



50TJQ004-007 Single-Package Rooftop Heat Pump 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 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 discharge configuration. To convert to horizontal configuration, remove horizontal duct opening covers. Using the same screws, install covers on duct openings in basepan of unit with the insulation-side down. Seals around duct openings must be tight.

Step 1 — Provide Unit Support

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

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

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

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

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

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

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

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

A minimum clearance to combustibles is not required around ductwork on vertical discharge units. On horizontal discharge units with electric heat, a minimum clearance of 1.0 in. is required for the first 12 in. of ductwork. Cabinet return-air static pressure should not exceed -0.35 in. wg with Durablade economizer, -0.20 in. wg with PARABLADE economizer, or -0.45 in. wg without economizer.

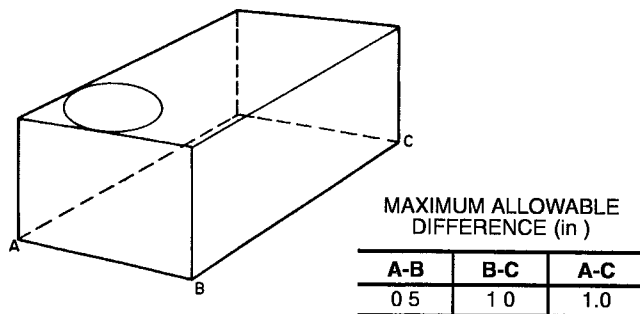


Fig. 2 — Unit Leveling Tolerances

Step 3 — Install Condensate Drain Line and External Trap — Condensate drain connections are located at the bottom and side of the unit. Unit discharge connections do not determine the use of drain connections; either drain connection can be used with vertical or horizontal discharge units.

When using the standard side drain connection, make sure the plug 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. 3. The piping for the condensate drain and external trap can be completed after the unit is in place.

All units must have an external trap for condensate drainage. Install a trap at least 4 in. deep and protect against freeze-up. See Fig. 4. If drain line is installed downstream from the external trap, pitch the line away from the 50TJQ 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, and file any claim with transportation agency. Keep unit upright and do not drop. Spreader bars are not required if top crating is left on unit, and rollers may be used to move unit across a roof. Level by using unit frame as a reference. See Table 1 and Fig. 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. 5 and 6. Refer to rigging instructions on unit.

⚠ CAUTION

All panels must be in place when rigging.

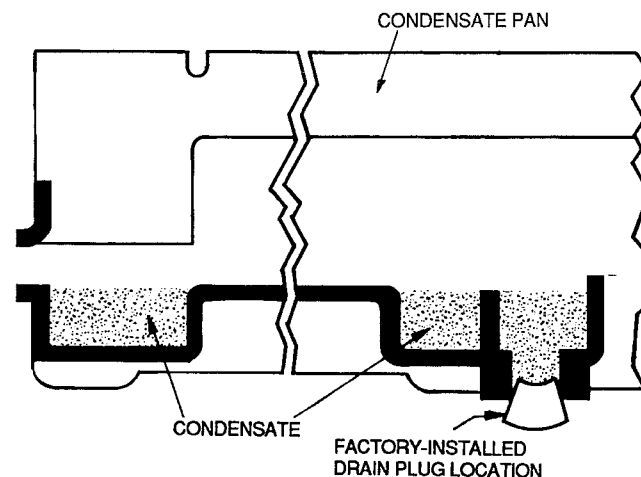
POSITIONING — Maintain clearance around and above unit to provide proper airflow and service access. See Fig. 6.

A properly positioned unit will have the following clearances: 1/4-in. clearance between roof curb and base rails on each side and front of unit; 1 1/2-in. clearance between roof curb and rear of unit. (See Fig. 1, section C-C.)

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

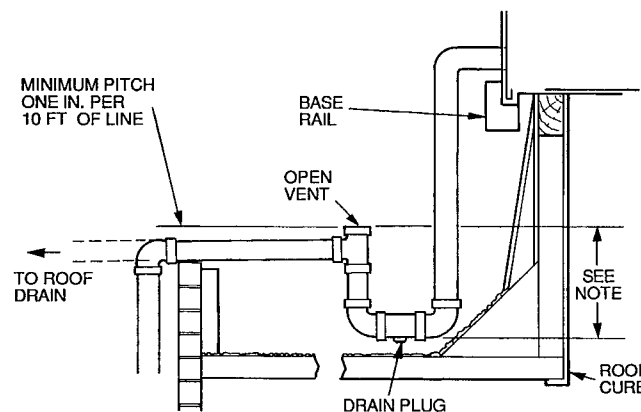
Although unit is weatherproof, guard against water from higher level runoff and overhangs.

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



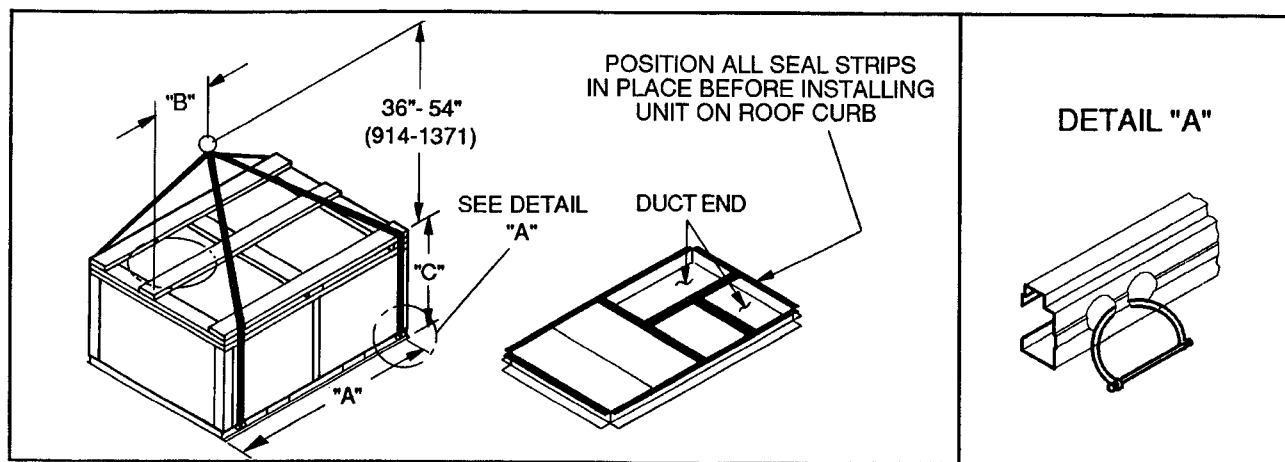
NOTE Drain plug is shown in factory-installed position

Fig. 3 — Condensate Drain Connection



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

Fig. 4 — External Trap Condensate Drain



NOTES:

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

⚠ CAUTION

All panels must be in place when rigging

UNIT	OPERATING WEIGHT		DIMENSIONS					
			"A"		"B"		"C"	
	lb	kg	in.	mm	in.	mm	in.	mm
50TJQ004	500	227	73.69	1872	35.50	902	33.31	847
50TJQ005	520	236	73.69	1872	35.50	902	33.31	847
50TJQ006	550	249	73.69	1872	35.50	902	33.31	847
50TJQ007	590	268	73.69	1872	35.50	902	33.31	847

Fig. 5 — Rigging Details

Step 5 — Make Electrical Connections

⚠ WARNING

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

FIELD POWER SUPPLY — All units except 208/230-v units are factory wired for the voltage shown on the nameplate. If the 208/230-v unit is to be connected to a 208-v power supply, the transformer *must* be rewired by disconnecting the black wire from the 230-v 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. Pig-tails are provided for field wire connections. Use factory-supplied splices or UL (Underwriters' Laboratories) approved copper/aluminum connector.

When installing units, provide a disconnect per the NEC.

All field wiring must comply with the NEC and local requirements.

Install field wiring as follows:

1. Install conduit through side panel openings. For units without electric heat, install conduit between disconnect and control box.
2. Install power lines to terminal connections as shown in Fig. 7.
3. For units with electric heat, refer to Accessory Electric Heat Installation Instructions.

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

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

Table 1 — Physical Data

UNIT SIZE	004	005	006	007
NOMINAL CAPACITY (tons)	3	4	5	6
OPERATING WEIGHT (lb)				
Unit				
Al/Al*	500	520	550	590
Al/Cu*	—	—	—	—
Economizer				
Durablade	34	34	34	34
Parablade	42	42	42	42
Roof Curb†	115	115	115	115
COMPRESSOR			Hermetic	
Quantity	1	1	1	1
Oil (oz)	45	54	50	54
REFRIGERANT TYPE		R-22		
Operating Charge (lb-oz)	5-1	6-0	8-0	11-2
OUTDOOR COIL		Enhanced Copper Tubes, Aluminum Lanced Fins, Acutrol™ Feed Device		
Rows...Fins/in.	1.. 17	1.. 17	2.. 17	2.. 17
Total Face Area (sq ft)	10.31	14.58	12.25	16.53
OUTDOOR FAN		Propeller Type		
Nominal Cfm	4000	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
INDOOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Acutrol Feed Device		
Rows...Fins/in.	2.. 15	2.. 15	3.. 15	3.. 15
Total Face Area (sq ft)	4.2	4.2	5.5	5.5
INDOOR FAN		Centrifugal Type		
Quantity...Size (in.)	1 10 x 10	1 10 x 10	1 10 x 10	1 10 x 10
Type Drive	1 .10 x 10	1 .10 x 10	1 .10 x 10	—
	Direct	Direct	Direct	Belt
	Belt	Belt	Belt	—
Nominal Cfm	1200	1600	2000	2100
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 760-1000	835-1185	900-1300	—
Motor Bearing Type	Ball	Ball	Ball	Ball
Maximum Allowable Rpm	2100	2100	2100	2100
Motor Pulley Pitch Diameter	Std —	—	—	2 8/3.8
Min/Max (in.)	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 34	1 A 34	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 48	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 856	975	1060	—
Fan Shaft Diameter at Pulley (in.)	½	½	½	½
HIGH-PRESSURE SWITCH (psig)**			450 ± 50	
Standard Compressor Internal Relief (Differential)			428	
Cutout			320	
Reset (Auto.)				
LOW-PRESSURE SWITCH (psig)**			7 ± 3	
Cutout			22 ± 5	
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

Al — Aluminum
Bhp — Brake Horsepower
Cu — Copper

*Indoor coil fin material/outdoor coil fin material

†Weight of 14-in roof curb

**Requires an accessory or optional controls upgrade kit

NOTE: The 50TJQ units have a loss-of-charge/low-pressure switch located in the liquid line available as an option or an accessory (Standard on 006 and 007)

UNIT	STD UNIT WEIGHT		ECONOMIZER WEIGHT (DURABLADE)		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg
50TJQ004	500	227	34	15.4	125	57	120	54	125	57	130	59
50TJQ005	520	236	34	15.4	130	59	125	57	130	59	135	61
50TJQ006	550	249	34	15.4	138	63	132	60	138	62	142	64
50TJQ007	590	268	34	15.4	148	68	142	64	148	67	152	69

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

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

THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
1/2"	24 v POWER*	1/8" [22.2]
3/4"	POWER*	1 1/8" [28.4]
1 1/4"	POWER*	1 3/4" [44.4]

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

NOTES:

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

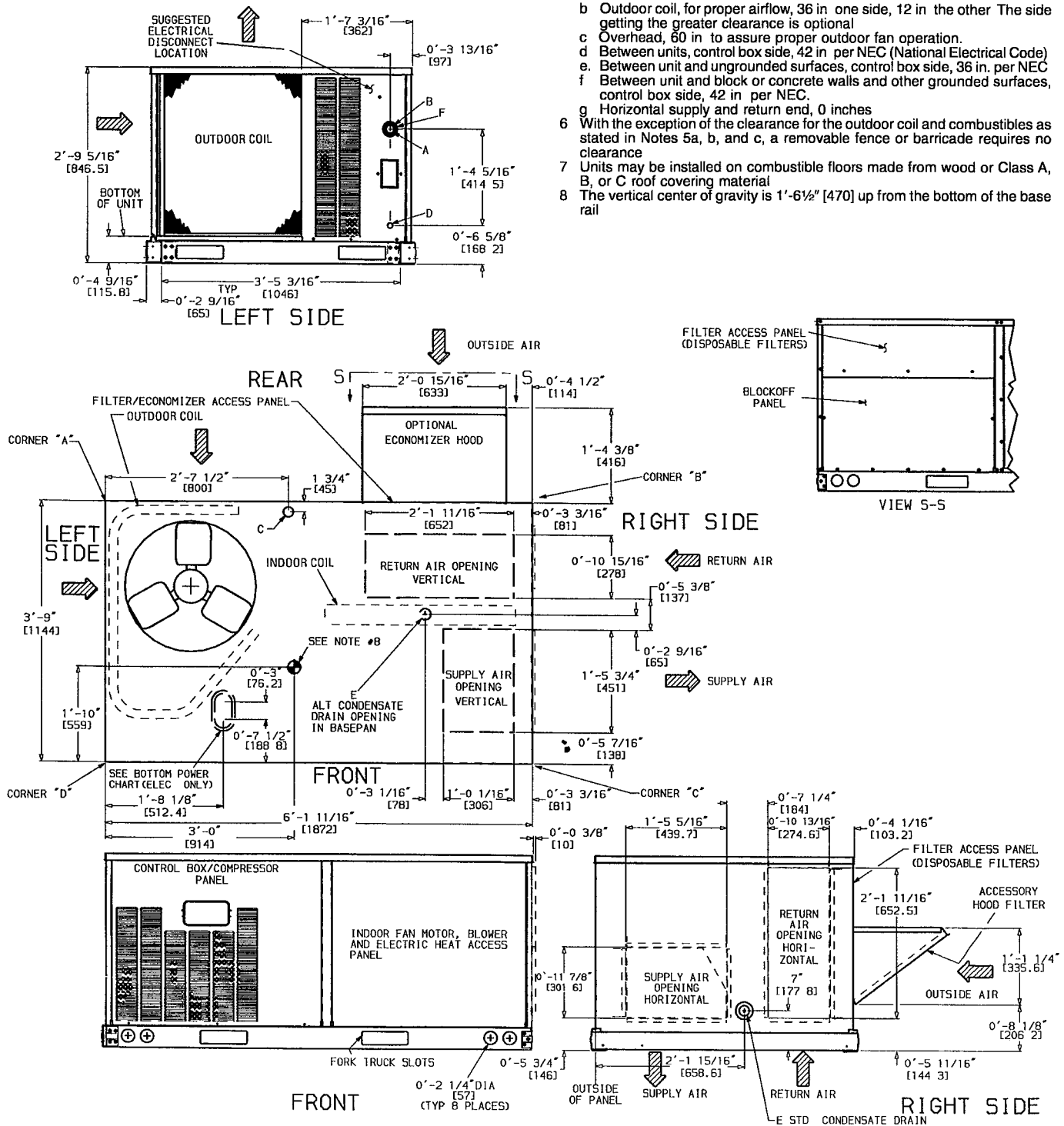
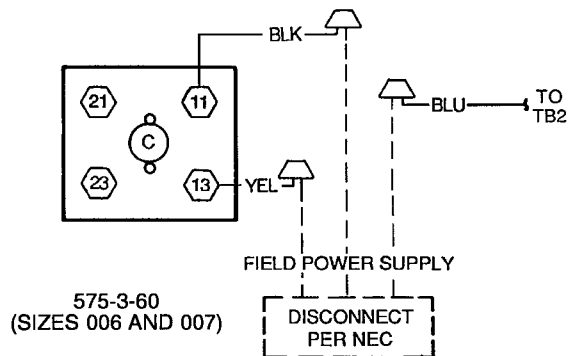
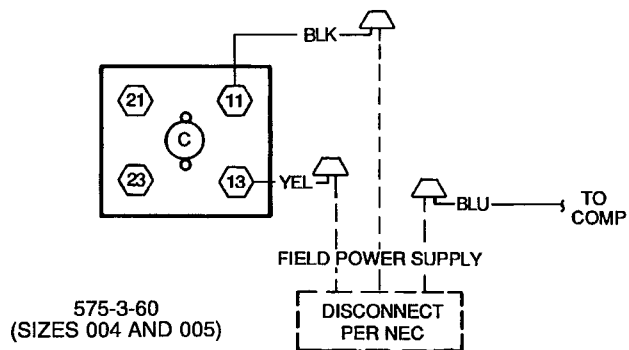
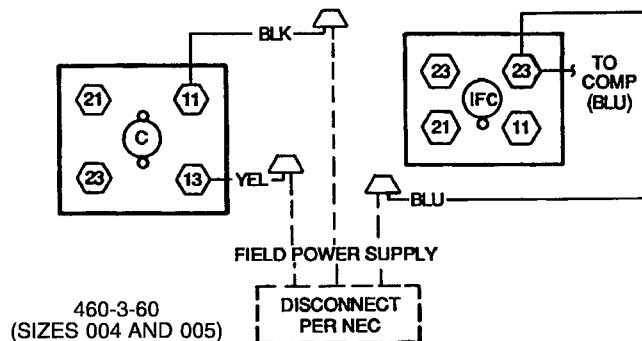
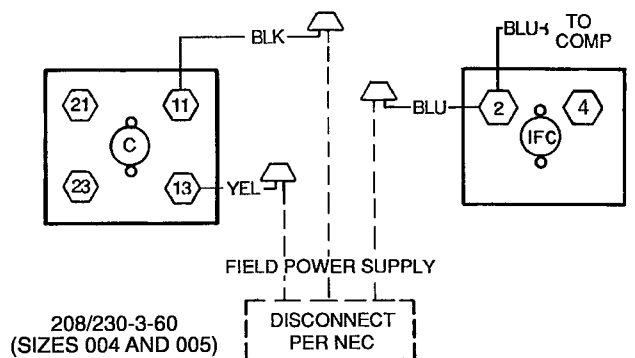
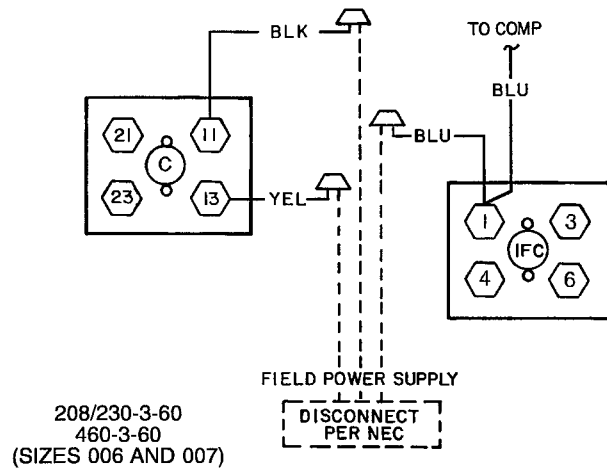
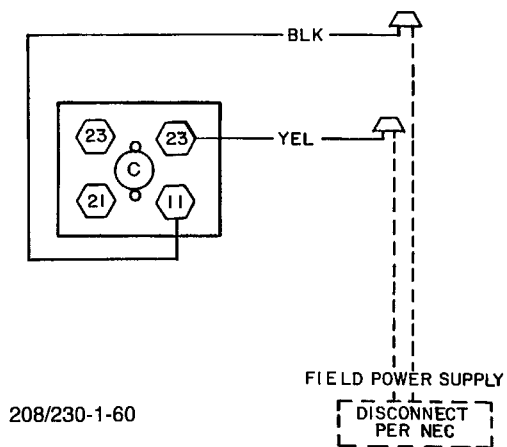


Fig. 6 — Base Unit Dimensions



LEGEND

C — Contactor
COMP — Compressor
IFC — Indoor Fan Contactor
NEC — National Electrical Code

Fig. 7 — Power Wiring Connections

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

UNIT 50TJQ	NOMINAL V-PH-HZ	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (each)		OFM FLA	IFM FLA	ELECTRIC HEAT*		POWER SUPPLY		DISCONNECT SIZE**	
			Min	Max	RLA	LRA			Nominal kW†	FLA	MCA	MOCP	FLA	LRA
004 (3 Tons)	208/230-1-60	STD	187	254	16.4	96.0	1.5	3.1	—	—	25.5/ 25.5	30/ 30††	25/ 25	107/107
									3.3/ 4.4	15.9/18.3	45.4/ 48.4	50/ 50††	43/ 46	123/125
									4.9/ 6.5	23.6/27.1	55.0/ 59.4	60/ 60††	52/ 56	131/184
									6.5/ 8.7	31.3/36.3	64.6/ 70.9	70/ 80	61/ 66	138/143
									7.9/10.5	38.0/43.8	73.0/ 80.3	80/ 90	68/ 75	145/151
									9.8/13.0	47.1/54.2	84.4/ 93.3	90/100	79/ 87	154/161
		ALT	187	254	16.4	96.0	1.5	4.9	—	—	26.9/ 26.9	30/ 30††	26/ 26	111/111
									3.3/ 4.4	15.9/18.3	46.8/ 49.8	50/ 50††	45/ 47	127/130
									4.9/ 6.5	23.6/27.1	56.4/ 60.8	60/ 70	53/ 57	135/138
									6.5/ 8.7	31.3/36.3	66.0/ 72.3	70/ 80	62/ 68	143/148
									7.9/10.5	38.0/43.8	74.4/ 81.7	80/ 90	70/ 77	149/155
									9.8/13.0	47.1/54.2	85.8/ 94.7	90/100	80/ 89	158/166
	208/230-3-60	STD	187	254	10.2	75.0	1.5	3.1	—	—	17.8/ 17.8	20/ 20††	17/ 17	86/ 86
									3.3/ 4.4	9.2/10.6	29.3/ 31.0	30/ 35††	28/ 30	95/ 97
									4.9/ 6.5	13.6/15.6	34.8/ 37.3	35/ 40††	33/ 35	100/102
									6.5/ 8.7	18.0/20.9	40.3/ 43.9	45/ 45††	38/ 42	104/107
									7.9/10.5	21.9/25.3	45.1/ 49.4	50/ 50††	43/ 47	108/111
									12.0/16.0	33.3/38.5	59.4/ 65.9	60/ 70	56/ 62	119/124
		ALT	187	254	10.2	75.0	1.5	4.9	—	—	19.2/ 19.2	20/ 20††	19/ 19	90/ 90
									3.3/ 4.4	9.2/10.6	30.7/ 32.4	35/ 35††	30/ 31	100/101
									4.9/ 6.5	13.6/15.6	36.2/ 38.7	40/ 40††	35/ 37	104/106
									6.5/ 8.7	18.0/20.9	41.7/ 45.3	45/ 50††	40/ 43	108/111
									7.9/10.5	21.9/25.3	46.5/ 50.8	50/ 60††	44/ 48	112/116
									12.0/16.0	33.3/38.5	60.8/ 67.3	70/ 70	57/ 63	124/129
	460-3-60	STD	414	508	4.8	40.0	0.8	1.7	—	—	8.1	15††	8	45
									6.0	7.2	12.1	20††	16	52
									8.8	10.6	21.4	25††	20	55
									11.5	13.8	25.4	30††	24	59
		ALT	414	508	4.8	40.0	0.8	2.1	—	—	8.9	15††	9	48
									6.0	7.2	17.9	20††	17	55
									8.8	10.6	22.2	25††	21	59
									11.5	13.8	26.2	30††	25	62
	575-3-60	STD	518	632	3.8	31.0	0.8	1.7	—	—	6.4	15††	6	35
		ALT	518	632	3.8	31.0	0.8	2.1	—	—	7.1	15††	7	37
005 (4 Tons)	208/230-1-60	STD	187	254	23.4	110.0	1.5	3.5	—	—	34.3/ 34.3	35/ 35††	33/ 33	121/121
									3.3/ 4.4	15.9/18.3	54.1/ 57.1	60/ 60††	51/ 54	137/139
									6.5/ 8.7	31.3/36.3	73.4/ 79.6	80/ 80	69/ 74	152/157
									9.8/13.0	47.1/54.2	93.1/102.0	100/110	87/ 95	168/175
									13.1/17.4	63.0/72.5	113.0/124.9	125/125	105/116	184/193
									15.8/21.0	76.0/87.5	129.3/143.6	150/150	120/133	197/208
		ALT	187	254	23.4	110.0	1.5	4.9	—	—	35.7/ 35.7	40/ 40††	34/ 34	125/125
									3.3/ 4.4	15.9/18.3	55.5/ 58.5	60/ 60††	53/ 55	141/144
									6.5/8.7	31.3/36.3	74.8/ 81.0	80/ 90	70/ 76	157/162
									9.8/13.0	47.1/54.2	94.5/103.4	100/110	88/ 97	172/180
									13.1/17.4	63.0/72.5	114.4/126.3	125/150	107/118	188/198
									15.8/21.0	76.0/87.5	130.7/145.0	150/150	122/135	201/213
	208/230-3-60	STD	187	254	14.1	103.0	1.5	3.5	—	—	22.6/ 22.6	25/ 25††	22/ 22	114/114
									4.9/ 6.5	13.6/15.6	39.6/ 42.1	45/ 45††	38/ 40	127/129
									6.5/ 8.7	18.0/20.9	45.1/ 48.8	50/ 50††	43/ 46	132/135
									12.0/16.0	33.3/38.5	64.3/ 70.8	70/ 80	60/ 66	147/152
									15.8/21.0	43.9/50.5	77.5/ 85.8	80/ 90	72/ 80	158/164
		ALT	187	254	14.1	103.0	1.5	4.9	—	—	24.0/ 24.0	25/ 25††	24/ 24	118/118
									4.9/ 6.5	13.6/15.6	41.0/ 43.5	45/ 45††	39/ 42	132/134
									6.5/ 8.7	18.0/20.9	46.5/ 50.2	50/ 60††	44/ 48	136/139
									12.0/16.0	33.3/38.5	65.7/ 72.2	70/ 80	62/ 68	152/157
									15.8/21.0	43.9/50.5	78.9/ 87.2	80/ 90	74/ 82	162/169

