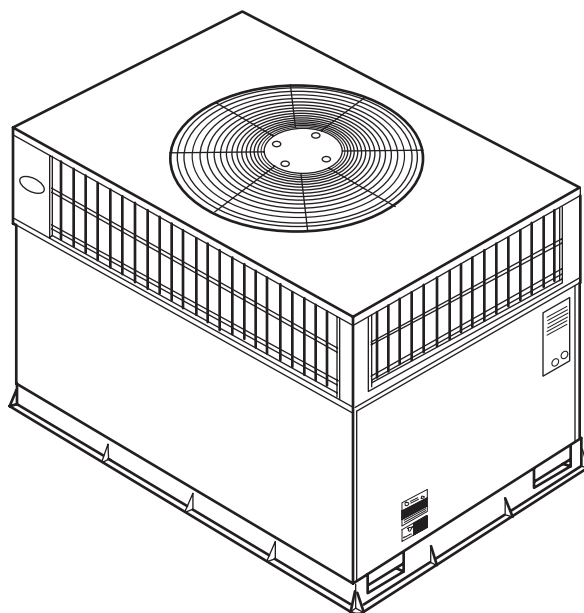


50JS
3-PHASE SINGLE-PACKAGED HEAT
PUMP UNITS
2-1/2 to 5 Nominal Tons



Turn to the Experts.™

Product Data



UNIT 50JS
(STANDARD)

Single-Package Heat Pump for Residential and Light Commercial Applications

- Low Sound Levels
- 10 SEER

Features/Benefits

One-piece heat pump with optional electric heater, low installation cost, dependable performance and easy maintenance.

Efficient operation

The **50JS** is designed to deliver SEERs (Seasonal Energy Efficiency Ratios) of 10.0 and HSPFs (Heating Seasonal Performance Factors) of up to 7.0

Easy Installation

Factory-assembled package is a compact, fully self-contained, heat pump unit that is pre-wired, pre-piped, and pre-charged for minimum installation expense. 50JS units are available in a variety of standard capacity ranges with voltage options to meet residential and light commercial requirements. Units install easily on a rooftop or at ground-level.

Durable, dependable components

Compressors are hermetically sealed against contamination to help promote longer life and dependable operation. Vibration isolation provides quiet operation. Compressors have internal high-pressure and overcurrent protection.

Convertible duct configuration

Unit is designed for easy use in either downflow or horizontal applications. Each unit is easily converted from horizontal to downflow, and includes horizontal duct covers.

Direct-drive multi-speed, PSC (permanent split capacitor) blower motor is standard on all 50JS models.

Direct-drive, PSC condenser-fan motors are designed to help reduce energy consumption and provide for cooling operation down to 40°F outdoor temperature. Motormaster® II low ambient kit is available as a field-installed accessory and does not require a special motor.

Corporate thermostats work with Carrier's small packaged products as a system to promote year round comfort.

Refrigerant system is designed to provide dependability. Liquid refrigerant strainers are used to promote clean, unrestricted operation. 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. The indoor coil is fabricated from copper tube and aluminum fins and is located inside the unit for protection against damage. The outdoor coil is internally mounted on the top tier of the unit. A FIOP (Factory-Installed Option) metal louvered grille is available on all models. Copper fin coils and pre-coated

fin coils are available from the factory by special order. These coils are recommended in applications where aluminum fins are likely to be damaged due to corrosion. They are ideal for seacoast applications.

Low sound ratings ensure a quiet indoor and outdoor environment with sound ratings as low as 73 dB. (See page 3.)

Easy to service cabinets provide easy single-panel accessibility to serviceable components during maintenance and installation. The unit base with integrated drain provides easy ground level installation with or without a mounting pad. Convenient handholds are provided to manipulate the unit on the jobsite. A nesting feature ensures a positive unit base to roof curb seal when the unit is roof mounted. A convenient 3/4-in. wide perimeter flange makes frame mounting on a rooftop easy.

Downflow operation is easily provided in the field to allow vertical ductwork connections. The unit base utilizes knockout style seals on the bottom openings to ensure a positive seal in the horizontal airflow mode.

Cabinets are constructed of heavy-duty, phosphated, zinc-coated prepainted steel capable of withstanding 500 hours of salt spray. Interior surfaces are insulated with cleanable semi-rigid insulation board, which keeps the conditioned air from being affected by the outdoor ambient temperature and provides improved indoor air quality. (Conforms to American Society of Heating, Refrigeration and Air Conditioning Engineers No. 62P.) The sloped drain minimizes standing water in the drain, which is provided with an external drain.

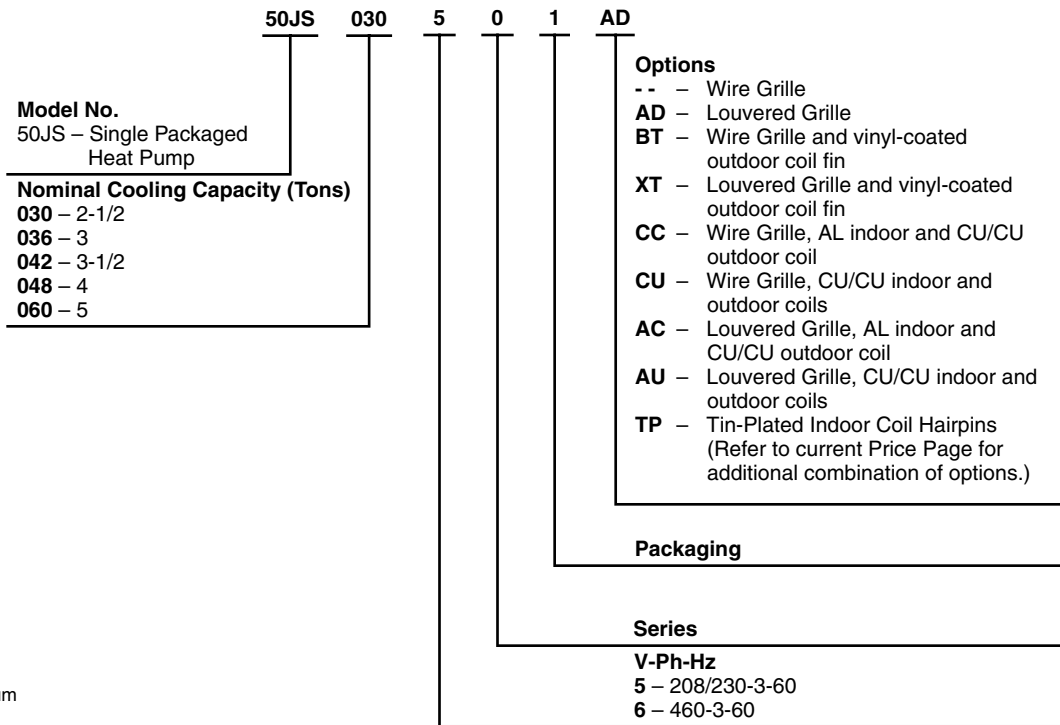
Standard metal duct covers with insulation come with the unit and cover the duct openings. These can be left in place if the units are converted to downshot.

Short-Cycling protection for the compressor is incorporated into our defrost control board ensuring a five minute delay (+/-2 minutes) before restarting compressor after shutdown for any reason.

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Model number nomenclature



AL — Aluminum
 CU — Copper

50JS

ARI* capacities

COOLING CAPACITIES AND EFFICIENCIES

UNIT 50JS	NOMINAL TONS	STANDARD CFM	NET COOLING CAPACITIES (Btuh)	SEER†	SOUND RATINGS‡ (dB)
030	2-1/2	1000	29,000	10	75
036	3	1200	35,000	10	79
042	3-1/2	1250	42,000	10	73
048	4	1600	47,000	10	80
060	5	2000	57,500	10	78

LEGEND

dB — Sound Levels (decibels)

db — Dry Bulb

SEER — Seasonal Energy Efficiency Ratio

wb — Wet Bulb

* Air Conditioning & Refrigeration Institute.

† Rated in accordance with U.S. Government DOE Department of Energy) test procedures and/or ARI Standard 210/240-94.

‡ Tested in accordance with ARI Standard 270-95 (not listed in ARI).

NOTES:

1. Ratings are net values, reflecting the effects of circulating fan heat. Ratings are based on:

Cooling Standard: 80°F db, 67°F wb indoor entering-air temperature and 95°F db outdoor entering-air temperature.

2. Before purchasing this appliance, read important energy cost and efficiency information available from your retailer.

HEATING CAPACITIES AND EFFICIENCIES

UNIT 50JS	HIGH HEAT CAPACITY (BTUH) @ 47°F	HIGH HEAT COP @ 47°F	LOW HEAT CAPACITY (BTUH) @ 17°F	LOW HEAT COP @ 17°F	HSPF
030	29,000	3	15,000	1.9	6.9
036	35,000	3	18,000	1.9	7
042	40,500	3	22,000	1.9	7
048	47,000	3	27,000	2	7
060	57,000	3.2	32,000	2	7

OUTDOOR SOUND: OCTAVE BAND DATA - DECIBELS

MODEL NO.	50JS				
	030	036	042	048	060
Frequency (Hz)					
63	41.0	58.9	50.4	56.7	57.1
125	65.7	66.1	58.2	64.2	63.2
250	66.6	66.5	60.5	70.5	68.0
500	66.2	71.3	66.0	73.8	71.3
1000	67.7	72.9	66.8	74.0	72.3
2000	65.3	70.9	64.1	71.3	70.1
4000	62.1	66.1	61.8	68.9	67.4
8000	56.2	58.6	53.0	60.9	61.0

Physical data

UNIT SIZE 50JS	030	036	042	048	060
NOMINAL CAPACITY (ton)	2-1/2	3	3-1/2	4	5
OPERATING WEIGHT (lb)	287	291	323	353	418
COMPRESSORS QUANTITY	1				
TYPE	RECIPROCATING COMPRESSOR		SCROLL COMPRESSOR		
REFRIGERANT	R-22				
REFRIGERANT METERING DEVICE	Accurater				
Refrigerant (R-22) Quantity (lb.)	5.6	7.6	8.0	7.85	9.3
ORIFICE ID (in.)	0.068	0.078	0.078	0.088	0.093
ORIFICE ID (in.)	2@0.042	2@0.046	2@0.052	2@0.057	2@0.061
OUTDOOR COIL Rows—Fins/in. Face Area (sq ft)	1—17 12.0	2—17 10.3	2—17 10.3	2—17 11.6	2—17 11.6
OUTDOOR FAN Nominal Airflow (Cfm) Diameter Motor Hp (Rpm)	2400 22 1/8 (825)	2800 22 1/4 (1100)	2400 22 1/8 (825)	3300 22 1/4 (1100)	3300 22 1/4 (1100)
INDOOR COIL Rows—Fins/in. Face Area (sq ft)	3—15 3.7	3—15 3.7	4—15 3.7	3—15 4.7	4—15 4.7
INDOOR BLOWER Nominal Airflow (Cfm) Size (in.) Motor Hp (Rpm)	1000 10 x 10 1/4 (1050)	1200 11 x 10 1/2 (1075)	1250 11 x 10 3/4 (1075)	1600 11 x 10 3/4 (1075)	2000 11 x 10 1 (1100)
RETURN-AIR FILTERS (in.)* Throwaway	20 x 20 x 1	20 x 24 x 1	24 x 30 x 1	24 x 30 x 1	24 x 30 x 1

* Air filter pressure drop for non-standard filters must not exceed 0.08 in. wg.



ELECTRIC HEAT PRESSURE DROP TABLES

Small Cabinet: 030-042

STATIC	CFM											
	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
5 kW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.06	0.07
10 kW	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.06	0.07	0.09	0.10	0.11
15 kW	0.00	0.00	0.00	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18
20 kW	0.00	0.00	0.02	0.04	0.06	0.08	0.09	0.11	0.13	0.15	0.17	0.19

Large Cabinet: 048-060

STATIC	CFM														
	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
5 kW	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12
10 kW	0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13
15 kW	0.00	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
20 kW	0.02	0.03	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

Options and accessories

Factory-installed options

Louvered grille provides hail and vandalism protection. A wire grille is standard on all models. See model number nomenclature for louvered grille options.

Coil options include copper/copper and vinyl-coated construction for refrigerant coils. Units are shipped standard with copper tube/aluminum fin construction. See model number nomenclature for coil options.

Field-installed accessories

Economizer with Solid-State Controls and Barometric Relief Dampers
Manual Air Damper (25% open)
Electric Heaters
Filter Rack
Flat Roof Curbs (8-in. and 14-in.)
Square-to-Round Duct Transition Kit
Thermostats
Controls Upgrade Kit
Crankcase Heater
Rigging Kit
Low Ambient Kit (Motormaster® II Control)
Solid-State Time Guard® II Device

Economizer with solid-state controls and barometric relief dampers includes filter racks and provide outdoor air during cooling and reduce compressor operation.

Manual outside air damper includes hood and filter rack with adjustable damper blade for up to 25% outdoor air.

Electric heaters provide additional heat in the unit when required. Each package has a heater module that slides into the controls compartment. Heater sizes range from 5.0 to 20.0 kW. The electric heater design allows the use of a single-point power supply for the entire unit, resulting in lower installed costs.

Flat roof curbs in both 8 in. and 14 in. sizes are available for roof mounted applications.

Square-to-round duct transition kit enables 030-048 size units to be fitted to 14 in. round ductwork.

