



50TJ004-007 Single-Package Rooftop Cooling Units



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 the 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. Electrical shock could cause personal injury.

INSTALLATION

Unit is shipped in the vertical configuration. To convert to horizontal configuration, remove screws from side duct opening covers and remove covers. Using the same screws, install covers on vertical duct openings with the insulation-side down. Seals around duct openings must be tight. See Fig. 1.

Step 1 — Provide Unit Support

ROOF CURB — Assemble and install accessory roof curb in accordance with instructions shipped with curb. See Fig. 2. 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 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 a watertight seal. Install gasket supplied with the roof curb as shown in Fig. 2. 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. 3. 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 in. is required for the first 12 in. of ductwork. Cabinet return-air static shall not exceed $-.35$ in. wg with Varislide economizer, $-.20$ with PARABLADE economizer, or $-.45$ in. wg without economizer.

Step 3 — Install External Trap for Condensate Drain

— The unit's $\frac{3}{4}$ -in. 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 applications.

When using the standard side drain connection, make sure the plug 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 from the bottom connection to the side connection. See Fig. 4A. 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. See Fig. 4B. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1 in. per 10 ft of run. Do not use a pipe size smaller than the unit connection.

Step 4 — Rig and Place Unit — Inspect unit for transportation damage. 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. Rollers may be used to

move unit across a roof. Level by using unit frame as a reference. See Table 1 and Fig. 5 for additional information. Operating weight is shown in Table 1 and Fig. 5.

Lifting holes are provided in base rails as shown in Fig. 6. 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. 6. A properly positioned unit will have the following clearances: $\frac{1}{4}$ -in. clearance between roof curb and base rails on each side and front of unit; $1\frac{1}{2}$ -in. clearance between roof curb and rear of unit. (See Fig. 2, 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 shipping materials and top crating.

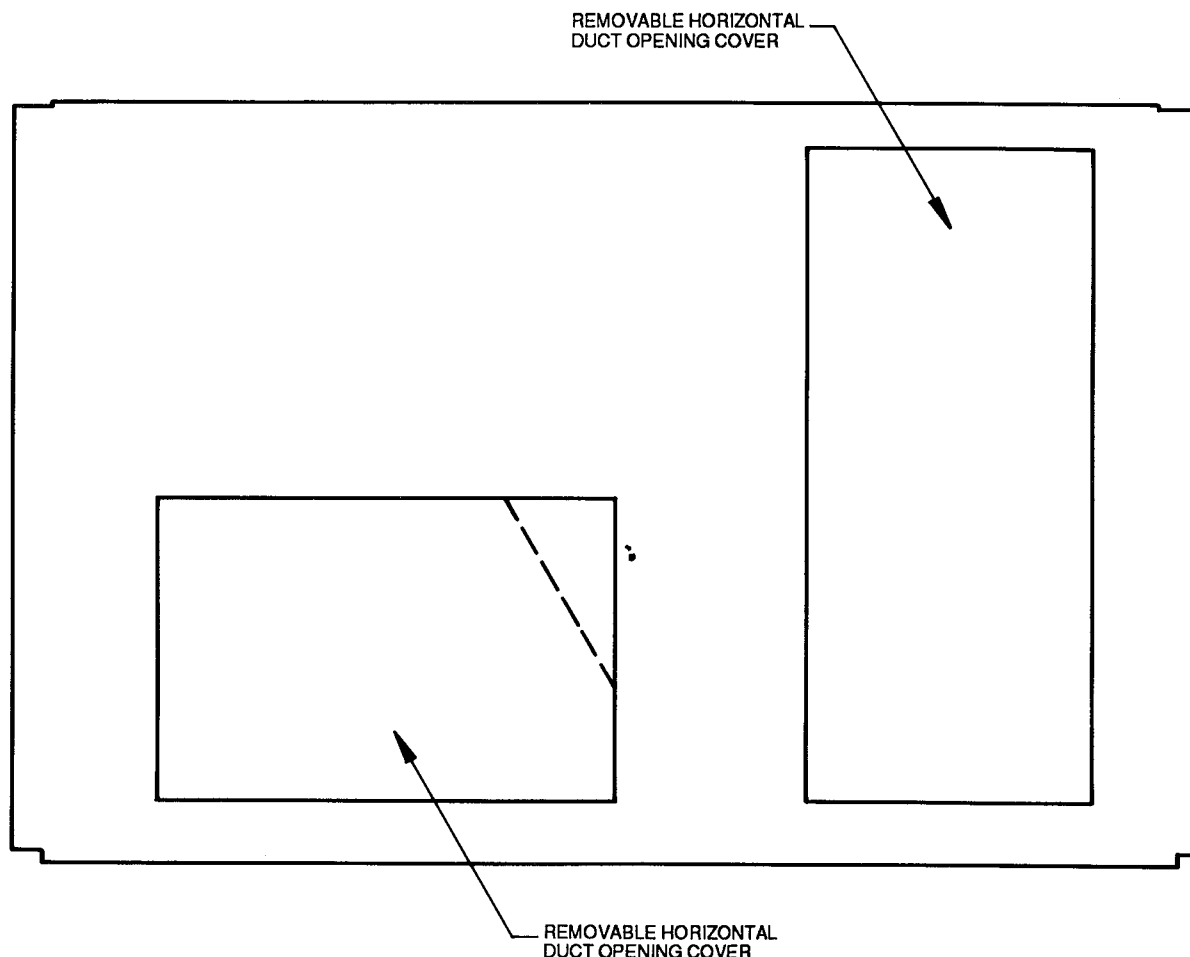


Fig. 1 — Horizontal Conversion Panels

CONNECTION SIZES

UNIT SIZE	"B"	"C"	"D" ALT DRAIN HOLE	POWER	CONTROL	CONNECTOR ACY PKG
50TJ004-007	1'-9 ¹¹ / ₁₆ " [551]	1'-4" [406]	1 ³ / ₄ " [44.5]	3/4" NPT	1/2" NPT	CRBTMPWR001A00 (THRU-THE-BOTTOM)
				1 ¹ / ₄ " NPT	1/2" NPT	CRBTMPWR002A00 (THRU-THE-BOTTOM)

ROOF CURB ACCESSORY	"A"	UNIT SIZE
CRRFCURB001A00	1'-2" [356]	50TJ004-007
CRRFCURB002A00	2'-0" [610]	

NOTES:

- 1 Roof curb accessory is shipped unassembled
- 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

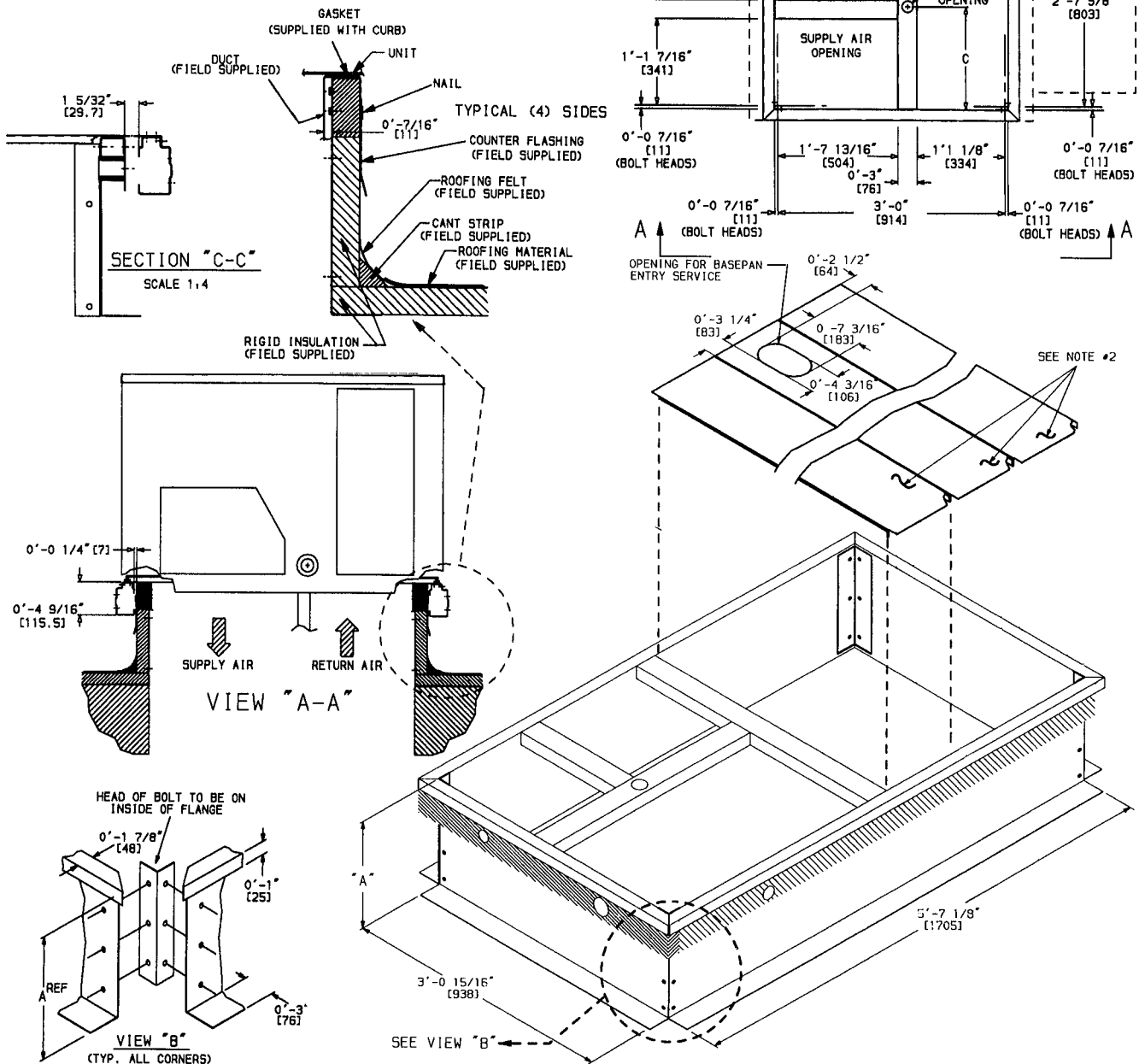
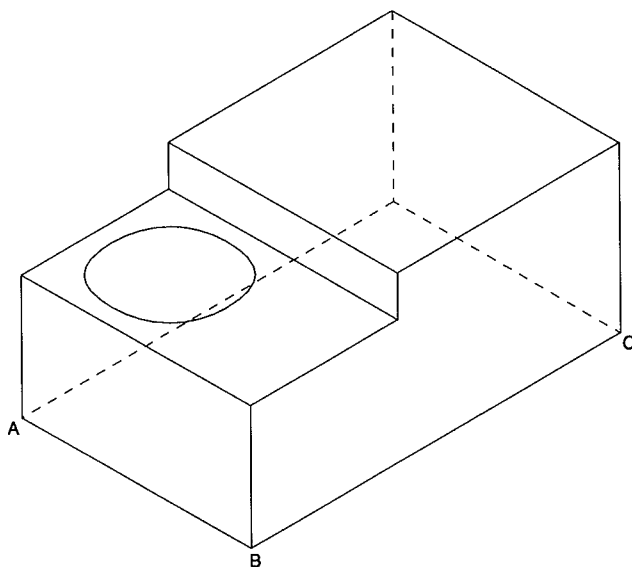


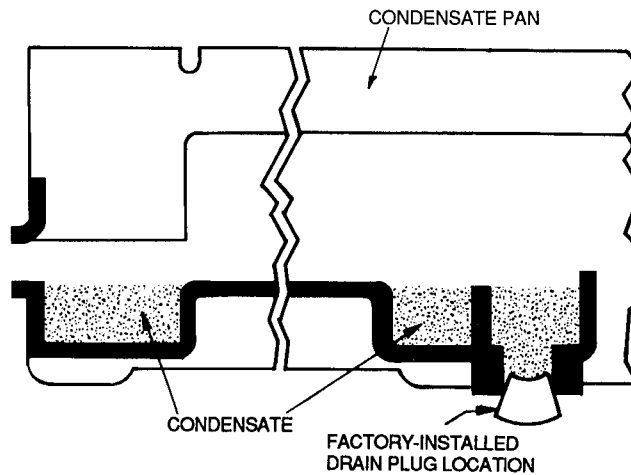
Fig. 2 — Roof Curb Dimensions



MAXIMUM ALLOWABLE
DIFFERENCE (in.)

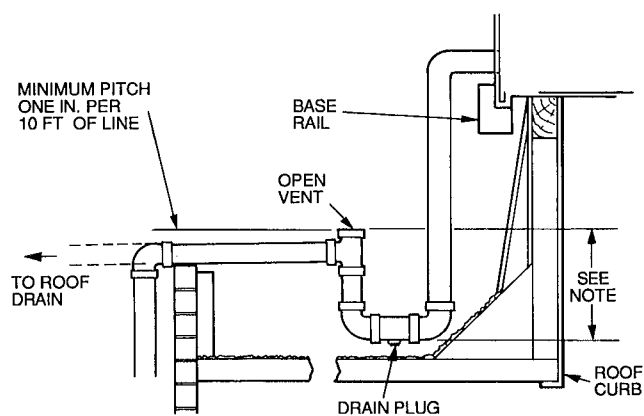
A-B	B-C	A-C
0.5	1.0	1.0

Fig. 3 — Unit Leveling Tolerances



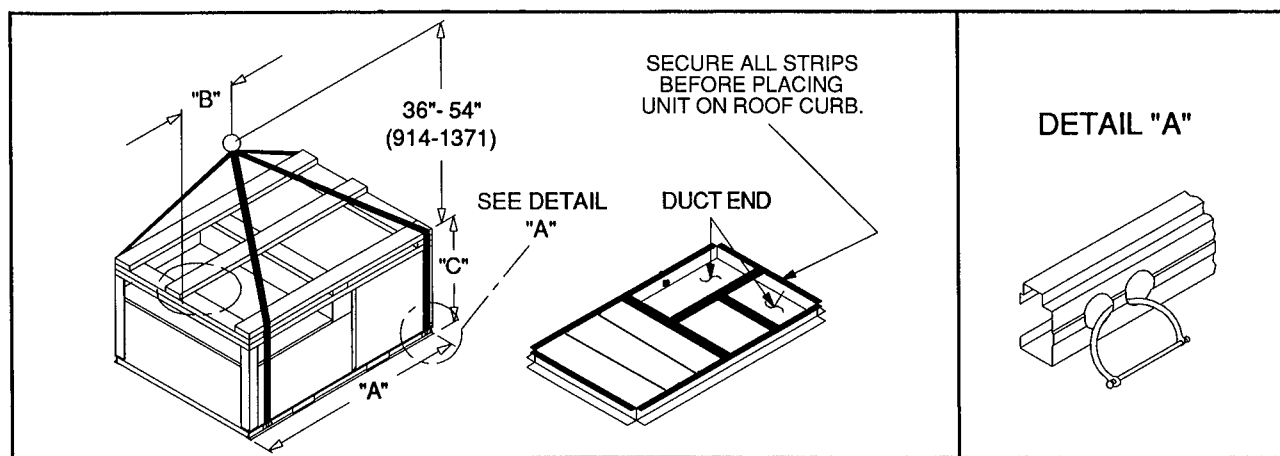
NOTE: Drain plug is shown in factory-installed position.

Fig. 4A — Internal Trap Condensate Drain



NOTE: Trap should be deep enough to offset maximum unit static difference. A 4-in. trap is recommended.

Fig. 4B — External Trap Condensate Drain



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. Weights do not include economizer. See Table 1 for economizer weights.

