



Installation, Start-Up and Service Instructions

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SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguisher available for all brazing operations.

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit, and install lockout tag. Electrical shock could cause personal injury.

INSTALLATION

Unit is shipped in the vertical discharge configuration. To convert to horizontal configuration, remove horizontal duct opening covers. Using the same screws, install covers on duct openings in basepan of unit with the insulation-side down. Seals around duct openings must be tight.

Step 1 — Provide Unit Support

ROOF CURB — Assemble and install accessory roof curb in accordance with instructions shipped with curb. See Fig. 1. Install insulation, cant strips, roofing felt, and counter flashing as shown. *Ductwork must be attached to curb, not to the unit.* If electric or control power is to be routed through the basepan, attach the accessory thru-the-bottom service connections to the basepan and roof curb in accordance with the accessory installation instructions. Connections must be installed before unit is set on roof curb.

IMPORTANT: The gasketing of the unit to the roof curb is critical for watertightness. Install gasket supplied with the roof curb as shown in Fig. 1. Improperly applied gasket can also result in air leaks and poor unit performance.

Curb should be level. This is necessary for unit drain to function properly. Unit leveling tolerances are shown in Fig. 2. Refer to Accessory Roof Curb Installation Instructions for additional information as required.

SLAB MOUNT (Horizontal Units Only) — Provide a level concrete slab that extends a minimum of 6 in. beyond unit cabinet. Install a gravel apron in front of condenser coil air inlet to prevent grass and foliage from obstructing airflow.

NOTE: Horizontal units may be installed on a roof curb if required.

Step 2 — Field Fabricate Ductwork — Secure all ducts to roof curb and building structure on vertical discharge units. *Do not connect ductwork to unit.* For horizontal applications, field-supplied flanges should be attached to horizontal discharge openings and all ductwork should be attached to the flanges. Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes.

Ducts passing through an unconditioned space must be insulated and covered with a vapor barrier.

If a plenum return is used on a vertical unit, the return should be ducted through the roof deck to comply with applicable fire codes.

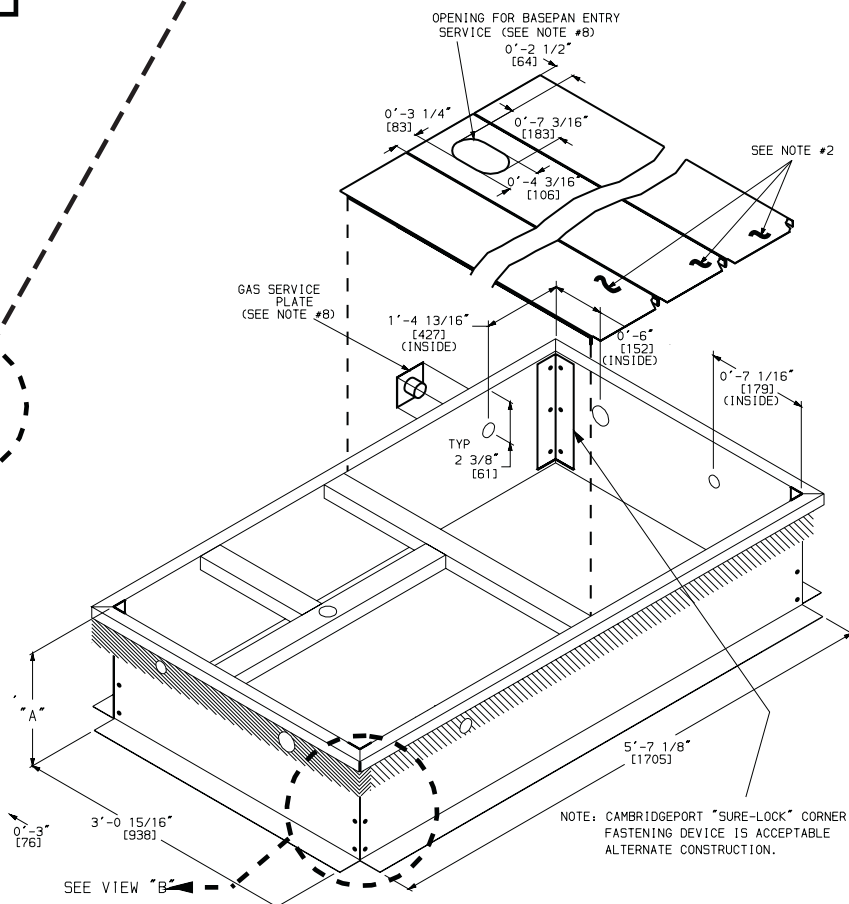
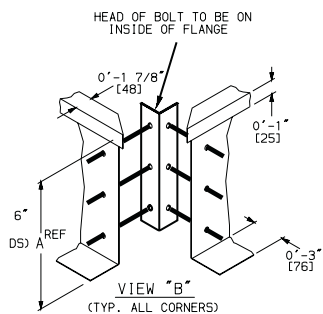
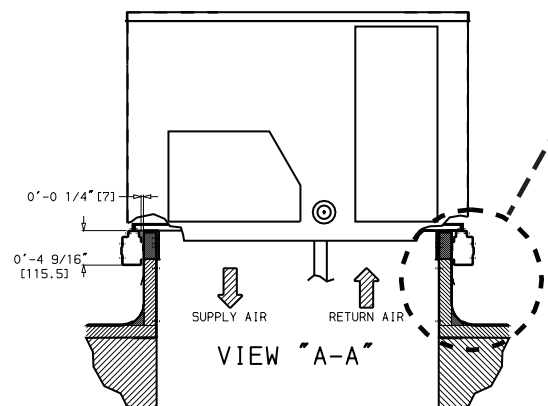
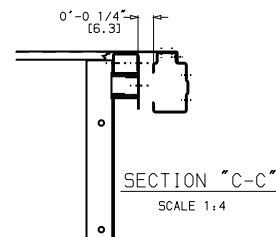
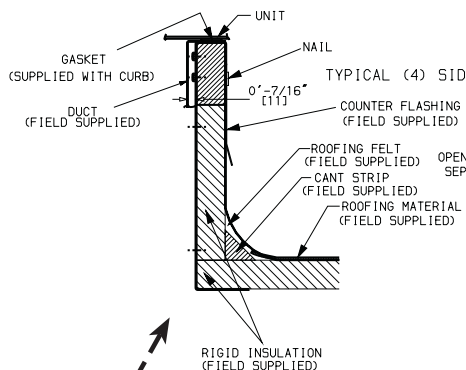
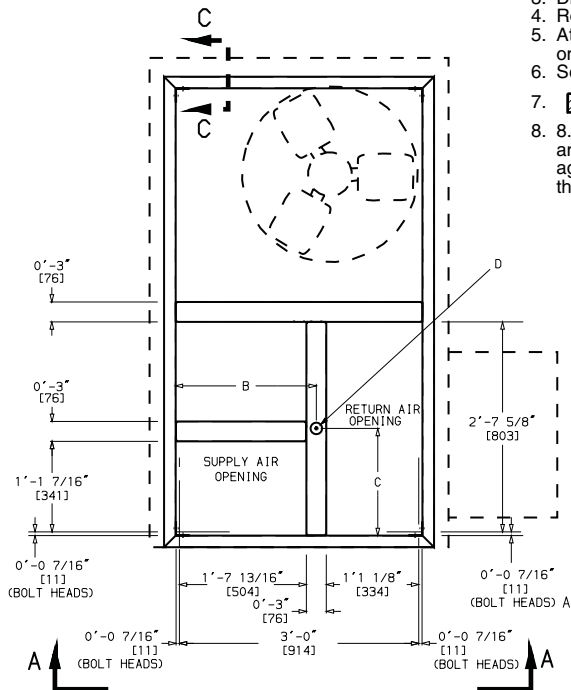
A minimum clearance to combustibles is not required around ductwork on vertical discharge units. On horizontal discharge units, a minimum clearance of 1.0 in. is required for the first 12 in. of ductwork. Cabinet return-air static pressure should not exceed -0.35 in. wg with Durablade economizer, -0.30 in. wg with EconoMi\$er, or -0.45 in. wg without economizer.

CONNECTOR PKG. ACCY.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL
CRBTMPWR001A00	1'-9 11/16" [551]	1'-4" [406]	1 3/4" [44.5]	3/4" [19] NPT	3/4" [19] NPT	1/2" [12.7] NPT
CRBTMPWR002A00				1 1/4" [31.7] NPT	1 1/4" [31.7] NPT	
CRBTMPWR003A00				1/2" [12.7] NPT	3/4" [19] NPT	
CRBTMPWR004A00				3/4" [19] NPT	1 1/4" [31.7] NPT	

NOTES:

1. Roof curb accessory is shipped disassembled.
2. Insulated panels.
3. Dimensions in [] are in millimeters.
4. Roof curb: galvanized 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. Connector packages CRBTMPWR001A00 and 2A00 are for thru-the-curb type gas. Packages CRBTMPWR003A00 and 4A00 are for thru-the-bottom type gas connections.

ROOF CURB ACCESSORY	"A"	UNIT SIZE 50HJQ
CRRFCURB001A00	1'-2" [356]	004-007
CRRFCURB002A00	2'-0" [610]	



NOTE: CAMBRIDGEPORT "SURE-LOCK" CORNER FASTENING DEVICE IS ACCEPTABLE ALTERNATE CONSTRUCTION.

Fig. 1 — Roof Curb Details

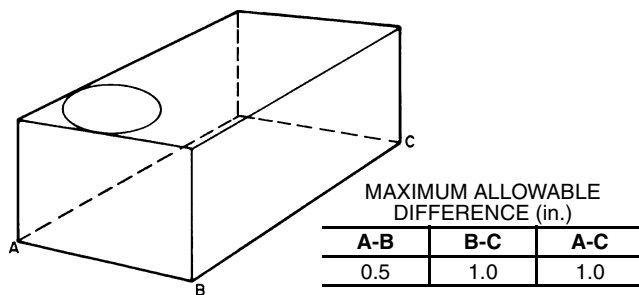


Fig. 2 — Unit Leveling Tolerances

Step 3 — Install Condensate Drain Line and External Trap

Condensate drain connections are located at the bottom and side of the unit. Unit discharge connections do not determine the use of drain connections; either drain connection can be used with vertical or horizontal discharge units.

When using the standard side drain connection, make sure the plug (red) in the alternate bottom connection is tight before installing the unit.

To use the bottom drain connection for a roof curb installation, relocate the factory-installed plug (red) from the bottom connection to the side connection. See Fig. 3. The piping for the condensate drain and external trap can be completed after the unit is in place.

All units must have an external trap for condensate drainage. Install a trap at least 4 in. deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the 50HJQ unit at 1 in. per 10 ft of run. Do not use a pipe size smaller than the unit connection ($\frac{3}{4}$ -in.).

Step 4 — Rig and Place Unit — Inspect unit for transportation damage, and file any claim with transportation agency. Keep unit upright and do not drop. Spreader bars are not required if top crating is left on unit, and rollers may be used to move unit across a roof. Level by using unit frame as a

reference. See Table 1 and Fig. 4 for additional information. Operating weight is shown in Table 1 and Fig. 4.

Lifting holes are provided in base rails as shown in Fig. 4 and 5. Refer to rigging instructions on unit.

⚠ CAUTION

All panels must be in place when rigging.

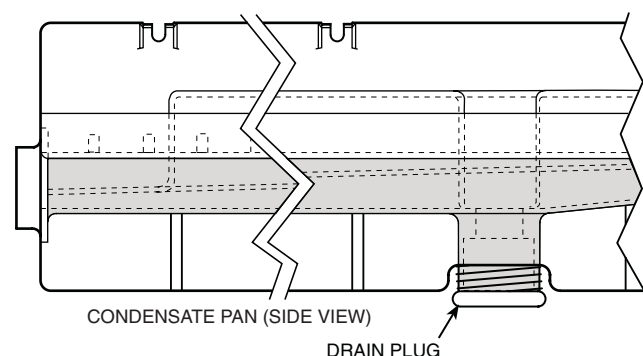
POSITIONING — Maintain clearance around and above unit to provide proper airflow and service access. See Fig. 5.

A properly positioned unit will have the following clearances: $\frac{1}{4}$ -in. clearance between roof curb and base rails on each side and duct end of unit; $\frac{1}{4}$ -in. clearance between roof curb and condenser end of unit. (See Fig. 1, section C-C.)

Do not install unit in an indoor location. Do not locate unit air inlets near exhaust vents or other sources of contaminated air.

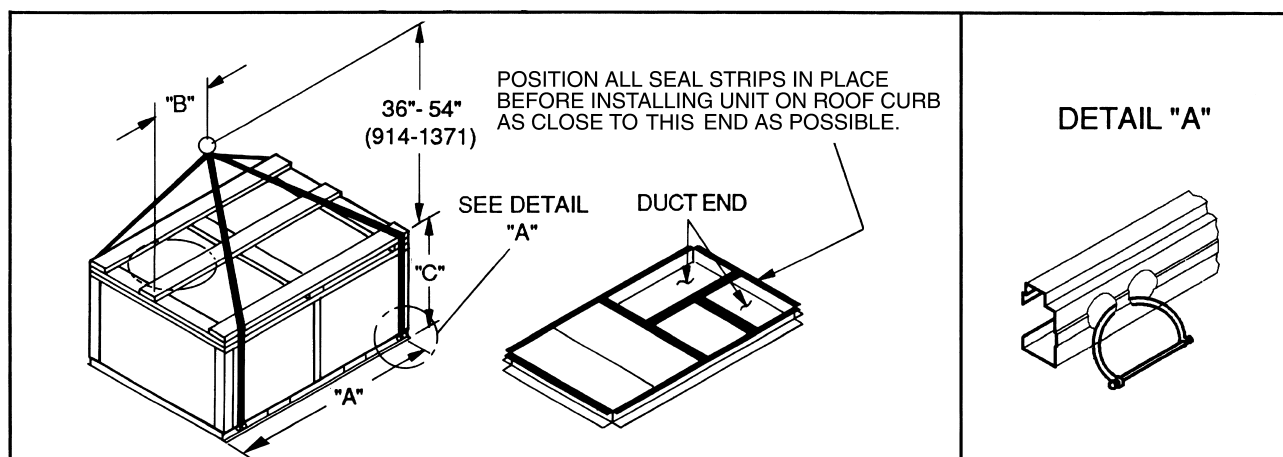
Although unit is weatherproof, guard against water from higher level runoff and overhangs.

After unit is in position, remove polyethylene shipping wrapper and top crating.



NOTE: Drain plug is shown in factory-installed position.

Fig. 3 — Condensate Drain Connection (Side View)



NOTES:

1. Dimension in () is in millimeters.
2. Hook rigging shackles through holes in base rail, as shown in detail "A." Holes in base rails are centered around the unit center of gravity. Use wooden top skid when rigging to prevent rigging straps from damaging unit.
3. Unit weights do not include economizer. See Table 1 for economizer weights.

⚠ CAUTION

All panels must be in place when rigging.

UNIT	OPERATING WEIGHT		DIMENSIONS					
			"A"		"B"		"C"	
	lb	kg	in.	mm	in.	mm	in.	mm
50HJQ004	500	227	73.69	1872	35.50	902	33.31	847
50HJQ005	550	249	73.69	1872	35.50	902	33.31	847
50HJQ006	590	268	73.69	1872	35.50	902	33.31	847
50HJQ007	610	277	73.69	1872	35.50	902	33.31	847

Fig. 4 — Rigging Details

BOTTOM POWER CHART, THESE HOLES REQ'D FOR USE
WITH ACCESSORY PACKAGES — CRBTMPWR001A00 (1/2", 3/4")
OR
CRBTMPWR002A00 (1/2", 1 1/4")

THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (Max.)
1/2"	24 V Power*	7/16" [22.2]
3/4"	Power*	1 1/8" [28.4]
1 1/4"	Power*	1 3/4" [44.4]

*Select either 3/4" or 1 1/4" for power, depending on wire size.

UNIT 50HJQ	STANDARD UNIT WEIGHT		DURABLE EON. WEIGHT		ECONOMIZER WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg
004	500	227	34	15.4	47	21.3	123	56	127	58	127	58	124	56
005	550	249					135	61	140	64	139	63	136	62
006	590	268					145	66	150	68	150	68	145	66
007	610	277					150	68	155	70	154	70	151	68

CONNECTION SIZES			
A	1 3/8" Dia [35]	Field Power Supply Hole	
B	2" Dia [51]	Power Supply Knockout	
C	1 3/4" Dia [44]	Charging Port Hole	
D	7/8" Dia [22]	Field Control Wiring Hole	
E	3/4" — 14 NPT	Condensate Drain	
F	2 1/2" Dia. [64]	Power Supply Knockout	

NOTES:

- Dimensions in [] are in millimeters.
- Center of gravity.
- Direction of airflow.
- Ductwork to be attached to accessory roof curb only.
- Minimum clearance (local codes or jurisdiction may prevail):
 - Bottom to combustible surfaces (when not using curb) 0 inches, on horizontal discharge units with electric heat 1 in. clearance to ductwork for 1 ft.
 - Outdoor coil, for proper airflow, 36 in. one side, 12 in. the other. The side getting the greater clearance is optional.
 - Overhead, 60 in. to assure proper condenser fan operation.
 - Between units, control box side, 42 in. per NEC.
 - Between unit and ungrounded surfaces, control box side, 36 in. per NEC.
 - Between unit and block or concrete walls and other grounded surfaces, control box side, 42 in. per NEC.
 - Horizontal supply and return end, 0 inches.
 - With the exception of the clearance for the outdoor coil as stated in Notes 5a, b, and c, a removable fence or barricade requires no clearance.
 - Units may be installed on combustible floors made from wood or Class A, B, or C roof covering material.
 - The vertical center of gravity is 1'-6 1/2" [470] up from the bottom of the base rail.

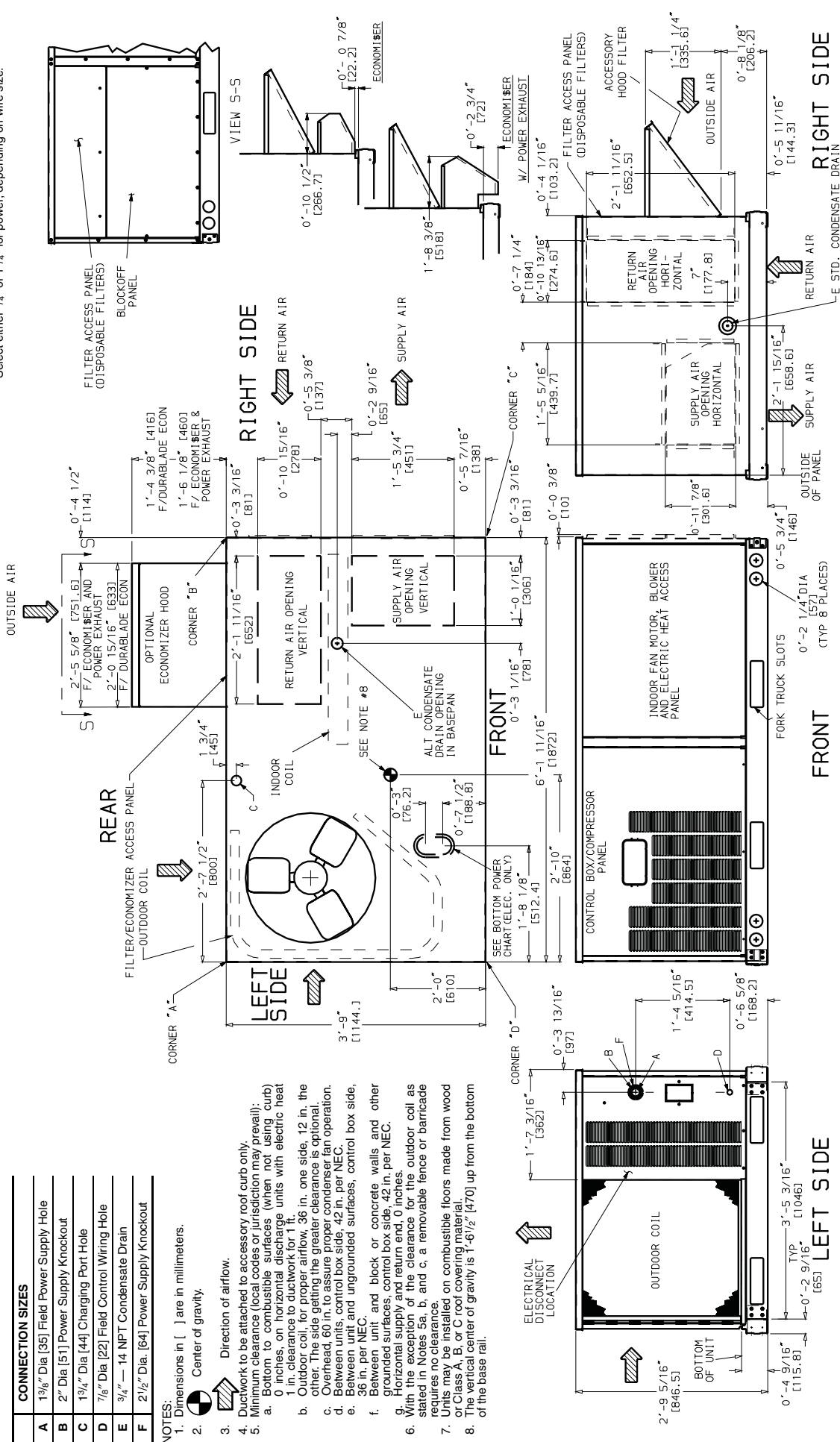


Fig. 5 — Base Unit Dimensions

Step 5 — Make Electrical Connections

⚠ WARNING

Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC (National Electrical Code), ANSI /NFPA (American National Standards Institute/National Fire Protection Association) 70 (latest year), and local electrical codes. Failure to follow this warning could result in the installer being liable for personal injury or others.

FIELD POWER SUPPLY — All units except 208/230-v units are factory wired for the voltage shown on the nameplate. If the 208/230-v unit is to be connected to a 208-v power supply, the transformer *must* be rewired by disconnecting the black wire from the 230-v 1/4-in. male spade terminal on the transformer and connecting it to the 208-v 1/4-in. male spade terminal from the transformer.

Refer to unit label diagram for additional information. Pig-tails are provided for field wire connections. Use factory-supplied splices or UL (Underwriters' Laboratories) approved copper/aluminum connector.

When installing units, provide a disconnect per the NEC. All field wiring must comply with the NEC and local requirements.

Install field wiring as follows:

1. Install conduit through side panel openings. For units without electric heat, install conduit between disconnect and control box.
2. Install power lines to terminal connections as shown in Fig. 6.
3. For units with electric heat, refer to Accessory Electric Heat Installation Instructions.

During operation, voltage to compressor terminals must be within range indicated on unit nameplate (also see Tables 2A-2D). On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in Tables 2A-2D, Note 2, on page 10 to determine the percentage of voltage imbalance. Operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation invalidates any applicable Carrier warranty.

NOTE: If accessory thru-the-bottom connections and roof curbs are used, refer to the thru-the-bottom accessory installation instructions for information on wiring the unit.