Legend on page 12

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

UNIT 50TJQ	NOMINAL V-PH-HZ	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (each)		OFM FLA	IFM FLA	ELECTRIC HEAT*		POWER SUPPLY		DISCONNECT SIZE**	
			Min	Max	RLA	LRA			Nominal kW†	FLA	MCA	MOCP	FLA	LRA
005 (4 Tons) (cont)	460-3-60	STD	414	508	7 1	52 5	0 8	1 8	—	—	11.5	15††	11	59
									6.0	7.2	20.5	25††	19	66
									11.5	13.8	28.7	30††	27	73
									14.0	16.8	32.5	35††	30	76
									23.0	27.7	46.1	50††	43	86
		ALT	414	508	7 1	52 5	0 8	2 1	—	—	11.8	15††	12	61
									6.0	7.2	20.8	25††	20	68
									11.5	13.8	29.0	30††	27	74
									14.0	16.8	32.8	35††	31	77
									23.0	27.7	46.4	50††	43	88
	575-3-60	STD	518	632	6.0	44.0	0.8	1.8	—	—	9.6	15††	9	49
		ALT	518	632	6.0	44.0	0.8	2.1	—	—	9.8	15††	10	50
006 (5 Tons)	208/230-1-60	STD	187	254	26 7	170 0	1 5	5 9	—	—	40.8/ 40.8	45/ 45††	39/ 39	184/184
									4.9/ 6.5	23.6/27	70.3/ 74.7	80/ 80	66/ 70	208/211
									6.5/ 8.7	31.3/36.3	79.9/ 86.2	80/ 90	75/ 81	215/220
									9.8/13.0	47.1/54.2	99.7/108.5	100/110	93/102	231/238
									13.1/17.4	63.0/72.5	119.5/131.4	125/150	112/123	247/257
		ALT	187	254	26 7	170 0	1 5	8 8	15.8/21.0	76.0/87.5	135.8/150.2	150/175	127/140	260/272
									—	—	48.5/ 48.5	50/ 50††	48/ 48	222/222
									4.9/ 6.5	23.6/27.1	78.0/ 82.4	80/ 90	75/ 79	246/249
									6.5/ 8.7	31.3/36.3	87.6/ 93.9	90/100	84/ 90	253/258
									9.8/13.0	47.1/54.2	107.4/116.2	110/125	102/110	269/276
	208/230-3-60	STD	187	254	15 4	124 0	1 5	5 9	13.1/17.4	63.0/72.5	127.2/139.1	150/150	121/131	285/294
									15.8/21.0	76.0/87.5	143.5/157.9	150/175	135/149	298/309
									—	—	26.7/ 26.7	30/ 30††	26/ 26	138/138
									4.9/ 6.5	13.6/15.6	43.7/ 46.2	45/ 50††	42/ 44	152/154
									7.9/10.5	21.9/25.3	54.0/ 58.3	60/ 60††	51/ 55	160/163
		ALT	187	254	15 4	124 0	1 5	5 8	12.0/16.0	33.3/38.5	68.3/ 74.8	70/ 80	65/ 70	171/177
									15.8/21.0	43.9/50.5	81.5/ 89.8	90/ 90	77/ 84	182/189
									19.9/26.5	55.2/63.8	95.7/106.4	100/110	90/100	193/202
									—	—	26.6/ 26.6	30/ 30††	26/ 26	169/169
									4.9/ 6.5	13.6/15.6	43.6/ 46.1	45/ 50††	42/ 44	182/184
	460-3-60	STD	414	508	7.7	59 6	0 8	3 2	7.9/10.5	21.9/25.3	53.9/ 58.2	60/ 60	51/ 55	191/194
									12.0/16.0	33.3/38.5	68.2/ 74.7	70/ 80	64/ 70	202/207
									15.8/21.0	43.9/50.5	81.4/ 89.7	90/ 90	77/ 84	213/219
									19.9/26.5	55.2/63.8	95.6/106.3	100/110	90/ 99	224/233
									—	—	13.6	15††	13	67
		ALT	414	508	7.7	59 6	0 8	2 6	6.0	7.2	22.6	25††	22	75
									11.5	13.8	30.9	35††	29	81
									14.0	16.8	34.6	35††	33	84
									23.0	27.7	48.3	50††	45	95
									25.5	30.7	52.0	60††	49	98
	575-3-60	STD	518	632	6.2	49.4	0.8	3.2	—	—	11.0	15††	11	56
		ALT	518	632	6.2	49.4	0.8	2.6	—	—	10.5	15††	10	67
007 (6 Tons)	208/230-3-60	STD	187	254	22 7	146 0	1 4	5 8	—	—	35.6/ 35.6	40/ 40††	34/ 34	190/190
									4.9/ 6.5	13.6/15.6	52.6/ 55.1	60/ 60††	50/ 52	204/206
									7.9/10.5	21.9/25.3	63.0/ 67.2	70/ 70	60/ 63	212/215
									12.0/16.0	33.3/38.5	77.2/ 83.7	80/ 90	73/ 79	223/229
									15.8/21.0	43.9/50.5	90.5/ 98.7	100/100	85/ 92	234/241
	460-3-60	STD	414	508	11 4	73 0	0 7	2 6	19.9/26.5	55.2/63.8	104.6/115.3	110/125	98/108	245/254
									—	—	17.6	20††	17	95
									6.0	7.2	26.6	30††	25	102
									11.5	13.8	34.8	35††	33	109
									14.0	16.8	38.6	40††	36	112
	575-3-60	STD	518	632	9 1	58 4	0 7	2 6	23.0	27.7	52.2	60††	49	123
									25.5	30.7	55.9	60††	52	126
	575-3-60	STD	518	632	9 1	58 4	0 7	2 6	—	—	14.0	15††	14	76
									—	—	14.0	15††	14	76

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Table 2B — Electrical Data (Units With Electrical Convenience Outlet)

UNIT 50TJQ	NOMINAL V-PH-HZ	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (each)		OFM FLA	IFM FLA	ELECTRIC HEAT*		POWER SUPPLY		DISCONNECT SIZE**	
			Min	Max	RLA	LRA			Nominal kW†	FLA	MCA	MOCP	FLA	LRA
004 (3 Tons)	208/230-1-60	STD	187	254	16.4	96.0	15	3.1	—	—	30.3/ 30.3	35/ 35††	30/ 30	112/112
									3.3/ 4.4	15.9/18.3	50.2/ 53.2	60/ 60††	48/ 51	128/130
									4.9/ 6.5	23.6/27.1	59.8/ 64.2	70/ 70	57/ 61	135/139
									6.5/ 8.7	31.3/36.3	69.4/ 75.7	70/ 80	66/ 72	143/148
									7.9/10.5	38.0/43.6	77.8/ 85.1	80/ 90	74/ 81	150/156
									9.8/13.0	47.1/54.2	89.2/ 98.1	90/100	84/ 72	159/166
		ALT	187	254	16.4	96.0	15	4.9	—	—	31.7/ 31.7	35/ 35††	32/ 32	116/116
									3.3/ 4.4	15.9/18.3	51.6/ 54.6	60/ 60††	50/ 53	132/134
									4.9/ 6.5	23.6/27.1	61.2/ 65.6	70/ 70	59/ 63	140/143
									6.5/ 8.7	31.3/36.3	70.8/ 77.1	80/ 80	68/ 73	147/152
									7.9/10.5	38.0/43.6	79.2/ 86.5	80/ 90	75/ 82	154/160
									9.8/13.0	47.1/54.2	90.6/ 99.5	100/110	86/ 94	163/170
	208/230-3-60	STD	187	154	10.2	75.0	15	3.1	—	—	22.6/ 22.6	25/ 25††	23/ 23	91/ 91
									3.3/ 4.4	9.2/10.6	34.1/ 35.8	40/ 40††	34/ 35	100/101
									4.9/ 6.5	13.6/15.6	39.6/ 42.1	45/ 45††	39/ 41	104/106
									8.5/ 8.7	18.0/20.9	45.1/ 48.7	50/ 50††	44/ 47	109/112
									7.9/10.5	21.9/25.3	49.9/ 54.2	60/ 60††	48/ 52	113/116
									12.0/16.0	33.3/38.5	64.2/ 70.7	70/ 80††	61/ 67	124/129
		ALT	187	254	10.2	75.0	15	4.9	—	—	24.0/ 24.0	30/ 30††	25/ 25	95/ 95
									3.3/ 4.4	9.2/10.6	35.5/ 37.2	40/ 40††	35/ 37	104/106
									4.9/ 6.5	13.6/15.6	41.0/ 43.5	45/ 45††	40/ 43	109/111
									6.5/ 8.7	18.0/20.9	46.5/ 50.1	50/ 60††	45/ 49	113/116
									7.9/10.5	21.9/25.3	51.3/ 55.6	60/ 60††	50/ 54	117/120
									12.0/16.0	33.3/38.5	65.6/ 72.1	70/ 80	63/ 69	128/134
	460-3-60	STD	414	508	4.8	40.0	0.8	1.7	—	—	10.3	15††	10	47
									6.0	7.2	19.3	20††	19	54
									8.8	10.6	23.5	25††	23	58
									11.5	13.8	27.5	30††	26	61
		ALT	414	508	4.8	40.0	0.8	2.1	—	—	11.1	15††	11	50
									6.0	7.2	20.1	25††	20	57
									8.8	10.6	24.3	25††	24	61
									11.5	13.8	28.3	30††	27	64
	575-3-60	STD	518	632	3.8	31.0	0.8	1.7	—	—	8.2	15††	8	37
		ALT	518	632	3.8	31.0	0.8	2.1	—	—	8.8	15††	9	39
005 (4 Tons)	208/230-1-60	STD	187	254	23.4	110.0	15	3.5	—	—	39.1/ 39.1	40/ 40††	38/ 38	126/126
									3.3/ 4.4	15.9/18.3	58.9/ 61.9	60/ 70	56/ 59	141/144
									6.5/ 8.7	31.3/36.3	78.2/ 84.4	80/ 90	74/ 80	157/162
									9.8/13.0	47.1/54.2	97.9/106.8	100/110	92/101	173/180
									13.1/17.4	63.0/72.5	117.8/129.8	125/150	111/122	189/198
									15.8/21.0	76.0/87.5	134.1/148.4	150/150	126/139	202/213
		ALT	187	254	23.4	110.0	15	4.9	—	—	40.5/ 40.5	45/ 45††	40/ 40	130/130
									3.3/ 4.4	15.9/18.3	60.3/ 63.3	70/ 70	58/ 61	146/148
									6.5/ 8.7	31.3/36.3	79.6/ 85.8	80/ 90	76/ 82	161/166
									9.8/13.0	47.1/54.2	99.3/108.2	100/110	94/102	177/184
									13.1/17.4	63.0/72.5	119.2/131.1	125/150	112/123	193/203
									15.8/21.0	76.0/87.5	135.5/149.8	150/150	127/140	206/218
	208/230-3-60	STD	187	254	14.1	103.0	15	3.5	—	—	27.4/ 27.4	30/ 30††	27/ 27	119/119
									4.9/ 6.5	13.6/15.6	44.4/ 46.9	50/ 50††	43/ 45	132/134
									6.5/ 8.7	18.0/20.9	49.9/ 53.6	60/ 60††	48/ 52	137/139
									12.0/16.0	33.3/38.5	69.1/ 75.6	70/ 80	66/ 72	152/157
									15.8/21.0	43.9/50.5	82.3/ 90.6	90/100	78/ 86	162/169
		ALT	187	254	14.1	103.0	15	4.9	—	—	28.8/ 28.8	30/ 30††	29/ 29	123/123
									4.9/ 6.5	13.6/15.6	45.8/ 48.3	50/ 50††	45/ 47	137/139
									6.5/ 8.7	18.0/20.9	51.3/ 55.0	60/ 60††	50/ 53	141/144
									12.0/16.0	33.3/38.5	70.5/ 77.0	80/ 80	67/ 73	156/162
									15.8/21.0	43.9/50.5	83.7/ 92.0	90/100	80/ 87	167/174

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Table 2B — Electrical Data (Units With Electrical Convenience Outlet) (cont)

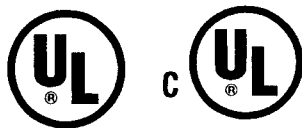
UNIT 50TJQ	NOMINAL V-PH-HZ	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (each)		OFM FLA	IFM FLA	ELECTRIC HEAT*		POWER SUPPLY		DISCONNECT SIZE**	
			Min	Max	RLA	LRA			Nominal kW†	FLA	MCA	MOCP	FLA	LRA
005 (4 Tons) (cont)	460-3-60	STD	414	508	7.1	52.5	0.8	1.8	—	—	13.7	15††	14	61
									6.0	7.2	22.7	25††	22	68
									11.5	13.8	30.9	35††	30	75
									14.0	16.8	34.7	35††	33	78
									23.0	27.7	48.3	50††	46	89
		ALT	414	508	7.1	52.5	0.8	2.1	—	—	14.0	15††	14	63
									6.0	7.2	23.0	25††	22	70
									11.5	13.8	31.2	35††	30	77
									14.0	16.8	35.0	40††	33	80
									23.0	27.7	48.6	50††	46	90
	575-3-60	STD	518	632	6.0	44.0	0.8	1.8	—	—	11.3	15††	11	51
		ALT	518	832	6.0	44.0	0.8	2.1	—	—	11.6	15††	12	52
006 (5 Tons)	208/230-1-60	STD	187	254	26.7	170.0	1.5	5.9	—	—	45.6/ 45.6	50/ 50††	45/ 45	189/189
									4.9/ 6.5	23.6/27.1	75.1/ 79.5	80/ 80	72/ 76	213/216
									6.5/ 8.7	31.3/36.3	84.7/ 91.0	90/100	81/ 86	220/225
									9.8/13.0	47.1/54.2	104.3/113.3	110/125	99/107	236/243
									13.1/17.4	63.0/72.5	124.3/136.2	150/150	117/128	252/261
									15.8/21.0	76.0/87.5	140.6/155.0	150/175	132/145	265/276
		ALT	187	254	26.7	170.0	1.5	8.8	—	—	48.5/ 48.5	50/ 50††	48/ 48	222/222
									4.9/ 6.5	23.6/27.1	78.0/ 82.4	80/ 90	75/ 79	246/249
									6.5/ 8.7	31.3/36.3	87.6/ 93.9	90/100	84/ 90	253/258
									9.8/13.0	47.1/54.2	107.4/116.2	110/125	102/110	269/276
									13.1/17.4	63.0/72.5	127.2/139.1	150/150	121/131	285/294
									15.8/21.0	76.0/87.5	143.5/157.9	150/175	135/149	298/309
	208/230-3-60	STD	187	254	15.4	124.0	1.5	5.9	—	—	31.5/ 31.5	35/ 35††	32/ 32	143/143
									4.9/ 6.5	13.6/15.6	48.5/ 51.0	50/ 60††	47/ 50	157/159
									7.9/10.5	21.9/25.3	58.8/ 63.1	60/ 70	57/ 61	165/168
									12.0/16.0	33.3/38.5	73.1/ 79.6	80/ 90	70/ 76	176/181
									15.8/21.0	43.9/50.5	86.3/ 94.6	90/100	82/ 90	187/193
									19.9/26.5	55.2/63.8	100.5/111.2	110/125	95/105	198/207
		ALT	187	254	15.4	124.0	1.5	5.8	—	—	31.4/ 31.4	35/ 35††	32/ 32	174/174
									4.9/ 6.5	13.6/15.6	48.4/ 50.9	50/ 60††	47/ 50	187/189
									7.9/10.5	21.9/25.3	58.7/ 63.0	60/ 70	57/ 61	195/199
									12.0/16.0	33.3/38.5	73.0/ 79.5	80/ 90	70/ 76	207/212
									15.8/21.0	43.9/50.5	86.2/ 94.5	90/100	82/ 90	217/224
									19.9/26.5	55.2/63.8	100.4/111.1	110/125	95/105	229/237
	460-3-60	STD	414	508	7.7	59.6	0.8	3.2	—	—	15.8	20††	16	70
									6.0	7.2	24.8	30††	24	77
									11.5	13.8	33.1	35††	32	83
									14.0	16.8	36.8	40††	35	86
									23.0	27.7	50.4	60††	48	97
									25.5	30.7	54.2	60††	51	100
		ALT	414	508	7.7	59.6	0.8	2.6	—	—	15.2	20††	15	84
									6.0	7.2	24.2	30††	24	91
									11.5	13.8	32.5	35††	31	98
									14.0	16.8	36.2	40††	35	101
									23.0	27.7	49.8	60††	47	112
									25.5	30.7	53.6	60††	51	115
	575-3-60	STD	518	632	6.2	49.4	0.8	3.2	—	—	12.7	15††	13	57
		ALT	518	632	6.2	49.4	0.8	2.6	—	—	12.2	15††	12	69
007 (6 Tons)	208/230-3-60	STD	187	254	22.7	146.0	1.4	5.8	—	—	40.4/ 40.4	45/ 45††	40/ 40	195/195
									4.9/ 6.5	13.6/15.6	57.4/ 59.9	60/ 60††	56/ 58	208/211
									7.9/10.5	21.9/25.3	67.8/ 72.0	70/ 80	65/ 69	217/220
									12.0/16.0	33.3/38.5	82.0/ 88.5	90/ 90	78/ 84	228/233
									15.8/21.0	43.9/50.5	95.3/103.5	100/110	90/ 98	239/245
									19.9/26.5	55.2/63.8	109.4/120.1	110/125	103/113	250/259
	460-3-60	STD	414	508	11.4	73.0	0.7	2.6	—	—	19.7	20††	19	97
									6.0	7.2	28.7	30††	28	104
									11.5	13.8	37.0	40††	35	111
									14.0	16.8	40.7	45††	39	114
									23.0	27.7	54.4	60††	51	125
									25.5	30.7	58.1	60††	55	128
	575-3-60	STD	518	632	9.1	58.4	0.7	2.6	—	—	15.8	20††	16	78

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LEGEND FOR TABLES 2A AND 2B

LEGEND

FLA	— Full Load Amps
HACR	— Heating, Air Conditioning and Refrigeration
IFM	— Indoor Fan Motor
LRA	— Locked Rotor Amps
MCA	— Minimum Circuit Amps
MOCP	— Maximum Overcurrent Protection
NEC	— National Electrical Code
OFM	— Outdoor Fan Motor
RLA	— Rated Load Amps



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

†Heaters are field installed only.