⚠ CAUTION

All panels must be in place when rigging

UNIT	MAX WEIGHT		DIMENSIONS					
			“A”		“B”		“C”	
	lb	kg	in.	mm	in.	mm	in.	mm
50TJ004	415	188	73.69	1872	35.00	889	33.35	847
50TJ005	425	193	73.69	1872	35.00	889	33.35	847
50TJ006	445	202	73.69	1872	35.00	889	33.35	847
50TJ007	520	236	73.69	1872	35.00	889	33.35	847

Fig. 5 — Rigging Details

Table 1 — Physical Data

BASE UNIT 50TJ		004	005	006	007
NOMINAL CAPACITY (tons)		3	4	5	6
OPERATING WEIGHT (lb)					
Unit		365	375	395	470
Varislide™ Economizer		34	34	34	34
PARABLADE Economizer		42	42	42	42
Roof Curb		115	115	115	115
COMPRESSOR		Hermetic			
Quantity		1	1	1	1
Oil (oz)		50	50	50	65
REFRIGERANT TYPE		R-22			
Operating Charge (lb-oz)		3-6	4-11	5-13	9-0
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins			
Rows...Fins/in.		1.. 17	1.. 17	1.. 17	2.. 17
Total Face Area (sq ft)		7.36	11.39	13.19	10.42
CONDENSER FAN		Propeller Type			
Nominal Cfm		3500	4000	4000	4000
Quantity...Diameter (in.)		1.. 22.0	1.. 22.0	1.. 22.0	1.. 22.0
Motor Hp...Rpm		¼.. 1100	¼.. 1100	¼.. 1100	¼.. 1100
Watts Input (Total)		325	325	325	325
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Acutrol™ Feed Device			
Rows...Fins/in.		2.. 15	2.. 15	3.. 15	4.. 15
Total Face Area (sq ft)		4.17	5.5	5.5	5.5
EVAPORATOR FAN		Centrifugal Type			
Quantity...Size (in.)		1.. 10 x 10	1.. 10 x 10	1.. 11 x 10	1... 10 x 10
	Std	1.. 10 x 10	1.. 10 x 10	1... 10 x 10	—
Type Drive	Std	Direct	Direct	Direct	Belt
	Alt	Belt	Belt	Belt	—
Nominal Cfm	Std	1200	1600	2000	2400
	Alt	1200	1600	2000	—
Maximum Continuous Bhp	Std	34	75	1.20	2.40
	Alt	1.00	1.00	1.80	—
Motor Frame Size	Std	48	48	48	56
	Alt	48	48	56	—
Nominal Rpm High/Low	Std	860/800	1075/970	1075/970	—
	Alt	—	—	—	—
Fan Rpm Range	Std	—	—	—	1070-1460
	Alt	760-1090	840-1185	900-1300	—
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	Std	—	—	—	2.8/3.8
	Alt	1 9/2.9	1 9/2.9	2 4/3.4	—
Nominal Motor Shaft Diameter (in.)	Std	½	½	½	5/8
	Alt	½	½	½	—
Fan Pulley Pitch Diameter (in.)	Std	—	—	—	4.5
	Alt	4.5	4.0	4.5	—
Belt, Quantity...Type...Length (in.)	Std	—	—	—	1 .A. 40
	Alt	1 A...39	1 A 36	1 ..A. 39	—
Pulley Center Line Distance (in.)	Std	—	—	—	14 7-15.5
	Alt	10.0-12.4	10.0-12.4	14.7-15.5	—
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Std	—	—	—	80
	Alt	65	70	80	—
Movable Pulley Maximum Full Turns From Closed Position	Std	—	—	—	5
	Alt	5	5	5	—
Factory Setting	Std	—	—	—	3
	Alt	3	3	3	—
Factory Speed Setting (rpm)	Std	—	—	—	1225
	Alt	890	980	1060	—
Fan Shaft Diameter at Pulley (in.)		5/8	5/8	5/8	5/8
HIGH-PRESSURE SWITCH (psig)*		450 ± 50			500 ± 50
Standard Compressor Internal Relief (Differential)		428			428
Cutout		320			320
Reset (Auto.)					
LOW-PRESSURE/LOSS-OF-CHARGE SWITCH (psig)*		7 ± 3			
Cutout		22 ± 7			
Reset (Auto.)					
FREEZE-PROTECTION THERMOSTAT (F)*		30 ± 5			
Opens		45 ± 5			
Closes					
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

*Requires an optional or accessory controls upgrade kit

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 (American National Standards Institute)/NFPA (National Fire Protection Association), latest edition (in Canada, Canadian Electrical Code CSA [Canadian Standards Association] C22.1), and local electrical codes. Failure to follow this warning could result in the installer being liable for personal injury of others.

DISCONNECT BOX LOCATION — The field-supplied disconnect box may be mounted on the unit's end panel or the corner post. Mount disconnect box on the left side of the rating plate when mounting on the unit's end panel. Do not mount the disconnect box over the unit rating plate. When mounting disconnect box on corner post, secure disconnect box to corner post and condenser coil top cover.

A disconnect box mounting space is available when an optional or accessory condenser coil grille is used. Mount the disconnect on the sheet metal provided with the condenser coil grille. The sheet metal is located adjacent to the corner post on the left side of the power wiring access panel.

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 moving the black wire from the 230-v orange wire on the transformer and connecting it to the 200-v red wire from the transformer. The end of the orange wire must then be insulated.

Refer to unit label diagram for additional information. Leads are provided for field wire connections. Use copper conductors only when splice connectors are used.

When installing units, provide a disconnect per NEC.

All field wiring must comply with NEC and local requirements.

Install field wiring as follows:

1. Install conduit between disconnect and power wiring access panel. See Fig. 7.
2. Install power lines to power wiring leads as shown in Fig. 8.
3. Power wiring leads are located inside power wiring access panel.

Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate (see Table 2). On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in the legend for Table 2, Note 2 to determine the percent of voltage imbalance. Operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation would invalidate any applicable Carrier warranty.

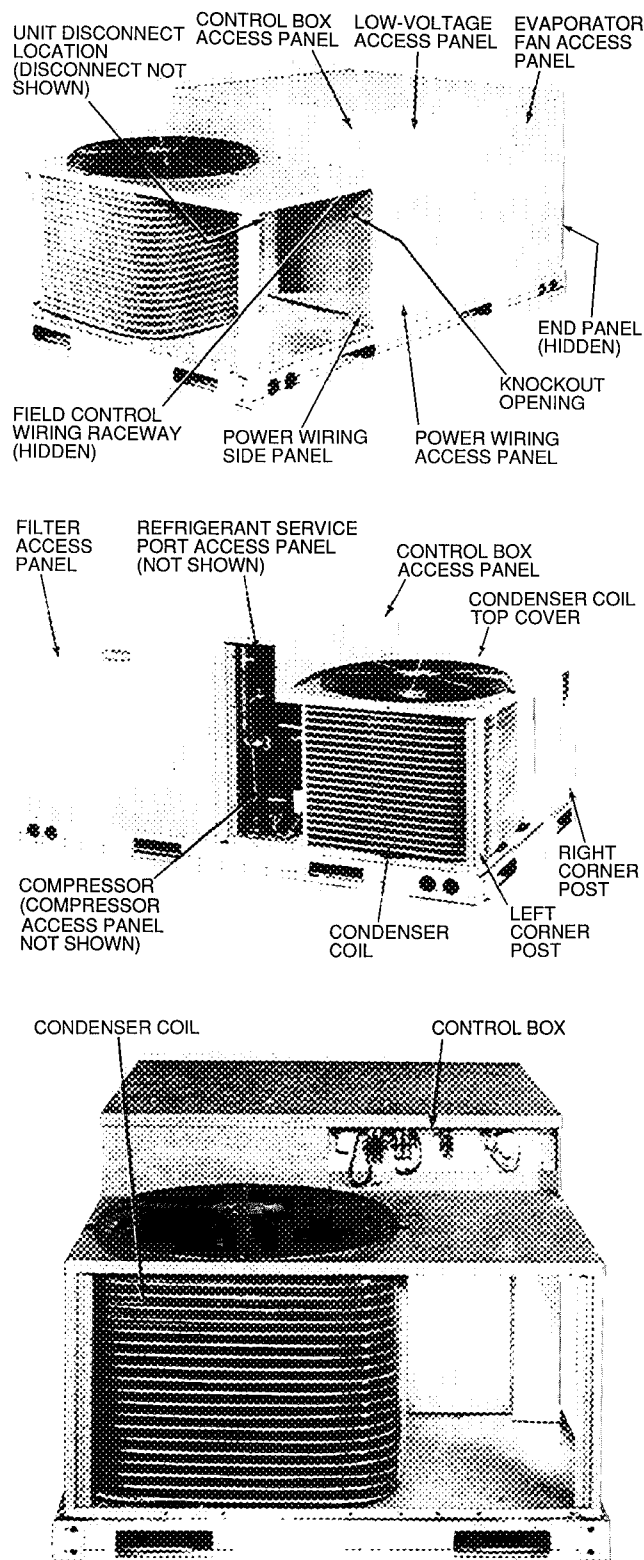
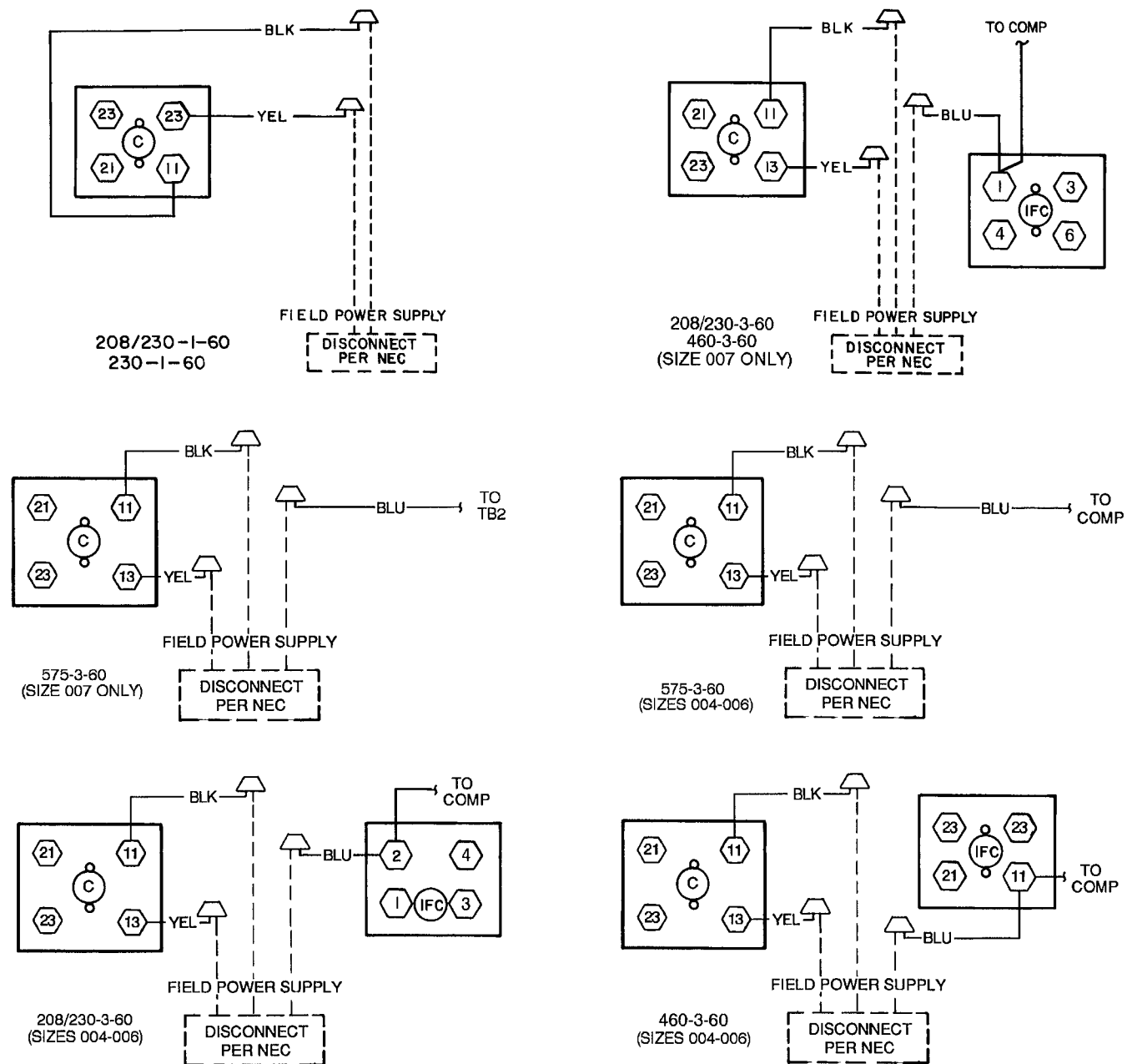


Fig. 7 — Typical Component Location



LEGEND

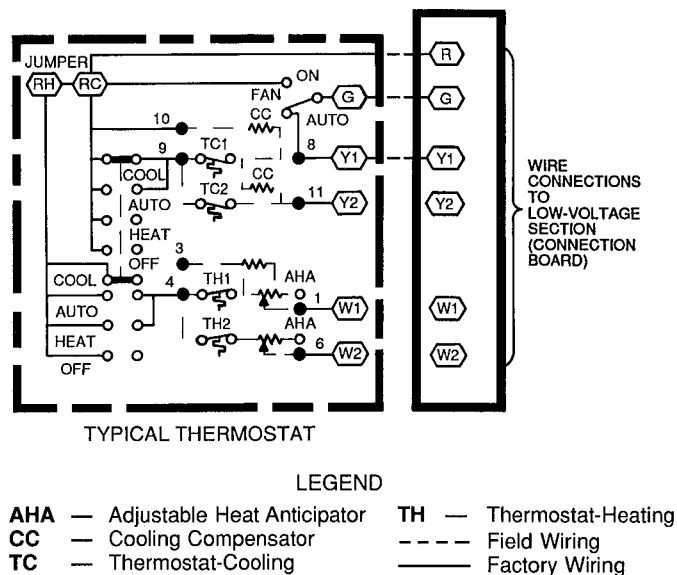
- C** — Contactor
- COMP** — Compressor
- IFC** — Indoor (Evaporator) Fan Contactor
- NEC** — National Electrical Code

Fig. 8 — Power Wiring Connections

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. Connect thermostat wires to terminal board.

Route thermostat cable or equivalent single leads of colored wire from subbase terminals to low-voltage connections on unit (shown in Fig. 9).

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.



NOTES:

- 1 Connect Y2 when unit is equipped with an economizer.
- 2 Connect W1 when unit is equipped with an accessory 1-module heater package. Connect W2 when unit is equipped with an accessory 2-module heater package.

Fig. 9 — Low-Voltage Connections

Feed control wires through the raceway located between the condenser coil top cover and power wiring access panel. See Fig. 7. Connect control wires to the low-voltage connections located inside low-voltage access panel. See Fig. 9 and 10. The barrier provides the UL (Underwriters' Laboratories) required clearance between high- and low-voltage wiring.

NOTE: If thru-the-bottom power connections are used refer to the accessory installation instructions for information on power wiring. Refer to Fig. 6 for drilling holes in basepan.

IMPORTANT: Optional factory-installed, alternate evaporator-fan motors are not available for 50TJ007 units. Contact your local Carrier representative for more information about field-installed motors.