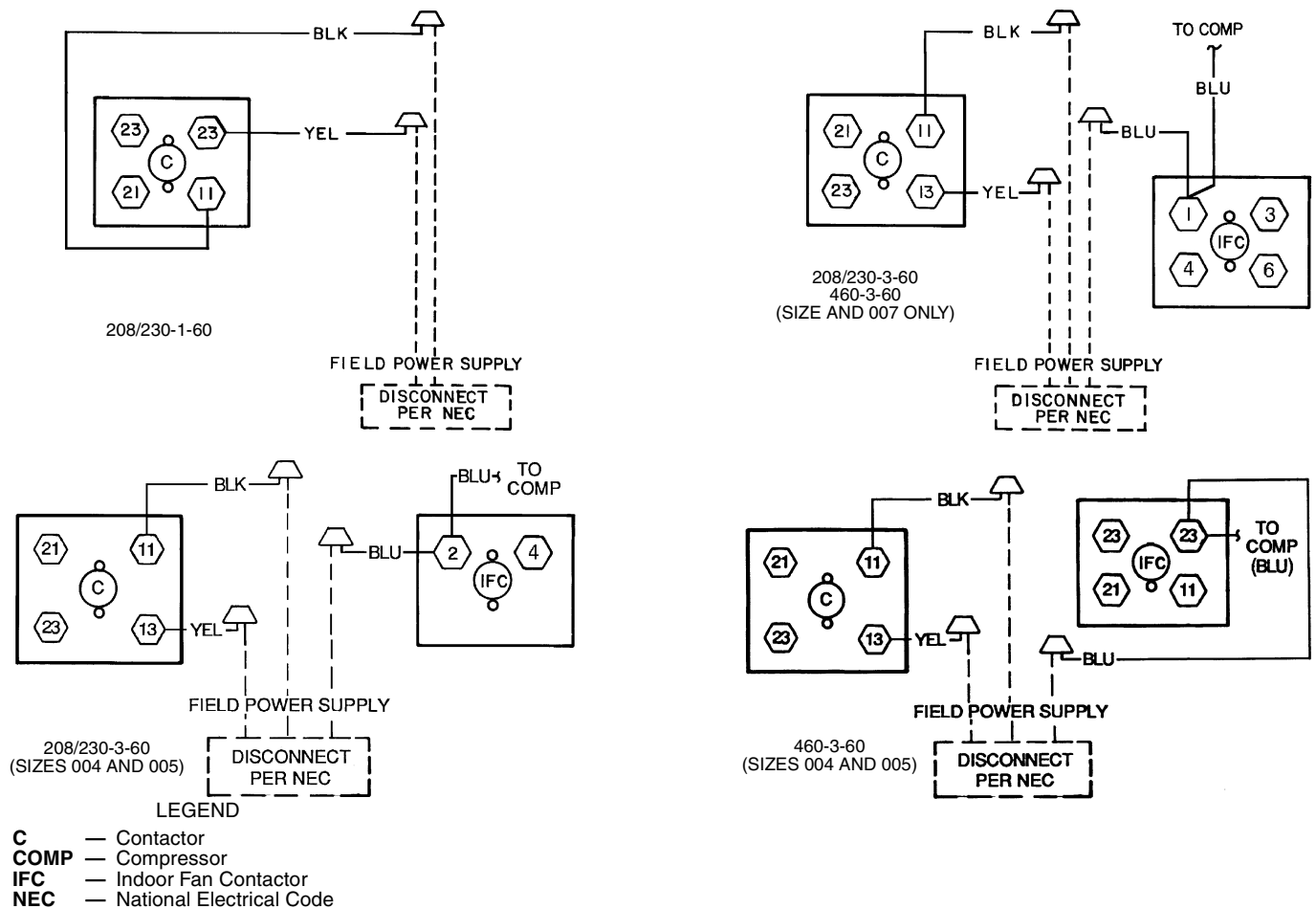


Fig. 6 — Power Wiring Connections

Table 1 — Physical Data

UNIT SIZE 50HJQ		004	005	006	007
NOMINAL CAPACITY (tons)		3	4	5	6
OPERATING WEIGHT (lb)					
Unit		500	550	590	610
Durablade Economizer		34	34	34	34
EconoMiSer		47	47	47	47
Roof Curb		115	115	115	115
COMPRESSOR		Scroll			
Quantity		1	1	1	1
Oil (oz)		42	53	50	60
REFRIGERANT TYPE		R-22			
Operating Charge (lb)		6.9	9.6	10.8	11.9
OUTDOOR FAN		Propeller Type			
Quantity...Diameter (in.)		1...22	1...22	1...22	1...22
Nominal Cfm		3500	3500	4100	4100
Motor Hp...Rpm		1/8...825	1/8...825	1/4...1100	1/4...1100
OUTDOOR COIL		Enhanced Copper Tubes, Aluminum Fins, Acutrol™ Metering Device			
Rows...Fins/in.		1...17	2...17	2...17	2...17
Total Face Area (sq ft)		14.58	16.53	16.53	16.53
INDOOR FAN		Centrifugal Type			
Quantity...Size (in.)		1...10 x 10	1...10 x 10	1...10 x 10	1...10 x 10
	Std	1...10 x 10	1...10 x 10	1...10 x 10	1...10 x 10
Type Drive		Belt	Belt	Belt	Belt
	High-Static	Belt	Belt	Belt	Belt
Nominal Cfm		1200	1600	2000	2400
Maximum Continuous Bhp		1.20	1.20	1.80/2.40*	2.40
	Std	2.40	2.40	2.90	2.90
Motor Frame Size		48	48	56	56
	High-Static	56	56	56	56
Nominal Rpm High/Low		1620	1620	1725	—
	Std	1725	1725	1725	1725
Fan Rpm Range		760-1090	840-1185	1020-1460	1120-1585
	High-Static	1075-1455	1075-1455	1300-1685	1300-1685
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	Std	1.9/2.9	1.9/2.9	2.4/3.4	2.4/3.4
	High-Static	2.8/3.8	2.8/3.8	3.4/4.4	3.4/4.4
Nominal Motor Shaft Diameter (in.)	Std	1/2	1/2	5/8	5/8
	High-Static	5/8	5/8	5/8	5/8
Fan Pulley Pitch Diameter (in.)	Std	4.5	4.0	4.5	3.7
	High-Static	4.5	4.5	4.5	4.5
Belt, Quantity...Type...Length (in.)	Std	1...A...34	1...A...34	1...A...39	1...A...40
	High-Static	1...A...39	1...A...39	1...A...40	1...A...40
Pulley Center Line Distance (in.)	Std	10.0-12.4	10.0-12.4	14.7-15.5	14.7-15.5
	High-Static	10.0-12.4	10.0-12.4	14.7-15.5	14.7-15.5
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Std	48	70	80	80
	High-Static	65	65	60	60
Movable Pulley Maximum Full Turns From Closed Position	Std	5	5	6	5
	High-Static	6	6	5	5
Factory Setting	Std	3	3	3	3
	High-Static	3 1/2	3 1/2	3 1/2	3 1/2
Factory Speed Setting (rpm)	Std	890	980	1240	1300
	High-Static	1233	1233	1396	1396
Fan Shaft Diameter at Pulley (in.)		5/8	5/8	5/8	5/8
INDOOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Acutrol Metering Device			
Rows...Fins/in.		2...15	2...15	4...15	4...15
Total Face Area (sq ft)		5.5	5.5	5.5	5.5
HIGH-PRESSURE SWITCH (psig)		428			
Cutout		320			
Reset (Auto.)					
LOSS OF CHARGE (Low-Pressure Switch) (Liquid Line) (psig)					
Cutout		7 ± 3			
Reset (Auto.)		22 ± 5			
FREEZE PROTECTION THERMOSTAT					
Opens (F)		30			
Closes (F)		45			
OUTDOOR-AIR INLET SCREENS		Cleanable			
Quantity...Size (in.)		1...20 x 24 x 1			
RETURN-AIR FILTERS		Throwaway			
Quantity...Size (in.)		2...16 x 25 x 2			

LEGEND

Bhp — Brake Horsepower

*Single phase/three phase.

Table 2A — Electrical Data — Standard Motor (Units Without Electrical Convenience Outlet)

UNIT	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE								
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP	FLA	LRA							
50HJQ004 (3 Tons)	208/230-1-60	187	254	16.0	88.0	0.7	4.9	—/— 3.3/ 4.4 4.9/ 6.5 6.5/ 8.7 7.9/10.5 9.8/13.0	—/— 15.9/18.3 23.6/27.1 31.3/36.3 38.0/43.8 47.1/54.2	25.6/ 25.6 45.5/ 48.5 55.1/ 59.5 64.7/ 71.0 73.1/ 80.4 84.5/ 93.4	30/ 30** 50/ 50** 60/ 60** 70/ 80 80/ 90 90/100	25/ 25 43/ 46 52/ 56 61/ 67 69/ 75 79/ 87	101/101 117/120 125/128 133/138 139/145 148/155††							
								208/230-3-60	187	254	10.3	77.0	0.7	4.9	—/— 3.3/ 4.4 4.9/ 6.5 6.5/ 8.7 7.9/10.5 12.0/16.0	—/— 9.2/10.6 13.6/15.6 18.0/20.9 21.9/25.3 33.3/38.5	18.5/ 18.5 30.0/ 31.7 35.5/ 38.0 41.0/ 44.6 45.9/ 50.1 60.1/ 66.6	20/20** 30/35** 40/40** 45/45** 50/60** 70/70	18/ 18 29/ 30 34/ 36 39/ 42 43/ 47 57/ 63	90/ 90 99/101 104/106 108/111 112/116 124/129
															460-3-60	414	508	5.1	39.0	0.4
	208/230-1-60	187	254	23.7	129.0	0.7	4.9													
								208/230-3-60	187	254	13.5	99.0	0.7	4.9						
															460-3-60	414	508	7.4	49.5	0.4
	208/230-1-60	187	254	28.8	169.0	1.5	8.8													
								208/230-3-60	187	254	17.3	123.0	1.5	5.8						
															460-3-60	414	508	9.0	62.0	0.8
208/230-3-60	187	254	20.5	156.0	1.4	5.8	—/— 4.9/ 6.5 6.5/ 8.7 12.0/16.0 15.8/21.0 19.9/26.5													
							460-3-60	414	508	9.6	70.0	0.6	2.6	— 6.0 11.5 14.0 23.0 25.5						

Table 2B — Electrical Data — High-Static Motor (Units Without Electrical Convenience Outlet)

UNIT	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP	FLA	LRA
50HJQ004 (3 Tons)	208/230-3-60	187	254	10.3	77.0	0.7	5.8	—/— 3.3/ 4.4 4.9/ 6.5 6.5/ 8.7 7.9/10.5 12.0/16.0	—/— 9.2/10.6 13.6/15.6 18.0/20.9 21.9/25.3 33.3/38.5	19.4/ 19.4 30.9/ 32.6 36.4/ 38.9 41.9/ 45.5 46.8/ 51.0 61.0/ 67.5	20/20 35/35 40/40 45/50 50/60 70/70	19/ 19 30/ 32 35/ 37 40/ 43 45/ 48 58/ 64	120/120 129/130 133/135 138/141 142/145 153/158
	460-3-60	414	508	5.1	39.0	0.4	2.6	— 6.0 8.8 11.5 14.0	— 7.2 10.6 13.8 16.8	9.4 18.4 22.6 26.6 30.4	15** 20** 25** 30** 35**	9 18 22 25 29	60 68 71 74 77
50HJQ005 (4 Tons)	208/230-3-60	187	254	13.5	99.0	0.7	5.8	—/— 4.9/ 6.5 6.5/ 8.7 12.0/16.0 15.8/21.0	—/— 13.6/15.6 18.0/20.9 33.3/38.5 43.9/50.5	23.4/ 23.4 40.4/ 42.9 45.9/ 49.5 65.0/ 71.5 78.3/ 86.5	25/ 25 45/ 45 50/ 50 70/ 80 80/ 90	23/ 23 39/ 41 44/ 47 61/ 67 73/ 81	142/142 155/157 160/163 175/180 186/192††
	460-3-60	414	508	7.4	49.5	0.4	2.6	— 6.0 11.5 14.0 23.0	— 7.2 13.8 16.8 27.7	12.3 21.3 29.5 33.3 46.9	15** 25** 30** 35** 50**	12 20 28 31 44	71 78 85 88 99
50HJQ006 (5 Tons)	208/230-3-60	187	254	17.3	123.0	1.5	7.5	—/— 4.9/ 6.5 7.9/10.5 12.0/16.0 15.8/21.0 19.9/26.5	—/— 13.6/15.6 21.9/25.3 33.3/38.5 43.9/50.5 55.2/63.8	30.6/ 30.6 47.6/ 50.1 58.0/ 62.3 72.3/ 78.8 85.5/ 93.8 99.6/110.4	35/ 35 50/ 60 60/ 70 80/ 80 90/100 100/125	30/ 30 46/ 48 55/ 59 69/ 75 81/ 88 94/104	187/187 200/202 209/212 220/225 231/237** 242/251**
	460-3-60	414	508	9.0	62.0	0.8	3.4	— 6.0 11.5 14.0 23.0 25.5	— 7.2 13.8 16.8 27.7 30.7	15.5 24.5 32.7 36.5 50.1 53.8	20** 25** 35** 40** 60** 60**	15 23 31 35 47 50	94 101 108 111 122 125
50HJQ007 (6 Tons)	208/230-3-60	187	254	20.5	156.0	1.4	7.5	—/— 4.9/ 6.5 7.9/10.5 12.0/16.0 15.8/21.0 19.9/26.5	—/— 13.6/15.6 21.9/25.3 33.3/38.5 43.9/50.5 55.2/63.8	34.5/ 34.5 51.5/ 54.0 61.9/ 66.2 76.2/ 82.7 89.4/ 97.7 103.5/114.3	35/ 35 60/ 60 70/ 70 80/ 90 90/100 110/125	34/ 34 49/ 52 59/ 63 72/ 78 84/ 92 97/107	219/219 233/235 241/244 252/258 263/270** 274/283**
	460-3-60	414	508	9.6	70.0	0.6	3.4	— 6.0 11.5 14.0 23.0 25.5	— 7.2 13.8 16.8 27.7 30.7	16.0 25.0 33.3 37.0 50.6 54.4	20** 25** 35** 40** 60** 60**	16 24 32 35 47 51	102 109 115 118 129 132

See Legend on page 10.

Table 2C — Electrical Data — Standard Motor (Units With Electrical Convenience Outlet)

UNIT	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP	FLA	LRA
50HJQ004 (3 Tons)	208/230-1-60	187	254	16.0	88.0	0.7	4.9	—/— 3.3/ 4.4 4.9/ 6.5 6.5/ 8.7 7.9/10.5 9.8/13.0	— 15.9/18.3 23.6/27.1 31.3/36.3 38.0/43.8 47.1/54.2	30.4/ 30.4 50.3/ 53.3 59.9/ 64.3 69.5/ 75.8 77.9/ 85.2 89.3/ 98.2	35/ 35** 60/ 60** 60/ 70 70/ 80 80/ 90 90/100	30/ 30 49/ 51 58/ 62 66/ 72 74/ 81 85/ 93	106/106 122/124 130/133 137/142 144/150†† 153/160††
	208/230-3-60	187	254	10.3	77.0	0.7	4.9	—/— 3.3/ 4.4 4.9/ 6.5 6.5/ 8.7 7.9/10.5 12.0/16.0	—/— 9.2/10.6 13.6/15.6 18.0/20.9 21.9/25.3 33.3/38.5	23.3/ 23.3 34.8/ 36.5 40.3/ 42.8 45.8/ 49.4 50.7/ 54.9 64.9/ 71.4	25/ 25** 35/ 40** 45/ 45** 50/ 50** 60/ 60** 70/ 80	24/ 24 34/ 36 39/ 42 45/ 48 49/ 53 62/ 68	95/ 95 104/106 109/111 113/116 117/120 128/134
	460-3-60	414	508	5.1	39.0	0.4	2.2	— 6.0 8.8 11.5 14.0	— 7.2 10.6 13.8 16.8	11.2 20.2 24.4 28.4 32.2	15** 25** 25** 30** 35**	11 20 24 27 31	48 55 59 62 65
50HJQ005 (4 Tons)	208/230-1-60	187	254	23.7	129.0	0.7	4.9	—/— 3.3/ 4.4 4.9/ 6.5 6.5/ 8.7 9.8/13.0 13.1/17.4 15.8/21.0	—/— 15.9/18.3 23.6/27.1 31.3/36.3 38.0/43.8 47.1/54.2 63.0/72.5 76.0/87.5	40.0/ 40.0 59.9/ 62.9 79.2/ 85.4 98.9/107.8 118.8/130.7 135.0/149.4	45/ 45** 60/ 70 80/ 90 100/110 125/150 150/150	39/ 39 58/ 60 75/ 81 93/102 112/123 127/140	147/147 163/165 178/183†† 194/201†† 210/220†† 223/235††
	208/230-3-60	187	254	13.5	99.0	0.7	4.9	—/— 4.9/ 6.5 6.5/ 8.7 9.8/13.0 12.0/16.0 15.8/21.0	—/— 13.6/15.6 18.0/20.9 21.9/25.3 33.3/38.5 43.9/50.5	27.3/ 27.3 44.3/ 46.8 49.8/ 53.4 68.9/ 75.4 82.2/ 90.4	30/ 30** 45/ 50** 50/ 60** 70/ 80 90/100	27/ 27 43/ 45 48/ 52 66/ 72 78/ 86	117/117 131/133 135/138 150/156 161/168††
	460-3-60	414	508	7.4	49.5	0.4	2.2	— 6.0 11.5 14.0 23.0	— 7.2 13.8 16.8 27.7	14.0 23.0 31.3 35.0 48.7	15** 25** 35** 40** 50**	14 22 30 33 46	59 66 73 76 86
50HJQ006 (5 Tons)	208/230-1-60	187	254	28.8	169.0	1.5	8.8	—/— 4.9/ 6.5 6.5/ 8.7 9.8/13.0 13.1/17.4 15.8/21.0	—/— 23.6/27.1 31.3/36.3 38.0/43.8 47.1/54.2 63.0/72.5 76.0/87.5	51.1/ 51.1 80.6/ 85.0 90.2/ 96.5 110.0/118.9 129.9/141.7 146.1/160.5	60/ 60** 90/ 90 100/100 110/125 150/150 150/175	50/ 50 78/ 82 86/ 92 105/113 123/134 138/151	221/221 245/248†† 252/257†† 268/275†† 284/293†† 297/308††
	208/230-3-60	187	254	17.3	123.0	1.5	5.8	—/— 4.9/ 6.5 7.9/10.5 12.0/16.0 15.8/21.0 19.9/26.5	—/— 13.6/15.6 21.9/25.3 33.3/38.5 43.9/50.5 55.2/63.8	33.7/ 33.7 50.7/ 53.2 61.1/ 65.4 75.4/ 81.9 88.6/ 96.9 102.7/113.5	35/ 35** 60/ 60** 70/ 70 80/ 90 90/100 110/125	34/ 34 49/ 52 59/ 63 72/ 78 84/ 92 97/107	173/173 186/188 194/198 206/211 216/223†† 228/236††
	460-3-60	414	508	9.0	62.0	0.8	2.6	— 6.0 11.5 14.0 23.0 25.5	— 7.2 13.8 16.8 27.7 30.7	16.8 25.8 34.1 37.8 51.5 55.2	20** 30** 35** 40** 60** 60**	17 25 33 36 49 52	87 94 100 103 114 117
50HJQ007 (6 Tons)	208/230-3-60	187	254	20.5	156.0	1.4	5.8	—/— 4.9/ 6.5 7.9/10.5 12.0/16.0 15.8/21.0 19.9/26.5	—/— 13.6/15.6 21.9/25.3 33.3/38.5 43.9/50.5 55.2/63.8	37.6/ 37.6 54.6/ 57.1 65.0/ 69.3 79.3/ 85.8 92.5/100.8 106.6/117.4	40/ 40** 60/ 60** 70/ 70 80/ 90 100/110 110/125	37/ 37 53/ 55 63/ 66 76/ 82 88/ 95 101/111	205/205 219/221 227/230 238/243†† 249/255†† 260/269††
	460-3-60	414	508	9.6	70.0	0.6	2.6	— 6.0 11.5 14.0 23.0 25.5	— 7.2 13.8 16.8 27.7 30.7	17.4 26.4 34.6 38.4 52.0 55.8	20** 30** 35** 40** 60** 60**	17 26 33 37 49 53	94 101 108 111 122 125

See Legend on page 10.

Table 2D — Electrical Data — High-Static Motor (Units With Electrical Convenience Outlet)

UNIT	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA			kW†	FLA	MCA	MOCP	FLA	LRA
50HJQ004 (3 Tons)	208/230-3-60	187	254	10.3	77.0	0.7	5.8	—/— 3.3/ 4.4 4.9/ 6.5 6.5/ 8.7 7.9/10.5 12.0/16.0	—/— 9.2/10.6 13.6/15.6 18.0/20.9 21.9/25.3 33.3/38.5	24.2/ 24.2 35.7/ 37.4 41.2/ 43.7 46.7/ 50.3 51.6/ 55.8 65.8/ 72.3	25/ 25 40/ 40 45/ 45 50/ 60 60/ 60 70/ 80	25/ 25 35/ 37 40/ 43 46/ 49 50/ 54 63/ 69	124/124 134/135 138/140 142/145 146/150 158/163
	460-3-60	414	508	5.1	39.0	0.4	2.6	— 6.0 8.8 11.5 14.0	— 7.2 10.6 13.8 16.8	11.6 20.6 24.8 28.8 33.6	15** 25** 25** 30** 35**	12 20 24 28 31	63 70 73 76 79
50HJQ005 (4 Tons)	208/230-3-60	187	254	13.5	99.0	0.7	5.8	—/— 4.9/ 6.5 6.5/ 8.7 12.0/16.0 15.8/21.0	—/— 13.6/15.6 18.0/20.9 33.3/38.5 43.9/50.5	28.2/ 28.2 45.2/ 47.7 50.7/ 54.3 69.8/ 76.3 83.1/ 91.3	30/ 30 50/ 50 60/ 60 70/ 80 90/100	29/ 29 44/ 46 49/ 53 67/ 73 79/ 87	146/146 160/162 164/167 180/185 190/197††
	460-3-60	414	508	7.4	49.5	0.4	2.6	— 6.0 11.5 14.0 23.0	— 7.2 13.8 16.8 27.7	14.4 23.4 31.7 35.4 49.1	15** 25** 35** 40** 50**	14 23 30 34 46	73 80 87 90 101
50HJQ006 (5 Tons)	208/230-3-60	187	254	17.3	123.0	1.5	7.5	—/— 4.9/ 6.5 7.9/10.5 12.0/16.0 15.8/21.0 19.9/26.5	—/— 13.6/15.6 21.9/25.3 33.3/38.5 43.9/50.5 55.2/63.8	35.4/ 35.4 52.4/ 54.9 62.8/ 67.1 77.1/ 83.6 90.3/ 98.6 104.4/115.2	40/ 40 60/ 60 70/ 70 80/ 90 100/100 110/125	36/ 36 51/ 54 61/ 65 74/ 80 86/ 94 99/109	192/192 205/207 213/217 225/230†† 235/242†† 247/255††
	460-3-60	414	508	9.0	62.0	0.8	3.4	— 6.0 11.5 14.0 23.0 25.5	— 7.2 13.8 16.8 27.7 30.7	17.6 26.6 34.9 38.6 52.3 56.0	20** 30** 35** 40** 60** 60**	18 26 34 37 50 53	96 103 110 113 124 127
50HJQ007 (6 Tons)	208/230-3-60	187	254	20.5	156.0	1.4	7.5	—/— 4.9/ 6.5 7.9/10.5 12.0/16.0 15.8/21.0 19.9/26.5	—/— 13.6/15.6 21.9/25.3 33.3/38.5 43.9/50.5 55.2/63.8	39.3/ 39.3 56.3/ 58.8 66.7/ 71.0 81.0/ 87.5 94.2/102.5 108.3/119.1	40/ 40 60/ 60 70/ 80 90/ 90 100/110 110/125	39/ 39 55/ 57 65/ 68 78/ 84 90/ 97 103/113	224/224 238/240 246/249 257/262†† 268/274†† 279/288††
	460-3-60	414	508	9.6	70.0	0.6	3.4	— 6.0 11.5 14.0 23.0 25.5	— 7.2 13.8 16.8 27.7 30.7	18.2 27.2 35.4 39.2 52.8 56.6	20** 30** 40** 40** 60** 60**	18 26 34 37 50 53	104 111 118 121 131 134

LEGEND

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
NEC	— National Electrical Code
OFM	— Outdoor-Fan Motor
RLA	— Rated Load Amps



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

†Heaters are field installed only.