**Used to determine minimum disconnect per NEC.

††Fuse or HACR circuit breaker.

|| Electrical disconnect cannot be used if electric heater is installed. (Applies to any line with an FLA greater than or equal to 80.)

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.

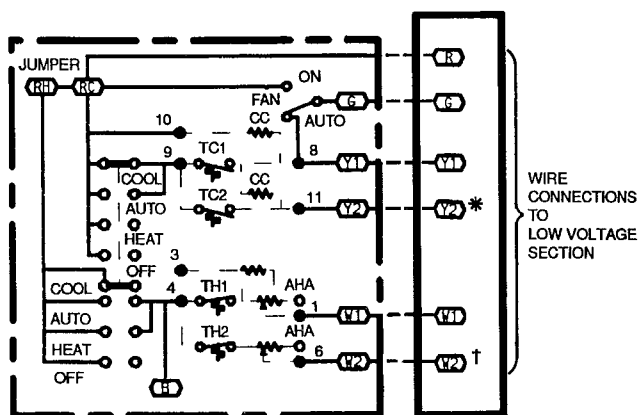
2 Unbalanced 3-Phase Supply Voltage

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

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.

Route thermostat cable or equivalent single leads of colored wire from subbase terminals to low-voltage connections on unit (shown in Fig. 8) as described in Steps 1 through 3 below.

NOTE: For wire runs up to 50 ft, use no. 18 AWG (American Wire Gauge) 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.



TYPICAL THERMOSTAT

LEGEND

AHA	— Adjustable Heat Anticipator	TH	— Thermostat-Heating
CC	— Cooling Compensator	---	— Field Wiring
TC	— Thermostat-Cooling	—	— Factory Wiring

*Used with economizer

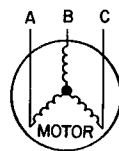
†Used with 2-stage electric heater

Fig. 8 — Low-Voltage Connections With or Without Economizer or Two-Position Damper

% Voltage Imbalance

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

Example: Supply voltage is 460-3-60



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

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

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

$$= 457$$

Determine maximum deviation from average voltage:

$$(AB) 457 - 452 = 5 \text{ v}$$

$$(BC) 464 - 457 = 7 \text{ v}$$

$$(AC) 457 - 455 = 2 \text{ v}$$

Maximum deviation is 7 v

Determine percentage of voltage imbalance:

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

$$= 1.53\%$$

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

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

1. Connect thermostat wires to screw terminals of low voltage connection board.
2. Pass the control wires through the hole provided in the corner post.
3. Feed wire through the raceway built into the corner post to the 24-v barrier located on the left side of the control box. See Fig. 9. The raceway provides the UL-required clearance between the high- and low-voltage wiring.

DEFROST BOARD — The defrost board timer is set for a 30 minute defrost cycle from the factory. To adjust to a 50 or 90 minute cycle, remove the wire connected to the 30 minute quick connect on the defrost board. See Fig. 10. Connect lead to the 50 or 90 minute quick connect on the defrost board, depending on the application.

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

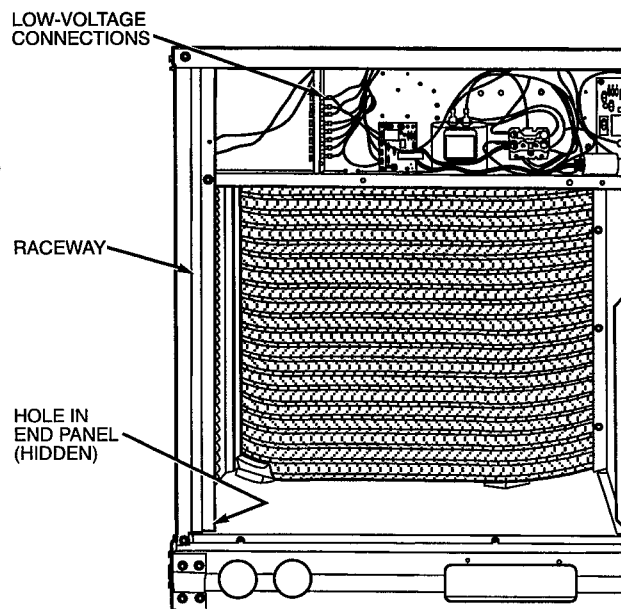


Fig. 9 — Field Control Wiring Raceway

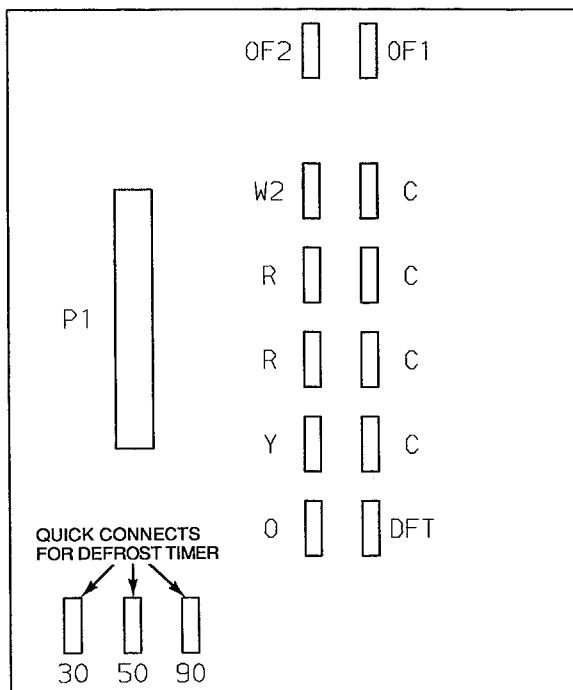


Fig. 10 — Defrost Board

Step 6 — Adjust Factory-Installed Options

DISCONNECT SWITCH — The optional disconnect switch is non-fused. The switch has the capability of being locked in place for safety purposes. The disconnect switch is only available for limited applications. See electrical data tables on pages 8 and 9 for disconnect switch usage.

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

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

Assembly

1. Determine if ventilation air is required in building. If so, determine the minimum amount to be supplied by each unit and record quantity of ventilation air needed for use in Step 8.
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. 11. Remove optional outdoor-air hood package from filter section.
3. Assemble outdoor-air hood top and side plates as shown in Fig. 12. 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. Economizer comes factory-installed in unit and secured with screws. See Fig. 13.

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

5. To convert to horizontal discharge application:
 - a. Rotate the economizer 90 degrees until the economizer motor faces the outdoor section (see Fig. 14).
 - b. Rotate the barometric relief damper hinge 90 degrees. Barometric relief damper should open vertically to operate properly.
 - c. Install horizontal discharge block-off plate over the opening on the access panel. (Block-off plate **MUST** be installed before installing hood assembly.)

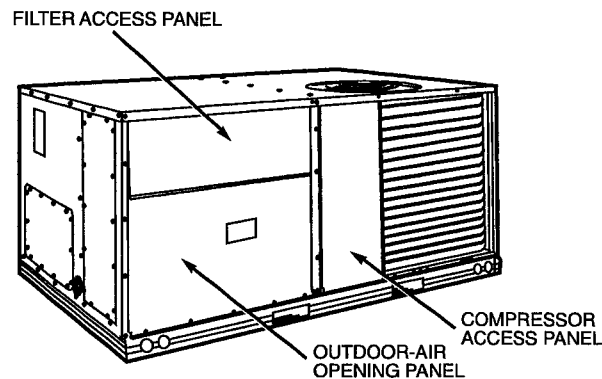
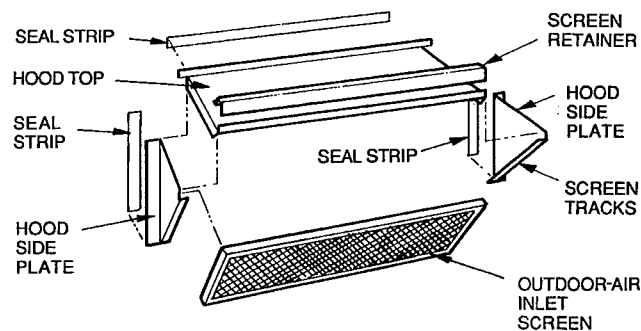
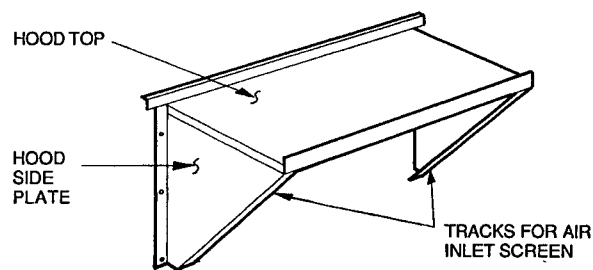


Fig. 11 — Typical Access Panel Locations



OUTDOOR-AIR HOOD - UNASSEMBLED



HOOD SIDES AND TOP - ASSEMBLED

Fig. 12 — Outdoor-Air Hood Details

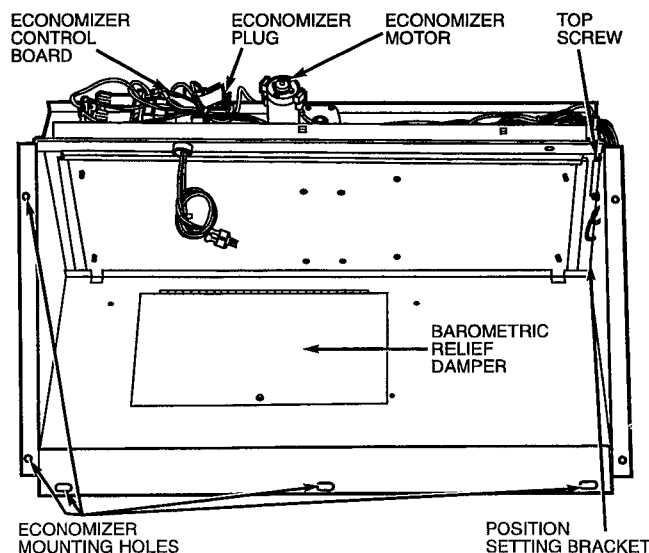


Fig. 13 — Durablade Economizer Installation

6. Insert economizer plug into economizer harness. Remove tape from barometric relief damper. See Fig. 13.
7. If ventilation air is not required, proceed to Step 8. If ventilation air is required, determine the minimum position setting for required airflow. See Fig. 15. Adjust minimum position setting by adjusting the screws on the position setting bracket. Slide bracket until the top screw is in the position determined by Fig. 15. Tighten screws. See Fig. 16.
8. Remove tape from outdoor-air thermostat (OAT). Fasten OAT to inside of hood using screws and speed clips provided. See Fig. 17. Make sure OAT terminals are positioned up.
9. Replace outdoor-air opening panel using screws from Step 2. Replace filter access panel. Ensure the filter access panel slides along the tracks and is securely engaged.
10. Fasten hood top and side plate assembly (Fig. 12) to outdoor-air opening panel with screws provided.
11. Place knob supplied with economizer on OAT. See Fig. 17. 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. 17.
12. Connect OAT per Fig. 18.
13. Slide outdoor-air inlet screen into screen track on hood side plate. While holding screen in place, fasten screen retainer to hood using screws provided.

NOTE: Refer to Fig. 19 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.