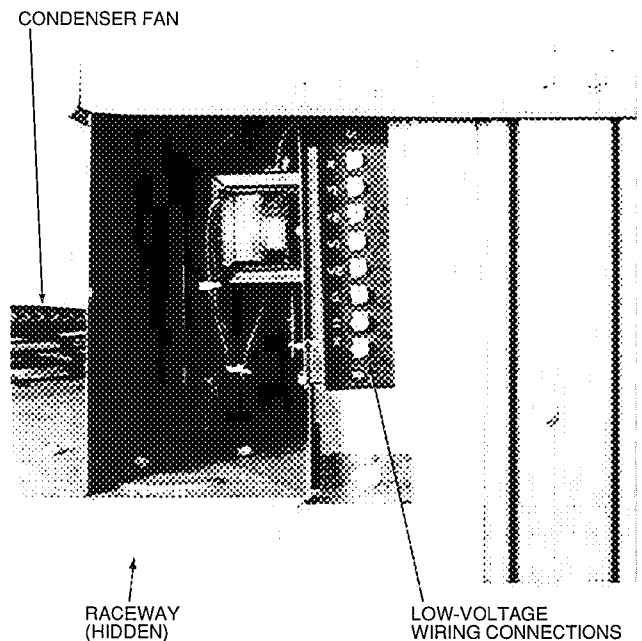


Fig. 10 — Low-Voltage Location

Table 2 — Electrical Data

UNIT 50TJ	NOMINAL V-PH-HZ	IFM TYPE	VOLTAGE RANGE		COMPR (each)		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		DISCONNECT SIZE†						
			Min	Max	RLA	LRA	FLA	FLA	Nominal kW	FLA	MCA	MOCPS**	FLA	LRA					
004 (3 Ton)	208/230-1-60	Std	187	254	16.9	86.7	1.4	2.8	—	—	25.3/25.3	35/35	24/24	97/97					
									3.3/ 4.4	15.9/18.3	25.3/26.4	35/35	24/24	97/97					
								4.9	4.9/ 6.5	23.8/27.3	32.8/37.4	35/40	30/34	97/97					
									6.5/ 8.7	31.4/36.2	42.8/48.8	45/50	39/45	97/97					
	208/230-3-60	Std	187	254	11.7	65.1	1.4	2.8	7.9/10.5	37.9/43.8	50.9/58.2	60/60	47/54	97/97					
									9.8/13.0	47.1/54.6	62.2/71.2	70/80	57/66	97/97					
								4.9	—	—	27.4/27.4	35/35	27/27	102/102					
									3.3/ 4.4	15.9/18.3	27.4/29.0	35/35	27/27	102/102					
	460-3-60	Std	414	508	5.1	32.8	0.8	1.3	4.9/ 6.5	13.6/15.6	20.4/23.0	25/25	19/21	76/76					
									6.5/ 8.7	18.1/20.9	26.2/29.7	30/30	24/27	76/76					
								2.1	7.9/10.5	21.9/25.3	30.9/35.1	35/40	28/32	76/76					
									12.0/16.0	33.5/38.6	45.3/51.7	50/60	42/48	76/76					
	575-3-60	Std	518	632	4.1	27.0	0.8††	1.3††	—	—	6.8	15	7	31					
								2.1††	—	—	7.4	15	7	34					
208/230-1-60		Std						187	254	23.0	110	1.4	3.5	—	—	33.7/ 33.7	40/ 40	32/ 32	122/122
														3.3/ 4.4	15.9/18.3	33.7/ 33.7	40/ 40	32/ 32	122/122
							4.9						6.5/ 8.7	31.4/36.3	43.6/ 49.7	45/ 50	40/ 46	122/122	
													9.8/13.0	46.9/54.2	63.0/ 72.1	70/ 80	58/ 66	122/122	
208/230-3-60	Std	187	254	15.3	92.0	1.4	3.5	13.1/17.4	62.8/72.5	82.9/ 95.0	90/100	76/ 87	122/122						
								15.8/21.0	75.8/87.5	99.2/113.8	100/125	91/105	122/122						
							4.9	—	—	35.1/ 35.1	40/ 40	34/ 34	125/125						
								3.3/ 4.4	15.9/18.3	35.1/ 35.1	40/ 40	34/ 34	125/125						
460-3-60	Std	414	508	7.0	46.0	0.8	1.8	6.5/ 8.7	31.4/36.3	45.4/ 51.4	45/ 60	42/ 47	125/125						
								9.8/13.0	46.9/54.2	64.8/ 73.8	70/ 80	60/ 68	125/125						
							2.1	13.0/17.4	62.8/72.5	84.7/ 96.8	90/100	78/ 89	125/125						
								15.8/21.0	75.8/87.5	100.9/115.5	100/125	93/106	125/125						
575-3-60	Std	518	632	5.8	44.0	0.8††	1.8††	—	—	9.3	15	9	49						
							2.1††	—	—	9.6	15	9	51						

Table 2 — Electrical Data (cont)

UNIT 50TJ	NOMINAL V-PH-HZ	IFM TYPE	VOLTAGE RANGE		COMPR (each)		OFM FLA	IFM FLA	ELECTRIC HEAT*		POWER SUPPLY		DISCONNECT SIZE†	
			Min	Max	RLA	LRA			Nominal kW	FLA	MCA	MOCP**	FLA	LRA
006 (5 Ton)	208/230-1-60	Std	187	254	30.5	141	1.4	5.9	4.9/ 6.5 6.5/ 8.7 9.8/13.0 13.0/17.4 15.8/21.0	23.5/27.1 31.4/36.3 46.9/54.2 62.8/72.5 75.8/87.5	42.7/ 42.7 42.7/ 42.7 46.6/ 52.7 66.0/ 75.1 85.9/ 98.0 102.2/116.8	50/ 50 50/ 50 50/ 60 70/ 80 90/100 110/125	41/ 41 41/ 41 43/ 49 61/ 69 79/ 90 94/107	155/155 155/155 155/155 155/155 155/155 155/155
									4.9/ 6.5 6.5/ 8.7 9.8/13.0 13.0/17.4 15.8/21.0	23.5/27.1 31.4/36.3 46.9/54.2 62.8/72.5 75.8/87.5	45.3/ 45.3 45.3/ 45.3 49.9/ 55.9 69.3/ 78.3 89.2/101.3 105.5/120.0	60/ 60 60/ 60 60/ 60 70/ 80 90/110 110/125	44/ 44 44/ 44 46/ 52 64/ 72 82/ 93 97/110	178/178 178/178 178/178 178/178 178/178 178/178
									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 33.4/38.5 43.8/50.5 55.2/63.8	29.4/29.4 29.4/29.4 34.7/38.9 49.1/55.5 62.1/70.5 76.4/87.1	35/35 35/35 40/40 50/60 70/80 80/90	29/29 29/29 32/36 45/51 57/65 70/80	124/124 124/124 124/124 124/124 124/124 124/124
									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 33.4/38.5 43.8/50.5 55.2/63.8	29.3/29.3 29.3/29.3 35.3/39.5 49.6/56.0 62.6/71.1 77.0/87.6	40/ 40 40/ 40 45/ 45 60/ 60 70/ 80 80/100	29/29 29/29 32/36 45/51 57/65 70/80	145/145 145/145 145/145 145/145 145/145 145/145
	208/230-3-60	Std	187	254	17.7	110	1.4	5.9	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 33.4/38.5 43.8/50.5 55.2/63.8	29.4/29.4 29.4/29.4 34.7/38.9 49.1/55.5 62.1/70.5 76.4/87.1	35/35 35/35 40/40 50/60 70/80 80/90	29/29 29/29 32/36 45/51 57/65 70/80	124/124 124/124 124/124 124/124 124/124 124/124
									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 33.4/38.5 43.8/50.5 55.2/63.8	29.3/29.3 29.3/29.3 35.3/39.5 49.6/56.0 62.6/71.1 77.0/87.6	40/ 40 40/ 40 45/ 45 60/ 60 70/ 80 80/100	29/29 29/29 32/36 45/51 57/65 70/80	145/145 145/145 145/145 145/145 145/145 145/145
									6.0 11.5 14.0 23.0 25.5	7.2 13.8 16.8 27.7 30.1	14.8 14.8 21.3 25.0 38.6 41.6	20 20 25 30 40 45	15 15 20 23 36 38	63 63 63 63 63 63
									6.0 11.5 14.0 23.0 25.5	7.2 13.8 16.8 27.7 30.1	14.2 14.2 21.0 24.8 38.3 41.3	20 20 25 30 45 45	14 14 19 22 35 38	73 73 73 73 73 73
	460-3-60	Std	414	508	8.6	55	0.8	3.2††	—	—	12.0	15	12	52
		Alt						2.6††	—	—	11.4	15	12	62
	575-3-60	Std	518	632	6.4	44	0.8††	3.2††	—	—	12.0	15	12	52
		Alt						2.6††	—	—	11.4	15	12	62
007 (6 Ton)	208/230-3-60	Std	187	254	20.9	142	1.9	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 33.4/38.4 48.9/55.4 55.2/63.8	33.3/33.3 33.3/33.3 34.6/38.8 48.9/55.4 62.0/70.4 76.8/86.9	40/40 40/40 40/40 50/60 70/80 80/90	32/32 32/32 32/32 45/51 57/65 70/80	187/187 187/187 187/187 187/187 187/187 187/187
									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 33.4/38.4 48.9/55.4 55.2/63.8	15.6 15.6 20.5 24.3 37.8 41.6	20 20 25 25 40 45	15 15 19 22 35 38	94 94 94 94 94 94
									6.0 11.5 14.0 23.0 25.5	7.2 13.8 16.8 27.8 30.7	15.6 15.6 20.5 24.3 37.8 41.6	20 20 25 25 40 45	15 15 19 22 35 38	94 94 94 94 94 94
									6.0 11.5 14.0 23.0 25.5	7.2 13.8 16.8 27.8 30.7	15.6 15.6 20.5 24.3 37.8 41.6	20 20 25 25 40 45	15 15 19 22 35 38	94 94 94 94 94 94
	460-3-60	Std	414	508	9.9	72.0	0.6	2.6	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 33.4/38.4 48.9/55.4 55.2/63.8	15.6 15.6 20.5 24.3 37.8 41.6	20 20 25 25 40 45	15 15 19 22 35 38	94 94 94 94 94 94
									6.0 11.5 14.0 23.0 25.5	7.2 13.8 16.8 27.8 30.7	15.6 15.6 20.5 24.3 37.8 41.6	20 20 25 25 40 45	15 15 19 22 35 38	94 94 94 94 94 94
									6.0 11.5 14.0 23.0 25.5	7.2 13.8 16.8 27.8 30.7	15.6 15.6 20.5 24.3 37.8 41.6	20 20 25 25 40 45	15 15 19 22 35 38	94 94 94 94 94 94
									6.0 11.5 14.0 23.0 25.5	7.2 13.8 16.8 27.8 30.7	15.6 15.6 20.5 24.3 37.8 41.6	20 20 25 25 40 45	15 15 19 22 35 38	94 94 94 94 94 94
	575-3-60	Std	518	632	7.9	58.0	0.6††	2.6††	—	—	14.6	15	12	76
		Alt							—	—	14.6	15	12	76

LEGEND

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



*Available with field-installed accessory heaters only. 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.

†Used to determine minimum disconnect per NEC.

**Fuse or HACR circuit breaker.

††Ampacities are based on 460 v. MCA, MOCP, and MOCP are based on 575 v.

||Fusing on single-point box provides the required branch circuit protection.

NOTES:

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

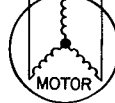
2 Unbalanced 3-Phase Supply Voltage

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

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

Example: Supply voltage is 460-3-60

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



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

NOTE: 575-v units are CSA only.

Determine maximum deviation from average voltage

(AB) 457 - 452 = 5 v

(BC) 464 - 457 = 7 v

(AC) 457 - 455 = 2 v

Maximum deviation is 7 v

Determine percent of voltage imbalance

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

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

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

Step 6 — Make Outdoor-Air Adjustments and Install Outdoor-Air Hood

MANUAL OUTDOOR-AIR DAMPER — The outdoor-air hood and screen are attached to the basepan at the bottom of the unit for shipping.

Assembly:

1. Determine quantity of ventilation required for building. Record amount for use in Step 8.
2. Remove and save evaporator coil access panel and screws. See Fig. 11.
3. Separate hood and screen from basepan by removing the 4 screws securing them. Save all screws.
4. Replace evaporator coil access panel.
5. Place hood on front of evaporator coil access panel. See Fig. 12 for hood details. Secure top of hood with the 4 screws removed in Step 3. See Fig. 13.
6. Remove and save 6 screws (3 on each side) from sides of the manual outdoor-air damper assembly.
7. Align screw holes on hood with screw holes on side of manual outdoor-air damper assembly. See Fig. 12 and 13. Secure hood with 6 screws from Step 6.
8. Adjust minimum position setting of the damper blade by adjusting the manual outdoor-air adjustment screws on the front of the damper blade. See Fig. 11. Slide blade vertically until it is in the appropriate position determined by Fig. 14. Tighten screws.
9. Remove and save screws currently on sides of hood. Insert screen. Secure screen to hood using the screws. See Fig. 13.

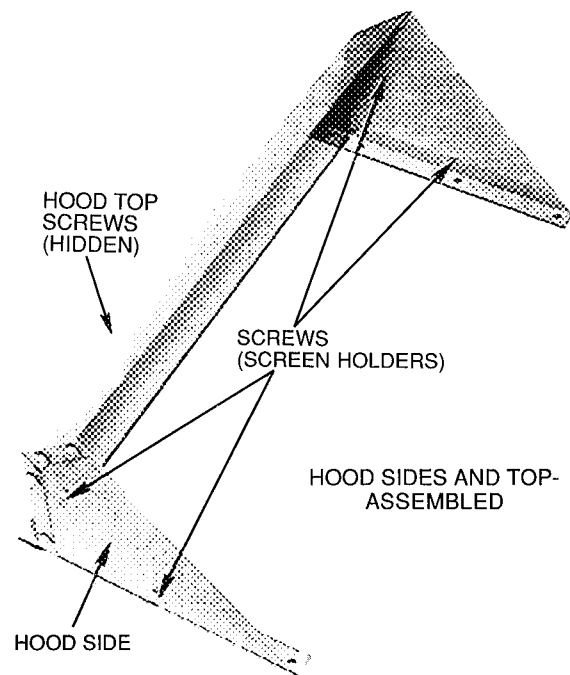


Fig. 12 — Outdoor-Air Hood Details

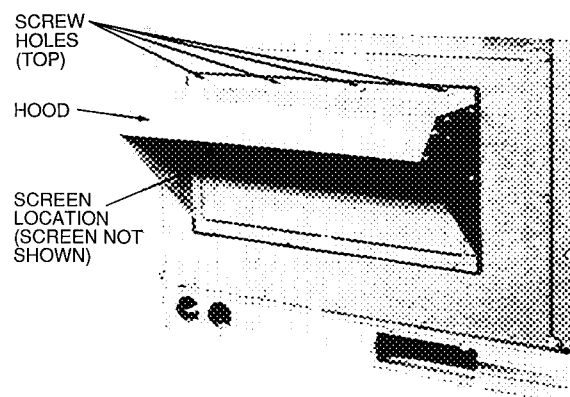


Fig. 13 — Outdoor-Air Damper with Hood Attached

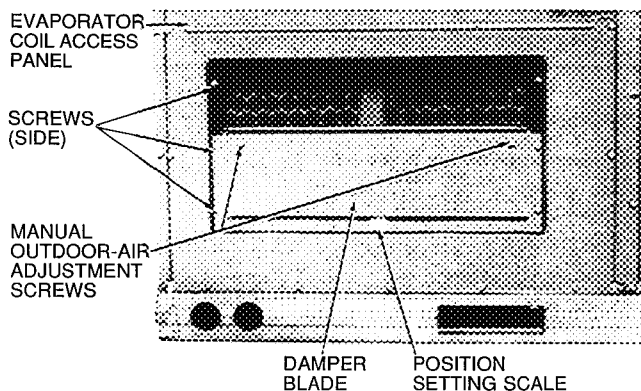


Fig. 11 — Damper Panel With Manual Outdoor-Air Damper Installed

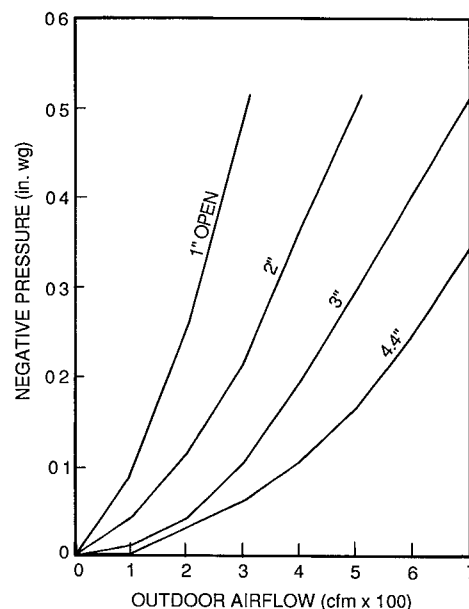


Fig. 14 — Position Setting

OPTIONAL VARISLIDE™ 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 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. 15. Remove optional outdoor-air damper hood package from filter section.

