Comfortmaker®
Air Conditioning & Heating

RAH

Product Specifications

HIGH EFFICIENCY PACKAGE ELECTRIC COOLING, R–410A SINGLE PACKAGE ROOFTOP 3 – 12.5 TONS (1 & 3–Phase)

BUILT TO LAST, EASY TO INSTALL AND SERVICE

- One–piece, high efficiency electric cooling with a low profile, prewired, tested, and charged at the factory
- Field Convertible from vertical to horizontal airflow on all models. No special kit required on 036–120 models. Field accessory supply duct kit required for 150 size model only.
- Full perimeter base rail with built-in rigging adapters and fork truck slots
- Pre–painted exterior panels and primer–coated interior panels tested to 500 hours salt spray protection
- Fully insulated cabinet
- Single-stage cooling capacity control on 036–072 models, two–stage on 090–150 models
- Single scroll compressor on 036–072 models, dual scroll compressors on 090–150 models with internal line–break overload protection
- All units have high and low pressure switches
- Two inch disposable fiberglass type return air filters in dedicated rack with tool–less filter access door
- Refrigerant circuits contain a liquid line filter drier to trap dirt and moisture
- Indoor and outdoor coils constructed of aluminum fins mechanically bonded to seamless copper tubes
- Newly–designed indoor refrigerant header for easier maintenance and replacement
- Exclusive non–corrosive composite condensate pan in accordance with ASHRAE 62 Standard, sloping design; side or center drain
- Direct drive high efficiency ECM blower motors on 036–060 single phase models
- Belt drive evaporator–fan motor and pulley combinations available on all 3 phase models
- Access panels with easy grip handles provide quick and easy access to the blower and blower motor, control box, and compressor.
- "No–strip" screw system has superior holding power and guides screws into position while preventing the screw from stripping the unit's metal.
- Newly designed terminal board facilitates simple safety circuit troubleshooting and simplified control box arrangement
- Outdoor temperature cooling operation range up to 125°F (52°C) and down to 35°F (–2°C) using winter start kit
- TXV refrigerant metering devices on all models to precisely control refrigerant flow
- Large, laminated control wiring and power wiring drawings are affixed to unit to make troubleshooting easy
- Standard, medium and high static fan motor options available
- Provisions for thru–the–bottom power entry capability
- Single point electrical connections

RAH036–060

RAH072–120

WARRANTY

- 5 Year compressor limited warranty
- 1 Year parts limited warranty

c UL us LISTED

ASHRAE 90.1 COMPLIANT

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ENERGY STAR

UNIT PERFORMANCE DATA – ONE STAGE COOLING

UNIT	Nom. Tons	COOLING Net Cap. (Btuh)	SEER	EER	Unit Dimensions H x W x L in [mm]	Unit Weight lb. [kg]
RAH036*0XA0AAA	3	36,000	15.0	12.50	33–3/8 x 46–3/4 x 74–3/8 (847 x 1187 x 1888)	468 (212)
RAH048*0XA0AAA	4	48,500	15.6	13.00	41–3/8 x 46–3/4 x 74–3/8 (1051 x 1187 x 1888)	524 (238)
RAH060*0XA0AAA	5	57,500	15.2	12.60	41–3/8 x 46–3/4 x 74–3/8 (1051 x 1187 x 1888)	554 (251)
RAH072*0AA0AAA	6	73,000	N/A	12.00	41–1/4 x 59–1/2 x 88–1/8 (1048 x 1510 x 2238)	637 (289)

UNIT PERFORMANCE DATA – TWO STAGE COOLING

UNIT	Nom. Tons	COOLING Net Cap. (Btuh)	SEER	EER	Unit Dimensions H x W x L in [mm]	Unit Weight lb. [kg]
RAH090*0AA0AAA	7½	89,000	N/A	12.20	49–3/8 x 59–1/2 x 88–1/8 (1253 x 1510 x 2238)	830 (376)
RAH102*0AA0AAA	8½	97,000	N/A	12.20	49–3/8 x 59–1/2 x 88–1/8 (1253 x 1510 x 2238)	855 (388)
RAH120*0AA0AAA	10	115,000	N/A	11.70	49–3/8 x 59–1/2 x 88–1/8 (1253 x 1510 x 2238)	1025 (465)
RAH150*0AA0AAA	12.5	146,000	N/A	12.40	57–3/8 x 63–3/8 x 115–7/8 (1456 x 1609 x 2942)	1360 (617)

* Indicates Unit voltage: K = 208/230–1–60, H = 208/230–3–60, L = 460–3–60, S = 575–3–60

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MODEL NOMENCLATURE

MODEL SERIES	R	A	H	0	9	0	H	0	A	A	0	A	A	A
Position Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14

R = Rooftop

A = Air Conditioning (Cooling Only) — **Type**

H = High Efficiency — **Efficiency**

036 = 36,000 = 3 Tons
048 = 48,000 = 4 Tons
060 = 60,000 = 5 Tons
072 = 72,000 = 6 Tons
090 = 90,000 = 7.5 Tons (Dual Compressor)
102 = 102,000 = 8.5 Tons (Dual Compressor)
120 = 120,000 = 10 Tons (Dual Compressor)
150 = 150,000 = 12.5 Tons (Dual Compressor) — **Nominal Cooling Capacity**

K = 208/230-1-60
H = 208/230-3-60
L = 460-3-60
S = 575-3-60 — **Voltage**

0 = No Heat — **Heating Capacity (See spec sheet for actual capacity)**

X = Direct drive ECM motor (3-5 Ton All voltages 1 & 3 phase)
A = Standard Static Option - (Belt Drive) 6-12.5 Ton, 3 phase only)
C = Medium Static Option (Belt Drive) (3-12.5 Ton, 3 phase only)
B = High Static Option (Belt Drive) (3-10 Ton, 3 phase only)
E = High Static High Efficiency Option (Belt Drive) (12.5 Ton) — **Motor Option**

A = None
B = Economizer w/Bara-relief, OA Temp sensor
E = Economizer w/Bara-relief + CO2 Sensor, OA Temp sensor
H = Economizer w/Bara-relief, enthalpy sensor
L = Economizer w/Bara-relief + CO2 Sensor, enthalpy sensor
P = 2-Position damper w/Baro-relief — **Outdoor Air Options / Control (See spec sheet for details)**

0A = No Options
4B = Non-Fused Disconnect
7C = Non-Fused Disconnect + Non-Powered 115v C.O.
7K = Non-Fused Disconnect + Non-Powered 115v C.O.+ SA Smoke detector
8A = Non-Fused Disconnect + SA Smoke detector
AT = Non-powered 115v C.O.
BA = Non-powered 115v C.O. + Supply Air Smoke Detector
AA = Easy Access Hinged Panels
6C = Non-Fused Disconnect + Easy Access Hinged Panels
6D = Non-Fused Disconnect + Easy Access Hinged Panels + Non-powered 115V C.O.
6L = Non-Fused Disconnect + Easy Access Hinged Panels + Non-powered 115V C.O. + SA Smoke detector
7B = Non-Fused Disconnect + Easy Access Hinged Panels + SA Smoke detector
AB = Easy Access Hinged Panels + Non-powered 115v C.O.
AJ = Easy Access Hinged Panels + Non-powered 115v C.O. + SA Smoke detector
CH = Easy Access Hinged Panels + SA Smoke detector

Factory Installed Options

A = Aluminum / Copper Cond & Alum/Copper Evap Coil
B = Pre-coat Alum/Copper Cond & Alum / Copper Evap
C = E-Coated Alum/Copper Cond & Alum / Copper Evap
D = E-Coated Alum / Copper Cond & E-Coated Alum/Copper Evap
E = Copper/Copper Cond & Alum/Copper Evap
F = Copper/Copper Cond & Copper/Copper Evap

Condenser / Evaporator Coil Configuration

A = Original Design — **Sales Digit**

Table 1 – FACTORY INSTALLED OPTIONS AND FIELD INSTALLED ACCESSORIES

CATEGORY	ITEM	FACTORY INSTALLED OPTION	FIELD INSTALLED ACCESSORY
Cabinet	Thru–the–base electrical	X	X
	Hinged Access Panels	X	
	Supply Duct Cover (12.5 ton only)		X
Coil Options	Copper/Copper indoor and/or outdoor coils	X	
	Pre–coated outdoor coils	X	
	Premium, E–coated outdoor coils	X	
Condenser Protection	Condenser coil hail guard (louvered design)	X	X
Controls	Smoke detector (supply air)	X	
	Time Guard II compressor delay control circuit		X
	Phase Monitor		X
	Temperature sensors		X
Economizers & Outdoor Air Dampers	Economizer (for electro–mechanical controlled RTUs)	X	X
	Motorized 2 position outdoor–air damper	X	X
	Manual outdoor–air damper (25% and 50%)		X
	Barometric relief[1]	X	X
	Power exhaust		X
Economizer Sensors & IAQ Devices	Single dry bulb temperature sensors[2]	X	X
	Differential dry bulb temperature sensors[2]		X
	Single enthalpy sensors[2]	X	X
	Differential enthalpy sensors[2]		X
	Wall or Duct mounted CO_2 sensors[2]		X
	Unit Mounted CO_2 sensor[2]	X	
Electric Heat	Electric heaters		X
	Single Point Kit		X
Indoor Motor & Drive	Multiple motor and drive packages	X	
Low Ambient Control	Winter start kit[4]		X
	Head pressure controller[4]		X
Power Options	Convenience outlet (unpowered)	X	
	Non–fused disconnect	X	
Roof Curbs	Roof curb 14” (356mm)		X
	Roof curb 24” (610mm)		X

NOTES:
1. Included with economizer.
2. Sensors used to optimize economizer performance.
3. See application data for assistance.

FACTORY OPTIONS AND/OR ACCESSORIES

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_2 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 equalizes building pressure and ambient air pressures. This can be a cast effective solution to prevent building pressurization.

CO_2 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_2 sensor detects their presence through increasing CO_2 levels, and opens the economizer appropriately.

When the occupants leave, the CO_2 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

Smoke detectors immediately shut down the rooftop unit when smoke is detected. They are available, installed by the factory for supply air.

Louvered Hail Guards

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

Convenience Outlet (un−powered)

Installed at the factory, this service feature provides a convenient, 15 amp, 115v GFCI receptacle with “Wet in Use” cover. The “unpowered” option is to be powered from a separate 115/120v power source.

Non−fused Disconnect

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

Power Exhaust with Barometric Relief

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

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.

Motorized 2−Position Damper

The 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.

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.

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 not 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.

Winter Start Kit

The winter start kit extends the low ambient limit of your rooftop to 25°F (−4°C). The kit bypasses the low pressure switch, preventing nuisance tripping of the low pressure switch. Other low ambient precautions may still be prudent.

Alternate Motors and Drives

Some applications need larger horsepower motors, some need more airflow, and some need both. 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 gas lines, main power lines, as well as control power.

Electric Heaters

A full−line of field−installed accessory heaters are available. The heaters are very easy to use, install and are all pre−engineered and certified.

ACCESSORIES – RAH036–150

FLAT ROOF CURBS		
Model Number	**Description**	**Use With Model Size**
CRRFCURB001A01	14" High Roof Curb. Ductwork attaches to the roof curb. Includes thru–the–bottom capability.	036 – 060
CRRFCURB003A01		072 – 120
CRRFCURB074A00		150
CRRFCURB002A01	24" High Roof Curb. Ductwork attaches to the roof curb. Includes thru–the–bottom capability.	036 – 060
CRRFCURB004A01		072 – 120
CRRFCURB075A00		150

ECONOMIZERS		
Model Number	**Description**	**Use With Model Size**
DNECOMZR020A02	Vertical EconoMi$er IV with solid–state controller, gear–driven, 3–position modulating damper, spring return actuator, up to 100% barometric relief, supply and outdoor air sensors, and CO2 sensor compatible.	036 – 060
DNECOMZR021A03		072 – 120
DNECOMZR062A00		150
DNECOMZR024A02	Horizontal EconoMi$er IV with solid–state controller, gear–driven, 3–position modulating damper, spring return actuator, up to 100% barometric relief, supply and outdoor air sensors, and CO2 sensor compatible.	036 – 060
DNECOMZR025A02		072 – 120
DNECOMZR064A00		150

POWER EXHAUST *		
Model Number	**Description**	**Use With Model Size**
DNPWREXH030A01	Vertical Power Exhaust 208/230 volt (1 or 3 Phase)	036 – 060
DNPWREXH021A01	Vertical Power Exhaust 460 volt	036 – 060
DNPWREXH022A01	Vertical Power Exhaust 208/230 volt	072 – 120
DNPWREXH023A01	Vertical Power Exhaust 460 volt	072 – 120
DNPWREXH080A00	Vertical Power Exhaust 208/230 volt	150
DNPWREXH081A00	Vertical Power Exhaust 460 volt	150
DNPWREXH028A01	Horizontal Power Exhaust 208/230 (1 or 3 Phase) & 575 volt	036 – 120
DNPWREXH029A01	Horizontal Power Exhaust 460 volt	036 – 120
DNPWREXH082A00	Horizontal Power Exhaust 208/230 & 575 volt	150
DNPWREXH083A00	Horizontal Power Exhaust 460 volt	150

575V TRANSFORMER		
Model Number	**Description**	**Use With Model Size**
1171494 [2]	Transformer for conversion from 575v to 208/230v power exhaust applications.	036 – 150

***** Vertical Power Exhaust requires a vertical economizer. Horizontal Power Exhaust should be duct–mounted in the return duct.

[2] Available from FAST Parts.

MANUAL OUTDOOR AIR DAMPERS		
Model Number	**Description**	**Use With Model Size**
CRMANDPR001A03	25% Open Manual Fresh Air Damper	036 – 060
CRMANDPR001A02	50% Open Manual Fresh Air Damper	036 – 060
CRMANDPR002A03	25% Open Manual Fresh Air Damper	072 – 120
CRMANDPR002A02	50% Open Manual Fresh Air Damper	072 – 120
CRMANDPR011A00	50% Open Manual Fresh Air Damper	150

MOTORIZED OUTDOOR AIR DAMPERS		
Model Number	**Description**	**Use With Model Size**
CRTWOPOS010A00	Motorized 2 position outdoor air damper (25–100% Outdoor Air)	036 – 060
CRTWOPOS011A00		072 – 120
CRTWOPOS014A00		150

SPECIAL – 150 SIZE SPECIFIC ACCESSORIES		
Model Number	**Description**	**Use With Model Size**
CRDISBKT001A00	Disconnect Switch Bracket – Provides a pre engineered and sized mounting bracket for applications requiring a unit mounted fused disconnect of greater than 100 amps. Bracket assures that no damage will occur to coils when mounting with screws and other fasteners.	150
CRDUCTCV002A00	Supply Duct Cover – This supply duct cover is required when field converting the factory standard vertical duct supply to horizontal duct supply configuration. One required per unit.	150

ACCESSORIES – RAH036–150 (cont.)

LOW AMBIENT CONTROLS *		
Model Number	**Description**	**Use With Model Size**
32LT900301[1]	Motormaster I –20°F (–29°C) Low Ambient Control 208/230–1–60, 208/203–3–60	036 – 102
32LT900611[1]	Motormaster I –20°F (–29°C) Low Ambient Control 460–3–60, 575–3–60	036 – 102
CPLOWAMB001A00	Motormaster® II –0°F (–18°C) Low Ambient Control 208/230–1, 208/230–3, 460–3–60	036 – 150
1178185 [2]	Motormaster I Compatible Condenser Fan Motor	036, 208/230–3–60
1178186 [2]	Motormaster I Compatible Condenser Fan Motor	036, 460–3–60
1171974 [2]	Motormaster I Compatible Condenser Fan Motor	048 – 102, 208/230–3–60, 575–3–60
1171975 [2]	Motormaster I Compatible Condenser Fan Motor	048 – 102, 460–3–60
CRLOWAMB030A00[3]	Motormaster®V Low Ambient Control Mechanical cooling operation down to –20°F (–29°C)	120, 208/230–3–60
CRLOWAMB031A00[3]		120, 460–3–60
CRLOWAMB032A00[3]		120, 575–3–60
CRLOWAMB039A00	Motormaster I Low Ambient Kit. Mechanical cooling operation down to –20° F (– 29° C). Kit includes 3 motors, MotorMaster controller, wiring label, and required wire ties and connectors, DNWINSTR001A00 also required (one per refrigerant circuit)	150, 208/230–3–60
CRLOWAMB040A00	Motormaster I Low Ambient Kit. Mechanical cooling operation down to –20° F (– 29° C). Kit includes 3 motors, MotorMaster controller, wiring label, and required wire ties and connectors) 575 Volt models also require CRTRXKIT002A00 plus DNWINSTR001A00 also required (one per refrigerant circuit)	150, 460–3–60
CRTRXKIT001A00	Motormaster I Low Ambient Control – Transformer Kit. Must be used in conjunction with Low Ambient Controller if used on 575–3–60 volt models.	150, 575–3–60

*See usage tables in kit instructions.

[1] Requires motor change out.

[2] Available from FAST Parts.

Note: Sizes 036–060 requires (1) low ambient controller and (1) compatible condenser fan motor for change out
Sizes 072–102 requires (1) low ambient controller and (2) compatible condenser fan motors for change out

[3] No motor change is required on these specific models. Requires two DNWINSTR001A00 Winter Start kits (one per circuit).

ACCESSORY KITS FOR UNITS WITH HINGED ACCESS PANELS		
Model Number	**Description**	**Use With Model Size**
DNHNGPNL001A00	Horizontal accessory kit. Required when field installing a two position damper or vertical economizer. Includes angle and seal strip.	036 – 060
DNHNGPNL002A00		072 – 120
DNPECONV003A00	Vertical accessory kit. Required when field installing a two position damper or vertical economizer. Includes door panel, angle and seal strip	036 – 060
DNPECONV004A00		072 – 120
LOUVERED HAIL GUARDS – CONDENSER COIL		
Model Number	**Description**	**Use With Model Size**
CRLVHLGD012A00	Louvered Condenser Coil Hail Guard	036
CRLVHLGD013A00	Louvered Condenser Coil Hail Guard	048 – 060
CRLVHLGD014A00	Louvered Condenser Coil Hail Guard	072
CRLVHLGD016A00	Louvered Condenser Coil Hail Guard	090 – 120
CRLVHLGD032A00	Louvered Condenser Coil Hail Guard	150

ACCESSORIES – RAH036–150 (cont.)

THROUGH–THE–BOTTOM/CURB POWER CONNECTION		
Model Number	**Description**	**Use With Model Size**
CRBTMPWR001A01	Thru–the–bottom electrical connections and thru–the–curb gas connections. Includes a 3/4–inch diameter liquid tight conduit fitting for high voltage power wires	036 – 060
CRBTMPWR002A01	Thru–the–bottom electrical connections and thru–the–curb gas connections. Includes a 1–1/4–inch diameter liquid tight conduit fitting for high voltage power wires	072 – 120
CRBTMPWR003A01	Thru–the–bottom power, control, and gas connections. Includes a 3/4–inch diameter liquid tight conduit fitting for high voltage power wires	036 – 060
CRBTMPWR004A01	Thru–the–bottom power, control, and gas connections. Includes a 1–1/4–inch diameter liquid tight conduit fitting for high voltage power wires	072 – 120
CRBTMPWR005A01	Thru–the–bottom power, control, and gas connections. Includes a 1–1/4 inch diameter liquid tight conduit fitting for high voltage power wires	150
CRBTMPWR006A00	Thru–the–bottom power, control, and gas connections. Includes a 1–1/2 inch diameter liquid tight conduit fitting for high voltage power wires	
CRBTMPWR007A00	Thru–the–bottom power, control, and gas connections. Includes a 2 inch diameter liquid tight conduit fitting for high voltage power wires	

ECONOMIZER SENSORS		
Model Number	**Description**	**Use With Model Size**
DNTEMPSN002A00	Outdoor or Return Dry Bulb Sensor used with Electro–Mechanical Control	ALL Economizers
DNCBDIOX005A00	CO2 Sensor for use in return airstream. Also includes Aspirator Box required for Duct Mounting.	ALL Economizers
DNENTDIF004A00	Return Air Enthalpy Sensor used with Electro–Mechanical controls, use with AX078ENT for differential enthalpy control	ALL Economizers
AXB078ENT	Economizer Differential Enthalpy Control Upgrade	ALL

CONTROL UPGRADE KITS		
Model Number	**Description**	**Use With Model Size**
NRTIMEGD001A00	Time Guard II	036 – 150
DNWINSTR001A00	Electronic phase monitor breaks “R” control signal if trouble is detected.(Allows operation down to 25°F from standard 40°F.)	036 – 150
CRPHASE3001A02	Phase Monitor Control	All 208/230v, 460v (3 Ph only)
CRPHASE3002A00	Phase Monitor Control	All 575v

See pages 13 to 20 for Electric Heater and single point wiring kit models and usage.

Table 2 – ARI COOLING RATING TABLE – 1 Stage

UNIT RAH	COOLING STAGES	NOM. CAPACITY (TONS)	NET COOLING CAPACITY (MBH)	TOTAL POWER (kW)	SEER	EER	IEER
036	1	3	36.0	2.9	15.00	12.50	N/A
048	1	4	48.5	3.7	15.60	13.00	N/A
060	1	5	57.5	4.6	15.20	12.45	N/A
072	1	6	73.0	6.0	N/A	12.00	13.20

Table 3 – ARI COOLING RATING TABLE – 2 Stage

UNIT RAH	COOLING STAGES	NOM. CAPACITY (TONS)	NET COOLING CAPACITY (MBH)	TOTAL POWER (kW)	SEER	EER	IEER
090	2	7.5	89.0	7.3	N/A	12.20	13.20
102	2	8.5	97.0	8.0	N/A	12.20	13.20
120	2	10	115.0	9.8	N/A	11.70	12.20
150	2	12.5	146.0	11.8	N/A	12.40	13.20

LEGEND

AHRI – Air Conditioning, Heating and Refrigeration Institute Test Standard
ASHRAE – American Society of Heating, Refrigerating and Air Conditioning, Inc.
EER – Energy Efficiency Ratio
IEER – Integrated Energy Efficiency Ratio
SEER – Seasonal Energy Efficiency Ratio

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification of certification for individual products, go to www.ahridirectory.org .

As an Energy Star® Partner, International Comfort Products has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

NOTES:

1. Rated and certified under AHRI Standard 210/240–06 or 340/360–04, 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 (35°C) db outdoor air temp.
IPLV Standard: 80°F (27°C) db, 67°F (19°C) wb indoor air temp and 80°F (27°C) db outdoor air temp.
IEER Standard: Procedure described in ARI Standard 340/360.
3. All RAH units comply with ASHRAE 90.1 2001, 2004 Energy Standard for minimum SEER and EER requirements.
4. RAH units comply with US Energy Policy Act (2005). To evaluate code compliance requirements, refer to state and local codes or visit the following website: http://bcap–energy.org .

Table 4 – MINIMUM – MAXIMUM AIRFLOWS ELECTRIC HEAT

UNIT RAH	COOLING		ELECTRIC HEATERS	
	Minimum	Maximum	Minimum	Maximum
036	900	1500	900	1500
048	1200	2000	1200	2000
060	1500	2500	1500	2500
072	1800	3000	1800	3000
090	2250	3750	2250	3750
102	2550	4250	2250	4250
120	3000	5000	3000	5000
150	3750	6250	3750	6250

Table 5 – SOUND PERFORMANCE TABLE

UNIT RAH	COOLING STAGES	OUTDOOR SOUND (dB) AT 60								
		A–WEIGHTED	63	125	250	500	1000	2000	4000	8000
036	1	76	78.2	78.0	74.2	73.3	70.6	66.0	62.4	56.9
048	1	78	84.7	83.6	77.1	74.6	72.3	68.3	64.7	60.9
060	1	77	87.5	82.5	76.1	73.6	71.3	67.1	64.1	60.0
072	1	82	90.1	82.6	81.0	79.4	77.0	73.0	70.4	66.7
090	2	82	90.6	84.3	80.2	79.3	77.1	72.2	67.4	63.7
102	2	82	88.6	85.0	81.6	79.5	77.4	74.1	71.0	66.3
120	2	87	85.9	87.9	85.6	84.4	82.8	78.5	74.9	72.5
150	2	83	89.3	86.0	82.9	80.7	78.5	73.6	69.6	64.5

LEGEND
dB – Decibel

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NOTES:
1. Outdoor sound data is measure 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 depends on specific environmental factors which normally do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
3. A–weighted sound ratings filter out very high and very low frequencies, to better approximate the response of "average" human ear. A–weighted measurements are taken in accordance with AHRI standard 270–95.

Table 6 – PHYSICAL DATA (COOLING) 3 – 6 TONS

UNIT: RAH		036	048	060	072
Refrigeration System					
	# Circuits / # Comp. / Type	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll	1 / 1 / Scroll
	R–410A refrig. charge A/B (lbs–oz)	9 – 0	12 – 8	13 – 3	14 – 0
	Metering Device	TXV	TXV	TXV	TXV
	High–press. Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505
	Low–press. Trip / Reset (psig)	54 / 117	54 / 117	54 / 117	54 / 117
	Compressor Capacity Staging (%)	100%	100%	100%	100%
Evap. Coil					
	Material (Tube/Fin)	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil type	3/8" RTPF	3/8" RTPF	3/8" RTPF	3/8" RTPF
	Rows / FPI	3 / 15	3 / 15	4 / 15	3 / 15
	Total Face Area (ft^2)	5.5	7.3	7.3	8.9
	Condensate Drain Conn. Size	3/4"	3/4"	3/4"	3/4"
Evap. Fan and Motor					
Standard Static 1 phase	Motor Qty / Drive Type	1 / Direct	1 / Direct	1 / Direct	n/a
	Max BHP	1	1	1	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 (in)	10 x 10	10 x 10	11 x 10	n/a
Medium Static 1 phase	Motor Qty / Drive Type	n/a	n/a	n/a	n/a
	Max BHP	n/a	n/a	n/a	n/a
	RPM Range	n/a	n/a	n/a	n/a
	Motor Frame Size	n/a	n/a	n/a	n/a
	Fan Qty / Type	n/a	n/a	n/a	n/a
	Fan Diameter (in)	n/a	n/a	n/a	n/a
Standard Static 3 phase	Motor Qty / Drive Type	1 / Direct	1 / Direct	1 / Direct	1 / Belt
	Max BHP	1	1	1	1.7
	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 (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	1.2	1.7	2.4	2.9
	RPM Range	770–1175	920–1303	1035–1466	733–949
	Motor Frame Size	48	56	56	56
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (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	2.4	2.9	2.9	4.7
	RPM Range	1035–1466	1208–1639	1303–1687	909–1102
	Motor Frame Size	56	56	56	14
	Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
	Fan Diameter (in)	10 x 10	10 x 10	10 x 10	15 x 15
Cond. Coil					
	Material (Tube/Fin)	Cu / Al	Cu / Al	Cu / Al	Cu / Al
	Coil type	3/8" RTPF	3/8" RTPF	3/8" RTPF	3/8" RTPF
	Rows / FPI	2 / 17	2 / 17	2 / 17	2 / 17
	Total Face Area (ft^2)	12.7	21.3	21.3	20.5
Cond. fan / motor					
	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
Filters					
	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

Table 7 – PHYSICAL DATA (COOLING) 7.5 – 12.5 TONS

Unit: RAH	090	102	120	150
Refrigeration System				
# Circuits / # Comp. / Type	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll	2 / 2 / Scroll
R–410A refrig charge A/B (lbs–oz)	9 – 10 / 9 – 10	9 – 14 / 9 – 14	12 – 11 / 12 – 5	16 – 7 / 15 – 5
Metering device	TXV	TXV	TXV	TXV
High–press. Trip / Reset (psig)	630 / 505	630 / 505	630 / 505	630 / 505
Low–press. Trip / Reset (psig)	54 / 117	54 / 117	54 / 117	54 / 117
Compressor Capacity Staging (%)	50% / 100%	50% / 100%	50% / 100%	50% / 100%
Evap. Coil				
Material (Tube/Fin)	Cu / Al	Cu / Al	Cu / Al	Cu / Al
Coil type	3/8" RTPF	3/8" RTPF	3/8" RTPF	3/8" RTPF
Rows / FPI	4 / 15	4 / 15	4 / 15	4 / 15
total face area (ft2)	11.1	11.1	11.1	17.5
Condensate drain conn. size	3/4"	3/4"	3/4"	3/4"
Evap. fan and motor				
Standard Static 3 phase – Motor Qty / Drive type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
Max BHP	1.7	1.7	2.4	2.9
RPM range	518–733	518–733	591–838	440–609
motor frame size	56	56	56	56Y
Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
Fan Diameter (in)	15 x 15	15 x 15	15 x 15	18 x 18
Medium Static 3 phase – Motor Qty / Drive type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
Max BHP	2.4	2.4	3.7	3.7
RPM range	690–936	690–936	838–1084	609–778
motor frame size	56	56	56HZ	56HZ
Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
Fan Diameter (in)	15 x 15	15 x 15	15 x 15	18 x 18
High Static 3 phase – Motor Qty / Drive type	1 / Belt	1 / Belt	1 / Belt	1 / Belt
Max BHP	3.7	3.7	4.9	6.1
RPM range	838–1084	838–1084	1022–1240	776–955
motor frame size	56	56	145TY	S184T
Fan Qty / Type	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal	1 / Centrifugal
Fan Diameter (in)	15 x 15	15 x 15	15 x 15	18 x 18
High Static–High Efficiency 3 phase* – Motor Qty / Drive type	n/a	n/a	n/a	1 / Belt
Max BHP	n/a	n/a	n/a	6.1
RPM range	n/a	n/a	n/a	776–955
motor frame size	n/a	n/a	n/a	S184T
Fan Qty / Type	n/a	n/a	n/a	1 / Centrifugal
Fan Diameter (in)	n/a	n/a	n/a	18 x 18
Cond. Coil				
Material (Tube/Fin)	Cu / Al	Cu / Al	Cu / Al	Cu / Al
Coil type	3/8" RTPF	3/8" RTPF	3/8" RTPF	3/8" RTPF
Rows / FPI	2 / 17	2 / 17	3 / 17	2 / 17
Total Face Area (ft^2)	25.1	25.1	25.1	2 at 23.1
Cond. fan / motor				
Qty / Motor drive type	2 / direct	2 / direct	1 / direct	3 / direct
Motor HP / RPM	1/4 / 1100	1/4 / 1100	1 / 1175	1/4 / 1100
Fan diameter (in)	22	22	30	22
Filters				
RA Filter # / size (in)	4 / 20 x 20 x 2	4 / 20 x 20 x 2	4 / 20 x 20 x 2	6 / 18 x 24 x 2 Vert 2 / 24 x 27 x 1
OA inlet screen # / size (in)	1 / 20 x 24 x 1	1 / 20 x 24 x 1	1 / 20 x 24 x 1	Horz 1 / 30 x 39 x 1

* Section 313 of the Energy Independence and Security Act of 2007 (EISA 2007) mandates that the efficiency of general purpose motors used in Light Commercial Rooftops rated at 5.0 HP and larger be increased on or after December 19, 2010. High and standard efficiency motors will be offered until inventory is depleted, at which time only high efficiency motors will be available.

Table 8 – ELECTRIC HEAT DATA **3 – 12.5 TONS**

Unit RAH	Nom. Volt–Ph–Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATERXXXXXX	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXXX	
						NO C.O. or UNPWRD C.O.	
						NO P.E.	w/P.E. (pwrd fr/unit)
036	208/230–1–60	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	040A00	040A00
			102A00,102A00	13	9.8/11.9	040A00	040A00
	208/230–3–60	STD	101A00	4.4	3.3/4.0	–	–
			102A00	6.5	4.9/6.0	–	–
			103B00	8.7	6.5/8.0	–	–
			104B00	10.5	7.9/9.6	–	–
			105A00	16	12.0/14.7	037A00	037A00
		MED	101A00	4.4	3.3/4.0	–	–
			102A00	6.5	4.9/6.0	–	–
			103B00	8.7	6.5/8.0	–	–
			104B00	10.5	7.9/9.6	–	–
			105A00	16	12.0/14.7	037A00	037A00
		HIGH	101A00	4.4	3.3/4.0	–	–
			102A00	6.5	4.9/6.0	–	–
			103B00	8.7	6.5/8.0	–	–
			104B00	10.5	7.9/9.6	–	–
			105A00	16	12.0/14.7	037A00	037A00
	460–3–60	STD	106A00	6	5.5	–	–
			107A00	8.8	8.1	–	–
			108A00	11.5	10.6	–	–
			109A00	14	12.9	–	–
		MED	106A00	6	5.5	–	–
			107A00	8.8	8.1	–	–
			108A00	11.5	10.6	–	–
			109A00	14	12.9	–	–
		HIGH	106A00	6	5.5	–	–
			107A00	8.8	8.1	–	–
			108A00	11.5	10.6	–	–
			109A00	14	12.9	–	–

LEGEND

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

Unit RAH	Nom. Volt—Ph—Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATERXXXXXX	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXXX	
						NO C.O. or UNPWRD C.O.	
						NO P.E.	w/P.E. (pwrd fr/unit)
048	208/230—1—60	STD	101A00	4.4	3.3/4.0	—	—
			103B00	8.7	6.5/8.0	037A00	037A00
			102A00,102A00	13	9.8/11.9	040A00	040A00
			103B00,103B00	17.4	13.1/16.0	040A00	040A00
			104B00,104B00	21	15.8/19.3	040A00	040A00
	208/230—3—60	STD	102A00	6.5	4.9/6.0	—	—
			103B00	8.7	6.5/8.0	—	—
			105A00	16	12.0/14.7	037A00	037A00
			104B00,104B00	21	15.8/19.3	038A00	038A00
		MED	102A00	6.5	4.9/6.0	—	—
			103B00	8.7	6.5/8.0	—	—
			105A00	16	12.0/14.7	037A00	037A00
			104B00,104B00	21	15.8/19.3	038A00	038A00
		HIGH	102A00	6.5	4.9/6.0	—	—
			103B00	8.7	6.5/8.0	—	—
			105A00	16	12.0/14.7	037A00	037A00
			104B00,104B00	21	15.8/19.3	038A00	038A00
	460—3—60	STD	106A00	6	5.5	—	—
			108A00	11.5	10.6	—	—
			109A00	14	12.9	—	—
			108A00,108A00	23	21.1	037A00	037A00
		MED	106A00	6	5.5	—	—
			108A00	11.5	10.6	—	—
			109A00	14	12.9	—	—
			108A00,108A00	23	21.1	037A00	037A00
		HIGH	106A00	6	5.5	—	—
			108A00	11.5	10.6	—	—
			109A00	14	12.9	—	—
			108A00,108A00	23	21.1	037A00	037A00

LEGEND

APP PWR — 208 / 230V / 460V / 575V
C.O. — Convenient outlet
FLA — Full load amps
IFM — Indoor fan motor
NOM PWR — 240V / 480V / 600V
P.E. — Power exhaust
UNPWRD — Unpowered convenient outlet

Table 8 (Cont.) ELECTRIC HEAT DATA **3 – 12.5 TONS**

Unit RAH	Nom Volt–Ph–Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATERXXXXXX	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXXX	
						NO C.O. or UNPWRD C.O.	
						NO P.E.	w/P.E. (pwrd fr/unit)
060	208/230–1–60	STD	102A00	6.5	4.9/6.0	–	–
			103B00	8.7	6.5/8.0	037A00	037A00
			102A00,102A00	13	9.8/11.9	040A00	040A00
			103B00,103B00	17.4	13.1/16.0	040A00	040A00
			104B00,104B00	21	15.8/19.3	040A00	040A00
	208/230–3–60	STD	102A00	6.5	4.9/6.0	–	–
			104B00	10.5	7.9/9.6	–	–
			105A00	16	12.0/14.7	037A00	037A00
			104B00,104B00	21	15.8/19.3	038A00	038A00
			104B00,105A00	26.5	19.9/24.3	038A00	038A00
		MED	102A00	6.5	4.9/6.0	–	–
			104B00	10.5	7.9/9.6	–	–
			105A00	16	12.0/14.7	037A00	037A00
			104B00,104B00	21	15.8/19.3	038A00	038A00
			104B00,105A00	26.5	19.9/24.3	038A00	038A00
		HIGH	102A00	6.5	4.9/6.0	–	–
			104B00	10.5	7.9/9.6	–	–
			105A00	16	12.0/14.7	037A00	037A00
			104B00,104B00	21	15.8/19.3	038A00	038A00
			104B00,105A00	26.5	19.9/24.3	038A00	038A00
	460–3–60	STD	106A00	6	5.5	–	–
			108A00	11.5	10.6	–	–
			109A00	14	12.9	–	–
			108A00,108A00	23	21.1	037A00	037A00
			108A00,109A00	25.5	23.4	037A00	037A00
		MED	106A00	6	5.5	–	–
			108A00	11.5	10.6	–	–
			109A00	14	12.9	–	–
			108A00,108A00	23	21.1	037A00	037A00
			108A00,109A00	25.5	23.4	037A00	037A00
		HIGH	106A00	6	5.5	–	–
			108A00	11.5	10.6	–	–
			109A00	14	12.9	–	–
			108A00,108A00	23	21.1	037A00	037A00
			108A00,109A00	25.5	23.4	037A00	037A00