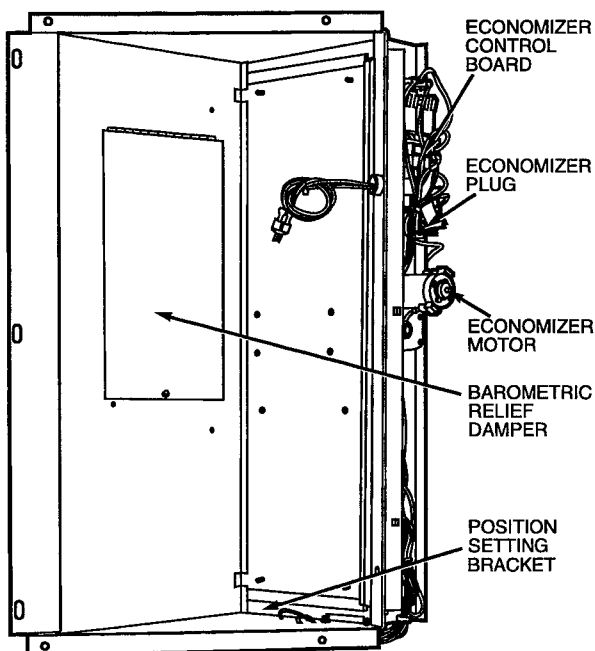
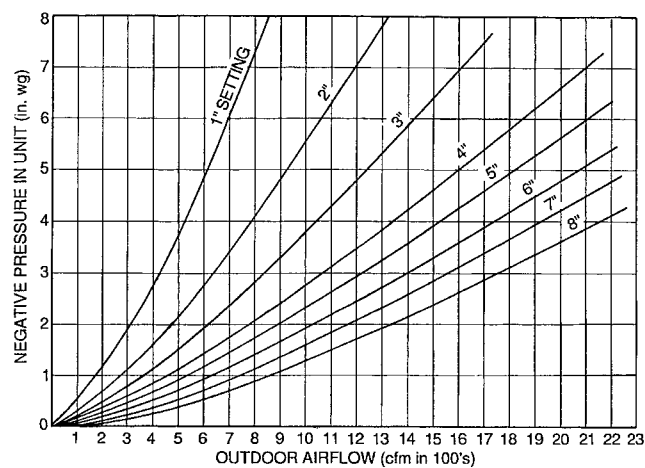


Fig. 14 — Horizontal Discharge Durablade Economizer Installation



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

Fig. 15 — Durablade Economizer Minimum Position Setting

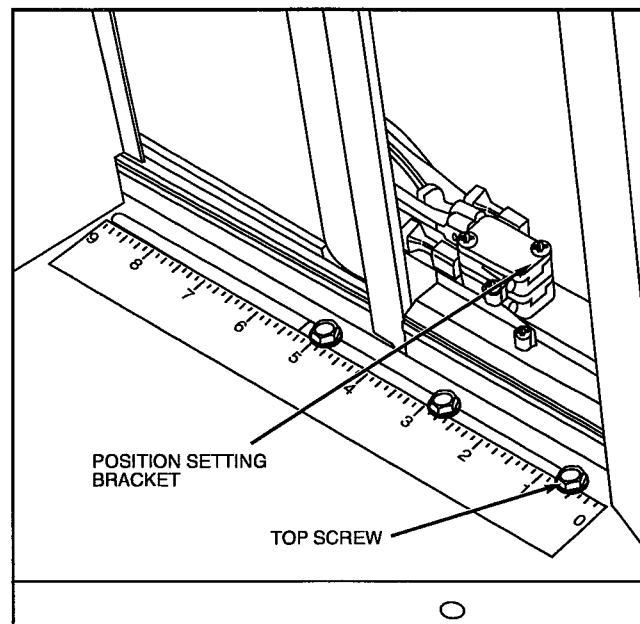


Fig. 16 — Minimum Position Setting Bracket

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 the minimum amount to be supplied by each unit and record quantity of ventilation air needed for use in Step 6.
2. Remove filter access panel by raising panel and swinging panel outward. Panel is not 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. Remove optional economizer so the outdoor-air damper hood package can be removed from the filter section.

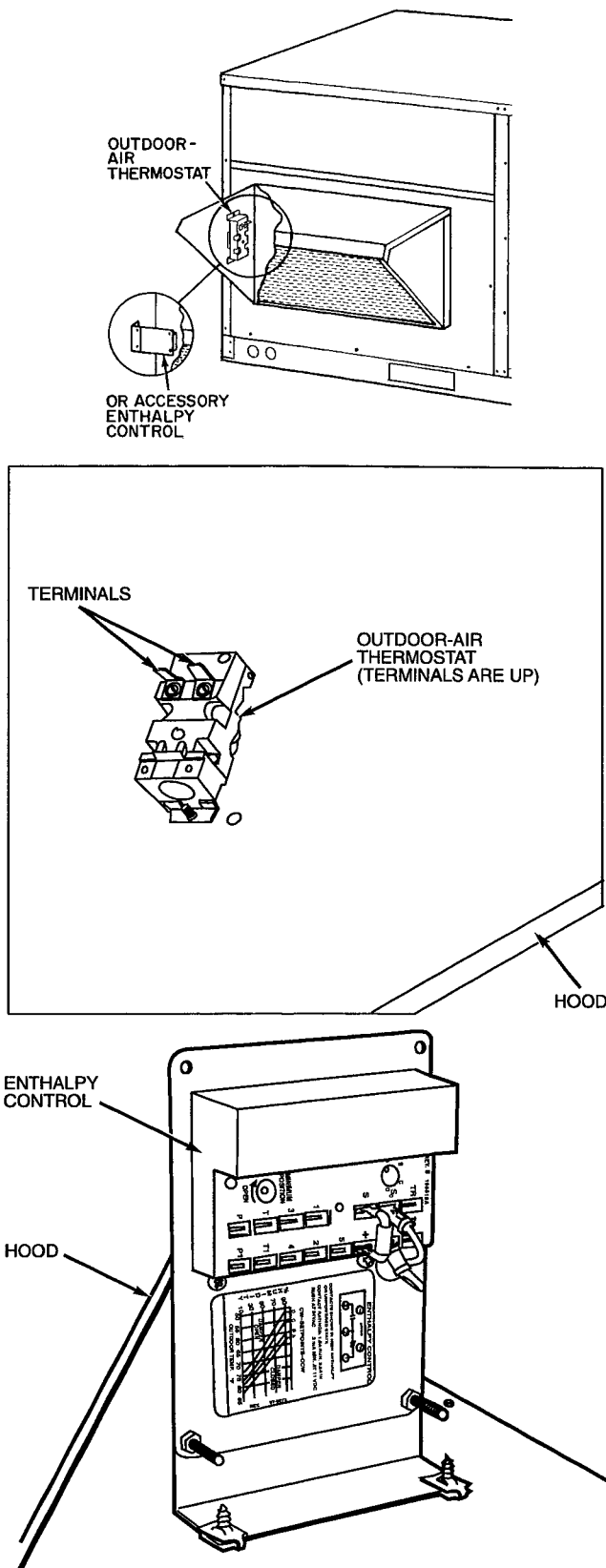
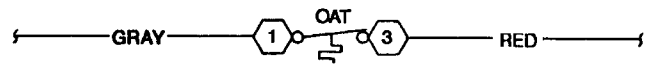


Fig. 17 — Outdoor-Air Thermostat/Enthalpy Control Installation



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

Fig. 18 — Wiring Connections for Outdoor-Air Thermostat

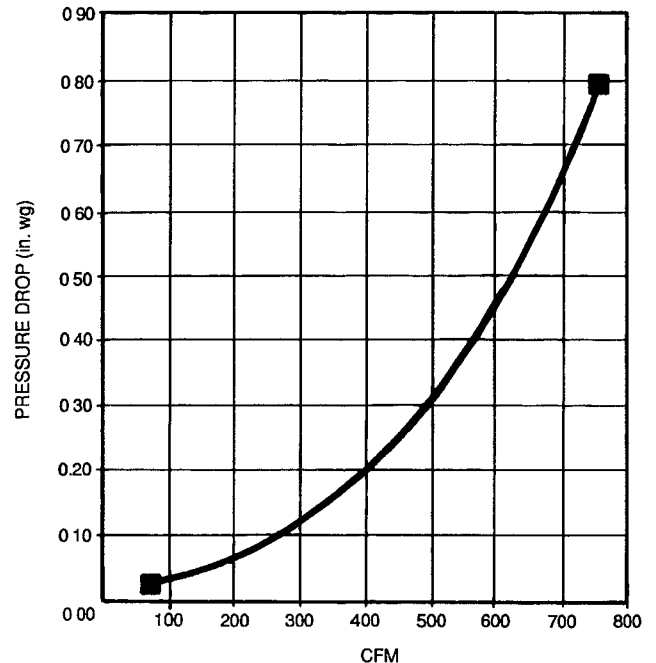


Fig. 19 — Durablade Economizer Barometric Relief Damper Characteristics

3. Assemble outdoor-air hood top and side plates as shown in Fig. 12. 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. Slide economizer into unit and secure with screws. See Fig. 20.

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

5. Insert economizer plug into economizer harness. Remove tape from barometric relief damper. See Fig. 20.
6. If ventilation air is not required, proceed to Step 7. 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 cfm, which will be the minimum airflow.

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:

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

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

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

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

7. Determine the enthalpy changeover set point from Fig. 21. 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. 21.
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. See Fig. 22.
9. Fasten hood top and side plate assembly (Fig. 23) to outdoor-air opening panel with screws provided.
10. 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. 24.

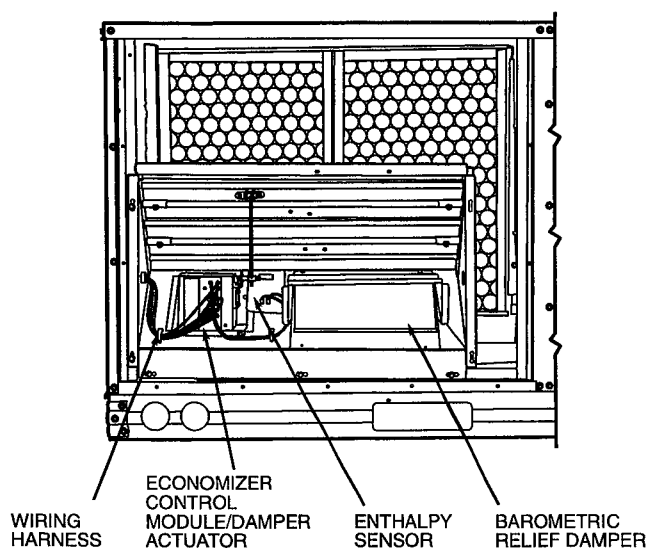


Fig. 20 — PARABLADE Economizer Installed in Unit

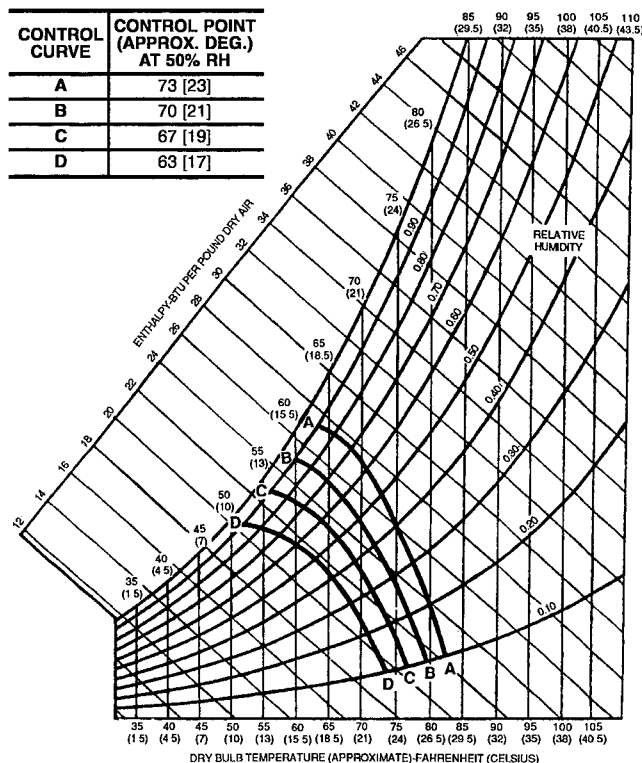


Fig. 21 — Enthalpy Settings for PARABLADE Economizer

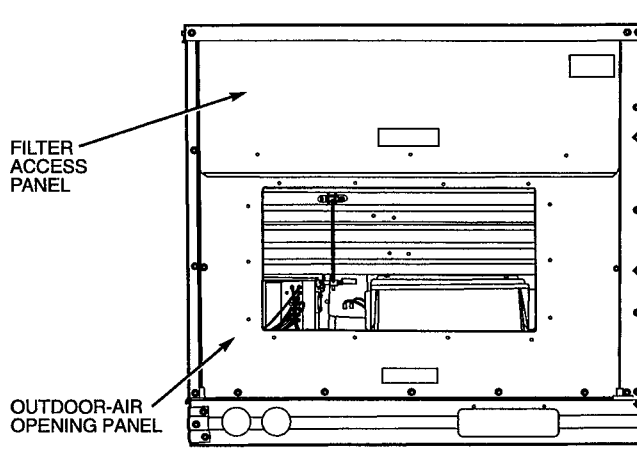


Fig. 22 — Panels Reinstalled On Unit

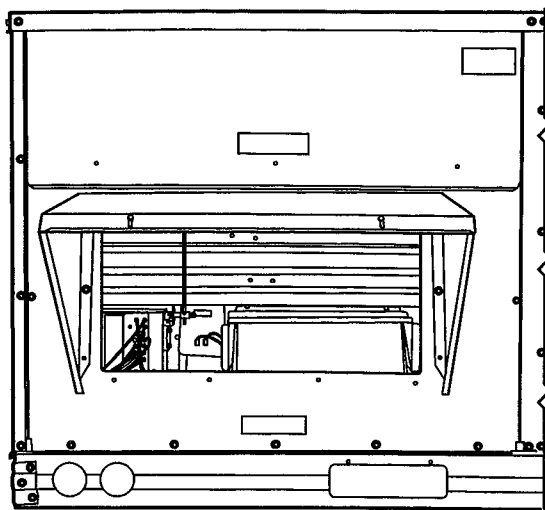


Fig. 23 — Outdoor-Air Hood Installed On Unit

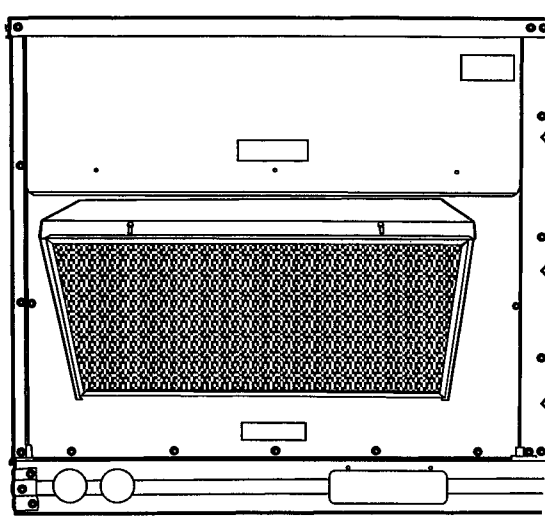


Fig. 24 — Filter Installed On Outdoor-Air Hood

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

Table 3 shows fan rpm at motor pulley settings for the 50TJQ004-007 units. Table 4 shows data for indoor-fan motors. Refer to Tables 5-18 to determine fan speed settings.

For units with electric heating, required minimum cfm is 900 for 50TJQ004; 1200 for 50TJQ005; 1500 for 50TJQ006 and 1800 for 50TJQ007.

