

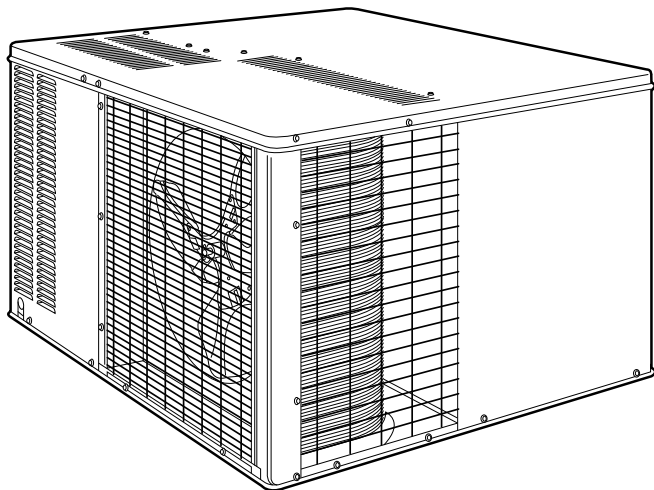


Bryant
Air Conditioning

HIGH EFFICIENCY SINGLE PACKAGE HEAT PUMP UNITS

Model 657A
Sizes 024-060

2 to 5 Tons



DESCRIPTION

Model 657A is our latest generation of high efficiency, packaged heat pumps for manufactured housing, residential, and light commercial applications. The model 657A design is the result of our firm commitment to the development of the finest comfort systems modern technology can offer. Our commitment is backed by our advanced engineering, testing, and research laboratories — and our years of practical experience.

Model 657A is designed in one basic cabinet size and features a side-by-side duct configuration on sizes 024-060.

FEATURES

HIGH EFFICIENCY DESIGN with SEERs (Seasonal Energy Efficiency Ratios) up to 12.0 and HSPFs (Heating Seasonal Performance Factors) of up to 7.2.

FACTORY-ASSEMBLED PACKAGE is a compact, fully self-contained, heat pump unit that is prewired, prepiped, and pre-charged for minimum installation expense.

657A units are available in a variety of standard sizes with voltage options to meet residential and light commercial requirements. Unit installs easily on a rooftop or a ground-level pad. The optional base rail provides an elevated base.

CONVERTIBLE DUCT CONFIGURATION on the 657A is designed for easy use in either downflow or horizontal discharge applications.

DURABLE, DEPENDABLE COMPRESSORS are designed for high efficiency. Each compressor is hermetically sealed against contamination to help promote longer life and dependable operation. Vibration isolation provides quiet operation. Scroll compressors are standard on all units. Compressors have internal high-pressure and overcurrent protection.

DIRECT-DRIVE MULTISPEED, PSC (permanent split capacitor) BLOWER MOTOR is standard on sizes 024-042 and variable speed (integrated control motor) on sizes 048 and 060.

DIRECT-DRIVE, PSC OUTDOOR-FAN MOTORS are designed to help reduce energy consumption and provide for cooling operation down to 40 F.

REFRIGERANT SYSTEM is designed to provide dependability. Liquid refrigerant strainers are used to promote clean, unrestricted operation. All units feature a proven-reliable reversing valve. Each unit leaves the factory with a full refrigerant charge. Refrigerant service connections make checking operating pressures easier.

INDOOR AND OUTDOOR COILS are computer-designed for optimum heat transfer and cooling efficiency. Outdoor coil is fabricated of copper tube and aluminum fins and is located inside the unit where it is protected against damage for long life and reliable operation.

Copper fin coils are also available by special order. These coils are recommended in applications where aluminum fins are likely to be damaged due to corrosion; for example, seacoast installations.

WEATHERIZED CABINETS are constructed of heavy-duty, phosphated, zinc-coated prepainted steel capable of withstanding 500 hours in salt spray. Interior surfaces of the indoor compartment are insulated with aluminum foil faced insulation to help keep the conditioned air from being affected by the outdoor ambient temperature. Insulation conforms to ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) No. 62P. A sloped condensate pan permits an external drain.

LOW SOUND RATINGS ensure a quiet indoor and outdoor environment with sound ratings as low as 7.8 bels.

EASY TO SERVICE CABINETS provide easy accessibility to serviceable components during maintenance and installation. Rounded corners are an important safety feature, and a high-quality finish ensures an attractive appearance.

OPTIONAL BASE RAIL provides holes for rigging and handling as well as an elevated mounting frame that gives additional structural support to horizontal applications.

DOWNFLOW OPTION UNIT is converted for downflow at factory for easy vertical ductwork connections.

FACTORY-INSTALLED OPTIONS DESCRIPTION AND USAGE

Unit With Base Rail — Unit has rigging holes and an elevated mounting frame.

SUGGESTED USE:

- Rigging holes to provide greater ease in handling. Frame to provide greater structural support for horizontal applications.

Downflow Option — Unit is shipped configured for downflow application. Unit is equipped with base rail.

SUGGESTED USE:

- To provide easy vertical ductwork connections.

FIELD-INSTALLED ACCESSORY DESCRIPTION AND USAGE

Flat Roof Curb — Consists of galvanized steel support frame in 8-, 11-, and 14-in. high designs. Provides wood nailer to attach roof counter flashing. Insulated basepans in curbs are provided to prevent condensation. Ductwork attaches to rails provided in the roof curb. A gasket is provided to form an airtight and watertight seal between unit and curb. The roof curb design meets the standards of the NRCA (National Roofing Contractors' Association).

SUGGESTED USE:

- Slab-mounted applications when elevation of the unit above the slab is necessary.
- Rooftop application for downflow discharge.
- Curbs are preassembled and are available for flat or pitched roofs.

Pitched Roof Curb — Provided in ratios of 1, 2, 3, 4, 5, and 6 to 12 for use on pitched roof applications.

SUGGESTED USE:

- For when a roof curb is needed on a pitched roof.

Modulating Economizer — Economizer is available for downflow or horizontal applications, and is designed for easy installation. The economizer reduces energy costs and extends equipment life by allowing the use of outdoor air to supply "free" cooling when conditions are favorable.

Constant ventilation is recommended for light commercial applications when the conditioned space is occupied.

The economizer is shipped complete with a damper motor and linkage, enthalpy control, low-voltage wiring harness, and a rainhood. Adequate wire lengths are provided (additional field-supplied wires are not required). The horizontal economizer is also furnished with a 2-in. disposable air filter and gasket material.

Modulating economizer package consists of low-leakage dampers with controls. The economizer will allow outdoor ventilation air into the unit whenever the indoor fan is running.

SUGGESTED USE:

- Allows outdoor air to be used for "free" cooling whenever the outdoor air is below the enthalpy control setting.
- To reduce energy usage. Use whenever the hours of operation at temperatures below 40 F are significant.

Two-Position Damper — Package consists of a low-leak damper assembly which allows outdoor air into the unit when the indoor fan is energized. When the indoor fan is off, the damper will be closed.

SUGGESTED USE:

- Allows a fixed percentage of outdoor air any time the indoor fan is on. Damper closes when indoor fan is off to prevent cold backdraft and wasted energy.

Manual Outdoor-Air Damper — Package consists of a manually adjustable damper. The package includes a rainhood and birdscreen.

SUGGESTED USE:

- To allow a fixed percentage of outdoor air for ventilation under all conditions.
- The damper may be used on either downflow or horizontal air-flow applications.

Thermostat and Subbase — These accessories provide cooling control for unit. Autochangeover and manual changeover types are available.

SUGGESTED USE:

- To operate and control unit, and to maintain desired building temperature.

The 0° F Low Ambient Kit — Kit permits operation down to 0° F in cooling.

SUGGESTED USE:

- When mechanical cooling is required when outdoor-air temperature is between 40 F and 0° F.

Filter Rack — Rack features easy installation and serviceability. The filter rack housing is constructed of heavy-gage steel and is fully insulated. Both sides of the filter rack are flanged for easy installation.

SUGGESTED USE:

- Kit provides ability to locate filters inside the unit.

Rectangular Duct Connection Kit — Kit consists of a sheet metal transition and hardware for mounting.

SUGGESTED USE:

- Allows easy conversion from round to rectangular ducts.

Duct Cover Kit — Kit consists of a panel which covers and seals horizontal duct openings.

SUGGESTED USE:

- To cover horizontal ducts after unit has been converted to downflow discharge.
- Not required with downflow option.

Lifting Bracket Kit — Provides attachment point for rigging straps.

SUGGESTED USE:

- When unit needs to be lifted or moved. The kit is not required when unit is equipped with optional base rail or downflow application.

High- and Low-Pressure Switches — Protect the unit from running at unsuitable pressures.

SUGGESTED USE:

- Provides additional safety features when needed.

Outdoor Thermostat — Accessory provides electric heater control when outdoor-air temperature falls below set point.

SUGGESTED USE:

- To bring second stage of 2-stage electric heat on line.

Electric Heater — Heater module slides into keyed mounting slots in the fan inlet. Heater sizes range from 5.0 to 20.0 kW. Design allows for single-point supply for entire unit.

SUGGESTED USE:

- To provide heating capability when required.

Downshot-to-Sideshot Conversion Kit — Kit consists of downshot (vertical) duct covers, blower mounting bracket, and blower support bracket.

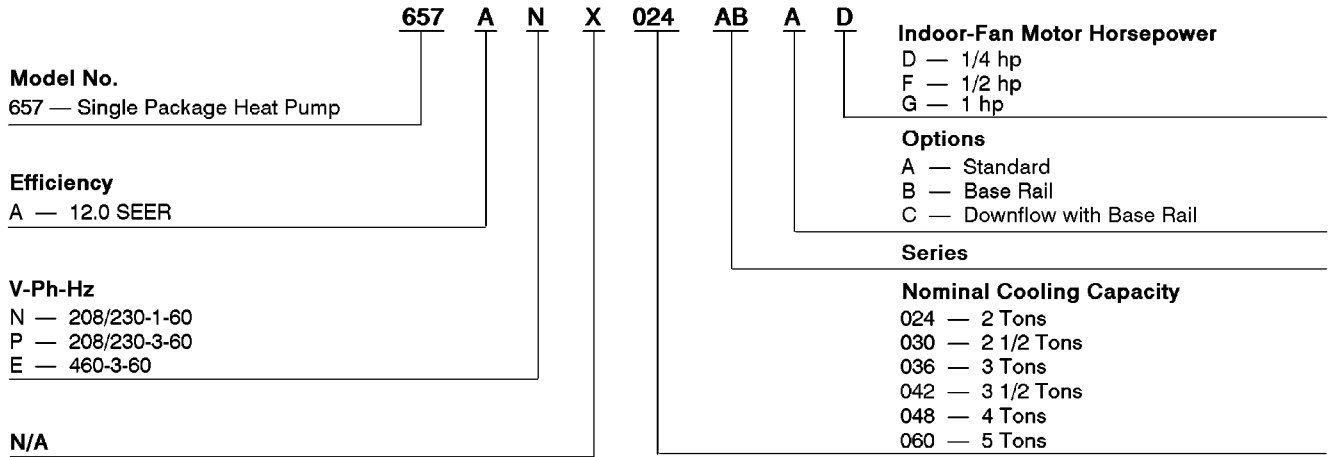
SUGGESTED USE:

- Converts a dedicated downshot discharge unit to a sideshot (horizontal) discharge unit.

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MODEL DESCRIPTION



Quality Assurance



Certificate No FM 22838

Approvals:

- ISO 9002
- EN 29002
- BS5750 PART 2
- ANSI/ASQC Q92

ARI* CAPACITIES

COOLING AND HEATING CAPACITIES AND EFFICIENCIES

UNIT 657A	NOMINAL TONS	STANDARD CFM	NET COOLING† CAPACITIES AT 95 F (Btuh)	SEER†	NET HEATING† CAPACITIES At 47 F (Btuh)	COP† At 47 F (Btuh)	NET HEATING† CAPACITIES At 17 F (Btuh)	COP† At 17 F (Btuh)	HSPF	SOUND RATINGS** (Bels)
024	2	800	23,400	12.0	23,800	3.2	12,400	1.8	6.9	7.8
030	2½	1000	28,600	12.0	28,200	3.2	15,400	1.9	7.1	7.8
036	3	1200	35,000	12.0	34,400	3.4	18,000	1.9	7.1	8.0
042	3½	1400	41,500	12.0	40,000	3.3	21,000	1.9	7.0	8.0
048	4	1600	47,500	12.0	44,000	3.5	23,600	2.0	7.0	8.2
060	5	1800	57,000	11.0	57,000	3.5	31,800	2.0	7.2	8.2

LEGEND

- Bels** — Sound Levels (1 bel = 10 decibels)
- COP** — Coefficient of Performance
- DOE** — Department of Energy
- HSPF** — Heating Seasonal Performance Factor
- SEER** — Seasonal Energy Efficiency Ratio

- *Air Conditioning & Refrigeration Institute.
- †Rated in accordance with ARI Standard 210/240-89 and/or U.S. Government DOE test procedures.
- **Rated in accordance with ARI Standard 270-89.



