor heat.
- Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

# Performance data (cont)



## COOLING CAPACITIES (cont)

48/50A2,A3,A4,A5040 (40 TONS)																					
Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm																			
		8,000					10,000					12,000					14,000				
		Evaporator Air — Ewb (F)																			
		75	72	67	62	57	75	72	67	62	57	75	72	67	62	57	75	72	67	62	57
75	TC	517	495	459	423	388	542	518	482	445	415	558	533	498	461	439	570	546	509	473	460
	SHC	206	235	284	330	371	216	253	313	370	408	228	270	341	408	439	239	287	368	441	460
	KW	25.9	25.5	25.0	24.7	24.3	26.3	25.9	25.4	25.0	24.5	26.6	26.2	25.6	25.2	24.8	26.8	26.4	25.8	25.3	25.1
	BF	0.00	0.00	0.06	0.04	0.05	0.00	0.10	0.06	0.05	0.13	0.15	0.08	0.06	0.06	0.20	0.11	0.08	0.07	0.08	0.29
85	TC	503	481	446	410	376	525	504	467	431	405	541	519	483	447	427	552	531	494	458	448
	SHC	199	230	278	325	364	210	248	307	363	397	222	265	335	400	427	233	282	362	434	448
	KW	29.2	28.8	28.5	28.0	27.7	29.6	29.3	28.8	28.4	27.9	29.9	29.5	29.0	28.6	28.3	30.1	29.7	29.2	28.7	28.5
	BF	0.00	0.13	0.06	0.03	0.05	0.00	0.09	0.06	0.05	0.16	0.13	0.08	0.06	0.06	0.23	0.10	0.08	0.07	0.08	0.31
95	TC	489	467	431	395	363	510	488	452	416	390	525	503	466	429	414	536	514	477	442	434
	SHC	193	224	272	317	356	205	242	301	356	390	217	260	328	392	414	228	276	355	425	434
	KW	33.0	32.6	32.3	32.0	31.7	33.4	33.1	32.6	32.3	31.8	33.7	33.4	32.9	32.5	32.1	33.9	33.5	33.0	32.6	32.4
	BF	0.00	0.10	0.05	0.04	0.06	0.10	0.08	0.05	0.05	0.15	0.11	0.08	0.06	0.06	0.25	0.10	0.08	0.07	0.09	0.33
105	TC	473	451	414	381	350	492	470	434	399	378	506	484	447	412	401	516	493	457	423	419
	SHC	187	218	264	311	346	200	236	293	348	378	211	253	321	384	401	221	269	347	414	419
	KW	37.2	36.8	36.8	36.2	36.5	37.6	37.4	37.0	37.0	36.6	37.9	37.6	37.2	37.1	36.7	38.1	37.8	37.4	37.0	36.8
	BF	0.00	0.08	0.05	0.03	0.07	0.15	0.08	0.05	0.05	0.18	0.10	0.07	0.06	0.07	0.27	0.09	0.08	0.07	0.10	0.35
115	TC	453	432	397	364	337	471	450	415	381	364	483	462	427	394	386	492	472	436	405	403
	SHC	180	211	257	302	332	193	228	286	340	364	204	245	313	375	386	214	262	339	402	403
	KW	42.0	41.4	42.2	42.1	41.8	42.5	42.4	42.4	42.5	42.2	42.6	42.6	42.5	42.5	42.2	42.8	42.8	42.7	42.3	42.2
	BF	0.00	0.07	0.05	0.03	0.11	0.12	0.07	0.05	0.05	0.21	0.09	0.07	0.06	0.07	0.30	0.08	0.07	0.06	0.11	0.37
120	TC	442	422	389	354	330	460	440	405	372	356	473	451	417	384	378	481	460	425	395	395
	SHC	177	207	255	297	327	189	225	281	336	356	200	241	309	369	378	211	258	335	395	395
	KW	44.6	44.8	44.1	45.8	45.1	45.2	45.3	45.3	45.2	45.2	45.5	45.4	45.4	45.4	45.2	45.6	45.6	45.6	45.2	45.2
	BF	0.00	0.07	0.03	0.04	0.12	0.11	0.07	0.05	0.04	0.23	0.09	0.07	0.06	0.07	0.32	0.08	0.07	0.06	0.12	0.39

48/50A2,A3,A4,A5040 (40 TONS) (cont)																					
Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm																			
		16,000						18,000						20,000							
		Evaporator Air — Ewb (F)																			
		75	72	67	62	57	75	72	67	62	57	75	72	67	62	57	75	72	67	62	57
75	TC	579	555	519	483	477	587	563	526	491	491	593	569	532	504	503					
	SHC	249	304	394	470	477	259	320	419	491	491	269	335	443	499	503					
	KW	26.9	26.5	25.9	25.4	25.3	27.1	26.6	26.1	25.5	25.5	27.2	26.7	26.1	25.7	25.7					
	BF	0.10	0.09	0.07	0.11	0.35	0.11	0.09	0.08	0.15	0.41	0.11	0.10	0.09	0.23	0.45					
85	TC	560	539	503	468	464	568	546	510	479	478	574	552	515	491	489					
	SHC	243	298	388	461	464	253	314	412	476	478	263	330	437	486	489					
	KW	30.2	29.9	29.3	28.8	28.7	30.4	30.0	29.4	28.9	28.9	30.5	30.1	29.5	29.1	29.1					
	BF	0.10	0.09	0.07	0.12	0.37	0.11	0.09	0.09	0.18	0.42	0.11	0.09	0.09	0.25	0.47					
95	TC	543	522	485	451	450	551	528	492	465	463	556	534	497	477	475					
	SHC	238	292	380	449	450	248	308	405	458	463	258	324	427	465	475					
	KW	34.0	33.7	33.2	32.6	32.6	34.1	33.8	33.3	32.8	32.8	34.2	33.9	33.4	32.9	32.9					
	BF	0.09	0.08	0.08	0.13	0.39	0.10	0.09	0.08	0.22	0.44	0.11	0.09	0.09	0.29	0.48					
105	TC	523	501	464	435	434	529	507	471	450	447	534	512	475	459	458					
	SHC	232	285	373	432	434	241	301	397	440	447	251	317	420	454	458					
	KW	38.2	38.0	37.5	36.9	37.0	38.4	38.1	37.6	37.0	37.1	38.5	38.2	37.7	37.2	37.3					
	BF	0.09	0.08	0.07	0.16	0.41	0.10	0.09	0.08	0.25	0.46	0.10	0.09	0.10	0.30	0.50					
115	TC	500	479	443	420	417	505	484	449	434	429	510	489	453	440	439					
	SHC	224	278	365	412	417	234	294	389	434	429	244	309	411	440	439					
	KW	43.1	42.9	42.7	42.0	42.2	43.2	43.0	42.8	42.3	42.3	43.3	43.1	42.8	42.4	42.4					
	BF	0.09	0.08	0.07	0.21	0.43	0.10	0.09	0.09	0.31	0.48	0.10	0.09	0.10	0.32	0.52					
120	TC	488	467	432	412	408	493	473	437	425	420	497	477	442	430	430					
	SHC	220	274	361	404	408	230	290	384	425	420	240	306	406	430	430					
	KW	45.9	45.7	45.5	44.4	45.2	46.0	45.8	45.7	45.2	45.2	46.1	45.9	45.6	45.2	45.2					
	BF	0.09	0.08	0.07	0.23	0.45	0.10	0.09	0.09	0.33	0.49	0.10	0.09	0.10	0.33	0.53					

See legend on page 43.



**COOLING CAPACITIES (cont)**

**48/50A2,A3,A4,A5050 (50 TONS)**

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm														
		10,000					12,500					15,000				
		Evaporator Air — Ewb (F)														
		75	72	67	62	57	75	72	67	62	57	75	72	67	62	57
75	TC	632	601	556	512	471	663	630	584	541	508	682	651	604	560	539
	SHC	254	292	353	411	463	271	316	391	463	508	286	339	428	511	539
	kW	30.8	30.4	29.8	29.2	29.0	31.3	30.8	30.1	29.7	29.2	31.5	31.1	30.4	30.0	29.6
	BF	0.00	0.07	0.03	0.01	0.03	0.10	0.05	0.03	0.02	0.13	0.08	0.05	0.03	0.04	0.23
85	TC	612	586	540	497	457	640	614	568	523	495	659	633	587	542	526
	SHC	246	286	347	403	453	263	310	384	454	495	278	333	421	502	526
	kW	34.8	34.4	33.8	33.8	33.2	35.3	34.9	34.4	34.1	33.6	35.5	35.2	34.7	34.3	33.9
	BF	0.00	0.07	0.02	0.02	0.04	0.13	0.05	0.03	0.03	0.15	0.07	0.04	0.03	0.04	0.25
95	TC	597	566	523	480	441	623	595	549	504	480	641	613	567	522	510
	SHC	239	279	338	396	441	257	303	376	445	480	272	326	412	493	510
	kW	39.5	38.9	38.9	38.4	38.7	39.9	39.7	39.3	39.5	38.6	40.3	40.0	39.6	39.5	38.8
	BF	0.00	0.05	0.03	0.01	0.05	0.10	0.04	0.03	0.02	0.18	0.07	0.04	0.03	0.04	0.27
105	TC	576	549	503	461	426	600	573	527	483	463	617	590	544	500	492
	SHC	233	271	329	387	426	249	295	367	435	463	264	317	403	482	492
	kW	44.9	44.9	45.4	45.0	45.7	45.4	45.5	45.7	46.5	45.5	45.9	45.9	46.2	46.1	45.4
	BF	0.00	0.05	0.03	0.01	0.09	0.08	0.04	0.03	0.03	0.20	0.06	0.04	0.03	0.04	0.30
115	TC	553	526	480	436	408	576	549	503	458	444	592	564	518	476	472
	SHC	226	262	319	374	408	241	286	357	423	444	256	308	393	469	472
	kW	51.9	52.2	53.4	55.1	54.4	52.5	53.0	53.8	55.1	53.9	53.1	53.4	54.5	54.0	53.6
	BF	0.00	0.04	0.02	0.01	0.12	0.07	0.04	0.03	0.03	0.24	0.05	0.04	0.03	0.05	0.32
120	TC	541	513	467	—	—	563	535	489	—	—	577	550	504	463	462
	SHC	221	257	314	—	—	237	281	351	—	—	251	303	387	461	462
	kW	56.0	56.9	58.0	—	—	57.0	57.3	58.9	—	—	57.2	57.7	59.2	58.5	58.3
	BF	0.13	0.04	0.02	—	—	0.06	0.04	0.03	—	—	0.05	0.04	0.03	0.06	0.34

**48/50A2,A3,A4,A5050 (50 TONS) (cont)**

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm									
		17,500					20,000				
		Evaporator Air — Ewb (F)									
		75	72	67	62	57	75	72	67	62	57
75	TC	—	—	619	575	565	—	—	631	587	585
	SHC	—	—	463	555	565	—	—	498	583	585
	kW	—	—	30.6	30.1	29.9	—	—	30.8	30.2	30.2
	BF	—	—	0.04	0.05	0.31	—	—	0.04	0.11	0.37
85	TC	—	—	602	557	551	—	—	613	573	571
	SHC	—	—	456	546	551	—	—	491	568	571
	kW	—	—	35.0	34.4	34.2	—	—	35.1	34.4	34.4
	BF	—	—	0.04	0.06	0.32	—	—	0.04	0.13	0.39
95	TC	—	—	580	537	534	—	—	590	557	554
	SHC	—	—	447	533	534	—	—	482	550	554
	kW	—	—	39.9	39.2	39.1	—	—	40.1	39.3	39.3
	BF	—	—	0.04	0.07	0.35	—	—	0.04	0.16	0.41
105	TC	—	—	557	517	516	—	—	566	538	535
	SHC	—	—	439	514	516	—	—	472	530	535
	kW	—	—	46.4	45.4	45.5	—	—	46.9	45.3	45.5
	BF	—	—	0.03	0.10	0.37	—	—	0.04	0.20	0.43
115	TC	—	—	530	497	495	—	—	538	514	513
	SHC	—	—	428	492	495	—	—	462	514	513
	kW	—	—	54.5	53.0	53.3	—	—	55.0	53.2	53.2
	BF	—	—	0.03	0.14	0.39	—	—	0.04	0.21	0.45
120	TC	—	—	514	485	484	—	—	523	502	501
	SHC	—	—	422	482	484	—	—	456	502	501
	kW	—	—	60.0	57.6	57.9	—	—	59.7	57.8	57.8
	BF	—	—	0.04	0.16	0.41	—	—	0.04	0.23	0.46

See legend on page 43.

# Performance data (cont)



## COOLING CAPACITIES (cont)

### 48/50A2,A3,A4,A5060 (60 TONS)

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm														
		12,000					15,000					18,000				
		Evaporator Air — Ewb (F)														
		75	72	67	62	57	75	72	67	62	57	75	72	67	62	57
75	TC	738	705	653	603	554	773	736	684	633	592	796	759	706	655	622
	SHC	293	334	406	474	533	305	361	447	530	578	324	386	486	582	622
	KW	40.0	39.2	38.1	37.1	36.3	40.7	39.9	38.7	37.7	36.9	41.2	40.4	39.2	38.2	37.5
	BF	0.00	0.00	0.10	0.08	0.08	0.00	0.15	0.10	0.09	0.19	0.23	0.13	0.11	0.10	0.25
85	TC	716	686	635	585	537	748	715	664	615	579	768	737	685	635	607
	SHC	284	327	398	465	522	298	353	439	521	562	315	378	478	572	607
	KW	44.4	43.7	42.7	41.7	40.9	45.1	44.4	43.3	42.3	41.5	45.6	44.9	43.7	42.7	42.1
	BF	0.00	0.12	0.10	0.07	0.09	0.00	0.14	0.10	0.09	0.22	0.20	0.12	0.11	0.10	0.27
95	TC	695	666	615	566	519	725	694	643	593	557	745	713	662	613	590
	SHC	276	320	389	456	510	292	346	430	511	557	308	370	469	561	590
	KW	49.5	48.8	47.8	46.9	46.1	50.2	49.5	48.4	47.5	46.8	50.7	50.0	48.8	47.9	47.4
	BF	0.00	0.19	0.09	0.07	0.10	0.00	0.13	0.09	0.09	0.20	0.18	0.12	0.10	0.10	0.29
105	TC	673	643	593	545	502	699	669	619	570	539	718	687	638	587	570
	SHC	264	311	380	446	493	283	337	420	500	539	300	361	460	549	570
	KW	55.3	54.6	53.7	52.8	51.8	55.9	55.3	54.2	53.3	52.6	56.4	55.7	54.7	53.7	53.3
	BF	0.00	0.15	0.09	0.07	0.13	0.24	0.12	0.09	0.08	0.22	0.16	0.12	0.10	0.11	0.31
115	TC	647	617	567	521	484	670	641	592	544	519	687	657	609	561	549
	SHC	255	301	369	434	474	274	327	410	488	519	290	350	448	536	549
	KW	61.7	61.1	60.3	60.0	59.2	62.3	61.7	60.9	60.4	59.9	62.8	62.2	61.3	60.6	60.2
	BF	0.00	0.13	0.08	0.07	0.17	0.18	0.11	0.09	0.08	0.25	0.14	0.11	0.10	0.11	0.34
120	TC	632	603	554	508	471	654	626	578	531	509	670	641	594	547	538
	SHC	251	296	364	428	461	269	322	404	482	509	285	345	443	528	538
	KW	65.2	64.8	64.3	64.1	63.3	65.8	65.5	64.9	64.5	64.0	66.4	65.8	65.2	64.7	64.4
	BF	0.00	0.12	0.08	0.07	0.17	0.17	0.10	0.09	0.09	0.27	0.13	0.11	0.10	0.12	0.35

### 48/50A2,A3,A4,A5060 (60 TONS) (cont)

Temp (F) Air Entering Condenser (Edb)		Evaporator Air Quantity — Cfm														
		21,000					24,000					27,000				
		Evaporator Air — Ewb (F)														
		75	72	67	62	57	75	72	67	62	57	75	72	67	62	57
75	TC	813	776	722	671	651	826	789	735	683	674	837	800	745	695	693
	SHC	340	409	523	627	651	355	432	560	665	674	369	454	594	689	693
	KW	41.6	40.7	39.5	38.5	38.1	41.9	41.0	39.8	38.7	38.5	42.2	41.3	40.1	39.0	38.9
	BF	0.18	0.13	0.11	0.12	0.33	0.16	0.14	0.12	0.16	0.39	0.16	0.14	0.13	0.21	0.44
85	TC	784	752	700	650	634	796	764	713	662	656	806	774	723	678	675
	SHC	331	401	515	617	634	346	423	552	648	656	361	446	587	665	675
	KW	46.0	45.2	44.1	43.0	42.7	46.3	45.5	44.3	43.2	43.1	46.5	45.8	44.6	43.6	43.5
	BF	0.16	0.13	0.11	0.13	0.35	0.15	0.14	0.12	0.18	0.41	0.15	0.14	0.13	0.25	0.46
95	TC	759	728	678	627	616	770	739	689	640	638	780	748	698	659	656
	SHC	323	393	507	604	616	338	415	543	630	638	353	437	577	644	656
	KW	51.1	50.4	49.2	48.2	47.9	51.4	50.6	49.5	48.4	48.3	51.6	50.9	49.7	48.8	48.7
	BF	0.15	0.13	0.11	0.14	0.36	0.15	0.13	0.12	0.20	0.42	0.15	0.14	0.13	0.27	0.47
105	TC	731	701	651	602	596	742	711	662	620	616	750	720	670	637	634
	SHC	315	384	497	589	596	330	406	533	608	616	344	428	566	622	634
	KW	56.8	56.1	55.0	54.0	53.8	57.1	56.4	55.3	54.2	54.2	57.3	56.6	55.5	54.6	54.6
	BF	0.14	0.12	0.11	0.15	0.39	0.14	0.13	0.12	0.23	0.44	0.14	0.14	0.13	0.30	0.49
115	TC	699	670	622	576	573	709	679	631	596	592	716	687	639	612	609
	SHC	305	373	485	568	573	320	396	521	583	592	334	418	555	596	609
	KW	63.2	62.5	61.5	60.6	60.6	63.5	62.7	61.8	60.8	60.8	63.6	62.9	62.0	61.1	61.1
	BF	0.13	0.12	0.11	0.17	0.41	0.13	0.13	0.12	0.26	0.47	0.14	0.14	0.13	0.33	0.51
120	TC	682	653	607	564	561	691	662	616	584	580	698	670	623	600	595
	SHC	300	368	480	555	561	315	390	515	570	580	329	412	549	584	595
	KW	66.7	66.1	65.4	64.4	64.6	67.0	66.3	65.7	64.7	64.8	67.1	66.5	65.8	65.0	65.4
	BF	0.13	0.12	0.11	0.19	0.42	0.13	0.13	0.12	0.28	0.48	0.13	0.13	0.13	0.35	0.52

See legend on page 43.



## FAN PERFORMANCE — VERTICAL DISCHARGE UNITS

### 48A2,A3 020 (20 TONS)

Airflow (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
4,000	328	0.62	406	0.84	472	1.07	529	1.30	580	1.54	626	1.78	668	2.02	708	2.27	745	2.51	780	2.76
5,000	369	0.97	439	1.19	500	1.43	554	1.69	604	1.95	650	2.21	692	2.48	731	2.74	769	3.01	804	3.28
6,000	415	1.43	477	1.65	533	1.90	584	2.17	631	2.45	676	2.73	717	3.01	756	3.30	793	3.59	828	3.88
7,000	463	2.01	519	2.25	570	2.50	618	2.78	662	3.06	704	3.36	744	3.65	782	3.96	818	4.27	852	4.58
7,500	488	2.36	541	2.60	590	2.86	636	3.13	679	3.42	720	3.72	759	4.02	796	4.33	832	4.65	866	4.96
8,000	513	2.74	564	2.98	611	3.24	655	3.52	697	3.81	737	4.11	775	4.42	811	4.74	846	5.06	879	5.38
9,000	564	3.61	612	3.87	655	4.13	696	4.42	735	4.71	772	5.02	808	5.33	843	5.65	876	5.98	909	6.32
10,000	616	4.64	661	4.91	701	5.18	739	5.47	776	5.77	811	6.08	845	6.40	878	6.72	909	7.06	940	7.40

### 48A2,A3 020 (20 TONS) (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	814	3.01	845	3.26	876	3.51	905	3.76	934	4.02	961	4.28	987	4.54	1013	4.80	1038	5.06	1062	5.32
5,000	837	3.55	869	3.82	900	4.10	929	4.37	958	4.64	985	4.92	1012	5.20	1038	5.48	1063	5.76	1087	6.04
6,000	861	4.17	893	4.46	923	4.76	953	5.05	981	5.35	1009	5.65	1036	5.94	1062	6.24	1087	6.54	1111	6.84
7,000	885	4.89	917	5.20	947	5.51	977	5.83	1005	6.14	1033	6.46	1059	6.78	1085	7.09	1110	7.41	1135	7.73
7,500	898	5.28	930	5.61	960	5.93	989	6.25	1017	6.58	1045	6.90	1071	7.23	1097	7.56	1122	7.88	1147	8.21
8,000	912	5.71	943	6.04	973	6.37	1002	6.70	1030	7.04	1057	7.37	1083	7.71	1109	8.04	1134	8.38	1159	8.72
9,000	940	6.66	970	7.00	999	7.35	1028	7.69	1055	8.04	1082	8.39	1109	8.75	1134	9.10	1159	9.45	1183	9.81
10,000	971	7.75	1000	8.10	1028	8.46	1056	8.82	1083	9.18	1109	9.54	1135	9.91	1160	10.28	1185	10.65	—	—

### 48A2,A3 025-030 (25 THRU 30 TONS)

Airflow (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
5,000	374	0.98	443	1.20	503	1.45	558	1.70	607	1.96	653	2.23	695	2.49	734	2.76	771	3.03	806	3.30
6,000	421	1.45	482	1.68	538	1.93	589	2.20	636	2.47	680	2.75	721	3.04	759	3.33	796	3.62	831	3.91
7,000	471	2.04	526	2.28	576	2.54	623	2.81	668	3.10	710	3.39	749	3.69	787	4.00	823	4.31	857	4.62
8,000	522	2.78	572	3.03	619	3.29	662	3.57	704	3.86	743	4.16	781	4.47	817	4.79	851	5.11	885	5.44
9,000	574	3.66	621	3.92	664	4.19	704	4.47	743	4.77	780	5.08	815	5.40	850	5.72	883	6.05	915	6.39
10,000	628	4.71	671	4.97	711	5.25	748	5.54	784	5.84	819	6.15	853	6.47	885	6.81	917	7.14	948	7.49
11,000	682	5.91	722	6.19	759	6.48	795	6.77	828	7.08	861	7.40	893	7.72	924	8.06	954	8.40	983	8.75
12,000	736	7.30	774	7.59	809	7.88	842	8.18	874	8.49	905	8.82	935	9.15	965	9.48	993	9.83	1021	10.19
13,000	791	8.86	827	9.16	860	9.46	891	9.78	922	10.09	951	10.42	979	10.75	1007	11.10	1034	11.45	1061	11.80
14,000	846	10.61	880	10.93	912	11.24	941	11.56	970	11.88	998	12.21	1025	12.56	1052	12.90	1078	13.26	1103	13.62
15,000	902	12.56	934	12.89	964	13.21	992	13.54	1020	13.87	1046	14.21	1072	14.55	1098	14.91	1122	15.26	1147	15.63

### 48A2,A3 025-030 (25 THRU 30 TONS) (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
5,000	839	3.57	871	3.84	902	4.11	931	4.39	960	4.66	987	4.94	1014	5.22	1039	5.50	1064	5.78	1089	6.06
6,000	864	4.20	896	4.49	926	4.79	956	5.08	984	5.38	1012	5.68	1038	5.97	1064	6.27	1089	6.57	1114	6.87
7,000	890	4.93	921	5.24	951	5.55	980	5.87	1009	6.18	1036	6.50	1063	6.82	1088	7.14	1114	7.45	1138	7.77
8,000	917	5.76	948	6.09	977	6.42	1006	6.76	1034	7.09	1061	7.43	1088	7.76	1113	8.10	1138	8.43	1163	8.77
9,000	946	6.73	976	7.07	1005	7.42	1033	7.76	1061	8.11	1088	8.46	1114	8.82	1139	9.17	1164	9.52	1188	9.88
10,000	978	7.84	1007	8.19	1035	8.55	1063	8.91	1089	9.27	1116	9.63	1141	10.00	1166	10.37	1191	10.74	—	—
11,000	1012	9.10	1040	9.47	1067	9.83	1094	10.20	1120	10.57	1145	10.95	1170	11.33	1195	11.71	—	—	—	—
12,000	1048	10.54	1075	10.91	1102	11.28	1127	11.66	1152	12.04	1177	12.42	—	—	—	—	—	—	—	—
13,000	1087	12.17	1113	12.54	1138	12.91	1163	13.30	1187	13.68	—	—	—	—	—	—	—	—	—	—
14,000	1128	13.98	1153	14.36	1177	14.74	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15,000	1171	16.00	1194	16.38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

#### LEGEND

**Bhp** — Brake Horsepower

#### NOTES:

1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.



# Performance data (cont)



## FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

### 48A2,A3 035 (35 TONS)

AIRFLOW (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
7,000	534	2.46	584	2.80	630	3.13	674	3.48	716	3.82	756	4.16	793	4.50	829	4.83	863	5.17	896	5.49
8,000	590	3.27	635	3.63	677	3.99	718	4.35	757	4.72	794	5.08	830	5.45	864	5.81	897	6.18	929	6.54
9,000	646	4.23	687	4.62	726	5.00	764	5.38	800	5.76	835	6.15	869	6.54	902	6.93	934	7.31	964	7.70
10,000	704	5.35	742	5.77	778	6.17	812	6.57	846	6.97	879	7.38	911	7.78	942	8.19	972	8.60	1002	9.01
10,500	733	5.97	769	6.40	804	6.82	837	7.23	870	7.64	902	8.05	933	8.46	963	8.88	992	9.30	1021	9.72
11,000	762	6.63	797	7.08	830	7.51	863	7.93	894	8.35	925	8.77	955	9.19	984	9.62	1013	10.04	1041	10.47
12,000	820	8.09	853	8.56	884	9.01	915	9.46	944	9.90	973	10.34	1001	10.78	1029	11.22	1056	11.66	1083	12.10
13,000	879	9.72	909	10.22	939	10.70	968	11.17	996	11.63	1023	12.09	1050	12.55	1076	13.01	1102	13.46	1127	13.92
14,000	938	11.54	967	12.07	995	12.58	1022	13.07	1048	13.55	1074	14.03	1099	14.51	1124	14.98	1149	15.46	1173	15.93
15,000	997	13.56	1024	14.11	1051	14.64	1076	15.16	1102	15.67	1126	16.17	1150	16.66	1174	17.16	1197	17.65	1220	18.14
16,000	1056	15.78	1082	16.35	1107	16.91	1132	17.45	1156	17.98	1179	18.50	1202	19.02	1225	19.53	1247	20.04	1269	20.55
17,000	1116	18.20	1140	18.80	1164	19.38	1188	19.95	1210	20.50	1233	21.05	1255	21.58	1276	22.11	1298	22.64	—	—
17,500	1145	19.49	1170	20.10	1193	20.70	1216	21.28	1238	21.84	1260	22.40	1282	22.94	—	—	—	—	—	—

### 48A2,A3 035 (35 TONS) (cont)

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	
7,000	927	5.81	956	6.13	985	6.45	1012	6.76	1039	7.06	1065	7.37	1090	7.67	1114	7.97	1138	8.26	1161	8.56
8,000	960	6.89	989	7.25	1018	7.60	1045	7.94	1072	8.29	1098	8.63	1122	8.96	1147	9.29	1170	9.62	1193	9.95
9,000	994	8.09	1023	8.47	1051	8.85	1078	9.23	1104	9.61	1130	9.98	1155	10.35	1179	10.71	1203	11.08	1226	11.44
10,000	1030	9.42	1058	9.82	1085	10.23	1112	10.64	1138	11.04	1163	11.44	1188	11.84	1212	12.24	1235	12.64	1258	13.03
10,500	1049	10.14	1077	10.56	1103	10.97	1129	11.39	1155	11.81	1180	12.23	1204	12.64	1228	13.05	1251	13.46	1274	13.87
11,000	1069	10.90	1095	11.33	1122	11.76	1147	12.18	1173	12.61	1197	13.04	1221	13.47	1245	13.89	1268	14.31	1291	14.73
12,000	1109	12.55	1135	13.00	1160	13.44	1185	13.89	1209	14.34	1233	14.79	1256	15.24	1279	15.69	—	—	—	—
13,000	1152	14.38	1176	14.84	1200	15.31	1224	15.77	1248	16.24	1271	16.70	1293	17.17	—	—	—	—	—	—
14,000	1196	16.41	1220	16.88	1243	17.36	1266	17.84	1288	18.32	—	—	—	—	—	—	—	—	—	—
15,000	1243	18.63	1265	19.12	1287	19.61	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16,000	1290	21.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

### 48A2,A3040 (40 TONS)

Airflow (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
8,000	502	2.90	550	3.30	596	3.71	639	4.12	680	4.54	720	4.97	759	5.40	796	5.85	832	6.31	867	6.77
9,000	552	3.81	595	4.24	637	4.67	677	5.11	715	5.55	752	6.00	788	6.45	823	6.92	857	7.39	890	7.87
10,000	602	4.89	642	5.34	680	5.80	717	6.26	752	6.73	787	7.20	821	7.67	854	8.16	886	8.64	917	9.14
11,000	653	6.15	689	6.62	725	7.11	759	7.59	792	8.08	825	8.58	856	9.07	887	9.57	918	10.08	947	10.59
12,000	704	7.60	738	8.09	771	8.60	803	9.11	834	9.63	865	10.14	895	10.66	924	11.18	952	11.71	980	12.24
13,000	756	9.24	788	9.76	818	10.29	848	10.83	878	11.36	906	11.90	935	12.44	962	12.99	989	13.53	1016	14.08
14,000	808	11.10	838	11.64	867	12.19	895	12.74	922	13.30	950	13.87	976	14.43	1002	15.00	1028	15.57	1053	16.14
15,000	861	13.18	888	13.74	915	14.31	942	14.88	968	15.46	994	16.05	1019	16.63	1044	17.22	1068	17.81	1093	18.40
16,000	914	15.49	940	16.06	965	16.65	990	17.24	1015	17.85	1039	18.45	1063	19.06	1087	19.67	1110	20.28	1133	20.89
17,000	967	18.03	991	18.62	1015	19.23	1039	19.85	1062	20.47	1086	21.09	1109	21.72	1131	22.35	1153	22.98	1175	23.61
18,000	1020	20.82	1043	21.43	1066	22.06	1088	22.69	1111	23.33	1133	23.97	1155	24.62	1176	25.27	1197	25.92	1219	26.58
19,000	1073	23.87	1095	24.50	1117	25.14	1138	25.79	1159	26.44	1180	27.11	1201	27.77	1222	28.45	1242	29.12	—	—
20,000	1127	27.18	1147	27.82	1168	28.48	1188	29.15	—	—	—	—	—	—	—	—	—	—	—	—

### 48A2,A3040 (40 TONS) (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	
8,000	901	7.24	933	7.72	965	8.20	995	8.69	1024	9.19	1053	9.69	1081	10.19	1108	10.70	1134	11.21	1159	11.73
9,000	923	8.35	954	8.85	985	9.35	1014	9.86	1043	10.37	1072	10.89	1099	11.41	1126	11.94	1152	12.47	1177	13.00
10,000	948	9.64	978	10.15	1007	10.66	1036	11.19	1064	11.71	1092	12.25	1119	12.78	1145	13.33	1171	13.88	1196	14.43
11,000	976	11.11	1005	11.63	1033	12.16	1061	12.70	1088	13.24	1114	13.79	1140	14.34	1166	14.90	1191	15.46	1216	16.03
12,000	1008	12.77	1035	13.31	1062	13.86	1088	14.41	1114	14.97	1139	15.53	1164	16.09	1189	16.67	1213	17.24	1237	17.83
13,000	1042	14.64	1068	15.19	1093	15.76	1118	16.32	1143	16.89	1167	17.47	1191	18.05	1215	18.64	1238	19.23	1262	19.82
14,000	1078	16.71	1103	17.28	1127	17.86	1151	18.45	1174	19.03	1198	19.63	1221	20.22	1244	20.82	1266	21.43	1288	22.04
15,000	1116	19.00	1140	19.59	1163	20.19	1186	20.79	1208	21.40	1230	22.00	1253	22.62	1274	23.23	1296	23.85	—	—
16,000	1156	21.51	1178	22.12	1200	22.74	1222	23.36	1244	23.98	1265	24.61	1286	25.24	—	—	—	—	—	—
17,000	1197	24.25	1218	24.89	1240	25.52	1261	26.17	1281	26.81	—	—	—	—	—	—	—	—	—	—
18,000	1239	27.24	1260	27.89	1280	28.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

#### LEGEND

**Bhp** — Brake Horsepower

#### NOTES:

- Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
- Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

- Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.



## FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

**48A2,A3050 (50 TONS)**

Airflow (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
10,000	611	5.00	651	5.45	689	5.91	725	6.37	761	6.84	795	7.31	829	7.79	861	8.27	893	8.76	925	9.26
11,000	662	6.27	699	6.75	734	7.23	768	7.72	801	8.21	833	8.71	865	9.20	895	9.71	925	10.21	955	10.73
12,000	714	7.74	748	8.24	780	8.75	812	9.26	843	9.77	873	10.29	903	10.81	932	11.33	960	11.86	988	12.39
13,000	766	9.41	798	9.93	828	10.46	858	11.00	887	11.54	916	12.08	944	12.62	971	13.16	998	13.71	1024	14.26
14,000	819	11.29	848	11.84	877	12.39	905	12.95	932	13.51	959	14.07	986	14.63	1012	15.20	1037	15.77	1062	16.34
15,000	872	13.40	899	13.96	926	14.54	953	15.11	979	15.70	1004	16.28	1029	16.87	1054	17.46	1078	18.05	1102	18.64
16,000	925	15.74	951	16.32	976	16.91	1001	17.51	1026	18.12	1050	18.72	1074	19.33	1097	19.94	1121	20.55	1143	21.17
17,000	979	18.32	1003	18.92	1027	19.53	1051	20.15	1074	20.77	1097	21.40	1120	22.03	1142	22.66	1164	23.29	1186	23.93
18,000	1032	21.15	1055	21.77	1078	22.40	1100	23.04	1123	23.68	1145	24.33	1166	24.98	1188	25.63	1209	26.28	1230	26.93
19,000	1086	24.24	1108	24.88	1129	25.52	1151	26.18	1172	26.84	1193	27.51	1214	28.18	1234	28.85	1255	29.52	1275	30.19
20,000	1140	27.60	1161	28.25	1181	28.92	1202	29.59	1222	30.27	1242	30.95	1262	31.64	1281	32.33	—	—	—	—

**48A2,A3050 (50 TONS) (cont)**

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
10,000	955	9.76	985	10.27	1014	10.79	1043	11.31	1071	11.84	1098	12.37	1125	12.91	1151	13.46	1177	14.01	1202	14.56
11,000	984	11.25	1012	11.77	1040	12.30	1068	12.84	1095	13.38	1121	13.93	1147	14.49	1172	15.05	1197	15.61	1222	16.18
12,000	1016	12.93	1043	13.47	1069	14.02	1095	14.57	1121	15.13	1147	15.69	1172	16.26	1196	16.83	1220	17.41	1244	18.00
13,000	1050	14.82	1076	15.38	1101	15.94	1126	16.51	1151	17.08	1175	17.66	1199	18.24	1223	18.83	1246	19.42	1269	20.02
14,000	1087	16.92	1111	17.49	1136	18.07	1159	18.66	1183	19.25	1206	19.84	1229	20.44	1252	21.04	1274	21.64	1296	22.25
15,000	1126	19.23	1149	19.83	1172	20.43	1195	21.03	1217	21.64	1239	22.25	1261	22.86	1283	23.48	—	—	—	—
16,000	1166	21.78	1188	22.40	1210	23.01	1232	23.64	1253	24.26	1275	24.89	1296	25.52	—	—	—	—	—	—
17,000	1208	24.56	1229	25.20	1250	25.84	1271	26.48	1291	27.12	—	—	—	—	—	—	—	—	—	—
18,000	1250	27.59	1271	28.25	1291	28.91	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19,000	1294	30.87	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**48A2,A3060 (60 TONS)**

Airflow (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
12,000	476	4.33	534	5.04	585	5.78	632	6.56	674	7.39	714	8.24	751	9.12	786	10.02	819	10.93	851	11.85
14,000	536	6.19	588	6.96	636	7.74	680	8.56	720	9.41	758	10.30	793	11.21	827	12.15	859	13.11	890	14.08
15,000	566	7.28	617	8.09	662	8.90	704	9.73	744	10.59	781	11.50	816	12.42	849	13.38	881	14.36	911	15.35
16,000	597	8.48	645	9.34	689	10.17	730	11.02	768	11.90	804	12.82	839	13.76	871	14.73	902	15.72	932	16.73
17,000	628	9.80	674	10.71	717	11.58	756	12.45	793	13.34	829	14.27	862	15.23	894	16.21	925	17.21	954	18.24
18,000	659	11.25	704	12.21	745	13.11	783	14.00	819	14.91	853	15.85	886	16.82	918	17.82	948	18.84	977	19.88
19,000	691	12.82	734	13.84	773	14.77	810	15.69	845	16.62	879	17.58	911	18.56	942	19.57	971	20.60	1000	21.65
20,000	723	14.53	764	15.60	802	16.57	838	17.52	872	18.47	905	19.44	936	20.44	966	21.45	995	22.50	1023	23.57
21,000	755	16.37	794	17.49	831	18.51	866	19.49	899	20.47	931	21.46	961	22.47	991	23.50	1019	24.55	1047	25.63
22,000	787	18.35	825	19.53	861	20.59	894	21.60	927	22.61	958	23.62	987	24.64	1016	25.69	1044	26.76	1071	27.84
23,000	819	20.48	856	21.71	890	22.81	923	23.87	954	24.90	985	25.93	1014	26.97	1042	28.03	1069	29.11	1096	30.21
24,000	851	22.75	887	24.04	920	25.19	952	26.28	983	27.34	1012	28.40	1041	29.46	1068	30.54	1095	31.63	1121	32.74
25,000	883	25.17	918	26.52	951	27.72	982	28.84	1011	29.94	1040	31.02	1068	32.11	1095	33.21	1121	34.31	1147	35.44
26,000	916	27.76	950	29.15	981	30.40	1011	31.57	1040	32.70	1068	33.81	1095	34.92	1122	36.04	1147	37.16	1172	38.30
27,000	948	30.49	981	31.95	1012	33.24	1041	34.46	1070	35.62	1097	36.76	1123	37.90	1149	39.04	1174	40.18	1199	41.34

**48A2,A3060 (60 TONS) (cont)**

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
12,000	881	12.78	911	13.72	939	14.67	967	15.62	993	16.58	1019	17.54	1045	18.51	1069	19.48	1093	20.45	1117	21.43
14,000	920	15.06	948	16.06	976	17.07	1003	18.08	1029	19.11	1054	20.13	1079	21.17	1103	22.21	1126	23.26	1149	24.31
15,000	940	16.36	968	17.38	996	18.41	1022	19.45	1048	20.50	1073	21.56	1097	22.63	1121	23.70	1144	24.78	1167	25.86
16,000	961	17.76	989	18.80	1016	19.86	1042	20.92	1067	22.00	1092	23.08	1116	24.17	1140	25.28	1162	26.38	1185	27.49
17,000	983	19.28	1010	20.34	1036	21.42	1062	22.51	1087	23.60	1112	24.71	1135	25.83	1159	26.95	1181	28.09	—	—
18,000	1005	20.94	1032	22.01	1058	23.11	1083	24.21	1108	25.33	1132	26.46	1156	27.60	1178	28.74	—	—	—	—
19,000	1027	22.72	1054	23.81	1080	24.92	1105	26.04	1129	27.18	1153	28.33	1176	29.48	1199	30.65	—	—	—	—
20,000	1050	24.65	1076	25.76	1102	26.88	1126	28.01	1151	29.17	1174	30.33	1197	31.50	—	—	—	—	—	—
21,000	1073	26.73	1099	27.84	1124	28.97	1149	30.13	1173	31.29	1196	32.47	—	—	—	—	—	—	—	—
22,000	1097	28.95	1123	30.08	1147	31.22	1172	32.39	1195	33.56	—	—	—	—	—	—	—	—	—	—
23,000	1122	31.33	1147	32.47	1171	33.63	1195	34.80	—	—	—	—	—	—	—	—	—	—	—	—
24,000	1146	33.87	1171	35.02	1195	36.19	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25,000	1171	36.58	1196	37.74	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26,000	1197	39.46	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** — Brake Horsepower

