

**50HCQ  
High Efficiency  
Packaged Rooftop Heat Pump Units  
3 to 10 Tons**



## Product Data



C10222



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**50HCQ**



Your Carrier Packaged Heat Pump rooftop unit (RTU) was designed by customers for customers. With no-strip screw collars, handled access panels, and more we've made your unit easy to install, easy to maintain and easy to use.

**Easy to install:**

All WeatherMaster™ units are field-convertible to horizontal air flow; no special kit required on 04-09 models. Supply duct kit required for 12 size only. Convertible airflow design makes it easy to adjust to unexpected job site complications. Lighter units make easy replacement. Carrier 3 - 10 ton 50HCQ rooftops fit on existing Carrier curbs dating back to 1989. Also, our large control box gives you room to work and room to mount Carrier accessory controls.

**Easy to maintain:**

Easy access handles by Carrier provide quick and easy access to all normally serviced components. Our "no-strip" screw system has superior holding power and guides screws into position while preventing the screw from stripping the unit's metal. Take accurate pressure readings by reading condenser pressure with panels on. Simply remove the black, composite plug, route your gauge line(s) through the hole, and connect them to the refrigeration service valve(s). Now, you can take refrigeration system pressure readings without affecting the condenser airflow.

**Easy to use:**

The newly designed, master terminal board by Carrier puts all your connections and troubleshooting points in one convenient place, standard. Most low voltage connections are made to the same board and make it easy to find what you're looking for and easy to access it.

**Reliable:**

Each unit comes with precision sized and tested scroll compressor that is internally protected from over temperature and pressures. Each refrigerant circuit is further protected with a high pressure, loss of charge and freeze protection switch. In addition, a liquid line filter drier and suction line accumulator protects each circuit. Each unit is factory tested prior to shipment to help ensure units operation once properly installed.



## FEATURES AND BENEFITS

- Up to 28% lighter than similar industry units. Lighter rooftops make easier replacement jobs.
- SEER up to 15.8, EER up to 12.8.
- IEER up to 13.0 with single speed indoor fan motor and up to 13.7 with 2-speed/VFD indoor fan motor.
- 3 - 10 ton units fit on existing Carrier rooftop curbs which saves time and money on replacement jobs.
- Standardized components and layout. Standardized components and controls make service and stocking parts easier.
- Scroll compressors on all units. This makes service, stocking parts, replacement, and troubleshooting easier.
- Crankcase heater on all models (except 04 size) provides added protection in all applications.
- Precision-sized refrigerant suction line accumulator provides high reliability by preventing liquid from entering the compressor during low ambient conditions and reverse cycle switch over.
- Filed convertible from vertical to horizontal airflow on all models. No special kits required on 04-09 models. Supply duct kit required for 12 size model only.
- 4-way reversing valve rapidly changes the flow of refrigerant to quickly changeover from cooling to heating and heating to cooling.
- Easy-adjust, belt drive motor available on all sizes. Carrier provides a factory solution for most points in the fan performance table. There's no need for field-supplied drives or motors.
- 3-5 ton models come standard with an Electric Drive X13, 5 speed/torque motor to provide exact performance in many applications. Belt drive motor optional on all three phase voltage models.
- Provisions for bottom or side condensate drain.
- Capable of thru-the-base or thru-the-curb electrical routing.
- Dependable time/temperature defrost logic provides a defrost cycle, if needed, every 30, 60, 90 or 120 minutes and is adjustable.
- Single-point electrical connection.
- Sloped, composite drain pan sheds water; and won't rust.
- Standardized controls and control box layout. Standardized components and controls make stocking parts and service easier.
- Clean, large, easy to use control box.
- Standard coils are copper round tube, aluminum plate fin with optional coil coatings and copper fin design.
- Color-coded wiring.
- Large, laminated wiring and power wiring drawings which are affixed to unit make troubleshooting easy.
- Single, central terminal board for test and wiring connections.
- Fast-access, handled, panels for easy access to the blower and blower motor, control box, and compressors.
- "No-strip" screw system guides screws into the panel and captures them tightly without stripping the screw, the panel, or the unit.
- Exclusive, newly-designed indoor refrigerant header for easier maintenance and replacement.
- Standard mechanical cooling (125°F to 30°F or 52°C to -1°C) .
- 2-in. (51mm) disposable filters on all units.
- High capacity refrigerant filter drier and TXV metering device on each circuit.
- High pressure switch, loss of charge switch and freeze protection adds greater unit reliability.
- Optional Staged Air Volume (SAV) system utilizes a Variable Frequency Drive (VFD) to automatically adjust the indoor fan motor speed between cooling stages. Available on 2-stage cooling models with electromechanical controls or RTU Open.

# MODEL NUMBER NOMENCLATURE

5 0 H C Q D 0 6 A 0 A 6 - 0 B 2 A 0

## Series - Weathermaster

50HCQ = Packaged Rooftop Heat  
Pump High Efficiency

## Refrig. Systems Options

A = Single stage cooling models  
D = 2-stage cooling models

## Cooling Tons

04 = 3 ton  
05 = 4 ton  
06 = 5 ton  
07 = 6 ton  
08 = 7.5 ton  
09 = 8.5 ton  
12 = 10 ton

## Sensor Options

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

## Indoor Fan Options

0 = Electric Drive X13 Motor (04 - 06)  
1 = Standard Static Option - Belt Drive  
2 = Medium Static Option - Belt Drive  
3 = High Static Option - Belt Drive  
C = High Static Option with High Efficiency Motor - Belt Drive  
(Size 12 only)

## Brand/Packaging

0 = Standard  
1 = LTL

## Electrical Options

A = None  
C = Non-Fused Disconnect  
D = Thru-the-base Connections  
F = Non-Fused Disconnect and  
Thru-the-base Connections  
G = 2-Speed Indoor Fan (VFD) Controller  
J = 2-Speed Fan Controller (VFD) &  
Non-fused Disconnect  
K = 2-Speed Fan Controller (VFD) &  
Thru-the-base Connections  
M = 2-Speed Fan Controller (VFD) w/Non-fused  
Disconnect & Thru-the-base Connections

## Service Options

0 = None  
1 = Unpowered Convenience Outlet  
2 = Powered Convenience Outlet  
3 = Hinged Panels  
4 = Hinged Panels, Unpowered Conv. Outlet  
5 = Hinged Panels, Powered Convenience Outlet

## Intake / Exhaust Options

A = None  
B = Temperature Economizer w/Barometric Relief  
F = Enthalpy Economizer w/Barometric Relief  
K = 2-Position Damper  
U = Temp Ultra Low Leak Economizer w/Baro Relief  
W = Enthalpy Ultra Low Leak Econo w/Baro Relief

## Base unit controls

0 = Base Electromechanical Controls  
1 = PremierLink Controller  
2 = RTU Open Multi-Protocol Controller  
6 = Electromechanical w/2-speed fan & W7220 Econo Controller

## Design Revision

- = Factory Design Revision

## Voltage

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

## Coil Options (Outdoor-Indoor-Hail Guard)

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

**Note: On single phase (-3 voltage code) models, the following are not available as a factory installed option:**

- Coated Coils or Cu Fin Coils
- Louvered Hail Guards
- Economizer or 2 Position Damper
- Powered 115 Volt Convenience Outlet

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# FACTORY OPTIONS AND/OR ACCESSORIES

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

CATEGORY	ITEM	FACTORY INSTALLED OPTION	FIELD INSTALLED ACCESSORY
<b>Cabinet</b>	Hinged access doors	X	
	Thru-the-base electrical connections	X	X
	Supply duct kit–Horizontal air applications (size 12 only)		X
<b>Coil Options</b>	Cu/Cu indoor and/or outdoor coils	X	
	Pre-coated outdoor coils	X	
	Premium, E-coated outdoor coils	X	
<b>Condenser Protection</b>	Condenser coil hail guard (louvered design)	X	X
<b>Controls</b>	Thermostats, temperature sensors, and subbases		X
	PremierLink DDC communicating controller	X	X
	RTU Open Multi-protocol controller	X	
	Smoke detector (supply and/or return air)	X	
	Time Guard II compressor delay control circuit		X
	Phase Monitor		X
<b>Economizers &amp; Outdoor Air Dampers</b>	EconoMi\$er IV (for electro-mechanical controlled RTUs)	X	X
	EconoMi\$er2 (for DDC controlled RTUs)	X	X
	Motorized 2 position outdoor air damper	X	X
	Manual outdoor air damper (25% and 50%)		X
	Barometric relief <sup>1</sup>	X	X
	Power exhaust		X
	Ultra Low Leak EconoMi\$er X (for 2-speed SAV system only with 2-stage cooling), vertical supply and return air only.	X	X
<b>Economizer Sensors &amp; IAQ Devices</b>	Single dry bulb temperature sensors <sup>2</sup>	X	X
	Differential dry bulb temperature sensors <sup>2</sup>		X
	Single enthalpy sensors <sup>2</sup>	X	X
	Differential enthalpy sensors <sup>2</sup>		X
	CO <sub>2</sub> sensor (wall, duct, or unit mounted) <sup>2</sup>	X	X
<b>Electric Heat</b>	Electric Resistance Heaters		X
	Single Point Kit		X
<b>Indoor Motor &amp; Drive</b>	Multiple motor and belt drive packages	X	
	Electric Drive, X13, 5-speed/torque (3–5 ton)	X	
	Staged Air Vol (SAV) system w/VFD controller (2-stage cool only with electrical mechanical and RTU Open controls)	X	
	Display Kit for SAV system with VFD		X
<b>Low Ambient Control</b>	Motormaster® head pressure controller <sup>3</sup>		X
<b>Power Options</b>	Convenience outlet (powered)	X	
	Convenience outlet (unpowered)	X	
	Non-fused disconnect	X	
<b>Roof Curbs</b>	Roof curb 14-in. (356mm)		X
	Roof curb 24-in. (610mm)		X

**NOTES:**

1. Included with economizer.
2. Sensors for optimizing economizer.
3. See application data for assistance.

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## FACTORY OPTIONS AND/OR ACCESSORIES (cont.)

### Economizer (dry bulb or enthalpy)

Economizers save money. They bring in fresh, outside air for ventilation; and provide cool, outside air to cool your building. This is the preferred method of low ambient cooling. When coupled to CO<sub>2</sub> sensors, economizers can provide even more savings by coupling the ventilation air to only that amount required.

Economizers are available, installed and tested by the factory, with either enthalpy or dry bulb temperature inputs. There are also models for electromechanical as well as direct digital controllers. Additional sensors are available as accessories to optimize the economizers.

Economizers include gravity controlled, barometric relief which equalizes building pressure and ambient air pressures. This can be a cost effective solution to prevent building pressurization.

### CO<sub>2</sub> Sensor

Improves productivity and saves money by working with the economizer to intake only the correct amount of outside air for ventilation. As occupants fill your building, the CO<sub>2</sub> sensor detects their presence through increasing CO<sub>2</sub> levels, and opens the economizer appropriately.

When the occupants leave, the CO<sub>2</sub> levels decrease, and the sensor appropriately closes the economizer. This intelligent control of the ventilation air, called Demand Control Ventilation (DCV) reduces the overall load on the rooftop, saving money.

### Smoke Detectors

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

### Louvered Hail Guards

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

### Convenience Outlet (powered or unpowered)

Lower service bills by including a convenience outlet in your specification. Carrier will install this service feature at our factory, powered or unpowered. Provides a convenient, 15 amp, 115V GFCI receptacle.

### Non-fused Disconnect

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

### Power Exhaust Pressure Relief

Superior internal building pressure control. This field-installed accessory may eliminate the need for costly, external pressure control fans.

### PremierLink

This CCN controller regulates your rooftop's performance to tighter tolerances and expanded limits, as well as facilitates zoning systems and digital accessories. It also unites your Carrier HVAC equipment together on one, coherent CCN network. The PremierLink can be factory installed, or easily field-installed.

### RTU Open, Multi-protocol Controller

Connect the rooftop to an existing BAS without needing complicated translators or adapter modules using the RTU Open controller. This new controller speaks the 4 most common building automation system languages (Bacnet, Modbus, N2, and Lonworks). Use this controller when you have an existing BAS.

### Time Guard II Control Circuit

This accessory protects your compressor by preventing short-cycling in the event of some other failure, prevents the compressor from restarting for 30 seconds after stopping. Not required with PremierLink, RTU Open, or authorized commercial thermostats.

### Motorized 2-Position Damper

The new Carrier 2-position, motorized outdoor air damper admits up to 100% outside air. Using reliable, gear-driven technology, the 2-position damper opens to allow ventilation air and closes when the rooftop stops, stopping unwanted infiltration.

### Manual OA Damper

Manual outdoor air dampers are an economical way to bring in ventilation air. The dampers are available in 25% and 50% versions.

## FACTORY OPTIONS AND/OR ACCESSORIES (cont.)

### Staged Air Volume (SAV) Indoor Fan Speed System

Carrier's Staged Air Volume (SAV) system saves energy and installation time by utilizing a Variable Frequency Drive (VFD) to automatically adjust the indoor fan motor speed in sequence with the units cooling operation. Per ASHRAE 90.1 2010 standard section 6.4.3.10.b, during the first stage of cooling operation the VFD will adjust the fan motor to provide 2/3rd of the total cfm established for the unit. When a call for the second stage of cooling is required, the VFD will allow the total cfm for the unit established (100%). During the heating mode the VFD will allow total design cfm (100%) operation and during the ventilation mode the VFD will allow operation to 2/3rd of total cfm.

Compared to single speed indoor fan motor systems, Carrier's SAV system can save substantial energy, 25%+\*, versus single speed indoor fan motor systems.

The VFD used in Carrier's SAV system has soft start capabilities to slowly ramp up the speeds, thus eliminating any high inrush air volume during initial start-up. It also has internal over current protection for the fan motor and a field installed display kit that allows adjustment and in depth diagnostics of the VFD.

This SAV system is available on models with 2-stage cooling operation with electrical mechanical or RTU Open, Multi Protocol controls. Both space sensor and conventional thermostats controls can be used to provide accurate control in any application.

The SAV system is very flexible for initial fan performance set up and adjustment. The standard factory shipped VFD is pre-programmed to automatically stage the fan speed between the first and second stage of cooling. The unit fan performance static pressure and cfm can be easily adjusted using the traditional means of pulley adjustments. The other means to adjust the unit static and cfm performance is to utilize the field installed Display Kit and adjust the frequency and voltage in the VFD to required performance requirements. In either case, once set up, the VFD will automatically adjust the speed between the cooling stage operations.

\*Data based on .10 (\$/kWh) in an office application utilizing Carrier's HAP 4.6 simulation software program

### Motormaster Head Pressure Controller

The Motormaster motor controller is a low ambient, head pressure controller kit that is designed to maintain the unit's condenser head pressure during periods of low ambient cooling operation. This device should be used as an alternative to economizer free cooling when economizer usage is either not appropriate or desired. The Motormaster will either cycle the outdoor fan motors or operate them at reduced speed to maintain the unit operation, depending on the model.

### Alternate Motors and Drives

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

### Thru-the-Base Connections

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

### Electric Heaters

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

### Hinged Access Panels

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

**Table 2 – AHRI COOLING RATING TABLES**

UNIT	COOLING STAGES	NOMINAL CAPACITY (TONS)	NET COOLING CAPACITY (BTUH)	TOTAL POWER (kW)	SEER	EER	IEER
A04	1	3	36,400	2.8	15.60	12.70	N/A
A05	1	4	47,000	3.6	15.80	12.80	N/A
A06	1	5	58,500	4.6	15.00	12.50	N/A
A07	1	6	72,000	6.0	N/A	12.00	12.8

UNIT	COOLING STAGES	NOMINAL CAPACITY (TONS)	NET COOLING CAPACITY (BTUH)	TOTAL POWER (kW)	SEER	EER	IEER WITH SINGLE SPEED INDOOR MOTOR	IEER WITH 2-SPEED INDOOR MOTOR
D08	2	7.5	90,000	7.4	N/A	12.10	12.8	13.7
D09	2	8.5	100,000	8.3	N/A	12.00	12.5	12.9
D12	2	10	119,000	9.8	N/A	12.30	13.0	13.6

NA Not applicable

HEATING MODE					
UNIT	HSPF	HEATING, LOW		HEATING, HIGH	
		CAPACITY (BTUH)	COP	CAPACITY (BTUH)	COP
A04	8.00	18,400	N/A	34,000	N/A
A05	8.10	23,800	N/A	46,000	N/A
A06	8.20	28,600	N/A	55,000	N/A
A07	N/A	39,000	2.40	70,000	3.40
D08	N/A	47,000	2.40	84,000	3.50
D09	N/A	56,000	2.26	100,000	3.40
D12	N/A	65,000	2.40	116,000	3.50

**LEGEND**

- AHRI – Air Conditioning, Heating and Refrigeration Institute
- ASHRAE – American Society of Heating, Refrigerating and Air Conditioning, Inc.
- COP – Coefficient of Performance
- EER – Energy Efficiency Ratio
- HSPF – Heating Seasonal Performance Factor
- IEER – Integrated Energy Efficiency Ratio
- SEER – Seasonal Energy Efficiency Ratio

**NOTES:**

1. Rated and certified under AHRI Standard 210/240 or 340/360, as appropriate.
2. Ratings are based on:  
**Cooling Standard:** 80°F (27°C) db, 67°F (19°C) wb indoor air temp and 95°F db outdoor air temp.  
**IEER Standard:** A measure that expresses cooling part-load EER efficiency for commercial unitary air conditioning and heat pump equipment on the basis of weighted operation at variable load capacities.
3. All 50HCQ units comply with ASHRAE 90.1 Energy Standard for minimum SEER and EER requirements.

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**Table 3 – MINIMUM - MAXIMUM AIRFLOWS ELECTRIC HEAT**

UNIT	COOLING		ELECTRIC HEATERS	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
50HCQA04	900	1500	900	1500
50HCQA05	1200	2000	1200	2000
50HCQA06	1500	2500	1500	2500
50HCQA07	1800	3000	1800	3000
50HCQD08	2250 (1508)	3750	2250*	3750
50HCQD09	2550 (1869)	4250	2552*	4250
50HCQD12	3000 (1993)	5000	3000*	5000

( ) With Staged Air volume (SAV) 2–speed indoor fan motor system only. Values are minimum for VFD controller at 40Hz.

\* Minimum electric heat CFM exceptions :

UNIT	UNIT VOLTAGE	HEATER kW	UNIT CONFIGURATION	REQUIRED MINIMUM CFM
50HCQD08 50HCQD09	575	17.0	Horizontal or Vertical	2800
		34.0		2350
50HCQD12	230	50.0	Vertical	3550
			Horizontal	3420
		43.5	Horizontal or Vertical	3040
	575	50.0	Vertical	3150
		33.5		3520
		26.5	Horizontal	3420
		Vertical	3610	

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**Table 4 – SOUND PERFORMANCE TABLE**

50HCQ	OUTDOOR SOUND (dB)								
	A-WEIGHTED	63	125	250	500	1000	2000	4000	8000
A04	76	51.8	69.0	64.6	67.8	70.7	63.8	60.9	59.0
A05	79	56.1	69.6	68.7	72.5	72.8	68.9	65.0	61.2
A06	79	57.7	66.6	68.7	72.9	74.5	71.1	67.6	62.6
A07	81	86.7	82.7	79.1	78.4	75.4	71.2	67.8	62.9
D08	83	87.3	81.6	79.7	80.6	79.0	73.5	69.2	66.1
D09	87	61.7	74.7	77.4	82.6	84.9	81.9	78.8	75.9
D12	83	61.0	67.3	75.1	77.7	78.1	75.5	71.2	66.7

**LEGEND**

dB – Decibel

**NOTES:**

1. Outdoor sound data is measured in accordance with AHRI standard 270–95.
2. Measurements are expressed in terms of sound power. Do not compare these values to sound pressure values because sound pressure accounts for specific environmental factors which do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
3. A–weighted sound ratings filter out very high and very low frequencies, to better approximate the response of an “average” human ear. A–weighted measurements for Carrier units are taken in accordance with 270–95.

**Table 5 – PHYSICAL DATA**

**(COOLING)**

**3 - 6 TONS**

	<b>50HCQA04</b>	<b>50HCQA05</b>	<b>50HCQA06</b>	<b>50HCQA07</b>	
<b>Refrigeration System</b>					
# Circuits / # Comp. / Type	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll	
Refrig. charge per circuit A/B(lbs-oz)	12 – 8 / –	15 – 8 / –	17 – 8 / –	15 – 8 / –	
Metering Device	TXV	TXV	TXV	TXV	
High pressure Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505	
Loss of Charge Press. Trip / Reset (psig)	27 / 44	27 / 44	27 / 44	27 / 44	
Compressor Capacity Staging (%)	100	100	100	100	
<b>Evap. Coil</b>					
Material – Tube / Fin	Cu / Al	Cu / Al	Cu / Al	Cu / Al	
Coil type	3/8-in RTPF	3/8-in RTPF	3/8-in RTPF	3/8-in RTPF	
Rows / FPI	3 / 15	3 / 15	4 / 15	3 / 15	
Total Face Area (ft <sup>2</sup> )	5.5	7.3	7.3	8.9	
Condensate Drain Conn. Size	3/4-in	3/4-in	3/4-in	3/4-in	
<b>Evap. Fan and Motor</b>					
Standard Static 1 phase	Motor Qty / Drive Type	1 / Direct	1 / Direct	1 / Direct	N/A
	Max BHP	1.0	1.0	1.0	N/A
	RPM Range	600–1200	600–1200	600–1200	N/A
	Motor Frame Size	48	48	48	N/A
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	N/A
	Fan Diameter x Length (in)	10 x 10	10 x 10	11 x 10	N/A
Standard Static 3 phase	Motor Qty / Drive Type	1 / Direct	1 / Direct	1 / Direct	1 / Belt
	Max BHP	1.0	1.0	1.0	1.2
	RPM Range	600–1200	600–1200	600–1200	489–747
	Motor Frame Size	48	48	48	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	10 x 10	10 x 10	11 x 10	15 x 15
Medium Static 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	1.5	1.5	2.0	2.9
	RPM Range	819–1251	920–1303	1066–1380	733–949
	Motor Frame Size	56	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	10 x 10	10 x 10	10 x 10	15 x 15
High Static 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
	Max BHP	2.0	2.0	2.9	4.0
	RPM Range	1035–1466	1035–1466	1208–1639	909–1102
	Motor Frame Size	56	56	56	145
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	10 x 10	10 x 10	10 x 10	15 x 15
<b>Cond. Coil</b>					
Material – Tube / Fin	Cu / Al	Cu / Al	Cu / Al	Cu / Al	
Coil type	3/8-in RTPF	3/8-in RTPF	3/8-in RTPF	3/8-in RTPF	
Rows / FPI	2 / 17	2 / 17	2 / 17	2 / 17	
Total Face Area (ft <sup>2</sup> )	16.5	21.3	21.3	20.5	
<b>Cond. fan / motor</b>					
Qty / Motor Drive Type	1 / direct	1 / direct	1 / direct	2 / direct	
Motor HP / RPM	1/8 / 825	1/4 / 1100	1/4 / 1100	1/4 / 1100	
Fan diameter (in)	22	22	22	22	
<b>Filters</b>					
RA Filter # / Size (in)	2 / 16 x 25 x 2	4 / 16 x 16 x 2	4 / 16 x 16 x 2	4 / 16 x 20 x 2	
OA inlet screen # / Size (in)	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 36 x 1	

**50HCQ**

**Table 6 – PHYSICAL DATA**

**(COOLING)**

**7.5 - 10 TONS**

	<b>50HCQD08</b>	<b>50HCQD09</b>	<b>50HCQD12</b>	
<b>Refrigeration System</b>				
# Circuits / # Comp. / Type	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	
Refrig. charge per circuit A/B (lbs-oz)	11 – 12 / 11 – 12	14 – 1/14 – 4	16 – 3/17 – 3	
Metering Device	TXV	TXV	TXV	
High pressure Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	
Loss of Charge Press. Trip / Reset (psig)	27 / 44	27 / 44	27 / 44	
Compressor Capacity Staging (%)	50 / 100	50 / 100	50 / 100	
<b>Evap. Coil</b>				
Material – Tube / Fin	Cu / Al	Cu / Al	Cu / Al	
Coil type	3/8-in RTPF	3/8-in RTPF	3/8-in RTPF	
Rows / FPI	4 / 15	4 / 15	3 / 15	
Total Face Area (ft <sup>2</sup> )	11.1	11.1	17.3	
Condensate Drain Conn. Size	3/4-in	3/4-in	3/4-in	
<b>Evap. Fan and Motor</b>				
Standard Static 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt
	Max BHP	1.2	1.2	2.4
	RPM Range	518–733	460–652	440–609
	Motor Frame Size	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	15 x 15	15 x 15	18 x 18
Medium Static 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt
	Max BHP	1.7	2.9	2.9
	RPM Range	690–936	591–838	547–757
	Motor Frame Size	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	15 x 15	15 x 15	18 x 18
High Static 3 phase	Motor Qty / Drive Type	1 / Belt	1 / Belt	1 / Belt
	Max BHP	2.8	2.9	6.1
	RPM Range	838–1084	838–1084	762–963
	Motor Frame Size	56	56	S184T
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter x Length (in)	15 x 15	15 x 15	18 x 18
<b>Cond. Coil</b>				
Material – Tube / Fin	Cu / Al	Cu / Al	Cu / Al	
Coil type	3/8-in RTPF	3/8-in RTPF	3/8-in RTPF	
Rows / FPI	2 / 17	3 / 17	2 / 17	
Total Face Area (ft <sup>2</sup> )	25.1	25.1	46.2	
<b>Cond. fan / motor</b>				
Qty / Motor Drive Type	2 / direct	1 / direct	3 / direct	
Motor HP / RPM	1/4 / 1100	1 / 1175	1 / 1100	
Fan diameter (in)	22	30	22	
<b>Filters</b>				
RA Filter # / Size (in)	4 / 20 x 20 x 2	4 / 20 x 20 x 2	6 / 18 x 24 x 2	
OA inlet screen # / Size (in)	1 / 20 x 24 x 1	1 / 20 x 24 x 1	2 / 24 x 27 x 1 (Vert) 1 / 30 x 39 x 1 (Horiz)	

**50HCQ**

Table 7 – 50HCQA04

**ELECTRIC HEAT - ELECTRICAL DATA  
SINGLE STAGE COOLING SINGLE SPEED INDOOR FAN MOTOR**

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLE			
					WITHOUT C.O. or UNPWRD C.O.		w/PWRD C.O.	
					WITHOUT P.E.	w/ P.E. (pwrd fr/unit)	WITHOUT P.E.	w/ P.E. (pwrd fr/unit)
208/ 230-1-60	DD- STD	101A00	4.4	3.3/4.0	037A00	037A00	037A00	037A00
		102A00	6.5	4.9/6.0	040A00	040A00	040A00	040A00
		103B00	8.7	6.5/8.0	040A00	040A00	040A00	040A00
		104B00	10.5	7.9/9.6	040A00	040A00	040A00	040A00
		102A00,102A00	13.0	9.8/11.9	041A00	041A00	041A00	041A00
208/ 230-3-60	DD- STD	101A00	4.4	3.3/4.0	-	-	-	-
		102A00	6.5	4.9/6.0	-	-	-	-
		103B00	8.7	6.5/8.0	-	-	037A00	037A00
		104B00	10.5	7.9/9.6	037A00	037A00	037A00	037A00
		105A00	16.0	12.0/14.7	038A00	038A00	038A00	038A00
	MED	101A00	4.4	3.3/4.0	-	-	-	-
		102A00	6.5	4.9/6.0	-	-	-	-
		103B00	8.7	6.5/8.0	-	-	-	037A00
		104B00	10.5	7.9/9.6	037A00	037A00	037A00	037A00
		105A00	16.0	12.0/14.7	038A00	038A00	038A00	038A00
	HIGH	101A00	4.4	3.3/4.0	-	-	-	-
		102A00	6.5	4.9/6.0	-	-	-	-
		103B00	8.7	6.5/8.0	-	-	-	037A00
		104B00	10.5	7.9/9.6	037A00	037A00	037A00	037A00
		105A00	16.0	12.0/14.7	038A00	038A00	038A00	038A00
460-3-60	DD- STD	106A00	6.0	5.5	-	-	-	-
		107A00	8.8	8.1	-	-	-	-
		108A00	11.5	10.6	-	-	-	-
		109A00	14.0	12.9	-	-	-	-
	MED	106A00	6.0	5.5	-	-	-	-
		107A00	8.8	8.1	-	-	-	-
		108A00	11.5	10.6	-	-	-	-
		109A00	14.0	12.9	-	-	-	-
	HIGH	106A00	6.0	5.5	-	-	-	-
		107A00	8.8	8.1	-	-	-	-
		108A00	11.5	10.6	-	-	-	-
		109A00	14.0	12.9	-	-	-	-

**50HCQ**

**LEGEND**

- No Single Point Kit required
- APP PWR - 208 / 230V / 460V / 575V
- BD - Belt drive motor
- C.O. - Convenience outlet
- DD - Electric Drive X13 5 speed/torque motor
- FLA - Full load amps
- IFM - Indoor fan motor
- NOM PWR - 240V / 480V / 600V
- P.E. - Power exhaust
- PWRD - Powered convenience outlet
- UNPWRD - Unpowered convenience outlet

Table 8 – 50HCQA05

**ELECTRIC HEAT - ELECTRICAL DATA  
SINGLE STAGE COOLING SINGLE SPEED INDOOR FAN MOTOR**

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLE			
					WITHOUT C.O. or UNPWRD C.O.		w/PWRD C.O.	
					WITHOUT P.E.	w/ P.E. (pwrd fr/unit)	WITHOUT P.E.	w/ P.E. (pwrd fr/unit)
208/ 230-1-60	DD- STD	101A00	4.4	3.3/4.0	037A00	037A00	040A00	040A00
		103B00	8.7	6.5/8.0	040A00	040A00	040A00	040A00
		102A00,102A00	13.0	9.8/11.9	041A00	041A00	041A00	041A00
		103B00,103B00	17.4	13.1/16.0	041A00	041A00	041A00	041A00
		104B00,104B00	21.0	15.8/19.3	041A00	041A00	041A00	041A00
208/ 230-3-60	DD- STD	102A00	6.5	4.9/6.0	-	-	-	037A00
		103B00	8.7	6.5/8.0	037A00	037A00	037A00	037A00
		105A00	16.0	12.0/14.7	038A00	038A00	038A00	038A00
		104B00,104B00	21.0	15.8/19.3	039A00	039A00	039A00	039A00
	MED	102A00	6.5	4.9/6.0	-	-	-	-
		103B00	8.7	6.5/8.0	-	037A00	037A00	037A00
		105A00	16.0	12.0/14.7	038A00	038A00	038A00	038A00
		104B00,104B00	21.0	15.8/19.3	039A00	039A00	039A00	039A00
	HIGH	102A00	6.5	4.9/6.0	-	-	-	-
		103B00	8.7	6.5/8.0	-	037A00	037A00	037A00
		105A00	16.0	12.0/14.7	038A00	038A00	038A00	038A00
		104B00,104B00	21.0	15.8/19.3	039A00	039A00	039A00	039A00
460-3-60	DD- STD	106A00	6.0	5.5	-	-	-	-
		108A00	11.5	10.6	-	-	-	-
		109A00	14.0	12.9	-	-	-	-
		108A00,108A00	23.0	21.1	037A00	037A00	037A00	037A00
	MED	106A00	6.0	5.5	-	-	-	-
		108A00	11.5	10.6	-	-	-	-
		109A00	14.0	12.9	-	-	-	-
		108A00,108A00	23.0	21.1	037A00	037A00	037A00	037A00
	HIGH	106A00	6.0	5.5	-	-	-	-
		108A00	11.5	10.6	-	-	-	-
		109A00	14.0	12.9	-	-	-	-
		108A00,108A00	23.0	21.1	037A00	037A00	037A00	037A00

50HCQ

**LEGEND**

- No Single Point Kit required
- APP PWR - 208 / 230V / 460V / 575V
- BD - Belt drive motor
- C.O. - Convenience outlet
- DD - Electric Drive X13 5 speed/torque motor
- FLA - Full load amps
- IFM - Indoor fan motor
- NOM PWR - 240V / 480V / 600V
- P.E. - Power exhaust
- PWRD - Powered convenience outlet
- UNPWRD - Unpowered convenience outlet

Table 9 – 50HCQA06

ELECTRIC HEAT - ELECTRICAL DATA  
SINGLE STAGE COOLING SINGLE SPEED INDOOR FAN MOTOR

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLE			
					WITHOUT C.O. or UNPWRD C.O.		w/PWRD C.O.	
					WITHOUT P.E.	w/ P.E. (pwr fr/unit)	WITHOUT P.E.	w/ P.E. (pwr fr/unit)
208/ 230-1-60	DD- STD	102A00	6.5	4.9/6.0	040A00	040A00	040A00	040A00
		103B00	8.7	6.5/8.0	040A00	040A00	040A00	040A00
		102A00,102A00	13.0	9.8/11.9	041A00	041A00	041A00	041A00
		103B00,103B00	17.4	13.1/16.0	041A00	041A00	041A00	041A00
		104B00,104B00	21.0	15.8/19.3	041A00	041A00	041A00	041A00
208/ 230-3-60	DD- STD	102A00	6.5	4.9/6.0	-	-	037A00	037A00
		104B00	10.5	7.9/9.6	038A00	038A00	038A00	038A00
		105A00	16.0	12.0/14.7	038A00	038A00	038A00	038A00
		104B00,104B00	21.0	15.8/19.3	039A00	039A00	039A00	039A00
		104B00,105A00	26.5	19.9/24.3	039A00	039A00	039A00	039A00
	MED	102A00	6.5	4.9/6.0	-	-	037A00	037A00
		104B00	10.5	7.9/9.6	037A00	037A00	038A00	038A00
		105A00	16.0	12.0/14.7	038A00	038A00	038A00	038A00
		104B00,104B00	21.0	15.8/19.3	039A00	039A00	039A00	039A00
		104B00,105A00	26.5	19.9/24.3	039A00	039A00	039A00	039A00
	HIGH	102A00	6.5	4.9/6.0	-	-	037A00	037A00
		104B00	10.5	7.9/9.6	038A00	038A00	038A00	038A00
		105A00	16.0	12.0/14.7	038A00	038A00	038A00	038A00
		104B00,104B00	21.0	15.8/19.3	039A00	039A00	039A00	039A00
		104B00,105A00	26.5	19.9/24.3	039A00	039A00	039A00	039A00
460-3-60	DD- STD	106A00	6.0	5.5	-	-	-	-
		108A00	11.5	10.6	-	-	-	-
		109A00	14.0	12.9	-	-	-	-
		108A00,108A00	23.0	21.1	037A00	037A00	037A00	037A00
		108A00,109A00	25.5	23.4	037A00	037A00	037A00	037A00
	MED	106A00	6.0	5.5	-	-	-	-
		108A00	11.5	10.6	-	-	-	-
		109A00	14.0	12.9	-	-	-	-
		108A00,108A00	23.0	21.1	037A00	037A00	037A00	037A00
		108A00,109A00	25.5	23.4	037A00	037A00	037A00	037A00
	HIGH	106A00	6.0	5.5	-	-	-	-
		108A00	11.5	10.6	-	-	-	-
		109A00	14.0	12.9	-	-	-	-
		108A00,108A00	23.0	21.1	037A00	037A00	037A00	037A00
		108A00,109A00	25.5	23.4	037A00	037A00	037A00	037A00

LEGEND

- No Single Point Kit required
- APP PWR - 208 / 230V / 460V / 575V
- BD - Belt drive motor
- C.O. - Convenience outlet
- DD - Electric Drive X13 5 speed/torque motor
- FLA - Full load amps
- IFM - Indoor fan motor
- NOM PWR - 240V / 480V / 600V
- P.E. - Power exhaust
- PWRD - Powered convenience outlet
- UNPWRD - Unpowered convenience outlet

Table 10 – 50HCQA07

**ELECTRIC HEAT - ELECTRICAL DATA  
SINGLE STAGE COOLING SINGLE SPEED INDOOR FAN MOTOR**

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLE			
					WITHOUT C.O. or UNPWRD C.O.		w/PWRD C.O.	
					WITHOUT P.E.	w/ P.E. (pwrd fr/unit)	WITHOUT P.E.	w/ P.E. (pwrd fr/unit)
208/ 230-3-60	STD	264A00	6.5	4.9/6.0	042A00	042A00	042A00	045A00
		117A00	10.4	7.8/9.6	043A00	043A00	043A00	043A00
		110A00	16.0	12.0/14.7	043A00	043A00	043A00	043A00
		117A00,117A00	21.0	15.8/19.3	045A00	045A00	045A00	045A00
		110A00,117A00	26.5	19.9/24.3	045A00	045A00	045A00	045A00
	MED	264A00	6.5	4.9/6.0	042A00	042A00	042A00	045A00
		117A00	10.4	7.8/9.6	043A00	043A00	043A00	043A00
		110A00	16.0	12.0/14.7	043A00	043A00	043A00	043A00
		117A00,117A00	21.0	15.8/19.3	045A00	045A00	045A00	045A00
		110A00,117A00	26.5	19.9/24.3	045A00	045A00	045A00	045A00
	HIGH	264A00	6.5	4.9/6.0	045A00	045A00	045A00	045A00
		117A00	10.4	7.8/9.6	043A00	043A00	043A00	043A00
		110A00	16.0	12.0/14.7	043A00	043A00	043A00	043A00
		117A00,117A00	21.0	15.8/19.3	045A00	045A00	045A00	045A00
		110A00,117A00	26.5	19.9/24.3	045A00	045A00	045A00	045A00
460-3-60	STD	265A00	6.0	5.5	042A00	042A00	042A00	042A00
		266A00	11.5	10.6	042A00	042A00	042A00	042A00
		267A00	14.0	12.9	042A00	042A00	042A00	042A00
		268A00	23.0	21.1	042A00	042A00	042A00	042A00
		269A00	25.5	23.4	042A00	042A00	042A00	042A00
	MED	265A00	6.0	5.5	042A00	042A00	042A00	042A00
		266A00	11.5	10.6	042A00	042A00	042A00	042A00
		267A00	14.0	12.9	042A00	042A00	042A00	042A00
		268A00	23.0	21.1	042A00	042A00	042A00	042A00
		269A00	25.5	23.4	042A00	042A00	042A00	042A00
	HIGH	265A00	6.0	5.5	042A00	042A00	042A00	042A00
		266A00	11.5	10.6	042A00	042A00	042A00	042A00
		267A00	14.0	12.9	042A00	042A00	042A00	042A00
		268A00	23.0	21.1	042A00	042A00	042A00	042A00
		269A00	25.5	23.4	042A00	048A00	048A00	048A00

**50HCQ**

**LEGEND**

- No Single Point Kit required
- APP PWR - 208 / 230V / 460V / 575V
- C.O. - Convenience outlet
- FLA - Full load amps
- IFM - Indoor fan motor
- NOM PWR - 240V / 480V / 600V
- P.E. - Power exhaust
- PWRD - Powered convenience outlet
- UNPWRD - Unpowered convenience outlet

Table 11 – 50HCQD08

**ELECTRIC HEAT - ELECTRICAL DATA  
2-STAGE COOLING SINGLE SPEED INDOOR FAN MOTOR**

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLE			
					WITHOUT C.O. or UNPWRD C.O.		w/PWRD C.O.	
					WITHOUT P.E.	w/ P.E. (pwrd fr/unit)	WITHOUT P.E.	w/ P.E. (pwrd fr/unit)
208/ 230-3-60	STD	117A00	10.4	7.8/9.6	049A00	049A00	049A00	049A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	049A00
		111A00	24.8	18.6/22.8	051A00	051A00	051A00	051A00
		112A00	32.0	24.0/29.4	051A00	051A00	051A00	051A00
		112A00,117A00	42.4	31.8/38.9	053A00	053A00	053A00	053A00
	MED	117A00	10.4	7.8/9.6	049A00	049A00	049A00	049A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	049A00
		111A00	24.8	18.6/22.8	051A00	051A00	051A00	051A00
		112A00	32.0	24.0/29.4	051A00	051A00	051A00	051A00
		112A00,117A00	42.4	31.8/38.9	053A00	053A00	053A00	053A00
	HIGH	117A00	10.4	7.8/9.6	049A00	049A00	049A00	049A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	049A00
111A00		24.8	18.6/22.8	051A00	051A00	051A00	051A00	
112A00		32.0	24.0/29.4	051A00	051A00	051A00	051A00	
112A00,117A00		42.4	31.8/38.9	053A00	053A00	053A00	053A00	
460-3-60	STD	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	047A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
	MED	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	047A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
	HIGH	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	050A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
575-3-60	STD	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00
	MED	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00
	HIGH	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00

**LEGEND**

- No Single Point Kit required
- APP PWR - 208 / 230V / 460V / 575V
- C.O. - Convenience outlet
- FLA - Full load amps
- IFM - Indoor fan motor
- NOM PWR - 240V / 480V / 600V
- P.E. - Power exhaust
- PWRD - Powered convenience outlet
- UNPWRD - Unpowered convenience outlet



Table 12 – 50HCQD08

**ELECTRIC HEAT - ELECTRICAL DATA  
2-STAGE COOLING 2-SPEED INDOOR FAN MOTOR**

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLE			
					WITHOUT C.O. or UNPWRD C.O.		w/PWRD C.O.	
					WITHOUT P.E.	w/ P.E. (pwrd fr/unit)	WITHOUT P.E.	w/ P.E. (pwrd fr/unit)
208/ 230-3-60	STD	117A00	10.4	7.8/9.6	049A00	049A00	049A00	049A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	049A00
		111A00	24.8	18.6/22.8	051A00	051A00	051A00	051A00
		112A00	32.0	24.0/29.4	051A00	051A00	051A00	051A00
		112A00,117A00	42.4	31.8/38.9	053A00	053A00	053A00	053A00
	MED	117A00	10.4	7.8/9.6	049A00	049A00	049A00	049A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	049A00
		111A00	24.8	18.6/22.8	051A00	051A00	051A00	051A00
		112A00	32.0	24.0/29.4	051A00	051A00	051A00	051A00
		112A00,117A00	42.4	31.8/38.9	053A00	053A00	053A00	053A00
	HIGH	117A00	10.4	7.8/9.6	049A00	049A00	049A00	049A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	049A00
111A00		24.8	18.6/22.8	051A00	051A00	051A00	051A00	
112A00		32.0	24.0/29.4	051A00	051A00	051A00	051A00	
112A00,117A00		42.4	31.8/38.9	053A00	053A00	053A00	053A00	
460-3-60	STD	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	047A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
	MED	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	050A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
	HIGH	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	050A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
575-3-60	STD	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00
	MED	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00
	HIGH	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00

**50HCQ**

**LEGEND**

- No Single Point Kit required
- APP PWR – 208 / 230V / 460V / 575V
- C.O. – Convenience outlet
- FLA – Full load amps
- IFM – Indoor fan motor
- NOM PWR – 240V / 480V / 600V
- P.E. – Power exhaust
- PWRD – Powered convenience outlet
- UNPWRD – Unpowered convenience outlet

Table 13 – 50HCQD09

**ELECTRIC HEAT - ELECTRICAL DATA  
2-STAGE COOLING SINGLE SPEED INDOOR FAN MOTOR**

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLE			
					WITHOUT C.O. or UNPWRD C.O.		w/PWRD C.O.	
					WITHOUT P.E.	w/ P.E. (pwrd fr/unit)	WITHOUT P.E.	w/ P.E. (pwrd fr/unit)
208/ 203-3-60	STD	117A00	10.4	7.8/9.6	049A00	049A00	049A00	049A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	049A00
		111A00	24.8	18.6/22.8	051A00	051A00	051A00	051A00
		112A00	32.0	24.0/29.4	051A00	051A00	051A00	051A00
		112A00,117A00	42.4	31.8/38.9	053A00	053A00	053A00	053A00
	MED	117A00	10.4	7.8/9.6	049A00	049A00	049A00	051A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	051A00
		111A00	24.8	18.6/22.8	051A00	051A00	051A00	053A00
		112A00	32.0	24.0/29.4	051A00	051A00	051A00	053A00
		112A00,117A00	42.4	31.8/38.9	053A00	053A00	053A00	054A00
	HIGH	117A00	10.4	7.8/9.6	049A00	049A00	049A00	051A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	051A00
111A00		24.8	18.6/22.8	051A00	051A00	051A00	053A00	
112A00		32.0	24.0/29.4	051A00	051A00	051A00	053A00	
112A00,117A00		42.4	31.8/38.9	053A00	053A00	053A00	054A00	
460-3-60	STD	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	050A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
	MED	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	050A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
	HIGH	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	050A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
575-3-60	STD	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00
	MED	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00
	HIGH	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00

**LEGEND**

- No Single Point Kit required
- APP PWR - 208 / 230V / 460V / 575V
- C.O. - Convenience outlet
- FLA - Full load amps
- IFM - Indoor fan motor
- NOM PWR - 240V / 480V / 600V
- P.E. - Power exhaust
- PWRD - Powered convenience outlet
- UNPWRD - Unpowered convenience outlet

Table 14 – 50HCQD09

**ELECTRIC HEAT - ELECTRICAL DATA  
2-STAGE COOLING 2-SPEED INDOOR FAN MOTOR**

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLE			
					WITHOUT C.O. or UNPWRD C.O.		w/PWRD C.O.	
					WITHOUT P.E.	w/ P.E. (pwrd fr/unit)	WITHOUT P.E.	w/ P.E. (pwrd fr/unit)
208/ 203-3-60	STD	117A00	10.4	7.8/9.6	049A00	049A00	049A00	049A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	049A00
		111A00	24.8	18.6/22.8	051A00	051A00	051A00	051A00
		112A00	32.0	24.0/29.4	051A00	051A00	051A00	051A00
		112A00,117A00	42.4	31.8/38.9	053A00	053A00	053A00	053A00
	MED	117A00	10.4	7.8/9.6	049A00	049A00	049A00	051A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	051A00
		111A00	24.8	18.6/22.8	051A00	051A00	051A00	053A00
		112A00	32.0	24.0/29.4	051A00	051A00	051A00	053A00
		112A00,117A00	42.4	31.8/38.9	053A00	053A00	053A00	054A00
	HIGH	117A00	10.4	7.8/9.6	049A00	049A00	049A00	051A00
		110A00	16.0	12.0/14.7	049A00	049A00	049A00	051A00
111A00		24.8	18.6/22.8	051A00	051A00	051A00	053A00	
112A00		32.0	24.0/29.4	051A00	051A00	051A00	053A00	
112A00,117A00		42.4	31.8/38.9	053A00	053A00	053A00	054A00	
460-3-60	STD	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	050A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
	MED	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	050A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
	HIGH	116A00	13.9	12.8	047A00	047A00	047A00	047A00
		113A00	16.5	15.2	047A00	047A00	047A00	047A00
		114A00	27.8	25.5	050A00	050A00	050A00	050A00
		115A00	33.0	30.3	050A00	050A00	050A00	050A00
		114A00,116A00	41.7	38.3	052A00	052A00	052A00	052A00
575-3-60	STD	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00
	MED	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00
	HIGH	118A00	17.0	17.0	047A00	047A00	047A00	047A00
		119A00	34.0	34.0	050A00	050A00	050A00	050A00

**50HCQ**

**LEGEND**

- No Single Point Kit required
- APP PWR – 208 / 230V / 460V / 575V
- C.O. – Convenience outlet
- FLA – Full load amps
- IFM – Indoor fan motor
- NOM PWR – 240V / 480V / 600V
- P.E. – Power exhaust
- PWRD – Powered convenience outlet
- UNPWRD – Unpowered convenience outlet

Table 15 – 50HCQD12

**ELECTRIC HEAT - ELECTRICAL DATA  
2-STAGE COOLING SINGLE SPEED INDOOR FAN MOTOR**

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLE			
					WITHOUT C.O. or UNPWRD C.O.		w/PWRD C.O.	
					WITHOUT P.E.	w/ P.E. (pwrd fr/unit)	WITHOUT P.E.	w/ P.E. (pwrd fr/unit)
208/ 230-3-60	STD	288A00	10.0	7.5/9.2	049A00	049A00	049A00	049A00
		291A00	16.5	12.4/15.2	049A00	049A00	049A00	049A00
		294A00	33.5	25.2/30.8	051A00	051A00	051A00	051A00
		288A00,294A00	43.5	32.7/40.0	053A00	053A00	053A00	053A00
		291A00,294A00	50.0	37.6/45.9	053A00	053A00	053A00	053A00
	MED	288A00	10.0	7.5/9.2	049A00	049A00	049A00	051A00
		291A00	16.5	12.4/15.2	049A00	049A00	049A00	051A00
		294A00	33.5	25.2/30.8	051A00	051A00	051A00	053A00
		288A00,294A00	43.5	32.7/40.0	053A00	053A00	053A00	054A00
		291A00,294A00	50.0	37.6/45.9	053A00	053A00	053A00	054A00
	HIGH	288A00	10.0	7.5/9.2	051A00	051A00	051A00	051A00
		291A00	16.5	12.4/15.2	051A00	051A00	051A00	051A00
294A00		33.5	25.2/30.8	053A00	053A00	053A00	053A00	
288A00,294A00		43.5	32.7/40.0	054A00	054A00	054A00	054A00	
291A00,294A00		50.0	37.6/45.9	054A00	054A00	054A00	054A00	
460-3-60	STD	289A00	10.0	9.2	047A00	047A00	047A00	047A00
		292A00	16.5	15.2	047A00	047A00	047A00	047A00
		295A00	33.5	30.8	050A00	050A00	050A00	050A00
		289A00,295A00	43.5	40.0	052A00	052A00	052A00	052A00
		292A00,295A00	50.0	45.9	052A00	052A00	052A00	052A00
	MED	289A00	10.0	9.2	047A00	047A00	047A00	047A00
		292A00	16.5	15.2	047A00	047A00	047A00	047A00
		295A00	33.5	30.8	050A00	050A00	050A00	050A00
		289A00,295A00	43.5	40.0	052A00	052A00	052A00	052A00
		292A00,295A00	50.0	45.9	052A00	052A00	052A00	052A00
	HIGH	289A00	10.0	9.2	047A00	047A00	047A00	047A00
		292A00	16.5	15.2	047A00	047A00	047A00	047A00
295A00		33.5	30.8	050A00	050A00	050A00	050A00	
289A00,295A00		43.5	40.0	052A00	052A00	052A00	052A00	
292A00,295A00		50.0	45.9	052A00	052A00	052A00	052A00	
575-3-60	STD	290A00	10.0	9.2	047A00	047A00	047A00	047A00
		293A00	16.5	15.2	047A00	047A00	047A00	047A00
		296A00	33.5	30.8	047A00	050A00	047A00	050A00
		290A00,296A00	43.5	40.0	052A00	052A00	052A00	052A00
		293A00,296A00	50.0	45.9	052A00	052A00	052A00	052A00
	MED	290A00	10.0	9.2	047A00	047A00	047A00	047A00
		293A00	16.5	15.2	047A00	047A00	047A00	047A00
		296A00	33.5	30.8	047A00	050A00	047A00	050A00
		290A00,296A00	43.5	40.0	052A00	052A00	052A00	052A00
		293A00,296A00	50.0	45.9	052A00	052A00	052A00	052A00
	HIGH	290A00	10.0	9.2	047A00	047A00	047A00	047A00
		293A00	16.5	15.2	047A00	047A00	047A00	047A00
296A00		33.5	30.8	050A00	050A00	050A00	050A00	
290A00,296A00		43.5	40.0	052A00	052A00	052A00	052A00	
293A00,296A00		50.0	45.9	052A00	052A00	052A00	052A00	