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

To change fan speed:

1. Shut off unit power supply.
2. Loosen belt by loosening fan motor mounting nuts. See Fig. 25.
3. Loosen movable pulley flange setscrew (see Fig. 26).
4. Screw movable flange toward fixed flange to increase speed or away from fixed flange to decrease speed. Increasing fan speed increases load on motor. Do not exceed maximum speed specified in Table 1.
5. Set movable flange at nearest keyway of pulley hub and tighten setscrew. (See Table 1 for speed change for each full turn of pulley flange.)

To align fan and motor pulleys (see Fig. 26):

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 motor mounting nuts.
4. Adjust bolt and tighten nut to secure motor in fixed position.

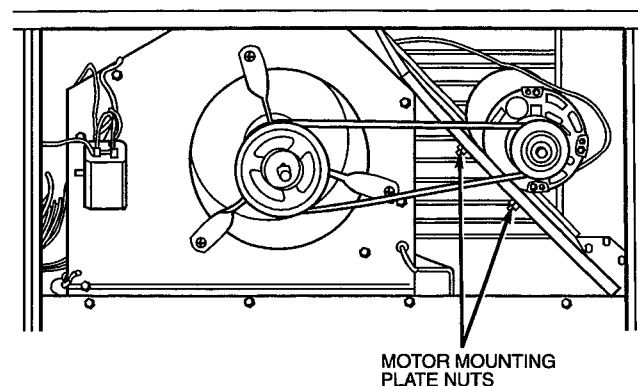


Fig. 25 — Belt Drive Motor Mounting

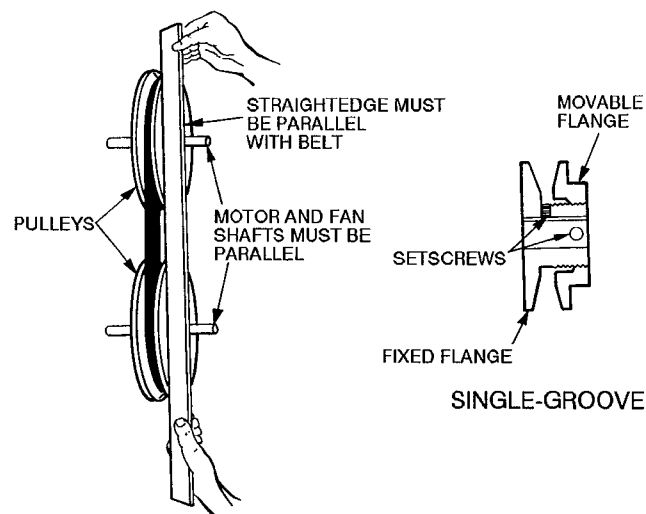


Fig. 26 — Indoor-Fan Pulley Adjustment

Table 3 — Fan Rpm at Motor Pulley Settings*

UNIT 50TJQ	MOTOR PULLEY TURNS OPEN										
	0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5
004†	1000	976	952	928	904	880	856	832	808	784	760
005†	1185	1150	1115	1080	1045	1010	975	940	905	870	835
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 standard motor and drive package.

†Indicates alternate motor and drive package.

Table 4 — Indoor-Fan Motor Performance

UNIT 50TJQ	INDOOR-FAN MOTOR	UNIT VOLTAGE	MAXIMUM ACCEPTABLE CONTINUOUS BHP*	MAXIMUM ACCEPTABLE OPERATING WATTS	MAXIMUM AMP DRAW
004	Standard	208/230	0.34	440	2.9
		460			1.4
		575			1.4
	Alternate	208/230	1.00	1000	5.4
		460			2.3
		575			2.3
005	Standard	208/230	0.75	850	3.5
		460			1.8
		575			1.8
	Alternate	208/230	1.00	1000	5.4
		460			2.3
		575			2.3
006	Standard	208/230	1.20	1340	5.9
		460			3.2
		575			3.2
	Alternate	208/230†	1.80	1921	8.9†
		208/230**			6.1**
		460			4.7
007	Standard	575	2.40	2120	4.7
		208/230			6.1
		460			2.7
		575			2.7

LEGEND

Bhp — Brake Horsepower

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

†Single-phase motor.

**Three-phase motor.

Table 5 — Fan Performance — 50TJQ004 — Vertical Discharge Units (Standard Direct Drive Motor)

STANDARD MOTOR (DIRECT DRIVE)												
Airflow (Cfm)	Low Speed						High Speed					
	208 v			230, 460, 575 v			208 v			230, 460, 575 v		
	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts
900	0.67	0.21	253	0.68	0.23	277	0.69	0.26	307	0.69	0.31	363
1000	0.60	0.23	270	0.61	0.25	292	0.61	0.27	321	0.63	0.32	374
1100	0.55	0.24	287	0.56	0.26	307	0.57	0.28	335	0.58	0.33	385
1200	0.51	0.26	304	0.51	0.27	323	0.52	0.29	349	0.53	0.34	397
1300	0.45	0.27	321	0.46	0.29	338	0.46	0.31	364	0.47	0.34	408
1400	0.38	0.29	338	0.41	0.30	354	0.43	0.32	378	—	—	—
1500	0.34	0.30	355	0.36	0.31	369	0.38	0.33	392	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in wg)
Watts — Input Watts to Motor

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.

- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.

Table 6 — Fan Performance — 50TJQ004 — Vertical Discharge Units (Alternate Belt Drive Motor)

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

ALTERNATE MOTOR (BELT DRIVE) (cont)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

NOTES:

- Boldface** indicates a field-supplied drive is required. (See Note 6.)
- 1105** indicates field-supplied motor and drive are required
- Maximum usable watts input is 1000 and maximum continuous bhp is 1.00. 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.

- 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: 760 to 1000 rpm. All other rpms require field-supplied drive.
- Interpolation is permissible. Do not extrapolate.

Table 7 — Fan Performance — 50TJQ005 — Vertical Discharge Units (Standard Direct Drive Motor)

STANDARD MOTOR (DIRECT DRIVE)												
Airflow (Cfm)	Low Speed						High Speed					
	208 v			230, 460, 575 v			208 v			230, 460, 575 v		
	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts
1200	0.93	0.41	458	0.94	0.45	506	0.94	0.51	572	0.99	0.56	632
1300	0.86	0.42	471	0.87	0.46	521	0.87	0.52	589	0.92	0.58	651
1400	0.78	0.45	503	0.79	0.49	556	0.79	0.54	616	0.87	0.60	681
1500	0.70	0.47	536	0.73	0.52	593	0.73	0.56	631	0.80	0.62	698
1600	0.61	0.49	557	0.64	0.54	616	0.66	0.58	654	0.76	0.64	723
1700	0.51	0.52	584	0.54	0.57	646	0.58	0.60	678	0.68	0.66	750
1800	0.40	0.54	610	0.44	0.60	674	0.51	0.62	698	0.63	0.68	772
1900	0.29	0.56	629	0.37	0.62	696	0.46	0.64	720	0.56	0.70	796
2000	0.25	0.58	651	0.30	0.64	720	0.39	0.66	744	0.50	0.73	823

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)
Watts — Input Watts to Motor

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.

3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify

Table 8 — Fan Performance — 50TJQ005 — Vertical Discharge Units (Alternate Belt Drive Motor)

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

ALTERNATE MOTOR (BELT DRIVE) (cont)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

NOTES

1. **Boldface** indicates a field-supplied drive is required. (See Note 6.)
2. **Shaded** indicates field-supplied motor and drive are required
3. Maximum usable watts input is 1000 and maximum continuous bhp is 1.00. 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.

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: 835 to 1185 rpm. All other rpms require field-supplied drive
7. Interpolation is permissible. Do not extrapolate

Table 9 — Fan Performance — 50TJQ006 — Vertical Discharge Units (Standard Direct Drive Motor)

STANDARD MOTOR (DIRECT DRIVE)																		
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	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts
1500	0.88	0.67	750	1.20	0.71	791	1.19	0.70	782	1.36	0.76	845	1.38	0.79	875	1.44	0.85	949
1600	0.68	0.70	780	1.04	0.74	824	1.04	0.74	821	1.22	0.79	883	1.25	0.82	913	1.33	0.89	988
1700	0.51	0.73	810	0.89	0.77	857	0.89	0.77	861	1.09	0.83	921	1.13	0.85	950	1.22	0.92	1027
1800	0.35	0.75	839	0.73	0.80	891	0.74	0.81	900	0.96	0.86	959	1.00	0.89	988	1.11	0.96	1066
1900	0.26	0.78	873	0.58	0.83	924	0.59	0.84	940	0.86	0.90	997	0.88	0.92	1025	1.00	0.99	1105
2000	0.18	0.81	905	0.42	0.86	957	0.44	0.88	979	0.73	0.93	1035	0.78	0.95	1063	0.92	1.03	1144
2100	0.08	0.84	940	0.27	0.89	990	0.29	0.91	1018	0.59	0.96	1073	0.63	0.99	1101	0.81	1.06	1183
2200	—	—	—	0.19	0.92	1023	0.19	0.93	1035	0.46	1.00	1111	0.49	1.02	1138	0.69	1.10	1222
2300	—	—	—	0.11	0.95	1056	0.11	0.97	1076	0.34	1.03	1149	0.41	1.06	1176	0.59	1.13	1261
2400	—	—	—	0.03	0.98	1096	0.04	1.00	1113	0.19	1.07	1187	0.22	1.09	1213	0.43	1.17	1300
2500	—	—	—	—	—	—	—	—	—	0.09	1.10	1225	0.12	1.12	1251	0.34	1.20	1340

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)
Watts — Input Watts to Motor

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.

3 Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify

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

Table 10 — Fan Performance — 50TJQ006 — Vertical Discharge Units (Alternate Belt Drive Motor)

ALTERNATE MOTOR (BELT DRIVE)															
Airflow (Cfm)	External Static Pressure (in. wg)														
	0.1			0.2			0.4			0.6			0.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	730	0.34	347	789	0.40	409	896	0.53	542	990	0.67	685	1072	0.83	848
1600	770	0.40	409	826	0.46	470	931	0.61	623	1020	0.75	766	1101	0.91	930
1700	811	0.47	480	865	0.54	552	966	0.69	705	1051	0.84	858	1133	1.01	1032
1800	852	0.55	562	905	0.62	634	1002	0.78	797	1084	0.93	950	1163	1.10	1124
1900	894	0.54	552	945	0.72	736	1037	0.88	899	1119	1.04	1063	1194	1.21	1237
2000	936	0.74	756	984	0.82	838	1072	0.98	1001	1154	1.16	1185	1226	1.33	1359
2100	978	0.85	869	1024	0.93	950	1108	1.10	1124	1192	1.29	1318	1259	1.47	1502
2200	1021	0.97	991	1064	1.05	1073	1145	1.22	1247	1225	1.43	1461	1294	1.62	1656
2300	1064	1.10	1124	1104	1.18	1206	1183	1.36	1390	1260	1.57	1604	1330	1.78	1819
2400	1107	1.24	1267	1145	1.32	1349	1222	1.45	1482	1296	1.73	1768	1365	1.94	1983
2500	1150	1.39	1420	1186	1.48	1512	1262	1.68	1717	1331	1.80	1921	1400	2.12	2166

ALTERNATE MOTOR (BELT DRIVE) (cont)

Airflow (Cfm)	External Static Pressure (in. wg)														
	1.0			1.2			1.4			1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1153	1.00	1022	1221	1.17	1196	1256	1.30	1328	1280	1.32	1349	1320	1.22	1400
1600	1178	1.09	1114	1252	1.27	1298	1311	1.45	1482	1340	1.58	1615	1380	1.61	1645
1700	1205	1.18	1206	1278	1.37	1400	1345	1.57	1604	1397	1.76	1799	1424	1.89	1931
1800	1235	1.29	1318	1303	1.48	1512	1371	1.69	1727	1433	1.90	1942	1480	2.09	2136
1900	1266	1.40	1431	1330	1.59	1625	1396	1.80	1850	1460	2.03	2074	1517	2.25	2299
2000	1297	1.53	1564	1362	1.73	1768	1422	1.94	1983	1485	2.16	2207	1544	2.40	2453
2100	1327	1.66	1696	1393	1.80	1911	1452	2.08	2126	1510	2.31	2361	1569	2.55	2606
2200	1359	1.80	1850	1423	2.02	2064	1483	2.24	2289	1538	2.46	2514	1595	2.71	2769
2300	1392	1.97	2013	1454	2.18	2228	1515	2.41	2463	1569	2.64	2698	1622	2.88	2943
2400	1426	2.15	2197	1485	2.36	2412	1544	2.59	2647	1601	2.84	2902	1652	3.07	3137
2500	1461	2.34	2391	1518	2.55	2606	1575	2.78	2841	1631	3.03	3096	1684	3.28	3352

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

NOTES:

1. **Boldface** indicates a field-supplied drive is required (See Note 6)
2. **Shaded** indicates field-supplied motor and drive are required
3. Maximum usable watts input is 1921 and maximum continuous bhp is 1.80. 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.

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. Interpolation is permissible. Do not extrapolate.

Table 11 — Fan Performance — 50TJQ007 — Vertical Discharge Units (Standard Belt Drive Motor)

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

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

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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 and maximum continuous bhp is 2.40. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with

confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.

- 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.
- Standard motor drive range: 1070 to 1460 rpm. All other rpms require field-supplied drive.
- Interpolation is permissible. Do not extrapolate.

Table 12 — Fan Performance — 50TJQ004 — Horizontal Discharge Units (Standard Direct Drive Motor)

STANDARD MOTOR (DIRECT DRIVE)												
Airflow (Cfm)	Low Speed						High Speed					
	208 v			230, 460, 575 v			208 v			230, 460, 575 v		
	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts
900	0.72	0.21	253	0.75	0.23	277	0.73	0.26	307	0.76	0.31	363
1000	0.67	0.23	270	0.69	0.25	292	0.70	0.27	321	0.71	0.32	374
1100	0.61	0.24	287	0.63	0.26	307	0.64	0.28	335	0.65	0.33	385
1200	0.57	0.26	304	0.58	0.27	323	0.56	0.29	349	0.59	0.34	397
1300	0.51	0.27	321	0.53	0.29	338	0.53	0.31	364	0.54	0.34	408
1400	0.44	0.29	338	0.46	0.30	354	0.47	0.32	378	—	—	—
1500	0.39	0.30	355	0.41	0.31	369	0.43	0.33	392	—	—	—

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)
Watts — Input Watts to Motor

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.

3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.

Table 13 — Fan Performance — 50TJQ004 — Horizontal Discharge Units (Alternate Belt Drive Motor)

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

ALTERNATE MOTOR (BELT DRIVE) (cont)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

NOTES

1. **Boldface** indicates a field-supplied drive is required (See Note 4.)
2. Maximum usable watts input is 1000 and maximum continuous bhp is 1.00. 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.

3. Values include losses for filters, unit casing, and wet coils.
4. Alternate motor drive range. 760 to 1000 rpm. All other rpms require field-supplied drive.
5. Interpolation is permissible. Do not extrapolate.
6. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.

Table 14 — Fan Performance — 50TJQ005 — Horizontal Discharge Units (Standard Direct Drive Motor)

STANDARD MOTOR (DIRECT DRIVE)												
Airflow (Cfm)	Low Speed						High Speed					
	208 v			230, 460, 575 v			208 v			230, 460, 575 v		
	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts
1200	0.93	0.41	458	0.97	0.45	506	1.04	0.51	572	1.09	0.56	632
1300	0.86	0.42	471	0.90	0.46	521	0.96	0.52	589	1.02	0.58	651
1400	0.78	0.45	503	0.84	0.49	556	0.90	0.54	616	0.96	0.60	681
1500	0.73	0.47	536	0.76	0.52	593	0.83	0.56	631	0.89	0.62	698
1600	0.67	0.49	557	0.70	0.54	616	0.75	0.58	654	0.82	0.64	723
1700	0.60	0.52	584	0.63	0.57	646	0.67	0.60	678	0.74	0.66	750
1800	0.51	0.54	610	0.54	0.60	674	0.62	0.62	698	0.69	0.68	772
1900	0.40	0.56	629	0.45	0.62	696	0.54	0.64	720	0.62	0.70	796
2000	0.32	0.58	661	0.33	0.65	731	0.47	0.66	744	0.54	0.73	823

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)
Watts — Input Watts to Motor

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.

- Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.

Table 15 — Fan Performance — 50TJQ005 — Horizontal Discharge Units (Alternate Belt Drive Motor)

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

ALTERNATE MOTOR (BELT DRIVE) (cont)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

NOTES:

- Boldface** indicates a field-supplied drive is required (See Note 6)
- Shaded** indicates field-supplied motor and drive are required
- Maximum usable watts input is 1000 and maximum continuous bhp is 1.00. 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.

- 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: 835 to 1185 rpm. All other rpms require field-supplied drive
- Interpolation is permissible. Do not extrapolate.

Table 16 — Fan Performance — 50TJQ006 — Horizontal Discharge Units (Standard Direct Drive Motor)

STANDARD MOTOR (DIRECT DRIVE)																		
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	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts
1500	1.01	0.67	750	1.25	0.71	791	1.26	0.70	782	1.46	0.76	845	1.46	0.79	875	1.52	0.85	949
1600	0.82	0.70	780	1.09	0.74	824	1.11	0.74	821	1.32	0.79	883	1.33	0.82	913	1.41	0.89	988
1700	0.64	0.73	810	0.97	0.77	857	0.99	0.77	861	1.22	0.83	921	1.24	0.85	950	1.33	0.92	1027
1800	0.44	0.75	839	0.81	0.80	891	0.84	0.80	900	1.09	0.86	959	1.11	0.89	988	1.22	0.96	1066
1900	0.32	0.78	869	0.66	0.83	924	0.69	0.83	940	0.96	0.90	997	0.99	0.92	1025	1.11	0.99	1105
2000	0.21	0.81	899	0.47	0.86	957	0.51	0.86	979	0.80	0.93	1035	0.83	0.95	1063	0.97	1.03	1144
2100	0.13	0.83	929	0.32	0.89	990	0.36	0.89	1018	0.64	0.96	1073	0.71	0.99	1101	0.86	1.06	1183
2200	0.05	0.86	959	0.19	0.92	1023	0.21	0.92	1058	0.50	1.00	1111	0.58	1.02	1138	0.75	1.10	1222
2300	—	—	—	0.08	0.95	1057	0.08	0.95	1097	0.34	1.03	1149	0.39	1.06	1176	0.57	1.13	1261
2400	—	—	—	—	—	—	—	—	—	0.24	1.07	1187	0.29	1.09	1213	0.49	1.17	1300
2500	—	—	—	—	—	—	—	—	—	0.15	1.10	1225	0.15	1.12	1251	0.34	1.20	1340

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)
Watts — Input Watts to Motor

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.

3 Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.

NOTES:

1. Values include losses for filters, unit casing, and wet coils.
2. Extensive motor and electrical testing on these units ensures that

Table 17 — Fan Performance — 50TJQ006 — Horizontal Discharge Units (Alternate Belt Drive Motor)

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

ALTERNATE MOTOR (BELT DRIVE) (cont)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

NOTES:

1. **Boldface** indicates a field-supplied drive is required (See Note 6)
2. **Shaded** indicates field-supplied motor and drive are required
3. Maximum usable watts input is 1921 and maximum continuous bhp is 1.80. 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.

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. Interpolation is permissible. Do not extrapolate.

Table 18 — Fan Performance — 50TJQ007 — Horizontal Discharge Units (Standard Belt Drive Motor)

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

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

LEGEND

Bhp — Brake Horsepower Input to Fan
Watts — Input Watts to Motor

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 and maximum continuous bhp is 2.40. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with

confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected

- 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 Interpolation is permissible. Do not extrapolate.

PRE-START-UP

⚠ WARNING

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

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

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

1. Remove all access panels.
2. Read and follow instructions on all **WARNING**, **CAUTION**, and **INFORMATION** labels attached to (or shipped with) unit.
3. Make the following inspections:
 - a. Inspect for shipping and handling damages such as broken lines, loose parts, or disconnected wires.
 - b. Inspect for oil at all refrigerant tubing connections and on unit base. Detecting oil generally indicates a refrigerant leak. Leak-test all refrigerant tubing connections using electronic leak detector, halide torch, or liquid-soap solution.
 - c. Inspect all field- and factory-wiring connections. Be sure that connections are completed and tight.
 - d. Inspect coil fins. If damaged during shipping and handling, carefully straighten fins with a fin comb.
4. Verify the following conditions:
 - a. Make sure that outdoor-fan blades are correctly positioned in fan orifice. Refer to Outdoor-Fan Adjustment section on page 30 for more details.
 - b. Make sure that air filter(s) is in place.
 - c. Make sure that condensate drain trap is filled with water to ensure proper drainage.
 - d. Make sure that all tools and miscellaneous loose parts have been removed.

START-UP

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

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

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

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

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

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

Compressor Rotation — On 3-phase (size 006 and 007) units it is important to be certain compressor is rotating in the proper direction. To determine whether or not compressor is rotating in the proper direction:

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

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

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

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

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

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

Check cooling effects at a setting below room temperature. Check unit charge. Refer to Refrigerant Charge section on page 30.

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.

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

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

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

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

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

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

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

Operating Sequence

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

HEATING, UNITS WITHOUT ECONOMIZER — Upon a call for heating through terminal W1, IFC, OFC, and compressor are energized. On units equipped for 2 stages of heat, when additional heat is needed HC is energized through W2.

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 fan motor. The indoor 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 fully 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 fully closed position.

COOLING, UNITS WITH DURABLADE 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 fan motor (OFM). The indoor fan motor (IFM) is energized and the economizer damper moves to the minimum position. After the thermostat is satisfied, the indoor 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 2 stages of cooling. Compressor and the outdoor fan will be energized and the position of the economizer damper will be determined by the supply-air temperature. When the second stage of cooling is satisfied, the compressor and OFM will be deenergized. The damper position will be determined by the supply-air temperature. When the first stage of cooling is satisfied, 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.

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 accessory two-position damper is used, the outdoor-air damper opens to the minimum position whenever the evaporator fan runs. If unit is equipped with 2 stages of heat, when additional heat is needed a call is made through W2.

As space temperature approaches the heating temperature set point, heating stages cycle off. Economizer or two-position damper returns to fully closed position.

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

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

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

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

SERVICE

⚠ 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 and as operating conditions require.

INDOOR COIL

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

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

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

2-Row Coils — Clean coil as follows:

1. Turn off unit power.
2. Remove top panel screws on outdoor end of unit.
3. Remove outdoor coil corner post. See Fig. 27. To hold top panel open, place coil corner post between top panel and center post. See Fig. 28.
4. Remove device holding coil sections together at return end of outdoor coil. Carefully separate the outer coil section 3 to 4 in. from the inner coil section. See Fig. 29.
5. Use a water hose or other suitable equipment to flush down between the 2 coil sections to remove dirt and debris. Clean the outer surfaces with a stiff brush in the normal manner.
6. Secure the sections together. Reposition the outer coil section, and remove the coil corner post from between the top panel and center post. Install the coil corner and center posts, and replace all screws.

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

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

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

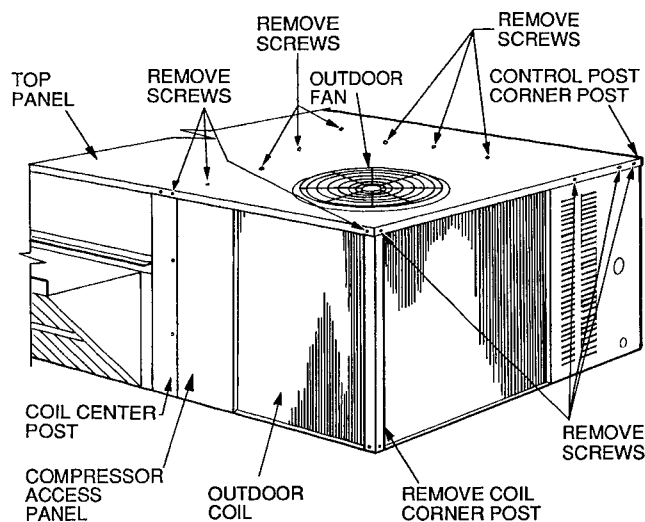


Fig. 27 — Cleaning Outdoor Coil

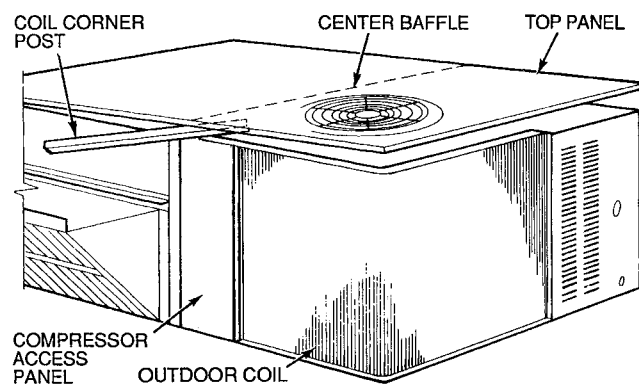


Fig. 28 — Propping Up Top Panel

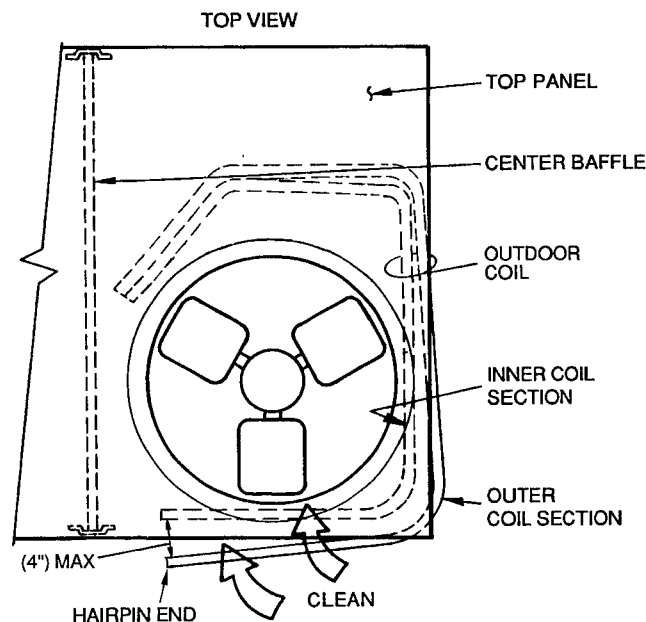


Fig. 29 — Separating Coil Sections

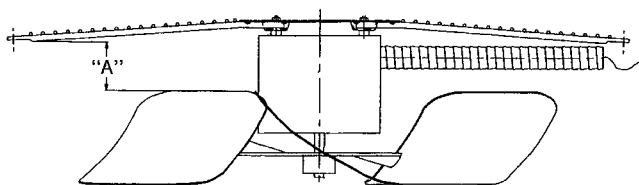
Lubrication

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

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

Outdoor-Fan Adjustment (Fig. 30)

1. Shut off unit power supply.
2. Remove outdoor-fan assembly (grille, motor, motor cover, and fan) by removing screws and flipping assembly onto unit top cover.
3. Loosen fan hub setscrews.
4. Adjust fan height as shown in Fig. 30.
5. Tighten setscrews.
6. Replace outdoor-fan assembly.



UNIT 50TJQ	FAN HEIGHT — "A" (in.)
004-006 AND 007 (208/230 v)	2 75
007 (460 v and 575 v)	3 50

Fig. 30 — Outdoor-Fan Adjustment

Economizer Adjustment — Refer to Optional Economizer sections on pages 13 and 14.

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

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

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

LOW CHARGE COOLING — Use Cooling Charging Charts, Fig. 31-34. Vary refrigerant until the conditions of the charts are met. Note that the charging charts are different from type normally used. Charts are based on charging the units to the correct superheat for the various operating conditions. Accurate pressure gage and temperature sensing device are required. Connect the pressure gage to the service port on the suction line. Mount the temperature sensing device on the suction line and insulate it so that outdoor ambient temperature does not affect the reading. Indoor-air cfm must be within the normal operating range of the unit.

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

Example: (Fig. 31)

Outdoor Temperature 85 F
Suction Pressure 74 psig
Suction Temperature should be 70 F
(Suction Temperature may vary $\pm 5^{\circ}$ F.)

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

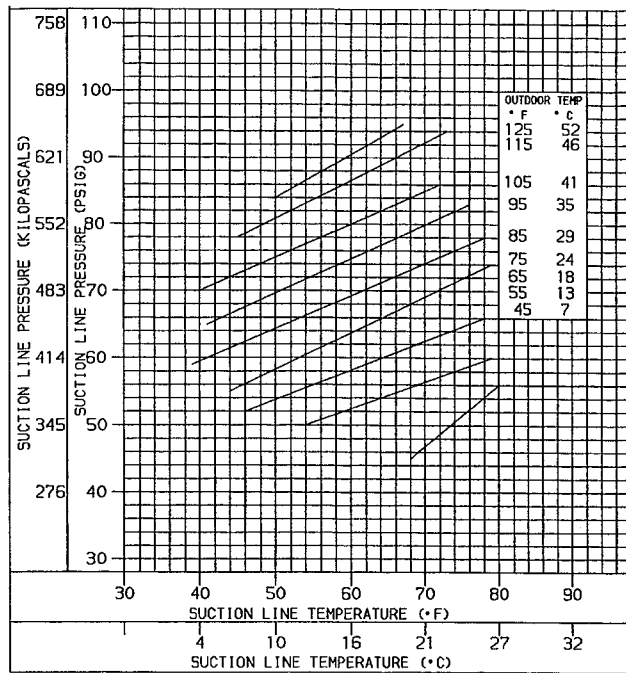


Fig. 31 — Cooling Charging Chart — 50TJQ004

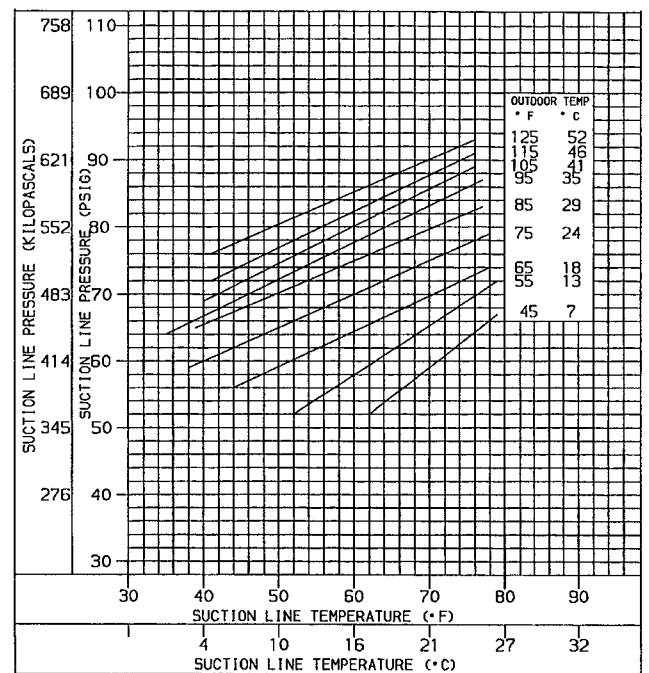


Fig. 33 — Cooling Charging Chart — 50TJQ006

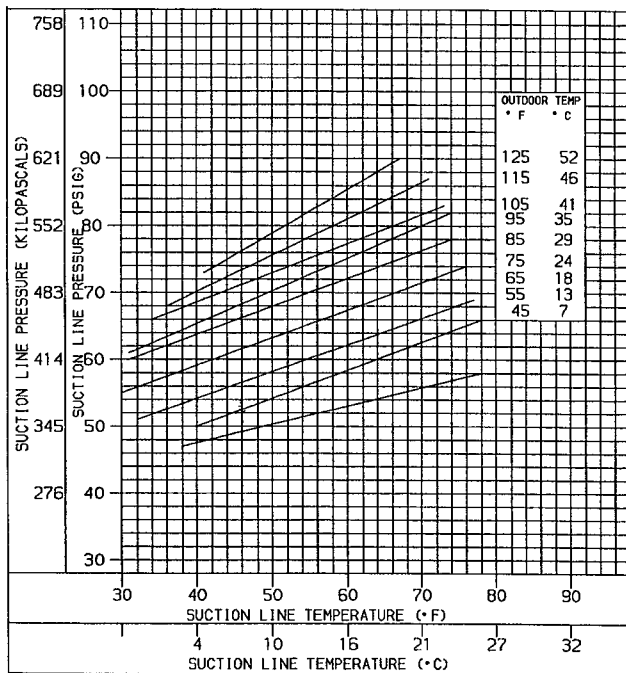


Fig. 32 — Cooling Charging Chart — 50TJQ005

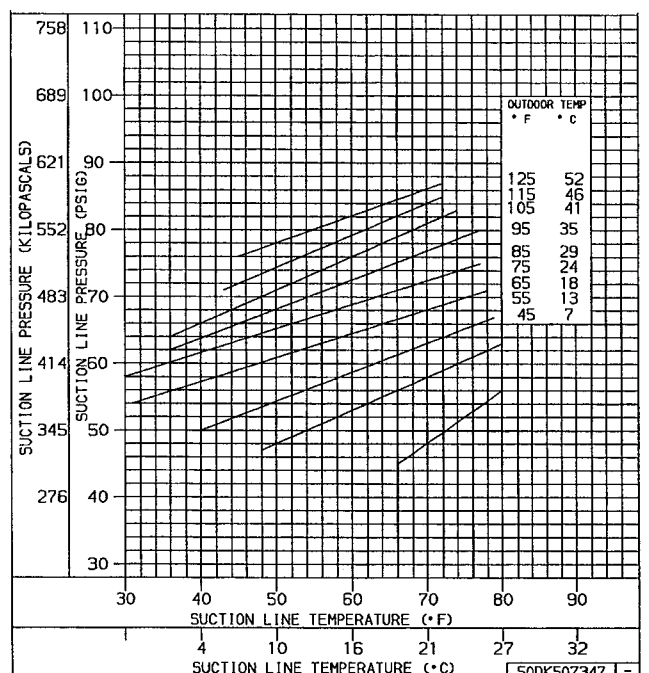


Fig. 34 — Cooling Charging Chart — 50TJQ007

TROUBLESHOOTING

Table 19 — Heating and Cooling Troubleshooting

PROBLEM	CAUSE	REMEDY
Compressor and outdoor fan will not start.	Power failure	Call power company.
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Defective thermostat, contactor, transformer, control relay, or capacitor.	Replace component
	Insufficient line voltage.	Determine cause and correct.
	Incorrect or faulty wiring.	Check wiring diagram and rewire correctly
	Thermostat setting too high.	Lower thermostat setting below room temperature.
	High pressure switch tripped.	See problem "Excessive head pressure."
	Low pressure switch tripped.	Check system for leaks. Repair as necessary.
	Freeze-up protection thermostat tripped.	See problem "Suction pressure too low."
Compressor will not start but outdoor fan runs.	Faulty wiring or loose connections in compressor circuit.	Check wiring and repair or replace
	Compressor motor burned out, seized, or internal overload open.	Determine cause Replace compressor.
	Defective run/start capacitor, overload, start relay.	Determine cause and replace
	One leg of 3-phase power dead.	Replace fuse or reset circuit breaker. Determine cause.
Compressor cycles (other than normally satisfying thermostat).	Refrigerant overcharge or undercharge.	Recover refrigerant, evacuate system, and recharge to nameplate.
	Defective compressor	Replace and determine cause.
	Insufficient line voltage.	Determine cause and correct.
	Blocked outdoor coil or dirty air filter.	Determine cause and correct.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace
	Defective thermostat.	Replace thermostat.
	Faulty outdoor-fan (cooling) or indoor-fan (heating) motor or capacitor.	Replace
	Restriction in refrigerant system.	Locate restriction and remove.
Compressor operates continuously.	Dirty air filter.	Replace filter.
	Unit undersized for load.	Decrease load or increase unit size.
	Thermostat set too low	Reset thermostat
	Low refrigerant charge.	Locate leak; repair and recharge.
	Leaking valves in compressor.	Replace compressor.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Outdoor coil dirty or restricted.	Clean coil or remove restriction.
Compressor makes excessive noise. (Sizes 006 and 007 only)	Compressor rotating in the wrong direction.	Reverse the 3-phase power leads as described in Start-Up, page 27
Excessive head pressure.	Dirty air filter.	Replace filter.
	Dirty outdoor coil.	Clean coil.
	Refrigerant overcharged.	Recover excess refrigerant.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condensing air restricted or air short-cycling.	Determine cause and correct.
Head pressure too low.	Low refrigerant charge.	Check for leaks, repair and recharge.
	Compressor valves leaking.	Replace compressor.
	Restriction in liquid tube.	Remove restriction.
Excessive suction pressure.	High heat load.	Check for source and eliminate.
	Compressor valves leaking.	Replace compressor.
	Refrigerant overcharged.	Recover excess refrigerant.
Suction pressure too low.	Dirty air filter (cooling) or dirty outdoor coil (heating).	Replace filter
	Low refrigerant charge.	Check for leaks; repair and recharge.
	Metering device or low side restricted.	Remove source of restriction.
	Insufficient indoor airflow (cooling mode).	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
	Field-installed filter drier restricted.	Replace.
	Outdoor ambient below 25 F.	Install low-ambient kit.

Table 20 — Durablade Economizer Troubleshooting

PROBLEM	CAUSE	REMEDY
Damper does not open.	Indoor fan is off	1. Check to ensure that 24 vac is present at terminal C1 on the IFC or that 24 vac is present at the IFO terminal. Check whether 24 vac is present at PL6-1 (red wire) and/or PL6-3 (black wire). If 24 vac is not present, check wiring (see unit label diagram) 2. Check proper thermostat connection to G on the connection board.
	No power to economizer motor	1. Check that SW3 is 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 fan and economizer motor are energized, verify that there is a minimum of 18 vdc at the positive motor terminal. If the motor is not operating, replace the motor.
Economizer operation limited to minimum position.	OAT or EC set too high	1. Set at correct temperature (3 F below indoor space temperature). 2. Check OAT or EC by setting above outdoor temperature or humidity level. If the OAT or EC switches do not close, replace OAT or EC.
	Economizer control board incorrectly wired or not functioning.	1. Perform the following tests when OAT or EC is closed. Y1 is called for, and damper is at minimum position. Confirm 24 vac on gray terminal of the economizer control board (gray wire). If 24 vac is not present, check wiring (see unit label diagram). 2. Verify that SW1 and SW3 are wired correctly and working properly (see unit label diagram). 3. Check to ensure that 24 vac exists at PL6-2 (blue wire). If 24 vac is not present, check wiring (see unit wiring label diagram). 4. Check 24 vac output at PL6-10 (white wire). If 24 vac is not present, replace economizer control board.
	Incorrect SAT wiring or inoperative SAT	1. After verifying that the OAT and EC settings and the economizer control board wiring are correct, check to ensure that the 24 vac terminal of the SAT has 24 vac (white wire). If OAT, EC, and control board are functioning and wired properly and no 24 vac exists, check wiring (see unit label diagram). 2. If supply-air temperature is greater than 57 F, 24 vac should be found at terminal T2 on the SAT (pink wire). If 24 vac is not present, replace SAT.
Damper does not close.	Incorrect economizer wiring	1. Verify that SW2 and SW4 are wired and working properly (see unit label diagram). 2. Check diode D19. If diode is not functioning properly, replace D19.
	Incorrect damper actuator wiring or inoperative economizer circuit board.	1. After verifying that the wiring is correct, modulate the damper to the minimum position. Remove the calls for G. 2. If the damper does not move, check for 24 vac at PL6-1 (red wire). If 24 vac is not present, check wiring (see unit label diagram). 3. If damper still does not move, check for 24 vac at blue terminal of economizer control board (blue wire). If 24 vac is not present, replace the economizer circuit board.
	Incorrect SAT wiring or inoperative SAT.	1. After verifying that the wiring is correct and the economizer control board is functioning properly, place the OAT or EC switch in the closed position. Place a call for Y1 and open the damper to the fully open position. Confirm that the 24 vac terminal of the SAT has 24 vac (white wire). If 24 vac is not present, check wiring (see unit label diagram). 2. If supply-air temperature is less than 52 F, 24 vac should be found at terminal T1 on the SAT (violet wire). If 24 vac not found, replace SAT.
	Economizer motor failure.	If economizer control board and SAT are functioning properly, verify that there is a minimum of 18 vdc at the positive motor terminal. If a minimum of 18 vdc is present and the motor is still not operating, replace the motor.
Economizer damper does not close on power loss.	Insufficient battery power, inoperative economizer control board	1. Check voltage potential across batteries. If lower than 14 vdc, replace close-on-power-loss power supply (9-v alkaline batteries). Check this emergency power supply on a regular basis or whenever the filters are changed. 2. If the close-on-power-loss and economizer control board are functioning properly, check for 14 vdc or higher at the blue terminal of the economizer control board (blue wire) when power is disconnected from unit. If 14 vdc is not present, replace the control board.

LEGEND

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

Table 21 — PARABLADE Economizer Troubleshooting

PROBLEM	CAUSE	REMEDY
Damper does not open.	Indoor 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 +. 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 towards 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 towards 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 towards 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 towards open. If this does not happen, replace the economizer control module.
	Return spring 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.

For a free Service Training Material Catalog (STM), call 1-800-962-9212. Ordering instructions are included.

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

I. PRELIMINARY INFORMATION

MODEL NO.: _____

SERIAL NO.: _____

DATE: _____

TECHNICIAN: _____

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

- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTALLATION INSTRUCTIONS
- ☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS
- ☐ CHECK THAT INDOOR AIR FILTER IS CLEAN AND IN PLACE
- ☐ VERIFY THAT UNIT INSTALLATION IS LEVEL
- ☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS
- ☐ CHECK PULLEY ALIGNMENT AND BELT TENSION PER INSTALLATION INSTRUCTIONS
(Size 007 Standard Motor and Sizes 004-006 Alternate Motor and Drives)

III. START-UP

ELECTRICAL

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

TEMPERATURES

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

PRESSURES

REFRIGERANT SUCTION	_____	PSIG
REFRIGERANT DISCHARGE	_____	PSIG

- ☐ VERIFY THAT 3-PHASE SCROLL COMPRESSOR IS ROTATING IN CORRECT DIRECTION
(Size 007 3-Phase Units Only)
- ☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS ON PAGE 31.