Thermostats provide control for the system heating and cooling functions. Thermostat models are available in both programmable and non-programmable versions.

Controls upgrade kit supplies high and low pressure safety protection and protects the unit from operating in unsuitable conditions.

Crankcase heater provides anti-floodback protection for low-load cooling applications.

Rigging kit includes lifting brackets which are inserted into the unit base rigging holds to lift unit for rooftop applications.

Low-ambient kit (Motormaster II control) allows the use of mechanical cooling down to outdoor temperatures as low as 0°F.

Filter rack features easy installation, serviceability, and high-filtering performance for vertical and horizontal applications.

ELECTRIC HEATERS

ODS CATALOG ORDERING NO.	NOMINAL CAPACITY (kW)	USED WITH SIZES						
		FUSED (YES/NO)	STAGES	030	036	042	048	060
ELECTRIC HEATERS (208/230 — 3 PHASE — 60 Hz)								
CPHEATER055A00	3.8 / 5.0	NO	3	X	X	X	X	X
CPHEATER056A00	7.5 / 10.0	NO	3	X	X	X	X	
CPHEATER058A00	11.3 / 15.0	YES	3	X	X	X	X	X
CPHEATER059A01	15.0 / 20.0	YES	3			X	X	X
CPHEATER068A00	7.5 / 10.0	YES	3					X
ELECTRIC HEATERS (460 — 3 PHASE — 60 Hz)								
CPHEATER060A00	3.8 / 5.0	NO	1		X	X	X	X
CPHEATER061A00	7.5 / 10.0	NO	1		X	X	X	X
CPHEATER062A00	11.3 / 15.0	NO	1		X	X	X	X
CPHEATER063A00	15.0 / 20.0	NO	1			X	X	X

LEGEND

ODS — Order Distribution System

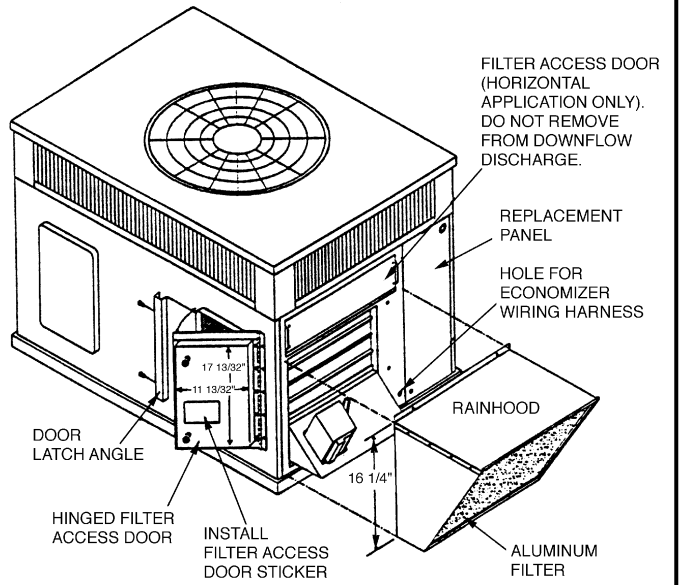
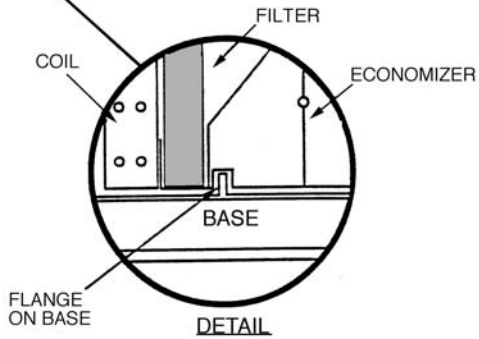
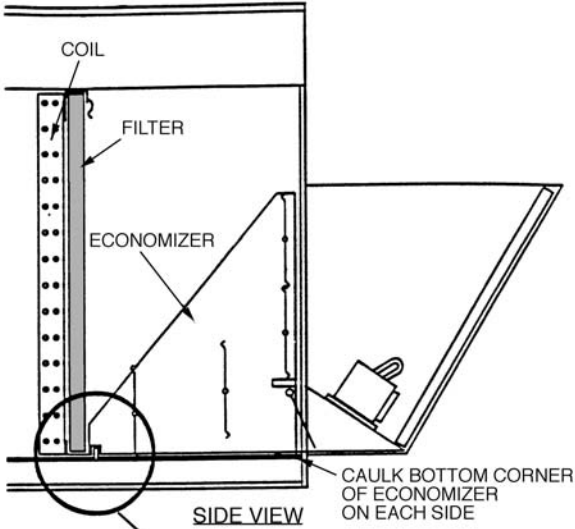
NOTE: Electric heaters are rated at 240 v and 480 v. Refer to Multiplication Factors table for other voltages.

Minimum Airflow for Reliable Electric Heater Operation

UNIT 50JS	030	036	042	048	060
AIRFLOW	1000*	1200	1400	1600	2000

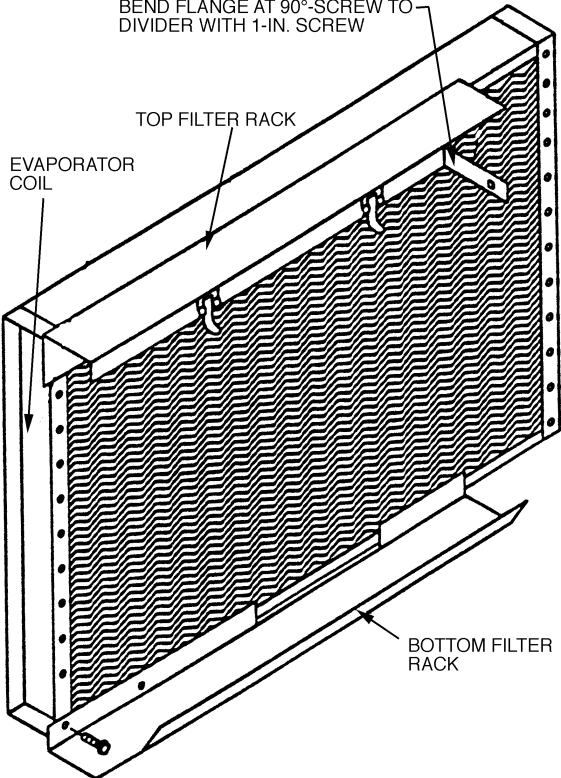
*The 030 size models must be run on medium or high speed when used in conjunction with 15 Kw electric heat accessory.

ECONOMIZER

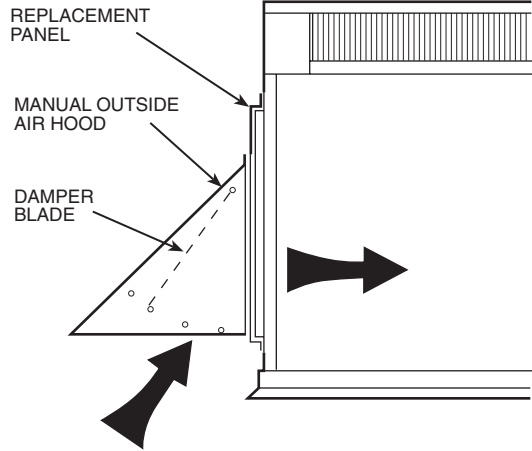


FILTER RACK

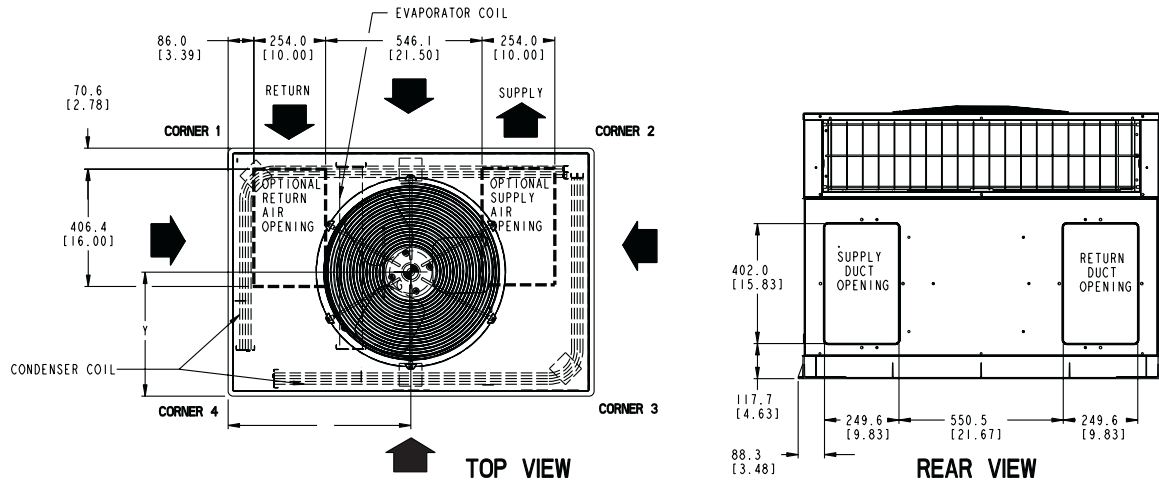
BEND FLANGE AT 90°-SCREW TO DIVIDER WITH 1-IN. SCREW



MANUAL OUTSIDE AIR DAMPER



Base unit dimensions—50JS030-042



REQUIRED CLEARANCES TO COMBUSTIBLE MATL.

	MILLIMETERS [IN]
TOP OF UNIT.....	355.6 [14.00]
DUCT SIDE OF UNIT.....	50.8 [2.00]
SIDE OPPOSITE DUCTS.....	355.6 [14.00]
BOTTOM OF UNIT.....	12.7 [0.50]
ELECTRIC HEAT PANEL.....	914.4 [36.00]

NEC. REQUIRED CLEARANCES.

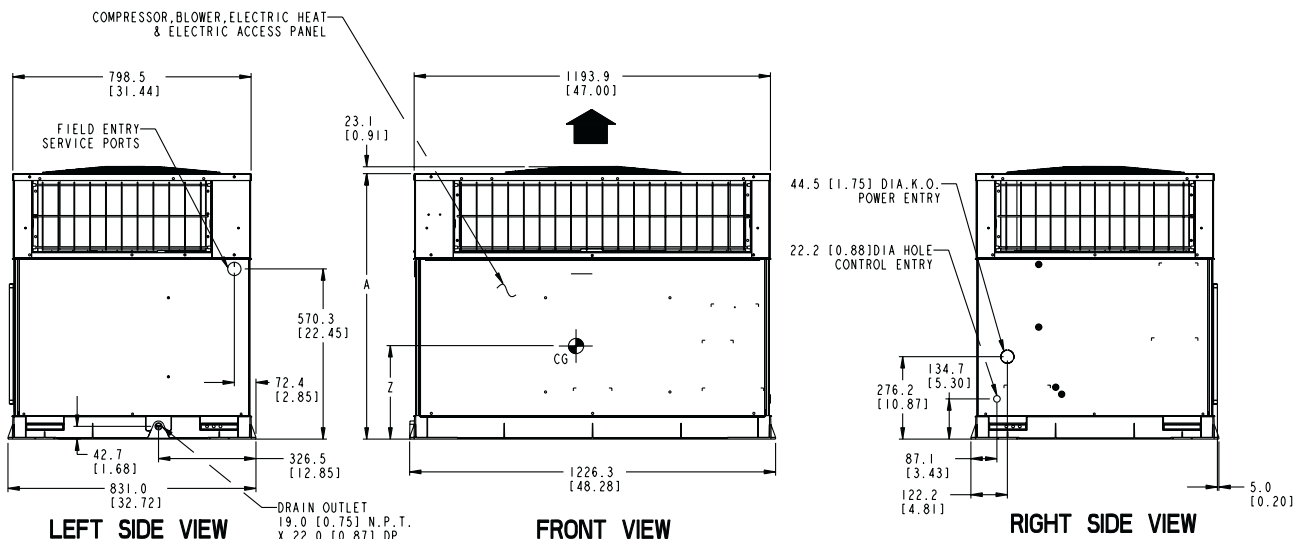
	MILLIMETERS [IN]
BETWEEN UNITS, POWER ENTRY SIDE.....	1066.8 [42.00]
UNIT AND UNGROUNDED SURFACES, POWER ENTRY SIDE.....	914.0 [36.00]
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, POWER ENTRY SIDE.....	1066.8 [42.00]

REQUIRED CLEARANCE FOR OPERATION AND SERVICING

	MILLIMETERS [IN]
EVAP. COIL ACCESS SIDE.....	914.0 [36.00]
POWER ENTRY SIDE.....	914.0 [36.00]
(EXCEPT FOR NEC REQUIREMENTS)	
UNIT TOP.....	914.0 [36.00]
SIDE OPPOSITE DUCTS.....	914.0 [36.00]
DUCT PANEL.....	304.8 [12.00]*

*MINIMUM DISTANCES: IF UNIT IS PLACED LESS THAN 304.8 [12.00] FROM WALL SYSTEM, THEN SYSTEM PERFORMANCE MAYBE COMPROMISED.