**LEGEND**

- No Single Point Kit required
- APP PWR - 208 / 230V / 460V / 575V
- C.O. - Convenience outlet
- FLA - Full load amps
- IFM - Indoor fan motor
- NOM PWR - 240V / 480V / 600V
- P.E. - Power exhaust
- PWRD - Powered convenience outlet
- UNPWRD - Unpowered convenience outlet

**50HCQ**

Table 16 – 50HCQD12

ELECTRIC HEAT - ELECTRICAL DATA  
2-STAGE COOLING 2-SPEED INDOOR FAN MOTOR

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATER	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLE			
					WITHOUT C.O. or UNPWRD C.O.		w/PWRD C.O.	
					WITHOUT P.E.	w/ P.E. (pwrd fr/unit)	WITHOUT P.E.	w/ P.E. (pwrd fr/unit)
208/ 230-3-60	STD	288A00	10.0	7.5/9.2	049A00	049A00	049A00	049A00
		291A00	16.5	12.4/15.2	049A00	049A00	049A00	049A00
		294A00	33.5	25.2/30.8	051A00	051A00	051A00	051A00
		288A00,294A00	43.5	32.7/40.0	053A00	053A00	053A00	053A00
		291A00,294A00	50.0	37.6/45.9	053A00	053A00	053A00	053A00
	MED	288A00	10.0	7.5/9.2	049A00	049A00	049A00	051A00
		291A00	16.5	12.4/15.2	049A00	049A00	049A00	051A00
		294A00	33.5	25.2/30.8	051A00	051A00	051A00	053A00
		288A00,294A00	43.5	32.7/40.0	053A00	053A00	053A00	054A00
		291A00,294A00	50.0	37.6/45.9	053A00	053A00	053A00	054A00
	HIGH	288A00	10.0	7.5/9.2	051A00	051A00	051A00	051A00
		291A00	16.5	12.4/15.2	051A00	051A00	051A00	051A00
		294A00	33.5	25.2/30.8	053A00	053A00	053A00	053A00
		288A00,294A00	43.5	32.7/40.0	054A00	054A00	054A00	054A00
		291A00,294A00	50.0	37.6/45.9	054A00	054A00	054A00	054A00
460-3-60	STD	289A00	10.0	9.2	047A00	047A00	047A00	047A00
		292A00	16.5	15.2	047A00	047A00	047A00	047A00
		295A00	33.5	30.8	050A00	050A00	050A00	050A00
		289A00,295A00	43.5	40.0	052A00	052A00	052A00	052A00
		292A00,295A00	50.0	45.9	052A00	052A00	052A00	052A00
	MED	289A00	10.0	9.2	047A00	047A00	047A00	047A00
		292A00	16.5	15.2	047A00	047A00	047A00	047A00
		295A00	33.5	30.8	050A00	050A00	050A00	050A00
		289A00,295A00	43.5	40.0	052A00	052A00	052A00	052A00
		292A00,295A00	50.0	45.9	052A00	052A00	052A00	052A00
	HIGH	289A00	10.0	9.2	047A00	047A00	047A00	047A00
		292A00	16.5	15.2	047A00	047A00	047A00	047A00
		295A00	33.5	30.8	050A00	050A00	050A00	050A00
		289A00,295A00	43.5	40.0	052A00	052A00	052A00	052A00
		292A00,295A00	50.0	45.9	052A00	052A00	052A00	052A00
575-3-60	STD	290A00	10.0	9.2	047A00	047A00	047A00	047A00
		293A00	16.5	15.2	047A00	047A00	047A00	047A00
		296A00	33.5	30.8	047A00	050A00	050A00	050A00
		290A00,296A00	43.5	40.0	052A00	052A00	052A00	052A00
		293A00,296A00	50.0	45.9	052A00	052A00	052A00	052A00
	MED	290A00	10.0	9.2	047A00	047A00	047A00	047A00
		293A00	16.5	15.2	047A00	047A00	047A00	047A00
		296A00	33.5	30.8	047A00	050A00	050A00	050A00
		290A00,296A00	43.5	40.0	052A00	052A00	052A00	052A00
		293A00,296A00	50.0	45.9	052A00	052A00	052A00	052A00
	HIGH	290A00	10.0	9.2	047A00	047A00	047A00	047A00
		293A00	16.5	15.2	047A00	047A00	047A00	047A00
		296A00	33.5	30.8	050A00	050A00	050A00	050A00
		290A00,296A00	43.5	40.0	052A00	052A00	052A00	052A00
		293A00,296A00	50.0	45.9	052A00	052A00	052A00	052A00



50HCQ

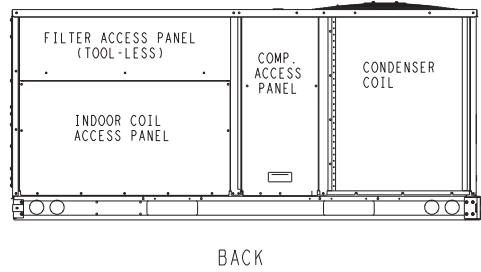
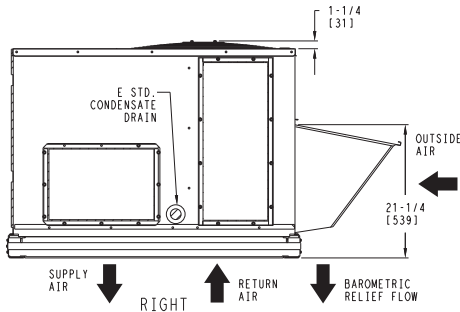
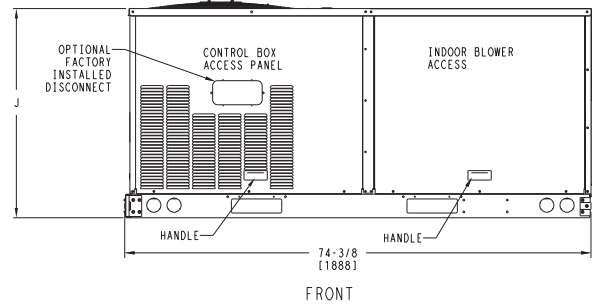
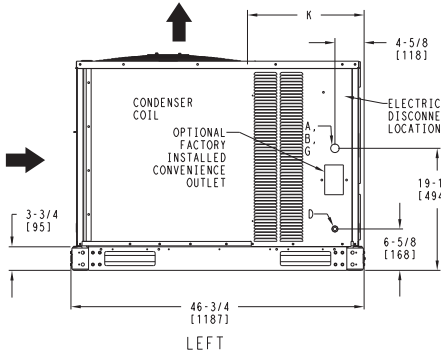
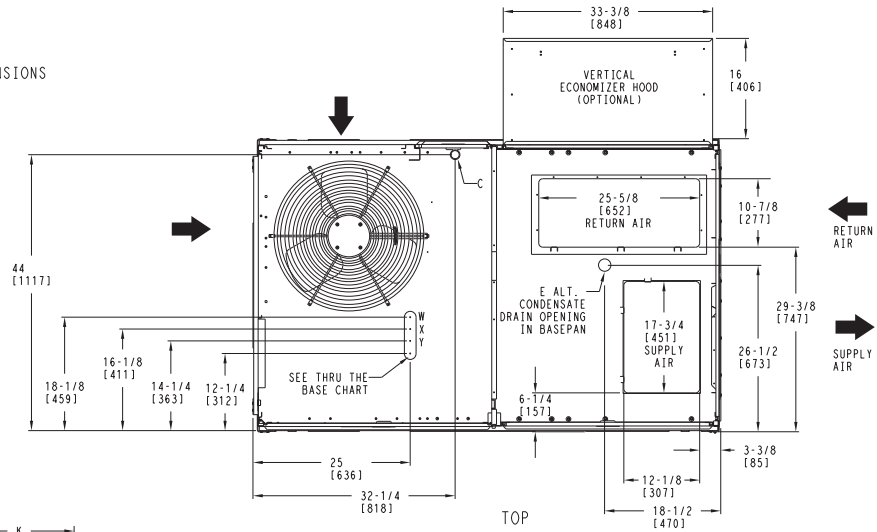
**LEGEND**

- No Single Point Kit required
- APP PWR - 208 / 230V / 460V / 575V
- C.O. - Convenience outlet
- FLA - Full load amps
- IFM - Indoor fan motor
- NOM PWR - 240V / 480V / 600V
- P.E. - Power exhaust
- PWRD - Powered convenience outlet
- UNPWRD - Unpowered convenience outlet

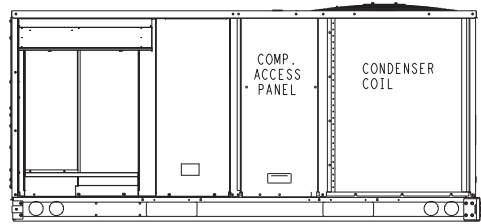
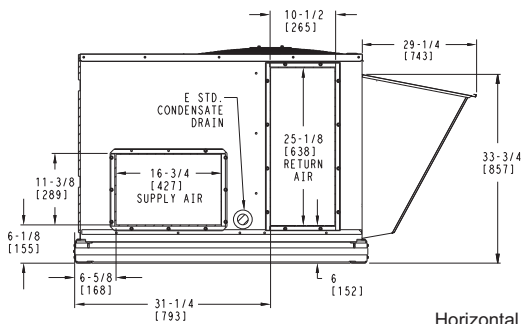
# WEIGHTS & DIMENSIONS

NOTES:

1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2.  CENTER OF GRAVITY
3.  DIRECTION OF AIR FLOW



## Vertical Connections / Economizer



## Horizontal Connections / Economizer

CONNECTION SIZES	
A	1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B	2" [51] DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [44] DIA GAUGE ACCESS PLUG
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
G	2 1/2" [64] DIA POWER SUPPLY KNOCK-OUT

THRU-THE-BASE CHART THESE HOLES REQUIRED FOR USE CRBTMPWR001A01			
	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	ACC.	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y *	3/4" (001)	POWER	1 1/8" [28.4]
FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X & Y ARE PROVIDED			
* SELECT EITHER 3/4" OR 1/2" FOR POWER, DEPENDING ON WIRE SIZE			

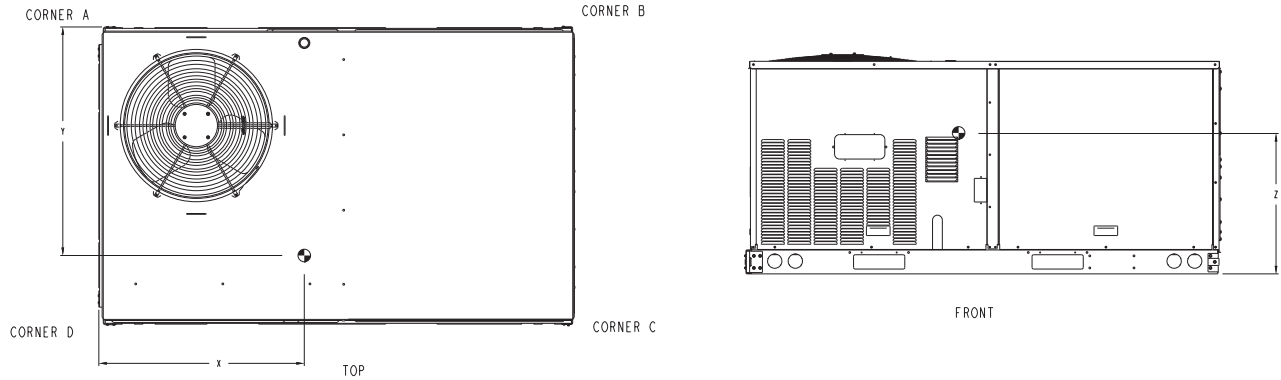
UNIT	J	K
50HCOA04	33 3/8 [847]	18 5/8 [472]
50HCOA05	41 3/8 [1051]	14 7/8 [377]
50HCOA06	41 3/8 [1051]	14 7/8 [377]

Fig. 1 - Dimensions 50HCQ 04-06

50HCQ

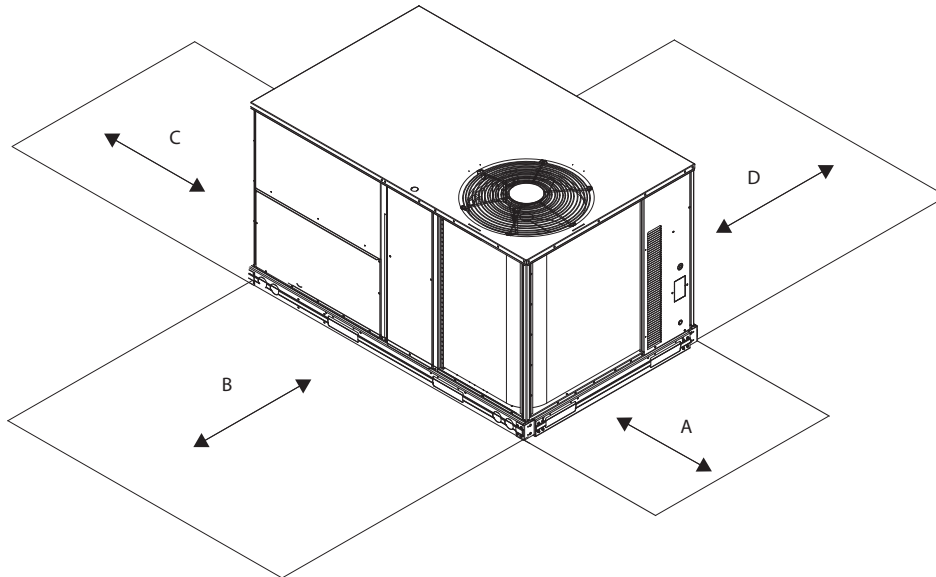
## WEIGHTS & DIMENSIONS (cont.)

UNIT	STD. UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		HEIGHT
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50HCQA04	495	225	130	59	118	54	118	54	130	59	35 3/8 [899]	23 3/8 [594]	18 3/8 [467]
50HCQA05	580	263	161	73	147	67	130	59	142	64	35 1/2 [902]	21 7/8 [556]	20 1/2 [521]
50HCQA06	610	277	165	75	152	69	141	64	152	69	35 3/4 [908]	22 1/2 [572]	20 3/4 [527]



**Fig. 2 - Dimensions 50HCQ 04-06**

C10231



**Fig. 3 - Service Clearance**

C10577


LOC	DIMENSION	CONDITION
A	48-in. (1219 mm)	Unit disconnect is mounted on panel
	18-in. (457 mm)	No disconnect, convenience outlet option
	18-in. (457 mm)	Recommended service clearance
	12-in. (305 mm)	Minimum clearance
B	42-in. (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall)
	36-in. (914 mm)	Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)
	Special	Check for sources of flue products within 10-ft of unit fresh air intake hood
C	36-in. (914 mm)	Side condensate drain is used
	18-in. (457 mm)	Minimum clearance
D	42-in. (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36-in. (914 mm)	Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)

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

# WEIGHTS & DIMENSIONS (cont.)

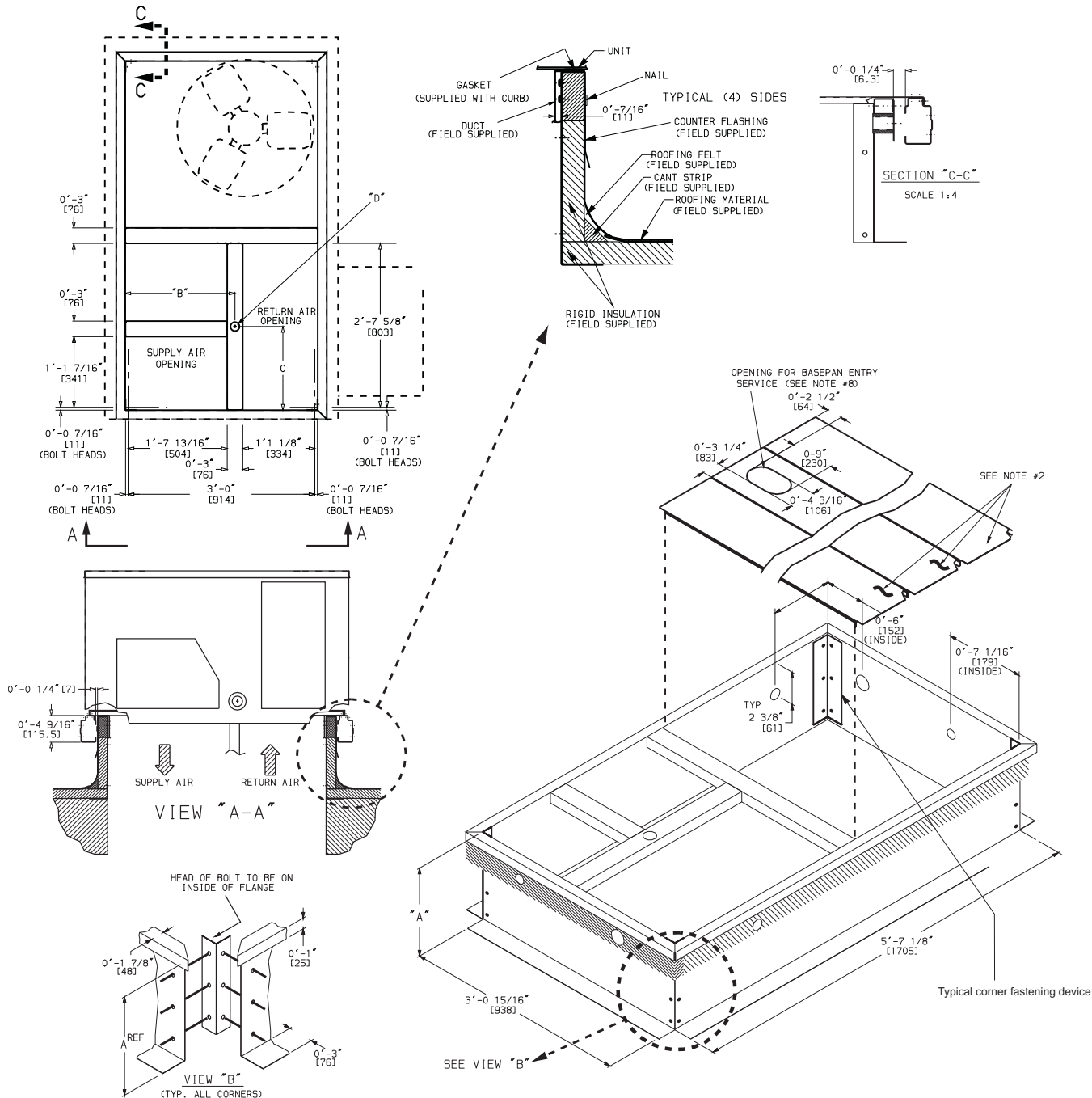
ROOFCURB ACCESSORY	A	UNIT SIZE
CRRFCURB001A01	1'-2" [356]	50HCQA04-06
CRRFCURB002A01	2'-0" [610]	

**NOTES:**

1. ROOFCURB ACCESSORY IS SHIPPED DISASSEMBLED.
2. INSULATED PANELS: 1" THK. POLYURETHANE FOAM, 1-3/4 # DENSITY.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOFCURB: 18 GAGE STEEL ON 14" CURB, AND 16 GAGE STEEL ON 24" CURB.
5. ATTACH DUCTWORK TO CURB. (FLANGES OF DUCT REST ON CURB)
6. SERVICE CLEARANCE 4' ON EACH SIDE.
7.  DIRECTION OF AIR FLOW.
8. CONNECTOR PACKAGES CRBTMPWR001A01 AND 2A01 ARE FOR THRU-THE-CURB TYPE CONNECTIONS. PACKAGES CRBTMPWR003A01 AND 4A01 ARE FOR THE THRU-THE-BOTTOM TYPE CONNECTIONS.

CONNECTOR PKG. ACCY.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL	ACCESSORY POWER
CRBTMPWR001A01	1'-9 11/16" [551]	1'-4" [406]	1 3/4" [44.5]	3/4" [19] NPT	3/4" [19] NPT	1/2" [12.7] NPT	1/2" [12.7] NPT
CRBTMPWR003A01				1/2" [12.7] NPT			

**50HCQ**





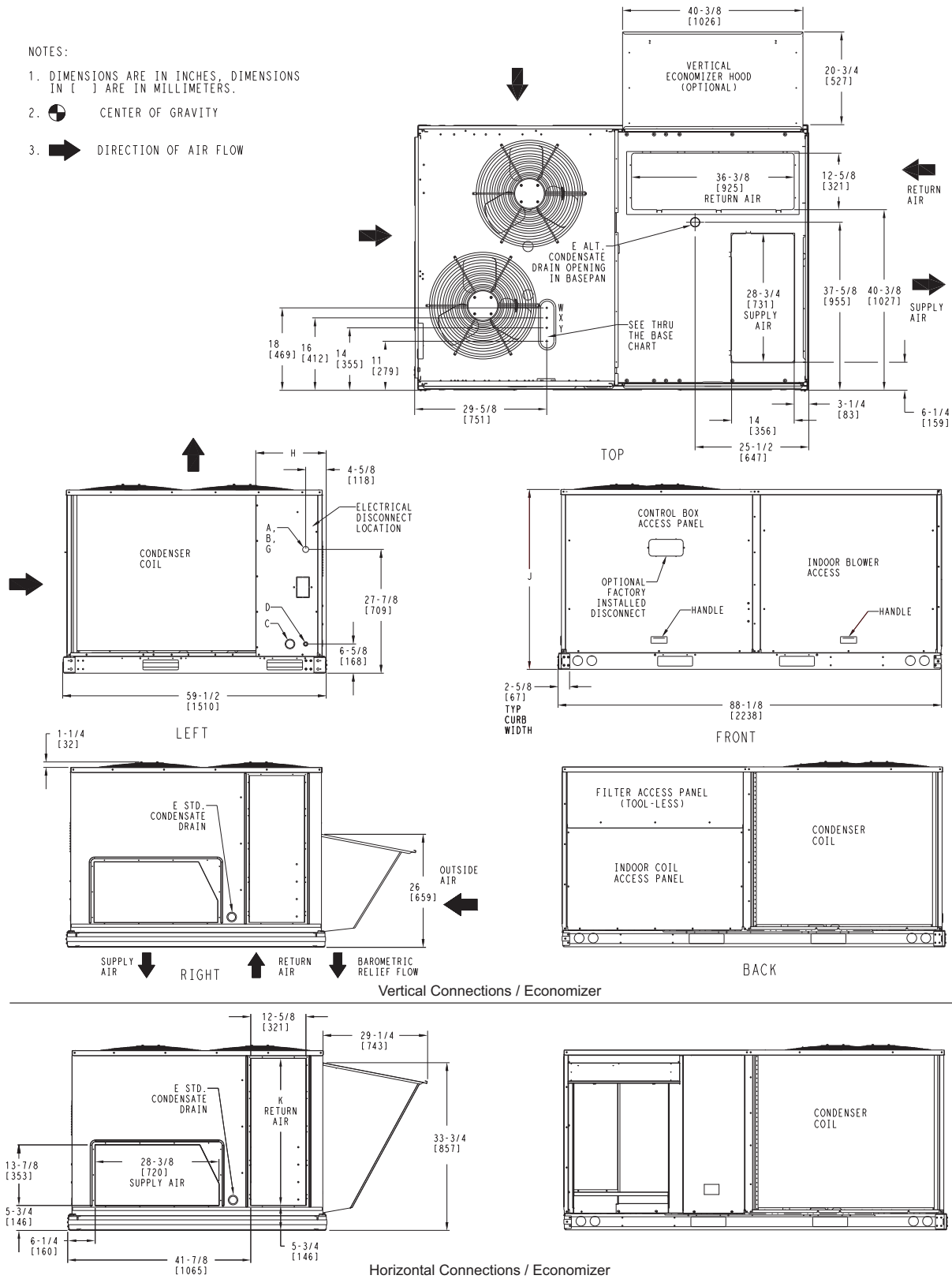
**Fig. 4 - Curb Dimensions 50HCQ 04-06**



# WEIGHTS & DIMENSIONS (cont.)

**NOTES:**

1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN ( ) ARE IN MILLIMETERS.
2.  CENTER OF GRAVITY
3.  DIRECTION OF AIR FLOW



**50HCQ**

CONNECTION SIZES	
A	1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B	2 1/2" [64] DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [51] DIA GAUGE ACCESS PLUG
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
G	2" [51] DIA POWER SUPPLY KNOCK-OUT

THRU-THE-BASE CHART (FIELD INST)			
THESE HOLES REQUIRED FOR USE WITH ACCY KITS: CRBTMPWR001A01: 07 CRBTMPWR002A01: 08			
THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)	
W	1/2"	ACC.	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y	3/4" (001) 1 1/4" (002)	POWER	1 1/8" [28.6] 1 3/4" [44.4]

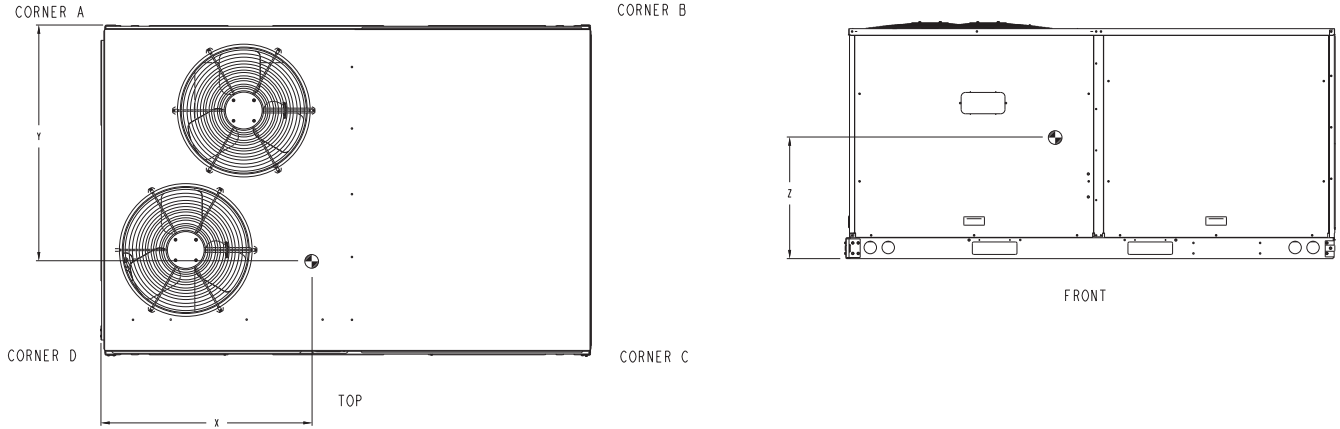
THRU-THE-BASE CHART (FIOP)			
FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X & Y ARE PROVIDED: (1) 1/2" & (1) 1 1/4" ELECTRICAL FITTINGS.			
UNIT	J	K	H
50HCOA07	41 1/4 [1048]	33 [658]	15 7/8 [403]
50HCO08	49 3/8 [1253]	36 3/8 [925]	15 7/8 [403]

**Fig. 5 - Dimensions 50HCQ 07-08**

## WEIGHTS & DIMENSIONS (cont.)

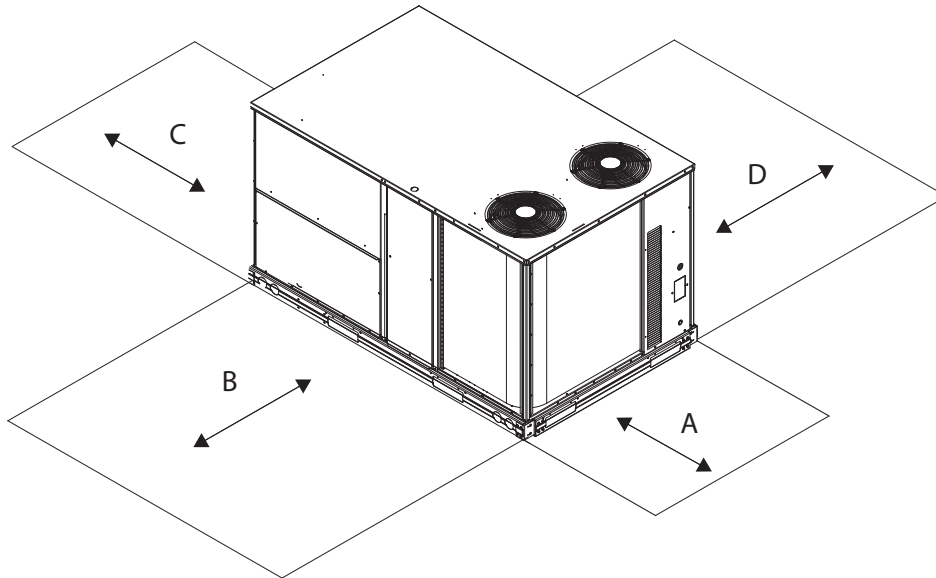
UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50HCQA07	710	322	162	73.5	129	58.5	186	84.4	234	106	38 5/8 [481]	34 1/8 [867]	21 1/4 [540]
50HCQD08	875	397	190	86.2	160	72.6	253	114.8	284	128.8	40 [1016]	34 5/8 [879]	24 3/8 [619]

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



**Fig. 6 - Dimensions 50HCQ 07-08**

C10465



**Fig. 7 - Service Clearance**



C10577

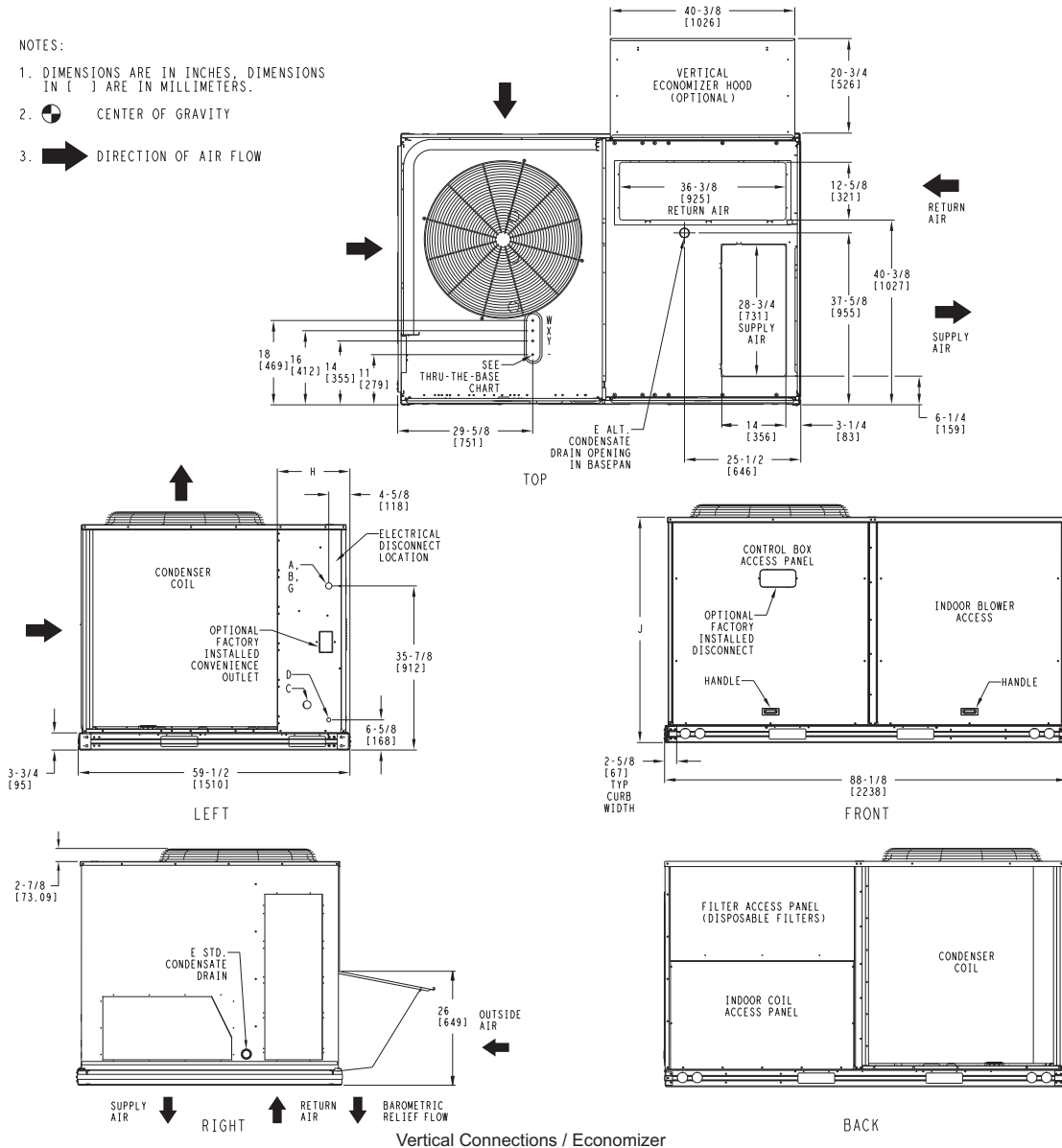
LOC	DIMENSION	CONDITION
A	48-in. (1219 mm)	Unit disconnect is mounted on panel
	18-in. (457 mm)	No disconnect, convenience outlet option
	18-in. (457 mm)	Recommended service clearance
	12-in. (305 mm)	Minimum clearance
B	42-in. (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall)
	36-in. (914 mm)	Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)
	Special	Check for sources of flue products within 10-ft of unit fresh air intake hood
C	36-in. (914 mm)	Side condensate drain is used
	18-in. (457 mm)	Minimum clearance
D	42-in. (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36-in. (914 mm)	Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)

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

# WEIGHTS & DIMENSIONS (cont.)

**NOTES:**

1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2.  CENTER OF GRAVITY
3.  DIRECTION OF AIR FLOW



CONNECTION SIZES	
A	1 3/8" [35] DIA. FIELD POWER SUPPLY HOLE
B	2 1/2" [64] DIA. POWER SUPPLY KNOCKOUT
C	1 3/4" [51] DIA. GAUGE ACCESS PLUG
D	7/8" [22] DIA. FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
G	2" [51] DIA. POWER SUPPLY KNOCK-OUT

THRU-THE-BASE CHART THESE HOLES REQUIRED FOR USE CRBTMPWR002A01			
	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	ACC.	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y	1 1/4"	POWER	1 3/4" [44.4]

FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X & Y ARE PROVIDED

UNIT	H	J	K
50HCQ09	15 7/8 [403]	49 3/8 [1253]	36 3/8 [925]

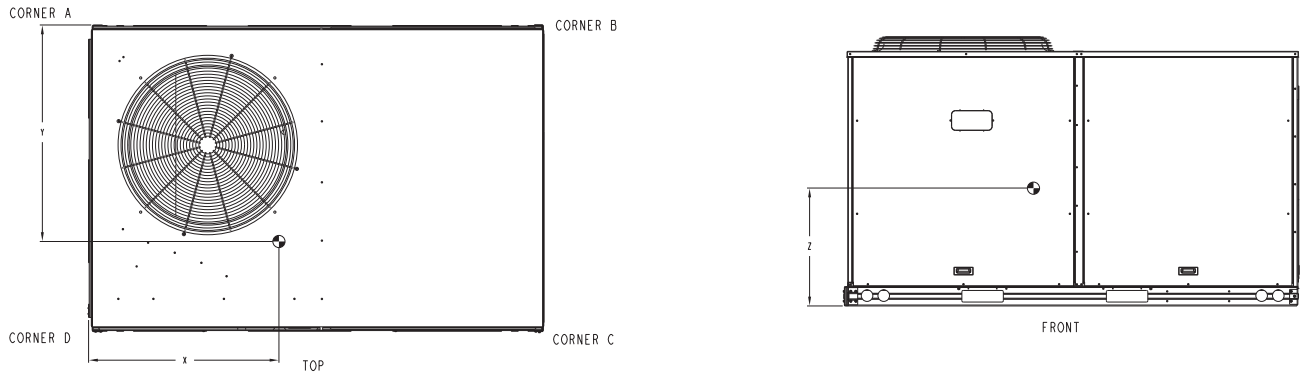
**50HCQ**

**Fig. 8 - Dimensions 50HCQ 09**

## WEIGHTS & DIMENSIONS (cont.)

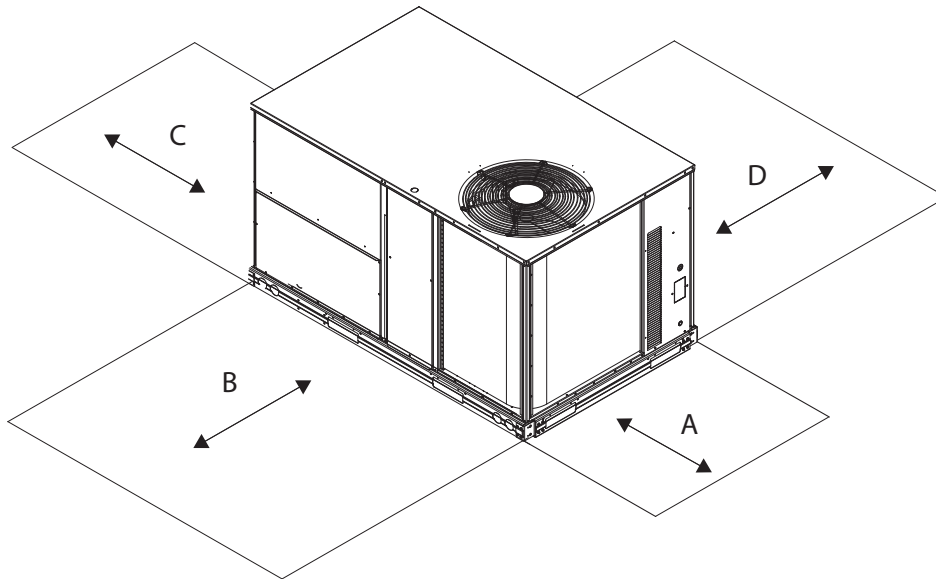
UNIT	STD. UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50HCQD09	1020	463	255	115.7	199	90.3	248	112.5	318	144.2	38 1/4 [972]	32 [813]	24 [610]

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



**Fig. 9 - Dimensions 50HCQ 09**

C10461



**Fig. 10 - Service Clearance**


C08337

LOC	DIMENSION	CONDITION
A	48-in. (1219 mm)	Unit disconnect is mounted on panel
	18-in. (457 mm)	No disconnect, convenience outlet option
	18-in. (457 mm)	Recommended service clearance
	12-in. (305 mm)	Minimum clearance
B	42-in. (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall)
	36-in. (914 mm)	Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)
	Special	Check for sources of flue products within 10-ft of unit fresh air intake hood
C	36-in. (914 mm)	Side condensate drain is used
	18-in. (457 mm)	Minimum clearance
D	42-in. (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36-in. (914 mm)	Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)

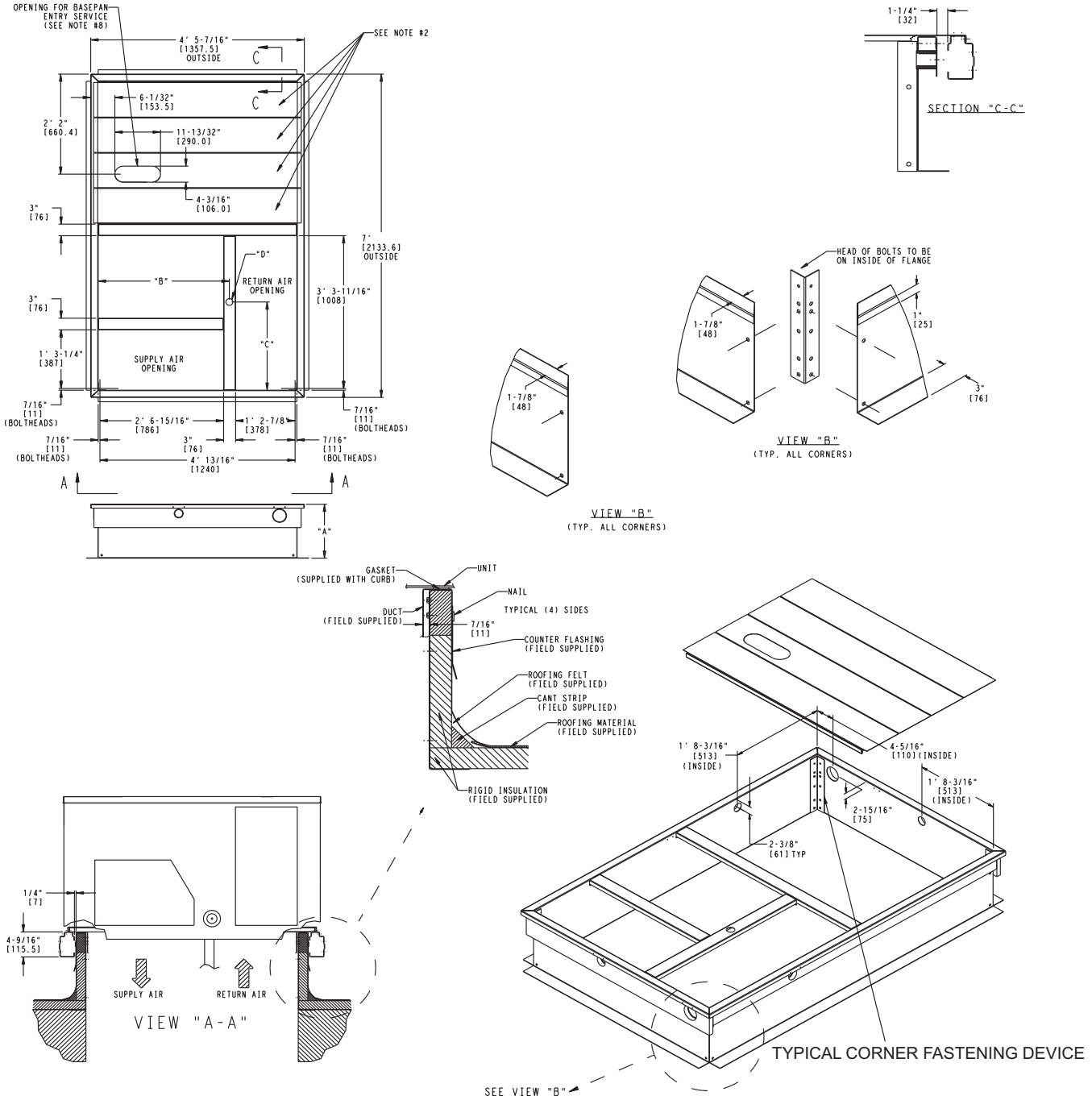
**NOTE:** Unit not designed to have overhead obstruction. Contact Application Engineering for guidance on any application planning overhead obstruction or for vertical clearances.

# WEIGHTS & DIMENSIONS (cont.)

ROOF CURB ACCESSORY #	A	UNIT SIZE
CRRFCURB003A01	1'-2" [356]	50HCQ*07-09
CRRFCURB004A01	2'-0" [610]	

- NOTES:
1. ROOFCURB ACCESSORY IS SHIPPED DISASSEMBLED.
  2. INSULATED PANELS: 1" THK. POLYURETHANE FOAM, 1-3/4 # DENSITY.
  3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
  4. ROOFCURB: 16 GAGE STEEL.
  5. ATTACH DUCTWORK TO CURB. (FLANGES OF DUCT REST ON CURB).
  6. SERVICE CLEARANCE 4" ON EACH SIDE.
  7.  DIRECTION OF AIR FLOW.
  8. CONNECTOR PACKAGES CRBTMPWR001A01 AND 2A01 ARE FOR THRU-THE-CURB TYPE CONNECTIONS. CRBTMPWR003A01 AND 4A01 ARE FOR THRU-THE-BOTTOM TYPE CONNECTIONS.

CONNECTOR PKG. ACC.	B	C	D (ALT. DRAIN HOLE)	POWER	CONTROL	ACCESSORY PWR
CRBTMPWR001A01	2' 8-7/16" [827]	1' 10-15/16" [583]	1-3/4" [44.5]	3/4" [19] NPT	1/2" [12.7] NPT	1/2" [12.7] NPT
CRBTMPWR002A01				1-1/4" [31.7] NPT		
CRBTMPWR003A01				3/4" [19] NPT		
CRBTMPWR004A01				1-1/4" [31.7] NPT		



50HCQ

Fig. 11 - Curb Dimensions 50HCQ 07-09

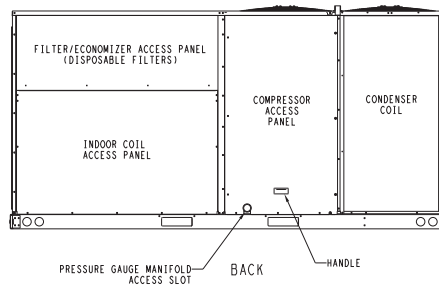
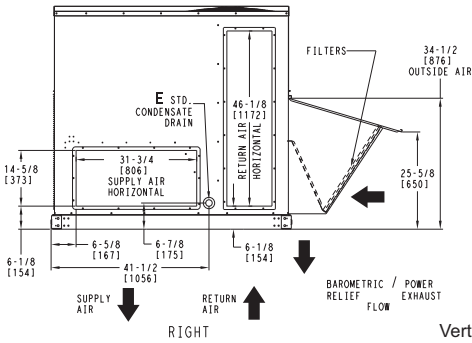
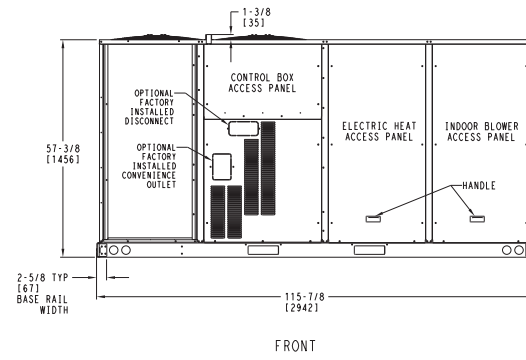
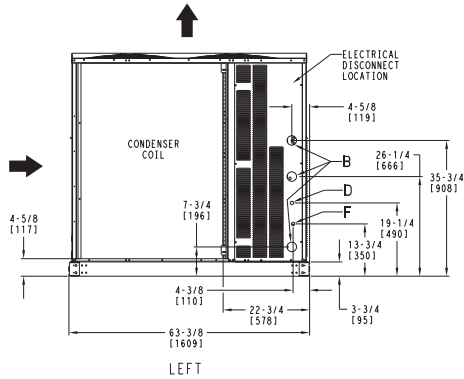
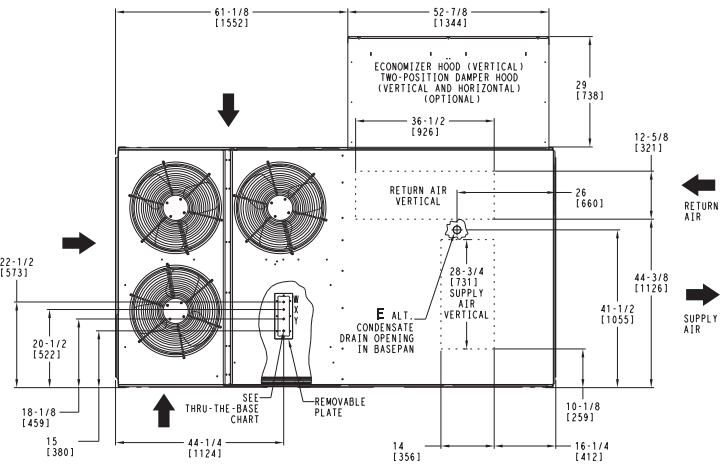
C10462

# WEIGHTS & DIMENSIONS (cont.)

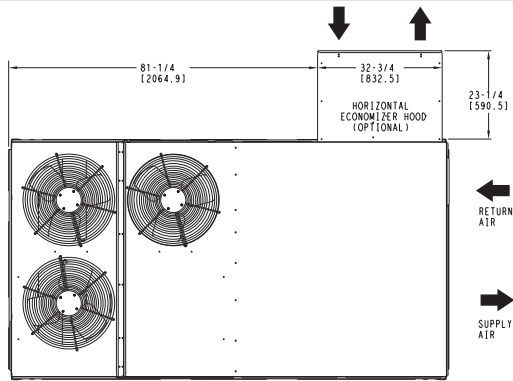
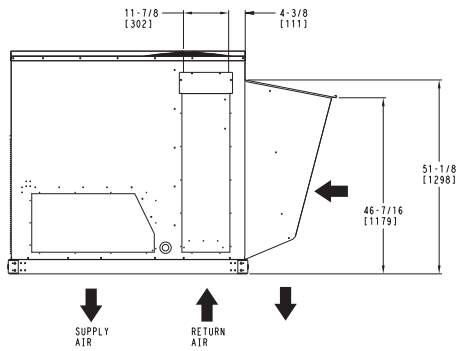
**NOTES:**

1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW

**50HCQ**



**Vertical Connections / Economizer**



**Horizontal Connections / Economizer**

CONNECTION SIZES	
B	2 1/2" [64] DIA POWER SUPPLY HOLE
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4" -14 NPT CONDENSATE DRAIN
F	7/8" [22] DIA FIELD CONVENIENCE OUTLET HOLE

THRU-THE-BASE CHART THESE HOLES REQUIRED FOR USE CRBTMPR005A00.006A00.007A00				
ACCESSORY NO.	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)	
005	W 1/2"	ACC.	7/8" [22.2]	
	X 1/2"	24V	7/8" [22.2]	
	Y 1 1/4"	POWER	1 1/2" [38.1]	
006	W 1/2"	ACC.	7/8" [22.2]	
	X 1/2"	24V	7/8" [22.2]	
	Y 1 1/2"	POWER	2" [50.8]	
007	W 1/2"	ACC.	7/8" [22.2]	
	X 1/2"	24V	7/8" [22.2]	
	Y 2"	POWER	2 1/2" [63.5]	

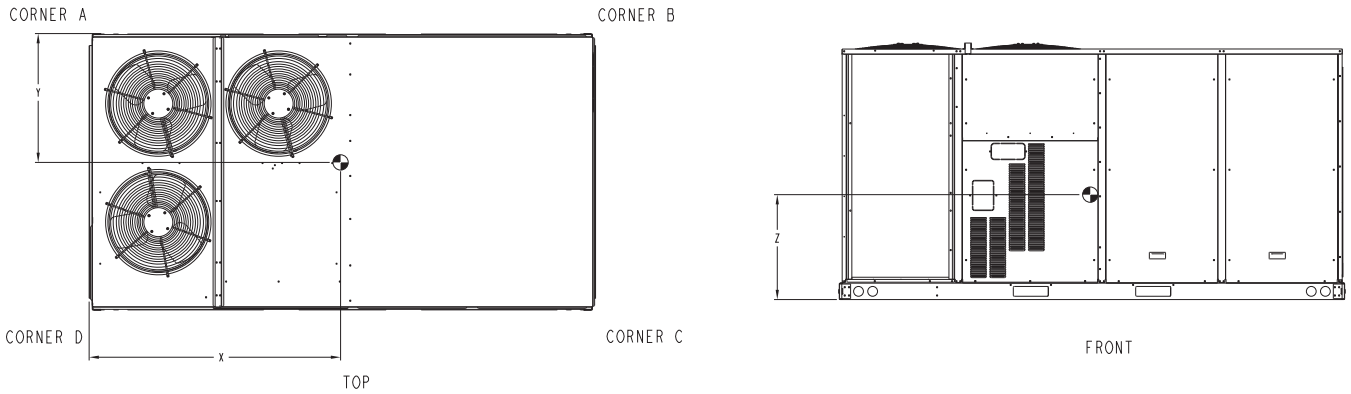
FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR X & Y ARE PROVIDED AS SPECIFIED ON "006".