LEGEND

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

Table 8 (Cont.) ELECTRIC HEAT DATA **3 – 12.5 TONS**

Unit RAH	Nom Volt–Ph–Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATERXXXXXX	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXXX	
						NO C.O. or UNPWRD C.O.	
						NO P.E.	w/P.E. (pwrd fr/unit)
072	208/230–3–60	STD	264A00	6.5	4.9/6.0	042A00	042A00
			117A00	10.5	7.9/9.6	042A00	042A00
			110A00	16.0	12.0/14.7	042A00	042A00
			117A00,117A00	21.0	15.8/19.3	043A00	043A00
			110A00,117A00	26.5	19.9/24.3	043A00	043A00
		MED	264A00	6.5	4.9/6.0	042A00	042A00
			117A00	10.5	7.9/9.6	042A00	042A00
			110A00	16.0	12.0/14.7	042A00	043A00
			117A00,117A00	21.0	15.8/19.3	043A00	043A00
			110A00,117A00	26.5	19.9/24.3	043A00	043A00
		HIGH	264A00	6.5	4.9/6.0	042A00	042A00
			117A00	10.5	7.9/9.6	042A00	042A00
			110A00	16.0	12.0/14.7	043A00	043A00
			117A00,117A00	21.0	15.8/19.3	043A00	043A00
			110A00,117A00	26.5	19.9/24.3	043A00	043A00
	460–3–60	STD	265A00	6.0	5.5	042A00	042A00
			266A00	11.5	10.6	042A00	042A00
			267A00	14.0	12.9	042A00	042A00
			268A00	23.0	21.1	042A00	042A00
			269A00	25.5	23.4	042A00	042A00
		MED	265A00	6.0	5.5	042A00	042A00
			266A00	11.5	10.6	042A00	042A00
			267A00	14.0	12.9	042A00	042A00
			268A00	23.0	21.1	042A00	042A00
			269A00	25.5	23.4	042A00	042A00
		HIGH	265A00	6.0	5.5	042A00	042A00
			266A00	11.5	10.6	042A00	042A00
			267A00	14.0	12.9	042A00	042A00
			268A00	23.0	21.1	042A00	042A00
			269A00	25.5	23.4	042A00	042A00

LEGEND

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

Table 8 (Cont.) ELECTRIC HEAT DATA **3 – 12.5 TONS**

Unit RAH	Nom. Volt–Ph–Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATERXXXXXX	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXXX	
						NO C.O. or UNPWRD C.O.	
						NO P.E.	w/P.E. (pwrd fr/unit)
090	208/230–3–60	STD	117A00	10.4	7.8/9.6	047A00	047A00
			110A00	16.0	12.0/14.7	047A00	047A00
			111A00	24.8	18.6/22.8	049A00	049A00
			112A00	32.0	24.0/29.4	049A00	049A00
			112A00,117A00	42.4	31.8/38.9	051A00	051A00
		MED	117A00	10.4	7.8/9.6	047A00	047A00
			110A00	16.0	12.0/14.7	047A00	047A00
			111A00	24.8	18.6/22.8	049A00	049A00
			112A00	32.0	24.0/29.4	049A00	049A00
			112A00,117A00	42.4	31.8/38.9	051A00	051A00
		HIGH	117A00	10.4	7.8/9.6	047A00	047A00
			110A00	16.0	12.0/14.7	049A00	049A00
			111A00	24.8	18.6/22.8	049A00	049A00
			112A00	32.0	24.0/29.4	049A00	049A00
			112A00,117A00	42.4	31.8/38.9	051A00	051A00
	460–3–60	SYD	116A00	13.9	12.8	047A00	047A00
			113A00	16.5	15.2	047A00	047A00
			114A00	27.8	25.5	047A00	047A00
			115A00	33.0	30.3	047A00	047A00
			114A00,116A00	41.7	38.3	050A00	050A00
		MED	116A00	13.9	12.8	047A00	047A00
			113A00	16.5	15.2	047A00	047A00
			114A00	27.8	25.5	047A00	047A00
			115A00	33.0	30.3	047A00	047A00
			114A00,116A00	41.7	38.3	050A00	050A00
		HIGH	116A00	13.9	12.8	047A00	047A00
			113A00	16.5	15.2	047A00	047A00
			114A00	27.8	25.5	047A00	047A00
			115A00	33.0	30.3	047A00	047A00
			114A00,116A00	41.7	38.3	050A00	050A00
	575–3–60	STD	118A00	17.0	17.0	047A00	047A00
			119A00	34.0	34.0	047A00	047A00
		MED	118A00	17.0	17.0	047A00	047A00
			119A00	34.0	34.0	047A00	047A00
		HIGH	118A00	17.0	17.0	047A00	047A00
			119A00	34.0	34.0	047A00	047A00

LEGEND

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

Table 8 (Cont.) ELECTRIC HEAT DATA **3 – 12.5 TONS**

Unit RAH	Nom Volt–Ph–Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATERXXXXXX	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXXX	
						NO C.O. or UNPWRD C.O.	
						NO P.E.	w/P.E. (pwrd fr/unit)
102	208/230–3–60	STD	117A00	10.4	7.8/9.6	047A00	047A00
			110A00	16.0	12.0/14.7	047A00	047A00
			111A00	24.8	18.6/22.8	049A00	049A00
			112A00	32.0	24.0/29.4	049A00	049A00
			112A00,117A00	42.4	31.8/38.9	051A00	051A00
		MED	117A00	10.4	7.8/9.6	047A00	047A00
			110A00	16.0	12.0/14.7	047A00	047A00
			111A00	24.8	18.6/22.8	049A00	049A00
			112A00	32.0	24.0/29.4	049A00	049A00
			112A00,117A00	42.4	31.8/38.9	051A00	051A00
		HIGH	117A00	10.4	7.8/9.6	047A00	047A00
			110A00	16.0	12.0/14.7	049A00	049A00
			111A00	24.8	18.6/22.8	049A00	049A00
			112A00	32.0	24.0/29.4	049A00	049A00
			112A00,117A00	42.4	31.8/38.9	051A00	051A00
	460–3–60	STD	116A00	13.9	12.8	047A00	047A00
			113A00	16.5	15.2	047A00	047A00
			114A00	27.8	25.5	047A00	047A00
			115A00	33.0	30.3	047A00	047A00
			114A00,116A00	41.7	38.3	050A00	050A00
		MED	116A00	13.9	12.8	047A00	047A00
			113A00	16.5	15.2	047A00	047A00
			114A00	27.8	25.5	047A00	047A00
			115A00	33.0	30.3	047A00	047A00
			114A00,116A00	41.7	38.3	050A00	050A00
		HIGH	116A00	13.9	12.8	047A00	047A00
			113A00	16.5	15.2	047A00	047A00
			114A00	27.8	25.5	047A00	047A00
			115A00	33.0	30.3	047A00	047A00
			114A00,116A00	41.7	38.3	050A00	050A00
	575–3–60	STD	118A00	17.0	17.0	047A00	047A00
			119A00	34.0	34.0	047A00	047A00
		MED	118A00	17.0	17.0	047A00	047A00
			119A00	34.0	34.0	047A00	047A00
		HIGH	118A00	17.0	17.0	047A00	047A00
			119A00	34.0	34.0	047A00	047A00

LEGEND

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

Unit RAH	Nom Volt–Ph–Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATERXXXXXX	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXXX	
						NO C.O. or UNPWRD C.O.	
						NO P.E.	w/P.E. (pwrd fr/unit)
120	208/230–3–60	STD	117A00	10.4	7.8/9.6	047A00	047A00
			110A00	16.0	12.0/14.7	047A00	047A00
			112A00	32.0	24.0/29.4	049A00	049A00
			112A00,117A00	42.4	31.8/38.9	051A00	051A00
			112A00,110A00	50.0	37.6/45.9	051A00	051A00
		MED	117A00	10.4	7.8/9.6	047A00	047A00
			110A00	16.0	12.0/14.7	049A00	049A00
			112A00	32.0	24.0/29.4	049A00	049A00
			112A00,117A00	42.4	31.8/38.9	051A00	051A00
			112A00,110A00	50.0	37.6/45.9	051A00	051A00
		HIGH	117A00	10.4	7.8/9.6	049A00	049A00
			110A00	16.0	12.0/14.7	049A00	049A00
			112A00	32.0	24.0/29.4	049A00	049A00
			112A00,117A00	42.4	31.8/38.9	051A00	051A00
			112A00,110A00	50.0	37.6/45.9	051A00	051A00
	460–3–60	STD	116A00	13.9	12.8	047A00	047A00
			113A00	16.5	15.2	047A00	047A00
			115A00	33.0	30.3	047A00	047A00
			115A00,116A00	41.7	38.3	050A00	050A00
			115A00,113A00	50.0	45.9	050A00	050A00
		MED	116A00	13.9	12.8	047A00	047A00
			113A00	16.5	15.2	047A00	047A00
			115A00	33.0	30.3	047A00	047A00
			114A00,116A00	41.7	38.3	050A00	050A00
			115A00,113A00	50.0	45.9	050A00	050A00
		HIGH	116A00	13.9	12.8	047A00	047A00
			113A00	16.5	15.2	047A00	047A00
			115A00	33.0	30.3	047A00	050A00
			114A00,116A00	41.7	38.3	050A00	050A00
			115A00,113A00	50.0	45.9	050A00	050A00
	575–3–60	STD	118A00	17.0	17.0	047A00	047A00
			119A00	34.0	34.0	047A00	047A00
			118A00,119A00	51.0	51.0	050A00	050A00
		MED	118A00	17.0	17.0	047A00	047A00
			119A00	34.0	34.0	047A00	047A00
			118A00,119A00	51.0	51.0	050A00	050A00
		HIGH	118A00	17.0	17.0	047A00	047A00
			119A00	34.0	34.0	047A00	050A00
			118A00,119A00	51.0	51.0	050A00	050A00

LEGEND

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

Unit RAH	Nom Volt–Ph–Hz	IFM TYPE	ELECTRIC HEATER PART NUMBER CRHEATERXXXXXX	NOM PWR (kW)	APP PWR (kW)	SINGLE POINT KIT PART NUMBER CRSINGLEXXXXXX	
						NO C.O. or UNPWRD C.O.	
						NO P.E.	w/P.E. (pwrd fr/unit)
150	208/230–3–60	Standard	291A00	16.5	12.4/15.2	–	049A00
			288A00,291A00	26.5	19.9/24.3	049A00	049A00
			294A00	33.5	25.2/30.8	049A00	049A00
			288A00,294A00	43.5	32.7/40.0	051A00	051A00
			291A00,294A00	50.0	37.6/45.9	051A00	051A00
		MED	291A00	16.5	12.4/15.2	049A00	049A00
			288A00,291A00	26.5	19.9/24.3	049A00	049A00
			294A00	33.5	25.2/30.8	049A00	049A00
			288A00,294A00	43.5	32.7/40.0	051A00	051A00
			291A00,294A00	50.0	37.6/45.9	051A00	051A00
		High Hi–Effi-ciency	291A00	16.5	12.4/15.2	049A00	049A00
			288A00,291A00	26.5	19.9/24.3	049A00	049A00
			294A00	33.5	25.2/30.8	049A00	049A00
			288A00,294A00	43.5	32.7/40.0	051A00	051A00
			291A00,294A00	50.0	37.6/45.9	051A00	051A00
	460–3–60	Standard	292A00	16.5	15.2	–	–
			289A00,292A00	26.5	24.3	047A00	047A00
			295A00	33.5	30.8	047A00	047A00
			289A00,295A00	43.5	40.0	050A00	050A00
			292A00,295A00	50.0	45.9	050A00	050A00
		MED	292A00	16.5	15.2	–	–
			289A00,292A00	26.5	24.3	047A00	047A00
			295A00	33.5	30.8	047A00	047A00
			289A00,295A00	43.5	40.0	050A00	050A00
			292A00,295A00	50.0	45.9	050A00	050A00
		High Hi–Effi-ciency	292A00	16.5	15.2	–	–
			289A00,292A00	26.5	24.3	047A00	047A00
			295A00	33.5	30.8	050A00	050A00
			289A00,295A00	43.5	40.0	050A00	050A00
			292A00,295A00	50.0	45.9	050A00	050A00
	575–3–60	Standard	293A00	16.5	15.2	–	–
			290A00,293A00	26.5	24.3	047A00	047A00
			296A00	33.5	30.8	047A00	047A00
			290A00,296A00	43.5	40.0	047A00	050A00
			293A00,296A00	50.0	45.9	047A00	047A00
		MED	293A00	16.5	15.2	–	–
			290A00,293A00	26.5	24.3	047A00	047A00
			296A00	33.5	30.8	047A00	047A00
			290A00,296A00	43.5	40.0	047A00	050A00
			293A00,296A00	50.0	45.9	047A00	047A00
		High Hi–Effi-ciency	293A00	16.5	15.2	–	–
			290A00,293A00	26.5	24.3	047A00	047A00
			296A00	33.5	30.8	047A00	047A00
			290A00,296A00	43.5	40.0	050A00	050A00
			293A00,296A00	50.0	45.9	050A00	050A00

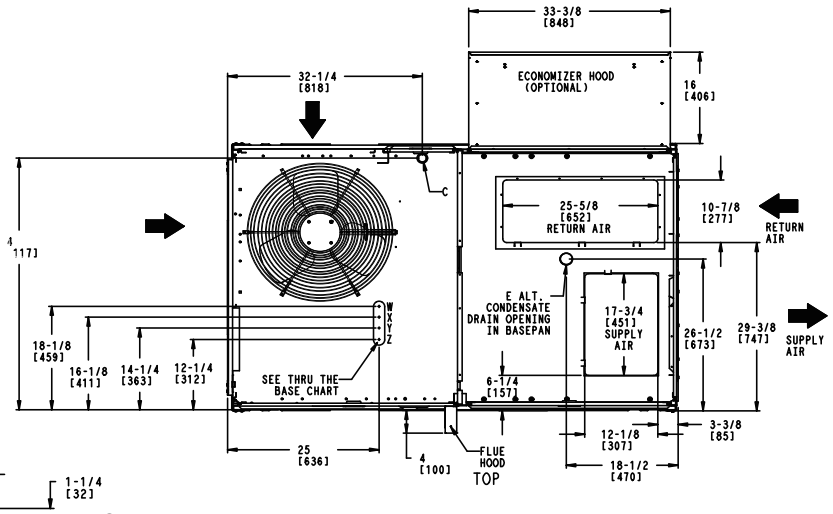
LEGEND

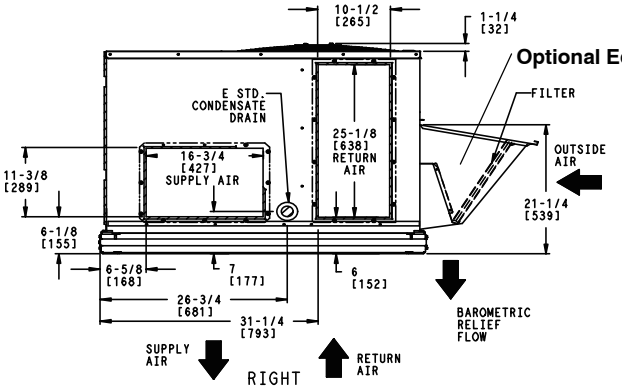
APP PWR – 208 / 230V / 460V / 575V
C.O. – Convenient outlet
FLA – Full load amps
IFM – Indoor fan motor
NOM PWR – 240V / 480V / 600V
P.E. – Power exhaust
UNPWRD – Unpowered convenient outlet

BASE UNIT DIMENSIONS – RAH036–060

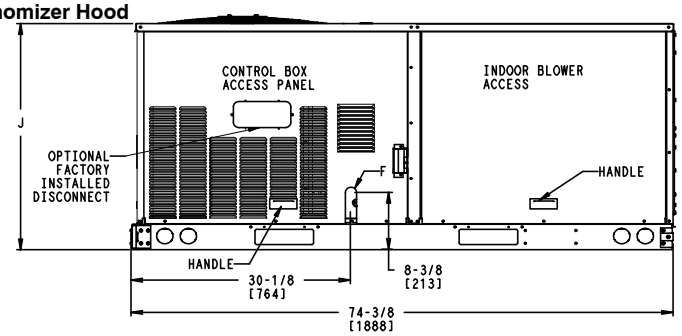
NOTES:

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

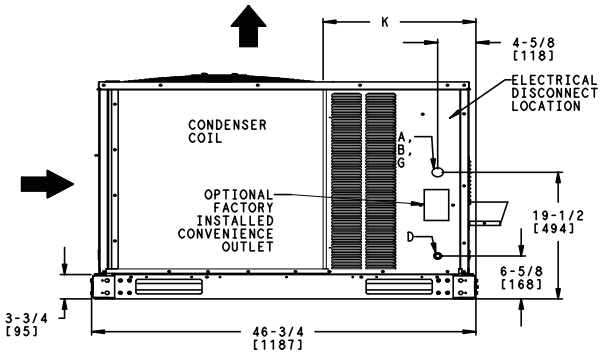




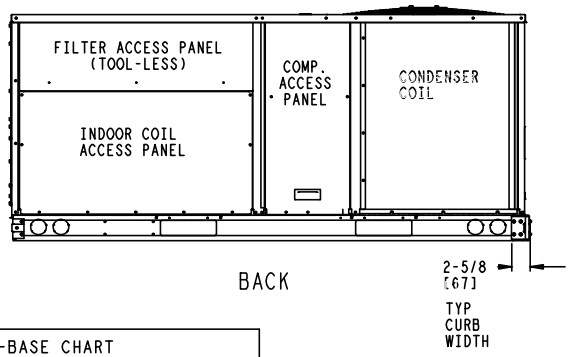
Optional Economizer Hood



FRONT



LEFT



BACK

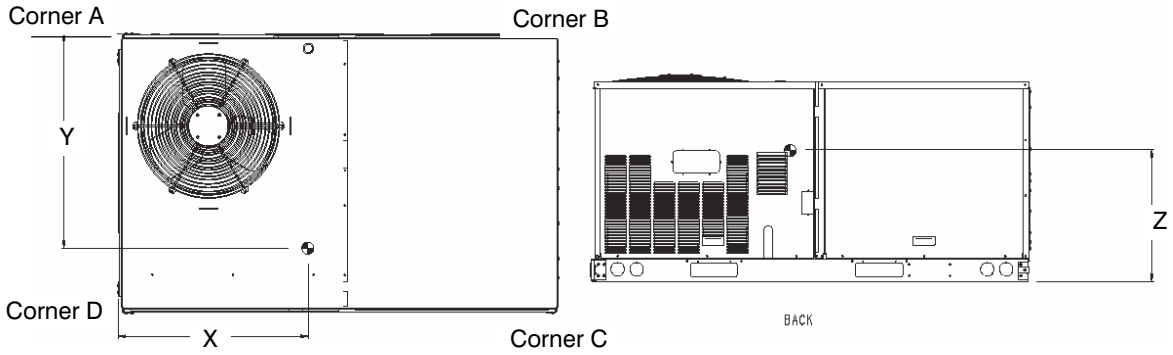
	CONNECTION SIZES
A	1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B	2" [50] DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [51] DIA GAUGE ACCESS PLUG
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
G	2 1/2 " [64] DIA POWER SUPPLY KNOCK-OUT

THRU-THE-BASE CHART THESE HOLES REQUIRED FOR USE CRBTMPWR001A01, 003A01			
	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" (001,003)	POWER	1 1/8" [28.4]
Z**	(003) 1/2" FPT	GAS	1 3/16" [30.0]
	FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X,Y, & Z ARE PROVIDED		
*	SELECT EITHER 3/4" OR 1/2" FOR POWER, DEPENDING ON WIRE SIZE		

UNIT	J	K
036	33 3/8 [847]	18 5/8 [472]
048	41 3/8 [1051]	14 7/8 [377]
060	41 3/8 [1051]	14 7/8 [377]

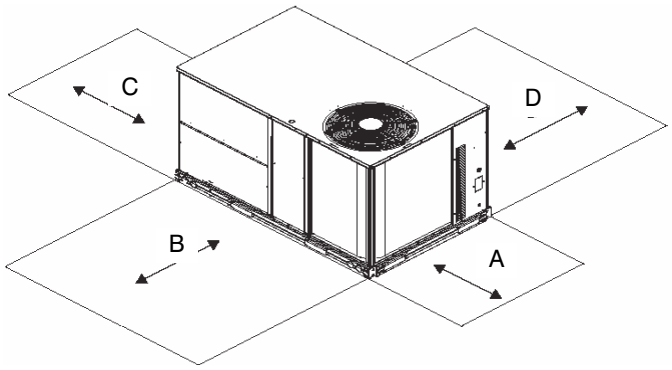
WEIGHT & CLEARANCE DIMENSIONS – RAH036–060 (cont.)

UNIT	BASE UNIT WEIGHT		Corner Weight A		Corner Weight B		Corner Weight C		Corner Weight D		Center of Gravity In [mm]		
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	X	Y	Z
RAH036	458	208	128	58	109	49	101	46	120	54	34–1/8 [867]	22–1/2 [572]	19 3/4 [502]
RAH048	545	247	156	71	135	61	118	54	136	62	34–5/8 [879]	21–3/4 [552]	20–7/8 [530]
RAH060	550	249	160	73	136	62	117	53	138	63	34–1/8 [867]	21–5/8 [549]	20–1/4 [514]



UNIT CLEARANCES

LOC	DIMENSION	CONDITION
A	48” (1219 mm)	Unit disconnect is mounted on panel
	18” (457 mm)	No disconnect, convenience outlet option
	18” (457 mm)	Recommended service clearance
	12” (305 mm)	Minimum clearance
B	42” (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall)
	36” (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” (914 mm)	Side condensate drain is used
	18” (457 mm)	Minimum clearance
D	48” (1219 mm)	No flue discharge accessory installed, surface is combustible material
	42” (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36” (914 mm)	Surface behind servicer is electrically non–conductive (e.g., wood, fiberglass)
	Special	Check for adjacent units or building fresh air intakes within 10–ft of this unit’s flue outlet

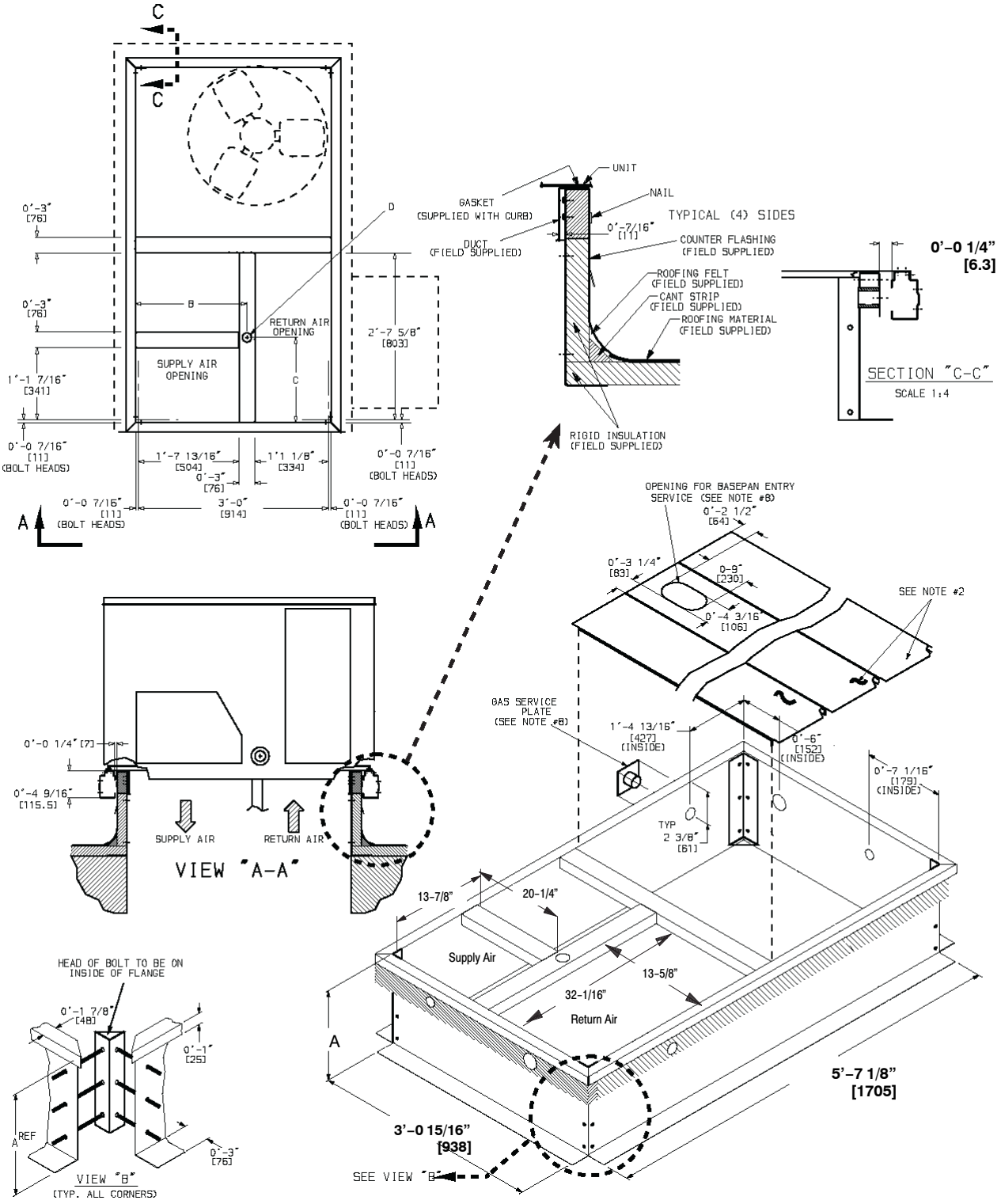


ROOF CURB DETAILS – RAH036–060

RoofCurb Accessory	A	Unit Size
CRRFCURB001A01	1' 2 " [356]	RAH036–060
CRRFCURB002A01	2' 0" [610]	

NOTES:
1. **Roofcurb accessory is shipped disassembled.**
2. **Insulated panels, 1" thick polyurethane foam, 1–3/4# density.**
3. **Dimensions in. [ ] in millimeters.**
4. **Roofcurb 16ga steel.**
5. **Attach ductwork to curb (Flanges of duct rest on curb)**
6. **Service clearance 4' on each side.**
7. **⇨ Direction of airflow.**
8. **Connector pkg. CRBTMPWR001A01 is for thru–the–curb connections. Pkg. CRBTMPWR003A01 is for thru–the–bottom connections.**

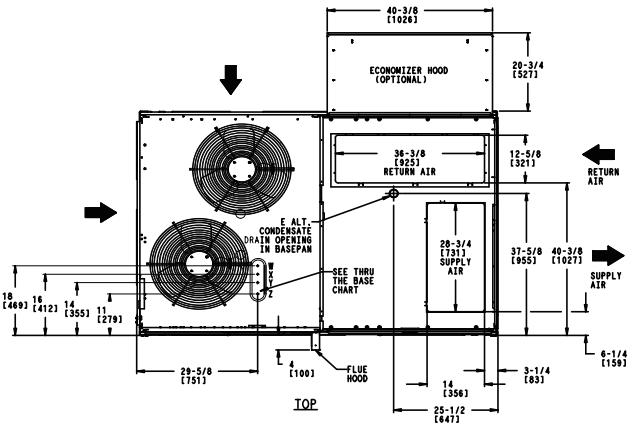
Connector Pkg. Acc.	B	C	D Alt. Drain Hole	Power	Control	Accessory Power
CRBTMPWR001A01	1' 9–11/16" [551]	1' 4" [406]	1–3/4" [44.5]	3/4" [19] NPT	1/2" [12.7] NPT	1/2" [12.7] NPT
CRBTMPWR003A01						

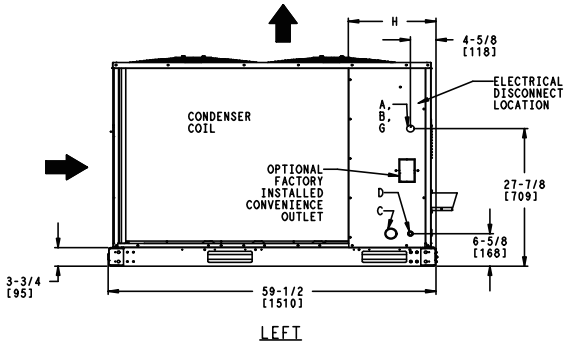


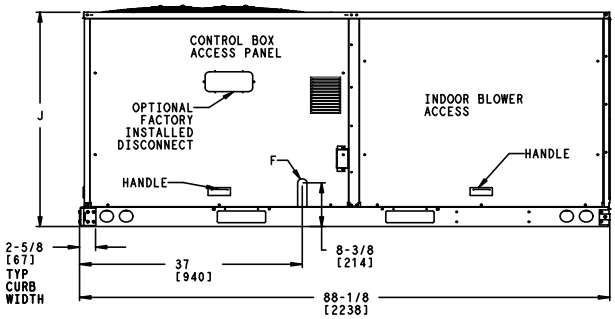
BASE UNIT DIMENSIONS – RAH072–102

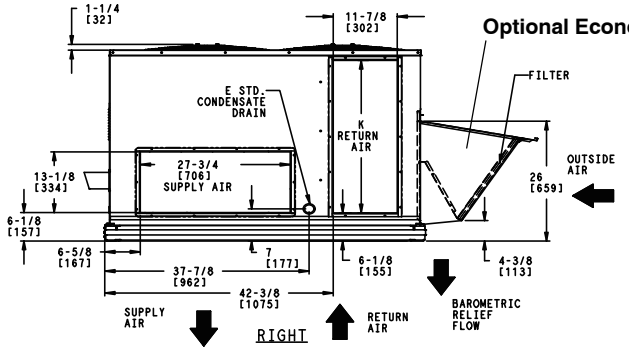
NOTES:

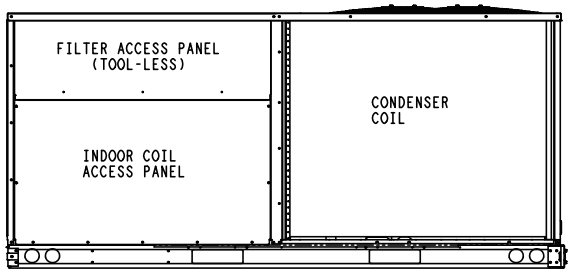
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW











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

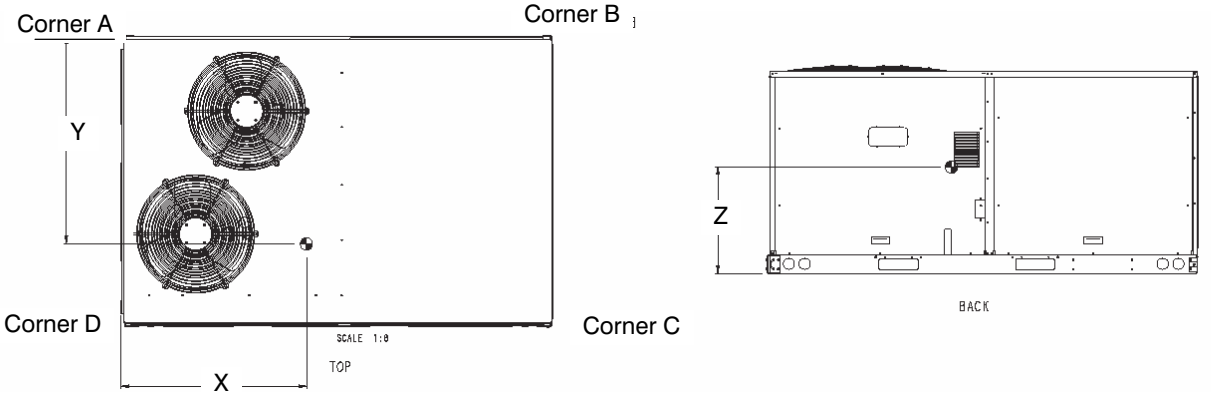
THRU-THE-BASE CHART (FIELD INST)			
THESE HOLES REQUIRED FOR USE WITH ACCY KITS: CRBTMPWR001A01: 072 CRBTMPWR002A01: 090, 102			
	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	ACC.	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y	3/4" (001,003) 1 1/4" (002,004)	POWER	1 1/8" [28.6] 1 3/4" [44.4]

UNIT	J	K	H
072	41 1/4 [1048]	33 [658]	15 7/8 [403]
090	49 3/8 [1253]	36 3/8 [925]	15 7/8 [403]
102	49 3/8 [1253]	36 3/8 [925]	15 7/8 [403]

THRU-THE-BASE CHART (FIOP)
FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X & Y ARE PROVIDED. **
(1) ½" & (1) 1–1/4" Electrical Fittings

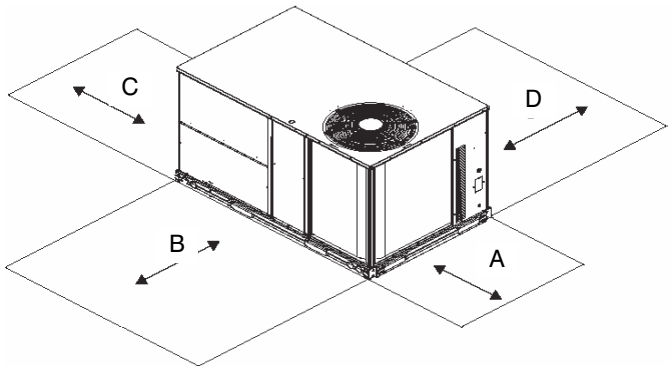
WEIGHT & CLEARANCE DIMENSIONS – RAH072–102 (cont.)