**NOTES:**

- 1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
- 2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

# Performance data (cont)



## FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

50A2,A3 020 (20 TONS)																					
Airflow (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
4,000	311	0.54	390	0.71	457	0.88	515	1.05	567	1.21	613	1.38	656	1.55	696	1.71	733	1.88	768	2.04	
5,000	347	0.84	417	1.02	480	1.21	536	1.40	587	1.59	633	1.78	676	1.97	716	2.16	753	2.34	788	2.52	
6,000	387	1.25	450	1.43	507	1.63	560	1.84	609	2.05	654	2.26	696	2.47	735	2.68	773	2.88	808	3.09	
7,000	430	1.77	488	1.96	540	2.17	588	2.38	634	2.61	677	2.83	718	3.06	756	3.29	793	3.51	828	3.74	
7,500	452	2.07	507	2.27	557	2.48	604	2.70	648	2.93	690	3.16	730	3.40	768	3.63	804	3.87	839	4.10	
8,000	474	2.41	528	2.61	576	2.82	620	3.04	663	3.28	704	3.52	743	3.76	780	4.00	816	4.24	850	4.48	
9,000	519	3.19	570	3.39	614	3.60	656	3.83	696	4.07	734	4.32	771	4.57	806	4.82	840	5.08	873	5.34	
10,000	565	4.10	613	4.31	655	4.53	694	4.76	731	5.00	767	5.26	802	5.51	835	5.78	868	6.04	900	6.31	

50A2,A3 020 (20 TONS) (cont)																					
Airflow (Cfm)		Available External Static Pressure (in. wg)																			
		2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
		Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	802	2.21	833	2.38	864	2.55	893	2.71	921	2.88	949	3.06	975	3.23	1001	3.40	1026	3.58	1050	3.75	
5,000	822	2.71	854	2.89	885	3.08	914	3.26	943	3.45	970	3.64	997	3.82	1023	4.01	1048	4.20	1072	4.39	
6,000	842	3.29	874	3.50	905	3.70	934	3.90	963	4.10	991	4.31	1017	4.51	1043	4.71	1069	4.91	1093	5.12	
7,000	862	3.96	894	4.19	924	4.41	954	4.63	983	4.85	1010	5.07	1037	5.29	1063	5.51	1089	5.72	1113	5.94	
7,500	872	4.33	904	4.56	934	4.79	964	5.02	993	5.25	1020	5.48	1047	5.71	1073	5.94	1099	6.16	1123	6.39	
8,000	883	4.73	914	4.97	945	5.21	974	5.45	1003	5.68	1030	5.92	1057	6.16	1083	6.39	1108	6.63	1133	6.87	
9,000	905	5.60	936	5.85	966	6.11	995	6.37	1023	6.62	1051	6.88	1077	7.13	1103	7.38	1129	7.64	1153	7.89	
10,000	931	6.58	961	6.85	990	7.13	1018	7.40	1046	7.67	1073	7.94	1099	8.21	1124	8.48	1149	8.75	1174	9.02	

50A2,A3 025-030 (25 THRU 30 TONS)																					
Airflow (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
5,000	352	0.85	422	1.03	484	1.22	540	1.42	590	1.61	636	1.79	678	1.98	718	2.17	755	2.35	791	2.54	
6,000	394	1.26	456	1.45	513	1.65	565	1.86	613	2.07	658	2.28	700	2.49	739	2.70	776	2.90	811	3.11	
7,000	438	1.79	495	1.98	546	2.19	594	2.41	640	2.64	682	2.86	723	3.09	761	3.32	798	3.54	833	3.77	
8,000	483	2.44	536	2.64	583	2.85	628	3.08	670	3.32	710	3.55	749	3.80	786	4.04	821	4.28	855	4.52	
9,000	530	3.23	579	3.43	623	3.65	664	3.88	704	4.12	741	4.37	778	4.62	813	4.88	847	5.13	880	5.39	
10,000	577	4.15	624	4.36	665	4.58	703	4.82	740	5.06	776	5.32	810	5.58	843	5.84	876	6.11	907	6.38	
11,000	625	5.22	669	5.44	708	5.67	744	5.91	779	6.16	813	6.41	845	6.68	877	6.95	907	7.22	937	7.50	
12,000	674	6.45	715	6.67	753	6.90	787	7.15	820	7.40	851	7.67	882	7.93	912	8.21	941	8.49	970	8.78	
13,000	722	7.85	762	8.07	798	8.30	831	8.55	862	8.81	892	9.08	921	9.35	950	9.63	977	9.92	1005	10.21	
14,000	771	9.41	810	9.64	844	9.88	875	10.13	905	10.39	934	10.66	962	10.94	989	11.22	1015	11.51	1041	11.81	
15,000	821	11.15	857	11.38	890	11.62	921	11.88	949	12.14	977	12.42	1004	12.70	1030	12.99	1055	13.28	1080	13.58	

50A2,A3 025-030 (25 THRU 30 TONS) (cont)																					
Airflow (Cfm)		Available External Static Pressure (in. wg)																			
		2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
		Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
5,000	824	2.72	856	2.91	887	3.09	916	3.28	945	3.46	972	3.65	999	3.83	1024	4.02	1049	4.21	1074	4.40	
6,000	845	3.31	877	3.52	908	3.72	937	3.92	966	4.12	993	4.32	1020	4.53	1046	4.73	1071	4.93	1096	5.14	
7,000	866	3.99	898	4.21	928	4.43	958	4.66	986	4.88	1014	5.10	1041	5.31	1067	5.53	1092	5.75	1116	5.97	
8,000	888	4.77	919	5.01	950	5.25	979	5.49	1007	5.72	1035	5.96	1061	6.20	1087	6.43	1113	6.67	1137	6.90	
9,000	912	5.65	942	5.90	972	6.16	1001	6.42	1029	6.67	1056	6.93	1083	7.18	1108	7.43	1134	7.69	1158	7.94	
10,000	938	6.65	968	6.92	997	7.19	1025	7.46	1052	7.73	1079	8.00	1105	8.27	1130	8.54	1155	8.81	1180	9.08	
11,000	967	7.78	995	8.07	1023	8.35	1051	8.63	1077	8.92	1103	9.20	1129	9.49	1154	9.77	1178	10.06	—	—	
12,000	998	9.07	1025	9.35	1052	9.65	1078	9.94	1104	10.24	1130	10.54	1154	10.83	1179	11.13	—	—	—	—	
13,000	1031	10.50	1058	10.80	1083	11.10	1109	11.40	1133	11.71	1158	12.01	1182	12.32	—	—	—	—	—	—	
14,000	1067	12.10	1092	12.41	1117	12.71	1141	13.02	1165	13.33	1188	13.65	—	—	—	—	—	—	—	—	
15,000	1104	13.88	1128	14.19	1152	14.50	1175	14.81	1198	15.13	—	—	—	—	—	—	—	—	—	—	

### LEGEND

Bhp — Brake Horsepower

### NOTES:

- Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
- Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

- Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.



**FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)**

50A2,A3035 (35 TONS)																				
AIRFLOW (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
7,000	503	1.96	553	2.22	601	2.47	646	2.72	689	2.97	730	3.22	768	3.46	804	3.70	839	3.94	872	4.17
8,000	553	2.62	599	2.89	643	3.16	684	3.43	724	3.70	763	3.97	799	4.23	834	4.50	868	4.76	901	5.02
9,000	605	3.39	647	3.68	687	3.97	726	4.26	763	4.55	798	4.83	833	5.12	867	5.40	899	5.68	930	5.96
10,000	657	4.29	696	4.61	733	4.91	769	5.22	803	5.52	837	5.82	870	6.12	901	6.42	932	6.72	962	7.02
10,500	684	4.80	721	5.12	757	5.43	791	5.75	825	6.06	857	6.37	889	6.68	920	6.98	950	7.29	979	7.60
11,000	710	5.33	747	5.66	781	5.99	814	6.31	847	6.63	878	6.95	909	7.26	939	7.58	968	7.89	997	8.21
12,000	764	6.52	798	6.86	830	7.21	861	7.54	891	7.88	921	8.21	950	8.54	978	8.87	1006	9.20	1033	9.53
13,000	818	7.85	849	8.21	880	8.57	909	8.92	938	9.27	966	9.62	993	9.97	1020	10.31	1046	10.66	1072	11.00
14,000	872	9.33	901	9.71	930	10.09	958	10.45	985	10.82	1012	11.19	1037	11.55	1063	11.91	1088	12.27	1113	12.63
15,000	926	10.98	954	11.37	981	11.76	1008	12.15	1033	12.53	1059	12.91	1083	13.28	1108	13.66	1131	14.03	1155	14.40
16,000	980	12.79	1007	13.20	1033	13.60	1058	14.00	1082	14.40	1106	14.79	1130	15.18	1153	15.57	1176	15.96	1199	16.35
17,000	1035	14.77	1060	15.19	1085	15.61	1109	16.03	1132	16.44	1155	16.84	1178	17.25	1200	17.65	1222	18.05	1243	18.46
17,500	1062	15.83	1087	16.25	1111	16.68	1134	17.10	1157	17.52	1180	17.94	1202	18.35	1224	18.76	1245	19.17	1266	19.58

50A2,A3035 (35 TONS) (cont)																				
AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	903	4.40	933	4.62	962	4.84	990	5.06	1017	5.27	1043	5.48	1068	5.69	1092	5.89	1116	6.09	1139	6.28
8,000	932	5.27	962	5.52	991	5.77	1019	6.02	1045	6.26	1071	6.50	1097	6.73	1121	6.96	1145	7.19	1168	7.42
9,000	961	6.24	990	6.52	1019	6.79	1047	7.06	1073	7.33	1099	7.59	1125	7.85	1149	8.11	1173	8.37	1196	8.62
10,000	992	7.32	1020	7.62	1048	7.91	1075	8.20	1102	8.49	1127	8.78	1152	9.07	1177	9.35	1201	9.63	1224	9.91
10,500	1008	7.90	1036	8.21	1063	8.51	1090	8.82	1116	9.12	1142	9.41	1166	9.71	1191	10.01	1214	10.30	1238	10.59
11,000	1025	8.52	1052	8.84	1079	9.15	1105	9.46	1131	9.77	1156	10.08	1181	10.39	1205	10.69	1228	10.99	1252	11.29
12,000	1060	9.86	1086	10.19	1112	10.52	1137	10.85	1162	11.17	1187	11.50	1211	11.82	1234	12.15	1257	12.47	1280	12.79
13,000	1097	11.35	1122	11.69	1147	12.03	1171	12.37	1195	12.72	1219	13.06	1242	13.40	1265	13.74	1287	14.08	—	—
14,000	1137	12.98	1161	13.34	1184	13.69	1208	14.05	1231	14.41	1253	14.76	1276	15.12	1298	15.47	—	—	—	—
15,000	1178	14.77	1201	15.15	1223	15.51	1246	15.88	1268	16.25	1289	16.62	—	—	—	—	—	—	—	—
16,000	1221	16.73	1243	17.11	1264	17.50	1286	17.88	—	—	—	—	—	—	—	—	—	—	—	—
17,000	1265	18.85	1286	19.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17,500	1287	19.98	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

50A2,A3040 (40 TONS)																				
AIRFLOW (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
8,000	475	2.69	523	3.08	569	3.47	612	3.86	653	4.26	692	4.66	730	5.07	767	5.49	802	5.92	836	6.36
9,000	521	3.53	565	3.94	606	4.36	646	4.78	684	5.20	721	5.63	757	6.06	791	6.49	825	6.94	857	7.39
10,000	568	4.52	608	4.96	646	5.40	683	5.84	719	6.29	753	6.74	787	7.20	819	7.65	851	8.11	882	8.58
11,000	615	5.68	652	6.14	687	6.60	722	7.07	755	7.55	788	8.02	819	8.50	850	8.97	880	9.46	909	9.94
12,000	663	7.01	697	7.49	730	7.98	762	8.47	794	8.97	824	9.47	854	9.96	883	10.47	912	10.97	939	11.48
13,000	712	8.53	743	9.03	774	9.54	804	10.05	834	10.57	862	11.09	891	11.61	918	12.13	945	12.66	972	13.19
14,000	760	10.24	790	10.76	819	11.29	847	11.82	875	12.36	902	12.90	929	13.45	955	13.99	981	14.54	1006	15.09
15,000	809	12.15	837	12.69	864	13.24	891	13.79	917	14.35	943	14.91	968	15.48	993	16.04	1018	16.62	1042	17.18
16,000	859	14.27	885	14.83	910	15.40	936	15.97	960	16.55	985	17.13	1009	17.71	1033	18.30	1056	18.89	1079	19.48
17,000	908	16.61	933	17.19	957	17.77	981	18.36	1004	18.96	1028	19.56	1051	20.16	1073	20.77	1096	21.38	1118	21.99
18,000	958	19.18	981	19.77	1004	20.37	1027	20.98	1049	21.60	1071	22.22	1093	22.84	1115	23.46	1136	24.09	1157	24.72
19,000	1007	21.98	1030	22.59	1052	23.21	1073	23.84	1095	24.47	1116	25.10	1137	25.74	1157	26.39	1178	27.04	1198	27.68
20,000	1057	25.02	1079	25.65	1099	26.29	1120	26.93	1140	27.58	1161	28.23	1181	28.89	—	—	—	—	—	—

50A2,A3040 (40 TONS) (cont)																				
AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
8,000	870	6.81	902	7.26	933	7.73	964	8.20	993	8.67	1022	9.16	1050	9.65	1077	10.14	1104	10.64	1129	11.15
9,000	889	7.85	920	8.31	950	8.79	979	9.27	1008	9.75	1036	10.25	1064	10.75	1090	11.26	1117	11.77	1142	12.29
10,000	912	9.05	941	9.53	970	10.02	998	10.51	1026	11.00	1053	11.51	1080	12.02	1106	12.54	1131	13.06	1157	13.59
11,000	938	10.43	966	10.92	993	11.42	1020	11.93	1047	12.44	1073	12.95	1099	13.47	1124	14.00	1149	14.53	1173	15.07
12,000	967	11.98	993	12.49	1020	13.01	1046	13.53	1071	14.05	1096	14.58	1121	15.11	1145	15.65	1169	16.19	1192	16.74
13,000	998	13.72	1023	14.25	1049	14.78	1073	15.32	1098	15.86	1121	16.40	1145	16.95	1168	17.50	1191	18.06	1214	18.62
14,000	1031	15.64	1055	16.19	1079	16.75	1103	17.30	1126	17.86	1149	18.42	1172	18.98	1195	19.55	1217	20.12	1239	20.69
15,000	1066	17.76	1089	18.33	1112	18.90	1135	19.48	1157	20.06	1179	20.63	1201	21.21	1223	21.80	1244	22.38	1265	22.97
16,000	1102	20.08	1124	20.67	1147	21.26	1168	21.86	1190	22.46	1211	23.06	1232	23.66	1253	24.26	1274	24.86	1294	25.46
17,000	1140	22.61	1161	23.22	1182	23.84	1203	24.45	1224	25.07	1245	25.69	1265	26.31	1285	26.93	—	—	—	—
18,000	1178	25.36	1199	25.99	1219	26.63	1240	27.26	1260	27.90	1279	28.54	1299	29.18	—	—	—	—	—	—
19,000	1218	28.34	1238	28.99	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**  
**Bhp** — Brake Horsepower

**NOTES:**  
1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.

2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

# Performance data (cont)



## FAN PERFORMANCE — VERTICAL DISCHARGE UNITS (cont)

### 50A2,A3050 (50 TONS)

Airflow (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
10,000	577	4.62	617	5.06	655	5.50	692	5.95	727	6.40	761	6.85	794	7.30	827	7.76	858	8.22	889	8.69
11,000	625	5.80	661	6.26	697	6.73	731	7.20	764	7.67	796	8.14	827	8.62	858	9.10	888	9.58	917	10.07
12,000	673	7.15	707	7.63	740	8.12	772	8.62	803	9.11	833	9.61	863	10.11	891	10.61	920	11.12	947	11.62
13,000	722	8.69	753	9.19	784	9.70	814	10.22	843	10.74	872	11.26	900	11.78	927	12.31	954	12.83	980	13.36
14,000	771	10.43	800	10.95	829	11.48	857	12.01	885	12.55	912	13.10	938	13.64	964	14.19	990	14.74	1015	15.29
15,000	821	12.37	848	12.91	875	13.46	901	14.01	928	14.57	953	15.14	978	15.70	1003	16.27	1028	16.84	1052	17.41
16,000	870	14.52	896	15.08	922	15.65	947	16.22	971	16.80	996	17.39	1020	17.97	1043	18.56	1066	19.15	1089	19.75
17,000	920	16.89	945	17.48	969	18.06	993	18.65	1016	19.25	1039	19.86	1062	20.46	1084	21.07	1107	21.68	1129	22.30
18,000	971	19.50	994	20.10	1017	20.71	1039	21.32	1061	21.93	1083	22.55	1105	23.18	1126	23.80	1148	24.44	1169	25.07
19,000	1021	22.35	1043	22.96	1065	23.59	1086	24.21	1107	24.85	1128	25.49	1149	26.13	1170	26.78	1190	27.42	1210	28.08
20,000	1071	25.43	1092	26.07	1113	26.71	1133	27.36	1154	28.01	1174	28.66	1194	29.33	1213	29.99	1233	30.65	1252	31.33

### 50A2,A3050 (50 TONS) (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
10,000	919	9.17	948	9.64	977	10.13	1005	10.62	1032	11.12	1059	11.63	1086	12.14	1112	12.66	1137	13.18	1162	13.71
11,000	945	10.56	973	11.05	1001	11.55	1027	12.06	1054	12.57	1080	13.09	1105	13.61	1130	14.14	1155	14.67	1179	15.21
12,000	975	12.13	1001	12.64	1027	13.16	1053	13.68	1078	14.21	1103	14.74	1128	15.27	1152	15.81	1176	16.35	1199	16.90
13,000	1006	13.89	1032	14.42	1057	14.96	1081	15.49	1105	16.03	1129	16.58	1153	17.12	1176	17.68	1199	18.23	1221	18.80
14,000	1040	15.84	1064	16.39	1088	16.94	1112	17.50	1135	18.06	1158	18.62	1180	19.18	1203	19.75	1225	20.32	1246	20.90
15,000	1075	17.99	1098	18.56	1121	19.13	1144	19.71	1166	20.29	1188	20.86	1210	21.45	1231	22.03	1253	22.62	1274	23.21
16,000	1112	20.34	1134	20.93	1156	21.53	1178	22.12	1199	22.72	1221	23.32	1241	23.92	1262	24.52	1283	25.13	—	—
17,000	1150	22.91	1172	23.52	1193	24.14	1214	24.76	1234	25.37	1255	25.99	1275	26.61	1295	27.23	—	—	—	—
18,000	1190	25.70	1210	26.34	1230	26.97	1250	27.61	1270	28.25	1290	28.89	—	—	—	—	—	—	—	—
19,000	1230	28.73	1250	29.38	1269	30.04	1289	30.70	—	—	—	—	—	—	—	—	—	—	—	—
20,000	1271	31.99	1290	32.67	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

### 50A2,A3060 (60 TONS)

Airflow (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
12,000	450	4.02	509	4.71	560	5.41	605	6.12	647	6.86	686	7.62	723	8.40	757	9.21	790	10.04	821	10.89
14,000	505	5.74	558	6.49	606	7.24	649	8.01	689	8.79	727	9.59	762	10.40	795	11.24	827	12.09	857	12.96
15,000	533	6.75	584	7.53	630	8.32	672	9.11	711	9.91	748	10.73	782	11.56	815	12.41	846	13.28	876	14.17
16,000	561	7.88	610	8.68	655	9.50	696	10.32	734	11.14	770	11.98	803	12.84	836	13.71	866	14.59	896	15.49
17,000	590	9.12	637	9.95	680	10.79	720	11.64	757	12.49	792	13.35	825	14.23	857	15.12	887	16.02	916	16.94
18,000	619	10.48	664	11.33	706	12.20	744	13.07	781	13.96	815	14.84	847	15.74	878	16.65	908	17.57	937	18.50
19,000	648	11.96	692	12.84	732	13.74	769	14.64	805	15.54	838	16.45	870	17.37	900	18.30	930	19.24	958	20.19
20,000	678	13.57	719	14.47	758	15.40	795	16.32	829	17.25	862	18.19	893	19.13	923	20.08	952	21.04	979	22.01
21,000	707	15.30	748	16.24	785	17.19	821	18.14	854	19.09	886	20.05	917	21.02	946	22.00	974	22.98	1001	23.97
22,000	737	17.18	776	18.14	812	19.11	847	20.09	879	21.07	911	22.06	940	23.05	969	24.04	997	25.05	1024	26.06
23,000	767	19.20	804	20.18	840	21.17	873	22.17	905	23.18	935	24.19	965	25.21	993	26.23	1020	27.25	1046	28.28
24,000	797	21.35	833	22.36	867	23.38	900	24.40	931	25.43	961	26.47	989	27.51	1017	28.55	1044	29.60	1070	30.65
25,000	827	23.66	862	24.68	895	25.72	927	26.78	957	27.83	986	28.89	1014	29.95	1041	31.02	1068	32.09	1093	33.17
26,000	857	26.11	891	27.16	923	28.23	954	29.30	984	30.38	1012	31.46	1040	32.55	1066	33.64	1092	34.73	1117	35.83
27,000	888	28.72	920	29.79	952	30.88	982	31.97	1011	33.08	1038	34.19	1065	35.29	1091	36.40	1117	37.52	1141	38.64

### 50A2,A3060 (60 TONS) (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
12,000	851	11.75	880	12.63	907	13.53	934	14.45	960	15.38	985	16.32	1010	17.28	1033	18.24	1057	19.22	1079	20.22
14,000	886	13.85	915	14.76	942	15.68	968	16.62	993	17.57	1018	18.54	1042	19.52	1066	20.51	1088	21.52	1111	22.53
15,000	905	15.07	933	15.99	960	16.92	986	17.87	1011	18.83	1035	19.81	1059	20.81	1082	21.81	1105	22.82	1127	23.85
16,000	924	16.41	952	17.34	978	18.28	1004	19.25	1029	20.22	1053	21.21	1077	22.21	1100	23.22	1122	24.25	1144	25.29
17,000	944	17.86	971	18.81	997	19.77	1023	20.74	1047	21.73	1071	22.73	1095	23.74	1117	24.76	1140	25.80	1161	26.85
18,000	964	19.45	991	20.41	1017	21.38	1042	22.36	1066	23.36	1090	24.37	1113	25.40	1136	26.43	1158	27.48	1179	28.54
19,000	985	21.15	1011	22.13	1037	23.12	1061	24.11	1085	25.13	1109	26.15	1132	27.19	1154	28.24	1176	29.29	1197	30.36
20,000	1006	22.99	1032	23.98	1057	24.99	1081	26.00	1105	27.03	1128	28.06	1151	29.11	1173	30.17	1195	31.24	—	—
21,000	1028	24.97	1053	25.97	1078	26.99	1102	28.02	1126	29.06	1148	30.11	1171	31.17	1193	32.25	—	—	—	—
22,000	1050	27.08	1075	28.10	1099	29.14	1123	30.18	1146	31.24	1169	32.30	1191	33.38	—	—	—	—	—	—
23,000	1072	29.32	1097	30.37	1121	31.42	1144	32.48	1167	33.55	1190	34.64	—	—	—	—	—	—	—	—
24,000	1095	31.71	1119	32.78	1143	33.85	1166	34.93	1189	36.02	—	—	—	—	—	—	—	—	—	—
25,000	1118	34.25	1142	35.33	1165	36.42	1188	37.52	—	—	—	—	—	—	—	—	—	—	—	—
26,000	1141	36.93	1165	38.04	1188	39.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27,000	1165	39.76	1188	40.89	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

#### LEGEND

Bhp — Brake Horsepower

3. Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

#### NOTES:

1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$





## FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS

**48A4,A5 020 (20 TONS)**

Airflow (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
4,000	339	0.71	414	0.97	478	1.25	534	1.54	585	1.84	631	2.14	674	2.44	714	2.75	751	3.06	787	3.37
5,000	384	1.10	452	1.37	510	1.66	563	1.96	611	2.28	656	2.60	698	2.93	738	3.27	775	3.60	811	3.94
6,000	433	1.61	494	1.89	548	2.19	597	2.51	643	2.84	686	3.18	726	3.52	764	3.88	800	4.23	835	4.60
7,000	484	2.27	540	2.56	590	2.87	636	3.19	679	3.53	719	3.88	757	4.24	794	4.61	829	4.98	863	5.36
7,500	511	2.66	563	2.95	612	3.26	656	3.59	698	3.94	737	4.29	775	4.66	810	5.03	845	5.41	877	5.79
8,000	538	3.09	588	3.38	634	3.70	678	4.03	718	4.38	756	4.74	793	5.11	827	5.49	861	5.87	893	6.26
9,000	593	4.07	639	4.37	682	4.69	722	5.03	760	5.39	796	5.76	831	6.13	864	6.52	896	6.91	927	7.32
10,000	649	5.23	691	5.54	731	5.87	769	6.21	805	6.58	839	6.95	872	7.34	904	7.73	934	8.13	964	8.54

**48A4,A5 020 (20 TONS) (cont)**

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	820	3.68	852	3.99	883	4.30	912	4.62	940	4.93	967	5.25	993	5.57	1019	5.89	1043	6.21	1067	6.53
5,000	844	4.28	877	4.63	907	4.97	937	5.31	966	5.66	993	6.01	1020	6.35	1046	6.70	1071	7.05	1095	7.40
6,000	869	4.96	901	5.33	931	5.70	961	6.07	990	6.44	1017	6.81	1044	7.19	1070	7.57	1096	7.94	1121	8.32
7,000	895	5.74	926	6.13	956	6.52	986	6.91	1014	7.30	1042	7.70	1068	8.10	1094	8.50	1120	8.90	1145	9.30
7,500	909	6.18	940	6.57	970	6.97	999	7.37	1027	7.78	1054	8.18	1081	8.59	1107	9.00	1132	9.41	1157	9.82
8,000	925	6.66	955	7.06	984	7.46	1013	7.87	1040	8.28	1067	8.69	1094	9.11	1119	9.53	1144	9.95	1169	10.37
9,000	957	7.72	986	8.13	1015	8.55	1042	8.97	1069	9.39	1096	9.82	1121	10.25	1146	10.69	1171	11.12	1195	11.56
10,000	993	8.96	1021	9.38	1048	9.80	1075	10.23	1101	10.67	1126	11.11	1151	11.55	1176	12.00	1200	12.45	—	—

**48A4,A5 025-030 (25 THRU 30 TONS)**

Airflow (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
5,000	389	1.11	456	1.38	514	1.68	566	1.98	614	2.30	659	2.62	701	2.95	740	3.29	777	3.62	813	3.96
6,000	439	1.64	499	1.92	553	2.22	602	2.54	647	2.87	689	3.21	730	3.56	768	3.91	804	4.27	838	4.63
7,000	492	2.31	546	2.60	596	2.91	641	3.24	684	3.58	724	3.93	762	4.29	798	4.66	833	5.03	867	5.41
8,000	546	3.14	596	3.43	642	3.75	684	4.09	724	4.44	762	4.80	798	5.17	833	5.55	866	5.93	898	6.32
9,000	602	4.13	647	4.43	690	4.76	730	5.10	768	5.46	803	5.83	838	6.21	871	6.60	903	7.00	933	7.40
10,000	659	5.31	701	5.62	740	5.95	777	6.30	813	6.67	847	7.04	880	7.43	911	7.83	942	8.23	971	8.64
11,000	717	6.67	755	6.99	792	7.33	827	7.68	860	8.06	893	8.44	924	8.83	954	9.24	983	9.65	1011	10.07
12,000	775	8.23	811	8.56	845	8.90	878	9.27	909	9.64	940	10.03	970	10.43	999	10.84	1026	11.26	1054	11.69
13,000	834	9.99	867	10.33	899	10.68	930	11.05	960	11.44	989	11.83	1017	12.24	1045	12.65	1072	13.08	1098	13.51
14,000	893	11.97	924	12.32	954	12.68	983	13.06	1012	13.44	1039	13.85	1066	14.26	1093	14.68	1118	15.11	1143	15.54
15,000	953	14.17	982	14.53	1010	14.90	1037	15.28	1064	15.68	1091	16.08	1116	16.50	1142	16.93	1166	17.36	1190	17.80

**48A4,A5 025-030 (25 THRU 30 TONS) (cont)**

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
5,000	846	4.31	879	4.65	909	4.99	939	5.34	968	5.68	995	6.03	1022	6.38	1048	6.73	1073	7.08	1097	7.43
6,000	872	5.00	903	5.36	934	5.73	964	6.10	992	6.48	1020	6.85	1047	7.22	1073	7.60	1098	7.98	1123	8.36
7,000	899	5.79	930	6.18	960	6.57	989	6.96	1018	7.36	1045	7.75	1072	8.15	1098	8.55	1123	8.95	1148	9.35
8,000	930	6.72	960	7.12	989	7.53	1017	7.94	1045	8.35	1072	8.76	1098	9.18	1124	9.60	1148	10.02	1173	10.44
9,000	963	7.80	992	8.22	1020	8.63	1048	9.06	1075	9.48	1101	9.91	1126	10.34	1151	10.78	1176	11.21	1200	11.65
10,000	1000	9.06	1028	9.48	1055	9.91	1081	10.34	1107	10.77	1133	11.22	1157	11.66	1182	12.11	—	—	—	—
11,000	1039	10.49	1066	10.92	1092	11.36	1117	11.80	1142	12.24	1167	12.69	1191	13.15	—	—	—	—	—	—
12,000	1080	12.12	1106	12.56	1131	13.00	1156	13.45	1180	13.90	—	—	—	—	—	—	—	—	—	—
13,000	1123	13.95	1148	14.39	1172	14.84	1196	15.30	—	—	—	—	—	—	—	—	—	—	—	—
14,000	1168	15.99	1192	16.44	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Bhp** — Brake Horsepower

**NOTES:**

- Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
- Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

- Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

# Performance data (cont)



## FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48A4,A5 035 (35 TONS)																					
AIRFLOW (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
7,000	553	2.59	602	2.92	648	3.26	691	3.61	732	3.95	770	4.29	807	4.63	842	4.96	875	5.29	907	5.62	
8,000	612	3.45	656	3.81	698	4.17	738	4.53	776	4.90	812	5.27	847	5.63	881	6.00	913	6.36	944	6.72	
9,000	672	4.47	712	4.86	750	5.24	787	5.62	823	6.01	857	6.39	890	6.78	922	7.17	953	7.56	983	7.95	
10,000	733	5.67	769	6.08	805	6.48	839	6.88	872	7.28	904	7.69	935	8.10	966	8.51	995	8.92	1024	9.33	
10,500	763	6.33	798	6.75	832	7.17	865	7.58	897	7.99	929	8.40	959	8.82	989	9.24	1017	9.66	1046	10.08	
11,000	794	7.04	828	7.47	861	7.90	892	8.32	923	8.74	954	9.16	983	9.59	1012	10.01	1040	10.44	1067	10.87	
12,000	855	8.60	887	9.06	918	9.51	948	9.95	977	10.39	1005	10.83	1033	11.27	1060	11.71	1087	12.16	1113	12.60	
13,000	917	10.36	947	10.84	976	11.31	1004	11.77	1031	12.23	1058	12.69	1084	13.14	1110	13.60	1135	14.06	1160	14.52	
14,000	980	12.32	1008	12.82	1035	13.31	1061	13.79	1087	14.27	1112	14.75	1137	15.22	1161	15.70	1185	16.17	1209	16.65	
15,000	1042	14.49	1069	15.01	1094	15.52	1119	16.03	1143	16.53	1167	17.02	1191	17.51	1214	18.01	1237	18.50	1260	18.99	
16,000	1105	16.88	1130	17.42	1154	17.96	1178	18.48	1201	19.00	1224	19.51	1246	20.02	1268	20.53	1290	21.04	—	—	
17,000	1168	19.49	1191	20.06	1214	20.61	1237	21.16	1259	21.69	1281	22.23	—	—	—	—	—	—	—	—	
17,500	1200	20.88	1222	21.46	1245	22.03	1267	22.58	1288	23.13	—	—	—	—	—	—	—	—	—	—	

48A4,A5 035 (35 TONS) (cont)																					
AIRFLOW (Cfm)		AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)																			
		2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
		Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	937	5.94	967	6.26	995	6.57	1022	6.87	1048	7.18	1073	7.48	1098	7.78	1122	8.07	1145	8.36	1168	8.66	
8,000	974	7.08	1003	7.43	1031	7.77	1058	8.12	1084	8.46	1109	8.79	1134	9.13	1158	9.46	1181	9.78	1204	10.11	
9,000	1012	8.33	1041	8.72	1068	9.10	1094	9.47	1120	9.85	1145	10.22	1169	10.58	1193	10.95	1216	11.31	1239	11.66	
10,000	1052	9.74	1080	10.15	1106	10.55	1132	10.96	1157	11.36	1182	11.76	1206	12.16	1229	12.55	1252	12.95	1275	13.34	
10,500	1073	10.50	1100	10.92	1126	11.34	1151	11.75	1176	12.17	1201	12.59	1224	13.00	1248	13.41	1271	13.82	1293	14.22	
11,000	1094	11.30	1120	11.73	1146	12.16	1171	12.59	1196	13.02	1220	13.45	1243	13.87	1266	14.30	1289	14.72	—	—	
12,000	1138	13.05	1163	13.50	1188	13.95	1212	14.40	1236	14.84	1259	15.30	1282	15.74	—	—	—	—	—	—	
13,000	1184	14.99	1208	15.45	1232	15.92	1255	16.39	1278	16.85	—	—	—	—	—	—	—	—	—	—	
14,000	1232	17.13	1255	17.61	1278	18.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
15,000	1282	19.48	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
16,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
17,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
17,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

48A4,A5040 (40 TONS)																					
Airflow (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
8,000	526	3.10	573	3.50	617	3.91	660	4.33	700	4.75	740	5.18	778	5.62	814	6.07	850	6.53	884	7.00	
9,000	579	4.08	621	4.51	662	4.95	701	5.39	738	5.83	775	6.28	810	6.74	845	7.21	878	7.69	911	8.17	
10,000	633	5.24	671	5.70	709	6.16	744	6.62	779	7.09	813	7.57	846	8.05	879	8.53	910	9.03	941	9.53	
11,000	687	6.59	723	7.07	757	7.56	790	8.05	823	8.54	854	9.04	885	9.54	916	10.05	945	10.56	974	11.08	
12,000	742	8.15	775	8.65	807	9.17	838	9.68	868	10.20	898	10.72	927	11.24	955	11.77	983	12.30	1011	12.84	
13,000	797	9.92	827	10.45	857	10.98	887	11.52	915	12.07	943	12.61	970	13.15	997	13.70	1024	14.25	1050	14.81	
14,000	852	11.92	881	12.47	909	13.03	936	13.59	963	14.15	990	14.72	1016	15.29	1041	15.86	1066	16.43	1091	17.01	
15,000	908	14.15	935	14.72	961	15.31	987	15.89	1013	16.48	1038	17.06	1062	17.65	1086	18.25	1110	18.84	1134	19.44	
16,000	964	16.63	989	17.23	1014	17.83	1039	18.43	1063	19.04	1086	19.65	1110	20.26	1133	20.88	1156	21.49	1178	22.11	
17,000	1021	19.37	1044	19.98	1068	20.60	1091	21.23	1114	21.86	1136	22.49	1158	23.12	1180	23.76	1202	24.39	1223	25.03	
18,000	1077	22.37	1099	23.01	1122	23.64	1144	24.29	1165	24.94	1187	25.59	1208	26.25	1229	26.90	1250	27.56	1270	28.22	
19,000	1133	25.65	1155	26.30	1176	26.96	1197	27.62	1217	28.29	1238	28.96	—	—	—	—	—	—	—	—	
20,000	1190	29.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

48A4,A5040 (40 TONS) (cont)																					
Airflow (Cfm)		Available External Static Pressure (in. wg)																			
		2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
		Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
8,000	917	7.48	949	7.96	980	8.44	1010	8.94	1039	9.43	1067	9.93	1094	10.44	1121	10.95	1147	11.46	1172	11.98	
9,000	942	8.66	973	9.16	1003	9.66	1033	10.17	1061	10.69	1089	11.21	1116	11.73	1142	12.26	1168	12.80	1193	13.33	
10,000	971	10.03	1001	10.55	1030	11.06	1058	11.59	1086	12.12	1113	12.66	1139	13.20	1165	13.75	1190	14.30	1215	14.86	
11,000	1003	11.60	1031	12.13	1059	12.67	1086	13.21	1112	13.75	1139	14.31	1164	14.86	1189	15.43	1214	15.99	1238	16.56	
12,000	1038	13.38	1065	13.92	1091	14.47	1117	15.03	1142	15.59	1167	16.16	1192	16.73	1216	17.31	1240	17.89	1264	18.48	
13,000	1075	15.37	1101	15.93	1126	16.50	1150	17.07	1175	17.65	1199	18.23	1222	18.82	1246	19.41	1269	20.00	1291	20.61	
14,000	1115	17.59	1139	18.17	1163	18.75	1186	19.34	1210	19.94	1232	20.53	1255	21.14	1277	21.74	1300	22.35	—	—	
15,000	1157	20.04	1180	20.64	1202	21.24	1225	21.85	1247	22.46	1269	23.07	1290	23.69	—	—	—	—	—	—	
16,000	1200	22.73	1222	23.35	1243	23.97	1265	24.60	1286	25.23	—	—	—	—	—	—	—	—	—	—	
17,000	1245	25.67	1266	26.32	1286	26.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
18,000	1290	28.88	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
19,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
20,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

**LEGEND**  
**Bhp** — Brake Horsepower

**NOTES:**  
 1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.  
 2. Conversion — Bhp to watts:  

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.





FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

48A4,A5050 (50 TONS)																					
Airflow (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
10,000	642	5.35	680	5.80	717	6.27	753	6.73	787	7.20	821	7.68	854	8.16	886	8.65	917	9.14	948	9.65	
11,000	696	6.72	732	7.20	766	7.69	799	8.18	831	8.67	863	9.17	893	9.68	923	10.18	953	10.70	982	11.21	
12,000	751	8.29	784	8.80	816	9.32	847	9.83	877	10.35	906	10.87	935	11.40	964	11.92	991	12.46	1019	12.99	
13,000	807	10.09	837	10.62	867	11.16	896	11.70	924	12.24	952	12.78	979	13.33	1006	13.88	1032	14.43	1058	14.99	
14,000	863	12.12	891	12.67	919	13.23	946	13.79	973	14.36	999	14.92	1025	15.49	1050	16.06	1075	16.64	1100	17.21	
15,000	919	14.38	946	14.96	972	15.54	997	16.12	1023	16.71	1047	17.30	1072	17.89	1096	18.48	1120	19.08	1143	19.68	
16,000	975	16.90	1000	17.49	1025	18.09	1049	18.70	1073	19.31	1097	19.92	1120	20.53	1143	21.15	1165	21.76	1188	22.38	
17,000	1032	19.67	1056	20.29	1079	20.91	1102	21.54	1125	22.17	1147	22.80	1169	23.44	1191	24.07	1213	24.71	1234	25.35	
18,000	1089	22.71	1111	23.35	1134	23.99	1155	24.64	1177	25.29	1198	25.95	1219	26.60	1240	27.26	1261	27.92	1281	28.58	
19,000	1146	26.04	1167	26.69	1188	27.35	1209	28.02	1230	28.69	1250	29.37	1270	30.04	1290	30.72	—	—	—	—	
20,000	1203	29.65	1224	30.32	1244	31.00	1263	31.69	1283	32.38	—	—	—	—	—	—	—	—	—	—	

48A4,A5050 (50 TONS) (cont)																					
Airflow (Cfm)		Available External Static Pressure (in. wg)																			
		2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
		Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
10,000	978	10.15	1008	10.67	1036	11.19	1064	11.72	1092	12.25	1119	12.79	1145	13.33	1171	13.88	1196	14.43	1221	14.99	
11,000	1010	11.74	1038	12.27	1066	12.81	1093	13.35	1119	13.90	1145	14.45	1171	15.01	1196	15.57	1220	16.14	1245	16.72	
12,000	1046	13.53	1072	14.08	1098	14.63	1124	15.19	1149	15.76	1174	16.32	1199	16.90	1223	17.48	1247	18.06	1270	18.65	
13,000	1084	15.55	1109	16.11	1134	16.68	1158	17.26	1182	17.84	1206	18.42	1230	19.01	1253	19.60	1276	20.20	1299	20.80	
14,000	1124	17.79	1148	18.38	1171	18.97	1195	19.55	1218	20.15	1241	20.75	1263	21.35	1285	21.96	—	—	—	—	
15,000	1166	20.27	1189	20.88	1211	21.49	1234	22.09	1256	22.71	1277	23.32	1299	23.94	—	—	—	—	—	—	
16,000	1210	23.00	1231	23.62	1253	24.25	1274	24.88	1295	25.51	—	—	—	—	—	—	—	—	—	—	
17,000	1255	25.99	1276	26.63	1296	27.27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
18,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
19,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
20,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

48A4,A5060 (60 TONS)																					
Airflow (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
12,000	516	4.81	569	5.54	617	6.30	660	7.10	701	7.93	739	8.79	774	9.68	808	10.59	841	11.52	872	12.46	
14,000	584	6.90	632	7.69	676	8.50	716	9.33	754	10.20	790	11.10	824	12.02	857	12.97	888	13.94	917	14.92	
15,000	619	8.13	664	8.96	706	9.79	745	10.65	782	11.53	817	12.44	850	13.38	882	14.35	912	15.33	941	16.34	
16,000	654	9.49	697	10.36	737	11.22	775	12.10	811	13.00	845	13.93	877	14.88	908	15.86	938	16.86	966	17.88	
17,000	689	10.99	730	11.90	769	12.79	806	13.69	840	14.61	873	15.56	904	16.53	935	17.52	964	18.54	992	19.58	
18,000	725	12.64	764	13.58	801	14.51	837	15.43	870	16.38	902	17.34	933	18.32	962	19.33	990	20.36	1018	21.41	
19,000	760	14.43	798	15.41	834	16.37	868	17.32	900	18.29	932	19.27	961	20.27	990	21.29	1018	22.34	1045	23.40	
20,000	796	16.37	833	17.39	867	18.39	900	19.37	931	20.36	962	21.36	991	22.38	1019	23.42	1046	24.48	1072	25.56	
21,000	832	18.47	867	19.54	901	20.56	932	21.57	963	22.59	992	23.61	1020	24.65	1048	25.71	1074	26.78	1100	27.87	
22,000	869	20.74	902	21.84	934	22.90	965	23.94	995	24.98	1023	26.03	1051	27.09	1077	28.17	1103	29.26	1129	30.36	
23,000	905	23.17	937	24.31	968	25.40	998	26.48	1027	27.55	1055	28.62	1081	29.70	1107	30.79	1133	31.90	1157	33.02	
24,000	942	25.78	973	26.95	1003	28.08	1032	29.18	1059	30.28	1086	31.38	1113	32.48	1138	33.59	1163	34.72	1187	35.86	
25,000	978	28.56	1008	29.77	1037	30.93	1065	32.07	1092	33.20	1119	34.32	1144	35.44	1169	36.58	1193	37.72	—	—	
26,000	1015	31.52	1044	32.76	1072	33.96	1099	35.13	1125	36.29	1151	37.44	1176	38.59	—	—	—	—	—	—	
27,000	1052	34.66	1080	35.94	1107	37.18	1133	38.38	1159	39.57	1184	40.75	—	—	—	—	—	—	—	—	

48A4,A5060 (60 TONS) (cont)																					
Airflow (Cfm)		Available External Static Pressure (in. wg)																			
		2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
		Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
12,000	901	13.42	930	14.38	958	15.36	985	16.34	1011	17.33	1036	18.33	1061	19.33	1085	20.34	1108	21.35	1131	22.36	
14,000	946	15.92	974	16.94	1001	17.97	1027	19.01	1052	20.06	1077	21.12	1101	22.18	1125	23.25	1148	24.33	1170	25.42	
15,000	970	17.36	997	18.40	1024	19.45	1049	20.51	1074	21.58	1099	22.67	1122	23.76	1146	24.86	1168	25.97	1191	27.08	
16,000	994	18.93	1021	19.98	1047	21.05	1072	22.14	1097	23.23	1121	24.34	1144	25.45	1167	26.58	1190	27.71	—	—	
17,000	1019	20.63	1045	21.70	1071	22.79	1096	23.89	1120	25.01	1144	26.13	1167	27.27	1190	28.42	—	—	—	—	
18,000	1045	22.48	1070	23.57	1096	24.67	1120	25.79	1144	26.93	1167	28.07	1190	29.23	—	—	—	—	—	—	
19,000	1071	24.49	1096	25.59	1121	26.71	1145	27.84	1169	28.99	1192	30.16	—	—	—	—	—	—	—	—	
20,000	1098	26.66	1123	27.77	1147	28.90	1171	30.05	1194	31.21	—	—	—	—	—	—	—	—	—	—	
21,000	1125	28.99	1150	30.12	1173	31.26	1197	32.42	—	—	—	—	—	—	—	—	—	—	—	—	
22,000	1153	31.49	1177	32.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
23,000	1181	34.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
24,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
25,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
26,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
27,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

LEGEND

Bhp — Brake Horsepower

2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

NOTES:

1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.

3. Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

# Performance data (cont)



## FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

### 50A4,A5 020 (20 TONS)

Airflow (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
4,000	322	0.62	399	0.82	464	1.04	521	1.26	572	1.48	619	1.71	662	1.93	702	2.16	739	2.38	774	2.61
5,000	361	0.95	431	1.17	491	1.41	545	1.65	594	1.89	640	2.14	682	2.39	722	2.64	759	2.89	795	3.14
6,000	405	1.41	467	1.64	524	1.88	574	2.14	621	2.40	664	2.67	705	2.93	744	3.20	780	3.47	816	3.75
7,000	451	2.00	508	2.22	559	2.48	607	2.75	651	3.02	693	3.30	732	3.58	769	3.87	804	4.16	839	4.45
7,500	475	2.34	529	2.57	579	2.82	625	3.10	668	3.38	708	3.66	746	3.96	783	4.25	818	4.55	851	4.84
8,000	500	2.72	551	2.95	598	3.21	643	3.48	685	3.77	724	4.06	762	4.36	797	4.66	832	4.96	864	5.27
9,000	550	3.60	596	3.83	640	4.09	682	4.36	721	4.66	759	4.96	795	5.27	829	5.58	862	5.90	893	6.22
10,000	601	4.63	644	4.86	684	5.12	723	5.40	760	5.70	796	6.01	830	6.33	863	6.65	894	6.98	925	7.31

### 50A4,A5 020 (20 TONS) (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4,000	808	2.84	840	3.06	870	3.29	900	3.52	928	3.75	955	3.98	981	4.21	1007	4.44	1031	4.67	1055	4.91
5,000	829	3.39	861	3.64	892	3.89	922	4.14	950	4.40	978	4.65	1005	4.90	1031	5.16	1056	5.41	1080	5.67
6,000	849	4.02	881	4.29	912	4.57	942	4.84	971	5.12	999	5.39	1026	5.67	1052	5.94	1077	6.22	1102	6.49
7,000	871	4.74	903	5.03	933	5.33	963	5.62	991	5.92	1019	6.21	1046	6.51	1072	6.80	1098	7.10	1123	7.40
7,500	883	5.14	915	5.44	945	5.75	974	6.05	1002	6.35	1030	6.66	1057	6.96	1083	7.27	1108	7.58	1133	7.88
8,000	896	5.58	927	5.89	957	6.20	985	6.51	1014	6.82	1041	7.13	1067	7.45	1093	7.76	1118	8.08	1143	8.39
9,000	924	6.54	954	6.86	983	7.19	1011	7.51	1038	7.84	1064	8.17	1090	8.50	1116	8.83	1141	9.16	1165	9.49
10,000	954	7.64	983	7.98	1011	8.31	1038	8.65	1065	8.99	1091	9.34	1116	9.68	1141	10.02	1165	10.37	1189	10.72

### 50A4,A5 025-030 (25 THRU 30 TONS)

Airflow (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
5,000	366	0.97	435	1.19	495	1.42	548	1.67	597	1.91	642	2.16	685	2.41	724	2.65	762	2.90	797	3.16
6,000	411	1.43	473	1.66	529	1.91	579	2.16	625	2.43	668	2.69	709	2.96	747	3.23	784	3.50	819	3.77
7,000	459	2.02	515	2.25	566	2.51	613	2.78	657	3.06	698	3.34	737	3.62	774	3.91	809	4.20	843	4.49
8,000	508	2.76	559	2.99	606	3.25	650	3.53	691	3.82	731	4.11	768	4.41	803	4.71	837	5.01	870	5.32
9,000	560	3.64	605	3.88	649	4.14	690	4.42	729	4.72	766	5.02	802	5.33	835	5.64	868	5.96	900	6.28
10,000	612	4.68	654	4.92	694	5.19	732	5.47	769	5.77	804	6.09	838	6.40	870	6.73	902	7.06	932	7.39
11,000	665	5.89	703	6.14	740	6.41	776	6.69	811	7.00	844	7.31	876	7.64	907	7.97	937	8.31	967	8.65
12,000	718	7.28	754	7.53	788	7.80	822	8.09	854	8.39	886	8.71	916	9.04	946	9.38	975	9.72	1003	10.07
13,000	772	8.85	806	9.11	838	9.38	869	9.67	899	9.98	929	10.30	958	10.63	987	10.97	1014	11.32	1041	11.68
14,000	826	10.61	858	10.87	888	11.15	917	11.44	946	11.75	974	12.07	1002	12.41	1029	12.75	1055	13.10	1081	13.46
15,000	881	12.57	910	12.84	939	13.12	967	13.41	994	13.72	1021	14.05	1047	14.38	1073	14.73	1098	15.08	1123	15.45

### 50A4,A5 025-030 (25 THRU 30 TONS) (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
5,000	831	3.41	863	3.66	894	3.91	924	4.16	952	4.41	980	4.67	1007	4.92	1032	5.17	1057	5.43	1082	5.68
6,000	852	4.05	884	4.32	915	4.59	945	4.87	974	5.14	1001	5.42	1028	5.69	1054	5.97	1080	6.24	1105	6.52
7,000	875	4.78	907	5.07	937	5.37	967	5.66	995	5.95	1023	6.25	1049	6.55	1076	6.84	1101	7.14	1126	7.44
8,000	901	5.63	932	5.94	961	6.25	990	6.56	1018	6.87	1045	7.18	1072	7.50	1097	7.81	1123	8.13	1147	8.44
9,000	930	6.60	960	6.93	988	7.25	1016	7.58	1043	7.91	1070	8.23	1096	8.57	1121	8.90	1146	9.23	1170	9.56
10,000	961	7.72	990	8.06	1018	8.40	1045	8.74	1071	9.08	1097	9.42	1122	9.76	1147	10.11	1171	10.46	1194	10.80
11,000	995	8.99	1022	9.34	1049	9.69	1075	10.04	1101	10.39	1126	10.75	1151	11.11	1175	11.47	1198	11.82	—	—
12,000	1030	10.43	1057	10.78	1083	11.14	1108	11.51	1133	11.87	1157	12.24	1181	12.61	—	—	—	—	—	—
13,000	1068	12.04	1093	12.40	1119	12.77	1143	13.14	1167	13.52	1191	13.89	—	—	—	—	—	—	—	—
14,000	1107	13.83	1131	14.20	1156	14.58	1179	14.96	—	—	—	—	—	—	—	—	—	—	—	—
15,000	1147	15.82	1171	16.19	1194	16.58	—	—	—	—	—	—	—	—	—	—	—	—	—	—

#### LEGEND

Bhp — Brake Horsepower

#### NOTES:

- Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
- Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

- Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.



# FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

## 50A4,A5035 (35 TONS)

AIRFLOW (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
7,000	522	2.06	573	2.32	620	2.57	664	2.82	705	3.06	744	3.30	780	3.54	815	3.78	849	4.01	881	4.24
8,000	576	2.75	622	3.03	665	3.30	706	3.57	745	3.84	782	4.10	817	4.36	850	4.62	883	4.87	914	5.12
9,000	630	3.57	672	3.86	712	4.16	750	4.45	787	4.74	822	5.02	855	5.30	888	5.58	919	5.86	949	6.13
10,000	686	4.52	724	4.84	761	5.15	797	5.46	831	5.77	864	6.07	896	6.37	927	6.67	957	6.97	986	7.26
10,500	714	5.05	750	5.38	786	5.70	821	6.02	854	6.34	886	6.65	917	6.96	947	7.27	977	7.57	1005	7.87
11,000	742	5.62	777	5.95	811	6.28	845	6.61	877	6.94	909	7.26	939	7.58	968	7.90	997	8.21	1025	8.52
12,000	799	6.88	831	7.22	863	7.57	894	7.91	925	8.25	954	8.60	983	8.93	1011	9.27	1039	9.60	1065	9.93
13,000	856	8.29	886	8.65	916	9.01	945	9.37	974	9.72	1002	10.08	1029	10.44	1056	10.79	1082	11.14	1108	11.49
14,000	914	9.87	942	10.24	969	10.61	997	10.98	1024	11.36	1050	11.73	1076	12.10	1102	12.47	1127	12.84	1152	13.20
15,000	971	11.62	998	12.00	1024	12.39	1050	12.77	1075	13.16	1100	13.54	1125	13.93	1149	14.31	1173	14.70	1197	15.08
16,000	1029	13.55	1054	13.94	1079	14.34	1103	14.74	1127	15.13	1151	15.53	1174	15.93	1198	16.33	1220	16.73	1243	17.12
17,000	1088	15.66	1111	16.07	1134	16.47	1157	16.88	1180	17.29	1203	17.70	1225	18.11	1247	18.53	1269	18.93	1290	19.34
17,500	1117	16.79	1140	17.20	1162	17.61	1184	18.02	1207	18.44	1229	18.86	1250	19.27	1272	19.69	1293	20.11	—	—

## 50A4,A5035 (35 TONS) (cont)

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7,000	912	4.46	942	4.68	970	4.90	998	5.12	1025	5.33	1051	5.54	1076	5.75	1101	5.96	1124	6.16	1148	6.36
8,000	944	5.37	973	5.62	1001	5.86	1029	6.11	1055	6.35	1081	6.58	1106	6.82	1130	7.05	1154	7.28	1177	7.51
9,000	978	6.40	1006	6.67	1034	6.93	1060	7.20	1086	7.46	1112	7.72	1136	7.98	1160	8.23	1184	8.49	1207	8.74
10,000	1014	7.55	1041	7.84	1068	8.12	1094	8.41	1119	8.69	1144	8.97	1168	9.25	1192	9.52	1215	9.80	1238	10.07
10,500	1033	8.17	1059	8.47	1086	8.77	1111	9.06	1136	9.35	1161	9.64	1184	9.93	1208	10.22	1231	10.50	1253	10.79
11,000	1052	8.83	1078	9.14	1104	9.44	1129	9.75	1154	10.05	1178	10.35	1201	10.64	1224	10.94	1247	11.23	1269	11.53
12,000	1091	10.26	1117	10.58	1142	10.90	1166	11.23	1190	11.54	1213	11.86	1236	12.18	1259	12.49	1281	12.80	—	—
13,000	1133	11.83	1157	12.17	1181	12.51	1205	12.85	1228	13.19	1251	13.52	1273	13.86	1295	14.19	—	—	—	—
14,000	1176	13.56	1199	13.92	1222	14.28	1245	14.63	1268	14.99	1290	15.34	—	—	—	—	—	—	—	—
15,000	1220	15.45	1243	15.83	1265	16.20	1287	16.58	—	—	—	—	—	—	—	—	—	—	—	—
16,000	1265	17.52	1287	17.91	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

## 50A4,A5040 (40 TONS)

Airflow (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
8,000	499	2.88	546	3.27	590	3.66	632	4.06	672	4.46	711	4.87	748	5.28	784	5.70	819	6.14	853	6.58
9,000	548	3.78	591	4.20	631	4.62	670	5.04	708	5.47	744	5.90	778	6.33	812	6.77	845	7.22	877	7.67
10,000	599	4.86	637	5.30	675	5.74	711	6.19	746	6.64	779	7.09	812	7.55	844	8.01	875	8.47	905	8.94
11,000	649	6.11	685	6.57	720	7.04	753	7.51	786	7.99	817	8.47	848	8.94	878	9.43	907	9.91	936	10.40
12,000	701	7.54	734	8.03	766	8.52	797	9.02	828	9.52	857	10.02	886	10.52	915	11.03	943	11.53	970	12.04
13,000	753	9.18	783	9.69	813	10.21	842	10.72	871	11.25	899	11.77	927	12.30	953	12.82	980	13.35	1006	13.88
14,000	805	11.03	833	11.56	861	12.09	889	12.63	916	13.18	942	13.73	968	14.27	994	14.82	1019	15.37	1044	15.92
15,000	857	13.09	884	13.64	910	14.20	936	14.76	962	15.32	987	15.89	1011	16.46	1036	17.03	1060	17.61	1083	18.18
16,000	910	15.38	935	15.95	960	16.53	984	17.11	1008	17.69	1032	18.28	1056	18.87	1079	19.47	1101	20.06	1124	20.66
17,000	963	17.91	986	18.50	1010	19.09	1033	19.69	1056	20.30	1078	20.91	1101	21.52	1123	22.13	1145	22.75	1166	23.36
18,000	1016	20.68	1038	21.29	1060	21.90	1082	22.52	1104	23.15	1126	23.77	1147	24.41	1168	25.04	1189	25.67	1209	26.31
19,000	1069	23.71	1090	24.33	1111	24.96	1132	25.60	1153	26.25	1173	26.89	1194	27.54	1214	28.19	1234	28.85	—	—
20,000	1122	26.99	1142	27.64	1162	28.29	1182	28.95	—	—	—	—	—	—	—	—	—	—	—	—

## 50A4,A5040 (40 TONS) (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
8,000	885	7.03	917	7.48	948	7.95	978	8.42	1007	8.90	1036	9.39	1063	9.88	1090	10.38	1116	10.88	1142	11.39
9,000	908	8.13	939	8.60	968	9.08	997	9.56	1026	10.05	1053	10.55	1080	11.05	1107	11.56	1133	12.08	1158	12.60
10,000	934	9.42	963	9.90	992	10.39	1020	10.89	1047	11.39	1073	11.89	1100	12.41	1125	12.93	1151	13.45	1175	13.99
11,000	964	10.89	992	11.39	1019	11.89	1045	12.40	1071	12.91	1097	13.43	1122	13.96	1147	14.49	1171	15.02	1195	15.56
12,000	996	12.55	1023	13.07	1048	13.59	1074	14.11	1099	14.64	1123	15.17	1147	15.71	1171	16.25	1195	16.80	1218	17.35
13,000	1031	14.41	1056	14.95	1081	15.48	1105	16.03	1129	16.57	1152	17.12	1175	17.67	1198	18.22	1221	18.78	1243	19.35
14,000	1068	16.48	1092	17.03	1115	17.59	1138	18.15	1161	18.71	1184	19.27	1206	19.84	1228	20.41	1250	20.99	1271	21.56
15,000	1106	18.75	1129	19.33	1151	19.91	1174	20.48	1196	21.07	1217	21.65	1239	22.23	1260	22.82	1280	23.41	—	—
16,000	1146	21.25	1168	21.85	1189	22.45	1211	23.04	1232	23.64	1253	24.25	1273	24.85	1293	25.45	—	—	—	—
17,000	1187	23.98	1208	24.60	1229	25.21	1249	25.83	1270	26.46	1289	27.07	—	—	—	—	—	—	—	—
18,000	1230	26.95	1250	27.58	1269	28.22	1289	28.86	—	—	—	—	—	—	—	—	—	—	—	—
19,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

### LEGEND

**Bhp** — Brake Horsepower

### NOTES:

1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.

2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.

# Performance data (cont)



## FAN PERFORMANCE — HORIZONTAL DISCHARGE UNITS (cont)

### 50A4,A5050 (50 TONS)

Airflow (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
10,000	608	4.96	646	5.40	683	5.85	719	6.30	754	6.75	787	7.20	819	7.66	851	8.12	882	8.58	912	9.06
11,000	659	6.23	694	6.69	728	7.16	762	7.64	794	8.11	825	8.59	856	9.07	886	9.55	915	10.04	943	10.53
12,000	710	7.68	743	8.17	775	8.67	806	9.17	836	9.67	866	10.17	895	10.67	923	11.17	950	11.68	978	12.19
13,000	763	9.35	793	9.86	823	10.37	852	10.89	880	11.42	908	11.94	935	12.47	962	12.99	988	13.52	1014	14.05
14,000	815	11.22	843	11.75	871	12.29	899	12.83	925	13.38	952	13.92	978	14.47	1003	15.02	1028	15.57	1052	16.12
15,000	868	13.31	895	13.86	921	14.42	946	14.98	972	15.55	997	16.12	1021	16.69	1045	17.26	1069	17.83	1092	18.41
16,000	921	15.64	946	16.21	971	16.78	995	17.37	1019	17.96	1043	18.54	1066	19.14	1089	19.73	1111	20.32	1134	20.92
17,000	974	18.20	998	18.79	1021	19.39	1044	19.99	1067	20.60	1089	21.21	1112	21.82	1134	22.43	1155	23.05	1176	23.66
18,000	1028	21.01	1050	21.62	1072	22.24	1094	22.86	1116	23.49	1137	24.12	1158	24.75	1179	25.38	1200	26.02	1220	26.65
19,000	1081	24.08	1103	24.71	1124	25.35	1145	25.99	1165	26.63	1185	27.28	1206	27.93	1226	28.58	1245	29.24	1265	29.90
20,000	1135	27.42	1155	28.06	1175	28.72	1195	29.38	1215	30.04	1234	30.71	1254	31.38	1273	32.05	1292	32.72	—	—

### 50A4,A5050 (50 TONS) (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
10,000	941	9.53	970	10.02	998	10.51	1026	11.00	1053	11.51	1080	12.01	1106	12.53	1131	13.05	1156	13.58	1181	14.11
11,000	971	11.02	999	11.52	1026	12.02	1052	12.53	1078	13.05	1103	13.57	1128	14.09	1153	14.63	1177	15.16	1201	15.71
12,000	1004	12.70	1030	13.22	1056	13.74	1081	14.26	1106	14.79	1130	15.33	1154	15.86	1178	16.41	1201	16.96	1224	17.51
13,000	1039	14.59	1064	15.12	1088	15.66	1113	16.20	1136	16.74	1160	17.29	1183	17.85	1206	18.40	1228	18.96	1250	19.53
14,000	1076	16.68	1100	17.23	1123	17.79	1147	18.35	1169	18.91	1192	19.48	1214	20.04	1236	20.62	1257	21.19	1279	21.77
15,000	1115	18.98	1138	19.56	1160	20.14	1182	20.72	1204	21.30	1226	21.88	1247	22.47	1268	23.05	1289	23.65	—	—
16,000	1156	21.52	1178	22.11	1199	22.71	1220	23.31	1241	23.91	1262	24.51	1282	25.12	—	—	—	—	—	—
17,000	1198	24.28	1218	24.90	1239	25.52	1259	26.14	1279	26.76	1299	27.38	—	—	—	—	—	—	—	—
18,000	1240	27.29	1260	27.93	1280	28.57	1300	29.21	—	—	—	—	—	—	—	—	—	—	—	—
19,000	1284	30.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

### 50A4,A5060 (60 TONS)

Airflow (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
12,000	490	4.48	543	5.17	591	5.88	634	6.61	674	7.37	711	8.14	746	8.94	779	9.76	811	10.60	841	11.45
14,000	554	6.41	602	7.17	645	7.94	686	8.72	723	9.51	759	10.33	792	11.16	824	12.01	855	12.88	884	13.76
15,000	586	7.56	632	8.34	674	9.14	713	9.94	749	10.77	784	11.60	816	12.45	848	13.32	878	14.21	906	15.11
16,000	619	8.83	663	9.64	703	10.46	741	11.30	776	12.14	810	13.00	841	13.87	872	14.76	901	15.66	929	16.58
17,000	652	10.23	694	11.07	733	11.92	769	12.78	803	13.65	836	14.53	867	15.42	897	16.33	926	17.25	953	18.19
18,000	685	11.76	725	12.63	763	13.51	798	14.39	831	15.29	863	16.20	893	17.11	922	18.04	950	18.98	978	19.93
19,000	719	13.44	757	14.33	793	15.23	827	16.14	860	17.07	890	18.00	920	18.94	949	19.88	976	20.84	1003	21.81
20,000	753	15.26	789	16.18	824	17.10	857	18.04	888	18.99	918	19.94	947	20.90	975	21.87	1002	22.85	1028	23.84
21,000	787	17.23	822	18.17	855	19.12	887	20.08	918	21.05	947	22.03	975	23.02	1002	24.01	1029	25.01	1054	26.02
22,000	821	19.35	855	20.32	887	21.29	918	22.28	947	23.28	976	24.28	1003	25.28	1030	26.30	1056	27.32	1081	28.35
23,000	855	21.63	888	22.62	919	23.62	949	24.63	977	25.65	1005	26.68	1032	27.71	1058	28.75	1083	29.79	1108	30.85
24,000	889	24.07	921	25.08	951	26.11	980	27.14	1008	28.19	1035	29.24	1061	30.29	1086	31.35	1111	32.42	1135	33.49
25,000	924	26.67	954	27.71	983	28.76	1011	29.82	1038	30.89	1065	31.96	1090	33.04	1115	34.12	1139	35.21	1163	36.31
26,000	958	29.45	987	30.51	1016	31.59	1043	32.67	1069	33.76	1095	34.85	1120	35.95	1144	37.06	1168	38.17	1191	39.29
27,000	993	32.40	1021	33.49	1048	34.58	1075	35.69	1101	36.80	1126	37.92	1150	39.04	1174	40.17	1197	41.30	—	—

### 50A4,A5060 (60 TONS) (cont)

Airflow (Cfm)	Available External Static Pressure (in. wg)																			
	2.2		2.4		2.6		2.8		3.0		3.2		3.4		3.6		3.8		4.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
12,000	870	12.33	898	13.22	925	14.13	951	15.06	977	16.00	1002	16.96	1026	17.92	1049	18.90	1072	19.89	1094	20.89
14,000	912	14.67	939	15.59	965	16.52	991	17.47	1016	18.44	1040	19.42	1063	20.41	1086	21.41	1109	22.43	1131	23.46
15,000	934	16.02	961	16.96	987	17.90	1012	18.87	1036	19.84	1060	20.83	1083	21.84	1106	22.85	1128	23.88	1150	24.92
16,000	957	17.51	983	18.46	1008	19.42	1033	20.39	1057	21.38	1081	22.39	1104	23.40	1126	24.43	1148	25.47	1170	26.52
17,000	980	19.13	1006	20.10	1031	21.07	1055	22.06	1079	23.06	1102	24.07	1125	25.10	1147	26.14	1169	27.19	1190	28.26
18,000	1004	20.89	1029	21.87	1054	22.86	1078	23.86	1101	24.88	1124	25.91	1147	26.94	1169	28.00	1190	29.06	—	—
19,000	1028	22.80	1053	23.79	1078	24.80	1101	25.81	1124	26.84	1147	27.89	1169	28.94	1190	30.00	—	—	—	—
20,000	1053	24.85	1078	25.86	1102	26.88	1125	27.91	1148	28.96	1170	30.01	1192	31.08	—	—	—	—	—	—
21,000	1079	27.04	1103	28.07	1126	29.11	1149	30.16	1172	31.22	1194	32.30	—	—	—	—	—	—	—	—
22,000	1105	29.39	1129	30.44	1152	31.50	1174	32.57	1196	33.65	—	—	—	—	—	—	—	—	—	—
23,000	1131	31.90	1155	32.97	1177	34.05	1199	35.13	—	—	—	—	—	—	—	—	—	—	—	—
24,000	1158	34.57	1181	35.66	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25,000	1186	37.41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

#### LEGEND

**Bhp** — Brake Horsepower

#### NOTES:

1. Fan performance is based on wet coils, economizer, roof curb, cabinet losses, and clean 2-in. filters.
2. Conversion — Bhp to watts:

$$\text{Watts} = \frac{\text{Bhp} \times 746}{\text{Motor efficiency}}$$

3. Variable air volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by edb and ewb conditions.



## FAN PERFORMANCE — POWER EXHAUST

**48/50A2,A3,A4,A5020-050 (20 to 50 Tons)**

Airflow (Cfm)	208 V			230, 460, 575 V		
	ESP	Bhp	Watts	ESP	Bhp	Watts
7,700	0.60	3.69	4140	0.73	3.98	4460
7,900	0.56	3.74	4190	0.69	4.02	4510
8,100	0.51	3.78	4240	0.65	4.07	4560
8,500	0.41	3.83	4290	0.56	4.12	4620
8,900	0.31	3.93	4410	0.47	4.23	4740
9,300	0.20	4.07	4560	0.37	4.37	4900
9,700	0.11	4.17	4670	0.30	4.47	5010
10,100	0.04	4.25	4770	0.23	4.56	5110
10,500	—	—	—	0.17	4.66	5220
10,900	—	—	—	0.12	4.75	5330
11,300	—	—	—	0.07	4.80	5380
11,700	—	—	—	0.04	4.83	5420

**LEGEND**

**Bhp** — Brake Horsepower  
**ESP** — External Static Pressure (in. wg)  
**Watts** — Input Watts to Motor

**48/50A2,A3,A4,A5060 (60 Tons)**

Airflow (Cfm)	208 V			230, 460, 575 V		
	ESP	Bhp	Watts	ESP	Bhp	Watts
11,550	0.60	5.54	6210	0.73	5.97	6690
11,850	0.56	5.61	6285	0.69	6.03	6765
12,150	0.51	5.67	6360	0.65	6.10	6840
12,750	0.41	5.74	6435	0.56	6.18	6930
13,350	0.31	5.90	6615	0.47	6.34	7110
13,950	0.20	6.10	6840	0.37	6.56	7350
14,550	0.11	6.25	7005	0.30	6.70	7515
15,150	0.04	6.38	7155	0.23	6.84	7665
15,750	—	—	—	0.17	6.98	7830
16,350	—	—	—	0.12	7.13	7995
16,950	—	—	—	0.07	7.20	8070
17,550	—	—	—	0.04	7.25	8130

**LEGEND**

**Bhp** — Brake Horsepower  
**ESP** — External Static Pressure (in. wg)  
**Watts** — Input Watts to Motor

### MOTOR LIMITATIONS

#### HIGH-EFFICIENCY MOTORS

Nominal		Maximum		Maximum Amps			Maximum Efficiency
Bhp	BkW	Bhp	BkW	230 v	460 v	575 v	
5	3.73	5.9	4.40	15.0	7.9	6.0	87.5
10	7.46	10.2	7.61	31.0	—	—	89.5
		11.8	8.80	—	15.0	12.0	89.5
15	11.19	15.3	11.41	46.0	—	—	91.0
		18.0	13.43	—	22.0	19.0	91.0
20	14.92	22.4	16.71	60.0	—	—	91.0
		23.4	17.46	—	28.7	23.0	91.0
25	18.65	28.9	21.56	73.0	—	—	91.7
		29.4	21.93	—	37.4	28.4	91.7
30	22.38	35.6	26.56	91.0	—	—	92.4
		34.7	25.89	—	43.8	36.3	92.4
40	29.84	42.0	31.33	110.0	55.0	43.8	93.0

#### PREMIUM-EFFICIENCY MOTORS

Nominal		Maximum		Maximum Amps		Maximum Efficiency
Bhp	BkW	Bhp	BkW	230 v	460 v	
5	3.73	5.9	4.40	15.8	7.9	89.5
10	7.46	10.2	7.61	30.0	—	91.7
		11.8	8.80	—	15.0	91.7
15	11.19	15.3	11.41	46.0	—	93.0
		18.0	13.43	—	22.0	93.0
20	14.92	22.4	16.71	59.0	—	93.6
		23.4	17.46	—	28.7	93.6
25	18.65	28.9	21.56	73.0	—	93.6
		29.4	21.93	—	36.3	93.6
30	22.38	35.6	26.56	82.6	—	93.6
		34.7	25.89	—	41.7	93.6
40	29.84	42.0	31.33	110.0	55.0	94.5

**LEGEND**

**Bhp** — Brake Horsepower  
**BkW** — Brake Kilowatts

2. All motors comply with Energy Policy Act (EPACT) Standards effective October 24, 1997.

**NOTES:**

1. Extensive motor and electrical testing on the Carrier units has ensured that the full horsepower range of the motor can be utilized with confidence. Using the fan motors up to the horsepower ratings shown in the Motor Limitations table will not result in nuisance tripping or premature motor failures. Unit warranty will not be affected.

# Performance data (cont)



## AIR QUANTITY LIMITS (48A2,A3,A4,A5)

UNIT 48A2,A3,A4,A5	MINIMUM HEATING AIRFLOW CFM (Low Heat)	MINIMUM HEATING AIRFLOW CFM (High Heat)	MINIMUM COOLING AIRFLOW (VAV) CFM AT FULL LOAD	MINIMUM COOLING AIRFLOW CFM (CV)	MAXIMUM AIRFLOW CFM
020	5,900	6,100	4,000	6,000	10,000
025	5,900	6,100	5,000	7,500	12,500
027	5,900	6,100	5,400	8,100	13,500
030	5,900	6,100	6,000	9,000	15,000
035	5,900	10,100	7,000	10,500	17,500
040	7,600	10,100	8,000	12,000	20,000
050	7,600	10,100	10,000	13,500	20,000
060	11,000	14,700	12,000	18,000	27,000

LEGEND

- CV — Constant Volume  
VAV — Variable Air Volume

NOTE: Variable air volume units will operate down to 70 cfm/ton in Cooling mode. Performance at 70 cfm/ton is limited to unloaded operation and may be also limited by edb (entering dry bulb) and ewb (entering wet bulb) conditions.

## AIR QUANTITY LIMITS (50A2,A3,A4,A5)

UNIT	COOLING		ELECTRIC HEAT	
	Min CFM	Max CFM*	Min CFM	Max CFM
50A2,A4020	6,000	10,000	6,000	15,000
50A3,A5020	4,000	10,000		
50A2,A4025	7,500	12,500		
50A3,A5025	5,000	12,500		
50A2,A4027	8,100	13,500		
50A3,A5027	5,400	13,500		
50A2,A4030	9,000	15,000		
50A3,A5030	6,000	15,000		
50A2,A4035	10,500	17,500		
50A3,A5035	7,000	17,500		
50A2,A4040	12,000	20,000	10,500	20,000
50A3,A5040	8,000	20,000		
50A2,A4050	13,500	20,000		
50A3,A5050	10,000	20,000		
50A2,A4060	18,000	27,000		
50A3,A5060	12,000	27,000	15,000	27,000

\*Operation at these levels may be limited by entering evaporator air wet bulb temperatures.

NOTES:

1. Extensive motor and electrical testing on the Carrier units has ensured that the full horsepower range of the motor can be utilized with confidence. Using the fan motors up to the horsepower ratings shown in the Motor Limitations table will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
2. All motors comply with Energy Policy Act (EPACT) Standards effective October 24, 1997.

# Electrical data



## 48A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET

UNIT SIZE 48A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	POWER SUPPLY	
		Min	Max	Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2		Qty	FLA	Hp	FLA	FLA (total)	MCA	MOCPS*
				RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA							
020	208	187	229	22.4	149	22.4	149	29.5	195	—	—	2	6.5 (ea)	5	16.7	—	111.4	125
														10	30.8	23.6	135.0	150
														15	46.2	23.6	145.1	175
	230	207	253	22.4	149	22.4	149	29.5	195	—	—	2	6.6 (ea)	5	15.2	—	110.1	125
														10	28.0	23.6	122.9	150
														15	42.0	23.6	140.0	175
	460	414	508	10.6	75	10.6	75	14.7	95	—	—	2	3.3 (ea)	5	7.6	—	53.8	60
														10	14.0	12.6	60.2	70
														15	21.0	—	68.8	80
	575	518	632	7.7	54	7.7	54	12.2	80	—	—	2	2.6 (ea)	5	6.1	—	42.0	50
														10	11.0	9.6	46.9	60
														15	17.0	9.6	54.1	70
025	208	187	229	29.5	195	29.5	195	29.5	195	—	—	2	6.5 (ea)	5	16.7	—	125.6	150
														10	30.8	23.6	149.2	175
														15	46.2	—	159.3	200
	230	207	253	29.5	195	29.5	195	29.5	195	—	—	2	6.6 (ea)	5	15.2	—	124.3	150
														10	28.0	23.6	137.1	175
														15	42.0	—	154.2	200
	460	414	508	14.7	95	14.7	95	14.7	95	—	—	2	3.3 (ea)	5	7.6	—	62.0	70
														10	14.0	12.6	68.4	80
														15	21.0	12.6	77.0	90
	575	518	632	12.2	80	12.2	80	12.2	80	—	—	2	2.6 (ea)	5	6.1	—	51.0	60
														10	11.0	9.6	55.9	70
														15	17.0	9.6	63.1	80
027	208	187	229	29.5	195	29.5	195	29.5	195	—	—	2	6.5 (ea)	10	30.8	—	140.0	150
														15	46.2	23.6	159.3	200
														20	59.4	—	175.8	225
	230	207	253	29.5	195	29.5	195	29.5	195	—	—	2	6.6 (ea)	10	28.0	—	137.1	150
														15	42.0	23.6	160.7	175
														20	54.0	—	154.2	200
	460	414	508	14.7	95	14.7	95	14.7	95	—	—	2	3.3 (ea)	10	14.0	—	68.4	80
														15	21.0	12.6	77.0	90
														20	27.0	12.6	84.5	110
	575	518	632	12.2	80	12.2	80	12.2	80	—	—	2	2.6 (ea)	10	11.0	—	55.9	60
														15	17.0	9.6	65.5	70
														20	22.0	—	63.1	80

See Legend and Notes on page 85.



# Electrical data (cont)



## 48A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET (cont)

UNIT SIZE 48A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST FLA (total)	POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2							MCA	MOCPS*
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	
030	208	187	229	23.2	184	23.2	164	23.2	164	23.2	164	2	6.5 (ea)	10	30.8	—	144.3	175
														15	46.2	23.6	163.6	200
														20	59.4	23.6	180.1	225
	230	207	253	23.2	164	23.2	164	23.2	164	23.2	164	2	6.6 (ea)	10	28.0	23.6	141.0	150
														15	42.0	23.6	158.5	200
														20	54.0	23.6	173.5	225
	460	414	508	11.2	75	11.2	75	11.2	75	11.2	75	2	3.3 (ea)	10	14.0	12.6	68.9	80
														15	21.0	12.6	77.7	90
														20	27.0	12.6	85.2	110
	575	518	632	7.9	54	7.9	54	7.9	54	7.9	54	2	2.6 (ea)	10	11.0	9.6	50.6	60
														15	17.0	9.6	58.1	70
														20	22.0	9.6	64.3	80
035	208	187	229	22.4	149	22.4	149	30.1	225	30.1	225	2	6.5 (ea)	15	46.2	23.6	175.8	200
														20	59.4	23.6	192.3	250
														25	74.8	23.6	211.5	300
	230	207	253	22.4	149	22.4	149	30.1	225	30.1	225	2	6.6 (ea)	15	42.0	23.6	170.7	200
														20	54.0	23.6	185.7	225
														25	68.0	23.6	203.2	250
	460	414	508	10.6	75	10.6	75	16.7	114	16.7	114	2	3.3 (ea)	15	21.0	12.6	87.5	100
														20	27.0	12.6	95.0	110
														25	34.0	12.6	103.7	125
	575	518	632	7.7	54	7.7	54	12.2	80	12.2	80	2	2.6 (ea)	15	17.0	9.6	66.3	80
														20	22.0	9.6	72.5	90
														25	27.0	9.6	78.8	100
040	208	187	229	30.1	225	30.1	225	30.1	225	30.1	225	4	6.5 (ea)	15	46.2	23.6	204.2	250
														20	59.4	23.6	220.7	300
														25	74.8	23.6	239.9	300
	230	207	253	30.1	225	30.1	225	30.1	225	30.1	225	4	6.6 (ea)	15	42.0	23.6	199.3	225
														20	54.0	23.6	214.3	250
														25	68.0	23.6	231.8	250
	460	414	508	16.7	114	16.7	114	16.7	114	16.7	114	4	3.3 (ea)	15	21.0	12.6	106.3	125
														20	27.0	12.6	113.8	125
														25	34.0	12.6	122.5	150
	575	518	632	12.2	80	12.2	80	12.2	80	12.2	80	4	2.6 (ea)	15	17.0	9.6	80.5	90
														20	22.0	9.6	86.7	100
														25	27.0	9.6	93.0	110

See Legend and Notes on page 85.