**Fig. 12 - Dimensions 50HCQ 12**

## WEIGHTS & DIMENSIONS (cont.)

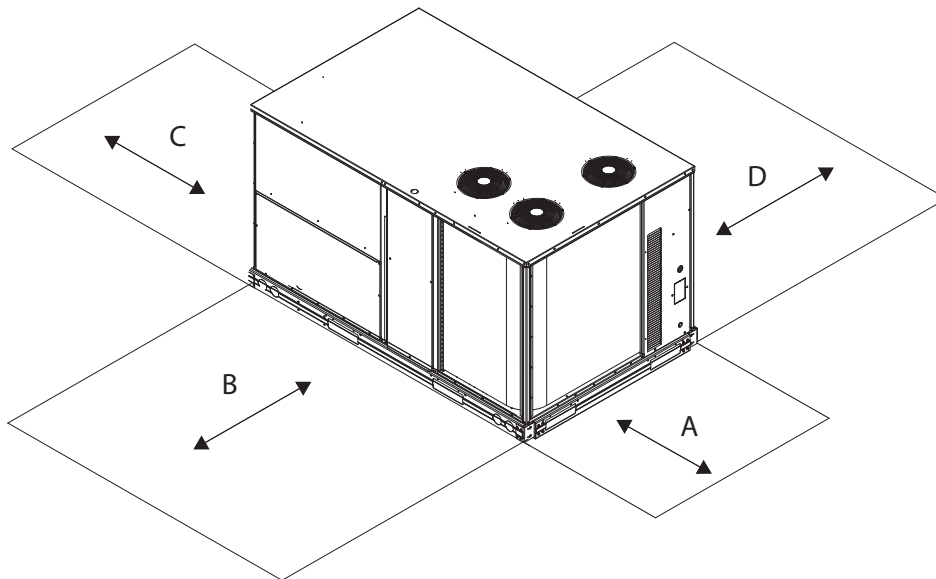
UNIT	STD UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50HCQD12	1390	632	356	162	344	156	339	154	351	160	57 [1448]	31 1/2 [800]	21 1/8 [537]

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



**Fig. 13 - Dimensions 50HCQ 12**

C10846



**Fig. 14 - Service Clearance**

C10578B

LOC	DIMENSION	CONDITION
A	48-in. (1219 mm)	Unit disconnect is mounted on panel
	18-in. (457 mm)	No disconnect, convenience outlet option
	18-in. (457 mm)	Recommended service clearance
	12-in. (305 mm)	Minimum clearance
B	42-in. (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall)
	36-in. (914 mm)	Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)
	Special	Check for sources of flue products within 10-ft of unit fresh air intake hood
C	36-in. (914 mm)	Side condensate drain is used
	18-in. (457 mm)	Minimum clearance
D	42-in. (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36-in. (914 mm)	Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)

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





## OPTION / ACCESSORY WEIGHTS

OPTION / ACCESSORY	OPTION / ACCESSORY WEIGHTS													
	04		05		06		07		08		09		12	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
Power Exhaust – vertical	50	23	50	23	50	23	50	23	75	34	75	34	85	39
Power Exhaust – horizontal	30	14	30	14	30	14	30	14	30	14	30	14	75	34
EconoMi\$er (IV or 2)	50	23	50	23	50	23	50	23	75	34	75	34	115	52
Two Position damper	39	18	39	18	39	18	39	18	58	26	58	26	65	29
Manual Dampers	12	5	12	5	12	5	12	5	18	8	18	8	25	11
Hail Guard (louvered)	16	7	16	7	16	7	16	7	34	15	34	15	45	20
Cu/Cu Condenser Coil	35	16	35	16	35	16	95	43	95	43	95	43	160	73
Cu/Cu Cond. & Evaporator Coils	60	27	60	27	90	41	165	75	140	64	195	88	280	127
Roof Curb (14–in. curb)	115	52	115	52	115	52	143	65	143	65	143	65	180	82
Roof Curb (24–in. curb)	197	89	197	89	197	89	245	111	245	111	245	111	255	116
CO <sub>2</sub> sensor	5	2	5	2	5	2	5	2	5	2	5	2	5	2
Electric Heater	30	14	30	14	30	14	30	14	45	20	45	20	25	11
Single Point Kit	10	5	10	5	10	5	10	5	12	5	12	5	25	11
Optional Indoor Motor / Drive	10	5	10	5	10	5	10	5	15	7	15	7	45	20
Motormaster Controller	35	16	35	16	35	16	35	16	35	16	35	16	35	16
Return Smoke Detector	5	2	5	2	5	2	5	2	5	2	5	2	5	2
Supply Smoke Detector	5	2	5	2	5	2	5	2	5	2	5	2	5	2
Non–Fused Disconnect	15	7	15	7	15	7	15	7	15	7	15	7	15	7
Powered Convenience outlet	35	16	35	16	35	16	35	16	35	16	35	16	35	16
Non–Powered Convenience outlet	5	2	5	2	5	2	5	2	5	2	5	2	5	2
Enthalpy Sensor	2	1	2	1	2	1	2	1	2	1	2	1	2	1
Differential Enthalpy Sensor	3	1	3	1	3	1	3	1	3	1	3	1	3	1
SAV System with VFD	–	–	–	–	–	–	–	–	20	9	20	9	20	9

**NOTE:** Where multiple variations are available, the heaviest combination is listed.

**50HCC**

## APPLICATION / SELECTION DATA

### Min operating ambient temp (cooling):

In mechanical cooling mode, your Carrier rooftop can safely operate down to an outdoor ambient temperature of 30°F (-1°C). It is possible to provide cooling at lower outdoor ambient temperatures by using less outside air, economizers, and/or accessory low ambient kits.

### Max operating ambient temp (cooling):

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

### Min and max airflow (cooling mode):

To maintain safe and reliable operation of your rooftop, operate within the cooling airflow limits. Operating above the max may cause blow-off, undesired airflow noise, or airflow related problems with the rooftop unit. Operating below the min may cause problems with coil freeze-up.

### Airflow:

All units are draw-through in cooling mode.

### Outdoor air application strategies:

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

### Motor limits, Brake horsepower (BHP):

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

### Sizing a rooftop

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

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

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

### Low ambient applications

When equipped with a Carrier economizer, your rooftop unit can cool your space by bringing in fresh, cool outside air. In fact, when so equipped, accessory low ambient kit may not be necessary. In low ambient conditions, unless the outdoor air is excessively humid or contaminated, economizer-based "free cooling" is the preferred less costly and energy conscious method.

In low ambient applications where outside air might not be desired (such as contaminated or excessively humid outdoor environments), your Carrier rooftop can operate at ambient temperatures down to -20°F (-29°C) using the recommended accessory Motormaster low ambient controller.

### Application / Selection Option

Selection software by Carrier saves time by calculating performance in the selection process. Contact your Carrier sales representative for assistance.

Table 17 – COOLING CAPACITIES

1-STAGE COOLING

3 TONS

50HCQA04			AMBIENT TEMPERATURE														
			85			95			105			115			125		
			EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)		
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85
900 Cfm	58	THC	31.8	31.8	36.0	30.5	30.5	34.5	29.0	29.0	32.9	27.5	27.5	31.1	25.7	25.7	29.2
		SHC	27.5	31.8	36.0	26.4	30.5	34.5	25.2	29.0	32.9	23.8	27.5	31.1	22.3	25.7	29.2
	62	THC	33.5	33.5	34.2	31.8	31.8	33.4	30.0	30.0	32.5	28.0	28.0	31.4	25.9	25.9	30.2
		SHC	24.9	29.5	34.2	24.0	28.7	33.4	23.2	27.8	32.5	22.2	26.8	31.4	21.1	25.7	30.2
	67	THC	36.8	36.8	36.8	34.9	34.9	34.9	32.9	32.9	32.9	30.8	30.8	30.8	28.4	28.4	28.4
		SHC	20.6	25.2	29.9	19.8	24.4	29.1	18.9	23.6	28.3	18.0	22.7	27.4	17.0	21.7	26.4
72	THC	40.4	40.4	40.4	38.4	38.4	38.4	36.2	36.2	36.2	33.8	33.8	33.8	31.3	31.3	31.3	
	SHC	16.1	20.9	25.6	15.4	20.1	24.8	14.5	19.2	24.0	13.6	18.3	23.0	12.7	17.4	22.1	
76	THC	-	43.4	43.4	-	41.2	41.2	-	38.9	38.9	-	36.4	36.4	-	33.7	33.7	
	SHC	-	17.3	22.2	-	16.5	21.5	-	15.7	20.6	-	14.8	19.6	-	13.9	18.7	
1050 Cfm	58	THC	33.5	33.5	38.0	32.1	32.1	36.4	30.6	30.6	34.7	28.9	28.9	32.7	27.0	27.0	30.6
		SHC	29.0	33.5	38.0	27.8	32.1	36.4	26.5	30.6	34.7	25.0	28.9	32.7	23.4	27.0	30.6
	62	THC	34.6	34.6	37.4	32.8	32.8	36.5	30.9	30.9	35.5	28.9	28.9	34.1	27.0	27.0	31.9
		SHC	26.7	32.1	37.4	25.9	31.2	36.5	24.9	30.2	35.5	23.8	28.9	34.1	22.2	27.0	31.9
	67	THC	37.9	37.9	37.9	35.9	35.9	35.9	33.8	33.8	33.8	31.5	31.5	31.5	29.0	29.0	29.0
		SHC	21.8	27.2	32.6	21.0	26.4	31.8	20.1	25.5	30.9	19.2	24.6	29.9	18.2	23.6	28.9
72	THC	41.5	41.5	41.5	39.4	39.4	39.4	37.1	37.1	37.1	34.6	34.6	34.6	31.9	31.9	31.9	
	SHC	16.7	22.1	27.6	15.9	21.3	26.7	15.0	20.4	25.9	14.1	19.5	24.9	13.1	18.6	24.0	
76	THC	-	44.6	44.6	-	42.3	42.3	-	39.8	39.8	-	37.2	37.2	-	34.4	34.4	
	SHC	-	18.0	23.6	-	17.2	22.8	-	16.3	21.9	-	15.4	21.0	-	14.5	20.0	
1200 Cfm	58	THC	35.0	35.0	39.7	33.5	33.5	38.0	31.8	31.8	36.1	30.0	30.0	34.0	28.1	28.1	31.8
		SHC	30.3	35.0	39.7	29.0	33.5	38.0	27.6	31.8	36.1	26.0	30.0	34.0	24.3	28.1	31.8
	62	THC	35.5	35.5	40.4	33.7	33.7	39.3	31.9	31.9	37.6	30.1	30.1	35.4	28.1	28.1	33.1
		SHC	28.4	34.4	40.4	27.4	33.3	39.3	26.2	31.9	37.6	24.7	30.1	35.4	23.1	28.1	33.1
	67	THC	38.7	38.7	38.7	36.7	36.7	36.7	34.5	34.5	34.5	32.1	32.1	32.4	29.5	29.5	31.4
		SHC	22.9	29.0	35.1	22.1	28.2	34.3	21.2	27.3	33.4	20.3	26.3	32.4	19.2	25.3	31.4
72	THC	42.4	42.4	42.4	40.2	40.2	40.2	37.8	37.8	37.8	35.2	35.2	35.2	32.5	32.5	32.5	
	SHC	17.1	23.3	29.4	16.3	22.5	28.6	15.5	21.6	27.7	14.5	20.7	26.8	13.6	19.7	25.8	
76	THC	-	45.5	45.5	-	43.1	43.1	-	40.6	40.6	-	37.8	37.8	-	34.9	34.9	
	SHC	-	18.6	25.0	-	17.8	24.1	-	17.0	23.2	-	16.0	22.3	-	15.1	21.3	
1350 Cfm	58	THC	36.2	36.2	41.1	34.6	34.6	39.3	32.9	32.9	37.3	31.0	31.0	35.1	28.9	28.9	32.8
		SHC	31.4	36.2	41.1	30.0	34.6	39.3	28.5	32.9	37.3	26.9	31.0	35.1	25.1	28.9	32.8
	62	THC	36.3	36.3	42.8	34.7	34.7	40.9	32.9	32.9	38.8	31.0	31.0	36.6	29.0	29.0	34.1
		SHC	29.8	36.3	42.8	28.5	34.7	40.9	27.1	32.9	38.8	25.5	31.0	36.6	23.8	29.0	34.1
	67	THC	39.4	39.4	39.4	37.3	37.3	37.3	35.0	35.0	35.8	32.5	32.5	34.8	29.9	29.9	33.7
		SHC	24.0	30.8	37.6	23.2	30.0	36.8	22.3	29.1	35.8	21.3	28.1	34.8	20.3	27.0	33.7
72	THC	43.1	43.1	43.1	40.8	40.8	40.8	38.3	38.3	38.3	35.7	35.7	35.7	32.9	32.9	32.9	
	SHC	17.6	24.4	31.3	16.8	23.6	30.4	15.9	22.7	29.5	14.9	21.8	28.6	14.0	20.8	27.6	
76	THC	-	46.2	46.2	-	43.8	43.8	-	41.1	41.1	-	38.3	38.3	-	35.3	35.3	
	SHC	-	19.2	26.2	-	18.4	25.4	-	17.5	24.5	-	16.6	23.5	-	15.6	22.5	
1500 Cfm	58	THC	37.3	37.3	42.3	35.6	35.6	40.4	33.8	33.8	38.3	31.8	31.8	36.1	29.7	29.7	33.6
		SHC	32.3	37.3	42.3	30.9	35.6	40.4	29.3	33.8	38.3	27.6	31.8	36.1	25.7	29.7	33.6
	62	THC	37.3	37.3	44.0	35.7	35.7	42.0	33.9	33.9	39.9	31.9	31.9	37.5	29.7	29.7	35.0
		SHC	30.7	37.3	44.0	29.3	35.7	42.0	27.8	33.9	39.9	26.2	31.9	37.5	24.4	29.7	35.0
	67	THC	39.9	39.9	40.0	37.8	37.8	39.1	35.4	35.4	38.1	32.9	32.9	37.1	30.3	30.3	35.9
		SHC	25.1	32.5	40.0	24.2	31.7	39.1	23.3	30.7	38.1	22.3	29.7	37.1	21.2	28.5	35.9
72	THC	43.7	43.7	43.7	41.3	41.3	41.3	38.8	38.8	38.8	36.1	36.1	36.1	33.2	33.2	33.2	
	SHC	18.0	25.5	33.0	17.2	24.7	32.1	16.3	23.8	31.2	15.3	22.8	30.3	14.3	21.8	29.3	
76	THC	-	46.8	46.8	-	44.3	44.3	-	41.6	41.6	-	38.7	38.7	-	35.6	35.6	
	SHC	-	19.8	27.4	-	19.0	26.6	-	18.1	25.7	-	17.1	24.7	-	16.1	23.7	

50HCQ

LEGEND

- Do not operate in this region
- Cfm - Cubic feet per minute (supply air)
- EAT(db) - Entering air temperature (dry bulb)
- EAT(wb) - Entering air temperature (wet bulb)
- SHC - Sensible heat capacity
- THC - Total capacity

Table 18 – COOLING CAPACITIES

1-STAGE COOLING

4 TONS

50HCQ

50HCQA05			AMBIENT TEMPERATURE															
			85			95			105			115			125			
			EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)			
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
1200 Cfm	EAT (wb)	58	THC	41.1	41.1	46.6	39.5	39.5	44.8	37.7	37.7	42.7	35.8	35.8	40.6	33.7	33.7	38.2
			SHC	35.6	41.1	46.6	34.2	39.5	44.8	32.7	37.7	42.7	31.0	35.8	40.6	29.2	33.7	38.2
		62	THC	43.1	43.1	44.7	41.0	41.0	43.6	38.7	38.7	42.5	36.3	36.3	41.2	33.8	33.8	39.8
			SHC	32.3	38.5	44.7	31.3	37.5	43.6	30.2	36.3	42.5	29.0	35.1	41.2	27.8	33.8	39.8
		67	THC	47.4	47.4	47.4	45.1	45.1	45.1	42.6	42.6	42.6	39.9	39.9	39.9	37.1	37.1	37.1
		SHC	26.7	32.9	39.1	25.7	31.9	38.0	24.6	30.8	37.0	23.5	29.7	35.9	22.4	28.5	34.7	
	72	THC	52.1	52.1	52.1	49.6	49.6	49.6	46.8	46.8	46.8	43.9	43.9	43.9	40.8	40.8	40.8	
		SHC	20.8	27.1	33.4	19.9	26.1	32.3	18.8	25.1	31.3	17.7	24.0	30.2	16.6	22.8	29.0	
		THC	-	56.1	56.1	-	53.3	53.3	-	50.4	50.4	-	47.3	47.3	-	44.0	44.0	
		SHC	-	22.4	29.0	-	21.4	28.0	-	20.4	26.9	-	19.3	25.7	-	18.2	24.6	
1400 Cfm	EAT (wb)	58	THC	43.3	43.3	49.1	41.6	41.6	47.1	39.6	39.6	44.9	37.6	37.6	42.6	35.4	35.4	40.1
			SHC	37.5	43.3	49.1	36.0	41.6	47.1	34.4	39.6	44.9	32.6	37.6	42.6	30.6	35.4	40.1
		62	THC	44.5	44.5	48.9	42.3	42.3	47.7	39.9	39.9	46.3	37.7	37.7	44.4	35.4	35.4	41.7
			SHC	34.7	41.8	48.9	33.6	40.7	47.7	32.4	39.4	46.3	30.9	37.7	44.4	29.1	35.4	41.7
		67	THC	48.8	48.8	48.8	46.3	46.3	46.3	43.7	43.7	43.7	40.9	40.9	40.9	37.9	37.9	38.1
		SHC	28.3	35.4	42.5	27.2	34.4	41.5	26.2	33.3	40.4	25.0	32.2	39.3	23.8	31.0	38.1	
	72	THC	53.6	53.6	53.6	50.9	50.9	50.9	48.0	48.0	48.0	45.0	45.0	45.0	41.7	41.7	41.7	
		SHC	21.6	28.7	35.9	20.5	27.7	34.9	19.5	26.6	33.8	18.4	25.5	32.7	17.2	24.3	31.5	
		THC	-	57.6	57.6	-	54.7	54.7	-	51.6	51.6	-	48.4	48.4	-	44.9	44.9	
		SHC	-	23.3	30.9	-	22.3	29.8	-	21.3	28.7	-	20.1	27.5	-	19.0	26.3	
1600 Cfm	EAT (wb)	58	THC	45.2	45.2	51.3	43.3	43.3	49.1	41.3	41.3	46.8	39.1	39.1	44.3	36.7	36.7	41.6
			SHC	39.2	45.2	51.3	37.5	43.3	49.1	35.8	41.3	46.8	33.9	39.1	44.3	31.8	36.7	41.6
		62	THC	46.1	46.1	50.5	43.4	43.4	51.1	41.3	41.3	48.7	39.1	39.1	46.1	36.7	36.7	43.3
			SHC	36.0	43.3	50.5	35.7	43.4	51.1	33.9	41.3	48.7	32.1	39.1	46.1	30.2	36.7	43.3
		67	THC	49.9	49.9	49.9	47.3	47.3	47.3	44.6	44.6	44.6	41.6	41.6	42.6	38.6	38.6	41.3
		SHC	29.8	37.8	45.9	28.7	36.8	44.8	27.6	35.7	43.7	26.5	34.5	42.6	25.2	33.3	41.3	
	72	THC	54.7	54.7	54.7	51.9	51.9	51.9	48.9	48.9	48.9	45.7	45.7	45.7	42.4	42.4	42.4	
		SHC	22.2	30.3	38.4	21.2	29.2	37.3	20.1	28.2	36.2	18.9	27.0	35.1	17.7	25.8	33.9	
		THC	-	58.8	58.8	-	55.8	55.8	-	52.6	52.6	-	49.2	49.2	-	45.6	45.6	
		SHC	-	24.2	32.6	-	23.1	31.5	-	22.1	30.3	-	20.9	29.1	-	19.7	27.9	
1800 Cfm	EAT (wb)	58	THC	46.8	46.8	53.1	44.8	44.8	50.8	42.7	42.7	48.3	40.3	40.3	45.7	37.8	37.8	42.9
			SHC	40.6	46.8	53.1	38.8	44.8	50.8	37.0	42.7	48.3	34.9	40.3	45.7	32.8	37.8	42.9
		62	THC	46.9	46.9	55.2	44.8	44.8	52.8	42.7	42.7	50.3	40.4	40.4	47.6	37.9	37.9	44.6
			SHC	38.5	46.9	55.2	36.8	44.8	52.8	35.1	42.7	50.3	33.2	40.4	47.6	31.1	37.9	44.6
		67	THC	50.8	50.8	50.8	48.1	48.1	48.1	45.2	45.2	46.9	42.2	42.2	45.7	39.1	39.1	44.3
		SHC	31.2	40.2	49.1	30.1	39.1	48.0	29.0	37.9	46.9	27.8	36.7	45.7	26.6	35.4	44.3	
	72	THC	55.7	55.7	55.7	52.7	52.7	52.7	49.6	49.6	49.6	46.4	46.4	46.4	42.9	42.9	42.9	
		SHC	22.8	31.8	40.8	21.7	30.7	39.7	20.6	29.6	38.6	19.5	28.4	37.4	18.3	27.2	36.2	
		THC	-	59.7	59.7	-	56.6	56.6	-	53.3	53.3	-	49.8	49.8	-	46.1	46.1	
		SHC	-	25.0	34.2	-	23.9	33.1	-	22.8	31.9	-	21.6	30.7	-	20.4	29.5	
2000 Cfm	EAT (wb)	58	THC	48.2	48.2	54.6	46.1	46.1	52.2	43.8	43.8	49.7	41.4	41.4	46.9	38.8	38.8	44.0
			SHC	41.8	48.2	54.6	39.9	46.1	52.2	38.0	43.8	49.7	35.9	41.4	46.9	33.6	38.8	44.0
		62	THC	48.2	48.2	56.8	46.1	46.1	54.4	43.9	43.9	51.7	41.4	41.4	48.8	38.8	38.8	45.7
			SHC	39.6	48.2	56.8	37.9	46.1	54.4	36.0	43.9	51.7	34.0	41.4	48.8	31.9	38.8	45.7
		67	THC	51.4	51.4	52.2	48.7	48.7	51.1	45.8	45.8	49.9	42.7	42.7	48.6	39.5	39.5	47.1
		SHC	32.6	42.4	52.2	31.5	41.3	51.1	30.3	40.1	49.9	29.1	38.8	48.6	27.8	37.4	47.1	
	72	THC	56.4	56.4	56.4	53.4	53.4	53.4	50.2	50.2	50.2	46.9	46.9	46.9	43.3	43.3	43.3	
		SHC	23.3	33.2	43.0	22.2	32.1	41.9	21.1	31.0	40.8	20.0	29.8	39.6	18.8	28.6	38.4	
		THC	-	60.4	60.4	-	57.2	57.2	-	53.9	53.9	-	50.3	50.3	-	46.5	46.5	
		SHC	-	25.7	35.7	-	24.6	34.6	-	23.5	33.5	-	22.3	32.2	-	21.1	31.0	

LEGEND

- Do not operate in this region
- Cfm - Cubic feet per minute (supply air)
- EAT(db) - Entering air temperature (dry bulb)
- EAT(wb) - Entering air temperature (wet bulb)
- SHC - Sensible heat capacity
- THC - Total capacity

**Table 19 – COOLING CAPACITIES**

**1-STAGE COOLING**

**5 TONS**

50HCQA06			AMBIENT TEMPERATURE															
			85			95			105			115			125			
			EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)			
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
1500 Cfm	EAT (wb)	58	THC	53.8	53.8	60.7	51.7	51.7	58.3	49.4	49.4	55.8	46.9	46.9	53.0	44.2	44.2	49.9
			SHC	46.9	53.8	60.7	45.0	51.7	58.3	43.0	49.4	55.8	40.9	46.9	53.0	38.5	44.2	49.9
		62	THC	56.2	56.2	58.3	53.5	53.5	57.0	50.6	50.6	55.5	47.5	47.5	53.9	44.2	44.2	51.8
			SHC	42.6	50.5	58.3	41.3	49.1	57.0	39.9	47.7	55.5	38.4	46.2	53.9	36.6	44.2	51.8
		67	THC	61.7	61.7	61.7	58.7	58.7	58.7	55.5	55.5	55.5	52.0	52.0	52.0	48.2	48.2	48.2
		SHC	35.1	43.0	50.9	33.8	41.7	49.6	32.5	40.4	48.3	31.1	38.9	46.8	29.5	37.4	45.3	
	72	THC	67.7	67.7	67.7	64.4	64.4	64.4	60.9	60.9	60.9	57.1	57.1	57.1	53.0	53.0	53.0	
		SHC	27.4	35.3	43.3	26.1	34.1	42.0	24.8	32.7	40.7	23.4	31.3	39.2	21.9	29.8	37.7	
	76	THC	-	72.7	72.7	-	69.2	69.2	-	65.4	65.4	-	61.3	61.3	-	56.9	56.9	
		SHC	-	29.0	37.3	-	27.8	36.1	-	26.5	34.7	-	25.1	33.2	-	23.5	31.6	
1750 Cfm	EAT (wb)	58	THC	56.7	56.7	64.0	54.4	54.4	61.4	51.9	51.9	58.6	49.2	49.2	55.6	46.2	46.2	52.2
			SHC	49.4	56.7	64.0	47.4	54.4	61.4	45.2	51.9	58.6	42.9	49.2	55.6	40.3	46.2	52.2
		62	THC	58.0	58.0	63.8	55.2	55.2	62.3	52.2	52.2	60.5	49.3	49.3	57.8	46.3	46.3	54.2
			SHC	45.9	54.8	63.8	44.5	53.4	62.3	42.9	51.7	60.5	40.8	49.3	57.8	38.3	46.3	54.2
		67	THC	63.4	63.4	63.4	60.3	60.3	60.3	56.9	56.9	56.9	53.2	53.2	53.2	49.3	49.3	49.7
		SHC	37.3	46.4	55.5	36.0	45.1	54.2	34.6	43.7	52.8	33.1	42.2	51.3	31.5	40.6	49.7	
	72	THC	69.5	69.5	69.5	66.0	66.0	66.0	62.4	62.4	62.4	58.3	58.3	58.3	54.0	54.0	54.0	
		SHC	28.3	37.5	46.7	27.0	36.2	45.4	25.7	34.8	44.0	24.2	33.4	42.5	22.7	31.8	41.0	
	76	THC	-	74.5	74.5	-	70.9	70.9	-	66.9	66.9	-	62.6	62.6	-	58.0	58.0	
		SHC	-	30.2	39.7	-	29.0	38.4	-	27.6	37.0	-	26.2	35.5	-	24.6	33.9	
2000 Cfm	EAT (wb)	58	THC	59.1	59.1	66.7	56.7	56.7	64.0	54.0	54.0	61.0	51.1	51.1	57.7	48.0	48.0	54.1
			SHC	51.5	59.1	66.7	49.4	56.7	64.0	47.1	54.0	61.0	44.5	51.1	57.7	41.8	48.0	54.1
		62	THC	59.5	59.5	68.7	56.7	56.7	66.5	54.1	54.1	63.4	51.2	51.2	60.0	48.0	48.0	56.2
			SHC	48.7	58.7	68.7	47.0	56.7	66.5	44.8	54.1	63.4	42.4	51.2	60.0	39.7	48.0	56.2
		67	THC	64.7	64.7	64.7	61.5	61.5	61.5	57.9	57.9	57.9	54.1	54.1	55.6	50.1	50.1	53.9
		SHC	39.3	49.6	59.9	38.0	48.3	58.6	36.6	46.9	57.2	35.0	45.3	55.6	33.4	43.7	53.9	
	72	THC	70.9	70.9	70.9	67.3	67.3	67.3	63.4	63.4	63.4	59.3	59.3	59.3	54.8	54.8	54.8	
		SHC	29.2	39.5	49.9	27.9	38.2	48.6	26.5	36.8	47.2	25.0	35.3	45.7	23.4	33.8	44.1	
	76	THC	-	75.9	75.9	-	72.1	72.1	-	68.0	68.0	-	63.6	63.6	-	58.8	58.8	
		SHC	-	31.3	41.9	-	30.0	40.6	-	28.7	39.2	-	27.2	37.6	-	25.6	36.0	
2250 Cfm	EAT (wb)	58	THC	61.2	61.2	69.1	58.6	58.6	66.1	55.8	55.8	63.0	52.7	52.7	59.5	49.4	49.4	55.7
			SHC	53.3	61.2	69.1	51.0	58.6	66.1	48.6	55.8	63.0	45.9	52.7	59.5	43.0	49.4	55.7
		62	THC	61.2	61.2	71.8	58.6	58.6	68.7	55.8	55.8	65.4	52.8	52.8	61.9	49.4	49.4	57.9
			SHC	50.7	61.2	71.8	48.6	58.6	68.7	46.2	55.8	65.4	43.7	52.8	61.9	40.9	49.4	57.9
		67	THC	65.8	65.8	65.8	62.4	62.4	62.8	58.8	58.8	61.3	54.9	54.9	59.7	50.7	50.7	57.9
		SHC	41.2	52.7	64.2	39.9	51.3	62.8	38.4	49.9	61.3	36.9	48.3	59.7	35.2	46.5	57.9	
	72	THC	72.0	72.0	72.0	68.3	68.3	68.3	64.3	64.3	64.3	60.0	60.0	60.0	55.4	55.4	55.4	
		SHC	30.0	41.5	53.0	28.6	40.1	51.6	27.2	38.7	50.2	25.8	37.2	48.7	24.2	35.6	47.1	
	76	THC	-	77.0	77.0	-	73.1	73.1	-	68.9	68.9	-	64.3	64.3	-	59.5	59.5	
		SHC	-	32.3	44.1	-	31.0	42.7	-	29.6	41.3	-	28.1	39.7	-	26.6	38.1	
2500 Cfm	EAT (wb)	58	THC	62.9	62.9	71.1	60.2	60.2	68.0	57.3	57.3	64.7	54.1	54.1	61.1	50.6	50.6	57.1
			SHC	54.8	62.9	71.1	52.5	60.2	68.0	49.9	57.3	64.7	47.1	54.1	61.1	44.1	50.6	57.1
		62	THC	63.0	63.0	73.8	60.3	60.3	70.6	57.3	57.3	67.2	54.1	54.1	63.4	50.6	50.6	59.3
			SHC	52.2	63.0	73.8	49.9	60.3	70.6	47.5	57.3	67.2	44.8	54.1	63.4	41.9	50.6	59.3
		67	THC	66.6	66.6	68.2	63.2	63.2	66.8	59.5	59.5	65.2	55.5	55.5	63.5	51.3	51.3	61.5
		SHC	43.1	55.6	68.2	41.7	54.2	66.8	40.2	52.7	65.2	38.6	51.0	63.5	36.8	49.1	61.5	
	72	THC	72.8	72.8	72.8	69.0	69.0	69.0	65.0	65.0	65.0	60.6	60.6	60.6	55.9	55.9	55.9	
		SHC	30.7	43.3	56.0	29.4	42.0	54.6	28.0	40.6	53.2	26.5	39.1	51.7	24.9	37.5	50.1	
	76	THC	-	77.9	77.9	-	73.9	73.9	-	69.5	69.5	-	64.9	64.9	-	59.9	59.9	
		SHC	-	33.3	46.1	-	32.0	44.7	-	30.6	43.3	-	29.1	41.7	-	27.5	40.1	

**50HCQ**

**LEGEND**

- Do not operate in this region
- Cfm - Cubic feet per minute (supply air)
- EAT(db) - Entering air temperature (dry bulb)
- EAT(wb) - Entering air temperature (wet bulb)
- SHC - Sensible heat capacity
- THC - Total capacity

Table 20 – COOLING CAPACITIES

1-STAGE COOLING

6 TONS

50HCQA07			AMBIENT TEMPERATURE															
			85			95			105			115			125			
			EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)			
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
1800 Cfm	EAT (wb)	58	THC	63.5	63.5	71.7	60.1	60.1	67.9	56.4	56.4	63.7	52.3	52.3	59.1	47.8	47.8	54
			SHC	55.2	63.5	71.7	52.3	60.1	67.9	49.1	56.4	63.7	45.5	52.3	59.1	41.6	47.8	54
		62	THC	66.5	66.5	68.9	62.1	62.1	66.9	57.4	57.4	64.6	52.4	52.4	61.4	47.9	47.9	56.2
			SHC	50.2	59.5	68.9	48.1	57.5	66.9	45.9	55.2	64.6	43.3	52.4	61.4	39.6	47.9	56.2
		67	THC	73.9	73.9	73.9	69.9	69.9	69.9	64.6	64.6	64.6	59	59	59	52.8	52.8	52.8
		SHC	40.7	50	59.4	39.2	48.7	58.1	37.2	46.6	56	35	44.5	53.9	32.7	42.1	51.6	
	72	THC	78.2	78.2	78.2	76.9	76.9	76.9	73.1	73.1	73.1	67.5	67.5	67.5	61	61	61	
		SHC	29.8	38.9	47.9	29.4	38.7	48	28	37.4	46.8	26.1	35.5	44.9	23.9	33.3	42.7	
	76	THC	-	79.5	79.5	-	79.9	79.9	-	78.1	78.1	-	74	74	-	68.1	68.1	
		SHC	-	29.8	39.7	-	29.9	39.8	-	29.3	39.1	-	27.9	37.5	-	26.1	35.5	
2100 Cfm	EAT (wb)	58	THC	67.7	67.7	76.4	64	64	72.3	60.1	60.1	67.9	55.8	55.8	63	51	51	57.7
			SHC	58.9	67.7	76.4	55.7	64	72.3	52.3	60.1	67.9	48.5	55.8	63	44.4	51	57.7
		62	THC	69.2	69.2	75.6	64.7	64.7	73.5	60.2	60.2	70.5	55.8	55.8	65.5	51.1	51.1	60
			SHC	54.2	64.9	75.6	52.2	62.8	73.5	49.7	60.1	70.5	46.2	55.8	65.5	42.2	51.1	60
		67	THC	75.6	75.6	75.6	72.1	72.1	72.1	66.9	66.9	66.9	60.9	60.9	60.9	54.5	54.5	56.9
		SHC	42.8	53.4	63.9	41.8	52.6	63.3	39.9	50.7	61.6	37.6	48.5	59.3	35.3	46.1	56.9	
	72	THC	78.9	78.9	78.9	78.2	78.2	78.2	75	75	75	69.6	69.6	69.6	63	63	63	
		SHC	30.2	40.2	50.2	30.1	40.6	51	29.1	39.8	50.5	27.3	38.1	48.9	25.1	35.9	46.7	
	76	THC	-	79.7	79.7	-	80.5	80.5	-	79.1	79.1	-	75.5	75.5	-	69.8	69.8	
		SHC	-	30.7	42.3	-	30.8	42.1	-	30.3	41.4	-	29.1	40.1	-	27.4	38.3	
2400 Cfm	EAT (wb)	58	THC	70.8	70.8	80	67.3	67.3	76.1	63.1	63.1	71.3	58.6	58.6	66.2	53.7	53.7	60.7
			SHC	61.6	70.8	80	58.6	67.3	76.1	54.9	63.1	71.3	51	58.6	66.2	46.7	53.7	60.7
		62	THC	71.3	71.3	81.4	67.4	67.4	79	63.1	63.1	74.1	58.7	58.7	68.9	53.7	53.7	63.1
			SHC	57.7	69.6	81.4	55.7	67.4	79	52.2	63.1	74.1	48.5	58.7	68.9	44.4	53.7	63.1
		67	THC	76.7	76.7	76.7	73.7	73.7	73.7	68.5	68.5	68.5	62.4	62.4	64.4	56	56	62
		SHC	44.7	56.2	67.8	44.1	56.1	68.1	42.3	54.5	66.7	40.1	52.2	64.4	37.8	49.9	62	
	72	THC	79.3	79.3	79.3	79	79	79	76.3	76.3	76.3	71.1	71.1	71.1	64.4	64.4	64.4	
		SHC	30.5	41.3	52.1	30.7	42.1	53.6	29.9	41.8	53.8	28.3	40.4	52.5	26.2	38.3	50.5	
	76	THC	-	80	80	-	80.8	80.8	-	79.8	79.8	-	76.5	76.5	-	71	71	
		SHC	-	31.2	43.5	-	31.4	43.6	-	31.1	43.3	-	30.2	42.4	-	28.6	40.8	
2700 Cfm	EAT (wb)	58	THC	73.3	73.3	82.8	70	70	79.1	65.8	65.8	74.3	61	61	68.9	55.9	55.9	63.2
			SHC	63.7	73.3	82.8	60.9	70	79.1	57.2	65.8	74.3	53.1	61	68.9	48.7	55.9	63.2
		62	THC	73.3	73.3	85.8	70.1	70.1	82.3	65.8	65.8	77.3	61.1	61.1	71.7	56	56	65.7
			SHC	60.5	73.2	85.8	58	70.1	82.3	54.4	65.8	77.3	50.5	61.1	71.7	46.3	56	65.7
		67	THC	77.5	77.5	77.5	74.9	74.9	74.9	70	70	71.5	63.7	63.7	69.2	57.2	57.2	66.6
		SHC	46.1	58.6	71.1	46.1	59.3	72.5	44.7	58.1	71.5	42.4	55.8	69.2	40	53.3	66.6	
	72	THC	79.6	79.6	79.6	79.5	79.5	79.5	77.2	77.2	77.2	72.3	72.3	72.3	65.6	65.6	65.6	
		SHC	30.8	42.3	53.7	31.1	43.4	55.8	30.7	43.7	56.7	29.2	42.5	55.9	27.2	40.6	54.1	
	76	THC	-	80.1	80.1	-	81.1	81.1	-	80.3	80.3	-	77.1	77.1	-	71.9	71.9	
		SHC	-	31.6	44.5	-	32	44.9	-	31.8	44.9	-	31	44.3	-	29.6	43	
3000 Cfm	EAT (wb)	58	THC	75	75	84.8	72.2	72.2	81.6	68.1	68.1	76.9	63.1	63.1	71.2	57.8	57.8	65.3
			SHC	65.3	75	84.8	62.9	72.2	81.6	59.2	68.1	76.9	54.9	63.1	71.2	50.3	57.8	65.3
		62	THC	75.1	75.1	88.1	72.3	72.3	84.8	68.1	68.1	79.9	63.1	63.1	74.1	57.9	57.9	67.9
			SHC	62.1	75.1	88.1	59.8	72.3	84.8	56.3	68.1	79.9	52.2	63.1	74.1	47.8	57.9	67.9
		67	THC	77.9	77.9	77.9	75.9	75.9	76.5	71.1	71.1	76	65	65	73.8	58.4	58.4	70.9
		SHC	47.3	60.6	73.8	48	62.2	76.5	46.8	61.4	76	44.6	59.2	73.8	42.1	56.5	70.9	
	72	THC	79.3	79.3	79.3	79.9	79.9	79.9	77.9	77.9	77.9	73.2	73.2	73.2	66.5	66.5	66.5	
		SHC	30.9	42.8	54.6	31.6	44.6	57.7	31.3	45.3	59.3	30	44.5	59	28.1	42.7	57.4	
	76	THC	-	80.1	80.1	-	81.2	81.2	-	80.6	80.6	-	77.6	77.6	-	72.5	72.5	
		SHC	-	32	45.4	-	32.4	46	-	32.5	46.4	-	31.8	46.1	-	30.6	45.1	

LEGEND

- Do not operate in this region
- Cfm - Cubic feet per minute (supply air)
- EAT(db) - Entering air temperature (dry bulb)
- EAT(wb) - Entering air temperature (wet bulb)
- SHC - Sensible heat capacity
- THC - Total capacity

Table 21 – COOLING CAPACITIES

2-STAGE COOLING

7.5 TONS

50HCQD08			AMBIENT TEMPERATURE															
			85			95			105			115			125			
			EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)			
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
2250 Cfm	EAT (wb)	58	THC	81.1	81.1	92.1	76.4	76.4	86.8	73.0	73.0	82.9	69.3	69.3	78.7	65.2	65.2	74.1
			SHC	70.1	81.1	92.1	66.0	76.4	86.8	63.1	73.0	82.9	59.8	69.3	78.7	56.4	65.2	74.1
		62	THC	86.2	86.2	86.2	80.1	80.1	83.0	75.6	75.6	80.9	70.8	70.8	78.6	65.9	65.9	76.1
			SHC	62.5	74.2	85.9	59.7	71.3	83.0	57.6	69.3	80.9	55.4	67.0	78.6	53	64.5	76.1
		67	THC	94.3	94.3	94.3	87.6	87.6	87.6	82.8	82.8	82.8	77.6	77.6	77.6	72.1	72.1	72.1
			SHC	51.3	63.0	74.6	48.5	60.1	71.8	46.5	58.1	69.8	44.4	56.0	67.7	42.2	53.8	65.5
		72	THC	102.9	102.9	102.9	95.6	95.6	95.6	90.3	90.3	90.3	84.7	84.7	84.7	78.7	78.7	78.7
			SHC	39.6	51.4	63.1	36.9	48.6	60.3	34.9	46.6	58.3	32.9	44.5	56.2	30.7	42.4	54.1
		76	THC	-	109.9	109.9	-	102.1	102.1	-	96.4	96.4	-	90.5	90.5	-	84.1	84.1
			SHC	-	41.8	54.2	-	39.1	51.4	-	37.2	49.4	-	35.2	47.2	-	33.1	45
2625 Cfm	EAT (wb)	58	THC	85.7	85.7	97.3	80.6	80.6	91.5	76.9	76.9	87.3	72.8	72.8	82.7	68.5	68.5	77.8
			SHC	74.0	85.7	97.3	69.6	80.6	91.5	66.4	76.9	87.3	62.9	72.8	82.7	59.2	68.5	77.8
		62	THC	89.0	89.0	94.2	82.6	82.6	91.1	78.0	78.0	88.7	73.3	73.3	85.3	68.5	68.5	81
			SHC	67.3	80.7	94.2	64.3	77.7	91.1	62.1	75.4	88.7	59.3	72.3	85.3	56.1	68.5	81
		67	THC	97.2	97.2	97.2	90.1	90.1	90.1	85.0	85.0	85.0	79.6	79.6	79.6	73.8	73.8	73.8
			SHC	54.3	67.8	81.2	51.4	64.9	78.3	49.4	62.8	76.3	47.3	60.7	74.1	45	58.5	71.9
		72	THC	105.8	105.8	105.8	98.1	98.1	98.1	92.6	92.6	92.6	86.7	86.7	86.7	80.5	80.5	80.5
			SHC	40.9	54.4	67.9	38.1	51.5	65.0	36.1	49.5	63.0	34.0	47.4	60.9	31.8	45.3	58.7
		76	THC	-	112.7	112.7	-	104.5	104.5	-	98.6	98.6	-	92.4	92.4	-	85.8	85.8
			SHC	-	43.5	57.6	-	40.7	54.6	-	38.7	52.5	-	36.7	50.4	-	34.5	48.1
3000 Cfm	EAT (wb)	58	THC	89.5	89.5	101.6	84.1	84.1	95.5	80.1	80.1	90.9	75.7	75.7	86.0	71.2	71.2	80.8
			SHC	77.3	89.5	101.6	72.6	84.1	95.5	69.2	80.1	90.9	65.5	75.7	86.0	61.5	71.2	80.8
		62	THC	91.3	91.3	101.9	84.8	84.8	97.7	80.3	80.3	94.3	75.8	75.8	89.5	71.2	71.2	84.1
			SHC	71.7	86.8	101.9	68.2	83.0	97.7	65.5	79.9	94.3	62.1	75.8	89.5	58.3	71.2	84.1
		67	THC	99.5	99.5	99.5	92.1	92.1	92.1	86.8	86.8	86.8	81.1	81.1	81.1	75.1	75.1	78.2
			SHC	57.2	72.4	87.5	54.2	69.4	84.6	52.2	67.4	82.6	50.0	65.2	80.4	47.8	63	78.2
		72	THC	108.1	108.1	108.1	100.0	100.0	100.0	94.3	94.3	94.3	88.2	88.2	88.2	81.8	81.8	81.8
			SHC	42.0	57.2	72.4	39.1	54.3	69.5	37.1	52.3	67.4	35.0	50.2	65.3	32.9	48	63.1
		76	THC	-	114.8	114.8	-	106.3	106.3	-	100.3	100.3	-	93.8	93.8	-	87	87
			SHC	-	44.9	60.6	-	42.0	57.6	-	40.1	55.5	-	38.0	53.3	-	35.8	51
3375 Cfm	EAT (wb)	58	THC	92.8	92.8	105.4	87.0	87.0	98.8	82.8	82.8	94.0	78.2	78.2	88.9	73.4	73.4	83.4
			SHC	80.2	92.8	105.4	75.2	87.0	98.8	71.5	82.8	94.0	67.6	78.2	88.9	63.4	73.4	83.4
		62	THC	93.6	93.6	108.0	87.1	87.1	102.8	82.8	82.8	97.8	78.3	78.3	92.5	73.5	73.5	86.8
			SHC	75.3	91.6	108.0	71.3	87.1	102.8	67.9	82.8	97.8	64.1	78.3	92.5	60.1	73.5	86.8
		67	THC	101.3	101.3	101.3	93.6	93.6	93.6	88.1	88.1	88.6	82.3	82.3	86.4	76.2	76.2	84
			SHC	59.9	76.8	93.6	56.9	73.8	90.7	54.8	71.7	88.6	52.6	69.5	86.4	50.3	67.2	84
		72	THC	109.8	109.8	109.8	101.5	101.5	101.5	95.6	95.6	95.6	89.3	89.3	89.3	82.8	82.8	82.8
			SHC	43.0	59.9	76.7	40.1	56.9	73.8	38.1	54.9	71.7	36.0	52.8	69.6	33.8	50.6	67.4
		76	THC	-	116.4	116.4	-	107.6	107.6	-	101.4	101.4	-	94.8	94.8	-	87.9	87.9
			SHC	-	46.1	63.3	-	43.2	60.2	-	41.2	58.1	-	39.1	55.9	-	37	53.6
3750 Cfm	EAT (wb)	58	THC	95.6	95.6	108.6	89.5	89.5	101.7	85.1	85.1	96.7	80.4	80.4	91.3	75.3	75.3	85.5
			SHC	82.6	95.6	108.6	77.4	89.5	101.7	73.6	85.1	96.7	69.4	80.4	91.3	65.1	75.3	85.5
		62	THC	95.7	95.7	113.0	89.6	89.6	105.8	85.2	85.2	100.6	80.4	80.4	95.0	75.4	75.4	89
			SHC	78.3	95.7	113.0	73.4	89.6	105.8	69.7	85.2	100.6	65.8	80.4	95.0	61.7	75.4	89
		67	THC	102.7	102.7	102.7	94.8	94.8	96.6	89.2	89.2	94.4	83.3	83.3	92.1	77.1	77.1	89.6
			SHC	62.5	81.0	99.6	59.5	78.0	96.6	57.4	75.9	94.4	55.1	73.6	92.1	52.8	71.2	89.6
		72	THC	111.3	111.3	111.3	102.8	102.8	102.8	96.7	96.7	96.7	90.3	90.3	90.3	83.6	83.6	83.6
			SHC	44.0	62.4	80.8	41.1	59.5	77.9	39.0	57.4	75.8	36.9	55.3	73.7	34.7	53.1	71.5
		76	THC	-	117.5	117.5	-	108.6	108.6	-	102.3	102.3	-	95.6	95.6	-	88.6	88.6
			SHC	-	47.2	65.7	-	44.3	62.6	-	42.3	60.5	-	40.2	58.2	-	38	55.9

50HCQ

LEGEND

- Do not operate in this region
- Cfm - Cubic feet per minute (supply air)
- EAT(db) - Entering air temperature (dry bulb)
- EAT(wb) - Entering air temperature (wet bulb)
- SHC - Sensible heat capacity
- THC - Total capacity