OUTDOOR SOUND: ONE-THIRD OCTAVE BAND DATA — DECIBELS

FREQ. Hz	UNIT 657A					
	024	030	036	042	048	060
63	50.2	52.8	51.8	50.0	53.2	54.3
125	57.4	59.2	61.4	64.7	65.4	65.1
250	71.8	71.9	70.6	70.4	74.5	71.5
500	69.6	69.7	70.6	69.9	74.3	72.7
1000	71.6	70.4	74.3	75.3	75.2	73.9
2000	68.6	68.8	70.0	73.8	72.6	73.4
4000	65.5	65.2	67.3	75.1	68.6	71.7
8000	57.7	57.1	58.7	69.2	61.2	66.3

DIMENSIONAL DRAWINGS

UNIT 657A	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)				UNIT HEIGHT (in./mm)	DIMENSION (in./mm)
		Lb	Kg	A	B	C	D	E	F
024	208/230-1-60	257	117	57/26	69/31	75/34	56/25	28.1/714	22.2/462
030	208/230-1-60, 208/230-3-60	288	131	56/25	87/40	74/34	71/32	28.1/714	22.2/462
036	208/230-1-60, 208/230-3-60, 460-3-60	291	132	68/31	68/31	100/45	55/25	28.1/714	22.2/462
042	208/230-1-60, 208/230-3-60, 460-3-60	316	144	46/21	103/47	81/37	86/39	34.1/866	28.4/716

UNIT 657A	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
024	20.4/519	21.3/540	11.8/300
030	20.4/518	21.5/547	11.8/300
036	21.1/535	20.3/515	11.8/300
042	21.2/539	20.5/520	13.5/343

REQ'D CLEARANCES FOR SERVICING — in. (mm)

Indoor Coil Access Side	30 (762)
Control Box Access Side	30 (762)
(Except for NEC requirements)	
Unit Top	36 (914)
Side Opposite Ducts	30 (762)

REQ'D CLEARANCES TO COMBUSTIBLE MAT'L — in. (mm)

Unit Top	0
Duct Side of Unit	0
Side Opposite Ducts	0
Bottom of Unit	0
Vertical Discharge, First 12 in. (305) of Supply Duct	1 (25)

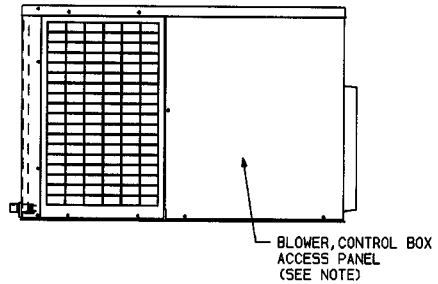
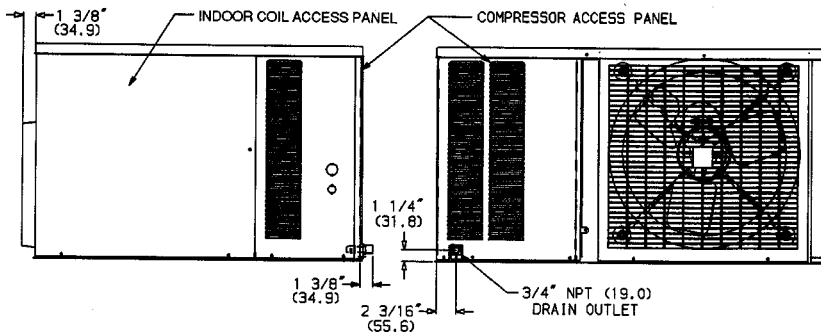
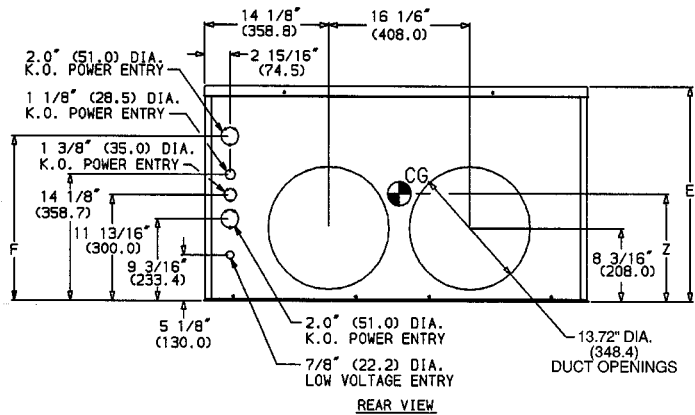
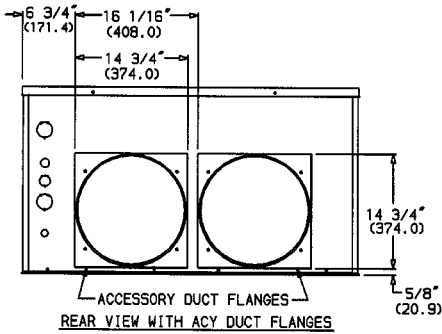
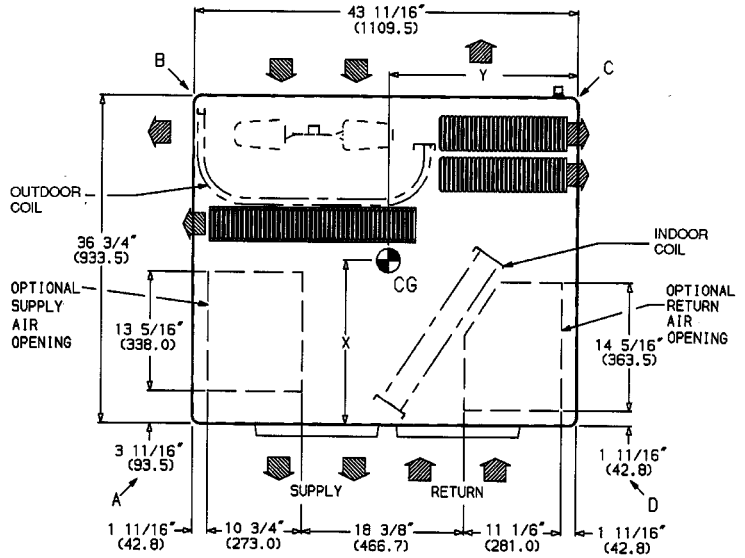
NEC REQ'D CLEARANCES — in. (mm)

Between Units, Control Box Side	42 (1067)
Unit and Ungrounded Surfaces, Control Box Side	36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side	42 (1067)

LEGEND

- CG — Center of Gravity
- MAT'L — Material
- NEC — National Electrical Code
- REQ'D — Required

NOTE: Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.



Unit Sizes 024-042 Without Base Rail

DIMENSIONAL DRAWINGS (cont)

UNIT 657A	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)				UNIT HEIGHT (in./mm)	DIMENSION (in./mm)
		Lb	Kg	A	B	C	D	E	F
024	208/230-1-60	277	126	62/28	74/34	80/36	61/28	34.1/799	25.5/648
030	208/230-1-60, 208/230-3-60	308	140	61/28	92/42	79/36	76/35	31.4/799	25.5/648
036	208/230-1-60, 208/230-3-60, 460-3-60	311	142	73/33	73/33	105/48	60/27	31.4/799	25.5/648
042	208/230-1-60, 208/230-3-60, 460-3-60	336	153	51/23	108/49	86/39	91/41	37.4/951	31.5/800

UNIT 657A	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
024	20.3/515	21.3/541	13.2/335
030	20.2/514	21.6/547	13.2/335
036	20.9/530	20.4/517	13.2/335
042	21.1/535	20.5/521	15.7/399

REQ'D CLEARANCES FOR SERVICING — in. (mm)

Indoor Coil Access Side 30 (762)
 Control Box Access Side 30 (762)
 (Except for NEC requirements)

Unit Top 36 (914)
 Side Opposite Ducts 30 (762)

REQ'D CLEARANCES TO COMBUSTIBLE MAT'L — in. (mm)

Unit Top 0
 Duct Side of Unit 0
 Side Opposite Ducts 0
 Bottom of Unit 0
 Vertical Discharge, First 12 in. (305) of Supply Duct 1 (25)

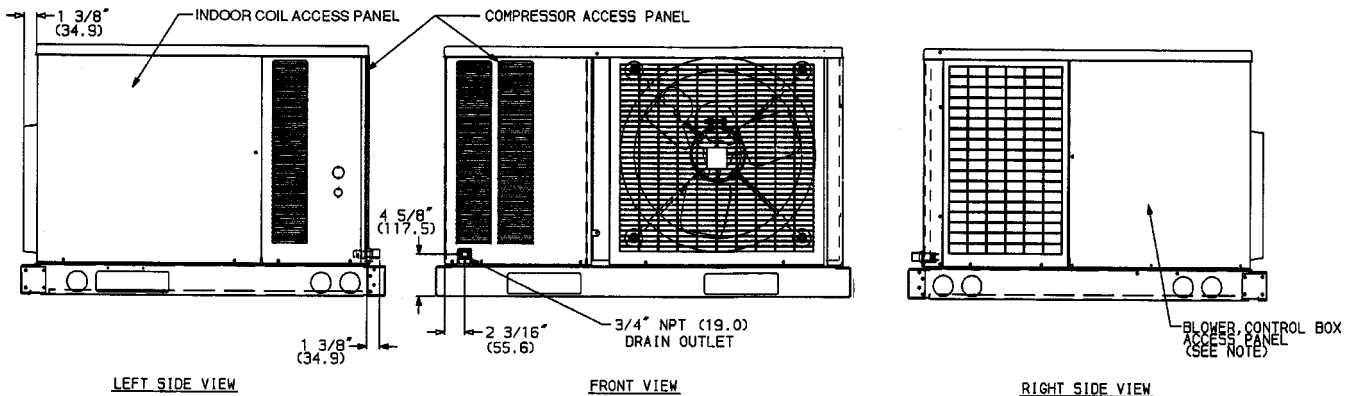
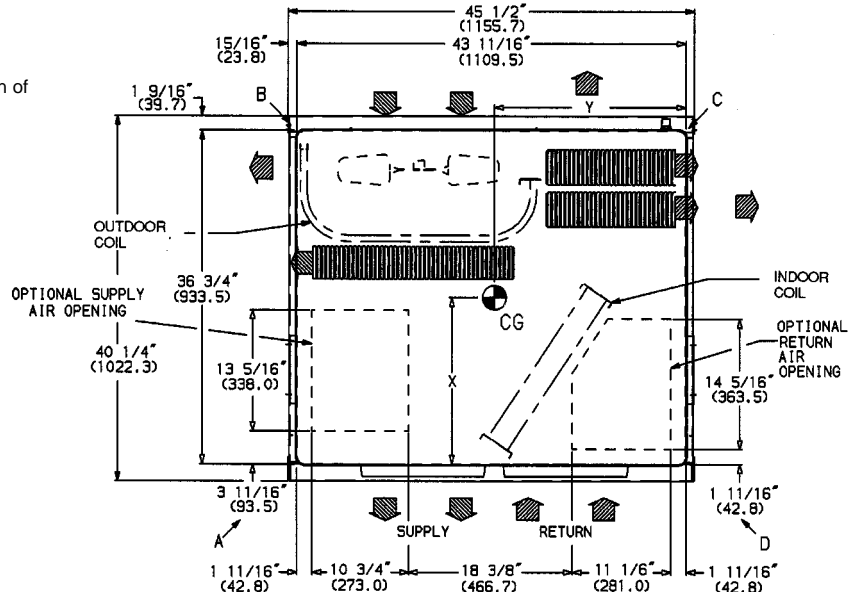
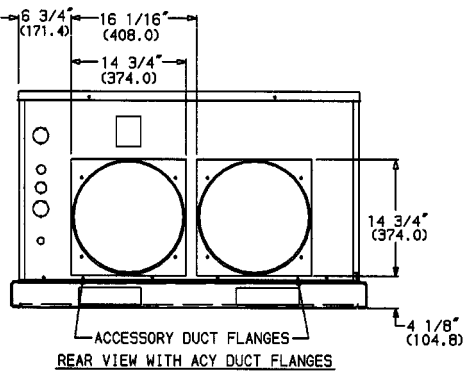
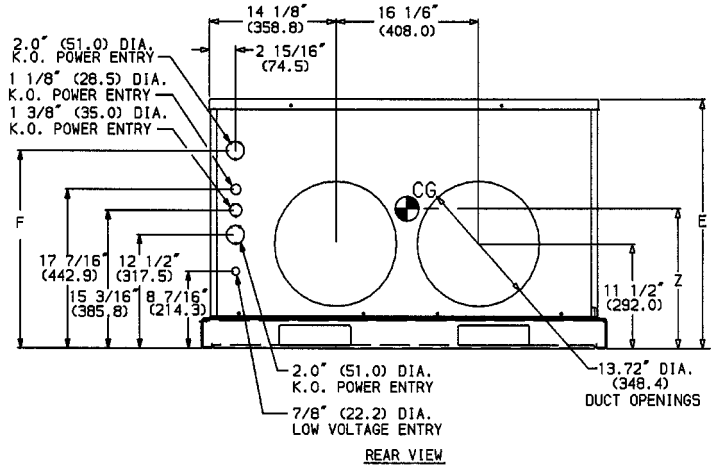
NEC REQ'D CLEARANCES — in. (mm)

Between Units, Control Box Side 42 (1067)
 Unit and Ungrounded Surfaces, Control Box Side 36 (914)
 Unit and Block or Concrete Walls and Other
 Grounded Surfaces, Control Box Side 42 (1067)

LEGEND

- CG — Center of Gravity
- MAT'L — Material
- NEC — National Electrical Code
- REQ'D — Required

NOTE: Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.



Unit Sizes 018-042 With Optional Base Rail

DIMENSIONAL DRAWINGS (cont)

UNIT	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)			
		Lb	Kg	A	B	C	D
657A048	208/230-1-60, 208/230-3-60	359	163	89/40	81/37	113/51	76/35
657A060	208/230-1-60, 208/230-3-60	373	170	92/42	85/39	116/53	80/36

UNIT	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
657A048	19.7/500	20.5/522	15.0/381
657A060	19.7/499	20.6/523	15.0/381

REQ'D CLEARANCES FOR SERVICING — in. (mm)

Indoor Coil Access Side	30 (762)
Control Box Access Side (Except for NEC requirements)	30 (762)
Unit Top	36 (914)
Side Opposite Ducts	30 (762)

REQ'D CLEARANCES TO COMBUSTIBLE MAT'L — in. (mm)

Unit Top	0
Duct Side of Unit	0
Side Opposite Ducts	0
Bottom of Unit	0
Vertical Discharge, First 12 in. (305) of Supply Duct	1 (25)

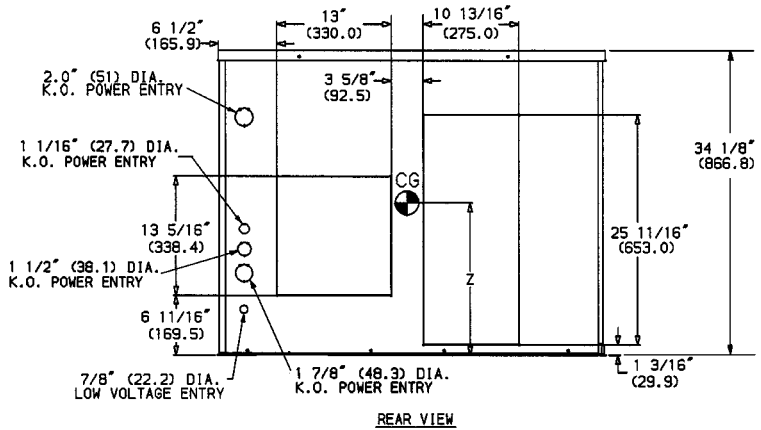
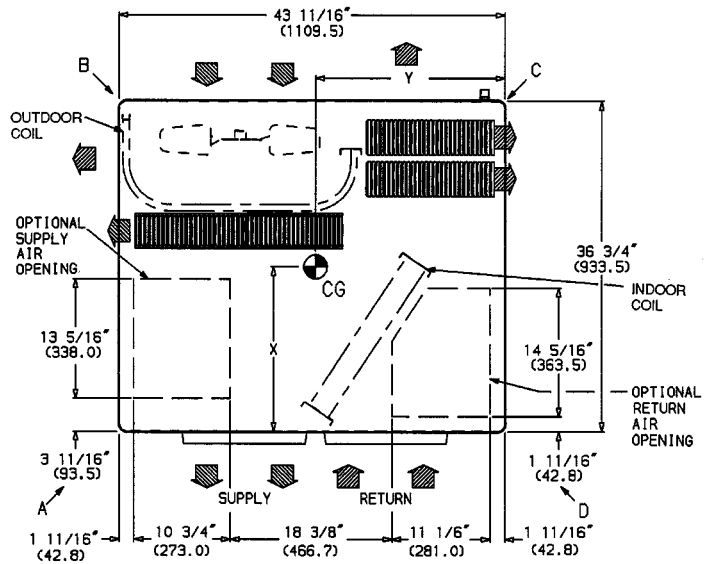
NEC REQ'D CLEARANCES — in. (mm)

Between Units, Control Box Side	42 (1067)
Unit and Ungrounded Surfaces, Control Box Side	36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side	42 (1067)

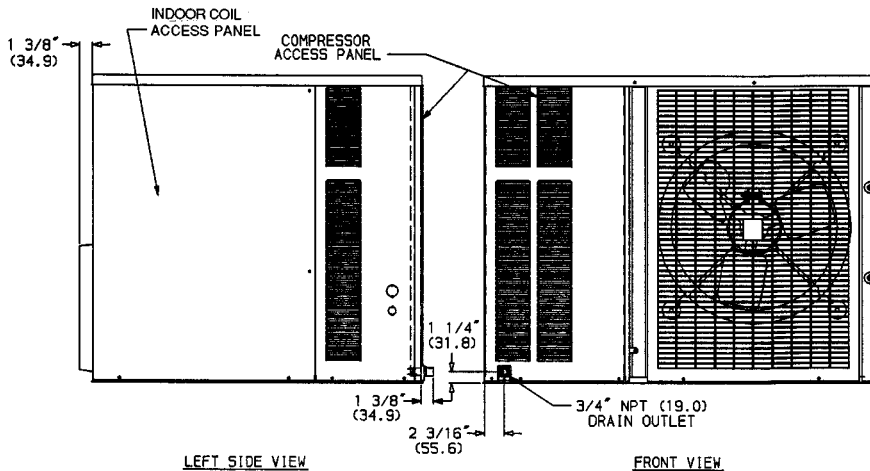
LEGEND

CG	— Center of Gravity
MAT'L	— Material
NEC	— National Electrical Code
REQ'D	— Required

NOTE: Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.