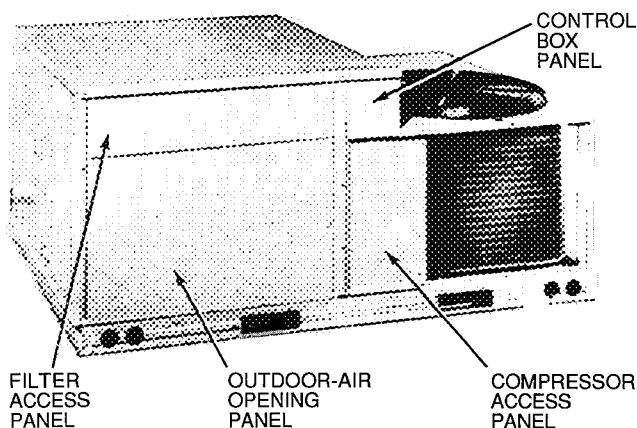


Fig. 15 — Typical Access Panel Locations

3. Assemble outdoor-air hood top and side plates as shown in Fig. 16. Install seal strips on hood top and sides. Put aside screen retainer and retainer screw for later assembly. *Do not attach hood to unit at this time*
4. To convert to horizontal discharge application:
 - a. Rotate economizer 90 degrees until the economizer motor faces the condenser section (see Fig. 17).
 - b. Rotate the barometric relief damper cover 90 degrees.
 - 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. 18.
5. Insert economizer plug into economizer harness. Remove tape from barometric relief damper. See Fig. 19.
6. If ventilation air is not required, proceed to Step 8. If ventilation air is required, determine minimum position setting for required airflow. See Fig. 20. 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. 20. Tighten screws.
7. Remove tape from outdoor-air thermostat (OAT). Fasten OAT to inside of hood using screws and speed clips provided. See Fig. 21. Make sure OAT terminals are positioned up.
8. 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.

9. Fasten hood top and side plate assembly (Fig. 16) to outdoor-air opening panel with screws provided.
10. Place knob supplied with economizer on OAT. See Fig. 21. 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. 21.
11. Connect OAT per Fig. 22.
12. 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.

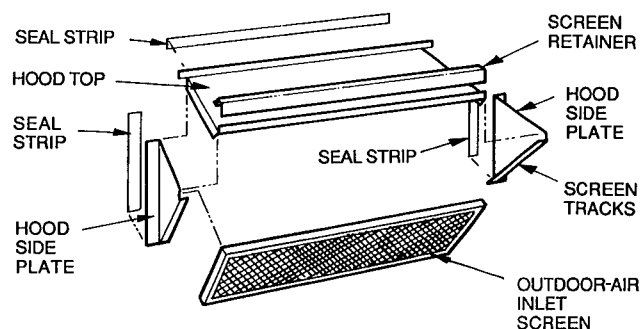
NOTE: Refer to Fig. 23 for economizer barometric relief damper characteristics.

OPTIONAL PARABLADE ECONOMIZER — The optional PARABLADE 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.

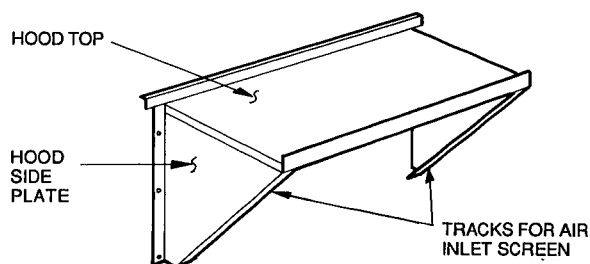
NOTE: Horizontal discharge block-off plate is shipped with the air hood package. The PARABLADE economizer can only be used for vertical discharge applications. Discard this plate.

Assembly

1. Determine if ventilation air is required in building. If so, determine minimum amount to be supplied by each unit and record quantity of ventilation air needed for use in Step 5.
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. 15.
3. Assemble outdoor-air hood top and side plates as shown in Fig. 16. Install seal strips on hood top and sides. Put aside screen retainer and retainer screw for later assembly. *Do not attach hood to unit at this time.*
4. Insert economizer plug into economizer harness. Remove tape from barometric relief damper. See Fig. 24.



OUTDOOR-AIR HOOD - UNASSEMBLED



HOOD SIDES AND TOP - ASSEMBLED

Fig. 16 — Outdoor-Air Hood Details

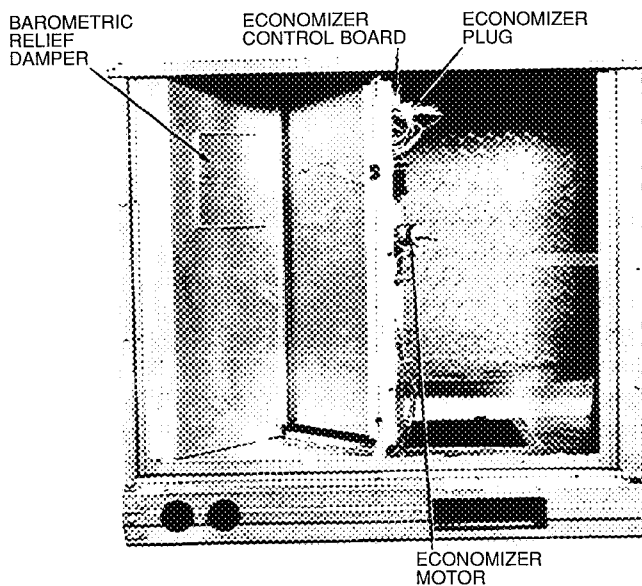


Fig. 17 — Horizontal Varislide™ Economizer Installation

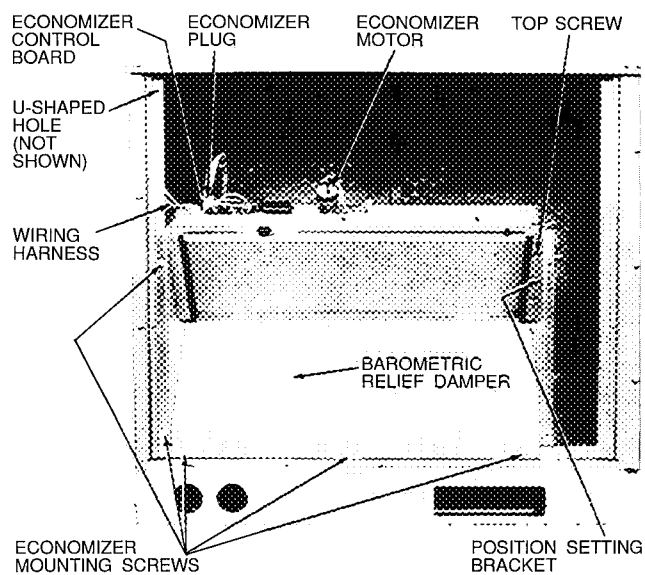


Fig. 19 — Typical Varislide Economizer and Wiring Harness

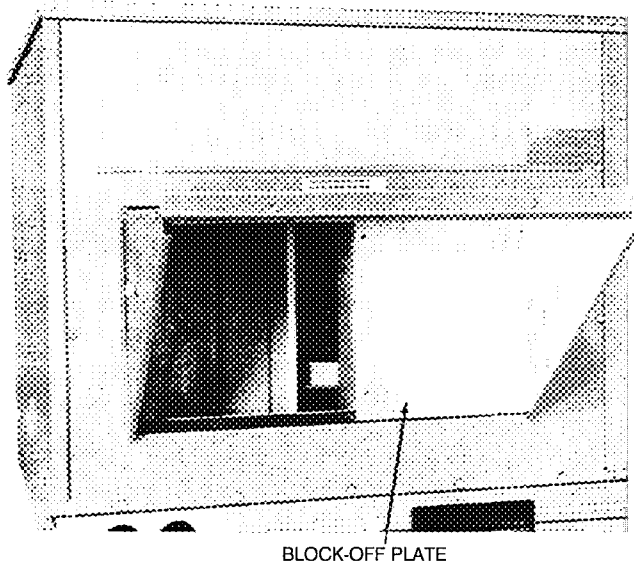
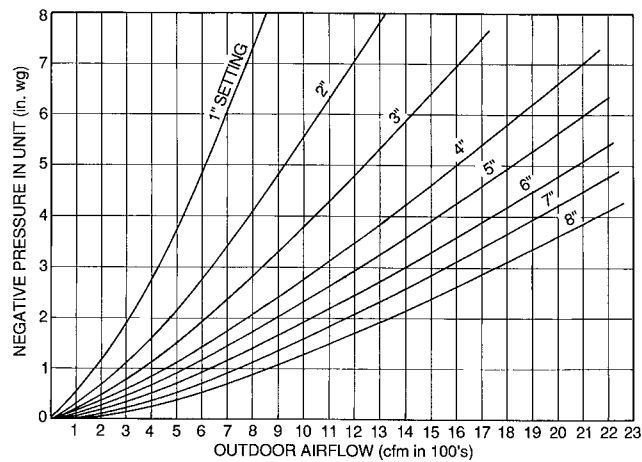


Fig. 18 — Horizontal Discharge Block-Off Plate



EXAMPLE

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

Fig. 20 — Varislide Economizer Minimum Position Setting

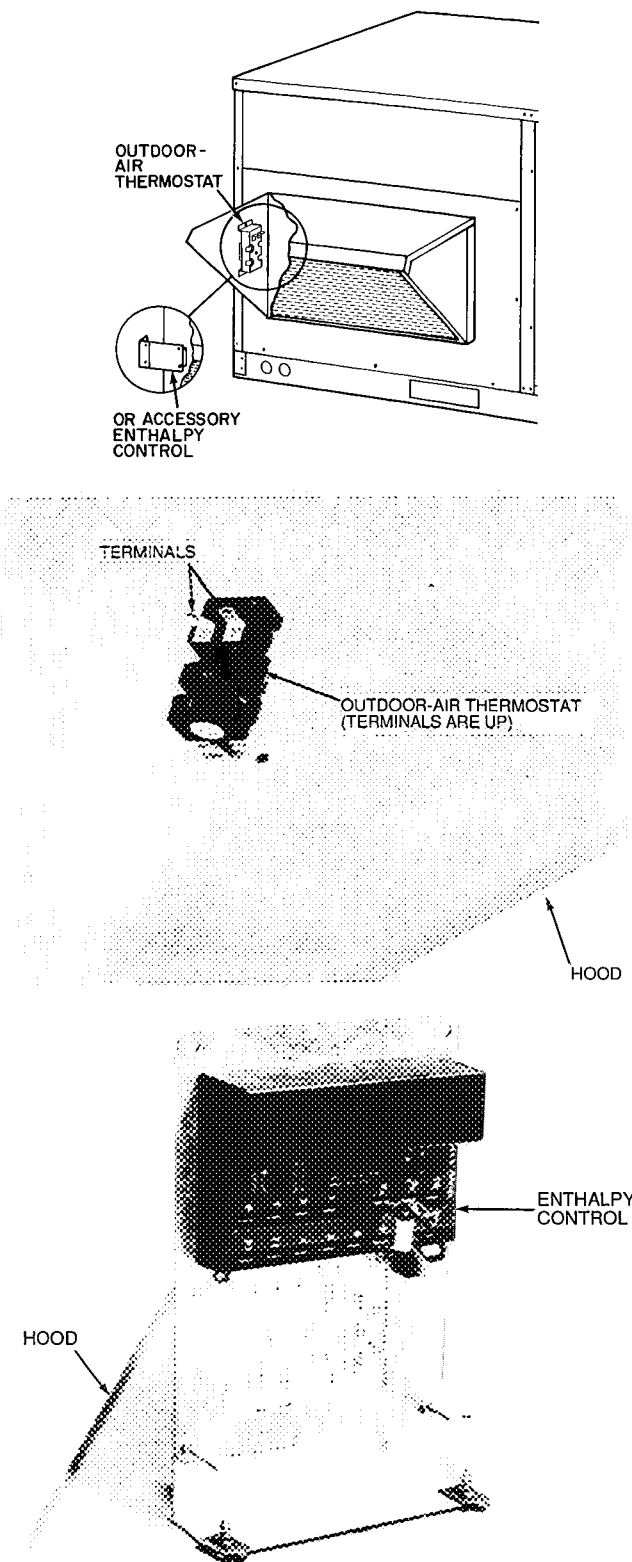
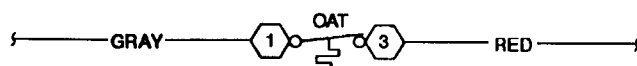


Fig. 21 — Outdoor-Air Thermostat/Enthalpy Control Installation



LEGEND

OAT — Outdoor-Air Thermostat
NOTE: See unit wiring diagram for details

Fig. 22 — Wiring Connections for Outdoor-Air Thermostat

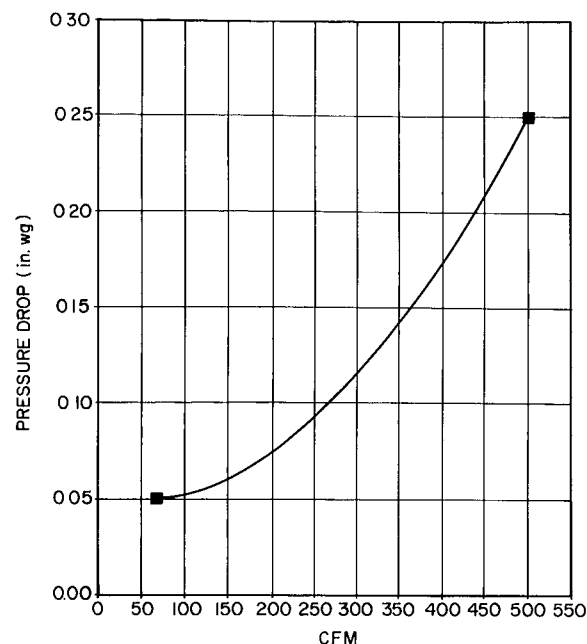


Fig. 23 — Varislide™ Economizer Barometric Relief Damper Characteristics

5. If ventilation air is not required, proceed to Step 6. If ventilation air is required, perform the following:
 - a. Make sure the factory-installed jumper is in place across terminals P and P1 on the economizer logic module. T and T1 should be disconnected during adjustment.
 - b. The 2 potentiometers with slots for adjustment are located on the face of the economizer logic module. Turn the lower potentiometer fully clockwise. The dampers should be fully closed. Turn the potentiometer gradually counterclockwise until the desired position is reached.
 - c. Connect T and T1 to the 24-v power supply.
 - d. After installation is complete, calculate the minimum airflow across the economizer. To calculate the minimum airflow, the following data is needed: total cfm (cfm_3), temperature of the total cfm (T_3), temperature of the return air (T_2), and temperature of the entering outside air (T_1). cfm_1 is the outside air (minimum) cfm.

Insert the data into the following equations:

$$\frac{T_1 (cfm_1) + T_2 (cfm_2)}{cfm_3} = T_3$$

$$cfm_2 = (cfm_3 - cfm_1)$$

Therefore:

$$\frac{T_1 (cfm_1) + T_2 (cfm_3 - cfm_1)}{cfm_3} = T_3$$

Further derivation reveals the following formula for airflow:

$$cfm_1 = \frac{(T_3 - T_2) cfm_3}{(T_1 - T_2)}$$

Use this equation to determine cfm_1 , which is the minimum airflow across the economizer.