**Table 22 – COOLING CAPACITIES**

**2-STAGE COOLING**

**8.5 TONS**

**50HCQ**

50HCQD09			AMBIENT TEMPERATURE																
			85			95			105			115			125				
			EAT (db)			EAT (db)			EAT (db)			EAT (db)			EAT (db)				
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85		
2550 Cfm	EAT (wb)	58	THC	85.8	85.8	97.8	80.9	80.9	91.8	75.7	75.7	85.9	70.2	70.2	79.7	64.4	64.4	73.1	
			SHC	73.9	85.8	97.8	70	80.9	91.8	65.5	75.7	85.9	60.7	70.2	79.7	55.7	64.4	73.1	
		62	THC	90.4	90.4	94.5	83.8	83.8	91.4	76.8	76.8	88	70.5	70.5	82.7	64.5	64.5	76.1	
			SHC	67.8	81.1	94.5	64.8	78.1	91.4	61.6	74.8	88	57.6	70.1	82.7	52.8	64.5	76.1	
		76	THC	101.6	101.6	101.6	95	95	95	87.4	87.4	87.4	79.3	79.3	79.3	71	71	71	
	SHC		55.5	68.7	81.9	52.9	66.3	79.7	49.9	63.3	76.7	46.9	60.3	73.7	43.8	57.2	70.6		
	2975 Cfm	EAT (wb)	58	THC	91.8	91.8	104.5	86.4	86.4	98	80.7	80.7	91.6	74.7	74.7	84.8	68.6	68.6	77.8
				SHC	79.1	91.8	104.5	74.7	86.4	98	69.8	80.7	91.6	64.6	74.7	84.8	59.3	68.6	77.8
			62	THC	94.4	94.4	104.4	87.5	87.5	100.5	81	81	95.1	74.8	74.8	88.3	68.7	68.7	81
				SHC	73.8	89.1	104.4	70.3	85.4	100.5	66.1	80.6	95.1	61.3	74.8	88.3	56.3	68.7	81
76			THC	104.3	104.3	104.3	98.6	98.6	98.6	90.6	90.6	90.6	82.1	82.1	82.1	73.4	73.4	78.4	
		SHC	58.7	73.7	88.6	56.8	72.3	87.8	53.8	69.3	84.8	50.7	66.1	81.6	47.5	62.9	78.4		
EAT (wb)		72	THC	111.3	111.3	111.3	108	108	108	102.7	102.7	102.7	94.5	94.5	94.5	85.5	85.5	85.5	
			SHC	42.2	56.7	71.3	41	56.1	71.3	39.3	54.8	70.3	36.6	52.1	67.6	33.7	49.2	64.7	
		76	THC	-	116.3	116.3	-	112.7	112.7	-	109.2	109.2	-	103.5	103.5	-	95.4	95.4	
			SHC	-	44.3	60.6	-	43.1	59	-	41.9	57.7	-	40.2	56	-	37.7	53.4	
	3400 Cfm	EAT (wb)	58	THC	96.6	96.6	109.9	91.1	91.1	103.4	85.1	85.1	96.6	78.7	78.7	89.3	72.1	72.1	81.8
SHC				83.3	96.6	109.9	78.8	91.1	103.4	73.6	85.1	96.6	68.1	78.7	89.3	62.4	72.1	81.8	
62			THC	97.7	97.7	112.8	91.7	91.7	106.8	85.3	85.3	100.7	78.8	78.8	93	72.2	72.2	85.2	
			SHC	78.6	95.7	112.8	74.4	90.6	106.8	69.9	85.3	100.7	64.6	78.8	93	59.2	72.2	85.2	
76			THC	106	106	106	101.2	101.2	101.2	93	93	93	84.4	84.4	89.2	75.5	75.5	85.8	
		SHC	61.6	78.1	94.7	60.2	77.7	95.1	57.4	74.9	92.4	54.2	71.7	89.2	50.9	68.4	85.8		
EAT (wb)		72	THC	112.7	112.7	112.7	109.3	109.3	109.3	104.8	104.8	104.8	96.8	96.8	96.8	87.7	87.7	87.7	
			SHC	43.1	59	75	41.9	58.5	75.2	40.7	58	75.4	38.1	55.7	73.2	35.2	52.8	70.4	
		76	THC	-	117.6	117.6	-	113.9	113.9	-	110.2	110.2	-	105.2	105.2	-	97.2	97.2	
			SHC	-	45.4	63	-	44.2	61.5	-	43.1	60.5	-	41.8	59.4	-	39.5	57.2	
	3825 Cfm	EAT (wb)	58	THC	100.5	100.5	114.2	95.1	95.1	107.9	88.9	88.9	100.8	82.2	82.2	93.3	75.3	75.3	85.5
SHC				86.7	100.5	114.2	82.3	95.1	107.9	76.9	88.9	100.8	71.1	82.2	93.3	65.2	75.3	85.5	
62			THC	100.6	100.6	119	95.4	95.4	112.5	89	89	105	82.3	82.3	97.1	75.4	75.4	89	
			SHC	82.3	100.6	119	78.2	95.4	112.5	72.9	89	105	67.5	82.3	97.1	61.8	75.4	89	
76			THC	107.3	107.3	107.3	103.1	103.1	103.1	95.1	95.1	99.8	86.3	86.3	96.4	77.3	77.3	92.6	
		SHC	64.1	82.2	100.2	63.4	82.7	102	60.8	80.3	99.8	57.6	77	96.4	54.2	73.4	92.6		
EAT (wb)		72	THC	113.8	113.8	113.8	110.3	110.3	110.3	106.3	106.3	106.3	98.5	98.5	98.5	89.3	89.3	89.3	
			SHC	44	61.2	78.3	42.7	60.8	78.9	41.8	61	80.1	39.5	59	78.5	36.6	56.2	75.7	
		76	THC	-	118.6	118.6	-	114.8	114.8	-	110.9	110.9	-	106.3	106.3	-	98.5	98.5	
			SHC	-	46.4	65.1	-	45.2	63.9	-	44.2	63	-	43.2	62.5	-	41.1	60.7	
	4250 Cfm	EAT (wb)	58	THC	103.2	103.2	117.2	98.5	98.5	111.8	92.2	92.2	104.6	85.3	85.3	96.8	78.1	78.1	88.7
SHC				89.1	103.2	117.2	85.2	98.5	111.8	79.7	92.2	104.6	73.8	85.3	96.8	67.6	78.1	88.7	
62			THC	103.2	103.2	121.8	98.6	98.6	116.3	92.3	92.3	108.9	85.4	85.4	100.7	78.2	78.2	92.3	
			SHC	84.6	103.2	121.8	80.8	98.6	116.3	75.6	92.3	108.9	70	85.4	100.7	64.1	78.2	92.3	
76			THC	108.3	108.3	108.3	104.5	104.5	108.3	96.8	96.8	106.7	88	88	103.2	79.3	79.3	97.6	
		SHC	66.5	86	105.5	66.3	87.3	108.3	64	85.3	106.7	60.7	82	103.2	56.6	77.1	97.6		
EAT (wb)		72	THC	114.7	114.7	114.7	111.1	111.1	111.1	107.3	107.3	107.3	99.9	99.9	99.9	90.6	90.6	90.6	
			SHC	44.8	63.1	81.5	43.5	62.9	82.3	42.8	63.5	84.2	40.7	62.1	83.5	37.9	59.4	81	
		76	THC	-	119.4	119.4	-	115.5	115.5	-	111.4	111.4	-	107.1	107.1	-	99.5	99.5	
			SHC	-	47.3	67	-	46.2	66	-	45.2	65.3	-	44.5	65.3	-	42.6	63.9	

**LEGEND**

- Do not operate in this region
- Cfm – Cubic feet per minute (supply air)
- EAT(db) – Entering air temperature (dry bulb)
- EAT(wb) – Entering air temperature (wet bulb)
- SHC – Sensible heat capacity
- THC – Total capacity



Table 23 – COOLING CAPACITIES

2-STAGE COOLING

10 TONS

50HCQD12			AMBIENT TEMPERATURE															
			85			95			105			115			125			
			EA (dB)			EA (dB)			EA (dB)			EA (dB)			EA (dB)			
			75	80	85	75	80	85	75	80	85	75	80	85	75	80	85	
3000 Cfm	EAT (wb)	58	THC	106.0	106.0	119.9	102.0	102.0	115.3	97.6	97.6	110.4	92.9	92.9	105.0	87.5	87.5	98.9
		58	SHC	92.2	106.0	119.9	88.6	102.0	115.3	84.9	97.6	110.4	80.7	92.9	105.0	76.1	87.5	98.9
		62	THC	112.3	112.3	113.3	107.1	107.1	110.7	101.5	101.5	107.9	95.4	95.4	104.7	88.9	88.9	100.5
		62	SHC	83.4	98.3	113.3	80.8	95.8	110.7	78.1	93.0	107.9	75.1	89.9	104.7	71.5	86.0	100.5
		67	THC	123.3	123.3	123.3	117.6	117.6	117.6	111.4	111.4	111.4	104.5	104.5	104.5	97.0	97.0	97.0
	72	THC	135.2	135.2	135.2	128.8	128.8	128.8	121.9	121.9	121.9	114.4	114.4	114.4	106.2	106.2	106.2	
	72	SHC	54.5	69.8	85.0	52.0	67.3	82.5	49.4	64.6	79.8	46.5	61.7	76.8	43.4	58.5	73.6	
	76	THC	-	145.1	145.1	-	138.2	138.2	-	130.7	130.7	-	122.6	122.6	-	113.7	113.7	
	76	SHC	-	57.9	74.3	-	55.4	71.8	-	52.8	69.1	-	50.0	66.1	-	46.9	62.8	
	3500 Cfm	EAT (wb)	58	THC	111.6	111.6	126.2	107.3	107.3	121.4	102.6	102.6	116.0	97.4	97.4	110.2	91.6	91.6
58			SHC	97.1	111.6	126.2	93.3	107.3	121.4	89.2	102.6	116.0	84.7	97.4	110.2	79.6	91.6	103.6
62			THC	115.9	115.9	123.6	110.5	110.5	120.7	104.6	104.6	117.4	98.6	98.6	112.5	92.1	92.1	106.9
62			SHC	89.4	106.5	123.6	86.7	103.7	120.7	83.7	100.5	117.4	79.8	96.1	112.5	75.4	91.2	106.9
67			THC	127.0	127.0	127.0	120.9	120.9	120.9	114.3	114.3	114.3	107.1	107.1	107.1	99.2	99.2	99.2
72		THC	139.1	139.1	139.1	132.3	132.3	132.3	125.0	125.0	125.0	117.0	117.0	117.0	108.4	108.4	108.4	
72		SHC	56.4	73.8	91.3	53.8	71.2	88.6	51.1	68.4	85.8	48.1	65.4	82.8	44.9	62.2	79.5	
76		THC	-	149.0	149.0	-	141.7	141.7	-	133.8	133.8	-	125.2	125.2	-	-	-	
76		SHC	-	60.3	79.1	-	57.7	76.3	-	54.9	73.3	-	52.0	70.1	-	-	-	
4000 Cfm		EAT (wb)	58	THC	116.5	116.5	131.7	111.8	111.8	126.5	106.8	106.8	120.7	101.2	101.2	114.4	95.0	95.0
	58		SHC	101.2	116.5	131.7	97.2	111.8	126.5	92.8	106.8	120.7	88.0	101.2	114.4	82.5	95.0	107.4
	62		THC	118.9	118.9	133.1	113.5	113.5	128.6	107.8	107.8	123.8	101.7	101.7	118.4	95.1	95.1	111.7
	62		SHC	94.9	114.0	133.1	91.4	110.0	128.6	87.6	105.7	123.8	83.4	100.9	118.4	78.5	95.1	111.7
	67		THC	129.9	129.9	129.9	123.5	123.5	123.5	116.6	116.6	116.6	109.1	109.1	109.1	100.9	100.9	103.8
	72	THC	142.0	142.0	142.0	135.0	135.0	135.0	127.3	127.3	127.3	119.1	119.1	119.1	110.1	110.1	110.1	
	72	SHC	58.0	77.6	97.2	55.4	74.9	94.5	52.6	72.1	91.6	49.6	69.0	88.5	46.3	65.7	85.1	
	76	THC	-	152.0	152.0	-	144.4	144.4	-	136.2	136.2	-	-	-	-	-	-	
	76	SHC	-	62.4	83.1	-	59.7	80.2	-	56.9	77.2	-	-	-	-	-	-	
	4500 Cfm	EAT (wb)	58	THC	120.6	120.6	136.3	115.7	115.7	130.8	110.3	110.3	124.7	104.4	104.4	118.0	97.8	97.8
58			SHC	104.8	120.6	136.3	100.5	115.7	130.8	95.9	110.3	124.7	90.7	104.4	118.0	85.0	97.8	110.5
62			THC	122.1	122.1	139.4	116.6	116.6	134.6	110.6	110.6	129.9	104.4	104.4	122.7	97.8	97.8	114.9
62			SHC	98.8	119.1	139.4	95.1	114.9	134.6	91.3	110.6	129.9	86.2	104.4	122.7	80.7	97.8	114.9
67			THC	132.2	132.2	132.2	125.5	125.5	125.5	118.4	118.4	118.4	110.6	110.6	114.6	102.2	102.2	111.0
72		THC	144.4	144.4	144.4	137.1	137.1	137.1	129.2	129.2	129.2	120.7	120.7	120.7	111.4	111.4	111.4	
72		SHC	59.5	81.2	102.8	56.8	78.4	100.1	54.0	75.5	97.1	50.9	72.4	93.9	47.6	69.1	90.5	
76		THC	-	154.4	154.4	-	146.5	146.5	-	138.0	138.0	-	-	-	-	-	-	
76		SHC	-	64.2	86.9	-	61.5	84.0	-	58.7	81.0	-	-	-	-	-	-	
5000 Cfm		EAT (wb)	58	THC	124.1	124.1	140.4	119.0	119.0	134.5	113.3	113.3	128.1	107.1	107.1	121.1	100.1	100.1
	58		SHC	107.9	124.1	140.4	103.4	119.0	134.5	98.5	113.3	128.1	93.1	107.1	121.1	87.0	100.1	113.2
	62		THC	124.9	124.9	144.9	119.2	119.2	140.0	113.4	113.4	133.2	107.1	107.1	125.8	100.2	100.2	117.7
	62		SHC	102.2	123.6	144.9	98.4	119.2	140.0	93.6	113.4	133.2	88.4	107.1	125.8	82.7	100.2	117.7
	67		THC	134.0	134.0	134.0	127.2	127.2	128.2	119.8	119.8	125.1	111.9	111.9	121.6	103.3	103.3	117.6
	72	THC	146.3	146.3	146.3	138.8	138.8	138.8	130.7	130.7	130.7	121.9	121.9	121.9	112.5	112.5	112.5	
	72	SHC	60.9	84.6	108.3	58.1	81.8	105.4	55.2	78.8	102.4	52.2	75.6	99.1	48.8	72.2	95.6	
	76	THC	-	156.4	156.4	-	148.2	148.2	-	-	-	-	-	-	-	-	-	
	76	SHC	-	66.0	90.6	-	63.3	87.6	-	-	-	-	-	-	-	-	-	

50HCQ

LEGEND


- Do not operate in this region
- Cfm - Cubic feet per minute (supply air)
- EAT(db) - Entering air temperature (dry bulb)
- EAT(wb) - Entering air temperature (wet bulb)
- SHC - Sensible heat capacity
- THC - Total capacity

Table 24 – HEATING CAPACITIES

3 TONS

50HCQA04											
RETURN AIR (°F db)	CFM (STANDARD AIR)		TEMPERATURE AIR ENTERING OUTDOOR COIL (°F db AT 70% RH)								
			-10	0	10	17	30	40	47	50	60
55	900	Capacity		13.3	17.2	20.0	26.0	31.3	35.6	37.0	42.7
		Int. Cap.		12.3	15.8	18.3	22.8	31.3	35.6	37.0	42.7
		kW		1.9	2.0	2.1	2.2	2.4	2.6	2.7	2.9
	1200	Capacity		13.8	17.8	20.8	27.0	32.8	36.9	38.3	44.1
		Int. Cap.		12.7	16.3	18.9	23.6	32.8	36.9	38.3	44.1
		kW		1.8	1.9	2.0	2.1	2.3	2.4	2.4	2.6
	1500	Capacity			18.7	21.8	28.2	34.0	38.1	39.4	45.1
		Int. Cap.			17.2	19.8	24.7	34.0	38.1	39.4	45.1
		kW			2.0	2.1	2.2	2.4	2.4	2.5	2.6
70	900	Capacity	7.5	11.0	14.9	17.8	23.6	28.5	32.7	34.2	40.4
		Int. Cap.	6.9	10.2	13.7	16.2	20.7	28.5	32.7	34.2	40.4
		kW	2.1	2.2	2.3	2.4	2.6	2.7	2.9	3.0	3.3
	1200	Capacity	7.9	11.6	15.6	18.6	24.7	29.9	34.6	36.0	41.9
		Int. Cap.	7.3	10.7	14.3	16.9	21.6	29.9	34.6	36.0	41.9
		kW	2.0	2.1	2.2	2.3	2.4	2.6	2.8	2.8	3.0
	1500	Capacity	8.7	12.4	16.5	19.6	25.8	31.3	35.9	37.3	43.1
		Int. Cap.	8.0	11.4	15.1	17.8	22.6	31.3	35.9	37.3	43.1
		kW	2.2	2.2	2.3	2.4	2.5	2.6	2.8	2.8	3.0
80	900	Capacity	5.7	9.3	13.2	16.1	21.9	26.8	30.5	32.1	38.4
		Int. Cap.	5.3	8.5	12.1	14.7	19.2	26.8	30.5	32.1	38.4
		kW	2.3	2.4	2.5	2.6	2.8	3.0	3.2	3.2	3.6
	1200	Capacity	6.1	9.8	13.9	16.9	22.9	28.1	32.3	33.9	40.3
		Int. Cap.	5.6	9.0	12.7	15.4	20.1	28.1	32.3	33.9	40.3
		kW	2.2	2.3	2.4	2.5	2.7	2.8	3.0	3.1	3.3
	1500	Capacity	6.8	10.6	14.8	17.9	24.1	29.4	34.0	35.6	41.6
		Int. Cap.	6.3	9.8	13.6	16.3	21.1	29.4	34.0	35.6	41.6
		kW	2.4	2.5	2.5	2.6	2.7	2.9	3.0	3.1	3.3

50HCQ

 – Indicates operation not permissible

**LEGEND**


- Capacity – Instantaneous Capacity (1000 Btuh) includes indoor fan motor heat @AHRI static conditions
- Int. Cap. – Integrated Capacity is Instantaneous Capacity minus the effects of frost on the outdoor coil and the heat required to defrost
- RH – Relative Humidity
- db – Dry Bulb

Table 25 – HEATING CAPACITIES

4 TONS

50HCQA05											
RETURN AIR (°F db)	CFM (STANDARD AIR)		TEMPERATURE AIR ENTERING OUTDOOR COIL (°F db AT 70% RH)								
			-10	0	10	17	30	40	47	50	60
55	1200	Capacity		18.5	23.8	27.7	35.3	41.9	47.6	49.3	56.5
		Int. Cap.		17.1	21.8	25.2	30.9	41.9	47.6	49.3	56.5
		kW		2.6	2.7	2.8	3.1	3.3	3.6	3.6	3.9
	1600	Capacity		18.8	24.3	28.4	36.1	43.6	48.7	50.4	57.4
		Int. Cap.		17.3	22.3	25.9	31.6	43.6	48.7	50.4	57.4
		kW		2.5	2.6	2.6	2.8	3.1	3.2	3.3	3.5
	2000	Capacity		19.8	25.3	29.7	37.5	44.9	49.8	51.4	58.0
		Int. Cap.		18.2	23.2	27.1	32.9	44.9	49.8	51.4	58.0
		kW		2.6	2.7	2.8	2.9	3.2	3.3	3.3	3.5
70	1200	Capacity	10.9	16.2	21.4	25.2	32.8	38.9	44.0	46.0	54.0
		Int. Cap.	10.1	14.9	19.7	23.0	28.7	38.9	44.0	46.0	54.0
		kW	2.8	2.9	3.1	3.2	3.5	3.7	4.0	4.1	4.5
	1600	Capacity	11.2	16.6	22.0	25.9	34.0	40.0	46.1	48.0	55.2
		Int. Cap.	10.3	15.3	20.2	23.6	29.8	40.0	46.1	48.0	55.2
		kW	2.7	2.8	2.9	3.0	3.2	3.4	3.7	3.8	4.0
	2000	Capacity	12.1	17.7	23.2	27.1	35.2	41.8	47.7	49.4	56.2
		Int. Cap.	11.2	16.2	21.2	24.7	30.9	41.8	47.7	49.4	56.2
		kW	2.9	2.9	3.0	3.1	3.3	3.5	3.7	3.8	4.0
80	1200	Capacity	8.9	14.3	19.6	23.3	30.8	37.4	41.8	43.6	51.8
		Int. Cap.	8.2	13.1	18.0	21.3	27.0	37.4	41.8	43.6	51.8
		kW	3.0	3.2	3.3	3.5	3.8	4.1	4.3	4.4	4.8
	1600	Capacity	9.2	14.7	20.2	24.1	31.9	38.4	43.4	45.5	53.5
		Int. Cap.	8.5	13.6	18.6	22.0	28.0	38.4	43.4	45.5	53.5
		kW	2.9	3.0	3.2	3.3	3.5	3.8	4.0	4.1	4.4
	2000	Capacity	10.1	15.8	21.4	25.3	33.4	39.8	45.4	47.4	54.7
		Int. Cap.	9.4	14.5	19.6	23.1	29.2	39.8	45.4	47.4	54.7
		kW	3.1	3.2	3.3	3.4	3.6	3.8	4.0	4.1	4.4

50HCQ

 – Indicates operation not permissible

**LEGEND**

- Capacity – Instantaneous Capacity (1000 Btuh) includes indoor fan motor heat @AHRI static conditions
- Int. Cap. – Integrated Capacity is Instantaneous Capacity minus the effects of frost on the outdoor coil and the heat required to defrost
- RH – Relative Humidity
- db – Dry Bulb

Table 26 – HEATING CAPACITIES

5 TONS

50HCQA06											
RETURN AIR (°F db)	CFM (STANDARD AIR)		TEMPERATURE AIR ENTERING OUTDOOR COIL (°F db AT 70% RH)								
			-10	0	10	17	30	40	47	50	60
55	1500	Capacity		22.0	28.5	33.3	43.5	51.4	58.0	60.1	68.6
		Int. Cap.		20.3	26.1	30.4	38.1	51.4	58.0	60.1	68.6
		kW		2.9	3.1	3.2	3.5	3.7	3.8	3.9	4.1
	2000	Capacity		23.9	30.5	35.5	45.7	54.1	60.4	62.3	69.9
		Int. Cap.		22.0	28.0	32.4	40.1	54.1	60.4	62.3	69.9
		kW		3.2	3.3	3.4	3.6	3.8	3.9	3.9	4.1
2500	Capacity		25.0	31.7	36.9	47.1	55.2	60.7	62.3	68.8	
	Int. Cap.		23.0	29.1	33.6	41.3	55.2	60.7	62.3	68.8	
	kW		3.3	3.4	3.5	3.7	3.8	3.9	3.9	4.0	
70	1500	Capacity		18.9	25.3	30.1	40.1	48.4	54.8	56.8	65.4
		Int. Cap.		17.4	23.3	27.5	35.2	48.4	54.8	56.8	65.4
		kW		3.4	3.5	3.6	3.9	4.2	4.4	4.5	4.7
	2000	Capacity		20.7	27.4	32.3	43.0	50.9	57.4	59.3	67.4
		Int. Cap.		19.1	25.1	29.4	37.7	50.9	57.4	59.3	67.4
		kW		3.6	3.7	3.8	4.1	4.3	4.4	4.4	4.6
2500	Capacity		21.9	28.6	33.6	44.4	52.5	58.5	60.3	67.3	
	Int. Cap.		20.1	26.3	30.7	38.9	52.5	58.5	60.3	67.3	
	kW		3.7	3.8	3.9	4.1	4.3	4.4	4.4	4.6	
80	1500	Capacity	10.3	16.5	23.1	27.8	37.4	46.2	52.4	54.7	63.2
		Int. Cap.	9.5	15.2	21.2	25.4	32.8	46.2	52.4	54.7	63.2
		kW	3.5	3.7	3.9	4.0	4.3	4.6	4.8	4.9	5.2
	2000	Capacity	12.0	18.4	25.1	30.0	40.1	48.9	55.2	57.4	65.4
		Int. Cap.	11.1	16.9	23.0	27.4	35.2	48.9	55.2	57.4	65.4
		kW	3.8	3.9	4.1	4.2	4.4	4.6	4.8	4.9	5.1
2500	Capacity	13.0	19.5	26.3	31.4	41.9	50.5	56.6	58.4	65.7	
	Int. Cap.	12.0	18.0	24.2	28.6	36.7	50.5	56.6	58.4	65.7	
	kW	3.9	4.0	4.2	4.3	4.5	4.7	4.8	4.8	5.0	

50HCQ

 – Indicates operation not permissible

**LEGEND**

- Capacity – Instantaneous Capacity (1000 Btuh) includes indoor fan motor heat @AHRI static conditions
- Int. Cap. – Integrated Capacity is Instantaneous Capacity minus the effects of frost on the outdoor coil and the heat required to defrost
- RH – Relative Humidity
- db – Dry Bulb

Table 27 – HEATING CAPACITIES

6 TONS

50HCQA07											
RETURN AIR (°F db)	CFM (STANDARD AIR)		TEMPERATURE AIR ENTERING OUTDOOR COIL (°F db AT 70% RH)								
			-10	0	10	17	30	40	47	50	60
55	900	Capacity	20.5	28.2	36.0	41.6	52.8	62.7	71.0	73.5	83.8
		Int. Cap.	19.0	25.9	33.0	38.0	46.3	62.7	71.0	73.5	83.8
		kW	4.0	4.2	4.4	4.5	4.7	5.0	5.2	5.3	5.5
	1200	Capacity		29.0	37.0	42.8	54.4	65.4	73.0	75.4	86.1
		Int. Cap.		26.7	34.0	39.1	47.7	65.4	73.0	75.4	86.1
		kW		4.1	4.2	4.3	4.5	4.8	4.9	4.9	5.1
	1500	Capacity		29.5	37.6	43.5	55.4	66.4	73.9	76.4	87.2
		Int. Cap.		27.1	34.5	39.7	48.5	66.4	73.9	76.4	87.2
		kW		4.0	4.1	4.2	4.4	4.6	4.7	4.7	4.9
70	900	Capacity	15.8	23.6	31.6	37.3	48.5	57.7	65.5	68.5	79.7
		Int. Cap.	14.6	21.7	29.0	34.0	42.5	57.7	65.5	68.5	79.7
		kW	4.5	4.7	4.9	5.0	5.3	5.5	5.7	5.8	6.1
	1200	Capacity	16.4	24.6	32.8	38.7	50.2	60.1	68.9	71.7	82.3
		Int. Cap.	15.1	22.6	30.1	35.3	44.0	60.1	68.9	71.7	82.3
		kW	4.4	4.6	4.8	4.9	5.1	5.2	5.5	5.5	5.7
	1500	Capacity	16.8	25.1	33.5	39.5	51.3	61.6	70.5	73.0	83.6
		Int. Cap.	15.5	23.1	30.8	36.1	44.9	61.6	70.5	73.0	83.6
		kW	4.4	4.6	4.7	4.8	4.9	5.1	5.3	5.3	5.5
80	900	Capacity	11.9	20.0	28.1	33.9	45.2	54.3	61.5	64.5	76.1
		Int. Cap.	11.0	18.4	25.8	30.9	39.6	54.3	61.5	64.5	76.1
		kW	4.8	5.0	5.3	5.4	5.7	5.9	6.1	6.2	6.5
	1200	Capacity	12.5	20.9	29.3	35.4	47.0	56.7	64.6	67.7	79.4
		Int. Cap.	11.5	19.2	26.9	32.3	41.2	56.7	64.6	67.7	79.4
		kW	4.8	5.0	5.1	5.3	5.5	5.6	5.8	5.9	6.1
	1500	Capacity	12.8	21.4	30.1	36.2	48.1	57.9	66.5	69.6	80.9
		Int. Cap.	11.8	19.7	27.6	33.0	42.1	57.9	66.5	69.6	80.9
		kW	4.8	4.9	5.1	5.2	5.3	5.5	5.6	5.7	5.9

50HCQA

– Indicates operation not permissible

**LEGEND**

- Capacity – Instantaneous Capacity (1000 Btuh) includes indoor fan motor heat @AHRI static conditions
- Int. Cap. – Integrated Capacity is Instantaneous Capacity minus the effects of frost on the outdoor coil and the heat required to defrost
- RH – Relative Humidity
- db – Dry Bulb

Table 28 – HEATING CAPACITIES

7.5 TONS

50HCQD08											
RETURN AIR (°F db)	CFM (STANDARD AIR)		TEMPERATURE AIR ENTERING OUTDOOR COIL (°F db AT 70% RH)								
			-10	0	10	17	30	40	47	50	60
55	2250	Capacity	24.3	33.6	43.4	50.6	66.3	78.0	87.4	90.4	102.6
		Int. Cap.	22.4	30.9	39.8	46.2	58.1	78.0	87.4	90.4	102.6
		kW	4.8	5.0	5.2	5.4	5.8	6.1	6.3	6.4	6.7
	3000	Capacity	24.7	34.2	44.3	51.8	67.8	80.2	89.6	92.5	104.6
		Int. Cap.	22.8	31.5	40.7	47.3	59.4	80.2	89.6	92.5	104.6
		kW	4.7	4.9	5.0	5.1	5.4	5.7	5.9	5.9	6.2
	3750	Capacity	24.9	34.6	44.9	52.6	68.7	81.3	90.4	93.1	104.3
		Int. Cap.	23.1	31.9	41.2	48.0	60.2	81.3	90.4	93.1	104.3
		kW	4.7	4.8	4.9	5.0	5.3	5.5	5.6	5.6	5.8
70	2250	Capacity	20.3	29.6	39.3	46.5	60.8	73.8	82.7	85.9	98.3
		Int. Cap.	18.7	27.2	36.1	42.4	53.3	73.8	82.7	85.9	98.3
		kW	5.5	5.7	5.9	6.1	6.5	6.9	7.2	7.3	7.7
	3000	Capacity	20.8	30.4	40.5	47.9	63.4	75.9	85.4	88.5	100.6
		Int. Cap.	19.3	28.0	37.2	43.6	55.6	75.9	85.4	88.5	100.6
		kW	5.4	5.6	5.8	5.9	6.2	6.5	6.7	6.7	7.0
	3750	Capacity	21.2	31.0	41.2	48.7	64.8	77.2	86.8	89.8	101.4
		Int. Cap.	19.6	28.5	37.8	44.4	56.7	77.2	86.8	89.8	101.4
		kW	5.4	5.5	5.6	5.7	6.0	6.2	6.4	6.4	6.6
80	2250	Capacity	16.8	26.2	36.0	43.2	57.2	70.2	79.5	82.8	95.2
		Int. Cap.	15.5	24.1	33.0	39.4	50.1	70.2	79.5	82.8	95.2
		kW	6.0	6.2	6.5	6.7	7.1	7.5	7.9	8.0	8.4
	3000	Capacity	17.4	27.1	37.2	44.6	59.3	73.0	82.1	85.4	97.7
		Int. Cap.	16.1	24.9	34.2	40.7	52.0	73.0	82.1	85.4	97.7
		kW	5.9	6.1	6.3	6.4	6.7	7.1	7.3	7.4	7.7
	3750	Capacity	17.7	27.6	38.0	45.5	60.6	74.3	83.7	87.0	98.8
		Int. Cap.	16.4	25.4	34.9	41.5	53.1	74.3	83.7	87.0	98.8
		kW	5.9	6.0	6.2	6.3	6.5	6.8	7.0	7.0	7.3

50HCQ

**LEGEND**

- Capacity – Instantaneous Capacity (1000 Btuh) includes indoor fan motor heat @AHRI static conditions
- Int. Cap. – Integrated Capacity is Instantaneous Capacity minus the effects of frost on the outdoor coil and the heat required to defrost
- RH – Relative Humidity
- dD – Dry Bulb

**Table 29 – HEATING CAPACITIES**

**8.5 TONS**

50HCQD09											
RETURN AIR (°F db)	CFM (STANDARD AIR)		TEMPERATURE AIR ENTERING OUTDOOR COIL (°F db AT 70% RH)								
			-10	0	10	17	30	40	47	50	60
55	2250	Capacity	35.1	37.7	49.0	57.4	74.4	87.8	98.9	102.6	118.3
		Int. Cap.	32.5	34.7	45.0	52.3	65.2	87.8	98.9	102.6	118.3
		kW	5.4	5.3	5.5	5.7	6.1	6.4	6.7	6.7	7.1
	3400	Capacity	32.6	39.1	50.8	59.4	76.8	90.8	102.1	105.7	121.3
		Int. Cap.	30.1	36.0	46.6	54.1	67.3	90.8	102.1	105.7	121.3
		kW	5.4	5.3	5.5	5.7	6.0	6.2	6.4	6.4	6.7
	4250	Capacity	34.4	42.6	54.4	63.3	80.9	95.1	106.1	109.6	125.0
		Int. Cap.	31.8	39.2	50.0	57.7	70.9	95.1	106.1	109.6	125.0
		kW	6.2	6.2	6.3	6.4	6.7	6.9	7.0	7.1	7.3
70	2250	Capacity	35.2	33.3	44.5	52.8	69.3	83.1	93.6	97.3	112.9
		Int. Cap.	32.6	30.6	40.9	48.1	60.7	83.1	93.6	97.3	112.9
		kW	6.3	6.0	6.3	6.5	6.9	7.3	7.6	7.7	8.1
	3400	Capacity	35.6	34.9	46.5	55.0	72.5	86.1	97.1	100.8	116.2
		Int. Cap.	32.9	32.1	42.7	50.1	63.5	86.1	97.1	100.8	116.2
		kW	6.3	6.1	6.3	6.5	6.8	7.1	7.3	7.3	7.6
	4250	Capacity	38.2	38.6	50.3	59.0	76.7	90.5	101.6	105.2	120.2
		Int. Cap.	35.3	35.5	46.2	53.7	67.2	90.5	101.6	105.2	120.2
		kW	7.2	6.9	7.1	7.2	7.5	7.7	7.9	7.9	8.2
80	2250	Capacity	34.6	29.6	40.9	49.1	65.4	79.8	89.9	93.8	109.1
		Int. Cap.	32.0	27.2	37.5	44.8	57.3	79.8	89.9	93.8	109.1
		kW	7.1	6.6	6.9	7.1	7.5	8.0	8.3	8.4	8.8
	3400	Capacity	35.2	31.2	42.8	51.4	68.2	82.7	93.4	97.2	112.5
		Int. Cap.	32.5	28.7	39.3	46.8	59.8	82.7	93.4	97.2	112.5
		kW	7.1	6.7	6.9	7.1	7.4	7.7	8.0	8.1	8.4
	4250	Capacity	38.2	34.9	46.7	55.4	72.7	87.1	98.2	101.8	116.8
		Int. Cap.	35.3	32.1	42.9	50.5	63.7	87.1	98.2	101.8	116.8
		kW	7.9	7.5	7.7	7.8	8.1	8.4	8.6	8.6	8.9

**50HCQ**

**LEGEND**

- Capacity – Instantaneous Capacity (1000 Btuh) includes indoor fan motor heat @AHRI static conditions
- Int. Cap. – Integrated Capacity is Instantaneous Capacity minus the effects of frost on the outdoor coil and the heat required to defrost
- RH – Relative Humidity
- db – Dry Bulb

Table 30 – HEATING CAPACITIES

10 TONS

50HCQD12											
RETURN AIR (°F db)	CFM (STANDARD AIR)		TEMPERATURE AIR ENTERING OUTDOOR COIL (°F db AT 70% RH)								
			-10	0	10	17	30	40	47	50	60
55	3000	Capacity	39.8	50.9	62.9	72.7	91.4	106.1	117.2	121.0	136.2
		Int. Cap.	36.8	46.8	57.8	66.3	80.1	106.1	117.2	121.0	136.2
		kW	6.23	6.55	6.87	7.15	7.71	8.20	8.62	8.76	9.39
	4000	Capacity	42.1	53.5	66.0	75.9	94.8	109.6	120.7	124.3	139.4
		Int. Cap.	39.0	49.2	60.6	69.2	83.0	109.6	120.7	124.3	139.4
		kW	6.50	6.75	7.01	7.22	7.65	8.03	8.36	8.47	8.96
	5000	Capacity	44.5	56.0	69.1	79.1	97.5	112.3	123.0	126.3	140.9
		Int. Cap.	41.2	51.5	63.4	72.1	85.4	112.3	123.0	126.3	140.9
		kW	6.93	7.15	7.38	7.56	7.91	8.25	8.51	8.60	9.01
70	3000	Capacity	34.6	45.8	57.9	66.9	86.4	101.6	112.2	116.3	131.2
		Int. Cap.	32.0	42.1	53.1	61.0	75.7	101.6	112.2	116.3	131.2
		kW	7.04	7.42	7.81	8.11	8.82	9.41	9.86	10.06	10.75
	4000	Capacity	37.0	48.5	60.9	70.4	90.4	105.1	116.1	120.0	134.8
		Int. Cap.	34.2	44.6	55.9	64.2	79.3	105.1	116.1	120.0	134.8
		kW	7.31	7.62	7.93	8.17	8.73	9.16	9.53	9.66	10.21
	5000	Capacity	39.4	51.1	63.7	73.6	93.5	108.0	118.9	122.5	137.0
		Int. Cap.	36.4	47.0	58.4	67.1	81.9	108.0	118.9	122.5	137.0
		kW	7.74	8.01	8.28	8.48	8.96	9.33	9.63	9.74	10.21
80	3000	Capacity	30.4	41.9	54.1	63.1	82.6	98.5	108.9	113.1	127.9
		Int. Cap.	28.1	38.6	49.6	57.6	72.3	98.5	108.9	113.1	127.9
		kW	7.65	8.09	8.53	8.86	9.64	10.34	10.83	11.05	11.80
	4000	Capacity	32.8	44.6	57.1	66.5	86.5	102.1	112.7	116.9	131.5
		Int. Cap.	30.4	41.1	52.4	60.6	75.8	102.1	112.7	116.9	131.5
		kW	7.92	8.28	8.64	8.90	9.51	10.03	10.43	10.58	11.17
	5000	Capacity	35.2	47.2	59.9	69.4	89.8	105.1	115.8	119.6	134.0
		Int. Cap.	32.6	43.5	55.0	63.3	78.7	105.1	115.8	119.6	134.0
		kW	8.36	8.68	8.98	9.19	9.72	10.15	10.49	10.61	11.12

50HCQ

**LEGEND**

- Capacity – Instantaneous Capacity (1000 Btuh) includes indoor fan motor heat @AHRI static conditions
- Int. Cap. – Integrated Capacity is Instantaneous Capacity minus the effects of frost on the outdoor coil and the heat required to defrost
- RH – Relative Humidity
- db – Dry Bulb



**Table 31 – STATIC PRESSURE ADDERS (FACTORY OPTIONS AND/OR ACCESSORIES)**

**Economizer**

3 – 5 TONS											
CFM (in. wg)	600	800	1000	1250	1500	1750	2000	2250	2500	2750	3000
Vertical Economizer	0.01	0.02	0.04	0.05	0.07	0.09	0.12	0.15	0.18	0.22	0.26
Horizontal Economizer	0.02	0.03	0.04	0.06	0.08	0.10	0.13	0.15	0.18	0.23	0.28

6 – 10 TONS																
CFM (in. wg)	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000	5250	5500	5750	6000
Vertical Economizer	0.06	0.08	0.09	0.12	0.13	0.15	0.17	0.20	0.22	0.25	0.29	0.33	0.36	0.40	0.44	0.48
Horizontal Economizer	0.08	0.10	0.13	0.15	0.18	0.21	0.25	0.28	0.30	0.34	0.39	0.43	0.47	0.51	0.56	0.60

**Electric Heaters**

3 – 5 TONS										
CFM (in. wg)	600	900	1200	1400	1600	1800	2000	2200	2400	2600
1 Electric Heater Module	0.03	0.05	0.07	0.09	0.09	0.10	0.11	0.11	0.12	0.13
2 Electric Heater Modules	0.13	0.15	0.16	0.16	0.16	0.17	0.17	0.17	0.18	0.18

6 – 10 TONS																
CFM (in. wg)	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000	5250	5500	5750	6000
1 Electric Heater Module	0.03	0.04	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.18
2 Electric Heater Modules	0.04	0.05	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.15	0.16	0.17	0.19	0.20

**50HCC**

**GENERAL FAN PERFORMANCE NOTES:**

1. Interpolation is permissible. Do not extrapolate.
2. External static pressure is the static pressure difference between the return duct and the supply duct plus the static pressure caused by any FIOPs or accessories.
3. Tabular data accounts for pressure loss due to clean filters, unit casing, and wet coils. Factory options and accessories may add static pressure losses, as shown in Table 31. Selection software is available, through your salesperson, to help you select the best motor/drive combination for your application.
4. The Fan Performance tables offer motor/drive recommendations. In cases when two motor/drive combinations would work, Carrier recommended the lower horsepower option.
5. For information on the electrical properties of Carrier motors, please see the Electrical information section of this book.
6. For more information on the performance limits of Carrier motors, see the application data section of this book.

## FAN PERFORMANCE

**Table 32 – 50HCQA04  
3 TON HORIZONTAL UNIT DIRECT DRIVE**

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	900	0.57	0.25
	975	0.47	0.24
	1050	0.37	0.22
	1125	0.27	0.21
	1200	0.18	0.20
	1275	0.09	0.20
	1350	–	–
	1425	–	–
1500	–	–	
2	900	0.73	0.30
	975	0.62	0.29
	1050	0.51	0.28
	1125	0.41	0.27
	1200	0.30	0.25
	1275	0.19	0.24
	1350	0.08	0.22
	1425	–	–
1500	–	–	
3	900	1.04	0.41
	975	0.93	0.40
	1050	0.82	0.39
	1125	0.70	0.38
	1200	0.58	0.36
	1275	0.46	0.35
	1350	0.34	0.33
	1425	0.23	0.31
1500	0.12	0.30	
4	900	1.26	0.49
	975	1.18	0.50
	1050	1.09	0.50
	1125	0.99	0.50
	1200	0.88	0.49
	1275	0.76	0.47
	1350	0.63	0.46
	1425	0.50	0.44
1500	0.37	0.42	
5	900	1.35	0.52
	975	1.30	0.54
	1050	1.26	0.57
	1125	1.21	0.59
	1200	1.16	0.62
	1275	1.12	0.64
	1350	1.07	0.67
	1425	1.02	0.70
1500	0.97	0.73	

**Table 33 – 50HCQA04  
3 TON VERTICAL UNIT DIRECT DRIVE**

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	900	0.44	0.19
	975	0.34	0.18
	1050	0.24	0.17
	1125	0.15	0.16
	1200	0.07	0.16
	1275	–	–
	1350	–	–
	1425	–	–
1500	–	–	
2	900	0.60	0.24
	975	0.49	0.23
	1050	0.38	0.22
	1125	0.28	0.21
	1200	0.18	0.20
	1275	0.09	0.19
	1350	–	–
	1425	–	–
1500	–	–	
3	900	0.93	0.36
	975	0.81	0.35
	1050	0.70	0.34
	1125	0.58	0.33
	1200	0.47	0.31
	1275	0.36	0.30
	1350	0.25	0.29
	1425	0.14	0.27
1500	–	–	
4	900	1.15	0.44
	975	1.07	0.45
	1050	0.97	0.46
	1125	0.86	0.46
	1200	0.74	0.43
	1275	0.61	0.41
	1350	0.48	0.40
	1425	0.35	0.39
1500	0.23	0.37	
5	900	1.24	0.51
	975	1.19	0.52
	1050	1.24	0.54
	1125	1.24	0.57
	1200	1.03	0.59
	1275	0.98	0.61
	1350	0.93	0.64
	1425	0.88	0.67
1500	0.82	0.69	

**50HCQ**

## FAN PERFORMANCE (cont.)

**Table 34 – 50HCQA05  
4 TON HORIZONTAL UNIT DIRECT DRIVE**

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1200	0.93	0.48
	1300	0.80	0.46
	1400	0.66	0.44
	1500	0.51	0.41
	1600	0.36	0.39
	1700	0.22	0.36
	1800	0.08	0.33
	1900	–	–
2000	–	–	
2	1200	1.04	0.53
	1300	0.91	0.51
	1400	0.76	0.48
	1500	0.61	0.46
	1600	0.45	0.43
	1700	0.30	0.40
	1800	0.16	0.38
	1900	0.04	0.35
2000	–	–	
3	1200	1.18	0.58
	1300	1.09	0.59
	1400	0.98	0.60
	1500	0.86	0.60
	1600	0.72	0.57
	1700	0.57	0.54
	1800	0.42	0.51
	1900	0.28	0.48
2000	0.15	0.45	
4	1200	1.24	0.60
	1300	1.18	0.63
	1400	1.12	0.66
	1500	1.04	0.71
	1600	0.95	0.70
	1700	0.85	0.71
	1800	0.73	0.71
	1900	0.60	0.69
2000	0.45	0.65	
5	1200	1.25	0.61
	1300	1.20	0.65
	1400	1.12	0.68
	1500	1.04	0.68
	1600	1.05	0.76
	1700	1.01	0.76
	1800	0.96	0.84
	1900	0.91	0.89
2000	0.87	0.93	

**Table 35 – 50HCQA05  
4 TON VERTICAL UNIT DIRECT DRIVE**

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1200	0.87	0.43
	1300	0.73	0.41
	1400	0.59	0.39
	1500	0.43	0.37
	1600	0.27	0.34
	1700	0.12	0.33
	1800	–	–
	1900	–	–
2000	–	–	
2	1200	0.96	0.48
	1300	0.84	0.46
	1400	0.69	0.44
	1500	0.53	0.41
	1600	0.37	0.39
	1700	0.21	0.36
	1800	0.06	0.34
	1900	–	–
2000	–	–	
3	1200	1.13	0.53
	1300	1.06	0.53
	1400	0.98	0.54
	1500	0.88	0.56
	1600	0.76	0.54
	1700	0.62	0.52
	1800	0.47	0.50
	1900	0.31	0.47
2000	0.15	0.45	
4	1200	1.16	0.57
	1300	1.12	0.59
	1400	1.07	0.62
	1500	1.00	0.67
	1600	0.91	0.66
	1700	0.80	0.67
	1800	0.67	0.67
	1900	0.52	0.63
2000	0.35	0.61	
5	1200	1.16	0.59
	1300	1.11	0.63
	1400	1.01	0.67
	1500	0.91	0.67
	1600	0.96	0.75
	1700	0.91	0.75
	1800	0.86	0.83
	1900	0.80	0.87
2000	0.74	0.91	

**50HCQ**

## FAN PERFORMANCE (cont.)

**Table 36 – 50HCQA06  
5 TON HORIZONTAL UNIT DIRECT DRIVE**

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1500	0.37	0.35
	1625	0.22	0.33
	1750	0.08	0.31
	1875	–	–
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
2500	–	–	
2	1500	0.54	0.44
	1625	0.37	0.41
	1750	0.20	0.38
	1875	0.04	0.35
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
2500	–	–	
3	1500	1.28	0.83
	1625	1.10	0.81
	1750	0.90	0.78
	1875	0.68	0.74
	2000	0.47	0.70
	2125	0.27	0.66
	2250	0.10	0.62
	2375	–	–
2500	–	–	
4	1500	1.46	0.94
	1625	1.32	0.92
	1750	1.16	0.96
	1875	0.96	0.95
	2000	0.76	0.91
	2125	0.54	0.86
	2250	0.33	0.82
	2375	0.14	0.78
2500	0.00	0.72	
5	1500	1.52	0.97
	1625	1.42	1.01
	1750	1.16	1.05
	1875	0.96	1.09
	2000	1.00	1.09
	2125	0.82	1.06
	2250	0.62	1.02
	2375	0.40	0.98
2500	0.16	0.93	

**Table 37 – 50HCQA06  
5 TON VERTICAL UNIT DIRECT DRIVE**

SPEED (TORQUE) TAP	CFM	ESP	BHP
1	1500	0.27	0.32
	1625	0.13	0.30
	1750	–	–
	1875	–	–
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
2500	–	–	
2	1500	0.42	0.40
	1625	0.25	0.37
	1750	0.08	0.34
	1875	–	–
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
2500	–	–	
3	1500	1.11	0.79
	1625	0.91	0.76
	1750	0.70	0.74
	1875	0.50	0.70
	2000	0.30	0.67
	2125	0.12	0.63
	2250	–	–
	2375	–	–
2500	–	–	
4	1500	1.29	0.90
	1625	1.13	0.88
	1750	0.95	0.91
	1875	0.74	0.88
	2000	0.52	0.84
	2125	0.30	0.80
	2250	0.11	0.77
	2375	–	–
2500	–	–	
5	1500	1.36	0.94
	1625	1.24	0.99
	1750	0.95	1.02
	1875	0.74	1.05
	2000	0.74	1.03
	2125	0.53	0.99
	2250	0.31	0.94
	2375	0.08	0.90
2500	–0.14	0.86	

**50HCQ**

## FAN PERFORMANCE (cont.)

**Table 38 – 50HCQA04**

**3 TON HORIZONTAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	574	0.13	707	0.23	817	0.34	913	0.47	999	0.61
975	597	0.15	727	0.25	835	0.37	929	0.50	1015	0.64
1050	621	0.18	747	0.28	853	0.40	946	0.53	1030	0.68
1125	646	0.20	768	0.31	872	0.43	964	0.57	1047	0.72
1200	671	0.23	790	0.34	892	0.47	982	0.61	1064	0.76
1275	696	0.26	812	0.38	912	0.51	1001	0.65	1082	0.81
1350	723	0.30	835	0.42	933	0.55	1020	0.70	1100	0.86
1425	749	0.34	859	0.46	955	0.60	1040	0.75	1119	0.91
1500	776	0.38	883	0.51	977	0.65	1061	0.80	1138	0.97

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1078	0.77	1151	0.93	1220	1.11	1284	1.30	1346	1.49
975	1093	0.80	1165	0.97	1233	1.15	1297	1.33	1358	1.53
1050	1108	0.84	1180	1.01	1247	1.19	1311	1.38	1371	1.58
1125	1123	0.88	1195	1.05	1261	1.23	1325	1.42	1385	1.62
1200	1140	0.92	1210	1.10	1276	1.28	1339	1.47	1399	1.68
1275	1157	0.97	1226	1.15	1292	1.33	1354	1.53	1414	1.73
1350	1174	1.02	1243	1.20	1308	1.39	1370	1.59	1429	1.80
1425	1192	1.08	1260	1.26	1325	1.45	1386	1.65	1444	1.86
1500	1210	1.14	1278	1.33	1342	1.52	1403	1.72	1461	1.93

Med Static Motor and Drive – 819–1251 RPM, Max BHP 1.5

High Static Motor and Drive – 1035–1466 RPM, Max BHP 2.0

**Table 39 – 50HCQA04**

**3 TON VERTICAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	594	0.15	740	0.25	867	0.37	981	0.52	1084	0.68
975	618	0.17	758	0.28	881	0.40	991	0.55	1092	0.71
1050	642	0.19	777	0.30	896	0.43	1003	0.58	1102	0.75
1125	668	0.22	797	0.34	912	0.47	1017	0.62	1113	0.79
1200	695	0.25	818	0.37	930	0.51	1032	0.66	1126	0.83
1275	722	0.29	841	0.41	949	0.55	1048	0.71	1140	0.88
1350	750	0.33	864	0.46	968	0.60	1065	0.76	1155	0.93
1425	778	0.37	888	0.50	989	0.65	1083	0.81	1171	0.99
1500	807	0.42	913	0.56	1011	0.71	1103	0.87	1188	1.05

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1180	0.86	1269	1.05	1354	1.25	1434	1.47	<b>1511</b>	<b>1.70</b>
975	1186	0.89	1275	1.08	1358	1.29	1437	1.51	<b>1513</b>	<b>1.74</b>
1050	1194	0.92	1281	1.12	1363	1.32	1441	1.54	<b>1516</b>	<b>1.78</b>
1125	1204	0.97	1289	1.16	1370	1.37	1447	1.59	<b>1520</b>	<b>1.82</b>
1200	1215	1.01	1298	1.21	1378	1.42	1454	1.64	<b>1526</b>	<b>1.87</b>
1275	1227	1.06	1309	1.26	1387	1.47	1462	1.69	<b>1533</b>	<b>1.92</b>
1350	1240	1.12	1321	1.32	1397	1.53	<b>1471</b>	<b>1.75</b>	<b>1541</b>	<b>1.99</b>
1425	1254	1.18	1333	1.38	1409	1.59	<b>1481</b>	<b>1.82</b>	–	–
1500	1270	1.24	1347	1.45	1421	1.66	<b>1492</b>	<b>1.89</b>	–	–