**Fuse or HACR circuit breaker.

††Electrical disconnect cannot be used if electric heater is installed.

NOTES:

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

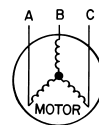
2. Unbalanced 3-Phase Supply Voltage

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

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

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

$$= 457$$

Determine maximum deviation from average voltage.

(AB) 457 – 452 = 5 v

(BC) 464 – 457 = 7 v

(AC) 457 – 455 = 2 v

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

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

$$= 1.53\%$$

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.

FIELD CONTROL WIRING — Install a Carrier-approved accessory thermostat assembly according to installation instructions included with the accessory. Locate thermostat assembly on a solid wall in the conditioned space to sense average temperature in accordance with thermostat installation instructions.

NOTE: If using Carrier electronic thermostat, set thermostat configuration for “non-heat pump operation.” The use of the O terminal is not required to energize the reversing valve in this family of products.

Route thermostat cable or equivalent single leads of colored wire from subbase terminals to low-voltage connections on unit (shown in Fig. 7) as described in Steps 1 through 3 below.

NOTE: For wire runs up to 50 ft, use no. 18 AWG (American Wire Gage) insulated wire (35 C minimum). For 50 to 75 ft, use no. 16 AWG insulated wire (35 C minimum). For over 75 ft, use no. 14 AWG insulated wire (35 C minimum). All wire larger than no. 18 AWG cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat.

1. Connect thermostat wires to screw terminals of low voltage connection board.
2. Pass the control wires through the hole provided in the corner post.
3. Feed wire through the raceway built into the corner post to the 24-v barrier located on the left side of the control box. See Fig. 8. The raceway provides the UL-required clearance between the high- and low-voltage wiring.

DEFROST BOARD — The defrost board timer is set for a 30 minute defrost cycle from the factory. To adjust to a 50 or 90 minute cycle, remove the wire connected to the 30 minute quick connect on the defrost board. See Fig. 9. Connect lead to the 50 or 90 minute quick connect on the defrost board, depending on the application.

HEAT ANTICIPATOR SETTINGS — Set first-stage heat anticipator setting at 0.8 and set second-stage heat anticipator setting at 0.3.

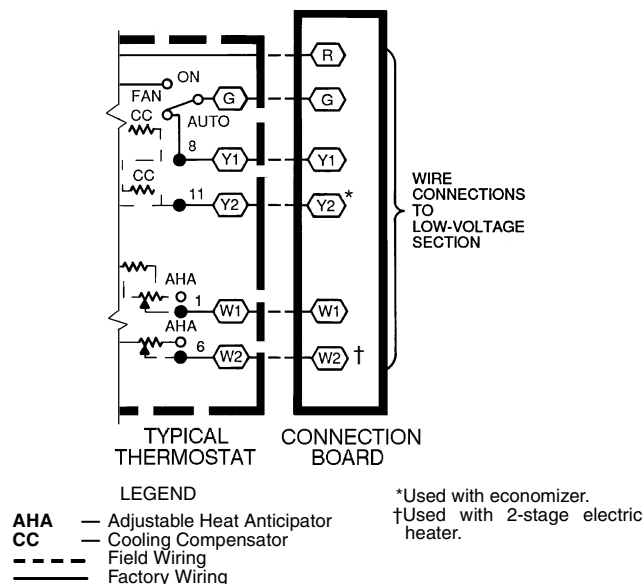


Fig. 7 — Low-Voltage Connections With or Without Economizer or Two-Position Damper

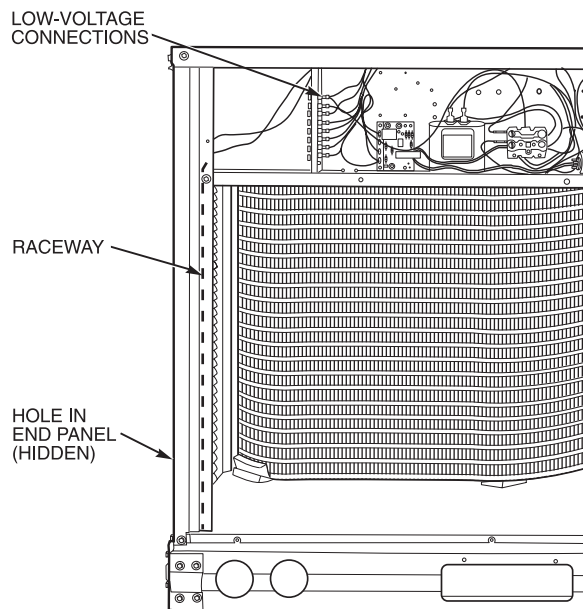


Fig. 8 — Field Control Wiring Raceway

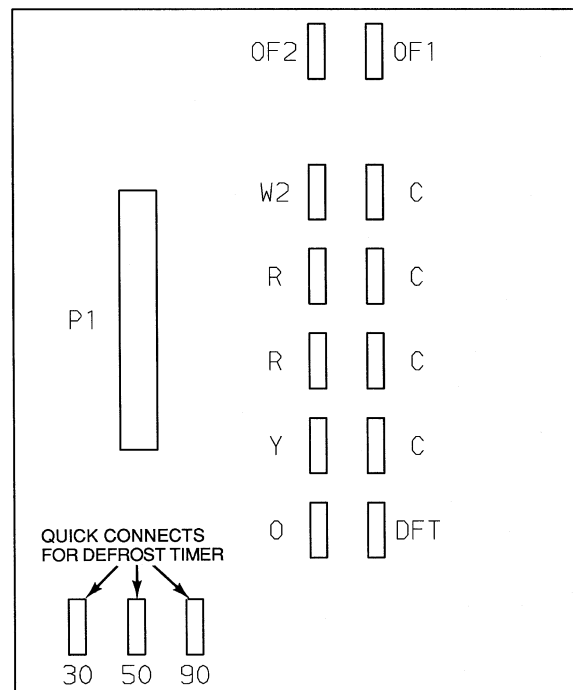


Fig. 9 — Defrost Board

Step 6 — Adjust Factory-Installed Options

DISCONNECT SWITCH — The optional disconnect switch is non-fused. The switch has the capability of being locked in place for safety purposes. The disconnect switch is only available for limited applications. See Electrical Data Tables 2A-2D on pages 7-10 for disconnect switch usage.

OPTIONAL DURABLADE ECONOMIZER — The optional economizer hood assembly is packaged and shipped in the filter section. Damper blades and control boards are installed at the factory and the economizer is shipped in the vertical discharge position.

NOTE: Horizontal discharge block-off plate is shipped with the air hood package. If unit is to be used for vertical discharge application, discard this plate.

Assembly

1. Determine if ventilation air is required in building. If so, determine the minimum amount to be supplied by each unit and record quantity of ventilation air needed for use in Step 7.
2. Remove filter access panel by raising panel and swinging panel outward. Panel is now disengaged from track and can be removed. No tools are required to remove filter access panel. Remove outdoor-air opening panel. Save panels and screws. See Fig. 10. Remove optional outdoor-air hood package from filter section.
3. Assemble outdoor-air hood top and side plates as shown in Fig. 11. Install seal strips on hood top and sides. Put aside screen retainer and screws for later assembly. *Do not attach hood to unit at this time.*
4. Slide economizer into unit and secure with screws. See Fig. 14.

NOTE: Be sure to engage rear economizer flange under tabs in vertical return-air opening.

5. To convert to horizontal discharge application:
 - a. Rotate the economizer 90 degrees until the economizer motor faces the condenser section (see Fig. 12).
 - b. Rotate the barometric relief damper hinge 90 degrees. Barometric relief damper should open vertically to operate properly.
 - c. Install horizontal discharge block-off plate over the opening on the access panel. (Block-off plate **MUST** be installed before installing hood assembly.) See Fig. 13.
6. Insert economizer plug into economizer harness. Remove tape from barometric relief damper. See Fig. 14. Remove shipping screw (see Fig. 12).
7. If ventilation air is not required, proceed to Step 8. If ventilation air is required, determine the minimum position setting for required airflow. See Fig. 15. Adjust minimum position setting by adjusting the screws on the position setting bracket. Slide bracket until the top screw is in the position determined by Fig. 15. Tighten screws.
8. Remove tape from outdoor-air thermostat (OAT). Fasten OAT to inside of hood using screws and speed clips provided. See Fig. 16. Make sure OAT terminals are positioned up.
9. Replace outdoor-air opening panel using screws from Step 2. Replace filter access panel. Ensure the filter access panel slides along the tracks and is securely engaged.
10. Fasten hood top and side plate assembly (Fig. 11) to outdoor-air opening panel with screws provided.
11. Place knob supplied with economizer on OAT. See Fig. 16. Set for 3° F below indoor room thermostat setting. If accessory enthalpy control (EC) is used in place of OAT, see instructions shipped with EC for installation and adjustment. See Fig. 16.
12. Connect OAT per Fig. 17.
13. Slide outdoor-air inlet screen into screen track on hood side plate. While holding screen in place, fasten screen retainer to hood using screws provided.

NOTE: Refer to Fig. 18 for economizer barometric relief damper characteristics.

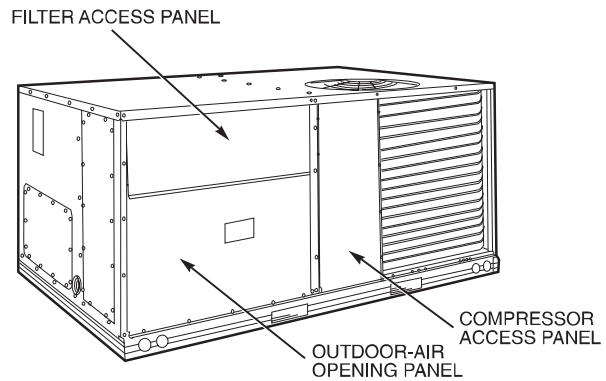


Fig. 10 — Typical Access Panel Locations

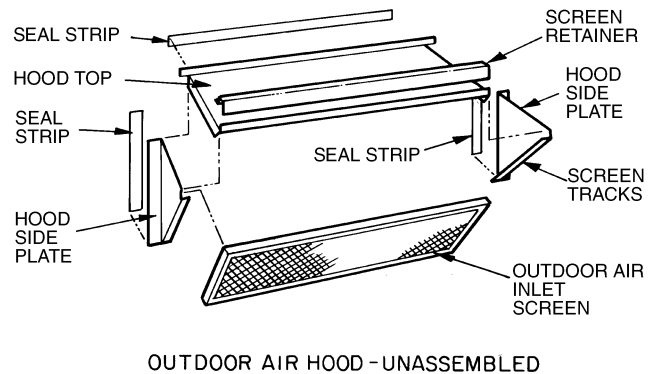


Fig. 11 — Outdoor-Air Hood Details

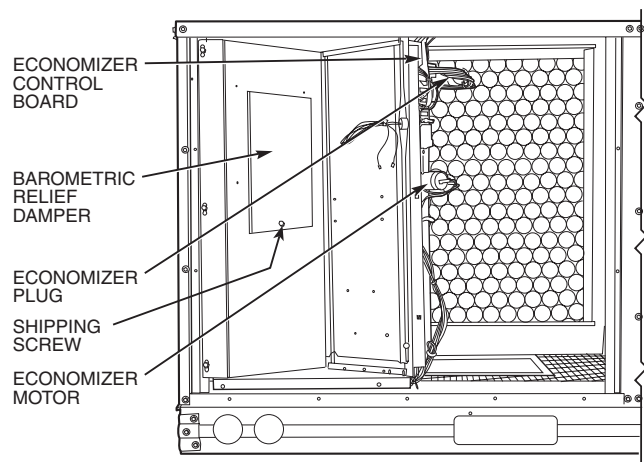


Fig. 12 — Horizontal Durablade Economizer Installation

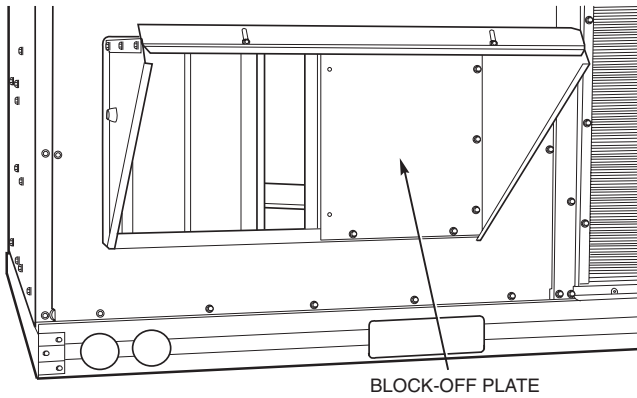


Fig. 13 — Horizontal Discharge Block-Off Plate

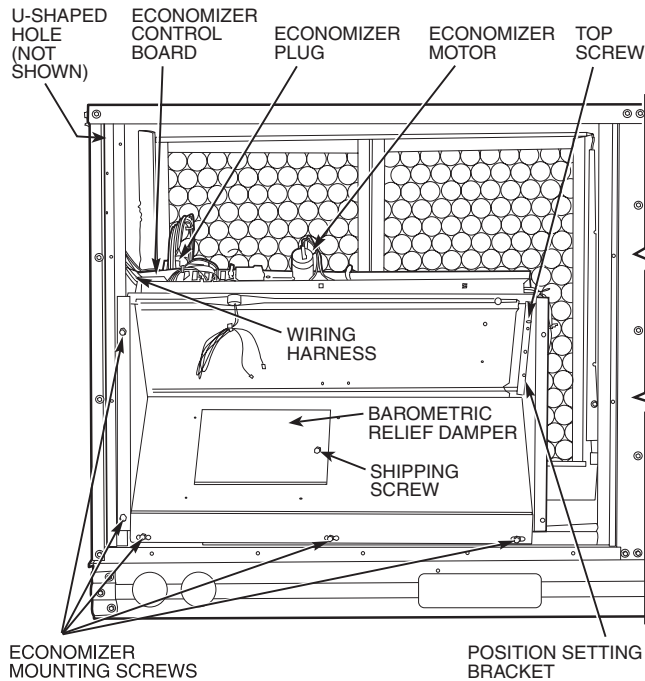
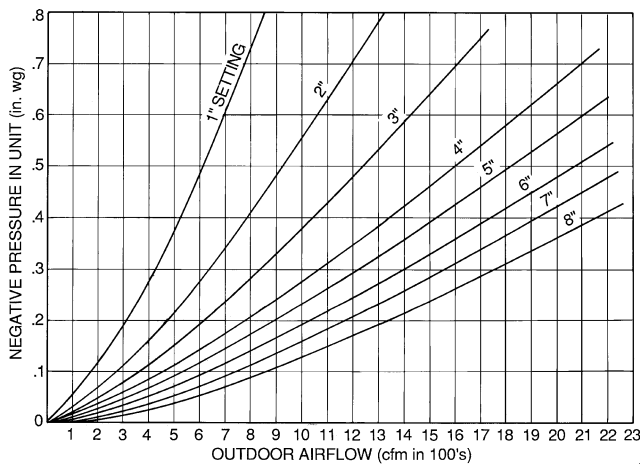


Fig. 14 — Durablade Economizer Installed in Unit



Example:
 Given — Negative Pressure 0.2 in. wg
 Outdoor Air 900 cfm
 Determine — Setting = 5 in.

Fig. 15 — Durablade Economizer Minimum Position Setting

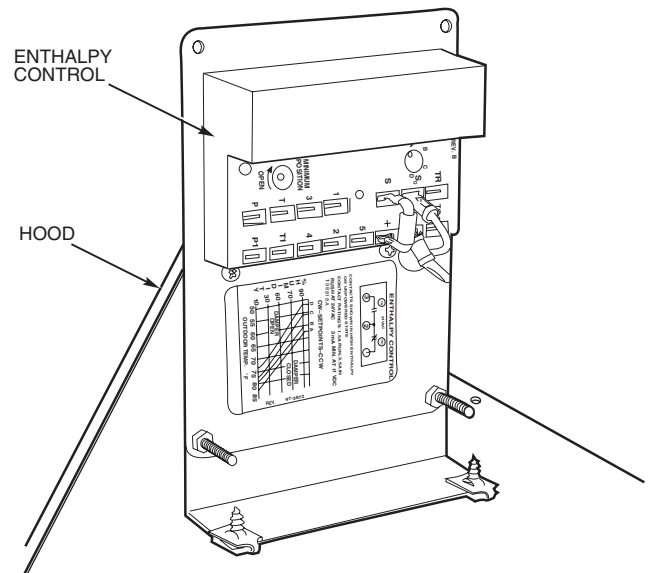
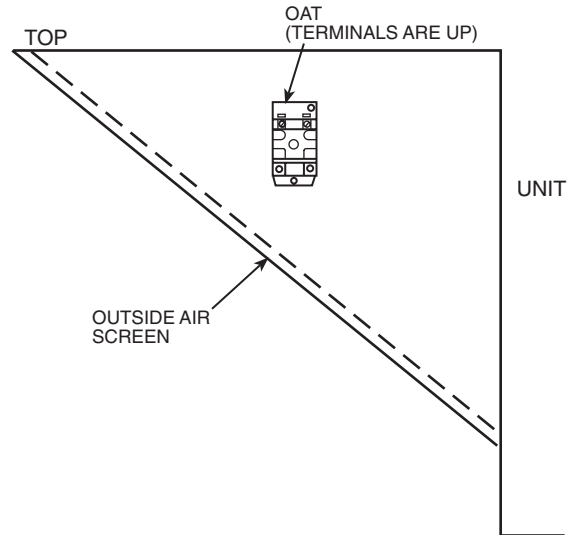
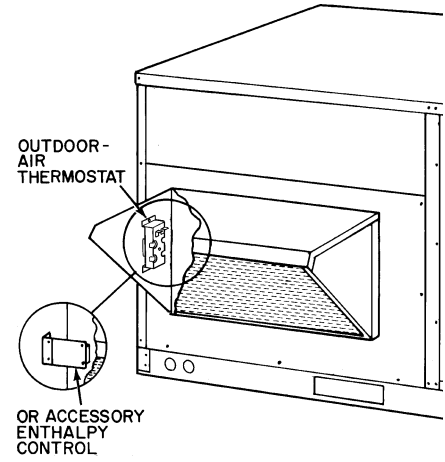
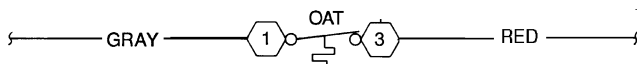


Fig. 16 — Outdoor-Air Thermostat/Enthalpy Control Installation



LEGEND
OAT — Outdoor-Air Thermostat

NOTE: See unit wiring diagram for more details.

Fig. 17 — Wiring Connections for Outdoor-Air Thermostat

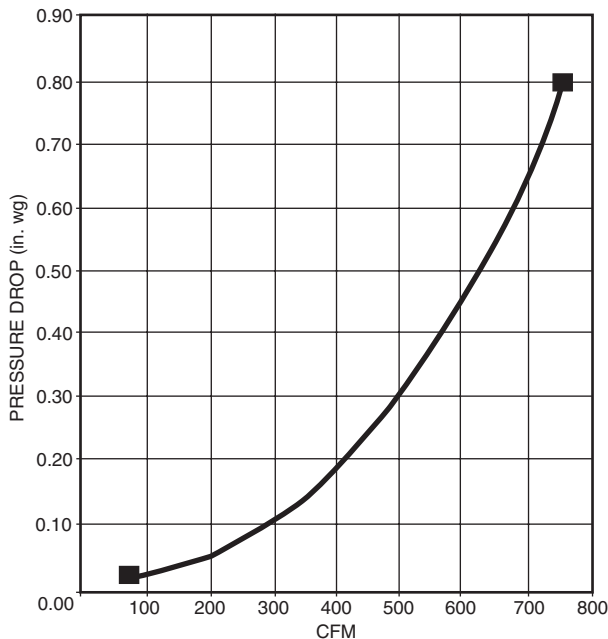


Fig. 18 — Durablade Economizer Barometric Relief Damper Characteristics

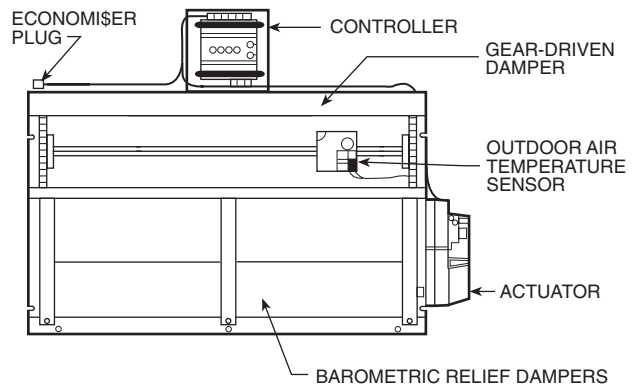


Fig. 19 — EconoMi\$er Component Locations

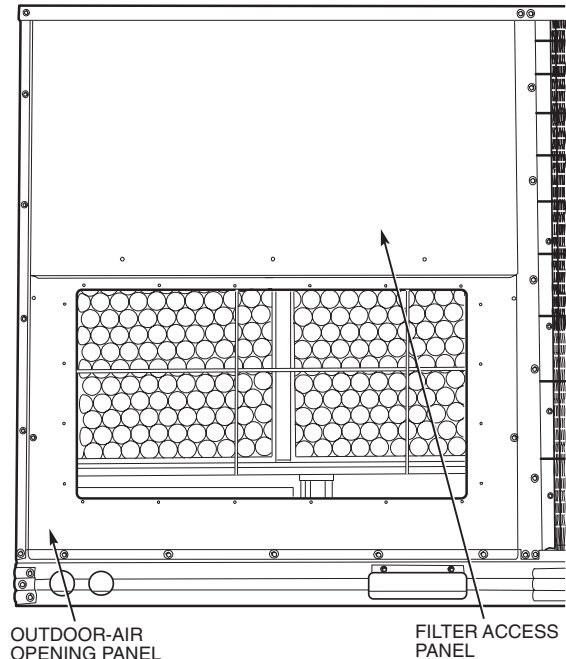


Fig. 20 — Typical Access Panel Locations

OPTIONAL ECONOMISER — See Fig. 19 for EconoMi\$er component locations.

1. To remove the existing unit filter access panel, raise the panel and swing the bottom outward. The panel is now disengaged from the track and can be removed. Remove the indoor coil access panel and discard. See Fig. 20.

If installing an optional Power Exhaust Assembly, refer to the *EconoMi\$er Power Exhaust Installation Instructions*.

Controller should be mounted in vertical position as shown in Fig. 19.

2. Assemble the hood assembly as follows:

Remove the EconoMi\$er hood from its packaging. Remove shipping brackets holding hood package to EconoMi\$er. Locate the outdoor-air opening panel. See Fig. 21. Remove hood assembly shipping brackets located on the back (sloped) side of the EconoMi\$er assembly. These brackets are used to retain the hood assembly during shipping only.