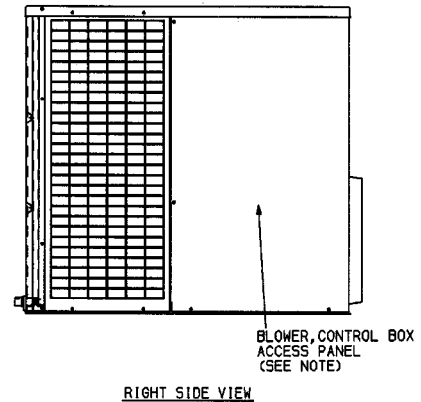


REAR VIEW



LEFT SIDE VIEW

FRONT VIEW



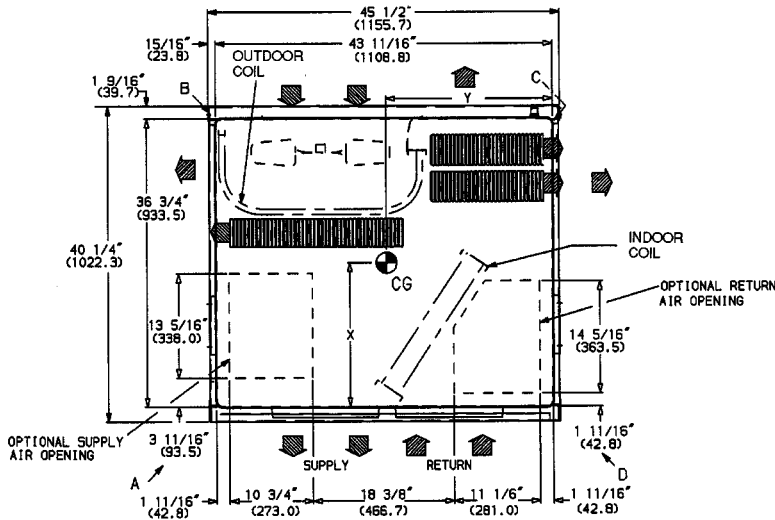
RIGHT SIDE VIEW

Unit Sizes 048,060 Without Base Rail

DIMENSIONAL DRAWINGS (cont)

UNIT	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)			
		Lb	Kg	A	B	C	D
657A048	208/230-1-60, 208/230-3-60	379	172	94/43	86/39	118/54	81/37
657A060	208/230-1-60, 208/230-3-60	393	179	97/44	90/41	121/55	85/39

UNIT	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
657A048	19.6/498	20.6/524	17.3/440
657A060	19.6/497	20.6/524	17.3/440



REQ'D CLEARANCES FOR SERVICING — in. (mm)

Indoor Coil Access Side	30 (762)
Control Box Access Side	30 (762)
(Except for NEC requirements)	
Unit Top	36 (914)
Side Opposite Ducts	30 (762)

REQ'D CLEARANCES TO COMBUSTIBLE MAT'L — in. (mm)

Unit Top	0
Duct Side of Unit	0
Side Opposite Ducts	0
Bottom of Unit	0
Vertical Discharge, First 12 in. (305) of Supply Duct	1 (25)

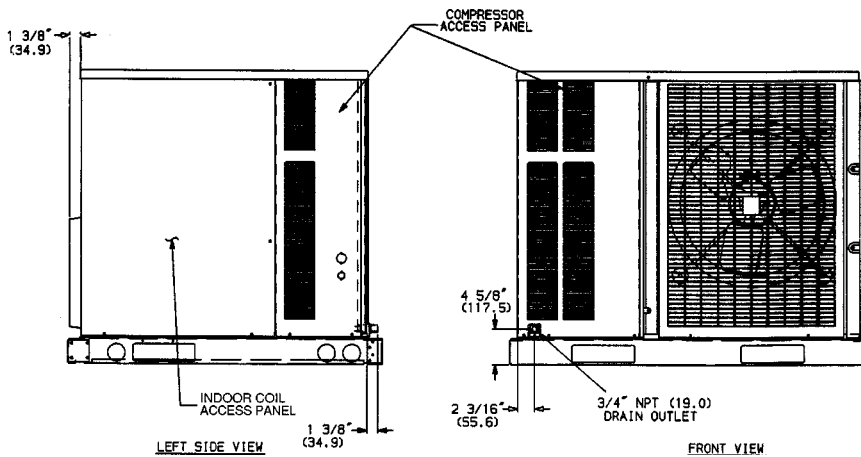
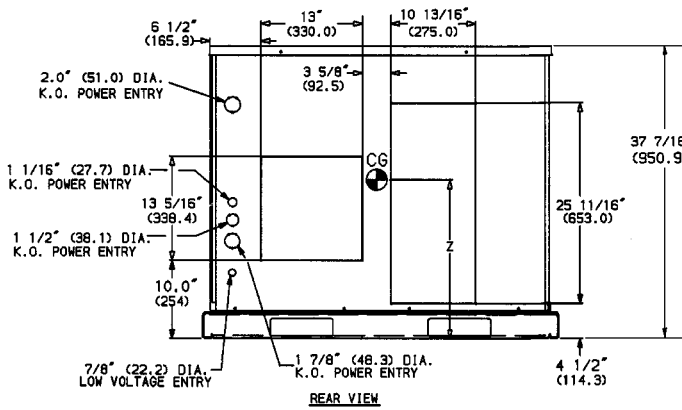
NEC REQ'D CLEARANCES — in. (mm)

Between Units, Control Box Side	42 (1067)
Unit and Ungrounded Surfaces, Control Box Side	36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side	42 (1067)

LEGEND

CG	— Center of Gravity
MAT'L	— Material
NEC	— National Electrical Code
REQ'D	— Required

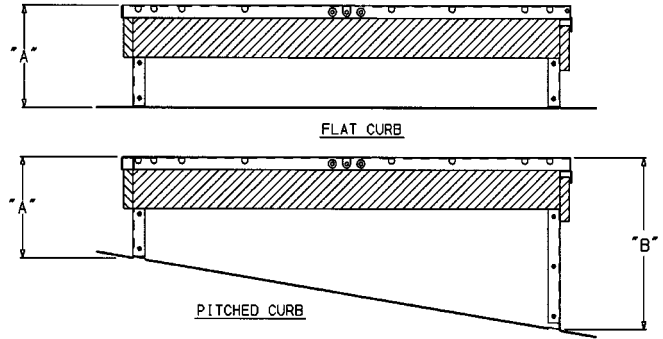
NOTE: Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.



Unit Sizes 048,060 With Optional Base Rail

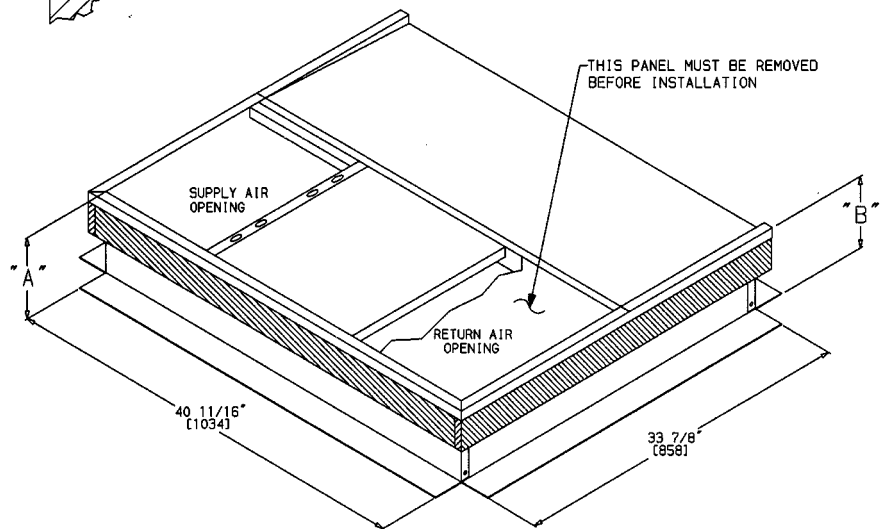
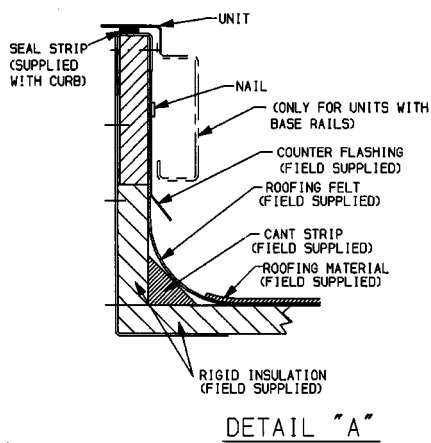
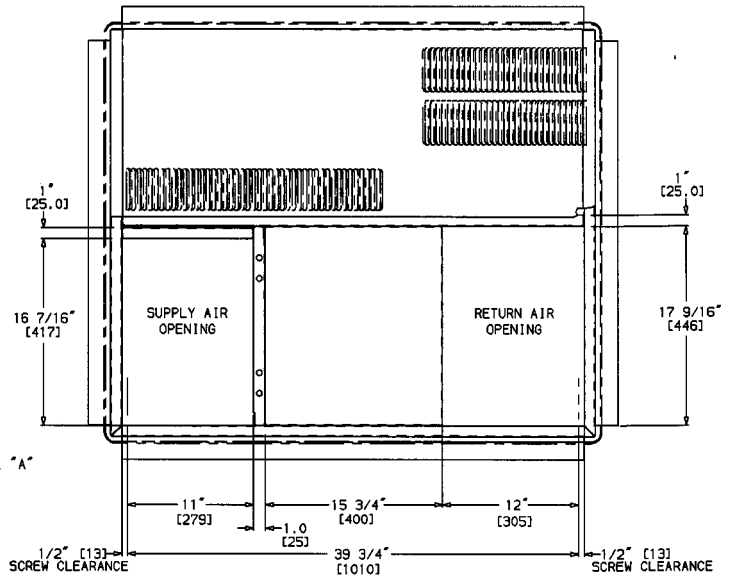
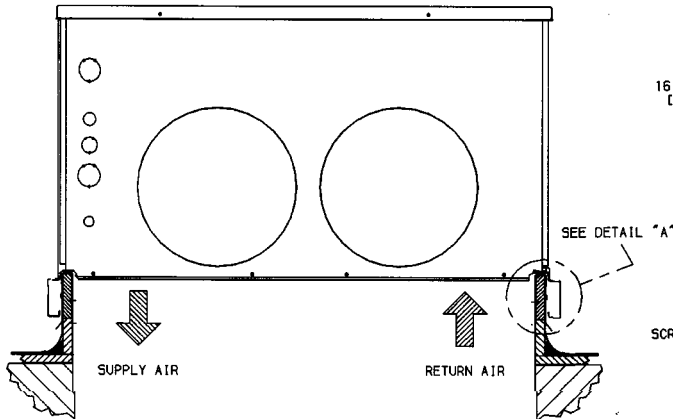
DIMENSIONAL DRAWINGS (cont)

	PART NUMBER	"A"	"B"	PITCH
Flat	50SS900015	8" [203]	—	—
	50SS900016	11" [279]	—	—
	50SS900017	14" [356]	—	—
Pitched	50SS900019	8" [203]	10 ⁷ / ₈ " [276]	1 : 12
	50SS900020	8" [203]	13 ³ / ₁₆ " [344]	2 : 12
	50SS900021	8" [203]	16 ³ / ₈ " [416]	3 : 12
	50SS900022	8" [203]	19 ¹ / ₄ " [489]	4 : 12
	50SS900023	8" [203]	22 ³ / ₈ " [568]	5 : 12
	50SS900024	8" [203]	25 ³ / ₈ " [651]	6 : 12



NOTES:

1. Roof curb must be set up for unit being installed.
2. Seal strip must be applied as required for unit being installed.
3. Dimensions in [] are in millimeters.
4. Roof curb is made of 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 airflow.
8. Insulated panels: 1-in. thick fiberglass, 1-lb density.



Roof Curb Dimensions

SPECIFICATIONS

UNIT 657A	024	030	036	042	048	060
REFRIGERANT*	R-22					
Refrigerant Control	Fixed Orifice Metering Device					
SHIPPING WEIGHT (lb)						
Without Base Rail	309	340	343	368	411	425
With Optional Base Rail	296	327	330	355	398	412
COMPRESSOR TYPE	Scroll					
INDOOR FAN	Centrifugal — Direct Drive					
Speeds	3	3	3	3	Variable	Variable
Rpm (High Speed)	1075	1075	1100	1100	—	—
Diameter (in.)	10	10	10	10	10	10
Width (in.)	9	9	9	9	10	10
Nominal Airflow (Cfm)	800	1000	1300	1400	1600	1800
Motor Hp	¼	¼	½	½	1.0	1.0
INDOOR COIL						
Rows...Fins/in.	3...15	3...15	3...15	4...15	4...15	4...15
Face Area (sq ft)	3.6	3.6	3.6	4.5	4.5	4.5
OUTDOOR FAN	Propeller — Direct Drive					
Cfm	2200	2200	2200	2400	2400	2400
Rpm	1100	1100	1100	1100	1100	1100
Diameter (in.)	20	20	20	20	20	20
Motor Hp	¼	¼	¼	¼	⅓	⅓
OUTDOOR COIL						
Rows...Fins/in.	2...17	2...17	2...17	2...17	2...17	2...17
Face Area (sq ft)	7.00	7.00	7.00	8.66	8.66	8.66
FILTER SIZE (in.)†						
Throwaway	24 x 24	24 x 24	24 x 24	24 x 30	24 x 30	24 x 30

*Operating charge listed on unit nameplate.

†Recommended field-supplied filters are 1 in. thick.

SELECTION PROCEDURE

I DETERMINE COOLING AND HEATING REQUIREMENTS AT DESIGN CONDITIONS.

Given:

Required Cooling Capacity (TC)	28,000 Btuh
Sensible Heat Capacity (SHC)	20,500 Btuh
Required Heating Capacity	28,550 Btuh
Outdoor Entering-Air Temperature	95 F
Outdoor-Air Winter Design Temperature	20 F
Indoor-Air Winter Design Temperature	70 F
Indoor Entering-Air Temperature	80 F edb, 67 F ewb
Indoor-Air Quantity	1125 cfm
External Static Pressure	0.40 in. wg
Electrical Characteristics (V-Ph-Hz)	230-1-60
edb — entering dry bulb	
ewb — entering wet bulb	

II SELECT UNIT BASED ON REQUIRED COOLING CAPACITY.