**Boldface** – Field-supplied Drive  
– Outside operating range

Med Static Motor and Drive – 819–1251 RPM, Max BHP 1.5

High Static Motor and Drive – 1035–1466 RPM, Max BHP 2.0

**50HCQ**

## FAN PERFORMANCE (cont.)

**Table 40 – 50HCQA05**

**4 TON HORIZONTAL SUPPLY**

CFM	Available External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	630	0.20	755	0.31	859	0.43	949	0.56	1030	0.70
1300	659	0.24	781	0.36	883	0.48	972	0.61	1052	0.76
1400	689	0.28	808	0.40	908	0.53	995	0.67	1075	0.82
1500	720	0.33	836	0.46	933	0.59	1020	0.74	1098	0.89
1600	752	0.38	864	0.52	960	0.66	1044	0.81	1121	0.97
1700	784	0.44	893	0.58	986	0.73	1070	0.89	1146	1.05
1800	816	0.50	922	0.65	1014	0.81	1096	0.97	1171	1.14
1900	849	0.58	952	0.73	1042	0.90	1122	1.07	1196	1.24
2000	882	0.66	982	0.82	1070	0.99	1149	1.17	1222	1.35

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	1104	0.84	1173	0.99	1237	1.15	1298	1.32	1356	1.49
1300	1125	0.91	1194	1.06	1258	1.23	1318	1.40	1375	1.58
1400	1147	0.98	1215	1.14	1278	1.31	1338	1.48	1395	1.67
1500	1170	1.05	1237	1.22	1299	1.39	1359	1.57	1416	1.76
1600	1193	1.13	1259	1.31	1321	1.49	1380	1.67	1437	1.86
1700	1216	1.22	1282	1.40	1344	1.59	1402	1.78	1458	1.97
1800	1240	1.32	1305	1.50	1366	1.69	1424	1.89	1480	2.09
1900	1265	1.43	1329	1.61	1390	1.81	1447	2.01	1502	2.22
2000	1290	1.54	1353	1.73	1413	1.93	1470	2.14	1525	2.35

**50HCQ**

*Italics – Field-supplied motor and drive required*

Med Static Motor and Drive – 920–1303 RPM, Max BHP 1.5  
 High Static Motor and Drive – 1035–1466 RPM, Max BHP 2.0

**Table 41 – 50HCQA05**

**4 TON VERTICAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	682	0.25	800	0.36	897	0.48	982	0.61	1058	0.75
1300	717	0.29	832	0.42	928	0.55	1011	0.68	1086	0.82
1400	753	0.34	865	0.48	958	0.61	1041	0.76	1115	0.91
1500	789	0.40	898	0.54	990	0.69	1071	0.84	1144	1.00
1600	826	0.47	932	0.62	1022	0.77	1102	0.93	1174	1.09
1700	863	0.54	966	0.70	1055	0.86	1133	1.03	1205	1.20
1800	901	0.62	1001	0.79	1088	0.96	1165	1.13	1235	1.31
1900	939	0.71	1037	0.89	1121	1.07	1197	1.25	1267	1.44
2000	978	0.81	1073	0.99	1156	1.18	1230	1.37	1299	1.57

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	1128	0.89	1192	1.03	1252	1.18	1309	1.34	1363	1.50
1300	1155	0.97	1219	1.12	1279	1.28	1336	1.44	1389	1.61
1400	1183	1.06	1247	1.22	1306	1.38	1362	1.55	1416	1.72
1500	1212	1.16	1275	1.32	1334	1.49	1389	1.67	1443	1.85
1600	1241	1.26	1303	1.43	1362	1.61	1417	1.79	1470	1.98
1700	1271	1.37	1332	1.55	1390	1.74	1445	1.93	1498	2.12
1800	1301	1.50	1362	1.68	1419	1.87	1474	2.07	1526	2.27
1900	1331	1.63	1392	1.82	1449	2.02	1503	2.22	-	-
2000	1362	1.77	1422	1.97	1478	2.18	1532	2.38	-	-

*Italics – Field-supplied motor and drive required*

Med Static Motor and Drive – 920–1303 RPM, Max BHP 1.5  
 High Static Motor and Drive – 1035–1466 RPM, Max BHP 2.0

– Outside operating range

# FAN PERFORMANCE (cont.)

**Table 42 – 50HCQA06**

**5 TON HORIZONTAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	725	0.33	840	0.46	937	0.60	1023	0.75	1101	0.90
1625	765	0.40	876	0.54	970	0.68	1054	0.84	1131	1.00
1750	806	0.48	912	0.63	1004	0.78	1087	0.94	1162	1.11
1875	847	0.57	950	0.72	1039	0.88	1120	1.05	1194	1.23
2000	889	0.66	988	0.83	1075	1.00	1154	1.18	1226	1.36
2125	931	0.78	1027	0.95	1112	1.13	1189	1.31	1260	1.50
2250	974	0.90	1067	1.08	1149	1.27	1224	1.46	1294	1.66
2375	1018	1.03	1107	1.23	1187	1.43	1261	1.63	1329	1.84
2500	1061	1.19	1148	1.39	1226	1.59	1297	1.81	1364	2.02

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	1172	1.06	1239	1.23	1302	1.40	1361	1.58	1418	1.77
1625	1201	1.16	1267	1.34	1329	1.52	1388	1.71	1444	1.90
1750	1231	1.28	1296	1.46	1358	1.65	1416	1.84	1472	2.04
1875	1262	1.41	1326	1.60	1387	1.79	1445	1.99	1499	2.20
2000	1294	1.55	1357	1.74	1417	1.95	1474	2.15	1528	2.36
2125	1326	1.70	1388	1.90	1447	2.11	1504	2.33	1557	2.55
2250	1359	1.87	1420	2.08	1479	2.29	1534	2.51	1587	2.74
2375	1393	2.05	1453	2.27	1511	2.49	1566	2.72	-	-
2500	1427	2.24	1487	2.47	1543	2.70	1597	2.94	-	-

**50HCQ**

Med Static Motor and Drive – 1066–1380 RPM, Max BHP 2.0 – Outside operating range  
 High Static Motor and Drive – 1208–1639 RPM, Max BHP 2.9

**Table 43 – 50HCQA06**

**5 TON VERTICAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	794	0.41	902	0.55	993	0.69	1074	0.85	1147	1.00
1625	840	0.49	945	0.64	1034	0.80	1113	0.96	1185	1.13
1750	888	0.59	988	0.75	1075	0.92	1153	1.09	1223	1.26
1875	936	0.70	1033	0.87	1117	1.05	1193	1.23	1263	1.41
2000	984	0.82	1078	1.00	1160	1.19	1235	1.39	1303	1.58
2125	1033	0.96	1124	1.15	1204	1.35	1277	1.56	1343	1.76
2250	1083	1.11	1170	1.32	1248	1.53	1319	1.74	1385	1.96
2375	1133	1.28	1217	1.50	1293	1.72	1363	1.95	1427	2.17
2500	1183	1.47	1265	1.70	1339	1.93	1406	2.17	1470	2.41

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	1214	1.16	1277	1.33	1336	1.50	1392	1.67	1445	1.85
1625	1251	1.30	1313	1.47	1371	1.65	1427	1.83	1479	2.02
1750	1289	1.44	1350	1.63	1407	1.81	1462	2.01	1514	2.20
1875	1327	1.60	1387	1.80	1444	1.99	1498	2.19	1550	2.40
2000	1366	1.78	1426	1.98	1482	2.19	1535	2.40	1586	2.61
2125	1406	1.97	1464	2.18	1520	2.40	1573	2.62	1623	2.84
2250	1446	2.18	1504	2.40	1559	2.62	1611	2.85	-	-
2375	1487	2.40	1544	2.63	1598	2.87	-	-	-	-
2500	1529	2.64	1585	2.89	-	-	-	-	-	-

Med Static Motor and Drive – 1066–1380 RPM, Max BHP 2.0 – Outside operating range  
 High Static Motor and Drive – 1208–1639 RPM, Max BHP 2.9

## FAN PERFORMANCE (cont.)

**Table 44 – 50HCQA07**

**6 TON HORIZONTAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	415	0.28	510	0.46	588	0.65	655	0.85	715	1.08
1950	431	0.32	525	0.51	601	0.71	668	0.93	727	1.16
2100	448	0.38	540	0.57	615	0.78	681	1.01	740	1.25
2250	465	0.43	555	0.64	629	0.86	694	1.10	753	1.34
2400	483	0.49	571	0.71	644	0.94	708	1.19	766	1.45
2550	501	0.56	587	0.79	659	1.04	722	1.29	779	1.56
2700	519	0.64	603	0.88	674	1.14	737	1.40	793	1.68
2850	538	0.72	620	0.98	689	1.24	751	1.52	807	1.80
3000	557	0.82	637	1.08	705	1.36	766	1.64	822	1.94

**50HCQ**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	770	1.31	821	1.56	868	1.82	913	2.09	955	2.36
1950	782	1.40	832	1.66	879	1.92	924	2.20	966	2.49
2100	794	1.50	844	1.76	891	2.03	935	2.32	977	2.61
2250	806	1.60	856	1.87	903	2.15	947	2.45	988	2.75
2400	819	1.71	868	1.99	915	2.28	958	2.58	1000	2.89
2550	832	1.83	881	2.12	927	2.42	971	2.73	1012	3.05
2700	845	1.96	894	2.26	940	2.57	983	2.88	1024	3.21
2850	859	2.10	907	2.41	953	2.72	995	3.05	1036	3.38
3000	873	2.24	921	2.56	966	2.89	1008	3.22	1049	3.56

Std Static Motor and Drive – 489–747 RPM, Max BHP 1.2  
 Med Static Motor and Drive – 733–949 RPM, Max BHP 2.9  
 High Static Motor and Drive – 909–1102 RPM, Max BHP 4.0

**Table 45 – 50HCQA07**

**6 TON VERTICAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	446	0.33	534	0.50	609	0.70	676	0.91	736	1.14
1950	467	0.39	552	0.57	625	0.77	690	0.99	750	1.23
2100	489	0.45	571	0.64	642	0.86	706	1.08	764	1.33
2250	511	0.53	591	0.73	660	0.95	722	1.19	779	1.44
2400	534	0.61	611	0.82	678	1.05	739	1.30	795	1.56
2550	558	0.71	631	0.93	697	1.17	756	1.42	811	1.69
2700	581	0.81	652	1.04	716	1.29	774	1.55	828	1.83
2850	605	0.93	674	1.17	736	1.43	792	1.70	845	1.98
3000	630	1.06	696	1.31	756	1.58	811	1.86	863	2.15

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1800	791	1.39	843	1.65	892	1.93	938	2.22	981	2.53
1950	804	1.49	855	1.76	903	2.04	949	2.34	992	2.65
2100	818	1.59	868	1.87	915	2.16	961	2.46	1003	2.78
2250	832	1.71	882	1.99	928	2.29	973	2.59	1015	2.92
2400	847	1.83	896	2.12	942	2.43	986	2.74	1028	3.07
2550	862	1.97	910	2.27	956	2.58	999	2.90	1041	3.23
2700	878	2.12	926	2.42	971	2.74	1013	3.07	1055	3.41
2850	895	2.28	941	2.59	986	2.92	1028	3.25	1069	3.60
3000	912	2.46	958	2.78	1001	3.11	1043	3.45	1083	3.80

Std Static Motor and Drive – 489–747 RPM, Max BHP 1.2  
 Med Static Motor and Drive – 733–949 RPM, Max BHP 2.9  
 High Static Motor and Drive – 909–1102 RPM, Max BHP 4.0



# FAN PERFORMANCE (cont.)

**Table 46 – 50HCQD08**

**7.5 TON HORIZONTAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	433	0.29	518	0.41	596	0.54	667	0.67	733	0.81
2438	454	0.35	535	0.48	609	0.61	677	0.75	741	0.90
2625	477	0.42	553	0.55	624	0.69	689	0.84	751	1.00
2813	500	0.49	572	0.64	640	0.78	703	0.94	763	1.10
3000	523	0.58	592	0.73	657	0.88	718	1.05	775	1.22
3188	547	0.68	613	0.83	675	1.00	733	1.17	789	1.34
3375	571	0.78	634	0.95	694	1.12	750	1.30	804	1.48
3563	596	0.90	656	1.07	713	1.25	768	1.44	820	1.63
3750	621	1.03	679	1.21	734	1.40	786	1.59	837	1.79

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	795	0.96	854	1.11	910	1.27	963	1.43	1014	1.60
2438	802	1.05	859	1.21	913	1.38	966	1.55	1016	1.72
2625	810	1.16	865	1.32	919	1.49	970	1.67	1019	1.85
2813	819	1.27	874	1.44	925	1.62	975	1.80	1023	1.99
3000	830	1.39	883	1.57	934	1.76	982	1.95	1029	2.14
3188	843	1.53	894	1.71	943	1.90	990	2.10	1036	2.30
3375	856	1.67	905	1.86	953	2.06	1000	2.27	1045	2.48
3563	870	1.83	918	2.03	965	2.23	1010	2.44	1054	2.66
3750	885	1.99	932	2.20	978	2.42	1022	2.64	1065	2.86

Std Static Motor and Drive – 518–733 RPM, Max BHP 1.2  
 Med Static Motor and Drive – 690–936 RPM, Max BHP 1.7  
 High Static Motor and Drive – 838–1084 RPM, Max BHP 2.8

**50HCQ**

**Table 47 – 50HCQD08**

**7.5 TON VERTICAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	457	0.32	536	0.44	604	0.55	664	0.67	719	0.79
2438	481	0.39	557	0.51	623	0.64	682	0.77	735	0.89
2625	505	0.47	578	0.60	642	0.73	700	0.87	753	1.00
2813	530	0.55	601	0.70	663	0.84	719	0.98	771	1.13
3000	556	0.65	623	0.80	684	0.95	738	1.11	789	1.26
3188	582	0.76	647	0.92	705	1.08	759	1.25	808	1.41
3375	608	0.88	671	1.05	727	1.22	779	1.40	828	1.57
3563	634	1.01	695	1.19	750	1.38	801	1.56	848	1.74
3750	661	1.16	719	1.35	773	1.54	822	1.73	869	1.93

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2250	770	0.91	817	1.03	861	1.15	903	1.28	943	1.40
2438	785	1.02	832	1.15	876	1.28	917	1.41	957	1.55
2625	802	1.14	847	1.28	891	1.42	932	1.56	971	1.70
2813	819	1.27	864	1.42	907	1.57	947	1.72	986	1.87
3000	836	1.42	881	1.57	923	1.73	963	1.89	1001	2.05
3188	855	1.57	898	1.74	940	1.90	979	2.07	1017	2.24
3375	873	1.74	916	1.91	957	2.09	996	2.26	1034	2.44
3563	893	1.92	935	2.11	975	2.29	1014	2.47	1051	2.66
3750	912	2.12	954	2.31	994	2.50	1031	2.70	1068	2.89

Std Static Motor and Drive – 518–733 RPM, Max BHP 1.2  
 Med Static Motor and Drive – 690–936 RPM, Max BHP 1.7  
 High Static Motor and Drive – 838–1084 RPM, Max BHP 2.8

## FAN PERFORMANCE (cont.)

**Table 48 – 50HCQD09**

**8.5 TON HORIZONTAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2550	468	0.39	546	0.52	618	0.66	684	0.80	747	0.96
2763	493	0.47	567	0.61	635	0.76	699	0.91	760	1.07
2975	520	0.57	589	0.72	654	0.87	716	1.03	774	1.20
3188	547	0.68	613	0.83	675	1.00	733	1.17	789	1.34
3400	575	0.80	637	0.96	696	1.14	752	1.31	806	1.50
3613	603	0.94	662	1.11	719	1.29	773	1.48	824	1.67
3825	631	1.09	688	1.27	742	1.46	794	1.66	843	1.86
4038	660	1.26	714	1.45	766	1.65	816	1.85	864	2.06
4250	689	1.45	741	1.65	790	1.86	838	2.07	885	2.29

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2550	806	1.11	863	1.28	916	1.45	968	1.62	1018	1.80
2763	817	1.24	871	1.41	924	1.59	974	1.77	1022	1.95
2975	829	1.37	882	1.55	932	1.74	981	1.93	1028	2.12
3188	843	1.53	894	1.71	943	1.90	990	2.10	1036	2.30
3400	858	1.69	907	1.88	955	2.09	1001	2.29	1046	2.50
3613	874	1.87	922	2.07	968	2.28	1013	2.49	1057	2.71
3825	891	2.07	938	2.28	983	2.49	1027	2.71	1069	2.94
4038	910	2.28	955	2.50	999	2.72	1041	2.95	1083	3.19
4250	930	2.51	973	2.74	1015	2.97	1057	3.21	1097	3.45

Std static – 460–652 RPM, Max BHP 1.2

Med static – 591–838 RPM, Max BHP 2.9

High static – 838–1084 RPM, Max BHP 2.9

**Table 49 – 50HCQD09**

**8.5 VERTICAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2550	495	0.43	570	0.56	634	0.70	693	0.83	746	0.96
2763	524	0.53	595	0.67	657	0.81	714	0.95	766	1.09
2975	552	0.63	620	0.79	681	0.94	736	1.09	787	1.24
3188	582	0.76	647	0.92	705	1.08	759	1.25	808	1.41
3400	611	0.89	674	1.07	730	1.24	782	1.42	831	1.59
3613	641	1.05	701	1.23	756	1.42	806	1.60	854	1.79
3825	672	1.22	729	1.42	782	1.61	831	1.81	877	2.00
4038	702	1.41	758	1.62	809	1.83	857	2.03	901	2.24
4250	733	1.62	787	1.84	836	2.06	883	2.28	926	2.49

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2550	795	1.09	841	1.23	885	1.36	926	1.50	965	1.64
2763	814	1.24	859	1.38	902	1.53	943	1.68	982	1.82
2975	834	1.40	878	1.55	921	1.71	961	1.86	999	2.02
3188	855	1.57	898	1.74	940	1.90	979	2.07	1017	2.24
3400	876	1.76	919	1.94	960	2.12	998	2.29	1036	2.47
3613	898	1.97	940	2.16	980	2.34	1018	2.53	1055	2.72
3825	921	2.20	962	2.40	1001	2.59	1039	2.79	1075	2.99
4038	944	2.45	984	2.65	1023	2.86	1060	3.07	1096	3.27
4250	968	2.71	1007	2.93	1045	3.15	1081	3.36	1117	3.58

Std static – 460–652 RPM, Max BHP 1.2

Med static – 591–838 RPM, Max BHP 2.9

High static – 838–1084 RPM, Max BHP 2.9

**50HCQ**

## FAN PERFORMANCE (cont.)

**Table 50 – 50HCQD12**

**10 TON HORIZONTAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	<b>335</b>	0.32	<b>421</b>	<b>0.51</b>	500	0.74	572	1.00	637	1.29
3250	<b>350</b>	<b>0.38</b>	<b>430</b>	<b>0.58</b>	505	0.81	575	1.08	640	1.37
3500	<b>365</b>	<b>0.45</b>	441	0.65	512	0.89	579	1.16	642	1.46
3750	<b>381</b>	<b>0.53</b>	452	0.74	520	0.98	584	1.26	645	1.56
4000	<b>397</b>	<b>0.61</b>	464	0.83	529	1.08	590	1.36	650	1.67
4250	<b>413</b>	<b>0.70</b>	477	0.93	538	1.19	598	1.47	655	1.78
4500	<b>429</b>	<b>0.81</b>	491	1.05	549	1.31	606	1.60	661	1.91
4750	445	0.92	505	1.17	561	1.44	615	1.73	667	2.05
5000	462	1.04	519	1.30	573	1.58	625	1.88	675	2.21

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	697	1.59	751	1.91	801	2.24	847	2.59	891	2.94
3250	699	1.68	753	2.01	803	2.35	850	2.71	895	3.08
3500	701	1.78	755	2.12	806	2.47	853	2.84	898	3.22
3750	703	1.88	757	2.23	808	2.59	855	2.97	900	3.36
4000	706	2.00	<b>759</b>	<b>2.35</b>	809	2.72	857	3.11	902	3.51
4250	709	2.12	<b>761</b>	<b>2.48</b>	811	2.86	858	3.25	903	3.66
4500	714	2.25	765	2.62	813	3.00	860	3.40	905	3.82
4750	719	2.40	768	2.77	816	3.15	862	3.56	906	3.99
5000	725	2.55	773	2.93	820	3.32	865	3.73	908	4.16

Std Static Motor and Drive – 440–609 RPM, Max BHP 2.4  
 Med Static Motor and Drive – 547–757 RPM, Max BHP 2.9  
 High Static Motor and Drive – 762–963 RPM, Max BHP 6.1

**Boldface** – Field-supplied Drive (motor pulley KR11HY151)  
*Italics* – Field-supplied drive (motor pulley KR11HY186)

**50HCQ**

**Table 51 – 50HCQD12**

**10 VERTICAL SUPPLY**

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	0.2		0.4		0.6		0.8		1.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	<b>383</b>	<b>0.39</b>	470	0.60	549	0.85	620	1.13	684	1.42
3250	<b>402</b>	<b>0.47</b>	483	0.68	559	0.94	629	1.22	692	1.53
3500	<b>421</b>	<b>0.55</b>	498	0.78	570	1.04	637	1.33	699	1.65
3750	441	0.65	513	0.88	582	1.15	647	1.45	707	1.78
4000	461	0.75	529	0.99	594	1.27	657	1.58	716	1.91
4250	481	0.87	545	1.12	608	1.41	668	1.72	725	2.06
4500	502	1.01	563	1.26	622	1.55	680	1.88	735	2.22
4750	522	1.15	581	1.42	637	1.72	693	2.05	746	2.40
5000	543	1.31	599	1.59	653	1.90	706	2.23	758	2.59

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (IN. WG)									
	1.2		1.4		1.6		1.8		2.0	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	742	1.73	795	2.05	845	2.38	891	2.73	935	3.08
3250	749	1.85	802	2.19	852	2.54	899	2.89	943	3.26
3500	756	1.98	809	2.33	859	2.69	906	3.06	950	3.45
3750	764	2.12	816	2.48	866	2.86	912	3.24	956	3.64
4000	771	2.27	824	2.64	873	3.03	919	3.42	963	3.83
4250	780	2.43	831	2.81	880	3.21	926	3.62	<u>970</u>	<u>4.04</u>
4500	788	2.60	839	2.99	887	3.40	933	3.82	<u>976</u>	<u>4.25</u>
4750	798	2.78	847	3.18	895	3.60	940	4.03	<u>983</u>	<u>4.47</u>
5000	808	2.98	856	3.38	903	3.81	947	4.25	<u>990</u>	<u>4.71</u>

Std Static Motor and Drive – 440–609 RPM, Max BHP 2.4  
 Med Static Motor and Drive – 547–757 RPM, Max BHP 2.9  
 High Static Motor and Drive – 762–963 RPM, Max BHP 6.1

**Boldface** – Field-supplied Drive (motor pulley KR11HY151)  
*Italics* – Field-supplied drive (motor pulley KR11HY186)  
Underline – Field-supplied (motor pulley KR11HY194)

## FAN PERFORMANCE (cont.)

**Table 52 – PULLEY ADJUSTMENT**

UNIT		MOTOR/DRIVE COMBO	MOTOR PULLEY TURNS OPEN										
			0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
04	3 phase	Medium Static	1251	1208	1165	1121	1078	1035	992	949	905	862	819
		High Static	1466	1423	1380	1337	1294	1251	1207	1164	1121	1078	1035
05	3 phase	Medium Static	1303	1265	1226	1188	1150	1112	1073	1035	997	958	920
		High Static	1466	1423	1380	1337	1294	1251	1207	1164	1121	1078	1035
06	3 phase	Medium Static	1380	1349	1317	1286	1254	1223	1192	1160	1129	1097	1066
		High Static	1639	1596	1553	1510	1467	1424	1380	1337	1294	1251	1208
07	3 phase	Standard Static	747	721	695	670	644	618	592	566	541	515	489
		Medium Static	949	927	906	884	863	841	819	798	776	755	733
		High Static	1102	1083	1063	1044	1025	1006	986	967	948	928	909
08	3 phase	Standard Static	733	712	690	669	647	626	604	583	561	540	518
		Medium Static	936	911	887	862	838	813	788	764	739	715	690
		High Static	1084	1059	1035	1010	986	961	936	912	887	863	838
09	3 phase	Standard Static	652	633	614	594	575	556	537	518	498	479	460
		Medium Static	838	813	789	764	739	715	690	665	640	616	591
		High Static	1084	1059	1035	1010	986	961	936	912	887	863	838
12	3 phase	Standard Static	609	592	575	558	541	525	508	491	474	457	440
		Medium Static	757	736	715	694	673	652	631	610	589	568	547
		High Static	963	943	923	903	883	863	842	822	802	782	762

**NOTE:** Do not adjust pulley further than 5 turns open.

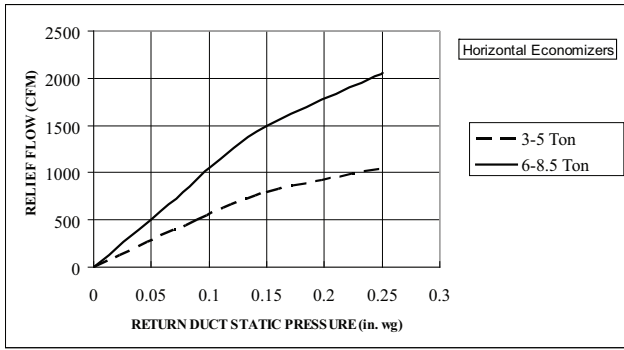
■ – Factory settings

\* Do not set motor pulley above 5 turns open for A or AX section belts

\*\* Do not set motor pulley below 1 turn open for B or BX section belts

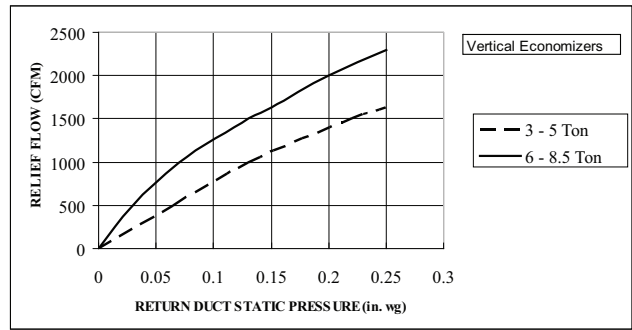
**50HCQ**

# ECONOMIZER, BAROMETRIC RELIEF AND PE PERFORMANCE



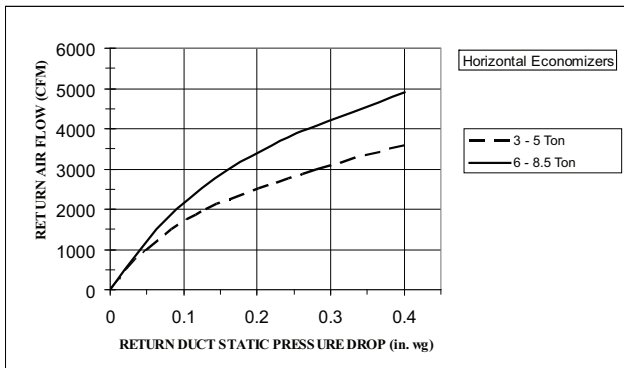
C10612

**Fig. 16 - Barometric Relief Flow Capacity**



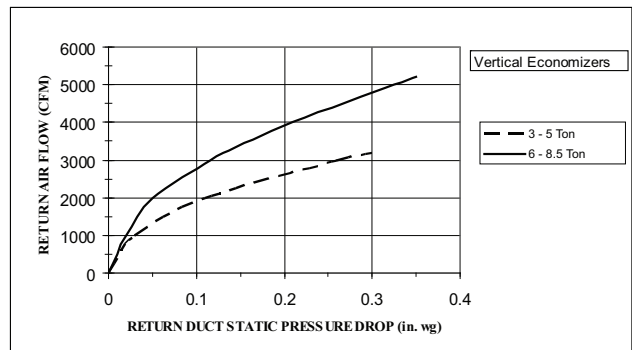
C10616

**Fig. 19 - Barometric Relief Flow Capacity**



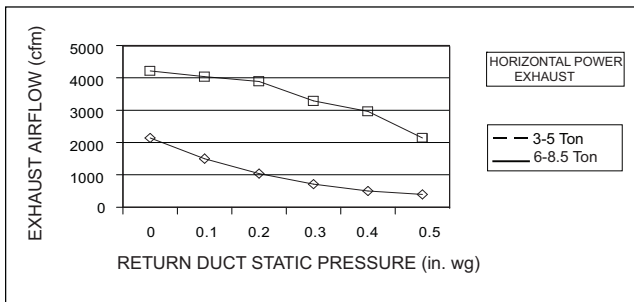
C10614

**Fig. 17 - Return Air Pressure Drop**



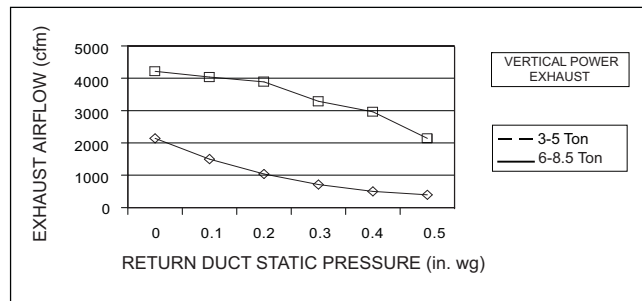
C10618

**Fig. 20 - Return Air Pressure Drop**



C10615

**Fig. 18 - Horizontal Power Exhaust Performance**



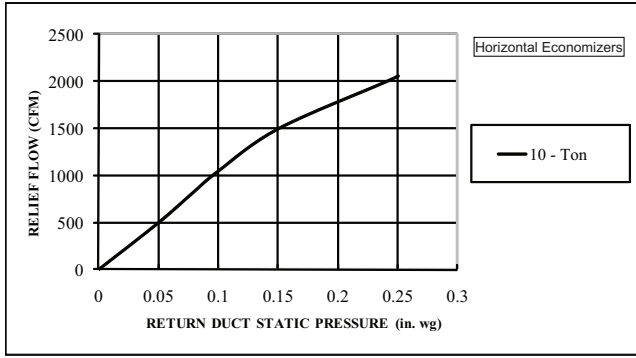
C10619

**Fig. 21 - Vertical Power Exhaust Performance**

**50HCQ**

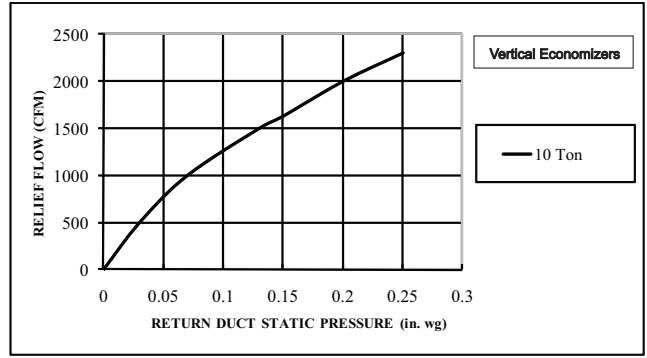
# ECONOMIZER, BAROMETRIC RELIEF AND PE PERFORMANCE (cont.)

50HCQ



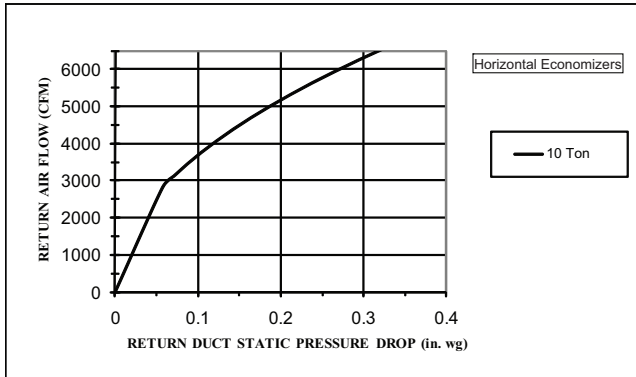
C101018

**Fig. 22 - Barometric Relief Flow Capacity**



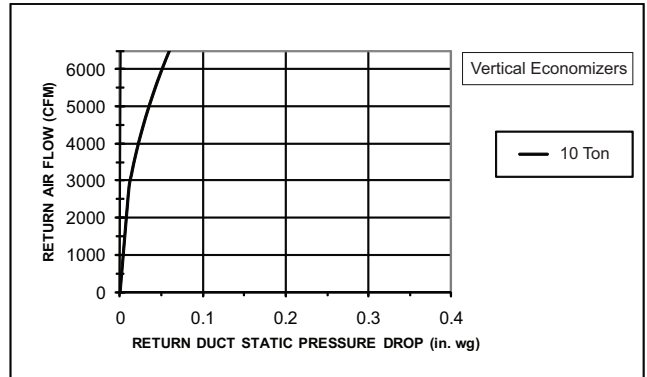
C101020

**Fig. 25 - Barometric Relief Flow Capacity**



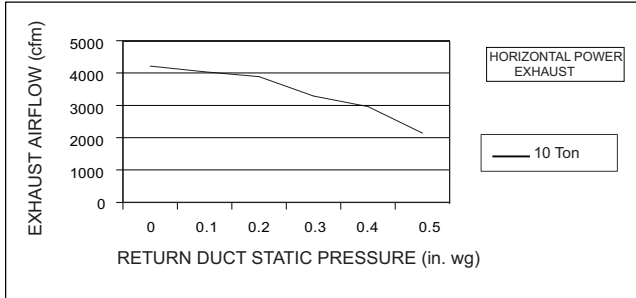
C101019

**Fig. 23 - Return Air Pressure Drop**



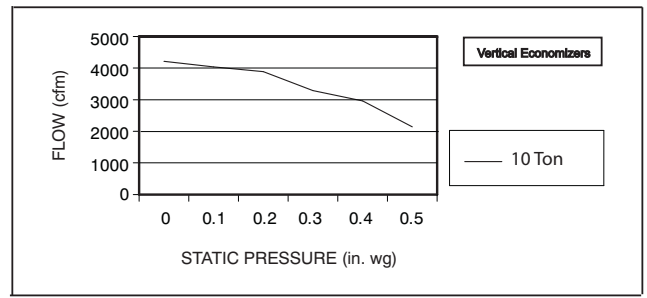
C101021

**Fig. 26 - Return Air Pressure Drop**



C101022

**Fig. 24 - Horizontal Power Exhaust Performance**



C101027

**Fig. 27 - Vertical Power Exhaust Performance**

## ELECTRICAL INFORMATION

**Table 53 – 50HCQA04**

**SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR**

V-Ph-Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
230-1-60	187	253	16.6	79	190	1.0	DD-STD	84%	7.4
208-3-60	187	253	10.4	73	190	1.0	DD-STD	84%	7.4
							MED	80%	5.2
							HIGH	80%	5.2
230-3-60	187	253	10.4	73	190	1.0	DD-STD	84%	7.4
							MED	80%	5.2
							HIGH	80%	5.2
460-3-60	414	506	5.8	38	190	0.5	DD-STD	84%	4.0
							MED	80%	2.6
							HIGH	80%	2.6
575-3-60	518	633	3.8	37	190	0.5	DD-STD	84%	4.0
							MED	80%	2.4
							HIGH	80%	2.0

**50HCQ**

**Table 54 – 50HCQA05**

**SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR**

V-Ph-Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208-1-60	187	253	19.8	109	325	1.4	DD-STD	84%	7.4
208-3-60	187	253	13.1	83	325	1.4	DD-STD	84%	7.4
							MED	80%	5.2
							HIGH	80%	5.2
230-3-60	187	253	13.1	83	325	1.4	DD-STD	84%	7.4
							MED	80%	5.2
							HIGH	80%	5.2
460-3-60	414	506	6.1	41	325	0.8	DD-STD	84%	4.0
							MED	80%	2.6
							HIGH	80%	2.6
575-3-60	518	633	4.4	33	325	0.8	DD-STD	84%	4.0
							MED	80%	2.4
							HIGH	80%	2.0

**Table 55 – 50HCQA06**

**SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR**

V-Ph-Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208-1-60	187	253	25.0	134	325	1.4	DD-STD	84%	7.4
208-3-60	187	253	15.9	110	325	1.4	DD-STD	84%	7.4
							MED	80%	5.2
							HIGH	81%	7.5
230-3-60	187	253	15.9	110	325	1.4	DD-STD	84%	7.4
							MED	80%	5.2
							HIGH	81%	7.5
460-3-60	414	506	7.0	52	325	0.8	DD-STD	84%	4.0
							MED	80%	2.6
							HIGH	81%	3.4
575-3-60	518	633	5.1	40	325	0.8	DD-STD	84%	4.0
							MED	80%	2.0
							HIGH	81%	2.8

## ELECTRICAL INFORMATION (cont.)

**Table 56 – 50HCQA07**
**SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR**

V-Ph-Hz	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208-3-60	187	253	19.0	123	325	1.5	STD	80%	5.2
							MED	80%	7.5
							HIGH	80%	15.0
230-3-60	187	253	19.0	123	325	1.5	STD	80%	5.2
							MED	80%	7.5
							HIGH	80%	15.0
460-3-60	414	506	9.7	62	325	0.8	STD	80%	2.6
							MED	80%	3.4
							HIGH	80%	7.4
575-3-60	518	633	7.4	50	325	0.6	STD	80%	2.4
							MED	80%	2.8
							HIGH	80%	5.6

**50HCQ**
**Table 57 – 50HCQD08**
**2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR**

V-Ph-Hz	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM		
			RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
	MIN	MAX									
208-3-60	187	253	13.1	83	13.1	83	325	1.5	STD	80%	5.2
									MED	80%	5.2
									HIGH	81%	10.0
230-3-60	187	253	13.1	83	13.1	83	325	1.5	STD	80%	5.2
									MED	80%	5.2
									HIGH	81%	10.0
460-3-60	414	506	6.1	41	6.1	41	325	0.8	STD	80%	2.6
									MED	80%	2.6
									HIGH	81%	4.4
575-3-60	518	633	4.4	33	4.4	33	325	0.6	STD	80%	2.4
									MED	80%	2.0
									HIGH	81%	2.8

**Table 58 – 50HCQD08**
**2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR**

V-Ph-Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208-3-60	187	253	13.1	83	13.1	83	325	1.5	STD	84%	5.8
							325	1.5	MED	77%	7.1
							325	1.5	HIGH	82%	10.8
230-3-60	187	253	13.1	83	13.1	83	325	1.5	STD	84%	5.6
							325	1.5	MED	77%	6.8
							325	1.5	HIGH	82%	9.8
460-3-60	414	506	6.1	41	6.1	41	325	0.8	STD	79%	2.9
							325	0.8	MED	77%	3.8
							325	0.8	HIGH	82%	4.9
575-3-60	518	633	4.4	33	4.4	33	325	0.6	STD	81%	2.8
							325	0.6	MED	80%	3.5
							325	0.6	HIGH	84%	4.5



## ELECTRICAL INFORMATION (cont.)

**Table 59 – 50HCQD09**

**2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR**

V-Ph-Hz	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM		
			RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
	MIN	MAX									
208-3-60	187	253	16.0	91	13.7	83	325	6.2	STD	80%	5.2
									MED	80%	7.5
									HIGH	81%	10.0
230-3-60	187	253	16.0	91	13.7	83	325	6.2	STD	80%	5.2
									MED	80%	7.5
									HIGH	81%	10.0
460-3-60	414	506	7.0	46	6.2	41	325	3.1	STD	80%	2.6
									MED	80%	3.4
									HIGH	81%	4.4
575-3-60	518	633	5.6	37	4.8	33	325	2.5	STD	80%	2.0
									MED	80%	2.8
									HIGH	81%	2.8

**50HCQ**

**Table 60 – 50HCQD09**

**2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR**

V-Ph-Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208-3-6 0	187	253	16.0	91	13.7	83	1070	6.2	STD	84%	5.8
							1070	6.2	MED	85%	8.6
							1070	6.2	HIGH	82%	10.8
230-3-6 0	187	253	16.0	91	13.7	83	1070	6.2	STD	84%	5.6
							1070	6.2	MED	85%	7.8
							1070	6.2	HIGH	82%	9.8
460-3-6 0	414	506	7.0	46	6.2	41	1070	3.1	STD	79%	2.9
							1070	3.1	MED	85%	3.8
							1070	3.1	HIGH	82%	4.9
575-3-6 0	518	633	5.6	37	4.8	33	1070	2.5	STD	80%	3.5
							1070	2.5	MED	84%	4.5
							1070	2.5	HIGH	84%	4.5

## ELECTRICAL INFORMATION (cont.)

**Table 61 – 50HCQD12**

**2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR**

V-Ph-Hz	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM		
			RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
	MIN	MAX									
208-3-60	187	253	15.6	110	15.9	110	280	1.5	STD	80%	5.2
									MED	80%	7.5
									HIGH	89.5%	20.4
230-3-60	187	253	15.6	110	15.9	110	280	1.5	STD	80%	5.2
									MED	80%	7.5
									HIGH	89.5%	20.4
460-3-60	414	506	7.7	52	7.7	52	280	0.8	STD	80%	2.6
									MED	80%	3.4
									HIGH	89.5%	10.2
575-3-60	518	633	5.8	39	5.7	39	280	0.7	STD	80%	2.0
									MED	80%	2.8
									HIGH	89.5%	9.0

**50HCQ**

**Table 62 – 50HCQD12**

**2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR**

V-Ph-Hz	VOLTAGE RANGE		COMP 1		COMP 2		OFM (ea)		IFM		
	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208-3-60	187	253	15.6	110	15.9	110	280	1.5	STD	77%	7.1
							280	1.5	MED	85%	8.6
							280	1.5	HIGH	90%	20.4
230-3-60	187	253	15.6	110	15.9	110	280	1.5	STD	77%	6.8
							280	1.5	MED	85%	7.8
							280	1.5	HIGH	90%	20.4
460-3-60	414	506	7.7	52	7.7	52	280	0.8	STD	77%	3.8
							280	0.8	MED	85%	3.8
							280	0.8	HIGH	90%	10.2
575-3-60	518	633	5.8	39	5.7	39	280	0.7	STD	80%	3.5
							280	0.7	MED	84%	4.5
							280	0.7	HIGH	94%	9

# MCA/MOCP

**Table 63 – 50HCQA04**

## MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V-PH-Hz	IFM TYPE	ELECTRIC HEATER		WITHOUT C.O. or UNPWR C.O.								
		NOM (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)				
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE		
				FLA	LRA	FLA	LRA	FLA	LRA	FLA	LRA	
208/ 230-1-60	DD-STD	-	-	29.2	45	29	88	31.1	45	31	90	
		3.3/4.4	15.9/18.3	49.0/52.0	60/60	47/50	104/106	50.9/53.9	60/60	49/52	106/108	
		4.9/6.5	23.5/27.1	58.5/63.0	60/70	56/60	112/115	60.4/64.9	70/70	58/62	114/117	
		6.5/8.7	31.4/36.3	68.4/74.5	70/80	65/70	119/124	70.3/76.4	80/80	67/73	121/126	
		7.9/10.5	37.9/43.8	76.5/83.9	80/90	72/79	126/132	78.4/85.8	80/90	75/81	128/134	
		9.8/13.0	46.9/54.2	87.8/96.9	90/100	83/91	182/196	89.7/98.8	90/100	85/93	184/198	
208/ 230-3-60	DD-STD	-	-	21.4	30	22	82	23.3	30	24	84	
		3.3/4.4	9.2/10.6	32.9/34.7	40/40	32/34	91/93	34.8/36.6	40/40	34/36	93/95	
		4.9/6.5	13.6/15.6	38.4/40.9	45/45	37/40	96/98	40.3/42.8	45/45	39/42	98/100	
		6.5/8.7	18.1/20.9	44.0/47.5	45/50	42/46	100/103	45.9/49.4	50/50	45/48	102/105	
		7.9/10.5	21.9/25.3	48.8/53.0	50/60	47/51	104/107	50.7/54.9	60/60	49/53	106/109	
		12.0/16.0	33.4/38.5	63.2/69.5	70/70	60/66	115/121	65.1/71.4	70/80	62/68	117/123	
	MED	-	-	19.2	25	19	94	21.1	30	21	96	
		3.3/4.4	9.2/10.6	30.7/32.5	35/40	30/31	103/105	32.6/34.4	40/40	32/33	105/107	
		4.9/6.5	13.6/15.6	36.2/38.7	40/45	35/37	108/110	38.1/40.6	45/45	37/39	110/112	
		6.5/8.7	18.1/20.9	41.8/45.3	45/50	40/43	112/115	43.7/47.2	45/50	42/45	114/117	
		7.9/10.5	21.9/25.3	46.6/50.8	50/60	44/48	116/119	48.5/52.7	50/60	46/50	118/121	
		12.0/16.0	33.4/38.5	61.0/67.3	70/70	58/63	127/133	62.9/69.2	70/70	60/66	129/135	
	HIGH	-	-	19.2	25	19	105	21.1	30	21	107	
		3.3/4.4	9.2/10.6	30.7/32.5	35/40	30/31	114/116	32.6/34.4	40/40	32/33	116/118	
		4.9/6.5	13.6/15.6	36.2/38.7	40/45	35/37	119/121	38.1/40.6	45/45	37/39	121/123	
		6.5/8.7	18.1/20.9	41.8/45.3	45/50	40/43	123/126	43.7/47.2	45/50	42/45	125/128	
		7.9/10.5	21.9/25.3	46.6/50.8	50/60	44/48	127/130	48.5/52.7	50/60	46/50	129/132	
		12.0/16.0	33.4/38.5	61.0/67.3	70/70	58/63	138/144	62.9/69.2	70/70	60/66	140/146	
460-3-60	DD-STD	-	-	11.8	15	12	43	12.8	15	13	44	
		6.0	7.2	20.8	25	20	50	21.8	25	21	51	
		8.8	10.6	25.0	25	24	54	26.0	30	25	55	
		11.5	13.8	29.0	30	28	57	30.0	30	29	58	
		14.0	16.8	32.8	35	31	60	33.8	35	32	61	
	MED	-	-	10.4	15	10	48	11.4	15	11	49	
		6.0	7.2	19.4	20	19	55	20.4	25	20	56	
		8.8	10.6	23.6	25	22	59	24.6	25	24	60	
		11.5	13.8	27.6	30	26	62	28.6	30	27	63	
		14.0	16.8	31.4	35	30	65	32.4	35	31	66	
	HIGH	-	-	10.4	15	10	54	11.4	15	11	55	
		6.0	7.2	19.4	20	19	61	20.4	25	20	62	
		8.8	10.6	23.6	25	22	65	24.6	25	24	66	
		11.5	13.8	27.6	30	26	68	28.6	30	27	69	
		14.0	16.8	31.4	35	30	71	32.4	35	31	72	
	575-3-60	DD-STD	-	-	9.3	15	10	42	11.2	15	12	44
		MED	-	-	7.7	15	8	45	9.6	15	10	47
		HIGH	-	-	7.3	15	7	49	9.2	15	9	51

**50HCQ**

**LEGEND**

- C.O. - Convenience outlet
- DD - Electric Drive X13 Motor
- DISC - Disconnect
- FLA - Full load amps
- IFM - Indoor fan motor
- LRA - Locked rotor amps
- MCA - Minimum circuit amps
- MOCP - Maximum over current protection
- P.E. - Power exhaust
- UNPWRD C.O. - Unpowered Convenience outlet

**NOTES:**

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

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

Example: Supply voltage is 230-3-60



AB = 224V  
BC = 231V  
AC = 226V

$$\text{Average Voltage} = \frac{(224 + 231 + 226)}{3} = \frac{681}{3} = 227$$

Determine maximum deviation from average voltage.

(AB) 227 - 224 = 3V

Maximum deviation is 4V.