3. Install the $\frac{1}{8} \times \frac{3}{4}$ in. seal strip on the exhaust air hood side panels and the bottom bracket. Assemble the exhaust air hood to the outdoor-air opening panel as shown in Fig. 21, using the screws provided. *Do not attach hood assembly to unit at this time.*
4. Install the $\frac{1}{8} \times \frac{3}{4}$ in. seal strip on the outdoor-air hood top and side panels. Assemble the outdoor-air hood to the outdoor-air opening panel as shown in Fig. 22, using the screws provided. *Do not attach hood assembly to the unit at this time.*

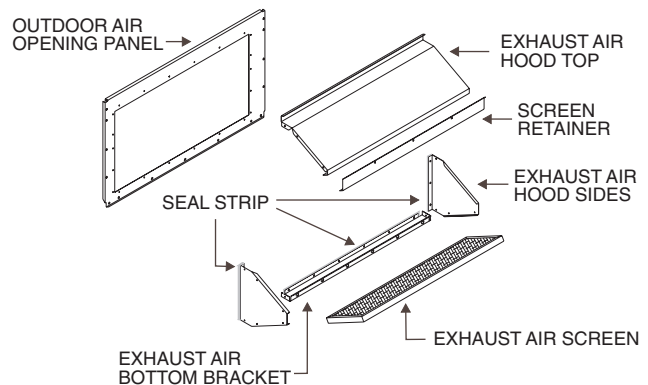


Fig. 21 — Exhaust Air Hood Assembly

5. Slide the outdoor-air inlet screens into the screen track on the hood side panels. While holding the screens in place, fasten the screen retainer to the hood using the screws provided. Repeat the process for the barometric exhaust air screen. *Do not attach completed (Fig. 23) hood assembly to unit at this time.*
6. Slide the EconoMi\$er assembly into the rooftop unit. See Fig. 24 and 25.

NOTE: Be sure to engage rear EconoMi\$er flange under tabs in return air opening of the unit base. See Fig. 24.

7. Install the outdoor air block-off plate, then secure the EconoMi\$er with the screws provided. See Fig. 25.
8. Remove and store the 12-pin jumper plug from the unit wiring harness located in the upper left corner and insert the EconoMi\$er plug into the unit wiring harness. Refer to wiring diagrams Fig. 26 and 27. Also refer to Fig. 28 if installing an accessory power exhaust.
9. Install the complete hood assembly on the unit and secure using the screws provided.
10. Remove the indoor fan motor access panel. See Fig. 29.
11. Mount the supply-air temperature sensor to the lower left portion of the indoor blower housing with the two (2) screws provided (see Fig. 30). Connect the violet and pink wires to the corresponding connections on the supply-air temperature sensor. Replace the indoor fan motor access panel.

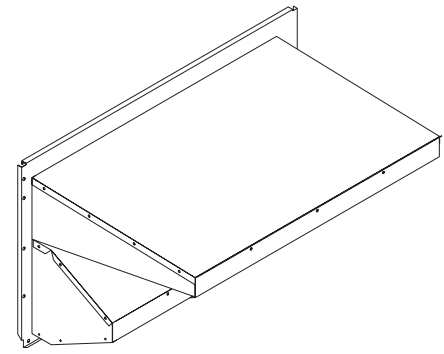


Fig. 23 — Completed Hood Assembly

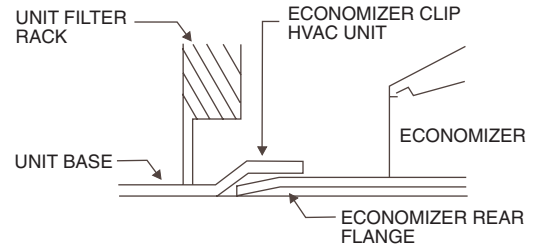


Fig. 24 — Completed Hood Assembly

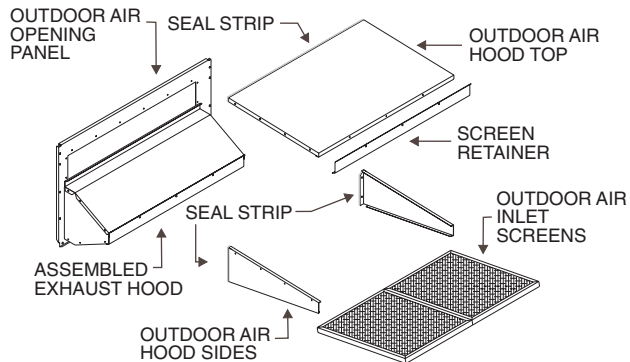


Fig. 22 — Outdoor-Air Hood Assembly

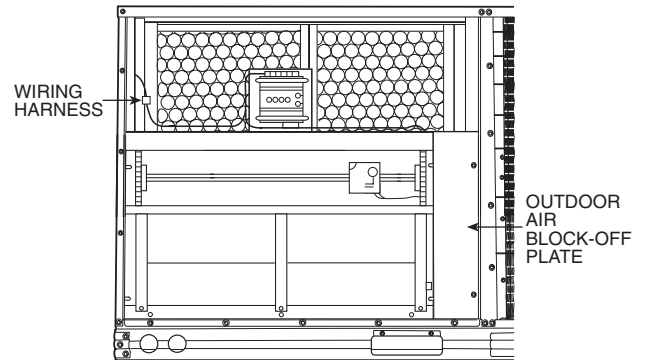


Fig. 25 — EconoMi\$er Installed

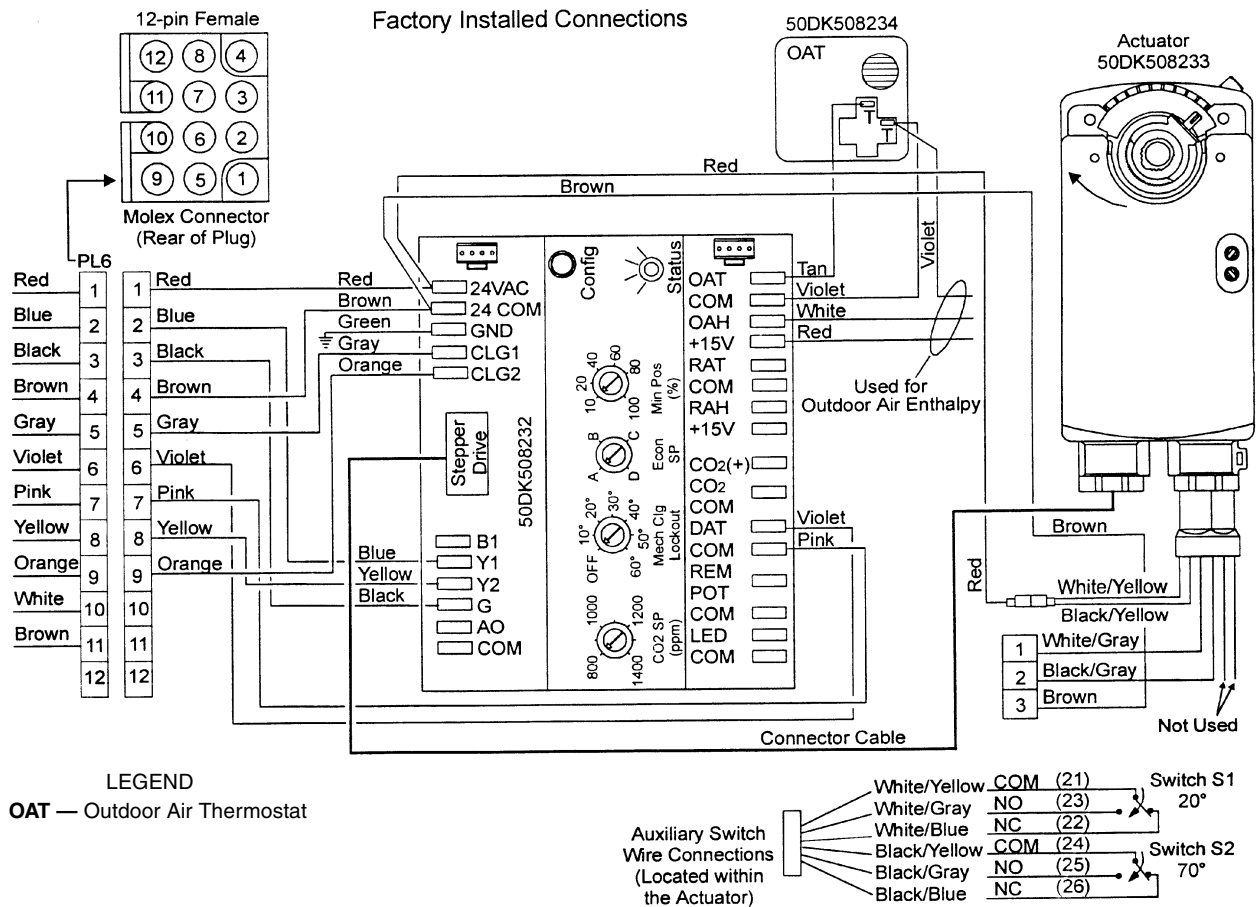


Fig. 26 — EconoMi\$er Wiring

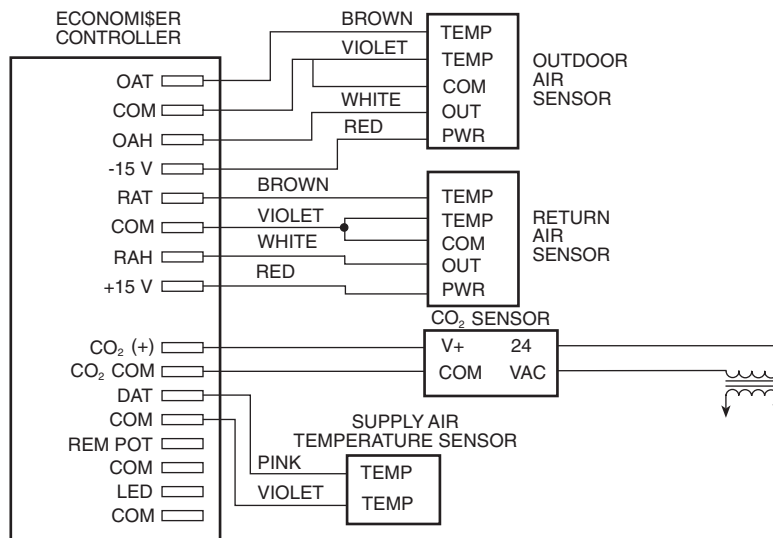


Fig. 27 — EconoMi\$er Sensor Wiring

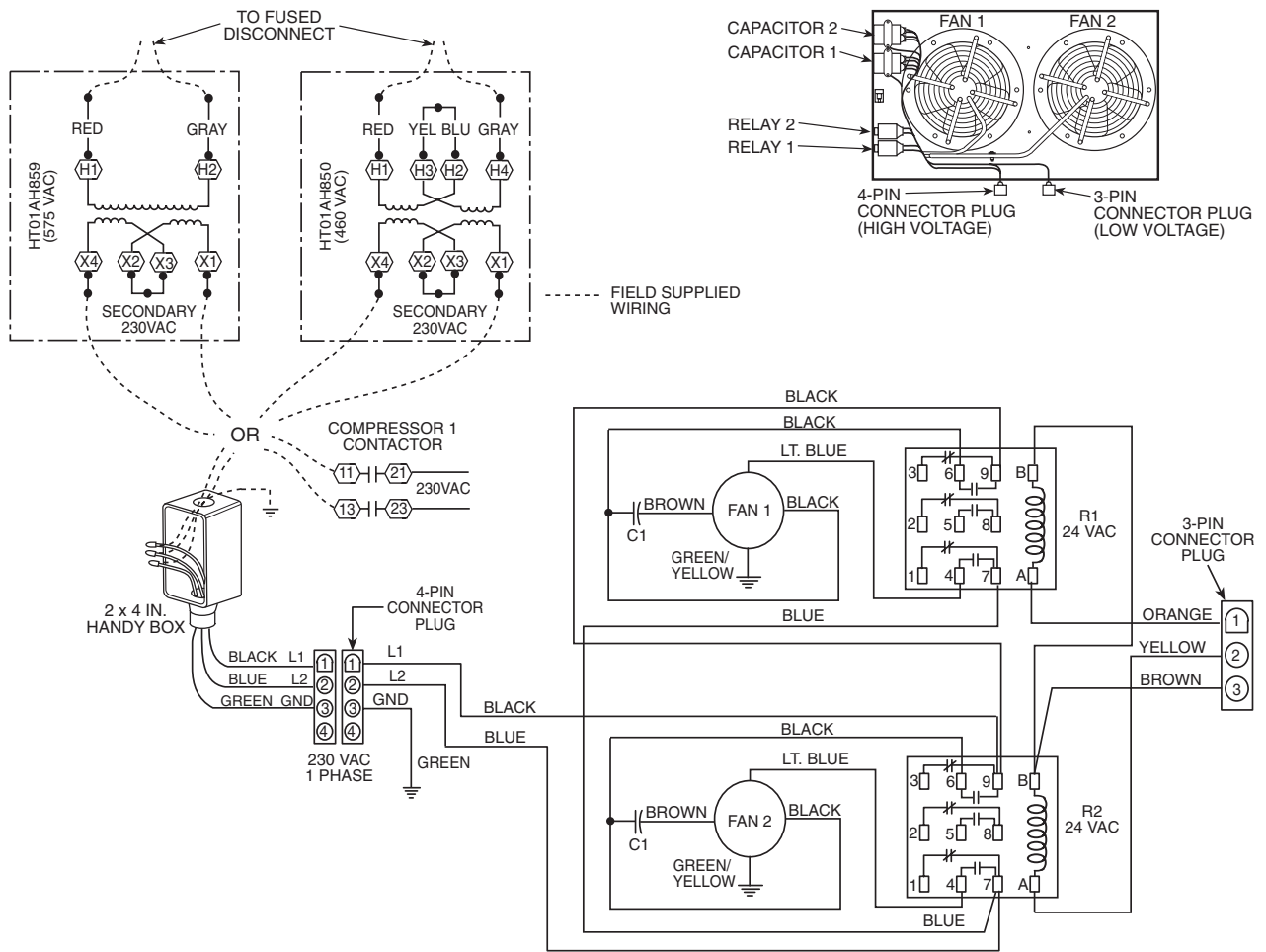


Fig. 28 — Wiring Diagram for Power Exhaust System

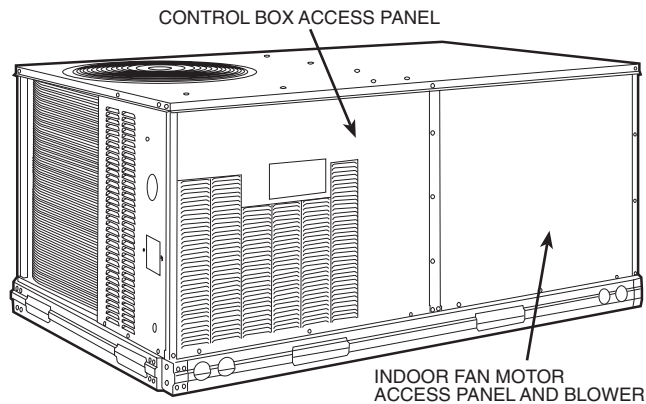


**Fig. 29 — Typical Access Panel Locations
(Standard Efficiency Unit Shown)**

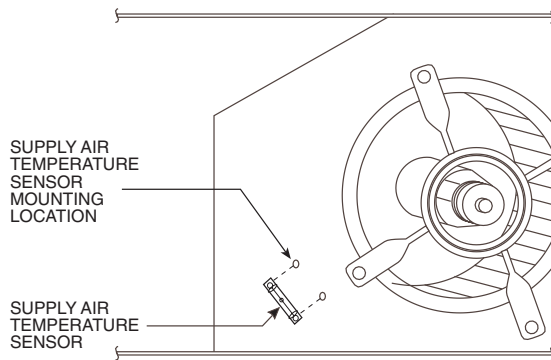


Fig. 30 — Supply-Air Sensor Placement

CO₂ Control Set Up — If a CO₂ sensor is not being used, proceed to the next section. If a CO₂ sensor is being used, perform the following:

1. Determine the value at which you want the minimum position of the dampers to begin opening to allow a greater amount of outdoor-air to enter. The range is 800 to 1,400 ppm.
2. Locate the CO₂ SP (PPM) potentiometer and adjust to the desired set point. See Fig. 31.

Mechanical Cooling Lockout — Determine the outdoor-air temperature at which you want the mechanical cooling (compressors) to be disabled. Locate the mechanical cooling lockout (MECH CLG LOCKOUT) potentiometer. To disable this feature, turn the potentiometer counterclockwise (CCW) to the OFF position. Otherwise, set the value between 10 and 60 F. Mechanical cooling will not operate when the outdoor air temperature is below this value. See Fig. 31.

Dry Bulb Changeover Set Up — Determine the dry bulb changeover set point from Table 3. The settings are A, B, C and D. Locate the ECON SP potentiometer and set the dry bulb changeover set point. See Fig. 31. When the OAT is above this set point, the damper is limited to minimum position setting.

Table 3 — Changeover Set Points

SETTINGS	A	B	C	D
Dry Bulb (°F)	73	69	66	63
Single Enthalpy* (Btu/lb)	27	25	24	22
Differential Temperature* (°F, Not Adjustable)	2	2	2	2
Differential Enthalpy* (Btu/lb, Not Adjustable)	1	1	1	1

*Field-installed accessory.

If a potentiometer fails, its setting will default to the values in Table 4.

Table 4 — Default Potentiometer Settings

POTENTIOMETER	DEFAULT SETTING
CO ₂ SP (PPM)	1,000
MECH CLG LOCKOUT	47°
ECON SP	D
MIN POS (%)	20

Ventilation Air (Minimum Position Set Up) — If ventilation air is not required, proceed to Step 5. If ventilation air is required, perform the following:

1. The indoor fan must be on to set the ventilation air. Either put the thermostat in the continuous fan mode or jumper the R and G terminals at the rooftop unit connection board.
2. Locate the minimum position (MIN POS) potentiometer. Turn the potentiometer full CCW to fully close the outdoor-air dampers. Turn the potentiometer gradually clockwise (CW) to the desired position. See Fig. 31.
3. Replace the filter access panel. See Fig. 20. Ensure the filter access panel slides along the tracks and is securely engaged.
4. Calculate the minimum airflow across the EconoMi\$er.
 - a. Calculate % of outside air using the following formula.
% Outdoor air through EconoMi\$er

$$\% \text{ Outdoor air} = \frac{\text{Mixture Temp} - \text{Return Air Temp}}{\text{Outdoor Temp} - \text{Return Air Temp}}$$

- b. Multiply total CFM by percentage outdoor air, this gives outdoor air volume in CFM.

5. Turn on base unit power.

NOTE: The EconoMi\$er begins operation three minutes after power up.

⚠ WARNING

Personal Injury Hazard. Avoid possible injury by keeping fingers away from damper blades.

6. See Fig. 32 for barometric relief damper characteristics.

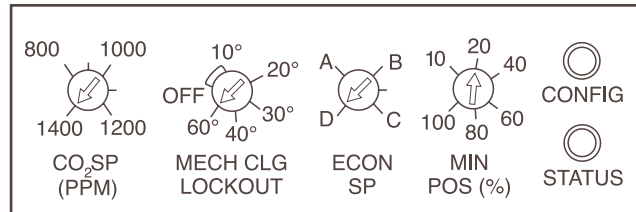


Fig. 31 — EconoMi\$er Control Adjustment Potentiometers (Factory Settings)

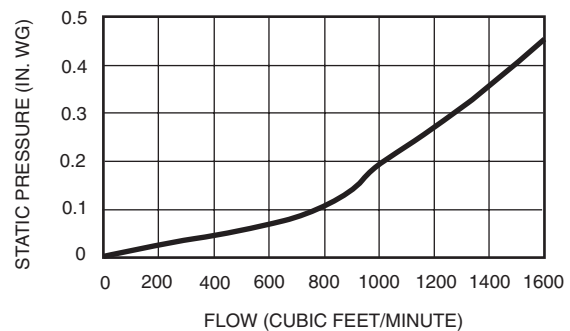


Fig. 32 — Barometric Relief Capacity

Step 7 — Adjust Indoor-Fan Speed — Adjust indoor-fan rpm to meet jobsite conditions.

Table 5 shows fan rpm at motor pulley settings for the 50HJQ004-007 units. Tables 6 and 7 shows data for indoor-fan motors. Refer to Table 8 for accessory and option static pressure drops, see Table 9 for indoor-fan motor efficiency, see Tables 10-25 to determine fan speed settings.

For units with electric heating, required minimum cfm is 900 for 50HJQ004; 1200 for 50HJQ005; 1500 for 50HJQ006 and 1800 for 50HJQ007.

BELT-DRIVE MOTORS — Fan motor pulleys are factory-set for speed shown in Table 1. Check pulley alignment and belt tension prior to start-up.

To change fan speed:

1. Shut off unit power supply and tag disconnect.
2. Loosen belt by loosening fan motor mounting nuts. See Fig. 33.
3. Loosen movable pulley flange setscrew (see Fig. 34).
4. Screw movable flange toward fixed flange to increase speed or away from fixed flange to decrease speed. Increasing fan speed increases load on motor. Do not exceed maximum speed specified in Table 1.
5. Set movable flange at nearest keyway of pulley hub and tighten setscrew. (See Table 1 for speed change for each full turn of pulley flange.)

To align fan and motor pulleys (see Fig. 34):

1. Loosen fan pulley setscrews.
2. Slide fan pulley along fan shaft.
3. Make angular alignment by loosening motor from mounting.

To adjust belt tension:

1. Loosen fan motor mounting nuts.
2. Slide motor mounting plate away from fan scroll for proper belt tension ($\frac{5}{8}$ -in. deflection with 7 to 10 lbs force).
3. Tighten motor mounting nuts.
4. Adjust bolt and tighten nut to secure motor in fixed position.

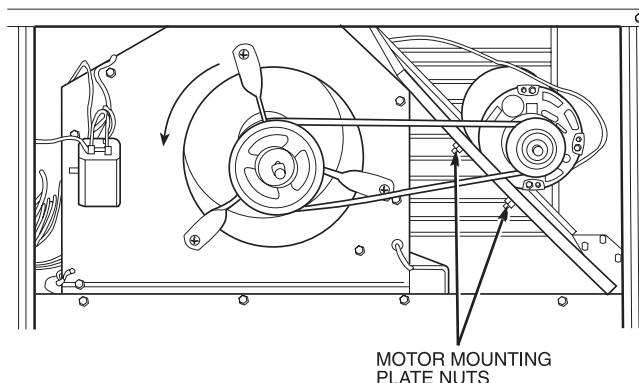


Fig. 33 — Belt Drive Motor Mounting

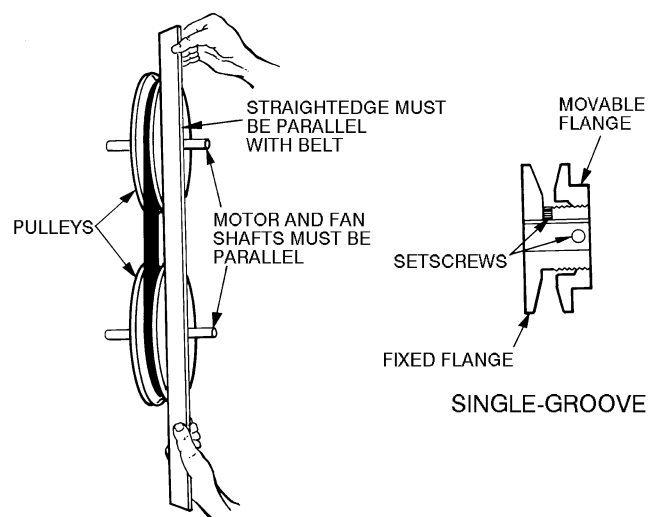


Fig. 34 — Evaporator-Fan Pulley Adjustment

Table 5 — Fan Rpm at Motor Pulley Settings*

UNIT 50HJQ	MOTOR PULLEY TURNS OPEN												
	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
004	1090	1055	1025	990	960	925	890	860	825	795	760	—	—
004†	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
005	1185	1150	1115	1080	1045	1015	980	945	910	875	840	—	—
005†	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
006	1460	1425	1385	1350	1315	1275	1240	1205	1165	1130	1095	1055	1020
006†	1685	1589	1557	1525	1493	1460	1428	1396	1364	1332	1300	—	—
007	1585	1540	1490	1445	1395	1350	1300	1255	1210	1165	1120	—	—
007†	1685	1589	1557	1525	1493	1460	1428	1396	1364	1332	1300	—	—

*Approximate fan rpm shown.