Enter Cooling Capacities table at condenser entering temperature of 95 F, indoor air entering at 1125 cfm and 67 F ewb (entering wet bulb). The 657A030 unit will provide a total cooling capacity of 28,800 Btuh and a sensible heat capacity of 21,900 Btuh.

For indoor-air temperature other than 80 F edb (entering dry bulb), calculate sensible heat capacity correction, as required, using the formula found in Note 3 following the cooling capacities tables.

NOTE: Unit ratings are net capacities.

III SELECT ELECTRIC HEAT.

Enter the unit 657A030 Heating Capacities table at 1125 cfm. At 70 F return indoor air and 20 F air entering outdoor coil, the integrated heating capacity is 15,300 Btuh. (Select integrated heating capacity value since deductions for outdoor-coil frost and defrosting have already been made. No correction is required.)

The required heating capacity is 28,550 Btuh. Therefore, 13,250 Btuh (28,550 – 15,300) additional electric heat is required.

Determine additional electric heat capacity in kW.

$$\frac{13,250 \text{ Btuh}}{3414 \text{ Btuh/kW}} = 3.9 \text{ kW of heat required}$$

Enter the 657A Electric Heater Packages 208/240 V, Single-Phase, Single-Point Wiring Connections table on page 20 for unit 657A030. The 5-kW heater at 240 v most closely satisfies the heating required. To calculate kW at 230 v, multiply the heater kW by multiplication factor 0.92 found in the Wattage Multiplication Factors table on page 22.

$$5 \text{ kW} \times 0.92 = 4.6 \text{ kW}$$

$$4.6 \times 3414 = 15,704 \text{ Btuh}$$

To calculate kW at 208 v, see electric heater packages table on page 20.

Total unit heating capacity is 31,004 Btuh (15,300 + 15,704).

IV DETERMINE FAN SPEED AND POWER REQUIREMENTS AT DESIGN CONDITIONS.

Before entering the air delivery tables, calculate the total static pressure required. From the given, the Accessory Electric Heat Pressure Drop table, Wet Coil Pressure Drop table, and the Filter Pressure Drop table, find:

External static pressure	0.40 in. wg
Filter	0.08 in. wg
Electric heat	0.04 in. wg
Wet coil	<u>0.06 in. wg</u>
Total static pressure	0.58 in. wg

Enter the table for Dry Coil Air Delivery — Horizontal and Vertical Discharge at 1125 cfm and 230-v high speed. By interpolation, the standard motor will deliver 0.66 in. wg static pressure. This will adequately handle job requirements.

COOLING CAPACITIES

657A024 (2 TONS)															
Indoor Air			Outdoor Air Temperature (F)												
			85				95				105				115
Cfm	BF	F Ewb	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	
			Total	Sensible		Total	Sensible		Total	Sensible		Total	Sensible		
700	0.03	72	26.1	12.6	2.10	25.6	12.5	2.29	24.5	12.3	2.50	22.5	11.6	2.74	
		67	24.1	16.5	2.09	22.8	16.1	2.28	20.7	15.3	2.48	19.0	14.6	2.71	
		62	19.8	19.0	2.07	18.3	18.2	2.24	17.3	17.3	2.45	16.9	16.9	2.68	
		63*	20.4	15.3	2.07	18.8	14.6	2.24	17.5	14.0	2.45	17.0	13.8	2.68	
800	0.04	72	26.7	13.3	2.14	25.9	13.1	2.32	24.9	12.9	2.54	23.2	12.4	2.78	
		67	24.5	17.5	2.13	23.4	17.2	2.32	21.2	16.5	2.52	18.7	15.5	2.74	
		62	20.6	20.5	2.11	19.3	19.3	2.29	18.0	18.0	2.49	16.7	16.7	2.72	
		63*	20.8	16.3	2.11	19.2	15.7	2.28	17.4	15.0	2.48	15.9	14.3	2.71	
900	0.04	72	26.9	13.6	2.17	26.2	13.7	2.36	25.1	13.5	2.57	23.7	13.1	2.82	
		67	24.8	18.4	2.16	23.7	18.3	2.35	22.0	17.7	2.56	19.0	16.6	2.78	
		62	22.5	22.5	2.16	21.1	21.1	2.34	19.3	19.3	2.54	17.4	17.4	2.77	
		63*	22.6	18.0	2.16	21.0	17.3	2.34	18.3	16.2	2.53	15.9	15.2	2.75	

657A030 (2½ TONS)															
Indoor Air			Outdoor Air Temperature (F)												
			85				95				105				115
Cfm	BF	F Ewb	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	
			Total	Sensible		Total	Sensible		Total	Sensible		Total	Sensible		
875	0.04	72	32.5	15.4	2.61	31.5	15.2	2.85	30.1	14.7	3.09	28.8	14.3	3.37	
		67	29.4	19.9	2.58	28.2	19.5	2.81	26.8	19.0	3.06	24.8	18.3	3.32	
		62	25.7	23.8	2.55	23.9	22.9	2.77	22.3	22.1	3.01	21.8	21.7	3.27	
		63*	27.0	19.3	2.56	25.1	18.5	2.78	23.4	17.8	3.02	22.6	17.4	3.27	
1000	0.05	72	33.2	16.2	2.67	31.9	15.8	2.90	30.5	15.3	3.14	29.1	15.0	3.42	
		67	29.8	21.1	2.63	28.6	20.7	2.86	27.2	20.3	3.11	25.1	19.6	3.38	
		62	26.2	25.5	2.61	24.8	24.6	2.83	23.4	23.4	3.07	21.9	21.9	3.34	
		63*	27.5	20.5	2.62	25.9	19.9	2.83	23.8	19.1	3.07	21.5	18.1	3.33	
1125	0.06	72	33.2	16.6	2.72	31.9	16.2	2.94	30.8	16.1	3.20	29.3	15.6	3.47	
		67	30.1	22.3	2.68	28.8	21.9	2.91	27.4	21.4	3.16	25.9	21.0	3.44	
		62	27.0	27.0	2.66	26.0	26.0	2.89	24.7	24.7	3.13	22.8	22.8	3.41	
		63*	27.9	21.7	2.66	26.5	21.2	2.89	24.6	20.5	3.13	21.7	19.3	3.38	

657A036 (3 TONS)															
Indoor Air			Outdoor Air Temperature (F)												
			85				95				105				115
Cfm	BF	F Ewb	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	
			Total	Sensible		Total	Sensible		Total	Sensible		Total	Sensible		
1050	0.03	72	39.7	19.7	3.17	38.1	19.2	3.48	36.3	18.6	3.82	34.2	18.0	4.19	
		67	36.2	25.3	3.12	34.5	24.7	3.43	32.7	24.0	3.76	30.4	23.1	4.10	
		62	32.6	30.5	3.08	31.1	29.7	3.38	29.2	28.8	3.69	27.3	27.3	4.03	
		63*	33.5	24.5	3.10	31.9	23.8	3.39	30.0	23.0	3.70	27.7	22.1	4.04	
1200	0.04	72	40.4	20.7	3.24	38.7	20.2	3.55	36.8	19.6	3.89	34.7	19.0	4.26	
		67	36.7	27.0	3.19	35.0	26.3	3.50	33.1	25.7	3.83	30.9	24.8	4.17	
		62	33.3	32.6	3.15	31.8	31.7	3.45	30.3	30.2	3.77	28.5	28.4	4.12	
		63*	34.1	26.1	3.16	32.4	25.4	3.46	30.5	24.6	3.77	28.2	23.7	4.11	
1350	0.05	72	40.7	21.5	3.30	39.1	21.1	3.61	37.2	20.5	3.95	35.0	19.9	4.33	
		67	37.1	28.6	3.26	35.4	28.0	3.57	33.5	27.3	3.90	31.3	26.5	4.24	
		62	34.1	34.1	3.21	32.7	32.7	3.53	31.3	31.2	3.85	29.4	29.4	4.20	
		63*	34.5	27.6	3.23	32.7	27.0	3.53	30.9	26.2	3.84	28.5	25.2	4.17	

LEGEND

BF — Bypass Factor
Ewb — Entering Wet Bulb
ldb — Leaving Dry Bulb
lwb — Leaving Wet Bulb

*At 75 F entering dry bulb (edb) (Tennessee Valley Authority [TVA] rating conditions); all others at 80 F.

NOTES:

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

$$t_{ldb} = t_{ewb} - \frac{\text{sensible capacity (Btuh x 1000)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (MBtuh x 1000)}}{4.5 \text{ cfm}}$$

Where: h_{ewb} = Enthalpy of air entering indoor coil

- The sensible heat capacity is based on 80 F edb temperature of air entering indoor coil.

Below 80 F edb, subtract (corr factor x cfm) from the sensible heat capacity. Above 80 F edb, add (corr factor x cfm) to the sensible heat capacity.

Correction Factor = $1.10 \times (1 - BF) \times (edb - 80)$.

COOLING CAPACITIES (cont)

657A042 (3½ TONS)															
Indoor Air			Outdoor Air Temperature (F)												
			85				95				105				115
Cfm	BF	F Ewb	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	
			Total	Sensible		Total	Sensible		Total	Sensible		Total	Sensible		
1225	0.09	72	46.1	22.9	3.72	44.3	22.3	4.08	42.5	21.7	4.48	40.6	21.1	4.93	
		67	42.6	29.5	3.67	40.9	28.9	4.03	39.1	28.2	4.43	37.2	27.5	4.87	
		62	38.9	35.7	3.63	37.3	34.8	3.98	35.6	33.9	4.37	33.8	32.9	4.80	
		63*	39.7	28.8	3.64	37.9	28.1	4.00	36.2	27.3	4.39	34.3	26.5	4.82	
1400	0.10	72	46.6	23.7	3.80	44.8	23.1	4.16	43.0	22.5	4.56	41.0	21.9	5.01	
		67	43.2	31.2	3.75	41.5	30.6	4.11	39.6	29.9	4.50	37.7	29.3	4.95	
		62	39.8	38.0	3.71	38.1	37.0	4.06	36.4	35.9	4.46	34.7	34.6	4.89	
		63*	40.4	30.6	3.72	38.6	29.8	4.08	36.7	29.0	4.47	34.8	28.2	4.90	
1575	0.11	72	47.4	24.8	3.88	45.5	24.2	4.24	43.1	23.2	4.63	41.2	22.7	5.08	
		67	43.7	32.7	3.82	41.9	32.3	4.19	40.0	31.5	4.58	38.0	30.9	5.02	
		62	40.5	39.9	3.79	38.8	38.7	4.15	37.3	37.3	4.55	35.7	35.6	4.99	
		63*	40.9	32.2	3.79	39.1	31.4	4.15	37.2	30.5	4.54	35.2	29.8	4.98	

657A048 (4 TONS)															
Indoor Air			Outdoor Air Temperature (F)												
			85				95				105				115
Cfm	BF	F Ewb	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	
			Total	Sensible		Total	Sensible		Total	Sensible		Total	Sensible		
1400	0.05	72	54.2	26.9	4.25	51.9	26.2	4.71	49.5	25.4	5.21	46.9	24.7	5.77	
		67	49.0	34.3	4.18	46.8	33.5	4.64	44.4	32.7	5.13	41.8	31.7	5.67	
		62	44.1	41.4	4.13	41.9	40.3	4.58	39.7	39.2	5.07	37.6	37.6	5.59	
		63*	45.4	33.3	4.14	43.1	32.4	4.60	40.8	31.4	5.09	38.4	30.4	5.60	
1600	0.05	72	55.1	28.3	4.31	52.8	27.6	4.78	50.2	26.8	5.27	47.6	26.0	5.84	
		67	49.8	36.6	4.24	47.5	35.8	4.70	45.1	35.0	5.19	42.4	34.0	5.74	
		62	45.1	44.2	4.19	43.1	43.0	4.64	41.1	41.1	5.15	39.1	39.1	5.68	
		63*	46.2	35.5	4.20	43.8	34.6	4.66	41.4	33.6	5.15	38.9	32.6	5.67	
1800	0.06	72	55.8	29.7	4.38	53.2	28.9	4.83	50.8	28.1	5.34	48.0	27.3	5.90	
		67	50.5	38.8	4.31	48.1	38.1	4.77	45.6	37.3	5.26	42.8	36.2	5.80	
		62	46.2	46.1	4.26	44.4	44.4	4.71	42.4	42.4	5.23	40.3	40.3	5.77	
		63*	46.8	37.7	4.26	44.3	36.7	4.72	41.8	35.7	5.22	39.3	34.6	5.74	

657A060 (5 TONS)															
Indoor Air			Outdoor Air Temperature (F)												
			85				95				105				115
Cfm	BF	F Ewb	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	Capacity MBtuh		Compressor kW	
			Total	Sensible		Total	Sensible		Total	Sensible		Total	Sensible		
1800	0.03	72	66.8	34.3	5.94	63.5	33.2	6.50	60.0	32.1	7.13	56.4	30.9	7.79	
		67	60.0	44.2	5.71	57.0	43.0	6.27	53.9	41.8	6.88	50.6	40.6	7.52	
		62	54.1	53.3	5.53	51.6	51.6	6.08	49.3	49.3	6.70	47.1	47.0	7.37	
		63*	55.7	42.6	5.56	52.8	41.5	6.10	49.9	40.3	6.70	46.9	39.2	7.33	
2000	0.04	72	67.5	35.8	6.04	64.1	34.7	6.60	60.5	33.5	7.22	57.0	32.4	7.89	
		67	60.7	46.7	5.80	57.5	45.5	6.35	54.2	44.2	6.96	51.0	43.0	7.62	
		62	55.4	55.4	5.64	53.1	53.1	6.20	50.7	50.7	6.83	48.2	48.2	7.50	
		63*	56.3	45.0	5.65	53.4	43.8	6.19	50.3	42.5	6.79	47.3	41.3	7.42	
2250	0.04	72	68.2	37.7	6.14	64.6	36.5	6.70	61.0	35.3	7.33	57.3	34.2	8.00	
		67	61.2	49.7	5.91	58.0	48.4	6.46	54.6	47.2	7.07	51.3	46.0	7.72	
		62	57.1	57.1	5.78	54.6	54.6	6.34	52.1	52.1	6.97	49.5	49.5	7.64	
		63*	56.8	47.8	5.75	53.8	46.5	6.29	50.7	45.3	6.89	47.6	44.0	7.53	

LEGEND

BF — Bypass Factor
Ewb — Entering Wet Bulb
ldb — Leaving Dry Bulb
lwb — Leaving Wet Bulb

*At 75 F entering dry bulb (edb) (Tennessee Valley Authority [TVA] rating conditions); all others at 80 F.

NOTES:

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

$$t_{ldb} = t_{ewb} - \frac{\text{sensible capacity (Btuh x 1000)}}{1.10 \times \text{cfm}}$$

t_{lwb} = Wet-bulb temperature corresponding to enthalpy of air leaving indoor coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (MBtuh x 1000)}}{4.5 \text{ cfm}}$$

Where: h_{ewb} = Enthalpy of air entering indoor coil

- The sensible heat capacity is based on 80 F edb temperature of air entering indoor coil.