DIMENSIONS IN [] ARE IN INCHES

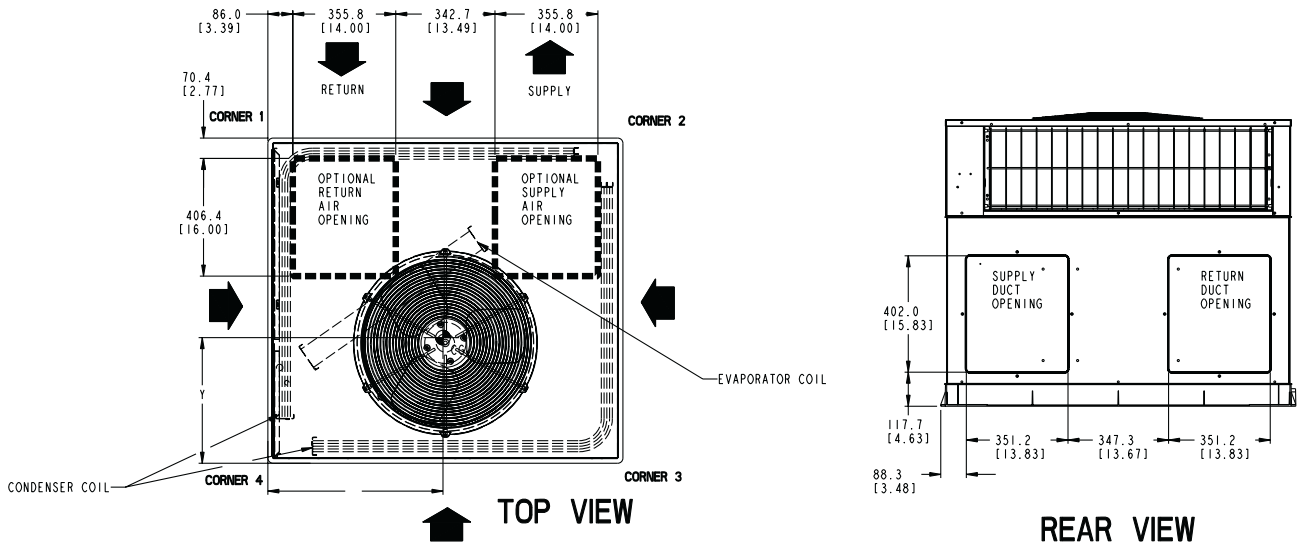


UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		UNIT HEIGHT mm (in.) "A"	CENTER OF GRAVITY mm (in.)		
		lb	kg		X	Y	Z
50JS030	208/230-3-60	287	130.2	991.1 (39.02)	495.3 (19.5)	348.0 (13.7)	381.0 (15.0)
50JS036	208/230-3-60, 460-3-60	291	132.0	940.3 (37.02)	495.3 (19.5)	348.0 (13.7)	330.2 (13.0)
50JS042	208/230-3-60, 460-3-60	323	146.5	940.3 (37.02)	500.4 (19.7)	355.0 (14.0)	330.2 (13.0)

50JS

Base unit dimensions—50JS048-060

50JS



REQUIRED CLEARANCES TO COMBUSTIBLE MATL.

	MILLIMETERS [IN]
TOP OF UNIT.....	355.6 [14.00]
DUCT SIDE OF UNIT.....	50.8 [2.00]
SIDE OPPOSITE DUCTS.....	355.6 [14.00]
BOTTOM OF UNIT.....	12.7 [0.50]
ELECTRIC HEAT PANEL.....	914.4 [36.00]

NEC. REQUIRED CLEARANCES.

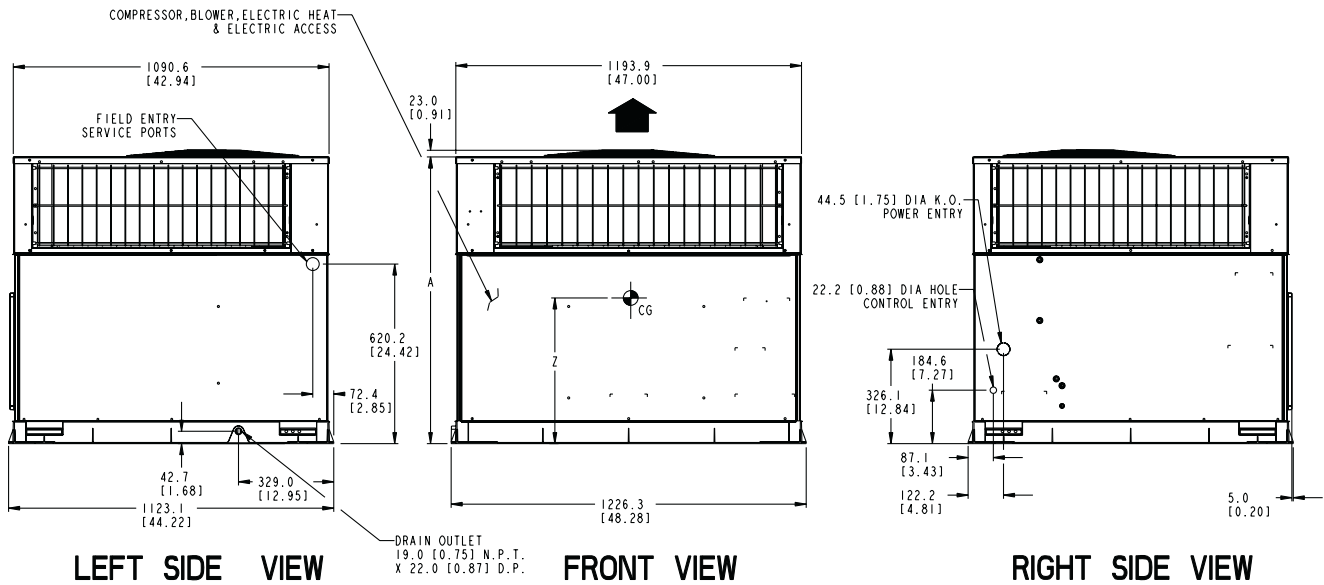
	MILLIMETERS [IN]
BETWEEN UNITS, POWER ENTRY SIDE.....	1066.8 [42.00]
UNIT AND UNGROUNDED SURFACES, POWER ENTRY SIDE.....	914.0 [36.00]
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, POWER ENTRY SIDE.....	1066.8 [42.00]

REQUIRED CLEARANCE FOR OPERATION AND SERVICING

	MILLIMETERS [IN]
EVAP. COIL ACCESS SIDE.....	914.0 [36.00]
POWER ENTRY SIDE.....	914.0 [36.00]
(EXCEPT FOR NEC REQUIREMENTS)	
UNIT TOP.....	914.0 [36.00]
SIDE OPPOSITE DUCTS.....	914.0 [36.00]
DUCT PANEL.....	304.8 [12.00]

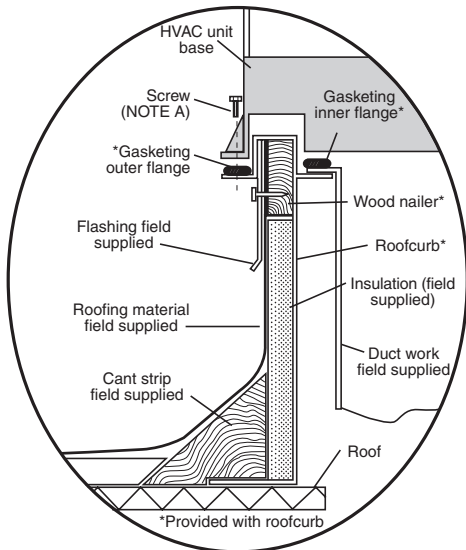
*MINIMUM DISTANCES: IF UNIT IS PLACED LESS THAN 304.8 [12.00] FROM WALL SYSTEM, THEN SYSTEM PERFORMANCE MAYBE COMPROMISED.

DIMENSIONS IN [] ARE IN INCHES



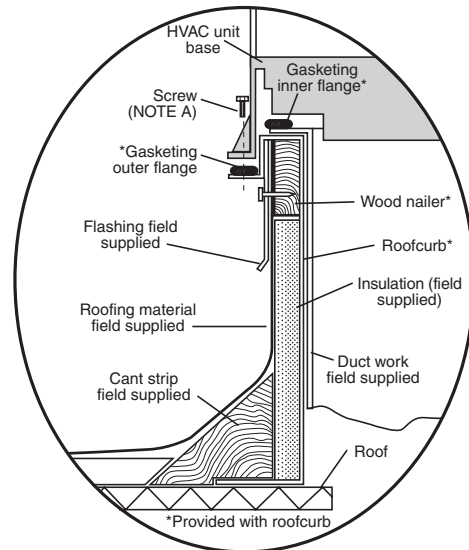
UNIT	ELECTRICAL CHARACTERISTICS	UNIT WEIGHT		UNIT HEIGHT mm (in.) "A"	CENTER OF GRAVITY mm (in.)		
		lb	kg		X	Y	Z
50JS048	208/230-3-60, 460-3-60	353	160.1	990.2 (38.98)	505.5 (19.9)	398.8 (15.7)	431.8 (17.0)
50JS060	208/230-3-60, 460-3-60	418	189.6	990.2 (38.98)	505.5 (19.9)	398.8 (15.7)	431.8 (17.0)

Accessory dimensions



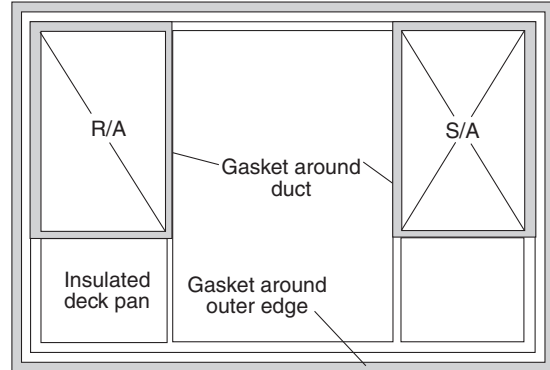
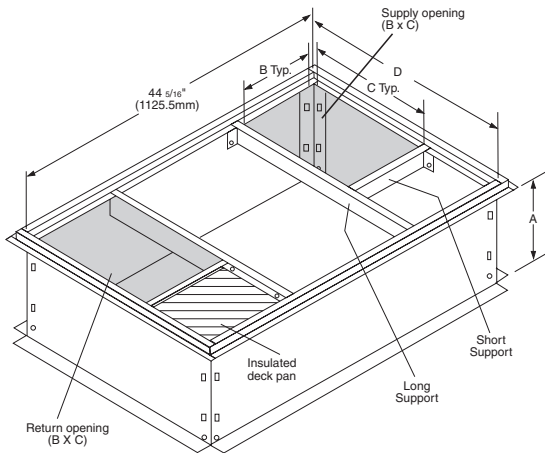
Roof Curb for Small Cabinet

Note A: When unit mounting screw is used, retainer bracket must also be used.



Roof Curb for Large Cabinet

Note A: When unit mounting screw is used, retainer bracket must also be used.



C00076

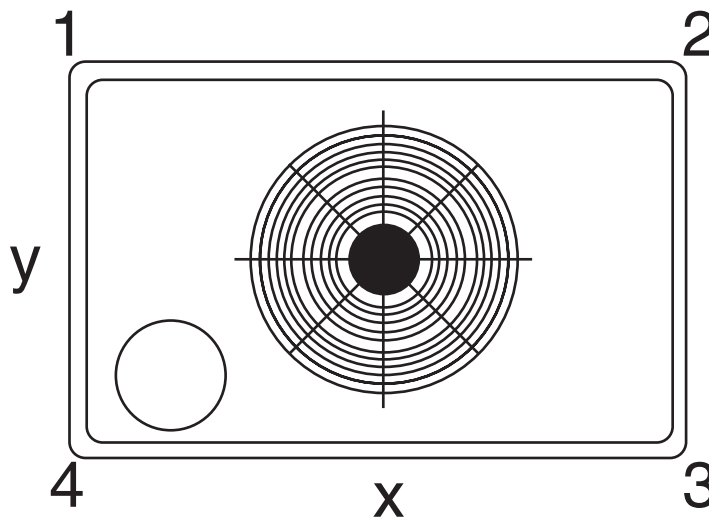
UNIT SIZE	ODS CATALOG NO.	A in. [mm]	B in. [mm]	C in. [mm]	D in. [mm]
50JS030-042	CPRFCURB006A00	8 [203]	11[279]	16-1/2 [419]	28-3/4 [730]
	CPRFCURB007A00	14 [356]	11[279]	16-1/2 [419]	28-3/4 [730]
50JS048-060	CPRFCURB008A00	8 [203]	16-3/16 [411]	17-3/8 [441]	40-1/4 [1022]
	CPRFCURB009A00	14 [356]	16-3/16 [411]	17-3/8 [441]	40-1/4 [1022]

NOTES:

1. Roof curb must be set up for unit being installed.
2. Seal strip must be applied, as required, to unit being installed.
3. Dimensions in () are in millimeters.
4. Roof curb is made of 16-gage steel.
5. Table lists only the dimensions, per part number, that have changed.
6. Attach ductwork to curb (flanges of duct rest on curb).
7. Insulated panels: 1-in. thick fiberglass 1 lb density.
8. Dimensions are in inches.
9. When unit mounting screw is used (see Note A), a retainer bracket must be used as well. This bracket must also be used when required by code for hurricane or seismic conditions. This bracket is available through Micrometl.