48A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET (cont)

UNIT SIZE 48A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	POWER SUPPLY	
		Min	Max	Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2		Qty	FLA	Hp	FLA	FLA (total)	MCA	MOCP*
				RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA							
050	208	187	229	33.3	239	33.3	239	33.3	239	33.3	239	4	6.5 (ea)	20	59.4	—	233.5	250
														25	74.8	—	252.7	300
														30	88.0	—	269.2	350
	230	207	253	33.3	239	33.3	239	33.3	239	33.3	239	4	6.6 (ea)	20	54.0	—	227.1	250
														25	68.0	—	244.6	300
														30	80.0	—	259.6	350
	460	414	508	17.9	125	17.9	125	17.9	125	17.9	125	4	3.3 (ea)	20	27.0	—	118.6	125
														25	34.0	—	127.3	150
														30	40.0	—	134.8	175
	575	518	632	12.8	80	12.8	80	12.8	80	12.8	80	4	2.6 (ea)	20	22.0	—	89.1	110
														25	27.0	—	95.4	125
														30	32.0	—	101.6	150
060 (MCHX)	208	187	229	51.3	300	51.3	300	51.3	300	51.3	300	4	5.5 (ea)	25	74.8	—	320.7	350
														30	88.0	—	337.2	400
														40	114.0	—	369.7	500
	230	207	253	51.3	300	51.3	300	51.3	300	51.3	300	4	5.8 (ea)	25	68.0	—	313.4	350
														30	80.0	—	328.4	400
														40	104.0	—	358.4	500
	460	414	508	22.4	150	22.4	150	22.4	150	22.4	150	4	2.9 (ea)	25	34.0	—	143.7	175
														30	40.0	—	151.2	200
														40	52.0	—	166.2	225
	575	518	632	19.9	109	19.9	109	19.9	109	19.9	109	4	2.3 (ea)	25	27.0	—	122.6	150
														30	32.0	—	128.8	175
														40	41.0	—	140.1	200
060 (RTPF)	208	187	229	51.3	300	51.3	300	51.3	300	51.3	300	6	6.5 (ea)	25	74.8	—	337.7	400
														30	88.0	—	354.2	450
														40	114.0	—	386.7	500
	230	207	253	51.3	300	51.3	300	51.3	300	51.3	300	6	6.6 (ea)	25	68.0	—	329.8	350
														30	80.0	—	344.8	400
														40	104.0	—	374.8	500
	460	414	508	22.4	150	22.4	150	22.4	150	22.4	150	6	3.3 (ea)	25	34.0	—	151.9	175
														30	40.0	—	159.4	200
														40	52.0	—	174.4	225
	575	518	632	19.9	109	19.9	109	19.9	109	19.9	109	6	2.6 (ea)	25	27.0	—	129.0	150
														30	32.0	—	135.2	175
														40	41.0	—	146.5	200

See Legend and Notes on page 85.

# Electrical data (cont)



## 48A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET

UNIT SIZE 48A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET		POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2										
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	FLA	MCA	MOCP*	
020	208	187	229	22.4	149	22.4	149	29.5	195	—	—	2	6.5 (ea)	5	16.7	— 23.6	7.0 7.0	118.4 142.0	125 150	
														10	30.8	— 23.6	7.0 7.0	132.8 156.4	150 175	
														15	46.2	— 23.6	7.0 7.0	152.1 175.7	175 200	
	230	207	253	22.4	149	22.4	149	29.5	195	—	—	2	6.6 (ea)	5	15.2	— 23.6	7.0 7.0	117.1 140.7	125 150	
														10	28.0	— 23.6	7.0 7.0	129.9 153.5	150 175	
														15	42.0	— 23.6	7.0 7.0	147.0 170.6	175 200	
	460	414	508	10.6	75	10.6	75	14.7	95	—	—	2	3.3 (ea)	5	7.6	— 12.6	3.5 3.5	57.3 69.9	70 80	
														10	14.0	— 12.6	3.5 3.5	63.7 76.3	70 90	
														15	21.0	— 12.6	3.5 3.5	72.3 84.9	90 100	
	575	518	632	7.7	54	7.7	54	12.2	80	—	—	2	2.6 (ea)	5	6.1	— 9.6	2.5 2.5	44.5 54.1	50 60	
														10	11.0	— 9.6	2.5 2.5	49.4 59.0	60 70	
														15	17.0	— 9.6	2.5 2.5	56.6 66.2	70 80	
025	208	187	229	29.5	195	29.5	195	29.5	195	—	—	2	6.5 (ea)	5	16.7	— 23.6	7.0 7.0	132.6 156.2	150 175	
														10	30.8	— 23.6	7.0 7.0	147.0 170.6	175 200	
														15	46.2	— 23.6	7.0 7.0	166.3 189.9	200 225	
	230	207	253	29.5	195	29.5	195	29.5	195	—	—	2	6.6 (ea)	5	15.2	— 23.6	7.0 7.0	131.3 154.9	150 175	
														10	28.0	— 23.6	7.0 7.0	144.1 167.7	150 175	
														15	42.0	— 23.6	7.0 7.0	161.2 184.8	200 225	
	460	414	508	14.7	95	14.7	95	14.7	95	—	—	2	3.3 (ea)	5	7.6	— 12.6	3.5 3.5	65.5 78.1	80 90	
														10	14.0	— 12.6	3.5 3.5	71.9 84.5	80 90	
														15	21.0	— 12.6	3.5 3.5	80.5 93.1	100 110	
	575	518	632	12.2	80	12.2	80	12.2	80	—	—	2	2.6 (ea)	5	6.1	— 9.6	2.5 2.5	53.5 63.1	60 70	
														10	11.0	— 9.6	2.5 2.5	58.4 68.0	70 80	
														15	17.0	— 9.6	2.5 2.5	65.6 75.2	80 90	
027	208	187	229	29.5	195	29.5	195	29.5	195	—	—	2	6.5 (ea)	10	30.8	— 23.6	7.0 7.0	147.0 170.6	175 200	
														15	46.2	— 23.6	7.0 7.0	166.3 189.9	200 225	
														20	59.4	— 23.6	7.0 7.0	182.8 206.4	225 250	
	230	207	253	29.5	195	29.5	195	29.5	195	—	—	2	6.6 (ea)	10	28.0	— 23.6	7.0 7.0	144.1 167.7	150 175	
														15	42.0	— 23.6	7.0 7.0	161.2 184.8	200 225	
														20	54.0	— 23.6	7.0 7.0	176.2 199.8	225 250	
	460	414	508	14.7	95	14.7	95	14.7	95	—	—	2	3.3 (ea)	10	14.0	— 12.6	3.5 3.5	71.9 84.5	80 90	
														15	21.0	— 12.6	3.5 3.5	80.5 93.1	100 110	
														20	27.0	— 12.6	3.5 3.5	88.0 100.6	110 125	
	575	518	632	12.2	80	12.2	80	12.2	80	—	—	2	2.6 (ea)	10	11.0	— 9.6	2.5 2.5	58.4 68.0	70 80	
														15	17.0	— 9.6	2.5 2.5	65.6 75.2	80 90	
														20	22.0	— 9.6	2.5 2.5	71.8 81.4	90 100	

See Legend and Notes on page 85.



48A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET (cont)

UNIT SIZE 48A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET		POWER SUPPLY	
		Min	Max	Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2		Qty	FLA	Hp	FLA	FLA (total)	FLA	MCA	MOCP*	
				RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA									
030	208	187	229	23.2	184	23.2	164	23.2	164	23.2	164	2	6.5 (ea)	10	30.8	— 23.6	7.0 7.0	151.3 174.9	175 200	
														15	46.2	— 23.6	7.0 7.0	170.6 194.2	200 225	
														20	59.4	— 23.6	7.0 7.0	187.1 210.7	225 250	
	230	207	253	23.2	164	23.2	164	23.2	164	23.2	164	2	6.6 (ea)	10	28.0	— 23.6	7.0 7.0	148.0 171.6	175 175	
														15	42.0	— 23.6	7.0 7.0	165.5 189.1	200 225	
														20	54.0	— 23.6	7.0 7.0	180.5 204.1	225 250	
	460	414	508	11.2	75	11.2	75	11.2	75	11.2	75	2	3.3 (ea)	10	14.0	— 12.6	3.5 3.5	72.4 85.0	80 90	
														15	21.0	— 12.6	3.5 3.5	81.2 93.8	100 110	
														20	27.0	— 12.6	3.5 3.5	88.7 101.3	110 125	
	575	518	632	7.9	54	7.9	54	7.9	54	7.9	54	2	2.6 (ea)	10	11.0	— 9.6	2.5 2.5	53.1 62.7	60 70	
														15	17.0	— 9.6	2.5 2.5	60.6 70.2	70 80	
														20	22.0	— 9.6	2.5 2.5	66.8 76.4	80 90	
035	208	187	229	22.4	149	22.4	149	30.1	225	30.1	225	2	6.5 (ea)	15	46.2	— 23.6	7.0 7.0	182.8 206.4	225 250	
														20	59.4	— 23.6	7.0 7.0	199.3 222.9	250 250	
														25	74.8	— 23.6	7.0 7.0	218.5 242.1	250 300	
	230	207	253	22.4	149	22.4	149	30.1	225	30.1	225	2	6.6 (ea)	15	42.0	— 23.6	7.0 7.0	177.7 201.3	200 225	
														20	54.0	— 23.6	7.0 7.0	192.7 216.3	225 250	
														25	68.0	— 23.6	7.0 7.0	210.2 233.8	250 300	
	460	414	508	10.6	75	10.6	75	16.7	114	16.7	114	2	3.3 (ea)	15	21.0	— 12.6	3.5 3.5	91.0 103.6	110 110	
														20	27.0	— 12.6	3.5 3.5	98.5 111.1	125 125	
														25	34.0	— 12.6	3.5 3.5	107.2 119.8	125 150	
	575	518	632	7.7	54	7.7	54	12.2	80	12.2	80	2	2.6 (ea)	15	17.0	— 9.6	2.5 2.5	68.8 78.4	80 90	
														20	22.0	— 9.6	2.5 2.5	75.0 84.6	90 100	
														25	27.0	— 9.6	2.5 2.5	81.3 90.9	100 110	
040	208	187	229	30.1	225	30.1	225	30.1	225	30.1	225	2	6.5 (ea)	15	46.2	— 23.6	7.0 7.0	211.2 234.8	250 250	
														20	59.4	— 23.6	7.0 7.0	227.7 251.3	250 300	
														25	74.8	— 23.6	7.0 7.0	246.9 270.5	300 300	
	230	207	253	30.1	225	30.1	225	30.1	225	30.1	225	2	6.6 (ea)	15	42.0	— 23.6	7.0 7.0	206.3 229.9	225 250	
														20	54.0	— 23.6	7.0 7.0	221.3 244.9	250 250	
														25	68.0	— 23.6	7.0 7.0	238.8 262.4	300 300	
	460	414	508	16.7	114	16.7	114	16.7	114	16.7	114	2	3.3 (ea)	15	21.0	— 12.6	3.5 3.5	109.8 122.4	125 125	
														20	27.0	— 12.6	3.5 3.5	117.3 129.9	125 150	
														25	34.0	— 12.6	3.5 3.5	126.0 138.6	150 150	
	575	518	632	12.2	80	12.2	80	12.2	80	12.2	80	2	2.6 (ea)	15	17.0	— 9.6	2.5 2.5	83.0 92.6	90 100	
														20	22.0	— 9.6	2.5 2.5	89.2 98.8	110 110	
														25	27.0	— 9.6	2.5 2.5	95.5 105.1	110 125	

See Legend and Notes on page 85.

# Electrical data (cont)



## 48A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET (cont)

UNIT SIZE 48A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET	POWER SUPPLY	
		Min	Max	Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2		Qty	FLA	Hp	FLA	FLA (total)	FLA	MCA	MOCP*
				RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA								
050	208	187	229	33.3	239	33.3	239	33.3	239	33.3	239	4	6.5 (ea)	20	59.0	— 23.6	7.0 7.0	240.5 264.1	250 300
														25	75.0	— 23.6	7.0 7.0	259.7 283.3	300 350
														30	88.0	— 23.6	7.0 7.0	276.2 299.8	350 350
	230	207	253	33.3	239	33.3	239	33.3	239	33.3	239	4	6.6 (ea)	20	54.0	— 23.6	7.0 7.0	234.1 257.7	250 300
														25	68.0	— 23.6	7.0 7.0	251.6 275.2	300 300
														30	80.0	— 23.6	7.0 7.0	266.6 290.2	300 350
	460	414	508	17.9	125	17.9	125	17.9	125	17.9	125	4	3.3 (ea)	20	27.0	— 12.6	3.5 3.5	122.1 134.7	125 150
														25	34.0	— 12.6	3.5 3.5	130.8 143.4	150 175
														30	40.0	— 12.6	3.5 3.5	138.3 150.9	175 175
	575	518	632	12.8	80	12.8	80	12.8	80	12.8	80	4	2.6 (ea)	20	22.0	— 9.6	2.5 2.5	91.6 101.2	110 110
														25	27.0	— 9.6	2.5 2.5	97.9 107.5	110 125
														30	32.0	— 9.6	2.5 2.5	104.1 113.7	125 125
060 (MCHX)	208	187	229	51.3	300	51.3	300	51.3	300	51.3	300	4	5.5 (ea)	25	75.0	— 35.4	7.0 7.0	327.7 363.1	400 400
														30	88.0	— 35.4	7.0 7.0	344.2 379.6	400 450
														40	114.0	— 35.4	7.0 7.0	376.7 412.1	450 500
	230	207	253	51.3	300	51.3	300	51.3	300	51.3	300	4	5.8 (ea)	25	68.0	— 35.4	7.0 7.0	320.4 355.8	350 400
														30	80.0	— 35.4	7.0 7.0	335.4 370.8	400 450
														40	104.0	— 35.4	7.0 7.0	365.4 400.8	450 500
	460	414	508	22.4	150	22.4	150	22.4	150	22.4	150	4	2.9 (ea)	25	34.0	— 18.9	3.5 3.5	147.2 166.1	175 200
														30	40.0	— 18.9	3.5 3.5	154.7 173.6	175 200
														40	52.0	— 18.9	3.5 3.5	169.7 188.6	200 225
	575	518	632	19.9	109	19.9	109	19.9	109	19.9	109	4	2.3 (ea)	25	27.0	— 14.4	2.5 2.5	125.1 139.5	150 150
														30	32.0	— 14.4	2.5 2.5	131.3 145.7	150 175
														40	41.0	— 14.4	2.5 2.5	142.6 157.0	175 175
060 (RTPF)	208	187	229	51.3	300	51.3	300	51.3	300	51.3	300	6	6.5 (ea)	25	74.8	— 35.4	7.0 7.0	344.7 380.1	400 450
														30	88.0	— 35.4	7.0 7.0	361.2 396.6	400 450
														40	114.0	— 35.4	7.0 7.0	393.7 429.1	500 500
	230	207	253	51.3	300	51.3	300	51.3	300	51.3	300	6	6.6 (ea)	25	68.0	— 35.4	7.0 7.0	336.8 372.2	400 400
														30	80.0	— 35.4	7.0 7.0	351.8 387.2	400 450
														40	104.0	— 35.4	7.0 7.0	381.8 417.2	450 500
	460	414	508	22.4	150	22.4	150	22.4	150	22.4	150	6	3.3 (ea)	25	34.0	— 18.9	3.5 3.5	155.4 174.3	175 200
														30	40.0	— 18.9	3.5 3.5	162.9 181.8	200 200
														40	52.0	— 18.9	3.5 3.5	177.9 196.8	225 225
	575	518	632	19.9	109	19.9	109	19.9	109	19.9	109	6	2.6 (ea)	25	27.0	— 14.4	2.5 2.5	131.5 145.9	150 150
														30	32.0	— 14.4	2.5 2.5	137.7 152.1	150 175
														40	41.0	— 14.4	2.5 2.5	149.0 163.4	175 200

See Legend and Notes on page 85.



50A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2										
		Min	Max	FLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	FLA	kW	MCA	MOCPS*
020	208	187	229	22.4	149	22.4	149	29.5	195	—	—	2	6.5 (ea)	5	16.7	—	—	—	111.4	125
																75.1	27	114.8	125	
																150.1	54	171.0	200	
																23.6	75.1	27	135.0	150
																150.1	54	200.5	150	225
																—	—	—	125.8	150
	75.1	27	132.4	150	200															
	150.1	54	188.6	200	225															
	23.6	75.1	27	149.4	175															
	150.1	54	218.1	175	225															
	—	—	—	145.1	175															
	75.1	27	151.6	175	250															
	150.1	54	207.9	175	250															
	23.6	75.1	27	168.7	200															
	150.1	54	237.4	200	250															
	—	—	—	110.1	125															
	86.6	36	127.3	150	225															
	173.2	72	192.2	150	225															
	23.6	86.6	36	133.7	150															
	173.2	72	221.7	175	225															
	—	—	—	122.9	150															
	86.6	36	143.3	150	225															
	173.2	72	208.2	150	225															
	23.6	86.6	36	146.5	175															
173.2	72	237.7	175	250																
—	—	—	140.0	175																
86.6	36	160.8	175	250																
173.2	72	225.7	175	250																
23.6	86.6	36	163.6	200																
173.2	72	255.2	200	300																
—	—	—	53.8	60																
43.3	36	63.6	70	110																
86.6	72	96.1	80	125																
12.6	43.3	36	66.4	80																
86.6	72	111.9	80	125																
—	—	—	60.2	70																
43.3	36	71.6	80	110																
86.6	72	104.1	80	110																
12.6	43.3	36	72.8	80																
86.6	72	119.9	90	125																
—	—	—	68.8	80																
43.3	36	80.4	90	125																
86.6	72	112.9	90	125																
12.6	43.3	36	81.4	100																
86.6	72	128.6	100	150																
—	—	—	42.0	50																
34.6	36	50.9	60	90																
69.3	72	76.9	60	90																
9.6	34.6	36	51.6	60																
69.3	72	88.9	70	100																
—	—	—	46.9	50																
34.6	36	57.0	60	90																
69.3	72	83.1	60	90																
9.6	34.6	36	56.5	60																
69.3	72	95.1	70	100																
—	—	—	54.1	70																
34.6	36	64.5	70	100																
69.3	72	90.6	70	100																
9.6	34.6	36	63.7	80																
69.3	72	102.6	80	110																
—	—	—	59.2	70																
34.2	23	59.2	70	100																
68.4	45	96.9	70	100																
14.8	34.2	23	74.0	90																
68.4	45	115.4	90	125																
—	—	—	66.8	80																
34.2	23	66.8	80	110																
68.4	45	106.4	80	110																
14.8	34.2	23	81.6	90																
68.4	45	124.9	90	125																
—	—	—	76.5	100																
34.2	23	76.5	100	125																
68.4	45	116.1	100	125																
14.8	34.2	23	91.3	110																
68.4	45	134.6	110	150																

See Legend and Notes on page 85.

# Electrical data (cont)



## 50A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2							FLA	kW		
		Min	Max	FLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	FLA	kW	MCA	MOCPS*
025	208	187	229	29.5	195	29.5	195	29.5	195	—	—	2	6.5 (ea)	5	16.7	—	—	—	125.6	150
																75.1	27	125.6	150	
																150.1	54	171.0	200	
																23.6	—	—	149.2	175
																75.1	27	149.2	175	
																150.1	54	200.5	225	
	230	207	253	29.5	195	29.5	195	29.5	195	—	—	2	6.6 (ea)	5	15.2	—	—	—	124.3	150
																86.6	36	127.3	150	
																173.2	72	192.2	225	
																23.6	—	—	147.9	175
																86.6	36	156.8	175	
																173.2	72	221.7	225	
460	414	508	14.7	95	14.7	95	14.7	95	—	—	2	3.3 (ea)	5	7.6	—	—	—	62.0	70	
															43.3	36	63.6	70		
															86.6	72	96.1	110		
															12.6	—	—	74.6	80	
															43.3	36	79.4	80		
															86.6	72	111.9	125		
575	518	632	12.2	80	12.2	80	12.2	80	—	—	2	2.6 (ea)	5	6.1	—	—	—	51.0	60	
															34.6	36	51.0	60		
															69.3	72	76.9	90		
															9.6	—	—	60.6	70	
															34.6	36	62.9	70		
															69.3	72	88.9	100		
380	342	418	16.7	123	16.7	123	16.7	123	—	—	2	3.6 (ea)	5	9.1	—	—	—	70.6	80	
															34.2	23	70.6	80		
															68.4	45	96.9	100		
															14.8	—	—	85.4	100	
															34.2	23	85.4	100		
															68.4	45	115.4	125		
380	342	418	16.7	123	16.7	123	16.7	123	—	—	2	3.6 (ea)	10	16.7	—	—	—	78.2	90	
															34.2	23	78.2	90		
															68.4	45	106.4	110		
															14.8	—	—	93.0	100	
															34.2	23	93.0	100		
															68.4	45	124.9	125		
380	342	418	16.7	123	16.7	123	16.7	123	—	—	2	3.6 (ea)	15	24.5	—	—	—	87.9	110	
															34.2	23	87.9	110		
															68.4	45	116.1	125		
															14.8	—	—	102.7	125	
															34.2	23	102.7	125		
															68.4	45	134.6	150		

See Legend and Notes on page 85.





50A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2										
		Min	Max	FLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	FLA	kW	MCA	MOCPS*
027	208	187	229	29.5	195	29.5	195	29.5	195	—	—	2	6.5 (ea)	10	30.8	—	75.1	27	140.0	150
																—	150.1	54	140.0	150
																23.6	75.1	27	163.6	175
																—	150.1	54	163.6	175
																—	75.1	27	182.9	225
																—	150.1	54	182.9	225
	230	207	253	29.5	195	29.5	195	29.5	195	—	—	2	6.6 (ea)	10	28.0	—	86.6	36	137.1	150
																—	173.2	72	143.3	150
																23.6	86.6	36	160.7	175
																—	173.2	72	160.7	175
																—	86.6	36	177.8	200
																—	173.2	72	177.8	200
	460	414	508	14.7	95	14.7	95	14.7	95	—	—	2	3.3 (ea)	10	14.0	—	43.3	36	68.4	80
																—	86.6	72	71.6	80
																12.6	43.3	36	81.0	90
																—	86.6	72	87.4	90
																—	43.3	36	112.9	125
																—	86.6	72	112.9	125
	575	518	632	12.2	80	12.2	80	12.2	80	—	—	2	2.6 (ea)	10	11.0	—	34.6	36	55.9	60
																—	69.3	72	57.0	60
																9.6	34.6	36	65.5	70
																—	69.3	72	69.0	70
																—	34.6	36	95.1	100
																—	69.3	72	95.1	100
380	342	418	16.7	123	16.7	123	16.7	123	—	—	2	3.6 (ea)	10	16.7	—	34.2	23	78.2	90	
															—	68.4	45	78.2	90	
															14.8	34.2	23	106.4	110	
															—	68.4	45	106.4	110	
															—	34.2	23	124.9	125	
															—	68.4	45	124.9	125	

See Legend and Notes on page 85.

# Electrical data (cont)



## 50A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2							FLA	KW	MCA	MOCP*
		Min	Max	FLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	FLA	KW	MCA	MOCP*
030	208	187	229	23.2	164	23.2	164	23.2	164	23.2	164	2	6.5 (ea)	10	30.8	—	—	—	144.3	175
																75.1	27	144.3	175	
																150.1	54	188.6	200	
																23.6	—	—	167.9	175
																75.1	27	167.9	175	
																150.1	54	218.1	225	
	15	46.2	—	—	—	163.6	200													
			75.1	27	163.6	200														
			150.1	54	207.9	250														
			23.6	—	—	187.2	225													
			75.1	27	187.2	225														
			150.1	54	237.4	250														
20	59.4	—	—	—	180.1	225														
		75.1	27	180.1	225															
		150.1	54	224.4	250															
		23.6	—	—	203.7	250														
		75.1	27	203.7	250															
		150.1	54	253.9	300															
030	230	207	253	23.2	164	23.2	164	23.2	164	23.2	164	2	6.6 (ea)	10	28.0	—	—	—	141.0	150
																86.6	36	143.3	150	
																173.2	72	208.2	225	
																23.6	—	—	175	175
																86.6	36	172.8	175	
																173.2	72	237.7	250	
	15	42.0	—	—	—	158.5	200													
			86.6	36	160.8	200														
			173.2	72	225.7	250														
			23.6	—	—	182.1	200													
			86.6	36	190.3	200														
			173.2	72	255.2	300														
20	54.0	—	—	—	173.5	225														
		86.6	36	175.8	225															
		173.2	72	240.7	250															
		23.6	—	—	197.1	250														
		86.6	36	205.3	250															
		173.2	72	270.2	300															
030	460	414	508	11.2	75	11.2	75	11.2	75	11.2	75	2	3.3 (ea)	10	14.0	—	—	—	68.9	80
																43.3	36	71.6	80	
																86.6	72	104.1	110	
																12.6	—	—	81.5	90
																43.3	36	87.4	90	
																86.6	72	119.9	125	
	15	21.0	—	—	—	77.7	90													
			43.3	36	80.4	90														
			86.6	72	112.9	125														
			12.6	—	—	90.3	110													
			43.3	36	96.1	110														
			86.6	72	128.6	150														
20	27.0	—	—	—	85.2	110														
		43.3	36	87.9	110															
		86.6	72	120.4	125															
		12.6	—	—	97.8	110														
		43.3	36	103.6	110															
		86.6	72	136.1	150															
030	575	518	632	7.9	54	7.9	54	7.9	54	7.9	54	2	2.6 (ea)	10	11.0	—	—	—	50.6	60
																34.6	36	57.0	60	
																69.3	72	83.1	90	
																9.6	—	—	60.2	70
																34.6	36	69.0	70	
																69.3	72	95.1	100	
	15	17.0	—	—	—	58.1	70													
			34.6	36	64.5	70														
			69.3	72	90.6	100														
			9.6	—	—	67.7	80													
			34.6	36	76.5	80														
			69.3	72	102.6	110														
20	22.0	—	—	—	64.3	80														
		34.6	36	70.8	80															
		69.3	72	96.8	110															
		9.6	—	—	73.9	90														
		34.6	36	82.8	90															
		69.3	72	108.8	125															
030	380	342	418	12.2	73	12.2	73	12.2	73	12.2	73	2	3.6 (ea)	10	16.7	—	—	—	76.9	90
																34.2	23	76.9	90	
																68.4	45	106.4	110	
																14.8	—	—	91.7	100
																34.2	23	91.7	100	
																68.4	45	124.9	125	
	15	24.5	—	—	—	86.6	110													
			34.2	23	86.6	110														
			68.4	45	116.1	125														
			14.8	—	—	101.4	125													
			34.2	23	101.4	125														
			68.4	45	134.6	150														
20	30.0	—	—	—	93.5	110														
		34.2	23	93.5	110															
		68.4	45	123.0	125															
		14.8	—	—	108.3	125														
		34.2	23	108.3	125															
		68.4	45	141.5	150															

See Legend and Notes on page 85.



50A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2							FLA	kW	MCA	MOCP*
		Min	Max	FLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	FLA	kW	MCA	MOCP*
035	208	187	229	22.4	149	22.4	149	30.1	225	30.1	225	2	6.5 (ea)	15	46.2	—	—	—	175.8	200
																—	75.1	27	175.8	200
																—	150.1	54	207.9	250
																23.6	—	—	199.4	225
																—	75.1	27	199.4	225
																—	150.1	54	237.4	250
	20	59.4	—	—	—	192.3	250													
			—	75.1	27	192.3	250													
			—	150.1	54	224.4	250													
			23.6	—	—	215.9	250													
			—	75.1	27	215.9	250													
			—	150.1	54	253.9	300													
25	74.8	—	—	—	211.5	250														
		—	75.1	27	211.5	250														
		—	150.1	54	243.6	300														
		23.6	—	—	235.1	300														
		—	75.1	27	235.1	300														
		—	150.1	54	273.1	300														
035	230	207	253	22.4	149	22.4	149	30.1	225	30.1	225	2	6.6 (ea)	15	42.0	—	—	—	170.7	200
																—	86.6	36	170.7	200
																—	173.2	72	225.7	250
																23.6	—	—	194.3	225
																—	86.6	36	194.3	225
																—	173.2	72	255.2	300
	20	54.0	—	—	—	185.7	225													
			—	86.6	36	185.7	225													
			—	173.2	72	240.7	250													
			23.6	—	—	209.3	250													
			—	86.6	36	209.3	250													
			—	173.2	72	270.2	300													
25	68.0	—	—	—	203.2	250														
		—	86.6	36	203.2	250														
		—	173.2	72	258.2	300														
		23.6	—	—	226.8	250														
		—	86.6	36	226.8	250														
		—	173.2	72	287.7	300														
035	460	414	508	10.6	75	10.6	75	16.7	114	16.7	114	2	3.3 (ea)	15	21.0	—	—	—	87.5	100
																—	43.3	36	87.5	100
																—	86.6	72	112.9	125
																12.6	—	—	100.1	110
																—	43.3	36	100.1	110
																—	86.6	72	128.6	150
	20	27.0	—	—	—	95.0	110													
			—	43.3	36	95.0	110													
			—	86.6	72	120.4	125													
			12.6	—	—	107.6	125													
			—	43.3	36	107.6	125													
			—	86.6	72	136.1	150													
25	34.0	—	—	—	103.7	125														
		—	43.3	36	103.7	125														
		—	86.6	72	129.1	150														
		12.6	—	—	116.3	150														
		—	43.3	36	116.3	150														
		—	86.6	72	144.9	175														
035	575	518	632	7.7	54	7.7	54	12.2	80	12.2	80	2	2.6 (ea)	15	17.0	—	—	—	66.3	80
																—	34.6	36	66.3	80
																—	69.3	72	90.6	100
																9.6	—	—	75.9	90
																—	34.6	36	76.5	90
																—	69.3	72	102.6	110
	20	22.0	—	—	—	72.5	90													
			—	34.6	36	72.5	90													
			—	69.3	72	96.8	110													
			9.6	—	—	82.1	100													
			—	34.6	36	82.8	100													
			—	69.3	72	108.8	125													
25	27.0	—	—	—	78.8	100														
		—	34.6	36	78.8	100														
		—	69.3	72	103.1	125														
		9.6	—	—	88.4	110														
		—	34.6	36	89.0	110														
		—	69.3	72	115.1	125														
035	380	342	418	11	75.3	11	75.3	19.2	140	19.2	140	2	3.6 (ea)	15	24.5	—	—	—	98.2	110
																—	34.2	23	98.2	110
																—	68.4	45	116.1	125
																14.8	—	—	113.0	125
																—	34.2	23	113.0	125
																—	68.4	45	134.6	150
	20	30.0	—	—	—	105.1	125													
			—	34.2	23	105.1	125													
			—	68.4	45	123.0	125													
			14.8	—	—	119.9	125													
			—	34.2	23	119.9	125													
			—	68.4	45	141.5	150													
25	38.0	—	—	—	115.1	150														
		—	34.2	23	115.1	150														
		—	68.4	45	133.0	150														
		14.8	—	—	129.9	150														
		—	34.2	23	129.9	150														
		—	68.4	45	151.5	175														

See Legend and Notes on page 85.

# Electrical data (cont)



## 50A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2							FLA	kW		
		Min	Max	FLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	FLA	kW	MCA	MOCP*
040	208	187	229	30.1	225	30.1	225	30.1	225	30.1	225	4	6.5 (ea)	15	46.2	—	—	—	204.2	250
																—	75.1	27	204.2	250
																—	150.1	54	207.9	250
																23.6	—	—	227.8	250
																—	75.1	27	227.8	250
																—	150.1	54	237.4	250
	20	59.4	—	—	—	220.7	250													
			—	75.1	27	220.7	250													
			—	150.1	54	224.4	250													
			23.6	—	—	244.3	300													
			—	75.1	27	244.3	300													
			—	150.1	54	253.9	300													
25	74.8	—	—	—	239.9	300														
		—	75.1	27	239.9	300														
		—	150.1	54	243.6	300														
		23.6	—	—	263.5	300														
		—	75.1	27	263.5	300														
		—	150.1	54	273.1	300														
040	230	207	253	30.1	225	30.1	225	30.1	225	30.1	225	4	6.6 (ea)	15	42.0	—	—	—	199.3	225
																—	86.6	36	199.3	225
																—	173.2	72	225.7	250
																23.6	—	—	222.9	250
																—	86.6	36	222.9	250
																—	173.2	72	255.2	300
	20	54.0	—	—	—	214.3	250													
			—	86.6	36	214.3	250													
			—	173.2	72	240.7	250													
			23.6	—	—	237.9	250													
			—	86.6	36	237.9	250													
			—	173.2	72	270.2	300													
25	68.0	—	—	—	231.8	250														
		—	86.6	36	231.8	250														
		—	173.2	72	258.2	300														
		23.6	—	—	255.4	300														
		—	86.6	36	255.4	300														
		—	173.2	72	287.7	300														
040	460	414	508	16.7	114	16.7	114	16.7	114	16.7	114	4	3.3 (ea)	15	21.0	—	—	—	106.3	125
																—	43.3	36	106.3	125
																—	86.6	72	112.9	125
																12.6	—	—	118.9	125
																—	43.3	36	118.9	125
																—	86.6	72	128.6	150
	20	27.0	—	—	—	113.8	125													
			—	43.3	36	113.8	125													
			—	86.6	72	120.4	125													
			12.6	—	—	126.4	150													
			—	43.3	36	126.4	150													
			—	86.6	72	136.1	150													
25	34.0	—	—	—	122.5	150														
		—	43.3	36	122.5	150														
		—	86.6	72	129.1	150														
		12.6	—	—	135.1	150														
		—	43.3	36	135.1	150														
		—	86.6	72	144.9	175														
040	575	518	632	12.2	80	12.2	80	12.2	80	12.2	80	4	2.6 (ea)	15	17.0	—	—	—	80.5	90
																—	34.6	36	80.5	90
																—	69.3	72	90.6	100
																9.6	—	—	90.1	100
																—	34.6	36	90.1	100
																—	69.3	72	102.6	110
	20	22.0	—	—	—	86.7	100													
			—	34.6	36	86.7	100													
			—	69.3	72	96.8	110													
			9.6	—	—	96.3	110													
			—	34.6	36	96.3	110													
			—	69.3	72	108.8	125													
25	27.0	—	—	—	93.0	110														
		—	34.6	36	93.0	110														
		—	69.3	72	103.1	125														
		9.6	—	—	102.6	125														
		—	34.6	36	102.6	125														
		—	69.3	72	115.1	125														
040	380	342	418	19.2	140	19.2	140	19.2	140	19.2	140	4	3.6 (ea)	15	24.5	—	—	—	121.8	125
																—	34.2	23	121.8	125
																—	68.4	45	121.8	125
																14.8	—	—	136.6	150
																—	34.2	23	136.6	150
																—	68.4	45	136.6	150
	20	30.0	—	—	—	128.7	150													
			—	34.2	23	128.7	150													
			—	68.4	45	128.7	150													
			14.8	—	—	143.5	150													
			—	34.2	23	143.5	150													
			—	68.4	45	143.5	150													
25	38.0	—	—	—	138.7	175														
		—	34.2	23	138.7	175														
		—	68.4	45	138.7	175														
		14.8	—	—	153.5	175														
		—	34.2	23	153.5	175														
		—	68.4	45	153.5	175														

See Legend and Notes on page 85.



50A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2							FLA	kW	MCA	MOCP*
		Min	Max	FLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	FLA	kW	MCA	MOCP*
050	208	187	229	33.3	239	33.3	239	33.3	239	33.3	239	4	6.5 (ea)	20	59.0	—	—	—	233.5	250
																—	75.1	27	233.2	250
																—	150.1	54	233.5	250
																23.6	—	—	257.1	300
																—	75.1	27	257.1	300
																—	150.1	54	257.1	300
	25	75.0	—	—	—	252.7	300													
			—	75.1	27	252.7	300													
			—	150.1	54	252.7	300													
			23.6	—	—	276.3	350													
			—	75.1	27	276.3	350													
			—	150.1	54	276.3	350													
30	88.0	—	—	—	269.2	350														
		—	75.1	27	269.2	350														
		—	150.1	54	269.2	350														
		23.6	—	—	292.8	350														
		—	75.1	27	292.8	350														
		—	150.1	54	292.8	350														
230	207	253	33.3	239	33.3	239	33.3	239	33.3	239	4	6.6 (ea)	20	54.0	—	—	—	227.1	250	
															—	86.6	36	227.1	250	
															—	173.2	72	240.7	250	
															23.6	—	—	250.7	300	
															—	86.6	36	250.7	300	
															—	173.2	72	270.2	300	
	25	68.0	—	—	—	244.6	300													
			—	86.6	36	244.6	300													
			—	173.2	72	258.2	300													
			23.6	—	—	268.2	300													
			—	86.6	36	268.2	300													
			—	173.2	72	287.7	300													
30	80.0	—	—	—	259.6	300														
		—	86.6	36	259.6	300														
		—	173.2	72	273.2	350														
		23.6	—	—	283.2	350														
		—	86.6	36	283.2	350														
		—	173.2	72	302.7	350														
460	414	508	17.9	125	17.9	125	17.9	125	17.9	125	4	3.3 (ea)	20	27.0	—	—	—	118.6	125	
															—	43.3	36	118.6	125	
															—	86.6	72	120.4	125	
															12.6	—	—	131.2	150	
															—	43.3	36	131.2	150	
															—	86.6	72	136.1	150	
	25	34.0	—	—	—	127.3	150													
			—	43.3	36	127.3	150													
			—	86.6	72	129.1	150													
			12.6	—	—	139.9	150													
			—	43.3	36	139.9	150													
			—	86.6	72	144.9	175													
30	40.0	—	—	—	134.8	150														
		—	43.3	36	134.8	150														
		—	86.6	72	136.6	175														
		12.6	—	—	147.4	175														
		—	43.3	36	147.4	175														
		—	86.6	72	152.4	175														
575	518	632	12.8	80	12.8	80	12.8	80	12.8	80	4	2.6 (ea)	20	22.0	—	—	—	89.1	110	
															—	34.6	36	89.1	110	
															—	69.3	72	96.8	110	
															9.6	—	—	98.7	110	
															—	34.6	36	98.7	110	
															—	69.3	72	108.8	125	
	25	27.0	—	—	—	95.4	110													
			—	34.6	36	95.4	110													
			—	69.3	72	103.1	125													
			9.6	—	—	105.0	125													
			—	34.6	36	105.0	125													
			—	69.3	72	115.1	125													
30	32.0	—	—	—	101.6	125														
		—	34.6	36	101.6	125														
		—	69.3	72	109.3	125														
		9.6	—	—	111.2	125														
		—	34.6	36	111.2	125														
		—	69.3	72	121.3	150														
380	342	418	23.7	145	23.7	145	23.7	145	23.7	145	4	3.6 (ea)	20	30.0	—	—	—	146.7	175	
															—	34.2	23	146.7	175	
															—	68.4	45	146.7	175	
															14.8	—	—	161.5	175	
															—	34.2	23	161.5	175	
															—	68.4	45	161.5	175	
	25	38.0	—	—	—	156.7	175													
			—	34.2	23	156.7	175													
			—	68.4	45	156.7	175													
			14.8	—	—	171.5	200													
			—	34.2	23	171.5	200													
			—	68.4	45	171.5	200													
30	43.5	—	—	—	163.6	200														
		—	34.2	23	163.6	200														
		—	68.4	45	163.6	200														
		14.8	—	—	178.4	200														
		—	34.2	23	178.4	200														
		—	68.4	45	178.4	200														

See Legend and Notes on page 85.