Below 80 F edb, subtract (corr factor x cfm) from the sensible heat capacity.

Above 80 F edb, add (corr factor x cfm) to the sensible heat capacity.

Correction Factor = $1.10 \times (1 - BF) \times (edb - 80)$.

HEATING CAPACITIES

657A024 (2 TONS)																		
Outdoor Coil Air Temp (F db at 70% rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)			Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)																	
	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)																	
	700									750								
70	32.7	33.0	31.3	32.7	33.0	31.3	2.13	2.36	2.53	33.1	32.4	32.7	33.1	32.4	32.7	2.12	2.30	2.54
60	29.0	28.9	27.8	29.0	28.9	27.8	2.09	2.29	2.47	29.3	28.7	28.6	29.3	28.7	28.6	2.07	2.25	2.46
50	25.3	24.9	24.3	25.3	24.9	24.3	2.04	2.22	2.41	25.5	24.9	24.6	25.5	24.9	24.6	2.03	2.20	2.39
47	24.1	23.7	23.2	24.1	23.7	23.2	2.02	2.20	2.39	24.3	23.8	23.4	24.3	23.8	23.4	2.01	2.18	2.37
40	21.2	20.7	20.3	20.3	19.9	19.5	1.98	2.15	2.33	21.3	20.9	20.5	20.4	20.0	19.6	1.98	2.14	2.32
30	16.9	16.5	16.2	14.8	14.5	14.2	1.92	2.08	2.25	17.0	16.7	16.3	14.9	14.6	14.3	1.92	2.07	2.24
20	13.6	13.3	13.0	12.2	12.0	11.7	1.89	2.03	2.19	13.7	13.4	13.1	12.3	12.1	11.8	1.89	2.03	2.18
17	12.6	12.3	12.0	11.5	11.2	11.0	1.87	2.01	2.17	12.7	12.4	12.1	11.6	11.3	11.0	1.88	2.01	2.17
10	10.9	10.6	10.2	10.0	9.7	9.4	1.85	1.98	2.11	10.9	10.6	10.2	10.0	9.7	9.4	1.85	1.98	2.12
0	8.6	8.2	7.7	7.9	7.5	7.1	1.81	1.92	2.04	8.4	8.0	7.6	7.7	7.4	7.0	1.82	1.93	2.04
-10	6.2	5.8	5.2	5.8	5.4	4.8	1.78	1.87	1.96	5.9	5.4	4.9	5.5	5.0	4.5	1.79	1.88	1.97

657A024 (2 TONS) (cont)									
Outdoor Coil Air Temp (F db at 70% rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)								
	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)								
	900								
70	30.5	32.4	32.6	30.5	32.4	32.6	2.01	2.24	2.45
60	27.8	28.8	28.7	27.8	28.8	28.7	2.01	2.21	2.40
50	25.2	25.2	24.8	25.2	25.2	24.8	2.00	2.17	2.35
47	24.4	24.1	23.7	24.4	24.1	23.7	2.00	2.16	2.34
40	21.5	21.2	20.8	20.6	20.3	19.9	1.97	2.12	2.30
30	17.4	16.9	16.6	15.2	14.8	14.5	1.93	2.07	2.24
20	13.9	13.6	13.3	12.6	12.3	12.0	1.91	2.04	2.19
17	12.9	12.6	12.3	11.8	11.5	11.2	1.90	2.03	2.18
10	11.1	10.7	10.3	10.1	9.8	9.5	1.88	2.00	2.13
0	8.5	8.0	7.5	7.8	7.4	6.9	1.86	1.96	2.07
-10	5.9	5.3	4.7	5.5	5.0	4.4	1.83	1.92	2.01

657A030 (2 1/2 TONS)																		
Outdoor Coil Air Temp (F db at 70%rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)			Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)																	
	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)																	
	875									1000								
70	35.0	34.5	33.7	35.0	34.5	33.7	2.47	2.79	3.11	35.5	35.0	33.8	35.5	35.0	33.8	2.39	2.69	2.99
60	32.1	31.6	31.1	32.1	31.6	31.1	2.42	2.72	3.04	32.5	32.1	31.3	32.5	32.1	31.3	2.35	2.64	2.95
50	29.3	28.7	28.4	29.3	28.7	28.4	2.37	2.65	2.98	29.6	29.1	28.7	29.6	29.1	28.7	2.32	2.59	2.91
47	28.4	27.9	27.6	28.4	27.9	27.6	2.36	2.63	2.96	28.7	28.2	28.0	28.7	28.2	28.0	2.31	2.58	2.89
40	25.7	25.0	25.3	24.6	24.0	24.2	2.31	2.57	2.90	25.9	25.2	25.6	24.8	24.2	24.5	2.28	2.53	2.85
30	21.8	21.0	21.9	19.1	18.4	19.2	2.25	2.48	2.82	21.9	21.0	22.2	19.2	18.4	19.5	2.23	2.46	2.79
20	18.2	17.1	18.6	16.4	15.5	16.8	2.20	2.42	2.74	17.8	16.7	19.0	16.1	15.0	17.1	2.18	2.39	2.73
17	17.1	16.0	17.7	15.6	14.6	16.1	2.19	2.40	2.72	16.6	15.4	18.0	15.2	14.0	16.4	2.17	2.37	2.72
10	14.5	13.3	13.8	13.1	12.1	12.5	2.15	2.37	2.60	14.0	12.9	14.0	12.7	11.7	12.6	2.15	2.35	2.60
0	12.3	10.1	8.8	10.1	9.0	7.8	2.13	2.32	2.55	11.1	9.9	8.8	9.9	8.8	7.8	2.11	2.30	2.55
-10	7.8	6.8	3.9	6.8	5.9	3.3	2.10	2.25	2.50	9.7	7.0	3.6	6.7	6.0	3.0	2.10	2.25	2.50

657A030 (2 1/2 TONS) (cont)									
Outdoor Coil Air Temp (F db at 70% rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)								
	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)								
	1125								
70	35.3	35.2	34.0	35.3	35.2	34.0	2.33	2.62	2.92
60	32.6	32.3	31.5	32.6	32.3	31.5	2.31	2.59	2.89
50	29.8	29.3	29.0	29.8	29.3	29.0	2.30	2.56	2.86
47	29.0	28.5	28.2	29.0	28.5	28.2	2.29	2.55	2.86
40	26.2	25.5	25.9	25.1	24.4	24.7	2.27	2.51	2.82
30	22.2	21.2	22.6	19.4	18.6	19.8	2.23	2.45	2.78
20	18.1	16.9	19.3	16.3	15.3	17.4	2.20	2.40	2.74
17	16.9	15.7	18.3	15.4	14.3	16.7	2.19	2.39	2.72
10	14.1	13.0	13.9	12.1	11.7	12.5	2.17	2.35	2.60
0	10.8	9.7	9.1	9.6	8.6	8.1	2.11	2.30	2.55
-10	7.1	6.4	3.9	6.2	5.5	3.3	2.10	2.25	2.50

LEGEND

- db — Dry Bulb
- edb — Entering Dry Bulb
- rh — Relative Humidity

NOTES:

1. Instantaneous heating capacity values shown include indoor-fan motor heat. These values ignore the effect of outdoor coil frost build-up.
2. Integrated heating capacity values shown are net values to which indoor-fan motor heat has been added and from which the defrost effect has been subtracted. To obtain total system heating capacities, add the heating capacity of the supplemental electric heaters to the integrated capacities.
3. Total power input values include the compressor, outdoor-fan motor, and indoor-fan motor.

HEATING CAPACITIES (cont)

657A036 (3 TONS)																		
Outdoor Coil Air Temp (F db at 70% rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)			Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)																	
	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)																	
	1050									1200								
70	47.3	46.0	45.0	47.3	46.0	45.0	2.86	3.13	3.44	47.8	47.6	46.6	47.8	47.6	46.6	2.79	3.08	3.38
60	41.8	40.8	39.9	41.8	40.8	39.9	2.80	3.07	3.37	42.3	41.9	41.0	42.3	41.0	41.0	2.75	3.03	3.32
50	36.3	35.6	34.7	36.3	35.6	34.7	2.75	3.02	3.31	36.8	36.1	35.3	36.8	36.1	35.3	2.71	2.98	3.26
47	34.6	34.0	33.1	34.6	34.0	33.1	2.73	3.00	3.29	35.1	34.4	33.6	35.1	34.4	33.6	2.70	2.96	3.24
40	30.6	29.9	28.9	29.4	28.7	27.8	2.69	2.94	3.21	31.0	30.3	29.4	29.8	29.0	28.2	2.67	2.91	3.18
30	24.9	24.0	22.9	21.8	21.0	20.1	2.62	2.86	3.10	25.3	24.4	23.3	22.1	21.4	20.5	2.62	2.85	3.09
20	20.0	19.1	18.1	18.0	17.2	16.3	2.56	2.78	3.02	20.3	19.5	18.5	18.3	17.6	16.7	2.57	2.79	3.02
17	18.5	17.7	16.7	16.9	16.1	15.2	2.54	2.76	2.99	18.8	18.0	17.0	17.2	16.4	15.5	2.56	2.77	3.00
10	16.0	15.1	14.1	14.6	13.8	12.9	2.51	2.72	2.93	16.1	15.3	14.3	14.8	14.0	13.0	2.53	2.73	2.95
0	12.4	11.5	10.4	11.4	10.6	9.5	2.47	2.66	2.85	12.3	11.4	10.3	11.3	10.5	9.5	2.49	2.68	2.88
-10	8.8	7.9	6.7	8.2	7.3	6.2	2.43	2.60	2.77	8.4	7.5	6.4	7.9	7.0	6.0	2.46	2.63	2.81

657A036 (3 TONS) (cont)									
Outdoor Coil Air Temp (F db at 70% rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)								
	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)								
	1350								
70	49.4	47.9	46.8	49.4	47.9	46.8	2.78	3.03	3.32
60	43.4	42.2	41.3	43.4	42.2	41.3	2.74	2.99	3.27
50	37.3	36.5	35.7	37.3	36.5	35.7	2.70	2.95	3.23
47	35.5	34.8	34.0	35.5	34.8	34.0	2.69	2.94	3.22
40	31.4	30.6	29.8	30.1	29.4	28.6	2.66	2.90	3.17
30	25.6	24.7	23.7	22.4	21.7	20.8	2.63	2.85	3.09
20	20.6	19.8	18.8	18.6	17.8	16.9	2.59	2.80	3.03
17	19.1	18.3	17.3	17.4	16.7	15.8	2.58	2.79	3.01
10	16.4	15.5	14.5	15.0	14.2	13.2	2.56	2.76	2.97
0	12.5	11.5	10.4	11.5	10.6	9.6	2.53	2.72	2.91
-10	8.6	7.6	6.3	8.0	7.1	5.9	2.50	2.67	2.85

657A042 (3 1/2 TONS)																		
Outdoor Coil Air Temp (F db at 70% rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)			Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)																	
	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)																	
	1250									1400								
70	56.7	55.2	55.1	56.7	55.2	55.1	3.53	3.84	4.24	56.8	55.7	55.5	56.8	55.7	55.5	3.45	3.77	4.14
60	49.6	48.4	48.1	49.6	48.4	48.1	3.42	3.73	4.11	49.9	48.8	48.5	49.9	48.8	48.5	3.37	3.67	4.03
50	42.5	41.7	41.1	42.5	41.7	41.1	3.32	3.62	3.97	42.9	42.0	41.4	42.9	42.0	41.4	3.28	3.58	3.91
47	40.4	39.6	39.0	40.4	39.6	39.0	3.29	3.59	3.93	40.8	40.0	39.3	40.8	40.0	39.3	3.26	3.55	3.88
40	35.6	34.9	34.2	34.1	33.5	32.8	3.21	3.50	3.83	36.0	35.2	34.5	34.5	33.8	33.1	3.19	3.47	3.79
30	28.7	28.1	27.4	25.2	24.6	24.0	3.10	3.38	3.68	29.0	28.5	27.7	25.4	24.9	24.3	3.09	3.36	3.66
20	23.1	22.4	21.7	20.8	20.2	19.5	3.00	3.26	3.54	23.4	22.7	22.0	21.1	20.5	19.8	3.01	3.26	3.54
17	21.4	20.7	20.0	19.5	18.9	18.2	2.98	3.23	3.50	21.7	21.0	20.3	19.8	19.1	18.5	2.99	3.23	3.51
10	18.4	17.7	16.9	16.8	16.2	15.4	2.92	3.16	3.41	18.6	17.9	17.0	17.0	16.3	15.6	2.94	3.17	3.43
0	14.1	13.4	12.5	13.0	12.3	11.5	2.85	3.06	3.29	14.1	13.4	12.4	13.0	12.3	11.4	2.87	3.09	3.31
-10	9.9	9.1	8.0	9.2	8.5	7.5	2.77	2.97	3.16	9.7	8.9	7.9	9.0	8.3	7.3	2.80	3.00	3.20

657A042 (3 1/2 TONS) (cont)									
Outdoor Coil Air Temp (F db at 70% rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)								
	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)								
	1575								
70	52.2	56.0	55.1	52.2	56.0	55.1	3.31	3.71	4.05
60	47.4	49.2	48.4	47.4	49.2	48.4	3.29	3.63	3.97
50	42.7	42.5	41.7	42.7	42.5	41.7	3.26	3.56	3.88
47	41.2	40.4	39.7	41.2	40.4	39.7	3.25	3.53	3.85
40	36.3	35.6	34.9	34.8	34.2	33.5	3.19	3.47	3.77
30	29.3	28.8	28.1	25.7	15.2	24.6	3.11	3.37	3.66
20	23.7	23.0	22.3	21.3	20.7	20.1	3.04	3.28	3.56
17	22.0	21.3	20.5	20.0	19.4	18.7	3.02	3.26	3.52
10	18.8	18.1	17.3	17.2	16.6	15.8	2.98	3.20	3.45
0	14.4	13.6	12.7	13.2	12.5	11.7	2.92	3.13	3.35
-10	9.9	9.1	8.1	9.2	8.5	7.6	2.86	3.05	3.25

HEATING CAPACITIES (cont)

657A048 (4 TONS)																		
Outdoor Coil Air Temp (F db at 70% rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)			Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)																	
	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)																	
	1400									1600								
70	62.1	61.8	61.4	62.1	61.8	61.4	3.60	4.02	4.47	60.5	62.1	61.8	60.5	62.1	61.8	3.44	3.88	4.32
60	54.4	53.9	53.3	54.4	53.9	53.3	3.51	3.90	4.34	53.7	54.2	53.7	53.7	54.2	53.7	3.39	3.79	4.21
50	46.8	46.0	45.2	46.8	46.0	45.2	3.42	3.80	4.20	46.9	46.4	45.6	46.9	46.4	45.6	3.34	3.71	4.10
47	44.5	43.6	42.7	44.5	43.6	42.7	3.40	3.76	4.16	44.8	44.0	43.1	44.8	44.0	43.1	3.33	3.68	4.07
40	39.2	38.4	37.7	37.6	36.8	36.1	3.33	3.69	4.08	39.5	38.7	38.0	37.9	37.1	36.4	3.27	3.62	4.00
30	31.6	31.0	30.4	27.7	27.1	26.6	3.24	3.58	3.95	31.8	31.2	30.6	27.9	27.4	26.8	3.20	3.53	3.90
20	25.6	25.2	24.7	23.1	22.7	22.3	3.18	3.51	3.86	25.9	25.4	24.9	23.3	22.9	22.5	3.15	3.47	3.82
17	23.8	23.4	23.0	21.7	21.4	21.0	3.16	3.48	3.84	24.1	23.6	23.2	21.9	21.5	21.1	3.14	3.45	3.80
10	20.7	20.3	19.8	19.0	18.6	18.1	3.13	3.44	3.77	20.9	20.5	20.0	19.2	18.7	18.3	3.12	3.42	3.75
0	16.3	15.8	15.2	15.0	14.6	14.0	3.09	3.38	3.68	16.5	16.0	15.4	15.2	14.8	14.1	3.09	3.38	3.68
-10	11.9	11.4	10.6	11.1	10.6	9.8	3.05	3.32	3.59	12.0	11.6	10.8	11.2	10.8	10.0	3.06	3.33	3.60