If cfm_1 does not match the desired minimum airflow from Step 1, re-adjust the minimum position setting screw.

6. Determine the enthalpy changeover set point from Fig. 25. The enthalpy changeover set point should be set to return the outdoor-air damper to the minimum position when enthalpy rises above the set point. The settings are A, B, C, and D. Set the enthalpy changeover per the setting in Fig. 25.
7. 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. See Fig. 26.
8. Fasten hood top and side plate assembly (Fig. 27) to outdoor-air opening panel with screws provided.
9. 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. See Fig. 28.

NOTE: Refer to Fig. 29 for PARABLADE economizer barometric relief damper characteristics.

Step 7 — Adjust Evaporator-Fan Speed — Adjust evaporator-fan speed to meet jobsite conditions. See Table 3 for fan rpm at motor pulley settings. See Table 4 for motor performance data. Refer to Tables 5-18 to determine fan speed settings.

For units with accessory electric heating, required minimum cfm is 900 for 50TJ004; 1200 for 50TJ005; 1500 for 50TJ006; and 1800 for 50TJ007.

DIRECT DRIVE MOTORS — The evaporator-fan motor factory speed setting is shown on label diagram affixed to base unit. If other than factory setting is desired, refer to label located on motor for motor reconnection. Insert wire into the speed tap corresponding to desired speed.

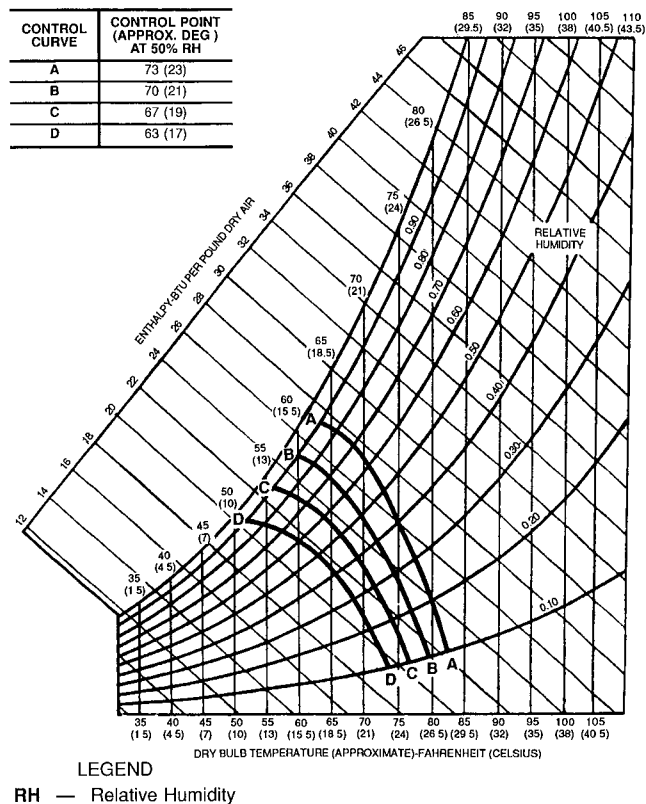


Fig. 25 — Enthalpy Settings for PARABLADE Economizer

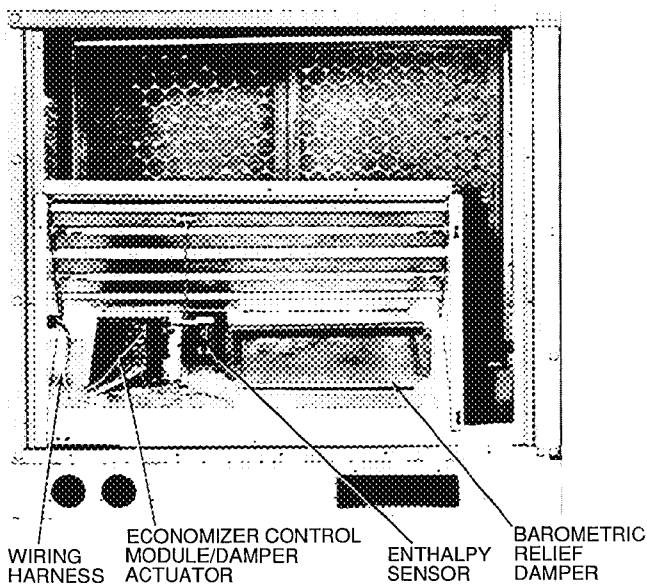


Fig. 24 — PARABLADE Economizer Installed in Unit

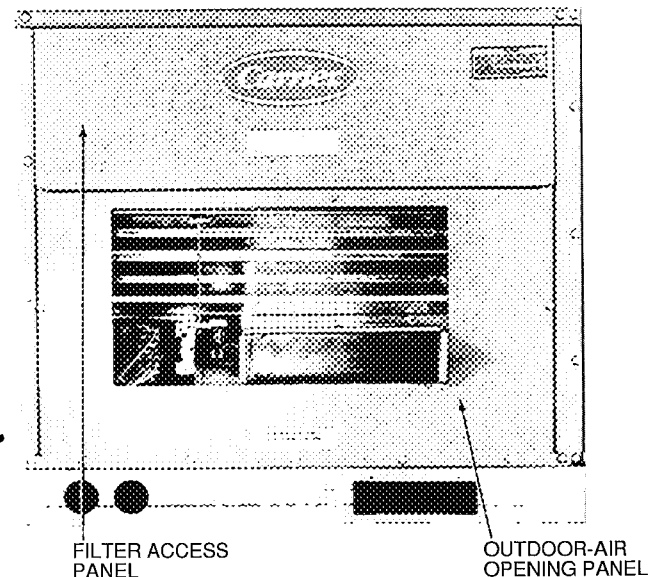


Fig. 26 — Panels Reinstalled on Unit

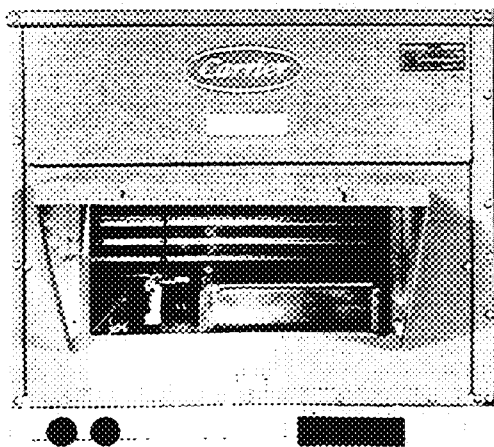


Fig. 27 — Outdoor-Air Hood Installed on Unit

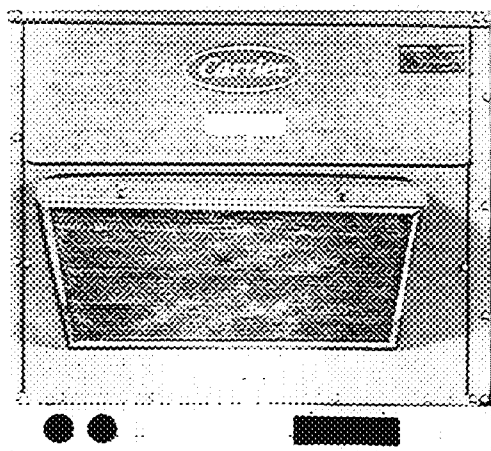


Fig. 28 — Filter Installed on Outdoor-Air Hood

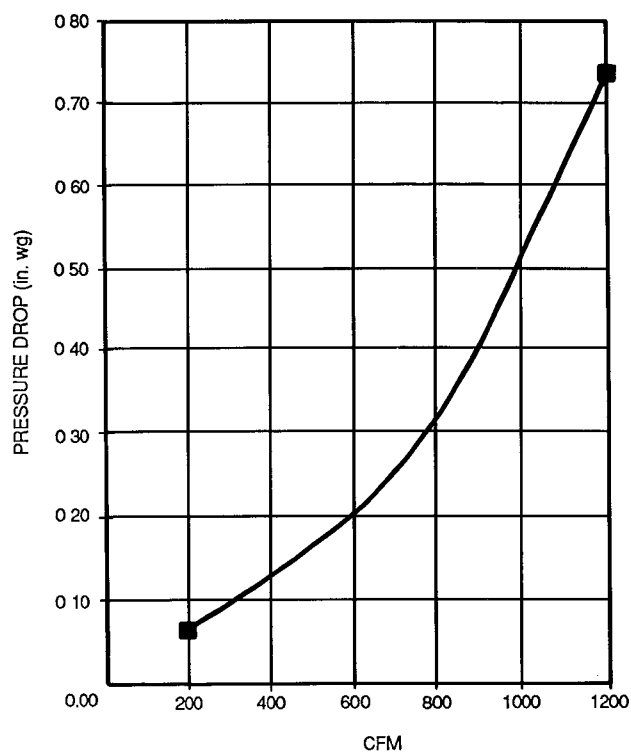


Fig. 29 — PARABLADE Economizer Barometric Relief Damper Characteristics

BELT DRIVE MOTORS — Fan motor pulleys are factory set for speed shown in Table 1. See Fig. 30.

To change fan speed:

1. Shut off unit power supply.
2. Loosen belt by loosening fan motor mounting nuts.
3. Loosen movable pulley flange setscrew (see Fig. 31).
4. Screw movable flange toward fixed flange to increase speed and 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:

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 ($\frac{1}{2}$ in. deflection with one finger).
3. Tighten nuts.
4. Adjust bolt and tighten nut to secure motor in fixed position.

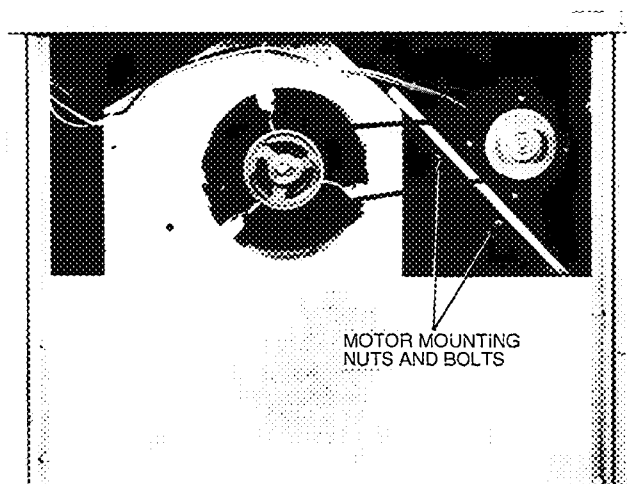


Fig. 30 — Belt Drive Motor Mounting

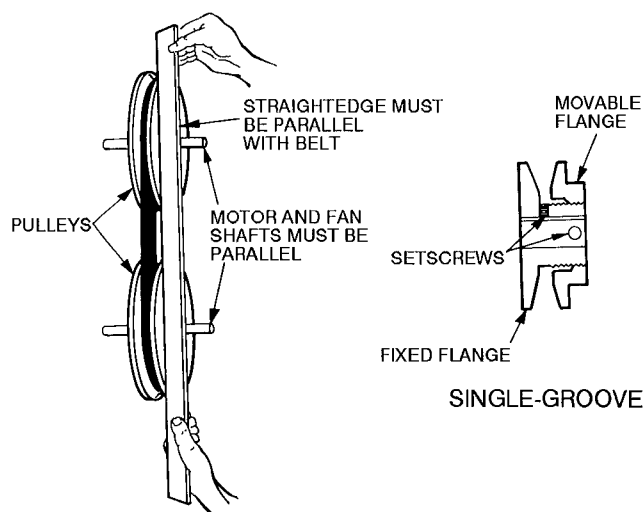


Fig. 31 — Evaporator-Fan Pulley Adjustment

Table 3 — Fan Rpm at Motor Pulley Settings*

UNIT 50TJ	MOTOR PULLEY TURNS OPEN										
	0	½	1	1½	2	2½	3	3½	4	4½	5
004†	1090	1055	1025	990	960	925	890	860	825	795	760
005†	1185	1150	1115	1080	1045	1015	980	945	910	875	840
006†	1300	1260	1220	1180	1140	1100	1060	1020	980	940	900
007**	1460	1420	1380	1345	1305	1265	1225	1185	1150	1110	1070

*Approximate fan rpm shown.

†Indicates alternate motor and drive package.

**Indicates standard motor and drive package

Table 4 — Motor Data

UNIT 50TJ	EVAPORATOR-FAN MOTOR	MAXIMUM CONTINUOUS BHP*	MAXIMUM OPERATING WATTS*	UNIT VOLTAGE	MAXIMUM AMP DRAW
004	Std	34	440	208/230	2.9
				460	1.4
				575	1.4
	Alt	1 00	1000	208/230	5.1
				460	2.3
				575	2.3
005	Std	.75	850	208/230	3.7
				460	1.9
				575	1.9
	Alt	1 00	1000	208/230	5.1
				460	2.3
				575	2.3
006	Std	1.20	1340	208/230	6.2
				460	3.4
				575	3.4
	Alt	1.80	1921	208/230	6.1†
				208/230	9.2**
				460	2.7
007	Std	2.40	2120	575	2.7
				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.

†Single-phase motor

**3-phase motor

Table 5 — Fan Performance, 50TJ004 Vertical Discharge Units; Standard Motor (Direct)

AIRFLOW (Cfm)	LOW SPEED				HIGH SPEED			
	208 v		230, 460, 575 v		208 v		230, 460, 575 v	
	ESP	Watts	ESP	Watts	ESP	Watts	ESP	Watts
900	0.67	253	0.68	277	0.69	307	0.69	363
1000	0.60	270	0.61	292	0.61	321	0.63	374
1100	0.55	287	0.56	307	0.57	335	0.58	385
1200	0.51	304	0.51	323	0.52	349	0.53	397
1300	0.45	321	0.46	338	0.46	364	0.47	408
1400	0.38	338	0.41	354	0.43	378	0.43	420
1500	0.34	355	0.36	369	0.38	392	0.39	431

LEGEND

ESP — External Static Pressure (in. wg)

NOTES.

- Values include losses for filters, unit casing, and wet coils
- 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 Table 4.
- To convert watts to bhp

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

$$\text{Motor efficiency} = .63$$

Table 6 — Fan Performance, 50TJ004 Vertical Discharge Units; Alternate Motor (Belt)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)															
	0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
900	581	119	673	179	736	219	805	249	865	288	911	338	957	388	988	428
1000	644	189	709	219	782	279	835	298	900	348	937	378	992	438	1039	487
1100	687	219	746	259	806	298	867	348	929	398	964	398	1013	487	1068	547
1200	733	259	785	318	843	348	903	408	960	467	994	497	1045	557	1090	637
1300	754	288	826	378	891	428	942	477	991	527	1047	597	1075	637	1122	696
1400	810	348	868	448	937	507	984	567	1032	617	1067	666	1110	726	1160	766
1500	841	418	911	527	985	607	1029	656	1073	716	1109	766	1150	816	1190	855

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)							
	0.9		1.0		1.1		1.2	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
900	1039	448	1061	487	1083	527	1105	567
1000	1061	507	1086	547	1111	587	1136	627
1100	1090	577	1109	607	1127	637	1145	666
1200	1109	647	1156	676	1203	706	1250	736
1300	1152	716	1190	756	1228	796	1266	836
1400	1181	806	1237	845	1293	885	1349	925
1500	1225	895	1271	945	1317	995	1353	1044

NOTES:

1. **Boldface** indicates a field-supplied drive is required. (See Note 6.)
2.  indicates field-supplied motor and drive are required
3. Maximum usable watts input is 1000. 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 Table 4.