# Electrical data (cont)



## 50A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	OPTIONAL ELECTRIC HEAT			POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2							FLA (total)	FLA	kW	MCA	MOCP*
		Min	Max	FLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA						
060 (MCHX)	208	187	229	51.3	300	51.3	300	51.3	300	51.3	300	4	5.5 (ea)	25	74.8	—	—	—	320.7	350	
																112.6	112.6	41	320.7	350	
		35.4	—	—	356.1	400															
		112.6	112.6	41	356.1	400															
		225.2	225.2	81	363.0	400															
		—	—	—	372.6	450															
	230	207	253	51.3	300	51.3	300	51.3	300	51.3	300	4	5.8 (ea)	25	68.0	—	—	—	313.4	350	
																129.9	129.9	54	313.4	350	
		35.4	—	—	348.8	400															
		129.9	129.9	54	348.8	400															
		259.8	259.8	108	389.1	400															
		—	—	—	328.4	400															
460	414	508	22.4	150	22.4	150	22.4	150	22.4	150	22.4	150	4	2.9 (ea)	25	34.0	—	—	—	143.7	175
																	65.0	65.0	54	143.7	175
	18.9	—	—	162.6	175																
	65.0	65.0	54	162.6	175																
	129.9	129.9	108	196.0	225																
	—	—	—	151.2	175																
575	518	632	19.9	109	19.9	190	19.9	109	19.9	109	19.9	109	4	2.3 (ea)	25	27.0	—	—	—	122.6	125
																	65.0	65.0	54	122.6	125
	14.4	—	—	137.0	150																
	65.0	65.0	54	137.0	150																
	129.9	129.9	108	155.7	175																
	—	—	—	128.8	150																
380	342	418	26.9	139	26.9	139	26.9	139	26.9	139	26.9	139	4	3.7 (ea)	25	38.0	—	—	—	169.9	200
																	51.4	51.4	33.8	169.9	200
	22.2	—	—	192.1	225																
	51.4	51.4	33.8	192.1	225																
	102.8	102.8	67.7	192.1	225																
	—	—	—	176.8	200																
380	342	418	26.9	139	26.9	139	26.9	139	26.9	139	26.9	139	4	3.7 (ea)	30	43.5	—	—	—	176.8	200
																	51.4	51.4	33.8	176.8	200
	22.2	—	—	199.0	225																
	51.4	51.4	33.8	199.0	225																
	102.8	102.8	67.7	199.0	225																
	—	—	—	192.7	225																
380	342	418	26.9	139	26.9	139	26.9	139	26.9	139	26.9	139	4	3.7 (ea)	40	56.2	—	—	—	214.9	250
																	51.4	51.4	33.8	214.9	250
22.2	—	—	214.9	250																	
51.4	51.4	33.8	214.9	250																	
102.8	102.8	67.7	214.9	250																	

See Legend and Notes on page 85.



50A2,A3,A4,A5 UNITS WITHOUT CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	OPTIONAL ELECTRIC HEAT		POWER SUPPLY		
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2							FLA (total)	kW	MCA	MOCP*	
				FLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA										Qty
060 (RTPF)	208	187	229	51.3	300	51.3	300	51.3	300	51.3	300	6	6.5 (ea)	25	74.8	—	—	—	333.7	400	
																112.6	—	—	333.7	400	
		225.2	35.4	—	373.1	400															
		—	112.6	—	373.1	400															
		225.2	35.4	—	373.0	400															
		—	112.6	—	354.2	400															
	225.2	35.4	—	354.2	400																
	—	112.6	—	389.6	450																
	225.2	35.4	—	389.6	450																
	—	112.6	—	389.6	450																
	225.2	35.4	—	386.7	500																
	—	112.6	—	386.7	500																
225.2	35.4	—	386.7	500																	
230	207	253	51.3	300	51.3	300	51.3	300	51.3	300	6	6.6 (ea)	25	68.0	—	—	—	329.8	350		
															129.9	—	—	329.8	350		
	259.8	35.4	—	344.8	400																
	—	129.9	—	344.8	400																
	259.8	35.4	—	359.8	400																
	—	129.9	—	365.2	400																
259.8	35.4	—	365.2	400																	
—	129.9	—	389.1	400																	
259.8	35.4	—	389.1	400																	
—	129.9	—	374.8	450																	
259.8	35.4	—	374.8	450																	
—	129.9	—	374.8	450																	
259.8	35.4	—	389.8	450																	
—	129.9	—	410.2	500																	
259.8	35.4	—	410.2	500																	
—	129.9	—	434.1	500																	
259.8	35.4	—	434.1	500																	
460	414	508	22.4	150	22.4	150	22.4	150	22.4	150	22.4	150	6	3.3 (ea)	25	34.0	—	—	—	151.9	175
																	65.0	—	—	151.9	175
	129.9	18.9	—	170.8	200																
	—	65.0	—	170.8	200																
	129.9	18.9	—	196.0	225																
	—	65.0	—	196.0	225																
129.9	18.9	—	178.3	200																	
—	65.0	—	178.3	200																	
129.9	18.9	—	203.5	225																	
—	65.0	—	203.5	225																	
129.9	18.9	—	174.4	225																	
—	65.0	—	174.4	225																	
129.9	18.9	—	194.9	225																	
—	65.0	—	194.9	225																	
129.9	18.9	—	193.3	225																	
—	65.0	—	193.3	225																	
129.9	18.9	—	218.5	250																	
—	65.0	—	218.5	250																	
575	518	632	19.9	109	19.9	190	19.9	109	19.9	109	19.9	109	6	2.6 (ea)	25	27.0	—	—	—	129.0	150
																	52.0	—	—	129.0	150
	103.9	14.4	—	137.7	150																
	—	52.0	—	143.4	150																
	103.9	14.4	—	143.4	150																
	—	52.0	—	155.7	175																
103.9	14.4	—	155.7	175																	
—	52.0	—	135.2	150																	
103.9	14.4	—	135.2	150																	
—	52.0	—	143.9	175																	
103.9	14.4	—	143.9	175																	
—	52.0	—	149.6	175																	
103.9	14.4	—	149.6	175																	
—	52.0	—	161.9	175																	
103.9	14.4	—	161.9	175																	
—	52.0	—	146.5	175																	
103.9	14.4	—	146.5	175																	
—	52.0	—	155.2	175																	
103.9	14.4	—	155.2	175																	
—	52.0	—	160.9	200																	
103.9	14.4	—	160.9	200																	
—	52.0	—	173.2	200																	
103.9	14.4	—	173.2	200																	
380	342	418	26.9	139	26.9	139	26.9	139	26.9	139	26.9	139	6	3.6 (ea)	25	38.0	—	—	—	151.9	175
																	51.4	—	—	151.9	175
	102.8	22.2	—	172.4	200																
	—	51.4	—	170.8	200																
	102.8	22.2	—	196.0	225																
	—	51.4	—	196.0	225																
102.8	22.2	—	159.4	175																	
—	51.4	—	159.4	175																	
102.8	22.2	—	179.9	200																	
—	51.4	—	179.9	200																	
102.8	22.2	—	178.3	200																	
—	51.4	—	178.3	200																	
102.8	22.2	—	203.5	225																	
—	51.4	—	203.5	225																	
102.8	22.2	—	174.4	225																	
—	51.4	—	174.4	225																	
102.8	22.2	—	194.9	225																	
—	51.4	—	194.9	225																	
102.8	22.2	—	193.3	225																	
—	51.4	—	193.3	225																	
102.8	22.2	—	218.5	250																	
—	51.4	—	218.5	250																	
102.8	22.2	—	218.5	250																	

See Legend and Notes on page 85.



# Electrical data (cont)



## 50A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
		Min	Max	Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2		Qty	FLA	Hp	FLA	FLA (total)	FLA	FLA	kW	MCA	MOCP*
				RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA										
020	208	187	229	22.4	149	22.4	149	29.5	195	—	—	2	6.5 (ea)	5	16.7	—	7.0	—	—	118.4	125
																7.0	75.1	27	123.5	125	
																150.1	54	179.7	200		
																23.6	7.0	—	—	142.0	150
																7.0	75.1	27	153.0	175	
																150.1	54	209.2	225		
	10	30.8	—	7.0	—	—	132.8	150													
			7.0	75.1	27	141.1	150														
			150.1	54	197.4	225															
			23.6	7.0	—	—	156.4	175													
			7.0	75.1	27	170.6	175														
			150.1	54	226.9	250															
15	46.2	—	7.0	—	—	152.1	175														
		7.0	75.1	27	160.4	175															
		150.1	54	216.6	250																
		23.6	7.0	—	—	175.7	200														
		7.0	75.1	27	189.9	200															
		150.1	54	246.1	250																
020	230	207	253	22.4	149	22.4	149	29.5	195	—	—	2	6.6 (ea)	5	15.2	—	7.0	—	—	117.1	125
																7.0	86.6	36	136.0	150	
																173.2	72	201.0	225		
																23.6	7.0	—	—	140.7	150
																7.0	86.6	36	165.5	175	
																173.2	72	230.5	250		
	10	28.0	—	7.0	—	—	129.9	150													
			7.0	86.6	36	152.0	175														
			173.2	72	217.0	225															
			23.6	7.0	—	—	153.5	175													
			7.0	86.6	36	181.5	200														
			173.2	72	246.5	250															
15	42.0	—	7.0	—	—	147.0	175														
		7.0	86.6	36	169.5	175															
		173.2	72	234.5	250																
		23.6	7.0	—	—	170.6	200														
		7.0	86.6	36	199.0	200															
		173.2	72	264.0	300																
020	460	414	508	10.6	75	10.6	75	14.7	95	—	—	2	3.3 (ea)	5	7.6	—	3.5	—	—	57.3	70
																3.5	43.3	36	68.0	70	
																86.6	72	100.5	110		
																12.6	3.5	—	—	69.9	80
																3.5	43.3	36	83.8	90	
																86.6	72	116.2	125		
	10	14.0	—	3.5	—	—	63.7	70													
			3.5	43.3	36	76.0	80														
			86.6	72	108.5	110															
			12.6	3.5	—	—	76.3	90													
			3.5	43.3	36	91.8	100														
			86.6	72	124.2	125															
15	21.0	—	3.5	—	—	72.3	90														
		3.5	43.3	36	84.8	90															
		86.6	72	117.2	125																
		12.6	3.5	—	—	84.9	100														
		3.5	43.3	36	100.5	110															
		86.6	72	133.0	150																
020	575	518	632	7.7	54	7.7	54	12.2	80	—	—	2	2.6 (ea)	5	6.1	—	2.5	—	—	44.5	50
																2.5	34.6	36	54.0	60	
																69.3	72	80.1	90		
																9.6	2.5	—	—	54.1	60
																2.5	34.6	36	66.0	70	
																69.3	72	92.1	100		
	10	11.0	—	2.5	—	—	49.4	60													
			2.5	34.6	36	60.1	70														
			69.3	72	86.2	90															
			9.6	2.5	—	—	59.0	70													
			2.5	34.6	36	72.1	80														
			69.3	72	98.2	100															
15	17.0	—	2.5	—	—	56.6	70														
		2.5	34.6	36	67.6	70															
		69.3	72	93.7	110																
		9.6	2.5	—	—	66.2	80														
		2.5	34.6	36	79.6	80															
		69.3	72	105.7	110																

See Legend and Notes on page 85.



50A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET		OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
		Min	Max	Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2		Qty	FLA	Hp	FLA	FLA (total)	FLA	FLA	kW	MCA	MOCP*	
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	FLA (total)	FLA	FLA	FLA	FLA	kW	MCA	MOCP*			
025	208	187	229	29.5	195	29.5	195	29.5	195	—	—	2	6.5 (ea)	5	16.7	—	7.0	—	—	132.6	150	
																—	7.0	75.1	27	132.6	150	
																—	7.0	150.1	54	179.7	200	
																23.6	7.0	—	—	156.2	175	
																—	7.0	75.1	27	156.2	175	
																—	7.0	150.1	54	209.2	225	
		10	30.8	—	7.0	—	—	147.0	175													
				—	7.0	75.1	27	147.0	175													
				—	7.0	150.1	54	197.4	225													
				23.6	7.0	—	—	170.6	200													
				—	7.0	75.1	27	170.6	200													
				—	7.0	150.1	54	226.9	250													
	15	46.2	—	7.0	—	—	166.3	200														
			—	7.0	75.1	27	166.3	200														
			—	7.0	150.1	54	216.6	250														
			23.6	7.0	—	—	189.9	225														
			—	7.0	75.1	27	189.9	225														
			—	7.0	150.1	54	246.1	250														
	230	207	253	29.5	195	29.5	195	29.5	195	—	—	2	6.6 (ea)	5	15.2	—	7.0	—	—	131.3	150	
																—	7.0	86.6	36	136.0	150	
																—	7.0	173.2	72	201.0	225	
																23.6	7.0	—	—	154.9	175	
																—	7.0	86.6	36	165.5	175	
																—	7.0	173.2	72	230.5	250	
10		28.0	—	7.0	—	—	144.1	150														
			—	7.0	86.6	36	152.0	175														
			—	7.0	173.2	72	217.0	225														
			23.6	7.0	—	—	167.7	175														
			—	7.0	86.6	36	181.5	200														
			—	7.0	173.2	72	246.5	250														
15	42.0	—	7.0	—	—	161.2	200															
		—	7.0	86.6	36	169.5	200															
		—	7.0	173.2	72	234.5	250															
		23.6	7.0	—	—	184.8	225															
		—	7.0	86.6	36	199.0	225															
		—	7.0	173.2	72	264.0	300															
460	414	508	14.7	95	14.7	95	14.7	95	—	—	2	3.3 (ea)	5	7.6	—	3.5	—	—	65.5	80		
															—	3.5	43.3	36	68.0	80		
															—	3.5	86.6	72	100.5	110		
															12.6	3.5	—	—	78.1	90		
															—	3.5	43.3	36	83.8	90		
															—	3.5	86.6	72	116.2	125		
	10	14.0	—	3.5	—	—	71.9	80														
			—	3.5	43.3	36	76.0	80														
			—	3.5	86.6	72	108.5	110														
			12.6	3.5	—	—	84.5	90														
			—	3.5	43.3	36	91.8	100														
			—	3.5	86.6	72	124.2	125														
	15	21.0	—	3.5	—	—	80.5	100														
			—	3.5	43.3	36	84.8	100														
			—	3.5	86.6	72	117.2	125														
			12.6	3.5	—	—	93.1	110														
			—	3.5	43.3	36	100.5	110														
			—	3.5	86.6	72	133.0	150														
575	518	632	12.2	80	12.2	80	12.2	80	—	—	2	2.6 (ea)	5	6.1	—	2.5	—	—	53.5	60		
															—	2.5	34.6	36	54.0	60		
															—	2.5	69.3	72	80.1	90		
															9.6	2.5	—	—	63.1	70		
															—	2.5	34.6	36	66.0	70		
															—	2.5	69.3	72	92.1	100		
	10	11.0	—	2.5	—	—	58.4	70														
			—	2.5	34.6	36	60.1	70														
			—	2.5	69.3	72	86.2	90														
			9.6	2.5	—	—	68.0	80														
			—	2.5	34.6	36	72.1	80														
			—	2.5	69.3	72	98.2	100														
15	17.0	—	2.5	—	—	65.6	80															
		—	2.5	34.6	36	67.6	80															
		—	2.5	69.3	72	93.7	110															
		9.6	2.5	—	—	75.2	90															
		—	2.5	34.6	36	79.6	90															
		—	2.5	69.3	72	105.7	110															

See Legend and Notes on page 85.

# Electrical data (cont)



## 50A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
		Min	Max	Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2		Qty	FLA	Hp	FLA	FLA (total)	FLA	FLA	kW	MCA	MOCP*
				RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA										
027	208	187	229	29.5	195	29.5	195	29.5	195	—	—	2	6.5 (ea)	10	30.8	—	7.0	—	—	147.0	175
																—	7.0	75.1	27	147.0	175
																—	7.0	150.1	54	197.4	225
																23.6	7.0	—	—	170.6	200
																—	7.0	75.1	27	170.6	200
																—	7.0	150.1	54	226.9	250
	15	46.2	—	7.0	—	—	166.3	200													
			—	7.0	75.1	27	166.3	200													
			—	7.0	150.1	54	216.6	250													
			23.6	7.0	—	—	189.9	225													
			—	7.0	75.1	27	189.9	225													
			—	7.0	150.1	54	246.1	250													
20	59.4	—	7.0	—	—	182.8	225														
		—	7.0	75.1	27	182.8	225														
		—	7.0	150.1	54	233.1	250														
		23.6	7.0	—	—	206.4	250														
		—	7.0	75.1	27	206.4	250														
		—	7.0	150.1	54	262.6	300														
027	230	207	253	29.5	195	29.5	195	29.5	195	—	—	2	6.6 (ea)	10	28.0	—	7.0	—	—	144.1	150
																—	7.0	86.6	36	152.0	175
																—	7.0	173.2	72	217.0	225
																23.6	7.0	—	—	167.7	175
																—	7.0	86.6	36	181.5	200
																—	7.0	173.2	72	246.5	250
	15	42.0	—	7.0	—	—	161.2	200													
			—	7.0	86.6	36	169.5	200													
			—	7.0	173.2	72	234.5	250													
			23.6	7.0	—	—	184.8	225													
			—	7.0	86.6	36	199.0	225													
			—	7.0	173.2	72	264.0	300													
20	54.0	—	7.0	—	—	176.2	225														
		—	7.0	86.6	36	184.5	225														
		—	7.0	173.2	72	249.5	300														
		23.6	7.0	—	—	199.8	250														
		—	7.0	86.6	36	214.0	250														
		—	7.0	173.2	72	279.0	300														
027	460	414	508	14.7	95	14.7	95	14.7	95	—	—	2	3.3 (ea)	10	14.0	—	3.5	—	—	71.9	80
																—	3.5	43.3	36	76.0	80
																—	3.5	86.6	72	108.5	110
																12.6	3.5	—	—	84.5	90
																—	3.5	43.3	36	91.8	100
																—	3.5	86.6	72	124.2	125
	15	21.0	—	3.5	—	—	80.5	100													
			—	3.5	43.3	36	84.8	100													
			—	3.5	86.6	72	117.2	125													
			12.6	3.5	—	—	93.1	110													
			—	3.5	43.3	36	100.5	110													
			—	3.5	86.6	72	133.0	150													
20	27.0	—	3.5	—	—	88.0	110														
		—	3.5	43.3	36	92.3	110														
		—	3.5	86.6	72	124.7	150														
		12.6	3.5	—	—	100.6	125														
		—	3.5	43.3	36	108.0	125														
		—	3.5	86.6	72	140.5	150														
027	575	518	632	12.2	80	12.2	80	12.2	80	—	—	2	2.6 (ea)	10	11.0	—	2.5	—	—	58.4	70
																—	2.5	34.6	36	60.1	70
																—	2.5	69.3	72	86.2	90
																9.6	2.5	—	—	68.0	80
																—	2.5	34.6	36	72.1	80
																—	2.5	69.3	72	98.2	100
	15	17.0	—	2.5	—	—	65.6	80													
			—	2.5	34.6	36	67.6	80													
			—	2.5	69.3	72	93.7	110													
			9.6	2.5	—	—	75.2	90													
			—	2.5	34.6	36	79.6	90													
			—	2.5	69.3	72	105.7	110													
20	22.0	—	2.5	—	—	71.8	90														
		—	2.5	34.6	36	73.9	90														
		—	2.5	69.3	72	99.9	110														
		9.6	2.5	—	—	81.4	100														
		—	2.5	34.6	36	85.9	100														
		—	2.5	69.3	72	111.9	125														

See Legend and Notes on page 85.



50A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET	OPTIONAL ELECTRIC HEAT		POWER SUPPLY			
		Min	Max	Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2		Qty	FLA	Hp	FLA	FLA (total)	FLA	FLA	kW	MCA	MOCP*		
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA												
030	208	187	229	23.2	164	23.2	164	23.2	164	23.2	164	2	6.5 (ea)	10	30.8	—	7.0	—	—	151.3	175		
																—	7.0	75.1	27	151.3	175		
																—	7.0	150.1	54	197.4	225		
																23.6	7.0	—	—	174.9	200		
																23.6	7.0	75.1	27	174.9	200		
																23.6	7.0	150.1	54	226.9	250		
		15	46.2	—	7.0	—	—	170.6	200														
				—	7.0	75.1	27	170.6	200														
				—	7.0	150.1	54	216.6	250														
				23.6	7.0	—	—	194.2	225														
				23.6	7.0	75.1	27	194.2	225														
				23.6	7.0	150.1	54	246.1	250														
	20	59.4	—	7.0	—	—	187.1	225															
			—	7.0	75.1	27	187.1	225															
			—	7.0	150.1	54	233.1	250															
			23.6	7.0	—	—	210.7	250															
			23.6	7.0	75.1	27	210.7	250															
			23.6	7.0	150.1	54	262.6	300															
	230	207	253	23.2	164	23.2	164	23.2	164	23.2	164	23.2	164	2	6.6 (ea)	10	28.0	—	7.0	—	—	148.0	175
																		—	7.0	86.6	36	152.0	175
																		—	7.0	173.2	72	217.0	225
																		23.6	7.0	—	—	171.6	175
																		23.6	7.0	86.6	36	181.5	200
																		23.6	7.0	173.2	72	246.5	250
15		42.0	—	7.0	—	—	165.5	200															
			—	7.0	86.6	36	169.5	200															
			—	7.0	173.2	72	234.5	250															
			23.6	7.0	—	—	189.1	225															
			23.6	7.0	86.6	36	199.0	225															
			23.6	7.0	173.2	72	264.0	300															
20	54.0	—	7.0	—	—	180.5	225																
		—	7.0	86.6	36	184.5	225																
		—	7.0	173.2	72	249.5	300																
		23.6	7.0	—	—	204.1	250																
		23.6	7.0	86.6	36	214.0	250																
		23.6	7.0	173.2	72	279.0	300																
460	414	508	11.2	75	11.2	75	11.2	75	11.2	75	11.2	75	2	3.3 (ea)	10	14.0	—	3.5	—	—	72.4	80	
																	—	3.5	43.3	36	76.0	80	
																	—	3.5	86.6	72	108.5	110	
																	12.6	3.5	—	—	85.0	90	
																	12.6	3.5	43.3	36	91.8	100	
																	12.6	3.5	86.6	72	124.2	125	
	15	21.0	—	3.5	—	—	81.2	100															
			—	3.5	43.3	36	84.8	100															
			—	3.5	86.6	72	117.2	125															
			12.6	3.5	—	—	93.8	110															
			12.6	3.5	43.3	36	100.5	110															
			12.6	3.5	86.6	72	133.0	150															
	20	27.0	—	3.5	—	—	88.7	110															
			—	3.5	43.3	36	92.3	110															
			—	3.5	86.6	72	124.7	150															
			12.6	3.5	—	—	101.3	125															
			12.6	3.5	43.3	36	108.0	125															
			12.6	3.5	86.6	72	140.5	150															
575	518	632	7.9	54	7.9	54	7.9	54	7.9	54	7.9	54	2	2.6 (ea)	10	11.0	—	2.5	—	—	53.1	60	
																	—	2.5	34.6	36	60.1	70	
																	—	2.5	69.3	72	86.2	90	
																	9.6	2.5	—	—	62.7	70	
																	9.6	2.5	34.6	36	72.1	80	
																	9.6	2.5	69.3	72	98.2	100	
	15	17.0	—	2.5	—	—	60.6	70															
			—	2.5	34.6	36	67.6	70															
			—	2.5	69.3	72	93.7	110															
			9.6	2.5	—	—	70.2	80															
			9.6	2.5	34.6	36	79.6	80															
			9.6	2.5	69.3	72	105.7	110															
20	22.0	—	2.5	—	—	66.8	80																
		—	2.5	34.6	36	73.9	80																
		—	2.5	69.3	72	99.9	110																
		9.6	2.5	—	—	76.4	90																
		9.6	2.5	34.6	36	85.9	90																
		9.6	2.5	69.3	72	111.9	125																

See Legend and Notes on page 85.

# Electrical data (cont)



## 50A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
		Min	Max	Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2		Qty	FLA	Hp	FLA	FLA (total)	FLA	FLA	kW	MCA	MOCP*
				RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA										
035	208	187	229	22.4	149	22.4	149	30.1	225	30.1	225	2	6.5 (ea)	15	46.2	—	7.0	—	—	182.8	225
																—	7.0	75.1	27	182.8	225
																—	7.0	150.1	54	216.6	250
																23.6	7.0	—	—	206.4	250
																—	7.0	75.1	27	206.4	250
																—	7.0	150.1	54	246.1	250
		20	59.4	—	7.0	—	—	199.3	250												
				—	7.0	75.1	27	199.3	250												
				—	7.0	150.1	54	233.1	250												
				23.6	7.0	—	—	222.9	250												
				—	7.0	75.1	27	222.9	250												
				—	7.0	150.1	54	262.6	300												
	25	74.8	—	7.0	—	—	218.5	250													
			—	7.0	75.1	27	218.5	250													
			—	7.0	150.1	54	252.4	300													
			23.6	7.0	—	—	218.5	250													
			—	7.0	75.1	27	218.5	250													
			—	7.0	150.1	54	281.9	300													
	230	207	253	22.4	149	22.4	149	30.1	225	30.1	225	2	6.6 (ea)	15	42.0	—	7.0	—	—	177.7	200
																—	7.0	86.6	36	177.7	200
																—	7.0	173.2	72	234.5	250
																23.6	7.0	—	—	201.3	225
																—	7.0	86.6	36	201.3	225
																—	7.0	173.2	72	264.0	300
20		54.0	—	7.0	—	—	192.7	225													
			—	7.0	86.6	36	192.7	225													
			—	7.0	173.2	72	249.5	300													
			23.6	7.0	—	—	216.3	250													
			—	7.0	86.6	36	216.3	250													
			—	7.0	173.2	72	279.0	300													
25	68.0	—	7.0	—	—	210.2	250														
		—	7.0	86.6	36	210.2	250														
		—	7.0	173.2	72	267.0	300														
		23.6	7.0	—	—	233.8	300														
		—	7.0	86.6	36	233.8	300														
		—	7.0	173.2	72	296.5	350														
460	414	508	10.6	75	10.6	75	16.7	114	16.7	114	2	3.3 (ea)	15	21.0	—	3.5	—	—	91.0	110	
															—	3.5	43.3	36	91.0	110	
															—	3.5	86.6	72	117.2	125	
															12.6	3.5	—	—	103.6	110	
															—	3.5	43.3	36	103.6	110	
															—	3.5	86.6	72	133.0	150	
	20	27.0	—	3.5	—	—	98.5	125													
			—	3.5	43.3	36	98.5	125													
			—	3.5	86.6	72	124.7	150													
			12.6	3.5	—	—	111.1	125													
			—	3.5	43.3	36	111.1	125													
			—	3.5	86.6	72	140.5	150													
	25	34.0	—	3.5	—	—	107.2	125													
			—	3.5	43.3	36	107.2	125													
			—	3.5	86.6	72	133.5	150													
			12.6	3.5	—	—	119.8	150													
			—	3.5	43.3	36	119.8	150													
			—	3.5	86.6	72	149.2	175													
575	518	632	7.7	54	7.7	54	12.2	80	12.2	80	2	2.6 (ea)	15	17.0	—	2.5	—	—	68.8	80	
															—	2.5	34.6	36	68.8	80	
															—	2.5	69.3	72	93.7	110	
															9.6	2.5	—	—	78.4	90	
															—	2.5	34.6	36	79.6	90	
															—	2.5	69.3	72	105.7	110	
	20	22.0	—	2.5	—	—	75.0	90													
			—	2.5	34.6	36	75.0	90													
			—	2.5	69.3	72	99.9	110													
			9.6	2.5	—	—	84.6	100													
			—	2.5	34.6	36	85.9	100													
			—	2.5	69.3	72	111.9	125													
25	27.0	—	2.5	—	—	81.3	100														
		—	2.5	34.6	36	81.3	100														
		—	2.5	69.3	72	106.2	125														
		9.6	2.5	—	—	90.9	110														
		—	2.5	34.6	36	92.1	110														
		—	2.5	69.3	72	118.2	125														

See Legend and Notes on page 85.



50A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
		Min	Max	Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2		Qty	FLA	Hp	FLA	FLA (total)	FLA	FLA	kW	MCA	MOCP*
		RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA										
040	208	187	229	30.1	225	30.1	225	30.1	225	30.1	30.1	4	6.5 (ea)	15	46.2	—	7.0	—	—	211.2	250
																—	7.0	75.1	27	211.2	250
																—	7.0	150.1	54	216.6	250
																23.6	7.0	—	—	234.8	250
																—	7.0	75.1	27	234.8	250
																—	7.0	150.1	54	246.1	250
		—	7.0	—	—	227.7	250														
		—	7.0	75.1	27	227.7	250														
		—	7.0	150.1	54	233.1	250														
		23.6	7.0	—	—	251.3	300														
		—	7.0	75.1	27	251.3	300														
		—	7.0	150.1	54	262.6	300														
	—	7.0	—	—	246.9	300															
	—	7.0	75.1	27	246.9	300															
	—	7.0	150.1	54	252.4	300															
	23.6	7.0	—	—	270.5	300															
	—	7.0	75.1	27	270.5	300															
	—	7.0	150.1	54	281.9	300															
	230	207	253	30.1	225	30.1	225	30.1	225	30.1	30.1	4	6.6 (ea)	15	42.0	—	7.0	—	—	206.3	225
																—	7.0	86.6	36	206.3	225
																—	7.0	173.2	72	234.5	250
																23.6	7.0	—	—	229.9	250
																—	7.0	86.6	36	229.9	250
																—	7.0	173.2	72	264.0	300
—		7.0	—	—	221.3	250															
—		7.0	86.6	36	221.3	250															
—		7.0	173.2	72	249.5	300															
23.6		7.0	—	—	244.9	250															
—		7.0	86.6	36	244.9	250															
—		7.0	173.2	72	279.0	300															
—	7.0	—	—	238.8	300																
—	7.0	86.6	36	238.8	300																
—	7.0	173.2	72	267.0	300																
23.6	7.0	—	—	262.4	300																
—	7.0	86.6	36	262.4	300																
—	7.0	173.2	72	296.5	350																
460	414	508	16.7	114	16.7	114	16.7	114	16.7	114	16.7	4	3.3 (ea)	15	21.0	—	3.5	—	—	109.8	125
																—	3.5	43.3	36	109.8	125
																—	3.5	86.6	72	117.2	125
																12.6	3.5	—	—	122.4	125
																—	3.5	43.3	36	122.4	125
																—	3.5	86.6	72	133.0	150
	—	3.5	—	—	117.3	125															
	—	3.5	43.3	36	117.3	125															
	—	3.5	86.6	72	124.7	150															
	12.6	3.5	—	—	129.9	150															
	—	3.5	43.3	36	129.9	150															
	—	3.5	86.6	72	140.5	150															
—	3.5	—	—	126.0	150																
—	3.5	43.3	36	126.0	150																
—	3.5	86.6	72	133.5	150																
12.6	3.5	—	—	138.6	150																
—	3.5	43.3	36	138.6	150																
—	3.5	86.6	72	149.2	175																
575	518	632	12.2	80	12.2	80	12.2	80	12.2	80	12.2	4	2.6 (ea)	15	17.0	—	2.5	—	—	83.0	90
																—	2.5	34.6	36	83.0	90
																—	2.5	69.3	72	93.7	110
																9.6	2.5	—	—	92.6	100
																—	2.5	34.6	36	92.6	100
																—	2.5	69.3	72	105.7	110
	—	2.5	—	—	89.2	110															
	—	2.5	34.6	36	89.2	110															
	—	2.5	69.3	72	99.9	110															
	9.6	2.5	—	—	98.8	110															
	—	2.5	34.6	36	98.8	110															
	—	2.5	69.3	72	111.9	125															
—	2.5	—	—	95.5	110																
—	2.5	34.6	36	95.5	110																
—	2.5	69.3	72	106.2	125																
9.6	2.5	—	—	105.1	125																
—	2.5	34.6	36	105.1	125																
—	2.5	69.3	72	118.2	125																

See Legend and Notes on page 85.

# Electrical data (cont)



## 50A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
		Min	Max	Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2		Qty	FLA	Hp	FLA	FLA (total)	FLA	FLA	kW	MCA	MOCP*
				RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA										
050	208	187	229	33.3	239	33.3	239	33.3	239	33.3	239	4	6.5 (ea)	20	59.0	—	7.0	—	—	240.5	250
																—	7.0	75.1	27	240.5	250
																—	7.0	150.1	54	240.5	250
																23.6	7.0	—	—	264.1	300
																—	7.0	75.1	27	264.1	300
																—	7.0	150.1	54	264.1	300
	—	7.0	—	—	259.7	300															
	—	7.0	75.1	27	259.7	300															
	—	7.0	150.1	54	259.7	300															
	23.6	7.0	—	—	283.3	350															
	—	7.0	75.1	27	283.3	350															
	—	7.0	150.1	54	283.3	350															
—	7.0	—	—	276.2	350																
—	7.0	75.1	27	276.2	350																
—	7.0	150.1	54	276.2	350																
23.6	7.0	—	—	299.8	350																
—	7.0	75.1	27	299.8	350																
—	7.0	150.1	54	299.8	350																
050	230	207	253	33.3	239	33.3	239	33.3	239	33.3	239	4	6.6 (ea)	20	54.0	—	7.0	—	—	234.1	250
																—	7.0	86.6	36	234.1	250
																—	7.0	173.2	72	249.5	300
																23.6	7.0	—	—	257.7	300
																—	7.0	86.6	36	257.7	300
																—	7.0	173.2	72	279.0	300
	—	7.0	—	—	251.6	300															
	—	7.0	86.6	36	251.6	300															
	—	7.0	173.2	72	267.0	300															
	23.6	7.0	—	—	275.2	300															
	—	7.0	86.6	36	275.2	300															
	—	7.0	173.2	72	296.5	350															
—	7.0	—	—	266.6	300																
—	7.0	86.6	36	266.6	300																
—	7.0	173.2	72	282.0	350																
23.6	7.0	—	—	290.2	350																
—	7.0	86.6	36	290.2	350																
—	7.0	173.2	72	311.5	350																
050	460	414	508	17.9	125	17.9	125	17.9	125	17.9	125	4	3.3 (ea)	20	27.0	—	3.5	—	—	122.1	125
																—	3.5	43.3	36	122.1	125
																—	3.5	86.6	72	124.7	150
																12.6	3.5	—	—	134.7	150
																—	3.5	43.3	36	134.7	150
																—	3.5	86.6	72	140.5	150
	—	3.5	—	—	130.8	150															
	—	3.5	43.3	36	130.8	150															
	—	3.5	86.6	72	133.5	150															
	12.6	3.5	—	—	143.4	175															
	—	3.5	43.3	36	143.4	175															
	—	3.5	86.6	72	149.2	175															
—	3.5	—	—	138.3	175																
—	3.5	43.3	36	138.3	175																
—	3.5	86.6	72	141.0	175																
12.6	3.5	—	—	150.9	175																
—	3.5	43.3	36	150.9	175																
—	3.5	86.6	72	156.7	175																
050	575	518	632	12.8	80	12.8	80	12.8	80	12.8	80	4	2.6 (ea)	20	22.0	—	2.5	—	—	91.6	110
																—	2.5	34.6	36	91.6	110
																—	2.5	69.3	72	99.9	110
																9.6	2.5	—	—	101.2	110
																—	2.5	34.6	36	101.2	110
																—	2.5	69.3	72	111.9	125
	—	2.5	—	—	97.9	110															
	—	2.5	34.6	36	97.9	110															
	—	2.5	69.3	72	106.2	125															
	9.6	2.5	—	—	107.5	125															
	—	2.5	34.6	36	107.5	125															
	—	2.5	69.3	72	118.2	125															
—	2.5	—	—	104.1	125																
—	2.5	34.6	36	104.1	125																
—	2.5	69.3	72	112.4	125																
9.6	2.5	—	—	113.7	125																
—	2.5	34.6	36	113.7	125																
—	2.5	69.3	72	124.4	150																

See Legend and Notes on page 85.





50A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2											
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	RLA	LRA	Qty	FLA	Hp	FLA	FLA (total)	FLA	FLA	kW	MCA	MOCP*
060 (MCHX)	208	187	229	51.3	300	51.3	300	51.3	300	51.3	300	4	5.5 (ea)	25	75.0	—	7.0	—	—	327.7	400
																—	7.0	112.6	41	327.7	400
																—	7.0	225.2	81	327.7	400
																35.4	7.0	—	—	363.1	400
																—	7.0	112.6	41	363.1	400
																—	7.0	225.2	81	371.7	400
		30	88.0	—	7.0	—	—	344.2	400												
				—	7.0	112.6	41	344.2	400												
				—	7.0	225.2	81	344.2	400												
				35.4	7.0	—	—	379.6	450												
				—	7.0	112.6	41	379.6	450												
				—	7.0	225.2	81	388.2	450												
	40	114.0	—	7.0	—	—	376.7	450													
			—	7.0	112.6	41	376.7	450													
			—	7.0	225.2	81	376.7	450													
			35.4	7.0	—	—	412.1	500													
			—	7.0	112.6	41	412.1	500													
			—	7.0	225.2	81	420.7	500													
	230	207	253	51.3	300	51.3	300	51.3	300	51.3	300	4	5.8 (ea)	25	68.0	—	7.0	—	—	320.4	350
																—	7.0	129.9	54	320.4	350
																—	7.0	259.8	108	353.6	400
																35.4	7.0	—	—	355.8	400
																—	7.0	129.9	54	355.8	400
																—	7.0	259.8	108	397.8	450
30														80.0	—	7.0	—	—	335.4	400	
															—	7.0	129.9	54	335.4	400	
															—	7.0	259.8	108	368.6	400	
															35.4	7.0	—	—	370.8	450	
															—	7.0	129.9	54	370.8	450	
															—	7.0	259.8	108	412.8	450	
40	104.0	—	7.0	—	—	365.4	450														
		—	7.0	129.9	54	365.4	450														
		—	7.0	259.8	108	398.6	500														
		35.4	7.0	—	—	400.8	500														
		—	7.0	129.9	54	400.8	500														
		—	7.0	259.8	108	442.8	500														
460	414	508	22.4	150	22.4	150	22.4	150	22.4	150	4	2.9 (ea)	25	34.0	—	3.5	—	—	147.2	175	
															—	3.5	65.0	54	147.2	175	
															—	3.5	129.9	108	176.8	200	
															18.9	3.5	—	—	166.1	200	
															—	3.5	65.0	54	166.1	200	
															—	3.5	129.9	108	200.4	225	
													30	40.0	—	3.5	—	—	154.7	175	
															—	3.5	65.0	54	154.7	175	
															—	3.5	129.9	108	184.3	200	
															18.9	3.5	—	—	173.6	200	
															—	3.5	65.0	54	173.6	200	
															—	3.5	129.9	108	207.9	225	
40	52.0	—	3.5	—	—	169.7	200														
		—	3.5	65.0	54	169.7	200														
		—	3.5	129.9	108	199.3	250														
		18.9	3.5	—	—	188.6	225														
		—	3.5	65.0	54	188.6	225														
		—	3.5	129.9	108	222.9	250														
575	518	632	19.9	109	19.9	190	19.9	109	19.9	109	4	2.3 (ea)	25	27.0	—	2.5	—	—	125.1	150	
															—	2.5	65.0	54	125.1	150	
															—	2.5	129.9	108	140.8	150	
															14.4	2.5	—	—	139.5	150	
															—	2.5	65.0	54	139.5	150	
															—	2.5	129.9	108	158.8	175	
													30	32.0	—	2.5	—	—	131.3	150	
															—	2.5	65.0	54	131.3	150	
															—	2.5	129.9	108	147.0	175	
															14.4	2.5	—	—	145.7	175	
															—	2.5	65.0	54	145.7	175	
															—	2.5	129.9	108	165.0	175	
40	41.0	—	2.5	—	—	142.6	175														
		—	2.5	65.0	54	142.6	175														
		—	2.5	129.9	108	158.3	175														
		14.4	2.5	—	—	157.0	175														
		—	2.5	65.0	54	157.0	175														
		—	2.5	129.9	108	176.3	200														

See Legend and Notes on page 85.