657A048 (4 TONS) (cont)									
Outdoor Coil Air Temp (F db at 70% rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)								
	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)								
	1800								
70	59.3	60.4	61.0	59.3	60.4	61.0	3.36	3.75	4.18
60	53.1	53.4	53.4	53.1	53.4	53.4	3.32	3.69	4.10
50	46.9	46.4	45.8	46.9	46.4	45.8	3.29	3.64	4.03
47	45.1	44.3	43.5	45.1	44.3	43.5	3.28	3.63	4.01
40	39.7	39.0	38.3	38.1	37.4	36.7	3.24	3.58	3.95
30	32.1	31.5	30.9	28.1	27.6	27.0	3.17	3.50	3.86
20	26.0	25.6	25.1	23.5	23.0	22.6	3.14	3.46	3.80
17	24.2	23.8	23.4	22.1	21.7	21.3	3.13	3.44	3.78
10	21.1	20.7	20.1	19.3	18.9	18.4	3.12	3.42	3.74
0	16.6	16.2	15.6	15.3	14.9	14.3	3.10	3.38	3.68
-10	12.2	11.7	11.0	11.3	10.9	10.2	3.08	3.35	3.62

657A060 (5 TONS)																		
Outdoor Coil Air Temp (F db at 70% rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)			Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)																	
	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)																	
	1800									2000								
70	83.6	81.7	79.8	83.6	81.7	79.8	4.64	5.09	5.58	84.5	82.5	80.5	84.5	82.5	80.5	4.53	4.97	5.44
60	72.4	70.8	69.2	72.4	70.8	69.2	4.53	4.98	5.47	73.1	71.4	69.8	73.1	71.4	69.8	4.45	4.88	5.36
50	61.2	59.8	58.6	61.2	59.8	58.6	4.43	4.87	5.36	61.7	60.3	59.0	61.7	60.3	59.0	4.37	4.80	5.27
47	57.8	56.6	55.4	57.8	56.6	55.4	4.40	4.83	5.32	58.3	57.0	55.8	58.3	57.0	55.8	4.35	4.77	5.24
40	51.3	50.2	49.2	49.1	48.1	47.1	4.36	4.79	5.27	51.6	50.6	49.6	49.5	48.5	47.5	4.32	4.74	5.21
30	41.9	41.1	40.3	36.7	36.0	35.3	4.29	4.72	5.20	42.2	41.4	40.6	37.0	36.3	35.6	4.27	4.69	5.15
20	34.5	33.7	32.6	31.1	30.4	29.4	4.27	4.68	5.09	34.7	34.0	33.0	31.3	30.7	29.7	4.26	4.67	5.08
17	32.2	31.5	30.3	29.4	28.7	27.6	4.26	4.67	5.06	32.5	31.8	30.7	29.6	29.0	28.0	4.25	4.66	5.06
10	28.0	27.0	25.2	25.6	24.6	23.1	4.24	4.60	4.89	28.3	27.3	25.6	25.8	24.9	23.4	4.25	4.60	4.91
0	22.0	20.4	18.0	20.2	18.8	16.6	4.22	4.49	4.65	22.2	20.8	18.4	20.5	19.1	17.0	4.24	4.53	4.70
-10	15.9	13.9	10.8	14.8	12.9	10.1	4.20	4.39	4.41	16.2	14.3	11.2	15.1	13.3	10.5	4.24	4.45	4.48

657A060 (5 TONS) (cont)									
Outdoor Coil Air Temp (F db at 70% rh)	Instantaneous Capacity (MBtuh)			Integrated Capacity (MBtuh)			Total Power Input (kW)		
	Indoor Air Temp (F edb)								
	60	70	80	60	70	80	60	70	80
	Indoor Airflow (cfm)								
	2250								
70	85.2	83.3	81.4	85.2	83.3	81.4	4.45	4.87	5.33
60	73.8	72.1	70.5	73.8	72.1	70.5	4.39	4.81	5.26
50	62.3	60.8	59.5	62.3	60.8	59.5	4.33	4.74	5.20
47	58.8	57.5	56.3	58.8	57.5	56.3	4.31	4.72	5.18
40	52.1	51.0	50.0	50.0	48.9	47.9	4.29	4.70	5.16
30	42.5	41.7	41.0	37.3	36.6	35.9	4.26	4.67	5.12
20	35.0	34.3	33.4	31.6	31.0	30.1	4.26	4.66	5.08
17	32.7	32.1	31.1	29.9	29.3	28.3	4.26	4.66	5.07
10	38.5	27.6	26.1	26.1	25.2	23.8	4.27	4.63	4.94
0	22.5	21.2	18.9	20.7	19.5	17.4	4.28	4.57	4.75
-10	16.5	14.7	11.7	15.4	13.7	10.9	4.29	4.52	4.57

LEGEND

- db — Dry Bulb
- edb — Entering Dry Bulb
- rh — Relative Humidity

NOTES:

1. Instantaneous heating capacity values shown include indoor-fan motor heat. These values ignore the effect of outdoor coil frost-build-up.
2. Integrated heating capacity values shown are net values to which indoor-fan motor heat has been added and from which the defrost effect has been subtracted. To obtain total system heating capacities, add the heating capacity of the supplemental electric heaters to the integrated capacities.
3. Total power input values include the compressor, outdoor-fan motor, and indoor-fan motor.

**DRY COIL AIR DELIVERY* — HORIZONTAL AND VERTICAL DISCHARGE
(DEDUCT 10% FOR 208 V) — UNITS 024-042**

UNIT SIZE	MOTOR SPEED		230 AND 460 V HORIZONTAL DISCHARGE										
			External Static Pressure (in. wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
024	Low	Watts	280	275	265	255	250	245	240	—	—	—	—
		Cfm	820	810	755	700	660	600	560	—	—	—	—
	Med	Watts	365	360	350	345	340	330	320	310	300	—	—
		Cfm	1025	1010	975	940	900	850	800	720	630	—	—
	High	Watts	—	—	490	480	470	460	445	430	410	390	380
		Cfm	—	—	1300	1255	1200	1150	1080	1005	915	790	620
030	Low	Watts	—	—	—	—	—	—	—	—	—	—	—
		Cfm	—	—	—	—	—	—	—	—	—	—	—
	Med	Watts	—	365	360	360	350	350	—	—	—	—	—
		Cfm	—	1060	1020	980	935	880	—	—	—	—	—
	High	Watts	—	—	—	—	490	485	475	460	450	430	—
		Cfm	—	—	—	—	1270	1220	1170	1100	1020	920	—
036	Low	Watts	520	495	474	458	495	425	—	—	—	—	—
		Cfm	1375	1335	1290	1244	1200	1146	—	—	—	—	—
	Med	Watts	575	560	535	510	480	460	440	425	—	—	—
		Cfm	1520	1490	1450	1440	1380	1300	1200	1080	—	—	—
	High	Watts	—	—	—	—	650	614	575	540	510	480	—
		Cfm	—	—	—	—	1560	1500	1380	1280	1170	1060	—
042	Low	Watts	490	480	470	460	450	430	410	390	—	—	—
		Cfm	1400	1380	1340	1300	1250	1200	1140	1070	—	—	—
	Med	Watts	590	580	560	545	525	505	480	450	420	—	—
		Cfm	1600	1560	1540	1470	1430	1360	1300	1220	1120	—	—
	High	Watts	—	—	—	—	—	700	670	640	600	560	500
		Cfm	—	—	—	—	—	1780	1670	1600	1480	1340	1100

*Air delivery values are based on operating voltage of 230 v or 460 v, dry coil, without filter or electric heater. Deduct wet coil, filter, and electric heater pressure drops to obtain external static pressure available for ducting.

NOTES:

1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Indoor coil frosting may occur at airflows below this point.
2. Dashes indicate portions of table that are beyond the blower motor capacity or are not recommended.

**DRY-COIL AIR DELIVERY* — HORIZONTAL AND VERTICAL DISCHARGE
FOR INTEGRATED CONTROL MOTOR UNITS AT 230 V —
UNITS 048 AND 060 (DEDUCT 10% FROM CFM FOR 208-V OPERATION)**

UNIT SIZE	FAN ONLY (Cfm)	COOLING (Cfm)	HEATING (Cfm)
048	1530	1575	1575
060	1750	1800	2000

*Air delivery values are for dry coil at 230 v. Airflow is independent of external static pressure within ±5% of table values up to 0.8 in. wg. Air delivery is preset at factory.

NOTE: Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Indoor coil icing may occur at airflows below this point. Water blow-off may occur at airflows above 450 cfm per 12,000 Btuh of rated cooling capacity.

WET COIL PRESSURE DROP

UNIT SIZE	AIRFLOW (cfm)	PRESSURE DROP (in. wg)
024	600	0.012
	700	0.022
	800	0.027
	900	0.039
030	900	0.039
	1000	0.057
	1200	0.072
036	1000	0.068
	1200	0.096
	1400	0.116
	1600	0.136
042	1000	0.030
	1200	0.048
	1400	0.057
	1600	0.078
048	1400	0.068
	1600	0.075
	1800	0.088
060	1700	0.082
	1900	0.095
	2100	0.108
	2300	0.123

ACCESSORY ELECTRIC HEATER PRESSURE DROP (in. wg)

HEATER kW	CFM								
	600	800	1000	1200	1400	1600	1800	2000	2200
5-20	0.030	0.033	0.037	0.042	0.047	0.052	0.060	0.067	0.075

FILTER PRESSURE DROP (in. wg)

UNIT SIZE	FILTER SIZE (in.)	CFM																		
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
024-036	24 x 24	—	—	0.06	0.06	0.07	0.07	0.08	0.09	0.10	0.12	0.13	—	—	—	—	—	—	—	—
042-060	24 x 30	—	—	—	—	—	0.07	0.07	0.08	0.08	0.09	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.17	0.18

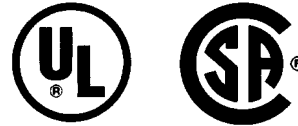
ELECTRIC HEATER PACKAGES — 208/240-V, SINGLE-PHASE DUAL-POINT WIRING CONNECTIONS

UNIT SIZE	ELECTRIC HEAT ACCESSORY KIT	ELECTRIC HEAT (kW)*		HEATER FLA		MIN CIRCUIT AMPACITY FOR WIRE SIZING		MAX FUSE OR HACR BRKR		MOCP	
		208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
024	389081-701	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	389082-701	5.60	7.5	27.1	31.3	33.7	39.1	35	40	—	—
	389083-701	7.50	10.0	36.1	41.7	45.1	50.8	50	60	—	—
030	389081-701	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	389082-701	5.60	7.5	27.1	31.3	33.7	39.1	35	40	—	—
	389083-701	7.50	10.0	36.1	41.7	45.1	50.1	50	60	—	—
	389215-701	11.30	15.0	54.3	62.5	67.9	78.1	—	—	70	80
036	389081-701	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	389082-701	5.60	7.5	27.1	31.3	33.7	39.1	35	40	—	—
	389083-701	7.50	10.0	36.1	41.7	45.1	50.8	50	60	—	—
	389215-701	11.30	15.0	54.3	62.5	67.9	78.1	—	—	70	80
	389085-701	13.10	17.5	65.5	75.1	82.0	93.8	—	—	90	100
042	389081-701	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	389082-701	5.60	7.5	27.1	31.3	33.7	39.1	35	40	—	—
	389083-701	7.50	10.0	36.1	41.7	45.1	50.8	50	60	—	—
	389215-701	11.30	15.0	54.3	62.5	67.9	78.1	—	—	70	80
	389086-701	15.00	20.0	72.1	83.3	90.1	104.2	—	—	100	110
048	389081-701	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	389082-701	5.60	7.5	27.1	31.3	33.7	39.1	35	40	—	—
	389083-701	7.50	10.0	36.1	41.7	45.1	50.8	50	60	—	—
	389215-701	11.30	15.0	54.3	62.5	67.9	78.1	—	—	70	80
	389086-701	15.00	20.0	72.1	83.3	90.1	104.2	—	—	100	110
060	389081-701	3.75	5.0	18.0	20.8	22.5	26.0	25	30	—	—
	389082-701	5.60	7.5	27.1	31.3	33.7	39.1	35	40	—	—
	389083-701	7.50	10.0	36.1	41.7	45.1	50.8	50	60	—	—
	389215-701	11.30	15.0	54.3	62.5	67.9	78.1	—	—	70	80
	389086-701	15.00	20.0	72.2	83.3	90.1	104.2	—	—	100	110

LEGEND

- FLA** — Full Load Amps
- HACR BRKR** — Heating, Air Conditioning and Refrigeration Circuit Breaker
- MOCP** — Maximum Overcurrent Protection (fuses or HACR-type circuit breaker)
- NEC** — National Electrical Code

NOTE: In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the over-current protective device for the unit shall be fuse or HACR breaker.



*Electric heat capacity (kW) is based on heater voltages of 208 v or 240 v. If power distribution voltage to units varies from rated heater voltage, see Wattage Multiplication Factors table on page 22.

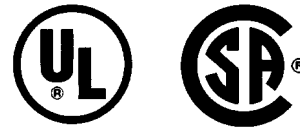
**ELECTRIC HEATER PACKAGES — 208/240 V, 3-PHASE,
DUAL-POINT WIRING CONNECTIONS**

UNIT SIZE	ELECTRIC HEAT ACCESSORY KIT	ELECTRIC HEAT (kW)*		HEATER FLA		MIN CIRCUIT AMPACITY FOR WIRE SIZING		MAX FUSE OR HACR BRKR	
		208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
030	389087-701	7.5	10.0	20.8	24.1	26.1	30.1	30	35
	389088-701	11.3	15.0	31.3	36.1	39.1	45.2	40	50
036	389087-701	7.5	10.0	20.8	24.1	26.1	30.1	30	35
	389088-701	11.3	15.0	31.3	36.1	39.1	45.2	40	50
	389089-701	13.1	17.5	36.5	41.0	45.6	51.3	50	60
042	389087-701	7.5	10.0	20.8	24.1	26.1	30.1	30	35
	389088-701	11.3	15.0	31.3	36.1	39.1	45.2	40	50
	389089-701	13.1	17.5	36.5	41.0	45.6	51.3	50	60
048	389087-701	7.5	10.0	20.8	24.1	26.1	30.1	30	35
	389088-701	11.3	15.0	31.3	36.1	39.1	45.2	40	50
	389089-701	13.1	17.5	36.5	41.0	45.6	51.3	50	60
060	389087-701	7.5	10.0	20.8	24.1	26.1	30.1	30	35
	389088-701	11.3	15.0	31.3	36.1	39.1	45.2	40	50
	389089-701	13.1	17.5	36.5	41.0	45.6	51.3	50	60

LEGEND

- FLA** — Full Load Amps
HACR BRKR — Heating, Air Conditioning and Refrigeration Circuit Breaker
MOCP — Maximum Overcurrent Protection (fuses or HACR-type circuit breaker)
NEC — National Electrical Code

NOTE: In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the over-current protective device for the unit shall be fuse or HACR breaker.