50JS Corner weights (In Pounds)

50JS



CORNER WEIGHTS (Small Cabinet)					CORNER WEIGHTS (Large Cabinet)		
Model 50JS	Unit	30	36	42	Unit	48	60
	Total Weight (lbs.)	287	291	323	Total Weight (lbs.)	353	418
	Corner Weight 1	66	67	83	Corner Weight 1	76	90
	Corner Weight 2	54	55	55	Corner Weight 2	49	58
	Corner Weight 3	62	63	78	Corner Weight 3	96	114
	Corner Weight 4	105	106	107	Corner Weight 4	132	156

Selection Procedure (with example)

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 0.30 in. wg
 Electrical Characteristics (V-Ph-Hz) 208/230-3-60
 edb — entering dry bulb
 ewb — entering wet bulb

II Select unit based on required cooling capacity.

Enter Cooling Capacities table at outdoor entering-air temperature of 95°F, indoor air entering at 1125 cfm and 67°F ewb (entering wet bulb). The unit will provide a total cooling capacity of 29,100 Btuh and a sensible heat capacity of 22,900 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 Heating Capacities table at 1125 cfm. At 70°F return indoor air and 20°F air entering outdoor coil, the integrated heating capacity is 15,030 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, 13,520 Btuh (28,550 – 15,030) additional electric heat is required.

Determine additional electric heat capacity in kW.

$$\frac{13,520 \text{ Btuh}}{3414 \text{ Btuh/kW}} = 3.96 \text{ kW of heat required}$$

Enter the Electric Heater table on page 5 for 208/230 v, three-phase, unit. 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 Multiplication Factors table on page 16.

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

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

Total unit heating capacity is 30,734 Btuh (15,030 + 15,704).

IV Determine fan speed and power requirements at design conditions.

Before entering the air delivery tables, calculate the total static pressure required.

Performance data

COOLING EXTENDED PERFORMANCE TABLE

50JS030 (2.5 TONS)

Temp (F) Air Ent Outdoor Coil (Edb)		Indoor Entering Air—CFM/BF											
		875/0.051				1000/0.077				1125/0.107			
		Indoor Entering Air—Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	32.6	30.1	27.1	27.0	32.8	30.4	27.5	27.9	32.8	30.5	28.4	27.9
	SHC	16.9	21.4	21.4	24.7	17.3	22.5	19.8	22.8	17.6	23.4	22.6	23.8
	kW	2.79	2.73	2.63	2.60	2.89	2.84	2.68	2.76	3.02	2.96	2.91	2.87
95	TC	31.3	28.8	26.1	25.7	31.5	29.0	26.4	25.8	31.5	29.1	26.9	25.9
	SHC	16.4	21.0	19.2	25.7	16.9	21.9	20.0	22.2	17.3	22.9	22.1	21.9
	kW	2.97	2.92	2.84	2.78	3.08	3.03	2.85	2.87	3.21	3.15	3.07	3.03
105	TC	29.9	26.7	24.5	25.0	30.1	27.4	24.9	24.8	30.1	27.5	25.1	23.8
	SHC	15.9	20.6	18.8	23.3	16.5	21.4	19.7	23.3	16.9	22.5	21.4	22.4
	kW	3.17	3.05	2.97	2.98	3.28	3.20	3.20	3.19	3.41	3.30	3.21	3.17
115	TC	28.3	25.1	23.2	23.2	28.5	25.6	23.1	22.9	28.4	25.7	22.3	22.6
	SHC	15.3	19.2	18.6	22.5	15.9	20.6	19.3	21.8	16.4	21.7	21.0	20.6
	kW	3.36	3.24	3.15	3.11	3.48	3.36	3.22	3.32	3.61	3.47	3.31	3.54

HEATING EXTENDED PERFORMANCE TABLE -10-20

50JS030 (2.5 TONS)

Temp (F)	Indoor Air Cfm (std)	Air Temperature Entering Outdoor Coil (F db at 70% rh)											
Ent Indoor Coil		-10			0		10		17		20		
60	875	TC	5.66	5.20	9.42	8.65	13.15	12.07	15.63	14.24	16.91	15.23	
		kW	1.82		1.90		1.99		2.08		2.12		
	1000	TC	5.81	5.34	9.63	8.85	13.45	12.36	15.82	14.44	17.21	15.53	
		kW	1.86		1.94		2.02		2.11		2.15		
	1125	TC	5.94	5.47	9.80	9.00	13.65	12.56	16.02	14.64	17.41	15.72	
		kW	1.90		1.97		2.05		2.14		2.18		
70	875	TC	5.02	4.63	8.74	8.03	12.46	11.47	14.83	13.55	16.12	14.54	
		kW	1.84		1.94		2.04		2.15		2.20		
	1000	TC	5.18	4.77	8.94	8.21	12.66	11.67	15.23	13.85	16.52	14.83	
		kW	1.88		1.98		2.08		2.18		2.23		
	1125	TC	5.32	4.90	9.13	8.38	12.96	11.87	15.33	13.94	16.61	15.03	
		kW	1.92		2.02		2.11		2.20		2.24		
80	875	TC	4.28	3.95	7.96	7.31	11.67	10.68	14.14	12.86	15.33	13.85	
		kW	1.86		1.98		2.10		2.21		2.26		
	1000	TC	4.44	4.08	8.16	7.50	11.87	10.88	14.44	13.15	15.63	14.04	
		kW	1.90		2.02		2.13		2.24		2.29		
	1125	TC	4.58	4.21	8.35	7.66	12.07	11.08	14.64	13.35	15.92	14.34	
		kW	1.94		2.05		2.17		2.28		2.31		

HEATING EXTENDED PERFORMANCE TABLE 30-60

50JS030 (2.5 TONS)

Temp (F)	Indoor Air Cfm (std)	Air Temperature Entering Outdoor Coil (F db at 70% rh)											
Ent Indoor Coil		30			40		47		50		60		
60	875	TC	21.26	18.69	25.91	25.91	28.58	28.58	30.86	30.86	33.13	33.13	
		kW	2.27		2.43		2.50		2.59		2.74		
	1000	TC	21.66	18.99	26.01	26.01	29.37	29.37	31.15	31.15	34.32	34.32	
		kW	2.30		2.44		2.53		2.60		2.81		
	1125	TC	21.95	19.19	26.21	26.21	29.87	29.87	31.45	31.45	35.80	35.80	
		kW	2.33		2.46		2.57		2.62		2.84		
70	875	TC	20.27	17.70	25.22	25.22	28.38	28.38	30.26	30.26	31.84	31.84	
		kW	2.35		2.54		2.70		2.72		2.92		
	1000	TC	20.77	18.20	25.61	25.61	29.17	29.17	30.76	30.76	33.13	33.13	
		kW	2.37		2.56		2.68		2.74		2.94		
	1125	TC	21.06	18.39	25.81	25.81	29.47	29.47	31.05	31.05	34.81	34.81	
		kW	2.40		2.58		2.70		2.71		2.95		
80	875	TC	19.28	16.91	24.13	24.13	28.38	28.38	29.77	29.77	30.86	30.86	
		kW	2.43		2.62		2.82		2.87		2.99		
	1000	TC	19.68	17.21	24.53	24.53	28.58	28.58	30.26	30.26	33.53	33.53	
		kW	2.46		2.65		2.81		2.88		3.05		
	1125	TC	19.98	17.50	24.92	24.92	28.88	28.88	30.56	30.56	34.32	34.32	
		kW	2.48		2.67		2.83		2.90		3.06		

See Legend and Notes on page 16. *At 75°F entering dry bulb—Tennessee Valley Authority [TVA] rating conditions; all others at 80°F entering dry bulb.

50JS

Performance data (cont)

COOLING EXTENDED PERFORMANCE TABLE

50JS036 (3 TONS)

Temp (F) Air Ent Outdoor Coil (Edb)		Indoor Entering Air—CFM/BF											
		1050/0.10				1200/0.13				1350/0.17			
		Indoor Entering Air—Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	39.4	36.0	33.2	32.3	39.5	36.6	33.9	33.1	40.0	37.1	34.2	33.7
	SHC	19.3	24.5	23.7	29.1	19.8	25.9	25.0	30.9	20.4	27.2	26.3	32.4
	kW	3.43	3.38	3.29	3.31	3.50	3.45	3.38	3.40	3.58	3.54	3.45	3.48
95	TC	38.1	34.3	31.6	30.7	38.5	35.0	32.2	31.5	39.1	35.5	32.6	32.1
	SHC	18.9	23.9	23.0	28.3	19.6	25.3	24.4	30.1	20.4	26.8	25.7	31.6
	kW	3.67	3.59	3.48	3.50	3.75	3.68	3.58	3.60	3.83	3.77	3.65	3.68
105	TC	36.4	32.6	30.0	29.1	36.9	33.2	30.5	29.8	37.5	33.6	30.7	30.5
	SHC	18.3	23.2	22.4	27.5	19.0	24.7	23.8	29.1	19.9	26.0	24.9	30.4
	kW	3.91	3.80	3.69	3.69	3.99	3.89	3.78	3.79	4.07	3.98	3.85	3.89
115	TC	34.5	30.8	28.2	27.3	35.1	31.3	28.5	28.2	35.5	31.7	28.9	29.1
	SHC	17.6	22.5	21.6	26.6	18.5	24.0	23.0	28.2	19.2	25.4	24.3	29.1
	kW	4.13	4.01	3.88	3.90	4.23	4.11	3.98	4.01	4.31	4.19	4.06	4.10

HEATING EXTENDED PERFORMANCE TABLE -10-20

50JS036 (3 TONS)

Temp (F)	Indoor Air Cfm (std)	Air Temperature Entering Outdoor Coil (F db at 70% rh)											
Ent Indoor Coil		-10		0		10		17		20			
60	1050	TC	6.06	5.61	11.03	10.20	15.93	15.06	19.38	17.65	20.91	18.80	
		kW	2.28		2.45		2.61		2.72		2.77		
	1200	TC	6.26	5.79	11.32	10.47	16.31	15.40	19.86	18.13	21.35	19.24	
		kW	2.35		2.50		2.66		2.76		2.82		
	1350	TC	6.46	5.97	11.61	10.74	16.69	15.73	20.24	18.42	21.78	19.67	
		kW	2.41		2.56		2.71		2.81		2.86		
70	1050	TC	5.28	4.88	10.07	9.32	14.87	14.01	18.23	16.60	19.67	17.75	
		kW	2.29		2.48		2.67		2.79		2.85		
	1200	TC	5.52	5.10	10.41	9.63	15.25	14.39	18.71	17.08	20.10	18.13	
		kW	2.36		2.53		2.72		2.84		2.89		
	1350	TC	5.76	5.32	10.75	9.94	15.64	14.77	19.09	17.37	20.53	18.52	
		kW	2.42		2.59		2.76		2.89		2.94		
80	1050	TC	4.14	3.83	8.90	8.23	13.62	12.86	16.98	15.45	18.42	16.89	
		kW	2.28		2.49		2.71		2.86		2.93		
	1200	TC	4.46	4.12	9.25	8.55	14.06	13.24	17.65	16.12	18.85	17.13	
		kW	2.35		2.55		2.76		2.90		2.97		
	1350	TC	4.77	4.41	9.59	8.87	14.49	13.62	17.84	16.31	19.28	17.37	
		kW	2.42		2.61		2.81		2.95		3.01		

HEATING EXTENDED PERFORMANCE TABLE 30-60

50JS036 (3 TONS)

Temp (F)	Indoor Air Cfm (std)	Air Temperature Entering Outdoor Coil (F db at 70% rh)											
Ent Indoor Coil		30		40		47		50		60			
60	1050	TC	25.81	22.64	31.37	31.37	35.98	35.98	37.42	37.42	41.73	41.73	
		kW	2.94		3.12		3.28		3.31		3.43		
	1200	TC	26.58	23.22	31.95	31.95	36.55	36.55	37.61	37.61	42.31	42.31	
		kW	2.96		3.15		3.29		3.33		3.46		
	1350	TC	26.86	23.60	32.43	32.43	36.65	36.65	37.70	37.70	43.08	43.08	
		kW	3.01		3.18		3.30		3.33		3.51		
70	1050	TC	24.46	21.39	29.93	29.93	34.54	34.54	36.07	36.07	41.54	41.54	
		kW	3.04		3.24		3.42		3.47		3.66		
	1200	TC	24.85	21.87	30.51	30.51	35.21	35.21	36.75	36.75	42.02	42.02	
		kW	3.06		3.26		3.43		3.49		3.66		
	1350	TC	25.52	22.35	31.08	31.08	35.79	35.79	36.75	36.75	42.12	42.12	
		kW	3.11		3.30		3.46		3.48		3.69		
80	1050	TC	23.22	20.34	28.40	28.40	33.00	33.00	34.54	34.54	41.35	41.35	
		kW	3.14		3.36		3.55		3.61		3.90		
	1200	TC	23.89	20.82	29.17	29.17	33.67	33.67	35.21	35.21	41.54	41.54	
		kW	3.18		3.38		3.57		3.63		3.90		
	1350	TC	24.18	21.20	29.74	29.74	34.25	34.25	35.88	35.88	41.73	41.73	
		kW	3.21		3.42		3.60		3.66		3.90		

See Legend and Notes on page 16. *At 75°F entering dry bulb—Tennessee Valley Authority [TVA] rating conditions; all others at 80°F entering dry bulb.