# Electrical data (cont)



## 50A2,A3,A4,A5 UNITS WITH CONVENIENCE OUTLET (cont)

UNIT SIZE 50A	VOLTAGE 3 PH, 60 Hz	VOLTAGE RANGE		COMPRESSOR								CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		POWER EXHAUST	CONVENIENCE OUTLET	OPTIONAL ELECTRIC HEAT		POWER SUPPLY	
				Cir A, No. 1		Cir A, No. 2		Cir B, No. 1		Cir B, No. 2											
				Min	Max	RLA	LRA	RLA	LRA	RLA	LRA										
060 (RTPF)	208	187	229	51.3	300	51.3	300	51.3	300	51.3	300	6	6.5 (ea)	25	74.8	—	7.0	—	—	344.7	400
																—	7.0	112.6	41	344.7	400
																—	7.0	225.2	81	344.7	400
																35.4	7.0	—	—	380.1	450
																—	7.0	112.6	41	380.1	450
																—	7.0	225.2	81	380.7	450
		—	7.0	—	—	361.2	400														
		—	7.0	112.6	41	361.2	400														
		—	7.0	225.2	81	361.2	400														
		35.4	7.0	—	—	396.6	450														
		—	7.0	112.6	41	396.6	450														
		—	7.0	225.2	81	396.6	450														
	—	7.0	—	—	393.7	500															
	—	7.0	112.6	41	393.7	500															
	—	7.0	225.2	81	393.7	500															
	35.4	7.0	—	—	429.1	500															
	—	7.0	112.6	41	429.1	500															
	—	7.0	225.2	81	429.1	500															
	230	207	253	51.3	300	51.3	300	51.3	300	51.3	300	6	6.6 (ea)	25	68.0	—	7.0	—	—	336.8	400
																—	7.0	129.9	54	336.8	400
																—	7.0	259.8	108	353.6	400
																35.4	7.0	—	—	372.2	400
																—	7.0	129.9	54	372.2	400
																—	7.0	259.8	108	397.8	450
—		7.0	—	—	351.8	400															
—		7.0	129.9	54	351.8	400															
—		7.0	259.8	108	368.6	400															
35.4		7.0	—	—	387.2	450															
—		7.0	129.9	54	387.2	450															
—		7.0	259.8	108	412.8	450															
—	7.0	—	—	381.8	450																
—	7.0	129.9	54	381.8	450																
—	7.0	259.8	108	398.6	500																
35.4	7.0	—	—	417.2	500																
—	7.0	129.9	54	417.2	500																
—	7.0	259.8	108	442.8	500																
460	414	508	22.4	150	22.4	150	22.4	150	22.4	150	6	3.3 (ea)	25	34.0	—	3.5	—	—	155.4	175	
															—	3.5	65.0	54	155.4	175	
															—	3.5	129.9	108	176.8	200	
															18.9	3.5	—	—	174.3	200	
															—	3.5	65.0	54	174.3	200	
															—	3.5	129.9	108	200.4	225	
	—	3.5	—	—	162.9	200															
	—	3.5	65.0	54	162.9	200															
	—	3.5	129.9	108	184.3	200															
	18.9	3.5	—	—	181.8	200															
	—	3.5	65.0	54	181.8	200															
	—	3.5	129.9	108	207.9	225															
—	3.5	—	—	177.9	225																
—	3.5	65.0	54	177.9	225																
—	3.5	129.9	108	199.3	250																
18.9	3.5	—	—	196.8	225																
—	3.5	65.0	54	196.8	225																
—	3.5	129.9	108	222.9	250																
575	518	632	19.9	109	19.9	190	19.9	109	19.9	109	6	2.6 (ea)	25	27.0	—	2.5	—	—	131.5	150	
															—	2.5	52.0	54	131.5	150	
															—	2.5	103.9	108	140.8	150	
															14.4	2.5	—	—	145.9	150	
															—	2.5	52.0	54	145.9	150	
															—	2.5	103.9	108	158.8	175	
	—	2.5	—	—	137.7	150															
	—	2.5	52.0	54	137.7	150															
	—	2.5	103.9	108	147.0	175															
	14.4	2.5	—	—	152.1	175															
	—	2.5	52.0	54	152.1	175															
	—	2.5	103.9	108	165.0	175															
—	2.5	—	—	149.0	175																
—	2.5	52.0	54	149.0	175																
—	2.5	103.9	108	158.3	175																
14.4	2.5	—	—	163.4	200																
—	2.5	52.0	54	163.4	200																
—	2.5	103.9	108	176.3	200																

See Legend and Notes on page 85.

## LEGEND AND NOTES FOR ELECTRICAL DATA TABLES

### LEGEND

FLA	— Full Load Amps
HACR	— Heating, Air Conditioning and Refrigeration
LRA	— Locked Rotor Amps
MCA	— Minimum Circuit Amps
MCHX	— Microchannel
MOCP	— Maximum Overcurrent Protection
NEC	— National Electrical Code
RLA	— Rated Load Amps
RTPF	— Round Tube Plate Fin

\*Fuse or HACR circuit breaker.



### 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.

### 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 percent voltage imbalance.

% Voltage Imbalance

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

EXAMPLE: Supply voltage is 460-3-60.



AB = 452 v  
BC = 464 v  
AC = 455 v

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3}$$

$$= \frac{1371}{3}$$

$$= 457$$

Determine maximum deviation from average voltage.

(AB) 457 - 452 = 5 v

(BC) 464 - 457 = 7 v

(AC) 457 - 455 = 2 v

Maximum deviation is 7 v.

Determine percent voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457}$$

## Controls

### Control components

The 48/50A Series rooftops use the *ComfortLink™* control system that has been developed for use in Carrier Commercial equipment. The control system monitors all operating conditions in the rooftop unit as well as controlling the compressors, economizers, fans, heat and other devices. It also has the capability of communicating with the Carrier Comfort Network® devices using the CCN protocol and other popular protocols including BACnet, MODBUS, LonWorks, etc.

The system uses a microprocessor and a series of boards, each with inputs and outputs. A local network communications bus (LEN) ties all the boards together into a system and enables the boards to communicate.

For the 48/50A Series, the control consists of the following key components:

**Main base board (MBB)** — The MBB is the center of the *ComfortLink* control system. It contains the major portion of the operating software and controls the operation of the unit. The MBB continuously monitors inputs and outputs as well as data from the LEN and CCN communications channels. The MBB also controls 11 output relays. A complete list of the MBB and system I/O are contained in the table on page 86. The board is located in the main control box.

**Economizer control board (ECB1)** — The ECB controls the economizer actuator. The ECB controls the economizer motor using a digital communications signal that also provides operation and diagnostic data on the economizer motor. The ECB also controls the operation of the power exhaust motors and provides up to 6 stages of digitally sequenced power exhaust. Exhaust sequencing can be based on either the economizer motor position or the building pressure. On the A Series unit, the ECB board is located in an auxiliary box located at the end of the unit near the economizer motor. The board also contains a second LEN port than can be used with the handheld Navigator™ display.

### Supply and building pressure control board (ECB2)

— The board, which is the same hardware as the ECB1, is used to control the supply fan inverter on the VAV units. It sends a 4 to 20 mA signal to the inverter based on a supply

duct pressure sensor connected to the board. The board also accepts a signal from another pressure sensor that monitors building pressure and controls the operation of the optional modulating power exhaust system. This board is located in the auxiliary control box.

**CV staged gas heat board (SCB)** — When the optional staged gas heat is used, the SCB board will be installed and control the operation of the gas valves. It also provides additional sensors for monitoring of the supply air temperature. This board is located in the gas heat section of the unit.

**Integrated gas controller (IGC)** — One IGC is provided with each bank of gas heat exchangers. It controls the direct spark ignition system and monitors the rollout switch, limit switches, and induced-draft motor Hall Effect sensor. It is equipped with an LED for diagnostics.

**Controls expansion module (CEM)** — The optional expansion module is used to provide inputs for demand limiting, remote set point and other optional inputs. It is located in the main control box.

**Compressor protection Cycle-LOC™ board (CS)** — This board monitors the status of the compressor by sensing the current flow to the compressors and then provides digital status signal to the MBB.

**Scrolling marquee display** — This device is the keypad interface used to access the control information, read sensor values, test the unit, and monitor alarm status. The marquee display is a 4-key, 4-character, 16-segment LED (light-emitting diode) display. The display is very easy to operate using 4 buttons and a group of 11 LED's that indicate the following menu structures:

- Run Status
- Service Test
- Temperatures
- Pressures
- Set Points
- Inputs
- Outputs
- Configuration
- Timeclock
- Operating Modes
- Alarms

# Controls (cont)



## MAIN BASE BOARD (MBB) INPUTS AND OUTPUTS

POINT NAME	POINT DESCRIPTION	I/O POINT NAME	PLUG AND PIN REFERENCE	SIGNAL PIN(S)	PORT STATE
<b>INPUTS</b>					
<b>GASFAN</b>	YAC Indoor Fan relay (fan request from YAC)	DI1	J6, 3-4	4	0 = 24vac, 1= 0vac
<b>FSD</b>	Fire Shutdown switch input	DI2	J6, 5-6	6	0 = 24vac, 1= 0vac
<b>G</b>	Thermostat 'G' input/Remote Occupied	DI3	J7, 1-2	2	0 = 24vac, 1= 0vac
<b>W2</b>	Thermostat 'W2' input	DI4	J7, 3-4	4	0 = 24vac, 1= 0vac
<b>W1</b>	Thermostat 'W1' input	DI5	J7, 5-6	6	0 = 24vac, 1= 0vac
<b>Y2</b>	Thermostat 'Y2' input	DI6	J7, 7-8	8	0 = 24vac, 1= 0vac
<b>Y1</b>	Thermostat 'Y1' input	DI7	J7, 9-10	10	0 = 24vac, 1= 0vac
<b>CSB_A1</b>	Compressor A1 current sensor	DIG1	J9, 10-12	10=5v, 11=Vin, 12=GND	0 = 5vdc, 1 = 0vdc
<b>CSB_A2</b>	Compressor A2 current sensor	DIG2	J9, 7-9	7=5v, 8=Vin, 9=GND	0 = 5vdc, 1 = 0vdc
<b>CSB_B1</b>	Compressor B1 current sensor	DIG3	J9, 4-6	4=5v, 5=Vin, 6 =GND	0 = 5vdc, 1 = 0vdc
<b>CSB_B2</b>	Compressor B2 current sensor	DIG4	J9, 1-3	1=5v, 2=Vin, 3=GND	0 = 5vdc, 1 = 0vdc
<b>DP_A/SCTA</b>	Circuit A saturated condensing pressure/temp	AN1	J8, 21-23	21=5v, 22=Vin, 23=GND (thermistor 21-22)	(0-5vdc, thermistor, ohms)
<b>DP_B/SCTB</b>	Circuit B saturated condensing pressure/temp	AN2	J8, 24-26	24=5v, 25=Vin, 26=GND (thermistor 24-25)	(0-5vdc, thermistor, ohms)
<b>SP_A/SSTA</b>	Circuit A saturated suction pressure/temp	AN3	J8, 15-17	15=5v, 16=Vin, 17=GND (thermistor 15-16)	(0-5vdc, thermistor, ohms)
<b>SP_B/SSTB</b>	Circuit B saturated suction pressure/temp	AN4	J8, 18-20	18=5v, 19=Vin, 20=GND (thermistor 18-20)	(0-5vdc, thermistor, ohms)
<b>RAT</b>	Return air temperature	AN5	J8, 9-10	9	(thermistor, ohms)
<b>SA_TEMP</b>	Supply air temperature	AN6	J8, 11-12	11	(thermistor, ohms)
<b>OAT</b>	Outdoor air temperature	AN7	J8, 13-14	13	(thermistor, ohms)
<b>SPT</b>	Space temperature (T55/56)	AN8	J8, 1-2	1	(thermistor, ohms)
<b>SPTO</b>	Space temperature offset (T56)	AN9	J8, 3-4	3	(thermistor, ohms)
<b>IAQ,IAQMINOV</b>	IAQ analog input	AN10	J8, 5-6	5	(thermistor, ohms)
<b>FLTS</b>	Filter Status	AN11	J8, 7-8	7	(thermistor, ohms)
<b>OUTPUTS</b>					
<b>CMPB2</b>	Compressor B2	RLY 1	J10, 20-21	20 = RLY1A (=RLY2A), 21 = RLY1B	1 = Closes RLY1A/RLY1B
<b>CMPB1</b>	Compressor B1	RLY 2	J10, 22-23	22 = RLY2A (=RLY1A), 23 = RLY2B	1 = Closes RLY2A/RLY2B
<b>CMPA2</b>	Compressor A2	RLY 3	J10, 24-25	24 = RLY3A (=RLY4A), 25 = RLY3B	1 = Closes RLY3A/RLY3B
<b>CMPA1</b>	Compressor A1	RLY 4	J10, 26-27	26 = RLY4A (=RLY3A), 27 = RLY4B	1 = Closes RLY4A/RLY4B
<b>CONDfanB</b>	Condenser fan B	RLY 5	J10, 10-11	10 = RLY5A (=RLY6A), 11 = RLY5B	1 = Closes RLY5A/RLY5B
<b>CONDfanA</b>	Condenser fan A	RLY 6	J10, 12-13	12 = RLY6A (=RLY5A), 13 = RLY6B	1 = Closes RLY6A/RLY6B
<b>HS2</b>	Heat stage 2	RLY7	J10, 14-16	14 = 15 = RLY7A, 16 = RLY7B	1 = Closes RLY7A/RLY7B
<b>HS1</b>	Heat stage 1	RLY 8	J10, 17-19	17 = 18 = RLY8A, 19 = RLY8B	1 = Closes RLY8A/RLY8B
<b>HIR</b>	Heat interlock relay	RLY 9	J10, 4-6	4 = 5 = RLY9A, 6 = RLY9B	1 = Closes RLY9A/RLY9B
<b>SF</b>	Supply fan	RLY 10	J10, 7-9	7 = 8 = RLY10A, 9 = RLY10B	1 = Closes RLY10A/RLY10B
<b>ALRM</b>	Alarm output relay	RLY 11	J10, 1-3	1 = 2 = RLY11A, 3 = RLY11B	1 = Closes RLY11A/RLY11B

LEGEND

IAQ — Indoor-Air Quality  
YAC — Gas Heat Unit

## CONTROLS EXPANSION MODULE (CEM) INPUTS AND OUTPUTS

POINT NAME	POINT DESCRIPTION	I/O POINT NAME	PLUG AND PIN REFERENCE	SIGNAL PIN(S)	PORT STATE
<b>INPUTS</b>					
<b>SFS</b>	Supply Fan Status switch	DI 1	J7, 1-2	2	0 = 24vac, 1= 0vac
<b>DMD_SW1</b>	Demand Limit - SW1	DI 2	J7, 3-4	4	0 = 24vac, 1= 0vac
<b>DMD_SW2/DHDISCIN</b>	Demand Limit - SW2 / Dehumidification Switch Input	DI 3	J7, 5-6	6	0 = 24vac, 1= 0vac
<b>PRES</b>	Pressurization	DI 4	J7, 7-8	8	0 = 24vac, 1= 0vac
<b>EVAC</b>	Evacuation	DI 5	J7, 9-10	10	0 = 24vac, 1= 0vac
<b>PURG</b>	Purge	DI 6	J7, 11-12	12	0 = 24vac, 1= 0vac
<b>IAQIN</b>	Indoor Air Quality Switch	DI 7	J7, 13-14	14	0 = 24vac, 1= 0vac
		AN7	J6, 1-3	2 (1 = loop power)	(0-20mA input)
<b>DMDLMTMA</b>	4-20mA Demand Limit	AN8	J6, 4-6	5 (4 = loop power)	(0-20mA input)
<b>EDTRESMA</b>	4-20mA Evaporator Discharge SP Reset	AN9	J6, 7-9	8 (7 = loop power)	(0-20mA input)
<b>OAQ</b>	Outside Air CO <sub>2</sub> Sensor	AN10	J6, 10-12	11 (10 = loop power)	(0-20mA input)
<b>SPRESET</b>	SP Reset milliamps	AN10	J6, 10-12	11 (10 = loop power)	(0-20mA input)
<b>CEM_10K1/CEM_4201</b>	CEM AN1 10k temp J5,1-2/CEM AN1 4-20 ma J5,1-2	AN1	J5, 1-2	1	(thermistor, ohms)
<b>CEM_10K2/CEM_4202</b>	CEM AN2 10k temp J5,3-4/CEM AN2 4-20 ma J5,3-4	AN2	J5, 3-4	3	(thermistor, ohms)
<b>CEM_10K3/CEM_4203</b>	CEM AN3 10k temp J5,5-6/CEM AN3 4-20 ma J5,5-6	AN3	J5, 5-6	5	(thermistor, ohms)
<b>CEM_10K4/CEM_4204</b>	CEM AN4 10k temp J5,7-8/CEM AN4 4-20 ma J5,7-8	AN4	J5, 7-8	7	(thermistor, ohms)
		AN5	J5, 9-10	9	(thermistor, ohms)
		AN6	J5, 11-12	11	(thermistor, ohms)



### ECONOMIZER CONTROL BOARD (ECB1) INPUTS AND OUTPUTS

POINT NAME	POINT DESCRIPTION	I/O POINT NAME	PLUG AND PIN REFERENCE	SIGNAL PIN(S)	PORT STATE
<b>INPUTS</b>					
RMTIN	Remote occupancy	DI1	J4, 1-2	2	24VAC = 1, 0VAC = 0
ECONENBL, ECOORIDE	Economizer enable	DI2	J4, 3-4	4	24VAC = 1, 0VAC = 0
RARH	Return air relative humidity	AN1	J5, 1-3	1=24VDC, 2=0-20mA in, 3=GND	0-20mA
OARH	Outdoor air relative humidity	AN2	J5, 4-6	4=24VDC, 5=0-20mA in, 6=GND	0-20mA
<b>OUTPUTS</b>					
ECB1_AO1	ECB1, analog output 1	AO1	J9, 1-2	1=0-20mA, 2=GND	0-20mA OUT
ECONOCMD	Economizer actuator (digital control)	PP/MP	J7, 1-3	1=PP/MP Data, 2=24VAC, 3=GND	Belimo PP/MP Protocol
PE_A	Power Exhaust stage A	RLY1	J8, 1-3	1 = 2 = RLY1A, 3 = RLY1B	1 = Closes RLY1A/RLY1B
PE_B	Power Exhaust stage B	RLY 2	J8, 4-6	4 =5 = RLY2A, 6 = RLY2B	1 = Closes RLY2A/RLY2B
PE_C	Power Exhaust stage C	RLY 3	J8, 7-9	7 = 8 = RLY3A, 9 = RLY3B	1 = Closes RLY3A/RLY3B
ECON_PWR	Economizer Power	RLY 6	J8, 16-18	16 = 17 = RLY6A, 18 = RLY6B	1 = Closes RLY6A/RLY6B

### VAV CONTROL BOARD (ECB2) INPUTS AND OUTPUTS

POINT NAME	POINT DESCRIPTION	I/O POINT NAME	PLUG AND PIN REFERENCE	SIGNAL PIN(S)	PORT STATE
<b>INPUTS</b>					
		DI1	J4, 1-2	2	24VAC = 1, 0VAC = 0
		DI2	J4, 3-4	4	24VAC = 1, 0VAC = 0
BP	Building static pressure	AN1	J5, 1-3	1=24VDC, 2=0-20mA in, 3=GND	0-20mA
SP	Supply Duct static pressure	AN2	J5, 4-6	4=24VDC, 5=0-20mA in, 6=GND	0-20mA
<b>OUTPUTS</b>					
SFAN_VFD	Supply Fan Inverter speed	AO1	J9, 1-2	1=0-20mA, 2=GND	0-20mA OUT
		PP/MP	J7, 1-3	1=PP/MP Data, 2=24VAC, 3=GND	Belimo PP/MP Protocol
		RLY1	J8, 1-3	1 = 2 = RLY1A, 3 = RLY1B	1 = Closes RLY1A/RLY1B
		RLY 2	J8, 4-6	4 =5 = RLY2A, 6 = RLY2B	1 = Closes RLY2A/RLY2B
		RLY 3	J8, 7-9	7 = 8 = RLY3A, 9 = RLY3B	1 = Closes RLY3A/RLY3B
MLV	Minimum load valve	RLY 6	J8, 16-18	16 = 17 = RLY6A, 18 = RLY6B	1 = Closes RLY6A/RLY6B

### STAGED GAS HEAT BOARD (SCB) INPUTS AND OUTPUTS

POINT NAME	POINT DESCRIPTION	I/O POINT NAME	PLUG AND PIN REFERENCE	SIGNAL PIN(S)	PORT STATE
<b>INPUTS</b>					
		AN1	J5, 1-3	1=5v, 2=Vin, 3=GND (thermistor 1-2)	(0-5VDC, thermistor, ohms)
		AN2	J5, 4-6	4=5v, 5=Vin, 6=GND (thermistor 4-5)	(0-5VDC, thermistor, ohms)
LAT1SGAS	Leaving air temperature 1	AN3	J5, 7-9	7=5v, 8=Vin, 9=GND (thermistor 7-8)	(0-5VDC, thermistor, ohms)
LAT2SGAS	Leaving air temperature 2	AN4	J5, 10-12	10=5v, 11=Vin, 12=GND (thermistor 10-11)	(0-5VDC, thermistor, ohms)
LAT3SGAS	Leaving air temperature 3	AN5	J5, 13-15	13=5v, 14=Vin, 15=GND (thermistor 13-14)	(0-5VDC, thermistor, ohms)
		AN6	J6, 1-3	1=5v, 2=Vin, 3=GND (thermistor 1-2)	(0-5VDC, thermistor, ohms)
		AN7	J6, 4-6	4=5v, 5=Vin, 6=GND (thermistor 4-5)	(0-5VDC, thermistor, ohms)
		AN8	J6, 7-9	7=5v, 8=Vin, 9=GND (thermistor 7-8)	(0-5VDC, thermistor, ohms)
		AN9	J7, 1-2	1	(thermistor, ohms)
		AN10	J7, 3-4	3	(thermistor, ohms)
<b>OUTPUTS</b>					
		AO1	J8, 1-2	1=0-20mA, 2=GND	0-20mA OUT
		AO2	J8, 3-4	3=0-20mA, 4=GND	0-20mA OUT
HS3	Heat Stage 3	RLY1	J9, 1-3	1 = 2 = RLY1A, 3 = RLY1B	1 = Closes RLY1A/RLY1B
HS4	Heat Stage 4	RLY 2	J9, 4-6	4 =5 = RLY2A, 6 = RLY2B	1 = Closes RLY2A/RLY2B
HS5	Heat Stage 5	RLY 3	J9, 7-9	7 = 8 = RLY3A, 9 = RLY3B	1 = Closes RLY3A/RLY3B
HS6	Heat Stage 6	RLY 4	J9, 10-12	10 = 11 = RLY4A, 12 = RLY4B	1 = Closes RLY4A/RLY4B
		RLY 5	J9, 13-15	13 = 14 = RLY5A, 15 = RLY5B	1 = Closes RLY5A/RLY5B

# Controls (cont)



## INPUT/OUTPUT CHANNEL DESIGNATIONS — FIELD CONNECTION TERMINAL STRIPS

TERMINAL BOARD	TERMINAL NO.	DESCRIPTION	TYPE
<b>TB-1 - POWER CONNECTION OR DISCONNECT (in Main Control Box)</b>			
TB1	11	L1 power supply	208-230/460/575/380/-3-60
	12	L2 power supply	208-230/460/575/380/-3-60
	13	L3 power supply	208-230/460/575/380/-3-60
<b>TB-2 - GROUND (in Main Control Box)</b>			
TB2	1	Neutral Power	
<b>TB-3 - CCN COMMUNICATIONS (HY84HA096) (in Main Control Box)</b>			
TB3	1	LEN +	5 VDC, logic
	2	LEN C	5 VDC, logic
	3	LEN -	5 VDC, logic
	4	24 VAC	24 VAC
	5	CCN +	5 VDC, logic
	6	CCN C	5 VDC, logic
	7	CCN -	5 VDC, logic
	8	Grd	ground
<b>TB-4 - THEROMSTAT CONNECTIONS (HY84HA090) (in Main Control Box)</b>			
TB4	1	Thermostat R	24 VAC Power
	2	Thermostat Y1	24 VAC Input
	3	Thermostat Y2	24 VAC Input
	4	Thermostat W1	24 VAC Input
	5	Thermostat W2	24 VAC Input
	6	Thermostat G	24 VAC Input
	7	Thermostat C	24 VAC Common
	8	Thermostat X (Alarm Contact)	24 VAC Output
<b>TB-5 - FIELD CONNECTIONS (HY84HA101) (in Main Control Box)</b>			
TB5	1	VAV Heater Interlock Relay, Ground	Dry Contact, Max 1 Amp
	2	VAV Heater Interlock Relay, 24 VAC	Dry Contact, Max 1 Amp
	3	T55/T56 10 K Thermistor	Thermistor Input
	4	T55/T56 10 K Thermistor	Thermistor Input
	5	T56 Set Point Adjustment (100 K ohm)	Thermistor Input
	6	Indoor Air IAQ Remote Sensor/Remote Pot/Remote 4-20 mA	4-20 mA, ext. powered w/res or 0-5 VDC, +
	7	Indoor Air IAQ Remote Sensor/Remote Pot/Remote 4-20 mA	4-20 mA, ext. powered w/res or 0-5 VDC, -
	8	Smoke Detector Remote Alarm	external contacts
	9	Smoke Detector Remote Alarm	external contacts
	10	Fire Shutdown	24 VAC Power
	11	Fire Shutdown	24 VAC Input
	12	Fire Control*	24 VAC Power
	13	Fire Pressurization*	24 VAC Input
	14	Fire Evacuation*	24 VAC Input
	15	Fire Smoke Purge*	24 VAC Input
	16	Not Used	—
<b>TB-6 - FIELD CONNECTIONS (HY84HA101) (in Main Control Box)</b>			
TB6	1	Remote Occupied/Economizer Enable 24 VAC	24 VAC Power
	2	Remote Economizer Contact	24 VAC Input
	3	Remote Occupied Contact	24 VAC Input
	4	Demand Limit Contacts Common*	24 VAC Power
	5	Demand Limit SW1*	24 VAC Input
	6	Demand Limit SW2 / Dehumidification Switch*	24 VAC Input
	7	Demand Limit 4-20 mA*	externally powered 4-20 mA
	8	Demand Limit 4-20 mA*	externally powered 4-20 mA
	9	Remote Supply Air Setpoint 4-20 mA*	externally powered 4-20 mA
	10	Remote Supply Air Setpoint 4-20 mA*	externally powered 4-20 mA
	11	Outdoor Air IAQ 4-20 mA*	externally powered 4-20 mA
	12	Outdoor Air IAQ 4-20 mA*	externally powered 4-20 mA
	13	IAQ Remote Switch*	24 VAC Power
	14	IAQ Remote Switch*	24 VAC Input
	15	Supply Fan Status Switch*	24 VAC Power
	16	Supply Fan Status Switch*	24 VAC Input
<b>TB-7 - ELECTRIC HEAT POWER BLOCK (in Electric Heat section)</b>			
TB7	1	L1 Power Supply	208-230/460/575/380/-3-60, 400-3-50
	2	L2 Power Supply	208-230/460/575/380/-3-60, 400-3-50
	3	L3 Power Supply	208-230/460/575/380/-3-60, 400-3-50

\* Requires optional Controls Expansion Module (CEM).





Through the display, inputs and outputs can be checked for their value or status. Because the unit is equipped with suction pressure transducers and discharge saturation temperature sensors it can also display pressures typically obtained from gages. The control includes a full alarm history which can be accessed from the display. Through the display, a built-in test routine can be used at start-up commission and during maintenance inspections to help diagnose operational problems with the unit.

### Cooling control options

When mechanical cooling is required, the A Series *ComfortLink*™ controls have the capability to control the staging of the compressors in several different ways. Three scroll compressors are used on size 020 to 027 units and four scroll compressors are used on sizes 030 to 060. In addition, the *ComfortLink* controls support the use of an optional minimum load hot gas bypass valve (MLV) with the Multiple Adaptive Demand and VAV control sequences. The MLV is directly controlled by the *ComfortLink* controls and provides an additional stage of capacity as well as low load coil freeze protection. The control also integrates the use of an economizer with the use of mechanical cooling to allow for the greatest use of free cooling. When both mechanical cooling and the economizer are being used, the control will use the economizer to provide better temperature control and limit the cycling of the compressors. The control also checks on various other operation parameters in the units to make sure that safety limits are not exceeded and the compressors are reliably operated.

The A Series *ComfortLink* controls offer two basic control approaches to mechanical cooling: constant volume with 2 stages of cooling and VAV with multiple stages of cooling. In addition to these traditional methods of control, the A Series *ComfortLink* controls offer the ability to run multiple stages of cooling in constant volume operation by controlling the unit to either a low or high cool supply air set point based on either a space temperature sensor or 2-stage thermostat input.

CONTROL TYPE			COOLING CONTROL METHOD
Unit	Application	Demand Source	
A3,A5	VAV	RAT or SPT	Multiple Stage EDT
A2,A4	CV	SPT or T-STAT	Multiple Adaptive Demand or 2-Stage Demand

**Control type** — The control type determines the selection of the type of cooling control as well as the technique for selecting a cooling mode. The control types are:

**VAV-RAT and VAV-SPT** — Both of these configurations refer to standard VAV operation. If the control is occupied, the supply fan is run continuously and return-air temperature will be used in the determination of the selection of the cooling mode. VAV-SPT differs from VAV-RAT only in that during the unoccupied period, space temperature will be used instead of return-air temperature to start the fan for ten minutes before the return-air temperature is allowed to call out any mode.

**CV TSTAT-Multiple Stage** — This configuration will force the control to monitor the thermostat inputs (Y1,Y2) to make a determination of mode. Unlike traditional 2-stage thermostat control, the unit is allowed to use multiple stages of cooling control and perform VAV-style capacity control.

**CV TSTAT-2 Stage** — This configuration will force the control to monitor the thermostat inputs (Y1,Y2) to make a determination of mode.

**CV SPT-Multiple Stage** — This configuration will force the control to monitor a space temperature sensor to make a determination of mode. The unit is allowed to use multiple stages of cooling control and perform VAV-style capacity control.

**CV SPT-2 Stage** — This configuration will force the control to monitor the space temperature sensor to make a determination of mode and allow two stages of cooling.

**Cooling control method** — Three different cooling control methods are used to step through the available stages of capacity. Depending on the unit size, cooling control method and presence of an MLV, this may range from 2 up to 5 stages of capacity control. These methods are:

**Multiple Stage Evaporator Discharge Temperature (EDT)** — The capacity of the economizer and compressors are controlled based on the evaporator air discharge temperature and supply air temperature set point. This control method uses an adaptive PID (proportional, integral, derivative) algorithm to calculate the estimated change in supply-air temperature before engaging or disengaging the next stage of cooling. The algorithm compensates for varying conditions, including changing flow rates across the evaporator coil, to provide better overall control of compressor staging.

**Multiple Adaptive Demand** — This control method will base the capacity of the economizer and compressors on the evaporator air discharge temperature and one of two supply air temperature set points. The control will be able to call out a LOW COOL or a HIGH COOL mode and maintain a low or high cool supply air set point. The unit will use either the input from a conventional thermostat to turn the Y1, Y2 signals into a high and low demand signal, or with a space temperature sensor use a differential from set point to determine the mode. Once the mode has been established the control uses the same algorithm as with VAV control.

**Two-Stage Demand** — The unit will operate with integrated economizer and 2 stages of compressor capacity control.

**Integrated economizer** — For each of the above modes of operation all mechanical cooling will first be delayed while the unit attempts to use the economizer for free cooling. Once the economizer is at full capacity, the control will then supplement the free cooling with as much mechanical cooling as required. To prevent any rapid changes in cooling, the control will also use the economizer to trim the cooling supplied.



# Controls (cont)



## Heating control options

When heating is required the A Series units can be provided with 2-stage electric heat, 2-stage gas heat or multiple-stage gas heat. Depending on unit size and heating capacity the multiple-stage option may have between 5 and 11 stages of heating capacity control. The A Series *ComfortLink™* controls have the capability to control the heating capacity based on input from a 2-stage mechanical thermostat, a space temperature sensor, or on VAV units by the return air temperature sensor. With CV units the heating mode (off, low or high) will be enabled based on W1 and W2 thermostat inputs, or when using a space temperature sensor the differential from heating set point will be used. Heating with VAV units will be enabled based on the return-air temperature or the space temperature, but once enabled control will be based on the return-air temperature. Variable air volume terminals will be commanded open to the heating cfm through linkage or the heat interlock relay. The A Series *ComfortLink™* controls will use one of the following control methods:

**Two-stage control** — The unit will operate in LOW HEAT or HIGH HEAT mode as determined by the demand inputs. In the LOW HEAT mode if the temperature sensed by the evaporator discharge temperature sensor is below 50 F, the unit will automatically go into a HIGH HEAT mode.

**Multiple-stage control** — When the unit is in a LOW HEAT mode the algorithm calculates the desired heat capacity based on set point and supply-air temperature. The staged gas control logic will stage the heating capacity to match the calculated demand. When the unit is in a HIGH HEAT mode all stages of heat will be activated. Staged gas heat can also be used in a TEMPERING mode. This mode is enabled during a VENTILATION, LOW COOL or HIGH COOL mode when the economizer dampers are at their minimum ventilation position and the mixed-air temperature is below the supply air set point. Tempering can also be used during a preoccupancy purge to prevent low temperature air from being delivered to the space.

## Economizer and IAQ options

The controls have been designed to support the requirements of indoor air quality control through the use of outside air. Units can either be equipped with an outside air adjustable, self-closing economizer or a fully modulating, gear driven economizer with no linkages. The economizer can be configured for a full modulation mode or 3-position mode of operation. The control includes logic for a minimum ventilation position and different set points for occupied and unoccupied minimum position set points. This control also has logic built in to calibrate the economizer position to the actual percentage of outside air introduced. During periods when the compressors are not being used the control will use the RAT, SAT and OAT to calibrate the economizer. This will allow for setting the outside air actual percentage and not just the percent damper position.

The use of the economizer will depend on the mode of change selected. This control integrates the changeover directly into the control. Five types of changeover are available:

- Outdoor air dry bulb
- Differential dry bulb
- Outdoor air enthalpy
- Differential enthalpy
- Outdoor air dew point

The units are provided with an outdoor air and return air temperature sensor so the first two changeover methods are available as standard. To use the enthalpy changeover options the control supports the addition of highly reliable, electronic humidity sensors. The humidity sensor input is then used with the dry bulb sensors to calculate the enthalpy. For outdoor enthalpy changeover the control also has the ASHRAE 90.1 A, B, C, D economizer changeover curves built into the software.

When operating with outside air economizers, large amounts of air can be introduced into the building and a means must be provided for building pressure relief. The 48/50A Series control supports the following three types of building pressure control:

- Relief Dampers — Can be used on low return duct static applications
- Non-Modulating Two-Stage Power Exhaust — The unit can be equipped with multiple power exhaust fans, 4 on sizes 020-050 and 6 on size 060. The software controls the power exhaust stages based on the economizer position (percent open).
- Modulating Power Exhaust — Both the VAV and CV units can be equipped with power exhaust fans that are controlled by a building pressure sensor that is connected to the *ComfortLink* controller. The fans are in groups which allow for 4 stages on sizes 020-050 and 6 stages on size 060.

The units are capable of using either 2-in. or optional 4-in. pleated filters and can have an optional filter pressure drop switch to warn of dirty filter conditions.

The indoor air quality (IAQ) function provides a demand-based control for ventilation air quantity, by providing a modulating outside air damper position that is proportional to the space CO<sub>2</sub> level. The ventilation damper position is varied between a minimum ventilation level (based on internal sources of contaminants and CO<sub>2</sub> levels other than the effect of people) and the maximum design ventilation level (determined at maximum populated status in the building). During a less-than-fully populated space period, the CO<sub>2</sub> level will be lower than that at full-load design condition and will require less ventilation air. Reduced quantities of ventilation air will result in reduced operating costs. Space CO<sub>2</sub> levels are monitored and compared to user-configured set points. Accessory CO<sub>2</sub> sensor for space (or return duct mounting) is required. The IAQ routine can be enhanced by also installing a sensor for outdoor air quality.



During the occupied period, in the absence of a demand for cooling using outside air, if CO<sub>2</sub> levels are below the set point for the minimum ventilation level, the outside-air damper will open to the minimum ventilation level damper position set point. The minimum damper position will be maintained as long as the CO<sub>2</sub> level remains below the set point.

When the space CO<sub>2</sub> level exceeds set point for the minimum ventilation level condition, the *ComfortLink* controls will begin to open the outside air damper position to admit more ventilation air and remove the additional contaminants. As the space CO<sub>2</sub> level approaches the set point for maximum design ventilation level condition, the outside air damper position will reach the maximum ventilation level damper position set point limit. Damper position will be modulated in a directly proportional relationship between these two CO<sub>2</sub> set point limits and their corresponding damper position limits.

In most applications a fixed reference value can be set for the outdoor air quality level, but the control also supports the addition of an outdoor air quality sensor that will be compared to the indoor or return IAQ sensor. If an OAQ (outdoor air quality) sensor is connected, the demand set point levels will be adjusted automatically as the outdoor CO<sub>2</sub> levels vary. Also, if the outdoor CO<sub>2</sub> level exceeds a user-configured maximum limit value, then outside air damper position will be limited to the minimum ventilation damper set point value. The control can also receive these signals through the CCN system.

The IAQ and OAQ measurement levels are displayed by the *ComfortLink*<sup>™</sup> scrolling marquee in parts per million (ppm).

**Fire and smoke controls interface** — The unit can be equipped with an optional return air smoke detector. The smoke detector is wired to stop the unit and send a message to a remote alarm system if a fault condition is detected. If the controls expansion module is added, the control will support smoke control modes including evacuation, smoke purge, and pressurization.

**Demand limiting** — The control supports demand limiting using one or two fixed capacity limits initiated by discrete input switches or a variable capacity limit function based on an analog input signal. On CCN systems this can be done through the network, or for non-CCN network jobs this can be done by adding the controls expansion module.

## Diagnostics

The *ComfortLink* controls have fully integrated all controls and sensors into a common control system. The control monitors these inputs as well as many of the routines to provide advanced diagnostics and prognostics. These include adaptive logic to allow the unit to continue to operate in a reduced output mode and automatic resets where applicable. The last 10 alarms and alerts are stored in memory and can be accessed through the display. The alarms can also be monitored through the Carrier Comfort Network<sup>®</sup> connection or building automation system. The unit also supports the use of the hand held Navigator<sup>™</sup> display which can be plugged in at the main control box and auxiliary control box at the opposite end of the unit.

Some of the diagnostics that are included are:

- Monitoring of all sensors
- Suction pressure transducers to provide compressor protection and coil freeze protection
- Monitoring of the economizer motor using a digitally controlled motor
- Monitoring of compressor status using compressor protection boards
- Adaptive logic for low supply-air temperatures
- Compressor lockout at low ambient conditions
- Storage of compressor run hours and starts
- Low refrigerant charge protection
- Compressor reverse rotation protection

## Control interface

The *ComfortLink* controller can interface with the i-Vu<sup>®</sup> Open Control System, a BACnet building automation system, or Carrier Comfort Network<sup>®</sup> devices. This will allow for the use of all system control programs. These include:

- Network Service Tool
- System Pilot<sup>™</sup> device
- Touch Pilot<sup>™</sup> device
- i-Vu Open Control System software
- ComfortView<sup>™</sup> software
- CCN Web software
- ComfortID<sup>™</sup> system

Contact Carrier Controls Marketing for more information.

The control can also provide interface with other energy management systems with the addition of either the BACnet communication option, MODBUS Carrier translator or the LonWorks Carrier translator.

Several contact connection points have been provided in the main control box for interface to external controls and systems. These are summarized in the Interface Connection table. External controls use the following interface points:

- Start/Stop (On/Off) — Start/Stop is accomplished with a contact closure between terminals 1 and 3 on TB6.
- Remote Economizer Enable — Enabling and disabling of the economizer can be done by connecting a contact closure to terminals 1 and 2 on TB6. The economizer can be configured for a switch closure changeover for 3-position operation.
- VAV Heating Interlock — Interface with non-linkage terminals can be done through TB5 terminal 1 and 2.
- Remote IAQ Inputs — External IAQ demand inputs can be connected through terminals 6 and 7 on TB5.
- Smoke Detectors Alarm Output — Remote detector alarm outputs can be connected through terminals 8 and 9 on TB5.
- Fire Shutdown — A remote fire shutdown signal can be connected to 10 and 11 on TB5. The software can be configured to shut the unit down on an open or closed signal.
- Fire Pressurization — For a remote control of pressurization a contact closer can be connected to terminals 12 and 13 on TB5. In this mode the economizer damper will be fully opened and the supply fan turned on to pressurize the space.

# Controls (cont)



- Fire Evacuation — For this mode a remote contact closure can be connected to terminal 12 and 14 on TB5. For remote evacuation of a space the outside-air dampers will be opened and the power exhaust fans turned on to evacuate the space of smoke.
- Fire Purge — For this mode external contacts can be connected to terminals 12 and 15 on TB5. In this mode the supply fan and return fans will be turned on with the economizer at a full open position.
- Demand Limiting — For demand limiting the controls expansion module must be used. Connections are provided on TB6 for switch input demand limiting and for 4 to 20 mA demand limit signals.
- Dehumidification — A discrete input is available on TB6 to initiate the Dehumidification mode. This input is shared with one of the demand limiting inputs and requires the controls expansion module.
- Remote Supply Air Set Point — A remote supply air temperature set point can be supported when the controls expansion module is used. It can be connected to terminals 11 and 12 on TB6.
- Outdoor Air IAQ Signal — If an external outdoor air signal is being used then it can be connected to terminals 9 and 10 on TB6.
- IAQ Switch Input — If an external control will be controlling IAQ then it can be connected as a contact closure through terminals 13 and 14 on TB6.

Carrier can also support electronic interface to other systems using the following;

- MODBUS Carrier translator (read/write, provides CCN to MODBUS remote terminal unit [RTU] protocol conversion)
- LonWorks Carrier translator (read/write, provides CCN to LON FT-10A ANSI/EIA-709.1 protocol conversion)

## Constant volume applications

The 48/50A2,A4 units are designed to operate in CV applications. The units are shipped as operable, stand-alone units using either a standard (mechanical or electronic) 2-stage heat, 2-stage cool thermostat, or with an electronic room temperature sensor and a timeclock to establish unit start and stop times. With a standard thermostat (programmable is optional), heating and cooling operation is set by space temperature. With a space sensor and field-supplied timeclock, the machine will operate at default values unless they are changed using appropriate input devices. The space sensor monitors space temperature and may be equipped with a timed override feature, which allows unit operation during unoccupied periods. The space sensors may be used in multiples of 4 or 9 to achieve space temperature averaging. The use of a space sensor also allows the unit to be turned on and off from a remote signal or it can be programmed to use the time of day scheduling that is built into the control.

## INTERFACE CONNECTIONS

TB-3 — CCN COMMUNICATIONS (HY84HA096)	
TB3	1 LEN +
	2 LEN C
	3 LEN -
	4 24 VAC
	5 CCN +
	6 CCN c
	7 CCN -
	8 Grd
TB-4 — THERMOSTAT CONNECTIONS (HY84HA090)	
TB4	1 Thermostat R
	2 Thermostat Y1
	3 Thermostat Y2
	4 Thermostat W1
	5 Thermostat W2
	6 Thermostat G
	7 Thermostat C
	8 Thermostat X
TB-5 — FIELD CONNECTIONS (HY84HA101)	
TB5	1 VAV Heater Interlock Relay, Ground
	2 VAV Heater Interlock Relay, 24 VAC
	3 T55/T56 10K Thermistor
	4 T55/T56 10K Thermistor
	5 T56 Set Point Adjustment (100 K ohm)
	6 Indoor Air IAQ Remote Sensor/Remote Pot/Remote 4-20 mA
	7 Indoor Air IAQ Remote Sensor/Remote Pot/Remote 4-20 mA
	8 Smoke Detector Remote Alarm
	9 Smoke Detector Remote Alarm
	10 Fire Shutdown
	11 Fire Shutdown
	12 Fire Control Common*
	13 Fire Pressurization*
	14 Fire Evacuation*
	15 Fire Smoke Purge*
	16 Not Used
TB-6 — FIELD CONNECTIONS (HY84HA101)	
TB6	1 Remote Occupied/Economizer Enable 24 VAC
	2 Remote Occupied Contact
	3 Remote Economizer Contact
	4 Demand Limit Contacts Common*
	5 Demand Limit Switch 1*
	6 Demand Limit Switch 2/Dehumidify Switch*
	7 Demand Limit 4-20 mA*
	8 Demand Limit 4-20 mA*
	9 Remote Supply Air Set Point 4-20 mA*
	10 Remote Supply Air Set Point 4-20 mA*
	11 Outdoor Air IAQ 4-20 mA*
	12 Outdoor Air IAQ 4-20 mA*
	13 IAQ Remote Switch Common*
	14 IAQ Remote Switch*
	15 Supply Fan Status Switch*
	16 Supply Fan Status Switch*

\* Optional controls expansion module (CEM) is required.

### Features with thermostat control of unit

- Two-stage heating (if installed)
- Multiple stage gas heating if unit is equipped with the staged gas heat option
- Two-stage demand with fully proportional economizers and integrated compressor capacity
- Two-stage cooling or adaptive multiple stage cooling which can provide up to 5 stages of capacity



- Control of unit using Y1, Y2, W1, W2, and G thermostat or T55, T56, or T58 space sensors
- Control of the indoor fan
- Outdoor-air temperature/supply-air temperature monitoring with logic to lock the compressors out at low ambient temperatures down to 0° F
- Control of a condenser fan based on outdoor-air and condensing pressures
- Control of modulating economizer to provide free cooling when outdoor conditions are suitable
- Control allows for use of the economizer and the compressors to maximize the use of outside air cooling to reduce part load operating costs
- Control of the power exhaust fans based on configurable damper positions or outside air intake valves or directly from the optional building pressure sensor
- Compressor time guard override (power up and minimum on and off timers) to assure air return in low load conditions
- Support of IAQ sensor

#### Features with sensor control of unit

There are 3 sensor options available:

- T55 sensor will monitor room temperature and provide unoccupied override capability (1 to 4 hours).
- T56 sensor will monitor room temperature, provide unoccupied override capability (1 to 4 hours), and provide a temperature offset of 5 F maximum.
- T58 is a CCN communicating sensor that will provide the set point and space temperature values.

*Standard features are:*

- Support of remote occupied/unoccupied input to start and stop the unit
- Two-stage economizer demand with fully proportional economizers and integrated compressor capacity
- Cooling capacity control of 2 levels cooling with either 2-stage control or adaptive control with up to 5 stages of mechanical refrigeration capacity
- Occupied or unoccupied set point
- Enable heating (if installed) or cooling during unoccupied periods as required to maintain space temperature within the unoccupied set points
- Adjustment of space temperature set points of  $\pm 5^\circ$  F when using a T56 sensor
- Support of IAQ sensor
- 365-day timeclock with backup (supports minute, hour, and day of week, date, month, and year access). The timeclock includes the following features:
  - Daylight savings time function
  - Occupancy control with 8 periods for unit operation
  - Holiday table containing up to 18 holiday schedules
  - Ability to initiate timed override from T55 or T56 sensors (for a timed period of 1 to 4 hours)
  - Temperature compensated start to calculate early start times before occupancy
  - For units connected into a CCN network the timeclock can be integrated into the overall building energy management system and be updated remotely

- For units connected to the CCN network the user can also display all the unit information including I/O values Maintenance, Configuration, Service, and Set Point data tables
- Indoor air quality (IAQ)

#### **Variable air volume (VAV) applications**

The 48/50A3,A5 units are designed to operate in VAV applications. As standard they include a supply fan inverter (VFD) to control the supply fan speed and duct pressure. They are designed to control the leaving-air temperature in cooling to a configurable set point. The changes in mode of operation from Heating to Vent to Cooling mode can be controlled either from the return air temperature sensor or from an accessory space temperature sensor. Some of the features for VAV units in a stand-alone application are:

- The units are shipped as operable, stand-alone units with the addition of a field-supplied timeclock to establish unit start and stop times or they can use *ComfortLink*™ time of day scheduling routine
- Provide cooling and heating control (if equipped with heat) in both occupied and unoccupied modes
- Supports an optional space temperature sensor for mode control and supply air temperature reset
- If space sensor is equipped with an override feature, the sensor will allow operation during the unoccupied period for a fixed length of time
- Base unit control supports a heat interlock relay (field supplied) to signal the VAV terminal devices to fully open during heating operation
- Control board diagnostics
- Control of an outdoor-condenser fan based upon outdoor-air temperature and saturated condensing temperature
- Control of modulating economizer to provide free cooling when outdoor conditions are suitable.
- Control also allows for use of the economizer and the compressors to maximize the use of outside air cooling to reduce part load operating costs
- Support of remote occupied/unoccupied input to start
- Controls the operation of the supply fan inverter to maintain a configurable supply duct static pressure set point. Inverter is configured and controlled directly by *ComfortLink* controls
- Support of IAQ sensor
- Support a field test for field check out
- Support linkage to *ComfortID*™ systems
- Cooling capacity control of up to 5 stages plus economizer
- Control of two stages of heat to maintain return-air temperature
- Multiple stage gas heating if unit is equipped with the staged gas heat option
- Control of heat interlock relay
- Compressor time delays to prevent rapid cycling of compressors
- Automatic lead-lag control of compressors to reduce the number of compressor cycles



# Controls (cont)



- With the addition of a remote start/stop switch heating or cooling is enabled during unoccupied periods as required to maintain space temperature to within unoccupied set points
- With the addition of the controls expansion board, the ComfortLink™ controls will also support demand limiting and remote set point control

When the unit is connected to a CCN (Carrier Comfort Network®) system, additional features can be used:

- Interface of the unit clock with the CCN network clock and allow for remote configuration of the schedules
- CCN demand limit participation
- Interface with ComfortID™ control systems through linkage

## Sequence of operation

**Cooling, constant volume (CV) units** — On power up, the control module will activate the initialization software. The initialization software will determine the unit configuration and also initialize any controls loops and input/output devices. All alarms and configurations are saved in memory and maintained during power outages. All alarms will be maintained in memory and must be cleared through the display.

**Constant volume conventional thermostat control** — If the unit is equipped with a conventional thermostat with Y1, Y2, W1, W2 and G connections then the control will perform the following sequence.

When G is closed the indoor fan will turn on. G must be closed for heating or cooling to occur. If Y1 is closed then the control will first check the ability to use the economizer. If the economizer can be used, the control will modulate the damper open to maintain the low load economizer leaving air temperature set point. If Y2 closes then the control will lower the leaving air temperature set point to the configured set point. If the economizer can not satisfy the load then compressors will be sequenced on to maintain either the low or high load temperature set points. If the economizer can not be used or the enable control disables the economizer, then the control will sequence the compressors based on the Y1 and Y2 signals. If two-stage control has been selected then the control will map the compressors to the Y1 and Y2 inputs as defined in the loading sequence. If Adaptive mode has been selected then the control will add and remove compressors stages to maintain the low and high demand leaving air set points. If Y1 is closed at least one compressor stage will be turned on.

If W1 closes then it will indicate that the units should be in the Heating mode. The economizer will be closed to the minimum position, and if the unit is equipped with gas or electric heat then the first stage of heat will be energized. If W2 closes then the control will turn on the second stage of heat. If the unit is equipped with a staged gas heat control option then the W1 signal will be used to control the gas heat to the configurable low heat load leaving air temperature set point. When W2 is energized, the unit will fire all stages of heat capacity. If the unit is equipped with gas heat then the IGC board will control the operation of the gas

heat. See the 48 Series Gas Heat units section for the IGC board sequence of operation.

**Constant volume space temperature sensor control** — If the space temperature operation has been selected using a T55, T56, or T58 sensor then the following logic will be used to control the operation of the unit. If a space temperature is used then a wire jumper must be added between R, W1, and W2. If a remote occupancy control method has been selected then the input must first be closed for the unit to go into Heat, Vent or Cooling mode. If the internal timeclock is used, the control module determines the occupancy state based on the system time schedules. If Temperature Compensated Start is active, the unit will be controlled as in the occupied mode and will start a time as determined by prior operation to have the space at set point by the occupied time. If the unit has been configured for a pre-occupancy purge then the control will start the unit in Vent mode prior to the occupancy time to vent the space. If an IAQ sensor is being used and the low IAQ set point is satisfied then the occupancy purge mode will be terminated. The set points for heat and cooling are configurable through the display. If a T56 sensor is being used then the set point can be shifted by as much as 5 degrees. If the space temperature goes above the cooling set point then the unit will go into Cooling mode. If the economizer can be used, the control will first try to control to the leaving air temperature set point. The set point will depend on the space temperature. If the temperature is above the low demand set point then the low economizer load discharge air temperature set point will be used. If the temperature is above the high load space temperature set point then the high load leaving air temperature set point will be used. If the economizer can not satisfy the load then compressors will be sequenced on to maintain either the low or high load temperature set points. If the economizer can not be used or the enable control disables the economizer then the control will sequence the compressors based on the low and high load space temperature variables. If two-stage control has been selected then the control will map the compressors to the low and high loads as defined in the loading sequence. If Adaptive mode has been selected then the control will add and remove compressor stages to maintain the high and low demand leaving air set points.

If the space temperature goes below the heating space temperature set points then it will indicate that the units should be in the Heating mode. The economizer will be closed to the minimum position and if the unit is equipped with gas or electric heat then the first stage of heat will be energized. If the space temperature goes below the high load space temperature set point then the control will turn on the second stage of heat. If the unit is equipped with a staged gas heat control option then the low load demand signal will turn on heating stages to maintain the leaving air temperature set point. A high demand signal will energize all stages of heat.

If the units is configured for unoccupied free cooling, mechanical cooling or heating and the temperature goes beyond the unoccupied configuration set points then the control will turn on free cooling, mechanical cooling or heat as needed to get within the unoccupied set points.



When in this mode, the economizer dampers will be maintained fully closed or to the minimum unoccupied ventilation set point.

**Variable air volume control** — On power up, the control module will activate the initialization software. The initialization software will determine the unit configuration and also initialize any controls loops and input/output devices. All alarms and configurations are saved in memory and maintained during power outages. All alarms will be maintained in memory and must be cleared through the display.

The unit will first determine the mode of operation. If the unit has been configured for space temperature demand then the control will determine, based on the configurable set points, if the unit should be in the heat mode, vent mode or cooling mode. If the unit is configured for return air temperature control then it will start the fan and monitor the return air temperature vs. the configurable set point to determine if the unit should be in cooling, vent or heating mode.

If the control is connected to a ComfortID™ system, the room terminals are equipped with microprocessor controls that give commands to the base module. If linkage is active, the control module will replace local ComfortLink™ set points and occupancy data with linkage supplied data.

If temperature compensated start is active then advance pre-cool or heat of the space is enabled. If the unit is configured to use a pre-purge cycle then the ComfortLink controls will start the unit in Vent mode based on a pre-start time interval. If an IAQ sensor is being used and the low IAQ control point is satisfied, then the mode will be terminated.

If Cooling mode is required, then the controlling set point will be the leaving air temperature set point. If an economizer is present and the changeover control allows the economizer to be used, then it will first attempt to control the leaving-air temperature using free cooling. If this can not satisfy the load, then additional compressor stages will be turned on to maintain the leaving-air temperature. When both compressors and economizers are being used, the control will use the economizer dampers to maintain better control of the leaving-air and to help prevent high compressor cycling. If the economizer can not be used then it will be set to the minimum vent position. When using compressors, the leaving-air temperature will sequence to compressors on and off using a PID control loop. If the unit is equipped with an optional hot gas bypass valve the control will use the hot gas as an additional stage of capacity. When the first stage of cooling is required the control will turn on a circuit “A” compressor and the hot gas bypass valve. When additional cooling is called for it will turn off the hot gas bypass valve. The valve will also be used for additional freeze protection of the coils when low evaporator refrigerant temperatures are detected using the suction pressure transducers.

When operating in cooling the control will also monitor the supply duct pressure and send a 4 to 20 mA signal to the factory-supplied inverter to control the speed of the fan and the delivered cfm. If on a linkage system the control will also support static pressure reset based on the needs of the zones.

If the unit has been enabled for occupied heat and the space temperature sensor (SPT), return air temperature sensor (RAT) or linkage demand calls for heat, the control will energize the electric heat or gas heat (if present) to warm the space. In this mode the control will energize the heat interlock relay which will signal the terminals to open to the heating position. Note that for the linkage systems the interlock relay connection is not required. Once the Heat mode is enabled, the heat capacity will be controlled by the return air temperature set point. Heating will continue until the return temperature set point is satisfied. If the unit is configured for morning warm-up and the heating demand is below the set point during the first 10 minutes of operation, the control will energize full heating capacity until the return air temperature set point is satisfied.

If the space temperature sensor (SPT), return air temperature sensor (RAT) or linkage demand requires that the unit be in heating then the control will energize the electric heat or gas heat (if present) to warm the space. In this mode the control will energize the heat interlock relay which should be connected to the terminals to indicate that they should open to the heating position. The interlock relay connection is not required for the linkage systems. Heating will continue until the mode selection sensor is satisfied.

**Dehumidification mode** — A Dehumidification mode can be initiated by either a discrete input on TB6 or by a direct measurement of humidity levels with an optional space or return air humidity sensor. When the Dehumidification mode is active, the evaporator coil leaving air temperature will be controlled to the Dehumidify Cool set point, which is typically colder than the normal cool mode leaving air set points.

In this mode, comfort condition set points, which are based on dry bulb temperature, will be overridden. If a source of reheat is available, then the leaving-air temperature can be raised to a more desirable temperature. Available methods of reheat are internal gas heat if the unit is equipped with the staged gas heating option or an external heat source that can be controlled by a 4 to 20 mA signal.

## 48 series gas heat units

The gas heat units incorporate 2 (3 on size 060) separate systems to provide gas heat. Each system incorporates its own induced-draft motor, integrated gas control (IGC) board, 2-stage gas valve, manifold, and safeties. For 2-stage heat control the systems are operated in parallel. For example, when there is a call for first stage heat, both induced-draft motors operate, both gas valves are energized, and both IGC boards initiate spark. With the staged gas control, the systems are operated independently to allow for a greater range of capacity control. All of the gas heating control is performed through the IGC boards (located in the heating section). The MBB module board serves only to initiate and terminate heating operation and monitor the status of the requirements for indoor fan operation. The fan will be controlled directly by the MBB board. The base module board is powered by 24 vac. When the thermostat or room sensor calls for heating the MBB board will close heating relays and send power to W on each of the IGC boards. An LED on the IGC board will be on

## Controls (cont)



during normal operation. A check is made to ensure that the rollout switches and limit switches are closed and the induced-draft motors are not running. After the induced-draft motors are energized and speed is proven with the Hall Effect sensor on the motor, the ignition activation period begins. The burners will ignite within 5 seconds. When ignition occurs the IGC board will continue to monitor the condition of the rollout and limit switches, the Hall Effect sensor and the flame sensor. If the unit is controlled through a room thermostat set for fan auto., 45 seconds after ignition occurs the indoor-fan motor will be energized and the outdoor-air dampers will open to their minimum position. If the over temperature limit opens prior to the start of the indoor fan blower, on the next attempt the 45-second delay will be shortened to 5 seconds less than the time from initiation of heat to when the limit tripped. Gas will not be interrupted to the burners and heating will continue. Once modified, the fan on delay will not change back to 45 seconds unless power is reset to the control. If the unit is controlled through a room sensor, the indoor fan will be operating in the occupied mode and the outdoor-air dampers will be in the minimum position. If the unit is

controlled with a room sensor in the unoccupied mode, the indoor fan will be energized through the IGC board with a 45-second delay and the outside-air dampers will move to the minimum unoccupied set point. When additional heat is required, the second stage MBB output relay closes and initiates power to the second stage of all main gas valves in all sections. When the demand is satisfied, MBB heat output relays will open and the gas valves close interrupting the flow of gas to the main burners. If the call for stage 1 heat lasts less than 1 minute, the heating cycle will not terminate until 1 minute after W1 became active. If the unit is configured for intermittent fan then the indoor-fan motor will continue to operate for an additional 45 seconds then stop and the outdoor-air dampers will close. If the over temperature limit opens after the indoor motor is stopped within 10 minutes of W1 becoming inactive, on the next cycle the time will be extended by 15 seconds. The maximum delay is 3 minutes. Once modified, the fan off delay will not change back to 45 seconds unless power is reset to the control.



# Application data



**Ductwork** — Secure vertical discharge ductwork to roof curb. Interior installation may proceed before unit is set in place on roof. For horizontal discharge applications, attach ductwork to unit, or field-supplied flanges can be attached to horizontal discharge openings and all ductwork attached to flanges. Units equipped with electric heat require a 90-degree elbow below the unit supply duct connection.

**Thru-the-curb service connections** — Roof curb connections allow field power wires and control wires to enter through the roof curb opening.

**Thermostat (CV only)** — Use of a thermistor-type room sensor is recommended on all CCN installations. A thermistor-type room sensor or a 2-stage heating/cooling thermostat may be used for all other units.

**Heating-to-cooling changeover** — All units are automatic changeover from heating to cooling when automatic changeover thermostat and subbase or a thermistor-type room sensor are used.

**Airflow** — Units are draw-thru on cooling and blow-thru on heating.

**Maximum airflow** — To minimize the possibility of condensate blow-off from evaporator, airflow through units should not exceed values shown in Cooling Cfm Operating Range table and Cooling Capacities tables.

**Minimum airflow** — The minimum airflow for cooling is 300 cfm/ton for constant volume units and 70 cfm/ton for VAV (variable air volume) units. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited by entering-air temperatures. Refer to Gas Heating Capacities and Efficiencies table on page 7 for minimum airflow cfm for heating.

**Minimum ambient cooling operation temperature** — All units are equipped with factory economizers to allow free cooling at any outdoor ambient. If mechanical cooling is required, the units are designed to operate at outdoor

temperatures down to 32 F. With accessory Motormaster® V control units can operate at outdoor temperatures down to -20 F. Outdoor-fan motor no. 1 change out is required for Motormaster V applications.

Carrier recommends the installation of field-fabricated wind baffles on all vertically oriented condenser coil surfaces when operating in environments with prevailing winds of more than 5 mph and where temperatures drop below 32 F.

**Maximum operating outdoor-air temperature** — The maximum operating outdoor-air temperature is 115 F. Some models will operate up to 125 F depending on model and operating conditions.

**High altitude (gas heat units only)** — A change to the gas orifice may be required at high altitudes. Refer to Altitude Compensation table on page 9.

**Minimum temperature** — Minimum allowable temperature of mixed air entering the heat exchanger during half rate (first stage) operation is 50 F. There is no minimum mixture temperature during full-rate operation. Comfort conditioning may be compromised at temperatures below 50 F. Below 50 F entering-air temperature (EAT) both stages of heat are engaged.

**Internal unit design** — Due to Carrier's internal unit design (draw-thru over the motor), air path, and specially designed motors, the full horsepower listed in the Physical Data table and Motor Limitations table can be utilized with extreme confidence. Using Carrier motors with the values listed in the Physical Data and Motor Limitations tables will not result in nuisance tripping or premature motor failure. The unit warranty will not be affected.

**Electric heat** — A field-supplied 90-degree elbow must be installed in the supply ductwork below the unit discharge.

# Typical wiring schematics



## TYPICAL POWER SCHEMATIC (48/50A2,A3,A4,A5040 Shown)

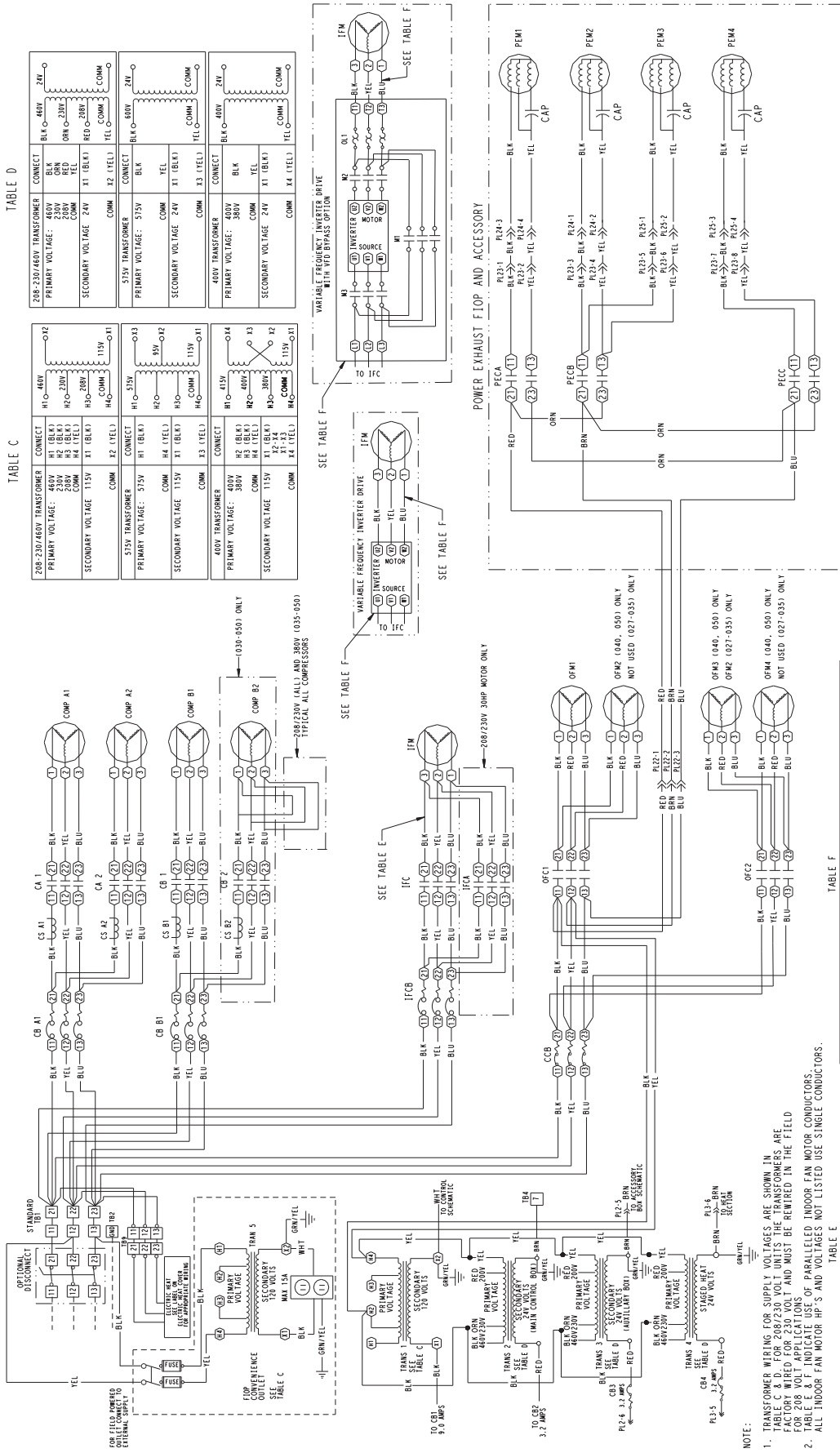


TABLE D

208/230/480V TRANSFORMER PRIMARY VOLTAGE: 480V SECONDARY VOLTAGE: 230V CONNECT: BLK (BLK), YEL (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)	208/230/480V TRANSFORMER PRIMARY VOLTAGE: 480V SECONDARY VOLTAGE: 230V CONNECT: BLK (BLK), YEL (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)
515V TRANSFORMER PRIMARY VOLTAGE: 515V SECONDARY VOLTAGE: 24V CONNECT: BLK (BLK), YEL (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)	515V TRANSFORMER PRIMARY VOLTAGE: 515V SECONDARY VOLTAGE: 24V CONNECT: BLK (BLK), YEL (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)
400V TRANSFORMER PRIMARY VOLTAGE: 400V SECONDARY VOLTAGE: 24V CONNECT: BLK (BLK), YEL (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)	400V TRANSFORMER PRIMARY VOLTAGE: 400V SECONDARY VOLTAGE: 24V CONNECT: BLK (BLK), YEL (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)

TABLE C

208/230/480V TRANSFORMER PRIMARY VOLTAGE: 480V SECONDARY VOLTAGE: 115V CONNECT: H1 (BLK), H2 (BLK), H3 (YEL), H4 (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)	208/230/480V TRANSFORMER PRIMARY VOLTAGE: 480V SECONDARY VOLTAGE: 115V CONNECT: H1 (BLK), H2 (BLK), H3 (YEL), H4 (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)
515V TRANSFORMER PRIMARY VOLTAGE: 515V SECONDARY VOLTAGE: 115V CONNECT: H1 (BLK), H2 (BLK), H3 (YEL), H4 (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)	515V TRANSFORMER PRIMARY VOLTAGE: 515V SECONDARY VOLTAGE: 115V CONNECT: H1 (BLK), H2 (BLK), H3 (YEL), H4 (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)
400V TRANSFORMER PRIMARY VOLTAGE: 400V SECONDARY VOLTAGE: 115V CONNECT: H1 (BLK), H2 (BLK), H3 (YEL), H4 (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)	400V TRANSFORMER PRIMARY VOLTAGE: 400V SECONDARY VOLTAGE: 115V CONNECT: H1 (BLK), H2 (BLK), H3 (YEL), H4 (YEL), COM1 (COM1), COM2 (COM2), COM3 (COM3)

TABLE E

CV UNITS: INDOOR FAN MOTOR CONDUCTORS	208/230V	460V	380V
IFM HP	15	15	15
IFC TO VFD	PARALLEL	SINGLE	SINGLE
IFM TO IFC	SINGLE	SINGLE	SINGLE
IFM TO VFD	PARALLEL	PARALLEL	PARALLEL
IFM TO IFC TO VFD	PARALLEL	PARALLEL	PARALLEL
IFM TO VFD TO IFC	PARALLEL	PARALLEL	PARALLEL
IFM TO VFD TO IFC TO VFD	PARALLEL	PARALLEL	PARALLEL

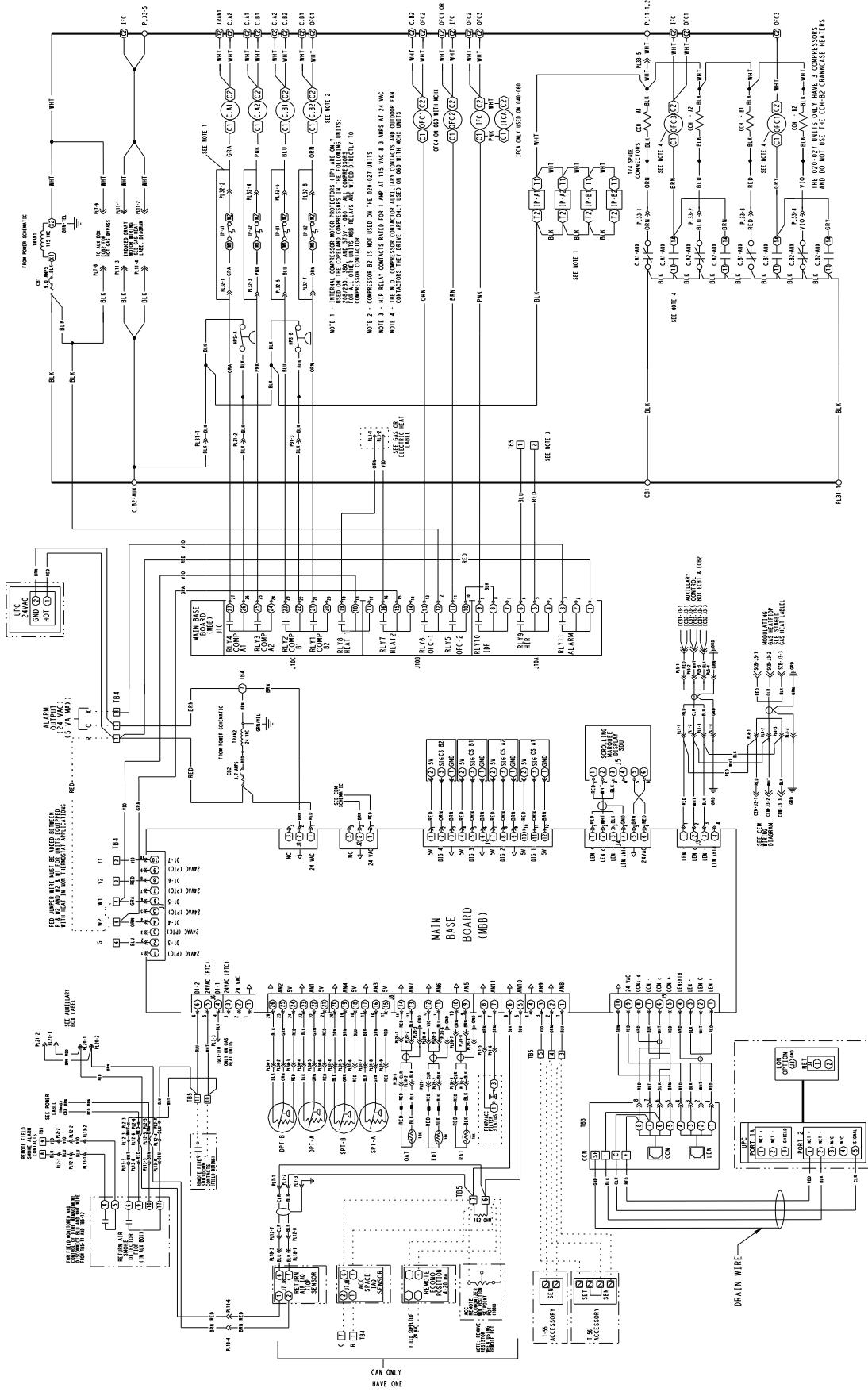
TABLE F

VAV UNITS: INDOOR FAN MOTOR CONDUCTORS	208/230V	460V	380V
IFM HP	15	15	15
IFC TO VFD	PARALLEL	SINGLE	SINGLE
IFM TO IFC	SINGLE	SINGLE	SINGLE
IFM TO VFD	PARALLEL	PARALLEL	PARALLEL
IFM TO IFC TO VFD	PARALLEL	PARALLEL	PARALLEL
IFM TO VFD TO IFC	PARALLEL	PARALLEL	PARALLEL
IFM TO VFD TO IFC TO VFD	PARALLEL	PARALLEL	PARALLEL

NOTE:

- TRANSFORMER WIRING FOR SUPPLY VOLTAGES ARE SHOWN IN TABLE C & D. FOR 208/230 VOLT UNITS THE TRANSFORMERS ARE FIELD WOUND AND MUST BE RETIRED IN THE FIELD FOR 208 VOLT APPLICATIONS.
- TABLE E & F INDICATE USE OF PARALLELED INDOOR FAN MOTOR CONDUCTORS. ALL INDOOR FAN MOTOR HP'S AND VOLTAGES NOT LISTED USE SINGLE CONDUCTORS.