(BC) 231 - 227 = 4V

Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{227} = 1.76\%$$

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

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

## MCA/MOCP (cont.)

Table 64 – 50HCQA05

### MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V-PH-Hz	IFM TYPE	ELECTRIC HEATER		WITHOUT C.O. or UNPWR C.O.							
		NOM (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-1-60	DD-STD	-	-	33.6	50	33	119	35.5	50	35	121
		3.3/4.4	15.9/18.3	53.4/56.4	60/60	51/54	135/137	55.3/58.3	60/60	53/56	137/139
		6.5/8.7	31.4/36.3	72.8/78.9	80/80	69/75	150/155	74.7/80.8	80/90	71/77	152/157
		9.8/13.0	46.9/54.2	92.2/101.3	100/110	87/95	213/227	94.1/103.2	100/110	89/97	215/229
		13.1/17.4	62.8/72.5	112.1/124.2	125/125	105/116	245/264	114.0/126.1	125/150	107/118	247/266
		15.8/21.0	75.8/87.5	128.3/142.9	150/150	120/134	271/294	130.2/144.8	150/150	122/136	273/296
208/ 230-3-60	DD-STD	-	-	25.2	30	25	93	27.1	40	27	95
		4.9/6.5	13.6/15.6	42.2/44.7	50/50	41/43	107/109	44.1/46.6	50/50	43/45	109/111
		6.5/8.7	18.1/20.9	47.8/51.3	50/60	46/49	111/114	49.7/53.2	50/60	48/51	113/116
		12.0/16.0	33.4/38.5	66.9/73.3	70/80	64/69	126/132	68.8/75.2	70/80	66/72	128/134
	15.8/21.0	43.8/50.5	79.9/88.3	80/90	76/83	181/194	81.8/90.2	90/100	78/85	183/196	
	MED	-	-	23.0	30	23	105	24.9	30	25	107
		4.9/6.5	13.6/15.6	40.0/42.5	45/50	38/41	119/121	41.9/44.4	50/50	40/43	121/123
		6.5/8.7	18.1/20.9	45.6/49.1	50/50	43/47	123/126	47.5/51.0	50/60	46/49	125/128
		12.0/16.0	33.4/38.5	64.7/71.1	70/80	61/67	138/144	66.6/73.0	70/80	63/69	140/146
	15.8/21.0	43.8/50.5	77.7/86.1	80/90	73/81	193/206	79.6/88.0	80/90	75/83	195/208	
	HIGH	-	-	23.0	30	23	116	24.9	30	25	118
		4.9/6.5	13.6/15.6	40.0/42.5	45/50	38/41	130/132	41.9/44.4	50/50	40/43	132/134
6.5/8.7		18.1/20.9	45.6/49.1	50/50	43/47	134/137	47.5/51.0	50/60	46/49	136/139	
12.0/16.0		33.4/38.5	64.7/71.1	70/80	61/67	149/155	66.6/73.0	70/80	63/69	151/157	
15.8/21.0	43.8/50.5	77.7/86.1	80/90	73/81	204/217	79.6/88.0	80/90	75/83	206/219		
460-3-60	DD-STD	-	-	12.4	15	13	47	13.4	15	14	48
		6.0	7.2	21.4	25	21	54	22.4	25	22	55
		11.5	13.8	29.7	30	28	61	30.7	35	30	62
		14.0	16.8	33.4	35	32	64	34.4	35	33	65
	23.0	27.7	47.1	50	44	102	48.1	50	46	103	
	MED	-	-	11.0	15	11	52	12.0	15	12	53
		6.0	7.2	20.0	25	19	59	21.0	25	20	60
		11.5	13.8	28.3	30	27	66	29.3	30	28	67
		14.0	16.8	32.0	35	30	69	33.0	35	31	70
	23.0	27.7	45.7	50	43	107	46.7	50	44	108	
	HIGH	-	-	11.0	15	11	58	12.0	15	12	59
		6.0	7.2	20.0	25	19	65	21.0	25	20	66
11.5		13.8	28.3	30	27	72	29.3	30	28	73	
14.0		16.8	32.0	35	30	75	33.0	35	31	76	
23.0	27.7	45.7	50	43	113	46.7	50	44	114		
575-3-60	DD-STD	-	-	10.3	15	11	39	12.2	15	13	41
	MED	-	-	8.7	15	9	42	10.6	15	11	44
	HIGH	-	-	8.3	15	8	46	10.2	15	10	48

50HCQ

## MCA/MOCP (cont.)

Table 65 – 50HCQA06

### MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V-PH-Hz	IFM TYPE	ELECTRIC HEATER		WITHOUT C.O. or UNPWR C.O.							
		NOM (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-1-60	DD-STD	-	-	40.1	60	39	144	42.0	60	41	146
		4.9/6.5	23.5/27.1	69.4/73.9	80/80	66/70	168/171	71.3/75.8	80/80	68/72	170/173
		6.5/8.7	31.4/36.3	79.3/85.4	80/100	75/81	175/180	81.2/87.3	90/100	77/83	177/182
		9.8/13.0	46.9/54.2	98.7/107.8	100/110	93/101	238/252	100.6/109.7	110/110	95/103	240/254
		13.1/17.4	62.8/72.5	118.6/130.7	125/150	111/122	270/289	120.5/132.6	125/150	113/124	272/291
		15.8/21.0	75.8/87.5	134.8/149.4	150/150	126/139	296/319	136.7/151.3	150/175	128/142	298/321
208/ 230-3-60	DD-STD	-	-	28.7	40	28	120	30.6	45	31	122
		4.9/6.5	13.6/15.6	45.7/48.2	50/60	44/46	134/136	47.6/50.1	60/60	46/49	136/138
		7.9/10.5	21.9/25.3	56.1/60.3	60/70	54/58	142/145	58.0/62.2	60/70	56/60	144/147
		12.0/16.0	33.4/38.5	70.4/76.8	80/80	67/73	153/159	72.3/78.7	80/80	69/75	155/161
		15.8/21.0	43.8/50.5	83.4/91.8	90/100	79/86	208/221	85.3/93.7	90/100	81/89	210/223
		19.9/26.5	55.2/63.8	97.7/108.4	100/110	92/102	230/248	99.6/110.3	100/125	94/104	232/250
	MED	-	-	26.5	40	26	143	28.4	40	28	145
		4.9/6.5	13.6/15.6	43.5/46.0	50/50	42/44	157/159	45.4/47.9	50/50	44/46	159/161
		7.9/10.5	21.9/25.3	53.9/58.1	60/60	51/55	165/168	55.8/60.0	60/60	53/57	167/170
		12.0/16.0	33.4/38.5	68.2/74.6	70/80	64/70	176/182	70.1/76.5	80/80	66/72	178/184
		15.8/21.0	43.8/50.5	81.2/89.6	90/90	76/84	231/244	83.1/91.5	90/100	78/86	233/246
		19.9/26.5	55.2/63.8	95.5/106.2	100/110	89/99	253/271	97.4/108.1	100/110	92/101	255/273
	HIGH	-	-	28.8	40	29	169	30.7	45	31	171
		4.9/6.5	13.6/15.6	45.8/48.3	50/60	44/46	183/185	47.7/50.2	60/60	46/49	185/187
		7.9/10.5	21.9/25.3	56.2/60.4	60/70	54/58	191/194	58.1/62.3	60/70	56/60	193/196
		12.0/16.0	33.4/38.5	70.5/76.9	80/80	67/73	202/208	72.4/78.8	80/80	69/75	204/210
		15.8/21.0	43.8/50.5	83.5/91.9	90/100	79/87	257/270	85.4/93.8	90/100	81/89	259/272
		19.9/26.5	55.2/63.8	97.8/108.5	100/110	92/102	279/297	99.7/110.4	100/125	94/104	281/299
460-3-60	DD-STD	-	-	13.6	20	14	58	14.6	20	15	59
		6.0	7.2	22.6	25	22	65	23.6	25	23	66
		11.5	13.8	30.8	35	29	72	31.8	35	31	73
		14.0	16.8	34.6	35	33	75	35.6	40	34	76
		23.0	27.7	48.2	50	45	113	49.2	50	47	114
		25.5	30.7	51.9	60	49	119	52.9	60	50	120
	MED	-	-	12.2	15	12	69	13.2	20	13	70
		6.0	7.2	21.2	25	20	76	22.2	25	21	77
		11.5	13.8	29.4	30	28	83	30.4	35	29	84
		14.0	16.8	33.2	35	31	86	34.2	35	32	87
		23.0	27.7	46.8	50	44	124	47.8	50	45	125
		25.5	30.7	50.5	60	47	130	51.5	60	48	131
	HIGH	-	-	13.0	15	13	82	14.0	20	14	83
		6.0	7.2	22.0	25	21	89	23.0	25	22	90
		11.5	13.8	30.2	35	29	96	31.2	35	30	97
		14.0	16.8	34.0	35	32	99	35.0	35	33	100
		23.0	27.7	47.6	50	45	137	48.6	50	46	138
		25.5	30.7	51.3	60	48	143	52.3	60	49	144
575-3-60	DD-STD	-	-	11.2	15	11	46	13.1	15	14	48
	MED	-	-	9.2	15	9	53	11.1	15	11	55
	HIGH	-	-	10.0	15	10	64	11.9	15	12	66

50HCQ

## MCA/MOCP (cont.)

Table 66 – 50HCQA07

### MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V-PH-Hz	IFM TYPE	ELECTRIC HEATER		WITHOUT C.O. or UNPWR C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwr fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-3-60	STD	-	-	32.0	50	31	148	35.8	50	36	152
		4.9/6.5	13.6/15.6	49.0/51.5	60/60	47/49	162/164	52.8/55.3	60/60	51/54	166/168
		7.8/10.4	21.7/25.0	59.1/63.2	60/70	56/60	170/173	62.9/67.0	70/70	61/64	174/177
		12.0/16.0	33.4/38.5	73.7/80.1	80/90	70/76	181/187	77.5/83.9	80/90	74/80	185/191
		15.8/21.0	43.8/50.5	86.7/95.1	90/100	82/89	236/249	90.5/98.9	100/100	86/94	240/253
		19.9/26.5	55.2/63.8	101.0/111.7	110/125	95/105	258/276	104.8/115.5	110/125	99/109	262/280
	MED	-	-	34.3	50	34	185	38.1	50	38	189
		4.9/6.5	13.6/15.6	51.3/53.8	60/60	50/52	199/201	55.1/57.6	60/60	54/56	203/205
		7.8/10.4	21.7/25.0	61.4/65.5	70/70	59/63	207/210	65.2/69.3	70/80	63/67	211/214
		12.0/16.0	33.4/38.5	76.0/82.4	80/90	72/78	218/224	79.8/86.2	80/90	77/83	222/228
		15.8/21.0	43.8/50.5	89.0/97.4	90/100	84/92	273/286	92.8/101.2	100/110	89/96	277/290
		19.9/26.5	55.2/63.8	103.3/114.0	110/125	97/107	295/313	107.1/117.8	110/125	102/112	299/317
	HIGH	-	-	41.8	60	43	211	45.6	60	47	215
		4.9/6.5	13.6/15.6	58.8/61.3	70/70	58/60	225/227	62.6/65.1	70/80	63/65	229/231
		7.8/10.4	21.7/25.0	68.9/73.0	80/80	68/71	233/236	72.7/76.8	80/80	72/76	237/240
12.0/16.0		33.4/38.5	83.5/89.9	90/90	81/87	244/250	87.3/93.7	90/100	85/91	248/254	
15.8/21.0		43.8/50.5	96.5/104.9	100/110	93/101	299/312	100.3/108.7	110/110	97/105	303/316	
19.9/26.5		55.2/63.8	110.8/121.5	125/125	106/116	321/339	114.6/125.3	125/150	110/120	325/343	
460-3-60	STD	-	-	16.3	25	16	75	18.1	25	18	77
		6.0	7.2	25.3	30	24	82	27.1	30	26	84
		11.5	13.8	33.6	35	32	89	35.4	40	34	91
		14.0	16.8	37.3	40	35	92	39.1	40	37	94
		23.0	27.7	51.0	60	48	103	52.8	60	50	105
		25.5	30.7	54.7	60	51	106	56.5	60	53	108
	MED	-	-	17.1	25	17	94	18.9	25	19	96
		6.0	7.2	26.1	30	25	101	27.9	30	27	103
		11.5	13.8	34.4	40	33	108	36.2	40	35	110
		14.0	16.8	38.1	40	36	111	39.9	45	38	113
		23.0	27.7	51.8	60	49	122	53.6	60	51	124
		25.5	30.7	55.5	60	52	125	57.3	60	54	127
	HIGH	-	-	21.1	30	22	107	22.9	30	24	109
		6.0	7.2	30.1	35	30	114	31.9	35	32	116
		11.5	13.8	38.4	40	37	121	40.2	45	39	123
		14.0	16.8	42.1	45	41	124	43.9	45	43	126
		23.0	27.7	55.8	60	53	135	57.6	60	55	137
		25.5	30.7	59.5	60	57	138	61.3	70	59	140
575-3-60	STD	-	-	12.9	20	13	61	16.7	20	17	65
	MED	-	-	13.3	20	13	76	17.1	20	17	80
	HIGH	-	-	16.1	20	16	90	19.9	25	21	94

50HCQ

## MCA/MOCP (cont.)

Table 67 – 50HCQD08

### MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. 2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V-PH-Hz	IFM TYPE	ELECTRIC HEATER		WITHOUT C.O. or UNPWR C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-3-60	STD	-	-	37.7	50	40	191	41.5	50	44	195
		7.8/10.4	21.7/25.0	64.8/68.9	70/70	65/68	213/216	68.6/72.7	70/80	69/73	217/220
		12.0/16.0	33.4/38.5	79.4/85.8	80/90	78/84	224/230	83.2/89.6	90/90	82/88	228/234
		18.6/24.8	51.7/59.7	102.3/112.3	110/125	99/108	243/251	106.1/116.1	110/125	103/113	247/255
		24.0/32.0	66.7/77.0	121.1/133.9	125/150	116/128	258/268	124.9/137.7	125/150	121/132	262/272
		31.8/42.4	88.4/102.0	148.2/165.2	150/175	141/157	368/395	152.0/169.0	175/175	146/161	372/399
	MED	-	-	37.7	50	40	202	41.5	50	44	206
		7.8/10.4	21.7/25.0	64.8/68.9	70/70	65/68	224/227	68.6/72.7	70/80	69/73	228/231
		12.0/16.0	33.4/38.5	79.4/85.8	80/90	78/84	235/241	83.2/89.6	90/90	82/88	239/245
		18.6/24.8	51.7/59.7	102.3/112.3	110/125	99/108	254/262	106.1/116.1	110/125	103/113	258/266
		24.0/32.0	66.7/77.0	121.1/133.9	125/150	116/128	269/279	124.9/137.7	125/150	121/132	273/283
		31.8/42.4	88.4/102.0	148.2/165.2	150/175	141/157	379/406	152.0/169.0	175/175	146/161	383/410
HIGH	-	-	42.5	50	45	245	46.3	50	49	249	
	7.8/10.4	21.7/25.0	69.6/73.7	70/80	70/74	267/270	73.4/77.5	80/80	74/78	271/274	
	12.0/16.0	33.4/38.5	84.2/90.6	90/100	83/89	278/284	88.0/94.4	90/100	88/94	282/288	
	18.6/24.8	51.7/59.7	107.1/117.1	110/125	105/114	297/305	110.9/120.9	125/125	109/118	301/309	
	24.0/32.0	66.7/77.0	125.9/138.7	150/150	122/134	312/322	129.7/142.5	150/150	126/138	316/326	
	31.8/42.4	88.4/102.0	153.0/170.0	175/175	147/162	422/449	156.8/173.8	175/175	151/167	426/453	
460-3-60	STD	-	-	17.9	20	19	95	19.7	25	21	97
		13.9	16.7	38.8	40	38	112	40.6	45	40	114
		16.5	19.8	42.7	45	42	115	44.5	45	44	117
		27.8	33.4	59.7	60	57	128	61.5	70	59	130
		33.0	39.7	67.6	70	65	135	69.4	70	67	137
		41.7	50.2	80.7	90	77	195	82.5	90	79	197
	MED	-	-	17.9	20	19	101	19.7	25	21	103
		13.9	16.7	38.8	40	38	118	40.6	45	40	120
		16.5	19.8	42.7	45	42	121	44.5	45	44	123
		27.8	33.4	59.7	60	57	134	61.5	70	59	136
		33.0	39.7	67.6	70	65	141	69.4	70	67	143
		41.7	50.2	80.7	90	77	201	82.5	90	79	203
	HIGH	-	-	19.7	25	21	123	21.5	25	23	125
		13.9	16.7	40.6	45	40	140	42.4	45	42	142
		16.5	19.8	44.5	45	44	143	46.3	50	46	145
		27.8	33.4	61.5	70	59	156	63.3	70	61	158
		33.0	39.7	69.4	70	67	163	71.2	80	69	165
		41.7	50.2	82.5	90	79	223	84.3	90	81	225
575-3-60	STD	-	-	13.5	15	14	77	17.3	20	19	81
		17.0	20.4	39.0	40	38	97	42.8	45	42	101
		34.0	40.9	64.6	70	61	118	68.4	70	66	122
	MED	-	-	13.1	15	14	81	16.9	20	18	85
		17.0	20.4	38.6	40	37	101	42.4	45	42	105
		34.0	40.9	64.2	70	61	122	68.0	70	65	126
	HIGH	-	-	13.9	20	15	92	17.7	20	19	96
		17.0	20.4	39.4	40	38	112	43.2	45	43	116
		34.0	40.9	65.0	70	62	133	68.8	70	66	137

50HCQ

## MCA/MOCP (cont.)

Table 68 – 50HCQD08

### MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. 2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER		WITHOUT C.O. or UNPWR C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				w/ P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-3-60	STD	-	-	38.3/38.1	50/50	40/40	195	42.1/41.9	50/50	45/44	199
		7.8/10.4	21.7/25.0	65.4/69.3	70/70	65/69	217/220	69.2/73.1	70/80	70/73	221/224
		12.0/16.0	33.4/38.5	80.0/86.2	90/90	79/84	228/234	83.8/90.0	90/90	83/89	232/238
		18.6/24.8	51.7/59.7	102.9/112.7	110/125	100/109	247/255	106.7/116.5	110/125	104/113	251/259
		24.0/32.0	66.7/77.0	121.7/134.3	125/150	117/129	262/272	125.5/138.1	150/150	121/133	266/276
	31.8/42.4	88.4/102.0	148.8/165.6	150/175	142/157	372/399	152.6/169.4	175/175	146/162	376/403	
	MED	-	-	39.6/39.3	50/50	42/41	199	43.4/43.1	50/50	46/46	203
		7.8/10.4	21.7/25.0	66.7/70.5	70/80	67/70	221/224	70.5/74.3	80/80	71/75	225/228
		12.0/16.0	33.4/38.5	81.3/87.4	90/90	80/86	232/238	85.1/91.2	90/100	85/90	236/242
		18.6/24.8	51.7/59.7	104.2/113.9	110/125	101/110	251/259	108.0/117.7	110/125	106/114	255/263
		24.0/32.0	66.7/77.0	123.0/135.5	125/150	118/130	266/276	126.8/139.3	150/150	123/134	270/280
	31.8/42.4	88.4/102.0	150.1/166.8	175/175	143/159	376/403	153.9/170.6	175/175	148/163	380/407	
	HIGH	-	-	43.3/42.3	50/50	46/45	249	47.1/46.1	60/50	50/49	253
		7.8/10.4	21.7/25.0	70.4/73.5	80/80	71/74	271/274	74.2/77.3	80/80	75/78	275/278
		12.0/16.0	33.4/38.5	85.0/90.4	90/100	84/89	282/288	88.8/94.2	90/100	89/93	286/292
18.6/24.8		51.7/59.7	107.9/116.9	110/125	105/114	301/309	111.7/120.7	125/125	110/118	305/313	
24.0/32.0		66.7/77.0	126.7/138.5	150/150	123/133	316/326	130.5/142.3	150/150	127/138	320/330	
31.8/42.4	88.4/102.0	153.8/169.8	175/175	148/162	426/453	157.6/173.6	175/175	152/167	430/457		
460-3-60	STD	-	-	18.2	20	19	97	20.0	25	21	99
		13.9	16.7	39.1	40	38	114	40.9	45	40	116
		16.5	19.8	43.0	45	42	117	44.8	45	44	119
		27.8	33.4	60.0	60	58	130	61.8	70	60	132
		33.0	39.7	67.9	70	65	137	69.7	70	67	139
	41.7	50.2	81.0	90	77	197	82.8	90	79	199	
	MED	-	-	19.1	25	20	100	20.9	25	22	102
		13.9	16.7	40.0	40	39	117	41.8	45	42	119
		16.5	19.8	43.9	45	43	120	45.7	50	45	122
		27.8	33.4	60.9	70	59	133	62.7	70	61	135
		33.0	39.7	68.8	70	66	140	70.6	80	68	142
	41.7	50.2	81.9	90	78	200	83.7	90	80	202	
	HIGH	-	-	20.2	25	22	125	22.0	25	24	127
		13.9	16.7	41.1	45	41	142	42.9	45	43	144
		16.5	19.8	45.0	45	44	145	46.8	50	46	147
27.8		33.4	62.0	70	60	158	63.8	70	62	160	
33.0		39.7	69.9	70	67	165	71.7	80	69	167	
41.7	50.2	83.0	90	79	225	84.8	90	81	227		
575-3-60	STD	-	-	13.9	20	15	79	17.7	20	19	83
		17.0	20.4	39.4	40	38	99	43.2	45	43	103
		34.0	40.9	65.0	70	62	120	68.8	70	66	124
	MED	-	-	14.6	20	16	83	18.4	20	20	87
		17.0	20.4	40.1	45	39	103	43.9	45	43	107
		34.0	40.9	65.7	70	63	124	69.5	70	67	128
	HIGH	-	-	15.6	20	17	92	19.4	25	21	96
		17.0	20.4	41.1	45	40	112	44.9	45	45	116
		34.0	40.9	66.8	70	64	133	70.6	80	68	137

50HCQ



## MCA/MOCP (cont.)

Table 69 – 50HCQD09

### MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. 2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V-PH-Hz	IFM TYPE	ELECTRIC HEATER		WITHOUT C.O. or UNPWR C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-3-60	STD	-	-	45.1	60	47	225	48.9	60	52	229
		7.8/10.4	21.7/25.0	72.2/76.4	80/80	72/76	247/250	76.0/80.2	80/90	77/80	251/254
		12.0/16.0	33.4/38.5	86.9/93.2	90/100	86/92	258/264	90.7/97.0	100/100	90/96	262/268
		18.6/24.8	51.7/59.7	109.7/119.7	110/125	107/116	277/285	113.5/123.5	125/125	111/120	281/289
		24.0/32.0	66.7/77.0	128.5/141.4	150/150	124/136	292/302	132.3/145.2	150/150	128/140	296/306
	31.8/42.4	88.4/102.0	155.6/172.6	175/175	149/165	402/429	159.4/176.4	175/200	153/169	406/433	
	MED	-	-	47.4	60	50	262	51.2	60	54	266
		7.8/10.4	21.7/25.0	74.5/78.7	80/80	75/79	284/287	78.3/82.5	80/90	79/83	288/291
		12.0/16.0	33.4/38.5	89.2/95.5	90/100	88/94	295/301	93.0/99.3	100/100	93/99	299/305
		18.6/24.8	51.7/59.7	112.0/122.0	125/125	109/119	314/322	115.8/125.8	125/150	114/123	318/326
		24.0/32.0	66.7/77.0	130.8/143.7	150/150	127/138	329/339	134.6/147.5	150/150	131/143	333/343
	31.8/42.4	88.4/102.0	157.9/174.9	175/175	152/167	439/466	161.7/178.7	175/200	156/172	443/470	
	HIGH	-	-	49.9	60	53	279	53.7	60	57	283
		7.8/10.4	21.7/25.0	77.0/81.2	80/90	78/82	301/304	80.8/85.0	90/90	82/86	305/308
		12.0/16.0	33.4/38.5	91.7/98.0	100/100	91/97	312/318	95.5/101.8	100/110	96/101	316/322
18.6/24.8		51.7/59.7	114.5/124.5	125/125	112/121	331/339	118.3/128.3	125/150	117/126	335/343	
24.0/32.0		66.7/77.0	133.3/146.2	150/150	129/141	346/356	137.1/150.0	150/150	134/146	350/360	
31.8/42.4	88.4/102.0	160.4/177.4	175/200	154/170	456/483	164.2/181.2	175/200	159/174	460/487		
460-3-60	STD	-	-	20.7	25	22	112	22.5	25	24	114
		13.9	16.7	41.5	45	41	129	43.3	45	43	131
		16.5	19.8	45.4	50	45	132	47.2	50	47	134
		27.8	33.4	62.4	70	60	145	64.2	70	62	147
		33.0	39.7	70.3	80	67	152	72.1	80	69	154
	41.7	50.2	83.4	90	79	212	85.2	90	82	214	
	MED	-	-	21.5	25	23	131	23.3	30	25	133
		13.9	16.7	42.3	45	42	148	44.1	45	44	150
		16.5	19.8	46.2	50	45	151	48.0	50	47	153
		27.8	33.4	63.2	70	61	164	65.0	70	63	166
		33.0	39.7	71.1	80	68	171	72.9	80	70	173
	41.7	50.2	84.2	90	80	231	86.0	90	82	233	
	HIGH	-	-	22.5	25	24	140	24.3	30	26	142
		13.9	16.7	43.3	45	43	157	45.1	50	45	159
		16.5	19.8	47.2	50	47	160	49.0	50	49	162
27.8		33.4	64.2	70	62	173	66.0	70	64	175	
33.0		39.7	72.1	80	69	180	73.9	80	72	182	
41.7	50.2	85.2	90	82	240	87.0	90	84	242		
575-3-60	STD	-	-	16.3	20	17	97	20.1	25	22	101
		17.0	20.4	41.8	45	41	117	45.6	50	45	121
		34.0	40.9	67.4	70	64	138	71.2	80	69	142
	MED	-	-	17.1	20	18	108	20.9	25	22	112
		17.0	20.4	42.6	45	42	128	46.4	50	46	132
		34.0	40.9	68.2	70	65	149	72.0	80	69	153
	HIGH	-	-	17.1	20	18	108	20.9	25	22	112
		17.0	20.4	42.6	45	42	128	46.4	50	46	132
		34.0	40.9	68.2	70	65	149	72.0	80	69	153

50HCQ

## MCA/MOCP (cont.)

Table 70 – 50HCQD09

### MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. 2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER		WITHOUT C.O. or UNPWR C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				w/ P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-3-60	STD	-	-	45.7/45.5	60/60	48/48	229	49.5/49.3	60/60	52/52	233
		7.8/10.4	21.7/25.0	72.8/76.8	80/80	73/76	251/254	76.6/80.6	80/90	77/81	255/258
		12.0/16.0	33.4/38.5	87.5/93.6	90/100	86/92	262/268	91.3/97.4	100/100	91/96	266/272
		18.6/24.8	51.7/59.7	110.3/120.1	125/125	107/116	281/289	114.1/123.9	125/125	112/121	285/293
		24.0/32.0	66.7/77.0	129.1/141.8	150/150	125/136	296/306	132.9/145.6	150/150	129/141	300/310
		31.8/42.4	88.4/102.0	156.2/173.0	175/175	150/165	406/433	160.0/176.8	175/200	154/169	410/437
	MED	-	-	48.5/47.7	60/60	51/50	259	52.3/51.5	60/60	56/55	263
		7.8/10.4	21.7/25.0	75.6/79.0	80/80	76/79	281/284	79.4/82.8	80/90	81/83	285/288
		12.0/16.0	33.4/38.5	90.3/95.8	100/100	90/95	292/298	94.1/99.6	100/100	94/99	296/302
		18.6/24.8	51.7/59.7	113.1/122.3	125/125	111/119	311/319	116.9/126.1	125/150	115/123	315/323
		24.0/32.0	66.7/77.0	131.9/144.0	150/150	128/139	326/336	135.7/147.8	150/150	132/143	330/340
		31.8/42.4	88.4/102.0	159.0/175.2	175/200	153/168	436/463	162.8/179.0	175/200	157/172	440/467
	HIGH	-	-	50.7/49.7	60/60	54/53	283	54.5/53.5	60/60	58/57	287
		7.8/10.4	21.7/25.0	77.8/81.0	80/90	79/81	305/308	81.6/84.8	90/90	83/86	309/312
		12.0/16.0	33.4/38.5	92.5/97.8	100/100	92/97	316/322	96.3/101.6	100/110	96/101	320/326
18.6/24.8		51.7/59.7	115.3/124.3	125/125	113/121	335/343	119.1/128.1	125/150	118/126	339/347	
24.0/32.0		66.7/77.0	134.1/146.0	150/150	130/141	350/360	137.9/149.8	150/150	135/145	354/364	
31.8/42.4		88.4/102.0	161.2/177.2	175/200	155/170	460/487	165.0/181.0	175/200	160/174	464/491	
460-3-60	STD	-	-	21.0	25	22	114	22.8	25	24	116
		13.9	16.7	41.8	45	41	131	43.6	45	43	133
		16.5	19.8	45.7	50	45	134	47.5	50	47	136
		27.8	33.4	62.7	70	60	147	64.5	70	63	149
		33.0	39.7	70.6	80	68	154	72.4	80	70	156
	41.7	50.2	83.7	90	80	214	85.5	90	82	216	
	MED	-	-	21.9	25	23	130	23.7	30	25	132
		13.9	16.7	42.7	45	42	147	44.5	45	44	149
		16.5	19.8	46.6	50	46	150	48.4	50	48	152
		27.8	33.4	63.6	70	62	163	65.4	70	64	165
		33.0	39.7	71.5	80	69	170	73.3	80	71	172
	41.7	50.2	84.6	90	81	230	86.4	90	83	232	
	HIGH	-	-	23.0	25	24	142	24.8	30	26	144
		13.9	16.7	43.8	45	44	159	45.6	50	46	161
		16.5	19.8	47.7	50	47	162	49.5	50	49	164
27.8		33.4	64.7	70	63	175	66.5	70	65	177	
33.0		39.7	72.6	80	70	182	74.4	80	72	184	
41.7	50.2	85.7	90	82	242	87.5	90	84	244		
575-3-60	STD	-	-	17.8	20	19	99	21.6	25	23	103
		17.0	20.4	43.3	45	42	119	47.1	50	47	123
		34.0	40.9	68.9	70	66	140	72.7	80	70	144
	MED	-	-	18.8	25	20	108	22.6	25	24	112
		17.0	20.4	44.3	45	43	128	48.1	50	48	132
		34.0	40.9	69.9	70	67	149	73.7	80	71	153
	HIGH	-	-	18.8	25	20	108	22.6	25	24	112
		17.0	20.4	44.3	45	43	128	48.1	50	48	132
		34.0	40.9	69.9	70	67	149	73.7	80	71	153

50HCQ

## MCA/MOCP (cont.)

Table 71 – 50HCQD12

### MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. 2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V–PH–Hz	IFM TYPE	ELECTRIC HEATER		WITHOUT C.O. or UNPWR C.O.							
		NOM (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230–3–60	STD	–	–	45.2	60	47	262	49.0	60	52	266
		7.5/10.0	20.9/24.1	71.3/75.3	80/80	71/75	283/286	75.1/79.1	80/80	76/79	287/290
		12.4/16.5	34.4/39.7	88.2/94.8	90/100	87/93	296/302	92.0/98.6	100/100	91/97	300/306
		25.2/33.5	69.9/80.6	132.6/145.9	150/150	128/140	332/343	136.4/149.7	150/150	132/144	336/347
		32.7/43.5	90.7/104.7	158.6/176.1	175/200	152/168	443/471	162.4/179.9	175/200	156/172	447/475
		37.6/50.0	104.3/120.3	175.6/165.5	200/175	167/186	471/503	179.4/169.3	200/175	172/190	475/507
	MED	–	–	47.5	60	50	288	51.3	60	54	292
		7.5/10.0	20.9/24.1	73.6/77.6	80/80	74/78	309/312	77.4/81.4	80/90	78/82	313/316
		12.4/16.5	34.4/39.7	90.5/97.1	100/100	90/96	322/328	94.3/100.9	100/110	94/100	326/332
		25.2/33.5	69.9/80.6	134.9/148.2	150/150	130/143	358/369	138.7/152.0	150/175	135/147	362/373
		32.7/43.5	90.7/104.7	160.9/178.4	175/200	154/170	469/497	164.7/182.2	175/200	159/175	473/501
		37.6/50.0	104.3/120.3	177.9/167.8	200/175	170/188	497/529	181.7/171.6	200/200	174/193	501/533
	HIGH	–	–	61.5	80	65	324	65.3	80	69	328
		7.5/10.0	20.9/24.1	87.6/91.6	100/100	89/93	345/348	91.4/95.4	100/100	93/97	349/352
		12.4/16.5	34.4/39.7	104.5/111.1	110/125	104/111	358/364	108.3/114.9	110/125	109/115	362/368
25.2/33.5		69.9/80.6	148.9/162.3	150/175	145/158	394/405	152.7/166.1	175/175	150/162	398/409	
32.7/43.5		90.7/104.7	174.9/192.4	175/200	169/185	505/533	178.7/196.2	200/200	174/190	509/537	
37.6/50.0		104.3/120.3	191.9/181.8	200/200	185/203	533/565	195.7/185.6	200/200	189/208	537/569	
460–3–60	STD	–	–	22.3	30	23	125	24.1	30	26	127
		10.0	12.0	37.3	40	37	137	39.1	40	39	139
		16.5	19.9	47.2	50	46	145	49.0	50	48	147
		33.5	40.3	72.7	80	70	165	74.5	80	72	167
		43.5	52.3	87.7	90	84	230	89.5	90	86	232
		50.0	60.2	82.5	90	93	245	84.3	90	95	247
	MED	–	–	23.1	30	24	138	24.9	30	26	140
		10.0	12.0	38.1	40	38	150	39.9	40	40	152
		16.5	19.9	48.0	50	47	158	49.8	50	49	160
		33.5	40.3	73.5	80	71	178	75.3	80	73	180
		43.5	52.3	88.5	90	85	243	90.3	100	87	245
		50.0	60.2	83.3	90	94	258	85.1	90	96	260
	HIGH	–	–	30.6	40	32	156	32.4	40	34	158
		10.0	12.0	45.6	50	46	168	47.4	50	48	170
		16.5	19.9	55.4	60	55	176	57.2	60	57	178
33.5		40.3	80.9	90	79	196	82.7	90	81	198	
43.5		52.3	95.9	100	92	261	97.7	100	94	263	
50.0		60.2	90.8	100	101	276	92.6	100	104	278	
575–3–60	STD	–	–	17.1	20	18	95	20.9	25	22	99
		10.0	9.6	29.1	30	29	105	32.9	35	33	109
		16.5	15.9	36.9	40	36	111	40.7	45	41	115
		33.5	32.2	57.3	60	55	127	61.1	70	59	131
		43.5	41.8	69.3	70	66	179	73.1	80	70	183
		50.0	48.1	65.2	70	73	191	69.0	80	78	195
	MED	–	–	17.9	20	19	106	21.7	25	23	110
		10.0	9.6	29.9	30	30	116	33.7	35	34	120
		16.5	15.9	37.7	40	37	122	41.5	45	42	126
		33.5	32.2	58.1	60	56	138	61.9	70	60	142
		43.5	41.8	70.1	80	67	190	73.9	80	71	194
		50.0	48.1	66.0	70	74	202	69.8	80	79	206
	HIGH	–	–	24.9	30	26	118	28.7	35	30	122
		10.0	9.6	36.9	40	37	128	40.7	45	41	132
		16.5	15.9	44.7	45	44	134	48.5	50	49	138
33.5		32.2	65.1	70	63	150	68.9	70	67	154	
43.5		41.8	77.1	80	74	202	80.9	90	78	206	
50.0		48.1	73.0	80	81	214	76.8	80	86	218	

50HCQ

## MCA/MOCP (cont.)

**Table 72 – 50HCQD12**

### MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. 2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER		WITHOUT C.O. or UNPWR C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				w/ P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-3-60	STD	-	-	47.1/46.8	60/60	50/49	259	50.9/50.6	60/60	54/54	263
		7.5/10.0	20.9/24.1	73.2/76.9	80/80	74/77	280/283	77.0/80.7	80/90	78/81	284/287
		12.4/16.5	34.4/39.7	90.1/96.4	100/100	89/95	293/299	93.9/100.2	100/110	93/99	297/303
		25.2/33.5	69.9/80.6	134.5/147.5	150/150	130/142	329/340	138.3/151.3	150/175	134/146	333/344
		32.7/43.5	90.7/104.7	160.5/177.7	175/200	154/170	440/468	164.3/181.5	175/200	158/174	444/472
		37.6/50.0	104.3/120.3	177.5/167.1	200/175	170/188	468/500	181.3/170.9	200/175	174/192	472/504
	MED	-	-	48.6/47.8	60/60	51/50	285	52.4/51.6	60/60	56/55	289
		7.5/10.0	20.9/24.1	74.7/77.9	80/80	75/78	306/309	78.5/81.7	80/90	80/82	310/313
		12.4/16.5	34.4/39.7	91.6/97.4	100/100	91/96	319/325	95.4/101.2	100/110	95/100	323/329
		25.2/33.5	69.9/80.6	136.0/148.5	150/150	132/143	355/366	139.8/152.3	150/175	136/147	359/370
		32.7/43.5	90.7/104.7	162.0/178.7	175/200	156/171	466/494	165.8/182.5	175/200	160/175	470/498
		37.6/50.0	104.3/120.3	179.0/168.1	200/175	171/189	494/526	182.8/171.9	200/200	176/193	498/530
	HIGH	-	-	61.5	80	65	324	65.3	80	69	328
		7.5/10.0	20.9/24.1	87.6/91.6	100/100	89/93	345/348	91.4/95.4	100/100	93/97	349/352
		12.4/16.5	34.4/39.7	104.5/111.1	110/125	104/111	358/364	108.3/114.9	110/125	109/115	362/368
25.2/33.5		69.9/80.6	148.9/162.3	150/175	145/158	394/405	152.7/166.1	175/175	150/162	398/409	
32.7/43.5		90.7/104.7	174.9/192.4	175/200	169/185	505/533	178.7/196.2	200/200	174/190	509/537	
37.6/50.0		104.3/120.3	191.9/181.8	200/200	185/203	533/565	195.7/185.6	200/200	189/208	537/569	
460-3-60	STD	-	-	23.5	30	25	124	25.3	30	27	126
		10.0	12.0	38.5	40	39	136	40.3	45	41	138
		16.5	19.9	48.4	50	48	144	50.2	60	50	146
		33.5	40.3	73.9	80	71	164	75.7	80	73	166
		43.5	52.3	88.9	90	85	229	90.7	100	87	231
	50.0	60.2	83.7	90	94	244	85.5	90	96	246	
	MED	-	-	23.5	30	25	137	25.3	30	27	139
		10.0	12.0	38.5	40	39	149	40.3	45	41	151
		16.5	19.9	48.4	50	48	157	50.2	60	50	159
		33.5	40.3	73.9	80	71	177	75.7	80	73	179
		43.5	52.3	88.9	90	85	242	90.7	100	87	244
	50.0	60.2	83.7	90	94	257	85.5	90	96	259	
	HIGH	-	-	30.6	40	32	156	32.4	40	34	158
		10.0	12.0	45.6	50	46	168	47.4	50	48	170
		16.5	19.9	55.4	60	55	176	57.2	60	57	178
33.5		40.3	80.9	90	79	196	82.7	90	81	198	
43.5		52.3	95.9	100	92	261	97.7	100	94	263	
50.0	60.2	90.8	100	101	276	92.6	100	104	278		
575-3-60	STD	-	-	18.6	25	20	97	22.4	25	24	101
		10.0	9.6	30.6	35	31	107	34.4	35	35	111
		16.5	15.9	38.4	40	38	113	42.2	45	42	117
		33.5	32.2	58.8	60	57	129	62.6	70	61	133
		43.5	41.8	70.8	80	68	181	74.6	80	72	185
	50.0	48.1	66.7	70	75	193	70.5	80	79	197	
	MED	-	-	19.6	25	21	106	23.4	25	25	110
		10.0	9.6	31.6	35	32	116	35.4	40	36	120
		16.5	15.9	39.4	40	39	122	43.2	45	43	126
		33.5	32.2	59.8	60	58	138	63.6	70	62	142
		43.5	41.8	71.8	80	69	190	75.6	80	73	194
	50.0	48.1	67.7	70	76	202	71.5	80	81	206	
	HIGH	-	-	24.9	30	26	118	28.7	35	30	122
		10.0	9.6	36.9	40	37	128	40.7	45	41	132
		16.5	15.9	44.7	45	44	134	48.5	50	49	138
33.5		32.2	65.1	70	63	150	68.9	70	67	154	
43.5		41.8	77.1	80	74	202	80.9	90	78	206	
50.0	48.1	73.0	80	81	214	76.8	80	86	218		

**50HCQ**

## MCA/MOCP (cont.)

Table 73 – 50HCQA04

### MCA/MOCP DETERMINATION WITH PWRD C.O. SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V-PH-Hz	IFM TYPE	ELECTRIC HEATER		WITH PWRD C.O.								
		Nom (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)				
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE		
						FLA	LRA			FLA	LRA	
208/ 230-1-60	DD-STD	-	-	34.0	50	34	93	35.9	50	36	95	
		3.3/4.4	15.9/18.3	53.8/56.8	60/60	53/55	109/111	55.7/58.7	60/60	55/58	111/113	
		4.9/6.5	23.5/27.1	63.3/67.8	70/70	61/65	117/120	65.2/69.7	70/70	63/68	119/122	
		6.5/8.7	31.4/36.3	73.2/79.3	80/80	70/76	124/129	75.1/81.2	80/90	73/78	126/131	
		7.9/10.5	37.9/43.8	81.3/88.7	90/90	78/85	131/137	83.2/90.6	90/100	80/87	133/139	
		9.8/13.0	46.9/54.2	92.6/101.7	100/110	88/97	187/201	94.5/103.6	100/110	90/99	189/203	
208/ 230-3-60	DD-STD	-	-	26.2	30	27	87	28.1	35	29	89	
		3.3/4.4	9.2/10.6	37.7/39.5	45/45	38/39	96/98	39.6/41.4	45/45	40/42	98/100	
		4.9/6.5	13.6/15.6	43.2/45.7	50/50	43/45	101/103	45.1/47.6	50/50	45/47	103/105	
		6.5/8.7	18.1/20.9	48.8/52.3	50/60	48/51	105/108	50.7/54.2	60/60	50/53	107/110	
		7.9/10.5	21.9/25.3	53.6/57.8	60/60	52/56	109/112	55.5/59.7	60/60	55/58	111/114	
		12.0/16.0	33.4/38.5	68.0/74.3	70/80	66/71	120/126	69.9/76.2	70/80	68/74	122/128	
	MED	-	-	24.0	30	25	99	25.9	30	27	101	
		3.3/4.4	9.2/10.6	35.5/37.3	40/45	35/37	108/110	37.4/39.2	45/45	37/39	110/112	
		4.9/6.5	13.6/15.6	41.0/43.5	45/50	40/43	113/115	42.9/45.4	45/50	42/45	115/117	
		6.5/8.7	18.1/20.9	46.6/50.1	50/60	45/49	117/120	48.5/52.0	50/60	48/51	119/122	
		7.9/10.5	21.9/25.3	51.4/55.6	60/60	50/54	121/124	53.3/57.5	60/60	52/56	123/126	
		12.0/16.0	33.4/38.5	65.8/72.1	70/80	63/69	132/138	67.7/74.0	70/80	65/71	134/140	
	HIGH	-	-	24.0	30	25	110	25.9	30	27	112	
		3.3/4.4	9.2/10.6	35.5/37.3	40/45	35/37	119/121	37.4/39.2	45/45	37/39	121/123	
		4.9/6.5	13.6/15.6	41.0/43.5	45/50	40/43	124/126	42.9/45.4	45/50	42/45	126/128	
		6.5/8.7	18.1/20.9	46.6/50.1	50/60	45/49	128/131	48.5/52.0	50/60	48/51	130/133	
		7.9/10.5	21.9/25.3	51.4/55.6	60/60	50/54	132/135	53.3/57.5	60/60	52/56	134/137	
		12.0/16.0	33.4/38.5	65.8/72.1	70/80	63/69	143/149	67.7/74.0	70/80	65/71	145/151	
460-3-60	DD-STD	-	-	14.0	20	14	45	15.0	20	16	46	
		6.0	7.2	23.0	25	23	52	24.0	25	24	53	
		8.8	10.6	27.2	30	27	56	28.2	30	28	57	
		11.5	13.8	31.2	35	30	59	32.2	35	31	60	
		14.0	16.8	35.0	35	34	62	36.0	40	35	63	
	MED	-	-	12.6	15	13	50	13.6	20	14	51	
		6.0	7.2	21.6	25	21	57	22.6	25	22	58	
		8.8	10.6	25.8	30	25	61	26.8	30	26	62	
		11.5	13.8	29.8	30	29	64	30.8	35	30	65	
		14.0	16.8	33.6	35	32	67	34.6	35	33	68	
	HIGH	-	-	12.6	15	13	56	13.6	20	14	57	
		6.0	7.2	21.6	25	21	63	22.6	25	22	64	
		8.8	10.6	25.8	30	25	67	26.8	30	26	68	
		11.5	13.8	29.8	30	29	70	30.8	35	30	71	
		14.0	16.8	33.6	35	32	73	34.6	35	33	74	
	575-3-60	DD-STD	-	-	11.0	15	12	44	12.9	15	14	46
		MED	-	-	9.4	15	10	47	11.3	15	12	49
		HIGH	-	-	9.0	15	9	51	10.9	15	11	53

50HCQ

## MCA/MOCP (cont.)

Table 74 – 50HCQA05

### MCA/MOCP DETERMINATION WITH PWRD C.O. SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V-PH-Hz	IFM TYPE	ELECTRIC HEATER		WITH PWRD C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-1-60	DD-STD	-	-	38.4	50	38	124	40.3	60	41	126
		3.3/4.4	15.9/18.3	58.2/61.2	60/70	57/59	140/142	60.1/63.1	70/70	59/62	142/144
		6.5/8.7	31.4/36.3	77.6/83.7	80/90	75/80	155/160	79.5/85.6	80/90	77/82	157/162
		9.8/13.0	46.9/54.2	97.0/106.1	100/110	92/101	218/232	98.9/108.0	100/110	95/103	220/234
		13.1/17.4	62.8/72.5	116.9/129.0	125/150	111/122	250/269	118.8/130.9	125/150	113/124	252/271
		15.8/21.0	75.8/87.5	133.1/147.7	150/150	126/139	276/299	135.0/149.6	150/150	128/141	278/301
208/ 230-3-60	DD-STD	-	-	30.0	40	31	98	31.9	40	33	100
		4.9/6.5	13.6/15.6	47.0/49.5	50/50	46/49	112/114	48.9/51.4	50/60	49/51	114/116
		6.5/8.7	18.1/20.9	52.6/56.1	60/60	52/55	116/119	54.5/58.0	60/60	54/57	118/121
		12.0/16.0	33.4/38.5	71.7/78.1	80/80	69/75	131/137	73.6/80.0	80/90	71/77	133/139
	15.8/21.0	43.8/50.5	84.7/93.1	90/100	81/89	186/199	86.6/95.0	90/100	83/91	188/201	
	MED	-	-	27.8	40	28	110	29.7	40	30	112
		4.9/6.5	13.6/15.6	44.8/47.3	50/50	44/46	124/126	46.7/49.2	50/50	46/48	126/128
		6.5/8.7	18.1/20.9	50.4/53.9	60/60	49/52	128/131	52.3/55.8	60/60	51/54	130/133
		12.0/16.0	33.4/38.5	69.5/75.9	70/80	67/72	143/149	71.4/77.8	80/80	69/75	145/151
	15.8/21.0	43.8/50.5	82.5/90.9	90/100	79/86	198/211	84.4/92.8	90/100	81/88	200/213	
	HIGH	-	-	27.8	40	28	121	29.7	40	30	123
		4.9/6.5	13.6/15.6	44.8/47.3	50/50	44/46	135/137	46.7/49.2	50/50	46/48	137/139
6.5/8.7		18.1/20.9	50.4/53.9	60/60	49/52	139/142	52.3/55.8	60/60	51/54	141/144	
12.0/16.0		33.4/38.5	69.5/75.9	70/80	67/72	154/160	71.4/77.8	80/80	69/75	156/162	
15.8/21.0	43.8/50.5	82.5/90.9	90/100	79/86	209/222	84.4/92.8	90/100	81/88	211/224		
460-3-60	DD-STD	-	-	14.6	20	15	49	15.6	20	16	50
		6.0	7.2	23.6	25	23	56	24.6	25	24	57
		11.5	13.8	31.9	35	31	63	32.9	35	32	64
		14.0	16.8	35.6	40	34	66	36.6	40	36	67
	23.0	27.7	49.3	50	47	104	50.3	60	48	105	
	MED	-	-	13.2	15	13	54	14.2	20	15	55
		6.0	7.2	22.2	25	22	61	23.2	25	23	62
		11.5	13.8	30.5	35	29	68	31.5	35	30	69
		14.0	16.8	34.2	35	33	71	35.2	40	34	72
	23.0	27.7	47.9	50	45	109	48.9	50	46	110	
	HIGH	-	-	13.2	15	13	60	14.2	20	15	61
		6.0	7.2	22.2	25	22	67	23.2	25	23	68
11.5		13.8	30.5	35	29	74	31.5	35	30	75	
14.0		16.8	34.2	35	33	77	35.2	40	34	78	
23.0	27.7	47.9	50	45	115	48.9	50	46	116		
575-3-60	DD-STD	-	-	12.0	15	13	41	13.9	20	15	43
	MED	-	-	10.4	15	11	44	12.3	15	13	46
	HIGH	-	-	10.0	15	10	48	11.9	15	12	50

50HCQ

## MCA/MOCP (cont.)

Table 75 – 50HCQA06

### MCA/MOCP DETERMINATION WITH PWRD C.O. SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V-PH-Hz	IFM TYPE	ELECTRIC HEATER		WITH PWRD C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-1-60	DD-STD	-	-	44.9	60	44	149	46.8	60	47	151
		4.9/6.5	23.5/27.1	74.2/78.7	80/80	71/76	173/176	76.1/80.6	80/90	74/78	175/178
		6.5/8.7	31.4/36.3	84.1/90.2	100/100	81/86	180/185	86.0/92.1	100/100	83/88	182/187
		9.8/13.0	46.9/54.2	103.5/112.6	110/125	98/107	243/257	105.4/114.5	110/125	101/109	245/259
		13.1/17.4	62.8/72.5	123.4/135.5	125/150	117/128	275/294	125.3/137.4	150/150	119/130	277/296
		15.8/21.0	75.8/87.5	139.6/154.2	150/175	132/145	301/324	141.5/156.1	150/175	134/147	303/326
208/ 230-3-60	DD-STD	-	-	33.5	45	34	125	35.4	50	36	127
		4.9/6.5	13.6/15.6	50.5/53.0	60/60	50/52	139/141	52.4/54.9	60/60	52/54	141/143
		7.9/10.5	21.9/25.3	60.9/65.1	70/70	59/63	147/150	62.8/67.0	70/70	61/65	149/152
		12.0/16.0	33.4/38.5	75.2/81.6	80/90	72/78	158/164	77.1/83.5	80/90	75/80	160/166
		15.8/21.0	43.8/50.5	88.2/96.6	90/100	84/92	213/226	90.1/98.5	100/100	86/94	215/228
		19.9/26.5	55.2/63.8	102.5/113.2	110/125	97/107	235/253	104.4/115.1	110/125	100/109	237/255
	MED	-	-	31.3	45	31	148	33.2	45	34	150
		4.9/6.5	13.6/15.6	48.3/50.8	60/60	47/49	162/164	50.2/52.7	60/60	49/52	164/166
		7.9/10.5	21.9/25.3	58.7/62.9	60/70	57/60	170/173	60.6/64.8	70/70	59/63	172/175
		12.0/16.0	33.4/38.5	73.0/79.4	80/80	70/76	181/187	74.9/81.3	80/90	72/78	183/189
		15.8/21.0	43.8/50.5	86.0/94.4	90/100	82/89	236/249	87.9/96.3	90/100	84/92	238/251
		19.9/26.5	55.2/63.8	100.3/111.0	110/125	95/105	258/276	102.2/112.9	110/125	97/107	260/278
	HIGH	-	-	33.6	45	34	174	35.5	50	36	176
		4.9/6.5	13.6/15.6	50.6/53.1	60/60	50/52	188/190	52.5/55.0	60/60	52/54	190/192
		7.9/10.5	21.9/25.3	61.0/65.2	70/70	59/63	196/199	62.9/67.1	70/70	61/65	198/201
		12.0/16.0	33.4/38.5	75.3/81.7	80/90	72/78	207/213	77.2/83.6	80/90	75/81	209/215
		15.8/21.0	43.8/50.5	88.3/96.7	90/100	84/92	262/275	90.2/98.6	100/100	87/94	264/277
		19.9/26.5	55.2/63.8	102.6/113.3	110/125	98/107	284/302	104.5/115.2	110/125	100/110	286/304
460-3-60	DD-STD	-	-	15.8	20	16	60	16.8	20	17	61
		6.0	7.2	24.8	25	24	67	25.8	30	26	68
		11.5	13.8	33.0	35	32	74	34.0	35	33	75
		14.0	16.8	36.8	40	35	77	37.8	40	37	78
		23.0	27.7	50.4	60	48	115	51.4	60	49	116
		25.5	30.7	54.1	60	51	121	55.1	60	53	122
	MED	-	-	14.4	20	14	71	15.4	20	16	72
		6.0	7.2	23.4	25	23	78	24.4	25	24	79
		11.5	13.8	31.6	35	30	85	32.6	35	32	86
		14.0	16.8	35.4	40	34	88	36.4	40	35	89
		23.0	27.7	49.0	50	46	126	50.0	50	47	127
		25.5	30.7	52.7	60	50	132	53.7	60	51	133
	HIGH	-	-	15.2	20	15	84	16.2	20	17	85
		6.0	7.2	24.2	25	24	91	25.2	30	25	92
		11.5	13.8	32.4	35	31	98	33.4	35	32	99
		14.0	16.8	36.2	40	35	101	37.2	40	36	102
		23.0	27.7	49.8	50	47	139	50.8	60	48	140
		25.5	30.7	53.5	60	51	145	54.5	60	52	146
575-3-60	DD-STD	-	-	12.9	15	13	48	14.8	20	16	50
	MED	-	-	10.9	15	11	55	12.8	15	13	57
	HIGH	-	-	11.7	15	12	66	13.6	15	14	68