*Electric heat capacity (kW) is based on heater voltages of 208 v or 240 v. If power distribution voltage to units varies from rated heater voltage, see Wattage Multiplication Factors table on page 22.

**ELECTRIC HEATER PACKAGES — 480 V, 3-PHASE,
DUAL-POINT WIRING CONNECTIONS**

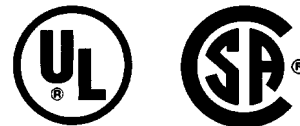
UNIT SIZE	ELECTRIC HEAT ACCESSORY KIT	ELECTRIC HEAT (kW)*	HEATER FLA	MIN CIRCUIT AMPACITY FOR WIRE SIZING	MAX FUSE OR HACR BRKR
		480 V		480 V	480 V
036	389090-701	10.0	12.2	15.3	20
	389091-701	15.0	18.1	22.6	25
	389092-701	17.5	21.1	26.3	30
042	389090-701	10.0	12.2	15.3	20
	389091-701	15.0	18.1	22.6	25
	389092-701	17.5	21.1	26.3	30

LEGEND

- FLA** — Full Load Amps
HACR BRKR — Heating, Air Conditioning and Refrigeration Circuit Breaker
MOCP — Maximum Overcurrent Protection (fuses or HACR-type circuit breaker)
NEC — National Electrical Code

NOTES:

- In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the over-current protective device for the unit shall be fuse or HACR breaker.
- This unit must be supplied from a 480 v, 3-phase power supply with a maximum voltage to ground of 300 v.



*Electric heat capacity (kW) is based on heater voltages of 480 v. If power distribution voltage to units varies from rated heater voltage, see Wattage Multiplication Factors table on page 22.

ELECTRIC HEATER PACKAGES — 208/240 V, SINGLE PHASE, SINGLE-POINT WIRING CONNECTIONS

UNIT SIZE	ELECTRIC HEAT ACCESSORY KIT	ELECTRIC HEAT (kW)*		HEATER FLA		MIN CIRCUIT AMPACITY FOR WIRE SIZING		MAX FUSE OR HACR BRKR		MOC P	
		208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
024	389081-701	3.76	5.0	18.0	20.8	42.1	45.6	50	50	—	—
	389082-701	5.60	7.5	27.1	31.3	53.4	58.6	60	60	—	—
	389203-701	7.50	10.0	36.1	41.7	64.7	71.6	—	—	70	80
030	389081-701	3.76	5.0	18.1	20.8	45.3	48.8	50	50	—	—
	389202-701	5.60	7.5	27.1	31.3	56.6	61.8	60	—	—	70
	389203-701	7.50	10.0	36.1	41.7	67.9	74.8	—	—	70	80
	389216-701	11.30	15.0	54.1	62.0	90.4	100.3	—	—	100	110
036	389081-701	3.76	5.0	18.1	20.8	48.3	51.7	60	60	—	—
	389202-701	5.60	7.5	27.1	31.3	59.5	64.8	60	—	—	70
	389203-701	7.50	10.0	36.1	41.7	70.8	77.8	—	—	80	80
	389216-701	11.30	15.0	54.3	62.0	93.3	103.2	—	—	100	110
	389205-701	15.00	20.0	72.2	83.3	116.0	129.9	—	—	125	150
042	389081-701	3.76	5.0	18.1	20.8	52.1	55.5	60	60	—	—
	389202-701	5.60	7.5	27.1	31.3	63.3	68.6	—	—	70	80
	389203-701	7.50	10.0	36.1	41.7	74.6	81.6	—	—	80	90
	389216-701	11.30	15.0	54.1	62.0	97.1	107.0	—	—	100	110
	389205-701	15.00	20.0	72.2	83.3	119.8	133.7	—	—	125	150
048	389201-701	3.76	5.0	18.1	20.8	64.2	67.6	—	—	80	80
	389202-701	5.60	7.5	27.1	31.3	75.4	80.7	—	—	90	90
	389203-701	7.50	10.0	36.1	41.7	86.7	93.7	—	—	100	100
	389216-701	11.30	15.0	54.1	62.0	109.2	119.1	—	—	110	125
	389205-701	15.00	20.0	72.2	83.3	131.9	145.8	—	—	150	150
060	389201-701	3.76	5.0	18.1	20.8	72.0	75.5	—	—	90	100
	389202-701	5.60	7.5	27.1	31.3	83.3	88.5	—	—	100	100
	389203-701	7.50	10.0	36.1	41.7	94.6	101.5	—	—	100	110
	389216-701	11.30	15.0	54.1	62.0	117.1	126.9	—	—	125	150
	389205-701	15.00	20.0	72.2	83.3	139.6	153.5	—	—	150	175

LEGEND

- FLA** — Full Load Amps
- HACR BRKR** — Heating, Air Conditioning and Refrigeration Circuit Breaker
- MOC P** — Maximum Overcurrent Protection (fuses or HACR-type circuit breaker)
- NEC** — National Electrical Code

NOTE: In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the over-current protective device for the unit shall be fuse or HACR breaker.



*Electric heat capacity (kW) is based on heater voltages of 208 v or 240 v. If power distribution voltage to units varies from rated heater voltage, see Wattage Multiplication Factors table on page 22.

ELECTRIC HEATER PACKAGES — 208/240 V, 3-PHASE SINGLE-POINT WIRING CONNECTIONS

UNIT SIZE	ELECTRIC HEAT ACCESSORY KIT	ELECTRIC HEAT (kW)*		HEATER FLA		MIN CIRCUIT AMPACITY FOR WIRE SIZING		MAX FUSE OR HACR BRKR		MOCP	
		208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
030	389087-701	7.5	10.0	20.8	24.1	42.7	46.7	45	50	—	—
	389207-701	11.3	15.0	31.3	36.1	55.7	61.7	60	—	—	70
036	389087-701	7.5	10.0	20.8	24.1	44.5	48.5	50	50	—	—
	389207-701	11.3	15.0	31.3	36.1	57.5	63.6	60	—	—	70
	389208-701	13.1	17.5	36.5	42.1	64.0	71.1	—	—	70	80
042	389087-701	7.5	10.0	20.8	24.1	47.9	51.9	50	60	—	—
	389207-701	11.3	15.0	31.3	36.1	61.0	67.0	—	—	70	70
	389208-701	13.1	17.5	36.5	42.1	67.5	74.5	—	—	70	80
048	389087-701	7.5	10.0	20.8	24.1	53.4	57.4	60	60	—	—
	389207-701	11.3	15.0	31.3	36.1	66.4	72.5	—	—	70	80
	389208-701	13.1	17.5	36.5	42.0	72.9	80.0	—	—	80	80
060	389206-701	7.5	10.0	20.8	24.1	59.5	63.5	—	—	70	70
	389207-701	11.3	15.0	31.3	36.1	72.5	78.5	—	—	80	80
	389208-701	13.1	17.5	36.5	42.0	79.0	86.0	—	—	80	90

LEGEND

- FLA** — Full Load Amps
HACR BRKR — Heating, Air Conditioning and Refrigeration Circuit Breaker
MOCP — Maximum Overcurrent Protection (fuses or HACR-type circuit breaker)
NEC — National Electrical Code

NOTE: In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the over-current protective device for the unit shall be fuse or HACR breaker.



*Electric heat capacity (kW) is based on heater voltages of 208 v or 240 v. If power distribution voltage to units varies from rated heater voltage, see Wattage Multiplication Factors table on page 22.

ELECTRIC HEATER PACKAGES — 480 V, 3-PHASE, SINGLE-POINT WIRING CONNECTIONS

UNIT SIZE	ELECTRIC HEAT ACCESSORY KIT	ELECTRIC HEAT (kW)*	HEATER FLA	MIN CIRCUIT AMPACITY FOR WIRE SIZING	MAX FUSE OR HACR BRKR
		480 V		480 V	480 V
036	389090-701	10.0	12.0	24.4	25
	389091-701	15.0	18.0	31.9	35
	389092-701	17.5	21.0	35.6	40
042	389090-701	10.0	12.0	25.9	30
	389091-701	15.0	18.0	33.5	35
	389092-701	17.5	21.0	37.2	40

LEGEND

- FLA** — Full Load Amps
HACR BRKR — Heating, Air Conditioning and Refrigeration Circuit Breaker
MOCP — Maximum Overcurrent Protection (fuses or HACR-type circuit breaker)
NEC — National Electrical Code

NOTES:

- In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the over-current protective device for the unit shall be fuse or HACR breaker.
- This unit must be supplied from a 480 v, 3-phase power supply with a maximum voltage to ground of 300 v.



*Electric heat capacity (kW) is based on heater voltages of 480 v. If power distribution voltage to units varies from rated heater voltage, see Wattage Multiplication Factors table on page 22.

WATTAGE MULTIPLICATION FACTORS

HEATER VOLTAGE RATING	ACTUAL HEATER VOLTAGE	MULTIPLICATION FACTOR
240	200	0.69
	208	0.75
	220	0.84
	230	0.92
	240	1.00
480	415	0.75
	440	0.84
	460	0.92
	480	1.00

Example: 20.0 kW (at 240 v) heater on 230 v
 = 20.0 (0.92 multiplication factor)
 = 18.4 kW capacity at 230 v

MINIMUM AIRFLOW (CFM) FOR SAFE ELECTRIC HEATER OPERATION

UNIT SIZE					
024	030	036	042	048	060
800	1000	1300	1300	1600	1750

OPERATING SEQUENCE

When power is supplied to unit, the transformer (TRAN) is energized.

Cooling — With the thermostat subbase in the cooling position, and when the space temperature comes within 2° F of the cooling set point, the thermostat makes circuit R-O. This energizes the reversing valve solenoid (RVS) and places the unit in standby condition for cooling.

As the space temperature continues to rise, the second stage of the thermostat makes, closing circuit R-Y. When compressor time delay (5 ± 2 minutes) is completed, a circuit is made to contactor (C), starting the compressor (COMP) and outdoor-fan motor (OFM). Circuit R-G is made at the same time, starting the indoor-fan motor (IFM) after a 1-second delay.

When the thermostat is satisfied, contacts open, deenergizing C. The COMP and OFM stop, and the IFM stops after a short time delay.

Heating — On a call for heat, thermostat makes circuits R-Y and R-G. When compressor time delay (5 ± 2 minutes) is

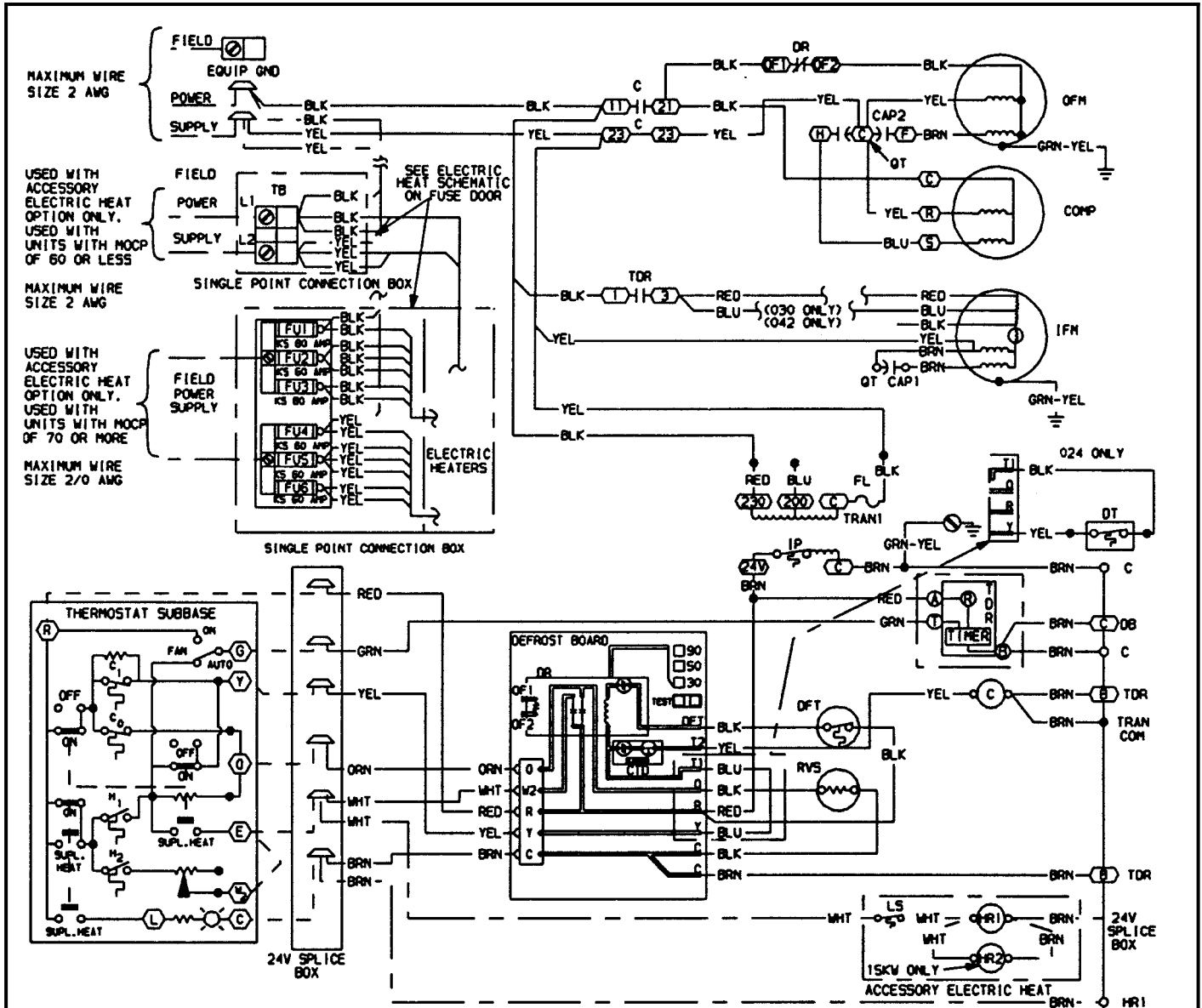
completed, a circuit is made to C, starting COMP and OFM. Circuit R-G also starts IFM after a 1-second delay.

Should room temperature continue to fall, circuit R-W is made through second-stage thermostat bulb. If optional electric heat package is used, a relay is energized, bringing on first bank of supplemental electric heat. When thermostat is satisfied, contacts open, deenergizing contactor and relay; motors and heaters deenergize. The IFM may be controlled by a time-delay relay that keeps the fan on for 30 seconds.