UNIT	BASE UNIT WEIGHT		Corner Weight A		Corner Weight B		Corner Weight C		Corner Weight D		Center of Gravity In [mm]		
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	X	Y	Z
RAH072	715	324	199	73	142	65	193	88	219	99	41–3/8 [1051]	34–1/4 [870]	20–1/2 [521]
RAH090	860	390	199	90	176	80	227	103	257	117	41–3/8 [1051]	33–1/2 [851]	23–3/4 [603]
RAH102	860	390	199	90	176	80	227	103	257	117	41–3/8 [1051]	33–1/2 [851]	23–3/4 [603]



UNIT CLEARANCES

LOC	DIMENSION	CONDITION
A	48” (1219 mm)	Unit disconnect is mounted on panel
	36” (914 mm)	If dimension–B is 12”
	18” (457 mm)	No disconnect, convenience outlet option
	18” (457 mm)	Recommended service clearance (use electric screwdriver)
	12” (305 mm)	Minimum clearance (use manual ratchet screwdriver)
B	36” (914 mm)	Unit has economizer
	12” (305 mm)	If dimension–A is 36”
	Special	Check for sources of flue products within 10–ft of unit fresh air intake hood
C	36” (914 mm)	Side condensate drain is used
	18” (457 mm)	Minimum clearance
D	48” (1219 mm)	No flue discharge accessory installed, surface is combustible material
	42” (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36” (914 mm)	Surface behind servicer is electrically non–conductive (e.g., wood, fiberglass)
	Special	Check for adjacent units or building fresh air intakes within 10–ft of this unit’s flue outlet



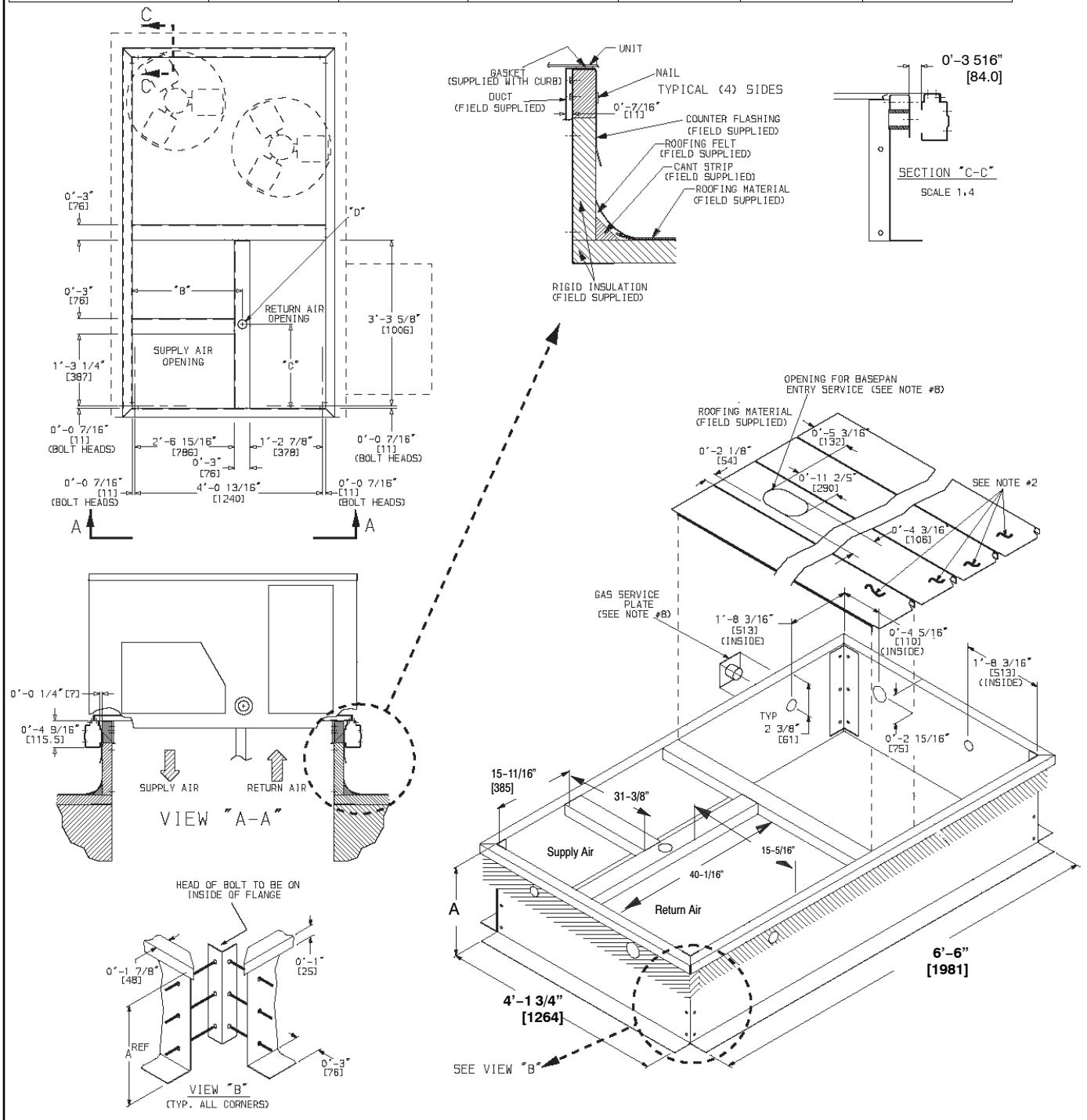
ROOF CURB DETAILS – RAH072 – 102

RoofCurb Accessory	A	Unit Size
CRRFCURB003A01	1' 2 " [356]	RAH072–102
CRRFCURB004A01	2' 0" [610]	

NOTES:

1. **Roofcurb accessory is shipped disassembled.**
2. **Insulated panels, 1" thick polyurethane foam, 1–3/4# density.**
3. **Dimensions in. [ ] in millimeters.**
4. **Roofcurb 16ga steel.**
5. **Attach ductwork to curb (Flanges of duct rest on curb)**
6. **Service clearance 4' on each side.**
7. **⇨ Direction of airflow.**
8. **Connector pkg. CRBTMPWR002A01 is for thru–the–curb connections. Pkg. CRBTMPWR004A01 is for thru–the–bottom connections.**

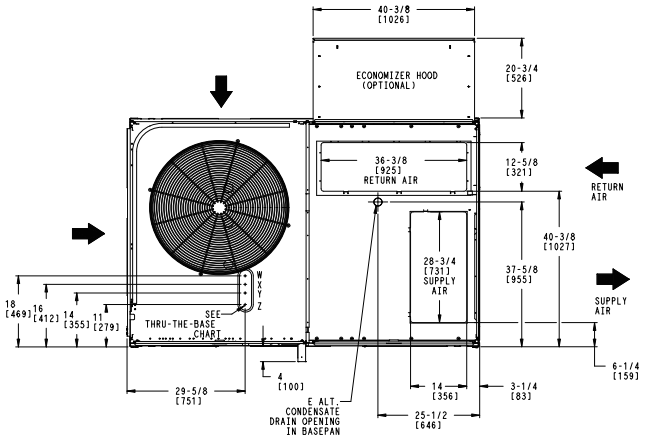
Connector Pkg. Acc.	B	C	D Alt. Drain Hole	Power	Control	Accessory Power
CRBTMPWR001A01 CRBTMPWR002A01	2' 8–7/16" [827]	1' 10–15/16" [583]	1–3/4" [44.5]	1–1/4" [31.7] NPT	1/2" [12.7] NPT	1/2" [12.7] NPT
CRBTMPWR003A01				3/4" [19] NPT		
CRBTMPWR004A01				1–1/4" [31.7] NPT		

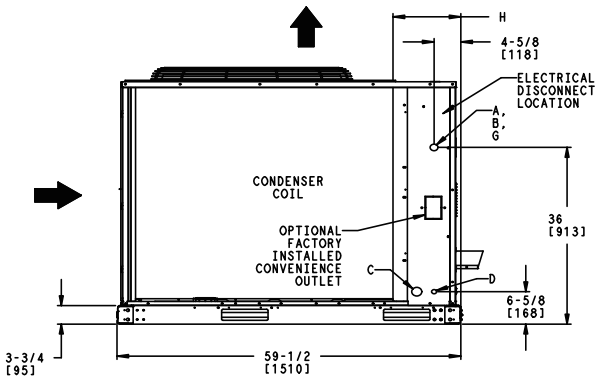


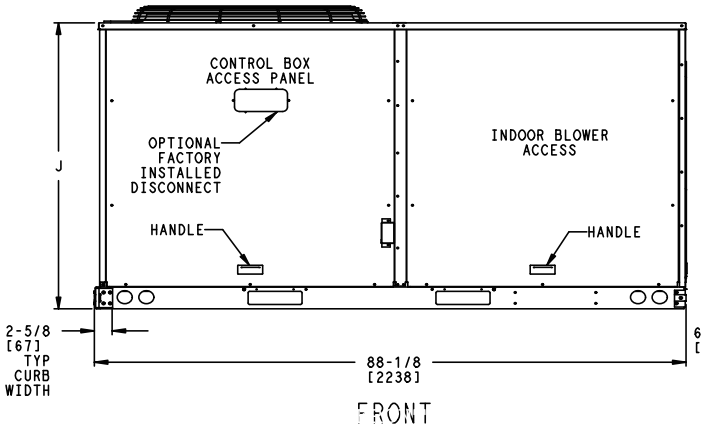
BASE UNIT DIMENSIONS – RAH120

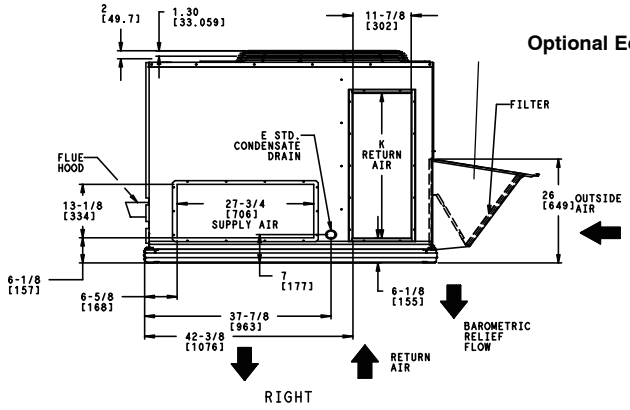
NOTES:

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

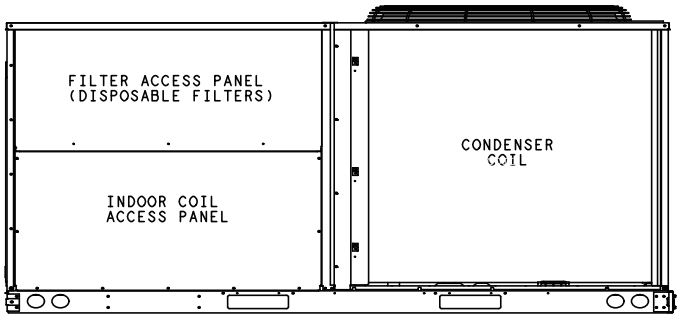








Optional Economizer Hood



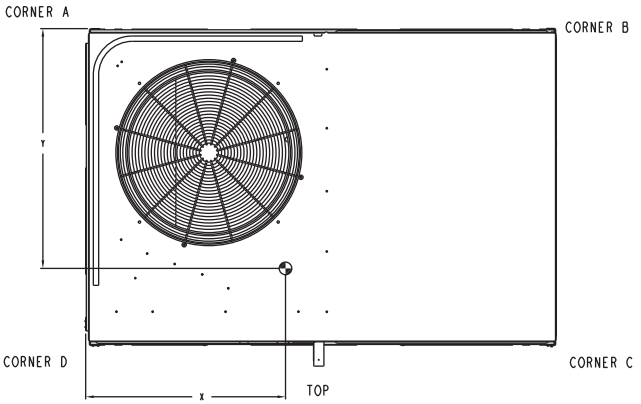
	CONNECTION SIZES
A	1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B	2 1/2" [64] DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [51] DIA GAUGE ACCESS PLUG
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
G	2" [51] DIA POWER SUPPLY KNOCK-OUT

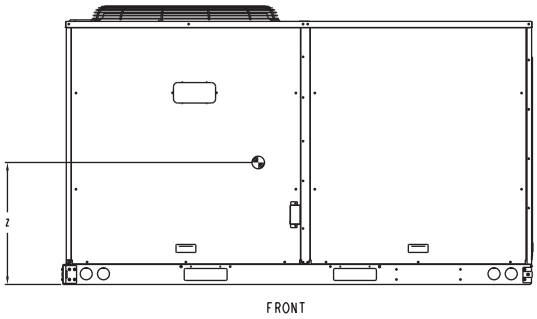
THRU-THE-BASE CHART THESE HOLES REQUIRED FOR USE CRBTMPWR002A01,004A01			
	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	ACC.	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y	1 1/4" (002,004)	POWER	1 3/4" [44.4]
	FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X & Y ARE PROVIDED		

UNIT	H	J	K
RAH120	11 3/8 [289]	49 3/8 [1253]	36-3/8 [925]

WEIGHT & CLEARANCE DIMENSIONS – RAH120 (cont.)

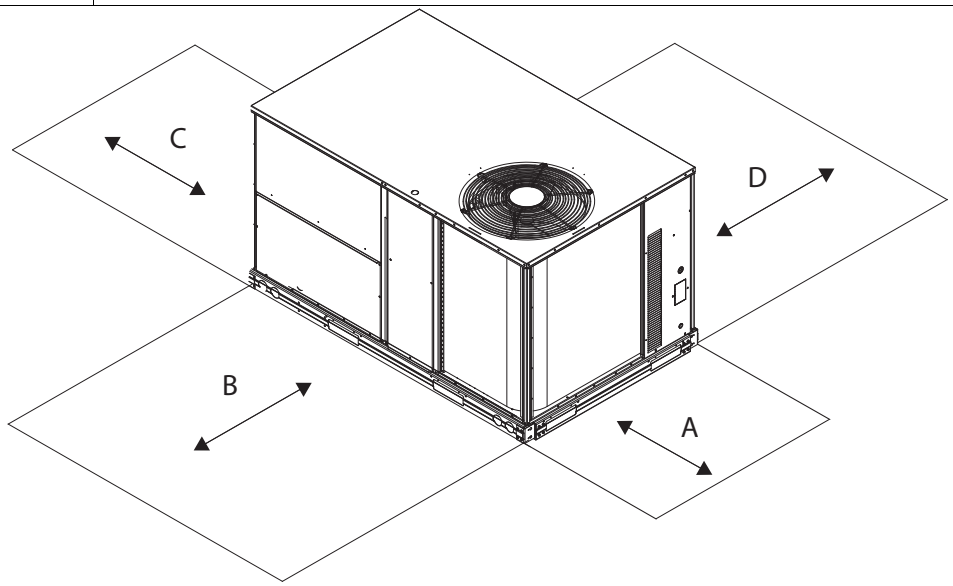
UNIT	BASE UNIT WEIGHT		Corner Weight A		Corner Weight B		Corner Weight C		Corner Weight D		Center of Gravity In [mm]		
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	X	Y	Z
RAH120	1025	465	333	151	290	132	181	85	215	98	41 [1041]	23–3/8 [594]	23–3/4 [603]





UNIT CLEARANCES

LOC	DIMENSION	CONDITION
A	48” (1219 mm)	Unit disconnect is mounted on panel
	18” (457 mm)	No disconnect, convenience outlet option
	18” (457 mm)	Recommended service clearance
	12” (305 mm)	Minimum clearance
B	42” (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall)
	36” (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” (914 mm)	Side condensate drain is used
	18” (457 mm)	Minimum clearance
D	48” (1219 mm)	No flue discharge accessory installed, surface is combustible material
	42” (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36” (914 mm)	Surface behind servicer is electrically non–conductive (e.g., wood, fiberglass)
	Special	Check for adjacent units or building fresh air intakes within 10–ft of this unit’s flue outlet



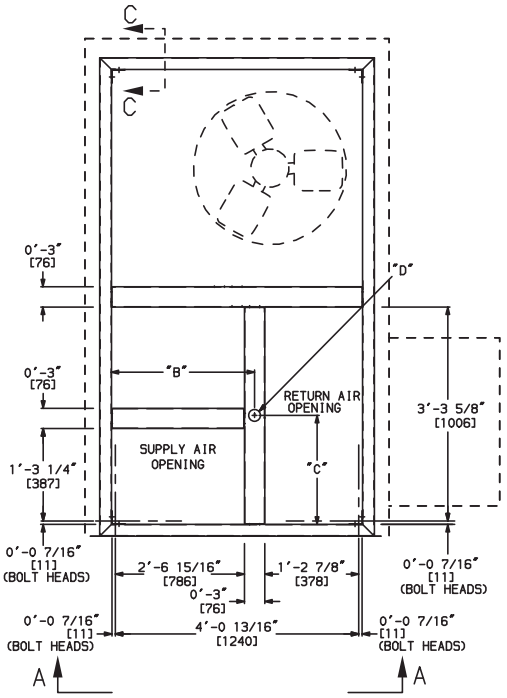
ROOF CURB DETAILS – RAH120

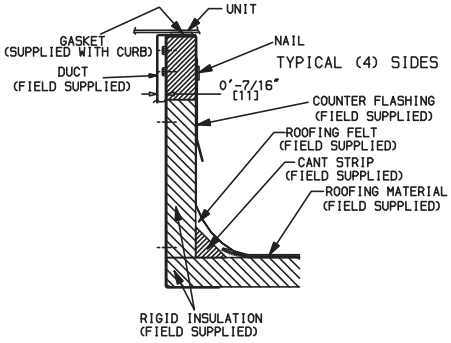
RoofCurb Accessory	A	Unit Size
CRRFCURB003A01	1' 2 " [356]	RAH120
CRRFCURB004A01	2' 0" [610]	

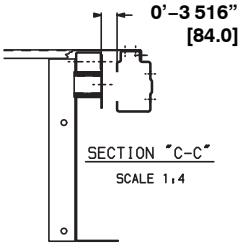
NOTES:

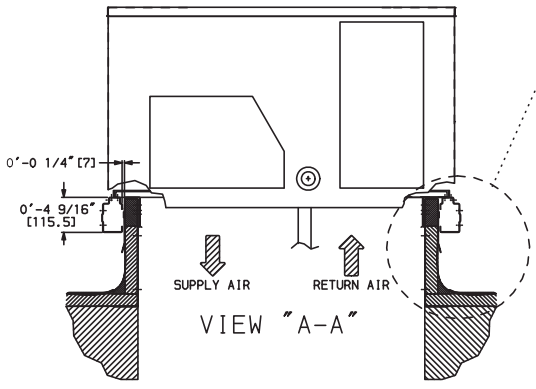
1. **Roofcurb accessory is shipped disassembled.**
2. **Insulated panels, 1" thick polyurethane foam, 1–3/4# density.**
3. **Dimensions in. [ ] in millimeters.**
4. **Roofcurb 16ga steel.**
5. **Attach ductwork to curb (Flanges of duct rest on curb)**
6. **Service clearance 4' on each side.**
7. **⇨ Direction of airflow.**
8. **Connector pkg. CRBTMPWR002A01 is for thru–the–curb connections. Pkg. CRBTMPWR004A01 is for thru–the–bottom connections.**

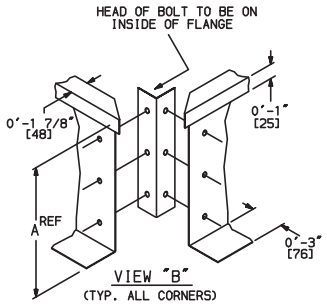
Connector Pkg. Acc.	B	C	D Alt. Drain Hole	Power	Control	Accessory Power
CRBTMPWR001A01 CRBTMPWR002A01	2' 8–7/16" [827]	1' 10–15/16" [583]	1–3/4" [44.5]	1–1/4" [31.7] NPT	1/2" [12.7] NPT	1/2" [12.7] NPT
CRBTMPWR003A01				3/4" [19] NPT		
CRBTMPWR004A01				1–1/4" [31.7] NPT		

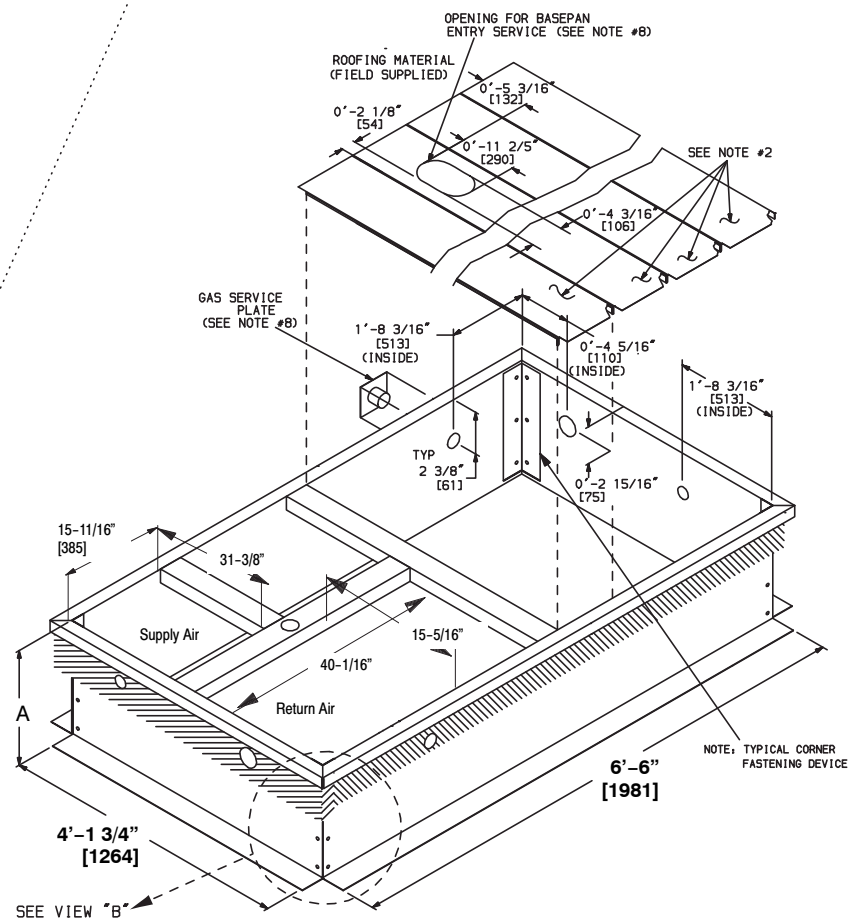








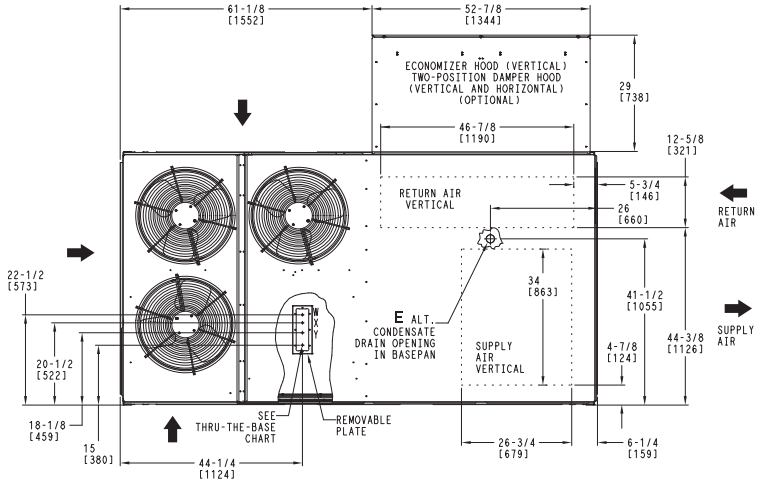


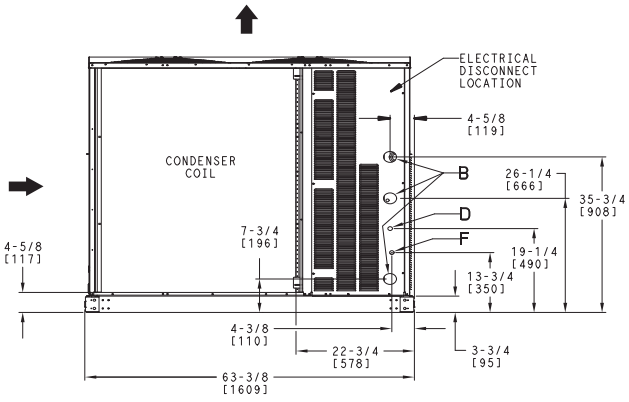


BASE UNIT DIMENSIONS – RAH150

NOTES:

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





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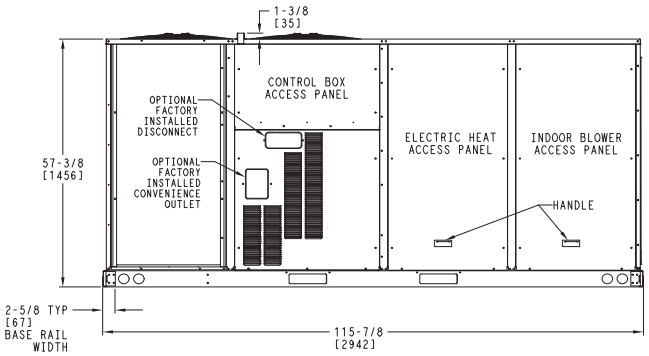
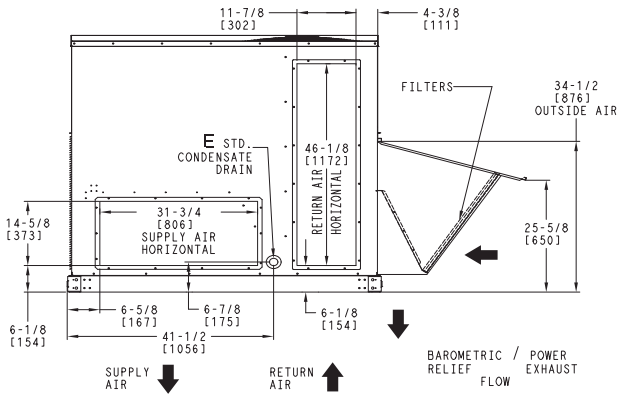


FRONT



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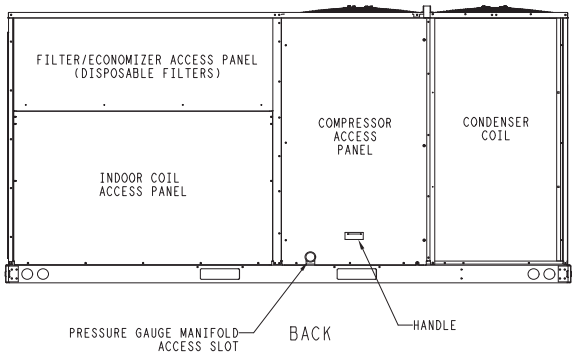


BACK

	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

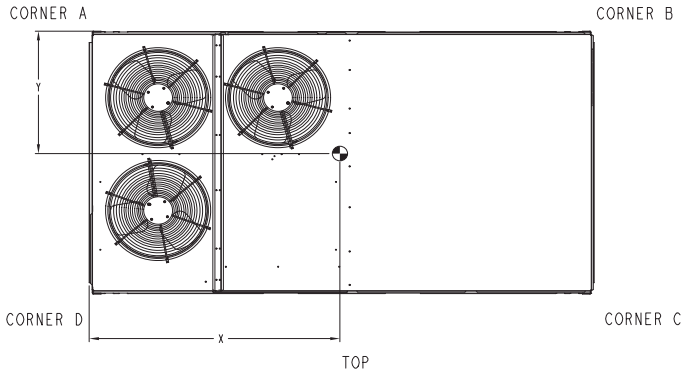
THRU-THE-BASE CHART THESE HOLES REQUIRED FOR USE CRBTMPWR005A00,006A00,007A00				
ACCESSORY NO.		THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
005	W	1/2"	ACC.	7/8" [22.2]
	X	1/2"	24V	7/8" [22.2]
	Y	1 1/4"	POWER	1 1/2" [38.1]
006	W	1/2"	ACC.	7/8" [22.2]
	X	1/2"	24V	7/8" [22.2]
	Y	1 1/2"	POWER	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".			

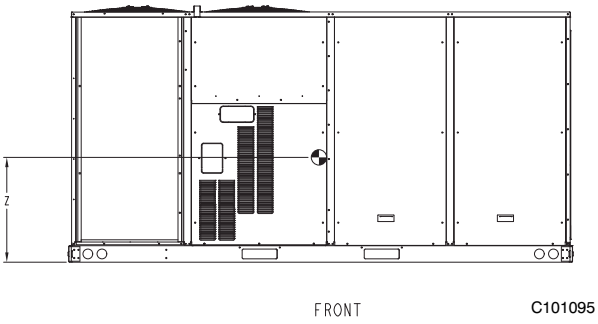
C101007

WEIGHT & CLEARANCE DIMENSIONS – RAH150 (cont.)

UNIT	BASE UNIT WEIGHT*		Corner Weight A		Corner Weight B		Corner Weight C		Corner Weight D		Center of Gravity In [mm]		
	LBS	KG	LBS	KG	LBS	KG	LBS	KG	LBS	KG	X	Y	Z
RAH150	1360	617	335	151	361	164	344	156	320	145	60–1/8 [1527]	31 [787]	21–1/8 [536]

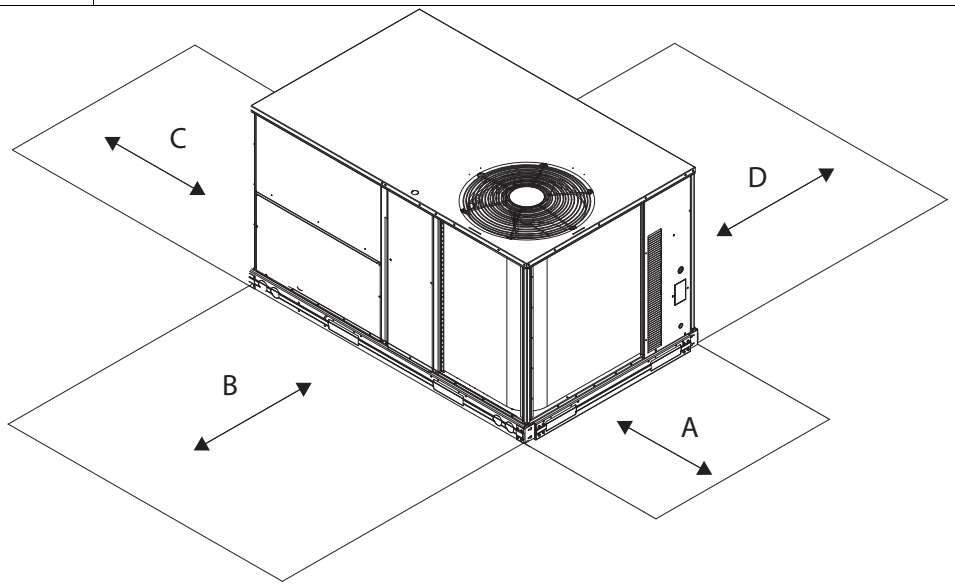
***** Standard unit weight is without electric heat & without packaging.





UNIT CLEARANCES

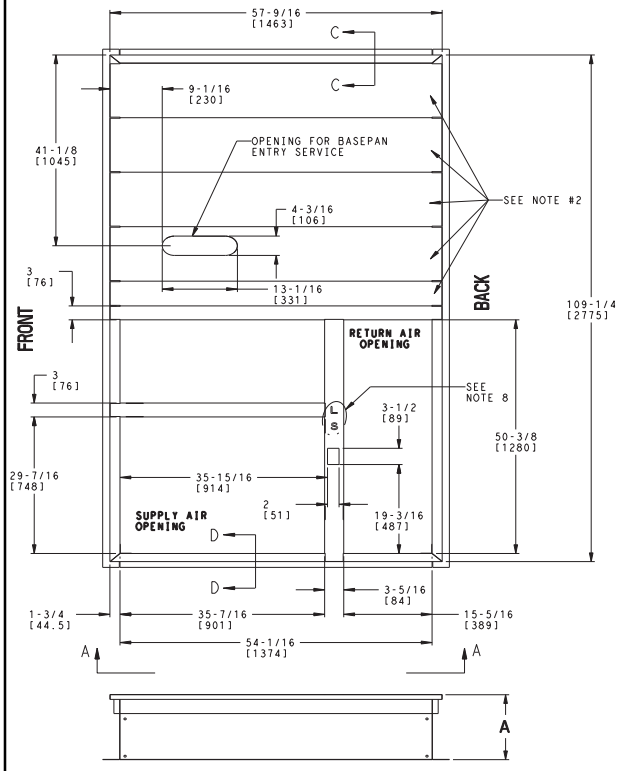
LOC	DIMENSION	CONDITION
A	48” (1219 mm)	Unit disconnect is mounted on panel
	18” (457 mm)	No disconnect, convenience outlet option
	18” (457 mm)	Recommended service clearance
	12” (305 mm)	Minimum clearance
B	42” (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall)
	36” (914 mm)	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” (914 mm)	Side condensate drain is used
	18” (457 mm)	Minimum clearance
D	48” (1219 mm)	No flue discharge accessory installed, surface is combustible material
	42” (1067 mm)	Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36” (914 mm)	Surface behind servicer is electrically non–conductive (e.g., wood, fiberglass)
	Special	Check for adjacent units or building fresh air intakes within 10–ft of this unit’s flue outlet

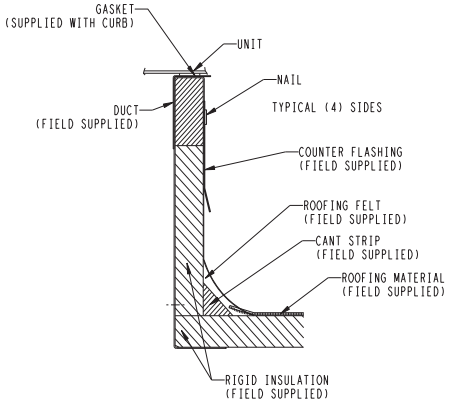


ROOF CURB DETAILS – RAH150

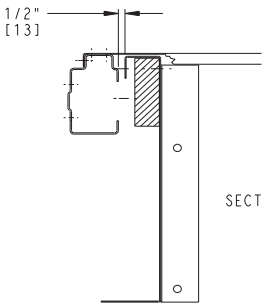
ROOF CURB ACCESSORY #	A
CRRFCURB074A00	14" [356]
CRRFCURB075A00	24" [610]

NOTES:
1. ROOFCURB ACCESSORY IS SHIPPED DISASSEMBLED.
2. INSULATED PANELS: 1/2" THK. NEOPRENE FOAM, 1.0# DENSITY.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOFCURB SIDEWALLS: 16 GAGE STEEL.
5. ATTACH DUCTWORK TO CURB. (FLANGES OF DUCT REST ON CURB).
6. SERVICE CLEARANCE 4 FT ON EACH SIDE.
7. ➡ DIRECTION OF AIR FLOW.
8. "L" & "S" DESIGNATIONS DENOTE LOCATION OF COMMON CROSS RAIL. (POSITION "L" FOR LARGE DUCT OPENING CURB).





DETAIL E



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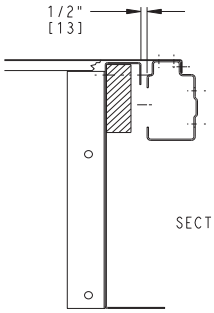

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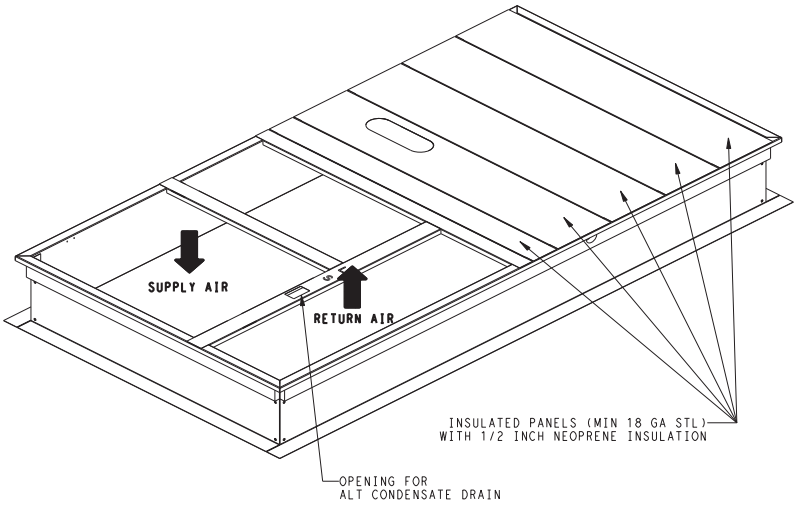
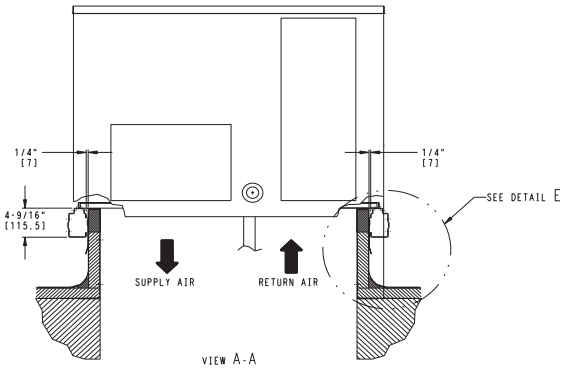




VIEW A-A

OPTIONS & ACCESSORY WEIGHTS

OPTION / ACCESSORY	OPTION / ACCESSORY WEIGHTS – RAH															
	036		048		060		072		090		102		120		150	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
Power Exhaust – vertical	50	23	50	23	50	23	75	34	75	34	75	34	75	34	85	39
Power Exhaust – horizontal	30	14	30	14	30	14	30	14	30	14	30	14	30	14	75	34
EconoMi$er	50	23	50	23	50	23	75	34	75	34	75	34	75	34	115	52
Two Position damper	39	18	39	18	39	18	58	26	58	26	58	26	58	26	65	29
Manual Dampers	12	5	12	5	12	5	18	8	18	8	18	8	18	8	25	11
Hail Guard (louvered)	16	7	16	7	16	7	34	15	34	15	34	15	34	15	45	20
Cu/Cu Condenser Coil	35	16	35	16	35	16	95	43	95	43	95	43	170	77	160	73
Cu/Cu Cond. & Evaporator Coils	60	27	60	27	90	41	140	64	140	64	195	88	270	122	280	127
Roof Curb (14–in. curb)	115	52	115	52	115	52	143	65	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	245	111	235	107
CO_2 sensor	5	2	5	2	5	2	5	2	5	2	5	2	5	2	5	2
Electric Heater	30	14	30	14	30	14	45	20	45	20	45	20	45	20	25	11
Single Point Kit	10	5	10	5	10	5	12	5	12	5	12	5	12	5	25	11
Optional Indoor Motor / Drive	10	5	10	5	10	5	15	7	15	7	15	7	15	7	45	20
Motor Master Controller	35	16	35	16	35	16	35	16	35	16	35	16	35	16	40	18
Supply Smoke Detector	5	2	5	2	5	2	5	2	5	2	5	2	5	2	5	2
Fan / Filter Status Switch	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
Non–Fused Disconnect	15	7	15	7	15	7	15	7	15	7	15	7	15	7	10	5
Non–Powered Convenience outlet	5	2	5	2	5	2	5	2	5	2	5	2	5	2	4	2
Enthalpy Sensor	2	1	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	3	1

APPLICATION DATA

Min operating ambient temp (cooling):

In mechanical cooling mode, your rooftop can safely operate down to an outdoor ambient temperature of 35°F (−2°C) and 25°F (−4°C), with an accessory winter start kit. 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−though 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.