†Indicates high-static motor and drive package.

Table 6 — Indoor-Fan Motor Performance

UNIT 50HJQ	UNIT PHASE	MAXIMUM CONTINUOUS BHP*	MAXIMUM OPERATING WATTS*	UNIT VOLTAGE	MAXIMUM AMP DRAW
004	Single	1.20	1000	208/230	5.1
	Three	1.20	1000	208/230	5.1
				460	2.3
005	Single	1.20	1000	208/230	5.1
	Three	1.20	1000	208/230	5.1
				460	2.3
006	Single	1.80	2120	208/230	9.2
	Three	2.40	2120	208/230	6.1
				460	2.7
007	Three	2.40	2120	208/230	6.1
				460	2.7

LEGEND

Bhp — Brake Horsepower

*Extensive motor and electrical testing on these units ensures that the full horsepower and watts range of the motors can be utilized with confidence. Using your fan motors up to the ratings shown in this table will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.

Table 7 — Indoor-Fan Motor Data — High-Static Motors

UNIT 50HJQ	UNIT PHASE	MAXIMUM CONTINUOUS BHP*	MAXIMUM OPERATING WATTS*	UNIT VOLTAGE	MAXIMUM AMP DRAW
004	Three	2.40	2120	208/230	6.1
				460	2.7
005	Three	2.40	2120	208/230	6.1
				460	2.7
006	Three	2.90	2615	208/230	8.3
				460	3.6
007	Three	2.90	2615	208/230	8.3
				460	3.6

LEGEND

Bhp — Brake Horsepower

*Extensive motor and electrical testing on these units ensures that the full horsepower and watts range of the motors can be utilized with confidence. Using your fan motors up to the ratings shown in this table will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.

Table 8 — Accessory/FIOP Economizers and Electric Heaters Static Pressure Drop (in. wg) 50HJQ004-007

COMPONENT	CFM								
	900	1200	1400	1600	1800	2000	2200	2400	2600
1 Heater Module	0.05	0.07	0.09	0.09	0.10	0.11	0.11	0.12	0.13
2 Heater Modules	0.15	0.16	0.16	0.16	0.17	0.17	0.17	0.18	0.18
Durablade Economizer	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
EconoMi\$er	0.05	0.09	0.13	0.17	0.22	0.27	0.32	0.39	0.45

LEGEND

FIOP — Factory-Installed Option

Table 9 — Indoor-Fan Motor Efficiency

MOTOR 50HJQ	EFFICIENCY
004,005	75
006	74/84*
007	84

*Single-phase/3-phase.

NOTE: Convert watts to bhp using the following formula:

$$\text{bhp} = \frac{\text{watts input} \times \text{motor efficiency}}{746}$$

Table 10 — Fan Performance 50HJQ004 — Vertical Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.1			0.2			0.3			0.4			0.5			0.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	581	0.12	119	673	0.18	179	736	0.22	219	805	0.25	249	865	0.29	288	911	0.34	338
1000	644	0.19	189	709	0.22	219	782	0.28	279	835	0.30	298	900	0.35	348	937	0.38	378
1100	687	0.22	219	746	0.26	259	806	0.30	298	867	0.35	348	929	0.40	398	964	0.40	398
1200	733	0.26	259	785	0.32	318	843	0.35	348	903	0.41	408	960	0.47	467	994	0.50	497
1300	754	0.29	288	826	0.38	378	891	0.43	428	942	0.48	477	991	0.53	527	1047	0.60	597
1400	810	0.35	348	868	0.45	448	937	0.51	507	984	0.57	567	1032	0.62	617	1067	0.67	666
1500	841	0.42	418	911	0.53	527	985	0.61	607	1029	0.66	656	1073	0.72	716	1109	0.77	766

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.7			0.8			0.9			1.0			1.1			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	957	0.39	388	988	0.43	428	1039	0.45	448	1061	0.47	487	1083	0.53	527	1105	0.57	567
1000	992	0.44	438	1039	0.49	487	1061	0.51	507	1086	0.55	547	1111	0.59	587	1136	0.63	627
1100	1013	0.49	487	1068	0.55	547	1090	0.58	577	1109	0.61	607	1127	0.64	637	1145	0.67	666
1200	1045	0.56	557	1090	0.64	637	1109	0.64	647	1156	0.68	676	1203	0.71	706	1250	0.74	736
1300	1075	0.64	637	1122	0.70	696	1152	0.72	716	1190	0.76	756	1228	0.80	796	1266	0.84	836
1400	1110	0.73	726	1160	0.84	766	1181	0.81	806	1237	0.85	845	1293	0.89	885	1349	0.93	925
1500	1150	0.82	816	1190	1.00	855	1225	0.90	895	1271	0.95	945	1317	1.00	995	1363	1.05	1044

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOF — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 760 to 1090 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. Maximum usable watts input is 1000 and maximum continuous bhp is 1.20. Extensive motor and electrical testing on these

units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Tables 6 and 7.

3. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOF static pressure information.
4. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
5. Interpolation is permissible. Do not extrapolate.

Table 11 — Fan Performance 50HJQ004 — Vertical Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	673	0.18	179	805	0.25	249	911	0.34	338	988	0.43	428	1061	0.47	487
1000	709	0.22	219	835	0.30	298	937	0.38	378	1039	0.49	487	1086	0.55	547
1100	746	0.26	259	867	0.35	348	964	0.40	398	1068	0.55	547	1109	0.61	607
1200	785	0.32	318	903	0.41	408	994	0.50	497	1090	0.64	637	1156	0.68	676
1300	826	0.38	378	942	0.48	477	1047	0.60	597	1122	0.70	696	1190	0.76	756
1400	868	0.45	448	984	0.57	567	1067	0.67	666	1160	0.84	766	1237	0.85	845
1500	911	0.53	527	1029	0.66	656	1109	0.77	766	1190	1.00	855	1271	0.95	945

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1105	0.57	567	1140	0.63	622	1170	0.68	674	1198	0.73	723	1224	0.77	771
1000	1136	0.63	627	1172	0.69	688	1203	0.75	745	1232	0.80	799	1258	0.86	852
1100	1145	0.67	666	1181	0.73	731	1213	0.80	792	1242	0.85	850	1268	0.91	906
1200	1210	0.74	736	1248	0.81	808	1282	0.88	875	1312	0.94	939	1340	1.01	1000
1300	1266	0.84	836	1306	0.92	917	1341	1.00	993	1373	1.07	1066	1402	1.14	1136
1400	1349	0.93	925	1391	1.02	1015	1429	1.11	1100	1463	1.19	1180	1494	1.26	1257
1500	1383	1.05	1044	1426	1.15	1146	1465	1.25	1242	1500	1.34	1332	1532	1.43	1419

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOF — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1075 to 1455 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. Values include losses for filters, unit casings, and wet coils. See Table 8 for accessory/FIOF static pressure information.

3. Maximum continuous bhp is 2.4, and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. Refer to Tables 6 and 7.

4. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
5. Interpolation is permissible. Do not extrapolate.

Table 12 — Fan Performance 50HJQ005 — Vertical Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																				
	0.1			0.2			0.3			0.4			0.6			0.7			0.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	542	0.16	168	616	0.21	221	678	0.27	278	739	0.32	336	842	0.44	462	886	0.50	525	929	0.56	588
1300	576	0.20	210	644	0.25	263	704	0.31	326	764	0.37	389	867	0.50	525	910	0.56	588	952	0.62	651
1400	610	0.24	252	673	0.30	315	732	0.36	378	791	0.42	441	889	0.55	578	933	0.62	651	976	0.69	725
1500	646	0.28	294	704	0.35	368	761	0.42	436	818	0.48	504	912	0.61	641	957	0.69	720	1001	0.76	777
1600	681	0.33	347	735	0.40	420	790	0.47	494	845	0.54	567	920	0.68	695	931	0.76	772	1023	0.83	848
1700	718	0.39	410	768	0.46	483	836	0.54	562	873	0.61	641	965	0.76	777	1005	0.84	853	1045	0.91	930
1800	754	0.45	473	801	0.53	557	851	0.61	641	900	0.69	725	992	0.84	858	1032	0.92	940	1071	1.00	1022
1900	791	0.52	546	836	0.60	630	832	0.69	720	828	0.77	809	1019	0.93	950	1058	1.02	1037	1097	1.10	1124
2000	828	0.60	630	870	0.68	714	864	0.77	809	858	0.86	904	1046	1.03	1053	1085	1.12	1139	1124	1.21	1237

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	1.0			1.1			1.2			1.4			1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1008	0.67	704	1052	0.73	762	1096	0.78	820	1134	0.89	835	1203	1.00	885	—	—	—
1300	1029	0.75	788	1065	0.81	846	1101	0.86	904	1174	1.01	1040	1229	1.15	1100	1277	1.27	1029
1400	1052	0.83	826	1087	0.90	890	1121	0.96	918	1183	1.09	1042	1255	1.22	1167	1305	1.38	1190
1500	1076	0.91	905	1111	0.99	980	1145	1.06	1014	1208	1.20	1138	1274	1.33	1272	1337	1.47	1350
1600	1100	1.00	995	1134	1.08	1069	1168	1.15	1100	1232	1.31	1253	1291	1.46	1396	1350	1.60	1558
1700	1124	1.09	1084	1158	1.17	1164	1192	1.25	1196	1255	1.42	1358	1314	1.58	1511	1370	1.77	1738
1800	1147	1.18	1174	1182	1.27	1263	1217	1.36	1301	1279	1.54	1473	1381	1.71	1635	1393	1.89	1907
1900	1169	1.27	1263	1205	1.37	1363	1240	1.47	1406	1303	1.66	1588	1408	1.85	1769	1417	2.03	2068
2000	1194	1.38	1373	1228	1.48	1472	1262	1.58	1511	1327	1.78	1702	1436	1.98	1894	1440	2.18	2229

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 840 to 1185 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied motor drive is required.
2. **■** indicates field-supplied motor and drive are required.
3. Maximum usable watts input is 1000 and maximum continuous bhp is 1.20. Extensive motor and electrical testing on these

units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Tables 6 and 7.

4. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 13 — Fan Performance 50HJQ005 — Vertical Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	618	0.21	263	739	0.32	378	842	0.44	504	928	0.56	630	1008	0.67	725
1300	644	0.25	315	764	0.37	441	867	0.50	578	952	0.62	704	1029	0.75	841
1400	673	0.30	378	791	0.42	504	889	0.55	651	976	0.69	788	1052	0.83	885
1500	704	0.35	441	818	0.48	578	912	0.61	725	1001	0.76	858	1076	0.91	985
1600	736	0.40	515	845	0.54	662	920	0.68	787	1023	0.83	950	1100	1.00	1084
1700	768	0.46	599	873	0.61	757	965	0.76	889	1045	0.91	1063	1124	1.09	1194
1800	801	0.52	693	900	0.69	851	892	0.84	991	1071	1.00	1165	1147	1.18	1313
1900	836	0.60	788	928	0.77	967	1019	0.93	1104	1097	1.10	1277	1169	1.27	1442
2000	870	0.68	904	968	0.86	1082	1046	1.03	1237	1124	1.21	1410	1194	1.38	1572

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1096	0.78	778	1134	0.89	935	1203	1.00	965	1232	1.07	1000	1258	1.14	1083
1300	1101	0.86	935	1174	1.01	988	1229	1.15	999	1277	1.27	1029	1304	1.35	1203
1400	1121	0.96	976	1183	1.09	1071	1255	1.22	1105	1305	1.38	1190	1333	1.47	1367
1500	1145	1.06	1081	1208	1.20	1215	1274	1.33	1294	1337	1.47	1350	1365	1.57	1564
1600	1168	1.15	1196	1232	1.31	1339	1291	1.46	1454	1350	1.60	1558	1379	1.70	1805
1700	1192	1.25	1310	1255	1.42	1463	1314	1.58	1605	1370	1.77	1738	1399	1.89	2013
1800	1217	1.36	1425	1279	1.54	1597	1381	1.71	1757	1383	1.89	1907	1423	2.01	2210
1900	1240	1.47	1559	1303	1.66	1731	1408	1.85	1889	1417	2.03	2068	1447	2.16	2375
2000	1262	1.58	1702	1372	1.78	1884	1436	1.98	2040	1440	2.18	2229	1471	2.32	2551

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1075 to 1455 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. **■** indicates field-supplied motor and drive are required.

3. Values include losses for filters, unit casings, and wet coils. See Table 8 for accessory/FIOP static pressure information.

4. Maximum continuous bhp is 2.4 and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Tables 6 and 7.

5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

**Table 14 — Fan Performance 50HJQ006 — Vertical Discharge Units;
Standard Motor (Direct Drive) — Single-Phase Units**

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.1			0.2			0.4			0.6			0.8		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	711	0.33	347	769	0.39	409	878	0.51	542	971	0.64	685	1052	0.78	848
1600	751	0.39	409	806	0.45	470	906	0.53	623	1024	0.73	766	1087	0.88	930
1700	791	0.46	480	846	0.53	552	941	0.66	705	1030	0.80	858	1112	0.96	1032
1800	852	0.55	562	905	0.62	634	1002	0.78	797	1084	0.93	950	1163	1.10	1124
1900	894	0.64	552	945	0.72	736	1037	0.88	899	1119	1.04	1063	1194	1.21	1237
2000	936	0.74	756	984	0.82	838	1072	0.98	1001	1154	1.16	1185	1226	1.33	1359
2100	978	0.85	869	1024	0.93	950	1108	1.10	1124	1190	1.29	1318	1259	1.47	1502
2200	1021	0.97	991	1064	1.05	1073	1145	1.22	1247	1225	1.43	1461	1294	1.62	1656
2300	1064	1.10	1124	1104	1.18	1206	1183	1.36	1390	1260	1.57	1604	1330	1.78	1819
2400	1107	1.24	1267	1145	1.32	1349	1222	1.52	1482	1296	1.73	1768	1365	1.94	1983
2500	1150	1.39	1420	1186	1.48	1512	1262	1.68	1717	1331	1.89	1921	1400	2.12	2166

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	1.0			1.2			1.4			1.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1134	0.95	1022	1213	1.11	1196	1276	1.38	1328	1331	1.49	1349
1600	1159	1.02	1114	1231	1.20	1298	1311	1.39	1482	1395	1.59	1615
1700	1184	1.12	1206	1258	1.30	1400	1322	1.49	1604	1403	1.69	1799
1800	1235	1.29	1318	1303	1.48	1512	1371	1.69	1727	1433	1.90	1942
1900	1266	1.40	1431	1330	1.59	1625	1396	1.81	1850	1460	2.03	2074
2000	1297	1.53	1564	1362	1.73	1768	1422	1.94	1983	1485	2.16	2207
2100	1327	1.66	1696	1393	1.87	1911	1452	2.08	2126	1510	2.31	2361
2200	1359	1.81	1850	1423	2.02	2064	1483	2.24	2289	1538	2.46	2514
2300	1392	1.97	2013	1454	2.18	2228	1515	2.41	2463	1569	2.64	2698
2400	1426	2.15	2197	1485	2.36	2412	1544	2.59	2647	1601	2.84	2902
2500	1461	2.34	2391	1518	2.55	2606	1575	2.78	2841	—	—	—

**Table 15 — Fan Performance 50HJQ006 — Vertical Discharge Units;
Standard Motor (Direct Drive) — Three-Phase Units**

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.1			0.2			0.4			0.6			0.8		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watt	Rpm	Bhp	Watts
1500	711	0.33	347	769	0.39	409	878	0.51	542	971	0.64	685	1052	0.78	848
1600	751	0.39	409	806	0.45	470	906	0.53	623	1024	0.73	766	1087	0.88	930
1700	791	0.46	480	846	0.53	552	941	0.66	705	1030	0.80	858	1112	0.96	1032
1800	852	0.55	562	905	0.62	634	1002	0.78	797	1084	0.93	950	1163	1.10	1124
1900	894	0.64	552	945	0.72	736	1037	0.88	899	1119	1.04	1063	1194	1.21	1237
2000	936	0.74	756	984	0.82	838	1072	0.98	1001	1154	1.16	1185	1226	1.33	1359
2100	978	0.85	869	1024	0.93	950	1108	1.10	1124	1190	1.29	1318	1259	1.47	1502
2200	1021	0.97	991	1064	1.05	1073	1145	1.22	1247	1225	1.43	1461	1294	1.62	1656
2300	1064	1.10	1124	1104	1.18	1206	1183	1.36	1390	1260	1.57	1604	1330	1.78	1819
2400	1107	1.24	1267	1145	1.32	1349	1222	1.52	1482	1296	1.73	1768	1365	1.94	1983
2500	1150	1.39	1420	1186	1.48	1512	1262	1.68	1717	1331	1.89	1921	1400	2.12	2166

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	1.0			1.2			1.4			1.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1134	0.95	1022	1213	1.11	1196	1276	1.38	1328	1331	1.49	1349
1600	1159	1.02	1114	1231	1.20	1298	1311	1.39	1482	1395	1.59	1615
1700	1184	1.12	1206	1258	1.30	1400	1322	1.49	1604	1403	1.69	1799
1800	1235	1.29	1318	1303	1.48	1512	1371	1.69	1727	1433	1.90	1942
1900	1266	1.40	1431	1330	1.59	1625	1396	1.81	1850	1460	2.03	2074
2000	1297	1.53	1564	1362	1.73	1768	1422	1.94	1983	1485	2.16	2207
2100	1327	1.66	1696	1393	1.87	1911	1452	2.08	2126	1510	2.31	2361
2200	1359	1.81	1850	1423	2.02	2064	1483	2.24	2289	1538	2.46	2514
2300	1392	1.97	2013	1454	2.18	2228	1515	2.41	2463	1569	2.64	2698
2400	1426	2.15	2197	1485	2.36	2412	1544	2.59	2647	1601	2.84	2902
2500	1461	2.34	2391	1518	2.55	2606	1575	2.78	2841	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1020 to 1460 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. indicates field-supplied motor and drive are required.

3. Maximum usable watts input is 2120 and maximum continuous bhp is 1.80 for single-phase units and 2.40 for 3-phase units. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Tables 6 and 7.
4. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 16 — Fan Performance 50HJQ006 — Vertical Discharge Units; High-Static Motor (Belt Drive)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	789	0.40	429	896	0.53	572	990	0.67	705	1072	0.83	869	1153	1.00	1032
1600	826	0.46	501	931	0.61	645	1020	0.75	797	1101	0.91	961	1178	1.09	1134
1700	865	0.54	582	966	0.69	736	1051	0.84	899	1133	1.01	1053	1206	1.18	1237
1800	905	0.62	674	1002	0.78	838	1084	0.93	1001	1163	1.10	1155	1235	1.29	1349
1900	946	0.72	777	1037	0.88	940	1119	1.04	1124	1194	1.21	1288	1266	1.40	1461
2000	984	0.82	889	1072	0.98	1063	1154	1.16	1247	1226	1.33	1431	1297	1.53	1604
2100	1024	0.93	1012	1108	1.10	1196	1192	1.29	1380	1259	1.47	1574	1327	1.66	1758
2200	1064	1.05	1145	1145	1.22	1328	1225	1.43	1523	1294	1.62	1737	1359	1.80	1931
2300	1104	1.18	1288	1183	1.36	1502	1260	1.57	1686	1330	1.78	1901	1392	1.97	2115
2400	1145	1.32	1441	1222	1.45	1645	1296	1.73	1860	1365	1.94	2074	1426	2.15	2310
2500	1186	1.48	1604	1262	1.68	1819	1331	1.80	2044	1400	2.12	2269	1461	2.34	2504

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1221	1.17	1216	1256	1.30	1492	1280	1.32	1757	1320	1.22	1944	1360	1.33	2164
1600	1252	1.27	1308	1311	1.45	1523	1340	1.58	1800	1380	1.61	2047	1421	1.76	2280
1700	1278	1.37	1420	1345	1.57	1615	1397	1.76	1850	1424	1.89	2070	1467	2.06	2305
1800	1303	1.48	1553	1371	1.69	1747	1433	1.90	1952	1480	2.09	2197	1524	2.28	2446
1900	1330	1.59	1676	1396	1.80	1891	1460	2.03	2095	1517	2.25	2358	1562	2.46	2625
2000	1362	1.73	1809	1422	1.94	2034	1485	2.16	2258	1544	2.40	2542	1590	2.62	2830
2100	1393	1.80	1952	1452	2.08	2167	1510	2.31	2501	1569	2.55	2821	1616	2.79	3141
2200	1423	2.02	2126	1483	2.24	2350	1538	2.46	2688	1595	2.71	3031	1643	2.96	3375
2300	1454	2.18	2310	1515	2.41	2698	1569	2.64	3091	1622	2.88	3486	1671	3.15	3881
2400	1485	2.36	2524	1544	2.59	2948	1601	2.84	3379	1652	3.07	3715	—	—	—
2500	1518	2.55	3010	1575	2.78	3522	1631	3.03	4036	1684	3.28	3970	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1300 to 1685 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. **■** indicates field-supplied motor and drive are required.
3. Values include losses for filters, unit casings, and wet coils. See Table 8 for accessory/FIOP static pressure information.

4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2615. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Tables 6 and 7 for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 17 — Fan Performance 50HJQ007 — Vertical Discharge Units; Standard Motor (Belt Drive)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.1			0.2			0.4			0.6			0.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	852	0.55	562	905	0.62	615	1002	0.78	739	1084	0.93	859	1163	1.10	998
1900	894	0.64	630	945	0.72	692	1037	0.88	818	1119	1.04	948	1194	1.21	1089
2000	936	0.74	708	984	0.82	771	1072	0.98	899	1154	1.16	1047	1226	1.33	1190
2100	978	0.85	795	1024	0.93	859	1108	1.10	998	1190	1.29	1156	1259	1.47	1310
2200	1021	0.97	891	1064	1.05	956	1145	1.22	1097	1225	1.43	1275	1294	1.62	1439
2300	1064	1.10	998	1104	1.18	1064	1183	1.36	1216	1260	1.57	1396	1330	1.78	1578
2400	1107	1.24	1114	1145	1.32	1182	1222	1.52	1353	1296	1.73	1534	1365	1.94	1718
2500	1150	1.39	1241	1186	1.48	1318	1262	1.68	1491	1331	1.89	1674	1400	2.12	1875
2600	1193	1.56	1387	1228	1.65	1465	1301	1.86	1648	1367	2.07	1831	1435	2.31	2041
2700	1237	1.74	1543	1269	1.83	1621	1341	2.05	1814	1404	2.26	1997	1471	2.51	2214
2800	1280	1.94	1718	1311	2.03	1796	1381	2.25	1989	1442	2.47	2180	1506	2.72	2394
2900	1324	2.15	1901	1354	2.24	1980	1420	2.47	2180	1481	2.69	2369	1542	2.94	2579
3000	1368	2.37	2093	1396	2.46	2171	1460	2.69	2369	1521	2.93	2571	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	1.0			1.2			1.4			1.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1235	1.29	1156	1303	1.48	1318	1371	1.69	1499	1433	1.90	1638
1900	1266	1.40	1250	1330	1.59	1413	1396	1.81	1604	1460	2.03	1796
2000	1297	1.53	1361	1362	1.73	1534	1422	1.94	1718	1485	2.16	1910
2100	1327	1.66	1473	1393	1.87	1656	1452	2.08	1840	1510	2.31	2041
2200	1359	1.81	1604	1423	2.02	1779	1483	2.24	1980	1538	2.46	2171
2300	1392	1.97	1744	1454	2.18	1927	1515	2.41	2128	1569	2.64	2326
2400	1426	2.15	1901	1485	2.36	2084	1544	2.59	2283	1601	2.84	2459
2500	1461	2.34	2067	1518	2.55	2249	1575	2.78	2445	—	—	—
2600	1497	2.54	2240	1552	2.76	2428	—	—	—	—	—	—
2700	1532	2.75	2420	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1120 to 1585 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. indicates field-supplied motor and drive are required.