50HCQ

## MCA/MOCP (cont.)

Table 76 – 50HCQA07

### MCA/MOCP DETERMINATION WITH PWRD C.O. SINGLE STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V–PH–Hz	IFM TYPE	ELECTRIC HEATER		WITH PWRD C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230–3–60	STD	–	–	36.8	50	37	153	40.6	50	41	157
		4.9/6.5	13.6/15.6	53.8/56.3	60/60	52/55	167/169	57.6/60.1	60/70	57/59	171/173
		7.8/10.4	21.7/25.0	63.9/68.0	70/80	62/66	175/178	67.7/71.8	80/80	66/70	179/182
		12.0/16.0	33.4/38.5	78.5/84.9	80/90	75/81	186/192	82.3/88.7	90/90	80/85	190/196
		15.8/21.0	43.8/50.5	91.5/99.9	100/100	87/95	241/254	95.3/103.7	100/110	92/99	245/258
		19.9/26.5	55.2/63.8	105.8/116.5	110/125	100/110	263/281	109.6/120.3	110/125	105/115	267/285
	MED	–	–	39.1	50	39	190	42.9	60	44	194
		4.9/6.5	13.6/15.6	56.1/58.6	60/60	55/57	204/206	59.9/62.4	70/70	59/62	208/210
		7.8/10.4	21.7/25.0	66.2/70.3	70/80	64/68	212/215	70.0/74.1	80/80	69/73	216/219
		12.0/16.0	33.4/38.5	80.8/87.2	90/90	78/84	223/229	84.6/91.0	90/100	82/88	227/233
		15.8/21.0	43.8/50.5	93.8/102.2	100/110	90/98	278/291	97.6/106.0	100/110	94/102	282/295
		19.9/26.5	55.2/63.8	108.1/118.8	110/125	103/113	300/318	111.9/122.6	125/125	107/117	304/322
	HIGH	–	–	46.6	60	48	216	50.4	60	52	220
		4.9/6.5	13.6/15.6	63.6/66.1	70/80	64/66	230/232	67.4/69.9	80/80	68/70	234/236
		7.8/10.4	21.7/25.0	73.7/77.8	80/80	73/77	238/241	77.5/81.6	80/90	77/81	242/245
12.0/16.0		33.4/38.5	88.3/94.7	90/100	86/92	249/255	92.1/98.5	100/100	91/97	253/259	
15.8/21.0		43.8/50.5	101.3/109.7	110/110	98/106	304/317	105.1/113.5	110/125	103/111	308/321	
19.9/26.5		55.2/63.8	115.6/126.3	125/150	112/121	326/344	119.4/130.1	125/150	116/126	330/348	
460–3–60	STD	–	–	18.5	25	19	77	20.3	30	21	79
		6.0	7.2	27.5	30	27	84	29.3	30	29	86
		11.5	13.8	35.8	40	34	91	37.6	40	36	93
		14.0	16.8	39.5	45	38	94	41.3	45	40	96
		23.0	27.7	53.2	60	50	105	55.0	60	52	107
		25.5	30.7	56.9	60	54	108	58.7	60	56	110
	MED	–	–	19.3	25	19	96	21.1	30	22	98
		6.0	7.2	28.3	30	28	103	30.1	35	30	105
		11.5	13.8	36.6	40	35	110	38.4	40	37	112
		14.0	16.8	40.3	45	39	113	42.1	45	41	115
		23.0	27.7	54.0	60	51	124	55.8	60	53	126
		25.5	30.7	57.7	60	55	127	59.5	60	57	129
	HIGH	–	–	23.3	30	24	109	25.1	30	26	111
		6.0	7.2	32.3	40	32	116	34.1	40	34	118
		11.5	13.8	40.6	45	40	123	42.4	45	42	125
		14.0	16.8	44.3	45	43	126	46.1	50	45	128
		23.0	27.7	58.0	60	56	137	59.8	60	58	139
		25.5	30.7	61.7	70	59	140	63.5	70	61	142
575–3–60	STD	–	–	14.6	20	15	63	18.4	25	19	67
	MED	–	–	15.0	20	15	78	18.8	25	19	82
	HIGH	–	–	17.8	25	18	92	21.6	25	23	96

50HCQ



## MCA/MOCP (cont.)

Table 77 – 50HCQD08

### MCA/MOCP DETERMINATION WITH PWRD C.O. 2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V–PH–Hz	IFM TYPE	ELECTRIC HEATER		WITH PWRD C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230–3–60	STD	–	–	42.5	50	45	196	46.3	50	49	200
		7.8/10.4	21.7/25.0	69.6/73.7	70/80	70/74	218/221	73.4/77.5	80/80	74/78	222/225
		12.0/16.0	33.4/38.5	84.2/90.6	90/100	83/89	229/235	88.0/94.4	90/100	88/94	233/239
		18.6/24.8	51.7/59.7	107.1/117.1	110/125	105/114	248/256	110.9/120.9	125/125	109/118	252/260
		24.0/32.0	66.7/77.0	125.9/138.7	150/150	122/134	263/273	129.7/142.5	150/150	126/138	267/277
	31.8/42.4	88.4/102.0	153.0/170.0	175/175	147/162	373/400	156.8/173.8	175/175	151/167	377/404	
	MED	–	–	42.5	50	45	207	46.3	50	49	211
		7.8/10.4	21.7/25.0	69.6/73.7	70/80	70/74	229/232	73.4/77.5	80/80	74/78	233/236
		12.0/16.0	33.4/38.5	84.2/90.6	90/100	83/89	240/246	88.0/94.4	90/100	88/94	244/250
		18.6/24.8	51.7/59.7	107.1/117.1	110/125	105/114	259/267	110.9/120.9	125/125	109/118	263/271
		24.0/32.0	66.7/77.0	125.9/138.7	150/150	122/134	274/284	129.7/142.5	150/150	126/138	278/288
	31.8/42.4	88.4/102.0	153.0/170.0	175/175	147/162	384/411	156.8/173.8	175/175	151/167	388/415	
	HIGH	–	–	47.3	60	51	250	51.1	60	55	254
		7.8/10.4	21.7/25.0	74.4/78.5	80/80	76/79	272/275	78.2/82.3	80/90	80/84	276/279
		12.0/16.0	33.4/38.5	89.0/95.4	90/100	89/95	283/289	92.8/99.2	100/100	93/99	287/293
18.6/24.8		51.7/59.7	111.9/121.9	125/125	110/119	302/310	115.7/125.7	125/150	114/124	306/314	
24.0/32.0		66.7/77.0	130.7/143.5	150/150	127/139	317/327	134.5/147.3	150/150	132/144	321/331	
31.8/42.4	88.4/102.0	157.8/174.8	175/175	152/168	427/454	161.6/178.6	175/200	157/172	431/458		
460–3–60	STD	–	–	20.1	25	21	97	21.9	25	23	99
		13.9	16.7	41.0	45	41	114	42.8	45	43	116
		16.5	19.8	44.9	45	44	117	46.7	50	46	119
		27.8	33.4	61.9	70	60	130	63.7	70	62	132
		33.0	39.7	69.8	70	67	137	71.6	80	69	139
	41.7	50.2	82.9	90	79	197	84.7	90	81	199	
	MED	–	–	20.1	25	21	103	21.9	25	23	105
		13.9	16.7	41.0	45	41	120	42.8	45	43	122
		16.5	19.8	44.9	45	44	123	46.7	50	46	125
		27.8	33.4	61.9	70	60	136	63.7	70	62	138
		33.0	39.7	69.8	70	67	143	71.6	80	69	145
	41.7	50.2	82.9	90	79	203	84.7	90	81	205	
	HIGH	–	–	21.9	25	23	125	23.7	30	26	127
		13.9	16.7	42.8	45	43	142	44.6	45	45	144
		16.5	19.8	46.7	50	46	145	48.5	50	48	147
27.8		33.4	63.7	70	62	158	65.5	70	64	160	
33.0		39.7	71.6	80	69	165	73.4	80	71	167	
41.7	50.2	84.7	90	81	225	86.5	90	83	227		
575–3–60	STD	–	–	15.2	20	16	79	19.0	25	21	83
		17.0	20.4	40.7	45	40	99	44.5	45	44	103
		34.0	40.9	66.3	70	63	120	70.1	80	68	124
	MED	–	–	14.8	20	16	83	18.6	20	20	87
		17.0	20.4	40.3	45	39	103	44.1	45	44	107
		34.0	40.9	65.9	70	63	124	69.7	70	67	128
	HIGH	–	–	15.6	20	17	94	19.4	25	21	98
		17.0	20.4	41.1	45	40	114	44.9	45	45	118
		34.0	40.9	66.7	70	64	135	70.5	80	68	139

50HCQ

## MCA/MOCP (cont.)

Table 78 – 50HCQD08

### MCA/MOCP DETERMINATION WITH PWRD C.O. 2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER		w/ PWRD C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				w/ P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-3-60	STD	-	-	43.1/42.9	50/50	46/46	200	46.9/46.7	60/50	50/50	204
		7.8/10.4	21.7/25.0	70.2/74.1	80/80	71/74	222/225	74.0/77.9	80/80	75/79	226/229
		12.0/16.0	33.4/38.5	84.8/91.0	90/100	84/90	233/239	88.6/94.8	90/100	89/94	237/243
		18.6/24.8	51.7/59.7	107.7/117.5	110/125	105/114	252/260	111.5/121.3	125/125	110/119	256/264
		24.0/32.0	66.7/77.0	126.5/139.1	150/150	122/134	267/277	130.3/142.9	150/150	127/138	271/281
	31.8/42.4	88.4/102.0	153.6/170.4	175/175	147/163	377/404	157.4/174.2	175/175	152/167	381/408	
	MED	-	-	44.4/44.1	50/50	47/47	204	48.2/47.9	60/60	52/51	208
		7.8/10.4	21.7/25.0	71.5/75.3	80/80	72/76	226/229	75.3/79.1	80/80	77/80	230/233
		12.0/16.0	33.4/38.5	86.1/92.2	90/100	86/91	237/243	89.9/96.0	90/100	90/96	241/247
		18.6/24.8	51.7/59.7	109.0/118.7	110/125	107/116	256/264	112.8/122.5	125/125	111/120	260/268
		24.0/32.0	66.7/77.0	127.8/140.3	150/150	124/135	271/281	131.6/144.1	150/150	128/140	275/285
	31.8/42.4	88.4/102.0	154.9/171.6	175/175	149/164	381/408	158.7/175.4	175/200	153/169	385/412	
	HIGH	-	-	48.1/47.1	60/60	52/50	254	51.9/50.9	60/60	56/55	258
		7.8/10.4	21.7/25.0	75.2/78.3	80/80	76/79	276/279	79.0/82.1	80/90	81/83	280/283
		12.0/16.0	33.4/38.5	89.8/95.2	90/100	90/95	287/293	93.6/99.0	100/100	94/99	291/297
18.6/24.8		51.7/59.7	112.7/121.7	125/125	111/119	306/314	116.5/125.5	125/150	115/123	310/318	
24.0/32.0		66.7/77.0	131.5/143.3	150/150	128/139	321/331	135.3/147.1	150/150	133/143	325/335	
31.8/42.4	88.4/102.0	158.6/174.6	175/175	153/168	431/458	162.4/178.4	175/200	158/172	435/462		
460-3-60	STD	-	-	20.4	25	22	99	22.2	25	24	101
		13.9	16.7	41.3	45	41	116	43.1	45	43	118
		16.5	19.8	45.2	50	45	119	47.0	50	47	121
		27.8	33.4	62.2	70	60	132	64.0	70	62	134
		33.0	39.7	70.1	80	67	139	71.9	80	69	141
	41.7	50.2	83.2	90	79	199	85.0	90	82	201	
	MED	-	-	21.3	25	23	102	23.1	25	25	104
		13.9	16.7	42.2	45	42	119	44.0	45	44	121
		16.5	19.8	46.1	50	46	122	47.9	50	48	124
		27.8	33.4	63.1	70	61	135	64.9	70	63	137
		33.0	39.7	71.0	80	68	142	72.8	80	70	144
	41.7	50.2	84.1	90	81	202	85.9	90	83	204	
	HIGH	-	-	22.4	25	24	127	24.2	30	26	129
		13.9	16.7	43.3	45	43	144	45.1	50	45	146
		16.5	19.8	47.2	50	47	147	49.0	50	49	149
27.8		33.4	64.2	70	62	160	66.0	70	65	162	
33.0		39.7	72.1	80	70	167	73.9	80	72	169	
41.7	50.2	85.2	90	82	227	87.0	90	84	229		
575-3-60	STD	-	-	15.6	20	17	81	19.4	25	21	85
		17.0	20.4	41.1	45	40	101	44.9	45	45	105
		34.0	40.9	66.7	70	64	122	70.5	80	68	126
		-	-	16.3	20	17	85	20.1	25	22	89
		17.0	20.4	41.8	45	41	105	45.6	50	45	109
	34.0	40.9	67.4	70	65	126	71.2	80	69	130	
	HIGH	-	-	17.3	20	19	94	21.1	25	23	98
		17.0	20.4	42.8	45	42	114	46.6	50	46	118
		34.0	40.9	68.5	70	66	135	72.3	80	70	139

50HCQ

## MCA/MOCP (cont.)

Table 79 – 50HCQD09

### MCA/MOCP DETERMINATION WITH PWRD C.O. 2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V-PH-Hz	IFM TYPE	ELECTRIC HEATER		WITH PWRD C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-3-60	STD	-	-	49.9	60	53	230	53.7	60	57	234
		7.8/10.4	21.7/25.0	77.0/81.2	80/90	78/82	252/255	80.8/85.0	90/90	82/86	256/259
		12.0/16.0	33.4/38.5	91.7/98.0	100/100	91/97	263/269	95.5/101.8	100/110	96/101	267/273
		18.6/24.8	51.7/59.7	114.5/124.5	125/125	112/121	282/290	118.3/128.3	125/150	117/126	286/294
		24.0/32.0	66.7/77.0	133.3/146.2	150/150	129/141	297/307	137.1/150.0	150/150	134/146	301/311
	31.8/42.4	88.4/102.0	160.4/177.4	175/200	154/170	407/434	164.2/181.2	175/200	159/174	411/438	
	MED	-	-	52.2	60	55	267	56.0	70	60	271
		7.8/10.4	21.7/25.0	79.3/83.5	80/90	80/84	289/292	83.1/87.3	90/90	85/89	293/296
		12.0/16.0	33.4/38.5	94.0/100.3	100/110	94/100	300/306	97.8/104.1	100/110	98/104	304/310
		18.6/24.8	51.7/59.7	116.8/126.8	125/150	115/124	319/327	120.6/130.6	125/150	119/128	323/331
		24.0/32.0	66.7/77.0	135.6/148.5	150/150	132/144	334/344	139.4/152.3	150/175	137/148	338/348
	31.8/42.4	88.4/102.0	162.7/179.7	175/200	157/173	444/471	166.5/183.5	175/200	161/177	448/475	
	HIGH	-	-	54.7	60	58	284	58.5	70	63	288
		7.8/10.4	21.7/25.0	81.8/86.0	90/90	83/87	306/309	85.6/89.8	90/90	88/91	310/313
		12.0/16.0	33.4/38.5	96.5/102.8	100/110	97/103	317/323	100.3/106.6	110/110	101/107	321/327
18.6/24.8		51.7/59.7	119.3/129.3	125/150	118/127	336/344	123.1/133.1	125/150	122/131	340/348	
24.0/32.0		66.7/77.0	138.1/151.0	150/175	135/147	351/361	141.9/154.8	150/175	139/151	355/365	
31.8/42.4	88.4/102.0	165.2/182.2	175/200	160/176	461/488	169.0/186.0	175/200	164/180	465/492		
460-3-60	STD	-	-	22.9	25	24	114	24.7	30	26	116
		13.9	16.7	43.7	45	43	131	45.5	50	46	133
		16.5	19.8	47.6	50	47	134	49.4	50	49	136
		27.8	33.4	64.6	70	63	147	66.4	70	65	149
		33.0	39.7	72.5	80	70	154	74.3	80	72	156
	41.7	50.2	85.6	90	82	214	87.4	90	84	216	
	MED	-	-	23.7	30	25	133	25.5	30	27	135
		13.9	16.7	44.5	45	44	150	46.3	50	46	152
		16.5	19.8	48.4	50	48	153	50.2	60	50	155
		27.8	33.4	65.4	70	64	166	67.2	70	66	168
		33.0	39.7	73.3	80	71	173	75.1	80	73	175
	41.7	50.2	86.4	90	83	233	88.2	90	85	235	
	HIGH	-	-	24.7	30	26	142	26.5	30	28	144
		13.9	16.7	45.5	50	46	159	47.3	50	48	161
		16.5	19.8	49.4	50	49	162	51.2	60	51	164
27.8		33.4	66.4	70	65	175	68.2	70	67	177	
33.0		39.7	74.3	80	72	182	76.1	80	74	184	
41.7	50.2	87.4	90	84	242	89.2	90	86	244		
575-3-60	STD	-	-	18.0	20	19	99	21.8	25	23	103
		17.0	20.4	43.5	45	43	119	47.3	50	47	123
		34.0	40.9	69.1	70	66	140	72.9	80	70	144
	MED	-	-	18.8	25	20	110	22.6	25	24	114
		17.0	20.4	44.3	45	43	130	48.1	50	48	134
		34.0	40.9	69.9	70	67	151	73.7	80	71	155
	HIGH	-	-	18.8	25	20	110	22.6	25	24	114
		17.0	20.4	44.3	45	43	130	48.1	50	48	134
		34.0	40.9	69.9	70	67	151	73.7	80	71	155

50HCQ

## MCA/MOCP (cont.)

**Table 80 – 50HCQD09**

### MCA/MOCP DETERMINATION WITH PWRD C.O. 2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER		w/ PWRD C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				w/ P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-3-60	STD	-	-	50.5/50.3	60/60	53/53	234	54.3/54.1	60/60	58/58	238
		7.8/10.4	21.7/25.0	77.6/81.6	80/90	78/82	256/259	81.4/85.4	90/90	83/86	260/263
		12.0/16.0	33.4/38.5	92.3/98.4	100/100	92/98	267/273	96.1/102.2	100/110	96/102	271/277
		18.6/24.8	51.7/59.7	115.1/124.9	125/125	113/122	286/294	118.9/128.7	125/150	117/126	290/298
		24.0/32.0	66.7/77.0	133.9/146.6	150/150	130/142	301/311	137.7/150.4	150/175	135/146	305/315
		31.8/42.4	88.4/102.0	161.0/177.8	175/200	155/171	411/438	164.8/181.6	175/200	160/175	415/442
	MED	-	-	53.3/52.5	60/60	57/56	264	57.1/56.3	70/70	61/60	268
		7.8/10.4	21.7/25.0	80.4/83.8	90/90	82/85	286/289	84.2/87.6	90/90	86/89	290/293
		12.0/16.0	33.4/38.5	95.1/100.6	100/110	95/100	297/303	98.9/104.4	100/110	99/104	301/307
		18.6/24.8	51.7/59.7	117.9/127.1	125/150	116/124	316/324	121.7/130.9	125/150	121/129	320/328
		24.0/32.0	66.7/77.0	136.7/148.8	150/150	133/144	331/341	140.5/152.6	150/175	138/149	335/345
		31.8/42.4	88.4/102.0	163.8/180.0	175/200	158/173	441/468	167.6/183.8	175/200	163/177	445/472
	HIGH	-	-	55.5/54.5	60/60	59/58	288	59.3/58.3	70/70	64/62	292
		7.8/10.4	21.7/25.0	82.6/85.8	90/90	84/87	310/313	86.4/89.6	90/90	89/91	314/317
		12.0/16.0	33.4/38.5	97.3/102.6	100/110	98/102	321/327	101.1/106.4	110/110	102/107	325/331
18.6/24.8		51.7/59.7	120.1/129.1	125/150	119/127	340/348	123.9/132.9	125/150	123/131	344/352	
24.0/32.0		66.7/77.0	138.9/150.8	150/175	136/147	355/365	142.7/154.6	150/175	140/151	359/369	
31.8/42.4		88.4/102.0	166.0/182.0	175/200	161/175	465/492	169.8/185.8	175/200	165/180	469/496	
460-3-60	STD	-	-	23.2	30	25	116	25.0	30	27	118
		13.9	16.7	44.0	45	44	133	45.8	50	46	135
		16.5	19.8	47.9	50	47	136	49.7	50	49	138
		27.8	33.4	64.9	70	63	149	66.7	70	65	151
		33.0	39.7	72.8	80	70	156	74.6	80	72	158
		41.7	50.2	85.9	90	82	216	87.7	90	84	218
	MED	-	-	24.1	30	26	132	25.9	30	28	134
		13.9	16.7	44.9	45	45	149	46.7	50	47	151
		16.5	19.8	48.8	50	48	152	50.6	60	50	154
		27.8	33.4	65.8	70	64	165	67.6	70	66	167
		33.0	39.7	73.7	80	71	172	75.5	80	73	174
		41.7	50.2	86.8	90	83	232	88.6	90	85	234
	HIGH	-	-	25.2	30	27	144	27.0	30	29	146
		13.9	16.7	46.0	50	46	161	47.8	50	48	163
		16.5	19.8	49.9	50	50	164	51.7	60	52	166
		27.8	33.4	66.9	70	65	177	68.7	70	67	179
		33.0	39.7	74.8	80	73	184	76.6	80	75	186
		41.7	50.2	87.9	90	85	244	89.7	90	87	246
575-3-60	STD	-	-	19.5	25	21	101	23.3	25	25	105
		17.0	20.4	45.0	45	44	121	48.8	50	49	125
		34.0	40.9	70.6	80	68	142	74.4	80	72	146
	MED	-	-	20.5	25	22	110	24.3	30	26	114
		17.0	20.4	46.0	50	45	130	49.8	50	50	134
		34.0	40.9	71.6	80	69	151	75.4	80	73	155
	HIGH	-	-	20.5	25	22	110	24.3	30	26	114
		17.0	20.4	46.0	50	45	130	49.8	50	50	134
		34.0	40.9	71.6	80	69	151	75.4	80	73	155

50HCQ

## MCA/MOCP (cont.)

Table 81 – 50HCQD12

### MCA/MOCP DETERMINATION WITH PWRD C.O. 2-STAGE COOLING WITH SINGLE SPEED INDOOR FAN MOTOR

NOM. V-PH-Hz	IFM TYPE	ELECTRIC HEATER		WITH PWRD C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				WITH P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-3-60	STD	-	-	50.0	60	53	267	53.8	60	57	271
		7.5/10.0	20.9/24.1	76.1/80.1	80/90	77/81	288/291	79.9/83.9	80/90	81/85	292/295
		12.4/16.5	34.4/39.7	93.0/99.6	100/100	92/99	301/307	96.8/103.4	100/110	97/103	305/311
		25.2/33.5	69.9/80.6	137.4/150.7	150/175	133/146	337/348	141.2/154.5	150/175	138/150	341/352
		32.7/43.5	90.7/104.7	163.4/180.9	175/200	157/173	448/476	167.2/184.7	175/200	162/178	452/480
	37.6/50.0	104.3/120.3	180.4/170.3	200/175	173/191	476/508	184.2/174.1	200/200	177/196	480/512	
	MED	-	-	52.3	60	56	293	56.1	70	60	297
		7.5/10.0	20.9/24.1	78.4/82.4	80/90	80/83	314/317	82.2/86.2	90/90	84/88	318/321
		12.4/16.5	34.4/39.7	95.3/101.9	100/110	95/101	327/333	99.1/105.7	100/110	99/106	331/337
		25.2/33.5	69.9/80.6	139.7/153.0	150/175	136/148	363/374	143.5/156.8	150/175	140/153	367/378
		32.7/43.5	90.7/104.7	165.7/183.2	175/200	160/176	474/502	169.5/187.0	175/200	164/180	478/506
	37.6/50.0	104.3/120.3	182.7/172.6	200/200	175/194	502/534	186.5/176.4	200/200	180/198	506/538	
	HIGH	-	-	66.3	80	70	329	70.1	80	75	333
		7.5/10.0	20.9/24.1	92.4/96.4	100/100	94/98	350/353	96.2/100.2	100/110	99/102	354/357
		12.4/16.5	34.4/39.7	109.3/115.9	110/125	110/116	363/369	113.1/119.7	125/125	114/120	367/373
25.2/33.5		69.9/80.6	153.7/167.1	175/175	151/163	399/410	157.5/170.9	175/175	155/167	403/414	
32.7/43.5		90.7/104.7	179.7/197.2	200/200	175/191	510/538	183.5/201.0	200/225	179/195	514/542	
37.6/50.0	104.3/120.3	196.7/186.6	200/200	190/209	538/570	200.5/190.4	225/200	195/213	542/574		
460-3-60	STD	-	-	24.5	30	26	127	26.3	30	28	129
		10.0	12.0	39.5	40	40	139	41.3	45	42	141
		16.5	19.9	49.4	50	49	147	51.2	60	51	149
		33.5	40.3	74.9	80	72	167	76.7	80	74	169
		43.5	52.3	89.9	90	86	232	91.7	100	88	234
	50.0	60.2	84.7	90	95	247	86.5	90	97	249	
	MED	-	-	25.3	30	27	140	27.1	30	29	142
		10.0	12.0	40.3	45	41	152	42.1	45	43	154
		16.5	19.9	50.2	60	50	160	52.0	60	52	162
		33.5	40.3	75.7	80	73	180	77.5	80	75	182
		43.5	52.3	90.7	100	87	245	92.5	100	89	247
	50.0	60.2	85.5	90	96	260	87.3	90	98	262	
	HIGH	-	-	32.8	40	35	158	34.6	40	37	160
		10.0	12.0	47.8	50	49	170	49.6	50	51	172
		16.5	19.9	57.6	60	58	178	59.4	60	60	180
33.5		40.3	83.1	90	81	198	84.9	90	83	200	
43.5		52.3	98.1	100	95	263	99.9	100	97	265	
50.0	60.2	93.0	100	104	278	94.8	100	106	280		
575-3-60	STD	-	-	18.8	25	20	97	22.6	25	24	101
		10.0	9.6	30.8	35	31	107	34.6	35	35	111
		16.5	15.9	38.6	40	38	113	42.4	45	43	117
		33.5	32.2	59.0	60	57	129	62.8	70	61	133
		43.5	41.8	71.0	80	68	181	74.8	80	72	185
	50.0	48.1	66.9	70	75	193	70.7	80	80	197	
	MED	-	-	19.6	25	21	108	23.4	25	25	112
		10.0	9.6	31.6	35	32	118	35.4	40	36	122
		16.5	15.9	39.4	40	39	124	43.2	45	43	128
		33.5	32.2	59.8	60	58	140	63.6	70	62	144
		43.5	41.8	71.8	80	69	192	75.6	80	73	196
	50.0	48.1	67.7	70	76	204	71.5	80	81	208	
	HIGH	-	-	26.6	30	28	120	30.4	35	32	124
		10.0	9.6	38.6	45	39	130	42.4	45	43	134
		16.5	15.9	46.4	50	46	136	50.2	60	51	140
33.5		32.2	66.8	70	65	152	70.6	80	69	156	
43.5		41.8	78.8	80	76	204	82.6	90	80	208	
50.0	48.1	74.7	80	83	216	78.5	90	88	220		

50HCQ

## MCA/MOCP (cont.)

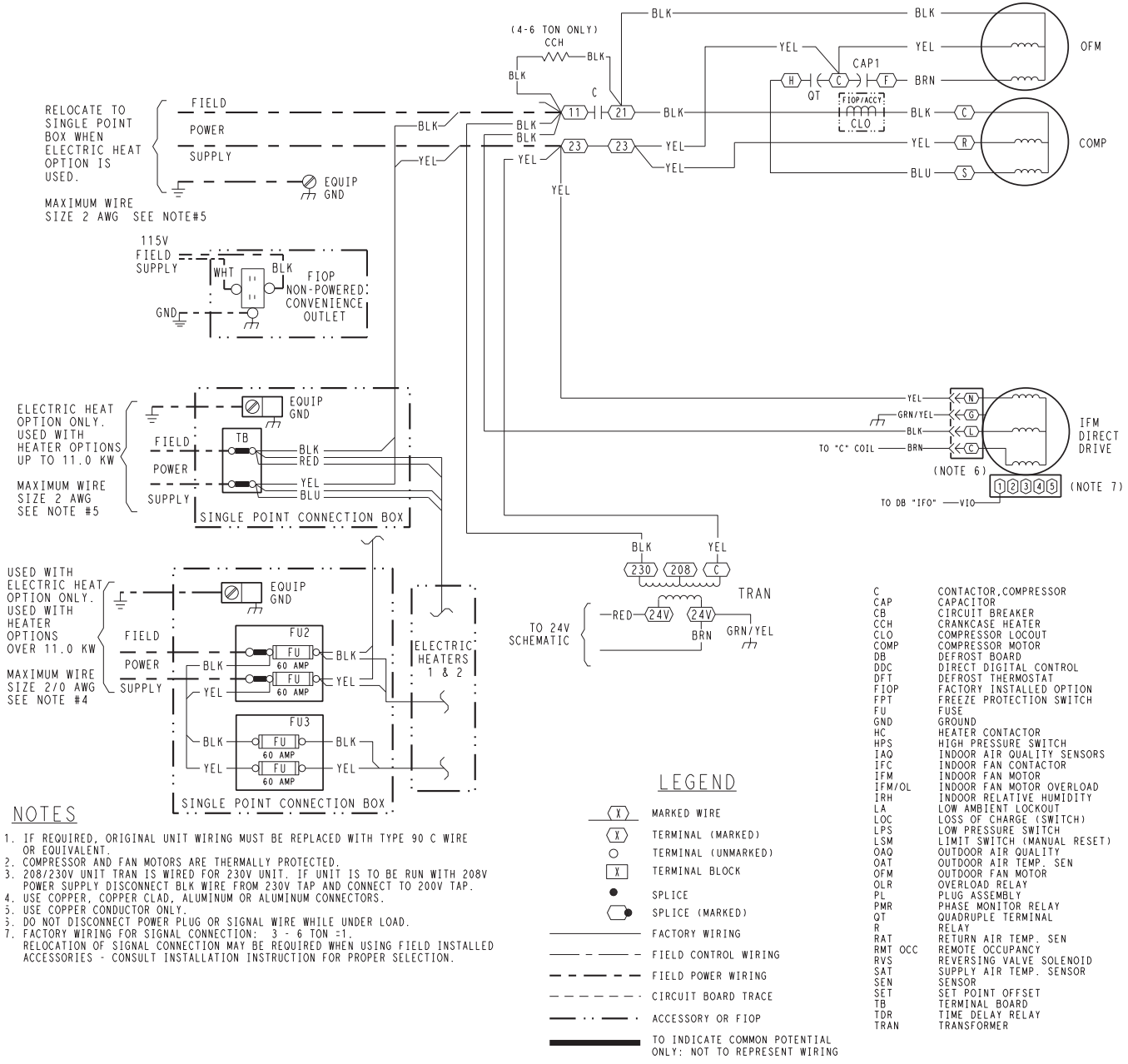
Table 82 – 50HCQD12

### MCA/MOCP DETERMINATION WITH PWRD C.O. 2-STAGE COOLING WITH 2-SPEED INDOOR FAN MOTOR

NOM. V-Ph-Hz	IFM TYPE	ELECTRIC HEATER		w/ PWRD C.O.							
		Nom (kW)	FLA	WITHOUT P.E.				w/ P.E. (pwrd fr/unit)			
				MCA	MOCP	DISC. SIZE		MCA	MOCP	DISC. SIZE	
						FLA	LRA			FLA	LRA
208/ 230-3-60	STD	-	-	51.9/51.6	60/60	55/55	264	55.7/55.4	60/60	59/59	268
		7.5/10.0	20.9/24.1	78.0/81.7	80/90	79/82	285/288	81.8/85.5	90/90	83/87	289/292
		12.4/16.5	34.4/39.7	94.9/101.2	100/110	95/100	298/304	98.7/105.0	100/110	99/105	302/308
		25.2/33.5	69.9/80.6	139.3/152.3	150/175	135/147	334/345	143.1/156.1	150/175	140/152	338/349
		32.7/43.5	90.7/104.7	165.3/182.5	175/200	159/175	445/473	169.1/186.3	175/200	164/180	449/477
		37.6/50.0	104.3/120.3	182.3/171.9	200/200	175/193	473/505	186.1/175.7	200/200	179/197	477/509
	MED	-	-	53.4/52.6	60/60	57/56	290	57.2/56.4	70/70	61/60	294
		7.5/10.0	20.9/24.1	79.5/82.7	80/90	81/84	311/314	83.3/86.5	90/90	85/88	315/318
		12.4/16.5	34.4/39.7	96.4/102.2	100/110	96/102	324/330	100.2/106.0	110/110	101/106	328/334
		25.2/33.5	69.9/80.6	140.8/153.3	150/175	137/149	360/371	144.6/157.1	150/175	142/153	364/375
		32.7/43.5	90.7/104.7	166.8/183.5	175/200	161/176	471/499	170.6/187.3	175/200	165/181	475/503
		37.6/50.0	104.3/120.3	183.8/172.9	200/200	177/194	499/531	187.6/176.7	200/200	181/199	503/535
	HIGH	-	-	66.3	80	70	329	70.1	80	75	333
		7.5/10.0	20.9/24.1	92.4/96.4	100/100	94/98	350/353	96.2/100.2	100/110	99/102	354/357
		12.4/16.5	34.4/39.7	109.3/115.9	110/125	110/116	363/369	113.1/119.7	125/125	114/120	367/373
25.2/33.5		69.9/80.6	153.7/167.1	175/175	151/163	399/410	157.5/170.9	175/175	155/167	403/414	
32.7/43.5		90.7/104.7	179.7/197.2	200/200	175/191	510/538	183.5/201.0	200/225	179/195	514/542	
37.6/50.0		104.3/120.3	196.7/186.6	200/200	190/209	538/570	200.5/190.4	225/200	195/213	542/574	
460-3-60	STD	-	-	25.7	30	27	126	27.5	30	29	128
		10.0	12.0	40.7	45	41	138	42.5	45	43	140
		16.5	19.9	50.6	60	50	146	52.4	60	52	148
		33.5	40.3	76.1	80	74	166	77.9	80	76	168
		43.5	52.3	91.1	100	88	231	92.9	100	90	233
	50.0	60.2	85.9	90	97	246	87.7	90	99	248	
	MED	-	-	25.7	30	27	139	27.5	30	29	141
		10.0	12.0	40.7	45	41	151	42.5	45	43	153
		16.5	19.9	50.6	60	50	159	52.4	60	52	161
		33.5	40.3	76.1	80	74	179	77.9	80	76	181
		43.5	52.3	91.1	100	88	244	92.9	100	90	246
	50.0	60.2	85.9	90	97	259	87.7	90	99	261	
	HIGH	-	-	32.8	40	35	158	34.6	40	37	160
		10.0	12.0	47.8	50	49	170	49.6	50	51	172
		16.5	19.9	57.6	60	58	178	59.4	60	60	180
33.5		40.3	83.1	90	81	198	84.9	90	83	200	
43.5		52.3	98.1	100	95	263	99.9	100	97	265	
50.0	60.2	93.0	100	104	278	94.8	100	106	280		
575-3-60	STD	-	-	20.3	25	22	99	24.1	30	26	103
		10.0	9.6	32.3	35	33	109	36.1	40	37	113
		16.5	15.9	40.1	45	40	115	43.9	45	44	119
		33.5	32.2	60.5	70	59	131	64.3	70	63	135
		43.5	41.8	72.5	80	70	183	76.3	80	74	187
	50.0	48.1	68.4	70	77	195	72.2	80	81	199	
	MED	-	-	21.3	25	23	108	25.1	30	27	112
		10.0	9.6	33.3	35	34	118	37.1	40	38	122
		16.5	15.9	41.1	45	41	124	44.9	45	45	128
		33.5	32.2	61.5	70	60	140	65.3	70	64	144
		43.5	41.8	73.5	80	71	192	77.3	80	75	196
	50.0	48.1	69.4	80	78	204	73.2	80	82	208	
	HIGH	-	-	26.6	30	28	120	30.4	35	32	124
		10.0	9.6	38.6	45	39	130	42.4	45	43	134
		16.5	15.9	46.4	50	46	136	50.2	60	51	140
33.5		32.2	66.8	70	65	152	70.6	80	69	156	
43.5		41.8	78.8	80	76	204	82.6	90	80	208	
50.0	48.1	74.7	80	83	216	78.5	90	88	220		

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# TYPICAL WIRING DIAGRAMS



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Fig. 28 - 1-Stage Cooling Typical Power Diagram

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# TYPICAL WIRING DIAGRAMS (cont.)

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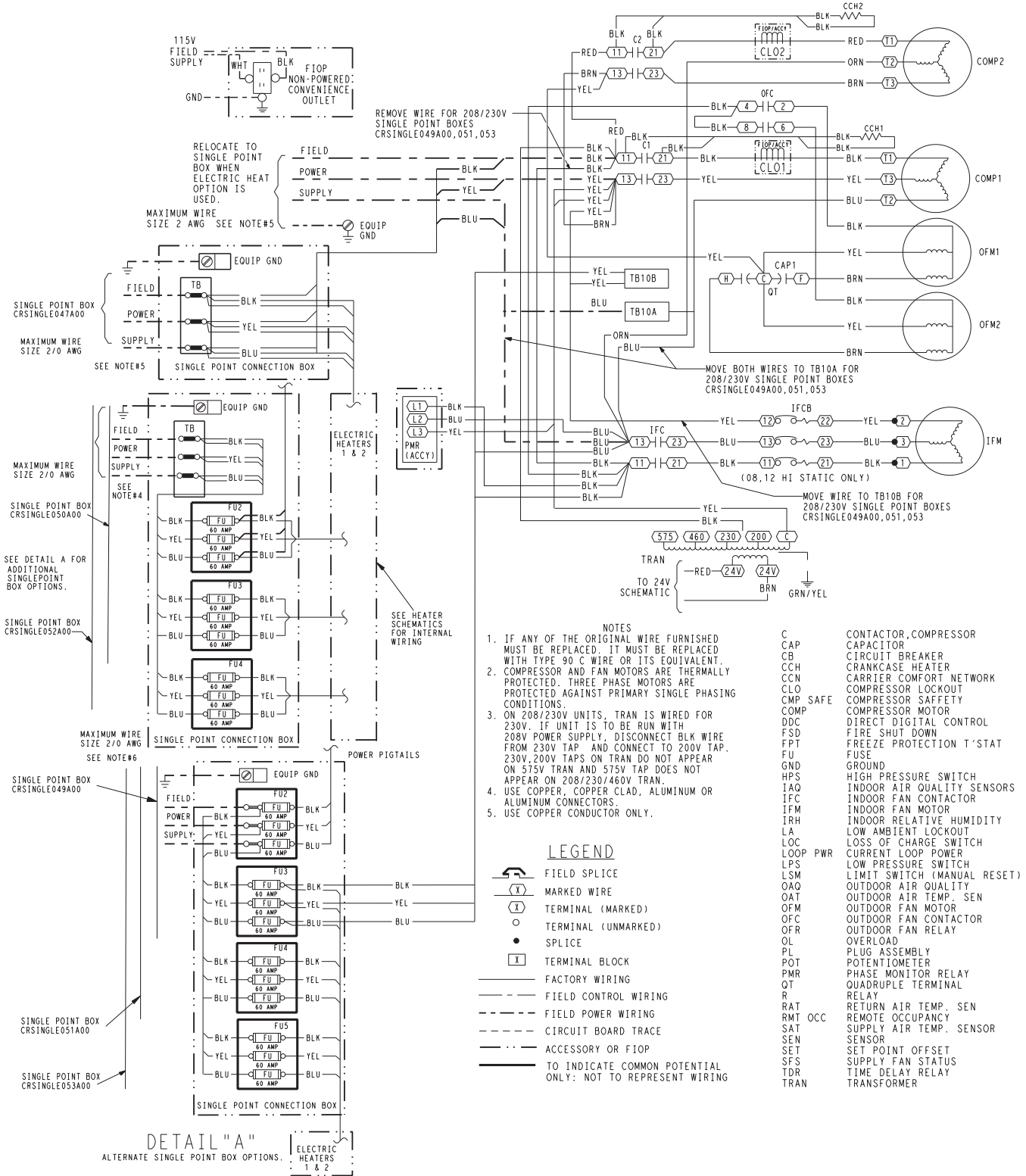


Fig. 29 - 2-Stage Cooling Typical Power Diagram

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# TYPICAL WIRING DIAGRAMS (cont.)

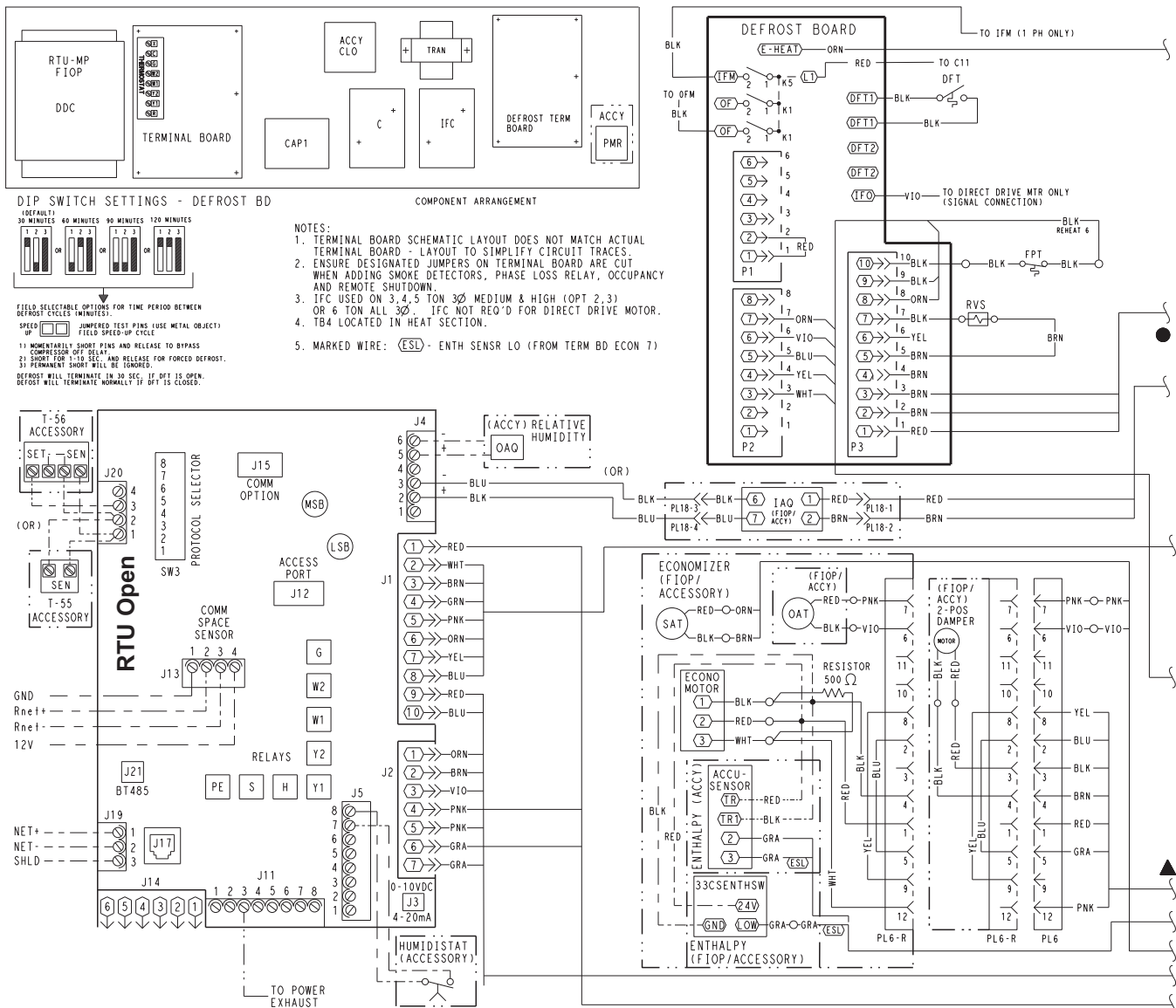
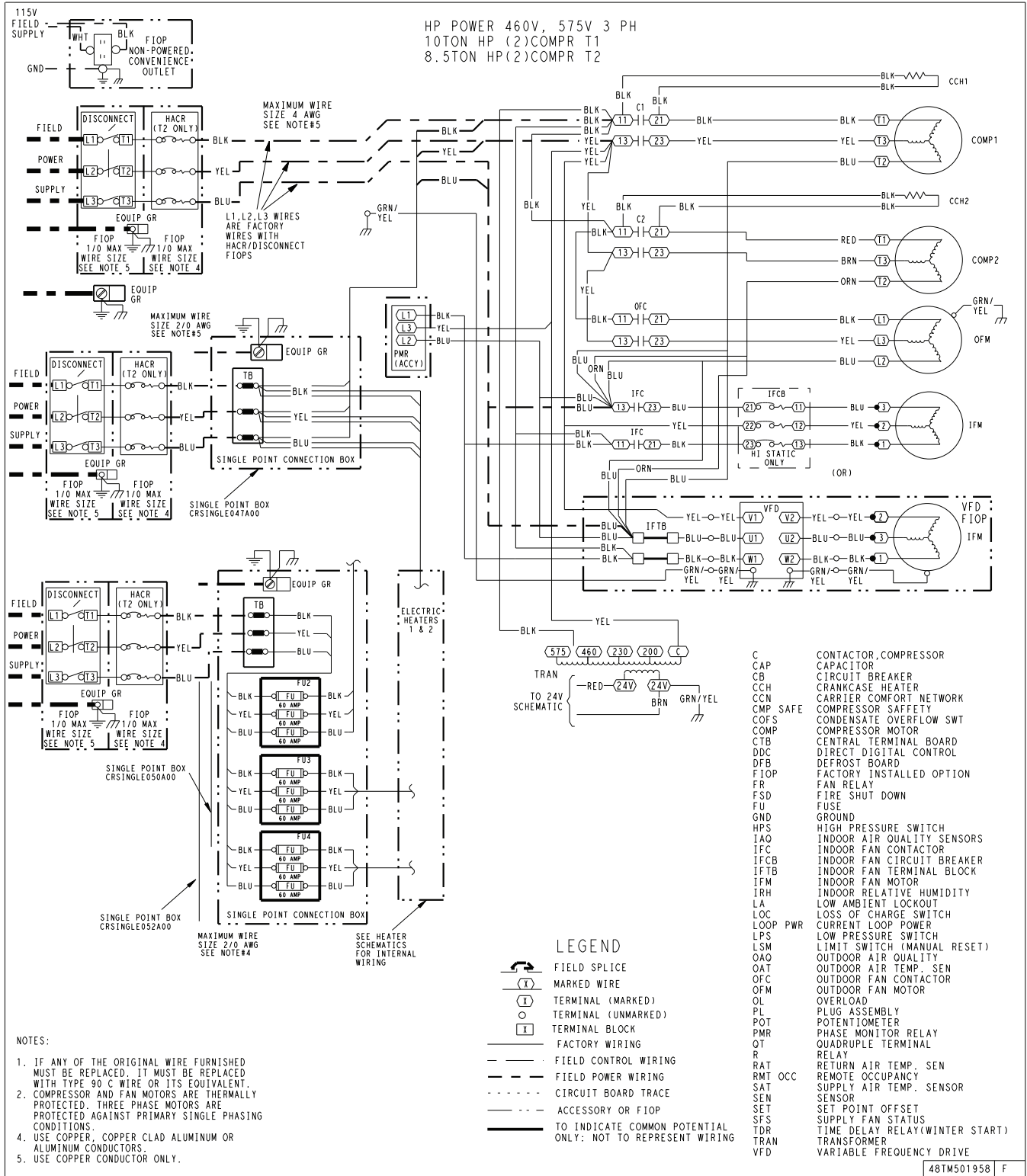


Fig. 31 - Multi-Protocol Option Diagram

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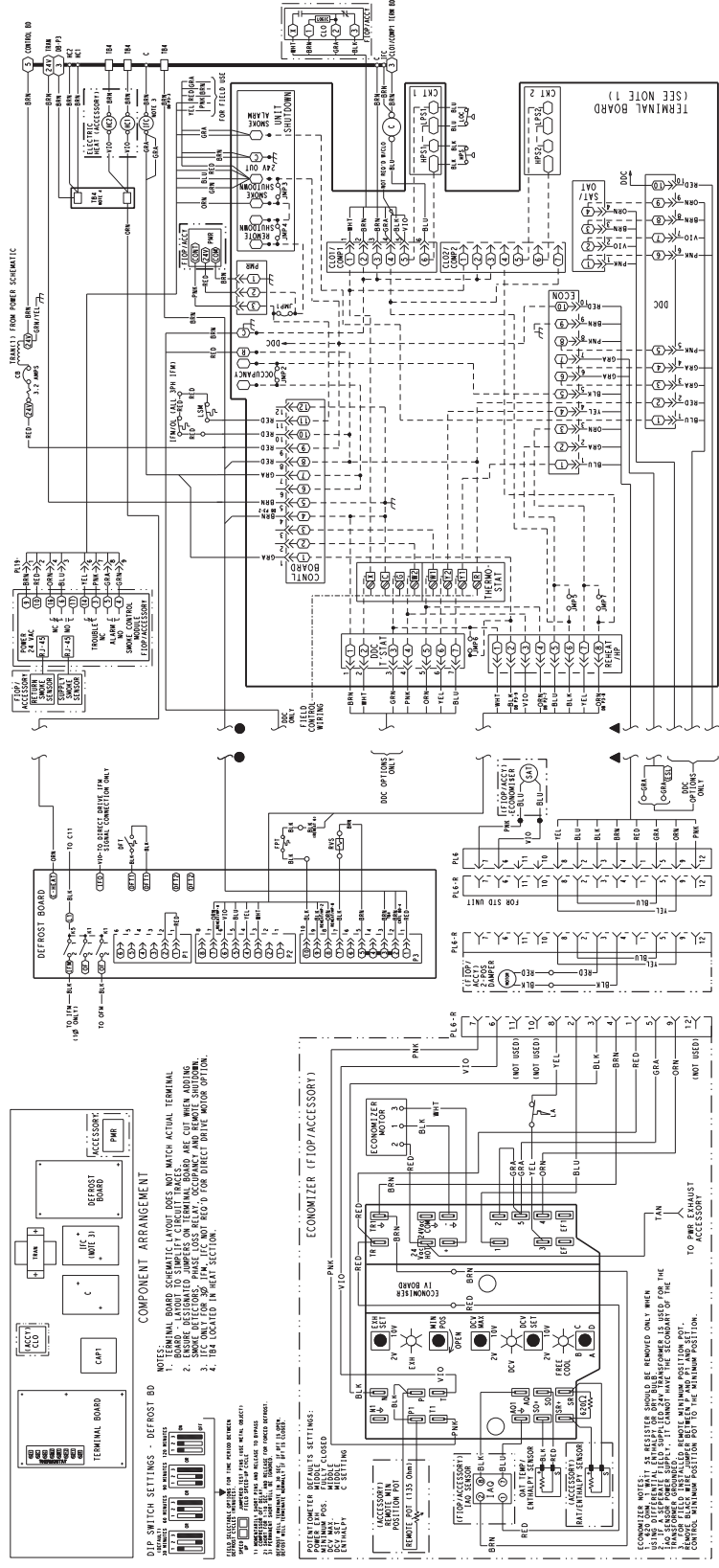
# TYPICAL WIRING DIAGRAMS (cont.)