Motor limits, break horsepower (BHP):

Due to the internal unit design, air path, and specially designed motors, the full horsepower (maximum continuous BHP) band, as listed in Table 6, can be used with the utmost confidence. There is no need for extra safety factors, as the 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 an 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 rooftop can operate to ambient temperatures down to −20°F (−29°C) using the recommended accessory Motormaster low ambient controller.

Winter start

The winter start kit extends the low ambient limit of your rooftop to 25°F (−4°C). The kit bypasses the low pressure switch, preventing nuisance tripping of the low pressure switch. Other low ambient precautions may still be prudent.

SELECTION PROCEDURE (WITH RAH072 EXAMPLE)[1]

I. Determine cooling and heating loads.

Given:

Mixed Air Dry bulb	80°F (27°C)
Mixed Air Wet bulb	67°F (19°C)
Ambient Dry bulb	95°F (35°C)
TC_{Load}	69.0 MBH
SHC_{Load}	51.0 MBH
Vertical Supply Air	2100 CFM
External Static Pressure	0.66 in. wg
Electrical Characteristics	230–3–60

II. Make an initial guess at cooling tons.

Refrig. tons = TC_{Load} / 12 MBH per ton
Refrig. tons = 69.0 / 12 = 5.75 tons

In this case, start by looking at the 50HC*A07.

III. Look up the rooftop's TC and SHC.

Table 12 shows that, at the application's supply air CFM, mixed air and ambient temperatures, the RAH072 supplies:
TC_{Load} = 73.6 MBH
SHC_{Load} = 53.3 MBH.

IV. Calculate the building Latent Heat Load.

$LC_{Load} = TC_{Load} - SHC_{Load}$
LC_{Load} = 69.0 MBH – 51.0 MBH = 18.0 MBH

V. Calculate RTU Latent Heat Capacity

LC = TC – SHC
LC = 73.6 MBH – 53.3 MBH = 20.3 MBH

VI. Compare RTU capacities to loads. [2,3]

Compare the rooftop's SHC and LC to the building's Sensible and Latent Heat Loads.

VII. Select factory options (FIOP)

Local code requires an economizer for any unit with TC larger than 65.0 MBH.

VIII. Calculate the total static pressure.

External static pressure	0.66 in. wg
Sum of FIOP/Accessory static	+0.05 in. wg
Total Static Pressure	0.71 in. wg

IX. Look up the Indoor Fan RPM & BHP.

Table 25 shows, at 2100 CFM & ESP= 0.71,
RPM = 680 & BHP = 0.97

X. Convert BHP (Step IX) into fan motor heat.

Fan Motor Heat = 2.546*097/.80 efficiency.
Fan Motor Heat = 1.98 MBH
Deduct this value from the gross capacity vaules for net capacity.

XI. Determine electrical requirements

Table 45 shows the MCA and MOCP of a RAH072 (without convenience outlet) as:

MCA = 32 amps & Breaker size = 50 amps
Min. Disconnect Size: FLA = 31 & LRA = 148.

XII. Determine electrical requirements

LEGEND

BHP — Break horsepower
FLA — Full load amps
LC – Latent capacity
LRA — Lock rotor amp
MBH — (1,000) BTUH
MCA — Min. circuit ampacity
MOCP — Max. over–current protection
RPM — Revolutions per minute
RTU — Rooftop unit
SHC — Sensible heat capacity
TC — Total capacity

NOTES:

1. Selection software saves time by performing many of the steps above. Contact your sales representative for assistance.
2. Selecting a unit with a SHC slightly lower than the SHC_{Load} is often better than oversizing. Slightly lower SHC's will help control indoor humidity, and prevent temperature swings.
3. If the rooftop's capacity meets the Sensible Heat Load, but not the Latent Heat Load.
4. Indoor Fan Motor efficiency is available in Table 41. Use the decimal form in the equation eg. 80% =.8.

Table 9 – COOLING CAPACITIES 1 STAGE COOLING 3 TONS

RAH036				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
900 Cfm	EA (wb)	58	TC	32.1	32.1	36.3	30.8	30.8	34.9	29.4	29.4	33.4	28.0	28.0	31.7	26.3	26.3	29.8
			SHC	27.8	32.1	36.3	26.7	30.8	34.9	25.5	29.4	33.4	24.2	28.0	31.7	22.8	26.3	29.8
		62	TC	34.0	34.0	34.3	32.3	32.3	33.5	30.6	30.6	32.6	28.7	28.7	31.7	26.6	26.6	30.6
			SHC	25.0	29.7	34.3	24.2	28.9	33.5	23.4	28.0	32.6	22.5	27.1	31.7	21.5	26.0	30.6
		67	TC	37.3	37.3	37.3	35.5	35.5	35.5	33.6	33.6	33.6	31.5	31.5	31.5	29.2	29.2	29.2
			SHC	20.7	25.4	30.0	20.0	24.6	29.3	19.2	23.8	28.4	18.3	22.9	27.6	17.4	22.0	26.6
		72	TC	40.8	40.8	40.8	38.9	38.9	38.9	36.9	36.9	36.9	34.6	34.6	34.6	32.2	32.2	32.2
			SHC	16.3	21.0	25.7	15.6	20.3	25.0	14.8	19.5	24.1	13.9	18.6	23.3	13.0	17.7	22.3
		76	TC	–	43.9	43.9	–	41.8	41.8	–	39.6	39.6	–	37.2	37.2	–	34.6	34.6
			SHC	–	17.4	22.4	–	16.7	21.7	–	15.9	20.8	–	15.1	19.9	–	14.2	19.0
1050 Cfm	EA (wb)	58	TC	33.8	33.8	38.4	32.5	32.5	36.8	31.0	31.0	35.1	29.4	29.4	33.3	27.6	27.6	31.3
			SHC	29.3	33.8	38.4	28.1	32.5	36.8	26.9	31.0	35.1	25.5	29.4	33.3	23.9	27.6	31.3
		62	TC	35.1	35.1	37.5	33.3	33.3	36.6	31.5	31.5	35.7	29.6	29.6	34.5	27.7	27.7	32.6
			SHC	26.9	32.2	37.5	26.0	31.3	36.6	25.1	30.4	35.7	24.1	29.3	34.5	22.7	27.7	32.6
		67	TC	38.4	38.4	38.4	36.5	36.5	36.5	34.5	34.5	34.5	32.3	32.3	32.3	29.9	29.9	29.9
			SHC	22.0	27.3	32.7	21.2	26.5	31.9	20.3	25.7	31.0	19.4	24.8	30.1	18.5	23.8	29.1
		72	TC	42.0	42.0	42.0	40.0	40.0	40.0	37.8	37.8	37.8	35.5	35.5	35.5	32.9	32.9	32.9
			SHC	16.9	22.3	27.6	16.1	21.5	26.9	15.3	20.7	26.0	14.4	19.8	25.1	13.5	18.8	24.2
		76	TC	–	45.0	45.0	–	42.9	42.9	–	40.6	40.6	–	38.0	38.0	–	35.3	35.3
			SHC	–	18.1	23.8	–	17.4	23.0	–	16.6	22.2	–	15.7	21.3	–	14.8	20.3
1200 Cfm	EA (wb)	58	TC	35.3	35.3	40.0	33.9	33.9	38.4	32.3	32.3	36.6	30.6	30.6	34.7	28.7	28.7	32.5
			SHC	30.6	35.3	40.0	29.4	33.9	38.4	28.0	32.3	36.6	26.5	30.6	34.7	24.9	28.7	32.5
		62	TC	35.9	35.9	40.5	34.2	34.2	39.4	32.4	32.4	38.1	30.6	30.6	36.1	28.7	28.7	33.9
			SHC	28.6	34.5	40.5	27.7	33.6	39.4	26.6	32.4	38.1	25.2	30.6	36.1	23.6	28.7	33.9
		67	TC	39.3	39.3	39.3	37.3	37.3	37.3	35.2	35.2	35.2	32.9	32.9	32.9	30.5	30.5	31.6
			SHC	23.1	29.1	35.2	22.3	28.3	34.4	21.4	27.5	33.5	20.5	26.6	32.6	19.5	25.6	31.6
		72	TC	42.9	42.9	42.9	40.8	40.8	40.8	38.5	38.5	38.5	36.1	36.1	36.1	33.4	33.4	33.4
			SHC	17.3	23.4	29.5	16.6	22.6	28.7	15.7	21.8	27.9	14.8	20.9	27.0	13.9	19.9	26.0
		76	TC	–	45.9	45.9	–	43.7	43.7	–	41.3	41.3	–	38.7	38.7	–	35.9	35.9
			SHC	–	18.8	25.1	–	18.0	24.3	–	17.2	23.4	–	16.3	22.5	–	15.4	21.5
1350 Cfm	EA (wb)	58	TC	36.6	36.6	41.5	35.1	35.1	39.7	33.4	33.4	37.9	31.6	31.6	35.8	29.6	29.6	33.6
			SHC	31.7	36.6	41.5	30.4	35.1	39.7	28.9	33.4	37.9	27.4	31.6	35.8	25.7	29.6	33.6
		62	TC	36.7	36.7	43.2	35.1	35.1	41.3	33.4	33.4	39.4	31.6	31.6	37.3	29.6	29.6	34.9
			SHC	30.2	36.7	43.2	28.8	35.1	41.3	27.5	33.4	39.4	26.0	31.6	37.3	24.4	29.6	34.9
		67	TC	39.9	39.9	39.9	37.9	37.9	37.9	35.8	35.8	35.9	33.4	33.4	34.9	30.9	30.9	33.9
			SHC	24.2	30.9	37.6	23.4	30.1	36.8	22.5	29.2	35.9	21.6	28.3	34.9	20.6	27.2	33.9
		72	TC	43.6	43.6	43.6	41.4	41.4	41.4	39.1	39.1	39.1	36.6	36.6	36.6	33.9	33.9	33.9
			SHC	17.8	24.5	31.3	17.0	23.7	30.5	16.1	22.9	29.6	15.2	22.0	28.7	14.3	21.0	27.7
		76	TC	–	46.7	46.7	–	44.4	44.4	–	41.9	41.9	–	39.2	39.2	–	36.3	36.3
			SHC	–	19.4	26.3	–	18.6	25.5	–	17.8	24.6	–	16.9	23.7	–	15.9	22.7
1500 Cfm	EA (wb)	58	TC	37.7	37.7	42.7	36.1	36.1	40.9	34.3	34.3	38.9	32.5	32.5	36.8	30.4	30.4	34.4
			SHC	32.6	37.7	42.7	31.3	36.1	40.9	29.8	34.3	38.9	28.1	32.5	36.8	26.3	30.4	34.4
		62	TC	37.7	37.7	44.4	36.1	36.1	42.5	34.4	34.4	40.5	32.5	32.5	38.3	30.4	30.4	35.8
			SHC	31.0	37.7	44.4	29.7	36.1	42.5	28.3	34.4	40.5	26.7	32.5	38.3	25.0	30.4	35.8
		67	TC	40.5	40.5	40.5	38.4	38.4	39.1	36.2	36.2	38.2	33.8	33.8	37.2	31.2	31.2	36.1
			SHC	25.2	32.6	40.0	24.4	31.7	39.1	23.5	30.8	38.2	22.5	29.9	37.2	21.5	28.8	36.1
		72	TC	44.2	44.2	44.2	41.9	41.9	41.9	39.6	39.6	39.6	37.0	37.0	37.0	34.2	34.2	34.2
			SHC	18.2	25.6	33.0	17.4	24.8	32.2	16.5	23.9	31.3	15.6	23.0	30.4	14.7	22.0	29.4
		76	TC	–	47.2	47.2	–	44.9	44.9	–	42.3	42.3	–	39.6	39.6	–	36.7	36.7
			SHC	–	19.9	27.5	–	19.1	26.7	–	18.3	25.8	–	17.4	24.9	–	16.4	23.9

LEGEND:

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

Table 10 – COOLING CAPACITIES 1 STAGE COOLING 4 TONS

RAH048				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
1200 Cfm	EA (wb)	58	TC	43.2	43.2	49.1	41.5	41.5	47.2	39.7	39.7	45.1	37.7	37.7	42.9	35.6	35.6	40.4
			SHC	37.3	43.2	49.1	35.9	41.5	47.2	34.3	39.7	45.1	32.6	37.7	42.9	30.7	35.6	40.4
		62	TC	45.9	45.9	46.0	43.7	43.7	45.0	41.3	41.3	43.8	38.8	38.8	42.6	36.0	36.0	41.2
			SHC	33.5	39.8	46.0	32.5	38.7	45.0	31.3	37.6	43.8	30.1	36.3	42.6	28.8	35.0	41.2
		67	TC	50.5	50.5	50.5	48.0	48.0	48.0	45.4	45.4	45.4	42.6	42.6	42.6	39.6	39.6	39.6
			SHC	27.9	34.1	40.4	26.8	33.1	39.4	25.7	32.0	38.2	24.5	30.8	37.1	23.2	29.5	35.8
		72	TC	55.4	55.4	55.4	52.7	52.7	52.7	49.9	49.9	49.9	46.8	46.8	46.8	43.5	43.5	43.5
			SHC	22.0	28.4	34.7	21.0	27.3	33.7	19.9	26.2	32.5	18.7	25.0	31.3	17.4	23.8	30.1
		76	TC	–	59.7	59.7	–	56.8	56.8	–	53.7	53.7	–	50.4	50.4	–	46.8	46.8
			SHC	–	23.6	30.2	–	22.6	29.2	–	21.5	28.1	–	20.3	26.8	–	19.1	25.5
1400 Cfm	EA (wb)	58	TC	45.6	45.6	51.9	43.8	43.8	49.8	41.9	41.9	47.6	39.7	39.7	45.1	37.3	37.3	42.4
			SHC	39.4	45.6	51.9	37.9	43.8	49.8	36.2	41.9	47.6	34.3	39.7	45.1	32.3	37.3	42.4
		62	TC	47.4	47.4	50.5	45.1	45.1	49.3	42.6	42.6	48.0	40.0	40.0	46.5	37.4	37.4	44.2
			SHC	36.0	43.2	50.5	34.9	42.1	49.3	33.7	40.9	48.0	32.4	39.5	46.5	30.6	37.4	44.2
		67	TC	52.1	52.1	52.1	49.5	49.5	49.5	46.7	46.7	46.7	43.7	43.7	43.7	40.5	40.5	40.5
			SHC	29.5	36.8	44.0	28.4	35.7	42.9	27.3	34.5	41.8	26.0	33.3	40.5	24.7	32.0	39.2
		72	TC	57.1	57.1	57.1	54.3	54.3	54.3	51.2	51.2	51.2	48.0	48.0	48.0	44.5	44.5	44.5
			SHC	22.8	30.1	37.4	21.7	29.0	36.3	20.5	27.8	35.1	19.3	26.6	33.9	18.0	25.3	32.6
		76	TC	–	61.4	61.4	–	58.3	58.3	–	55.1	55.1	–	51.6	51.6	–	47.8	47.8
			SHC	–	24.6	32.2	–	23.5	31.1	–	22.4	29.9	–	21.2	28.7	–	19.9	27.4
1600 Cfm	EA (wb)	58	TC	47.7	47.7	54.2	45.8	45.8	52.0	43.7	43.7	49.6	41.3	41.3	47.0	38.8	38.8	44.1
			SHC	41.2	47.7	54.2	39.5	45.8	52.0	37.7	43.7	49.6	35.7	41.3	47.0	33.5	38.8	44.1
		62	TC	48.7	48.7	54.5	46.3	46.3	53.2	43.7	43.7	51.7	41.4	41.4	48.9	38.8	38.8	45.9
			SHC	38.3	46.4	54.5	37.1	45.2	53.2	35.8	43.7	51.7	33.9	41.4	48.9	31.8	38.8	45.9
		67	TC	53.3	53.3	53.3	50.6	50.6	50.6	47.7	47.7	47.7	44.6	44.6	44.6	41.2	41.2	42.6
			SHC	31.0	39.2	47.5	29.9	38.1	46.3	28.7	37.0	45.2	27.5	35.7	43.9	26.2	34.4	42.6
		72	TC	58.4	58.4	58.4	55.4	55.4	55.4	52.3	52.3	52.3	48.9	48.9	48.9	45.2	45.2	45.2
			SHC	23.4	31.7	39.9	22.3	30.6	38.8	21.1	29.4	37.6	19.9	28.2	36.4	18.6	26.8	35.1
		76	TC	–	62.7	62.7	–	59.5	59.5	–	56.1	56.1	–	52.5	52.5	–	48.6	48.6
			SHC	–	25.5	34.0	–	24.4	32.9	–	23.2	31.7	–	22.0	30.4	–	20.7	29.1
1800 Cfm	EA (wb)	58	TC	49.5	49.5	56.2	47.4	47.4	53.9	45.2	45.2	51.3	42.7	42.7	48.5	40.1	40.1	45.5
			SHC	42.8	49.5	56.2	41.0	47.4	53.9	39.0	45.2	51.3	36.9	42.7	48.5	34.6	40.1	45.5
		62	TC	49.8	49.8	58.1	47.5	47.5	56.1	45.2	45.2	53.4	42.8	42.8	50.5	40.1	40.1	47.4
			SHC	40.4	49.2	58.1	38.8	47.5	56.1	37.0	45.2	53.4	35.0	42.8	50.5	32.8	40.1	47.4
		67	TC	54.3	54.3	54.3	51.5	51.5	51.5	48.5	48.5	48.5	45.3	45.3	47.1	41.8	41.8	45.7
			SHC	32.5	41.7	50.8	31.4	40.5	49.7	30.2	39.3	48.5	28.9	38.0	47.1	27.5	36.6	45.7
		72	TC	59.4	59.4	59.4	56.3	56.3	56.3	53.1	53.1	53.1	49.6	49.6	49.6	45.8	45.8	45.8
			SHC	24.0	33.2	42.4	22.9	32.1	41.3	21.7	30.9	40.1	20.4	29.6	38.8	19.1	28.3	37.5
		76	TC	–	63.8	63.8	–	60.5	60.5	–	57.0	57.0	–	53.2	53.2	–	49.2	49.2
			SHC	–	26.3	35.8	–	25.2	34.6	–	24.0	33.4	–	22.8	32.1	–	21.5	30.8
2000 Cfm	EA (wb)	58	TC	51.0	51.0	58.0	48.8	48.8	55.5	46.5	46.5	52.8	43.9	43.9	49.9	41.1	41.1	46.7
			SHC	44.1	51.0	58.0	42.2	48.8	55.5	40.2	46.5	52.8	37.9	43.9	49.9	35.5	41.1	46.7
		62	TC	51.1	51.1	60.4	48.9	48.9	57.8	46.5	46.5	55.0	44.0	44.0	51.9	41.1	41.1	48.6
			SHC	41.8	51.1	60.4	40.0	48.9	57.8	38.1	46.5	55.0	36.0	44.0	51.9	33.7	41.1	48.6
		67	TC	55.1	55.1	55.1	52.1	52.1	52.9	49.1	49.1	51.6	45.8	45.8	50.2	42.3	42.3	48.7
			SHC	33.9	44.0	54.1	32.7	42.8	52.9	31.5	41.5	51.6	30.2	40.2	50.2	28.8	38.8	48.7
		72	TC	60.3	60.3	60.3	57.1	57.1	57.1	53.7	53.7	53.7	50.1	50.1	50.1	46.3	46.3	46.3
			SHC	24.5	34.7	44.8	23.4	33.5	43.6	22.2	32.3	42.4	21.0	31.1	41.2	19.6	29.7	39.8
		76	TC	–	64.6	64.6	–	61.2	61.2	–	57.6	57.6	–	53.8	53.8	–	49.7	49.7
			SHC	–	27.1	37.5	–	26.0	36.3	–	24.8	35.1	–	23.5	33.8	–	22.2	32.4

LEGEND:

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

Table 11 – COOLING CAPACITIES 1 STAGE COOLING 5 TONS

RAH060				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
1500 Cfm	EA (wb)	58	TC	53.4	53.4	60.6	51.3	51.3	58.2	49.0	49.0	55.6	46.5	46.5	52.7	43.7	43.7	49.5
			SHC	46.3	53.4	60.6	44.5	51.3	58.2	42.5	49.0	55.6	40.3	46.5	52.7	37.9	43.7	49.5
		62	TC	55.6	55.6	58.2	52.9	52.9	56.9	50.0	50.0	55.5	46.9	46.9	53.9	43.8	43.8	51.6
			SHC	42.0	50.1	58.2	40.7	48.8	56.9	39.4	47.4	55.5	37.9	45.9	53.9	36.0	43.8	51.6
		67	TC	60.8	60.8	60.8	57.8	57.8	57.8	54.6	54.6	54.6	51.1	51.1	51.1	47.4	47.4	47.4
			SHC	34.4	42.6	50.7	33.2	41.3	49.4	31.8	39.9	48.1	30.4	38.5	46.6	28.9	37.0	45.1
		72	TC	66.6	66.6	66.6	63.2	63.2	63.2	59.7	59.7	59.7	55.9	55.9	55.9	51.8	51.8	51.8
			SHC	26.7	34.8	43.0	25.4	33.6	41.7	24.1	32.2	40.4	22.6	30.8	38.9	21.1	29.3	37.4
		76	TC	–	71.4	71.4	–	67.9	67.9	–	64.0	64.0	–	59.9	59.9	–	55.5	55.5
			SHC	–	28.5	36.7	–	27.2	35.5	–	25.9	34.2	–	24.5	32.7	–	23.0	31.3
1750 Cfm	EA (wb)	58	TC	56.3	56.3	63.8	54.0	54.0	61.2	51.5	51.5	58.3	48.7	48.7	55.2	45.7	45.7	51.8
			SHC	48.8	56.3	63.8	46.8	54.0	61.2	44.6	51.5	58.3	42.2	48.7	55.2	39.6	45.7	51.8
		62	TC	57.3	57.3	64.0	54.5	54.5	62.5	51.6	51.6	60.7	48.8	48.8	57.5	45.8	45.8	53.9
			SHC	45.3	54.7	64.0	44.0	53.3	62.5	42.4	51.6	60.7	40.1	48.8	57.5	37.6	45.8	53.9
		67	TC	62.5	62.5	62.5	59.3	59.3	59.3	55.9	55.9	55.9	52.3	52.3	52.3	48.3	48.3	49.7
			SHC	36.6	46.0	55.4	35.3	44.7	54.1	33.9	43.3	52.7	32.4	41.8	51.3	30.9	40.3	49.7
		72	TC	68.3	68.3	68.3	64.8	64.8	64.8	61.0	61.0	61.0	57.0	57.0	57.0	52.7	52.7	52.7
			SHC	27.5	37.0	46.5	26.2	35.7	45.2	24.9	34.4	43.8	23.4	32.9	42.4	21.9	31.4	40.8
		76	TC	–	73.2	73.2	–	69.4	69.4	–	65.4	65.4	–	61.1	61.1	–	56.5	56.5
			SHC	–	29.7	39.3	–	28.4	38.0	–	27.1	36.7	–	25.6	35.2	–	24.1	33.7
2000 Cfm	EA (wb)	58	TC	58.7	58.7	66.5	56.2	56.2	63.7	53.5	53.5	60.6	50.6	50.6	57.3	47.3	47.3	53.7
			SHC	50.9	58.7	66.5	48.7	56.2	63.7	46.4	53.5	60.6	43.8	50.6	57.3	41.0	47.3	53.7
		62	TC	58.8	58.8	69.2	56.3	56.3	66.3	53.6	53.6	63.1	50.6	50.6	59.6	47.4	47.4	55.8
			SHC	48.3	58.8	69.2	46.3	56.3	66.3	44.0	53.6	63.1	41.6	50.6	59.6	39.0	47.4	55.8
		67	TC	63.8	63.8	63.8	60.4	60.4	60.4	56.9	56.9	57.3	53.1	53.1	55.8	49.1	49.1	54.1
			SHC	38.6	49.3	60.1	37.3	48.0	58.7	35.9	46.6	57.3	34.4	45.1	55.8	32.8	43.4	54.1
		72	TC	69.6	69.6	69.6	65.9	65.9	65.9	62.1	62.1	62.1	57.9	57.9	57.9	53.5	53.5	53.5
			SHC	28.4	39.1	49.9	27.0	37.8	48.6	25.7	36.4	47.2	24.2	35.0	45.7	22.6	33.4	44.2
		76	TC	–	74.5	74.5	–	70.6	70.6	–	66.5	66.5	–	62.0	62.0	–	–	–
			SHC	–	30.8	41.8	–	29.5	40.4	–	28.2	39.0	–	26.7	37.6	–	–	–
2250 Cfm	EA (wb)	58	TC	60.7	60.7	68.8	58.1	58.1	65.8	55.2	55.2	62.6	52.1	52.1	59.1	48.7	48.7	55.2
			SHC	52.6	60.7	68.8	50.3	58.1	65.8	47.9	55.2	62.6	45.2	52.1	59.1	42.2	48.7	55.2
		62	TC	60.8	60.8	71.6	58.1	58.1	68.5	55.3	55.3	65.1	52.2	52.2	61.4	48.7	48.7	57.4
			SHC	50.0	60.8	71.6	47.8	58.1	68.5	45.4	55.3	65.1	42.9	52.2	61.4	40.1	48.7	57.4
		67	TC	64.7	64.7	64.7	61.3	61.3	63.2	57.7	57.7	61.7	53.8	53.8	60.1	49.7	49.7	58.3
			SHC	40.6	52.6	64.5	39.2	51.2	63.2	37.8	49.7	61.7	36.2	48.2	60.1	34.6	46.5	58.3
		72	TC	70.6	70.6	70.6	66.8	66.8	66.8	62.8	62.8	62.8	58.6	58.6	58.6	54.0	54.0	54.0
			SHC	29.1	41.2	53.3	27.8	39.9	51.9	26.4	38.4	50.5	24.9	37.0	49.0	23.3	35.4	47.4
		76	TC	–	75.6	75.6	–	71.6	71.6	–	67.3	67.3	–	–	–	–	–	–
			SHC	–	31.9	44.1	–	30.6	42.8	–	29.2	41.4	–	–	–	–	–	–
2500 Cfm	EA (wb)	58	TC	62.5	62.5	70.8	59.7	59.7	67.6	56.7	56.7	64.2	53.4	53.4	60.5	49.9	49.9	56.5
			SHC	54.1	62.5	70.8	51.7	59.7	67.6	49.1	56.7	64.2	46.3	53.4	60.5	43.2	49.9	56.5
		62	TC	62.5	62.5	73.6	59.7	59.7	70.3	56.7	56.7	66.8	53.5	53.5	63.0	49.9	49.9	58.8
			SHC	51.4	62.5	73.6	49.1	59.7	70.3	46.6	56.7	66.8	43.9	53.5	63.0	41.0	49.9	58.8
		67	TC	65.5	65.5	68.9	62.0	62.0	67.4	58.3	58.3	65.9	54.4	54.4	64.2	50.2	50.2	62.2
			SHC	42.5	55.7	68.9	41.1	54.3	67.4	39.6	52.7	65.9	38.0	51.1	64.2	36.3	49.2	62.2
		72	TC	71.4	71.4	71.4	67.5	67.5	67.5	63.4	63.4	63.4	59.1	59.1	59.1	54.4	54.4	54.4
			SHC	29.9	43.2	56.5	28.5	41.8	55.2	27.1	40.4	53.7	25.6	38.9	52.2	24.0	37.3	50.6
		76	TC	–	76.4	76.4	–	72.3	72.3	–	–	–	–	–	–	–	–	–
			SHC	–	33.0	46.4	–	31.6	45.1	–	–	–	–	–	–	–	–	–

LEGEND:

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

Table 12 – COOLING CAPACITIES 1 STAGE COOLING 6 TONS

RAH072				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
1800 Cfm	EA (wb)	58	THC	64.1	64.1	72.5	61.8	61.8	69.9	59.2	59.2	67	56.3	56.3	63.7	53.2	53.2	60.2
			SHC	55.7	64.1	72.5	53.7	61.8	69.9	51.4	59.2	67	48.9	56.3	63.7	46.2	53.2	60.2
		62	THC	67.9	67.9	68.5	64.9	64.9	67	61.5	61.5	65.3	57.9	57.9	63.5	54	54	61.4
			SHC	50.2	59.4	68.5	48.8	57.9	67	47.1	56.2	65.3	45.4	54.4	63.5	43.4	52.4	61.4
		67	THC	74.8	74.8	74.8	71.5	71.5	71.5	67.8	67.8	67.8	63.8	63.8	63.8	59.5	59.5	59.5
			SHC	41.8	50.9	60.1	40.3	49.5	58.7	38.8	47.9	57.1	37.1	46.2	55.4	35.3	44.4	53.6
		72	THC	82.2	82.2	82.2	78.7	78.7	78.7	74.7	74.7	74.7	70.4	70.4	70.4	65.6	65.6	65.6
			SHC	33	42.3	51.6	31.6	40.9	50.2	30.1	39.3	48.6	28.4	37.7	46.9	26.7	35.9	45.1
		76	THC	–	88.7	88.7	–	84.8	84.8	–	80.6	80.6	–	76	76	–	70.9	70.9
			SHC	–	35.3	45.2	–	33.9	43.7	–	32.4	42	–	30.7	40.3	–	28.9	38.5
2100 Cfm	EA (wb)	58	THC	67.6	67.6	76.5	65.1	65.1	73.7	62.3	62.3	70.5	59.3	59.3	67.1	55.9	55.9	63.2
			SHC	58.7	67.6	76.5	56.6	65.1	73.7	54.1	62.3	70.5	51.5	59.3	67.1	48.5	55.9	63.2
		62	THC	70.1	70.1	74.9	67	67	73.2	63.5	63.5	71.3	59.7	59.7	69.1	56	56	65.8
			SHC	53.9	64.4	74.9	52.4	62.8	73.2	50.6	61	71.3	48.7	58.9	69.1	46.2	56	65.8
		67	THC	77.1	77.1	77.1	73.6	73.6	73.6	69.7	69.7	69.7	65.5	65.5	65.5	60.9	60.9	60.9
			SHC	44.2	54.8	65.3	42.7	53.3	63.9	41.2	51.7	62.3	39.4	50	60.5	37.6	48.1	58.6
		72	THC	84.7	84.7	84.7	80.9	80.9	80.9	76.8	76.8	76.8	72.2	72.2	72.2	67.2	67.2	67.2
			SHC	34.2	44.8	55.5	32.7	43.4	54	31.1	41.8	52.4	29.5	40.1	50.7	27.6	38.2	48.8
		76	THC	–	91.3	91.3	–	87.2	87.2	–	82.7	82.7	–	77.8	77.8	–	72.5	72.5
			SHC	–	36.7	47.8	–	35.3	46.3	–	33.7	44.7	–	32	43	–	30.2	41.1
2400 Cfm	EA (wb)	58	THC	70.6	70.6	79.9	68	68	76.9	65	65	73.5	61.7	61.7	69.8	58.1	58.1	65.8
			SHC	61.3	70.6	79.9	59	68	76.9	56.4	65	73.5	53.6	61.7	69.8	50.5	58.1	65.8
		62	THC	72	72	80.6	68.7	68.7	78.7	65.2	65.2	76.6	61.8	61.8	72.6	58.2	58.2	68.4
			SHC	57.3	69	80.6	55.6	67.2	78.7	53.7	65.2	76.6	50.9	61.8	72.6	48	58.2	68.4
		67	THC	78.9	78.9	78.9	75.2	75.2	75.2	71.2	71.2	71.2	66.8	66.8	66.8	62	62	63.4
			SHC	46.5	58.4	70.3	45	56.9	68.8	43.4	55.3	67.2	41.6	53.5	65.4	39.7	51.6	63.4
		72	THC	86.6	86.6	86.6	82.7	82.7	82.7	78.3	78.3	78.3	73.6	73.6	73.6	68.4	68.4	68.4
			SHC	35.2	47.2	59.2	33.7	45.7	57.7	32.1	44.1	56	30.4	42.3	54.3	28.5	40.5	52.4
		76	THC	–	93.3	93.3	–	89	89	–	84.4	84.4	–	79.3	79.3	–	73.7	73.7
			SHC	–	38	50.4	–	36.6	48.9	–	35	47.3	–	33.3	45.5	–	31.4	43.6
2700 Cfm	EA (wb)	58	THC	73.2	73.2	82.8	70.4	70.4	79.6	67.3	67.3	76.1	63.8	63.8	72.2	60	60	67.9
			SHC	63.6	73.2	82.8	61.1	70.4	79.6	58.4	67.3	76.1	55.4	63.8	72.2	52.1	60	67.9
		62	THC	73.7	73.7	85.5	70.5	70.5	82.8	67.3	67.3	79.1	63.9	63.9	75.1	60.1	60.1	70.6
			SHC	60.2	72.9	85.5	58.1	70.5	82.8	55.5	67.3	79.1	52.7	63.9	75.1	49.5	60.1	70.6
		67	THC	80.3	80.3	80.3	76.5	76.5	76.5	72.4	72.4	72.4	67.8	67.8	70	62.9	62.9	67.9
			SHC	48.7	61.9	75.1	47.1	60.4	73.6	45.5	58.7	71.9	43.7	56.8	70	41.7	54.8	67.9
		72	THC	88.2	88.2	88.2	84	84	84	79.6	79.6	79.6	74.6	74.6	74.6	69.3	69.3	69.3
			SHC	36.1	49.4	62.7	34.6	47.9	61.2	33	46.2	59.5	31.2	44.5	57.7	29.3	42.6	55.8
		76	THC	–	94.9	94.9	–	90.4	90.4	–	85.6	85.6	–	80.4	80.4	–	74.7	74.7
			SHC	–	39.2	52.9	–	37.7	51.4	–	36.1	49.7	–	34.4	47.9	–	32.5	46
3000 Cfm	EA (wb)	58	THC	75.4	75.4	85.3	72.5	72.5	82	69.2	69.2	78.3	65.6	65.6	74.2	61.7	61.7	69.8
			SHC	65.5	75.4	85.3	62.9	72.5	82	60.1	69.2	78.3	57	65.6	74.2	53.5	61.7	69.8
		62	THC	75.5	75.5	88.7	72.5	72.5	85.3	69.3	69.3	81.4	65.7	65.7	77.2	61.7	61.7	72.5
			SHC	62.2	75.5	88.7	59.8	72.5	85.3	57.1	69.3	81.4	54.1	65.7	77.2	50.9	61.7	72.5
		67	THC	81.4	81.4	81.4	77.5	77.5	78.1	73.3	73.3	76.4	68.7	68.7	74.4	63.7	63.7	72.2
			SHC	50.7	65.2	79.7	49.2	63.7	78.1	47.5	61.9	76.4	45.6	60	74.4	43.6	57.9	72.2
		72	THC	89.4	89.4	89.4	85.2	85.2	85.2	80.5	80.5	80.5	75.5	75.5	75.5	70.1	70.1	70.1
			SHC	36.9	51.5	66.1	35.4	50	64.6	33.8	48.3	62.9	32	46.5	61.1	30.1	44.6	59.1
		76	THC	–	96.1	96.1	–	91.6	91.6	–	86.7	86.7	–	81.3	81.3	–	75.5	75.5
			SHC	–	40.4	55.3	–	38.9	53.8	–	37.2	52.1	–	35.5	50.3	–	33.6	48.3

LEGEND:

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

Table 13 – COOLING CAPACITIES 2 STAGE COOLING 7.5 TONS

RAH090				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
2250 Cfm	EA (wb)	58	THC	81	81	91.8	77.9	77.9	88.4	74.7	74.7	84.6	71.1	71.1	80.6	67.3	67.3	76.3
			SHC	70.2	81	91.8	67.5	77.9	88.4	64.7	74.7	84.6	61.6	71.1	80.6	58.3	67.3	76.3
		62	THC	85.1	85.1	87.2	81.1	81.1	85.3	76.9	76.9	83.2	72.5	72.5	81	67.8	67.8	78.5
			SHC	63.3	75.3	87.2	61.4	73.4	85.3	59.5	71.3	83.2	57.3	69.2	81	55	66.7	78.5
		67	THC	93.3	93.3	93.3	89	89	89	84.3	84.3	84.3	79.4	79.4	79.4	74.1	74.1	74.1
			SHC	52.3	64.2	76.2	50.4	62.4	74.4	48.4	60.4	72.4	46.4	58.3	70.3	44.2	56.2	68.1
		72	THC	102.3	102.3	102.3	97.5	97.5	97.5	92.5	92.5	92.5	87.1	87.1	87.1	81.3	81.3	81.3
			SHC	40.9	53	65	39	51.1	63.1	37.1	49.2	61.2	35.1	47.1	59.1	32.9	44.9	57
		76	THC	–	110	110	–	104.8	104.8	–	99.4	99.4	–	93.5	93.5	–	87.3	87.3
			SHC	–	43.7	56.1	–	41.9	54.2	–	39.9	52.2	–	37.9	50.2	–	35.8	48
2625 Cfm	EA (wb)	58	THC	85.4	85.4	96.9	82.1	82.1	93.1	78.6	78.6	89.1	74.7	74.7	84.7	70.5	70.5	80
			SHC	74	85.4	96.9	71.2	82.1	93.1	68.1	78.6	89.1	64.7	74.7	84.7	61.1	70.5	80
		62	THC	87.8	87.8	95.7	83.7	83.7	93.6	79.3	79.3	91.3	75	75	87.8	70.6	70.6	83.2
			SHC	68.2	82	95.7	66.2	79.9	93.6	64.1	77.7	91.3	61.3	74.6	87.8	58	70.6	83.2
		67	THC	96	96	96	91.4	91.4	91.4	86.5	86.5	86.5	81.3	81.3	81.3	75.8	75.8	75.8
			SHC	55.4	69.3	83.2	53.5	67.4	81.2	51.5	65.4	79.2	49.4	63.2	77.1	47.2	61	74.8
		72	THC	105.2	105.2	105.2	100.1	100.1	100.1	94.8	94.8	94.8	89.1	89.1	89.1	83	83	83
			SHC	42.3	56.2	70.2	40.4	54.3	68.2	38.4	52.3	66.2	36.3	50.2	64.1	34.1	48	61.9
		76	THC	–	112.9	112.9	–	107.5	107.5	–	101.7	101.7	–	95.6	95.6	–	89.1	89.1
			SHC	–	45.5	59.8	–	43.6	57.8	–	41.7	55.8	–	39.6	53.7	–	37.4	51.5
3000 Cfm	EA (wb)	58	THC	89.2	89.2	101.1	85.6	85.6	97.1	81.8	81.8	92.8	77.7	77.7	88.1	73.2	73.2	83
			SHC	77.3	89.2	101.1	74.2	85.6	97.1	70.9	81.8	92.8	67.3	77.7	88.1	63.5	73.2	83
		62	THC	90.1	90.1	103.5	86.1	86.1	100.3	81.9	81.9	96.5	77.8	77.8	91.6	73.3	73.3	86.4
			SHC	72.7	88.1	103.5	70.1	85.2	100.3	67.3	81.9	96.5	63.9	77.8	91.6	60.2	73.3	86.4
		67	THC	98.1	98.1	98.1	93.3	93.3	93.3	88.2	88.2	88.2	82.8	82.8	83.6	77	77	81.3
			SHC	58.4	74.1	89.9	56.5	72.2	87.9	54.4	70.1	85.8	52.3	67.9	83.6	50	65.6	81.3
		72	THC	107.3	107.3	107.3	102.1	102.1	102.1	96.5	96.5	96.5	90.6	90.6	90.6	84.3	84.3	84.3
			SHC	43.5	59.3	75.1	41.6	57.3	73.1	39.5	55.3	71.1	37.4	53.2	69	35.2	50.9	66.7
		76	THC	–	115.2	115.2	–	109.5	109.5	–	103.5	103.5	–	97.2	97.2	–	90.4	90.4
			SHC	–	47.2	63.2	–	45.3	61.3	–	43.3	59.3	–	41.2	57.1	–	38.9	54.8
3375 Cfm	EA (wb)	58	THC	92.4	92.4	104.7	88.6	88.6	100.4	84.6	84.6	95.9	80.2	80.2	90.9	75.5	75.5	85.6
			SHC	80	92.4	104.7	76.8	88.6	100.4	73.3	84.6	95.9	69.5	80.2	90.9	65.4	75.5	85.6
		62	THC	92.5	92.5	109	88.7	88.7	104.5	84.6	84.6	99.7	80.3	80.3	94.6	75.6	75.6	89
			SHC	76	92.5	109	72.9	88.7	104.5	69.6	84.6	99.7	66	80.3	94.6	62.1	75.6	89
		67	THC	99.7	99.7	99.7	94.8	94.8	94.8	89.5	89.5	92.2	84	84	89.9	78	78	87.4
			SHC	61.3	78.8	96.4	59.3	76.8	94.3	57.2	74.7	92.2	55	72.4	89.9	52.6	70	87.4
		72	THC	109	109	109	103.6	103.6	103.6	97.8	97.8	97.8	91.8	91.8	91.8	85.3	85.3	85.3
			SHC	44.6	62.2	79.9	42.7	60.3	77.9	40.6	58.2	75.8	38.5	56.1	73.6	36.2	53.8	71.3
		76	THC	–	116.9	116.9	–	111.1	111.1	–	104.9	104.9	–	98.4	98.4	–	91.5	91.5
			SHC	–	48.8	66.6	–	46.8	64.6	–	44.8	62.6	–	42.7	60.4	–	40.4	58.1
3750 Cfm	EA (wb)	58	THC	95.1	95.1	107.8	91.2	91.2	103.3	86.9	86.9	98.5	82.3	82.3	93.3	77.4	77.4	87.8
			SHC	82.4	95.1	107.8	79	91.2	103.3	75.3	86.9	98.5	71.3	82.3	93.3	67.1	77.4	87.8
		62	THC	95.2	95.2	112.2	91.2	91.2	107.5	87	87	102.5	82.4	82.4	97.1	77.5	77.5	91.3
			SHC	78.2	95.2	112.2	75	91.2	107.5	71.5	87	102.5	67.7	82.4	97.1	63.7	77.5	91.3
		67	THC	101.1	101.1	102.6	96	96	100.5	90.6	90.6	98.3	84.9	84.9	95.9	78.9	78.9	93.2
			SHC	64	83.3	102.6	62	81.2	100.5	59.8	79.1	98.3	57.6	76.7	95.9	55.1	74.2	93.2
		72	THC	110.4	110.4	110.4	104.8	104.8	104.8	98.9	98.9	98.9	92.7	92.7	92.7	86.1	86.1	86.1
			SHC	45.7	65.1	84.5	43.7	63.1	82.5	41.7	61	80.4	39.5	58.8	78.2	37.2	56.5	75.9
		76	THC	–	118.3	118.3	–	112.4	112.4	–	106	106	–	99.4	99.4	–	92.3	92.3
			SHC	–	50.3	69.9	–	48.3	67.9	–	46.2	65.8	–	44.1	63.6	–	41.8	61.3

LEGEND:

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

Table 14 – COOLING CAPACITIES 2 STAGE COOLING 8.5 TONS

RAH102				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
2550 Cfm	EA (wb)	58	THC	90.5	90.5	102.4	87	87	98.5	83.2	83.2	94.2	79.1	79.1	89.6	74.7	74.7	84.6
			SHC	78.6	90.5	102.4	75.5	87	98.5	72.2	83.2	94.2	68.7	79.1	89.6	64.8	74.7	84.6
		62	THC	94.8	94.8	98.1	90.2	90.2	95.8	85.4	85.4	93.4	80.3	80.3	90.8	74.9	74.9	87.8
			SHC	71.2	84.6	98.1	69.1	82.4	95.8	66.8	80.1	93.4	64.3	77.5	90.8	61.6	74.7	87.8
		67	THC	104	104	104	99	99	99	93.7	93.7	93.7	88	88	88	81.9	81.9	81.9
			SHC	58.7	72.2	85.7	56.6	70	83.5	54.3	67.8	81.3	52	65.4	78.9	49.5	62.9	76.4
		72	THC	114	114	114	108.5	108.5	108.5	102.7	102.7	102.7	96.5	96.5	96.5	89.8	89.8	89.8
			SHC	45.8	59.3	72.9	43.7	57.2	70.8	41.4	55	68.5	39.1	52.7	66.2	36.7	50.2	63.7
		76	THC	–	122.4	122.4	–	116.5	116.5	–	110.3	110.3	–	103.7	103.7	–	96.5	96.5
			SHC	–	48.8	62.8	–	46.7	60.6	–	44.5	58.4	–	42.2	56	–	39.8	53.5
2975 Cfm	EA (wb)	58	THC	95.4	95.4	108	91.6	91.6	103.7	87.5	87.5	99	83.1	83.1	94	78.3	78.3	88.6
			SHC	82.8	95.4	108	79.5	91.6	103.7	75.9	87.5	99	72.1	83.1	94	68	78.3	88.6
		62	THC	97.7	97.7	107.4	93	93	104.9	88.1	88.1	102.1	83.2	83.2	97.9	78.4	78.4	92.2
			SHC	76.7	92	107.4	74.3	89.6	104.9	71.8	86.9	102.1	68.6	83.2	97.9	64.6	78.4	92.2
		67	THC	106.9	106.9	106.9	101.6	101.6	101.6	96	96	96	90.1	90.1	90.1	83.7	83.7	83.9
			SHC	62.3	77.8	93.4	60.1	75.6	91.2	57.8	73.3	88.9	55.4	70.9	86.5	52.8	68.3	83.9
		72	THC	117	117	117	111.2	111.2	111.2	105.1	105.1	105.1	98.6	98.6	98.6	91.7	91.7	91.7
			SHC	47.3	62.9	78.6	45.1	60.8	76.4	42.9	58.5	74.1	40.5	56.1	71.7	38	53.6	69.2
		76	THC	–	125.6	125.6	–	119.4	119.4	–	112.8	112.8	–	105.9	105.9	–	98.4	98.4
			SHC	–	50.8	66.8	–	48.7	64.6	–	46.4	62.3	–	44.1	59.9	–	41.6	57.4
3400 Cfm	EA (wb)	58	THC	99.5	99.5	112.7	95.4	95.4	108	91	91	103	86.3	86.3	97.7	81.2	81.2	91.9
			SHC	86.4	99.5	112.7	82.8	95.4	108	79	91	103	74.9	86.3	97.7	70.5	81.2	91.9
		62	THC	100.3	100.3	115.8	95.6	95.6	112.4	91.2	91.2	107.2	86.4	86.4	101.6	81.3	81.3	95.6
			SHC	81.5	98.6	115.8	78.7	95.6	112.4	75.1	91.2	107.2	71.2	86.4	101.6	67	81.3	95.6
		67	THC	109.1	109.1	109.1	103.6	103.6	103.6	97.8	97.8	97.8	91.6	91.6	93.7	85	85	90.9
			SHC	65.6	83.2	100.8	63.4	81	98.6	61	78.6	96.2	58.6	76.1	93.7	55.9	73.4	90.9
		72	THC	119.3	119.3	119.3	113.3	113.3	113.3	107	107	107	100.3	100.3	100.3	93	93	93
			SHC	48.7	66.4	84.1	46.5	64.2	81.8	44.2	61.8	79.5	41.8	59.4	77.1	39.2	56.9	74.5
		76	THC	–	128	128	–	121.5	121.5	–	114.7	114.7	–	107.5	107.5	–	99.8	99.8
			SHC	–	52.6	70.6	–	50.5	68.4	–	48.2	66.1	–	45.8	63.6	–	43.3	61.1
3825 Cfm	EA (wb)	58	THC	103	103	116.6	98.7	98.7	111.7	94	94	106.4	89	89	100.8	83.6	83.6	94.7
			SHC	89.4	103	116.6	85.6	98.7	111.7	81.6	94	106.4	77.3	89	100.8	72.6	83.6	94.7
		62	THC	103.1	103.1	121.3	98.8	98.8	116.1	94.1	94.1	110.7	89.1	89.1	104.8	83.7	83.7	98.4
			SHC	85	103.1	121.3	81.4	98.8	116.1	77.5	94.1	110.7	73.4	89.1	104.8	69	83.7	98.4
		67	THC	110.9	110.9	110.9	105.2	105.2	105.7	99.2	99.2	103.2	92.9	92.9	100.5	86.1	86.1	97.6
			SHC	68.8	88.4	108	66.5	86.1	105.7	64.1	83.7	103.2	61.6	81.1	100.5	58.9	78.3	97.6
		72	THC	121.2	121.2	121.2	114.9	114.9	114.9	108.4	108.4	108.4	101.5	101.5	101.5	94.1	94.1	94.1
			SHC	50	69.7	89.4	47.7	67.4	87.1	45.4	65.1	84.7	43	62.6	82.3	40.4	60	79.6
		76	THC	–	129.8	129.8	–	123.2	123.2	–	116.2	116.2	–	108.8	108.8	–	100.9	100.9
			SHC	–	54.4	74.3	–	52.2	72.1	–	49.9	69.7	–	47.5	67.3	–	44.9	64.7
4250 Cfm	EA (wb)	58	THC	106	106	119.9	101.4	101.4	114.8	96.6	96.6	109.3	91.3	91.3	103.4	85.7	85.7	97
			SHC	92	106	119.9	88	101.4	114.8	83.8	96.6	109.3	79.3	91.3	103.4	74.4	85.7	97
		62	THC	106.1	106.1	124.7	101.5	101.5	119.4	96.6	96.6	113.6	91.4	91.4	107.5	85.7	85.7	100.8
			SHC	87.4	106.1	124.7	83.6	101.5	119.4	79.6	96.6	113.6	75.3	91.4	107.5	70.6	85.7	100.8
		67	THC	112.3	112.3	114.9	106.5	106.5	112.5	100.4	100.4	109.9	93.9	93.9	107	87.1	87.1	103.8
			SHC	71.8	93.4	114.9	69.5	91	112.5	67	88.5	109.9	64.4	85.7	107	61.6	82.7	103.8
		72	THC	122.6	122.6	122.6	116.2	116.2	116.2	109.5	109.5	109.5	102.5	102.5	102.5	94.9	94.9	94.9
			SHC	51.2	72.8	94.5	48.9	70.5	92.2	46.6	68.2	89.8	44.1	65.7	87.3	41.5	63.1	84.6
		76	THC	–	131.3	131.3	–	124.5	124.5	–	117.4	117.4	–	109.8	109.8	–	101.8	101.8
			SHC	–	56	77.9	–	53.8	75.6	–	51.5	73.3	–	49.1	70.8	–	46.5	68.1

LEGEND:

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

Table 15 – COOLING CAPACITIES 2 STAGE COOLING 10 TONS

RAH120				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	EA (wb)	58	THC	104.3	104.3	118.5	99.5	99.5	113	93.4	93.4	106.1	86.7	86.7	98.6	79.7	79.7	90.6
			SHC	90.2	104.3	118.5	86	99.5	113	80.6	93.4	106.1	74.9	86.7	98.6	68.8	79.7	90.6
		62	THC	109.7	109.7	112.4	103.6	103.6	109.5	95.9	95.9	105.9	87.6	87.6	101.2	79.8	79.8	94.4
			SHC	80.8	96.6	112.4	78	93.8	109.5	74.5	90.2	105.9	70.3	85.7	101.2	65.2	79.8	94.4
		67	THC	121.5	121.5	121.5	115.4	115.4	115.4	107.8	107.8	107.8	98.7	98.7	98.7	89.1	89.1	89.1
			SHC	65.2	81	96.9	62.7	78.6	94.5	59.7	75.6	91.5	56.2	72	87.9	52.5	68.3	84.2
		72	THC	133	133	133	127.1	127.1	127.1	120.5	120.5	120.5	112	112	112	102.1	102.1	102.1
			SHC	48.7	64.5	80.4	46.5	62.4	78.3	44.1	60	75.9	41.2	57.1	73	37.8	53.7	69.6
		76	THC	–	140.9	140.9	–	135.1	135.1	–	128.4	128.4	–	121.3	121.3	–	112.5	112.5
			SHC	–	50.6	67.1	–	48.7	65.2	–	46.6	63.1	–	44.3	60.7	–	41.4	57.7
3500 Cfm	EA (wb)	58	THC	109.9	109.9	124.9	104.9	104.9	119.3	98.7	98.7	112.2	91.6	91.6	104.2	84.2	84.2	95.8
			SHC	94.9	109.9	124.9	90.6	104.9	119.3	85.2	98.7	112.2	79	91.6	104.2	72.6	84.2	95.8
		62	THC	112.8	112.8	123.1	106.7	106.7	120	99.5	99.5	115.3	91.7	91.7	108.5	84.3	84.3	99.8
			SHC	86.8	104.9	123.1	83.9	102	120	80	97.6	115.3	74.9	91.7	108.5	68.8	84.3	99.8
		67	THC	124.2	124.2	124.2	118	118	118	110.3	110.3	110.3	101	101	101	91	91	92.5
			SHC	68.4	86.7	104.9	66.1	84.3	102.6	63.2	81.5	99.8	59.6	78	96.3	55.9	74.2	92.5
		72	THC	135.2	135.2	135.2	129.1	129.1	129.1	122.4	122.4	122.4	114.2	114.2	114.2	104.2	104.2	104.2
			SHC	49.2	67.3	85.4	47.1	65.3	83.4	44.8	63	81.2	42	60.4	78.7	38.7	57.1	75.5
		76	THC	–	142.4	142.4	–	136.5	136.5	–	129.6	129.6	–	122.4	122.4	–	114	114
			SHC	–	51.7	70.9	–	49.7	68.7	–	47.5	66.3	–	45.2	63.8	–	42.6	61.2
4000 Cfm	EA (wb)	58	THC	114.3	114.3	130	109.2	109.2	124.2	102.9	102.9	117	95.4	95.4	108.7	87.7	87.7	99.9
			SHC	98.6	114.3	130	94.2	109.2	124.2	88.7	102.9	117	82.2	95.4	108.7	75.5	87.7	99.9
		62	THC	115.3	115.3	132.4	109.6	109.6	128.3	102.9	102.9	121.9	95.5	95.5	113.2	87.8	87.8	104.1
			SHC	91.9	112.2	132.4	88.7	108.5	128.3	84	102.9	121.9	77.9	95.5	113.2	71.5	87.8	104.1
		67	THC	125.8	125.8	125.8	119.5	119.5	119.5	111.9	111.9	111.9	102.4	102.4	104.2	92.2	92.2	100.4
			SHC	71.3	91.8	112.3	69	89.6	110.2	66.2	86.9	107.6	62.8	83.5	104.2	59.1	79.7	100.4
		72	THC	136.3	136.3	136.3	130.2	130.2	130.2	123.4	123.4	123.4	115.4	115.4	115.4	105.3	105.3	105.3
			SHC	49.5	69.7	89.8	47.4	67.7	87.9	45.1	65.5	85.9	42.5	63.1	83.7	39.3	60.1	80.9
		76	THC	–	143.1	143.1	–	137.1	137.1	–	130.1	130.1	–	122.6	122.6	–	114.5	114.5
			SHC	–	52.2	73.2	–	50.2	71.1	–	48	68.7	–	45.7	66.4	–	43.3	64.1
4500 Cfm	EA (wb)	58	THC	117.5	117.5	133.8	112.4	112.4	127.9	106	106	120.7	98.4	98.4	112.1	90.3	90.3	103
			SHC	101.3	117.5	133.8	96.8	112.4	127.9	91.2	106	120.7	84.6	98.4	112.1	77.7	90.3	103
		62	THC	117.6	117.6	139.4	112.5	112.5	133.3	106.1	106.1	125.8	98.5	98.5	116.8	90.4	90.4	107.4
			SHC	95.9	117.6	139.4	91.6	112.5	133.3	86.4	106.1	125.8	80.1	98.5	116.8	73.5	90.4	107.4
		67	THC	126.6	126.6	126.6	120.2	120.2	120.2	112.8	112.8	114.8	103.2	103.2	111.6	93	93	107.6
			SHC	73.7	96.4	119.2	71.5	94.3	117.2	68.9	91.8	114.8	65.6	88.6	111.6	61.8	84.7	107.6
		72	THC	136.7	136.7	136.7	130.5	130.5	130.5	123.6	123.6	123.6	115.7	115.7	115.7	105.7	105.7	105.7
			SHC	49.4	71.6	93.7	47.4	69.7	91.9	45.1	67.5	89.9	42.7	65.4	88.2	39.5	62.6	85.8
		76	THC	–	143.1	143.1	–	137	137	–	129.9	129.9	–	122.4	122.4	–	114.3	114.3
			SHC	–	52.4	75.1	–	50.5	73.1	–	48.2	70.8	–	46	68.5	–	43.7	66.5
5000 Cfm	EA (wb)	58	THC	119.9	119.9	136.7	114.7	114.7	130.7	108.4	108.4	123.6	100.6	100.6	114.8	92.3	92.3	105.4
			SHC	103.2	119.9	136.7	98.6	114.7	130.7	93.2	108.4	123.6	86.4	100.6	114.8	79.2	92.3	105.4
		62	THC	120	120	142.4	114.7	114.7	136.2	108.5	108.5	128.8	100.7	100.7	119.7	92.4	92.4	109.9
			SHC	97.6	120	142.4	93.3	114.7	136.2	88.1	108.5	128.8	81.7	100.7	119.7	74.9	92.4	109.9
		67	THC	126.8	126.8	126.8	120.4	120.4	123.6	113.2	113.2	121.3	103.8	103.8	118.4	93.6	93.6	114
			SHC	75.7	100.6	125.4	73.6	98.6	123.6	71.2	96.2	121.3	68	93.2	118.4	64.2	89.1	114
		72	THC	136.5	136.5	136.5	130.2	130.2	130.2	123.2	123.2	123.2	115.5	115.5	115.5	105.6	105.6	105.6
			SHC	49.1	73.1	97	47.1	71.3	95.4	44.9	69.2	93.5	42.5	67.3	92	39.5	64.9	90.2
		76	THC	–	142.7	142.7	–	136.5	136.5	–	129.4	129.4	–	121.6	121.6	–	113.6	113.6
			SHC	–	52.2	76.7	–	50.4	74.7	–	48.2	72.4	–	45.9	70.1	–	43.7	68.3

LEGEND:

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

Table 16 – COOLING CAPACITIES 2 STAGE COOLING 12.5 TONS

RAH150				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
3750 Cfm	EA (wB)	58	TC	131.9	131.9	149.8	127.0	127.0	144.1	121.5	121.5	137.9	115.4	115.4	131.0	108.7	108.7	123.4
			SHC	114.1	131.9	149.8	109.8	127.0	144.1	105.0	121.5	137.9	99.8	115.4	131.0	94.0	108.7	123.4
		62	TC	138.0	138.0	143.4	131.7	131.7	140.4	124.7	124.7	136.9	117.1	117.1	133.1	109.4	109.4	127.4
			SHC	103.4	123.4	143.4	100.4	120.4	140.4	97.1	117.0	136.9	93.4	113.2	133.1	88.8	108.1	127.4
		67	TC	151.5	151.5	151.5	144.5	144.5	144.5	136.9	136.9	136.9	128.5	128.5	128.5	119.4	119.4	119.4
			SHC	85.1	105.2	125.3	82.1	102.2	122.3	78.9	99.0	119.0	75.4	95.5	115.5	71.7	91.8	111.8
		72	TC	166.1	166.1	166.1	158.5	158.5	158.5	150.2	150.2	150.2	141.1	141.1	141.1	131.3	131.3	131.3
			SHC	66.2	86.5	106.7	63.3	83.6	103.8	60.2	80.4	100.6	56.8	76.9	97.1	53.1	73.3	93.4
		76	TC	–	178.6	178.6	–	170.5	170.5	–	161.6	161.6	–	151.8	151.8	–	141.3	141.3
			SHC	–	71.1	91.8	–	68.3	88.9	–	65.2	85.8	–	61.8	82.5	–	58.2	78.7
4375 Cfm	EA (wB)	58	TC	139.2	139.2	158.0	133.8	133.8	151.9	127.9	127.9	145.2	121.3	121.3	137.7	114.1	114.1	129.5
			SHC	120.4	139.2	158.0	115.7	133.8	151.9	110.6	127.9	145.2	104.9	121.3	137.7	98.7	114.1	129.5
		62	TC	142.4	142.4	157.6	135.8	135.8	154.1	128.9	128.9	149.2	121.7	121.7	142.9	114.2	114.2	134.8
			SHC	111.5	134.5	157.6	108.2	131.2	154.1	104.2	126.7	149.2	99.4	121.1	142.9	93.6	114.2	134.8
		67	TC	155.8	155.8	155.8	148.5	148.5	148.5	140.4	140.4	140.4	131.6	131.6	131.6	122.1	122.1	123.0
			SHC	90.3	113.6	136.8	87.3	110.5	133.8	84.0	107.2	130.5	80.4	103.6	126.8	76.6	99.8	123.0
		72	TC	170.6	170.6	170.6	162.7	162.7	162.7	154.0	154.0	154.0	144.4	144.4	144.4	134.1	134.1	134.1
			SHC	68.5	91.9	115.3	65.5	88.9	112.3	62.3	85.6	109.0	58.8	82.1	105.4	55.1	78.4	101.7
		76	TC	–	183.3	183.3	–	174.8	174.8	–	165.4	165.4	–	155.2	155.2	–	144.3	144.3
			SHC	–	74.3	98.3	–	71.3	95.2	–	68.0	91.9	–	64.6	88.3	–	60.9	84.5
5000 Cfm	EA (wB)	58	TC	145.3	145.3	164.9	139.5	139.5	158.4	133.2	133.2	151.2	126.2	126.2	143.2	118.5	118.5	134.5
			SHC	125.6	145.3	164.9	120.7	139.5	158.4	115.2	133.2	151.2	109.1	126.2	143.2	102.5	118.5	134.5
		62	TC	146.5	146.5	169.3	140.2	140.2	163.9	133.3	133.3	157.4	126.3	126.3	149.1	118.6	118.6	140.0
			SHC	118.3	143.8	169.3	114.1	139.0	163.9	109.3	133.3	157.4	103.5	126.3	149.1	97.2	118.6	140.0
		67	TC	159.1	159.1	159.1	151.5	151.5	151.5	143.1	143.1	143.1	134.0	134.0	137.7	124.2	124.2	133.7
			SHC	95.2	121.6	148.0	92.2	118.5	144.9	88.8	115.1	141.5	85.1	111.4	137.7	81.3	107.5	133.7
		72	TC	174.1	174.1	174.1	165.9	165.9	165.9	156.8	156.8	156.8	146.9	146.9	146.9	136.2	136.2	136.2
			SHC	70.5	97.0	123.5	67.5	94.0	120.5	64.2	90.7	117.1	60.6	87.1	113.5	56.9	83.3	109.6
		76	TC	–	187.0	187.0	–	178.1	178.1	–	168.3	168.3	–	157.7	157.7	–	146.4	146.4
			SHC	–	77.0	104.0	–	74.0	100.9	–	70.7	97.5	–	67.2	93.9	–	63.4	90.0
5625 Cfm	EA (wB)	58	TC	150.4	150.4	170.8	144.4	144.4	163.9	137.7	137.7	156.3	130.3	130.3	147.9	122.2	122.2	138.7
			SHC	130.1	150.4	170.8	124.9	144.4	163.9	119.0	137.7	156.3	112.7	130.3	147.9	105.7	122.2	138.7
		62	TC	150.7	150.7	177.9	144.5	144.5	170.6	137.8	137.8	162.7	130.4	130.4	153.9	122.3	122.3	144.4
			SHC	123.5	150.7	177.9	118.4	144.5	170.6	112.9	137.8	162.7	106.8	130.4	153.9	100.2	122.3	144.4
		67	TC	161.7	161.7	161.7	153.9	153.9	155.6	145.3	145.3	152.1	135.9	135.9	148.2	125.9	125.9	143.9
			SHC	100.0	129.4	158.8	96.8	126.2	155.6	93.4	122.7	152.1	89.7	118.9	148.2	85.6	114.8	143.9
		72	TC	176.9	176.9	176.9	168.3	168.3	168.3	159.0	159.0	159.0	148.8	148.8	148.8	137.9	137.9	137.9
			SHC	72.3	101.9	131.5	69.3	98.8	128.4	66.0	95.5	125.0	62.4	91.8	121.3	58.6	88.0	117.4
		76	TC	–	189.8	189.8	–	180.6	180.6	–	170.6	170.6	–	159.7	159.7	–	148.1	148.1
			SHC	–	79.6	109.7	–	76.5	106.5	–	73.2	103.0	–	69.6	99.2	–	65.7	95.1
6250 Cfm	EA (wB)	58	TC	154.8	154.8	175.8	148.5	148.5	168.6	141.5	141.5	160.6	133.7	133.7	151.8	125.3	125.3	142.3
			SHC	133.9	154.8	175.8	128.4	148.5	168.6	122.3	141.5	160.6	115.6	133.7	151.8	108.4	125.3	142.3
		62	TC	155.0	155.0	183.0	148.6	148.6	175.5	141.6	141.6	167.2	133.9	133.9	158.0	125.4	125.4	148.1
			SHC	127.0	155.0	183.0	121.8	148.6	175.5	116.0	141.6	167.2	109.7	133.9	158.0	102.8	125.4	148.1
		67	TC	163.8	163.8	169.3	155.8	155.8	166.0	147.0	147.0	162.3	137.5	137.5	158.1	127.4	127.4	153.3
			SHC	104.5	136.9	169.3	101.3	133.6	166.0	97.8	130.0	162.3	93.9	126.0	158.1	89.7	121.5	153.3
		72	TC	179.1	179.1	179.1	170.3	170.3	170.3	160.8	160.8	160.8	150.3	150.3	150.3	139.2	139.2	139.2
			SHC	74.1	106.7	139.3	71.0	103.6	136.1	67.7	100.2	132.7	64.1	96.5	128.9	60.2	92.6	124.9
		76	TC	–	192.1	192.1	–	182.7	182.7	–	172.3	172.3	–	161.2	161.2	–	149.4	149.4
			SHC	–	82.1	115.1	–	79.0	111.8	–	75.6	108.2	–	71.9	104.3	–	67.9	100.0

LEGEND:

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

Table 17 – STATIC PRESSURE ADDERS (Factory Options and/or Accessories)

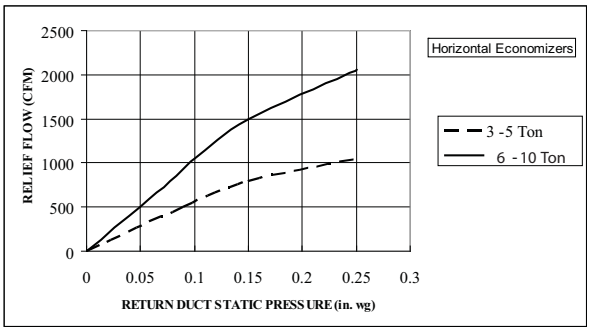
Electric Heaters

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

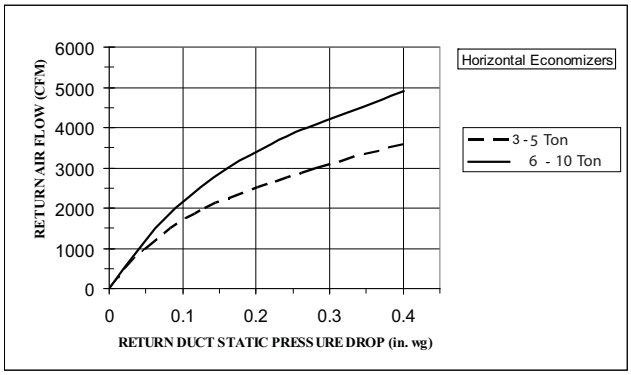
12.5 TON									
CFM	3750	4063	4375	4688	5000	5313	5625	5938	6250
Vertical - 1 Electric Heater Module	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04
Vertical - 2 Electric Heater Modules	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.08
Horizontal - 1 Electric Heater Module	0.04	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.09
Horizontal - 2 Electric Heater Modules	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.07	0.08

ECONOMIZER, BAROMETRIC RELIEF, AND PERFORMANCE



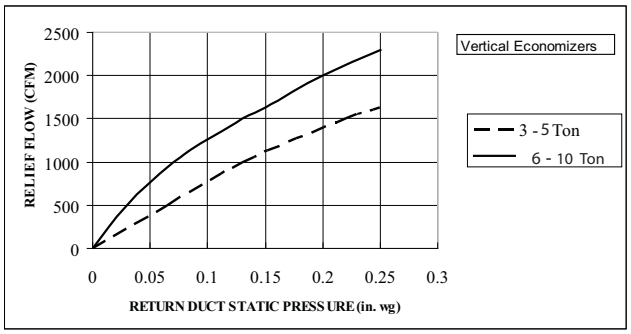
C10472

Fig. 1 Barometric Relief Flow – Horizontal 3–10 Ton



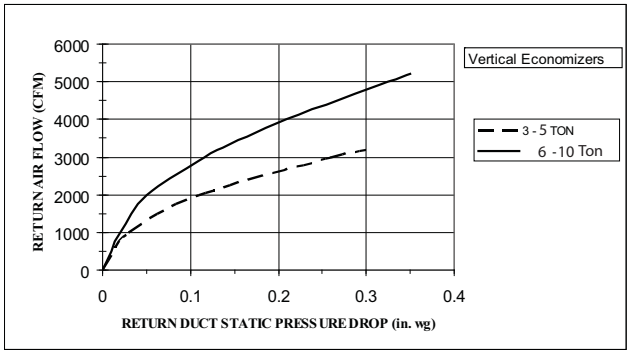
C10474

Fig. 2 Return Air Pressure Drop – Horizontal 3–10 Ton



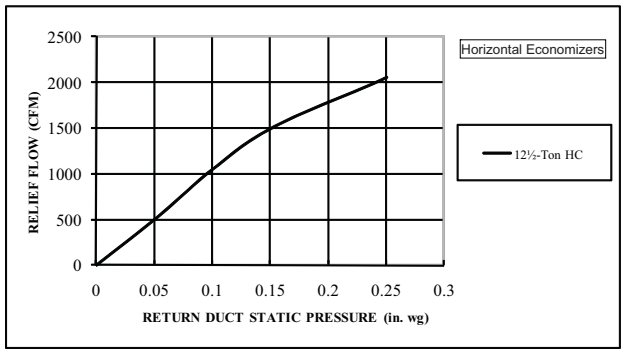
C10475

Fig. 3 Barometric Relief Flow Capacity – Vertical 3 – 10 Ton



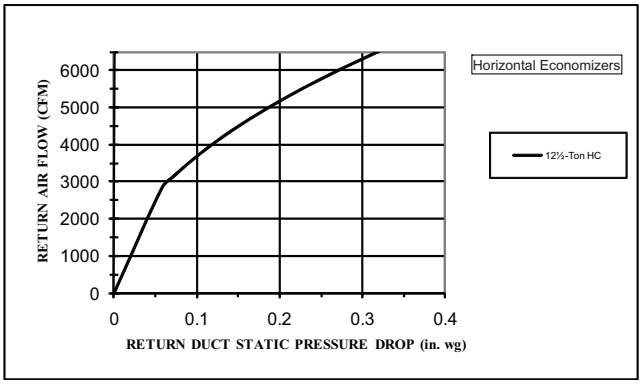
C10477

Fig. 4 Return Air Pressure Drop – Vertical 3 – 10 Ton



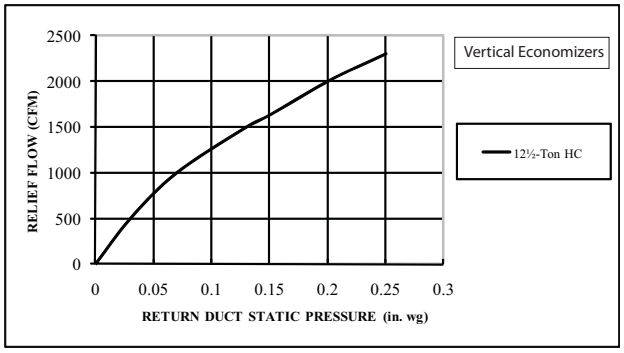
C101002

Fig. 5 Barometric Relief Flow – Horizontal 12.5 Ton



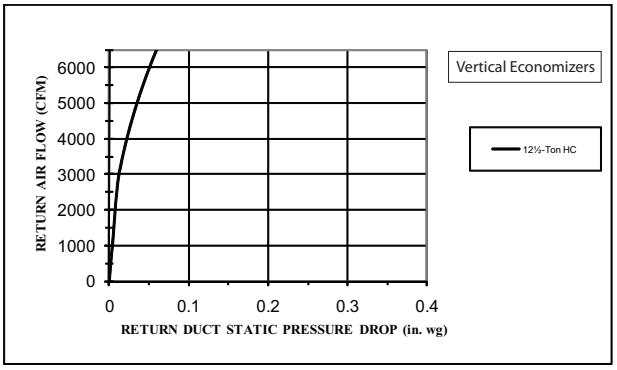
C101003

Fig. 6 Return Air Pressure Drop – Horizontal 12.5 Ton



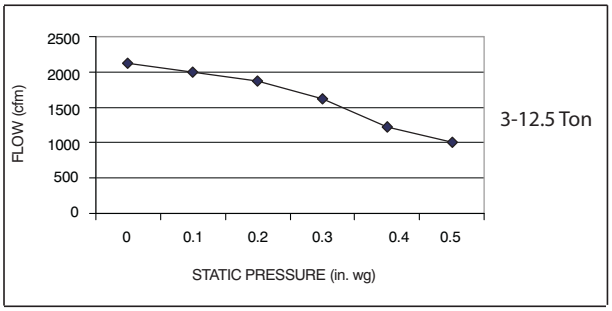
C101004

Fig. 7 Barometric Relief Flow Capacity – Vertical 12.5 Ton



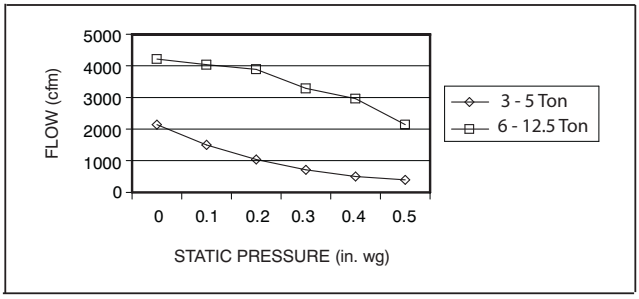
C101005

Fig. 8 Return Air Pressure Drop – Vertical 12.5 Ton



C10995

Fig 9 Horizontal Power Exhaust Performance



C10996

Fig. 10 Vertical Power Exhaust Performance

General fan performance notes:

1. Interpolation is permissible. Do not extrapolate.
2. External static pressure is the static pressure difference between the return duct and the supply duct plus the static pressure caused by any FIOPs or accessories.
3. Tabular data accounts for pressure loss due to clean filters, unit casing, and wet coils. Factory options and accessories may add static pressure losses, as shown in Table 17. 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,the lower horsepower options recommended.
5. For information on the electrical properties of motors, please see the Electrical information section of this book.
6. For more information on the performance limits of motors, see the application data section of this book.
7. The EPACT (Energy Policy Act of 1992) regulates energy requirements for specific types of indoor fan motors. Motors regulated by EPACT include any general purpose, T−frame (three−digit, 143 and larger), single−speed, foot mounted, polyphase, squirrel cage induction motors of NEMA (National Electrical Manufacturers Association) design A and B, manufactured for use in the United States. Ranging from 1 to 200 Hp, these continuous−duty motors operate on 230 and 460 volt, 60 Hz power. If a motor does not fit into these specifications, the motor does not have to be replaced by an EPACT compliant energy−efficient motor. Variable−speed motors are exempt from EPACT compliance requirements. Therefore, the indoor fan motors for RAH036−150 units are exempt from these requirements.