3. Maximum usable watts input is 2120 and maximum continuous bhp is 2.40. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Tables 6 and 7.
4. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 18 — Fan Performance 50HJQ007 — Vertical Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	906	0.62	700	1002	0.78	771	1084	0.93	891	1163	1.10	1081	1235	1.29	1190
1900	945	0.72	779	1037	0.88	843	1119	1.04	1006	1194	1.21	1158	1266	1.40	1310
2000	984	0.82	867	1072	0.98	924	1154	1.16	1106	1226	1.33	1258	1297	1.63	1353
2100	1024	0.93	998	1108	1.10	1056	1190	1.29	1207	1259	1.47	1361	1327	1.66	1473
2200	1064	1.05	1081	1145	1.22	1148	1225	1.43	1353	1294	1.62	1447	1359	1.81	1595
2300	1104	1.18	1140	1183	1.36	1233	1260	1.57	1499	1330	1.78	1526	1392	1.97	1709
2400	1145	1.32	1224	1222	1.52	1378	1296	1.73	1604	1365	1.94	1683	1426	2.15	1892
2500	1186	1.48	1335	1262	1.68	1517	1331	1.89	1718	1400	2.12	1910	1461	2.34	2076
2600	1228	1.66	1482	1301	1.86	1604	1367	2.07	1823	1435	2.31	2136	1497	2.54	2283
2700	1269	1.83	1595	1341	2.05	1691	1404	2.26	1936	1471	2.51	2326	1532	2.75	2504
2800	1311	2.03	1639	1381	2.25	1840	1442	2.47	2145	1506	2.72	2512	1603	3.28	3290
2900	1354	2.24	1814	1420	2.47	1989	1481	2.69	2335	1542	2.94	3262	—	—	—
3000	1396	2.46	2032	1460	2.69	2223	1521	2.93	2444	1649	3.73	3360	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1303	1.48	1301	1371	1.69	1387	1433	1.90	1517	1481	2.10	1761	1525	2.29	1967
1900	1330	1.59	1404	1396	1.81	1499	1460	2.03	1613	1509	2.24	1874	1554	2.45	2093
2000	1362	1.73	1482	1422	1.94	1613	1485	2.16	1744	1535	2.38	2029	1581	2.61	2266
2100	1393	1.87	1595	1452	2.08	1761	1510	2.31	1910	1561	2.65	2224	1607	2.79	2485
2200	1423	2.02	1726	1483	2.24	1919	1538	2.46	2093	1590	2.72	2441	1637	2.97	2645
2300	1454	2.18	1884	1515	2.41	2076	1569	2.64	2272	1622	2.91	2616	1670	3.18	2832
2400	1485	2.36	2015	1544	2.59	2249	1601	2.84	2467	1655	3.14	2823	1704	3.43	3055
2500	1518	2.55	2232	1575	2.78	2405	1635	3.11	2848	1690	3.43	3089	1740	3.75	3340
2600	1552	2.76	2436	1620	3.14	2964	1662	3.51	3215	1739	3.88	3488	1791	4.24	3776
2700	1612	3.21	3141	1683	3.65	3445	1747	4.08	3737	—	—	—	—	—	—
2800	1687	3.82	3738	1761	4.36	4115	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1300 to 1685 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. **Shaded** indicates field-supplied motor and drive are required.
3. Values include losses for filters, unit casings, and wet coils. See Table 8 for accessory/FOP static pressure information.

4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2615. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Tables 6 and 7 for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 19 — Fan Performance 50HJQ004 — Horizontal Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.1			0.2			0.3			0.4			0.5			0.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	526	0.06	70	584	0.08	99	656	0.12	139	734	0.22	219	818	0.25	269	875	0.27	289
1000	570	0.09	109	627	0.13	149	738	0.19	189	800	0.26	259	848	0.29	288	895	0.31	308
1100	614	0.13	149	670	0.16	189	758	0.23	229	812	0.29	288	863	0.32	308	914	0.35	348
1200	658	0.16	189	710	0.23	229	780	0.28	279	840	0.32	318	889	0.36	358	938	0.40	398
1300	703	0.20	239	752	0.27	269	808	0.32	318	868	0.37	368	916	0.41	408	963	0.45	448
1400	725	0.29	288	776	0.31	308	845	0.38	378	891	0.42	418	937	0.47	467	983	0.51	507
1500	755	0.33	328	816	0.38	378	870	0.43	428	924	0.48	477	969	0.53	527	1014	0.58	577

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.7			0.8			0.9			1.0			1.1			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	924	0.32	308	953	0.35	348	989	0.38	388	1028	0.42	438	1074	0.49	487	1120	0.54	537
1000	936	0.35	348	977	0.39	388	1020	0.44	438	1064	0.48	477	1124	0.54	537	1185	0.60	597
1100	960	0.39	388	1005	0.43	428	1052	0.49	487	1100	0.52	527	1163	0.59	587	1225	0.65	647
1200	960	0.45	388	1038	0.50	497	1076	0.53	527	1136	0.59	577	1201	0.65	647	1266	0.72	716
1300	1012	0.51	507	1061	0.56	557	1090	0.61	607	1172	0.65	647	1239	0.72	716	1306	0.79	786
1400	1027	0.56	557	1071	0.60	597	1108	0.67	666	1208	0.70	706	1278	0.79	786	1347	0.87	865
1500	1056	0.63	627	1097	0.68	676	1117	0.70	696	1245	0.74	776	1315	0.87	865	1385	0.96	955

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOF — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 760 to 1090 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. Maximum usable watts input is 1000 and maximum continuous bhp is 1.20. Extensive motor and electrical testing on these

units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Tables 6 and 7.

3. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOF static pressure information.
4. Interpolation is permissible. Do not extrapolate.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 20 — Fan Performance 50HJQ004 — Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	0.2			0.4			0.6			0.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	584	0.08	99	734	0.22	219	875	0.27	269	953	0.35	348
1000	627	0.13	149	800	0.26	259	895	0.31	308	977	0.39	388
1100	670	0.16	189	812	0.29	288	914	0.35	348	1005	0.43	428
1200	710	0.23	229	840	0.32	318	938	0.40	398	1038	0.50	497
1300	752	0.27	269	868	0.37	368	963	0.45	448	1061	0.56	557
1400	776	0.31	308	891	0.42	418	983	0.51	507	1071	0.60	597
1500	816	0.38	378	924	0.48	477	1014	0.58	577	1097	0.68	676

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	1.2			1.4			1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1120	0.54	537	1155	0.59	589	1186	0.64	639	1215	0.69	685
1000	1185	0.60	597	1222	0.66	655	1255	0.71	709	1285	0.77	761
1100	1225	0.65	647	1263	0.71	709	1298	0.77	769	1328	0.83	825
1200	1266	0.72	716	1306	0.79	786	1341	0.86	851	1373	0.92	914
1300	1306	0.79	786	1347	0.87	862	1383	0.94	934	1416	1.01	1003
1400	1347	0.87	865	1389	0.95	950	1427	1.03	1029	1461	1.11	1104
1500	1385	0.96	955	1428	1.05	1048	1467	1.14	1135	1502	1.22	1218

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOF — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1075 to 1455 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOF static pressure information.

3. Maximum continuous bhp is 2.4 and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Tables 6 and 7 for additional information.

4. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
5. Interpolation is permissible. Do not extrapolate.

Table 21 — Fan Performance 50HJQ005 — Horizontal Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																				
	0.1			0.2			0.3			0.4			0.6			0.7			0.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	514	0.15	158	590	0.20	210	657	0.25	263	723	0.30	315	828	0.42	441	876	0.49	510	924	0.55	578
1300	545	0.18	189	615	0.23	242	680	0.29	305	744	0.35	368	849	0.47	494	895	0.54	562	940	0.60	630
1400	577	0.21	221	642	0.27	284	704	0.33	347	766	0.39	410	870	0.52	546	915	0.59	620	959	0.66	693
1500	609	0.26	273	670	0.31	326	729	0.38	394	788	0.44	462	892	0.58	609	936	0.65	683	980	0.72	757
1600	642	0.30	315	699	0.36	378	755	0.43	447	811	0.49	515	913	0.64	672	957	0.72	751	1001	0.79	830
1700	675	0.36	378	728	0.42	441	782	0.49	510	836	0.55	578	935	0.71	746	979	0.79	825	1023	0.86	904
1800	709	0.41	431	759	0.48	504	810	0.55	578	860	0.62	651	957	0.78	820	1001	0.86	904	1044	0.94	988
1900	743	0.48	504	790	0.55	578	838	0.62	651	886	0.69	725	980	0.86	904	1023	0.95	993	1066	1.03	1082
2000	778	0.55	578	836	0.62	651	875	0.70	730	913	0.77	809	1004	0.94	988	1046	1.03	1082	1088	1.12	1177

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	1.0			1.1			1.2			1.4			1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	999	0.66	674	1018	0.67	685	1036	0.68	695	1073	0.71	756	1109	0.75	794	1138	0.79	851
1300	1025	0.74	756	1058	0.79	807	1090	0.84	858	1121	0.87	832	1159	0.90	918	1193	0.95	976
1400	1042	0.81	828	1080	0.88	899	1118	0.95	971	1175	1.06	1014	1206	1.09	1042	1244	1.12	1138
1500	1060	0.88	899	1098	0.96	981	1136	1.04	1063	1205	1.19	1138	1258	1.30	1243	1289	1.34	1282
1600	1080	0.95	971	1117	1.04	1058	1153	1.12	1140	1224	1.29	1234	1287	1.45	1387	1337	1.56	1492
1700	1101	1.03	1053	1137	1.12	1139	1172	1.20	1226	1241	1.38	1320	1307	1.56	1492	1366	1.73	1655
1800	1122	1.11	1134	1157	1.20	1226	1192	1.29	1318	1258	1.48	1415	1323	1.67	1597	1385	1.86	1779
1900	1143	1.21	1237	1179	1.30	1328	1214	1.39	1420	1279	1.58	1511	1341	1.78	1702	1402	1.98	1894
2000	1165	1.31	1339	1200	1.40	1431	1235	1.49	1523	1300	1.69	1616	1361	1.90	1817	1419	2.10	2008

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 840 to 1185 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. indicates field-supplied motor and drive are required.

3. Maximum usable watts input is 1000 and maximum continuous bhp is 1.20. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Tables 6 and 7.

4. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOP static pressure information.

5. Interpolation is permissible. Do not extrapolate.

6. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 22 — Fan Performance 50HJQ005 — Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	590	0.20	242	723	0.30	357	828	0.42	483	924	0.55	609	999	0.66	695
1300	615	0.23	294	744	0.35	410	849	0.47	546	940	0.60	683	1025	0.74	736
1400	642	0.27	347	766	0.39	473	870	0.52	620	959	0.66	757	1042	0.81	838
1500	670	0.31	399	788	0.44	536	892	0.58	683	980	0.72	851	1060	0.88	930
1600	699	0.36	462	811	0.49	609	913	0.64	767	1001	0.79	935	1080	0.95	1073
1700	728	0.42	536	836	0.55	693	935	0.71	851	1023	0.86	1030	1101	1.03	1185
1800	759	0.48	620	860	0.62	788	957	0.78	956	1044	0.94	1124	1122	1.11	1318
1900	790	0.55	714	886	0.69	883	980	0.86	1061	1066	1.03	1240	1143	1.21	1502
2000	836	0.62	809	913	0.77	988	1004	0.94	1177	1088	1.12	1366	1165	1.31	1604

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1036	0.68	889	1073	0.71	998	1109	0.75	1138	1138	0.79	1358	1162	0.84	1345
1300	1090	0.84	930	1121	0.87	1052	1159	0.90	1215	1193	0.95	1406	1218	1.01	1500
1400	1118	0.95	1012	1175	1.06	1090	1206	1.09	1282	1244	1.12	1463	1270	1.19	1645
1500	1136	1.04	1114	1205	1.19	1186	1258	1.30	1339	1289	1.34	1530	1316	1.43	1778
1600	1153	1.12	1226	1224	1.29	1291	1287	1.45	1444	1337	1.56	1607	1365	1.66	1867
1700	1172	1.20	1339	1241	1.38	1415	1307	1.56	1569	1366	1.73	1722	1395	1.84	2001
1800	1192	1.29	1461	1258	1.48	1540	1323	1.67	1702	1385	1.86	1865	1414	1.98	2167
1900	1214	1.39	1594	1279	1.58	1664	1341	1.78	1846	1402	1.98	2018	1432	2.11	2345
2000	1235	1.49	1727	1300	1.69	1808	1361	1.90	1989	1419	2.10	2171	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1075 to 1455 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. indicates field-supplied motor and drive are required.
3. Maximum continuous bhp is 2.4 and the maximum continuous watts are 2120. Extensive motor and electrical testing on these

units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Tables 6 and 7 for additional information.

4. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOP static pressure information.

5. Interpolation is permissible. Do not extrapolate.

6. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 23 — Fan Performance 50HJQ006 — Horizontal Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.1			0.2			0.4			0.6			0.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	658	0.27	276	722	0.33	337	840	0.46	470	937	0.59	603	1027	0.74	756
1600	693	0.32	327	754	0.38	388	867	0.52	531	963	0.65	664	1052	0.81	828
1700	729	0.38	388	787	0.44	450	895	0.58	593	991	0.73	746	1075	0.88	899
1800	765	0.45	460	821	0.51	521	923	0.65	664	1019	0.81	828	1099	0.96	981
1900	802	0.52	531	854	0.58	593	953	0.73	746	1046	0.90	920	1126	1.06	1083
2000	840	0.60	613	900	0.66	674	984	0.82	838	1073	0.99	1012	1154	1.16	1185
2100	878	0.69	705	923	0.75	766	1015	0.91	930	1101	1.08	1104	1182	1.27	1298
2200	916	0.78	797	958	0.85	869	1046	1.01	1032	1129	1.19	1216	1209	1.39	1420
2300	954	0.89	910	993	0.96	981	1079	1.13	1155	1160	1.31	1339	1237	1.51	1543
2400	993	1.00	1022	1029	1.07	1093	1112	1.25	1277	1190	1.43	1461	1264	1.63	1666
2500	1031	1.13	1155	1066	1.20	1226	1145	1.39	1420	1220	1.57	1604	1292	1.77	1809

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.0			1.2			1.4			1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1108	0.90	920	1186	1.08	1104	1263	1.30	1328	1343	1.58	1615	1431	1.79	1829
1600	1130	0.97	991	1205	1.15	1175	1278	1.35	1380	1350	1.61	1645	1424	1.80	1921
1700	1154	1.06	1083	1226	1.23	1257	1296	1.42	1451	1364	1.64	1676	1432	1.89	1931
1800	1178	1.14	1165	1249	1.32	1349	1316	1.52	1553	1382	1.72	1758	1447	1.95	1993
1900	1201	1.23	1257	1274	1.43	1461	1338	1.62	1656	1402	1.80	1870	1464	2.05	2095
2000	1226	1.33	1359	1297	1.53	1564	1363	1.73	1768	1424	1.94	1983	1484	2.16	2207
2100	1252	1.45	1482	1320	1.64	1676	1388	1.80	1891	1448	2.07	2115	1505	2.29	2340
2200	1280	1.58	1615	1345	1.77	1809	1410	1.97	2013	1473	2.20	2248	1529	2.43	2483
2300	1309	1.71	1747	1372	1.91	1952	1434	2.11	2156	1496	2.34	2391	1554	2.58	2637
2400	1336	1.80	1891	1400	2.06	2105	1459	2.26	2310	1519	2.48	2534	1578	2.76	2820
2500	1363	2.00	2044	1428	2.22	2269	1486	2.43	2483	1543	2.65	2708	1600	2.89	2953

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOF — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1020 to 1460 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. indicates field-supplied motor and drive are required.

3. Maximum usable watts input is 2120 and maximum continuous bhp is 1.80 for single-phase units and 2.40 for 3-phase units. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Tables 6 and 7.
4. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOF static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 24 — Fan Performance 50HJQ006 — Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	722	0.33	420	840	0.46	557	937	0.59	704	1027	0.74	872	1108	0.90	1051
1600	754	0.38	483	867	0.52	641	963	0.65	788	1052	0.81	956	1130	0.97	1145
1700	787	0.44	567	895	0.58	725	991	0.73	883	1075	0.88	1061	1154	1.06	1240
1800	821	0.51	661	923	0.65	820	1019	0.81	977	1099	0.96	1156	1178	1.14	1355
1900	854	0.58	757	953	0.73	925	1046	0.90	1093	1126	1.06	1271	1201	1.23	1471
2000	900	0.66	862	984	0.82	1030	1073	0.99	1219	1154	1.16	1397	1226	1.33	1608
2100	923	0.75	977	1015	0.91	1156	1101	1.08	1355	1182	1.27	1545	1252	1.45	1744
2200	958	0.85	1103	1046	1.01	1282	1129	1.19	1503	1209	1.39	1702	1280	1.58	1902
2300	993	0.96	1240	1079	1.13	1429	1160	1.31	1650	1237	1.51	1870	1309	1.71	2070
2400	1029	1.07	1387	1112	1.25	1524	1190	1.43	1818	1264	1.63	2038	1336	1.80	2259
2500	1066	1.20	1555	1145	1.39	1765	1220	1.57	1986	1292	1.77	2227	1363	2.00	2459

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1186	1.08	1229	1263	1.30	1366	1343	1.58	1387	1431	1.79	1282	1480	1.98	1390
1600	1205	1.15	1334	1278	1.35	1524	1350	1.61	1660	1424	1.80	1692	1473	1.99	1834
1700	1226	1.23	1439	1296	1.42	1650	1364	1.64	1849	1432	1.89	1986	1481	2.09	2153
1800	1249	1.32	1555	1316	1.52	1776	1382	1.72	1996	1447	1.95	2196	1497	2.16	2381
1900	1274	1.43	1671	1338	1.62	1902	1402	1.80	2133	1464	2.05	2364	1514	2.27	2563
2000	1297	1.53	1818	1363	1.73	2038	1424	1.94	2270	1484	2.16	2522	1535	2.39	2734
2100	1320	1.64	1965	1388	1.80	2185	1448	2.07	2427	1505	2.29	2674	1557	2.53	2905
2200	1345	1.77	2122	1410	1.97	2354	1473	2.20	2585	1529	2.43	2821	1581	2.69	3087
2300	1372	1.91	2291	1434	2.11	2532	1496	2.34	2758	1554	2.58	2976	1607	2.85	3280
2400	1400	2.06	2480	1459	2.26	2721	1519	2.48	2947	1578	2.76	3152	1632	3.05	3497
2500	1428	2.22	2679	1486	2.43	2905	1543	2.65	3134	1600	2.89	3345	1655	3.20	3736

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOF — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1300 to 1685 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. **■** indicates field-supplied motor is required.
3. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOF static pressure information.

4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2615. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Tables 6 and 7 for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 25 — Fan Performance 50HJQ007 — Horizontal Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.1			0.2			0.4			0.6			0.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	765	0.45	487	821	0.51	532	923	0.65	638	1019	0.81	843	1099	0.96	883
1900	802	0.45	539	854	0.58	585	953	0.73	700	1046	0.90	835	1126	1.06	965
2000	840	0.60	600	888	0.66	646	984	0.82	771	1073	0.99	907	1154	1.16	1047
2100	878	0.69	669	923	0.75	716	1015	0.91	843	1101	1.08	981	1182	1.27	1140
2200	916	0.78	739	958	0.85	795	1046	1.01	924	1129	1.19	1072	1209	1.39	1241
2300	954	0.89	827	993	0.96	883	1079	1.13	1022	1160	1.31	1173	1237	1.51	1344
2400	993	1.00	916	1029	1.07	973	1112	1.25	1123	1190	1.43	1275	1264	1.63	1447
2500	1031	1.13	1022	1066	1.20	1081	1145	1.39	1241	1220	1.57	1396	1292	1.77	1569
2600	1070	1.26	1131	1103	1.34	1199	1179	1.52	1353	1251	1.71	1517	1322	1.92	1700
2700	1109	1.41	1258	1140	1.48	1318	1212	1.67	1482	1283	1.87	1656	1352	2.09	1849
2800	1148	1.57	1396	1177	1.64	1456	1246	1.83	1621	1316	2.04	1805	1383	2.26	1997
2900	1188	1.74	1543	1215	1.81	1604	1281	2.00	1770	1349	2.22	1962	1413	2.44	2154
3000	1227	1.92	1700	1253	2.00	1770	1316	2.19	1936	1382	2.42	2136	1444	2.63	2317

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	1.0			1.2			1.4			1.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1178	1.14	1031	1249	1.32	1182	1316	1.52	1353	1382	1.72	1526
1900	1201	1.23	1106	1274	1.43	1275	1338	1.62	1439	1402	1.83	1621
2000	1226	1.33	1190	1297	1.53	1361	1363	1.73	1534	1424	1.94	1718
2100	1252	1.45	1292	1320	1.64	1456	1388	1.85	1639	1448	2.07	1831
2200	1280	1.58	1404	1345	1.77	1569	1410	1.97	1744	1473	2.20	1945
2300	1309	1.71	1517	1372	1.91	1691	1434	2.11	1866	1496	2.34	2067
2400	1336	1.85	1639	1400	2.06	1823	1459	2.26	1997	1519	2.48	2188
2500	1363	2.00	1770	1428	2.22	1962	1486	2.43	2145	1543	2.65	2335
2600	1390	2.15	1901	1456	2.38	2102	1514	2.61	2300	1569	2.83	2487
2700	1418	2.31	2041	1483	2.56	2257	1543	2.80	2462	—	—	—
2800	1446	2.48	2188	1510	2.73	2403	—	—	—	—	—	—
2900	1476	2.67	2352	1537	2.92	2562	—	—	—	—	—	—
3000	1506	2.88	2529	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOF — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1120 to 1585 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. indicates field-supplied motor is required.