4. Values include losses for filters, unit casing, and wet coils.
5. Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
6. Alternate motor drive range: 760 to 1090 rpm. All other rpms require field-supplied drive.
7. To convert watts to bhp:

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

$$\text{Motor efficiency} = 75$$

Table 7 — Fan Performance, 50TJ005 Vertical Discharge Units; Standard Motor (Direct)

AIRFLOW (Cfm)	LOW SPEED				HIGH SPEED			
	208 v		230, 460, 575 v		208 v		230, 460, 575 v	
	ESP	Watts	ESP	Watts	ESP	Watts	ESP	Watts
1200	0.93	458	0.94	506	0.94	572	0.99	632
1300	0.86	471	0.87	521	0.87	589	0.92	651
1400	0.78	503	0.79	556	0.79	616	0.87	681
1500	0.70	536	0.73	593	0.73	631	0.80	698
1600	0.61	557	0.64	616	0.66	654	0.76	723
1700	0.51	584	0.54	646	0.58	678	0.68	750
1800	0.40	610	0.44	674	0.51	698	0.63	772
1900	0.29	629	0.37	696	0.46	720	0.56	796
2000	0.25	651	0.30	720	0.39	744	0.50	823

LEGEND

ESP — External Static Pressure (in. wg)

NOTES:

1. Values include losses for filters, unit casing, and wet coils.
2. 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 Table 4.
3. To convert watts to bhp:

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

$$\text{Motor efficiency} = 66$$

Table 8 — Fan Performance, 50TJ005 Vertical Discharge Units; Alternate Motor (Belt)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)															
	0.1		0.2		0.3		0.4		0.6		0.7		0.8		1.0	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
1200	542	168	616	221	678	278	739	336	842	462	886	525	929	588	1008	704
1300	576	210	644	263	704	326	764	389	867	525	910	588	952	651	1029	788
1400	610	252	673	315	732	378	791	441	889	578	933	651	976	725	1052	826
1500	646	294	704	368	761	436	818	504	912	641	957	720	1001	777	1076	905
1600	681	347	735	420	790	494	845	567	920	695	931	772	1023	848	1100	995
1700	718	410	768	483	836	562	873	641	965	777	1005	853	1045	930	1124	1064
1800	754	473	801	557	851	641	900	725	992	858	1032	940	1074	1002	1147	1124
1900	791	546	836	630	832	720	828	809	1019	950	1058	1037	1097	1124	1169	1202
2000	828	630	870	714	864	809	858	904	1046	1053	1085	1139	1124	1237	1194	1323

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)									
	1.1		1.2		1.4		1.6		1.8	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
1200	1052	762	1096	820	1134	835	1203	885	1242	969
1300	1065	846	1101	904	1174	1040	1229	1100	1277	1029
1400	1087	890	1121	918	1183	1042	1255	1157	1305	1190
1500	1111	980	1145	1014	1208	1138	1274	1272	1337	1350
1600	1134	1069	1168	1100	1232	1253	1291	1296	1350	1559
1700	1158	1164	1192	1192	1255	1358	1314	1311	1370	1738
1800	1182	1263	1217	1301	1279	1472	1381	1405	1393	1907
1900	1205	1363	1240	1405	1303	1586	1408	1769	1417	2058
2000	1228	1472	1262	1511	1327	1702	1435	1894	1440	2229

NOTES:

1. **Boldface** indicates a field-supplied drive is required (See Note 6)
2. indicates field-supplied motor and drive are required
3. Maximum usable watts input is 1000. 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 Table 4.

4. Values include losses for filters, unit casing, and wet coils.
5. Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
6. Alternate motor drive range: 840 to 1185 rpm. All other rpms require field-supplied drive.
7. To convert watts to bhp.

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

Motor efficiency = .75

Table 9 — Fan Performance, 50TJ006 Vertical Discharge Units; Standard Motor (Direct)

AIRFLOW (Cfm)	LOW SPEED				MEDIUM SPEED				HIGH SPEED			
	208 v		230, 460, 575 v		208 v		230, 460, 575 v		208 v		230, 460, 575 v	
	ESP	Watts	ESP	Watts	ESP	Watts	ESP	Watts	ESP	Watts	ESP	Watts
1500	0.88	750	1.20	791	1.19	782	1.36	845	1.38	875	1.44	949
1600	0.68	780	1.04	824	1.04	821	1.22	883	1.25	913	1.33	988
1700	0.51	810	0.89	857	0.89	861	1.09	921	1.13	950	1.22	1027
1800	0.35	839	0.73	891	0.74	900	0.96	959	1.00	988	1.11	1066
1900	0.26	873	0.58	924	0.59	940	0.86	997	0.88	1025	1.00	1105
2000	0.18	905	0.42	957	0.44	979	0.73	1035	0.78	1063	0.92	1144
2100	0.08	940	0.27	990	0.29	1018	0.59	1073	0.63	1101	0.81	1183
2200	—	—	0.19	1023	0.19	1035	0.46	1111	0.49	1138	0.69	1222
2300	—	—	0.11	1056	0.11	1076	0.34	1149	0.41	1176	0.59	1261
2400	—	—	0.03	1096	0.04	1113	0.19	1187	0.22	1213	0.43	1300
2500	—	—	—	—	—	—	0.09	1225	0.12	1251	0.34	1340

LEGEND

ESP — External Static Pressure (in. wg)

NOTES:

1. Values include losses for filters, unit casing, and wet coils.
2. 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 Table 4.

3. To convert watts to bhp.

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

Motor efficiency = .67

Table 10 — Fan Performance, 50TJ006 Vertical Discharge Units; Alternate Motor (Belt)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.1		0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
1500	730	347	789	409	896	542	990	685	1072	848	1153	1022	1221	1196	1256	1328	1280	1349
1600	770	409	826	470	931	623	1020	766	1101	930	1178	1114	1252	1298	1311	1482	1340	1615
1700	811	480	865	552	966	705	1051	858	1133	1032	1205	1206	1278	1400	1345	1604	1397	1799
1800	852	562	905	634	1002	797	1084	950	1163	1124	1235	1318	1303	1512	1371	1727	1433	1942
1900	894	552	945	736	1037	899	1119	1063	1194	1237	1266	1431	1330	1625	1396	1850	1460	2074
2000	936	756	984	838	1072	1001	1154	1185	1226	1359	1297	1564	1362	1768	1422	1983	1485	2287
2100	978	869	1024	950	1108	1124	1192	1318	1259	1502	1327	1696	1393	1911	1452	2126	1510	2361
2200	1021	991	1064	1073	1145	1247	1225	1461	1294	1656	1359	1850	1423	2064	1483	2289	1538	2514
2300	1064	1124	1104	1206	1183	1390	1260	1604	1330	1819	1392	2013	1454	2228	1515	2463	1569	2690
2400	1107	1267	1145	1349	1222	1482	1296	1768	1365	1983	1426	2197	1485	2412	1544	2647	1601	2902
2500	1150	1420	1186	1512	1262	1717	1331	1931	1400	2166	1461	2391	1518	2606	1575	2841	1631	3096

NOTES

- 1 **Boldface** indicates a field-supplied drive is required. (See Note 6)
- 2  indicates field-supplied motor and drive are required
- 3 Maximum usable watts input is 1921. 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 Table 4

- 4 Values include losses for filters, unit casing, and wet coils.
- 5 Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
- 6 Alternate motor drive range: 900 to 1300 rpm. All other rpms require field-supplied drive
- 7 To convert watts to bhp:

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

$$\text{Motor efficiency} = 74$$

Table 11 — Fan Performance, 50TJ007 Vertical Discharge Units; Standard Motor (Belt)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.1		0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
1800	852	562	905	615	1002	739	1084	859	1163	998	1235	1156	1303	1318	1371	1499	1433	1638
1900	894	630	945	692	1037	818	1119	948	1194	1089	1266	1250	1330	1413	1396	1604	1460	1796
2000	936	708	984	771	1072	899	1154	1047	1226	1190	1297	1361	1362	1534	1422	1718	1485	1910
2100	978	795	1024	859	1108	998	1190	1156	1259	1310	1327	1473	1393	1656	1452	1840	1510	2041
2200	1021	891	1064	956	1145	1097	1225	1275	1294	1439	1359	1604	1423	1779	1483	1980	1536	2171
2300	1064	998	1104	1064	1183	1216	1260	1396	1330	1578	1392	1744	1454	1927	1515	2128	1569	2325
2400	1107	1114	1145	1182	1222	1353	1296	1534	1365	1718	1426	1901	1485	2084	1544	2283	1601	2459
2500	1150	1241	1186	1318	1262	1491	1331	1674	1400	1875	1461	2067	1518	2249	1575	2445	—	—
2600	1193	1387	1228	1465	1301	1648	1367	1831	1435	2041	1497	2240	1552	2428	—	—	—	—
2700	1237	1543	1269	1621	1341	1814	1404	1997	1471	2214	1532	2420	—	—	—	—	—	—
2800	1280	1718	1311	1796	1381	1989	1442	2180	1506	2394	—	—	—	—	—	—	—	—
2900	1324	1901	1354	1980	1425	2180	1481	2369	1542	2579	—	—	—	—	—	—	—	—
3000	1368	2093	1396	2171	1460	2369	1521	2571	—	—	—	—	—	—	—	—	—	—

NOTES:

- 1 **Boldface** indicates a field-supplied drive is required. (See Note 6)
- 2  indicates field-supplied motor and drive are required.
- 3 Maximum usable watts input is 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. For additional information on motor performance, refer to Table 4
- 4 Values include losses for filters, unit casing, and wet coils

- 5 Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
- 6 Standard motor drive range: 1070 to 1460 rpm. All other rpms require field-supplied drive
- 7 To convert watts to bhp:

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

$$\text{Motor efficiency} = 84$$

Table 12 — Fan Performance, 50TJ004 Horizontal Discharge Units; Standard Motor (Direct)

AIRFLOW (Cfm)	LOW SPEED				HIGH SPEED			
	208 v		230, 460, 575 v		208 v		230, 460, 575 v	
	ESP	Watts	ESP	Watts	ESP	Watts	ESP	Watts
900	0.72	253	0.75	277	0.73	307	0.76	363
1000	0.67	270	0.69	292	0.70	321	0.71	374
1100	0.61	287	0.63	307	0.64	335	0.65	385
1200	0.57	304	0.58	323	0.56	349	0.59	397
1300	0.51	321	0.53	338	0.53	364	0.54	408
1400	0.44	338	0.46	354	0.47	378	0.48	420
1500	0.39	355	0.41	369	0.43	392	0.43	431

LEGEND

ESP — External Static Pressure (in wg)

NOTES:

- Values include losses for filters, unit casing, and wet coils
- 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 Table 4.
- To convert watts to bhp

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

Motor efficiency = .63

Table 13 — Fan Performance, 50TJ004 Horizontal Discharge Units; Alternate Motor (Belt)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)															
	0.1		0.2		0.3		0.4		0.5		0.6		0.7		0.8	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
900	526	70	584	99	656	139	734	219	818	269	875	269	924	308	953	348
1000	570	109	627	149	738	189	800	259	848	288	895	308	936	348	977	388
1100	614	149	670	189	758	229	812	288	863	308	914	348	960	388	1005	428
1200	658	189	710	229	780	279	840	318	889	358	938	398	988	448	1038	497
1300	703	239	752	269	808	318	868	368	916	408	963	448	1012	507	1061	557
1400	725	288	776	308	845	378	891	418	937	467	983	507	1027	557	1071	597
1500	755	328	816	378	870	428	924	477	969	527	1014	577	1056	627	1097	676

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)							
	0.9		1.0		1.1		1.2	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
900	989	388	1028	438	1074	487	1120	537
1000	1020	438	1064	477	1124	537	1185	597
1100	1052	487	1100	527	1163	587	1225	647
1200	1076	527	1136	577	1201	647	1266	716
1300	1090	607	1172	647	1239	716	1306	786
1400	1108	666	1208	706	1278	786	1347	865
1500	1117	696	1245	776	1315	865	1385	955

NOTES:

- Boldface** indicates a field-supplied drive is required (See Note 4.)
- Maximum usable watts input is 1000. 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 Table 4.

- Values include losses for filters, unit casing, and wet coils.
- Alternate motor drive range 760 to 1090 rpm. All other rpms require field-supplied drive.
- To convert watts to bhp:

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

Motor efficiency = .75

Table 14 — Fan Performance, 50TJ005 Horizontal Discharge Units; Standard Motor (Direct)

AIRFLOW (Cfm)	LOW SPEED				HIGH SPEED			
	208 v		230, 460, 575 v		208 v		230, 460, 575 v	
	ESP	Watts	ESP	Watts	ESP	Watts	ESP	Watts
1200	0.93	458	0.97	506	1.04	572	1.09	632
1300	0.86	471	0.90	521	0.96	589	1.02	651
1400	0.78	503	0.84	556	0.90	616	0.96	681
1500	0.73	536	0.76	593	0.83	631	0.89	698
1600	0.67	557	0.70	616	0.75	654	0.82	723
1700	0.60	584	0.63	646	0.67	678	0.74	750
1800	0.51	610	0.54	674	0.62	698	0.69	772
1900	0.40	629	0.45	696	0.54	720	0.62	796
2000	0.32	661	0.33	731	0.47	744	0.54	823

LEGEND

ESP — External Static Pressure (in wg)

NOTES:

- Values include losses for filters, unit casing, and wet coils
- 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 Table 4
- To convert watts to bhp

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

Motor efficiency = .66

Table 15 — Fan Performance, 50TJ005 Horizontal Discharge Units; Alternate Motor (Belt)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)															
	0.1		0.2		0.3		0.4		0.6		0.7		0.8		1.0	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
1200	514	158	590	210	657	263	723	315	828	441	876	510	924	578	999	674
1300	545	189	615	242	680	305	744	368	849	494	895	562	940	630	1025	756
1400	577	221	642	284	704	347	766	410	870	546	915	620	959	693	1042	828
1500	609	273	670	326	729	394	788	462	892	609	936	683	980	757	1060	899
1600	642	315	699	378	755	447	811	515	913	672	957	751	1001	830	1080	971
1700	675	378	728	441	782	510	836	578	935	746	979	825	1023	904	1081	1053
1800	709	431	759	504	810	578	860	651	957	820	1001	904	1044	988	1122	1134
1900	743	504	790	578	838	651	886	725	980	904	1023	993	1066	1082	1142	1237
2000	778	578	836	651	875	730	913	809	1004	988	1045	1082	1088	1177	1165	1339

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)									
	1.1		1.2		1.4		1.6		1.8	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
1200	1018	685	1036	695	1073	756	1109	794	1138	851
1300	1058	807	1090	858	1121	832	1159	918	1193	976
1400	1080	899	1118	971	1175	1084	1205	1042	1244	1136
1500	1098	981	1136	1083	1205	1136	1258	1242	1283	1282
1600	1115	1089	1152	1195	1224	1254	1287	1307	1337	1432
1700	1137	1199	1172	1306	1241	1320	1307	1402	1386	1455
1800	1157	1228	1190	1348	1258	1415	1323	1457	1385	1775
1900	1176	1325	1214	1420	1275	1513	1341	1702	1482	1894
2000	1200	1439	1235	1523	1300	1616	1361	1817	1498	2006

NOTES:

- Boldface** indicates a field-supplied drive is required. (See Note 6)
-  indicates field-supplied motor and drive are required.
- Maximum usable watts input is 1000. 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 Table 4
- Values include losses for filters, unit casing, and wet coils
- Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
- Alternate motor drive range. 840 to 1185 rpm. All other rpms require field-supplied drive
- To convert watts to bhp

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

Motor efficiency = .75

Table 16 — Fan Performance, 50TJ006 Horizontal Discharge Units; Standard Motor (Direct)

AIRFLOW (Cfm)	LOW SPEED				MEDIUM SPEED				HIGH SPEED			
	208 v		230, 460, 575 v		208 v		230, 460, 575 v		208 v		230, 460, 575 v	
	ESP	Watts	ESP	Watts	ESP	Watts	ESP	Watts	ESP	Watts	ESP	Watts
1500	1 01	750	1 25	791	1 26	782	1 46	845	1 46	875	1 52	949
1600	0 82	780	1 09	824	1 11	821	1 32	883	1 33	913	1 41	988
1700	0 64	810	0 97	857	0 99	861	1 22	921	1 24	950	1 33	1027
1800	0 44	839	0 81	891	0 84	900	1 09	959	1 11	988	1 22	1066
1900	0 32	869	0 66	924	0 69	940	0 96	997	0 99	1025	1 11	1105
2000	0 21	899	0 47	957	0 51	979	0 80	1035	0 83	1063	0 97	1144
2100	0 13	929	0 32	990	0 36	1018	0 64	1073	0 71	1101	0 86	1183
2200	0 05	959	0 19	1023	0 21	1058	0 50	1111	0 58	1138	0 75	1222
2300	—	—	0 08	1057	0 08	1097	0 34	1149	0 39	1176	0 57	1261
2400	—	—	—	—	—	—	0 24	1187	0 29	1213	0 49	1300
2500	—	—	—	—	—	—	0 15	1225	0 15	1251	0 34	1340

LEGEND

ESP — External Static Pressure (in. wg)

NOTES:

1. Values include losses for filters, unit casing, and wet coils
2. 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 Table 4.