FAN PERFORMANCE

Table 18 – RAH036, 3 PHASE, 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

NOTE: For more information, see General Fan Performance Notes.

Boldface indicates field−supplied drive is required.

Medium static 770−1175 RPM, 1.2 BHP max

High static 1035−1466 RPM, 2.4 BHP max

Table 19 – RAH036, 3 PHASE, 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	**1511**	**1.70**
975	1186	0.89	1275	1.08	1358	1.29	1437	1.51	**1513**	**1.74**
1050	1194	0.92	1281	1.12	1363	1.32	1441	1.54	**1516**	**1.78**
1125	1204	0.97	1289	1.16	1370	1.37	1447	1.59	**1520**	**1.82**
1200	1215	1.01	1298	1.21	1378	1.42	1454	1.64	**1526**	**1.87**
1275	1227	1.06	1309	1.26	1387	1.47	1462	1.69	**1533**	**1.92**
1350	1240	1.12	1321	1.32	1397	1.53	**1471**	**1.75**	**1541**	**1.99**
1425	1254	1.18	1333	1.38	1409	1.59	**1481**	**1.82**	–	–
1500	1270	1.24	1347	1.45	1421	1.66	**1492**	**1.89**	–	–

NOTE: For more information, see General Fan Performance Notes.

Boldface indicates field−supplied drive is required.

Medium static 770−1175 RPM, 1.2 BHP max

High static 1035−1466 RPM, 2.4 BHP max

FAN PERFORMANCE (cont.)

Table 20 – RAH048, 3 PHASE, 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	**671**	**0.23**	**790**	**0.34**	**892**	**0.47**	982	0.61	1064	0.76
1300	**705**	**0.28**	**820**	**0.39**	**919**	**0.52**	1007	0.67	1088	0.82
1400	**740**	**0.33**	**851**	**0.45**	947	0.58	1034	0.73	1113	0.89
1500	**776**	**0.38**	**883**	**0.51**	977	0.65	1061	0.80	1138	0.97
1600	**813**	**0.45**	**916**	**0.58**	1007	0.73	1089	0.89	1165	1.05
1700	**851**	**0.52**	949	0.66	1038	0.81	1118	0.97	1192	1.15
1800	**888**	**0.60**	984	0.75	1069	0.90	1148	1.07	1221	1.25
1900	927	0.69	1019	0.84	1102	1.00	1179	1.18	1250	1.36
2000	965	0.78	1054	0.94	1135	1.11	1210	1.29	1280	1.48

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	1140	0.92	1210	1.10	1276	1.28	1339	1.47	1399	1.68
1300	1162	0.99	1232	1.16	1297	1.35	1360	1.55	1419	1.75
1400	1186	1.06	1254	1.24	1319	1.43	1381	1.63	1439	1.84
1500	1210	1.14	1278	1.33	1342	1.52	1403	1.72	1461	1.93
1600	1236	1.23	1302	1.42	1365	1.62	1425	1.82	1483	2.04
1700	1262	1.33	1328	1.52	1390	1.72	1449	1.93	1505	2.15
1800	1289	1.44	1354	1.63	1415	1.84	1473	2.05	1529	2.27
1900	1317	1.55	1380	1.75	1441	1.96	1498	2.18	1553	2.41
2000	1345	1.68	1408	1.88	1467	2.10	1524	2.32	1579	2.55

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
Medium Static – 920–1303 RPM, 1.7 BHP max
High Static – 1208–1639 RPM, 2.9 max BHP

Table 21 – RAH048, 3 PHASE, 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	**695**	**0.25**	**818**	**0.37**	930	0.51	1032	0.66	1126	0.83
1300	**731**	**0.30**	**849**	**0.43**	955	0.57	1053	0.72	1145	0.89
1400	**769**	**0.36**	**880**	**0.49**	982	0.63	1077	0.79	1166	0.97
1500	**807**	**0.42**	**913**	**0.56**	1011	0.71	1103	0.87	1188	1.05
1600	**847**	**0.49**	948	0.63	1042	0.79	1130	0.96	1213	1.14
1700	**887**	**0.57**	983	0.72	1073	0.88	1158	1.06	1239	1.24
1800	928	0.66	1020	0.82	1106	0.98	1188	1.16	1266	1.35
1900	969	0.76	1057	0.92	1140	1.09	1219	1.28	1295	1.48
2000	1010	0.87	1095	1.04	1175	1.21	1251	1.41	1325	1.61

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	1215	1.01	1298	1.21	1378	1.42	1454	1.64	1526	1.87
1300	1231	1.08	1313	1.28	1390	1.49	1465	1.71	1536	1.94
1400	1249	1.16	1329	1.36	1405	1.57	1478	1.79	1547	2.03
1500	1270	1.24	1347	1.45	1421	1.66	1492	1.89	1561	2.13
1600	1292	1.34	1367	1.54	1440	1.76	1509	1.99	1576	2.23
1700	1315	1.44	1389	1.65	1459	1.88	1527	2.11	1593	2.35
1800	1341	1.56	1412	1.77	1481	2.00	1547	2.23	1612	2.48
1900	1367	1.68	1437	1.90	1504	2.13	1569	2.37	1632	2.62
2000	1395	1.82	1463	2.04	1528	2.28	1591	2.52	**1653**	**2.77**

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.
Medium Static – 920–1303 RPM, 1.7 BHP max
High Static – 1208–1639 RPM, 2.9 max BHP

FAN PERFORMANCE (cont.)

Table 22 – RAH060, 3 PHASE, 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	**1618**	**2.95**
2500	1427	2.24	1487	2.47	1543	2.70	**1597**	**2.94**	**1649**	**3.18**

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.

Medium Static – 1035 – 1466 RPM, 2.4 BHP max
High Static – 1303 – 1687 RPM, 2.9 max BHP (motor is 2.4 max HP, 3 ph)

Table 23 – RAH060, 3 PHASE, 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	**1661**	**3.09**
2375	1487	2.40	1544	2.63	1598	2.87	**1650**	**3.11**	–	–
2500	1529	2.64	1585	2.89	**1638**	**3.13**	–	–	–	–

NOTE: For more information, see General Fan Performance Notes.
Boldface indicates field–supplied drive is required.

Medium Static – 1035 – 1466 RPM, 2.4 BHP max
High Static – 1303 – 1687 RPM, 2.9 max BHP (motor is 2.4 max HP, 3 ph)

FAN PERFORMANCE (cont.)

Table 24 – RAH072, 3 PHASE, 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

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

NOTE: For more information, see General Fan Performance Notes.

Standard static 489–747 RPM, 1.7 BHP max

Medium static 733–949 RPM, 2.9 BHP max

High static 909–1102 RPM, 4.7 BHP max

Table 25 – RAH072, 3 PHASE, 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

NOTE: For more information, see General Fan Performance Notes.

Standard static 489–747 RPM, 1.7 BHP max

Medium static 733–949 RPM, 2.9 BHP max

High static 909–1102 RPM, 4.7 BHP max

FAN PERFORMANCE (cont.)

Table 26 – RAH090, 3 PHASE, 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

NOTE: For more information, see General Fan Performance Notes.

Standard static 518–733 RPM, 1.7 BHP max

Medium static 690–936 RPM, 2.4 BHP max

High static 838–1084 RPM, 3.7 BHP max

Table 27 – RAH090, 3 PHASE, 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	482	0.36	577	0.51	659	0.66	732	0.82	799	0.98
2438	505	0.43	597	0.59	676	0.75	748	0.92	813	1.09
2625	529	0.51	617	0.68	694	0.85	764	1.03	827	1.22
2813	554	0.60	638	0.78	713	0.97	781	1.16	843	1.35
3000	579	0.70	660	0.89	732	1.09	799	1.29	860	1.50
3188	604	0.81	683	1.02	753	1.23	817	1.44	877	1.65
3375	630	0.94	706	1.15	774	1.37	836	1.60	895	1.82
3563	657	1.08	729	1.31	795	1.54	856	1.77	913	2.01
3750	683	1.23	753	1.47	817	1.71	877	1.96	933	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
2250	860	1.14	917	1.31	971	1.48	1022	1.66	1071	1.84
2438	873	1.27	929	1.45	983	1.63	1033	1.81	1081	2.00
2625	887	1.40	942	1.59	995	1.78	1045	1.98	1092	2.18
2813	901	1.55	956	1.75	1008	1.95	1057	2.15	1104	2.36
3000	917	1.70	970	1.91	1021	2.13	1070	2.34	1117	2.56
3188	933	1.87	986	2.09	1036	2.32	1084	2.54	1130	2.77
3375	950	2.05	1002	2.29	1051	2.52	1098	2.76	1144	3.00
3563	967	2.25	1018	2.49	1067	2.74	1113	2.99	1158	3.24
3750	985	2.46	1035	2.71	1083	2.97	1129	3.23	1173	3.49

NOTE: For more information, see General Fan Performance Notes.

Standard static 518–733 RPM, 1.7 BHP max

Medium static 690–936 RPM, 2.4 BHP max

High static 838–1084 RPM, 3.7 BHP max

FAN PERFORMANCE (cont.)

Table 28 – RAH102, 3 PHASE, 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
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

NOTE: For more information, see General Fan Performance Notes.

Standard static 518–733 RPM, 1.7 BHP max

Medium static 690–936 RPM, 2.4 BHP max

High static 838–1084 RPM, 3.7 BHP max

Table 29 – RAH102, 3 PHASE, 8.5 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	482	0.36	577	0.51	659	0.66	732	0.82	799	0.98
2438	505	0.43	597	0.59	676	0.75	748	0.92	813	1.09
2625	529	0.51	617	0.68	694	0.85	764	1.03	827	1.22
2813	554	0.60	638	0.78	713	0.97	781	1.16	843	1.35
3000	579	0.70	660	0.89	732	1.09	799	1.29	860	1.50
3188	604	0.81	683	1.02	753	1.23	817	1.44	877	1.65
3375	630	0.94	706	1.15	774	1.37	836	1.60	895	1.82
3563	657	1.08	729	1.31	795	1.54	856	1.77	913	2.01
3750	683	1.23	753	1.47	817	1.71	877	1.96	933	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
2250	860	1.14	917	1.31	971	1.48	1022	1.66	1071	1.84
2438	873	1.27	929	1.45	983	1.63	1033	1.81	1081	2.00
2625	887	1.40	942	1.59	995	1.78	1045	1.98	1092	2.18
2813	901	1.55	956	1.75	1008	1.95	1057	2.15	1104	2.36
3000	917	1.70	970	1.91	1021	2.13	1070	2.34	1117	2.56
3188	933	1.87	986	2.09	1036	2.32	1084	2.54	1130	2.77
3375	950	2.05	1002	2.29	1051	2.52	1098	2.76	1144	3.00
3563	967	2.25	1018	2.49	1067	2.74	1113	2.99	1158	3.24
3750	985	2.46	1035	2.71	1083	2.97	1129	3.23	1173	3.49

NOTE: For more information, see General Fan Performance Notes.

Standard static 518–733 RPM, 1.7 BHP max

Medium static 690–936 RPM, 2.4 BHP max

High static 838–1084 RPM, 3.7 BHP max

FAN PERFORMANCE (cont.)

Table 30 – RAH120, 3 PHASE, 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	523	0.58	592	0.73	657	0.88	718	1.05	775	1.22
3250	555	0.71	620	0.87	681	1.04	739	1.21	794	1.39
3500	588	0.86	649	1.03	707	1.21	762	1.39	815	1.58
3750	621	1.03	679	1.21	734	1.40	786	1.59	837	1.79
4000	655	1.23	709	1.42	761	1.61	812	1.82	860	2.03
4250	689	1.45	741	1.65	790	1.86	838	2.07	885	2.29
4500	723	1.69	773	1.90	820	2.12	866	2.35	910	2.57
4750	758	1.96	805	2.19	850	2.42	894	2.65	937	2.89
5000	793	2.26	838	2.50	881	2.74	923	2.98	965	3.23

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	830	1.39	883	1.57	934	1.76	982	1.95	1029	2.14
3250	847	1.57	897	1.76	946	1.96	993	2.16	1039	2.36
3500	865	1.77	914	1.97	961	2.18	1007	2.38	1051	2.60
3750	885	1.99	932	2.20	978	2.42	1022	2.64	1065	2.86
4000	907	2.24	952	2.46	996	2.68	1038	2.91	1080	3.14
4250	930	2.51	973	2.74	1015	2.97	1057	3.21	1097	3.45
4500	954	2.81	996	3.05	1037	3.29	1076	3.54	1115	3.79
4750	979	3.13	1019	3.38	1059	3.63	1097	3.89	1135	4.15
5000	1005	3.49	1044	3.74	1082	4.01	1119	4.27	1156	4.55

NOTE: For more information, see General Fan Performance Notes.

Standard static 591–838 RPM, 2.4 BHP max
Medium static 838–1084 RPM, 3.7 BHP max
High static 1022–1240 RPM, 5.0 BHP max

Table 31 – RAH120, 3 PHASE, 10 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
3000	556	0.65	623	0.80	684	0.95	738	1.11	789	1.26
3250	590	0.79	655	0.96	713	1.13	766	1.29	815	1.46
3500	625	0.96	687	1.14	742	1.32	794	1.50	841	1.68
3750	661	1.16	719	1.35	773	1.54	822	1.73	869	1.93
4000	697	1.37	753	1.58	804	1.79	852	1.99	897	2.20
4250	733	1.62	787	1.84	836	2.06	883	2.28	926	2.49
4500	770	1.89	821	2.13	869	2.36	914	2.59	956	2.82
4750	807	2.20	856	2.45	902	2.69	945	2.94	986	3.18
5000	844	2.54	891	2.80	936	3.06	978	3.31	1018	3.57

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
3000	836	1.42	881	1.57	923	1.73	963	1.89	1001	2.05
3250	861	1.63	904	1.79	945	1.96	985	2.13	1023	2.30
3500	886	1.86	929	2.04	969	2.22	1008	2.40	1045	2.58
3750	912	2.12	954	2.31	994	2.50	1031	2.70	1068	2.89
4000	940	2.40	980	2.61	1019	2.81	1056	3.02	1092	3.22
4250	968	2.71	1007	2.93	1045	3.15	1081	3.36	1117	3.58
4500	996	3.05	1035	3.28	1072	3.51	1108	3.74	1142	3.97
4750	1026	3.42	1063	3.66	1100	3.91	1135	4.15	1168	4.39
5000	1056	3.82	1093	4.08	1128	4.34	1162	4.59	–	–

NOTE: For more information, see General Fan Performance Notes.

Standard static 591–838 RPM, 2.4 BHP max
Medium static 838–1084 RPM, 3.7 BHP max
High static 1022–1240 RPM, 5.0 BHP max

FAN PERFORMANCE (cont.)

Table 32 – RAH150, 3 PHASE, 12.5 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
3438	379	0.48	455	0.69	526	0.94	593	1.23	655	1.54
3750	399	0.59	469	0.80	536	1.06	600	1.35	660	1.67
4063	420	0.71	486	0.93	549	1.19	609	1.49	667	1.81
4375	442	0.84	503	1.08	562	1.35	620	1.65	675	1.97
4688	464	1.00	522	1.25	578	1.52	632	1.83	685	2.16
5000	486	1.17	541	1.44	594	1.72	646	2.03	696	2.37
5313	509	1.37	561	1.64	612	1.94	661	2.26	708	2.60
5625	532	1.58	582	1.87	630	2.18	677	2.51	722	2.86
5938	555	1.82	603	2.13	649	2.45	694	2.78	737	3.14
6250	578	2.09	625	2.41	669	2.74	711	3.09	753	3.45

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
3438	713	1.89	766	2.25	816	2.64	863	3.04	907	3.46
3750	717	2.02	770	2.39	820	2.79	867	3.20	911	3.63
4063	722	2.17	774	2.55	824	2.95	870	3.37	914	3.81
4375	728	2.33	779	2.72	828	3.13	874	3.56	918	4.00
4688	736	2.52	785	2.91	832	3.32	878	3.76	922	4.21
5000	745	2.73	792	3.12	838	3.54	883	3.98	926	4.44
5313	755	2.97	801	3.36	846	3.78	889	4.23	931	4.69
5625	767	3.23	811	3.63	854	4.05	896	4.50	937	4.97
5938	780	3.52	822	3.92	864	4.35	904	4.80	944	5.27
6250	794	3.84	835	4.25	875	4.68	914	5.13	952	5.61

NOTE: For more information, see General Fan Performance Notes.

Standard static 440−609 RPM, 2.9 BHP max
Medium static 609−778 RPM, 3.7 BHP max
High static 776−955 RPM, 6.1 BHP max

Table 33 – RAH150, 3 PHASE, 12.5 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
3438	383	0.46	458	0.66	530	0.91	601	1.20	668	1.53
3750	402	0.56	474	0.77	540	1.01	605	1.30	670	1.64
4063	422	0.67	491	0.90	552	1.14	613	1.43	674	1.76
4375	443	0.79	508	1.04	567	1.29	623	1.58	680	1.90
4688	464	0.93	527	1.19	583	1.46	636	1.75	689	2.07
5000	486	1.10	546	1.37	600	1.65	651	1.95	700	2.27
5313	509	1.28	565	1.56	618	1.86	666	2.17	713	2.49
5625	533	1.48	585	1.77	636	2.09	683	2.41	728	2.74
5938	557	1.71	605	2.01	655	2.34	701	2.67	744	3.02
6250	581	1.97	626	2.26	673	2.61	718	2.96	760	3.32

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
3438	729	1.88	783	2.25	833	2.62	879	2.99	921	3.37
3750	731	2.00	787	2.39	838	2.78	885	3.18	929	3.59
4063	733	2.13	789	2.52	841	2.94	890	3.36	935	3.79
4375	736	2.27	791	2.67	843	3.10	892	3.54	938	3.99
4688	741	2.43	794	2.83	845	3.26	894	3.72	941	4.19
5000	749	2.63	799	3.02	848	3.45	896	3.90	942	4.39
5313	760	2.85	806	3.23	853	3.66	899	4.11	944	4.60
5625	772	3.10	816	3.48	860	3.90	904	4.35	947	4.83
5938	786	3.38	827	3.76	869	4.18	911	4.62	952	5.09
6250	801	3.69	841	4.07	880	4.49	920	4.93	959	5.40

NOTE: For more information, see General Fan Performance Notes.

Standard static 440−609 RPM, 2.9 BHP max
Medium static 609−778 RPM, 3.7 BHP max
High static 776−955 RPM, 6.1 BHP max

FAN PERFORMANCE (cont.)
ECM MULTI SPEED/TORQUE MOTOR

Table 34 – RAH036 Horizontal Unit Direct Drive

Speed (Torque) tap	CFM	ESP	BHP
1	900	0.47	0.21
	975	0.38	0.20
	1050	0.29	0.19
	1125	0.21	0.18
	1200	0.13	0.18
	1275	0.06	0.20
	1350	–	–
	1425	–	–
	1500	–	–
2	900	0.65	0.27
	975	0.54	0.26
	1050	0.44	0.25
	1125	0.33	0.24
	1200	0.23	0.23
	1275	0.13	0.21
	1350	0.02	0.20
	1425	–	–
	1500	–	–
3	900	0.96	0.38
	975	0.84	0.37
	1050	0.73	0.36
	1125	0.61	0.34
	1200	0.50	0.33
	1275	0.38	0.31
	1350	0.26	0.30
	1425	0.15	0.28
	1500	0.04	0.26
4	900	1.17	0.46
	975	1.08	0.46
	1050	0.98	0.46
	1125	0.87	0.45
	1200	0.75	0.44
	1275	0.63	0.42
	1350	0.51	0.40
	1425	0.39	0.39
	1500	0.27	0.37
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 35 – RAH036 Vertical Unit Direct Drive

Speed (Torque) tap	CFM	ESP	BHP
1	900	0.36	0.16
	975	0.27	0.16
	1050	0.18	0.15
	1125	0.10	0.15
	1200	0.04	0.16
	1275	–	–
	1350	–	–
	1425	–	–
	1500	–	–
2	900	0.51	0.21
	975	0.40	0.20
	1050	0.30	0.19
	1125	0.21	0.18
	1200	0.11	0.17
	1275	0.02	0.16
	1350	–	–
	1425	–	–
	1500	–	–
3	900	0.84	0.33
	975	0.72	0.32
	1050	0.60	0.31
	1125	0.49	0.29
	1200	0.38	0.28
	1275	0.28	0.26
	1350	0.17	0.25
	1425	0.07	0.24
	1500	–	–
4	900	1.06	0.41
	975	0.96	0.41
	1050	0.86	0.41
	1125	0.74	0.40
	1200	0.63	0.38
	1275	0.50	0.37
	1350	0.38	0.35
	1425	0.26	0.34
	1500	0.15	0.32
5	900	1.24	0.51
	975	1.19	0.52
	1050	1.14	0.54
	1125	1.08	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

FAN PERFORMANCE (cont.)
ECM MULTI SPEED/TORQUE MOTOR

Table 36 – RAH048 Horizontal Unit Direct Drive

Speed (Torque) tap	CFM	ESP	BHP
1	1200	0.62	0.34
	1300	0.48	0.32
	1400	0.35	0.30
	1500	0.23	0.28
	1600	0.12	0.28
	1700	0.02	0.27
	1800	–	–
	1900	–	–
	2000	–	–
2	1200	0.74	0.39
	1300	0.60	0.37
	1400	0.46	0.35
	1500	0.32	0.32
	1600	0.19	0.30
	1700	0.07	0.27
	1800	–	–
	1900	–	–
	2000	–	–
3	1200	1.20	0.59
	1300	1.12	0.60
	1400	1.01	0.61
	1500	0.89	0.62
	1600	0.76	0.59
	1700	0.61	0.56
	1800	0.47	0.53
	1900	0.32	0.50
	2000	0.18	0.47
4	1200	1.24	0.60
	1300	1.18	0.63
	1400	1.11	0.65
	1500	1.03	0.69
	1600	0.93	0.69
	1700	0.82	0.69
	1800	0.70	0.69
	1900	0.56	0.66
	2000	0.41	0.63
5	1200	1.25	0.61
	1300	1.20	0.65
	1400	1.11	0.68
	1500	1.03	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 37 – RAH048 Vertical Unit Direct Drive

Speed (Torque) tap	CFM	ESP	BHP
1	1200	0.57	0.31
	1300	0.44	0.29
	1400	0.30	0.27
	1500	0.16	0.25
	1600	0.03	0.25
	1700	–	–
	1800	–	–
	1900	–	–
	2000	–	–
2	1200	0.68	0.35
	1300	0.54	0.33
	1400	0.40	0.31
	1500	0.24	0.28
	1600	0.10	0.26
	1700	–	–
	1800	–	–
	1900	–	–
	2000	–	–
3	1200	1.15	0.54
	1300	1.09	0.54
	1400	1.02	0.55
	1500	0.93	0.58
	1600	0.82	0.57
	1700	0.69	0.55
	1800	0.54	0.52
	1900	0.38	0.50
	2000	0.21	0.47
4	1200	1.16	0.56
	1300	1.12	0.59
	1400	1.07	0.61
	1500	1.00	0.65
	1600	0.92	0.65
	1700	0.80	0.66
	1800	0.67	0.65
	1900	0.51	0.62
	2000	0.34	0.59
5	1200	1.16	0.59
	1300	1.11	0.63
	1400	1.00	0.67
	1500	0.88	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

FAN PERFORMANCE (cont.)
ECM MULTI SPEED/TORQUE MOTOR

Table 38 – RAH060 Horizontal Unit Direct Drive

Speed (Torque) tap	CFM	ESP	BHP
1	1500	0.63	0.49
	1625	0.45	0.46
	1750	0.27	0.43
	1875	0.10	0.39
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
2	1500	0.88	0.61
	1625	0.69	0.58
	1750	0.49	0.55
	1875	0.30	0.51
	2000	0.12	0.48
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
3	1500	1.37	0.89
	1625	1.20	0.87
	1750	1.02	0.86
	1875	0.81	0.83
	2000	0.60	0.79
	2125	0.39	0.75
	2250	0.21	0.71
	2375	0.07	0.67
	2500	–	–
4	1500	1.48	0.95
	1625	1.35	0.95
	1750	1.20	0.99
	1875	1.03	0.99
	2000	0.83	0.96
	2125	0.63	0.93
	2250	0.42	0.89
	2375	0.22	0.84
	2500	0.05	0.78
5	1500	1.52	0.97
	1625	1.42	1.01
	1750	1.20	1.05
	1875	1.03	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 39 – RAH060 Vertical Unit Direct Drive

Speed (Torque) tap	CFM	ESP	BHP
1	1500	0.50	0.44
	1625	0.32	0.42
	1750	0.14	0.39
	1875	–	–
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
2	1500	0.72	0.56
	1625	0.53	0.53
	1750	0.34	0.50
	1875	0.18	0.48
	2000	–	–
	2125	–	–
	2250	–	–
	2375	–	–
	2500	–	–
3	1500	1.20	0.84
	1625	1.02	0.82
	1750	0.82	0.82
	1875	0.61	0.79
	2000	0.40	0.75
	2125	0.20	0.71
	2250	0.04	0.67
	2375	–	–
	2500	–	–
4	1500	1.31	0.92
	1625	1.17	0.92
	1750	0.99	0.95
	1875	0.80	0.94
	2000	0.59	0.90
	2125	0.37	0.86
	2250	0.17	0.83
	2375	0.00	0.79
	2500	–	–
5	1500	1.36	0.94
	1625	1.24	0.99
	1750	0.99	1.02
	1875	0.80	1.05
	2000	0.74	1.03
	2125	0.53	0.99
	2250	0.31	0.94
	2375	0.08	0.90
	2500	–	0.86

FAN PERFORMANCE (cont.)

Table 40 – PULLEY ADJUSTMENT

UNIT RAH		Motor/Drive Combo	Motor Pulley turns open										
			0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
036	3 Phase	Medium Static	1175	1135	1094	1054	1013	973	932	892	851	811	770
		High Static	1466	1423	1380	1337	1294	1251	1207	1164	1121	1078	1035
048	3 Phase	Medium Static	1303	1265	1226	1188	1150	1112	1073	1035	997	958	920
		High Static	1639	1596	1553	1510	1467	1424	1380	1337	1294	1251	1208
060	3 Phase	Medium Static	1466	1423	1380	1337	1294	1251	1207	1164	1121	1078	1035
		High Static	1687	1649	1610	1572	1533	1495	1457	1418	1380	1341	1303
072	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
090	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
102	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
120	3 Phase	Standard Static	838	813	789	764	739	715	690	665	640	616	591
		Medium Static	1084	1059	1035	1010	986	961	936	912	887	863	838
		High Static	1240	1218	1196	1175	1153	1131	1109	1087	1066	1044	1022
150	3 Phase	Standard Static	609	592	575	558	541	525	508	491	474	457	440
		Medium Static	778	761	744	727	710	694	677	660	643	626	609
		High Static	955	973	951	929	907	886	864	842	820	798	776

– Factory settings

ELECTRICAL INFORMATION

Table 41 – RAH036 **1–STAGE** **3 TONS**

	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM				
V–Ph–Hz	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–1–60	187	253	16.6	79	190	1.0	DD–STD	980	7.8	84%	7.4
230–1–60	187	253	16.6	79	190	1.0	DD–STD	980	7.8	84%	7.4
208–3–60	187	253	10.4	73	190	1.0	DD–STD	980	7.8	84%	7.4
							MED	1000	5.1	70%	4.9
							HIGH	2120	5.5	80%	5.2
230–3–60	187	253	10.4	73	190	1.0	DD–STD	980	7.8	84%	7.4
							MED	1000	5.1	70%	4.9
							HIGH	2120	5.5	80%	5.2
460–3–60	414	506	5.8	38	190	0.5	DD–STD	980	4.2	84%	4.0
							MED	1000	2.2	70%	2.1
							HIGH	2120	2.7	80%	2.6
575–3–60	518	633	3.8	37	190	0.5	DD–STD	980	4.2	84%	4.0
							MED	1000	2.0	71%	1.9
							HIGH	2120	2.1	80%	2.0

Table 42 – RAH048 **1–STAGE** **4 TONS**

	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM				
V–Ph–Hz	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–1–60	187	253	21.8	117	325	1.4	DD–STD	980	7.8	84%	7.4
230–1–60	187	253	21.8	117	325	1.4	DD–STD	980	7.8	84%	7.4
208–3–60	187	253	13.7	83	325	1.4	DD–STD	980	7.8	84%	7.4
							MED	1000	5.1	70%	4.9
							HIGH	2120	5.5	80%	5.2
230–3–60	187	253	13.7	83	325	1.4	DD–STD	980	7.8	84%	7.4
							MED	1000	5.1	70%	4.9
							HIGH	2120	5.5	80%	5.2
460–3–60	414	506	6.2	41	325	0.9	DD–STD	980	4.2	84%	4.0
							MED	1000	2.2	70%	2.1
							HIGH	2120	2.7	80%	2.6
575–3–60	518	633	4.8	37	325	0.9	DD–STD	980	4.2	84%	4.0
							MED	1000	2.0	71%	1.9
							HIGH	2120	2.1	80%	2.0

Table 43 – RAH060 **1–STAGE** **5 TONS**

	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM				
V–Ph–Hz	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–1–60	187	253	25.0	134	325	1.4	DD–STD	980	7.8	84%	7.4
230–1–60	187	253	25.0	134	325	1.4	DD–STD	980	7.8	84%	7.4
208–3–60	187	253	15.9	110	325	1.4	DD–STD	980	7.8	84%	7.4
							MED	2120	5.5	80%	5.2
							HIGH	2615	7.9	81%	7.5
230–3–60	187	253	15.9	110	325	1.4	DD–STD	980	7.8	84%	7.4
							MED	2120	5.5	80%	5.2
							HIGH	2615	7.9	81%	7.5
460–3–60	414	506	7.0	52	325	0.9	DD–STD	980	4.2	84%	4.0
							MED	2120	2.7	80%	2.6
							HIGH	2615	3.6	81%	3.4
575–3–60	518	633	5.1	40	325	0.9	DD–STD	980	4.2	84%	4.0
							MED	1390	2.1	81%	2.0
							HIGH	3775	2.9	81%	2.8

ELECTRICAL INFORMATION (cont.)

Table 44 – RAH072 **1–STAGE** **6 TONS**

	VOLTAGE RANGE		COMP (ea)		OFM (ea)		IFM				
V–Ph–Hz	MIN	MAX	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–3–60	187	253	19.0	123	325	1.5	STD	2120	5.5	80%	5.2
							MED	2615	7.9	81%	7.5
							HIGH	2615	15.8	81%	15.0
230–3–60	187	253	19.0	123	325	1.5	STD	2120	5.5	80%	5.2
							MED	2615	7.9	81%	7.5
							HIGH	2615	15.8	81%	15.0
460–3–60	414	506	9.7	62	325	0.8	STD	2120	2.7	80%	2.6
							MED	2615	3.6	81%	3.4
							HIGH	3775	7.8	81%	7.4
575–3–60	518	633	7.4	50	325	0.6	STD	2120	2.5	80%	2.4
							MED	3775	2.9	81%	2.8
							HIGH	3775	5.9	81%	5.6

Table 45 – RAH090 **2–STAGE** **7.5 TONS**

	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM				
V–Ph–Hz	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–3–60	187	253	13.6	83	13.6	83	325	1.5	STD	1448	5.5	80%	5.2
									MED	2278	7.9	81%	7.5
									HIGH	4400	15.0	81%	15.0
230–3–60	187	253	13.6	83	13.6	83	325	1.5	STD	1448	5.5	80%	5.2
									MED	2278	7.9	81%	7.5
									HIGH	4400	15.0	81%	15.0
460–3–60	414	506	6.1	41	6.1	41	325	0.8	STD	1448	2.7	80%	2.6
									MED	2278	3.6	81%	3.4
									HIGH	4400	7.4	81%	7.4
575–3–60	518	633	4.2	33	4.2	33	325	0.6	STD	1379	2.5	80%	2.4
									MED	3775	2.9	81%	2.8
									HIGH	4400	5.9	81%	5.6

Table 46 – RAH102 **2–STAGE** **8.5 TONS**

	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM				
V–Ph–Hz	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–3–60	187	253	13.7	83	13.7	83	325	1.5	STD	1448	5.46	80%	5.2
									MED	2120	5.46	80%	5.2
									HIGH	2694	10.5	80%	10.0
230–3–60	187	253	13.7	83	13.7	83	325	1.5	STD	1448	5.46	80%	5.2
									MED	2120	5.46	80%	5.2
									HIGH	2694	10.5	80%	10.0
460–3–60	414	506	6.2	41	6.2	41	325	0.8	STD	1448	2.73	80%	2.6
									MED	2120	2.73	80%	2.6
									HIGH	2694	4.62	80%	4.4
575–3–60	518	633	4.8	37	4.8	37	325	0.6	STD	1379	2.52	80%	2.4
									MED	1390	2.1	80%	2.0
									HIGH	3775	2.94	81%	2.8

ELECTRICAL INFORMATION (cont.)