3. Maximum usable watts input is 2120 and maximum continuous bhp is 2.40. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Tables 6 and 7.
4. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOF static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 26 — Fan Performance 50HJQ007 — Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	821	0.51	700	923	0.65	835	1019	0.81	956	1099	0.96	1031	1178	1.14	1165
1900	854	0.58	779	953	0.73	932	1046	0.90	1006	1126	1.06	1114	1201	1.23	1233
2000	888	0.66	867	984	0.82	1014	1073	0.99	1097	1154	1.16	1216	1226	1.33	1284
2100	923	0.75	998	1015	0.91	1064	1101	1.08	1140	1182	1.27	1292	1252	1.45	1404
2200	958	0.85	1081	1046	1.01	1106	1129	1.19	1258	1209	1.39	1361	1280	1.58	1508
2300	993	0.96	1140	1079	1.13	1224	1160	1.31	1387	1237	1.51	1473	1309	1.71	1648
2400	1029	1.07	1224	1112	1.25	1396	1190	1.43	1447	1264	1.63	1630	1336	1.85	1726
2500	1066	1.20	1335	1145	1.39	1465	1220	1.57	1552	1292	1.77	1761	1363	2.00	1805
2600	1103	1.34	1482	1179	1.52	1560	1251	1.71	1735	1322	1.92	1858	1390	2.15	1936
2700	1140	1.48	1595	1212	1.67	1726	1283	1.87	1892	1352	2.09	1954	1418	2.31	2171
2800	1177	1.64	1639	1246	1.83	1875	1316	2.04	1989	1383	2.26	2136	1446	2.48	2343
2900	1215	1.81	1814	1281	2.00	2050	1349	2.22	2240	1413	2.44	2300	1476	2.67	2521
3000	1253	2.00	2032	1316	2.19	2119	1382	2.42	2343	1444	2.63	2470	1506	2.88	2648

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1249	1.32	1250	1316	1.52	1378	1382	1.72	1404	1427	1.89	1564	1468	2.06	1704
1900	1274	1.43	1361	1338	1.62	1439	1402	1.83	1482	1447	2.01	1653	1489	2.19	1801
2000	1297	1.53	1473	1363	1.73	1491	1424	1.94	1569	1470	2.13	1752	1512	2.32	1909
2100	1320	1.64	1552	1388	1.85	1534	1448	2.07	1700	1495	2.28	1901	1538	2.48	2070
2200	1345	1.77	1604	1410	1.97	1639	1473	2.20	1831	1521	2.42	2049	1564	2.64	2232
2300	1372	1.91	1665	1434	2.11	1831	1496	2.34	1980	1544	2.57	2218	1589	2.80	2415
2400	1400	2.06	1823	1459	2.26	1980	1519	2.48	2136	1568	2.73	2396	1613	2.97	2609
2500	1428	2.22	1980	1486	2.43	2136	1543	2.65	2292	1593	2.92	2574	1639	3.17	2804
2600	1456	2.38	2119	1514	2.61	2317	1569	2.83	2462	1620	3.11	2772	1666	3.39	3019
2700	1483	2.56	2300	1543	2.80	2487	—	—	—	—	—	—	—	—	—
2800	1510	2.73	2504	—	—	—	—	—	—	—	—	—	—	—	—
2900	1537	2.92	2725	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
FIOF — Factory-Installed Option
Watts — Input Watts to Motor

*Motor drive range: 1300 to 1685 rpm. All other rpms require field-supplied drive.

NOTES:

1. **Boldface** indicates field-supplied drive is required.
2. indicates field-supplied motor and drive are required.

3. Values include losses for filters, unit casing, and wet coils. See Table 8 for accessory/FIOF static pressure information.
4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2615. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Tables 6 and 7 for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

PRE-START-UP

WARNING

Failure to observe the following warnings could result in serious personal injury:

1. Follow recognized safety practices and wear protective goggles when checking or servicing refrigerant system.
2. Do not operate compressor or provide any electric power to unit unless compressor terminal cover is in place and secured.
3. Do not remove compressor terminal cover until all electrical sources are disconnected and tagged with lockout tags.
4. Relieve all pressure from system before touching or disturbing anything inside terminal box if refrigerant leak is suspected around compressor terminals. Use accepted methods to recover refrigerant.
5. Never attempt to repair soldered connection while refrigerant system is under pressure.
6. Do not use torch to remove any component. System contains oil and refrigerant under pressure. To remove a component, wear protective goggles and proceed as follows:
 - a. Shut off electrical power to unit and tag disconnect.
 - b. Recover refrigerant to relieve all pressure from system using both high- and low-pressure ports.
 - c. Cut component connection tubing with tubing cutter, and remove component from unit.
 - d. Carefully unsweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Proceed as follows to inspect and prepare the unit for initial start-up:

1. Remove all access panels.
2. Read and follow instructions on all WARNING, CAUTION, and INFORMATION labels attached to (or shipped with) unit.
3. Make the following inspections:
 - a. Inspect for shipping and handling damages such as broken lines, loose parts, or disconnected wires.
 - b. Inspect for oil at all refrigerant tubing connections and on unit base. Detecting oil generally indicates a refrigerant leak. Leak-test all refrigerant tubing connections using electronic leak detector, halide torch, or liquid-soap solution.
 - c. Inspect all field- and factory-wiring connections. Be sure that connections are completed and tight.
 - d. Inspect coil fins. If damaged during shipping and handling, carefully straighten fins with a fin comb.
4. Verify the following conditions:
 - a. Make sure that condenser-fan blades are correctly positioned in fan orifice. Refer to Outdoor-Fan Adjustment section on page 36 for more details.
 - b. Make sure that air filter(s) is in place.
 - c. Make sure that condensate drain trap is filled with water to ensure proper drainage.
 - d. Make sure that all tools and miscellaneous loose parts have been removed.

START-UP

Unit Preparation — Make sure that unit has been installed in accordance with installation instructions and applicable codes.

Return-Air Filters — Make sure correct filters are installed in unit (see Table 1). Do not operate unit without return-air filters.

Outdoor-Air Inlet Screens — Outdoor-air inlet screen(s) must be in place before operating unit.

Compressor Mounting — Compressors are internally spring mounted. Do not loosen or remove compressor hold-down bolts.

Internal Wiring — Check all electrical connections in unit control boxes; tighten as required.

Refrigerant Service Ports — Each unit system has 3 Schrader-type service ports: one on the suction line, one on the liquid line, and one on the compressor discharge line. Be sure that caps on the ports are tight.

High Flow Valves — Located on the compressor hot gas and suction tubes are High Flow Valves. Large black plastic caps distinguish these valves with o-rings located inside the caps. These valves cannot be accessed for service in the field. Ensure the plastic caps are in place and tight or the possibility of refrigerant leakage could occur.

Compressor Rotation — On 3-phase units it is important to be certain compressor is rotating in the proper direction. To determine whether or not compressor is rotating in the proper direction:

1. Connect service gages to suction and discharge pressure fittings.
2. Energize the compressor.
3. The suction pressure should drop and the discharge pressure should rise, as is normal on any start-up.

If the suction pressure does not drop and the discharge pressure does not rise to normal levels:

1. Note that the indoor fan (006 and 007 three-phase units only) is probably also rotating in the wrong direction.
2. Turn off power to the unit and tag disconnect.
3. Reverse any two of the unit power leads.
4. Turn on power to the unit and energize compressor.

The suction and discharge pressure levels should now move to their normal start-up levels.

NOTE: When the compressor is rotating in the wrong direction, the unit makes an elevated level of noise and does not provide cooling.

Cooling — Set space thermostat to OFF position. Set system selector switch at COOL position and fan switch at AUTO position. Adjust thermostat to a setting below room temperature. Compressor starts on closure of contactor.

Check cooling effects at a setting below room temperature. Check unit charge. Refer to Refrigerant Charge section on page 37.

Reset thermostat at a position above room temperature. Compressor will shut off.

TO SHUT OFF UNIT — Set system selector switch at OFF position. Resetting thermostat at a position above room temperature shuts unit off temporarily until space temperature exceeds thermostat setting. Units are equipped with Cycle-LOC™ protection device. Unit shuts down on any safety trip and remains off; an indicator light on thermostat comes on. Check reason for safety trip.

Compressor restart is accomplished by manual reset at the thermostat by turning the selector switch to OFF position and then to ON position.

Allow unit to operate a minimum of 10 minutes before checking refrigerant charge.

Heating — To start unit, turn on main power supply.

Set system selector switch at HEAT position, and set thermostat at a setting above room temperature. Set fan at AUTO position.

First stage of thermostat energizes the indoor fan, compressor, and outdoor fan; second stage energizes electric heater elements, if installed. Check heating effects at air supply grille(s).

If electric heaters do not energize, reset limit switch (located on indoor-fan scroll) by depressing button located between terminals on the switch.

TO SHUT OFF UNIT — Set system selector switch at OFF position. Resetting thermostat at a position below room temperature temporarily shuts unit off until space temperature falls below thermostat setting.

Safety Relief — A soft solder joint at the suction line fitting provides pressure relief under abnormal temperature and pressure conditions.

Ventilation (Continuous Fan) — Set fan and system selector switches at ON and OFF positions, respectively. Indoor fan operates continuously to provide constant air circulation.

Operating Sequence

COOLING, UNITS WITHOUT ECONOMIZER — When the thermostat calls for cooling, terminals G and Y1 are energized. The reversing valve solenoid (RVS), indoor-fan contactor (IFC), and compressor contactor no. 1 (C1) are energized and the indoor-fan motor (IFM), compressor, and outdoor fan start. The outdoor-fan motor (OFM) runs continuously while unit is cooling.

COOLING, UNITS WITH DURABLADE ECONOMIZER — When the outdoor-air temperature is above the OAT (outdoor-air temperature) setting and the room thermostat calls for cooling, the reversing valve solenoid (RVS) and the compressor contactor are energized to start the compressor and outdoor-fan motor (OFM). The indoor-fan motor (IFM) is energized and the economizer damper moves to the minimum position. After the thermostat is satisfied, the damper moves to the fully closed position when IFM is deenergized.

When the outdoor-air temperature is below the OAT setting and the thermostat calls for Y1 and G (cooling), the economizer damper moves to the minimum position when the indoor fan starts. The first stage of cooling is provided by the economizer. If the supply-air temperature is above 57 F, a switch on the supply-air thermostat is closed between the T2 terminal and the 24 vac terminal. This causes the damper to continue to modulate open until the supply-air temperature falls below 55 F or the damper reaches the fully open position.

When the supply-air temperature is between 55 F and 52 F, the supply-air thermostat has open switches between the T2 and 24 vac terminals and between the T1 and 24 vac terminals. This causes the economizer damper to remain in an intermediate open position.

If the supply-air temperature falls below 52 F, a switch on the supply-air thermostat is closed between the T1 terminal and the 24 vac terminal. This causes the damper to modulate closed until the supply-air temperature rises above 55 F or the damper reaches the minimum position.

When the supply-air temperature is between 55 F and 57 F, the supply-air thermostat has open switches between the T2 and 24 vac terminals. This causes the economizer damper to remain in an intermediate open position.

If the outdoor air alone cannot satisfy the cooling requirements of the conditioned space, economizer cooling is integrated with mechanical cooling, providing second stage cooling. The compressor and outdoor fan will be energized and the position of the economizer damper will be determined by the supply-air temperature.

When the second stage of cooling is satisfied, the compressor and OFM will be deenergized. The damper position will be determined by the supply-air temperature.

When the first stage of cooling is satisfied, the indoor fan shuts off. The damper will move to fully closed position.

COOLING, UNITS WITH ECONOMISER — When the outdoor-air temperature (OAT) is above the ECON SP set point and the room thermostat calls for Stage 1 cooling (R to G + Y1), the indoor-fan motor (IFM) is energized and the EconoMi\$er damper modulates to minimum position. The compressor contactor is energized to start the compressor and outdoor-fan motor (OFM). After the thermostat is satisfied, the damper modulates to the fully closed position when the IFM is deenergized.

When the OAT is below the ECON SP setting and the room thermostat calls for Stage 1 cooling (R to G + Y1), the EconoMi\$er modulates to the minimum position when the IFM is energized. The EconoMi\$er provides Stage 1 of cooling by modulating the return and outdoor air dampers to maintain a 55 F supply air set point. If the supply-air temperature (SAT) is greater than 57 F, the EconoMi\$er modulates open, allowing a greater amount of outdoor air to enter the unit. If the SAT drops below 53 F, the outdoor air damper modulates closed to reduce the amount of outdoor air. When the SAT is between 53 and 57 F, the EconoMi\$er maintains its position.

If outdoor air alone cannot satisfy the cooling requirements of the conditioned space, and the OAT is above the MECH CLG LOCKOUT set point, the EconoMi\$er integrates free cooling with mechanical cooling. This is accomplished by the strategies below.

NOTE: Compressor has a 2-minute Minimum On, Minimum Off, and Interstage delay timer.

1. If Y1 is energized, and the room thermostat calls for Y2 (2-stage thermostat), the compressor and OFM are energized. The position of the EconoMi\$er damper is maintained at its current value.
2. If Y1 is energized for more than 20 minutes, and Y2 is not energized (whether or not a 2-stage thermostat is used), the compressor and OFM are energized. The position of the EconoMi\$er damper is maintained at its current value.
3. If Y1 is energized, and the compressor is already energized (see Step 2) and the room thermostat calls for Y2, the compressor continues to operate.
4. If the compressor is energized and the thermostat is satisfied, the compressor, the OFM, and IFM are deenergized and the EconoMi\$er modulates closed.

When the OAT is below the MECH CLG LOCKOUT set point, the compressors remain off.

HEATING, UNITS WITHOUT ECONOMIZER — Set system switch at AUTO. or HEAT position. Set thermostat at desired temperature.

When the thermostat calls for heat, the IFC, outdoor-fan contactor and compressor contactor are energized. The reversing valve solenoid (RVS) is deenergized and switches position, and the indoor fan, outdoor fan, and compressor are energized. On economizer units, the economizer blade will move into the minimum position.

If the thermostat calls for a second stage of heat, the heater contactor (HC1) is energized and starts the electric heaters.

When the space temperature approaches the heating temperature set point, heating stages cycle off. The RVS is reenergized.

HEATING, UNITS WITH ECONOMIZER — When the room temperature calls for heat through terminal W1, the indoor fan contactor and heater contactor no. 1 are energized. On units equipped for 2 stages of heat, when additional heat is needed, heater contactor no. 2 is energized through W2. The economizer damper moves to the minimum position. When the thermostat is satisfied, the damper moves to the fully closed position.

Defrost — As frost builds up on the outdoor coil, the coil temperature drops below 28 F. When this outdoor-coil temperature drop is sensed by the defrost thermostat (DFT) and the defrost timer is at the end of a timed period (adjustable at 30, 50, 90 minutes), the unit operates in a defrost cycle controlled by the defrost timer and thermostat. During this cycle, the reversing valve solenoid (RVS) is energized and the outdoor fan shuts off. The electric heaters (if installed) will be energized.

The unit continues to defrost until the coil temperature as measured by DFT reaches 65 F, or the duration of defrost cycle completes a 10-minute period.

At the end of the defrost cycle, the electric heaters (if installed) and the reversing valve will be deenergized, and the outdoor-fan motor will be energized. The unit will now operate in the heating mode.

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

SERVICE

⚠ WARNING

When servicing unit, shut off all electrical power to unit and tag disconnect to avoid shock hazard or injury from rotating parts.

Cleaning — Inspect unit interior at the beginning of each heating and cooling season and as operating conditions require.

INDOOR COIL

1. Turn unit power off and install lockout tag. Remove filter access panel and indoor coil access panel.
2. If accessory economizer is installed, remove economizer by disconnecting Molex plug and removing economizer mounting screws.
3. Slide filters out of unit.
4. Clean coil using a commercial coil cleaner or dishwasher detergent in a pressurized spray canister. Wash both sides of coil and flush with clean water. For best results, back-flush toward return-air section to remove foreign material. Flush condensate pan after completion.
5. Reinstall economizer and filters.
6. Reconnect wiring.
7. Replace access panels.

OUTDOOR COIL — Inspect coil monthly. Clean outdoor coil annually, and as required by location or outdoor-air conditions.

One-Row Coils — Wash coil with commercial coil cleaner. It is not necessary to remove top panel.

2-Row Coils — Clean coil as follows:

1. Turn off unit power and tag disconnect.
2. Remove top panel screws on outdoor end of unit.
3. Remove outdoor coil corner post. See Fig. 35. To hold top panel open, place coil corner post between top panel and center post. See Fig. 36.
4. Remove device holding coil sections together at return end of outdoor coil. Carefully separate the outer coil section 3 to 4 in. from the inner coil section. See Fig. 37.

5. Use a water hose or other suitable equipment to flush down between the 2 coil sections to remove dirt and debris. Clean the outer surfaces with a stiff brush in the normal manner.
6. Secure the sections together. Reposition the outer coil section, and remove the coil corner post from between the top panel and center post. Install the coil corner and center posts, and replace all screws.

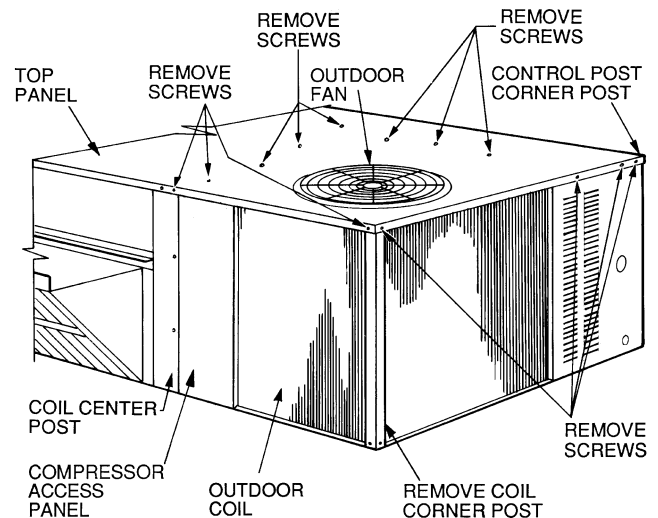


Fig. 35 — Cleaning Outdoor Coil

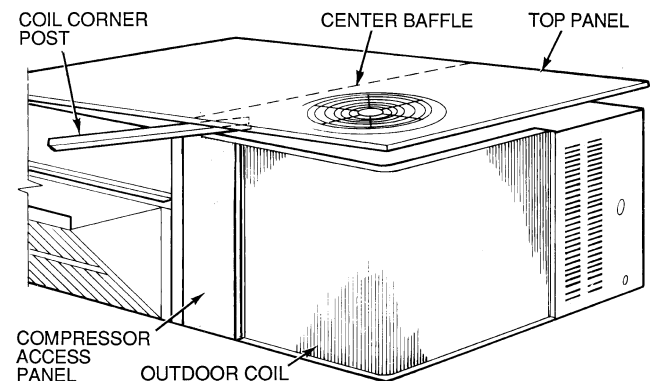


Fig. 36 — Propping Up Top Panel

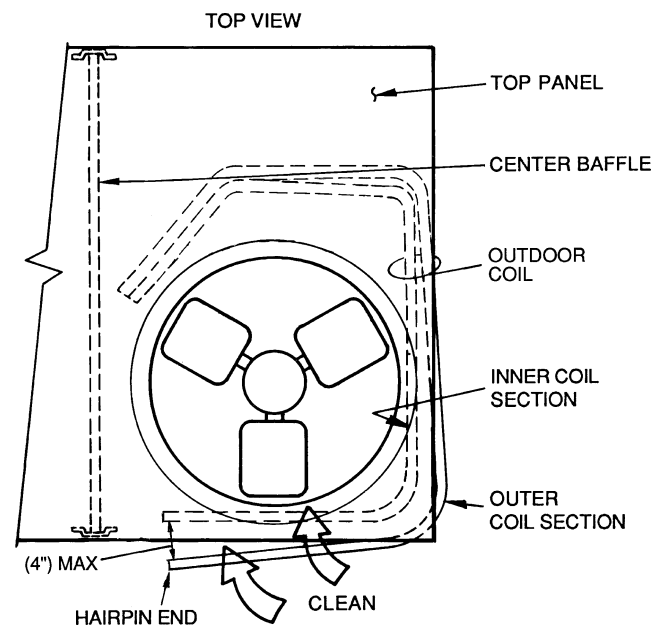


Fig. 37 — Separating Coil Sections

CONDENSATE DRAIN — Check and clean each year at start of cooling season. In winter, keep drain dry or protect against freeze-up.

FILTERS — Clean or replace at start of each heating and cooling season, or more often if operating conditions require it. Replacement filters must be same dimensions as original filters.

OUTDOOR-AIR INLET SCREENS — Clean screens with steam or hot water and a mild detergent. Do not use disposable filters in place of screens.

Lubrication

COMPRESSOR — The compressor is charged with the correct amount of oil at the factory.

FAN MOTOR BEARINGS — Fan motor bearings are permanently lubricated. No further lubrication of outdoor- or indoor-fan motors is required.

High-Pressure Switch — The high pressure switch contains a Schrader core depressor, and is located on the compressor hot gas line. This switch opens at 428 psig and closes at 320 psig. No adjustment is necessary.

Loss-of-Charge Switch — The loss-of-charge switch contains a Schrader core depressor, and is located on the compressor hot gas line. This switch opens at 7 psig and closes at 22 psig. No adjustment is necessary.

Freeze-Stat — The freeze-stat is a bimetal temperature-sensing switch that is located on the “hair pin” end of the evaporator coil. The switch protects the evaporator coil from freeze-up due to lack of airflow. The switch opens at 30 F and closes at 45 F. No adjustment is necessary.

Outdoor-Fan Adjustment (Fig. 38)

1. Shut off unit power supply and tag disconnect.
2. Remove outdoor-fan assembly (grille, motor, motor cover, and fan) by removing screws and flipping assembly onto unit top cover.
3. Loosen fan hub setscrews.
4. Adjust fan height as shown in Fig. 38.
5. Tighten setscrews.
6. Replace outdoor-fan assembly.

Blower Belt Adjustment — Inspect blower belt for wear and proper belt tension, and pulley alignment as conditions require, or at the beginning of each heating and air conditioning season. Refer to Step 7 — Adjust Indoor-Fan Speed on page 19 for adjustment and alignment procedures.

Economizer Adjustment — Refer to Optional Economizer sections on pages 12 and 14.

Refrigerant Charge — Amount of refrigerant charge is listed on unit nameplate (also refer to Table 1). Refer to Carrier Refrigerant Service Techniques Manual, Refrigerants section.

Unit panels must be in place when unit is operating during charging procedure. Compressor must run a minimum of 10 minutes before checking or adjusting refrigerant charge.

NO CHARGE — Refer to Carrier Refrigerant Service Techniques. Use standard evacuating techniques. After evacuating system to 500 microns, weigh in the specified amount of refrigerant. (Refer to Table 1.)

CHARGING, HEATING MODE — Do not attempt to adjust refrigerant charge while unit is operating in the Heating mode. If refrigerant charge amount is suspect, evacuate refrigerant system to 500 microns and weigh in refrigerant amount listed on unit data plate.

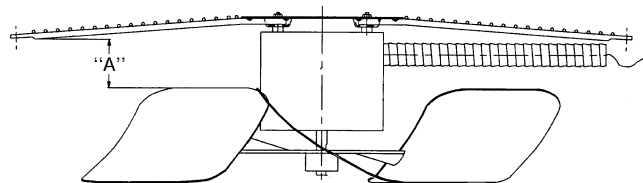
LOW CHARGE COOLING — Use Cooling Charging Charts, Fig. 39-42. Vary refrigerant until the conditions of the charts are met. Note that the charging charts are different from type normally used. Charts are based on charging the units to the correct superheat for the various operating conditions. Accurate pressure gage and temperature sensing device are required. Connect the pressure gage to the service port on the suction line. Mount the temperature sensing device on the suction line and insulate it so that outdoor ambient temperature does not affect the reading. Indoor-air cfm must be within the normal operating range of the unit.

NOTE: Do not use mercury or dial type pocket thermometers as they are not designed for this type of temperature measurement.

TO USE COOLING CHARGING CHARTS — Take the outdoor ambient temperature and read the suction pressure gage. Refer to charts to determine what the suction temperature should be. If suction temperature is high, add refrigerant. If suction temperature is low, carefully recover some of the charge. Recheck the suction pressure as charge is adjusted.

Example: (Fig. 39)

Outdoor Temperature 85 F
Suction Pressure 74 psig
Suction Temperature should be 52 F
(Suction Temperature may vary $\pm 5^\circ$ F.)