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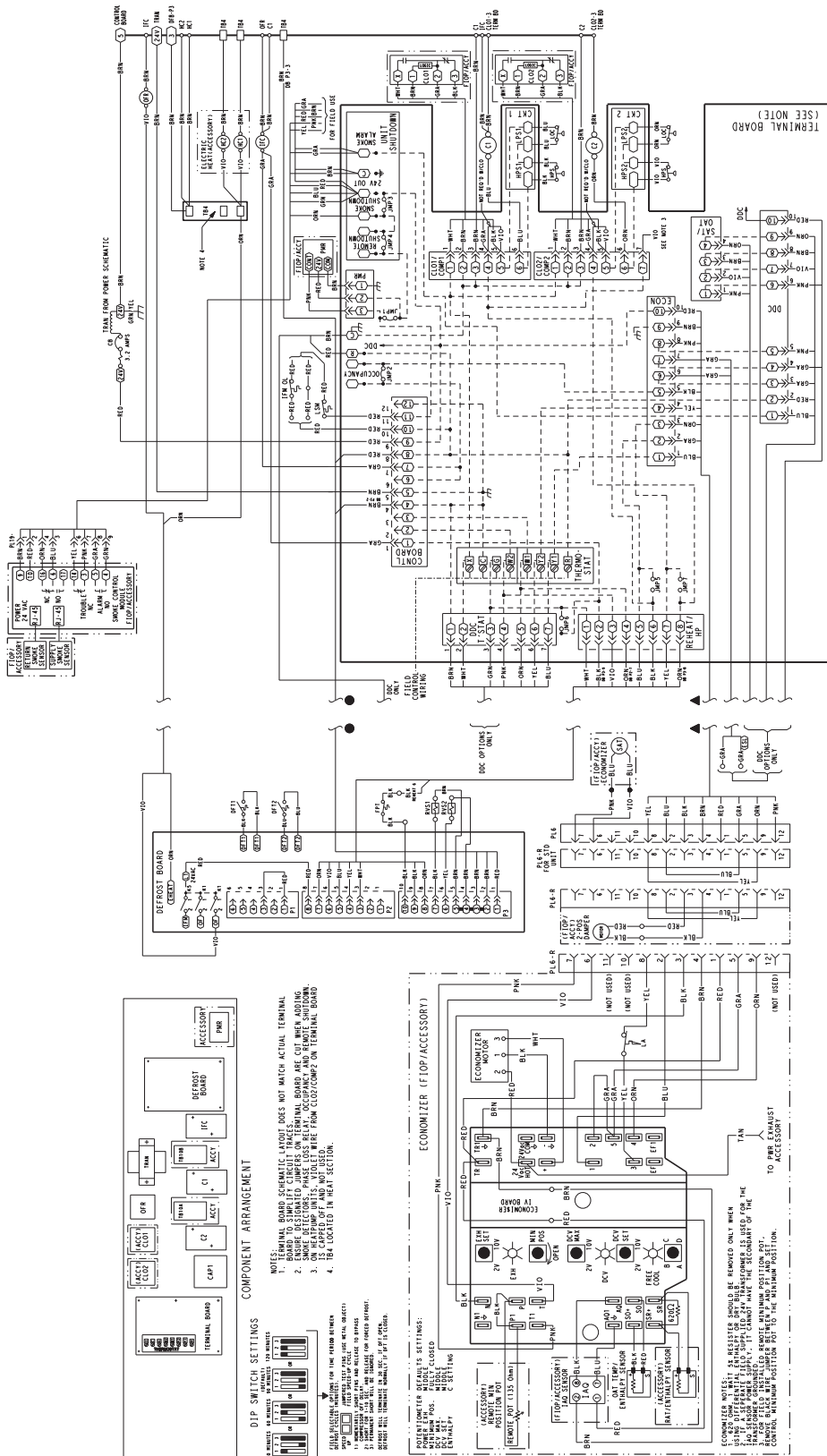
Fig. 32 - 2-Stage Unit Control Wiring Diagram with 2-Speed Indoor Fan Motor

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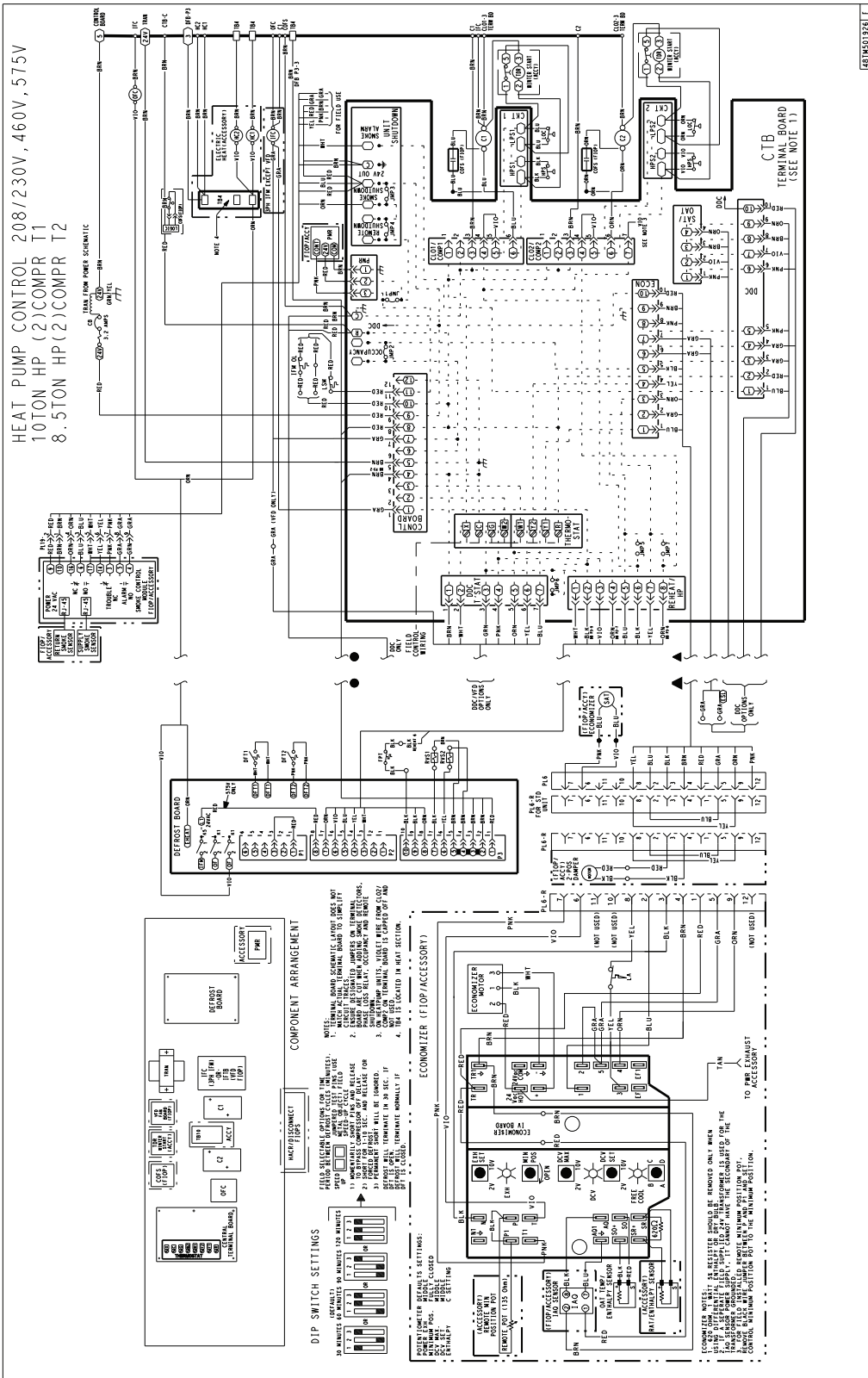
Fig. 33 - 1-Stage Typical Wiring Diagram



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Fig. 34 - 2-Stage Typical Wiring Diagram

HEAT PUMP CONTROL 208/230V, 460V, 575V  
 10TON HP (2)COMPR T1  
 8.5TON HP (2)COMPR T2



C12075

Fig. 35 - 2-Stage Unit Control Wiring Diagram with 2-Speed Indoor Fan Motor

# SEQUENCE OF OPERATION

## Cooling, unit without economizer

### Cooling (Single speed indoor fan motor) —

When thermostat calls for cooling, terminals G and Y1 are energized. The indoor fan contactor (IFC), reversing valve solenoid (RVS) and compressor contactor are energized and indoor fan motor, compressor, and outdoor fan starts. The outdoor fan motor runs continuously while unit is cooling.

Two-stage models: If Stage 1 cooling does not satisfy the space load, the space temperature will rise until thermostat calls for Stage 2 cooling (Y2 closes). Defrost Board activates Stage 2 Compressor. Reversing valve 2 switches to Cooling position. Compressor 2 contactor is energized; Compressor 2 starts and Circuit 2 operates in Cooling mode.

When Cooling Stage 2 is satisfied, thermostat Y2 opens. Compressor 2 contactor is de-energized; Compressor 2 stops. Reversing Valve 2 remains energized.

When Cooling Stage 1 is satisfied, thermostat Y1 opens. Compressor 1 contactor is de-energized; Compressor 1 stops. Outdoor fan relay is de-energized; outdoor fans stop. After the Fan Delay period, the Indoor fan contactor is de-energized; indoor fan stops (unless Continuous Fan operation has been selected). Reversing Valve 1 remains energized.

Reversing valve solenoids are energized in Cooling modes. Each solenoid will remain energized until the next Heating mode is initiated for this circuit.

### Cooling (2-speed indoor fan motor) —

Per ASHRAE 90.1 2010 standard section 6.4.3.10.b, during the first stage of cooling operation the VFD will adjust the fan motor to provide 2/3rd of the total cfm established for the unit. When a call for the second stage of cooling is required, the VFD will allow the total cfm for the unit established (100%).

## Heating, unit without economizer

Upon a request for heating from the space thermostat, terminal W1 will be energized with 24V. The IFC, outdoor fan contactor (OFC), C1, and C2 will be energized. The indoor fan, outdoor fans, and compressor no. 1, and compressor no. 2 are energized and reversing valves are de-energized and switch position.

If the space temperature continues to fall while W1 is energized, W2 will be energized with 24V, and the heater contactor(s) (HC) will be energized, which will energize the electric heater(s).

When the space thermostat is satisfied, W2 will be de-energized first, and the electric heater(s) will be de-energized.

Upon a further rise in space temperature, W1 will be de-energized.

Two compressor models: When the thermostat calls for heating, terminal W1 is energized. Defrost Board de-energizes both reversing valve solenoids and reversing valves move to Heating position. The indoor fan contactor is energized; indoor fan motor starts. Outdoor fan relay is energized; both outdoor fan motors run. Compressor contactors C1 and C2 are energized; both refrigeration circuits operate in Heating mode.

If Stage 1 heating does not satisfy the space load, the space temperature will fall until thermostat calls for Stage 2 heating (W2 closes). Terminal W2 is energized. Defrost Board issues an output at EHEAT. Heater contactor 1 and heater contactor 2 (if installed) are energized; all electric heaters are energized.

When space heating load is partially satisfied, thermostat terminal W2 is de-energized; heater contactors are de-energized and all electric heat is terminated. Stage 1 heating continues.

When the space heating load is fully satisfied, thermostat terminal W1 is also de-energized.

Reversing valve solenoids remain de-energized until the next call for Cooling mode is initiated.

## Cooling, unit with EconoMiSer IV

When free cooling is not available, the compressors will be controlled by the zone thermostat. When free cooling is available, the outdoor air damper is modulated by the EconoMiSer IV control to provide a 50 to 55°F (10° to 13°C) mixed air temperature into the zone. As the mixed air temperature fluctuates above 55 or below 50°F (13° to 10°C), the dampers will be modulated (open or close) to bring the mixed air temperature back within control.

If mechanical cooling is utilized with free cooling, the outdoor air damper will maintain its current position at the time the compressor is started. If the increase in cooling capacity causes the mixed air temperature to drop below 45°F (7°C), then the outdoor air damper position will be decreased to the minimum position. If the mixed air temperature continues to fall, the outdoor air damper will close. Control returns to normal once the mixed air temperature rises above 48°F (9°C).

If optional power exhaust is installed, as the outdoor air damper opens and closes, the power exhaust fans will be energized and de-energized.

If field-installed accessory CO<sub>2</sub> sensors are connected to the EconoMiSer IV control, a demand controlled ventilation strategy will begin to operate. As the CO<sub>2</sub> level in the zone increases above the CO<sub>2</sub> setpoint, the minimum position of the damper will be increased proportionally. As the CO<sub>2</sub> level decreases because of the increase in fresh air, the outdoor air damper will be proportionally closed.

## SEQUENCE OF OPERATION (cont.)

For EconoMi\$er IV operation, there must be a thermostat call for the fan (G). If the unit is occupied and the fan is on, the damper will operate at minimum position. Otherwise, the damper will be closed.

When the EconoMi\$er IV control is in the occupied mode and a call for cooling exists (Y1 on the thermostat), the control will first check for indoor fan operation. If the fan is not on, then cooling will not be activated. If the fan is on, then the control will open the EconoMi\$er IV damper to the minimum position.

On the initial power to the EconoMi\$er IV control, it will take the damper up to 2<sup>1</sup>/<sub>2</sub> minutes before it begins to position itself. Any change in damper position will take up to 30 seconds to initiate. Damper movement from full closed to full open (or vice versa) will take between 1<sup>1</sup>/<sub>2</sub> and 2<sup>1</sup>/<sub>2</sub> minutes.

If free cooling can be used as determined from the appropriate changeover command (switch, dry bulb, enthalpy curve, differential dry bulb, or differential enthalpy), then the control will modulate the dampers open to maintain the mixed air temperature setpoint at 50° to 55°F (10° to 13°C).

If there is a further demand for cooling (cooling second stage — Y2 is energized), then the control will bring on compressor stage 1 to maintain the mixed air temperature setpoint. The EconoMi\$er IV damper will be open at maximum position. EconoMi\$er IV operation is limited to a single compressor.

2-Speed Note: When operating in ventilation mode only, the indoor fan motor will automatically adjust to 2/3rd of the total cfm established.

### Heating, unit with EconoMi\$er

When the room temperature calls for heat through terminal W1, the indoor (evaporator) fan contactor (IFC) and heater contactor no. 1 (HC1) are energized and the reversing valve(s) de-energize and switches position. On units equipped for 2 stages of heat, when additional heat is needed, heater contactor no. 2 is energized through W2. The economizer damper moves to the minimum position. When the thermostat is satisfied, the damper moves to the fully closed position.

### Cooling, unit with EconoMi\$er2, PremierLink control and a thermostat

When free cooling is not available, the compressors will be controlled by the PremierLink control in response to the Y1 and Y2 inputs from the thermostat.

The PremierLink control will use the following information to determine if free cooling is available:

- Indoor fan has been on for at least 30 seconds.
- The SPT, SAT, and OAT inputs must have valid readings.
- OAT must be less than 75°F (24°C).

- OAT must be less than SPT.
- Enthalpy must be LOW (may be jumpered if an enthalpy sensor not available).
- Economizer position is NOT forced.

Pre-cooling occurs when there is no call from the thermostat except G. Pre-cooling is defined as the economizer modulates to provide 70°F (21°C) supply air.

When free cooling is available the PremierLink control will control the compressors, energize the reversing valve(s) and economizer to provide a supply air temperature determined to meet the Y1 and Y2 calls from the thermostat.

If optional power exhaust is installed, as the outdoor air damper opens and closes, the power exhaust fans will be energized and de-energized.

If field-installed accessory CO<sub>2</sub> sensors are connected to the PremierLink control, a PID controlled demand ventilation strategy will begin to operate. As the CO<sub>2</sub> level in the zone increases above the CO<sub>2</sub> setpoint, the minimum position of the damper will be increased proportionally. As the CO<sub>2</sub> level decreases because of the increase in fresh air, the outdoor air damper will be proportionally closed.

### Heating, unit with EconoMi\$er2, PremierLink control and a thermostat

When the thermostat calls for heating, terminal W1 is energized. The PremierLink control will move the economizer damper to the minimum position if there is a call for G and closed if there is a call for W1 without G. In order to prevent thermostat from short cycling, the unit is locked into the heating mode for at least 10 minutes when W1 is energized. The reversing valve solenoid(s) de-energizes and switches position.

On units equipped for two stages of heat, when additional heat is needed, W2 is energized and the electric heat (if used) comes on. When the thermostat is satisfied and W1 is de-energized, the IFM stops.

### Cooling, unit with EconoMi\$er2, PremierLink control and a room sensor

When free cooling is not available, the compressors will be controlled by the PremierLink controller using a PID Error reduction calculation.

The PremierLink controller will use the following information to determine if free cooling is available:

- Indoor fan has been on for at least 30 seconds.
- The SPT, SAT, and OAT inputs must have valid readings.
- OAT must be less than 75°F (24°C).
- OAT must be less than SPT.



## SEQUENCE OF OPERATION (cont.)

- Enthalpy must be LOW (may be jumpered if an enthalpy sensor is not available).
- Economizer position is NOT forced.

When free cooling is available, the outdoor air damper is positioned through the use of a Proportional Integral (PID) control process to provide a calculated supply air temperature into the zone. The supply air will maintain the space temperature between the heating and cooling setpoints.

The PremierLink control will integrate the compressors stages with the economizer based on similar logic as the three routines listed in the previous section. The SASP will float up and down based on the error reduction calculations that compare space temperature and space setpoint. The reversing valves will be energized.

If an optional power exhaust is installed, as the outdoor air damper opens and closes, the power exhaust fans will be energized and de-energized.

If field- installed accessory CO<sub>2</sub> sensors are connected to the PremierLink control, a PID-controlled demand ventilation strategy will begin to operate. As the CO<sub>2</sub> level in the zone increases above the CO<sub>2</sub> setpoint, the minimum position of the damper will be increased proportionally. As the CO<sub>2</sub> level decreases because of the increase in fresh air, the outdoor air damper will be proportionally closed.

### Heating, unit with EconoMiSer2, PremierLink control and a room sensor

Every 40 seconds the controller will calculate the required heat stages (maximum of 3) to maintain Supply Air Temperature (SAT) if the following qualifying conditions are met:

- Indoor fan has been on for at least 30 seconds.
- COOL mode is not active.
- OCCUPIED, TEMP.COMPENSATED START or HEAT mode is active.
- SAT reading is available.
- Fire shutdown mode is not active.

If all of the above conditions are met, the number of heat stages is calculated; otherwise the required number of heat stages will be set to 0.

If the PremierLink controller determines that heat stages are required, the economizer damper will be moved to minimum position if occupied and closed if unoccupied.

### Defrost

When the temperature of the outdoor coil drops below 28°F (-2°C) as sensed by the defrost thermostat (DFT2) and the defrost timer is at the end of a timed period (adjustable at 30, 60, 90 or 120 minutes), reversing valve solenoids (RVS1 and RVS2) are energized and the OFC is de-energized. This switches the position of the reversing valves and shuts off the outdoor fan. The electric heaters (if installed) will be energized.

The unit continues to defrost until the coil temperature as measured by DFT2 reaches 65°F (18°C), or the duration of defrost cycle completes a 10-minute period.

During the Defrost mode, if circuit 1 defrosts first, RVS1 will oscillate between Heating and Cooling modes until the Defrost mode is complete.

At the end of the defrost cycle, the electric heaters (if installed) will be de-energized; the reversing valves switch and the outdoor fan motor will be energized. The unit will now operate in the Heating mode.

If the space thermostat is satisfied during a defrost cycle, the unit will continue in the Defrost mode until the time or temperature constraints are satisfied.

### Automatic changeover

When the system selection switch is set at AUTO position, unit automatically changes from heating operation to cooling operation when the temperature of the conditioned space rises to the cooling level setting. When the temperature of the conditioned space falls to the heating level setting, unit automatically changes from cooling to heating operation (with a 3°F deadband in between).

### Continuous air circulation

Turn unit power on. Set system control at OFF position. Set fan switch at ON position. The indoor fan contactor is energized through the thermostat switch and the indoor fan runs continuously.

### Emergency heat

When the switch is on (thermostat is set to the EM HT position), compressor circuit and outdoor thermostats are bypassed, and the second stage of thermostat energizes the indoor blower and the electric resistance heaters.

# GUIDE SPECIFICATIONS - 50HCQ\*04-12

Note about this specification:

Carrier created this specification in “Masterformat” as published by the Construction Specification Institute. Please feel free to copy this specification directly into your building specifications.

## Rooftop Packaged Heat Pump

### HVAC Guide Specifications



**Size Range:** 3 to 10 Nominal Tons

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

<b>23 07 16</b>	<b>HVAC Equipment Insulation</b>
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23 07 16.13	Decentralized, Rooftop Units:
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23 07 16.13.A.	Evaporator fan compartment:
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1. Interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, minimum 1 1/2 lb density, flexible fiberglass insulation bonded with a phenolic binder, neoprene coated on the air side.
2. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

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

<b>23 09 13</b>	<b>Instrumentation and Control Devices for HVAC</b>
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23 09 13.23	Sensors and Transmitters
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23 09 13.23.A.	Thermostats
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1. Thermostat must
  - a. have capability to energize 2 different stages of cooling, and 2 different stages of heating.
  - b. include capability for occupancy scheduling.

<b>23 09 23</b>	<b>Direct-digital Control system for HVAC</b>
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23 09 23.13	Decentralized, Rooftop Units:
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23 09 23.13.A.	PremierLink controller
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1. Shall be ASHRAE 62-2001 compliant.
2. Shall accept 18-32VAC input power.
3. Shall have an operating temperature range from -40°F (-40°C) to 158°F (70°C), 10% - 95% RH (non-condensing).
4. Shall include an integrated economizer controller to support an economizer with 4 to 20 mA actuator input and no microprocessor controller.
5. Controller shall accept the following inputs: space temperature, setpoint adjustment, outdoor air temperature, indoor air quality, outdoor air quality, indoor relative humidity, compressor lock-out, fire shutdown, enthalpy, fan status, remote time clock/door switch.
6. Shall accept a CO<sub>2</sub> sensor in the conditioned space, and be Demand Control Ventilation (DCV) ready.
7. Shall provide the following outputs: Economizer, fan, cooling stage 1, cooling stage 2, heat stage 1, heat stage 2, heat stage 3/ exhaust/ reversing valve/ dehumidify/ occupied.
8. Unit shall provide surge protection for the controller through a circuit breaker.
9. Shall be Internet capable, and communicate at a Baud rate of 38.4K or faster
10. Shall have an LED display independently showing the status of activity on the communication bus, and processor operation.
11. Shall include an EIA-485 protocol communication port, an access port for connection of either a computer or a Carrier technician tool, an EIA-485 port for network communication to intelligent space sensors and displays, and a port to connect an optional LonWorks plug-in communications card.
12. Shall have built-in Carrier Comfort Network (CCN) protocol, and be compatible with other CCN devices, including ComfortLink and ComfortVIEW controllers.

13. Shall have built-in support for Carrier technician tool.
14. Software upgrades will be accomplished by local download. Software upgrades through chip replacements are not allowed.
15. Shall be shock resistant in all planes to 5G peak, 11ms during operation, and 100G peak, 11ms during storage.
16. Shall be vibration resistant in all planes to 1.5G @ 20-300 Hz.
17. Shall support a bus length of 4000 ft max, 60 devices per 1000 ft section, and 1 RS-485 repeater per 1000ft sections.

23 09 23.13.B. Multi-protocol, direct digital controller:

1. Shall be ASHRAE 62-2001 compliant.
2. Shall accept 18-30VAC, 50-60Hz, and consumer 15VA or less power.
3. Shall have an operating temperature range from -40°F (-40°C) to 130°F (54°C), 10% - 90% RH (non-condensing).
4. Shall include built-in protocol for BACNET (MS/TP and PTP modes), Modbus (RTU and ASCII), Johnson N2 and LonWorks. LonWorks Echelon processor required for all Lon applications shall be contained in separate communication board.
5. Shall allow access of up to 62 network variables (SNVT). Shall be compatible with all open controllers
6. Baud rate Controller shall be selectable using a dipswitch.
7. Shall have an LED display independently showing the status of serial communication, running, errors, power, all digital outputs, and all analog inputs.
8. Shall accept the following inputs: space temperature, setpoint adjustment, outdoor air temperature, indoor air quality, outdoor air quality, compressor lock-out, fire shutdown, enthalpy switch, and fan status/filter status/humidity/remote occupancy.
9. Shall provide the following outputs: economizer, fan, cooling stage 1, cooling stage 2, heat stage 1, heat stage 2, heat stage 3/ exhaust/ reversing valve.
10. Shall have built-in surge protection circuitry through solid state polyswitches. Polyswitches shall be used on incoming power and network connections. Polyswitches will return to normal when the “trip” condition clears.
11. Shall have a battery back-up capable of a minimum of 10,000 hours of data and time clock retention during power outages.
12. Shall have built-in support for Carrier technician tool.
13. Shall include an EIA-485 protocol communication port, an access port for connection of either a computer or a Carrier technician tool, an EIA-485 port for network communication to intelligent space sensors and displays, and a port to connect an optional LonWorks communications card.
14. Software upgrades will be accomplished by either local or remote download. No software upgrades through chip replacements are allowed.

**23 09 33 Electric and Electronic Control System for HVAC**

23 09 33.13 Decentralized, Rooftop Units:

23 09 33.13.A. General:

1. Shall be complete with self-contained low voltage control circuit protected by a resettable circuit breaker on the 24-v transformer side. Transformer shall have 75VA capability.
2. Shall utilize color-coded wiring.
3. Shall include a central control terminal board to conveniently and safely provide connection points for vital control functions such as: smoke detectors, phase monitor, economizer, thermostat, DDC control options, loss of charge, freeze switch, high pressure switches.
4. Unit shall include a minimum of one 8-pin screw terminal connection board for connection of control wiring.
5. Shall include integrated defrost system to prevent excessive frost accumulation during heating duty, and shall be controlled as follows:
  - a. Defrost shall be initiated on the basis of time and coil temperature.
  - b. A 30,60,90,120 minute timer shall activate the defrost cycle only if the coil temperature is low enough to indicate a heavy frost condition.
  - c. Defrost cycle shall terminate when defrost thermostat is satisfied and shall have a positive termination time of 10 minutes.
6. Defrost system shall also include:
  - a. Defrost Cycle Indicator LED.
  - b. Dip switch selectable defrost time between 30,60,90 and 120 minutes. Factory set at 30 minutes.
  - c. Molded plug connection to insure proper connection.

**23 09 33.23.B. Safeties:**

1. Compressor overtemperature, overcurrent.
2. Loss of charge switch.
  - a. Units with 2 compressors shall have different sized connectors for the circuit 1 and circuit 2 loss of charge switches. They shall physically prevent the cross-wiring of the safety switches between circuits 1 and 2.
  - b. Loss of charge switch shall use different color wire than the high pressure switch. The purpose is to assist the installer and service technician to correctly wire and or troubleshoot the rooftop unit.
3. High pressure switch.
  - a. Units with 2 compressors shall have different sized connectors for the circuit 1 and circuit 2 high pressure switches. They shall physically prevent the cross-wiring of the safety switches between circuits 1 and 2.
  - b. High pressure switch shall use different color wire than the low pressure switch. The purpose is to assist the installer and service technician to correctly wire and or troubleshoot the rooftop unit.
4. Freeze protection thermostat, evaporator coil.
5. Automatic reset, motor thermal overload protector.

**23 09 93 Sequence of Operations for HVAC Controls**

23 09 93.13 Decentralized, Rooftop Units:

23 09 93.13 INSERT SEQUENCE OF OPERATION

**23 40 13 Panel Air Filters**

23 40 13.13 Decentralized, Rooftop Units:

23 40 13.13.A. Standard filter section

1. Shall consist of factory-installed, low velocity, throwaway 2-in. thick fiberglass filters of commercially available sizes.
2. Unit shall use only one filter size. Multiple sizes are not acceptable.
3. Filters shall be accessible through an access panel with “no-tool” removal as described in the unit cabinet section of this specification (23 81 19.13.H).

**23 81 19 Self-Contained Air Conditioners**

23 81 19.13 Small-Capacity Self-Contained Air Conditioners (50HCQ\*04-12)

23 81 19.13.A. General

1. Outdoor, rooftop mounted, electrically controlled, heating and cooling unit utilizing a(n) hermetic scroll compressor(s) for cooling duty and heat pump for heating duty.
2. Factory assembled, single piece heating and cooling rooftop unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, and special features required prior to field startup.
3. Unit shall use environmentally safe, Puron refrigerant.
4. Unit shall be installed in accordance with the manufacturer’s instructions.
5. Unit must be selected and installed in compliance with local, state, and federal codes.

23 81 19.13.B. Quality Assurance

1. Unit meets ASHRAE 90.1 minimum efficiency requirements.
2. Unit shall be rated in accordance with AHRI Standards 210/240 and 340/360.
3. Unit shall be designed to conform to ASHRAE 15, 2001.
4. Unit shall be UL-tested and certified in accordance with ANSI Z21.47 Standards and UL-listed and certified under Canadian standards as a total package for safety requirements.
5. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
6. Unit casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
7. Unit casing shall be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 5000-hour salt spray.
8. Unit shall be designed in accordance with ISO 9001, and shall be manufactured in a facility registered by ISO 9001.
9. Roof curb shall be designed to conform to NRCA Standards.
10. Unit shall be subjected to a completely automated run test on the assembly line. The data for each unit will be stored at the factory, and must be available upon request.
11. Unit shall be designed in accordance with UL Standard 1995, including tested to withstand rain.
12. Unit shall be constructed to prevent intrusion of snow and tested to prevent snow intrusion into the control box up to 40 mph.
13. Unit shake tested to assurance level 1, ASTM D4169 to ensure shipping reliability.

14. High Efficient Motors listed shall meet Section 313 of the Energy Independence and Security Act of 2007 (EISA 2007).
- 23 81 19.13.C. Delivery, Storage, and Handling
  1. Unit shall be stored and handled per manufacturer's recommendations.
  2. Lifted by crane requires either shipping top panel or spreader bars.
  3. Unit shall only be stored or positioned in the upright position.
- 23 81 19.13.D. Project Conditions
  1. As specified in the contract.
- 23 81 19.13.E. Project Conditions
  1. As specified in the contract.
- 23 81 19.13.F. Operating Characteristics
  1. Unit shall be capable of starting and running at 125°F (52°C) ambient outdoor temperature, meeting maximum load criteria of AHRI Standard 210/240 or 340/360 at ± 10% voltage.
  2. Compressor with standard controls shall be capable of operation down to 30°F (-1°C), ambient outdoor temperatures. Accessory Low Ambient controls are available if mechanically cooling at ambient temperatures below 30°F (-1°C).
  3. Unit shall be capable of simultaneous heating duty and defrost cycle operation when using accessory electric heaters.
  4. Unit shall discharge supply air vertically or horizontally as shown on contract drawings.
  5. Unit shall be factory configured for vertical supply & return configurations.
  6. Unit shall be field convertible from vertical to horizontal configuration. No special kits on 04-09 sizes. Size 12 model shall require a supply duct kit for field installation.
  7. Unit shall be capable of mixed operation: vertical supply with horizontal return or horizontal supply with vertical return.
- 23 81 19.13.G. Electrical Requirements
  1. Main power supply voltage, phase, and frequency must match those required by the manufacturer.
- 23 81 19.13.H. Unit Cabinet
  1. Unit cabinet shall be constructed of galvanized steel, and shall be bonderized and coated with a prepainted baked enamel finish on all externally exposed surfaces.
  2. Unit cabinet exterior paint shall be: film thickness, (dry) 0.003 inches minimum, gloss (per ASTM D523, 60°F): 60, Hardness: H-2H Pencil hardness.
  3. Evaporator fan compartment interior cabinet insulation shall conform to AHRI Standards 210/240 or 340/360 minimum exterior sweat criteria. Interior surfaces shall be insulated with a minimum 1/2-in. thick, 1 lb density, flexible fiberglass insulation, neoprene coated on the air side. Aluminum foil-faced fiberglass insulation shall be used in the heat compartment.
  4. Base of unit shall have a minimum of three locations for thru-the-base electrical connections (factory-installed or field-installed), standard.
  5. Base Rail
    - a. Unit shall have base rails on a minimum of 2 sides.
    - b. Holes shall be provided in the base rails for rigging shackles to facilitate maneuvering and overhead rigging.
    - c. Holes shall be provided in the base rail for moving the rooftop by fork truck.
    - d. Base rail shall be a minimum of 16 gauge thickness.
  6. Condensate pan and connections:
    - a. Shall be a sloped condensate drain pan made of a non-corrosive material.
    - b. Shall comply with ASHRAE Standard 62.
    - c. Shall use a 3/4-in. -14 NPT drain connection, possible either through the bottom or end of the drain pan. Connection shall be made per manufacturer's recommendations.
  7. Top panel:
    - a. Shall be a single piece on all 04 to 09 models. Two piece on size 12 models.
  8. Electrical Connections
    - a. All unit power wiring shall enter unit cabinet at a single, factory prepared, knockout location.
    - b. Thru-the-base capability
      - (1.) Standard unit shall have a thru-the-base electrical location(s) using a raised, embossed portion of the unit basepan.

(2.) Optional, factory approved, watertight connection method must be used for thru-the-base electrical connections.

(3.) No basepan penetration, other than those authorized by the manufacturer, is permitted.

9. Component access panels (standard)

- a. Cabinet panels shall be easily removable for servicing.
- b. Unit shall have one factory-installed, tool-less, removable, filter access panel.
- c. Panels covering control box, indoor fan, indoor fan motor, gas components (where applicable), and compressors shall have molded composite handles.
- d. Handles shall be UV modified, composite, permanently attached, and recessed into the panel.
- e. Screws on the vertical portion of all removable access panels shall engage into heat resistant, molded composite collars.
- f. Collars shall be removable and easily replaceable using manufacturer recommended parts.

23 81 19.13.I. N/A

23 81 19.13.J. Coils

1. Standard Aluminum/Copper Coils: on all models.
  - a. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
  - b. Evaporator coils shall be leak tested to 150 psig. Pressure tested to 450 psig and qualified to UL 1995 burst test at 1775 psig.
  - c. Condenser coils shall be leak tested to 150 psig. Pressure tested to 650 psig and qualified to UL 1995 burst test at 1980 psig.
2. Optional Pre-coated aluminum fin condenser coils: on all models.
  - a. Shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments.
  - b. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube.
  - c. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.
3. Optional Copper-fin evaporator and condenser coils: on all models.
  - a. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
  - b. Galvanized steel tube sheets shall not be acceptable.
  - c. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.
4. Optional E-coated aluminum-fin evaporator and condenser coils: on all models.
  - a. Shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins.
  - b. Coating process shall ensure complete coil encapsulation of tubes, fins and headers.
  - c. Color shall be high gloss black with gloss per ASTM D523-89.
  - d. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges.
  - e. Superior hardness characteristics of 2H per ASTM D3363-92A and cross-hatch adhesion of 4B-5B per ASTM D3359-93.
  - f. Impact resistance shall be up to 160 in.-lb (ASTM D2794-93).
  - g. Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92).
  - h. Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117-90.

23 81 19.13.K. Refrigerant Components

1. Refrigerant circuit shall include the following control, safety, and maintenance features:
  - a. Thermostatic Expansion Valve (TXV) shall help provide optimum performance across the entire operating range. Shall contain removable power element to allow change out of power element and bulb without removing the valve body.
  - b. Refrigerant filter drier on each refrigerant circuit.
  - c. Service gauge connections on suction and discharge lines.
  - d. Pressure gauge access through a specially designed access port in the top panel of the unit.
  - e. Suction line accumulator to provide protection in all operating modes from cooling, heating and reverse cycle switching. Standard on each refrigerant circuit.

2. There shall be gauge line access port in the top of the rooftop, covered by a black, removable plug.
  - a. The plug shall be easy to remove and replace.
  - b. When the plug is removed, the gauge access port shall enable maintenance personnel to route their pressure gauge lines.
  - c. This gauge access port shall facilitate correct and accurate condenser pressure readings by enabling the reading with the compressor access panel on.
  - d. The plug shall be made of a leak proof, UV-resistant, composite material.

### 3. Compressors

- a. Unit shall use one fully hermetic, scroll compressor for each independent refrigeration circuit.
- b. Models shall be available with single compressor designs on 04-07 models, plus additional 2 compressor (stage) models from 08-12 sizes.
- c. Compressor motors shall be cooled by refrigerant gas passing through motor windings.
- d. Compressors shall be internally protected from high discharge temperature conditions.
- e. Compressors shall be protected from an overtemperature and over-ampere conditions by an internal, motor overload device.
- f. Compressor shall be factory mounted on rubber grommets.
- g. Compressor motors shall have internal line break thermal, current overload and high pressure differential protection.
- h. Crankcase heaters shall be utilized on all models to protect compressor with specific refrigerant charge.

#### 23 81 19.13.L. Filter Section

1. Filters access is specified in the unit cabinet section of this specification.
2. Filters shall be held in place by a pivoting filter tray, facilitating easy removal and installation.
3. Shall consist of factory-installed, low velocity, throw-away 2-in. thick fiberglass filters.
4. Filters shall be standard, commercially available sizes.
5. Only one size filter per unit is allowed.

#### 23 81 19.13.M. Evaporator Fan and Motor

1. Evaporator fan motor:
  - a. Shall have permanently lubricated bearings.
  - b. Shall have inherent automatic-reset thermal overload protection or circuit breaker.
  - c. Shall have a maximum continuous bhp rating for continuous duty operation; no safety factors above that rating shall be required.
2. Electric Drive (Direct Drive) X13 – 5 Speed/Torque Evaporator Fan:
  - a. Multi speed motor with easy quick adjustment settings.
  - b. Blower fan shall be double inlet type with forward curved blades.
  - c. Shall be constructed from steel with a corrosion resistant finish and dynamically balanced.
  - d. Standard on all 04-06 models.
3. Belt-driven Evaporator Fan:
  - a. Belt drive shall include an adjustable pitch motor pulley.
  - b. Shall use sealed, permanently lubricated ball-bearing type.
  - c. Blower fan shall be double inlet type with forward curved blades.
  - d. Shall be constructed from steel with a corrosion resistant finish and dynamically balanced.
  - e. Standard on all 07-12 size models. Optional on all 04-06 3-phase models.

#### 23 81 19.13.N. Condenser Fans and Motors

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

#### 23 81 19.13.O. Special Features, Options and Accessories

1. Staged Air Volume System (SAV) for 2-stage cooling models only. (Not available with Humidi-MiZer system):
  - a. Evaporator fan motor:

- (1.) Shall have permanently lubricated bearings.
  - (2.) Shall have a maximum continuous bhp rating for continuous duty operation; no safety factors above that rating.
  - (3.) Shall be Variable Frequency duty and 2-speed control.
  - (4.) Shall contain motor shaft grounding ring to prevent electrical bearing fluting damage by safely diverting harmful shaft voltages and bearing currents to ground.
2. Variable Frequency Drive (VFD). Only available on 2-speed indoor fan motor option (SAV):
    - a. Shall be installed inside the unit cabinet, mounted, wired and tested.
    - b. Shall contain Electromagnetic Interference (EMI) frequency protection.
    - c. Insulated Gate Bi-Polar Transistors (IGBT) used to produce the output pulse width modulated (PWM) waveform, allowing for quiet motor operation.
    - d. Self diagnostics with fault and power code LED indicator. Field accessory Display Kit available for further diagnostics and special setup applications.
    - e. RS485 capability standard.
    - f. Electronic thermal overload protection.
    - g. 5% swinging chokes for harmonic reduction and improved power factor.
    - h. All printed circuit boards shall be conformal coated.
  3. Standard Integrated Economizers (Factory installed on 3 Phase Models Only. Field installed on all 3 and 1 Phase Models):
    - a. Integrated, gear driven parallel modulating blade design type capable of simultaneous economizer and compressor operation.
    - b. Independent modules for vertical or horizontal return configurations shall be available. Vertical return modules shall be available as a factory-installed option.
    - c. Damper blades shall be galvanized steel with composite gears. Plastic or composite blades on intake or return shall not be acceptable.
    - d. Shall include all hardware and controls to provide free cooling with outdoor air when temperature and/or humidity are below setpoints.
    - e. Shall be equipped with gear driven dampers for both the outdoor ventilation air and the return air for positive air stream control.
    - f. Standard models shall be equipped with low-leakage dampers, not to exceed 2% leakage at 1 in. wg pressure differential. Economizer controller on electromechanical units shall be Honeywell W7212 that provides:
      - (1.) Combined minimum and DCV maximum damper position potentiometers with compressor staging relay.
      - (2.) Functions with solid state analog enthalpy or dry bulb changeover control sensing.
      - (3.) Contain LED indicates for:
        - When free cooling is available
        - When module is in DCV mode
        - When exhaust fan contact is closed
    - g. Ultra low leak EconoMiSer X system shall be available on models with SAV 2-speed Variable Frequency Drive (VFD) systems. Only available on 2-speed indoor fan motor systems with electromechanical controls or RTU Open.
      - (1.) Maximum damper leakage rate to be equal to or less than 4.0 cfm/sq. ft. at 1.0 in. w.g., meeting or exceeding ASHRAE 90.1 requirements. Economizer controller on electromechanical units shall be Honeywell W7220 that provides:
        - (2.) 2-line LCD interface screen for setup, configuration and troubleshooting
        - (3.) On-board fault detection and diagnostics
        - (4.) Sensor failure loss of communication identification
        - (5.) Automatic sensor detection
        - (6.) Capabilities for use with multiple-speed indoor fan systems
        - (7.) Utilize digital sensors: Dry bulb and Enthalpy
    - h. Shall be capable of introducing up to 100% outdoor air.
    - i. Shall be equipped with a barometric relief damper capable of relieving up to 100% return air.
    - j. Shall be designed to close damper(s) during loss-of-power situations with spring return built into motor.



- k. Dry bulb outdoor air temperature sensor shall be provided as standard. Outdoor air sensor setpoint shall be adjustable and shall range from 40 to 100°F / 4 to 38°C. Additional sensor options shall be available as accessories.
  - l. The economizer controller shall also provide control of an accessory power exhaust unit function. Factory set at 100%, with a range of 0% to 100%.
  - m. The economizer shall maintain minimum airflow into the building during occupied period and provide design ventilation rate for full occupancy. A remote potentiometer may be used to override the damper setpoint.
  - n. Dampers shall be completely closed when the unit is in the unoccupied mode.
  - o. Economizer controller shall accept a 2-10 Vdc CO<sub>2</sub> sensor input for IAQ/DCV control. In this mode, dampers shall modulate the outdoor air damper to provide ventilation based on the sensor input.
  - p. Compressor lockout sensor shall open at 35°F (2°C) and close closes at 50°F (10°C).
  - q. Actuator shall be direct coupled to economizer gear. No linkage arms or control rods shall be acceptable.
  - r. Economizer controller shall provide indications when in free cooling mode, in the DCV mode, or the exhaust fan contact is closed.
4. Two-Position Damper (Factory installed on 3 Phase Models Only. Field installed on all 3 and 1 Phase Models)
- a. Damper shall be a Two-Position Motorized Damper. Damper travel shall be from the full closed position to the field adjustable %-open setpoint.
  - b. Damper shall include adjustable damper travel from 25% to 100% (full open).
  - c. Damper shall include single or dual blade, gear driven dampers and actuator motor.
  - d. Actuator shall be direct coupled to damper gear. No linkage arms or control rods shall be acceptable.
  - e. Damper will admit up to 100% outdoor air for applicable rooftop units.
  - f. Damper shall close upon indoor (evaporator) fan shutoff and/or loss of power.
  - g. The damper actuator shall plug into the rooftop unit's wiring harness plug. No hard wiring shall be required.
  - h. Outside air hood shall include aluminum water entrainment filter
5. Manual damper
- a. Manual damper package shall consist of damper, air inlet screen, and rain hood which can be preset to admit up to 50% outdoor air for year round ventilation.
6. Head Pressure Control Package
- a. Controller shall control coil head pressure by condenser fan speed modulation or condenser fan cycling and wind baffles.
  - b. Shall consist of solid state control and condenser coil temperature sensor to maintain condensing temperature between 90°F (32°C) and 110°F (43°C) at outdoor ambient temperatures down to -20°F (-29°C).
7. Condenser Coil Hail Guard Assembly
- a. Shall protect against damage from hail.
  - b. Shall be louvered design.
8. Unit Mounted, Non-Fused Disconnect Switch:
- a. Switch shall be factory-installed, internally mounted.
  - b. National Electric Code (NEC) and UL approved non-fused switch shall provide unit power shutoff.
  - c. Shall be accessible from outside the unit
  - d. Shall provide local shutdown and lockout capability.
9. Convenience Outlet:
- a. Powered convenience outlet.
    - (1.) Outlet shall be powered from main line power to the rooftop unit.
    - (2.) Outlet shall be powered from line side or load side of disconnect by installing contractor, as required by code. If outlet is powered from load side of disconnect, unit electrical ratings shall be UL certified and rated for additional outlet amperage.
    - (3.) Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle.
    - (4.) Outlet shall include 15 amp GFI receptacles with independent fuse protection.
    - (5.) Voltage required to operate convenience outlet shall be provided by a factory-installed step down transformer.

- (6.) Outlet shall be accessible from outside the unit.
- b. Non-Powered convenience outlet.
  - (1.) Outlet shall be powered from a separate 115-120v power source.
  - (2.) A transformer shall not be included.
  - (3.) Outlet shall be factory-installed and internally mounted with easily accessible 115-v female receptacle.
  - (4.) Outlet shall include 15 amp GFI receptacles.
  - (5.) Outlet shall be accessible from outside the unit.
- 10. Thru-the-Base Connectors:
  - a. Kits shall provide connectors to permit electrical connections to be brought to the unit through the unit basepan.
  - b. Minimum of three connection locations per unit.
- 11. Propeller Power Exhaust:
  - a. Power exhaust shall be used in conjunction with an integrated economizer.
  - b. Independent modules for vertical or horizontal return configurations shall be available.
  - c. Horizontal power exhaust shall be mounted in return ductwork.
  - d. Power exhaust shall be controlled by economizer controller operation. Exhaust fans shall be energized when dampers open past the 0-100% adjustable setpoint on the economizer control.
- 12. Roof Curbs (Vertical):
  - a. Full perimeter roof curb with exhaust capability providing separate air streams for energy recovery from the exhaust air without supply air contamination.
  - b. Formed galvanized steel with wood nailer strip and shall be capable of supporting entire unit weight.
  - c. Permits installation and securing of ductwork to curb prior to mounting unit on the curb.
- 13. Medium and high Static Indoor Fan Motor(s) and Drive(s) (04-12):
  - a. Medium and high static motor(s) and drive(s) shall be factory-installed to provide additional performance range.
- 14. Thru-the-Bottom Utility Connectors:
  - a. Kit shall provide connectors to permit gas and electrical connections to be brought to the unit through the basepan.
- 15. Outdoor Air Enthalpy Sensor:
  - a. The outdoor air enthalpy sensor shall be used to provide single enthalpy control. When used in conjunction with a return air enthalpy sensor, the unit will provide differential enthalpy control. The sensor allows the unit to determine if outside air is suitable for free cooling.
- 16. Return Air Enthalpy Sensor:
  - a. The return air enthalpy sensor shall be used in conjunction with an outdoor air enthalpy sensor to provide differential enthalpy control.
- 17. Indoor Air Quality (CO<sub>2</sub>) Sensor:
  - a. Shall be able to provide demand ventilation indoor air quality (IAQ) control.
  - b. The IAQ sensor shall be available in duct mount, wall mount, or wall mount with LED display. The setpoint shall have adjustment capability.
- 18. Smoke detectors (Factory-Installed Only):
  - a. Shall be a Four-Wire Controller and Detector.
  - b. Shall be environmental compensated with differential sensing for reliable, stable, and drift-free sensitivity.
  - c. Shall use magnet activated test/reset sensor switches.
  - d. Shall have tool-less connection terminal access.
  - e. Shall have a recessed momentary switch for testing and resetting the detector.
  - f. Controller shall include:
    - (1.) One set of normally open alarm initiation contacts for connection to an initiating device circuit on a fire alarm control panel.
    - (2.) Two Form-C auxiliary alarm relays for interface with rooftop unit or other equipment.
    - (3.) One Form-C supervision (trouble) relay to control the operation of the Trouble LED on a remote test/reset station.
    - (4.) Capable of direct connection to two individual detector modules.
    - (5.) Can be wired to up to 14 other duct smoke detectors for multiple fan shutdown applications.

19. Time Guard
  - a. Shall prevent compressor short cycling by providing a 5-minute delay ( $\pm 2$  minutes) before restarting a compressor after shutdown for any reason.
  - b. One device shall be required per compressor.
20. Electric Heat:
  - a. Heating Section
    - (1.) Heater element open coil resistance wire, nickel-chrome alloy, 0.29 inches inside diameter, strung through ceramic insulators mounted on metal frame. Coil ends are staked and welded to terminal screw slots.
    - (2.) Heater assemblies are provided with integral fusing for protection of internal heater circuits not exceeding 48 amps each. Auto reset thermo limit controls, magnetic heater contactors (24V coil) and terminal block all mounted in electric heater control box (minimum 18 ga galvanized steel) attached to end of heater assembly.
21. Hinged Access panels
  - a. Shall provide easy access through integrated quarter turn latches.
  - b. Shall be on major panels of filter, control box, fan motor and compressor.
22. Display Kit for Variable Frequency Drive
  - a. Kit allows the ability to access the VFD controller programs to provide special setup capabilities and diagnostics.
  - b. Kit contains display module, mounting bracket and communication cable.
  - c. Display Kit can be permanently installed in the unit or used on any SAV system VFD controller as needed.