Table 47 – RAH120 **2–STAGE** **10 TONS**

	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM				
V–Ph–Hz	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	Max WATTS	Max AMP Draw	EFF at Full Load	FLA
208–3–60	187	253	15.9	110	15.9	110	1070	6.2	STD	2120	5.5	80%	5.2
									MED	3775	10.5	81%	10.0
									HIGH	4400	15.0	81%	15.0
230–3–60	187	253	15.9	110	15.9	110	1070	6.2	STD	2120	5.5	80%	5.2
									MED	3775	10.5	81%	10.0
									HIGH	4400	15.0	81%	15.0
460–3–60	414	506	7.7	52	7.7	52	1070	3.1	STD	2120	2.7	80%	2.6
									MED	3775	4.6	81%	4.4
									HIGH	4400	7.4	81%	7.4
575–3–60	518	633	5.7	39	5.7	39	1070	2.5	STD	1390	2.1	80%	2.0
									MED	3775	2.9	81%	2.8
									HIGH	4400	5.9	81%	5.6

Table 48 – RAH150 **2–STAGE** **12.5 TONS**

	VOLTAGE RANGE		COMP (Cir 1)		COMP (Cir 2)		OFM (ea)		IFM		
V–Ph–Hz	MIN	MAX	RLA	LRA	RLA	LRA	WATTS	FLA	TYPE	EFF at Full Load	FLA
208–3–60	187	253	19.0	123	19.0	123	1288	1.5	STD	81%	7.5
									MED	81%	10.0
									HIGH–High Eff	89.5%	20.4
230–3–60	187	253	19.0	123	19.0	123	1288	1.5	STD	81%	7.5
									MED	81%	10.0
									HIGH–High Eff	89.5%	20.4
460–3–60	414	506	9.7	62	9.7	62	1288	0.8	STD	81%	3.4
									MED	81%	4.4
									HIGH–High Eff	89.5%	10.2
575–3–60	518	633	7.4	50	7.4	50	1288	0.7	STD	81%	2.8
									MED	81%	2.8
									HIGH–High Eff	89.5%	9.0

Table 49 – MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. – 3 TON

UNIT RAH	V–Ph–Hz	IFM TYPE	ELEC. HTR		PWR EXH	NO C.O. or UNPWR C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)			
			Nom (kW)	FLA	FLA	MCA	FUSE or HACR BRKR	DISC. SIZE FLA	DISC. SIZE LRA	MCA	FUSE or HACR BRKR	DISC. SIZE FLA	DISC. SIZE LRA
036	208/230–1–60	DD–STD	–	–	1.9	29.2	45	29	88	31.1	45	31	90
			3.3/4.4	15.9/18.3		29.2/32.1	45/45	29/30	88/88	31.5/34.5	45/45	31/32	90/90
			4.9/6.5	23.5/27.1		38.6/43.1	45/45	36/40	88/88	41.0/45.5	45/50	38/42	90/90
			6.5/8.7	31.4/36.3		48.5/54.6	50/60	45/50	88/88	50.9/57.0	60/60	47/52	90/90
			7.9/10.5	37.9/43.8		56.6/64.0	60/70	52/59	88/88	59.0/66.4	60/70	54/61	90/90
			9.8/13.0	46.9/54.2		67.9/77.0	70/80	62/71	88/88	70.3/79.4	80/80	65/73	90/90
	208/230–3–60	DD–STD	–	–	1.9	21.4	30	22	82	23.3	30	24	84
			3.3/4.4	9.2/10.6		21.4/22.5	30/30	22/22	82/82	23.3/24.9	30/30	24/24	84/84
			4.9/6.5	13.6/15.6		26.3/28.8	30/30	24/26	82/82	28.6/31.1	30/35	26/29	84/84
			6.5/8.7	18.1/20.9		31.9/35.4	35/40	29/33	82/82	34.3/37.8	35/40	32/35	84/84
			7.9/10.5	21.9/25.3		36.6/40.9	40/45	34/38	82/82	39.0/43.3	40/45	36/40	84/84
			12.0/16.0	33.4/38.5		51.0/57.4	60/60	47/53	82/82	53.4/59.8	60/60	49/55	84/84
		MED	–	–	1.9	18.9	25	19	87	20.8	30	21	89
			3.3/4.4	9.2/10.6		18.9/19.4	25/25	19/19	87/87	20.8/21.8	30/30	21/21	89/89
			4.9/6.5	13.6/15.6		23.1/25.6	25/30	21/24	87/87	25.5/28.0	30/30	23/26	89/89
			6.5/8.7	18.1/20.9		28.8/32.3	30/35	26/30	87/87	31.1/34.6	35/35	29/32	89/89
			7.9/10.5	21.9/25.3		33.5/37.8	35/40	31/35	87/87	35.9/40.1	40/45	33/37	89/89
			12.0/16.0	33.4/38.5		47.9/54.3	50/60	44/50	87/87	50.3/56.6	60/60	46/52	89/89
		HIGH	–	–	1.9	19.2	25	19	105	21.1	30	21	107
			3.3/4.4	9.2/10.6		19.2/19.8	25/25	19/19	105/105	21.1/22.1	30/30	21/21	107/107
			4.9/6.5	13.6/15.6		23.5/26.0	25/30	22/24	105/105	25.9/28.4	30/30	24/26	107/107
			6.5/8.7	18.1/20.9		29.1/32.6	30/35	27/30	105/105	31.5/35.0	35/40	29/32	107/107
			7.9/10.5	21.9/25.3		33.9/38.1	35/40	31/35	105/105	36.3/40.5	40/45	33/37	107/107
			12.0/16.0	33.4/38.5		48.3/54.6	50/60	44/50	105/105	50.6/57.0	60/60	47/52	107/107
	460–3–60	DD–STD	–	–	1.0	11.8	15	12	43	12.8	15	13	44
			6.0	7.2		14.0	15	13	43	15.3	20	14	44
			8.8	10.6		18.3	20	17	43	19.5	20	18	44
			11.5	13.8		22.3	25	20	43	23.5	25	22	44
			14.0	16.8		26.0	30	24	43	27.3	30	25	44
		MED	–	–	1.0	9.9	15	10	45	10.9	15	11	46
			6.0	7.2		11.6	15	11	45	12.9	15	12	46
			8.8	10.6		15.9	20	15	45	17.1	20	16	46
			11.5	13.8		19.9	20	18	45	21.1	25	19	46
			14.0	16.8		23.6	25	22	45	24.9	25	23	46
		HIGH	–	–	1.0	10.4	15	10	54	11.4	15	11	55
			6.0	7.2		12.3	15	11	54	13.5	15	12	55
			8.8	10.6		16.5	20	15	54	17.8	20	16	55
			11.5	13.8		20.5	25	19	54	21.8	25	20	55
			14.0	16.8		24.3	25	22	54	25.5	30	23	55
	575–3–60	DD–STD	–	–	1.9	9.3	15	10	42	11.2	15	12	44
		MED	–	–	1.9	7.2	15	7	43	9.1	15	9	45
		HIGH	–	–	1.9	7.3	15	7	49	9.2	15	9	51

See LEGEND on page 70.

Table 45 (cont.) MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. – 4 TON

UNIT RAH	V—Ph—Hz	IFM TYPE	ELEC. HTR		PWR EXH	NO C.O. or UNPWR C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)			
			Nom (kW)	FLA	FLA	MCA	FUSE or HACR BRKR	DISC. SIZE FLA	DISC. SIZE LRA	MCA	FUSE or HACR BRKR	DISC. SIZE FLA	DISC. SIZE LRA
048	208/230—1—60	DD—STD	—	—	1.9	36.1	50	35	127	38.0	50	37	129
			3.3/4.4	15.9/18.3		36.1/36.1	50/50	35/35	127/127	38.0/38.0	50/50	37/37	129/129
			6.5/8.7	31.4/36.3		48.5/54.6	50/60	45/50	127/127	50.9/57.0	60/60	47/52	129/129
			9.8/13.0	46.9/54.2		67.9/77.0	70/80	62/71	127/127	70.3/79.4	80/80	65/73	129/129
			13.1/17.4	62.8/72.5		87.8/99.9	90/100	81/92	127/127	90.1/102.3	100/110	83/94	129/129
			15.8/21.0	75.8/87.5		104.0/118.6	110/125	96/109	127/127	106.4/121.0	110/125	98/111	129/129
	208/230—3—60	DD—STD	—	—	1.9	25.9	30	26	93	27.8	40	28	95
			4.9/6.5	13.6/15.6		26.3/28.8	30/30	26/26	93/93	28.6/31.1	40/40	28/29	95/95
			6.5/8.7	18.1/20.9		31.9/35.4	35/40	29/33	93/93	34.3/37.8	40/40	32/35	95/95
			12.0/16.0	33.4/38.5		51.0/57.4	60/60	47/53	93/93	53.4/59.8	60/60	49/55	95/95
			15.8/21.0	43.8/50.5		64.0/72.4	70/80	59/67	93/93	66.4/74.8	70/80	61/69	95/95
		MED	—	—	1.9	23.4	30	23	98	25.3	30	25	100
			4.9/6.5	13.6/15.6		23.4/25.6	30/30	23/24	98/98	25.5/28.0	30/30	25/26	100/100
			6.5/8.7	18.1/20.9		28.8/32.3	30/35	26/30	98/98	31.1/34.6	35/35	29/32	100/100
			12.0/16.0	33.4/38.5		47.9/54.3	50/60	44/50	98/98	50.3/56.6	60/60	46/52	100/100
			15.8/21.0	43.8/50.5		60.9/69.3	70/70	56/64	98/98	63.3/71.6	70/80	58/66	100/100
		HIGH	—	—	1.9	23.7	30	23	116	25.6	30	26	118
			4.9/6.5	13.6/15.6		23.7/26.0	30/30	23/24	116/116	25.9/28.4	30/30	26/26	118/118
			6.5/8.7	18.1/20.9		29.1/32.6	30/35	27/30	116/116	31.5/35.0	35/40	29/32	118/118
			12.0/16.0	33.4/38.5		48.3/54.6	50/60	44/50	116/116	50.6/57.0	60/60	47/52	118/118
			15.8/21.0	43.8/50.5		61.3/69.6	70/70	56/64	116/116	63.6/72.0	70/80	59/66	118/118
	460—3—60	DD—STD	—	—	1.0	12.7	15	13	47	13.7	20	14	48
			6.0	7.2		14.0	15	13	47	15.3	20	14	48
			11.5	13.8		22.3	25	20	47	23.5	25	22	48
			14.0	16.8		26.0	30	24	47	27.3	30	25	48
			23.0	27.7		39.6	40	36	47	40.9	45	38	48
		MED	—	—	1.0	10.8	15	11	49	11.8	15	12	50
			6.0	7.2		11.6	15	11	49	12.9	15	12	50
			11.5	13.8		19.9	20	18	49	21.1	25	19	50
			14.0	16.8		23.6	25	22	49	24.9	25	23	50
			23.0	27.7		37.3	40	34	49	38.5	40	35	50
		HIGH	—	—	1.0	11.3	15	11	58	12.3	15	12	59
			6.0	7.2		12.3	15	11	58	13.5	15	12	59
			11.5	13.8		20.5	25	19	58	21.8	25	20	59
			14.0	16.8		24.3	25	22	58	25.5	30	23	59
			23.0	27.7		37.9	40	35	58	39.1	40	36	59
	575—3—60	DD—STD	—	—	1.9	10.9	15	11	43	12.8	15	13	45
		MED	—	—	1.9	8.8	15	9	44	10.7	15	11	46
		HIGH	—	—	1.9	8.9	15	9	50	10.8	15	11	52

See LEGEND on page 70.

Table 45 (cont.) MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. – 5 TON

UNIT RAH	V–Ph–Hz	IFM TYPE	ELEC. HTR		PWR EXH	NO C.O. or UNPWR C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)			
			Nom (kW)	FLA	FLA	MCA	FUSE or HACR BRKR	DISC. SIZE FLA	DISC. SIZE LRA	MCA	FUSE or HACR BRKR	DISC. SIZE FLA	DISC. SIZE LRA
060	208/230–1–60	DD–STD	–	–	1.9	40.1	60	39	144	42.0	60	41	146
			4.9/6.5	23.5/27.1		40.1/43.1	60/60	39/40	144/144	42.0/45.5	60/60	41/42	146/146
			6.5/8.7	31.4/36.3		48.5/54.6	60/60	45/50	144/144	50.9/57.0	60/60	47/52	146/146
			9.8/13.0	46.9/54.2		67.9/77.0	70/80	62/71	144/144	70.3/79.4	80/80	65/73	146/146
			13.1/17.4	62.8/72.5		87.8/99.9	90/100	81/92	144/144	90.1/102.3	100/110	83/94	146/146
			15.8/21.0	75.8/87.5		104.0/118.6	110/125	96/109	144/144	106.4/121.0	110/125	98/111	146/146
	208–3–60	DD–STD	–	–	1.9	28.7	40	28	120	30.6	45	31	122
			4.9/6.5	13.6/15.6		28.7/28.8	40/40	28/28	120/120	30.6/31.1	45/45	31/31	122/122
			7.9/10.5	21.9/25.3		36.6/40.9	40/45	34/38	120/120	39.0/43.3	45/45	36/40	122/122
			12.0/16.0	33.4/38.5		51.0/57.4	60/60	47/53	120/120	53.4/59.8	60/60	49/55	122/122
			15.8/21.0	43.8/50.5		64.0/72.4	70/80	59/67	120/120	66.4/74.8	70/80	61/69	122/122
			19.9/26.5	55.2/63.8		78.3/89.0	80/90	72/82	120/120	80.6/91.4	90/100	74/84	122/122
		MED	–	–	1.9	26.5	40	26	143	28.4	40	28	145
			4.9/6.5	13.6/15.6		26.5/26.5	40/40	26/26	143/143	28.4/28.4	40/40	28/28	145/145
			7.9/10.5	21.9/25.3		33.9/38.1	40/40	31/35	143/143	36.3/40.5	40/45	33/37	145/145
			12.0/16.0	33.4/38.5		48.3/54.6	50/60	44/50	143/143	50.6/57.0	60/60	47/52	145/145
			15.8/21.0	43.8/50.5		61.3/69.6	70/70	56/64	143/143	63.6/72.0	70/80	59/66	145/145
			19.9/26.5	55.2/63.8		75.5/86.3	80/90	69/79	143/143	77.9/88.6	80/90	72/82	145/145
		HIGH	–	–	1.9	28.8	40	29	169	30.7	45	31	171
			4.9/6.5	13.6/15.6		28.8/28.9	40/40	29/29	169/169	30.7/31.3	45/45	31/31	171/171
			7.9/10.5	21.9/25.3		36.8/41.0	40/45	34/38	169/169	39.1/43.4	45/45	36/40	171/171
			12.0/16.0	33.4/38.5		51.1/57.5	60/60	47/53	169/169	53.5/59.9	60/60	49/55	171/171
			15.8/21.0	43.8/50.5		64.1/72.5	70/80	59/67	169/169	66.5/74.9	70/80	61/69	171/171
			19.9/26.5	55.2/63.8		78.4/89.1	80/90	72/82	169/169	80.8/91.5	90/100	74/84	171/171
	460–3–60	DD–STD	–	–	1.0	13.7	20	14	58	14.7	20	15	59
			6.0	7.2		14.0	20	14	58	15.3	20	15	59
			11.5	13.8		22.3	25	20	58	23.5	25	22	59
			14.0	16.8		26.0	30	24	58	27.3	30	25	59
			23.0	27.7		39.6	40	36	58	40.9	45	38	59
			25.5	30.7		43.4	45	40	58	44.6	45	41	59
		MED	–	–	1.0	12.3	15	12	69	13.3	20	13	70
			6.0	7.2		12.3	15	12	69	13.5	20	13	70
			11.5	13.8		20.5	25	19	69	21.8	25	20	70
			14.0	16.8		24.3	25	22	69	25.5	30	23	70
			23.0	27.7		37.9	40	35	69	39.1	40	36	70
			25.5	30.7		41.6	45	38	69	42.9	45	39	70
		HIGH	–	–	1.0	13.1	20	13	82	14.1	20	14	83
			6.0	7.2		13.3	20	13	82	14.5	20	14	83
			11.5	13.8		21.5	25	20	82	22.8	25	21	83
			14.0	16.8		25.3	30	23	82	26.5	30	24	83
			23.0	27.7		38.9	40	36	82	40.1	45	37	83
			25.5	30.7		42.6	45	39	82	43.9	45	40	83
	575–3–60	DD–STD	–	–	1.9	11.3	15	12	46	13.2	15	14	48
		MED	–	–	1.9	9.3	15	9	53	11.2	15	11	55
		HIGH	–	–	1.9	10.1	15	10	64	12.0	15	12	66

See LEGEND on page 70.

Table 45 (cont.) MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. – 6 TON

UNIT RAH	V–Ph–Hz	IFM TYPE	ELEC. HTR Nom (kW)	ELEC. HTR FLA	PWR EXH FLA	NO C.O. or UNPWR C.O. NO P.E. MCA	NO P.E. FUSE or HACR BRKR	NO P.E. DISC. SIZE FLA	NO P.E. DISC. SIZE LRA	w/ P.E. (pwrd fr/unit) MCA	w/ P.E. (pwrd fr/unit) FUSE or HACR BRKR	w/ P.E. (pwrd fr/unit) DISC. SIZE FLA	w/ P.E. (pwrd fr/unit) DISC. SIZE LRA
072	208/230–3–60	STD	–	–	3.8	32.0	50	31	148	35.8	50	36	152
			4.9/6.5	13.6/15.6		32.0/32.0	50/50	31/31	148/148	35.8/35.8	50/50	36/36	152/152
			7.8/10.4	21.7/25.0		33.6/37.8	50/50	31/35	148/148	38.4/42.5	50/50	36/39	152/152
			12.0/16.0	33.4/38.5		48.3/54.6	50/60	44/50	148/148	53.0/59.4	60/60	49/55	152/152
			15.8/21.0	43.8/50.5		61.3/69.6	70/70	56/64	148/148	66.0/74.4	70/80	61/68	152/152
			19.9/26.5	55.2/63.8		75.5/86.3	80/90	69/79	148/148	80.3/91.0	90/100	74/84	152/152
		MED	–	–	3.8	34.3	50	34	185	38.1	50	38	189
			4.9/6.5	13.6/15.6		34.3/34.3	50/50	34/34	185/185	38.1/38.1	50/50	38/38	189/189
			7.8/10.4	21.7/25.0		36.5/40.6	50/50	34/37	185/185	41.3/45.4	50/50	38/42	189/189
			12.0/16.0	33.4/38.5		51.1/57.5	60/60	47/53	185/185	55.9/62.3	60/70	51/57	189/189
			15.8/21.0	43.8/50.5		64.1/72.5	70/80	59/67	185/185	68.9/77.3	70/80	63/71	189/189
			19.9/26.5	55.2/63.8		78.4/89.1	80/90	72/82	185/185	83.1/93.9	90/100	76/86	189/189
		HIGH	–	–	3.8	41.8	60	43	211	45.6	60	47	215
			4.9/6.5	13.6/15.6		41.8/41.8	60/60	43/43	211/211	45.6/45.6	60/60	47/47	215/215
			7.8/10.4	21.7/25.0		45.9/50.0	60/60	43/46	211/211	50.6/54.8	60/60	47/50	215/215
			12.0/16.0	33.4/38.5		60.5/66.9	70/70	56/62	211/211	65.3/71.6	70/80	60/66	215/215
			15.8/21.0	43.8/50.5		73.5/81.9	80/90	68/75	211/211	78.3/86.6	80/90	72/80	215/215
			19.9/26.5	55.2/63.8		87.8/98.5	90/100	81/91	211/211	92.5/103.3	100/110	85/95	215/215
	460–3–60	STD	–	–	1.8	16.3	25	16	75	18.1	25	18	77
			6.0	7.2		16.3	25	16	75	18.1	25	18	77
			11.5	13.8		20.5	25	19	75	22.8	25	21	77
			14.0	16.8		24.3	25	22	75	26.5	30	24	77
			23.0	27.7		37.9	40	35	75	40.1	45	37	77
			25.5	30.7		41.6	45	38	75	43.9	45	40	77
		MED	–	–	1.8	17.1	25	17	94	18.9	25	19	96
			6.0	7.2		17.1	25	17	94	18.9	25	19	96
			11.5	13.8		21.5	25	20	94	23.8	25	22	96
			14.0	16.8		25.3	30	23	94	27.5	30	25	96
			23.0	27.7		38.9	40	36	94	41.1	45	38	96
			25.5	30.7		42.6	45	39	94	44.9	45	41	96
		HIGH	–	–	1.8	21.1	30	22	107	22.9	30	24	109
			6.0	7.2		21.1	30	22	107	22.9	30	24	109
			11.5	13.8		26.5	30	24	107	28.8	30	26	109
			14.0	16.8		30.3	35	28	107	32.5	35	30	109
			23.0	27.7		43.9	45	40	107	46.1	50	42	109
			25.5	30.7		47.6	50	44	107	49.9	50	46	109
	575–3–60	STD	–	–	3.8	12.9	20	13	61	16.7	20	17	65
		MED	–	–	3.8	13.3	20	13	76	17.1	20	17	80
		HIGH	–	–	3.8	16.1	20	16	90	19.9	25	21	94

See LEGEND on page 70.

Table 45 (cont.) MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. – 7.5 TON

UNIT RAH	V–Ph–Hz	IFM TYPE	ELEC. HTR Nom (kW)	ELEC. HTR FLA	PWR EXH FLA	NO C.O. or UNPWR C.O. NO P.E. MCA	NO P.E. FUSE or HACR BRKR	NO P.E. DISC. SIZE FLA	NO P.E. DISC. SIZE LRA	w/ P.E. (pwrd fr/unit) MCA	w/ P.E. FUSE or HACR BRKR	w/ P.E. DISC. SIZE FLA	w/ P.E. DISC. SIZE LRA
090	208/230–3–60	STD	–	–	3.8	38.8	50	41	191	42.6	50	45	195
			7.8/10.4	21.7/25.0		38.8/38.8	50/50	41/41	191/191	42.6/42.6	50/50	45/45	195/195
			12.0/16.0	33.4/38.5		48.3/54.6	50/60	44/50	191/191	53.0/59.4	60/60	49/55	195/195
			18.6/24.8	51.7/59.7		71.1/81.1	80/90	65/75	191/191	75.9/85.9	80/90	70/79	195/195
			24.0/32.0	66.7/77.0		89.9/102.8	90/110	83/95	191/191	94.6/107.5	100/110	87/99	195/195
			31.8/42.4	88.4/102.0		117.0/134.0	125/150	108/123	191/191	121.8/138.8	125/150	112/128	195/195
		MED	–	–	3.8	38.8	50	41	202	42.6	50	45	206
			7.8/10.4	21.7/25.0		38.8/38.8	50/50	41/41	202/202	42.6/42.6	50/50	45/45	206/206
			12.0/16.0	33.4/38.5		48.3/54.6	50/60	44/50	202/202	53.0/59.4	60/60	49/55	206/206
			18.6/24.8	51.7/59.7		71.1/81.1	80/90	65/75	202/202	75.9/85.9	80/90	70/79	206/206
			24.0/32.0	66.7/77.0		89.9/102.8	90/110	83/95	202/202	94.6/107.5	100/110	87/99	206/206
			31.8/42.4	88.4/102.0		117.0/134.0	125/150	108/123	202/202	121.8/138.8	125/150	112/128	206/206
		HIGH	–	–	3.8	43.6	50	46	245	47.4	60	51	249
			7.8/10.4	21.7/25.0		43.6/43.8	50/50	46/46	245/245	47.4/48.5	60/60	51/51	249/249
			12.0/16.0	33.4/38.5		54.3/60.6	60/70	50/56	245/245	59.0/65.4	60/70	54/60	249/249
			18.6/24.8	51.7/59.7		77.1/87.1	80/90	71/80	245/245	81.9/91.9	90/100	75/85	249/249
			24.0/32.0	66.7/77.0		95.9/108.8	100/110	88/100	245/245	100.6/113.5	110/125	93/104	249/249
			31.8/42.4	88.4/102.0		123.0/140.0	125/150	113/129	245/245	127.8/144.8	150/150	118/133	249/249
	460–3–60	STD	–	–	1.8	17.9	20	19	95	19.7	25	21	97
			13.9	16.7		24.1	25	22	95	26.4	30	24	97
			16.5	19.8		28.0	30	26	95	30.3	35	28	97
			27.8	33.4		45.0	50	41	95	47.3	50	43	97
			33.0	39.7		52.9	60	49	95	55.1	60	51	97
			41.7	50.2		66.0	70	61	95	68.3	70	63	97
		MED	–	–	1.8	17.9	20	19	101	19.7	25	21	103
			13.9	16.7		24.1	25	22	101	26.4	30	24	103
			16.5	19.8		28.0	30	26	101	30.3	35	28	103
			27.8	33.4		45.0	50	41	101	47.3	50	43	103
			33.0	39.7		52.9	60	49	101	55.1	60	51	103
			41.7	50.2		66.0	70	61	101	68.3	70	63	103
		HIGH	–	–	1.8	19.7	25	21	123	21.5	25	23	125
			13.9	16.7		26.4	30	24	123	28.6	30	26	125
			16.5	19.8		30.3	35	28	123	32.5	35	30	125
			27.8	33.4		47.3	50	43	123	49.5	50	46	125
			33.0	39.7		55.1	60	51	123	57.4	60	53	125
			41.7	50.2		68.3	70	63	123	70.5	80	65	125
	575–3–60	STD	–	–	3.8	13.1	15	14	77	16.9	20	18	81
			17.0	20.4		28.5	30	26	77	33.3	35	31	81
			34.0	40.9		54.1	60	50	77	58.9	60	54	81
		MED	–	–	3.8	12.7	15	13	81	16.5	20	18	85
			17.0	20.4		28.0	30	26	81	32.8	35	30	85
			34.0	40.9		53.6	60	49	81	58.4	60	54	85
		HIGH	–	–	3.8	13.5	15	14	92	17.3	20	19	96
			17.0	20.4		29.0	30	27	92	33.8	35	31	96
			34.0	40.9		54.6	60	50	92	59.4	60	55	96

See LEGEND on page 70.

Table 45 (cont.) MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. – 8.5 TON

UNIT RAH	V–Ph–Hz	IFM TYPE	ELEC. HTR Nom (kW)	ELEC. HTR FLA	PWR EXH FLA	NO C.O. or UNPWR C.O. NO P.E. MCA	NO P.E. FUSE or HACR BRKR	NO P.E. DISC. SIZE FLA	NO P.E. DISC. SIZE LRA	w/ P.E. (pwrd fr/unit) MCA	w/ P.E. (pwrd fr/unit) FUSE or HACR BRKR	w/ P.E. (pwrd fr/unit) DISC. SIZE FLA	w/ P.E. (pwrd fr/unit) DISC. SIZE LRA
102	208/230–3–60	STD	–	–	3.8	39.0	50	41	191	42.8	50	45	195
			7.8/10.4	21.7/25.0		39.0/39.0	50/50	41/41	191/191	42.8/42.8	50/50	45/45	195/195
			12.0/16.0	33.4/38.5		48.3/54.6	50/60	44/50	191/191	53.0/59.4	60/60	49/55	195/195
			18.6/24.8	51.7/59.7		71.1/81.1	80/90	65/75	191/191	75.9/85.9	80/90	70/79	195/195
			24.0/32.0	66.7/77.0		89.9/102.8	90/110	83/95	191/191	94.6/107.5	100/110	87/99	195/195
			31.8/42.4	88.4/102.0		117.0/134.0	125/150	108/123	191/191	121.8/138.8	125/150	112/128	195/195
		MED	–	–	3.8	39.0	50	41	202	42.8	50	45	206
			7.8/10.4	21.7/25.0		39.0/39.0	50/50	41/41	202/202	42.8/42.8	50/50	45/45	206/206
			12.0/16.0	33.4/38.5		48.3/54.6	50/60	44/50	202/202	53.0/59.4	60/60	49/55	206/206
			18.6/24.8	51.7/59.7		71.1/81.1	80/90	65/75	202/202	75.9/85.9	80/90	70/79	206/206
			24.0/32.0	66.7/77.0		89.9/102.8	90/110	83/95	202/202	94.6/107.5	100/110	87/99	206/206
			31.8/42.4	88.4/102.0		117.0/134.0	125/150	108/123	202/202	121.8/138.8	125/150	112/128	206/206
		HIGH	–	–	3.8	43.8	50	46	245	47.6	60	51	249
			7.8/10.4	21.7/25.0		43.8/43.8	50/50	46/46	245/245	47.6/48.5	60/60	51/51	249/249
			12.0/16.0	33.4/38.5		54.3/60.6	60/70	50/56	245/245	59.0/65.4	60/70	54/60	249/249
			18.6/24.8	51.7/59.7		77.1/87.1	80/90	71/80	245/245	81.9/91.9	90/100	75/85	249/249
			24.0/32.0	66.7/77.0		95.9/108.8	100/110	88/100	245/245	100.6/113.5	110/125	93/104	249/249
			31.8/42.4	88.4/102.0		123.0/140.0	125/150	113/129	245/245	127.8/144.8	150/150	118/133	249/249
	460–3–60	STD	–	–	1.8	18.2	20	19	95	20.0	25	21	97
			13.9	16.7		24.1	25	22	95	26.4	30	24	97
			16.5	19.8		28.0	30	26	95	30.3	35	28	97
			27.8	33.4		45.0	50	41	95	47.3	50	43	97
			33.0	39.7		52.9	60	49	95	55.1	60	51	97
			41.7	50.2		66.0	70	61	95	68.3	70	63	97
		MED	–	–	1.8	18.2	20	19	101	20.0	25	21	103
			13.9	16.7		24.1	25	22	101	26.4	30	24	103
			16.5	19.8		28.0	30	26	101	30.3	35	28	103
			27.8	33.4		45.0	50	41	101	47.3	50	43	103
			33.0	39.7		52.9	60	49	101	55.1	60	51	103
			41.7	50.2		66.0	70	61	101	68.3	70	63	103
		HIGH	–	–	1.8	20.0	25	21	123	21.8	25	23	125
			13.9	16.7		26.4	30	24	123	28.6	30	26	125
			16.5	19.8		30.3	35	28	123	32.5	35	30	125
			27.8	33.4		47.3	50	43	123	49.5	50	46	125
			33.0	39.7		55.1	60	51	123	57.4	60	53	125
			41.7	50.2		68.3	70	63	123	70.5	80	65	125
	575–3–60	STD	–	–	3.8	14.4	20	15	77	18.2	20	20	81
			17.0	20.4		28.5	30	26	77	33.3	35	31	81
			34.0	40.9		54.1	60	50	77	58.9	60	54	81
		MED	–	–	3.8	14.0	20	15	81	17.8	20	19	85
			17.0	20.4		28.0	30	26	81	32.8	35	30	85
			34.0	40.9		53.6	60	49	81	58.4	60	54	85
		HIGH	–	–	3.8	14.8	20	16	92	18.6	20	20	96
			17.0	20.4		29.0	30	27	92	33.8	35	31	96
			34.0	40.9		54.6	60	50	92	59.4	60	55	96

See LEGEND on page 70.

Table 45 (cont.) MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. – 10 TON

UNIT RAH	V–Ph–Hz	IFM TYPE	ELEC. HTR		PWR EXH	NO C.O. or UNPWR C.O.							
						NO P.E.				w/ P.E. (pwrd fr/unit)			
							FUSE or HACR BRKR	DISC. SIZE			FUSE or HACR BRKR	DISC. SIZE	
			Nom (kW)	FLA	FLA	MCA		FLA	LRA	MCA		FLA	LRA
120	208/230–3–60	STD	–	–	3.8	47.2	60	50	282	51.0	60	54	286
			7.8/10.4	21.7/25.0		47.2/47.2	60/60	50/50	282/282	51.0/51.0	60/60	54/54	286/286
			12.0/16.0	33.4/38.5		48.3/54.6	60/60	50/50	282/282	53.0/59.4	60/60	54/55	286/286
			24.0/32.0	66.7/77.0		89.9/102.8	90/110	83/95	282/282	94.6/107.5	100/110	87/99	286/286
			31.8/42.4	88.4/102.0		117.0/134.0	125/150	108/123	282/282	121.8/138.8	125/150	112/128	286/286
			37.6/50.0	104.2/120.3		136.8/126.8	150/150	126/144	282/282	141.5/131.6	150/150	130/149	286/286
		MED	–	–	3.8	52.0	60	55	325	55.8	60	60	329
			7.8/10.4	21.7/25.0		52.0/52.0	60/60	55/55	325/325	55.8/55.8	60/60	60/60	329/329
			12.0/16.0	33.4/38.5		54.3/60.6	60/70	55/56	325/325	59.0/65.4	60/70	60/60	329/329
			24.0/32.0	66.7/77.0		95.9/108.8	100/110	88/100	325/325	100.6/113.5	110/125	93/104	329/329
			31.8/42.4	88.4/102.0		123.0/140.0	125/150	113/129	325/325	127.8/144.8	150/150	118/133	329/329
			37.6/50.0	104.2/120.3		142.8/132.8	150/150	131/150	325/325	147.5/137.6	150/150	136/154	329/329
		HIGH	–	–	3.8	57.0	70	61	334	60.8	70	65	338
			7.8/10.4	21.7/25.0		57.0/57.0	70/70	61/61	334/334	60.8/60.8	70/70	65/65	338/338
			12.0/16.0	33.4/38.5		60.5/66.9	70/70	61/62	334/334	65.3/71.6	70/80	65/66	338/338
			24.0/32.0	66.7/77.0		102.1/115.0	110/125	94/106	334/334	106.9/119.8	110/125	98/110	338/338
			31.8/42.4	88.4/102.0		129.3/146.3	150/150	119/135	334/334	134.0/151.0	150/175	123/139	338/338
			37.6/50.0	104.2/120.3		149.0/139.1	150/175	137/156	334/334	153.8/143.8	175/175	141/160	338/338
	460–3–60	STD	–	–	1.8	23.0	30	24	135	24.8	30	26	137
			13.9	16.7		24.1	30	24	135	26.4	30	26	137
			16.5	19.8		28.0	30	26	135	30.3	35	28	137
			33.0	39.7		52.9	60	49	135	55.1	60	51	137
			41.7	50.2		66.0	70	61	135	68.3	70	63	137
			50.0	60.1		63.4	70	72	135	65.6	70	74	137
		MED	–	–	1.8	24.8	30	26	157	26.6	30	28	159
			13.9	16.7		26.4	30	26	157	28.6	30	28	159
			16.5	19.8		30.3	35	28	157	32.5	35	30	159
			33.0	39.7		55.1	60	51	157	57.4	60	53	159
			41.7	50.2		68.3	70	63	157	70.5	80	65	159
			50.0	60.1		65.6	80	74	157	67.9	80	76	159
		HIGH	–	–	1.8	27.8	30	30	161	29.6	35	32	163
			13.9	16.7		30.1	35	30	161	32.4	35	32	163
			16.5	19.8		34.0	35	31	161	36.3	40	33	163
			33.0	39.7		58.9	60	54	161	61.1	70	56	163
			41.7	50.2		72.0	80	66	161	74.3	80	68	163
			50.0	60.1		69.4	80	78	161	71.6	80	80	163
	575–3–60	STD	–	–	3.8	17.3	20	18	105	21.1	25	23	109
			17.0	20.4		28.0	30	26	105	32.8	35	30	109
			34.0	40.9		53.6	60	49	105	58.4	60	54	109
			51.0	61.3		63.8	70	73	105	68.6	80	77	109
		MED	–	–	3.8	18.1	20	19	116	21.9	25	24	120
			17.0	20.4		29.0	30	27	116	33.8	35	31	120
			34.0	40.9		54.6	60	50	116	59.4	60	55	120
			51.0	61.3		64.8	70	74	116	69.6	80	78	120
		HIGH	–	–	3.8	20.9	25	22	130	24.7	30	27	134
			17.0	20.4		32.5	35	30	130	37.3	40	34	134
			34.0	40.9		58.1	60	53	130	62.9	70	58	134
			51.0	61.3		68.3	80	77	130	73.1	80	81	134

See LEGEND on page 70.