Performance data (cont)

COOLING EXTENDED PERFORMANCE TABLE

50JS042 (3.5 TONS)

Temp (F) Air Ent Outdoor Coil (Edb)		Indoor Entering Air—CFM/BF											
		1225/0.06				1400/0.075				1575/0.110			
		Indoor Entering Air—Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	46.5	43.0	39.9	39.2	47.1	43.8	40.7	40.4	47.4	44.4	41.4	41.4
	SHC	24.1	30.7	29.4	36.5	25.3	32.8	31.6	39.0	26.4	34.9	33.6	41.4
	kW	4.11	4.04	3.98	3.96	4.12	4.05	3.99	3.99	4.13	4.06	4.00	4.01
95	TC	45.0	41.3	37.9	37.3	45.7	42.0	38.8	38.5	46.1	42.6	39.6	39.8
	SHC	23.6	30.0	28.5	35.5	24.8	32.1	30.6	37.9	26.1	34.2	32.6	39.8
	kW	4.48	4.39	4.29	4.27	4.49	4.41	4.32	4.32	4.49	4.42	4.36	4.37
105	TC	43.1	39.1	35.7	34.9	43.7	39.9	36.2	35.7	44.2	40.6	38.2	38.0
	SHC	22.8	28.9	27.9	34.9	24.2	31.2	30.4	35.7	25.4	33.3	32.2	38.0
	kW	4.84	4.75	4.59	4.59	4.86	4.78	4.63	4.59	4.87	4.80	4.84	4.71
115	TC	41.1	34.7	33.3	33.3	41.8	37.6	34.7	34.8	42.2	38.3	36.1	36.2
	SHC	22.1	24.3	27.4	33.3	23.5	30.4	29.4	34.8	24.9	32.3	31.5	36.2
	kW	5.23	4.88	4.90	4.92	5.25	5.11	5.01	4.98	5.27	5.15	5.13	5.05

HEATING EXTENDED PERFORMANCE TABLE -10-20

50JS042 (3.5 TONS)

Temp (F)	Indoor Air Cfm (std)	Ent Indoor Coil	Air Temperature Entering Outdoor Coil (F db at 70% rh)									
			-10		0		10		17		20	
60	1225	TC	14.49	13.27	18.16	16.65	21.92	20.04	24.94	22.77	26.44	23.90
		kW	2.63		2.73		2.83		2.91		2.95	
	1400	TC	14.77	13.55	18.54	17.03	22.30	20.42	25.31	23.05	26.82	24.18
		kW	2.68		2.78		2.88		2.94		2.97	
	1575	TC	15.06	13.83	18.82	17.31	22.58	20.70	25.59	23.34	27.10	24.46
		kW	2.75		2.83		2.92		2.98		3.01	
70	1225	TC	13.46	12.33	17.31	15.90	21.17	19.48	24.18	22.02	25.69	23.15
		kW	2.74		2.88		3.01		3.10		3.14	
	1400	TC	13.74	12.70	17.69	16.18	21.55	19.76	24.56	22.39	26.06	23.52
		kW	2.80		2.93		3.06		3.13		3.17	
	1575	TC	14.11	12.99	17.97	16.56	21.92	20.14	24.94	22.68	26.44	23.81
		kW	2.87		2.98		3.11		3.17		3.20	
80	1225	TC	12.23	11.29	16.28	14.96	20.32	18.63	23.34	21.27	24.84	22.39
		kW	2.83		3.00		3.18		3.28		3.33	
	1400	TC	12.51	11.57	16.65	15.24	20.70	19.01	23.71	21.64	25.22	22.77
		kW	2.90		3.06		3.22		3.32		3.36	
	1575	TC	12.89	11.86	16.94	15.62	21.08	19.29	24.09	21.92	25.59	23.05
		kW	2.96		3.11		3.27		3.36		3.40	

HEATING EXTENDED PERFORMANCE TABLE 30-60

50JS042 (3.5 TONS)

Temp (F)	Indoor Air Cfm (std)	Ent Indoor Coil	Air Temperature Entering Outdoor Coil (F db at 70% rh)									
			30		40		47		50		60	
60	1225	TC	31.43	27.57	36.89	36.89	40.84	40.84	41.40	41.68	42.91	42.91
		kW	3.06		3.18		3.27		3.27		3.20	
	1400	TC	31.80	27.85	36.98	36.98	41.03	41.03	41.50	40.46	43.94	43.94
		kW	3.07		3.19		3.28		3.29		3.23	
	1575	TC	32.09	28.13	37.07	36.41	41.50	38.67	41.59	39.71	46.01	46.01
		kW	3.11		3.20		3.27		3.39		3.34	
70	1225	TC	30.77	27.01	36.04	36.04	40.65	40.65	41.21	41.21	44.41	44.41
		kW	3.28		3.40		3.55		3.58		3.52	
	1400	TC	31.15	27.29	36.51	36.51	40.74	40.74	41.31	41.31	45.07	45.07
		kW	3.29		3.42		3.54		3.51		3.54	
	1575	TC	31.43	27.57	36.70	36.70	40.84	40.84	41.40	41.40	46.48	46.48
		kW	3.31		3.44		3.54		3.48		3.64	
80	1225	TC	29.83	26.16	35.19	35.19	39.71	39.71	41.12	41.12	45.54	45.54
		kW	3.49		3.65		3.77		3.81		3.85	
	1400	TC	30.30	26.53	35.76	35.76	40.18	40.18	41.21	41.21	46.39	46.39
		kW	3.51		3.64		3.78		3.81		3.90	
	1575	TC	30.67	26.91	36.04	36.04	40.27	40.27	41.31	41.31	47.42	47.42
		kW	3.54		3.66		3.78		3.82		4.00	

See Legend and Notes on page 16. *At 75°F entering dry bulb—Tennessee Valley Authority [TVA] rating conditions; all others at 80°F entering dry bulb.

50JS

Performance data (cont)

COOLING EXTENDED PERFORMANCE TABLE

50JS048(4 TONS)

Temp (F) Air Ent Outdoor Coil (Edb)		Indoor Entering Air—CFM/BF											
		1400				1600				1800			
		Indoor Entering Air—Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	51.8	48.6	45.1	44.4	51.8	48.8	45.5	45.5	51.9	48.8	46.6	46.3
	SHC	26.7	34.5	33.3	41.6	27.1	36.0	34.9	44.5	27.4	37.2	37.3	46.3
	kW	4.20	4.19	4.17	4.11	4.36	4.35	4.34	4.21	4.55	4.54	4.54	4.34
95	TC	50.8	46.7	43.0	42.1	50.8	47.0	43.4	43.5	50.9	47.0	45.5	44.8
	SHC	26.5	33.8	32.2	40.0	27.0	35.4	33.8	43.5	27.4	36.8	36.4	44.8
	kW	4.58	4.57	4.55	4.45	4.75	4.74	4.73	4.59	4.95	4.93	4.89	4.71
105	TC	49.0	44.7	40.9	40.3	49.1	44.7	41.3	41.5	49.2	45.0	43.3	42.7
	SHC	25.9	33.1	31.2	39.1	26.5	34.4	32.9	41.5	27.0	36.2	36.4	42.7
	kW	5.00	5.02	4.92	4.81	5.16	5.15	5.11	4.94	5.35	5.31	5.27	5.13
115	TC	47.1	42.1	38.8	37.3	47.3	42.4	41.6	39.9	47.4	42.8	42.5	40.7
	SHC	25.2	31.7	32.2	37.3	25.7	33.5	35.7	39.9	26.3	35.6	37.7	40.7
	kW	5.47	5.41	5.33	5.29	5.61	5.57	5.41	5.33	5.80	5.75	5.56	5.54

HEATING EXTENDED PERFORMANCE TABLE -10-20

50JS048(4 TONS)

Temp (F)	Indoor Air Cfm (std)	Ent Indoor Coil	Air Temperature Entering Outdoor Coil (F db at 70% rh)									
			-10		0		10		17		20	
			TC	kW	TC	kW	TC	kW	TC	kW	TC	kW
60	1400	TC	16.34	13.83	20.69	17.60	25.04	23.01	28.43	25.91	30.26	27.27
		kW	3.22		3.34		3.44		3.52		3.57	
	1600	TC	16.63	14.12	20.98	17.89	25.43	23.30	28.81	26.30	30.55	27.56
		kW	3.27		3.36		3.47		3.55		3.59	
	1800	TC	16.82	14.31	21.27	18.08	25.72	23.59	29.10	26.59	30.94	27.94
		kW	3.31		3.41		3.51		3.59		3.63	
70	1400	TC	15.57	13.25	20.02	17.02	24.46	22.43	27.85	25.43	29.49	26.59
		kW	3.45		3.57		3.68		3.78		3.83	
	1600	TC	15.86	13.54	20.31	17.31	24.85	22.82	28.23	25.72	29.97	27.07
		kW	3.50		3.61		3.71		3.80		3.85	
	1800	TC	16.15	13.73	20.69	17.60	25.14	23.11	28.52	26.01	30.36	27.36
		kW	3.55		3.65		3.74		3.83		3.88	
80	1400	TC	14.70	12.47	19.24	16.34	23.69	21.76	27.17	24.75	28.81	26.01
		kW	3.68		3.82		3.95		4.05		4.11	
	1600	TC	14.99	12.76	19.53	16.63	24.08	22.14	27.56	25.14	29.20	26.30
		kW	3.73		3.85		3.97		4.07		4.12	
	1800	TC	15.28	13.05	19.82	16.92	24.46	22.43	27.94	25.43	29.59	26.69
		kW	3.78		3.89		4.00		4.10		4.14	

HEATING EXTENDED PERFORMANCE TABLE 30-60

50JS048(4 TONS)

Temp (F)	Indoor Air Cfm (std)	Ent Indoor Coil	Air Temperature Entering Outdoor Coil (F db at 70% rh)									
			30		40		47		50		60	
			TC	kW	TC	kW	TC	kW	TC	kW	TC	kW
60	1400	TC	36.16	31.71	42.54	42.54	47.67	47.67	48.25	48.25	53.95	53.95
		kW	3.72		3.90		4.03		3.99		4.11	
	1600	TC	36.55	32.00	43.03	43.03	47.77	47.77	49.31	49.31	54.53	54.53
		kW	3.72		3.89		4.01		4.03		4.15	
	1800	TC	36.94	32.39	43.03	43.03	47.96	47.96	49.41	49.41	55.79	55.79
		kW	3.75		3.89		4.00		4.08		4.24	
70	1400	TC	35.10	30.75	41.67	41.67	47.09	47.09	48.15	48.15	53.66	53.66
		kW	3.98		4.17		4.36		4.41		4.46	
	1600	TC	35.87	31.42	42.16	42.16	47.28	47.28	49.02	49.02	54.34	54.34
		kW	3.99		4.17		4.31		4.35		4.52	
	1800	TC	36.26	31.71	42.54	42.54	47.67	47.67	49.12	48.83	54.63	54.63
		kW	4.01		4.18		4.31		4.45		4.46	
80	1400	TC	34.33	30.07	40.80	40.80	46.12	46.12	47.86	47.86	53.18	53.18
		kW	4.28		4.49		4.69		4.75		4.97	
	1600	TC	34.71	30.46	41.29	41.29	46.61	46.61	48.35	48.35	54.24	54.24
		kW	4.28		4.47		4.66		4.70		4.91	
	1800	TC	35.10	30.75	41.67	41.67	47.09	47.09	48.44	48.44	54.44	54.44
		kW	4.29		4.47		4.64		4.67		4.83	

See Legend and Notes on page 16. *At 75°F entering dry bulb—Tennessee Valley Authority [TVA] rating conditions; all others at 80°F entering dry bulb.