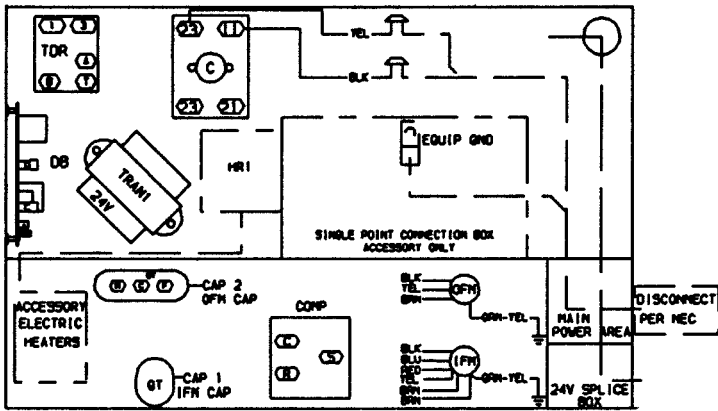
Defrost — Defrost board (DB) is a time and temperature control, which includes a field-selectable time period between checks for defrost (30, 50, and 90 minutes). Electronic timer and defrost cycle start only when contactor is energized and defrost thermostat (DFT) is closed.

Defrost mode is identical to Cooling mode, except OFM stops and a bank of optional electric heat turns on to warm air supplying the conditioned space.

TYPICAL FIELD WIRING (Single Phase, Units 024-042)



COMPONENT ARRANGEMENT



LEGEND

AWG	— American Wire Gage	TDR	— Time-Delay Relay
C	— Contactor, Compressor	TH	— Thermostat-Heating
CAP	— Capacitor	TRAN	— Transformer
COM	— Common		
COMP	— Compressor Motor		
CTD	— Compressor Time Delay		
DB	— Defrost Board		
DFT	— Defrost Thermostat		
DR	— Defrost Relay		
DT	— Discharge Thermostat		
EQUIP	— Equipment		
FL	— Fuse Link		
FU	— Fuse		
GND	— Ground		
HR	— Heater Relay (Strip Heat)		
IFM	— Indoor-Fan Motor		
LS	— Limit Switch		
MOCP	— Maximum Overcurrent Protection		
NEC	— National Electrical Code		
OF	— Outdoor Fan		
OFM	— Outdoor-Fan Motor		
QT	— Quadruple Terminal		
RVS	— Reversing Valve Solenoid		
TB	— Terminal Block		

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. Thermostat: HH07AT171
Subbase: HH93AZ188
3. Set heat anticipator at .26.
4. Use copper conductors only.

ELECTRICAL DATA

208/230 V, SINGLE PHASE

UNIT SIZE	COMPRESSOR		OFM	IFM	POWER SUPPLY MOCP	
	RLA	LRA	FLA	FLA	MCA	Max
024	12.9	63	1.4	2.0	19.5	30
030	15.0	73	1.4	2.6	22.8	30
036	17.2	88	1.4	2.8	25.7	40
042	20.0	104	1.4	3.1	29.5	45
048	26.4	129	1.4	7.2	41.6	60
060	32.1	169	2.1	7.2	49.4	60

208/230 V, 3-PHASE

UNIT SIZE	COMPRESSOR		OFM	IFM	POWER SUPPLY MOCP	
	RLA	LRA	FLA	FLA	MCA	Max
030	10.1	63.0	1.4	2.8	16.6	25
036	11.4	77.0	1.4	2.8	18.5	25
042	13.9	88.0	1.4	3.1	21.9	30
048	15.0	99.0	1.4	7.2	27.4	40
060	19.3	123.0	2.1	7.2	33.4	50

460 V, 3-PHASE

UNIT SIZE	COMPRESSOR		OFM	IFM	POWER SUPPLY MOCP	
	RLA	LRA	FLA	FLA	MCA	Max
036	5.7	39.0	0.8	1.4	9.3	15
042	6.8	44.0	0.8	1.6	10.9	15

LEGEND

- CSA — Canadian Standards Association
- FLA — Full Load Amps
- HACR — Heating, Air Conditioning and Refrigeration
- IFM — Indoor-Fan Motor
- LRA — Locked Rotor Amps
- MCA — Minimum Circuit Amps
- MOCP — Maximum Overcurrent Protection (fuses or HACR-type circuit breaker)
- NEC — National Electrical Code
- OFM — Outdoor-Fan Motor
- RLA — Rated Load Amps

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. The CSA units may be fuse or circuit breaker.

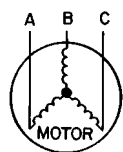
2. Unbalanced 3-Phase Supply Voltage

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

% Voltage Imbalance

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

Example: Supply voltage is 460-3-60.



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

$$\begin{aligned} \text{Average Voltage} &= \frac{452 + 464 + 455}{3} \\ &= \frac{1371}{3} \\ &= 457 \end{aligned}$$

Determine maximum deviation from average voltage.

(AB) 457 - 452 = 5 v

(BC) 464 - 457 = 7 v

(AC) 457 - 455 = 2 v

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

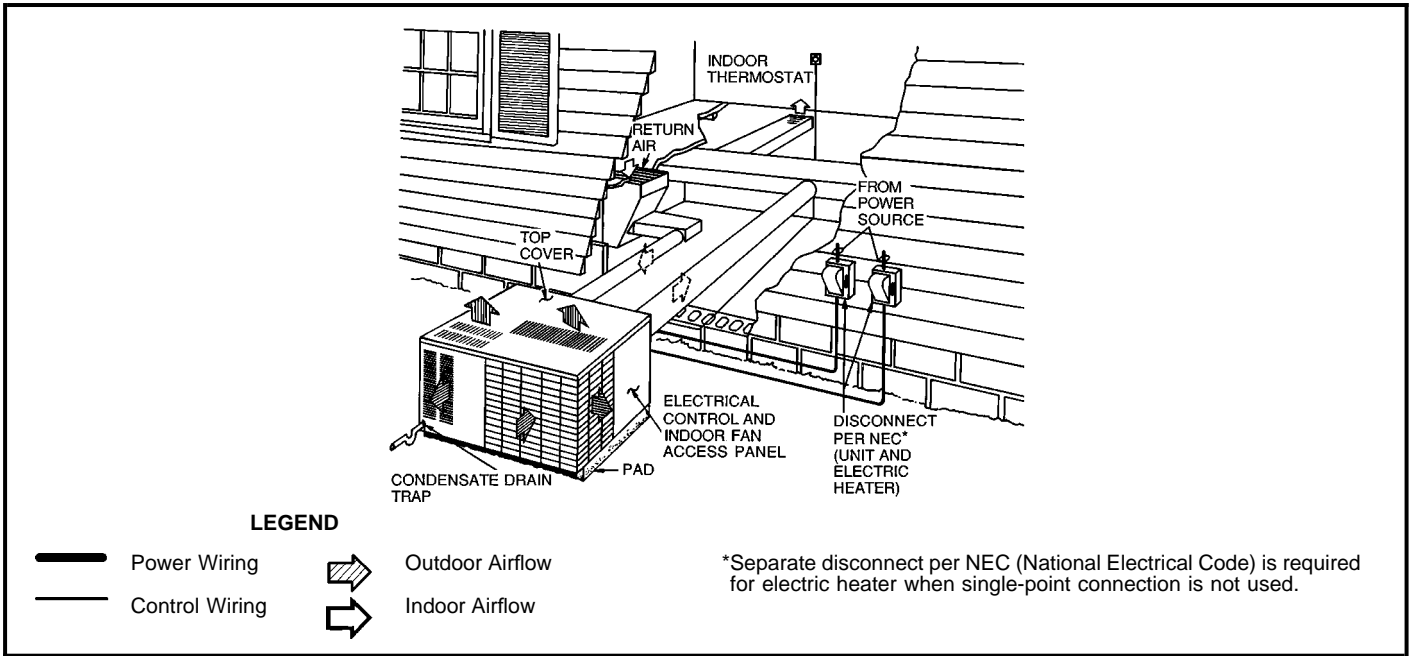
$$\begin{aligned} \% \text{ Voltage Imbalance} &= 100 \times \frac{7}{457} \\ &= 1.53\% \end{aligned}$$

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

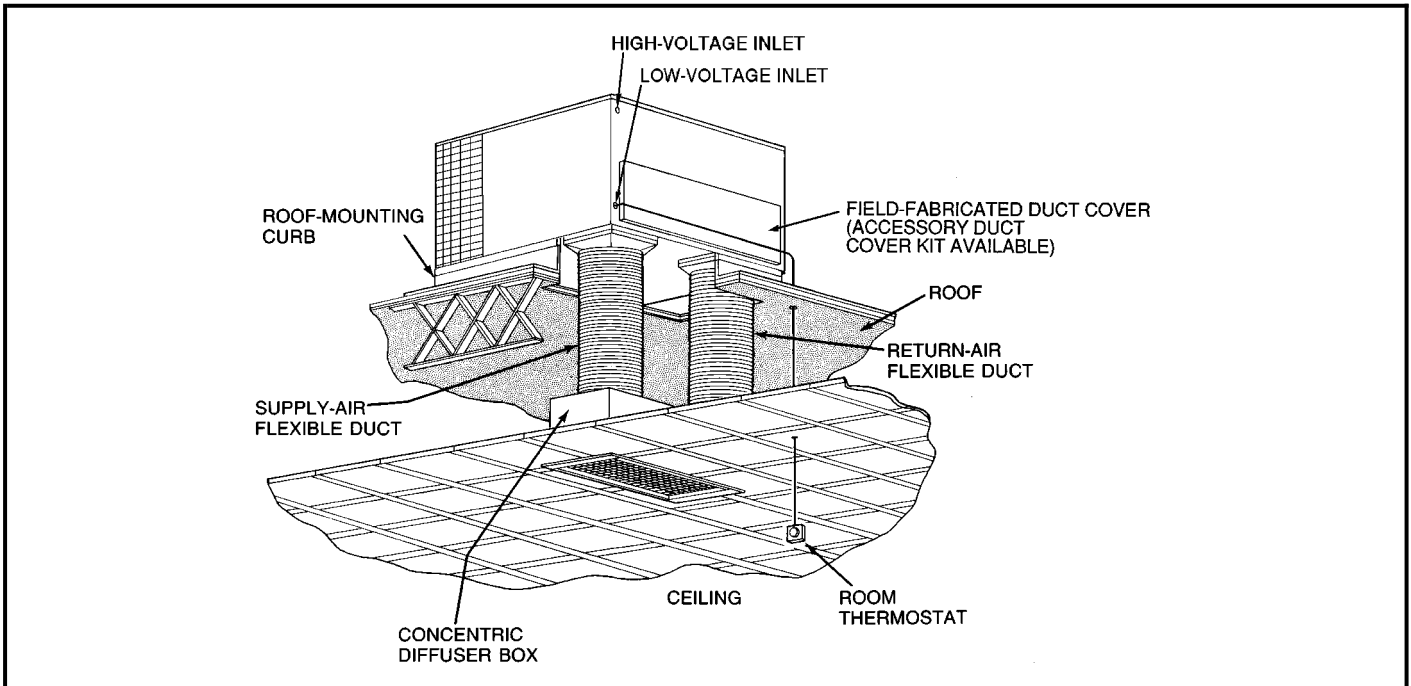
IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.



TYPICAL INSTALLATION



Slab Mount



Curb Mount

ENGINEERS' SPECIFICATION GUIDE

GENERAL: Furnish and install outdoor package, electrically controlled, heat pump utilizing a scroll-type compressor. Unit shall discharge supply air horizontally or vertically as shown on contract drawings.

Nominal unit electrical characteristics shall be _____ v, _____ ph, 60 Hz. The unit shall be capable of satisfactory operation within voltage limits of _____ v to _____ v. Unit power wiring shall enter unit cabinet at a single location. Separate power supply shall not be required for electric heat.

COOLING CAPACITY: Total cooling capacity of the unit shall be _____ Btuh or greater, and sensible capacity shall be _____ Btuh or greater at conditions of _____ cfm indoor air entering unit at _____ F dry bulb, _____ F wet bulb and outdoor entering air of _____ F dry bulb. Total design conditions shall be a minimum of _____ Btuh/Watt. The unit shall be capable of cooling operation down to 40 F as shipped from the factory.

HEATING CAPACITY: Total heating capacity shall be _____ Btuh or greater (integrated rating) when rated at _____ F dry-bulb outdoor ambient with _____ cfm and _____ F entering (heating) coil. The equipment must have a minimum HSPF (Heating Seasonal Performance Factor) of _____. Compressor shall be capable of operation in heating duty down to -20 F ambient outdoor-air temperature. Unit shall be capable of simultaneous heating duty and defrost cycle operation when using accessory electric heaters.

CABINET: Unit cabinet shall be constructed of phosphated, bonderized, zinc-coated, prepainted steel, capable of withstanding 500 hours in salt spray.

Indoor-fan compartment interior cabinet surfaces shall be insulated with a minimum 1/2-in. thick, flexible fiberglass insulation, coated on the air side with aluminum foil (shall conform to ASHRAE 62P).

Cabinet panels shall be easily removable for servicing.

COMPRESSOR: Compressor shall be fully hermetic type with internal and external vibration isolation.

OUTDOOR SECTION: Outdoor fan shall be of the direct-driven propeller type with aluminum blades, riveted to corrosion-resistant steel spiders, and shall be dynamically balanced and discharge air horizontally or vertically upwards.

Outdoor coils shall have aluminum-plate fins mechanically bonded to seamless copper tubes with all joints brazed.

Tube sheet openings shall be belled to prevent tube wear.

INDOOR SECTION: Fan shall be 3-speed (sizes 024-042) or variable speed (sizes 048,060) with direct drive motor as shown on the equipment drawings.

Fan wheel shall be made from steel, be double-inlet type with forward-curved blades with a corrosion-resistant finish and dynamically balanced.

Indoor coils shall have aluminum-plate fins mechanically bonded to seamless copper tubes with all joints brazed.

Tube sheet openings shall be belled to prevent tube wear.

MOTORS: Compressor motors shall be of the refrigerant-cooled type with line break thermal and current overload protection.

All fan motors shall have permanently lubricated bearings, and inherent automatic reset thermal overload protection.

Outdoor-fan motor shall be totally enclosed.

REFRIGERANT SYSTEM: Refrigerant system shall include fixed orifice metering feed system.

CONTROLS: Unit shall be complete with self-contained low-voltage control circuit.

APPROVALS: Unit shall be UL listed and CSA certified as a total package for safety requirements. All wiring shall be in accordance with NEC.

Unit shall be rated in accordance with ARI Standards 210/240-89 and 270-89. Unit shall be designed in accordance with UL Standard 1995.

Unit shall be designed to conform to ASHRAE 15.

Unit shall be manufactured in a facility registered to ISO 9002. (International Standards Organization) manufacturing quality standard.

Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

Roof curb shall be designed to conform to NRCA standards.

OPTIONS: Factory-installed options shall include base rail and downflow option.

ACCESSORIES: Field-installed accessories shall include outdoor thermostat, thermostat and subbase, electric heaters with single-point connection, modulating economizer, two-position damper, manual outdoor-air damper, filter rack, duct cover kit, lifting bracket kit, rectangular duct connection kit, low- and high-pressure switch kits, roof curbs, low-ambient kit and downshot-to-sideshot conversion kit.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE
UNIT MUST BE INSTALLED IN ACCORDANCE
WITH INSTALLATION INSTRUCTIONS