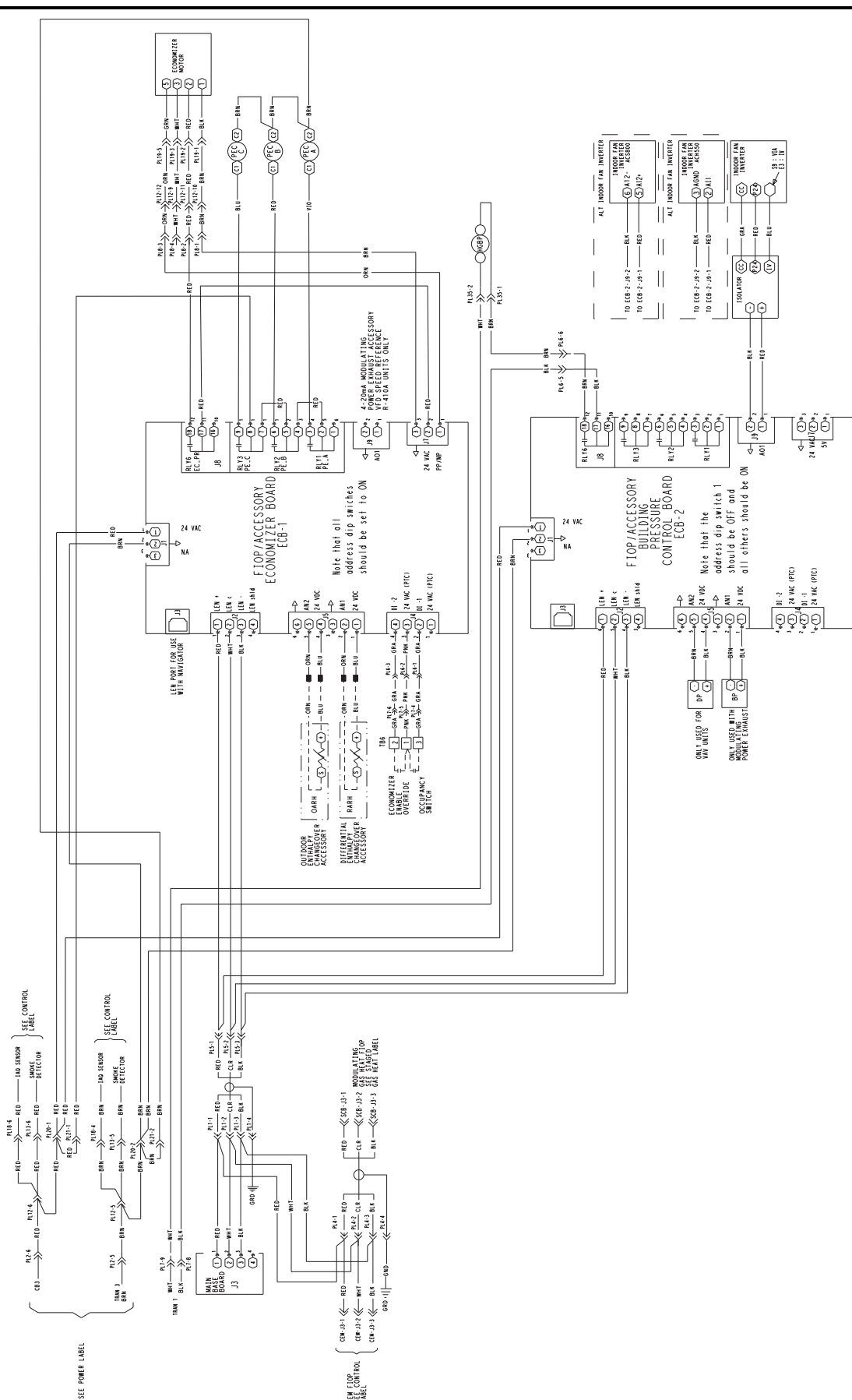
# MAIN BOX CONTROL SCHEMATIC 48/50A2,A3,A4,A5020-060



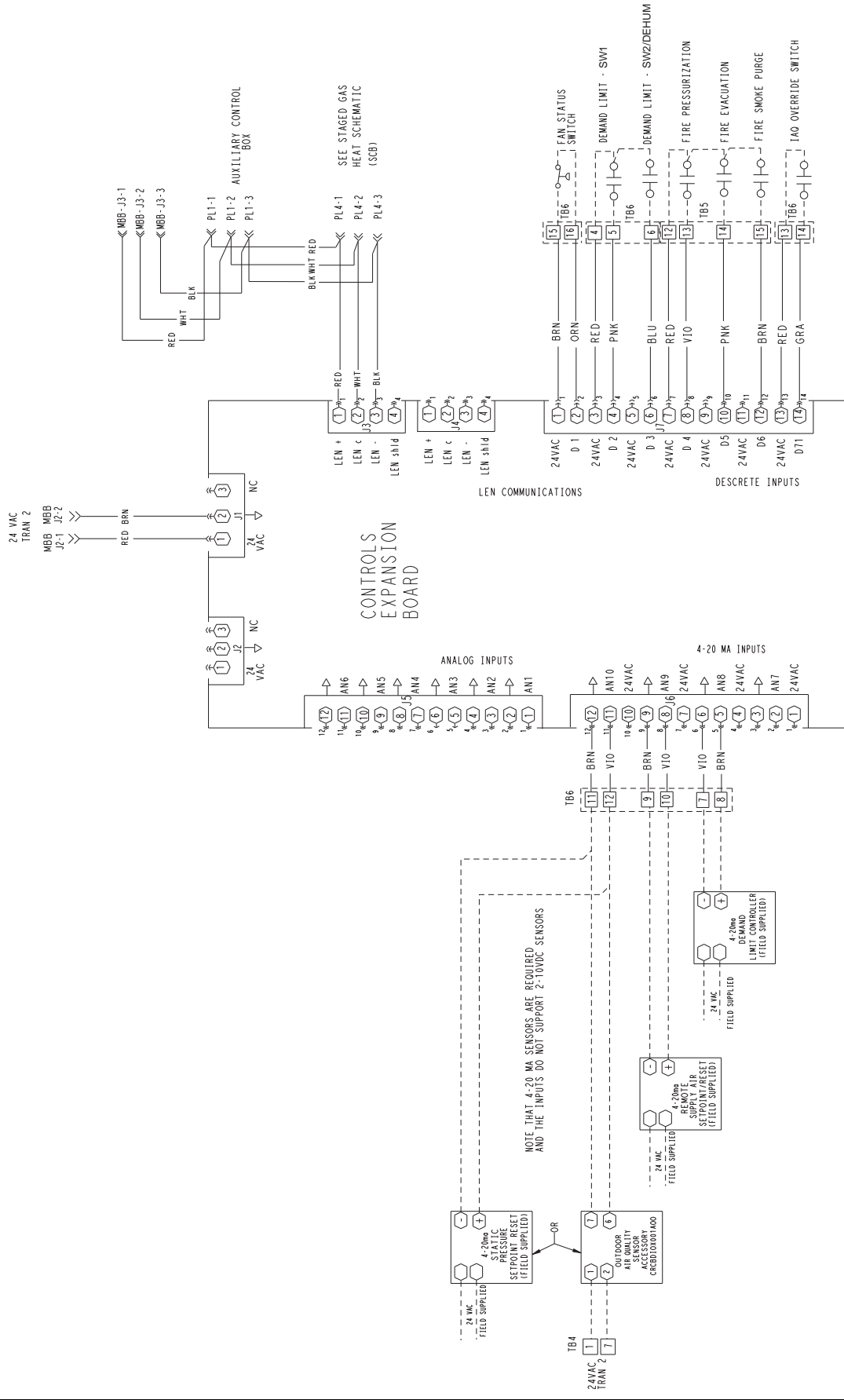
# Typical wiring schematics (cont)



AUXILIARY CONTROL BOX SCHEMATIC 48/50A2,A3,A4,A5020-060



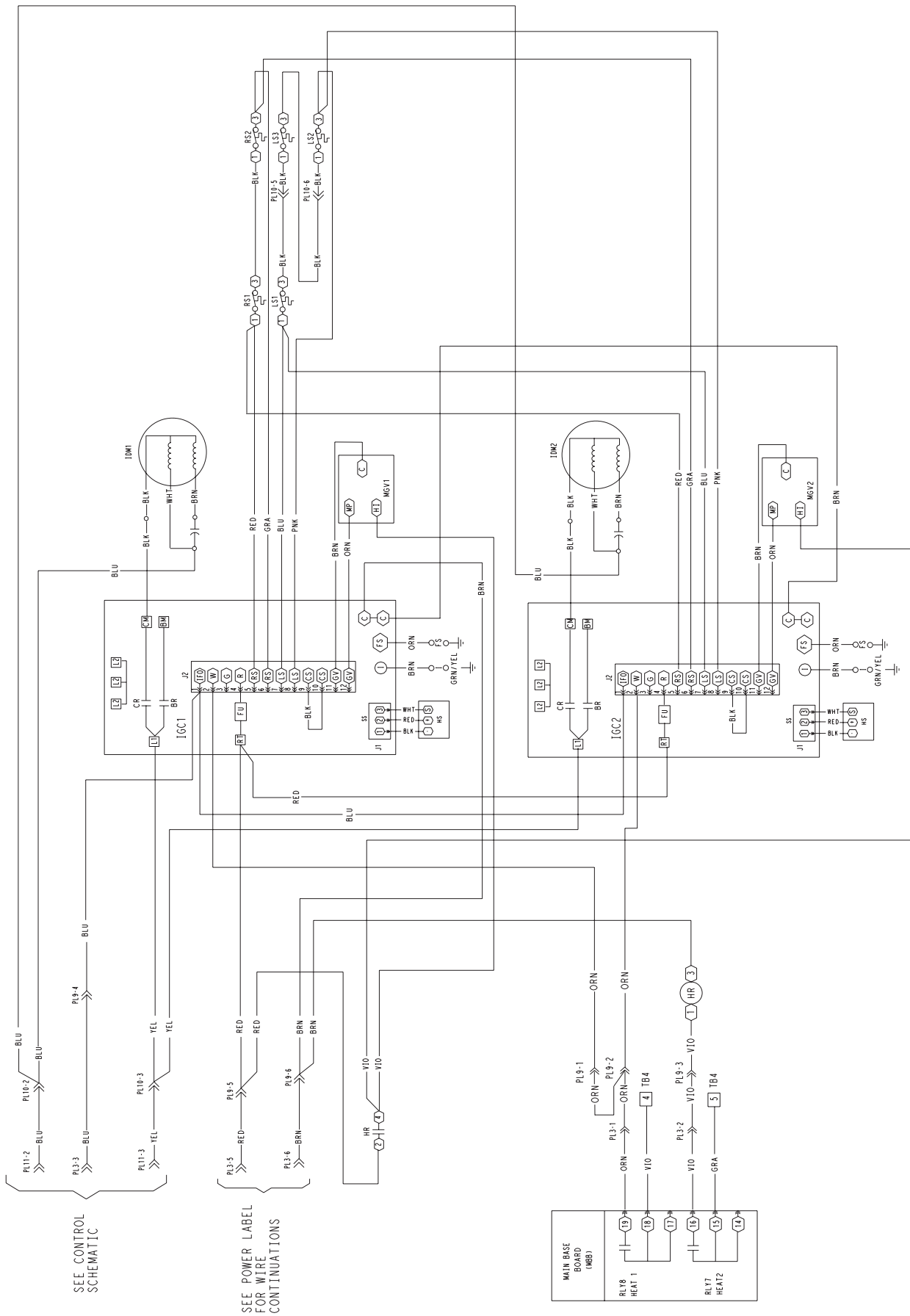
# CONTROLS EXPANSION MODULE WIRING SCHEMATIC 48/50A2,A3,A4,A5020-060



# Typical wiring schematics (cont)



**GAS HEAT CONTROL SCHEMATIC (TWO-STAGE HEAT) 48A2.A3020-060**



SEE CONTROL SCHEMATIC

SEE POWER LABEL FOR WIRE CONTINUATIONS



## LEGEND FOR TYPICAL WIRING SCHEMATICS

### LEGEND

**A** — Circuit A  
**AUX** — Auxiliary Contact  
**BP** — Building Pressure Transducer  
**C** — Compressor Contactor  
**CAP** — Capacitor  
**CB** — Circuit Breaker  
**CCB** — Control Circuit Breaker  
**CCN** — Carrier Comfort Network®  
**CEM** — Controls Expansion Module  
**COMP** — Compressor  
**CS** — Compressor Current Sensor Board  
**DP** — Discharge Pressure Transducer  
**DPT** — Discharge Pressure Transducer  
**ECB-1** — Economizer Control Board  
**ECB-2** — VAV Control Board  
**EDT** — Evaporator Discharge Temperature  
**FIOP** — Factory-Installed Option  
**FS** — Flame Sensor  
**FU** — Fuse  
**GND** — Ground  
**HGBP** — Hot Gas Bypass  
**HPS** — High-Pressure Switch  
**HR** — Heat Relay  
**HS** — Hall Effect Induced Draft Motor Switch  
**IAQ** — Indoor Air Quality  
**IDM** — Induced-Draft Motor  
**IFC** — Indoor-Fan Contactor  
**IFCB** — Indoor-Fan Circuit Breaker  
**IFM** — Indoor-Fan Motor

**IGC** — Integrated Gas Control Board  
**IP** — Internal Compressor Protector  
**LEN** — Local Equipment Network  
**LS** — Limit Switch  
**MBB** — Main Base Board  
**MGV** — Main Gas Valve  
**OARH** — Outdoor Air Relative Humidity  
**OAT** — Outdoor Air Temperature Sensor  
**OFC** — Outdoor-Fan Contactor  
**OFM** — Outdoor-Fan Motor  
**OL** — Overload  
**PEC** — Power Exhaust Contactor  
**PEM** — Power Exhaust Motor  
**PL** — Plug  
**PTC** — Positive Temperature Coefficient  
**RARH** — Return Air Relative Humidity  
**RAT** — Return Air Temperature Sensor  
**RS** — Rollout Switch  
**SCB** — Staged Gas Heat Control Board  
**SDU** — Scrolling Marquee Display  
**SPT** — Suction Pressure Transducer  
**T-55** — Room Temperature Sensor  
**T-56** — Room Temperature Sensor with Set Point  
**TB** — Terminal Block  
**TRANS** — Transformer  
**UPC** — Universal Protocol Converter  
**VAV** — Variable Air Volume  
**VFD** — Variable Frequency Drive

### THERMOSTAT MARKINGS

**BM** — Blower Motor  
**C** — Common  
**CM** — Inducer Motor  
**CS** — Centrifugal Switch  
**G** — Fan  
**IFO** — Indoor Fan On  
**L1** — Line 1  
**R** — Thermostat Power  
**RT** — Power Supply  
**SS** — Speed Sensor  
**W1** — Thermostat Heat Stage 1  
**W2** — Thermostat Heat Stage 2  
**X** — Alarm Output  
**Y1** — Thermostat Cooling Stage 1  
**Y2** — Thermostat Cooling Stage 2



Terminal (Marked)



Terminal (Unmarked)



Terminal Block



Splice



Factory Wiring



Field Wiring



To indicate common potential only, not to represent wiring.



# Guide specifications — 48/50A2,A4



## Packaged Rooftop Cooling Unit and Packaged Rooftop Cooling Unit With Gas Heat — Constant Volume Application

### HVAC Guide Specifications — Section 48/50A2,A4

Size Range: **20 to 60 Tons, Nominal (Cooling)**

Carrier Model Number:

**48A2, 48A4, 50A2, 50A4**

#### Part 1 — General

##### 1.01 SYSTEM DESCRIPTION

Outdoor roof curb or slab mounted, electronically controlled heating and cooling unit utilizing hermetic scroll compressors with crankcase heaters for cooling duty and with optional gas heat or electric heat. Units shall discharge supply and return air vertically or horizontally as shown on contract drawings. EER shall meet requirements of ASHRAE Standard 90.1-2007 (effective 1/1/2010).

##### 1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with AHRI Standard 340/360, latest edition.
- B. Unit shall be designed to conform to ANSI/ASHRAE 15 (latest edition), ASHRAE 62, and UL Standard 1995.
- C. Unit shall be listed by ETL and ETL, Canada as a total package.
- D. 48A2,A4 units shall be designed to conform with ANSI Standard Z21.47 (U.S.A.) / CSA Standard 2.3 (Canada), Gas-Fired Central Furnaces.
- E. Roof curb shall be designed to NRCA criteria per Bulletin B-1986.
- F. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
- G. Unit shall be manufactured in a facility registered to the ISO 9001:2000 manufacturing quality standard.

##### 1.03 DELIVERY, STORAGE AND HANDLING

Unit shall be stored and handled per manufacturer's recommendations. All exposed coils shall have protective shipping covers.

#### Part 2 — Products

##### 2.01 EQUIPMENT

###### A. General:

Factory-assembled, single-piece heating and cooling unit. Contained within the unit enclosure shall be all factory wiring, piping, refrigerant charge (R-410A), operating oil charge, dual refrigerant circuits, micro-processor based control system and associated hardware, and all special features required prior to field start-up.

###### B. Unit Cabinet:

1. Constructed of galvanized steel, bonderized and precoated with a baked enamel finish.

- a. Top cover shall be 18-gage sheet metal with 0.75-in. thick, 1.5-lb density, fiberglass insulation.
  - b. Access panels and doors shall be 20-gage sheet metal with 0.5-in. thick, 1.5-lb density, fiberglass insulation.
  - c. Corner and center posts shall be 16-gage galvanized steel.
  - d. Basepans in the heating and return air sections shall be 16-gage galvanized steel.
  - e. Basepans in the condenser section shall be 16-gage galvanized steel.
  - f. Compressor rail shall be 12-gage galvanized steel.
  - g. Condensate pan shall be 16-gage aluminized steel.
  - h. Air baffles shall be 18-gage galvanized steel with 0.5-in. thick, 1.5-lb density, fiberglass insulation.
  - i. Base rail shall be 14-gage galvanized steel.
  - j. Fan deck (indoor and outdoor section) shall be 16-gage galvanized steel.
2. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
  3. Sides shall have person-sized insulated hinged access doors for easy access to the control box and other areas requiring servicing. Each door shall seal against a rubber gasket to help prevent air and water leakage and be equipped to permit ease and safety during servicing.
  4. Interior cabinet surfaces shall be sheet metal lined or insulated with flexible fire-retardant material, coated on the air side.
  5. Unit shall have a factory-installed sloped condensate drain connection made from an aluminized steel or optional stainless steel.
  6. Equipped with lifting lugs to facilitate overhead rigging.
  7. Filters shall be accessible through a hinged access panel without requiring any special tools.

###### C. Fans:

1. Indoor Evaporator Fans:
  - a. Double-width/double-inlet, centrifugal, belt driven, forward-curved type with single outlet discharge.
  - b. Fan shaft bearings shall be of the pillow-block type with positive locking collar and lubrication provisions.
  - c. Statically and dynamically balanced.
  - d. Evaporator fan shaft bearings shall have a life of 200,000 hours at design operating conditions in accordance with ANSI B3.15.



e. Solid fan shaft construction for size 020-050 units and two-piece solid fan shaft construction on the size 060 unit.

2. Condenser Fans:

a. Fans shall be direct-driven propeller type only, with corrosion-resistant blades riveted to corrosion resistant steel supports for all size 020-050 units and the size 060 unit with optional condenser coil. Size 060 units with the microchannel condenser coil shall have a direct driven, 9-blade airfoil cross section, reinforced polymer construction, and shrouded-axial type fans with inherent corrosion resistance.

b. Discharge air vertically upward and protected by PVC coated steel wire safety guards.

c. Statically and dynamically balanced.

D. Compressors:

1. Fully hermetic, scroll type compressors with overload protection and short cycle protection with minimum on and off timers.

2. Factory rubber-in-shear mounted for vibration isolation.

3. Reverse rotation protection capability.

4. Crankcase heaters shall only be activated during compressor off mode.

E. Coils:

1. Standard evaporator coil shall have aluminum plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.

2. Standard condenser coil shall be microchannel design. The coil shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Microchannel coils shall consist of a two pass arrangement. Coil construction shall consist of aluminum alloys for the fins, tubes and manifolds.

3. Coils shall be leak tested at 150 psig and pressure tested at 650 psig.

4. Optional condenser coil shall have aluminum plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.

5. Optional pre-coated aluminum-fin coils shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments. 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. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.

6. Copper-fin coils shall be constructed of copper fins mechanically bonded to copper tubes and

copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan. All copper construction shall provide protection in moderate coastal environments.

7. E-Coated aluminum-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60 deg of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum fins mechanically bonded to copper tubes.

F. Gas Heating Section (48 Series Only):

1. Induced-draft combustion type with energy saving direct spark ignition systems and redundant main gas valves.

2. The heat exchanger shall be of the tubular section type constructed of a minimum of 20-gage steel coated with a nominal 1.2 mil aluminum-silicone alloy for corrosion resistance. Optional stainless steel heat exchangers shall be available.

3. Burners shall be of the in-shot type constructed of aluminum coated steel.

4. All gas piping shall enter the unit cabinet at a single location.

5. Induced Draft Fans:

a. Direct-driven, single inlet, forward-curved centrifugal type.

b. Statically and dynamically balanced.

c. Made from steel with a corrosion-resistant finish.

6. High-corrosion areas such as flue gas collection and exhaust areas shall be lined with corrosion resistant material.

G. Refrigerant Components:

Unit shall be equipped with dual refrigerant circuits each containing:

1. Solid core filter drier.

2. Thermostatic expansion valve.

3. Fusible plug.

# Guide specifications — 48/50A2,A4 (cont)



## H. Filter Section:

Standard filter section shall be supplied with 2-in. thick disposable fiberglass filters.

## I. Controls and Safeties:

### 1. Unit *ComfortLink*™ Controls:

- a. Scrolling marquee display.
  - b. CCN (Carrier Comfort Network®) capable.
  - c. Unit control with standard suction pressure and condensing pressure transducers.
  - d. Shall provide a minimum 5° F temperature difference between cooling and heating set points to meet ASHRAE 90.1, energy standard.
  - e. Shall provide and display a current alarm list and an alarm history list.
  - f. Automatic compressor lead/lag control.
  - g. Service run test capability.
  - h. Shall accept input from a CO<sub>2</sub> sensor (both indoor and outdoor).
  - i. Configurable alarm light shall be provided which activates when certain types of alarms occur.
  - j. Compressor minimum run time (3 minutes) and minimum off time (3 minutes) are provided.
  - k. Service diagnostic mode.
  - l. Optional integrated economizer control or two-position self-closing adjustable outside air damper.
  - m. Minimum of 3 capacity stages of mechanical capacity control (excluding hot gas bypass) controlled by one of the following user selectable methods:
    - 1) A control algorithm to maintain either high-cool or low-cool supply air temperature set point. Cooling mode (off, low or high) to be determined from space temperature sensor or standard 2-stage mechanical thermostat input.
    - 2) Two-stage control.
  - n. Optional minimum load valve for additional capacity stage.
  - o. Unit shall be complete with self-contained low voltage control circuit.
  - p. Control of evaporator leaving air temperature through compressor and economizer control.
- ### 2. Safeties:
- a. Unit shall incorporate a solid-state compressor lockout which provides optional reset capability at the space thermostat should any of the following safety devices trip and shut off compressor:
    - 1) Compressor lockout protection provided for either internal or external overload.

- 2) Low-pressure protection.
- 3) Freeze protection (evaporator coil).
- 4) High-pressure protection (high pressure switch or internal).
- 5) Compressor reverse rotation protection.
- 6) Loss-of-charge protection.
- 7) Welded contactor protection.

b. Supply-air sensor shall be located in the unit and should be used for economizer control and compressor stage control.

c. Induced draft heating section (48 Series) shall be provided with the following minimum protections:

- 1) High-temperature limit switch.
- 2) Induced-draft motor speed sensor.
- 3) Flame rollout switch.
- 4) Flame proving controls.
- 5) Redundant gas valve.

## J. Operating Characteristics:

1. Unit shall be capable of starting and running at 115 F ambient outdoor temperature per maximum load criteria of AHRI Standard 340/360.
2. Unit with standard controls will operate in cooling down to an outdoor ambient temperature of 32 F.
3. Unit shall be provided with fan time delay to help prevent cold air delivery.

## K. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single location.

## L. Motors:

1. Compressor motors shall be cooled by refrigerant gas passing through motor windings and shall have either internal line break thermal and current overload protection or external current overload modules with compressor temperature sensors.
2. All condenser-fan motors shall be totally enclosed 3-phase type with permanently lubricated ball bearings, class F insulation and internal, automatic-reset thermal overload protection or manual reset calibrated circuit breakers.
3. All indoor-fan motors 5 hp and larger shall meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT), effective October 24, 1997.

## M. Special Features:

Certain features are not applicable when the features designated \* are specified. For assistance in amending the specifications, contact your local Carrier Sales Office.



- \* 1. Integrated Economizer:
  - a. Economizer shall meet the requirements of ASHRAE 90.1.
  - b. Economizer shall be furnished and installed complete with recirculated air dampers, outside air dampers, and controls.
  - c. All dampers shall be low leakage type and gear driven.
  - d. Capable of introducing up to 100% outdoor air for minimum ventilation as well as free cooling.
  - e. Damper actuator shall be gear driven, 24-v fully modulating design.
  - f. Economizer outdoor hood shall be pre-painted.
  - g. Economizer shall meet the requirements of the California Energy Commission airside economizer acceptance test.
- \* 2. Barometric Relief Damper Package:
  - a. Package shall include damper, seals, hardware, and hoods to relieve excess internal pressure.
  - b. Damper shall close due to gravity upon unit shutdown.
- \* 3. Power Exhaust:

Package shall include a multiple exhaust fan (centrifugal style) fan, 1 Hp 208-230, 460 v direct-drive motor, and damper for vertical flow units with economizer to control over-pressurization of building. Control shall be through *ComfortLink™* controls based on damper position or through an optional building pressure sensor. On size 020-050 units, 4 stages of control shall be available. On size 060 units, 6 stages of control shall be available.
- \* 4. Thermostats and Subbases:

To provide staged heating and cooling in addition to automatic (or manual) changeover and fan control.
- \* 5. Electronic Programmable Thermostat:

Capable of using deluxe full-featured electronic thermostat.
- \* 6. Liquefied Propane Conversion Kit (48 Series):

Kit shall contain all the necessary hardware and instructions to convert a standard natural gas unit for use with liquefied propane gas.
- \* 7. Convenience Outlet:

Shall be factory-installed and internally mounted with an externally accessible 115-v, 15 amp. GFI, female receptacle with hinged cover. A step-down transformer and overload protection shall be included so no additional wiring is necessary unless the field-wired outlet has been requested. When applied with a unit-mounted disconnect, the outlet shall be wired to the load side of the disconnect so the outlet will shut off with the disconnect.
- \* 8. Non-Fused Disconnect Switch:

Shall be factory-installed, internally mounted, and UL approved. Non-fused switch shall provide unit power shutoff. Shall be accessible from outside the unit and shall provide power off lockout capability.
- \* 9. Electric Heater (50 Series Units Only):

Electric resistance heaters shall be factory-installed, nichrome element type, open wire coils with 0.29 in. inside diameter, insulated with ceramic bushings, and include operating and safety controls. Coil ends are staked and welded to terminal screw slots.
- \*10. Hail Guard, Condenser Coil Grille:

Shall protect the condenser coil from hail, flying debris, and damage by large objects without increasing unit clearances.
- \*11. CO<sub>2</sub> Sensor:

The CO<sub>2</sub> sensor shall have the ability to monitor CO<sub>2</sub> levels and relay information to the controller. The controller will use CO<sub>2</sub> level information to modulate the economizer and provide demand control ventilation. The sensor shall be available as field installed or factory-installed return air sensor or a remote space sensor.
- \*12. Return Air Smoke Detector:

The smoke detector shall send input to the controller to shut down the unit in case smoke is detected. The smoke detector shall be factory installed in the return air section or shall be available as a field-installed accessory.
- \*13. Filter Status:

The filter status switch shall be a pressure differential switch and will indicate a dirty filter. The switch shall be available as field or factory installed.
- \*14. Humidity Sensor:

A humidity sensor will allow for outside air enthalpy changeover control using the standard outside air dry bulb sensor and the accessory humidity sensor. When both an outside and return air humidity sensor are used then differential enthalpy changeover can be supported.
- \*15. Two-Position Damper:

A two-position damper shall admit up to 25% outdoor air during fan operation and shall close when the fan is off. The damper position shall be mechanically adjustable.
- \*16. 4-Inch Filters:

Optional filter section shall be supplied with 4-in. thick MERV-8 pleated fiberglass filters.

# Guide specifications — 48/50A2,A4 (cont)



- \*17. Control Expansion Module (CEM):  
Shall provide the following additional optional features:
  - a. Remote set point
  - b. Demand limit control
  - c. Remote economizer position
  - d. Fire and smoke control override control
  - e. Remote sensor monitoring
  - f. Fan status switch monitoring
- \*18. Staged Gas Heat (48A2,A4 only):  
The control shall have the option for control of the gas heat to a discharge air temperature by sequencing on the gas cells to provide up to 11 stages of capacity. The control shall be integrated directly into the main unit controls and shall include leaving air temperature sensors to ensure that high temperatures do not occur during the operation of the staged gas heat.
- 19. BACnet Communication Option:  
Shall provide factory installed communication capability with a BACnet MS/TP network.
- 20. MODBUS Protocol Translator:  
Allows integration with i-Vu® Open Control System or a BACnet Building Automation System.
- 20. MODBUS Protocol Translator:  
A controller-based accessory module shall provide CCN to MODBUS Remote Terminal Unit (RTU) protocol conversion.
- 21. LonWorks Protocol Translator:  
A controller-based accessory module shall provide CCN to LON FT-10A ANSI/EIA-709.1 protocol conversion.
- 22. Full Perimeter Roof Curbs (Horizontal and Vertical):  
Shall be formed of 14-gage galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.
- 23. Security Grille (48/50A060 Unit with MCHX Only):  
Factory-installed grille shall limit access to compressor and condenser coil area to authorized personnel only.



# Guide specifications — 48/50A3,A5



## Packaged Rooftop Cooling Unit and Packaged Rooftop Cooling Unit With Gas Heat — Variable Air Volume Application

### HVAC Guide Specifications — Section 48/50A3,A5

Size Range: **20 to 60 Tons, Nominal (Cooling)**

Carrier Model Number:  
**48A3, 48A5, 50A3, 50A5**

#### Part 1 — General

##### 1.01 SYSTEM DESCRIPTION

Outdoor roof curb or slab mounted, electronically controlled heating and cooling unit utilizing hermetic scroll compressors with crankcase heaters for cooling duty and gas combustion or electric heating duty. Units shall discharge supply and return air vertically or horizontally as shown on contract drawings. EER shall meet requirements of ASHRAE Standard 90.1-2007 (effective 1/1/2010).

##### 1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with AHRI Standard 340/360, latest edition.
- B. Unit shall be designed to conform to ANSI/ASHRAE 15 (latest edition), ASHRAE 62, and UL Standard 1995.
- C. Unit shall be listed by ETL and ETL, Canada as a total package.
- D. 48A3,A5 units shall be designed to conform with ANSI Standard Z21.47 (U.S.A.) / CSA Standard 2.3 (Canada), Gas-Fired Central Furnaces.
- E. Roof curb shall be designed to NRCA criteria per Bulletin B-1986.
- F. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
- G. Unit shall be manufactured in a facility registered to the ISO 9001:2000 manufacturing quality standard.

##### 1.03 DELIVERY, STORAGE AND HANDLING

Unit shall be stored and handled per manufacturer's recommendations.

#### Part 2 — Products

##### 2.01 EQUIPMENT

###### A. General:

Factory-assembled, single-piece heating and cooling unit. Contained within the unit enclosure shall be all factory wiring, piping, refrigerant charge (R-410A), operating oil charge, dual refrigerant circuits, micro-processor based control system and associated hardware, and all special features required prior to field start-up.

###### B. Unit Cabinet:

1. Constructed of galvanized steel, bonderized and precoated with a baked enamel finish.
  - a. Top cover shall be 18-gage sheet metal with 0.75-in. thick, 1.5-lb density, fiberglass insulation.

- b. Access panels and doors shall be 20-gage sheet metal with 0.5-in. thick, 1.5-lb density, fiberglass insulation.
  - c. Corner and center posts shall be 16-gage galvanized steel.
  - d. Basepans in the heating and return air sections shall be 16-gage galvanized steel.
  - e. Basepans in the condenser section shall be 16-gage galvanized steel.
  - f. Compressor rail shall be 12-gage galvanized steel.
  - g. Condensate pan shall be 16-gage aluminized steel.
  - h. Air baffles shall be 18-gage galvanized steel with 0.5-in. thick, 1.5-lb density, fiberglass insulation.
  - i. Base rail shall be 14-gage galvanized steel.
  - j. Fan deck (indoor and outdoor section) shall be 16-gage galvanized steel.
2. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
  3. Sides shall have person-sized insulated hinged access doors for easy access to the control box and other areas requiring servicing. Each door shall seal against a rubber gasket to help prevent air and water leakage and be equipped to permit ease and safety during servicing.
  4. Interior cabinet surfaces shall be sheet metal lined or insulated with flexible fire-retardant material, coated on the air side.
  5. Unit shall have a factory-installed sloped condensate drain connection made from an aluminized steel or optional stainless steel.
  6. Equipped with lifting lugs to facilitate overhead rigging.
  7. Filters shall be accessible through a hinged access panel without requiring any special tools.

###### C. Fans:

###### 1. Indoor Evaporator Fans:

- a. Double-width/double-inlet, centrifugal, belt driven, forward-curved type with single outlet discharge.
- b. Fan shaft bearings shall be of the pillow-block type with positive locking collar and lubrication provisions.
- c. Statically and dynamically balanced.
- d. Evaporator fan shaft bearings shall have a life of 200,000 hours at design operating conditions in accordance with ANSI B3.15.
- e. Solid fan shaft construction for size 020-050 units and two-piece solid fan shaft construction on the size 060 unit.



## 2. Condenser Fans:

- a. Fans shall be direct-driven propeller type only, with corrosion-resistant blades riveted to corrosion resistant steel supports for all size 020-050 units and the size 060 unit with optional condenser coil. Size 060 units with the microchannel condenser coil shall have a direct driven, 9-blade airfoil cross section, reinforced polymer construction, and shrouded-axial type fans with inherent corrosion resistance.
- b. Discharge air vertically upward and protected by PVC coated steel wire safety guards.
- c. Statically and dynamically balanced.

## 3. Supply Fan Drive:

Unit shall be equipped with variable frequency drive (VFD) inverter. The VFD shall be installed inside the unit cabinet and shall be factory-mounted, wired and tested. The VFD shall control motor speed to maintain set point static pressure at the sensor tube location of the supply duct pressure transducer (transducer is factory-provided and installed; sensor tube must be field-routed). The control system may be field-adjusted to maintain supply duct static pressure set points from 0 in. wg to 3.5 in. wg. The variable frequency drive shall include the following features:

- a. Full digital control with direct control from the unit *ComfortLink™* controls.
- b. Insulated Gate Bi-Polar Transistors (IGBT) used to produce the output pulse width modulated (PWM) waveform, allowing for quiet motor operation.
- c. Inverters capable of operation at a frequency of 8 kHz, so no acoustic noise shall be produced by the motor.
- d. Self diagnostics.
- e. Personal lockout code for additional security.
- f. Critical frequency avoidance.
- g. RS485 capability standard.
- h. Electronic thermal overload protection.
- i. 5% swinging chokes for harmonic reduction and improved power factor.
- j. All printed circuit boards shall be conformal coated.

## D. Compressors:

1. Fully hermetic, scroll type compressors with overload protection and short cycle protection with minimum on and off timers.
2. Factory rubber-in-shear mounted for vibration isolation.
3. Reverse rotation protection capability.
4. Crankcase heaters shall only be activated during compressor off mode.

## E. Coils:

1. Standard evaporator coil shall have aluminum plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
2. Standard condenser coil shall be microchannel design. The coil shall have a series of flat tubes containing a series of multiple, parallel flow microchannels layered between the refrigerant manifolds. Microchannel coils shall consist of a two pass arrangement. Coil construction shall consist of aluminum alloys for the fins, tubes and manifolds.
3. Coils shall be leak tested at 150 psig and pressure tested at 650 psig.
4. Optional condenser coil shall have aluminum plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
5. Optional pre-coated aluminum-fin coils shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments. 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. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.
6. Copper-fin coils shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan. All copper construction shall provide protection in moderate coastal environments.
7. E-Coated aluminum-fin coils shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss — 60 deg of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum fins mechanically bonded to copper tubes.





F. Gas Heating Section (48 Series Only):

1. Induced-draft combustion type with energy saving direct spark ignition systems and redundant main gas valves.
2. The heat exchanger shall be of the tubular section type constructed of a minimum of 20-gage steel coated with a nominal 1.2 mil aluminum-silicone alloy for corrosion resistance. Optional stainless steel heat exchangers shall be available.
3. Burners shall be of the in-shot type constructed of aluminum coated steel.
4. All gas piping shall enter the unit cabinet at a single location.
5. Induced Draft Fans:
  - a. Direct-driven, single inlet, forward-curved centrifugal type.
  - b. Statically and dynamically balanced.
  - c. Made from steel with a corrosion-resistant finish.
6. High-corrosion areas such as flue gas collection and exhaust areas shall be lined with corrosion resistant material.

G. Refrigerant Components:

Unit shall be equipped with dual refrigerant circuits each containing:

1. Solid core filter drier.
2. Thermostatic expansion valve.
3. Fusible plug.

H. Filter Section:

Standard filter section shall be supplied with 2-in. thick disposable fiberglass filters.

I. Controls and Safeties:

1. Unit *ComfortLink*<sup>™</sup> Controls:
  - a. Scrolling marquee display.
  - b. CCN (Carrier Comfort Network<sup>®</sup>) capable.
  - c. Unit control with standard suction pressure and condensing pressure transducers.
  - d. Shall provide a 5° F temperature difference between cooling and heating set points to meet ASHRAE 90.1, energy standard.
  - e. Shall provide and display a current alarm list and an alarm history list.
  - f. Automatic compressor redundancy.
  - g. Service run test capability.
  - h. Shall accept input from a CO<sub>2</sub> sensor (both indoor and outdoor).
  - i. Configurable alarm light shall be provided which activates when certain types of alarms occur.
  - j. Compressor minimum run time (3 minutes) and minimum off time (3 minutes) are provided.
  - k. Service diagnostic mode.

- l. Optional integrated economizer control or two-position self-closing adjustable outside-air damper.
- m. Minimum of 3 capacity stages of mechanical capacity control (excluding hot gas bypass) controlled with logic to maintain supply air temperature set point.
- n. Optional minimum load valve for additional capacity stage.
- o. Unit shall be complete with self-contained low voltage control circuit.

2. Safeties:

- a. Unit shall incorporate a solid-state compressor lockout which provides optional reset capability at the space thermostat should any of the following safety devices trip and shut off compressor:
  - 1) Compressor lockout protection provided for either internal or external overload.
  - 2) Low-pressure protection.
  - 3) Freeze protection (evaporator coil).
  - 4) High-pressure protection (high pressure switch or internal).
  - 5) Compressor reverse rotation protection.
  - 6) Loss of charge protection.
  - 7) Welded contactor protection.
- b. Supply-air sensor shall be located in the unit and should be used for economizer control and compressor stage control.
- c. Induced draft heating section (48 Series) shall be provided with the following minimum protections:
  - 1) High-temperature limit switch.
  - 2) Induced-draft motor speed sensor.
  - 3) Flame rollout switch.
  - 4) Flame proving controls.
  - 5) Redundant gas valve.

J. Operating Characteristics:

1. Unit shall be capable of starting and running at 115 F ambient outdoor temperature per maximum load criteria of AHRI Standard 340/360.
2. Unit with standard controls will operate in cooling down to an outdoor ambient temperature of 32 F.
3. Unit shall be provided with fan time delay to prevent cold air delivery.

K. Electrical Requirements:

All unit power wiring shall enter unit cabinet at a single location.

L. Motors:

1. Compressor motors shall be cooled by refrigerant gas passing through motor windings and shall have either internal line break thermal and current overload protection or external current overload modules with compressor temperature sensors.

# Guide specifications — 48/50A3,A5 (cont)



2. All condenser-fan motors shall be totally enclosed 3-phase type with permanently lubricated ball bearings, class F insulation and internal, automatic-reset thermal overload protection or manual reset calibrated circuit breakers.
3. All indoor-fan motors 5 hp and larger shall meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT), effective October 24, 1997.

## M. Special Features:

Certain features are not applicable when the features designated \* are specified. For assistance in amending the specifications, contact your local Carrier Sales Office.

- \* 1. Integrated Economizer:
  - a. Economizer shall meet the requirements of ASHRAE 90.1.
  - b. Economizer shall be furnished and installed complete with recirculated air dampers, outside air dampers, and controls.
  - c. All dampers shall be low leakage type and gear driven.
  - d. Capable of introducing up to 100% outdoor air for minimum ventilation as well as free cooling.
  - e. Damper actuator shall be gear driven, 24-v fully modulating design.
  - f. Economizer outdoor hood shall be pre-painted.
  - g. Economizer shall meet the requirements of the California Energy Commission airside economizer acceptance test.
- \* 2. Barometric Relief Damper Package:
  - a. Package shall include damper, seals, hardware, and hoods to relieve excess internal pressure.
  - b. Damper shall close due to gravity upon unit shutdown.
- \* 3. Power Exhaust:

Package shall include a multiple exhaust fan (centrifugal style) fan, 1 Hp 208-230, 460 v direct-drive motor, and damper for vertical flow units with economizer to control over-pressurization of building. Control shall be through *ComfortLink™* controls based on optional building pressure sensor. On size 020-050 units, 4 stages of control shall be available. On size 060 units, 6 stages on control shall be available.
- \* 4. Liquefied Propane Conversion Kit (48 Series):

Kit shall contain all the necessary hardware and instructions to convert a standard natural gas unit for use with liquefied propane gas.

- \* 5. Convenience Outlet:

Shall be factory-installed and internally mounted with an externally accessible 115-v, 15 amp GFI, female receptacle with hinged cover. A step-down transformer and overload protection shall be included so no additional wiring is necessary unless the field wired outlet has been requested. When applied with a unit-mounted disconnect, the outlet shall be wired to the load side of the disconnect so the outlet will shut off with the disconnect.
- \* 6. Non-Fused Disconnect Switch:

Shall be factory-installed, internally mounted, and UL approved. Non-fused switch shall provide unit power shutoff. Shall be accessible from outside the unit and shall provide power off lockout capability.
- \* 7. Electric Heater (50 Series Units Only):

Electric resistance heaters shall be factory-installed, nichrome element type, open wire coils with 0.29 in. inside diameter, insulated with ceramic bushings, and include operating and safety controls. Coil ends are staked and welded to terminal screw slots.
- \* 8. Hail Guard, Condenser Coil Grille:

Shall protect the condenser coil from hail, flying debris, and damage by large objects without increasing unit clearances.
- \* 9. CO<sub>2</sub> Sensor:

The CO<sub>2</sub> sensor shall have the ability to monitor CO<sub>2</sub> levels and relay information to the controller. The controller will use CO<sub>2</sub> level information to modulate the economizer and provide demand control ventilation. The sensor shall be available as field installed or factory-installed return air sensor or a remote space sensor.
- \*10. Return Air Smoke Detector:

The smoke detector shall send input to the controller to shut down the unit in case smoke is detected. The smoke detector shall be factory installed in the return air section or shall be available as a field-installed accessory.
- \*11. Filter Status:

The filter status switch shall be a pressure differential switch and will indicate a dirty filter. The switch shall be available as field or factory installed.
- \*12. Humidity Sensor:

A humidity sensor will allow for outside air enthalpy changeover control using the standard outside air dry bulb sensor and the accessory humidity sensor. When both an outside and return air humidity sensor are used then differential enthalpy changeover can be supported.



- \*13. Two-Position Damper:

A two-position damper shall admit up to 25% outdoor air during fan operation and shall close when the fan is off. The damper position shall be mechanically adjustable.
- \*14. 4-Inch Filters:

Optional filter section shall be supplied with 4-in. thick MERV-8 pleated fiberglass filters.
- \*15. Control Expansion Module (CEM):

Shall provide the following additional optional features:

  - a. Remote set point.
  - b. Demand limit control.
  - c. Remote economizer position.
  - d. Fire and smoke control override control.
  - e. Remote sensor monitoring.
  - f. Fan status switch monitoring.
- 16. Bypass for Supply Fan VFD:

Units may be equipped with an optional manual bypass switch which allows the supply fan VFD to be electrically bypassed.
- 17. BACnet Communication Option:

Shall provide factory installed communication capability with a BACnet MS/TP network. Allows integration with i-Vu® Open Control System or a BACnet Building Automation System.
- 18. MODBUS Protocol Translator:

A controller-based module shall provide CCN to MODBUS Remote Terminal Unit (RTU) protocol conversion.
- 19. LonWorks Protocol Translator:

A controller-based module shall provide CCN to LON FT-10A ANSI/EIA-709.1 protocol conversion.
- \*20. Staged Gas Heat (48A3,A5 only):

The control shall have the option for control of the gas heat to a discharge air temperature by sequencing on the gas cells to provide up to 11 stages of capacity. The control shall be integrated directly into the main unit controls and shall include leaving air temperature sensors to ensure that high temperatures do not occur during the operation of the staged gas heat.
- 21. Full Perimeter Roof Curbs (Horizontal and Vertical):

Shall be formed of 14-gage galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.
- 22. Security Grille (48/50A060 Unit with MCHX Only):

Factory-installed grille shall limit access to compressor and condenser coil area to authorized personnel only.