Performance data (cont)

COOLING EXTENDED PERFORMANCE TABLE

50JS060(5 TONS)

Temp (F) Air Ent Outdoor Coil (Edb)		Indoor Entering Air—CFM/BF											
		1750/0.079				2000/0.099				2250/0.167			
		Indoor Entering Air—Ewb (F)											
		72	67	63*	62	72	67	63*	62	72	67	63*	62
85	TC	64.8	59.9	55.9	54.9	64.8	59.9	55.9	53.7	64.8	59.9	55.9	55.0
	SHC	34.6	45.4	44.2	53.7	34.6	45.4	44.2	52.0	34.6	45.4	44.2	55.0
	kW	5.73	5.64	5.59	5.59	5.73	5.64	5.59	5.61	5.73	5.64	5.59	5.58
95	TC	62.6	57.5	53.2	52.6	62.6	57.5	52.9	52.7	62.6	57.5	53.4	52.8
	SHC	33.9	44.7	42.9	51.3	33.9	44.7	42.4	52.0	33.9	44.7	43.5	52.8
	kW	6.21	6.11	6.09	6.10	6.21	6.11	6.08	6.05	6.21	6.11	6.08	6.01
105	TC	60.0	54.8	50.6	50.4	60.0	54.7	49.8	50.6	60.0	54.8	50.7	50.0
	SHC	33.2	43.8	42.3	50.4	33.2	43.7	41.3	50.6	33.2	43.8	42.0	50.0
	kW	6.72	6.61	6.56	6.52	6.72	6.61	6.61	6.52	6.72	6.61	6.58	6.50
115	TC	57.0	51.9	47.3	48.2	57.0	51.9	47.4	47.9	57.0	51.9	47.5	15.8
	SHC	32.2	42.7	41.3	46.7	32.2	42.7	40.2	47.9	32.2	42.7	40.3	7.8
	kW	7.25	7.15	7.03	7.04	7.25	7.15	7.08	7.09	7.25	7.15	7.07	5.46

HEATING EXTENDED PERFORMANCE TABLE -10-20

50JS060(5 TONS)

Temp (F)	Indoor Air Cfm (std)	Ent Indoor Coil	Air Temperature Entering Outdoor Coil (F db at 70% rh)									
			-10		0		10		17		20	
			TC	kW	TC	kW	TC	kW	TC	kW	TC	kW
60	1750	TC	17.98	16.57	23.50	21.59	28.92	26.51	33.54	30.53	35.75	32.24
		kW	3.90		4.01		4.13		4.22		4.27	
	2000	TC	18.38	16.87	23.90	21.89	29.32	26.91	34.04	31.03	36.25	32.64
		kW	3.97		4.07		4.18		4.26		4.30	
	2250	TC	18.78	17.27	24.30	22.29	29.73	27.32	34.34	31.33	36.65	33.04
		kW	4.04		4.14		4.23		4.31		4.35	
70	1750	TC	16.77	15.36	22.29	20.49	27.92	25.61	32.44	29.63	34.75	31.33
		kW	4.14		4.29		4.43		4.53		4.59	
	2000	TC	17.17	15.77	22.80	20.89	28.32	26.01	32.94	30.03	35.25	31.83
		kW	4.22		4.34		4.47		4.57		4.62	
	2250	TC	17.57	16.17	23.20	21.29	28.82	26.41	33.44	30.53	35.75	32.24
		kW	4.29		4.41		4.53		4.62		4.66	
80	1750	TC	15.26	14.06	20.99	19.28	26.71	24.60	31.33	28.52	33.54	30.23
		kW	4.40		4.57		4.75		4.87		4.93	
	2000	TC	15.67	14.36	21.49	19.68	27.32	25.01	31.83	29.02	34.14	30.73
		kW	4.47		4.63		4.79		4.90		4.95	
	2250	TC	16.07	14.76	21.89	20.08	27.72	25.41	32.34	29.52	34.65	31.23
		kW	4.55		4.70		4.84		4.94		4.99	

HEATING EXTENDED PERFORMANCE TABLE 30-60

50JS060(5 TONS)

Temp (F)	Indoor Air Cfm (std)	Ent Indoor Coil	Air Temperature Entering Outdoor Coil (F db at 70% rh)									
			30		40		47		50		60	
			TC	kW	TC	kW	TC	kW	TC	kW	TC	kW
60	1750	TC	43.18	37.86	51.52	51.52	57.74	57.74	58.55	58.55	64.97	64.97
		kW	4.42		4.59		4.67		4.68		4.76	
	2000	TC	43.68	38.26	51.92	51.92	58.15	58.15	59.55	59.55	65.98	65.98
		kW	4.44		4.59		4.66		4.71		4.79	
	2250	TC	44.19	38.66	51.92	51.92	58.35	58.35	59.95	59.95	67.08	67.08
		kW	4.48		4.60		4.71		4.75		4.86	
70	1750	TC	42.28	37.06	50.61	50.61	57.24	57.24	59.15	59.15	64.57	64.57
		kW	4.76		4.95		5.10		5.13		5.30	
	2000	TC	42.88	37.56	51.22	51.22	57.34	57.34	59.55	59.55	65.68	65.68
		kW	4.77		4.94		5.06		5.10		5.16	
	2250	TC	43.38	37.96	51.62	51.62	57.94	57.94	59.55	59.55	66.98	66.98
		kW	4.80		4.96		5.07		5.09		5.16	
80	1750	TC	41.07	36.05	49.51	49.51	56.44	56.44	58.55	58.55	64.07	64.07
		kW	5.13		5.34		5.52		5.57		5.72	
	2000	TC	41.68	36.55	50.21	50.21	56.94	56.94	58.75	58.75	65.58	65.58
		kW	5.13		5.32		5.48		5.51		5.64	
	2250	TC	42.28	37.06	50.81	50.81	57.14	57.14	59.35	59.35	66.88	66.88
		kW	5.16		5.34		5.46		5.50		5.63	

See Legend and Notes on page 16. *At 75°F entering dry bulb—Tennessee Valley Authority [TVA] rating conditions; all others at 80°F entering dry bulb.

50JS

Performance data (cont)

ECONOMIZER 1-in. FILTER PRESSURE DROP (in. wg)

UNIT50JS	PRESSURE DROP
030-042	0.20
048-060	0.25

MULTIPLICATION FACTORS

HEATER kW RATING	VOLTAGE DISTRIBUTION V/3/60	MULTIPLICATION FACTOR
240	200	.69
	208	.75
	230	.92
	240	1.00
480	440	.84
	460	.92
	480	1.00

Example: 20 kW (at 240v) heater on 230v
 = 20.0 (.92 mult factor)
 = 18.4 kW capacity at 230 v

NOTES:

1. Ratings are net; they account for the effects of the evaporator-fan motor power and heat.
2. Direct interpolation is permissible. Do not extrapolate.
3. The following formulas may be used:

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

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

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

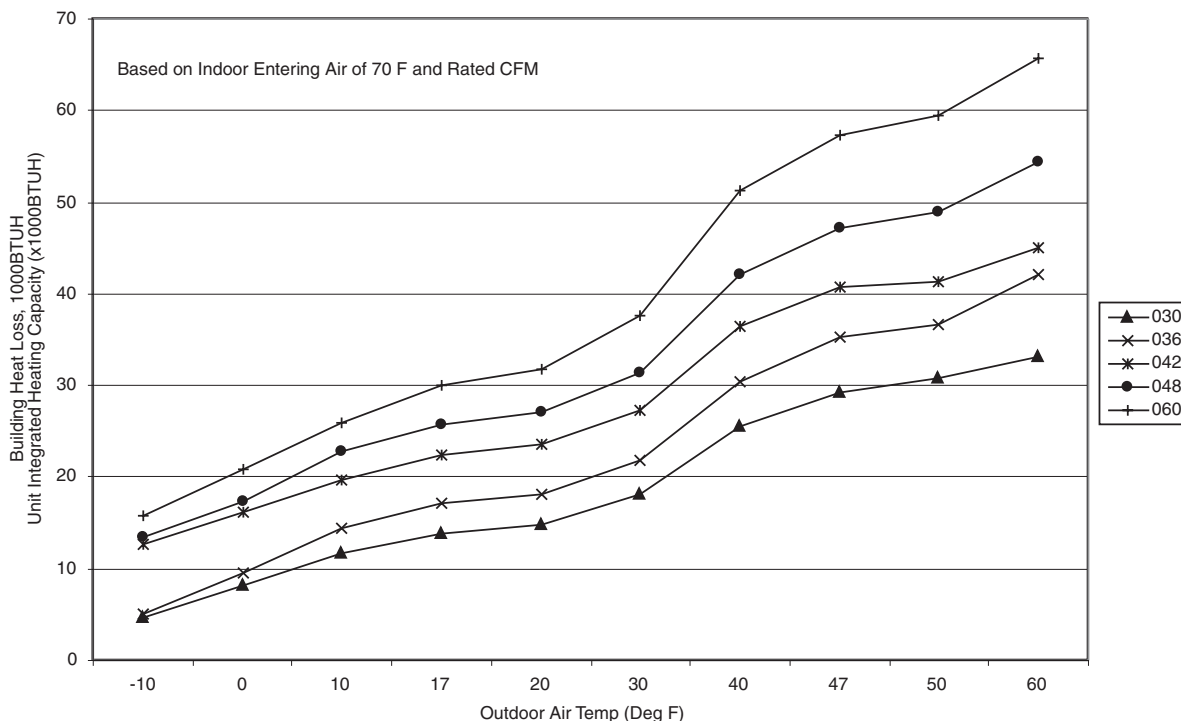
Where: h_{ewb} = Enthalpy of air entering evaporator coil

4. The SHC is based on 80 F edb temperature of air entering evaporator coil.
 Below 80 F edb, subtract (corr factor x cfm) from SHC.
 Above 80 F edb, add (corr factor x cfm) to SHC.
 Correction Factor = $1.10 \times (1 - BF) \times (edb - 80)$.
5. Integrated capacity is maximum (instantaneous) capacity less the effect of frost on the outdoor coil and the heat required to defrost it.

LEGEND

- BF—Bypass Factor
- Ewb—Entering Wet-Bulb
- kW—Total Unit Power Input
- SHC—Sensible Heat Capacity (1000 Btuh)
- TC—Total Capacity (1000 Btuh) (net)
- Edb—Entering Dry-Bulb
- rh—Relative Humidity
- Indicates Integrated Ratings

Balance Point Worksheet



**WET COIL AIR DELIVERY *
UNIT 50JS 030-060**

Unit 50JS	Motor Speed		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								
030	Low	Watts	295	292	289	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		Cfm	928	882	802	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Med	Watts	388	383	377	372	366	361	—	—	—	—	—	—	—	—	—	—	—	—	—
		Cfm	1203	1120	1062	1004	930	838	—	—	—	—	—	—	—	—	—	—	—	—	—
	High	Watts	—	—	—	—	469	458	449	442	—	—	—	—	—	—	—	—	—	—	—
		Cfm	—	—	—	—	1141	1027	924	828	—	—	—	—	—	—	—	—	—	—	—
036	Low	Watts	592	581	567	552	538	525	512	499	—	—	—	—	—	—	—	—	—	—	
		Cfm	1499	1421	1351	1281	1207	1125	1034	936	—	—	—	—	—	—	—	—	—	—	
	Med	Watts	—	—	—	660	636	617	603	592	581	566	—	—	—	—	—	—	—	—	
		Cfm	—	—	—	1475	1371	1274	1186	1105	1024	928	—	—	—	—	—	—	—	—	
	High	Watts	—	—	—	—	—	776	761	744	725	706	689	—	—	—	—	—	—	—	
		Cfm	—	—	—	—	—	1452	1356	1254	1145	1030	910	—	—	—	—	—	—	—	
042	Low	Watts	606	596	586	575	563	550	537	—	—	—	—	—	—	—	—	—	—	—	
		Cfm	1464	1399	1341	1282	1218	1146	1066	—	—	—	—	—	—	—	—	—	—	—	
	Med	Watts	680	665	649	635	622	611	600	590	—	—	—	—	—	—	—	—	—	—	
		Cfm	1608	1535	1461	1387	1316	1247	1180	1111	—	—	—	—	—	—	—	—	—	—	
	High	Watts	768	755	742	730	718	707	696	684	671	—	—	—	—	—	—	—	—	—	
		Cfm	1656	1576	1508	1447	1390	1331	1268	1198	1119	—	—	—	—	—	—	—	—	—	
048	Low	Watts	741	724	709	690	664	631	594	562	552	543	—	—	—	—	—	—	—	—	
		Cfm	1994	1937	1869	1797	1722	1645	1566	1480	1384	1269	—	—	—	—	—	—	—	—	
	Med	Watts	—	—	—	773	744	715	687	662	640	625	—	—	—	—	—	—	—	—	
		Cfm	—	—	—	1957	1867	1787	1719	1653	1575	1463	—	—	—	—	—	—	—	—	
	High	Watts	—	—	—	—	—	799	782	773	756	704	—	—	—	—	—	—	—	—	
		Cfm	—	—	—	—	—	1914	1842	1774	1686	1538	—	—	—	—	—	—	—	—	
060	Low	Watts	742	723	698	666	629	591	559	540	—	—	—	—	—	—	—	—	—	—	
		Cfm	2197	2141	2103	2057	1988	1894	1783	1674	—	—	—	—	—	—	—	—	—	—	
	Med	Watts	838	822	803	780	752	721	689	661	639	632	—	—	—	—	—	—	—	—	
		Cfm	2485	2406	2269	2127	2012	1937	1894	1855	1770	1571	—	—	—	—	—	—	—	—	
	High	Watts	—	934	913	891	866	837	806	776	750	735	—	—	—	—	—	—	—	—	
		Cfm	—	2483	2391	2283	2170	2061	1960	1868	1780	1687	—	—	—	—	—	—	—	—	

50JS

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

NOTES:

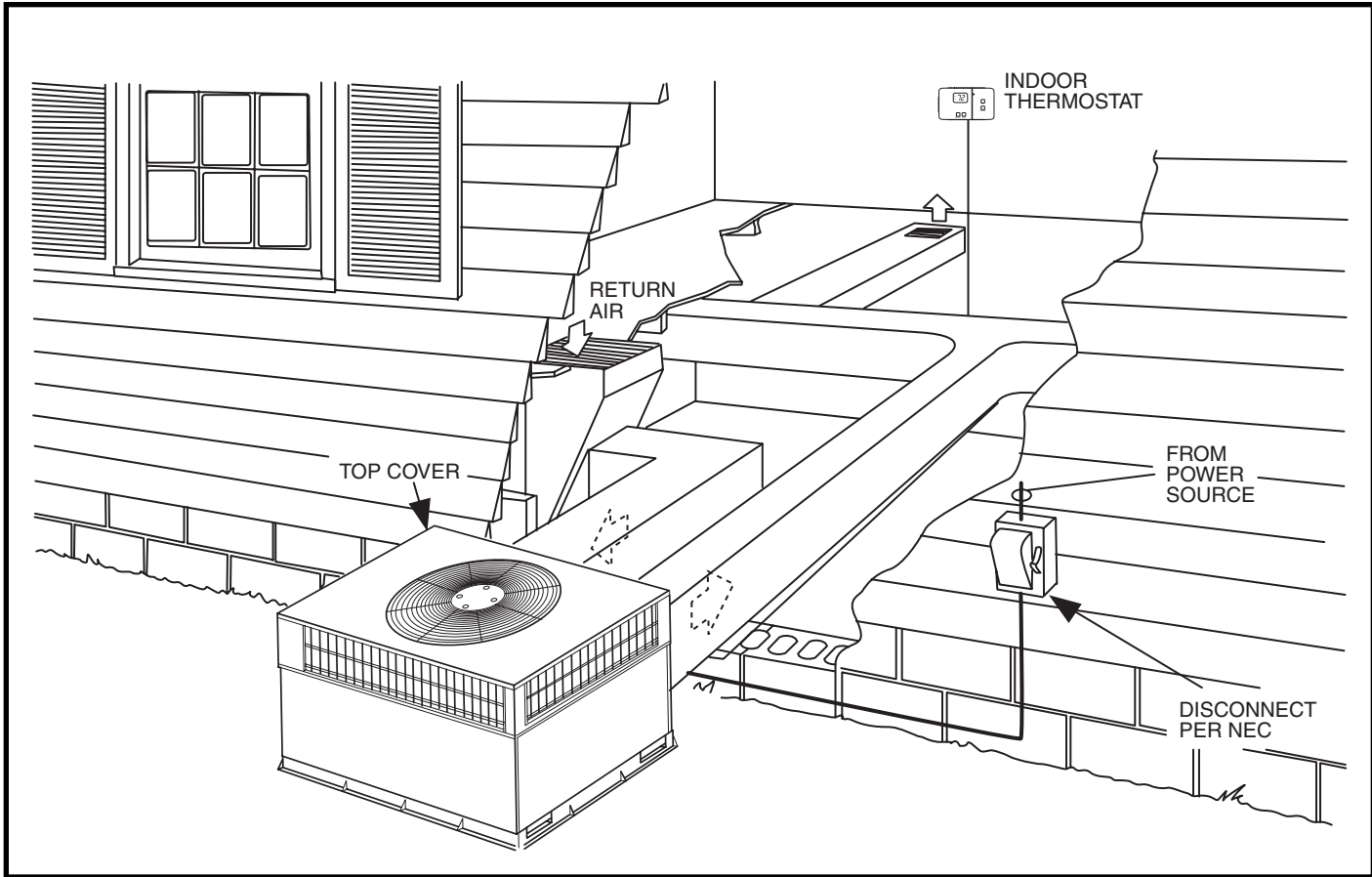
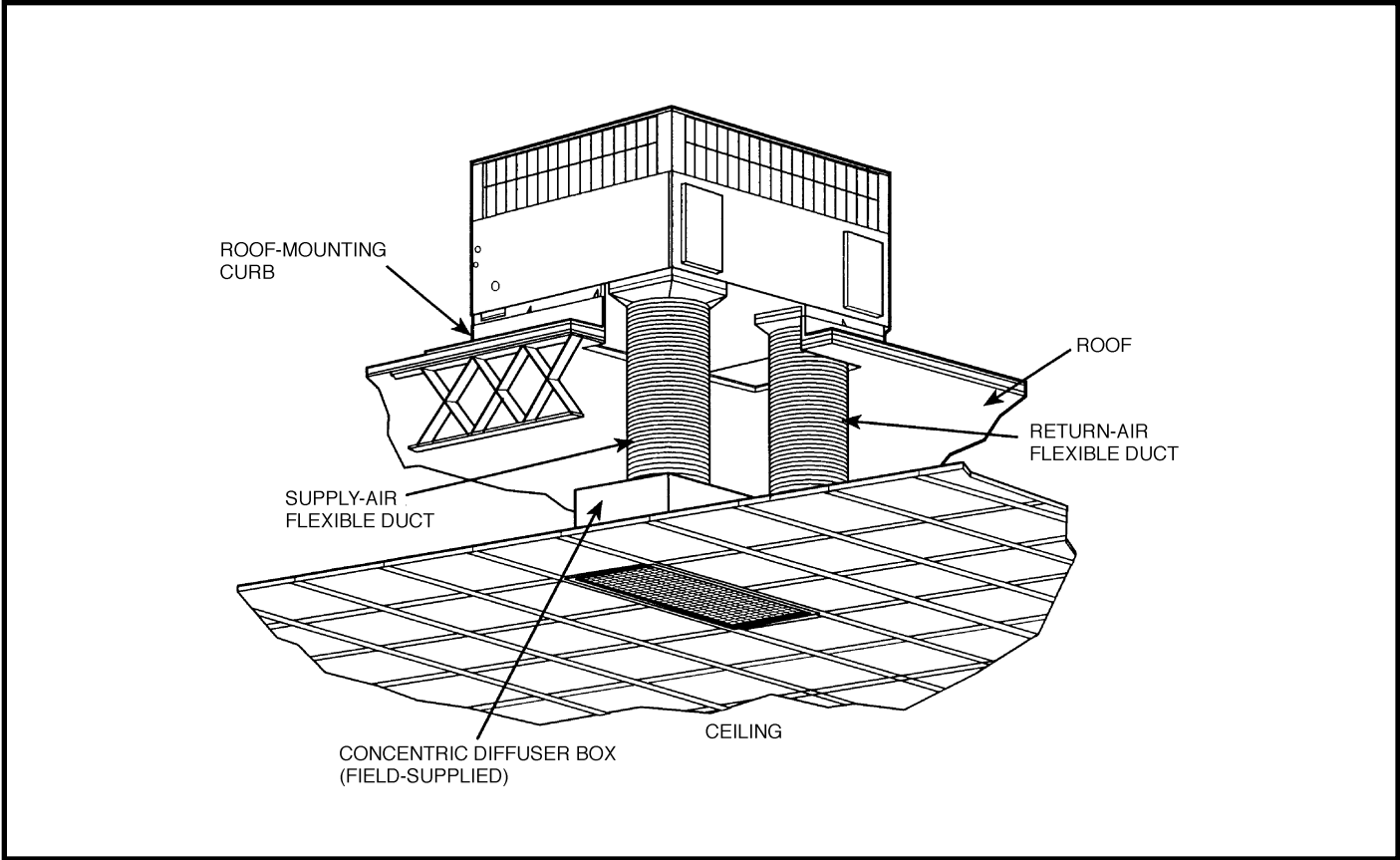
1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Evaporator coil frosting may occur at airflows below this point.
2. Dashes indicate portions of table that are beyond the blower motor capacity or are not recommended.
3. Deduct 10% for 208v.

FILTER PRESSURE DROP (In. wg)

UNIT SIZE 50JS	FILTER SIZE	CFM																		
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
030	20 X 20 X 1	0.05	0.07	0.08	0.10	0.12	0.13	0.14	0.15	—	—	—	—	—	—	—	—	—	—	—
036	20 X 24 X 1	—	—	—	—	0.09	0.10	0.11	0.13	0.14	0.15	0.16	—	—	—	—	—	—	—	—
042, 048, 060	24 X 30 X 1	—	—	—	—	—	—	—	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18

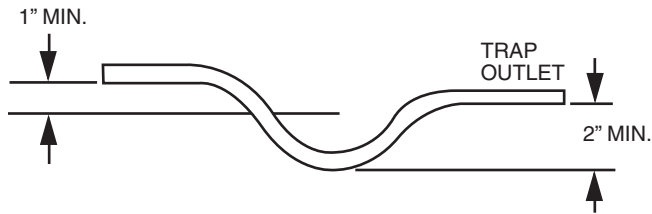
Typical piping and wiring

SF05



Application data

Condensate trap — A 2-in. condensate trap must be field supplied.



Ductwork — Secure downflow discharge ductwork to roof curb. For horizontal discharge applications, attach ductwork to unit with flanges.

To convert a unit to downflow discharge — Units are equipped with factory-installed inserts in the down-flow openings. Remove the inserts similar to removing an electrical knock-out.

Maximum cooling airflow — To minimize the possibility of condensate blow-off from the evaporator, airflow through the units should not exceed 450 cfm/ton.

Minimum cooling airflow — The minimum cooling airflow is 350 cfm/ton.

Minimum cooling ambient operating temperature — All standard units have a minimum ambient operating temperature of 40°F. With accessory low ambient temperature kit, units can operate at temperatures down to 0°F.

501S

Electrical Data Legend

(See Data on Page 20)

- LEGEND
- FLA — Full Load Amps
 - LRA — Locked Rotor Amps
 - MCA — Minimum Circuit Amps
 - MOCP — Maximum Overcurrent Protection
 - RLA — Rated Load Amps



*Heater capacity (KW) based on heater voltage of 208v, 240v, & 480v. If power distribution voltage to unit varies from rated heater voltage, heater KW will vary accordingly.

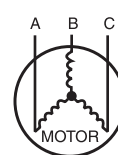
NOTES:

1. In compliance with NEC (National Electrical Code) requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be Power Supply fuse. The CGA (Canadian Gas Association) units may be fuse or circuit breaker.
2. Minimum wire size is based on 60 C copper wire. If other than 60 C wire is used, or if length exceeds wire length in table, determine size from NEC.
3. 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.

% 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%.

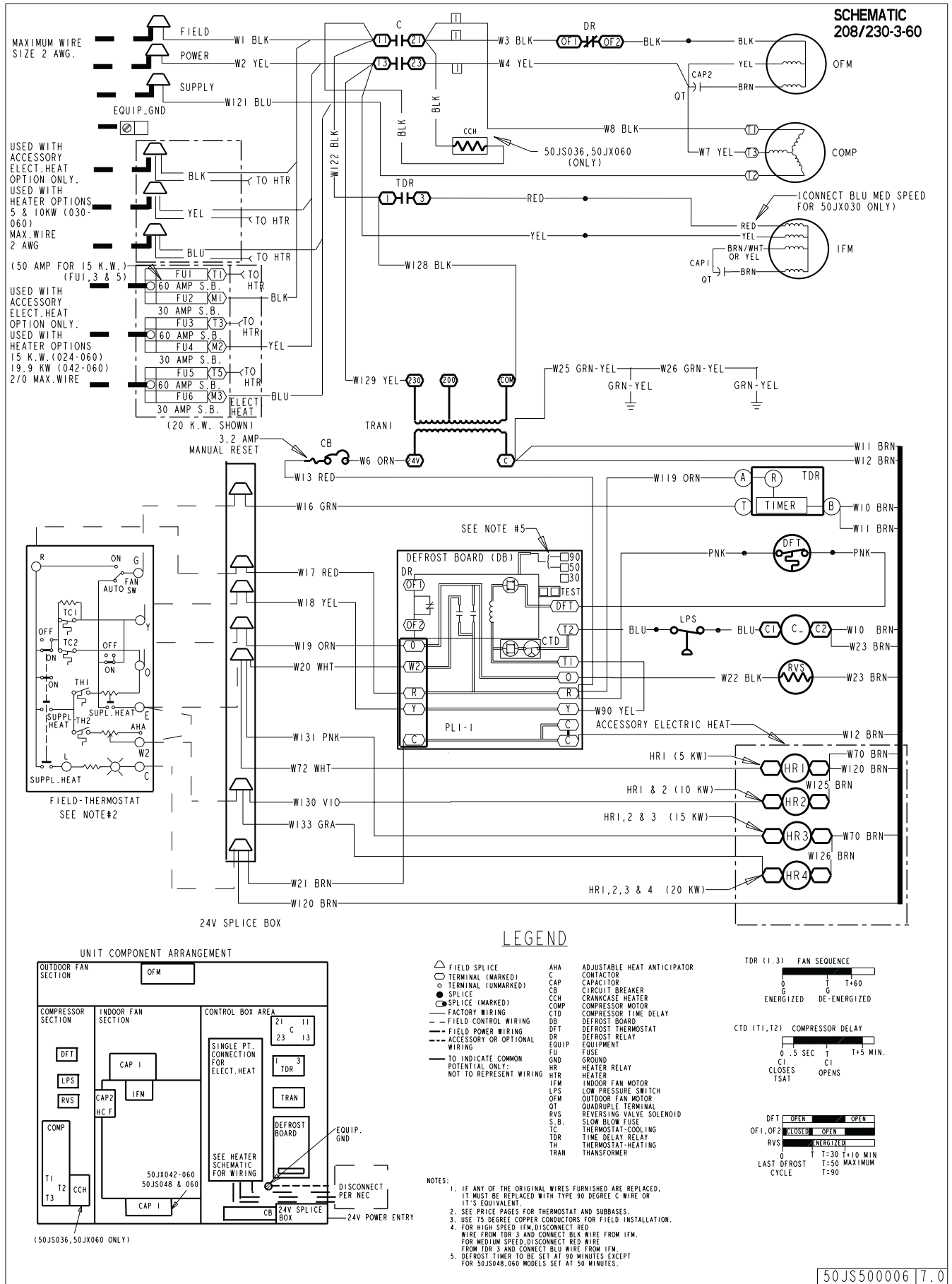
IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