3 To convert watts to bhp

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

Motor efficiency = .67

Table 17 — Fan Performance, 50TJ006 Horizontal Discharge Units; Alternate Motor (Belt)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																			
	0.1		0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
1500	658	276	722	337	840	470	937	603	1027	756	1108	920	1186	1104	1263	1328	1343	1615	1431	1829
1600	693	327	754	388	867	531	963	664	1052	828	1130	991	1205	1175	1278	1380	1350	1645	1424	1921
1700	729	388	787	450	895	593	991	746	1075	899	1154	1083	1226	1257	1296	1451	1364	1676	1422	1933
1800	765	460	821	521	923	664	1019	828	1099	981	1178	1165	1249	1349	1316	1553	1382	1758	1447	1933
1900	802	531	854	593	953	746	1046	920	1126	1083	1201	1257	1274	1461	1338	1656	1402	1870	1454	2055
2000	840	613	900	674	984	838	1073	1012	1154	1185	1226	1359	1297	1564	1363	1768	1324	1892	1484	2207
2100	878	705	923	766	1015	930	1101	1104	1182	1298	1252	1482	1320	1676	1388	1891	1348	2115	1505	2240
2200	916	797	958	869	1046	1032	1129	1216	1209	1420	1280	1615	1345	1809	1410	2015	1425	2248	1529	2483
2300	954	910	993	981	1079	1155	1160	1339	1237	1543	1309	1747	1372	1952	1434	2158	1448	2361	1534	2637
2400	993	1022	1029	1093	1112	1277	1190	1461	1264	1666	1336	1891	1400	2105	1459	2310	1519	2524	1578	2828
2500	1031	1155	1066	1226	1145	1420	1220	1604	1292	1809	1363	2044	1423	2268	1485	2465	1543	2709	1600	2963

NOTES:

1. **Boldface** indicates a field-supplied drive is required (See Note 6)
2.  indicates field-supplied motor and drive are required.
3. Maximum usable watts input is 1921. 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 Table 4.
4. Values include losses for filters, unit casing, and wet coils

5. Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
6. Alternate motor drive range: 900 to 1300 rpm. All other rpms require field-supplied drive.
7. To convert watts to bhp:

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

Motor efficiency = .74

Table 18 — Fan Performance, 50TJ007 Horizontal Discharge Units; Standard Motor (Belt)

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.1		0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
1800	765	487	821	532	923	638	1019	843	1099	883	1178	1031	1249	1182	1316	1353	1382	1526
1900	802	539	854	585	953	700	1046	835	1126	965	1201	1106	1274	1275	1338	1439	1402	1621
2000	840	600	888	646	984	771	1073	907	1154	1047	1226	1154	1297	1361	1363	1534	1424	1718
2100	878	669	923	716	1015	843	1101	981	1182	1140	1252	1292	1320	1456	1388	1639	1448	1831
2200	916	739	958	795	1046	924	1129	1072	1209	1241	1280	1404	1345	1569	1410	1744	1473	1945
2300	954	827	993	883	1079	1022	1160	1173	1237	1344	1309	1517	1372	1691	1434	1866	1496	2067
2400	993	916	1029	973	1112	1123	1190	1275	1264	1447	1336	1639	1400	1823	1459	1997	1518	2189
2500	1031	1022	1066	1081	1145	1241	1220	1396	1292	1569	1363	1770	1428	1962	1496	2145	1543	2311
2600	1070	1131	1103	1199	1179	1353	1251	1517	1322	1700	1390	1901	1456	2102	1514	2300	1563	2433
2700	1109	1258	1140	1318	1212	1482	1283	1656	1352	1849	1418	2041	1488	2257	1543	2462	—	—
2800	1148	1396	1177	1456	1246	1621	1316	1805	1383	1997	1444	2188	1510	2403	—	—	—	—
2900	1188	1543	1215	1604	1281	1770	1349	1962	1413	2154	1476	2352	1537	2567	—	—	—	—
3000	1227	1700	1253	1770	1316	1936	1382	2136	1444	2317	1506	2529	—	—	—	—	—	—

NOTES:

1. **Boldface** indicates a field-supplied drive is required. (See Note 6.)
2.  indicates field-supplied motor and drive are required
3. Maximum usable watts input is 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. For additional information on motor performance, refer to Table 4

4. Values include losses for filters, unit casing, and wet coils
5. Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
6. Standard motor drive range. 1070 to 1460 rpm. All other rpms require field-supplied drive.
7. To convert watts to bhp:

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

$$\text{Motor efficiency} = 84$$

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.

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

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

Refrigerant Service Ports — To service refrigerant service ports, remove refrigerant service port access panel. See Fig. 7. Each unit system has 4 Schrader-type service ports: one on the suction line, one on the liquid line, and two on the compressor discharge line. Be sure that caps on the ports are tight. When a controls upgrade package is used, one Schrader-type valve is located under both the high-pressure switch and the low-pressure switch.

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 Service, Refrigerant Charge Section.

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.

Safety Relief — A soft solder joint in the suction line at the low-pressure service port provides pressure relief under abnormal temperature and pressure conditions.

Ventilation (Continuous Fan) — Set fan and system selector switches at ON and OFF positions,

respectively. Evaporator fan operates continuously to provide constant air circulation.

Operating Sequence

COOLING, UNITS WITH VARISLIDE™ ECONOMIZER

— When the outdoor-air temperature is above the outdoor-air thermostat (OAT) setting and the room thermostat calls for cooling, compressor contactor is energized to start compressor and the outdoor (condenser) fan motor (OFM). The indoor (evaporator) fan motor (IFM) is energized and the economizer damper moves to the minimum position. After the thermostat is satisfied, there is a 30-second delay before the evaporator fan turns off. The damper then moves to the fully closed position. When using continuous fan, the damper moves to the minimum position.

When the outdoor-air temperature is below the OAT setting and the thermostat calls for cooling, the economizer damper moves to the minimum position. If the supply-air temperature is above 57 F, the damper continues to open until it reaches the fully open position or until the supply-air temperature drops below 52 F.

When the supply-air temperature falls between 57 F and 52 F, the damper will remain at an intermediate open position. If the supply-air temperature falls below 52 F, the damper will modulate closed until it reaches the minimum position or until the supply-air temperature is above 52 F. When the thermostat is satisfied, the damper moves to the fully closed position when using AUTO, fan or to the minimum position when using continuous fan.

If the outdoor air alone cannot satisfy the cooling requirements of the conditioned space, economizer cooling is integrated with mechanical cooling, providing two stages of cooling. Compressor and the condenser 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, there is a 30-second delay before the evaporator fan shuts off. The damper then moves to the fully closed position. When using a continuous fan, the damper moves to the minimum position.

COOLING, UNITS WITH PARABLADE ECONOMIZER

— When the outdoor-air is above the enthalpy control setting and the room thermostat calls for cooling, the compressor contactor is energized to start the compressor and the outdoor (condenser) fan motor. The indoor (evaporator) fan motor is energized and the economizer damper moves to the minimum position. After the room thermostat is satisfied the damper will spring return to the full closed position.

When the outdoor-air is below the enthalpy control setting and the thermostat calls for cooling, the economizer outdoor-air damper is opened proportionally to maintain between 50 and 56 F at the mixed-air sensor. If outside air alone cannot satisfy the cooling requirements, economizer cooling is integrated with mechanical cooling. When the room thermostat is satisfied, the damper will spring return to the full closed position.

ACCESSORY HEATING, UNITS WITH ECONOMIZER

— Upon a call for heat through W1, the IFC energizes to start the evaporator fan and the economizer damper blade opens to the minimum position. If the two-position damper is used, the outdoor-air damper opens to the minimum position whenever the evaporator fan runs.

When W1 is deenergized, the evaporator-fan motor stops, and economizer/two-position damper moves to the closed position.

COOLING, UNITS WITHOUT ECONOMIZER — When thermostat calls for cooling, terminals G and Y1 are energized. The indoor (evaporator) fan contactor (IFC), compressor contactor and outdoor (condenser) fan contactor (OFC) are energized and evaporator-fan motor, compressor no. 1, and condenser fan start. The condenser-fan motor runs continuously while unit is cooling. After Y1 is satisfied on 50TJ004-006 units, the evaporator fan remains energized for 30 seconds.

ACCESSORY HEATING, UNITS WITHOUT ECONOMIZER — Upon a call for heating through terminal W1, IFC and heater contactor no. 1 (HC1) are energized. On units equipped for 2 stages of heat, when additional heat is needed HC2 is energized through W2.

SERVICE

⚠ CAUTION

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

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

EVAPORATOR COIL

1. Turn unit power off. Remove evaporator coil access panel.
2. If economizer is installed, remove economizer by disconnecting Molex plug and removing economizer mounting screws. Refer to Accessory Economizer Installation Instructions, or Optional Economizer sections on page 13 for more details.
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.
5. Flush condensate pan.
6. Reinstall economizer and filters.

7. Reconnect wiring.

8. Replace access panels.

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

One-Row Coils (sizes (004-006)) — To access one-row coils, remove screws securing condenser-fan grille to condenser coil top cover. Place grille on top of condenser coil top cover as shown in Fig. 32. It is not necessary to remove the top cover.

Use a water hose or other suitable equipment to remove dirt and debris. Clean the outer surfaces with a stiff brush in the normal manner.

Reverse the procedure outlined above to reinstall the condenser-fan grille and condenser fan top cover.

2-Row Coils (size 007) (see Fig. 33)

NOTE: Save all screws removed in this section. The screws must be used when reinstalling the equipment.

1. To access 2-row coils, remove screws securing condenser-fan grille to condenser coil top cover. Place grille on top of condenser coil top cover as shown in Fig. 34. It is not necessary to remove the top cover.
2. Remove 3 screws on right side of compressor access panel. Remove one screw securing condenser coil top cover to compressor access panel. Remove lower screw securing condenser coil to compressor mounting plate.
3. Remove 4 screws securing control box access panel. Remove 3 screws (located in front of the control box access cover) securing condenser coil top cover.
4. Remove screws securing low-voltage access panel. Remove 2 screws inside low-voltage access panel. Tilt sheet metal (located on left side of low-voltage connections) back 45 degrees.
5. Remove screw securing refrigerant service port access panel.
6. Remove 2 U-clips securing 2-row coils together at hair-pin end.
7. Remove screws securing 2 corner posts. Remove 2 corner posts.
8. Use right corner post to prop up right side of condenser coil top cover. Slide condenser coil partially out of condenser fan housing. See Fig. 34.
9. Use left corner post to prop up left side of condenser coil top cover.
10. Carefully separate the outer coil section 3 to 4 in. from the inner coil section. See Fig. 35.
11. 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.
12. Secure inner and outer coil together with U-clip.
13. Reposition the outer and inner coil section.
14. Reverse the procedure outlined above to reinstall equipment.

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.

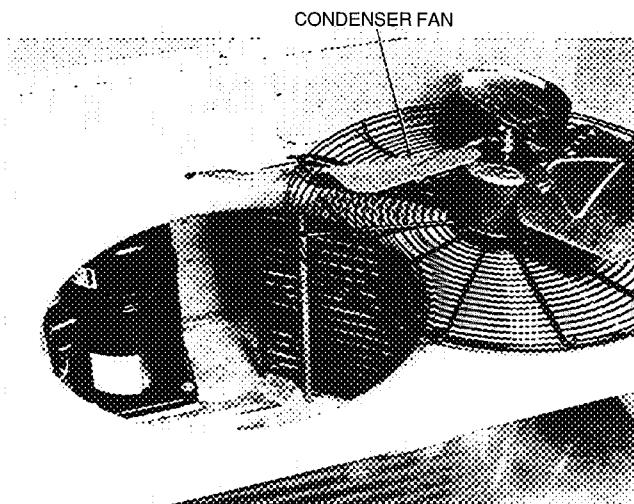


Fig. 32 — Condenser Coil Cleaning

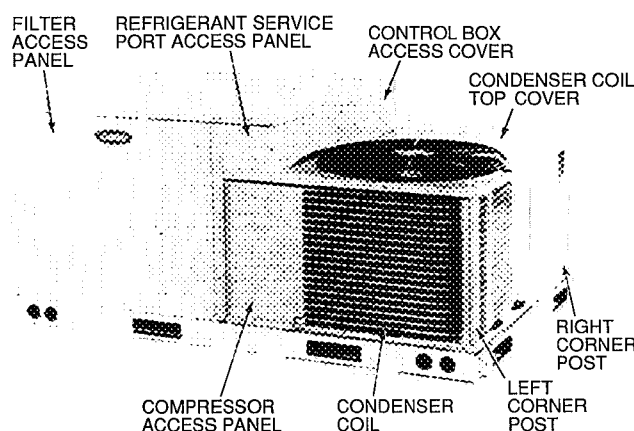


Fig. 33 — Cleaning Condenser coil

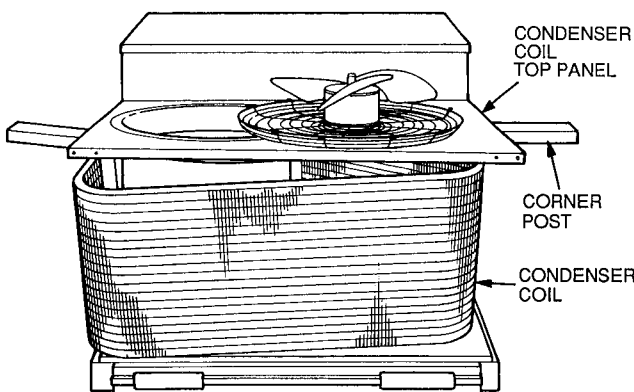


Fig. 34 — Propping Up Condenser coil Top Cover

Lubrication

COMPRESSORS — Each compressor is charged with the correct amount of oil at the factory.

FAN-MOTOR BEARINGS — Fan-motor bearings are of the permanently lubricated type. No further lubrication is required. No lubrication of condenser- or evaporator-fan motors is required.

Condenser-Fan Adjustment (Fig. 36)

1. Shut off unit power supply.
2. Remove condenser-fan assembly (grille, motor, and fan).
3. Loosen fan hub setscrews.

4. Adjust fan height as shown in Fig. 36.
5. Tighten setscrews.
6. Replace condenser-fan assembly.

Manual Outdoor-Air Damper — If outdoor-air damper blade adjustment is required, see Manual Outdoor-Air Damper section on page 12.

Economizer Adjustment — Refer to Optional Economizer sections on page 13.

Condenser Coil Grille — Condenser coil grille is shipped factory-installed. No adjustments are required.

Refrigerant Charge — Amount of refrigerant charge is listed on unit nameplate (also refer to Table 1). Refer to Carrier GTAC2-5 Charging, Recovery, Recycling, and Reclamation training manual and the following procedures.

