

Installation, Start-Up and Service Instructions

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SAFETY CONSIDERATIONS

Installation and servicing 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 extinguishers 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 screws from horizontal duct opening covers and remove 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. See Fig. 1.

IMPORTANT: An external filter kit **MUST** be used or the filters **MUST** be field-installed outside the unit on horizontal applications with optional economizer. Otherwise, the economizer must be partially removed to access the filters. The area of the field-installed filters should be equal to the area of the factory-installed filters

Step 1 — Provide Unit Support

ROOF CURB — Assemble and install accessory roof curb in accordance with instructions shipped with curb. See Fig. 2. Install insulation, cant strips, roofing felt, and counter flashing as shown. *Ductwork must be attached to curb, not to unit.* If electric or control power is to be routed through the curb, attach the accessory thru-the-curb service connection plates to the roof curb in accordance with the accessory installation instructions. Connection plates must be installed before unit is set on roof curb.

IMPORTANT: The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket supplied with the roof curb as shown in Fig. 2. Improperly applied gasket can also result in air leaks and poor unit performance.

Curb should be level. This is necessary for unit drain to function properly. Unit leveling tolerances are shown in Fig. 3. Refer to Accessory Roof Curb Installation Instructions for additional information as required.

SLAB MOUNT (Horizontal Units Only) — Provide a level concrete slab that extends a minimum of 6 in. beyond unit cabinet. Install a gravel apron in front of outdoor-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 — On vertical discharge units, secure all ducts to roof curb and building structure. *Do not connect ductwork to unit.* For horizontal applications, field-supplied flanges should be attached to horizontal discharge openings and all ductwork 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 plenum return is used on a vertical unit, the return should be ducted through the roof deck to comply with applicable fire codes.

A minimum clearance to combustibles is not required around ductwork on vertical discharge units. On horizontal discharge units, a minimum clearance of 1 in. is required for the first 12 in. of ductwork. Cabinet return-air static shall not exceed -.35 in. wg with economizer or -.45 in. wg without economizer.

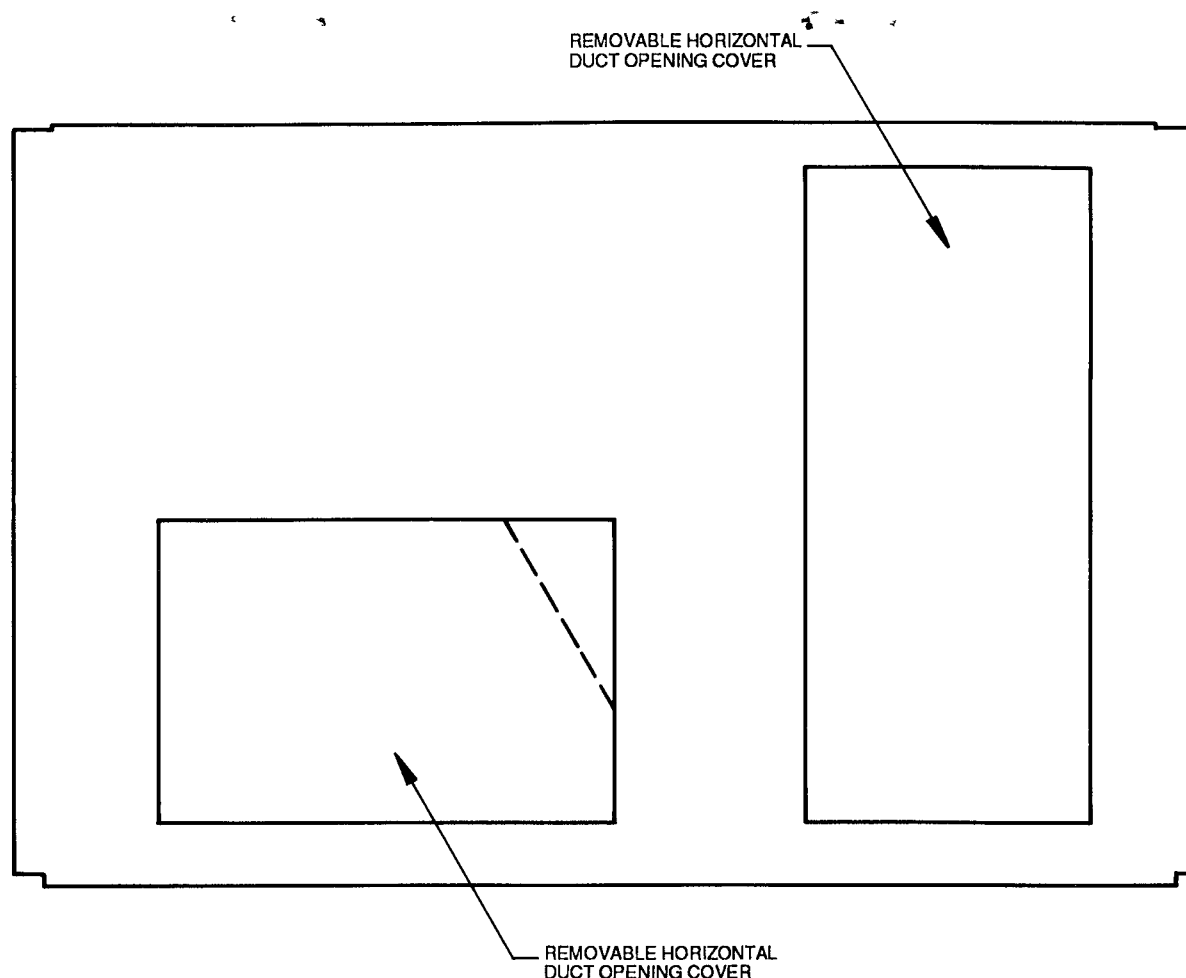


Fig. 1 – Horizontal Conversion Panels

Step 3 — Install External Trap for Condensate Drain

The unit's $\frac{3}{4}$ -in. condensate drain connections are located at the bottom and side of the unit. Unit discharge connections do not determine the use of drain connections; either drain connection can be used with vertical or horizontal applications.

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

To use the bottom drain connection for a roof curb installation, relocate the factory-installed plug from the bottom connection to the side connection. See Fig. 4A. The piping for the condensate drain and external trap can be completed after the unit is in place.

All units must have an external trap for condensate drainage. Install a trap at least 4 in. deep and protect against freeze-up. See Fig. 4B. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1 in. per 10 ft of run. Do not use a pipe size smaller than the unit connection.

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

as a reference. See Table 1 and Fig. 5 for additional information. Operating weight is shown in Table 1 and Fig. 5.

Lifting holes are provided in base rails as shown in Fig. 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.

Position unit on roof curb so that the following clearances are maintained: $\frac{1}{4}$ -in. clearance between roof curb and base rails on each side and front of unit; $1\frac{3}{32}$ -in. clearance between roof curb and rear of unit (see Fig. 2, section C-C).

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

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

After unit is in position, remove shipping materials and rigging skid.

SERVICE PLATE SIZES

UNIT SIZE	"B"	"C"	"D" ALT DRAIN HOLE	"F" POWER	"G" CONTROL	CONNECTOR PACKAGE ACCESSORY
50TJ008-014	2'-8 ⁷ / ₁₆ " [827]	1'-10 ¹⁵ / ₁₆ " [583]	1 ³ / ₄ " [44.5]	1" NPT or 2" NPT	3/4" NPT	50DJ901311

ROOF CURB ACCESSORY	"A"	UNIT SIZE
50DJ901371	1'-2" [356]	50TJ008-014
50DJ901381	2'-0" [610]	

NOTES:

1. Roof curb accessory is shipped unassembled.
2. Insulated panels.
3. Dimensions in [] are in millimeters
4. Roof curb: galvanized steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance 4 ft on each side
7.  Direction of airflow

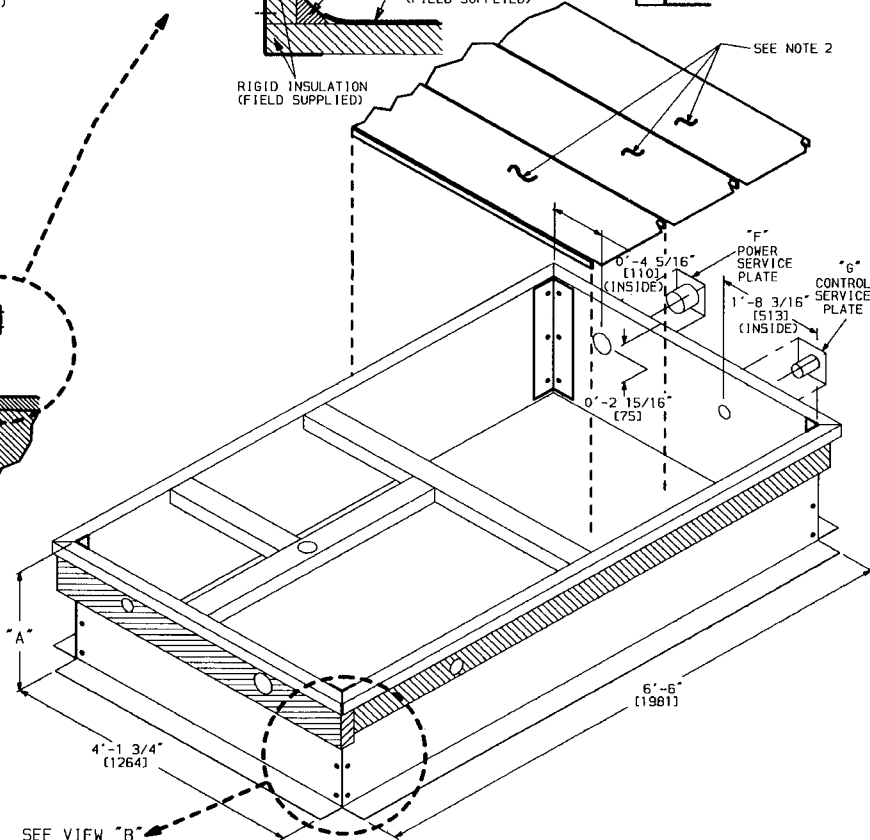
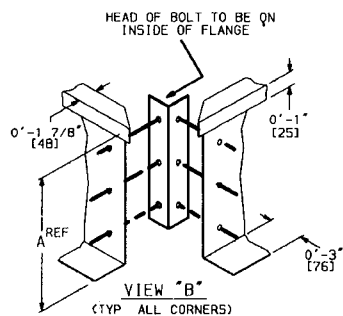
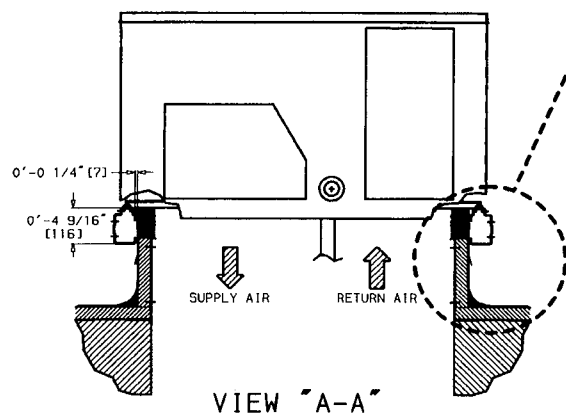
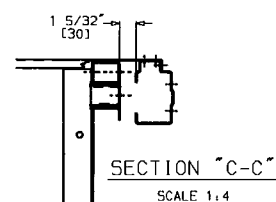
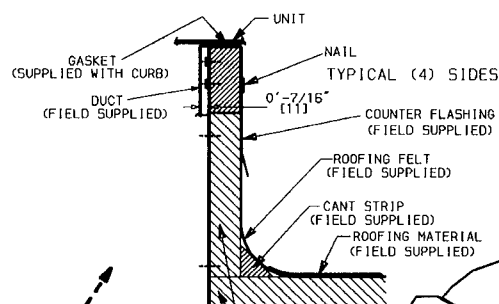
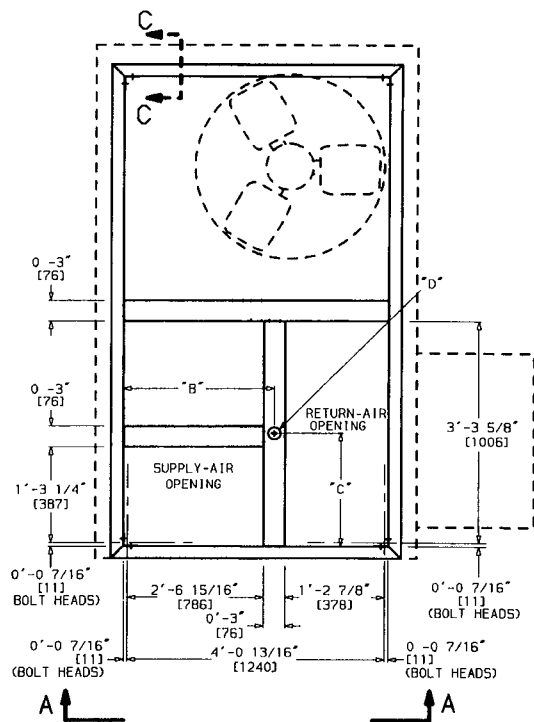
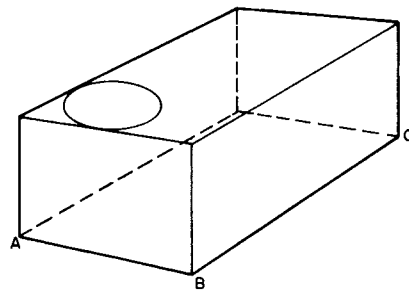


Fig. 2 – Roof Curb Details



MAXIMUM ALLOWABLE
DIFFERENCE (in.)

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

Fig. 3 – Unit Leveling Tolerance

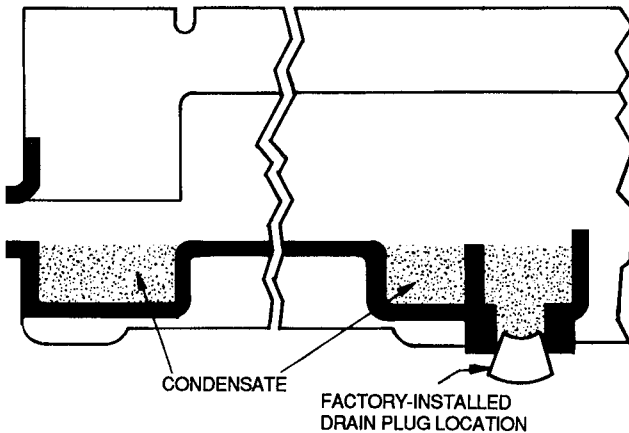
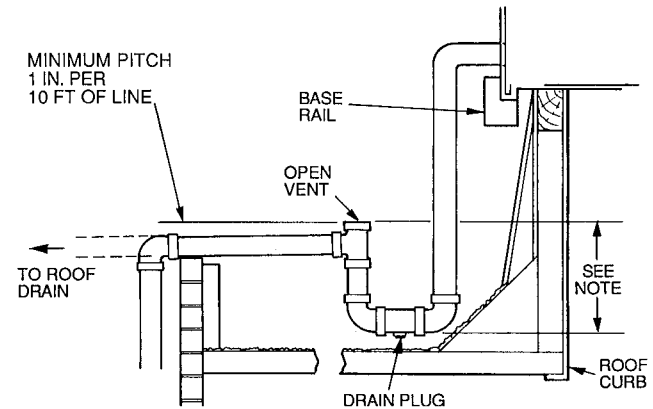
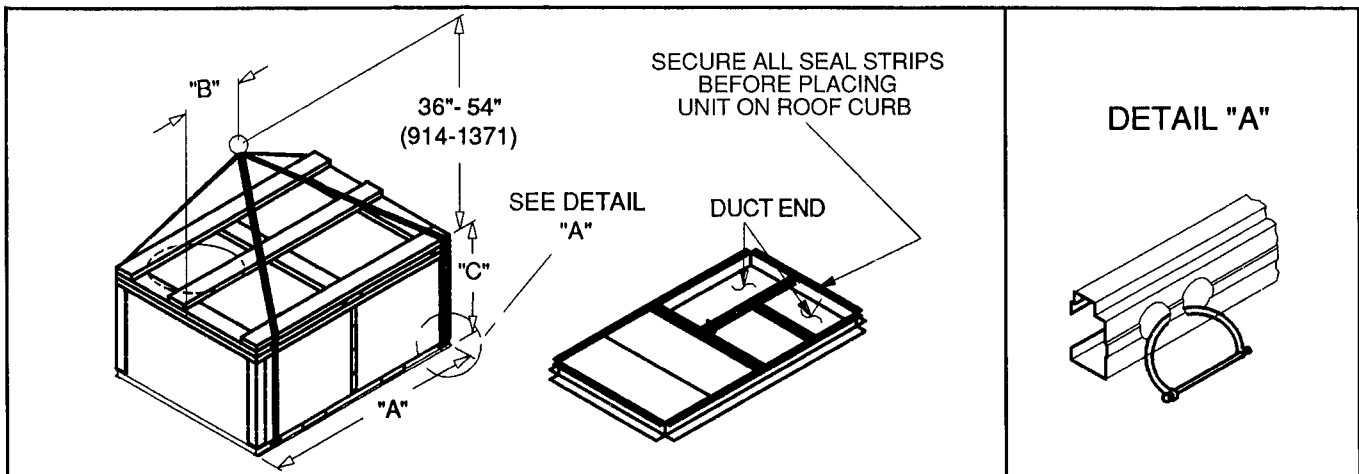


Fig. 4A – Condensate Drain Pan



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

Fig. 4B – External Trap Condensate Drain



NOTES:

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

CAUTION

All panels must be in place when rigging.

UNIT 50TJ	MAX WEIGHT		DIMENSIONS					
			"A"		"B"		"C"	
	lb	kg	in.	mm	in.	mm	in.	mm
008	755	342	77.42	1967	40.25	1022	41.31	1050
009	760	345	77.42	1967	40.25	1022	41.31	1050
012	915	415	77.42	1967	40.25	1022	49.31	1253
014	930	422	77.42	1967	40.25	1022	49.31	1253

Fig. 5 – Rigging Details

Table 1 — Physical Data

BASE UNIT 50TJ		008	009	012	014
NOMINAL CAPACITY (tons)		7½	8½	10	12½
OPERATING WEIGHT (lb)					
Unit		755	760	915	930
Economizer		44	44	44	44
Roof Curb*		143	143	143	143
COMPRESSOR		Hermetic			
Quantity		2	2	2	2
Oil (oz)		54 ea	54 ea	54 ea	65 ea
REFRIGERANT TYPE		R-22			
Operating Charge (lb-oz)					
Circuit 1		5-3	6-8	7-8	10-0
Circuit 2		5-8	6-0	7-6	9-3
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins			
Rows...Fins/in.		1...17	2...17	2...17	2...17
Total Face Area (sq ft)		20.50	14.25	19.86	25.06
CONDENSER FAN		Propeller Type			
Nominal Cfm		6400	6400	7000	7200
Quantity...Diameter (in.)		1... 26	1... 26	1...26	1...26
Motor Hp...Rpm		¾... 1100	¾... 1100	¾...1100	¾...1100
Watts Input (total)		950	950	950	950
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Acutrol™ Feed Device			
Rows...Fins/in.		3... 15	3... 15	3... 15	4... 15
Total Face Area (sq ft)		8.0	8.0	10.0	11.1
EVAPORATOR FAN		Centrifugal Type			
Quantity...Size (in.)	Std	1...15 x 15	1...15 x 15	1...15 x 15	1...15 x 15
	Alt	1...15 x 15	—	1...15 x 15	1...15 x 15
Type Drive	Std	Belt	Belt	Belt	Belt
	Alt	Belt	—	Belt	Belt
Nominal Cfm	Std	3000	3400	4000	5000
	Alt	3000	—	4000	5000
Maximum Continuous Bhp	Std	2.40	2.40	2.40	4.20
	Alt	—	—	2.90	4.25
Motor Frame Size	Std	56	56	56	56
	Alt	—	—	56	56
Fan Rpm Range	Std	590-840	685-935	685-935	860-1080
	Alt	685-935	—	835-1085	900-1260
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	Std	2 4/3.4	2.8/3.8	2.8/3.8	4 0/5.0
	Alt	2 8/3.8	—	3.4/4.4	2 8/3.8
Fan Pulley Pitch Diameter (in.)	Std	7.0	7.0	7.0	8.0
	Alt	7.0	—	7.0	5.4
Belt, Quantity...Type...Length (in.)	Std	1...A...48	1...A...48	1...A...48	1...A...51
	Alt	1...A...48	—	1...A...48	1...BX...46
Pulley Center Line Distance (in.)	Std	16.75-19.25	16.75-19.25	15.85-17.50	15.85-17.50
	Alt	16.75-19.25	—	15.85-17.50	15.85-17.50
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Std	50	50	50	45
	Alt	50	—	50	60
Movable Pulley Maximum Full Turns From Closed Position	Std	5	5	5	5
	Alt	5	—	5	6
Factory Setting	Std	5	5	5	5
	Alt	5	—	5	5
Factory Speed Setting (rpm)	Std	590	685	685	860
	Alt	685	—	835	960
Fan Shaft Diameter at Pulley (in.)		1	1	1	1
HIGH-PRESSURE SWITCH (psig)†					
Standard Compressor Internal Relief (Differential)		450 ± 50			
Cutout		428			
Reset (Auto.)		320			
LOW-PRESSURE/LOSS-OF-CHARGE SWITCH (psig)†					
Cutout		7 ± 3			
Reset (Auto.)		22 ± 7			
FREEZE-PROTECTION THERMOSTAT (F)†					
Opens		30 ± 5			
Closes		45 ± 5			
OUTDOOR-AIR INLET SCREENS		Cleanable			
Quantity...Size (in.)		1...20 x 25 x 1			
		1...16 x 25 x 1			
RETURN-AIR FILTERS		Throwaway			
Quantity...Size (in.)		4...16 x 20 x 2	4...16 x 20 x 2	4...20 x 20 x 2	4...20 x 20 x 2

LEGEND

Bhp — Brake Horsepower

*Weight of 14-in. roof curb

†Requires an optional or accessory controls upgrade kit.

UNIT 50TJ	STD. UNIT WEIGHT		ECONOMIZER WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		"H"		"J"		"K"	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg	Ft-in.	mm	Ft-in.	mm	Ft-in.	mm
008	755	342	44	20	164	74	140	64	208	94	243	110	2'-0 7/8"	632	3'-5 1/16"	1050	2'-9 1/16"	856
009	760	345	44	20	165	75	141	64	209	94	245	111	1'-2 7/8"	378	3'-5 1/16"	1050	2'-9 1/16"	856
012	915	415	44	20	199	90	170	77	252	114	294	134	2'-10 7/8"	885	4'-1 1/16"	1253	3'-0 3/8"	924
014	930	422	44	20	202	92	172	78	256	116	300	136	1'-2 7/8"	378	4'-1 1/16"	1253	3'-0 3/8"	924

LEGEND

NEC — National Electrical Code

*Indicates horizontal center of gravity.

†Indicates vertical center of gravity

NOTES:

1 Dimensions in [] are in millimeters

2  Center of gravity

3  Direction of airflow

4 Ductwork to be attached to accessory roof curb only

5. Minimum clearance (local codes or jurisdiction may prevail):

a Bottom to combustible surfaces (when not using curb) 0 in., on horizontal discharge units with electric heat 1 in. clearance to ductwork for 1 ft

b Condenser coil, for proper airflow, 36 in. one side, 12 in. the other. The side getting the greater clearance is optional.

c Overhead, 60 in. to assure proper condenser fan operation

d Between units, control box side, 42 in. per NEC

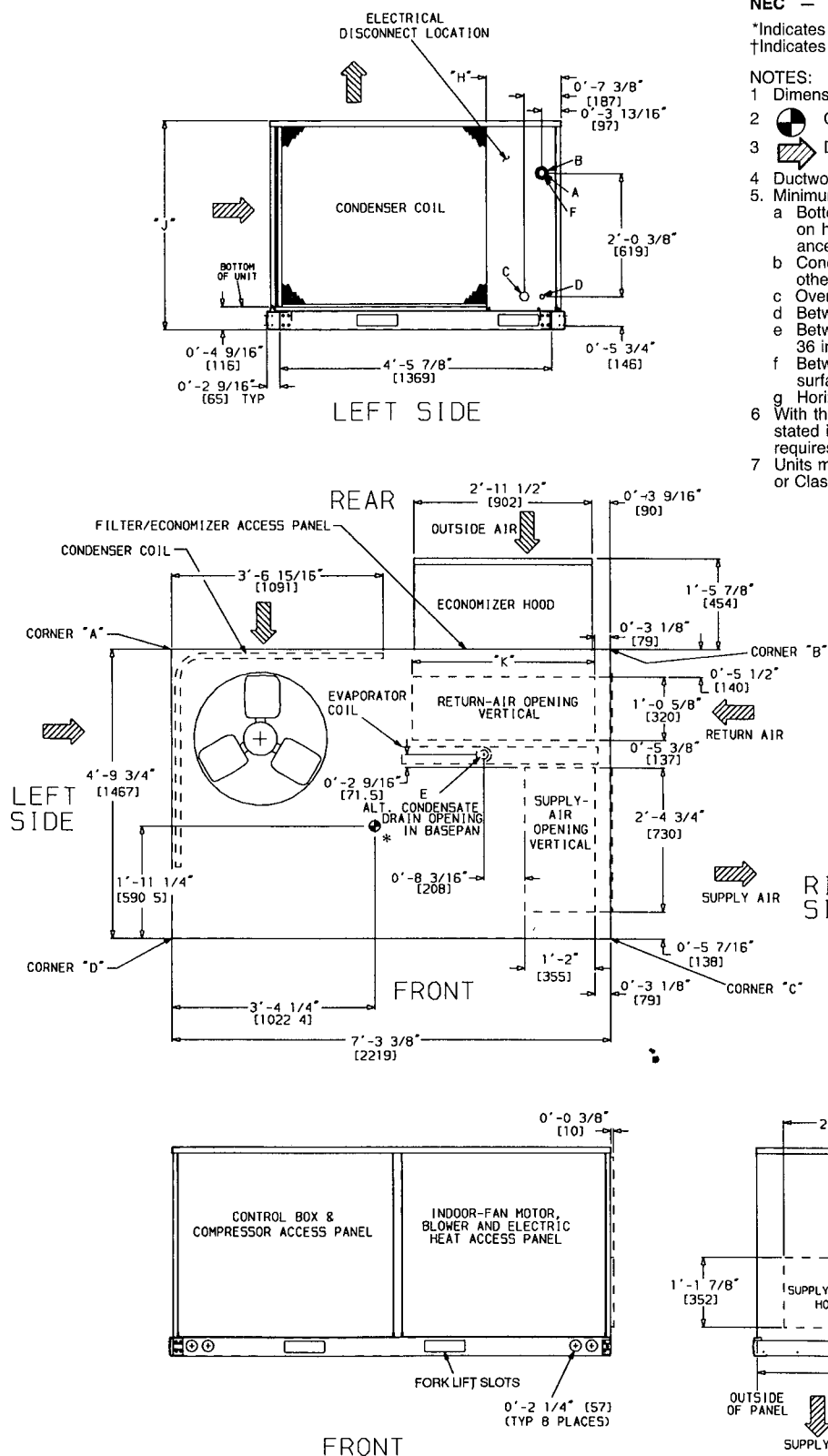
e Between unit and ungrounded surfaces, control box side, 36 in. per NEC

f Between unit and block or concrete walls and other grounded surfaces, control box side, 42 in. per NEC

g Horizontal supply and return end, 0 inches

6 With the exception of the clearance for the condenser coil as stated in Notes 5a, b, and c, a removable fence or barricade requires no clearance.

7 Units may be installed on combustible floors made from wood or Class A, B, or C roof covering material.



CONNECTION SIZES	
A	1 3/8" Dia. [35] Field Power Supply Hole
B	2 1/2" Dia. [64] 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" Dia. [61] Power Supply Knockout

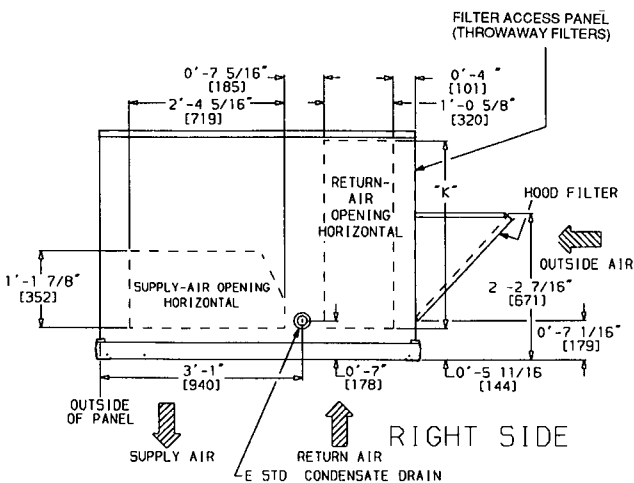
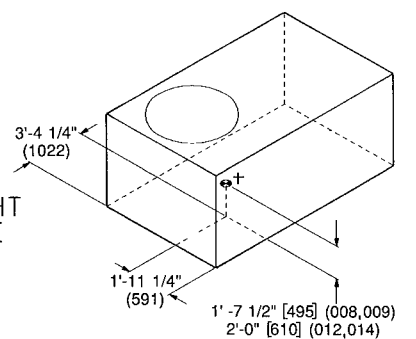


Fig. 6 — Base Unit Dimensions

Step 5 – Make Electrical Connections

⚠ WARNING

Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC (National Electrical Code), ANSI/NFPA (National Fire Protection Association), latest edition, 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 moving the black wire from the 230-v red wire on the transformer and connecting it to the 200-v blue wire from the transformer. The end of the red wire then must be insulated.

Refer to unit label diagram for additional information. Pigtails are provided for field wire connections.

When installing units, provide a disconnect per NEC. Use copper conductors only when splice connectors are used.

All field wiring must comply with NEC and local requirements. In Canada, electrical connections must be in accordance with CSA (Canadian Standards Association) C22.1 Canadian Electrical Code Part One

Install field wiring as follows (see Fig. 7, 8, and 9):

1. Install conduit through side panel openings between disconnect and control box (see Fig. 8 and 9).
2. Install power lines to terminal connections as shown in Fig. 7.

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

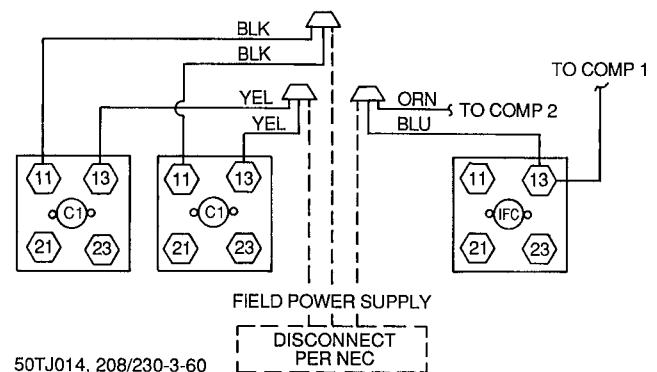
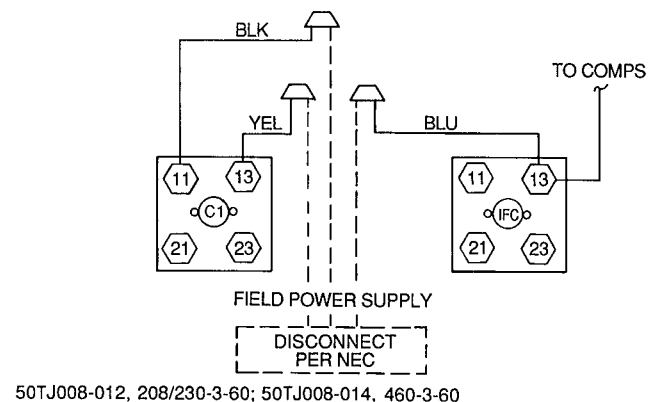
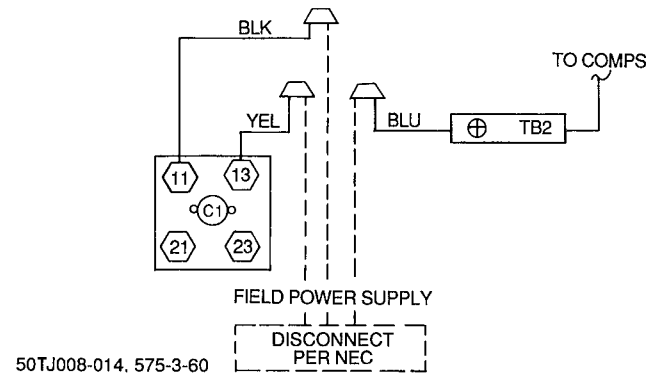
FIELD CONTROL WIRING — Install a Carrier-approved accessory thermostat assembly according to installation instructions included with the accessory. Locate thermostat assembly on a solid wall in the conditioned space to sense average temperature in accordance with thermostat installation instructions.

Route thermostat cable or equivalent single leads of colored wire from subbase terminals to low-voltage connections on unit (shown in Fig. 10) as described in Steps 1-4 below.

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

1. If unit is mounted on roof curb and accessory thru-the-curb service plate connection is used, route wire through connection plate.

2. Pass control wires through the hole provided on unit (see connection D, Connection Sizes Table, Fig. 6).
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. 11. The raceway provides the UL-required (Underwriters' Laboratories) clearance between the high- and low-voltage wiring.
4. Connect thermostat wires to screw terminals of low-voltage connector.



LEGEND		
C	— Contactor	⊕ Terminal Block Connection
COMP(S)	— Compressor(s)	⌋ Splice Connection
IFC	— Indoor (Evaporator) Fan Contactor	--- Field Wiring
NEC	— National Electrical Code	— Factory Wiring
TB	— Terminal Block	

Fig. 7 – Power Wiring Connections

Table 2 – Electrical Data

UNIT 50TJ	NOMINAL VOLTAGE	IFM	VOLTAGE RANGE		COMPR (ea)		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		DISCONNECT SIZE**															
			Min	Max	RLA	LRA	FLA	FLA	Nom kW	FLA	MCA	MOCP†	FLA	LRA														
008 (7½ Tons)	208/230-3-60	Std	187	254	13.6	73.4	3.8	5.8	— 7.8/10.4 12.0/16.0 18.6/24.8 24.0/32.0 31.9/42.4	— 21.7/ 25.0 33.4/ 38.5 51.7/ 59.7 66.7/ 74.2 88.4/102.0	40.2/ 40.2 40.2/ 40.2 48.9/ 55.4 71.9/ 81.8 90.6/103.5 117.8/134.8	45/45 45/45 50/60†† 80††/ 90†† 100††/110†† 125††/150††	42/ 42 42/ 42 45/ 51 66/ 75 83/ 95 108/124	206/206 206/206 206/206 206/206 206/206 206/206														
									460-3-60	Std	414	508	6.2	37.7	1.9	2.6	— 13.9 16.5 27.8 33.0 41.7	— 16.7 19.8 33.4 39.7 50.2	18.5 24.1 28.1 45.0 52.9 65.9	20 25 30 50 60†† 70††	19 22 26 41 49 61	105 105 105 105 105 105						
	575-3-60	Std	518	632	5.8	40.0	1.9	2.6									— 18.0 36.0	— 17.0 34.0	16.7 23.8 45.1	20 25 50	17 22 41	104 104 104						
									009 (8½ Tons)	208/230-3-60	Std	187	254	15.8	92.0	3.8	5.8	— 7.8/10.4 12.0/16.0 18.6/24.8 24.0/32.0 31.8/42.4	— 21.7/ 25.0 33.4/ 38.5 51.7/ 59.7 66.7/ 77.0 88.4/102.0	45.2/ 45.2 45.2/ 45.2 48.9/ 55.4 71.9/ 81.8 90.6/103.5 117.7/134.8	50/50 50/50 50/60†† 80††/ 90†† 100††/110†† 125††/150††	47/ 47 47/ 47 47/ 51 66/ 75 83/ 95 108/124	243/243 243/243 243/243 243/243 243/243 243/243					
	460-3-60	Std	414	508	7.4	46.0	1.9	2.6										— 13.9 16.5 27.8 33.0 41.7	— 16.7 19.8 33.4 39.7 50.2	21.0 24.1 28.1 45.0 52.9 65.9	25 25 30 50 60†† 70††	22 22 26 41 49 61	122 122 122 122 122 122					
										575-3-60	Std	518	632	5.9	44.0	1.9	2.6	— 18.0 36.0	— 17.0 34.0	16.8 23.8 45.1	20 25 50	18 22 42	112 112 112					
012 (10 Tons)	208/230-3-60	Std	187	254	17.9	110	3.8	5.8										— 7.8/10.4 12.0/16.0 24.0/32.0 31.8/42.4 37.5/50.0	— 21.7/ 25.0 33.4/ 38.5 51.7/ 59.7 66.7/ 77.0 88.4/102.0 104.2/120.3	49.5/ 49.5 49.5/ 49.5 49.5/ 55.4 90.6/103.5 117.7/134.8 137.5/127.5	60††/ 60†† 60††/ 60†† 60††/ 60†† 100††/110†† 125††/150†† 150††/150††	52/ 52 52/ 52 52/ 52 83/ 95 108/124 127/145	279/279 279/279 279/279 279/279 279/279 279/279					
								Alt		7.5	— 7.8/10.4 12.0/16.0 24.0/32.0 31.8/42.4 37.5/50.0	— 21.7/ 25.0 33.4/ 38.5 51.2/ 57.5 92.8/105.6 119.9/136.9 139.7/129.7	51.2/ 51.2 51.2/ 51.2 51.2/ 57.5 92.8/105.6 119.9/136.9 139.7/129.7	60/60†† 60/60†† 60/60†† 100††/110†† 125††/150†† 150††/150††	54/ 54 54/ 54 54/ 54 85/ 97 110/126 129/147	298/298 298/298 298/298 298/298 298/298 298/298												
											2.6	— 16.5 27.8 33.0 41.7 60.0	— 19.8 33.4 39.7 50.2 60.1	23.9 28.1 45.0 52.9 65.9 63.4	30 30 50 60†† 70†† 70††	25 26 41 49 61 72	140 140 140 140 140 140											
		460-3-60							Alt			414	508	8.6	55.0	1.9	3.4	— 16.5 27.8 33.0 41.7 50.0	— 19.8 33.4 39.7 50.2 60.1	24.7 29.1 46.0 53.9 66.9 64.4	30 30 50 60†† 70†† 70††	26 27 42 50 62 73	149 149 149 149 149 149					
								575-3-60		Std								518	632	6.4	50.0	1.9	2.6	— 18.0 36.0 54.0	— 17.0 34.0 51.0	18.0 23.8 45.1 53.6	25 25 50 60††	19 22 42 61
											Alt													3.4	— 18.0 36.0 54.0	— 17.0 34.0 51.0	18.6 24.6 45.9 54.4	25 25 50 60††

Table 2 – Electrical Data (cont)

UNIT 50TJ	NOMINAL VOLTAGE	IFM	VOLTAGE RANGE		COMPR (ea)		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		DISCONNECT SIZE**	
			Min	Max	RLA	LRA			FLA	FLA	Nom kW	FLA	MCA	MOCP†
014 (12½ Tons)	208/230-3-60	Std	187	254	22.3	142	3.8	12.0	—	—	66 0/ 66 0	80††/ 80††	69/ 69	386/386
									7 8/10 4	21.7/ 25 0	66 0/ 66 0	80††/ 80††	69/ 69	386/386
									12 0/16 0	33.4/ 38.1	66 0/ 66 0	80††/ 80††	69/ 69	386/386
								24.0/32 0	66.7/ 74.2	98.4/111.2	100††/125††	91/102	386/386	
								31.8/42.4	88.4/102.0	125.5/142.5	150††/150††	115/131	386/386	
								37.5/50.0	104.2/120.3	145.3/135.3	150††/150††	134/152	386/386	
	Alt	15.0	—	—	69 0/ 69.0	80/80††	73/ 73	410/410						
			7.8/10.4	21.7/ 25.0	69.0/ 69.0	80/80††	73/ 73	410/410						
			12.0/16.0	33 4/ 38.1	69.0/ 69.0	80/80††	73/ 73	410/410						
				24.0/32.0	66.7/ 74.2	102.1/115.0	110††/125††	94/106	410/410					
				31.8/42 4	88.4/102.0	129.2/146 3	150††/150††	119/135	410/410					
				37.5/50.0	104.2/120 3	149.0/139 0	150††/175††	137/156	410/410					
460-3-60	Std	414	508	10 4	72.0	1.9	5 4	—	—	30.7	35	32	195	
								16 5	19.8	31.6	35	32	195	
								27.8	33.4	48.5	50	45	195	
							33 0	39.7	56 4	60††	52	195		
							41 7	50.2	69.4	70††	64	195		
							60.0	60 1	66.9	80††	75	195		
Alt	7.4	—	—	32 8	40	35	207							
		16.5	19 8	34.2	40	35	207							
		27.8	33.4	51 2	60††	47	207							
			33.0	39.7	59.0	60††	54	207						
			41.7	50.2	72 1	80††	66	207						
			50.0	60 1	69.5	80††	78	207						
575-3-60	Std	518	632	9.6	58.5	1.9	5.4	—	—	27.4	35	29	158	
								18.0	17 0	27 4	35	29	158	
								36.0	34.0	47 9	50	45	158	
							54.0	51.0	56.4	70††	65	158		
	Alt						7.4	—	—	29 1	35	31	167	
								18.0	17.0	30 6	35	31	167	
36 0		34.0	51.8	60††	48	167								
		54.0	51 0	60 3	70††	67	167							

IMPORTANT: Alternate evaporator-fan motor is not available for 50TJ008 units. Alternate evaporator-fan motor and drive are not available for 50TJ009 units. Contact your local Carrier representative for more information about field-installed motors

LEGEND

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



*Available with field-installed accessory heaters only. Heater capacity is based on heater voltage of 208 v, 240 v, 480 v, and 575 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.

†Fuse or HACR circuit breaker.

**Used to determine minimum disconnect size per NEC.

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

NOTES:

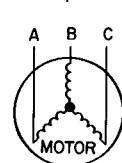
- In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. The CSA units may be fuse or circuit breaker.
- Unbalanced 3-Phase Supply Voltage

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

% Voltage imbalance

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

Example: Supply voltage is 460-3-60



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

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

Determine maximum deviation from average voltage.

(AB) 457 – 452 = 5 v
(BC) 464 – 457 = 7 v
(AC) 457 – 455 = 2 v

Maximum deviation is 7 v

Determine percent voltage imbalance.

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

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

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

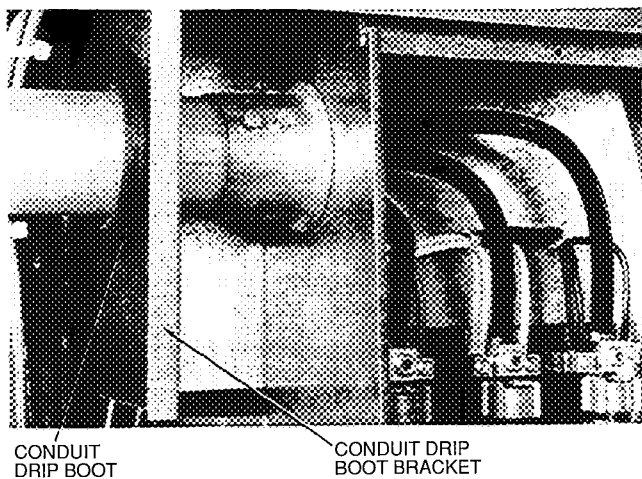


Fig. 8 – Conduit Installation

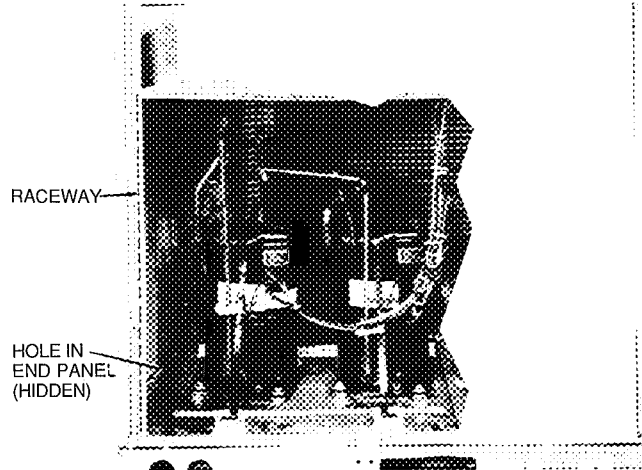


Fig. 11 – Field Control Wiring Raceway

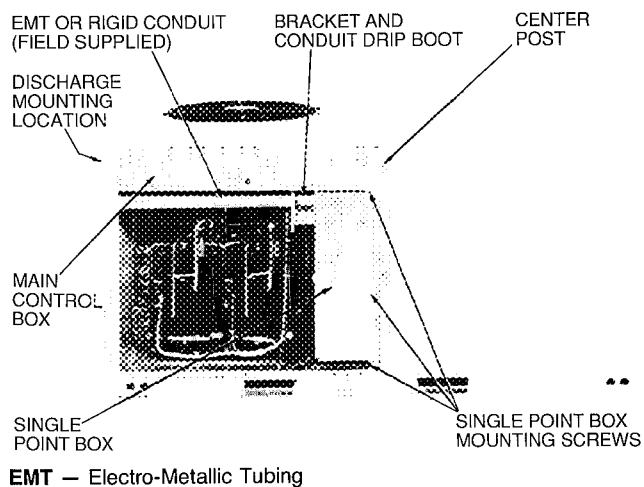
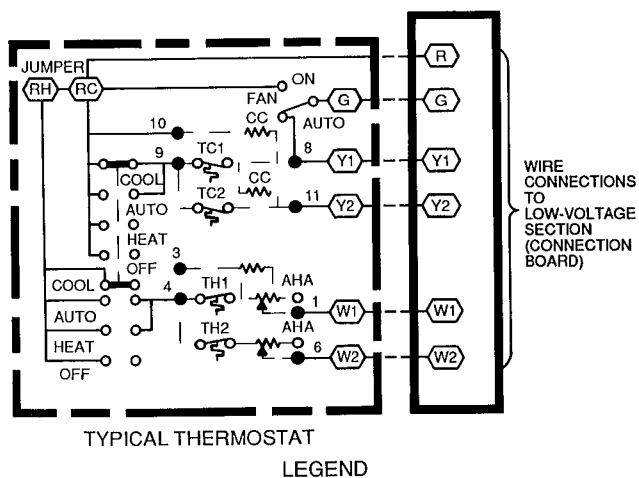


Fig. 9 – Component Location



LEGEND

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

NOTE: Connect W2 when 2-stage accessory electric heaters are used.

Fig. 10 – Low-Voltage Connections

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

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

Assembly:

1. Determine quantity of ventilation required for building. Record amount for use in Step 8.
2. Remove and save evaporator coil access panel and screws. See Fig. 12.
3. Separate hood and screen from basepan by removing the screws and brackets securing them. Save all screws and discard brackets.
4. Replace evaporator coil access panel
5. Place hood on front of evaporator coil access panel. See Fig. 13 for hood details. Secure top of hood with the 6 screws removed in Step 3. See Fig. 14.
6. Remove and save 8 screws (4 on each side) from sides of the manual outdoor-air damper.
7. Align screw holes on hood with screw holes on side of manual outdoor-air damper. See Fig. 13 and 14. Secure hood with 8 screws from Step 6.
8. Adjust minimum position setting of the damper blade by adjusting the manual outdoor-air adjustment screws on the front of the damper blade. See Fig. 12. Slide blade vertically until it is in the appropriate position determined by Fig. 15. Tighten screws.
9. Remove and save screws currently on sides of hood. Insert screen. Secure screen to hood using the screws. See Fig. 14.

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

Assembly:

1. Determine quantity of ventilation air required for building. Record amount of air for use in Step 9.
2. Remove evaporator coil access panel (see Fig. 16). Save panel and screws.
3. Assemble outdoor-air hood top and side plates as shown in Fig. 17. Install seal strips on hood top and sides. Put aside screen retainer and screws for later assembly. *Do not attach hood to unit at this time.*
4. On 50TJ012,014 units, install discharge block-off plate over duct openings. See Fig. 18.
5. The block-off panel should be removed from the evaporator coil access panel and discarded. Save screws. See Fig. 16.
6. Remove screws securing barometric relief damper, if desired. See Fig. 19.
7. To convert to horizontal discharge application:
 - a. Remove filters from filter track.

IMPORTANT: Filters must be installed outside the unit on horizontal discharge applications with economizer. Otherwise, economizer must be partially removed to access the filters. The area of the field-installed filters should be equal to the area of the factory-installed filters.

- b. Rotate economizer 90 degrees until economizer motor faces condenser section (see Fig. 20). If necessary, disassemble economizer to replace filter.
 - c. Rotate barometric relief damper 90 degrees so that it opens and closes vertically.
 - d. Install horizontal discharge block-off plate over opening on the access panel. Block-off plate **MUST** be installed before installing hood assembly (see Fig. 21).
- NOTE:** Install spacers at the same time as the horizontal block-off plate using same screws. The spacers are used to cover gaps between the economizer assembly and the unit.
8. Insert economizer plug from the wiring harness (supplied with the unit) into the wiring plug on economizer control board. See Fig. 19.
 9. Determine economizer damper position setting (see Fig. 22). Adjust damper setting by adjusting screws on the position setting bracket (see Fig. 23). Slide position setting bracket until top screw (see Fig. 23) is in the position determined by Fig. 22. Tighten screws.
 10. Install evaporator coil access panel with screws saved from Step 2.
 11. Fasten hood top, side plate assembly, and bottom stop assembly to unit with screws provided with block-off panel (see Fig. 17).
 12. Remove tape from outdoor-air thermostat (OAT). Fasten OAT to inside of hood using screws and speed clips provided (see Fig. 24). Make sure OAT terminals are up.
 13. Place knob, supplied with economizer, on OAT. Set it for 3 F below indoor room thermostat setting. If accessory solid-state enthalpy control (EC) is used instead of the OAT, see instructions shipped with EC for installation and adjustment (see Fig. 24).

14. Connect OAT per Fig. 25.

15. Slide outdoor-air inlet screens into screen track on hood side plates. While holding screens in place, fasten screen retainer to hood using screws provided.

NOTE: A supply-air thermostat is located in the evaporator-fan housing when an economizer is factory installed.

16. Turn on base unit power.

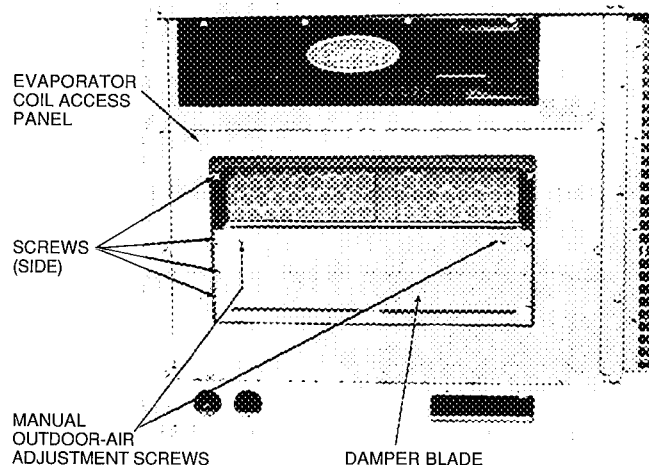


Fig. 12 — Damper Panel with Manual Outdoor-Air Damper Installed

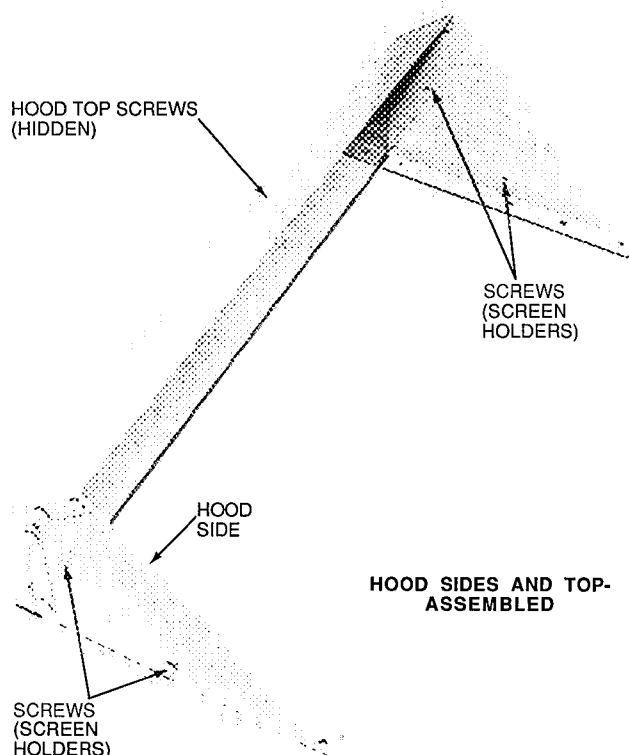


Fig. 13 — Outdoor-Air Hood Details

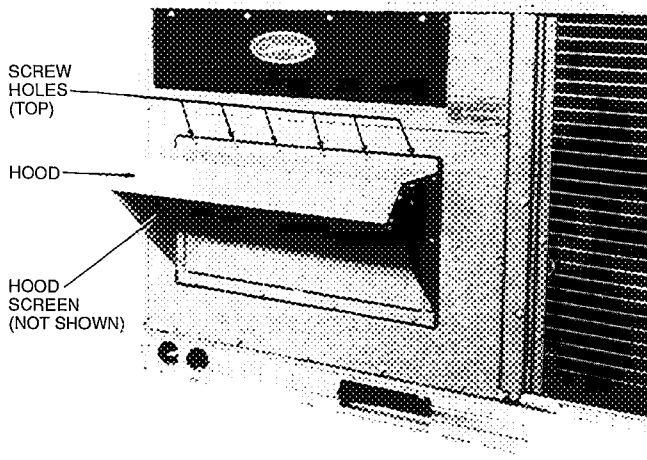


Fig. 14 – Damper with Hood Attached

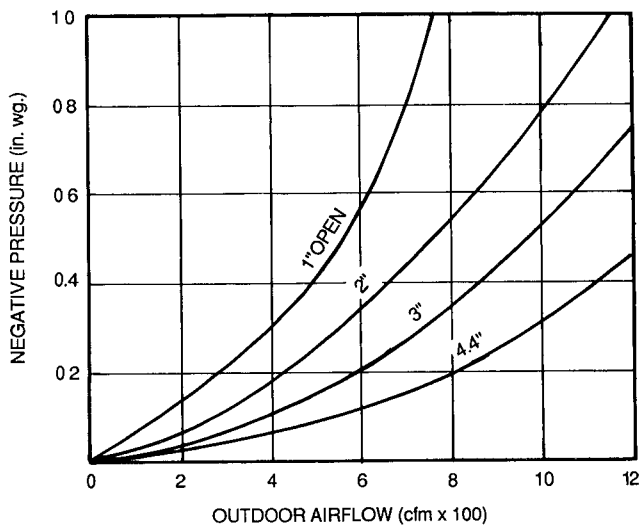


Fig. 15 – Position Setting

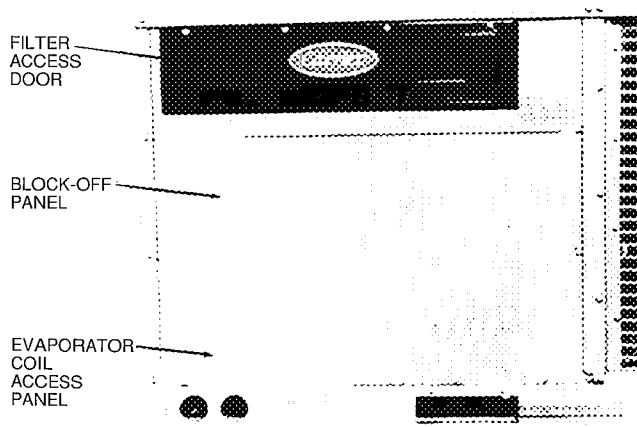
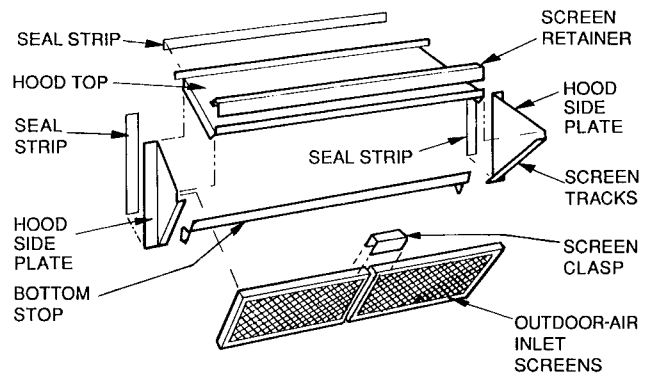
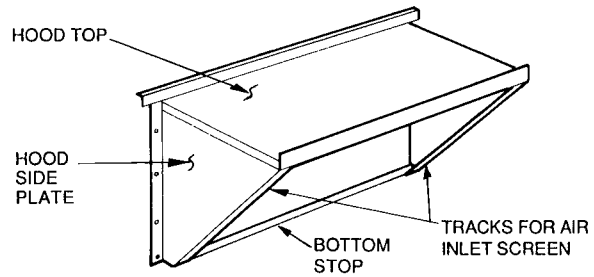


Fig. 16 – Access Panel Location



OUTDOOR-AIR HOOD-UNASSEMBLED



HOOD SIDES AND TOP ASSEMBLED

Fig. 17 – Outdoor-Air Hood Details

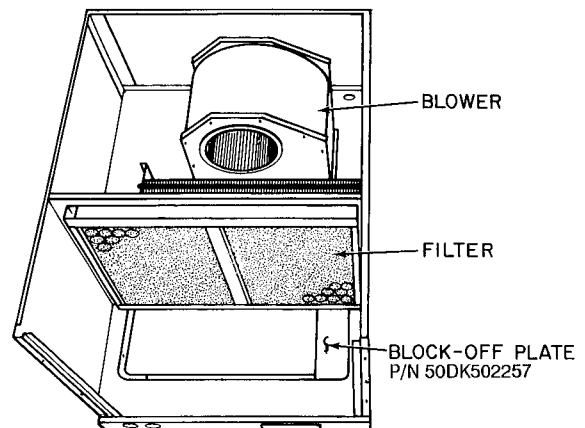


**Fig. 18 – Vertical Discharge Block-Off Plate
(Sizes 012,014 only)**

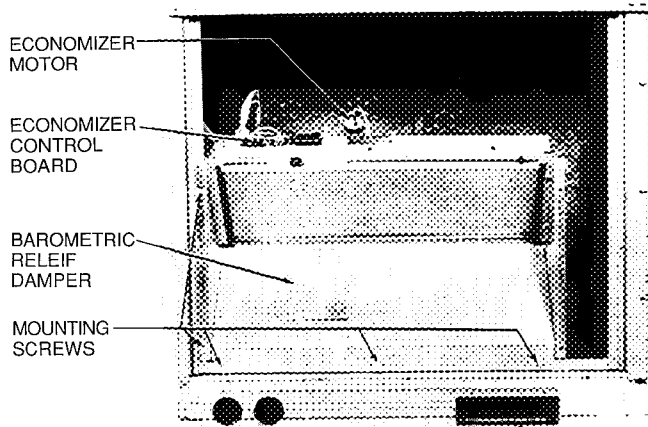


Fig. 19 – Economizer Installed in Unit

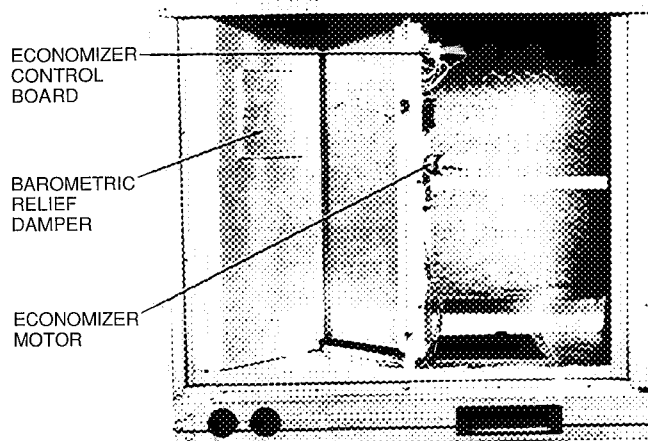


Fig. 20 – Horizontal Economizer Installation (90-Degree Rotation)

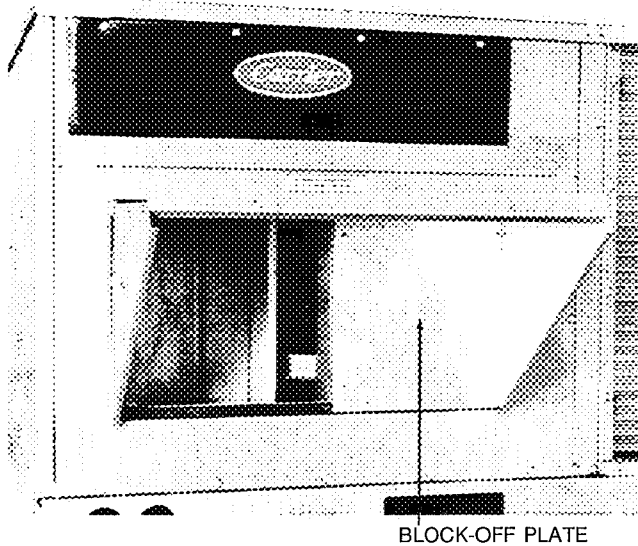
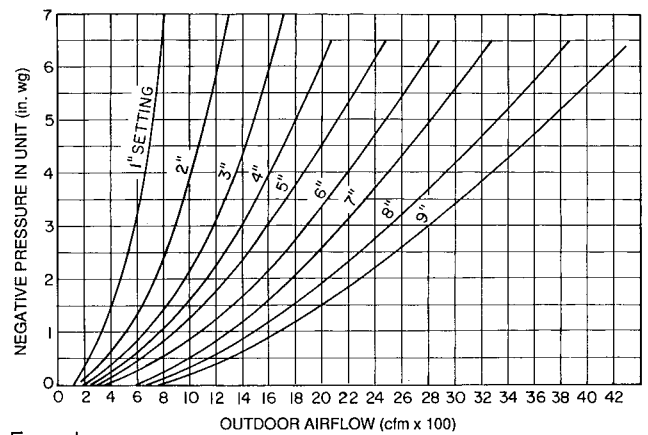


Fig. 21 – Horizontal Discharge Block-Off Plate



Example:

Given —

Negative Pressure 0.1 in. wg

Outdoor Airflow 1100 cfm

Determine —

Setting = 6"

Fig. 22 – Economizer Damper Minimum Position Setting

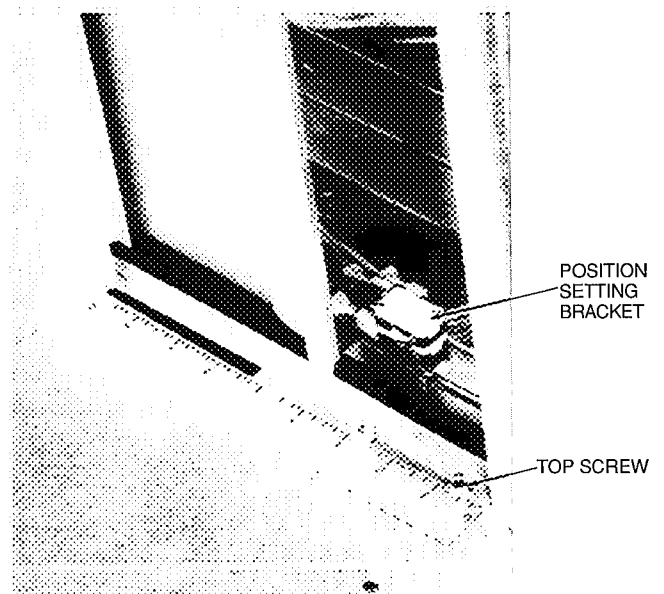


Fig. 23 – Minimum Position Damper Setting

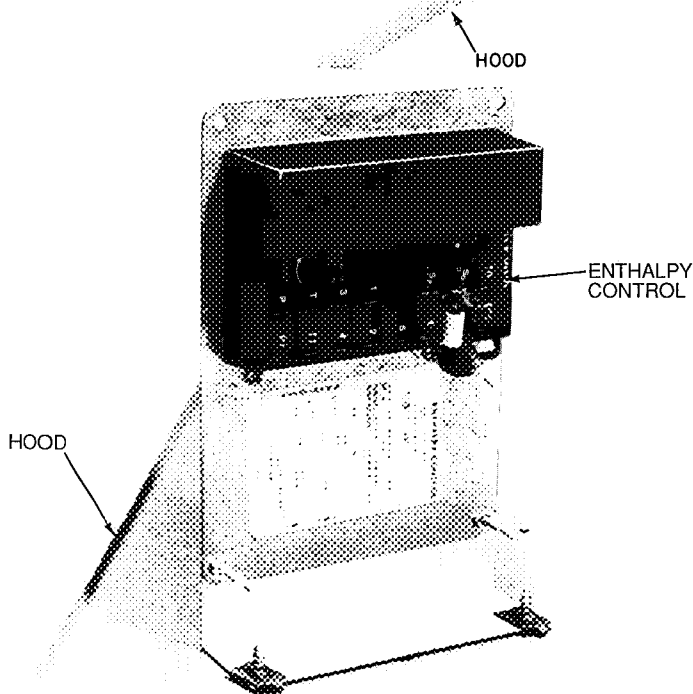
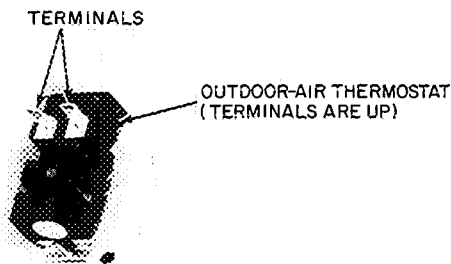
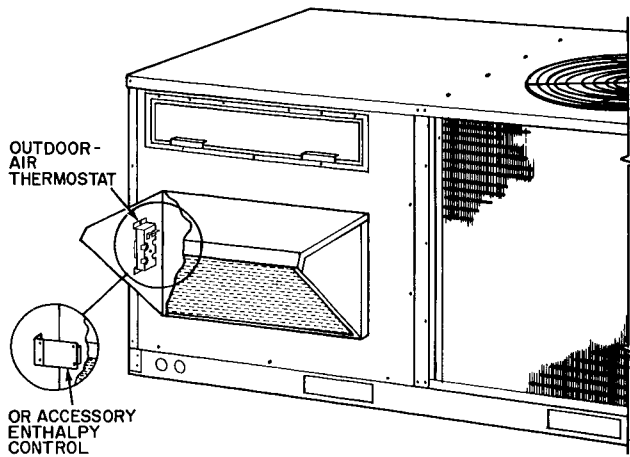


Fig. 24 — Outdoor-Air Thermostat/ Enthalpy Control Installation

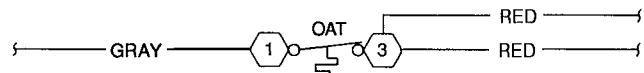


Fig. 25 — Wiring Connections for Outdoor-Air Thermostat

Step 7 — Adjust Evaporator-Fan Speed — Adjust evaporator-fan speed to meet jobsite conditions.

Table 3 shows fan rpm motor pulley settings, Table 4 shows motor efficiencies, and Table 5 gives accessory static pressure drops. See Table 6 for additional information on motor performance. Refer to Tables, 7-14 to determine fan speed settings. Fan motor pulleys are factory set for speed shown in Table 1.

To change fan speed:

1. Shut off unit power supply.
2. Loosen belt by loosening fan motor mounting plate nuts (see Fig. 26 and 27).
3. Loosen movable pulley flange setscrew (see Fig. 28).
4. Screw movable flange toward fixed flange to increase speed and away from fixed flange to decrease speed. Increasing fan speed increases load on motor. Do not exceed maximum speed specified in Table 1.
5. Set movable flange at nearest keyway of pulley hub and tighten setscrew (see Table 1 for speed change for each full turn of pulley flange).

To align fan and motor pulleys:

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

To adjust belt tension (see Fig. 26 and 27).

1. Loosen fan motor mounting nuts.
2. *Units 008, 009* — Slide motor mounting plate away from fan scroll for proper belt tension (1/2-in. deflection with one finger) and tighten mounting nuts. See Fig. 26.
Units 012, 014 — Slide motor mounting plate downward to tighten belt tension. See Fig. 27.
3. Adjust bolt and nut on mounting plate to secure motor in fixed position.

Table 3 – Fan Rpm at Motor Pulley Settings*

UNIT 50TJ	MOTOR PULLEY TURNS OPEN												
	0	½	1	1½	2	2½	3	3½	4	4½	5	5½	6
008†	840	815	790	765	740	715	690	665	640	615	590	—	—
008**	935	910	885	860	835	810	785	760	735	710	685	—	—
009†	935	910	885	860	835	810	785	760	735	710	685	—	—
012†	935	910	885	860	835	810	785	760	735	710	685	—	—
012††	1085	1060	1035	1010	985	960	935	910	885	860	835	—	—
014†	1080	1060	1035	1015	990	970	950	925	905	880	860	—	—
014††	1260	1220	1185	1155	1130	1100	1075	1045	1015	990	960	930	900

*Approximate rpm shown.

†Indicates standard motor and drive

**Indicates alternate drive.

††Indicates alternate motor and drive

Table 4 – Evaporator-Fan Motor Efficiency

MOTOR	EFFICIENCY (%)
50TJ008-012	80
50TJ014 (std)	85
50TJ014 (alt)	87

NOTE: Convert watts to bhp using the following formula:

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

Table 5 – Accessory Static Pressure Drop (in. wg) 50TJ008-014

COMPONENT	CFM								
	2200	2500	3000	3500	4000	4500	5000	5500	6000
1 Heater Module	.020	.030	.050	.065	.080	.100	.120	.140	.155
2 Heater Modules	.030	.050	.070	.090	.120	.140	.160	.190	.210
Economizer	.020	.020	.030	.040	.050	.060	.070	.080	.090

Table 6 – Motor Data

UNIT 50TJ	EVAPORATOR- FAN MOTOR	MAXIMUM CONTINUOUS BHP*	MAXIMUM OPERATING WATTS*	UNIT VOLTAGE	MAXIMUM AMP DRAW
008	Std	2.40	2120	208/230	6.1
				460	2.7
				575	2.7
009	Std	2.40	2120	208/230	6.1
				460	2.7
				575	2.7
012	Std	2.40	2120	208/230	6.1
				460	2.7
				575	2.7
	Alt	2.90	2615	208/230	7.9
				460	3.6
014	Std	4.20	3775	575	3.6
				208/230	12.6
				460	5.7
	Alt	5.25	4400	575	5.7
				208/230	15.0
				460	7.4
				575	7.4

LEGEND

Bhp — Brake Horsepower

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

Table 7 – Fan Performance, 50TJ008 – Vertical Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
2200	503	524	585	684	653	851	716	1039	772	1233	824	1447	878	1726	934	2032	936	2236
2250	511	539	592	708	659	875	722	1072	778	1275	829	1491	884	1744	937	2058	947	2243
2300	518	562	599	731	665	899	727	1097	783	1310	834	1526	885	1770	939	2084	953	2269
2400	534	607	613	787	677	965	738	1165	794	1378	844	1604	892	1840	944	2119	967	2428
2500	549	653	627	835	690	1031	750	1233	805	1456	855	1691	902	1927	949	2188	1002	2485
2550	557	684	633	867	697	1064	756	1267	811	1499	861	1735	908	1980	953	2232	1002	2521
2600	565	708	639	891	703	1097	761	1301	816	1543	866	1779	913	2023	957	2275	1004	2554
2700	581	763	652	948	717	1173	773	1378	827	1621	878	1875	924	2120	967	2377	1010	2637
2800	597	827	665	1014	733	1250	786	1473	839	1709	889	1971	935	2223	978	2478	1016	2735
2900	613	891	679	1081	745	1335	799	1560	850	1805	900	2067	946	2325	988	2535	1030	2847
3000	629	965	694	1156	759	1413	812	1665	862	1901	911	2171	957	2445	1000	2702	1040	2956
3100	646	1039	709	1241	772	1508	825	1761	875	2015	923	2275	968	2554	1011	2822	—	—
3200	662	1123	724	1335	785	1595	840	1866	887	2128	934	2386	980	2661	1022	2933	—	—
3300	679	1207	740	1430	798	1691	854	1980	900	2240	946	2504	991	2775	—	—	—	—
3400	696	1301	756	1534	811	1788	868	2093	914	2360	958	2629	1002	2886	—	—	—	—
3500	712	1396	771	1639	824	1892	881	2206	928	2475	971	2750	1014	3006	—	—	—	—
3600	729	1499	787	1753	839	2006	894	2326	942	2593	984	2886	—	—	—	—	—	—
3700	746	1613	803	1875	854	2136	907	2445	956	2715	997	3017	—	—	—	—	—	—
3750	755	1674	811	1945	862	2197	914	2504	963	2815	—	—	—	—	—	—	—	—
3800	763	1726	819	2006	869	2257	920	2562	970	2878	—	—	—	—	—	—	—	—
3900	780	1849	835	2136	884	2394	932	2686	983	3009	—	—	—	—	—	—	—	—
4000	796	1971	851	2257	900	2527	946	2815	—	—	—	—	—	—	—	—	—	—
4100	813	2110	867	2411	915	2675	960	2942	—	—	—	—	—	—	—	—	—	—
4200	830	2243	883	2554	931	2822	—	—	—	—	—	—	—	—	—	—	—	—
4250	838	2217	882	2539	929	2802	—	—	—	—	—	—	—	—	—	—	—	—
4300	847	2296	890	2702	947	2971	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1 **Boldface** indicates a field-supplied drive is required. (See Note 7)
- 2 **Shading** indicates an alternate drive is required
- 3 **Shading** indicates field-supplied motor and drive are required
- 4 Maximum usable watts input is 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance refer to Table 6

- 5 Values include losses for filters, unit casing, and wet coils
- 6 Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify
- 7 Standard motor drive range: 590 to 840 rpm. Alternate motor drive range: 685 to 935 rpm. All other rpms require field-supplied drive
- 8 To convert watts to bhp:

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

$$\text{Motor efficiency} = .80$$

Table 8 – Fan Performance, 50TJ009 – Vertical Discharge Unit

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
2200	503	524	585	684	653	851	716	1039	772	1233	824	1447	878	1726	934	2032	936	2236
2250	511	539	592	708	659	875	722	1072	778	1275	829	1491	884	1744	937	2058	947	2243
2300	518	562	599	731	665	899	727	1097	783	1310	834	1526	885	1770	939	2084	953	2269
2400	534	607	613	787	677	965	738	1165	794	1378	844	1604	892	1840	944	2119	967	2428
2500	549	653	627	835	690	1031	750	1233	805	1456	855	1691	902	1927	949	2188	1002	2485
2550	557	684	633	867	697	1064	756	1267	811	1499	861	1735	908	1980	953	2232	1002	2521
2600	565	708	639	891	703	1097	761	1301	816	1543	866	1779	913	2023	957	2275	1004	2554
2700	581	763	652	948	717	1173	773	1378	827	1621	878	1875	924	2120	967	2377	1010	2637
2800	597	827	665	1014	733	1250	786	1473	839	1709	889	1971	935	2223	978	2478	1016	2735
2900	613	891	679	1081	745	1335	799	1560	850	1805	900	2067	946	2325	988	2535	1030	2847
3000	629	965	694	1156	759	1413	812	1665	862	1901	911	2171	957	2445	1000	2702	1040	2956
3100	646	1039	709	1241	772	1508	825	1761	875	2015	923	2275	968	2554	1011	2822	—	—
3200	662	1123	724	1335	785	1595	840	1866	887	2128	934	2386	980	2661	1022	2933	—	—
3300	679	1207	740	1430	798	1691	854	1980	900	2240	946	2504	991	2775	—	—	—	—
3400	696	1301	756	1534	811	1788	868	2093	914	2360	958	2629	1002	2886	—	—	—	—
3500	712	1396	771	1639	824	1892	881	2206	928	2475	971	2750	1014	3006	—	—	—	—
3600	729	1499	787	1753	839	2006	894	2326	942	2593	984	2886	—	—	—	—	—	—
3700	746	1613	803	1875	854	2136	907	2445	956	2715	997	3017	—	—	—	—	—	—
3750	755	1674	811	1945	862	2197	914	2504	963	2815	—	—	—	—	—	—	—	—
3800	763	1726	819	2006	869	2257	920	2562	970	2878	—	—	—	—	—	—	—	—
3900	780	1849	835	2136	884	2394	932	2686	983	3009	—	—	—	—	—	—	—	—
4000	796	1971	851	2257	900	2527	946	2815	—	—	—	—	—	—	—	—	—	—
4100	813	2110	867	2411	915	2675	960	2942	—	—	—	—	—	—	—	—	—	—
4200	830	2243	883	2554	931	2822	—	—	—	—	—	—	—	—	—	—	—	—
4250	838	2217	882	2539	929	2802	—	—	—	—	—	—	—	—	—	—	—	—
4300	847	2296	890	2702	947	2971	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1 **Boldface** indicates a field-supplied drive is required (See Note 6)
- 2 **Shading** indicates field-supplied motor and drive are required
- 3 Maximum usable watts input is 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance refer to Table 6

- 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: 685 to 935 rpm. All other rpms require field-supplied drive
- 7 To convert watts to bhp:

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

$$\text{Motor efficiency} = .80$$

Table 9 – Fan Performance, 50TJ012 – Vertical Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
3000	532	630	605	763	670	891	725	1014	778	1148	825	1275	874	1422	926	1613	974	1920	1012	2134
3100	544	677	616	803	680	940	735	1081	787	1216	835	1353	880	1491	933	1656	983	1963	1017	2177
3200	557	716	628	859	690	998	746	1148	796	1284	844	1430	888	1569	934	1718	988	1980	1025	2230
3300	570	763	639	907	700	1064	757	1216	805	1353	854	1508	897	1648	940	1853	989	2031	1032	2282
3400	583	818	651	965	711	1123	767	1284	815	1430	863	1587	907	1744	947	1946	991	2099	1038	2318
3500	596	867	663	1031	721	1190	777	1353	826	1517	871	1665	916	1831	956	2039	997	2195	1043	2380
3600	609	924	674	1097	732	1267	787	1430	836	1595	880	1753	926	1927	966	2134	1004	2291	1045	2478
3700	622	989	686	1165	744	1335	797	1508	847	1691	890	1849	934	2015	976	2238	1013	2397	1051	2569
3800	635	1047	698	1241	755	1413	808	1595	857	1779	901	1945	943	2160	985	2334	1023	2514	1053	2659
3900	649	1123	713	1318	767	1491	818	1683	867	1866	912	2050	952	2265	994	2451	1032	2623	1058	2819
4000	662	1190	722	1396	778	1578	829	1779	878	1962	922	2203	962	2371	1003	2560	1042	2753	1069	2952
4100	675	1267	734	1482	790	1674	839	1875	888	2058	933	2309	973	2496	1013	2679	1051	2865	1087	3087
4200	689	1353	746	1569	801	1761	851	1971	898	2212	943	2424	983	2624	1023	2800	1060	2980	1090	3276
4300	702	1430	759	1665	813	1866	862	2067	908	2326	953	2533	994	2754	1033	2942	1069	3096	1097	3453
4400	715	1526	772	1761	825	1962	873	2221	919	2442	963	2651	1004	2885	1042	3087	1080	3206	1095	3642
4500	729	1621	785	1858	837	2076	885	2335	929	2569	973	2762	1015	3000	1053	3218	1090	3493	1112	3843
4600	742	1718	797	1962	848	2238	896	2451	940	2683	984	2914	1025	3126	1060	3369	1100	3653	1118	4057
4700	756	1823	810	2067	860	2353	908	2578	951	2772	994	3065	1035	3255	1070	3525	1111	3822	1126	4284
4800	770	1927	822	2221	872	2505	919	2708	963	2947	1004	3222	1046	3434	1080	3686	1121	3985	1133	4523
4900	783	2041	836	2344	884	2605	931	2839	974	2955	1013	3349	1050	3559	1093	3854	1122	4174	1140	4775
5000	797	2203	849	2460	897	2661	942	2870	984	3011	1023	3391	1062	3630	1099	4027	1144	4359	1147	5040

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1 **Boldface** indicates a field-supplied drive is required (See Note 7)
- 2 **Shading** indicates alternate motor and drive are required.
- 3 **Shading** indicates field-supplied motor and drive are required
4. Maximum usable watts input is 2120 with standard motor and 2615 with alternate motor. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to table 6

- 5 Values include losses for filters, unit casing, and wet coils.
- 6 Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
- 7 Standard motor drive range: 685 to 935 rpm. Alternate motor drive range: 835 to 1085 rpm. All other rpms require field-supplied drive
- 8 To convert watts to bhp:

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

$$\text{Motor efficiency} = 80$$

Table 10 – Fan Performance, 50TJ014 – Vertical Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
3700	654	1065	714	1218	767	1373	815	1514	861	1666	906	1862	950	2027	991	2202	1030	2361	1064	2512
3800	668	1129	727	1291	780	1456	827	1598	873	1751	916	1948	959	2123	1001	2299	1040	2476	1075	2638
3900	683	1194	741	1365	793	1540	839	1691	884	1836	927	2035	969	2228	1010	2405	1049	2593	1085	2773
4000	697	1267	754	1448	806	1624	851	1785	895	1931	938	2123	979	2334	1020	2521	1059	2710	1095	2901
4100	711	1340	767	1531	819	1708	864	1879	907	2035	949	2219	989	2441	1029	2638	1068	2837	1105	3028
4200	726	1423	780	1624	832	1802	877	1983	919	2149	960	2316	1000	2548	1039	2764	1077	2955	1114	3166
4300	741	1506	794	1717	845	1897	889	2096	931	2263	971	2423	1011	2647	1049	2882	1087	3092	1124	3304
4400	755	1598	808	1819	858	2000	902	2210	943	2387	983	2548	1022	2764	1059	3010	1097	3230	1133	3442
4500	770	1700	821	1923	871	2114	915	2325	955	2512	995	2683	1033	2882	1070	3138	1107	3368	1143	3590
4600	784	1794	835	2027	884	2219	928	2450	968	2638	1006	2828	1044	3010	1081	3258	1117	3516	1152	3748
4700	799	1905	849	2140	897	2343	941	2566	981	2773	1018	2964	1056	3147	1092	3387	1127	3655	1162	3897
4800	814	2009	863	2254	910	2468	954	2692	993	2919	1030	3111	1057	3304	1103	3525	1138	3804	1172	4055
4900	829	2131	877	2378	923	2602	967	2828	1006	3065	1043	3267	1079	3470	1114	3674	1149	3934	1182	4223
5000	843	2246	892	2503	937	2746	980	2964	1019	3221	1055	3424	1091	3637	1125	3822	1160	4083	1193	4382
5100	858	2378	906	2629	950	2891	993	3111	1032	3368	1068	3590	1103	3804	1137	4009	1171	4242	1209	4533
5200	873	2512	920	2764	963	3037	1006	3267	1045	3525	1081	3767	1115	3981	1149	4195	1182	4402	1215	4699
5300	888	2647	934	2910	977	3193	1019	3424	1058	3692	1094	3943	1127	4167	1161	4392	1194	4596	1226	4856
5400	903	2792	949	3065	991	3359	1032	3590	1071	3860	1106	4120	1139	4354	1173	4577	1205	4791	1237	5032
5500	918	2946	963	3212	1004	3516	1045	3757	1084	4027	1119	4307	1152	4598	1185	4772	1217	4955	1248	5216
5600	933	3101	978	3377	1018	3692	1058	3943	1097	4204	1132	4493	1165	4745	1197	4978	1229	5207	—	—
5700	948	3267	992	3544	1032	3869	1072	4130	1110	4391	1145	4689	1178	4943	1209	5189	—	—	—	—
5800	963	3433	1006	3720	1046	4055	1085	4326	1125	4585	1158	4884	1191	5078	—	—	—	—	—	—
5900	978	3590	1021	3906	1060	4232	1099	4511	1139	4782	1173	5078	—	—	—	—	—	—	—	—
6000	993	3795	1035	4093	1074	4419	1112	4705	1153	4965	—	—	—	—	—	—	—	—	—	—
6100	1008	3981	1050	4288	1088	4614	1125	4893	1167	5158	—	—	—	—	—	—	—	—	—	—
6200	1023	4176	1065	4484	1103	4819	1139	5092	—	—	—	—	—	—	—	—	—	—	—	—
6300	1038	4382	1079	4695	1119	5023	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1 **Boldface** indicates a field-supplied drive is required (See Note 7)
- 2 **Shading** indicates alternate motor and drive are required
- 3 **Shading** indicates field-supplied motor and drive are required.
4. Maximum usable watts input is 3775 with standard motor and 4400 with alternate motor. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6

- 5 Values include losses for filters, unit casing, and wet coils
- 6 Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify
- 7 Standard motor drive range: 860 to 1080 rpm. Alternate motor drive range: 900 to 1260 rpm. All other rpms require field-supplied drive.
- 8 To convert watts to bhp:

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

$$\text{Motor efficiency} = \begin{matrix} 85 \text{ (std)} \\ 87 \text{ (alt)} \end{matrix}$$

Table 11 – Fan Performance, 50TJ008 – Horizontal Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
2200	459	465	549	615	625	779	691	965	753	1173	805	1404	842	1656	857	1910	851	2182
2250	465	473	554	630	630	803	695	989	757	1199	810	1439	850	1691	873	1945	862	2206
2300	471	487	559	646	635	827	699	1014	760	1224	816	1465	859	1718	888	1980	867	2249
2400	482	524	569	684	645	875	708	1064	768	1284	824	1526	872	1779	909	2050	891	2295
2500	494	554	581	723	654	924	717	1123	776	1344	832	1587	882	1849	925	2119	905	2334
2550	501	577	587	747	659	956	722	1156	780	1378	836	1621	887	1884	931	2162	908	2368
2660	507	592	592	771	663	981	727	1182	784	1404	839	1656	891	1919	936	2187	913	2399
2700	520	638	604	827	672	1031	737	1250	793	1473	846	1726	898	1997	946	2275	917	2504
2800	533	684	615	875	683	1081	747	1327	802	1552	855	1805	906	2076	954	2352	925	2535
2900	546	731	626	932	693	1140	756	1396	813	1630	863	1884	913	2154	961	2436	931	2578
3000	559	779	637	989	704	1207	765	1473	823	1718	872	1962	921	2240	969	2529	934	2607
3100	572	835	648	1056	715	1275	775	1543	832	1814	882	2058	930	2335	976	2620	937	2632
3200	585	883	660	1114	727	1353	785	1621	841	1901	892	2162	939	2428	984	2710	940	2668
3300	598	940	671	1182	739	1439	795	1691	851	1997	902	2268	948	2529	993	2799	943	2709
3400	610	998	682	1258	750	1526	806	1779	860	2084	912	2369	958	2637	1002	2892	946	2749
3500	623	1056	694	1335	761	1613	817	1866	869	2180	921	2473	968	2751	—	—	—	—
3600	636	1123	707	1422	772	1709	828	1971	880	2266	930	2587	978	2862	—	—	—	—
3700	649	1190	720	1517	783	1796	840	2076	890	2369	940	2696	—	—	—	—	—	—
3750	655	1224	727	1569	789	1849	846	2136	896	2420	945	2743	—	—	—	—	—	—
3800	661	1258	733	1613	795	1901	852	2189	901	2482	949	2791	—	—	—	—	—	—
3900	674	1327	746	1709	806	1997	863	2300	912	2571	959	2894	—	—	—	—	—	—
4000	687	1396	759	1814	817	2102	874	2420	923	2694	—	—	—	—	—	—	—	—
4100	699	1473	772	1919	828	2206	885	2532	935	2815	—	—	—	—	—	—	—	—
4200	712	1552	785	2032	840	2306	897	2652	947	2940	—	—	—	—	—	—	—	—
4250	719	1595	792	2093	846	2366	903	2710	—	—	—	—	—	—	—	—	—	—
4300	725	1639	798	2145	852	2426	909	2767	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1 **Boldface** indicates a field-supplied drive is required (See Note 7)
- 2 **Shading** indicates an alternate drive is required
- 3 **Shading** indicates field-supplied motor and drive are required
- 4 Maximum usable watts input is 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6

5. Values include losses for filters, unit casing, and wet coils
6. Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify
7. Standard motor drive range: 590 to 840 rpm. Alternate motor drive range: 685 to 935 rpm. All other rpms require field-supplied drive
8. To convert watts to bhp:

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

$$\text{Motor efficiency} = 80$$

Table 12 – Fan Performance, 50TJ009 – Horizontal Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6		1.8	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
2200	459	465	549	615	625	779	691	965	753	1173	805	1404	842	1656	857	1910	851	2182
2250	465	473	554	630	630	803	695	989	757	1199	810	1439	850	1691	873	1945	862	2206
2300	471	487	559	646	635	827	699	1014	760	1224	816	1465	859	1718	888	1980	867	2249
2400	482	524	569	684	645	875	708	1064	768	1284	824	1526	872	1779	909	2050	891	2295
2500	494	554	581	723	654	924	717	1123	776	1344	832	1587	882	1849	925	2119	905	2334
2550	501	577	587	747	659	956	722	1156	780	1378	836	1621	887	1884	931	2162	908	2368
2660	507	592	592	771	663	981	727	1182	784	1404	839	1656	891	1919	936	2187	913	2399
2700	520	638	604	827	672	1031	737	1250	793	1473	846	1726	898	1997	946	2275	917	2504
2800	533	684	615	875	683	1081	747	1327	802	1552	855	1805	906	2076	954	2352	925	2535
2900	546	731	626	932	693	1140	756	1396	813	1630	863	1884	913	2154	961	2436	931	2578
3000	559	779	637	989	704	1207	765	1473	823	1718	872	1962	921	2240	969	2529	934	2607
3100	572	835	648	1056	715	1275	775	1543	832	1814	882	2058	930	2335	976	2620	937	2632
3200	585	883	660	1114	727	1353	785	1621	841	1901	892	2162	939	2428	984	2710	940	2668
3300	598	940	671	1182	739	1439	795	1691	851	1997	902	2268	948	2529	993	2799	943	2709
3400	610	998	682	1258	750	1526	806	1779	860	2084	912	2369	958	2637	1002	2892	946	2749
3500	623	1056	694	1335	761	1613	817	1866	869	2180	921	2473	968	2751	—	—	—	—
3600	636	1123	707	1422	772	1709	828	1971	880	2266	930	2587	978	2862	—	—	—	—
3700	649	1190	720	1517	783	1796	840	2076	890	2369	940	2696	—	—	—	—	—	—
3750	655	1224	727	1569	789	1849	846	2136	896	2420	945	2743	—	—	—	—	—	—
3800	661	1258	733	1613	795	1901	852	2189	901	2482	949	2791	—	—	—	—	—	—
3900	674	1327	746	1709	806	1997	863	2300	912	2571	959	2894	—	—	—	—	—	—
4000	687	1396	759	1814	817	2102	874	2420	923	2694	—	—	—	—	—	—	—	—
4100	699	1473	772	1919	828	2206	885	2532	935	2815	—	—	—	—	—	—	—	—
4200	712	1552	785	2032	840	2306	897	2652	947	2940	—	—	—	—	—	—	—	—
4250	719	1595	792	2093	846	2366	903	2710	—	—	—	—	—	—	—	—	—	—
4300	725	1639	798	2145	852	2426	909	2767	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1 **Boldface** indicates a field-supplied drive is required (See Note 6)
- 2 **Shading** indicates field-supplied motor and drive are required
3. Maximum usable watts input is 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6

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: 685 to 935 rpm. All other rpms require field-supplied drive
7. To convert watts to bhp:

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

$$\text{Motor efficiency} = 80$$

Table 13 – Fan Performance, 50TJ012 – Horizontal Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
3000	484	562	560	677	631	810	690	940	747	1081	800	1233	850	1353	879	1233
3100	495	607	570	723	638	851	699	998	755	1140	805	1284	857	1447	896	1473
3200	505	646	579	763	646	899	708	1047	761	1199	812	1344	862	1517	908	1639
3300	516	692	589	810	655	956	717	1106	767	1250	819	1413	867	1578	915	1753
3400	527	739	599	859	664	1006	724	1165	775	1318	827	1482	873	1639	920	1831
3500	537	795	609	907	672	1064	731	1216	784	1387	833	1552	880	1718	926	1901
3600	548	851	619	956	680	1114	738	1275	794	1456	840	1621	888	1805	931	1971
3700	560	916	629	1014	688	1173	747	1344	802	1534	847	1700	895	1884	938	2108
3800	571	981	639	1072	698	1241	756	1422	810	1604	856	1788	901	1971	945	2203
3900	582	1047	649	1140	708	1310	764	1499	816	1674	865	1875	908	2050	953	2300
4000	593	1123	659	1207	717	1387	773	1578	823	1753	875	1962	915	2186	960	2369
4100	605	1207	670	1284	727	1465	781	1648	832	1840	883	2050	924	2291	966	2487
4200	616	1292	680	1361	737	1543	789	1726	841	1927	889	2177	934	2389	972	2587
4300	628	1387	690	1447	747	1621	798	1814	849	2032	896	2265	943	2406	980	2696
4400	639	1482	701	1534	757	1700	807	1910	858	2177	903	2362	951	2603	980	2819
4500	651	1578	712	1630	767	1788	817	2006	866	2265	912	2469	959	2707	980	2946
4600	662	1691	722	1726	777	1884	827	2102	874	2362	921	2587	969	2810	980	3078
4700	674	1796	733	1831	787	1980	836	2256	882	2460	930	2697	972	2913	980	3214
4800	686	1919	744	1945	797	2084	846	2362	891	2569	939	2808	980	3018	980	3354
4900	698	2041	755	2058	808	2188	856	2460	900	2689	948	2922	980	3123	980	3499
5000	710	2172	766	2180	818	2292	866	2578	910	2819	954	3078	980	3277	980	3654

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1 **Boldface** indicates a field-supplied drive is required (See Note 7)
- 2 **Shading** indicates an alternate motor and drive are required.
- 3 **Shading** indicates field-supplied motor and drive are required.
- 4 Maximum usable watts input is 2120 with standard motor and 2615 with alternate motor. 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.

5. Values include losses for filters, unit casing, and wet coils

6. Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify. For additional information on motor performance, refer to Table 6

7. Standard motor drive range: 685 to 935 rpm. Alternate motor drive range: 835 to 1085 rpm. All other rpms require field-supplied drive

8. To convert watts to bhp:

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

$$\text{Motor efficiency} = .80$$

Table 14 – Fan Performance, 50TJ014 – Horizontal Discharge Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)															
	0.2		0.4		0.6		0.8		1.0		1.2		1.4		1.6	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
3700	607	947	670	1113	732	1267	782	1423	833	1565	879	1751	927	1940	973	2123
3800	621	1010	681	1170	742	1332	795	1506	842	1641	889	1819	934	2018	980	2210
3900	636	1073	693	1226	751	1398	808	1590	851	1725	898	1897	942	2105	987	2307
4000	650	1137	705	1291	761	1464	819	1674	861	1811	908	1974	950	2193	994	2405
4100	665	1210	717	1357	772	1548	830	1759	871	1905	917	2070	960	2272	1001	2503
4200	680	1283	728	1431	783	1632	839	1836	883	2009	925	2175	969	2370	1009	2602
4300	696	1365	739	1506	794	1717	848	1914	896	2123	935	2281	979	2468	1018	2701
4400	711	1456	750	1582	805	1811	857	2000	908	2237	945	2387	988	2575	1028	2801
4500	727	1540	762	1666	817	1897	867	2096	919	2343	955	2512	996	2692	1037	2901
4600	742	1641	774	1759	828	1992	877	2193	929	2450	967	2638	1005	2819	1046	3019
4700	758	1742	786	1854	840	2088	888	2307	938	2557	980	2773	1015	2946	1056	3147
4800	773	1845	799	1948	852	2193	899	2423	947	2656	992	2910	1025	3083	1064	3285
4900	789	1957	812	2053	863	2290	910	2548	957	2773	1003	3047	1036	3230	1073	3433
5000	805	2070	826	2166	875	2405	921	2665	966	2891	1014	3184	1049	3396	1083	3590
5100	821	2202	840	2290	887	2521	932	2792	976	3019	1024	3322	1061	3553	1093	3748
5200	837	2325	854	2414	898	2638	943	2928	987	3157	1033	3442	1073	3720	1103	3906
5300	853	2459	868	2539	909	2755	955	3056	998	3304	1042	3572	1084	3878	1115	4157
5400	869	2602	882	2683	920	2891	967	3193	1009	3461	1051	3720	1095	4045	1125	4279
5500	885	2755	897	2828	932	3019	978	3331	1029	3618	1061	3818	1105	4204	1135	4434
5600	901	2910	911	2973	943	3166	990	3470	1031	3775	1071	4018	1114	4344	1145	4599
5700	917	3074	926	3129	956	3313	1002	3618	1042	3943	1081	4186	1123	4458	1155	4764
5800	933	3239	941	3294	968	3470	1013	3775	1053	4111	1092	4372	1132	4651	1165	4929
5900	949	3414	956	3470	981	3637	1025	3934	1065	4279	1103	4558	1142	4833	1175	5094
6000	965	3600	972	3646	995	3804	1037	4102	1075	4444	1114	4745	1152	5013	1185	5259
6100	981	3785	987	3832	1008	3981	1042	4270	1088	4614	1125	4938	1162	5199	1195	5424
6200	997	3981	1002	4018	1022	4167	1053	4439	1099	4793	1136	5132	1173	5386	1205	5599
6300	1014	4186	1018	4223	1036	4363	1065	4624	1112	4984	1147	5329	1184	5579	1215	5774

LEGEND

Bhp — Brake Horsepower

NOTES:

- 1 **Boldface** indicates a field-supplied drive is required (See Note 7)
- 2 **Shading** indicates alternate motor and drive are required
- 3 **Shading** indicates field-supplied motor and drive are required
- 4 Maximum usable watts input is 3775 with standard motor and 4400 with alternate motor. 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

5. Values include losses for filters, unit casing, and wet coils

6. Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify. For additional information on motor performance, refer to Table 6

7. Standard motor drive range: 860 to 1080 rpm. Alternate motor drive range: 900 to 1260 rpm. All other rpms require field-supplied drive.

8. To convert watts to bhp:

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

$$\text{Motor efficiency} = \begin{matrix} 85 \text{ (std)} \\ 87 \text{ (alt)} \end{matrix}$$

START-UP

Unit Preparation — Make sure that unit has been installed in accordance with these 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. Remove the tie-down bands that hold the compressors together on 50TJ014 units.

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

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

Cooling — To start unit, turn on main power supply. 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 unit charge. Refer to Refrigerant Charge section on page 22.

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 (If Accessory Electric Heater is Installed) — To start unit, turn on main power supply.

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

First stage of thermostat energizes the first-stage electric heater; second stage energizes second-stage electric heater elements, if installed. Check air supply grille(s) to ensure proper heat supply.

If unit does not energize, reset limit switch (located on evaporator-fan scroll) by pressing button located between terminals on the switch.

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

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

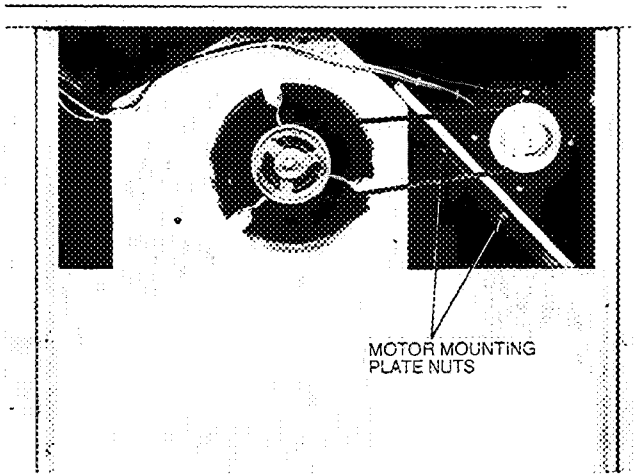


Fig. 26 — Typical Belt-Drive Motor Mounting for Sizes 008,009

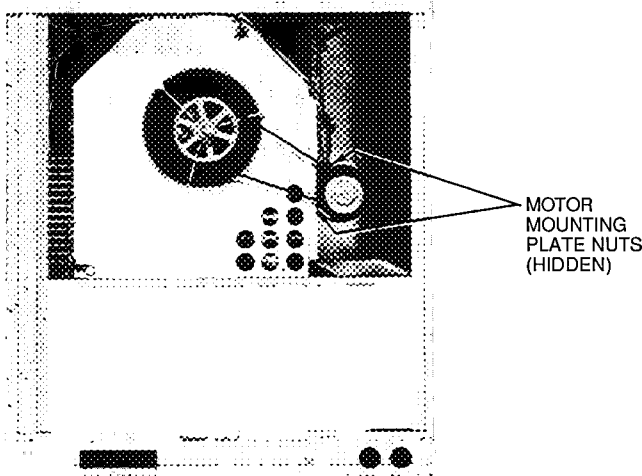


Fig. 27 — Typical Belt-Drive Motor Mounting for Sizes 012,014

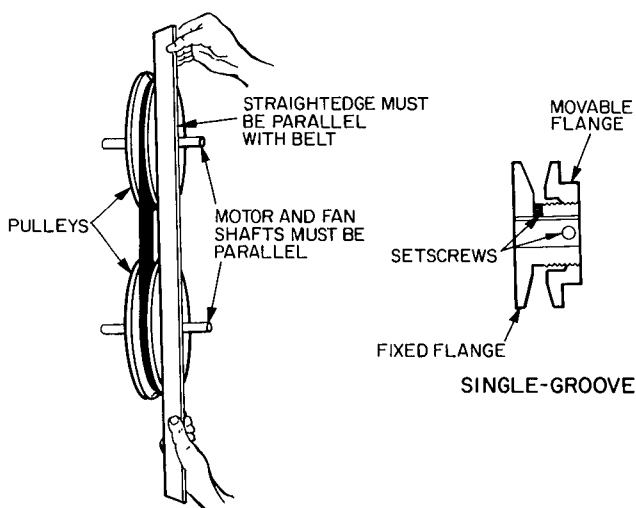


Fig. 28 — Evaporator-Fan Pulley Adjustment

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

Operating Sequence

COOLING, UNITS WITHOUT ECONOMIZER — When thermostat calls for cooling, terminals G and Y1 are energized. The indoor (evaporator) fan contactor (IFC), and compressor contactor no. 1 (C1) are energized and evaporator-fan motor, compressor no. 1, and condenser fan start. The condenser-fan motor runs continuously while unit is cooling. If the thermostat calls for a second stage of cooling by energizing Y2, compressor contactor no. 2 (C2) is energized and compressor no. 2 starts.

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

COOLING, UNITS WITH ECONOMIZER — When the outdoor-air temperature is above the OAT (outdoor-air thermostat) setting and the room thermostat calls for cooling, compressor contactor no. 1 is energized to start compressor no. 1 and the condenser-fan motor. The evaporator-fan motor is energized and the economizer damper moves to the minimum position. Upon a further call for cooling, compressor contactor no. 2 will be energized, starting compressor no. 2. After the thermostat is satisfied, the damper moves to the fully closed position.

When the outdoor-air temperature is below the OAT setting and the thermostat calls for cooling, the economizer dampers move 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 57 F.

When the supply-air temperature falls to 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.

If the outdoor air alone cannot satisfy the cooling requirements of the conditioned space, economizer cooling is integrated with mechanical cooling, providing second-stage cooling. Compressor no. 1 and the condenser fan will be energized and the position of the economizer damper will be determined by the supply-air temperature. Compressor no. 2 is locked out.

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

When the first stage of cooling is satisfied and the indoor (evaporator) fan motor is deenergized, the damper will move to fully closed position.

HEATING, UNITS WITH ECONOMIZER (If Optional or Accessory Heater is Installed) — When the room thermostat calls for heat through terminal W1, the evaporator-fan contactor and heater contactor no. 1 are energized. On units equipped for 2 stages of heat, when additional heat is needed, heater contactor no. 2 is energized through W2. The evaporator-fan motor is energized 45 seconds after heating begins, and the economizer damper moves to the minimum position. When the thermostat is satisfied, the damper moves to the fully closed position.

SERVICE

⚠ CAUTION

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

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

EVAPORATOR COIL

1. Turn unit power off. Remove evaporator coil access panel.
2. If economizer is installed, remove economizer by disconnecting Molex plug and removing economizer mounting screws. Refer to Accessory Economizer Installation Instructions or Optional Economizer section on page 11 for more details.
3. Slide filters out of unit.
4. Clean coil using a commercial coil cleaner or dishwasher detergent in a pressurized spray canister. Wash both sides of coil and flush with clean water. For best results, backflush toward return-air section to remove foreign material.
5. Flush condensate pan after completion.
6. Reinstall economizer and filters.
7. Reconnect wiring.
8. Replace access panels.

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

One-Row Coil — Wash coil with commercial coil cleaner. Clean the outer surfaces with a stiff brush in the normal manner. It is not necessary to remove top panel.

Two-Row Coils — Clean coils as follows:

1. Turn off unit power.
2. Remove top panel screws on condenser end of unit.
3. Remove condenser coil corner post. See Fig. 29. To hold top panel open, place coil corner post between top panel and center post. See Fig. 30.
4. Remove screws securing coil to center post.
5. Remove fastener holding coil sections together at return end of condenser coil. Carefully separate the outer coil section 3 to 4 in. from the inner coil section. See Fig. 31.
6. 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.
7. Secure inner and outer coil rows together with a field-supplied fastener.
8. Reposition the outer coil section and remove the coil corner post between the top panel and center post. Reinstall the coil corner post 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.

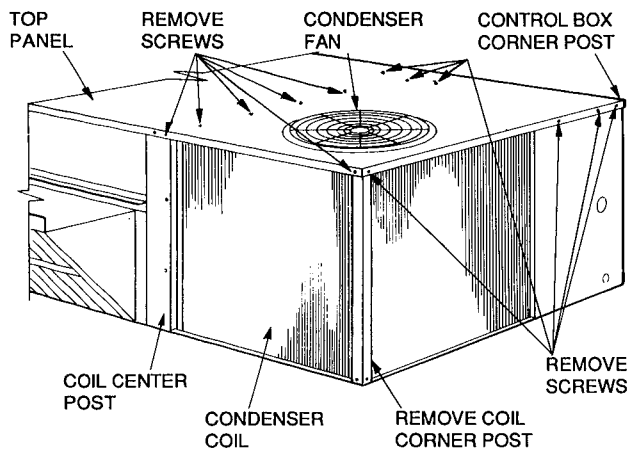


Fig. 29 — Cleaning Condenser Coil

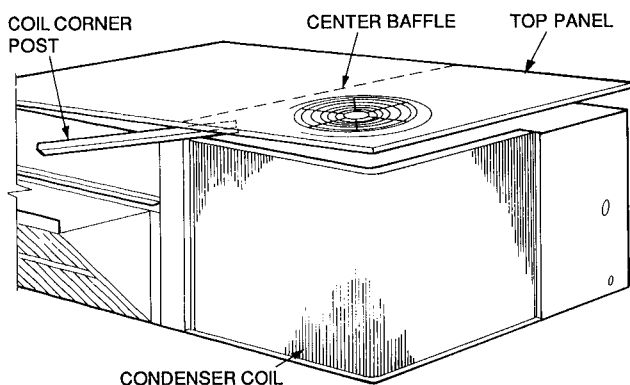


Fig. 30 — Propping Up Top Panel

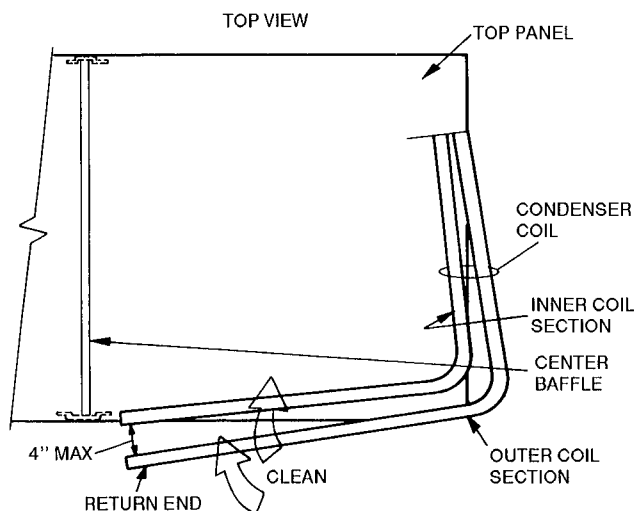


Fig. 31 — Separating Coil Sections

Lubrication

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

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

Condenser-Fan Adjustment (Fig. 32)

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

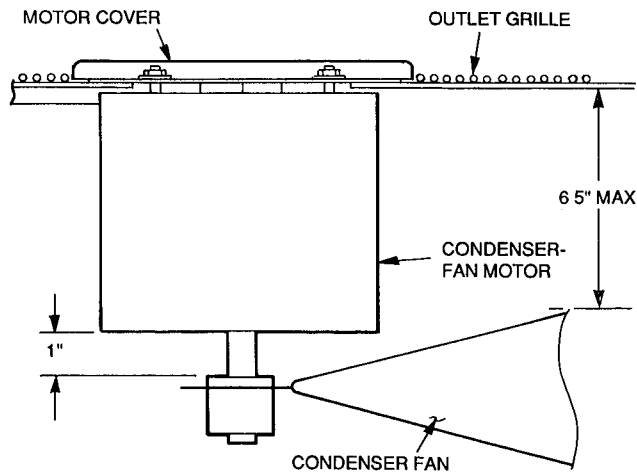


Fig. 32 — Condenser-Fan Adjustment

3. Adjust fan height as shown in Fig. 32.
4. Tighten setscrews.
5. Replace condenser-fan assembly.

Manual Outdoor-Air Damper — If outdoor-air damper blade adjustment is required, see Manual Outdoor-Air Damper section on page 10.

Economizer Adjustment — Refer to Optional Economizer section on page 11.

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

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

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

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

LOW CHARGE COOLING — Use Cooling Charging Charts, Fig. 33-36. Vary refrigerant until the conditions of the appropriate chart are met. Note 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 appropriate chart to determine what suction temperature should be. If suction temperature is high, add refrigerant. If suction temperature is low, carefully reclaim some of the charge. Recheck the suction pressure as charge is adjusted.

Example: (Fig. 36)

Outdoor Temperature	85 F
Suction Pressure	74 psig
Suction Temperature should be	58 F
(Suction Temperature may vary ± 5 F.)	

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

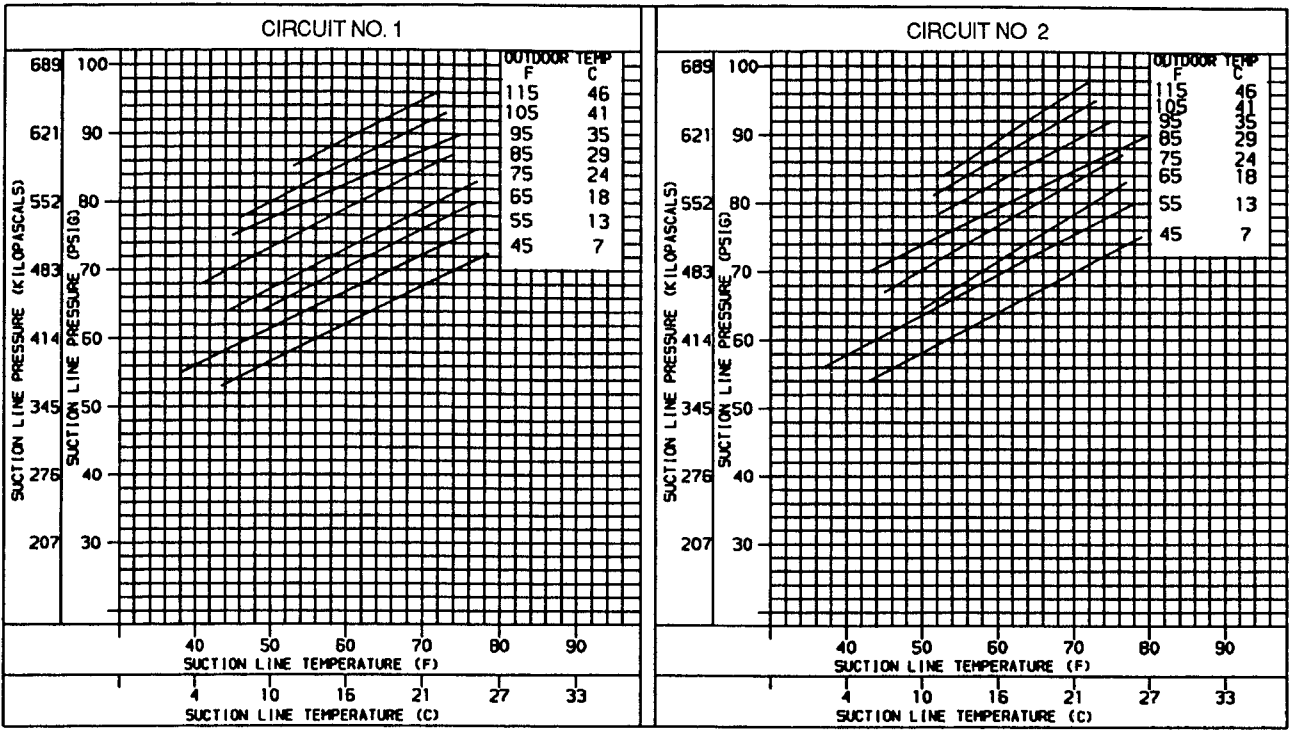


Fig. 33 — Cooling Charging Chart; 50TJ008

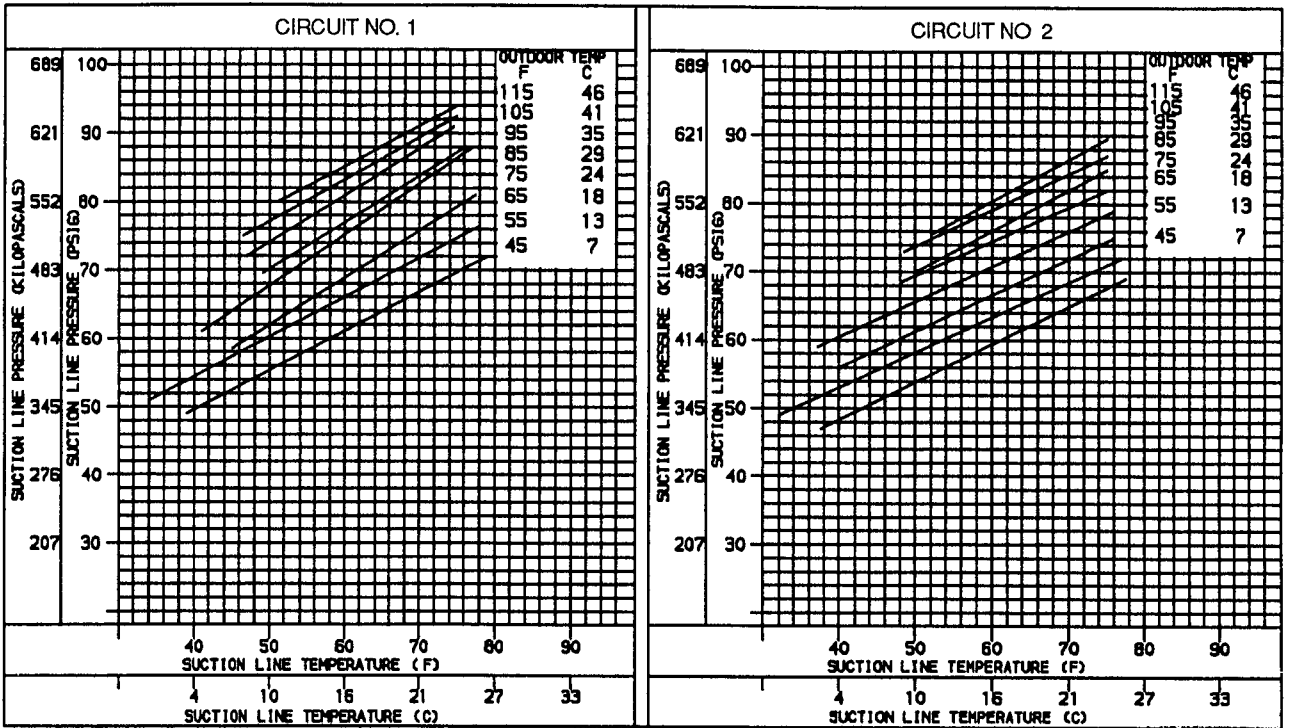


Fig. 34 — Cooling Charging Chart; 50TJ009

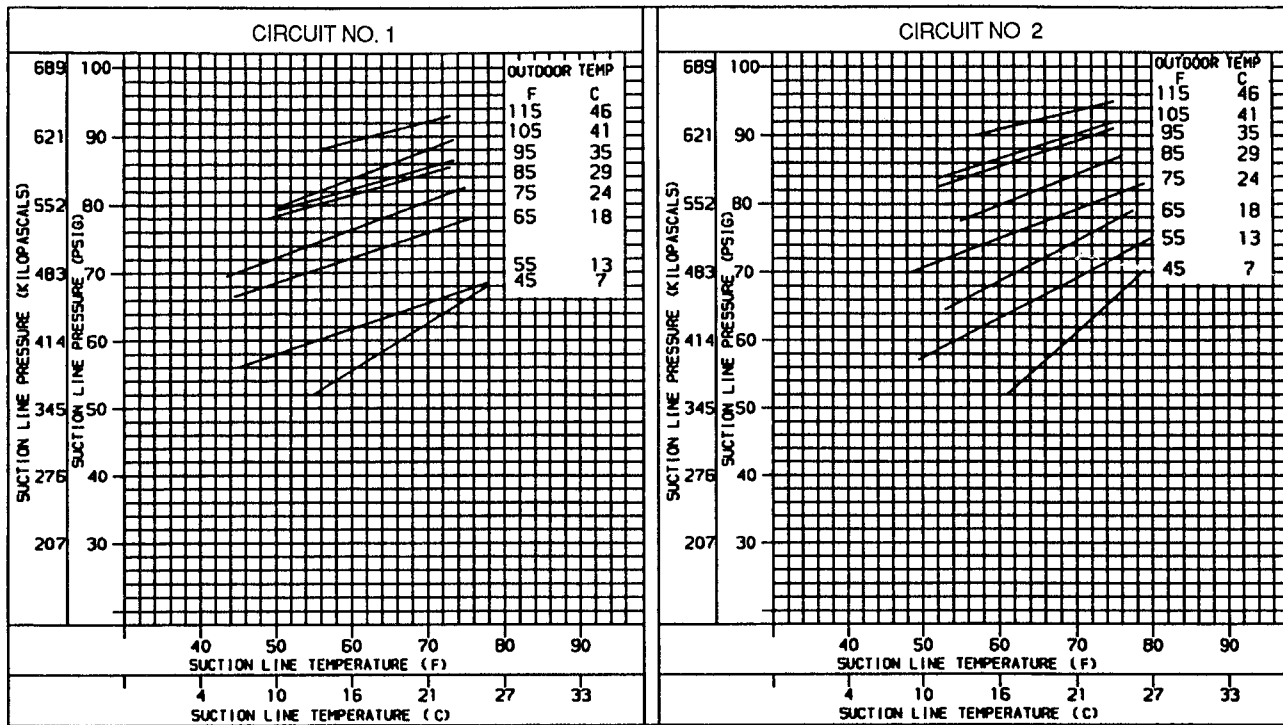


Fig. 35 – Cooling Charging Chart; 50TJ012

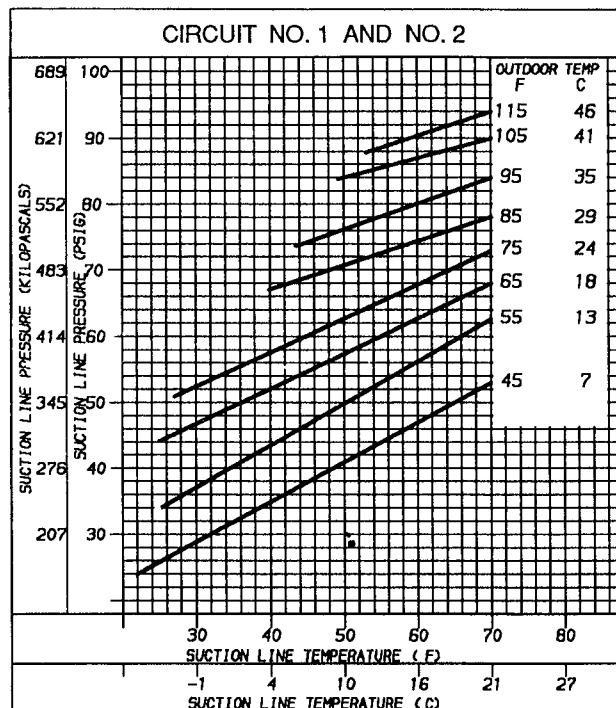


Fig. 36 – Cooling Charging Chart; 50TJ014

TROUBLESHOOTING

Table 15 – Economizer Service Analysis

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

LEGEND

C1 — Common Power
EC — Enthalpy Control
IFC — Indoor (Evaporator) Fan Contactor
IFO — Indoor (Evaporator) Fan On
OAT — Outdoor-Air Thermostat

PL — Plug
SAT — Supply-Air Thermostat
SW — Economizer Position Switch
vac — Volts Alternating Current
vdc — Volts Direct Current

Table 16 – Cooling Service Analysis

PROBLEM	CAUSE	REMEDY
Compressor and condenser fan will not start.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped	Replace fuse or reset circuit breaker
	Defective thermostat, contactor, transformer, or control relay	Replace component
	Insufficient line voltage.	Determine cause and correct.
	Incorrect or faulty wiring	Check wiring diagram and rewire correctly.
	Thermostat setting too high.	Lower thermostat setting below room temperature
Compressor will not start but condenser fan runs.	Faulty wiring or loose connections in compressor circuit.	Check wiring and repair or replace.
	Compressor motor burned out, seized, or internal overload open.	Determine cause Replace compressor.
	Defective run/start capacitor, overload, or 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	Reclaim refrigerant, evacuate system, and recharge to nameplate.
	Defective compressor	Replace and determine cause
	Insufficient line voltage.	Determine cause and correct.
	Blocked condenser.	Determine cause and correct.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace
	Defective thermostat	Replace thermostat
	Faulty condenser-fan motor or capacitor	Replace.
Compressor operates continuously.	Restriction in refrigerant system	Locate restriction and remove.
	Dirty air filter.	Replace filter.
	Unit undersized for load.	Decrease load or increase unit size.
	Thermostat set too low.	Reset thermostat.
	Low refrigerant charge	Locate leak, repair, and recharge.
	Leaking valves in compressor.	Replace compressor.
	Air in system.	Reclaim refrigerant, evacuate system, and recharge.
Excessive head pressure.	Condenser coil dirty or restricted	Clean coil or remove restriction
	Dirty air filter.	Replace filter
	Dirty condenser coil.	Clean coil.
	Refrigerant overcharged	Remove excess refrigerant
	Air in system.	Reclaim refrigerant, evacuate system, and recharge.
Head pressure too low.	Condenser air restricted or air short-cycling.	Determine cause and correct
	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.	Reclaim excess refrigerant.
Suction pressure too low.	Dirty air filter.	Replace filter.
	Low refrigerant charge	Check for leaks, repair, and recharge.
	Metering device or low side restricted	Remove source of restriction.
	Insufficient evaporator airflow.	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
Compressor no. 2 will not run.	Field-installed filter drier restricted	Replace
	Unit in economizer mode	Proper operation; no remedy necessary.

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)

- ☐ REMOVE ALL SHIPPING HOLDDOWN BOLTS AND BRACKETS PER INSTALLATION INSTRUCTIONS
- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED AS SHOWN IN THE INSTALLATION INSTRUCTIONS
- ☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS
- ☐ CHECK THAT INDOOR AIR FILTERS ARE CLEAN AND IN PLACE
- ☐ VERIFY THAT UNIT INSTALLATION IS LEVEL WITHIN TOLERANCES LISTED IN THE INSTALLATION INSTRUCTIONS
- ☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS
- ☐ CHECK PULLEY ALIGNMENT AND BELT TENSION; REFER TO INSTALLATION INSTRUCTIONS

III. START-UP

ELECTRICAL

SUPPLY VOLTAGE	L1-L2	_____	L2-L3	_____	L3-L1	_____
CIRCUIT #1 COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
CIRCUIT #2 COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
INDOOR FAN AMPS	L1	_____	L2	_____	L3	_____

TEMPERATURES

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

PRESSURES

	CIRCUIT #1		CIRCUIT #2	
REFRIGERANT SUCTION	_____ PSIG		_____ PSIG	
REFRIGERANT DISCHARGE	_____ PSIG		_____ PSIG	

- ☐ VERIFY REFRIGERANT CHARGE USING COOLING CHARGING CHARTS ON PAGES 23 AND 24.

CUT ALONG DOTTED LINE