Table 45 (cont.) MCA/MOCP DETERMINATION NO C.O. OR UNPWRD C.O. – 12.5 TON

UNIT	V–Ph–Hz	IFM TYPE	ELEC. HTR		PWR EXH	NO C.O. or UNPWR C.O.							
						NO P.E.				W/ P.E. (pwrd fr unit)			
			Nom (kW)	FLA	FLA	MCA	FUSE or HACR BRKR	DISC. SIZE		MCA	FUSE or HACR BRKR	DISC. SIZE	
								FLA	LRA			FLA	LRA
150	208/230–3–60	STD	–	–	3.8	54.8	60	58	314	58.6	70	62	318
			12.4/16.5	34.4/39.7		54.8/59.0	60/60	58/58	314/314	58.6/63.8	70/70	62/62	318/318
			19.9/26.5	55.3/63.8		78.5/89.1	80/90	72/82	314/314	83.3/93.9	90/100	77/86	318/318
			25.2/33.5	69.9/80.6		96.8/110.1	100/125	89/101	314/314	101.5/114.9	110/125	93/106	318/318
			32.7/43.5	90.7/104.7		122.8/140.3	125/150	113/129	314/314	127.5/145.0	150/150	117/133	318/318
			37.6/50.0	104.3/120.3		139.8/129.7	150/150	129/147	314/314	144.5/134.4	150/150	133/151	318/318
		MED	–	–	3.8	57.3	70	60	331	61.1	80	65	335
			12.4/16.5	34.4/39.7		57.3/62.1	70/70	60/60	331/331	61.1/66.9	80/80	65/65	335/335
			19.9/26.5	55.3/63.8		81.6/92.3	90/100	75/85	331/331	86.4/97.0	90/100	79/89	335/335
			25.2/33.5	69.9/80.6		99.9/113.3	100/125	92/104	331/331	104.6/118.0	110/125	96/109	335/335
			32.7/43.5	90.7/104.7		125.9/143.4	150/150	116/132	331/331	130.6/148.1	150/150	120/136	335/335
			37.6/50.0	104.3/120.3		142.9/132.8	150/150	131/150	331/331	147.6/137.6	150/150	136/154	335/335
		HIGH –High Eff	–	–	3.8	68.0	80	72	350	71.8	80	77	354
			12.4/16.5	34.4/39.7		68.5/75.1	80/80	72/72	350/350	73.3/79.9	80/80	77/77	354/354
			19.9/26.5	55.3/63.8		94.6/105.3	100/110	87/97	350/350	99.4/110.0	100/125	91/101	354/354
			25.2/33.5	69.9/80.6		112.9/126.3	125/150	104/116	350/350	117.6/131.0	125/150	108/121	354/354
			32.7/43.5	90.7/104.7		138.9/156.4	150/175	128/144	350/350	143.6/161.1	150/175	132/148	354/354
			37.6/50.0	104.3/120.3		155.9/145.8	175/175	143/162	350/350	160.6/150.6	175/175	148/166	354/354
	460–3–60	STD	–	–	1.8	27.6	35	29	158	29.4	35	31	160
			16.5	19.9		29.1	35	29	158	31.4	35	31	160
			26.5	31.9		44.1	45	41	158	46.4	50	43	160
			33.5	40.3		54.6	60	50	158	56.9	60	52	160
			43.5	52.3		69.6	70	64	158	71.9	80	66	160
			50.0	60.2		64.5	70	73	158	66.7	70	75	160
		MED	–	–	1.8	28.6	35	30	167	30.4	40	32	169
			16.5	19.9		30.4	35	30	167	32.6	40	32	169
			26.5	31.9		45.4	50	42	167	47.6	50	44	169
			33.5	40.3		55.9	60	51	167	58.1	60	53	169
			43.5	52.3		70.9	80	65	167	73.1	80	67	169
			50.0	60.2		65.7	80	74	167	68.0	80	76	169
		HIGH –High Eff	–	–	1.8	34.6	40	37	176	36.4	45	39	178
			16.5	19.9		37.6	40	37	176	39.9	45	39	178
			26.5	31.9		52.6	60	48	176	54.9	60	50	178
			33.5	40.3		63.1	70	58	176	65.4	70	60	178
			43.5	52.3		78.1	80	72	176	80.4	90	74	178
			50.0	60.2		73.0	80	81	176	75.2	80	83	178
14	575–3–60	STD	–	–	3.8	21.6	25	23	128	25.4	30	27	132
			16.5	15.9		23.4	25	23	128	28.1	30	27	132
			26.5	25.5		35.4	40	33	128	40.1	45	37	132
			33.5	32.2		43.8	45	40	128	48.5	50	45	132
			43.5	41.8		55.8	60	51	128	60.5	70	56	132
			50.0	48.1		51.6	60	59	128	56.4	60	63	132
		MED	–	–	3.8	21.6	25	23	128	25.4	30	27	132
			16.5	15.9		23.4	25	23	128	28.1	30	27	132
			26.5	25.5		35.4	40	33	128	40.1	45	37	132
			33.5	32.2		43.8	45	40	128	48.5	50	45	132
			43.5	41.8		55.8	60	51	128	60.5	70	56	132
			50.0	48.1		51.6	60	59	128	56.4	60	63	132
		HIGH –High Eff	–	–	3.8	28.2	35	30	140	32.0	40	34	144
			16.5	15.9		31.1	35	30	140	35.9	40	34	144
			26.5	25.5		43.1	45	40	140	47.9	50	44	144
			33.5	32.2		51.5	60	47	140	56.3	60	52	144
			43.5	41.8		63.5	70	58	140	68.3	70	63	144
			50.0	48.1		59.4	70	66	140	64.1	70	70	144

See LEGEND on page 70.

LEGEND:

CO	–	Convenient outlet
DISC	–	Disconnect
FLA	–	Full load amps
IFM	–	Indoor fan motor
LRA	–	Locked rotor amps
MCA	–	Minimum circuit amps
MOCP	–	Maximum over current protection
PE	–	Power exhaust
UNPWRD CO	–	Unpowered convenient outlet

NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.

2. Unbalanced 3-Phase Supply Voltage

Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.

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

Example: Supply voltage is 230-3-60

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

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

$$= 227$$

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

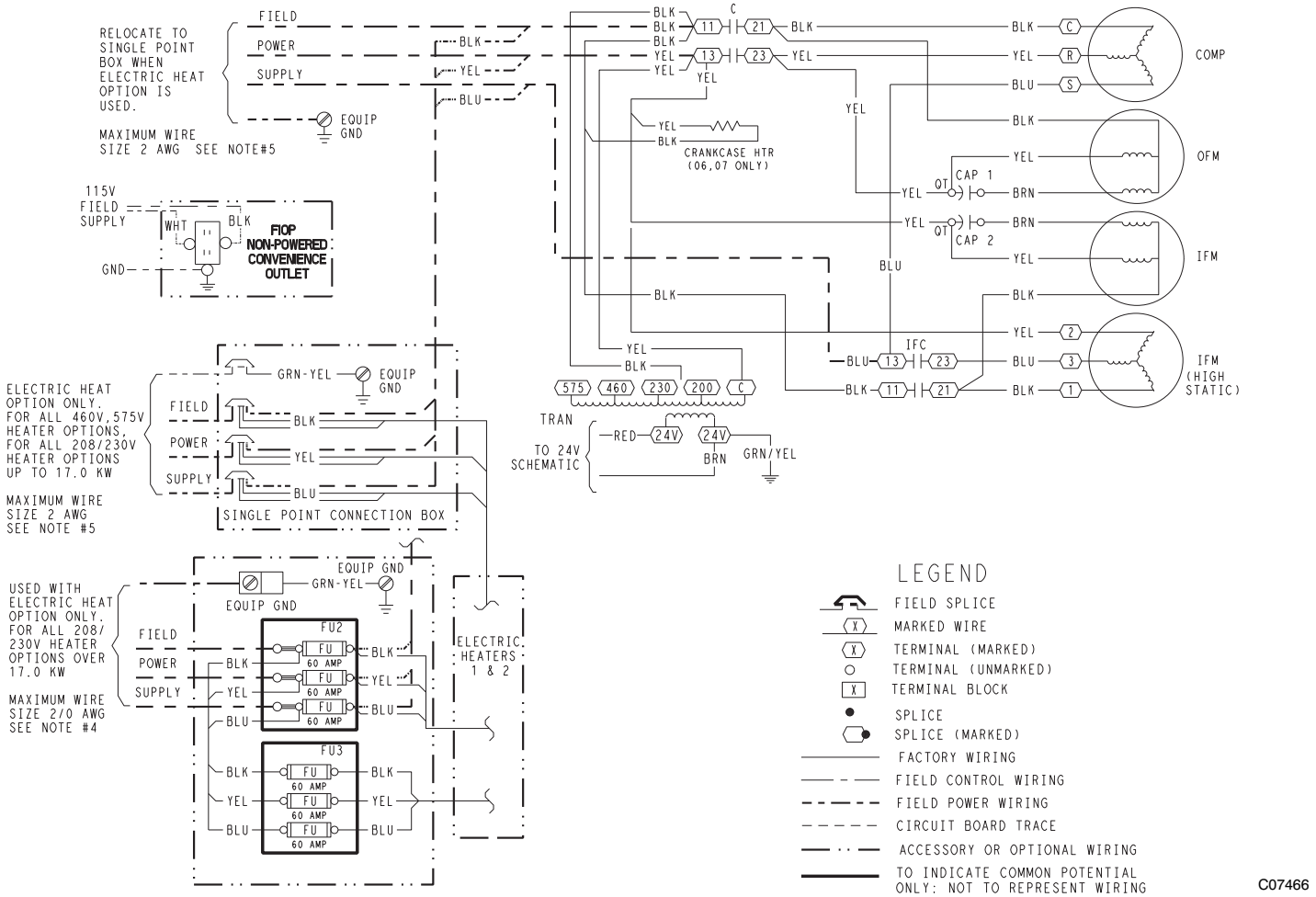
$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

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

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

Fig. 7 – 1 Stage Cooling Typical Power Diagram



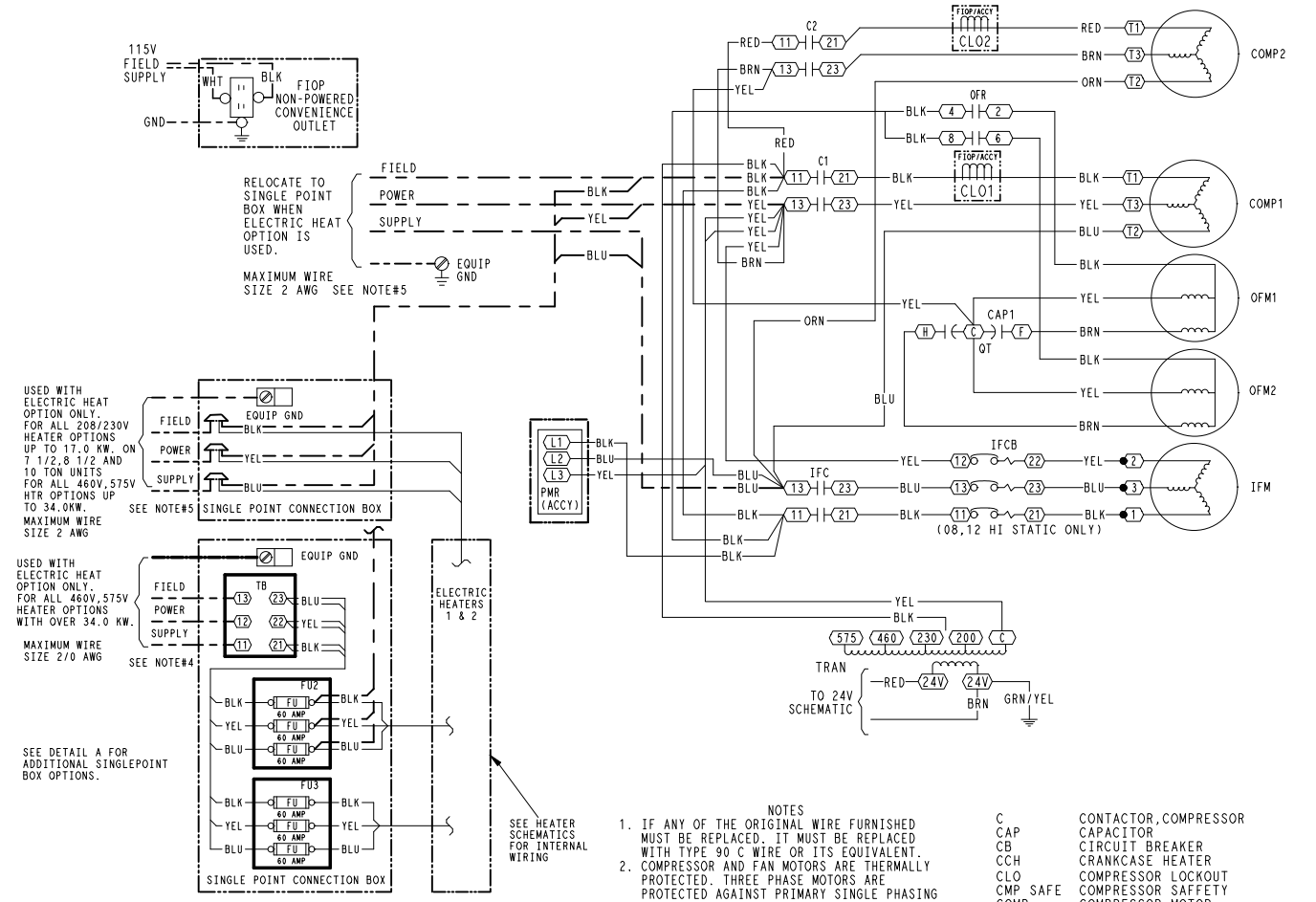
LEGEND

C	–	Contactor, compressor
CAP	–	Capacitor
CB	–	Circuit breaker
COMP	–	Compressor motor
DDC	–	Direct digital control
FU	–	Fuse
GND	–	Ground
HPS	–	High pressure switch
IAQ	–	Indoor air quality sensors
IFC	–	Indoor fan contactor
IFM	–	Indoor fan motor
LA	–	Low ambient lockout
LPS	–	Low pressure switch
OAT	–	Outdoor air temp sensor
OFM	–	Outdoor fan motor
OLR	–	Overload relay
PL	–	Plug assembly
POT	–	Potentiometer
PMR	–	Phase monitor relay
QT	–	Quadruple terminal
R	–	Relay
RAT	–	Return air temp sensor
SAT	–	Supply air temp sensor
TDR	–	Time delay relay
TRAN	–	Transformer

NOTES:

1. If any of the original wire furnished must be replaced, it must be replaced with type 90 C wire or its equivalent.
2. Compressor and fan motors are thermally protected. Three phase motors are protected against primary single phasing conditions.
3. On 208/230V units, transformer is wired for 230V. If unit is to be run with 208V power supply, disconnect black wire from 230V tap and connect to 200V tap. 230V, 200V taps on transformer do not appear on 575V transformer and 575V tap does not appear on 208/23/460V transformer.
4. Use copper, copper clad, aluminum or aluminum connectors.
5. Use copper conductor only.

Fig. 7A – 2 Stage Typical Power Diagram



NOTES

1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED. IT MUST BE REPLACED WITH TYPE 90 C WIRE OR ITS EQUIVALENT.
2. COMPRESSOR AND FAN MOTORS ARE THERMALLY PROTECTED. THREE PHASE MOTORS ARE PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. ON 208/230V UNITS, TRAN IS WIRED FOR 230V. IF UNIT IS TO BE RUN WITH 208V POWER SUPPLY, DISCONNECT BLK WIRE FROM 230V TAP AND CONNECT TO 200V TAP. 230V,200V TAPS ON TRAN DO NOT APPEAR ON 575V TRAN AND 575V TAP DOES NOT APPEAR ON 208/230/460V TRAN.
4. USE COPPER, COPPER CLAD, ALUMINUM OR ALUMINUM CONNECTORS.
5. USE COPPER CONDUCTOR ONLY.

LEGEND

	FIELD SPLICE
(X)	MARKED WIRE
(X)	TERMINAL (MARKED)
○	TERMINAL (UNMARKED)
X	TERMINAL BLOCK
———	FACTORY WIRING
—·—·—	FIELD CONTROL WIRING
- - - -	FIELD POWER WIRING
·····	CIRCUIT BOARD TRACE
——·——	ACCESSORY OR OPTIONAL WIRING
———	TO INDICATE COMMON POTENTIAL ONLY: NOT TO REPRESENT WIRING

C	CONTACTOR,COMPRESSOR
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CCH	CRANKCASE HEATER
CLO	COMPRESSOR LOCKOUT
CMP SAFE	COMPRESSOR SAFFETY
COMP	COMPRESSOR MOTOR
DDC	DIRECT DIGITAL CONTROL
FSD	FIRE SHUT DOWN
FU	FUSE
GND	GROUND
HC	HEATER CONTACTOR
HPS	HIGH PRESSURE SWITCH
IAQ	INDOOR AIR QUALITY SENSORS
IFC	INDOOR FAN CONTACTOR
IFCB	INDOOR FAN CIRCUIT BREAKER
IFM	INDOOR FAN MOTOR
IRH	INDOOR RELATIVE HUMIDITY
JMP	JUMPER
LA	LOW AMBIENT LOCKOUT
LOOP PWR	CURRENT LOOP POWER
LPS	LOW PRESSURE SWITCH
LSM	LIMIT SWITCH (MANUAL RESET)
LS	LIMIT SWITCH
OAQ	OUTDOOR AIR QUALITY
OAT	OUTDOOR AIR TEMP. SEN
OFM	OUTDOOR FAN MOTOR
OFR	OUTDOOR FAN RELAY
OL	OVERLOAD
PL	PLUG ASSEMBLY
POT	POTENTIOMETER
PMR	PHASE MONITOR RELAY
QT	QUADRUPLE TERMINAL
R	RELAY
RAT	RETURN AIR TEMP. SEN
RMT OCC	REMOTE OCCUPANCY
SAT	SUPPLY AIR TEMP. SENSOR
SEN	SENSOR
SET	SET POINT OFFSET
SFS	SUPPLY FAN STATUS
TDR	TIME DELAY RELAY
TRAN	TRANSFORMER

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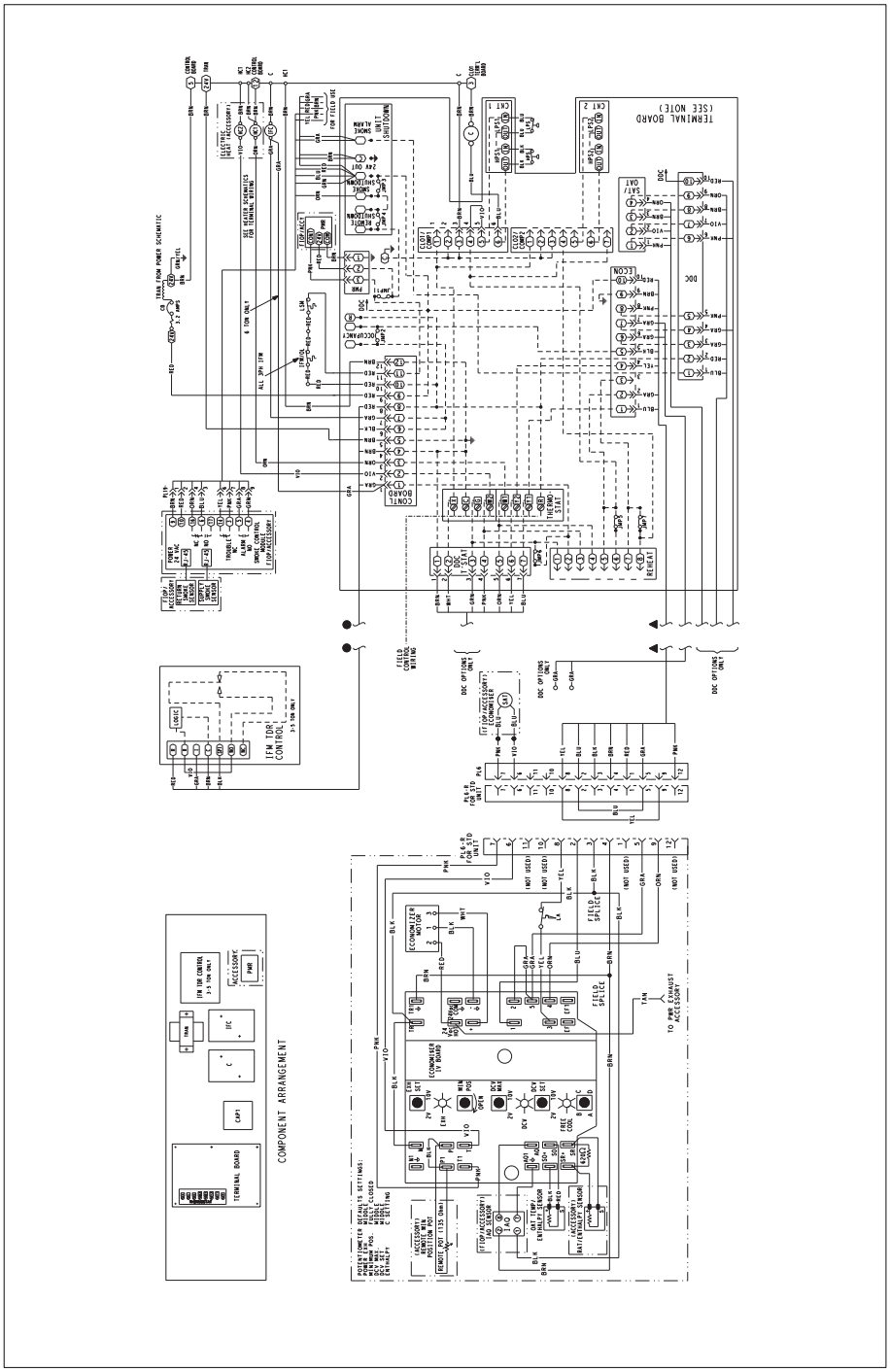

Fig. 8 – 1 Stage Typical Power Diagram

NOTES:

Terminal board schematic layout does not match actual terminal board to simplify circuit traces. Ensure designated jumpers on terminal board are cut when adding smoke detectors, phase loss relay and remote shutdown.

ECONOMIZER NOTES:

1. 620 ohm, 1 watt, 5% resister should be removed only when using differential enthalpy or dry bulb.

2. If a separate field−supplied 24V transformer is used for the IAQ sensor power supply, it cannot have the secondary of the transformer grounded.

3. For field−installed remote minimum position POT, remove black wire jumper between P and P1 and set control minimum position POT to the minimum position.

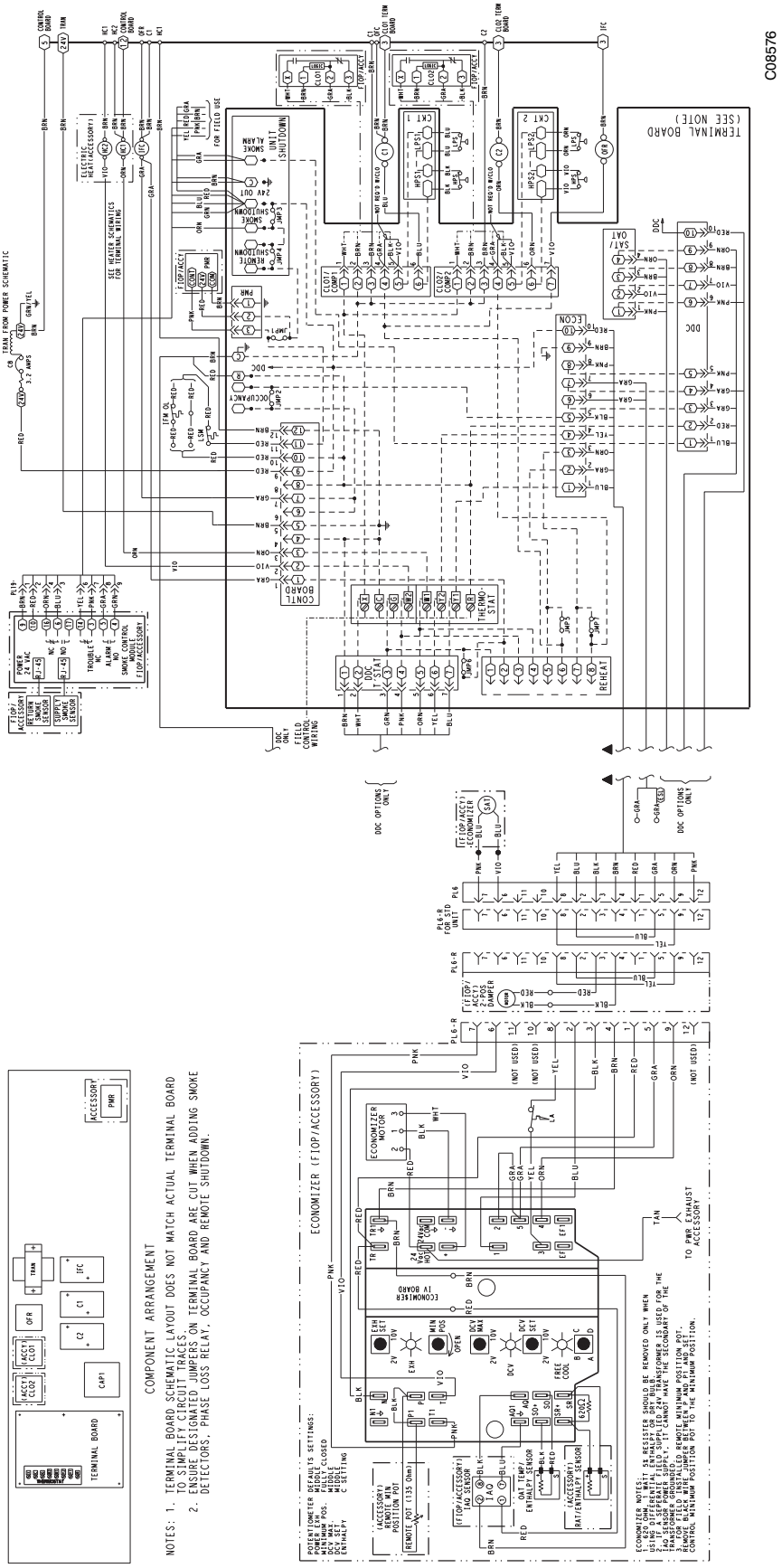

Fig. 8A – 2 Stage Typical Power Diagram

SEQUENCE OF OPERATION

General

The sequence below describes the sequence of operation for an electro−mechanical unit with and without a factory installed EconoMi$er™ IV (called “economizer” in this sequence). For information regarding a direct digital controller, see the start−up, operations, and troubleshooting manual for the applicable controller.

Electro−mechanical units with no economizer

Cooling —

When the thermostat calls for cooling, terminals G and Y1 are energized. As a result, the indoor−fan contactor (IFC) and the compressor contactor (C1) are energized, causing the indoor−an motor (IFM), compressor #1, and outdoor fan to start. If the unit has 2 stages of cooling, the thermostat will additionally energize Y2. The Y2 signal will energize compressor contactor #2 (C2), causing compressor #2 to start. Regardless of the number of stages, the outdoor−fan motor runs continuously while unit is cooling.

Heating

NOTE: The RAH is sold as cooling only. If electric heaters are required, use only factory−approved electric heaters. They will operate as described below.

Units have either 1 or 2 stages of electric heat. When the thermostat calls for heating, power is applied to the W1 terminal at the unit. The unit control will energize the indoor fan contactor and the first stage of electric heat. On units with two−stage heating, when additional heating is required, the second stage of electric heat (if equipped) will be energized when power is applied at the W2 terminal on the unit.

Electro−mechanical units with an economizer

Cooling —

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 EconoMi$er IV control to provide a 50°F (10°C) to 55°F (13°C) mixed−air temperature into the zone. As the mixed air temperature fluctuates above 55°F (13°C)or below 50°F (10°C) 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). The power exhaust fans will be energized and de−energized, if installed, as the outdoor−air damper opens and closes.

If field−installed accessory CO_2 sensors are connected to the EconoMi$er IV control, a demand controlled ventilation strategy will begin to operate. As the CO_2 level in the zone increases above the CO_2 setpoint, the minimum position of the damper will be increased proportionally. As the CO_2 level decreases because of the increase in fresh air, the outdoor−air damper will be proportionally closed. For EconoMi$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$er IV control, it will take the damper up to 2 1/2 minutes before it begins to position itself. After the initial power−up, further changes in damper position can take up to 30 seconds to initiate. Damper movement from full closed to full open (or vice versa) will take between 1 1/2 and 2 1/2 minutes. If free cooling can be used as determined from the appropriate changeover command (switch, dry bulb, enthalpy curve, differential dry bulb, or differential enthalpy), then the control will modulate the dampers open to maintain the mixed−air temperature setpoint at 50°F (10°C) to 55°F (13°C). If there is a further demand for cooling (cooling second stage − Y2 is energized), then the control will bring on compressor stage 1 to maintain the mixed−air temperature setpoint. The EconoMi$er IV damper will be open at maximum position. EconoMi$er IV operation is limited to a single compressor.

Heating

The sequence of operation for the heating is the same as an electromechanical unit with no economizer. The only difference is how the economizer acts. The economizer will stay at the Economizer Minimum Position while the evaporator fan is operating. The outdoor−air damper is closed when the indoor fan is not operating.

Electric Cooling Packaged Rooftop

HVAC Guide Specifications

Size Range: **3 to 12.5 Nominal Tons**

As an Energy Star® Partner, International Comfort Products has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

Section **Description**

23 06 80 Schedules for Decentralized HVAC Equipment

23 06 80.13 Decentralized Unitary HVAC Equipment Schedule

23 06 80.13.A. Rooftop unit schedule

1. Schedule is per the project specification requirements.

23 07 16 HVAC Equipment Insulation

23 07 16.13 Decentralized, Rooftop Units:

23 07 16.13.A. Evaporator fan compartment:

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:

1. Aluminum foil–faced fiberglass insulation shall be used.
2. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

23 09 13 Instrumentation and Control Devices for HVAC

23 09 13.23 Sensors and Transmitters

23 09 13.23.A. Thermostats

1. Thermostat must
   a. energize both “W” and “G” when calling for heat.
   b. have capability to energize 2 different stages of cooling, and 2 different stages of heating.
   c. include capability for occupancy scheduling.

23 09 23 Direct–digital Control system for HVAC

23 09 23.13

23 09 23.13.A.

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, and low and high pressure switches.
4. Unit shall include a minimum of one 8–pin screw terminal connection board for connection of control wiring.

23 09 33.23.B. Safeties:

1. Compressor over–temperature, over current.
2. Low–pressure switch.

a. Units with 2 compressors shall have different sized connectors for the circuit 1 and circuit 2 low and high pressure switches. They shall physically prevent the cross−wiring of the safety switches between circuits 1 and 2.

b. Low pressure switch shall use different color wire than the high pressure switch. The purpose is to assist the installer and service technician to correctly wire and or troubleshoot the rooftop unit.

3. High−pressure switch.

a. Units with 2 compressors shall have different sized connectors for the circuit 1 and circuit 2 low and 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. 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 (RAH036−120)

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 gas combustion 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 start−up.
3. Unit shall use environmentally safe, R−410A 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 90.1−2004 minimum efficiency requirements.
2. 3 phase units are Energy Star qualified.
3. Unit shall be rated in accordance with AHRI Standards 210/240 and 340/360.
4. Unit shall be designed to conform to ASHRAE 15, 2001.
5. 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.
6. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.
7. Unit casing shall be capable of withstanding 500−hour salt spray exposure per ASTM B117 (scribed specimen).
8. Unit casing shall be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 5000−hour salt spray.
9. Unit shall be designed in accordance with ISO 9001, and shall be manufactured in a facility registered by ISO 9001.
10. Roof curb shall be designed to conform to NRCA Standards.
11. 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.
12. Unit shall be designed in accordance with UL Standard 1995, including tested to withstand rain.
13. Unit shall be constructed to prevent intrusion of snow and tested to prevent snow intrusion into the control box up to 40 mph.
14. Unit shake tested to assurance level 1, ASTM D4169 to ensure shipping reliability.
15. 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 35°F (2°C), ambient outdoor temperatures. Accessory low ambient kits shall be available if operation below 35°F (2°C), is required. See below for head pressure control package or winter start kit.
3. Unit shall discharge supply air vertically or horizontally as shown on contract drawings.
4. Unit shall be factory configured for vertical supply & return configurations.
5. Unit shall be field convertible from vertical to horizontal airflow on all models. No special kit required on 036–120 models. Supply duct kit required for 150 size model only.
6. 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 pre–painted baked enamel finish on all externally exposed surfaces.
2. Unit cabinet exterior paint shall be: film thickness, (dry) 0.003 inches minimum, gloss (per ASTM D523, 60°F): 60, Hardness: H–2H Pencil hardness.
3. Evaporator fan compartment interior cabinet insulation shall conform to AHRI Standards 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 four locations for thru–the–base gas and electrical connections (factory installed or field installed), standard.
5. Base Rail
   a. Unit shall have base rails on a minimum of 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 an internally sloped condensate drain pan made of a non–corrosive material.
   b. Shall comply with ASHRAE Standard 62.
   c. Shall use a 3/4" –14 NPT drain connection, possible either through the bottom or end of the drain pan. Connection shall be made per manufacturer's recommendations.
7. Top panel:
   a. Shall be a single piece top panel on 036 thru 120 sizes two piece on 150 sizes.
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, water–tight 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 panel shall engage into heat resistant, molded composite collars.
f. Collars shall be removable and easily replaceable using manufacturer recommended parts.

23 81 19.13.I. N/A

23 81 19.13.J. Coils

1. Standard Aluminum Fin/Copper Tube Coils:
   a. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless internally grooved copper tubes with all joints brazed.
   b. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
   c. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.
2. Optional Pre−coated aluminum−fin condenser coils:
   a. Shall have a durable epoxy−phenolic coating to provide protection in mildly corrosive coastal environments.
   b. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube.
   c. Epoxy−phenolic barrier shall minimize galvanic action between dissimilar metals.
3. Optional Copper−fin evaporator and condenser coils:
   a. Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets.
   b. Galvanized steel tube sheets shall not be acceptable.
   c. A polymer strip shall prevent coil assembly from contacting the sheet metal coil pan to minimize potential for galvanic corrosion between coil and pan.
4. Optional E−coated aluminum−fin evaporator and condenser coils:
   a. Shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins.
   b. Coating process shall ensure complete coil encapsulation of tubes, fins and headers.
   c. Color shall be high gloss black with gloss per ASTM D523−89.
   d. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges.
   e. Superior hardness characteristics of 2H per ASTM D3363−92A and cross−hatch adhesion of 4B−5B per ASTM D3359−93.
   f. Impact resistance shall be up to 160 in.−lb (ASTM D2794−93).
   g. Humidity and water immersion resistance shall be up to minimum 1000 and 250 hours respectively (ASTM D2247−92 and ASTM D870−92).
   h. Corrosion durability shall be confirmed through testing to be no less than 1000 hours salt spray per ASTM B117−90.
5. Optional E−coated aluminum−fin, aluminum tube condenser coils:
   a. Shall have a flexible epoxy polymer coating uniformly applied to all coil external surface areas without material bridging between fins or louvers.
   b. Coating process shall ensure complete coil encapsulation, including all exposed fin edges.
   c. E−coat thickness of 0.8 to 1.2 mil with top coat having a uniform dry film thickness from 1.0 to 2.0 mil on all external coil surface areas, including fin edges, shall be provided.
   d. Shall have superior hardness characteristics of 2H per ASTM D3363−00 and cross−hatch adhesion of 4B−5B per ASTM D3359−02.
   e. Shall have superior impact resistance with no cracking, chipping or peeling per NSF/ANSI 51−2002 Method 10.2.

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.

2. There shall be gauge line access port in the skin 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/single stage cooling designs on 036−072 sizes and 2 compressor/2 stage cooling models on 090−150 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 over−temperature and over−amperage 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 not be required for normal operating range, unless provided by the factory.

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) ECM − 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 036−060 models with 208/230/1/60 operation.
   e. Standard on all 036−060 3−phase models with optional belt drive.
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 072−150 size models. Optional on all 036−060 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 036 to 150 models.
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. Integrated Economizers:
   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. Shall be equipped with low−leakage dampers, not to exceed 2% leakage at 1 in. wg pressure differential.
   g. Shall be capable of introducing up to 100% outdoor air.
   h. Shall be equipped with a barometric relief damper capable of relieving up to 100% return air.
   i. Shall be designed to close damper(s) during loss−of−power situations with spring return built into motor.
   j. 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.
   k. 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%.
   l. 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.
   m. Dampers shall be completely closed when the unit is in the unoccupied mode.
   n. Economizer controller shall accept a 2−10Vdc CO_2 sensor input for IAQ/DCV control. In this mode, dampers shall modulate the outdoor−air damper to provide ventilation based on the sensor input.
   o. Compressor lockout sensor shall open at 35°F (2°C) and close closes at 50°F (10°C).
   p. Actuator shall be direct coupled to economizer gear. No linkage arms or control rods shall be acceptable.
   q. Economizer controller shall provide indications when in free cooling mode, in the DCV mode, or the exhaust fan contact is closed.
2. Two−Position Damper
   a. Damper shall be a Two−Position 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
3. 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.
4. 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).
5. Condenser Coil Hail Guard Assembly
   a. Shall protect against damage from hail.
   b. Shall be louvered design.
6. 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.

7. Convenience Outlet:
   e. Non−Powered convenience outlet.
      (1.) Outlet shall be powered from a separate 115/120v power source.
      (2.) A transformer shall not be included.
      (3.) Outlet shall be factory−installed and internally mounted with easily accessible 115−v female receptacle.
      (4.) Outlet shall include 15 amp GFI receptacles with independent fuse protection.
      (5.) Outlet shall be accessible from outside the unit.
8. 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 four connection locations per unit.
9. 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 is shall be mounted in return ductwork.
   d. Power exhaust shall be controlled by economizer controller operation. Exhaust fans shall be energized when dampers open past the 0−100% adjustable setpoint on the economizer control.
10. 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.
11. High−Static Indoor Fan Motor(s) and Drive(s):
   a. High−static motor(s) and drive(s) shall be factory−installed to provide additional performance range.
12. Condenser Coil Grille:
   a. Shall protect against damage from hail.
   b. Shall be of louvered style.
13. 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.
14. 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.
15. 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.
16. Indoor Air Quality (CO_2) 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.
17. 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.

18. Winter start kit
    a. Shall contain a bypass device around the low pressure switch.
    b. Shall be required when mechanical cooling is required down to 25°F (–4°C).
    c. Shall not be required to operate on an economizer when below an outdoor ambient of 40°F (4°C).
19. Time Guard
    a. Shall prevent compressor short cycling by providing a 5–minute delay (±2 minutes) before restarting a compressor after shutdown for any reason.
    b. One device shall be required per compressor.
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 (24 v 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.