Unit panels must be in place when unit is operating during charging procedure.

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

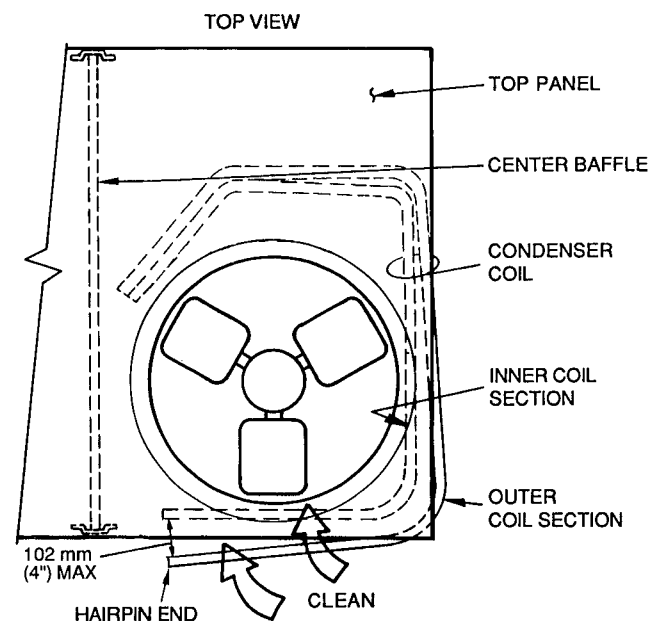


Fig. 35 — Separating Coil Sections

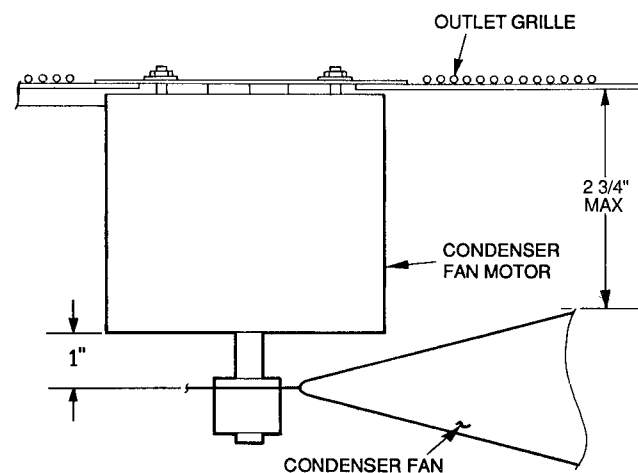


Fig. 36 — Condenser Fan Adjustment

LOW CHARGE COOLING — Use Cooling Charging Charts, Fig. 37-40. Vary refrigerant until the conditions of the appropriate chart are met. Note the charging chart is different from type normally used. Chart is 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.

TO USE COOLING CHARGING CHART — Take the outdoor ambient temperature and read the suction pressure gage.

Refer to appropriate chart to determine what suction temperature should be. If suction temperature is high, add refrigerant. If suction temperature is low, carefully reclaim some of the charge. Recheck the suction pressure as charge is adjusted.

Example: (Fig. 39)

Outdoor Temperature 85 F
Suction Pressure 80 psig
Suction Temperature should be 60 F
(Suction Temperature may vary ± 5 F.)

If Chargemaster® charging device is used, temperature and pressure readings must be accomplished using the charging chart.

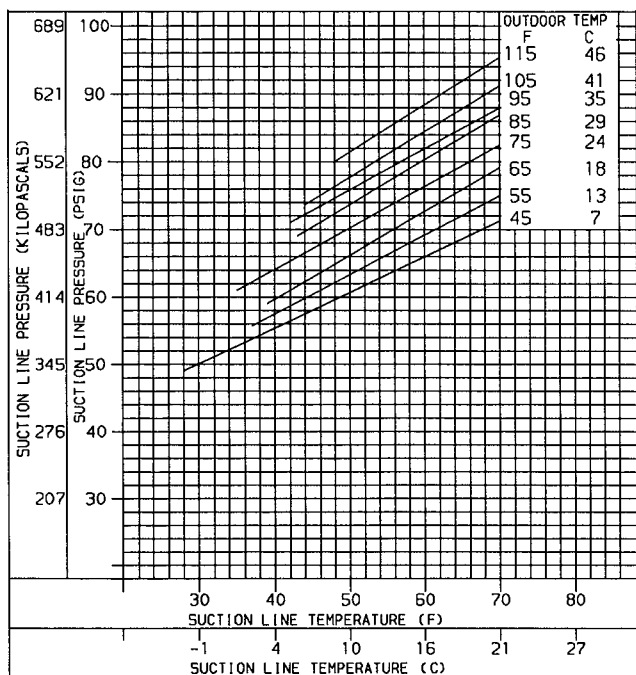


Fig. 37 — Cooling Charging Chart; 50TJ004

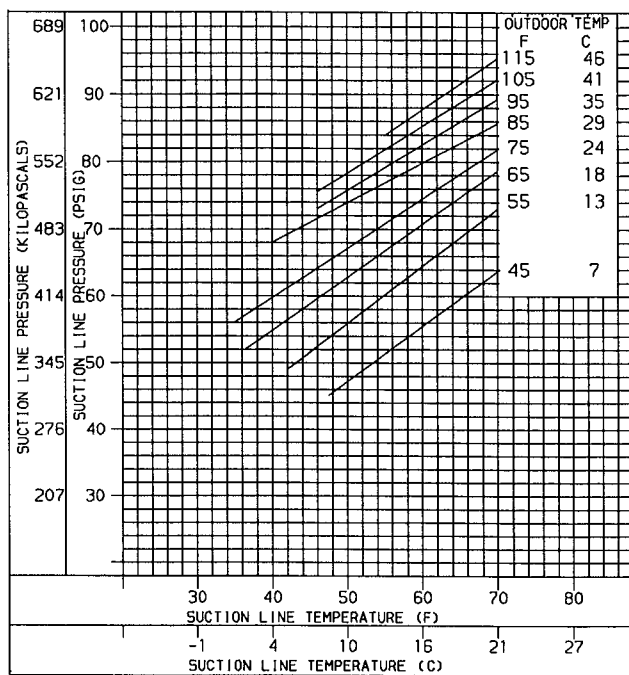


Fig. 39 — Cooling Charging Chart; 50TJ006

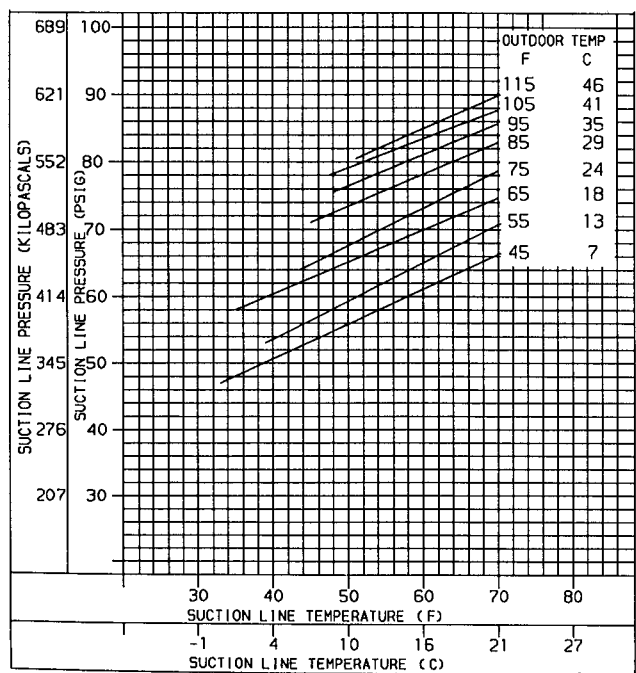


Fig. 38 — Cooling Charging Chart; 50TJ005

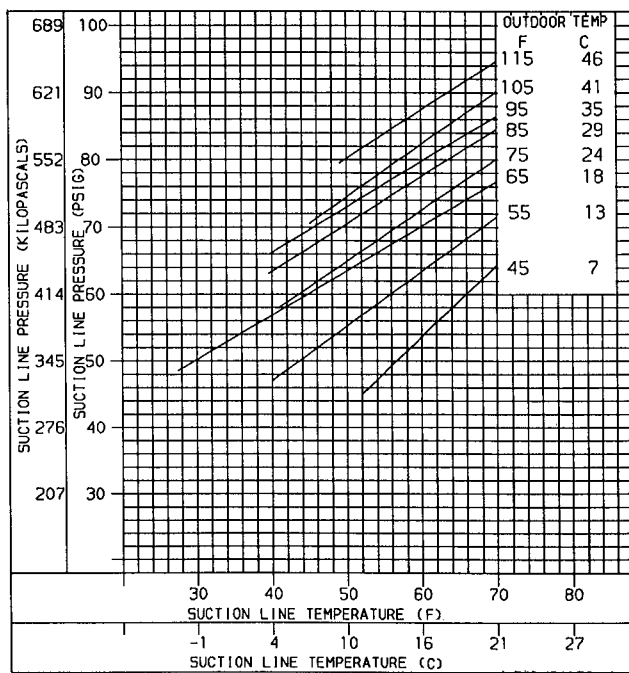


Fig. 40 — Cooling Charging Chart; 50TJ007

TROUBLESHOOTING

Table 19 — Cooling Service Analysis

PROBLEM	CAUSE	REMEDY
Compressor and condenser 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, or control relay	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.
Compressor will not start but condenser 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 three-phase power dead.	Replace fuse or reset circuit breaker. Determine cause
Compressor cycles (other than normally satisfying thermostat).	Refrigerant overcharge or undercharge.	Reclaim refrigerant, evacuate system, and recharge to nameplate
	Defective compressor.	Replace and determine cause.
	Insufficient line voltage	Determine cause and correct.
	Blocked condenser	Determine cause and correct.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace
	Defective thermostat.	Replace thermostat.
	Faulty condenser-fan 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.	Reclaim refrigerant, evacuate system, and recharge.
	Condenser coil dirty or restricted.	Clean coil or remove restriction.
Excessive head pressure.	Dirty air filter.	Replace filter.
	Dirty condenser coil.	Clean coil
	Refrigerant overcharged	Reclaim excess refrigerant
	Air in system.	Reclaim refrigerant, evacuate system, and recharge.
	Condenser 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 head load.	Check for source and eliminate
	Compressor valves leaking.	Replace compressor.
	Refrigerant overcharged	Reclaim excess refrigerant.
Suction pressure too low.	Dirty air filter.	Replace filter.
	Low refrigerant charge	Check for leaks; repair and recharge
	Metering device or low-side restricted.	Remove source of restriction.
	Insufficient evaporator airflow.	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
	Outdoor ambient below 25 F.	Install low-ambient kit.
Evaporator fan will not shut off. (Sizes 004-006 only.)	Time off delay not finished	Wait for 30-second off delay.

Table 20 — Varislide™ Economizer Troubleshooting

PROBLEM	CAUSE	REMEDY
Damper does not open.	Indoor (evaporator) 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 properly making contact with the damper blade. Check that SW1 is in the NC (normally closed) position. 2. Check diode D18. If diode is not functioning properly, replace D18. 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 (evaporator) 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.
	Verify economizer control board is correctly wired and works properly	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.
	Check 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 wiring of economizer	1. Verify that SW2 and SW4 are wired and working properly (see unit label diagram). 2. Check diode D19. If diode is not functioning properly, replace D19.
	Verify economizer control board is functioning properly	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.
	Check 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.	Verify that close-on-power-loss and economizer control board are functioning properly	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 (Evaporator) Fan Contactor
IFO	— Indoor (Evaporator) Fan On
OAT	— Outdoor-Air Thermostat
PL	— Plug
SAT	— Supply-Air Thermostat
SW	— Economizer Position Switch
vac	— Volts Alternating Current
vdc	— Volts Direct Current

Table 21 — PARABLADE Economizer Troubleshooting

PROBLEM	CAUSE	REMEDY
Damper does not open.	Evaporator fan not on	Check wiring between G on connection board and indoor fan contactor
	No power to economizer motor	1 Disconnect power at TR and TR1 Disconnect jumper across P and P1. 2 Connect jumper across TR and 1 3 Connect jumper across T1 and T 4 If connected, remove enthalpy sensor from terminals S_O and +. 5 Apply power (24 vac) to terminals TR and TR1. The LED should be off and the damper should be in the closed position 6 Disconnect the factory-installed 620 ohm resistor from terminals S_R and + The LED should light up and the motor should drive toward open If this does not happen, replace the economizer control module.
	Economizer motor failure.	If the indoor (evaporator) fan and economizer motor are energized, verify that there is a minimum of 24 vac at terminals TR and TR1. If the motor is not operating, replace the motor
Economizer operation limited to minimum position.	Economizer control module failure	1 To simulate high or low enthalpy, reconnect the factory-installed 620 ohm resistor across terminals S_R and + 2 Connect 1 2 Kohm checkout resistor across terminals S_O and +. Turn the enthalpy set point to "A." The LED should turn on, indicating low enthalpy. The motor should drive toward open If LED does not light, replace module. If motor does not drive open, check motor operation 3. Turn the enthalpy set point to "D." The LED should turn off, indicating high enthalpy The motor should drive toward closed. If these actions do not occur, replace module 4. Disconnect 1.2 Kohm checkout resistor before resuming operation.
Damper does not close.	No power to economizer	1 Disconnect power at TR and TR1 Disconnect jumper across P and P1. 2 Connect jumper across TR and 1. 3 Connect jumper across T1 and T. 4 If connected, remove enthalpy sensor from terminals S_O and +. Factory-installed 620 ohm resistor should be connected to terminals S_R and + 5. Apply power (24 vac) to terminals TR and TR1 The LED should be off and the damper should be in the closed position 6 Disconnect the factory-installed 620 ohm resistor from terminals S_R and +. The LED should light up and the motor should drive toward open. If this does not happen, replace the economizer control module
	Spring return failure.	If power to unit is off and damper does not close, check for a bound linkage If linkage is not bound, then internal spring may be broken. Replace actuator.
	Economizer motor failure	If the economizer control module is functioning properly, verify that there is a minimum of 24 Vac at terminals TR and TR1. If the motor is not operating, replace the motor.
Damper does not open or close according to enthalpy readings.	Sensor incorrectly wired or bad.	To verify sensor operation, reconnect the + lead of the outdoor enthalpy sensor to the + terminal of the economizer control module. Connect a DC milliammeter between terminals S _O of the economizer control module and terminals S of the enthalpy sensor. The milliammeter should indicate between 3 and 25 mA if the sensor is operating properly. If the milliammeter indicates 0, the sensor may be wired backwards If any other readings are shown, replace the sensor

LEGEND

LED — Light-Emitting Diode

PACKAGED SERVICE TRAINING

Our packaged service training programs provide an excellent way to increase your knowledge of the equipment discussed in this manual. Product programs cover:

- Unit Familiarization
- Maintenance
- Installation Overview
- Operating Sequence

A large selection of product, theory, and skills programs is available. All programs include a video cassette and/or slides and a companion booklet. Use these for self teaching or to conduct full training sessions.

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50TJ004-007 Single-Package Rooftop Cooling Units



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 the 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. Electrical shock could cause personal injury.

INSTALLATION

Unit is shipped in the vertical configuration. To convert to horizontal configuration, remove screws from side duct opening covers and remove covers. Using the same screws, install covers on vertical duct openings with the insulation-side down. Seals around duct openings must be tight. See Fig. 1.

Step 1 — Provide Unit Support

ROOF CURB — Assemble and install accessory roof curb in accordance with instructions shipped with curb. See Fig. 2. 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 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 a watertight seal. Install gasket supplied with the roof curb as shown in Fig. 2. 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. 3. 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 in. is required for the first 12 in. of ductwork. Cabinet return-air static shall not exceed $-.35$ in. wg with Varislide economizer, $-.20$ with PARABLADE economizer, or $-.45$ in. wg without economizer.