Electrical Data

UNIT SIZE 50JS	V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM FLA	IFM FLA	ELECTRIC HEAT		SINGLE POINT POWER SUPPLY		
		Min	Max	RLA	LRA			Nominal kW*	FLA	MCA	Fuse or Ckt Bkr	MOCP
030	208/230-3-60	187	253	9.9	78	0.9	2.0	—/—	—/—	15.3/15.3	20/20	—
								3.8/5.0	10.4/12.0	28.3/30.3	30/35	—
								7.5/10.0	20.8/24.1	41.3/45.3	45/50	—
								11.3/15.0	31.3/36.1	54.4/60.4	60/—	—/70
036	208/230-3-60	187	253	9.9	78	1.5	4.1	—/—	—/—	18.0/18.0	25/25	—
								3.8/5.0	10.4/12.0	31.0/33.0	35/35	—
								7.5/10.0	31.3/36.1	44.0/48.0	45/50	—
								11.3/15.0	36.1/41.7	57.1/63.1	60/—	—/70
	460-3-60	414	506	5.5	40	0.8	1.9	—/—	—/—	9.6	15	—
								5	6.0	17.1	20	—
								10	12.0	24.6	25	—
								15	18.0	32.1	35	—
042	208/230-3-60	187	253	12.4	90	0.9	3.8	—/—	—/—	20.2/20.2	25/25	—
								3.8/5.0	10.4/12.0	33.2/35.2	40/40	—
								7.5/10.0	20.8/24.1	46.3/50.3	50/60	—
								11.3/15.0	31.3/36.1	59.3/65.3	60/—	—/70
								15.0/19.9	41.6/48.0	72.2/80.2	—	80/90
	460-3-60	414	506	6.7	45	0.8	1.8	—/—	—/—	11.0	15	—
								5	6.0	18.5	20	—
								10	12.0	26.0	30	—
								15	18.0	33.5	35	—
								20.0	24.1	41.0	45	—
048	208/230-3-60	187	253	14.1	105	1.5	3.5	—/—	—/—	22.6/22.6	30/30	—
								3.8/5.0	10.4/12.0	35.7/37.7	40/40	—
								7.5/10.0	20.8/24.1	48.7/52.7	50/60	—
								11.3/15.0	31.3/36.1	61.7/67.7	—	70/70
								15.0/20.0	41.6/48.0	74.6/82.6	—	80/90
	460-3-60	414	506	7.1	53	0.8	1.8	—/—	—/—	11.5	15	—
								5	6.0	19.0	20	—
								10	12.0	26.5	30	—
								15	18.0	34.0	35	—
								20	24.1	41.5	45	—
060	208/230-3-60	187	253	19.4	125	1.5	6.2	—/—	—/—	32.0/32.0	40/40	—
								3.8/5.0	10.4/12.0	45.0/47.0	50/50	—
								7.5/10.0	20.8/24.1	58.0/62.1	—	60/70
								11.3/15.0	31.3/36.1	71.1/77.1	—	80/80
								15.0/19.9	41.6/48.0	83.9/91.9	—	90/100
	460-3-60	414	506	8.0	63	0.8	3.2	—/—	—/—	14.0	20	—
								5	6.0	21.5	25	—
								10	12.0	29.0	30	—
								15	18.0	36.6	40	—
								20	24.1	44.1	45	—

*Heater capacity (kW) based on heater voltage of 208v, 240v, & 480v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.
See Legend and Notes on page 19.

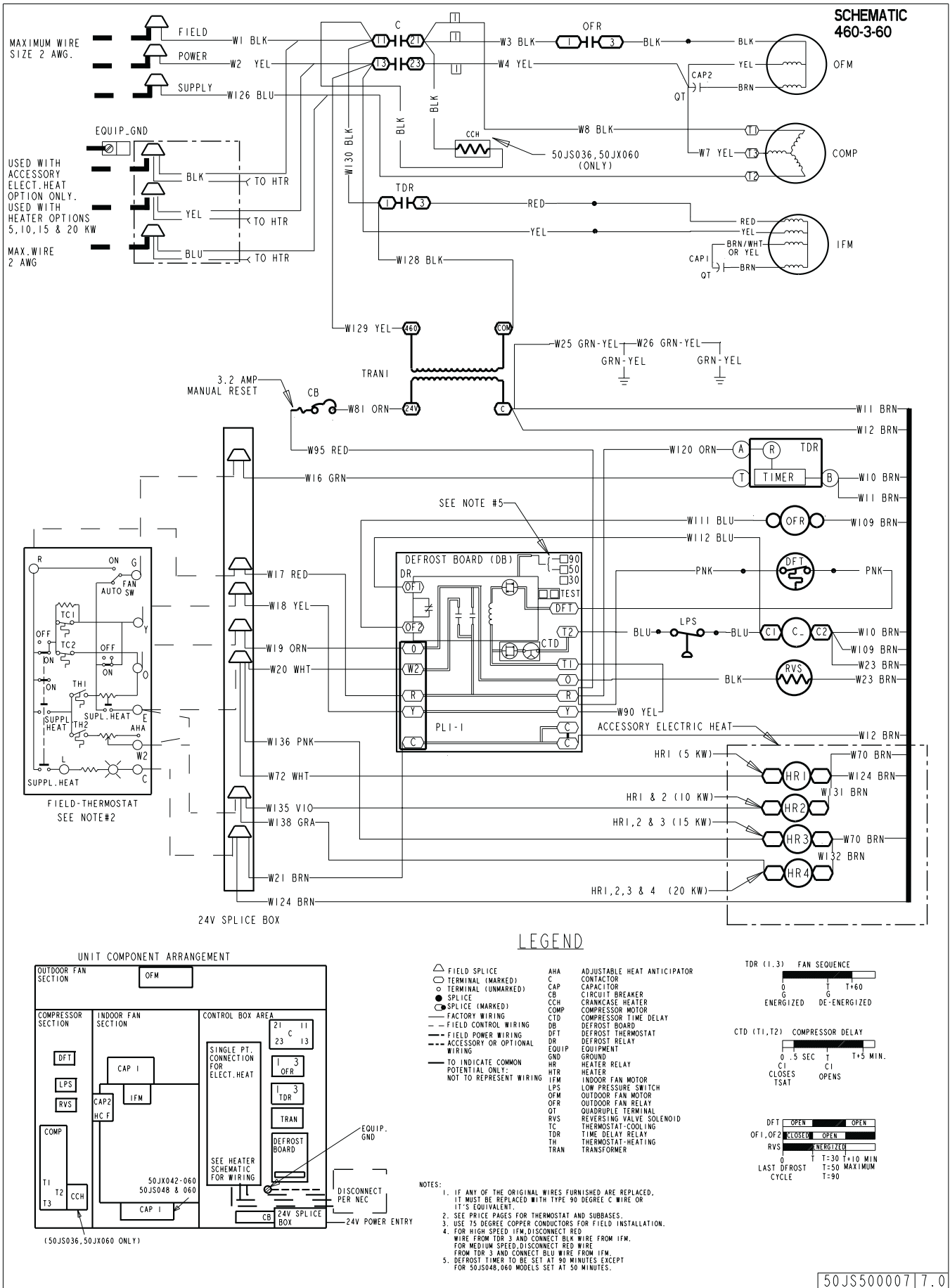
Typical wiring schematic — 208/230-3-60 shown



50JS

Typical wiring schematic — 460-3-60 shown

50JS



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Controls

Sequence of operation

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

On units with crankcase heater, heater is also energized.

Cooling — With the thermostat subbase in the cooling position, 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 rises, the thermostat makes, closing circuit R-Y. 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, energizing the indoor-fan relay (IFR) and 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 60 second time delay.

Heating — On a call for heat, thermostat makes circuits R-Y and R-G.

A circuit is made to C, starting COMP and OFM. Circuit R-G also is completed, energizing IFR and starting 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 is controlled by a time-delay relay that keeps the fan on for 60 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 outdoor fan motor stops and a bank of optional electric heat turns on to warm air supplying the conditioned space.

NOTES:

1. Compressor time delay occurs through the defrost control board.
2. Defrost control board has built in 5 minute compressor delay: once the compressor has started and then stopped, it cannot be restarted again until 5 minutes have elapsed.

Guide specifications

Packaged Heat Pumps Constant Volume Application

HVAC Guide Specifications

Size Range: 2-1/2 to 5 Tons, Nominal Cooling

Carrier Model Number: 50JS

Part 1—General

SYSTEM DESCRIPTION

Outdoor packaged air to air heat pump unit utilizing a hermetic compressor for cooling duty and optional electric heating. Unit shall discharge supply air vertically or horizontally as shown on contract drawings. Outdoor fan/coil section shall have a draw-thru design with vertical discharge for minimum sound levels.

QUALITY ASSURANCE

- A. Unit shall be rated in accordance with ARI Standards 210/240-94 and 270-95.
- B. Unit shall be designed in accordance with UL Standard 1995.
- C. Unit shall be manufactured in a facility registered to ISO 9001 manufacturing quality standard.
- D. Unit shall be UL listed and c-UL certified as a total package for safety requirements.
- E. Roof curb shall be designed to conform to NRCA Standards.
- F. Insulation and adhesives shall meet NFPA 90A requirements for flame spread and smoke generation.
- G. Cabinet insulation shall meet ASHRAE Standard 62P.

DELIVERY, STORAGE AND HANDLING

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

Part 2 — Products

EQUIPMENT

A. General:

Factory-assembled, single-piece, heat pump unit. Contained within the enclosure shall be all factory wiring, piping, controls, refrigerant charge (R-22), and special features required prior to field start-up.

B. Unit Cabinet:

1. Unit cabinet shall be constructed of phosphated, zinc-coated, pre-painted steel capable of withstanding 500 hours of salt spray.
2. Normal service shall be through a single removable cabinet panel.
3. The unit shall be constructed on a rust proof unit base that has an externally trapped, integrated sloped drain.
4. Indoor fan compartment top surface shall be insulated with a minimum 1/2-in. thick, flexible fiberglass insulation, coated on the air side and retained by adhesive and mechanical means. The indoor wall sections will be insulated with a minimum semi-rigid foil-faced board capable of being wiped clean. Aluminum foil-faced fiberglass insulation shall be used in the entire indoor air cavity section.
5. Unit shall have a field-supplied condensate trap.

6. Metal Insulated Duct Covers for side discharge will be standard on all sizes.

7. Unit Insulation conforms to ASHRAE 62P.

C. Fans:

1. The indoor fan shall be 3-speed, direct-drive, as shown on equipment drawings.
2. Fan wheel shall be made from steel and shall be double-inlet type with forward curved blades with corrosion resistant finish. Fan wheel shall be dynamically balanced.
3. Outdoor fan shall be direct drive propeller type with aluminum blades riveted to corrosion resistant steel spiders, be dynamically balanced, and discharge air vertically.

D. Compressor:

1. Fully hermetic compressors with factory-installed vibration isolation.
2. Reciprocating or scroll compressors shall be standard on all units.
3. Compressor Protection:
Defrost control shall protect compressor by preventing "short cycling."

E. Coils:

Indoor and outdoor coils shall have aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed. (Copper/copper and vinyl-coated construction available as option.) Tube sheet openings shall be belled to prevent tube wear.

F. Refrigerant Metering Device:

Refrigerant metering device shall be of the fixed orifice feed type.

G. Filters:

Filter section shall consist of field-installed, throw-away, 1-in. thick fiberglass filters of commercially available sizes.

H. Controls and Safeties:

1. Unit controls shall be complete with a self-contained low voltage control circuit.
2. Units shall incorporate an internal compressor protector that provides reset capability.

I. Operating Characteristics:

1. Unit shall be capable of starting and running at 125°F ambient outdoor temperature per maximum load criteria of ARI Standard 240-94.
2. Compressor with standard controls shall be capable of operation down to 40°F ambient outdoor temperature in cooling mode.
3. Unit shall be provided with 60-second fan time delay after the thermostat is satisfied.

J. Electrical Requirements:

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

K. Motors:

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

Guide specifications (cont)

2. All fan motors shall have permanently lubricated bearings, and inherent, automatic reset, thermal overload protection.
3. Condenser fan motor shall be totally enclosed.
- L. Special Features Available:
 1. Louvered Grille:

Wire grille shall be standard on all units. Louvered grille shall be available as a factory-installed option to provide hail guard and vandalism protection.
 2. Coil Options:

Shall include factory-installed optional copper/copper and vinyl-coated refrigerant coils.
 3. Economizer:
 - a. Economizer controls capable of providing free cooling using outside air.
 - b. Equipped with low leakage dampers not to exceed 3% leakage, at 1.0 in. wg pressure differential.
 - c. Spring return motor shuts off outdoor damper on power failure.
 4. Flat Roof Curb:

Curbs shall have seal strip and a wood nailer for flashing and shall be installed per manufacturer's instructions.
 5. Manual Outdoor Air Damper:

Package shall consist of damper, birdscreen, and rainhood which can be preset to admit outdoor air for year-round ventilation.
 6. Thermostat:

To provide for one-stage heating and cooling in addition manual or automatic changeover and indoor fan control.
 7. Low Ambient Package:

Shall consist of a solid-state control and outdoor coil temperature sensor for controlling outdoor-fan motor operation, which shall allow unit to operate down to 0° F outdoor ambient temperature.
 8. Filter Rack Kit:

Shall provide filter mounting for downflow applications.
 9. Controls Upgrade Kit:

Shall provide high and low pressure safety protection.
 10. Square-To-Round Duct Transitions (030-048):

Shall have the ability to convert the supply and return openings from rectangular to round.
 11. Crankcase Heater:

Shall provide anti-floodback protection for low-load cooling applications.
 12. Electric heaters:
 - a. Electric heater shall be available as a field-installed option.
 - b. Heater elements shall be open wire type, adequately supported and insulated with ceramic bushings.
 - c. Electric heater packages must provide single point power connection capability.