UNIT 50HJQ	FAN HEIGHT (in.)
004-006 AND 007 (208/230 v)	2.75
007 (460 v)	3.50

Fig. 38 — Outdoor-Fan Adjustment

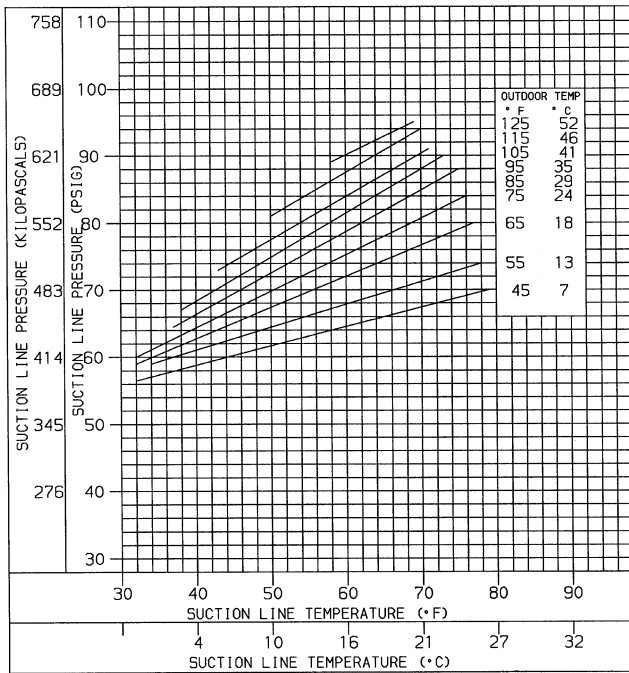


Fig. 39 — Cooling Charging Chart — 50HJQ004

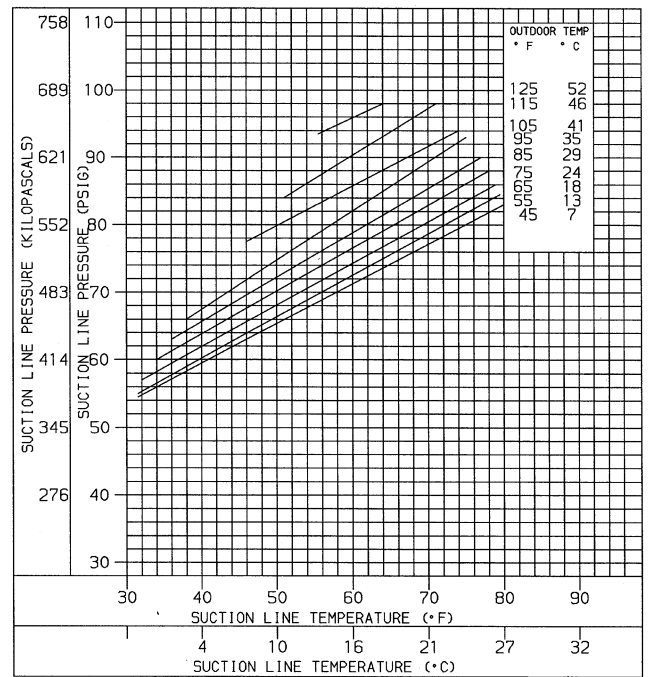


Fig. 41 — Cooling Charging Chart — 50HJQ006

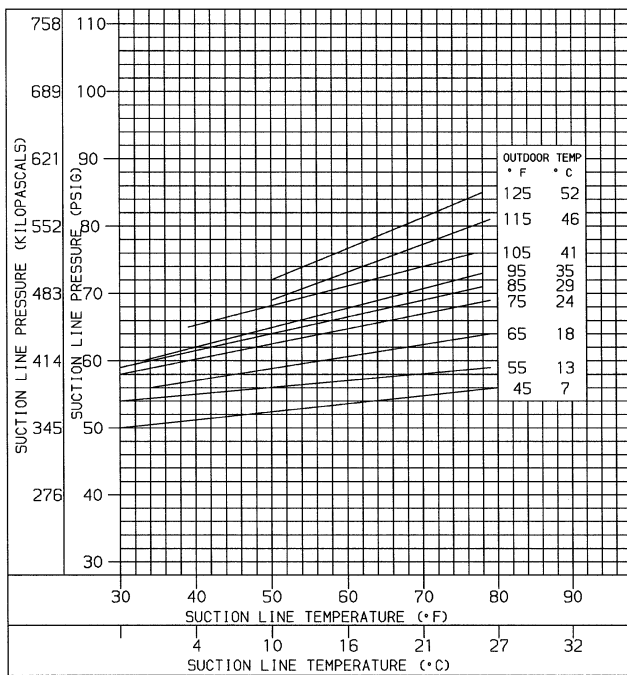


Fig. 40 — Cooling Charging Chart — 50HJQ005

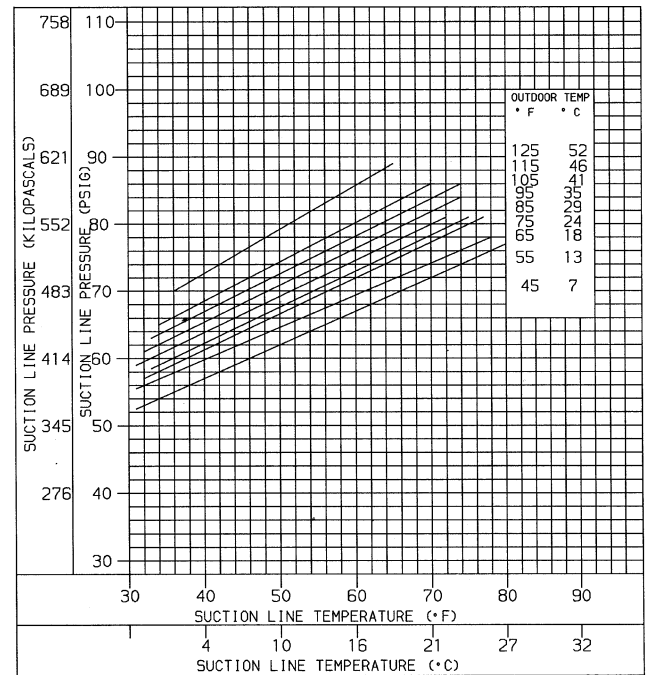


Fig. 42 — Cooling Charging Chart — 50HJQ007

TROUBLESHOOTING

Table 27 — Heating and Cooling Troubleshooting

PROBLEM	CAUSE	REMEDY
Compressor and outdoor fan will not start.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Defective thermostat, contactor, transformer, control relay, or capacitor.	Replace component.
	Insufficient line voltage.	Determine cause and correct.
	Incorrect or faulty wiring.	Check wiring diagram and rewire correctly.
	Thermostat setting too high.	Lower thermostat setting below room temperature.
	High pressure switch tripped.	See problem “Excessive head pressure.”
	Low pressure switch tripped.	Check system for leaks. Repair as necessary.
	Freeze-up protection thermostat tripped.	See problem “Suction pressure too low.”
Compressor will not start but outdoor fan runs.	Faulty wiring or loose connections in compressor circuit.	Check wiring and repair or replace.
	Compressor motor burned out, seized, or internal overload open.	Determine cause. Replace compressor.
	Defective run/start capacitor, overload, start relay.	Determine cause and replace.
	One leg of 3-phase power dead.	Replace fuse or reset circuit breaker. Determine cause.
Compressor cycles (other than normally satisfying thermostat).	Refrigerant overcharge or undercharge.	Recover refrigerant, evacuate system, and recharge to nameplate.
	Defective compressor.	Replace and determine cause.
	Insufficient line voltage.	Determine cause and correct.
	Blocked outdoor coil or dirty air filter.	Determine cause and correct.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace.
	Defective thermostat.	Replace thermostat.
	Faulty outdoor-fan (cooling) or indoor-fan (heating) motor or capacitor.	Replace.
	Restriction in refrigerant system.	Locate restriction and remove.
Compressor operates continuously.	Dirty air filter.	Replace filter.
	Unit undersized for load.	Decrease load or increase unit size.
	Thermostat set too low.	Reset thermostat.
	Low refrigerant charge.	Locate leak; repair and recharge.
	Leaking valves in compressor.	Replace compressor.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Outdoor coil dirty or restricted.	Clean coil or remove restriction.
Compressor makes excessive noise.	Compressor rotating in the wrong direction.	Reverse the 3-phase power leads as described in Start-Up, page 33.
Excessive head pressure.	Dirty air filter.	Replace filter.
	Dirty outdoor coil.	Clean coil.
	Refrigerant overcharged.	Recover excess refrigerant.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condensing air restricted or air short-cycling.	Determine cause and correct.
Head pressure too low.	Low refrigerant charge.	Check for leaks; repair and recharge.
	Compressor valves leaking.	Replace compressor.
	Restriction in liquid tube.	Remove restriction.
Excessive suction pressure.	High heat load.	Check for source and eliminate.
	Compressor valves leaking.	Replace compressor.
	Refrigerant overcharged.	Recover excess refrigerant.
Suction pressure too low.	Dirty air filter (cooling) or dirty outdoor coil (heating).	Replace filter.
	Low refrigerant charge.	Check for leaks; repair and recharge.
	Metering device or low side restricted.	Remove source of restriction.
	Insufficient indoor airflow (cooling mode).	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
	Field-installed filter drier restricted.	Replace.
	Outdoor ambient below 25 F.	Install low-ambient kit.

Table 28 — Durablade Economizer Troubleshooting

PROBLEM	CAUSE	REMEDY
Damper does not open.	Indoor fan is off.	1. Check to ensure that 24 vac is present at terminal C1 on the IFC or that 24 vac is present at the IFO terminal. Check whether 24 vac is present at PL6-1 (red wire) and/or PL6-3 (black wire). If 24 vac is not present, check wiring (see unit label diagram). 2. Check proper thermostat connection to G on the connection board.
	No power to economizer motor.	1. Check that SW3 is making contact properly with the damper blade. Check that SW1 is in the NC position. 2. Check diode D1. If diode is not functioning properly, replace D1. 3. Confirm that the economizer control board is grounded properly at PL6-4 (brown wire) and at brown terminal of the economizer control board (brown wire). The economizer motor must also be grounded properly at the negative motor terminal (brown wire). 4. Verify SW1 and SW3 are working and wired properly (see unit label diagram). 5. Check for 24 vac input at both PL6-1 (red wire) and PL6-3 (black wire). If 24 vac not present, check unit wiring (see unit label diagram). If 24 vac is found in both places, check for 24 vac at the yellow terminal of the economizer control board (yellow wire). If 24 vac power is not present, replace the economizer control board.
	Economizer motor failure.	If the indoor fan and economizer motor are energized, verify that there is a minimum of 18 vdc at the positive motor terminal. If the motor is not operating, replace the motor.
Economizer operation limited to minimum position.	OAT or EC set too high.	1. Set at correct temperature (3 F below indoor space temperature). 2. Check OAT or EC by setting above outdoor temperature or humidity level. If the OAT or EC switches do not close, replace OAT or EC.
	Economizer control board incorrectly wired or not functioning.	1. Perform the following tests when OAT or EC is closed. Y1 is called for, and damper is at minimum position. Confirm 24 vac on gray terminal of the economizer control board (gray wire). If 24 vac is not present, check wiring (see unit label diagram). 2. Verify that SW1 and SW3 are wired correctly and working properly (see unit label diagram). 3. Check to ensure that 24 vac exists at PL6-2 (blue wire). If 24 vac is not present, check wiring (see unit wiring label diagram). 4. Check 24 vac output at PL6-10 (white wire). If 24 vac is not present, replace economizer control board.
	Incorrect SAT wiring or inoperative SAT.	1. After verifying that the OAT and EC settings and the economizer control board wiring are correct, check to ensure that the 24 vac terminal of the SAT has 24 vac (white wire). If OAT, EC, and control board are functioning and wired properly and no 24 vac exists, check wiring (see unit label diagram). 2. If supply-air temperature is greater than 57 F, 24 vac should be found at terminal T2 on the SAT (pink wire). If 24 vac is not present, replace SAT.
Damper does not close.	Incorrect economizer wiring.	1. Verify that SW2 and SW4 are wired and working properly (see unit label diagram). 2. Check diode D2. If diode is not functioning properly, replace D2.
	Incorrect damper actuator wiring or inoperative economizer circuit board.	1. After verifying that the wiring is correct, modulate the damper to the minimum position. Remove the calls for G. 2. If the damper does not move, check for 24 vac at PL6-1 (red wire). If 24 vac is not present, check wiring (see unit label diagram). 3. If damper still does not move, check for 24 vac at blue terminal of economizer control board (blue wire). If 24 vac is not present, replace the economizer circuit board.
	Incorrect SAT wiring or inoperative SAT.	1. After verifying that the wiring is correct and the economizer control board is functioning properly, place the OAT or EC switch in the closed position. Place a call for Y1 and open the damper to the fully-open position. Confirm that the 24 vac terminal of the SAT has 24 vac (white wire). If 24 vac is not present, check wiring (see unit label diagram). 2. If supply-air temperature is less than 52 F, 24 vac should be found at terminal T1 on the SAT (violet wire). If 24 vac not found, replace SAT.
	Economizer motor failure.	If economizer control board and SAT are functioning properly, verify that there is a minimum of 18 vdc at the positive motor terminal. If a minimum of 18 vdc is present and the motor is still not operating, replace the motor.
Economizer damper does not close on power loss.	Insufficient battery power, inoperative economizer control board.	1. Check voltage potential across batteries. If lower than 14 vdc, replace close-on-power-loss power supply (9-v alkaline batteries). Check this emergency power supply on a regular basis or whenever the filters are changed. 2. If the close-on-power-loss and economizer control board are functioning properly, check for 14 vdc or higher at the blue terminal of the economizer control board (blue wire) when power is disconnected from unit. If 14 vdc is not present, replace the control board.

LEGEND

C1	— Common Power
EC	— Enthalpy Control
IFC	— Indoor Fan Contactor
IFO	— Indoor Fan On
NC	— Normally Closed
OAT	— Outdoor-Air Thermostat
PL	— Plug
SAT	— Supply-Air Thermostat
SW	— Economizer Position Switch

Table 29 — EconoMi\$er Troubleshooting

PROBLEM	CAUSE	REMEDY
Damper does not open.	Indoor fan is off.	Check to ensure that 24 vac is present at Terminal C1 (Common Power) on the IFC (Indoor Fan contactor) or that 24 vac is present at the IFO (Indoor Fan On) terminal. Check whether 24 vac is present at PL6-1 (red wire) and/or PL6-3 (black wire). If 24 vac is not present, check wiring (see unit label diagram). Check proper thermostat connection to G on the connection board.
	No power to EconoMi\$er controller.	Check to ensure that 24 vac is present across Terminals 24 VAC and 24 V COM on the EconoMi\$er control. If 24 vac is not present, check wiring (see unit label diagram). If 24 vac is present, STATUS light should be on constantly.
	No power to G terminal.	If IFM is on, check to ensure 24 vac is present on G Terminal of the EconoMi\$er controller. If 24 vac is not present, check wiring (see unit label diagram).
	Controller fault.	If STATUS light is flashing one flash, the EconoMi\$er controller is experiencing a fault condition. Cycle power to the controller. If condition continues, replace the EconoMi\$er controller.
	Thermostat fault.	If STATUS light is flashing two flashes, the EconoMi\$er controller senses the thermostat is wired incorrectly. Check wiring between the thermostat and the connection board in the electrical panel. The fault condition is caused by Y2 being energized before Y1.
	Actuator fault.	Check the wiring between the EconoMi\$er controller and the actuator. Hold CONFIG button between 3 and 10 seconds to verify the actuator's operation. (This process takes 3 minutes to complete.)
EconoMi\$er operation limited to minimum position.	Minimum position set incorrectly.	Verify that the MIN POS (%) is set greater than zero. Adjust MIN POS (%) to 100% to verify operation, and then set to correct setting.
	EconoMi\$er changeover set point set too high or too low.	Set at correct value. See Table 3.
	Supply air temperature sensor faulty.	If STATUS light is flashing 4 flashes, supply air temperature sensor is faulty. Check wiring or replace sensor.
	Outdoor air temperature sensor faulty.	If STATUS light is flashing 5 flashes, outdoor air temperature sensor is faulty. Check wiring or replace sensor.
Damper position less than minimum position set point.	Supply air low limit strategy controlling.	The supply-air temperature is less than 45° F, causing the minimum position to be decreased. Refer to the Start-Up instructions. Verify correct setting of MIN POS (%). If correct, EconoMi\$er is operating correctly.
Damper does not return to minimum position.	CO ₂ ventilation strategy controlling.	If a CO ₂ sensor is being used, and the damper position is greater than minimum position, the ventilation control strategy is controlling. Refer to the Start-Up instructions. EconoMi\$er is operating correctly.
Damper does not close on power loss.	Damper travel is restricted.	Check to ensure the damper is not blocked.

LEGEND

IFM — Indoor-Fan Motor
PL — Plug

LEGEND AND NOTES FOR FIG. 43

AWG	— American Wire Gage	QT	— Quadruple Terminal
AHA	— Adjustable Heat Anticipator	R	— Relay
C	— Contactor, Compressor	RVS	— Reversing Valve Solenoid
CAP	— Capacitor	SAT	— Supply-Air Thermostat
CB	— Circuit Breaker	SW1	— Switch Fully Open
CC	— Cooling Compensator	SW2	— Switch Fully Closed
CLO	— Compressor Lockout	SW3	— Switch Min. Vent Position
COMP	— Compressor Motor	SW4	— Switch Max. Vent Position
D	— Diode	TB	— Terminal Block
DB	— Defrost Board	TC	— Thermostat-Cooling
DFT	— Defrost Thermostat	TH	— Thermostat-Heating
EC	— Enthalpy Control	TRAN	— Transformer
ECON	— Economizer		Field Splice
EPS	— Emergency Power Supply (Nine Volt Battery)		Marked Wire
EQUIP	— Equipment		Terminal (Marked)
ER	— Economizer Relay		Terminal (Unmarked)
FPT	— Freeze Up Protection Thermostat		Terminal Block
FSS	— Filter Status Switch		Splice
FU	— Fuse		Splice (Marked)
GND	— Ground		Factory Wiring
HC	— Heater Contactor (Strip Heat)		Field Control Wiring
HP	— Heat Pump		Field Power Wiring
HPS	— High-Pressure Switch		Accessory or Optional Wiring
HR	— Heater Relay		To indicate common potential only; not to represent wiring.
IFC	— Indoor-Fan Contactor		
IFM	— Indoor-Fan Motor		
LPS	— Low-Pressure Switch		
LSM	— Limit Switch (Manual Reset)		
MTR	— Motor		
OAT	— Outdoor-Air Thermostat		
OFM	— Outdoor-Fan Motor		
OLR	— Overload Relay		
P	— Plug		
PL	— Plug Assembly		

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. Three-phase motors are protected under primary single-phasing conditions.
3. Thermostat:
HH07AT170, 172, 174 and P272-2783
Subbase:
HH93AZ176, 178 and P272-1882, 1883.
4. Set heat anticipator at .8 amp for first stage and .3 for second stage.
5. Use copper conductors only.
6. Use copper, copper-clad aluminum or aluminum conductors.
- 7.

VOLTAGE RATING	CB	MUST TRIP AMPS
	MFG. PT. NO.	
24 V	POTTER & BRUMFIELD	3.2
	W28X-1024-3.2	

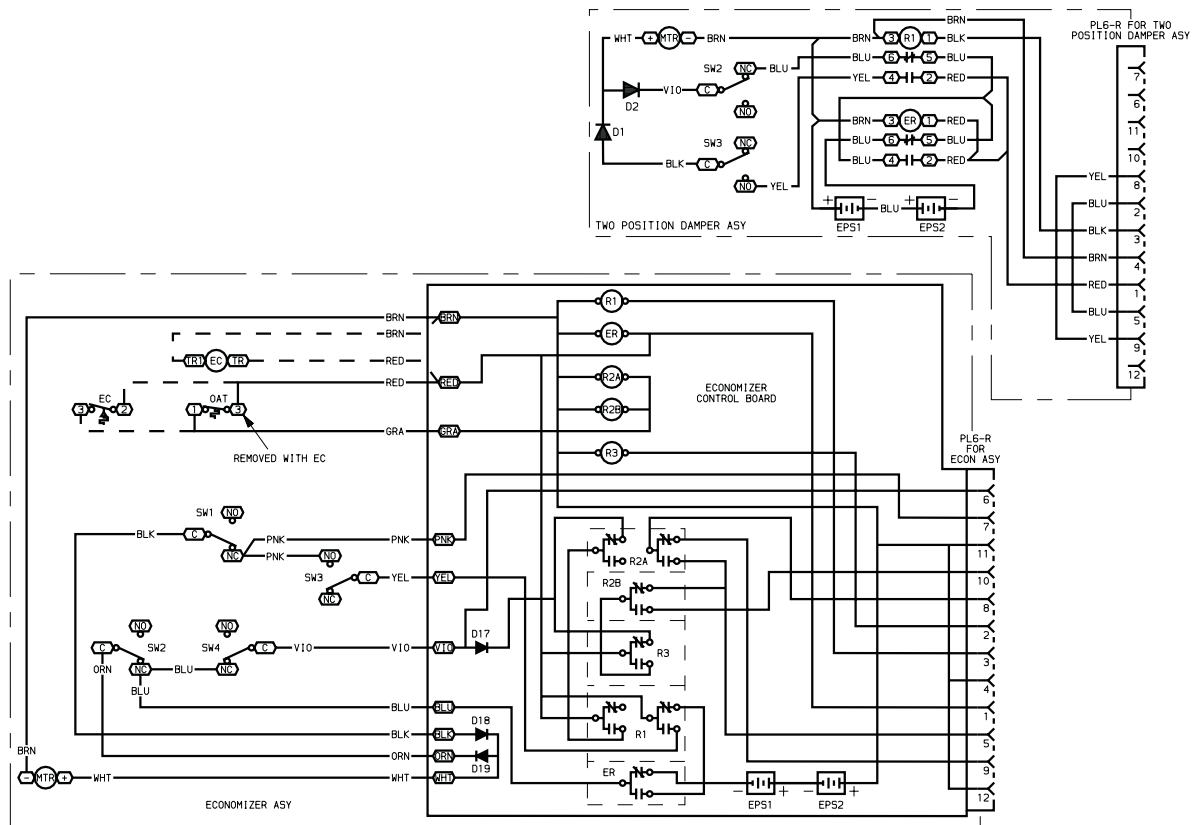


Fig. 43 — Typical Wiring Schematic (50HJQ006,007 Shown)



SERVICE TRAINING

Packaged Service Training programs are an excellent way to increase your knowledge of the equipment discussed in this manual, including:

- Unit Familiarization
- Installation Overview
- Maintenance
- Operating Sequence

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START-UP CHECKLIST
(Remove and Store in Job File)

I. PRELIMINARY INFORMATION

MODEL NO.: _____
DATE: _____

SERIAL NO.: _____
TECHNICIAN: _____

II. PRE-START-UP (insert checkmark in box as each item is completed)

- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTALLATION INSTRUCTIONS
- ☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS
- ☐ CHECK THAT INDOOR AIR FILTER IS CLEAN AND IN PLACE
- ☐ VERIFY THAT UNIT INSTALLATION IS LEVEL
- ☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS
- ☐ CHECK PULLEY ALIGNMENT AND BELT TENSION REFER INSTALLATION INSTRUCTIONS

III. START-UP

ELECTRICAL

SUPPLY VOLTAGE	L1-L2	_____	L2-L3	_____	L3-L1	_____
COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
INDOOR-FAN AMPS	L1	_____	L2	_____	L3	_____

TEMPERATURES

OUTDOOR-AIR TEMPERATURE	_____	DB		
RETURN-AIR TEMPERATURE	_____	DB	_____	WB
COOLING SUPPLY AIR	_____	DB	_____	WB

PRESSURES (Cooling Mode)

REFRIGERANT SUCTION	_____	PSIG	_____	° F
REFRIGERANT DISCHARGE	_____	PSIG	_____	° F

- ☐ VERIFY THAT 3-PHASE SCROLL COMPRESSOR IS ROTATING IN THE CORRECT DIRECTION
- ☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS ON PAGE 37

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE