

# 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 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

### Step 1 – Provide Unit Support

**ROOF CURB** — Assemble and install accessory roof curb in accordance with instructions shipped with the curb. Accessory roof curb and information required to field fabricate a roof curb are shown in Fig. 1 and 2. Install insulation, cant strips, roofing, and counter flashing as shown. Ductwork can be secured to roof curb before unit is set in place.

**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 result in air leaks and poor unit performance.

Curb should be level. This is necessary to permit unit drain to function properly. Unit leveling tolerance is  $\pm 1/16$  in. per linear ft in any direction. Refer to Accessory Roof Curb Installation Instructions for additional information as required.

**ALTERNATE UNIT SUPPORT** — When the curb cannot be used, support unit with sleepers using unit curb support area. If sleepers cannot be used, support long sides of unit with a minimum of 3 equally spaced 4-in. x 4-in. pads on each side.

**Step 2 – Rig and Place Unit** — Inspect unit for transportation damage. File any claim with transportation agency. Keep unit upright, and do not drop. Use spreader bars over unit to prevent sling or cable damage. Rollers may be used to move unit across a roof. Level by using unit frame as a reference; leveling tolerance is  $\pm 1/16$  in. per linear ft in any direction. See Fig. 1 for additional leveling tolerance information. Unit weight is shown in Table 1.

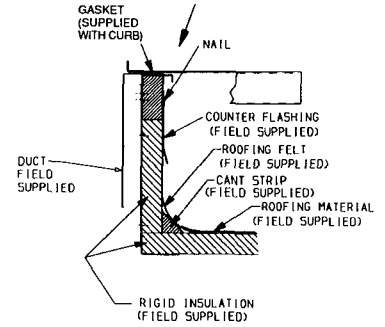
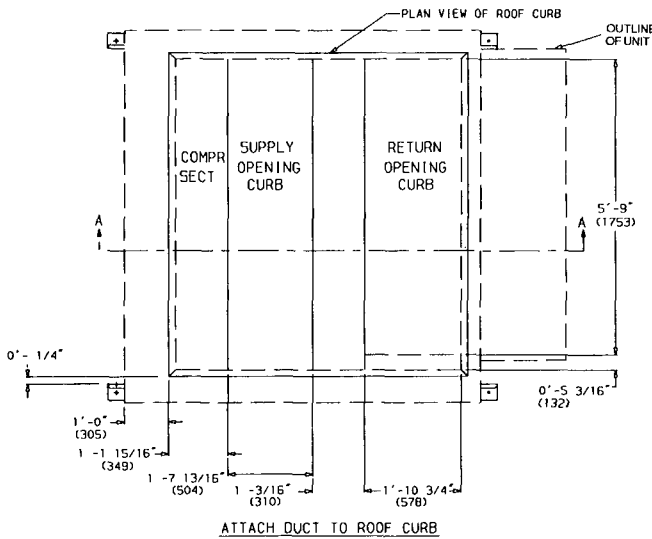
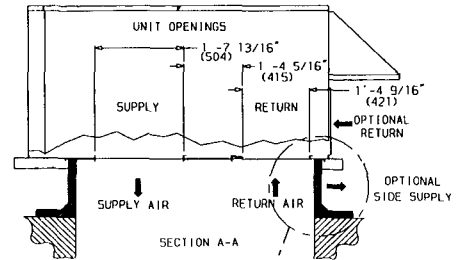
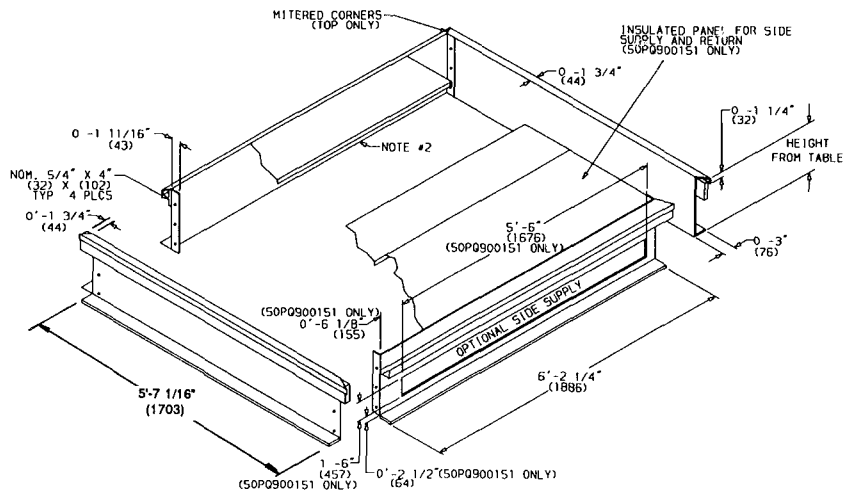
Four lifting holes are provided in ends of unit base rails as shown in Fig. 3. Refer to rigging instructions on unit.

**POSITIONING** — Provide clearance around and above unit for airflow, safety, and service access (Fig. 4).

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

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

**ROOF MOUNT** — Check building codes for weight distribution requirements.



NOTE: To prevent the hazard of stagnant water build-up in the drain pan of the indoor-air section, unit can only be pitched as shown.

ACCESSORY PACKAGE NO.	CURB HEIGHT	DESCRIPTION
50PQ900221	1'-2" (305)	Standard Curb — 14" High
50PQ900141	2'-0" (610)	Standard Curb for Units Requiring High Installation
50PQ900151	2'-0" (610)	Horizontal Supply and Return Curb

LEGEND

COMP SECT. — Compressor Section

NOTES:

- 1 Roof curb accessory is shipped unassembled.
- 2 Insulated panels, 1-in thick neoprene-coated, 1½ lb density.
- 3 Dimensions in ( ) are in millimeters.
- 4 Direction of airflow.
- 5 Roof curb 16 gage steel.

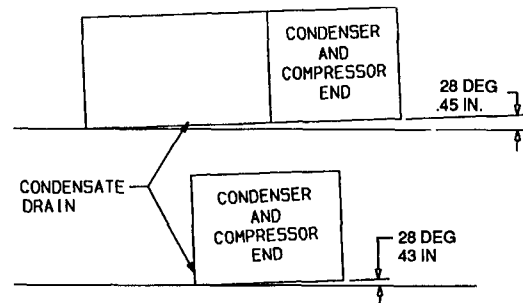
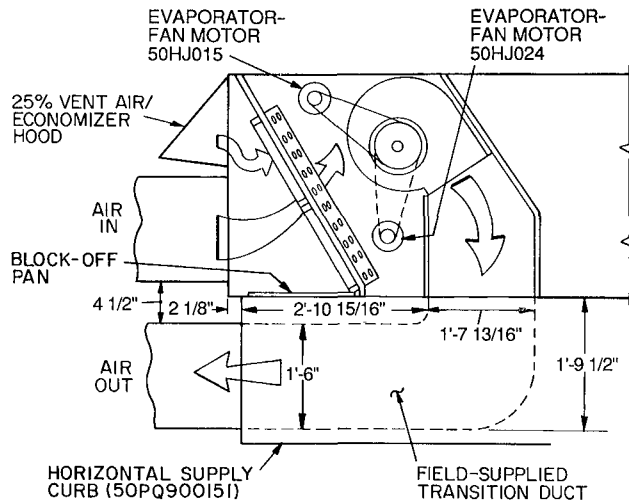
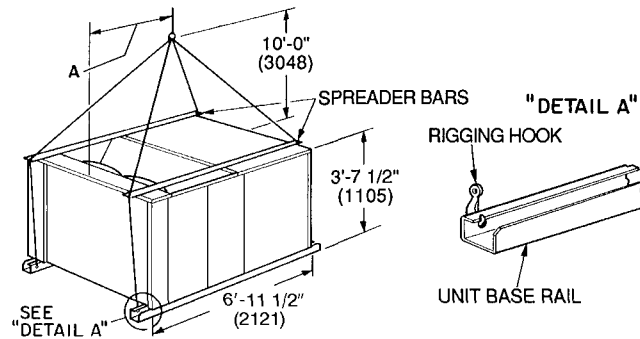


Fig. 1 — Roof Curb Details



**Fig. 2 – Horizontal Supply/Return Curb Details**



UNIT 50HJ	MAXIMUM SHIPPING WEIGHT	
	Lb	Kg
015	1700	771
024	2310	1048

**DIMENSION A**

UNIT 50HJ	Ft-in.	mm
015	3-0	914
024	3-4 1/2	1029

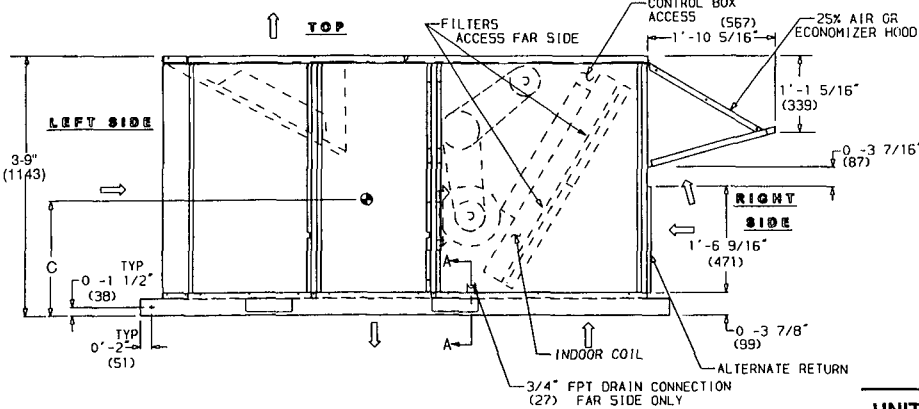
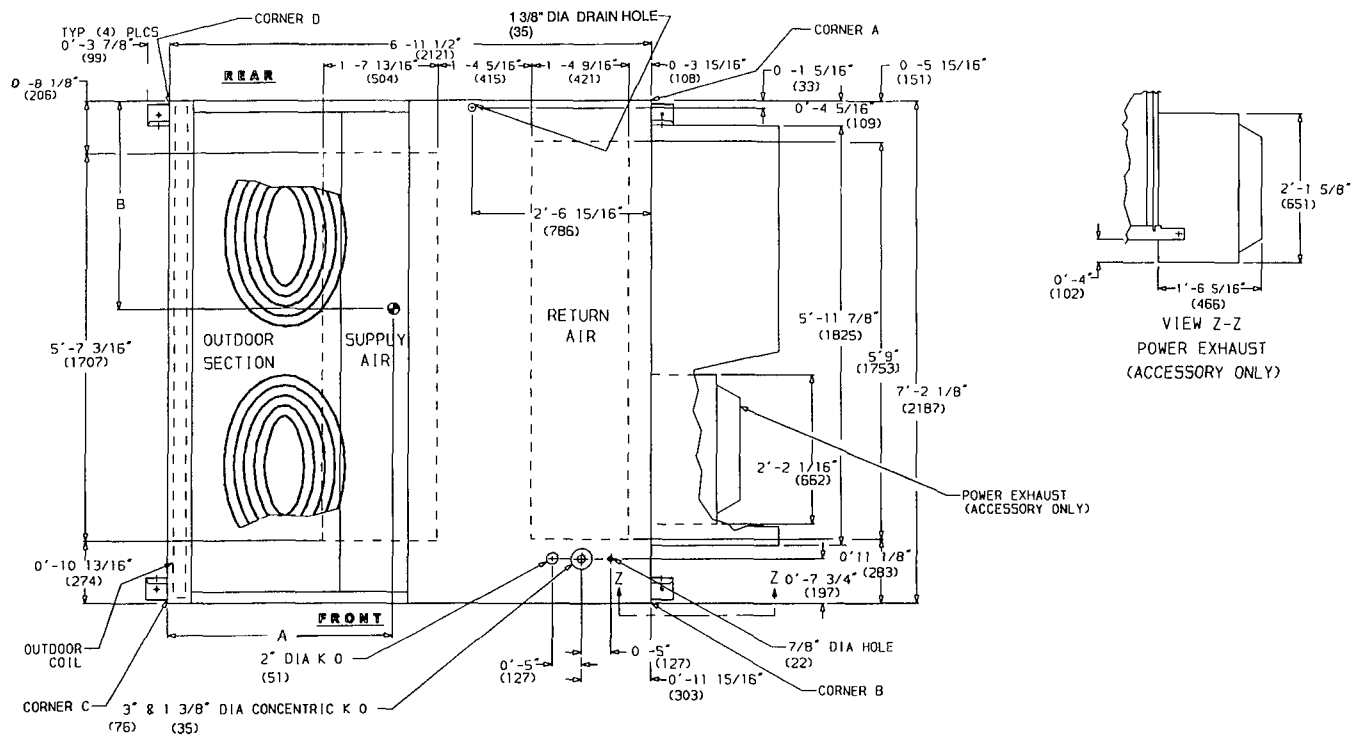
**NOTES:**

1. Dimensions in ( ) are in millimeters
2. Refer to Table 1 for unit operating weights.
3. Remove boards at ends of unit and runners prior to rigging.
4. Rig by inserting hooks into unit base rails as shown. Use corner post from packaging to protect coil from damage. Use bumper boards for spreader bars.
5. Weights do not include optional economizer. See Table 1 for economizer weight.
6. Weights given are for aluminum evaporator coil plate fins and copper condenser coil plate fins. Weights of other metal combinations are listed in Table 1.

**⚠ CAUTION**

All panels must be in place when rigging.

**Fig. 3 – Rigging Details**



**DIMENSIONS**

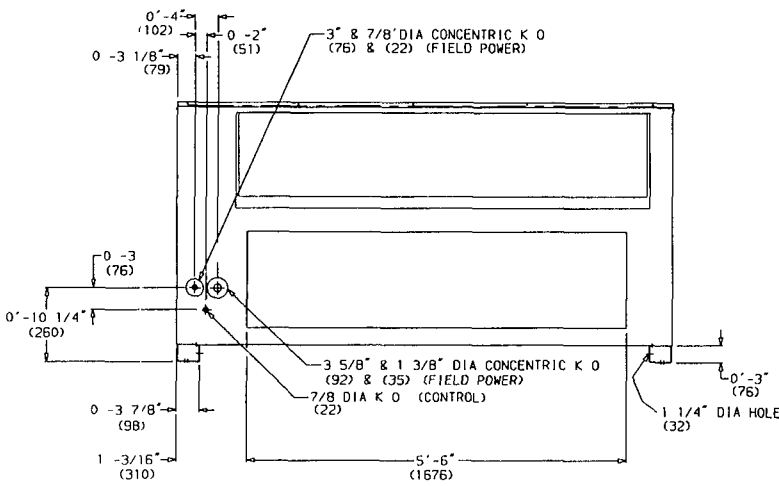
UNIT	A		B		C	
	Ft-in.	mm	Ft-in.	mm	Ft-in.	mm
015	3-0	914	2-9	838	1-10	559
024	3-4 <sup>3</sup> / <sub>4</sub>	1035	3-7	1092	1-8	508

**LEGEND**

**KO** — Knockout

**NOTES:**

- Dimensions in ( ) are in millimeters
- Center of gravity.
- Direction of airflow.
- Ductwork to be attached to accessory roof curb only.
- Minimum clearance:
  - Rear: 7'-0" (2134) for coil removal. This dimension can be reduced to 4'-0" (1219) if conditions permit coil removal from the top
  - Left side: 4'-0" (1219) for proper condenser coil airflow
  - Front: 4'-0" (1219) for control box access
  - Right side: 4'-0" (1219) for proper operation of damper and power exhaust (if so equipped).
  - Top: 6'-0" (1829) to assure proper condenser fan operation.
  - Local codes or jurisdiction may prevail.
- With the exception of clearance for the condenser coil and the damper/power exhaust as stated in note no 5, a removable fence or barricade requires no clearance
- Dimensions are from outside of corner post. Allow 0'-<sup>5</sup>/<sub>16</sub>" (8) on each side for top cover drip edge



UNIT	CORNER WEIGHT*							
	A		B		C		D	
	Lb	Kg	Lb	Kg	Lb	Kg	Lb	Kg
015	390	177	243	110	322	146	515	234
024	492	233	511	232	504	229	523	237

\*Weights are for unit only (with aluminum evaporator and condenser coil fins) and do not include options or crating

**Fig. 4 — Base Unit Dimensions**

**Table 1 – Physical Data**

UNIT SIZE 50HJ	015	024
<b>OPERATING WT (lb)</b>		
Al/Al*	1470	2030
Unit Al/Cu*	1550	2160
Cu/Cu*	1630	2270
Economizer	110	110
Roof Curb†	200	200
<b>COMPRESSOR</b>	06D824 Semi-Hermetic — 6 Cylinders	
Number	1	2
Oil (oz)152	152	152 ea
<b>REFRIGERANT</b>	R-22	
Charge (lb)** Sys 1, Sys 2	20.8, —	16.25, 16.25
<b>REFRIGERANT METERING DEVICE</b>	Capillary Tubes	
Upper Circuit		
No. ...Length (in.)...ID/OD	6...25...0 055/0.125 6... 25...0 055/0.125 6...25...0 055/0.125	13. 25 .0.055/0.125
Lower Circuit		
No. ...Length (in.)...ID/OD	—	13...25.. 0.055/0 125
<b>CONDENSER COIL</b>	Copper Tubes, Aluminum or Copper Plate Fins	
Rows	3	4
Fins/in.	13.6 Al or 12.4 Cu	13.6 Al or 12.4 Cu
Total Face Area (sq ft)	18.9	22.2
<b>CONDENSER FAN</b>	Propeller Type, Direct Drive	
Nominal Cfm	12,000	11,400
Number...Diameter (in.)	2...26	2 .26
Motor Hp (1075 Rpm)	1	1
Watts Input (Total)	2672	3000
<b>EVAPORATOR COIL</b>	Copper Tubes, Aluminum or Copper Plate Fins	
Rows	3	4
Fins/in.	14.3 Al or 13.1 Cu	14.4 Al or 13.1 Cu
Total Face Area (sq ft)	16.5	17.9
<b>EVAPORATOR FAN</b>	Centrifugal, Fixed Pitch Belt Drive	
Quantity...Size (in.)	2.. 10 x 10	2...12 x 12
Nominal Cfm	5000	8000
Maximum Allowable Rpm	1550	1500
Motor Pulley Pitch Diameter (in.)	3 4-4.4	6.10
Fan Pulley Pitch Diameter (in.)	6.0	8.40
Belt, Quantity...Type...Length (in.)	1 .V...41	1. BX.. 51
Factory Speed Setting (Rpm)	1092	1287
Motor Hp (Service Factor)	3 (1.15)	7½ (1.15)
Motor Frame Size	56	184T
<b>HIGH-PRESSURE SWITCH</b>		
Cutout (psig)		426
Reset (psig)		320
<b>LOW-PRESSURE SWITCH</b>		
Cutout (psig)		7
Reset (psig)		22
<b>AIR INLET SCREENS</b>		
Economizer, Quantity...Size (in.)		2 20 x 25 x 1 1 20 x 20 x 1
<b>RETURN-AIR FILTERS (TYPE)</b>	10% Efficient — 2-in Throwaway Fiberglass	
Quantity... Size (in.)	2...20 x 20 x 2 3...16 x 20 x 2 2...16 x 25 x 2	4.. 20 x 20 x 2 4.. 16 x 20 x 2

**LEGEND**

Al — Aluminum  
Cu — Copper

\*Evaporator coil fin material/condenser coil fin material.

†Weight of 14 in. roof curb.

\*\*System 1 consists of the upper portion of condenser coil and intertwined evaporator coil, and System 2 consists of the lower portion of the condenser coil and intertwined evaporator coil

NOTE: The 50HJ015 has adjustable pulleys The 50HJ024 has one set (2) of fixed pulleys

**Step 3 – Field Fabricate Ductwork** – Secure all ducts to building structure. Use flexible duct connectors between unit and ducts as required. 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.

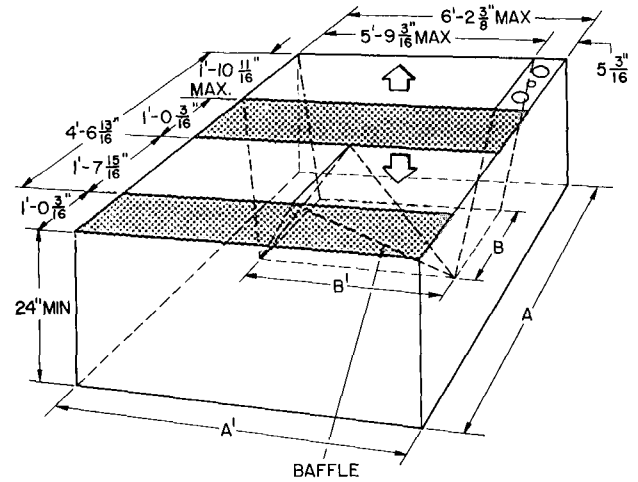
The 50HJ units with electric heat require a 1-in. clearance for the first 24 in. of ductwork.

Outlet grilles must not lie directly below unit discharge.

**Step 4 – Make Unit Duct Connections** – Unit is shipped for through-the-bottom duct connections. Ductwork openings are shown in Fig. 5. Field-fabricated concentric ductwork may be connected as shown in Fig. 6 and 7. Attach all ductwork to roof curb and roof curb basepans. Refer to installation instructions shipped with accessory roof curb for more information.

**Step 5 – Trap Condensate Drain** – See Fig. 4 and 8 for drain location. Plug is provided in drain hole and must be removed when unit is operating. One 3/4-in. half

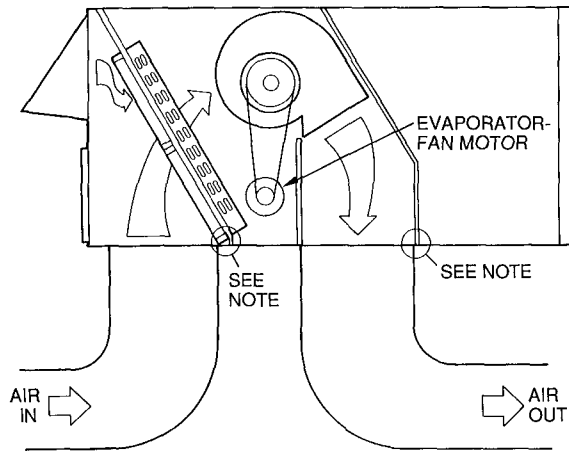
coupling is provided inside unit evaporator section for condensate drain connection. An 8 1/2 in. x 3/4-in. diameter nipple and a 2-in. x 3/4-in. diameter pipe nipple are coupled to standard 3/4-in. diameter elbows to provide a straight path down through holes in unit base rails (see Fig. 9). A trap at least 4-in. deep must be used.



Shaded area indicates block-off panels.

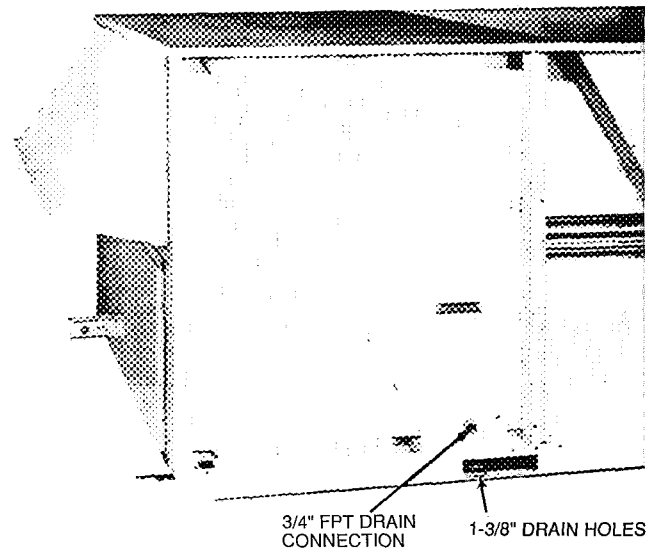
NOTE: Dimensions A, A' and B, B' are obtained from field-supplied ceiling diffuser

**Fig. 7 – Concentric Duct Details**

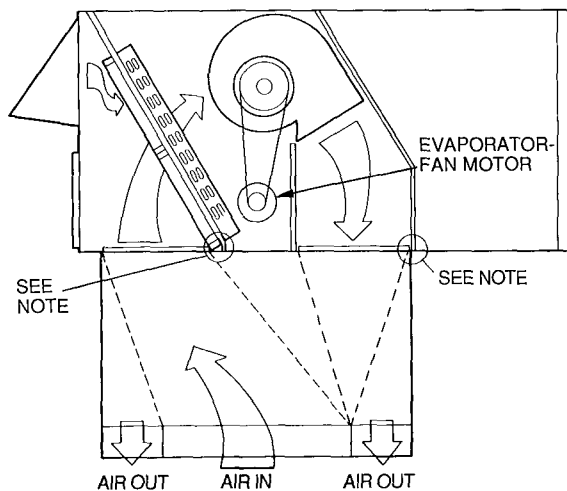


NOTE: Do not drill in this area, as damage to basepan may result in water leak.

**Fig. 5 – Air Distribution – Through-the-Bottom (50HJ024 Shown)**

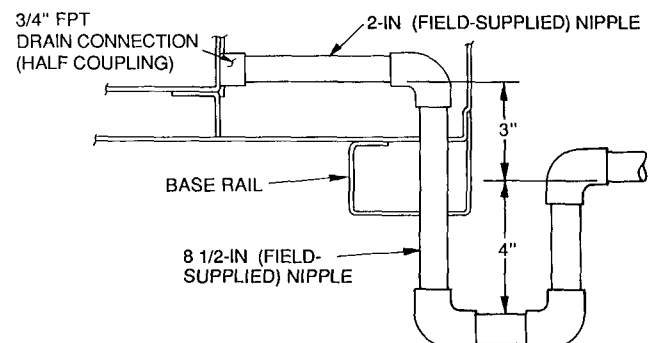


**Fig. 8 – Condensate Drain Details**



NOTE: Do not drill in this area, as damage to basepan may result in water leak.

**Fig. 6 – Concentric Duct Air Distribution (50HJ024 Shown)**



**Fig. 9 – Condensate Drain Piping Details**

## Step 6 – Make Electrical Connections

**FIELD POWER SUPPLY** — Unit is factory wired for voltage shown on nameplate.

When installing units, provide a disconnect, per NEC (National Electrical Code) requirements, of adequate size (Table 2).

All field wiring must comply with NEC and local requirements.

Route power lines through control box access panel or unit basepan (Fig. 4) to connections as shown on unit wiring diagram and Fig. 10.

Transformer no. 1 is wired for 230-v unit. If 208/230-v unit is to be run with 208-v power supply, the transformer must be rewired as follows:

1. Remove cap from red (208 v) wire.
2. Remove cap from orange (230 v) spliced wire.
3. Replace orange wire with red wire
4. Recap both wires.

**IMPORTANT: BE CERTAIN UNUSED WIRES ARE CAPPED.** Failure to do so may damage the transformers.

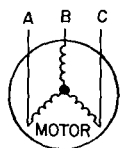
Operating voltage to compressor must be within voltage range indicated on unit nameplate. On 3-phase units, voltages between phases must be balanced within 2% and the current must be balanced within 10%.

Use the following formula to determine the percentage of voltage imbalance.

Percentage of 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.

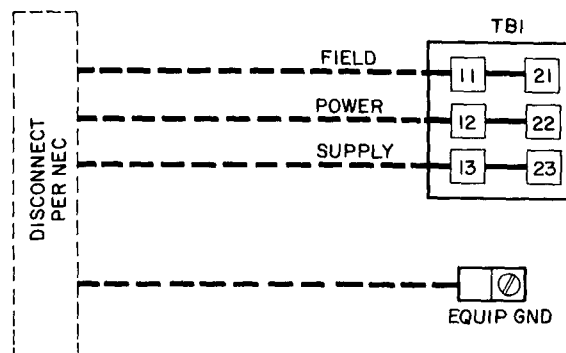
Determine the percentage of voltage imbalance:

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

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.**

Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components.



**TB1 MAXIMUM WIRE SIZE**

UNIT 50HJ	VOLTAGE		
	208/230	460	575
015	350 kcmil	2/0	2/0
024	350 kcmil	2/0	2/0

### LEGEND

**EQUIP** — Equipment  
**GND** — Ground  
**kcmil** — Thousand Circular Mills  
**NEC** — National Electrical Code  
**TB** — Terminal Block

**Fig. 10 – Field Power Wiring Connections**

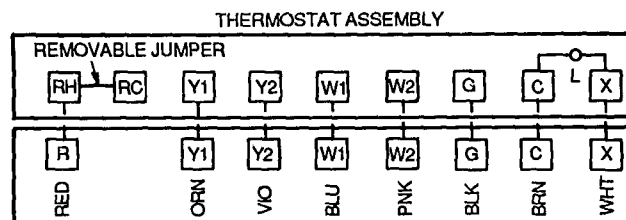
**FIELD CONTROL WIRING** — Install a Carrier-approved accessory thermostat assembly according to the installation instructions included with the accessory. Locate thermostat assembly on a solid wall in the conditioned space to sense average temperature.

Route thermostat cable or equivalent single leads of no. 18 AWG (American Wire Gauge) colored wire from subbase terminals through conduit in unit to low-voltage connections as shown on unit label wiring diagram and in Fig. 11.

**NOTE:** For wire runs up to 50 ft, use no. 18 AWG 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.

Set heat anticipator settings as indicated in Table 3. Settings may be changed slightly to provide a greater degree of comfort for a particular installation.

Refer to accessory remote control instructions as required.



**Fig. 11 – Field Control Thermostat Wiring**

**Table 2 – Electrical Data**

UNIT 50HJ	V-PH-HZ	VOLTAGE RANGE		COMPRESSOR				CONDENSER FAN MOTOR		EVAPORATOR FAN MOTOR		ACCESSORY/OPTIONAL ELECTRIC HEATERS*		POWER SUPPLY	
				No. 1		No. 2		Qty	FLA	Hp	FLA	FLA	kW	MCA	MOCPT†
		Min	Max	RLA	LRA	RLA	LRA								
015	208/230-3-60	187	253	49 3	191	—	—	2	7 7	3	10 5	39/ 45 72/ 82 117/135	14/19 26/34 42/56	88/ 88 88/ 88 103/116 159/148	100/100 100/100 110/125 175/175
	460-3-60	414	508	22 1	86	—	—	2	3 3	3	4 8	18 39 66	15 32 55	39 55 72	45 45 60 80
	575-3-60	518	632	17 9	69	—	—	2	2 6	3	3 9	— 37	— 37	32 52	35 60
024	208/230-3-60	187	253	43 9	170	43 9	170	2	5 4 (ea)	7½	24 2/22 0	72/ 82 117/135 156/180**	26/34 42/56 56/75**	134/132 134/132 177/163 186/208**	175/175 175/175 200/175 200/225**
	460-3-60	414	508	19 9	77	19 9	77	2	2 7 (ea)	7½	11 0	39 66 96**	32 55 80**	62 62 80 110**	80 80 90 110**
	575-3-60	518	632	15 9	62	15 9	62	2	3 4 (ea)	7½	9 0	—	—	52	60

**LEGEND**

- FLA — Full Load Amps
- HACR — Heating, Air Conditioning and Refrigeration
- LRA — Locked Rotor Amps
- MCA — Minimum Circuit Amps
- MOCPT — Maximum Overcurrent Protection
- NEC — National Electrical Code
- RLA — Rated Load Amps

\*Heater capacity (kW) 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. This is the maximum size permissible; smaller fuse size may be used where conditions permit.

†Fuse or HACR circuit breaker  
\*\*Heaters are field installed only

**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. The Canadian units may be fuse or circuit breaker.
2. MCA calculation for units with electric heaters over 50 kW = (1.25 x IFM amps) + (1.00 x heater FLA).



**Table 3 – Heat Anticipator Settings**

UNIT	VOLTAGES	kW	STAGE 1	STAGE 2
50HJ 015	208/230	14/17	40	—
		26/31	40	40
		42/52	66	40
50HJ 024	208/230,575-3-60	15	40	—
		30	40	40
		51	40	66
50HJ 024	208/230,575-3-60	26/31	40	66
		42/52	66	40
		56/69	66	66
50HJ 024	460-3-60	30	40	40
		51	40	66
		73	66	66

**Step 7 – Make Outdoor-Air Inlet Adjustments**

**MANUAL OUTDOOR-AIR DAMPER** — All units (except those equipped with a factory-installed economizer) have a manual outdoor-air damper to provide ventilation air. Damper can be preset to admit up to 25% outdoor air into return-air compartment. To adjust, loosen securing screws and move damper to desired setting. Then retighten screws to secure damper (Fig. 12).

**OPTIONAL FACTORY-INSTALLED ECONOMIZER**

**Economizer Motor Control Module (Fig. 13-15)** — Set to the "D" setting (Fig. 14). The control module is located on the economizer motor. See Fig. 13 and 15.

**Damper Vent Position Setting**

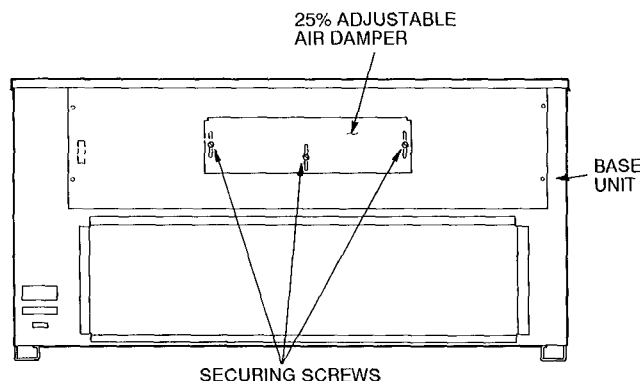
1. Set fan switch at ON position (continuous fan operation) and close night switch if used.
2. Set system selector switch to OFF position.
3. Turn adjustment screw slowly until dampers assume desired vent position. *Do not manually operate economizer motor since damage to motor will result.*

**NOTE:** Refer to accessory installation instructions included with the field-installed economizer for installation information. Also see Accessory Field-Installed Economizer Adjustment section on page 10.

**Step 8 – Install Outdoor-Air Hood** — The same type of factory-installed hood is used on units with 25% air ventilation and units with an economizer.

**NOTE:** The hood top panel, upper and lower filter retainers, hood drain pan, baffle (024 only), and filter support bracket are secured opposite the condenser end of the unit. The screens, hood side panels, remaining section of filter support bracket, seal strip, and all other hardware are in a package located inside the return-air filter access panel (Fig. 16)

1. Attach seal strip to upper filter retainer. See Fig. 17.
2. Assemble hood top panel and side panels, upper filter retainer, and hood drain pan (Fig. 18)
3. Secure lower filter retainer and long piece of filter support bracket to unit. See Fig. 18. Leave screws on 024 units loose
4. 50HJ024 Units Only: Slide baffle behind lower filter retainer and tighten screws.
5. Loosen sheet metal screws for base unit top panel located above outdoor-air inlet opening.



**Fig. 12 – 25% Outdoor-Air Section Details**



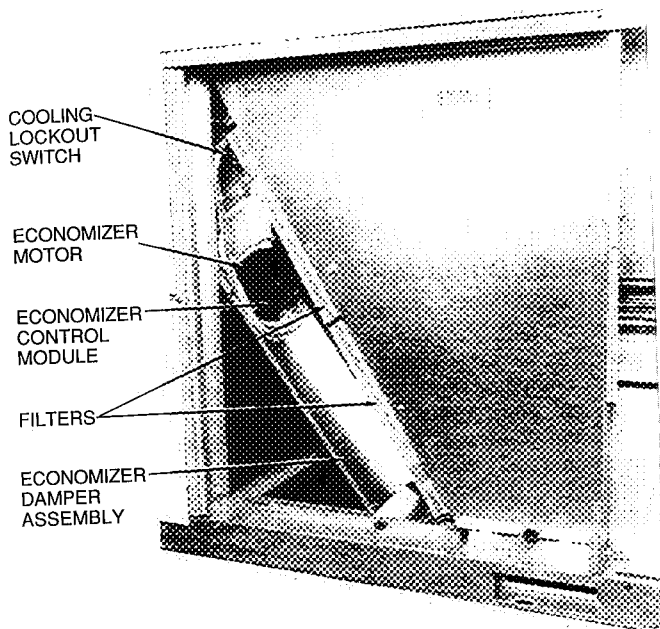
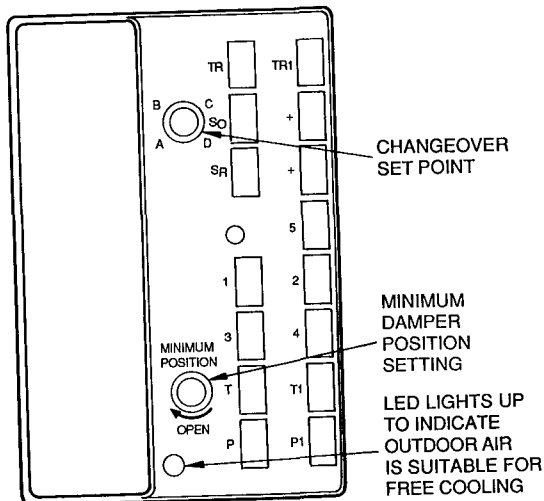


Fig. 13 - Economizer Damper Assembly - End View



LED - Light-Emitting Diode

Fig. 14 - Economizer Control Module

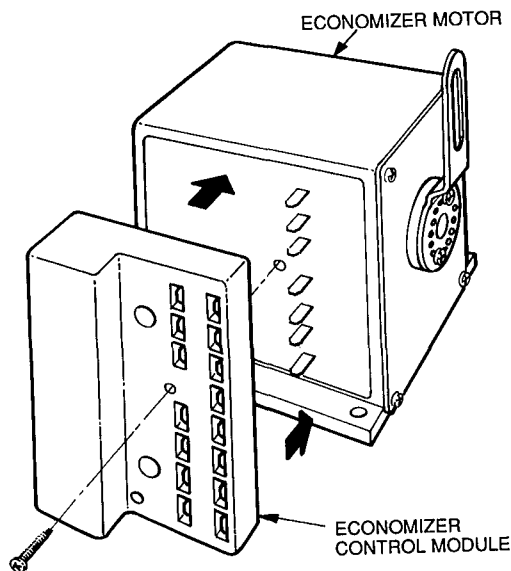


Fig. 15 - Economizer Control Module Location

6. Match notches in hood top panel to unit top panel screws. Insert hood flange between unit top panel flange and unit. Tighten screws.
7. Insert outdoor-air inlet screens and spacer in channel created by lower filter retainer and filter support bracket.
8. Attach remaining shorter section section of filter support bracket.

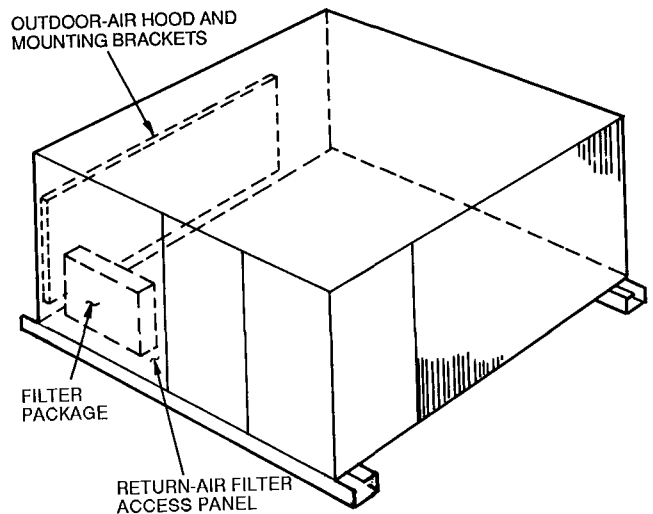


Fig. 16 - Outdoor-Air Hood Component Location

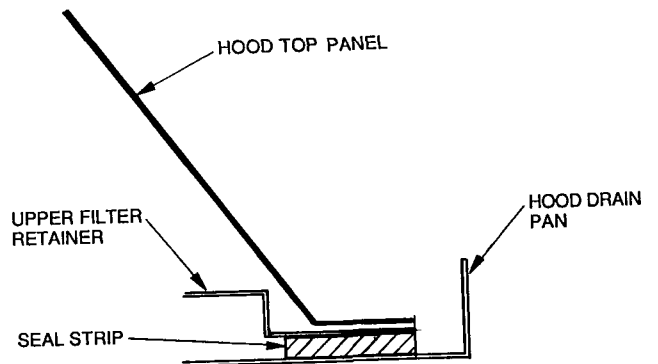


Fig. 17 - Seal Strip Location (Air Hood Cross-Sectional View)

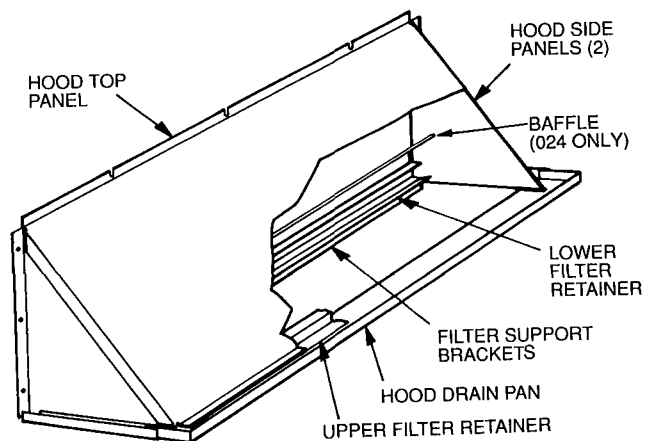


Fig. 18 - Outdoor-Air Hood Details

## START-UP

Use the following information and Start-Up Checklist on page CL-1 to check out unit PRIOR to start-up.

**Unit Preparation** — Check that unit has been installed in accordance with these installation instructions and all applicable codes.

**Compressor Mounting** — Loosen compressor hold-down bolts until sideways movement of the washer under each hold-down bolt head can be obtained. Do not loosen completely, as bolts are self-locking and will maintain adjustment.

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

**Refrigerant Service Ports and Valves** — Each 50HJ unit has 2 Schrader-type service ports per circuit; one on the suction line and one on the liquid line. Be sure that the caps on the ports are tight. The units also have 2 service valves per circuit; one on the suction line and one on the discharge line. Be sure all valves are open.

**Crankcase Heaters** — Heaters are energized as long as there is power to unit.

**IMPORTANT:** Unit power must be on for 24 hours prior to start-up. Otherwise, damage to compressor may result.

**Evaporator Fan** — Fan belt and pulleys are factory installed. Remove tape from the fan pulley and adjust pulleys on 50HJ015 units as required. See Evaporator-Fan Performance Adjustment section on page 12. See Table 4 for Air Quantity Limits. See Tables 5, 6A, and 6B for Fan Performance data. Be sure that fans rotate in the proper direction. See Table 7 for Static Pressure Drops for accessories and options. To alter fan performance, see Evaporator-Fan Performance Adjustment sections, pages 12 and 13.

**Table 4 — Air Quantity Limits**

UNIT 50HJ	MINIMUM CFM	MAXIMUM CFM
015	3750	6,250
024	6000	10,000

**Condenser Fans and Motors** — Fans and motors are factory set. Refer to Service, Condenser-Fan Adjustment section as required.

**Return-Air Filters** — Check that correct filters are installed in filter tracks. See Table 1. Do not operate unit without return-air filters.

**Outdoor-Air Inlet Screens** — Outdoor-air inlet screens must be in place before operating unit.

**Accessory Field-Installed Economizer Adjustment** — Remove filter access panel. Check that outdoor-air damper is closed and return-air damper is open.

Economizer operation and adjustment is described in Start-Up, Base Unit Operation; and Service, Economizer Adjustment sections, respectively.

### Base Unit Operation

**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 (024) or unloaded compressor (015), and condenser fans start. The condenser-fan motors run 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 (024), or compressor no. 1 runs fully loaded (015).

A freeze protection thermostat (FPT) is located on the evaporator coil. It detects frost buildup and turns off the compressors, allowing the coil to clear. Once frost has melted, the compressors can be reenergized by resetting the thermostat.

**HEATING, UNITS WITHOUT ECONOMIZER** (If Accessory or Optional 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** — Upon a call for cooling, when outdoor ambient temperature is above the outdoor-air temperature control setting, the evaporator and condenser fans and compressor energize. The economizer damper moves to VENT position.

Upon a first-stage call for cooling, when outdoor ambient temperature is below the temperature control setting, the evaporator fan starts and economizer damper modulates to maintain mixed-air temperature. The compressor(s) remains off.

Upon a second-stage call for cooling, compressor no. 1 (024) or unloaded compressor (015) is energized and mechanical cooling is integrated with economizer cooling. Compressor no. 2 (024 only) is locked out. If the outdoor-air temperature is below 50 F, a cooling lockout switch prevents the compressor(s) from running.

When supply-air temperature drops below a fixed set point, the economizer damper modulates to maintain the temperature at the fixed set point.

**HEATING, UNITS WITH ECONOMIZER** (If Accessory or Optional Heater is Installed) — The outdoor air damper stays at VENT position while the evaporator fan is operating. Upon a call for heating through terminal W1, the indoor (evaporator) fan contactor (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.

**Table 5 – Fan Performance Data, 50HJ015 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
3750	732	684	848	835	949	977	1041	1119	1124	1270	1194	1430	1247	1599	1274	1767	—	—	—	—
4000	764	799	876	968	974	1110	1065	1261	1146	1412	1221	1572	1284	1750	1331	1927	1357	2105	—	—
4250	797	933	904	1101	1001	1261	1089	1412	1170	1581	1244	1741	1312	1909	1369	2096	1413	2282	1440	2469
4500	831	1075	934	1252	1028	1430	1113	1581	1193	1750	1267	1918	1335	2096	1398	2282	1451	2478	1493	2673
4750	865	1226	965	1421	1056	1607	1139	1767	1217	1945	1290	2123	1358	2300	1422	2487	1480	2682	1531	2877
5000	900	1403	996	1599	1084	1803	1166	1980	1241	2149	1314	2336	1381	2522	1444	2709	1504	2904	—	—
5250	935	1590	1028	1794	1112	2007	1193	2202	1266	2371	1338	2567	1405	2762	1468	2948	—	—	—	—
5500	971	1794	1060	2007	1142	2229	1221	2433	1294	2629	1362	2806	1429	3011	—	—	—	—	—	—
5750	1007	2016	1093	2238	1173	2469	1249	2682	1321	2895	—	—	—	—	—	—	—	—	—	—
6000	1044	2256	1126	2487	1205	2718	1277	2948	—	—	—	—	—	—	—	—	—	—	—	—
6250	1080	2513	1159	2753	1236	2993	—	—	—	—	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Watts** — Input Watts to Motor

**NOTES:**

1. Factory shipped fan speed is 1092 rpm. The range of the standard evaporator-fan motor is 978 to 1285 rpm. Other rpms may require a field-supplied drive.
2. Static pressure losses (i.e., economizer, electric heater) must be added to external static pressure before entering Fan Performance table.
3. To convert watts to bhp, use the following equation:

$$\text{Bhp} = \frac{\text{Watts} \times \text{motor efficiency}}{746}$$

Motor efficiency:

0.84

Horsepower — Maximum Continuous Watts:

3 hp — 3065

4. Interpolation is permissible. Do not extrapolate.
5. Fan performance is based on wet coils, clean filters, and casing losses.
6. Extensive motor and drive testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the watts rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.

**Table 6A – Fan Performance Data – 50HJ024, 208/230-V and 575-V Units**

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.3		1.4		1.6		1.8	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
6,000	702	1428	796	1723	884	2025	965	2339	1041	2669	1115	3018	1150	3201	1186	3385	1255	3771	1322	4175
6,500	747	1757	835	2073	919	2394	997	2725	1070	3069	1140	3429	1174	3617	1208	3805	1274	4198	1338	4609
7,000	792	2138	877	2476	957	2816	1031	3165	1102	3525	1169	3898	1201	4091	1233	4285	1296	4687	1358	5106
7,500	838	2571	918	2929	996	3290	1067	3658	1135	4035	1199	4422	1230	4622	1262	4822	1322	5235	1381	5662
8,000	885	3060	962	3440	1036	3822	1105	4209	1170	4604	1232	5008	1262	5180	1292	5422	1350	5847	1407	6286
8,500	932	3610	1005	4011	1077	4414	1143	4821	1206	5234	1266	5655	1295	5870	1324	6085	1380	6524	1435	6975
9,000	980	4223	1050	4647	1119	5071	1183	5498	1244	5930	1302	6369	1330	6592	1359	6816	1413	7270	1466	7735
9,500	1028	4904	1096	5350	1162	5796	1224	6243	1283	6695	1340	7152	1367	7384	1394	7616	—	—	—	—
10,000	1077	5655	1141	6123	1205	6591	1266	7059	1323	7531	—	—	—	—	—	—	—	—	—	—

**LEGEND**

**Watts** — Input Watts to Motor

**NOTES:**

1. Factory shipped fan speed is 1287 rpm. Other rpms may require a field-supplied drive.
2. Static pressure losses (i.e., economizer, electric heater) must be added to external static pressure before entering Fan Performance table.
3. To convert watts to bhp, use the following equation:

$$\text{Bhp} = \frac{\text{Watts} \times \text{motor efficiency}}{746}$$

Motor efficiency:

0.87

Horsepower — Maximum Continuous Watts:

7½ hp — 7915

4. Interpolation is permissible. Do not extrapolate.
5. Fan performance is based on wet coils, clean filters, and casing losses.
6. Extensive motor and drive testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the watts rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.

**Table 6B – Fan Performance Data – 50HJ024, 460-V Units**

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																			
	0.2		0.4		0.6		0.8		1.0		1.2		1.3		1.4		1.6		1.8	
	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts	Rpm	Watts
6,000	702	1428	796	1723	884	2025	965	2339	1041	2669	1115	3018	1150	3201	1186	3385	1255	3771	1322	4175
6,500	747	1757	835	2073	919	2394	997	2725	1070	3069	1140	3429	1174	3617	1208	3805	1274	4198	1338	4609
7,000	792	2138	877	2476	957	2816	1031	3165	1102	3525	1169	3898	1201	4091	1233	4285	1296	4687	1358	5106
7,500	838	2571	918	2929	996	3290	1067	3658	1135	4035	1199	4422	1230	4622	1262	4822	1322	5235	1381	5662
8,000	885	3060	962	3440	1036	3822	1105	4209	1170	4604	1232	5008	1262	5180	1292	5422	1350	5847	1407	6286
8,500	932	3610	1005	4011	1077	4414	1143	4821	1206	5234	1266	5655	1295	5870	1324	6085	1380	6524	1435	6975
9,000	980	4223	1050	4647	1119	5071	1183	5498	1244	5930	1302	6369	1330	6592	1359	6816	1413	7270	1466	7735
9,500	1028	4904	1096	5350	1162	5796	1224	6243	1283	6695	1340	7152	1367	7384	1394	7616	1447	8088	—	—
10,000	1077	5655	1141	6123	1205	6591	1266	7059	1323	7531	1378	8007	1404	8248	1431	8489	—	—	—	—

**LEGEND**

**Watts** — Input Watts to Motor

**NOTES:**

1. Factory shipped fan speed is 1287 rpm. Other rpms may require a field-supplied drive.
2. Static pressure losses (i.e., economizer, electric heater) must be added to external static pressure before entering Fan Performance table.
3. To convert watts to bhp, use the following equation:

$$\text{Bhp} = \frac{\text{Watts} \times \text{motor efficiency}}{746}$$

Motor efficiency:

0.87

Horsepower — Maximum Continuous Watts:

7½ hp — 8640

4. Interpolation is permissible. Do not extrapolate.
5. Fan performance is based on wet coils, clean filters, and casing losses.
6. Extensive motor and drive testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the watts rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.

**Table 7 – Accessory/FIOP Static Pressure Drop\* (in. wg)**

UNIT 50HJ	UNIT VOLTAGE	CFM	ELECTRIC HEATERS (kW)			ECONOMIZER
015	208/230-3-60	4,000	0.05 (14-34)	0.06 (42)	0.07 (56)	0.03
		5,000	0.07 (14-34)	0.08 (42)	0.10 (56)	0.05
		6,000	0.09 (14-34)	0.12 (42)	0.15 (56)	0.07
		7,200	—	—	—	0.09
	460-3-60	4,000	0.05 (15,32)	0.06 (55)	—	0.03
		5,000	0.07 (15,32)	0.08 (55)	—	0.05
		6,000	0.09 (15,32)	0.12 (55)	—	0.07
		7,200	—	—	—	0.09
	575-3-60	4,000	—	0.06 (37)	—	0.03
5,000		—	0.08 (37)	—	0.05	
6,000		—	0.12 (37)	—	0.07	
7,200		—	0.15 (37)	—	0.09	
024	208/230-3-60	6,000	0.09 (26/34)	0.12 (42/56)	0.15 (56/75)	0.07
		7,200	0.11 (26/34)	0.16 (42/56)	0.20 (56/75)	0.09
		9,000	0.15 (26/34)	0.19 (42/56)	0.24 (56/75)	0.11
		10,000	0.17 (26/34)	0.21 (42/56)	0.26 (56/75)	0.12
	460-3-60	6,000	0.09 (32)	0.12 (55)	0.15 (80)	0.07
		7,200	0.11 (32)	0.15 (55)	0.20 (80)	0.09
		9,000	0.15 (32)	0.19 (55)	0.24 (80)	0.11
		10,000	0.17 (32)	0.21 (55)	0.26 (80)	0.12
	575-3-60	6,000	—	—	—	0.07
		7,200	—	—	—	0.09
		9,000	—	—	—	0.11
		10,000	—	—	—	0.12

FIOP — Factory-Installed Option

\*The static pressure must be added to external static pressure. The sum and the evaporator entering air cfm should then be used in conjunction with the Fan Performance table to determine blower rpm and watts.

NOTE: Heaters are rated at 208/240 v, 480 v, and 575 v

**SERVICE**

**▲ WARNING**

Before performing service or maintenance operations on unit, turn off main power switch to unit. Turn off accessory heater power switch if applicable. Electrical shock could cause personal injury.

**Cleaning** — Inspect unit interior at beginning of each heating and cooling season and as operating conditions require. Remove unit top panel and/or side panels for access to unit interior.

**EVAPORATOR COIL** — Clean as required with a commercial coil cleaner.

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

**CONDENSATE DRAIN** — Check and clean each year at start of cooling season.

**FILTERS** — Clean or replace at start of each heating and cooling season, or more often if operating conditions require. Refer to Table 1 for type and size.

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

**Lubrication**

**COMPRESSORS** — Each compressor is charged with correct amount of oil at the factory. Observe the oil level in the sight glass at start-up. If unit oil level is below sight glass, add oil until level is approximately ¼ sight glass.

**FAN SHAFT BEARINGS** — The bearings are of the pillow block type and have grease fittings. The bearing opposite the motor end has an extended tube line so it can be lubricated from the motor side. Lubricate the bearings twice annually.

Typical lubricants are given below:

MANUFACTURER	LUBRICANT
Texaco	Regal AFB-2*
Mobil	Mobilplex EP No. 1
Sunoco	Prestige 42
Texaco	Multifak 2

\*Preferred lubricant because it contains rust and oxidation inhibitors

**CONDENSER AND EVAPORATOR-FAN MOTOR BEARINGS** — The condenser and evaporator-fan motors have permanently-sealed bearings, so no field lubrication is necessary.

**Evaporator Fan, 50HJ015 Units**

**PERFORMANCE ADJUSTMENT** — Fan motor pulleys on the 50HJ015 units are factory set for speed shown in Table 1.

To change fan speeds:

1. Shut off unit power supply.
2. Loosen belt by loosening fan motor mounting plate nuts.
3. Loosen movable-pulley flange setscrew (see Fig. 19).
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:

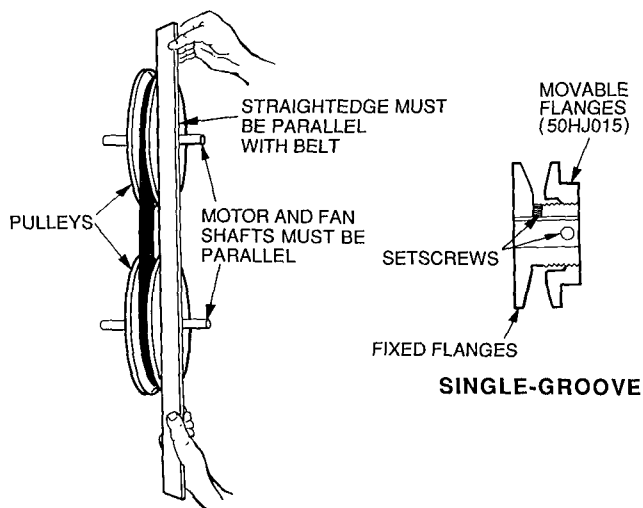
1. Loosen fan pulley setscrews.
2. Slide fan pulley along fan shaft.
3. Make angular alignment by loosening motor from mounting plate.

**SERVICE AND REPLACEMENT** (see Fig. 20)

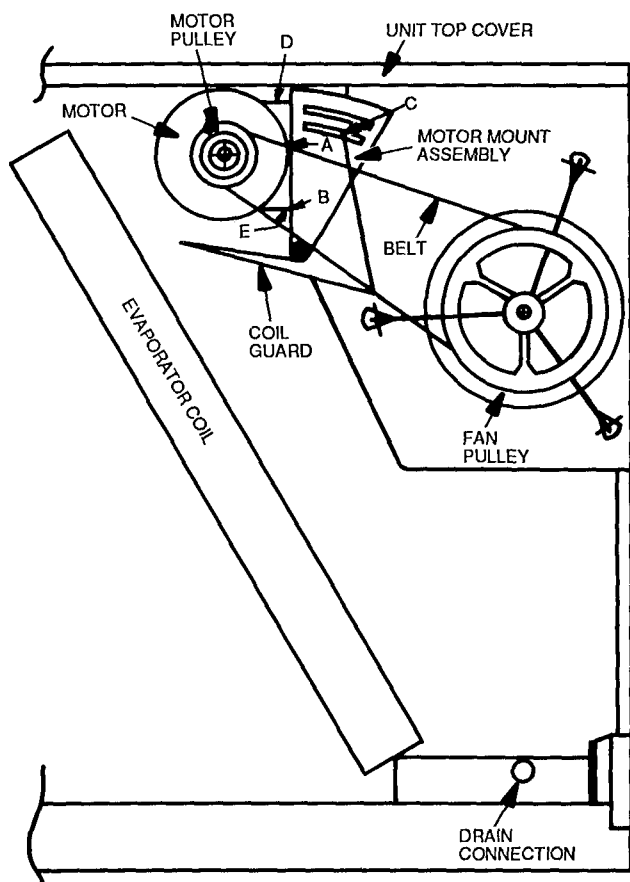
NOTE: To remove belts only, follow Steps 1-7.

1. Remove filter and supply-air section panels.
2. Remove unit to cover.
3. Remove coil guard.
4. Loosen screws A and B on both sides of motor mount assembly.
5. Loosen screw C.
6. Rotate motor mount assembly (with motor attached) as far as possible away from evaporator coil.
7. Remove belt.

- 8 Rotate motor mount assembly back past original position toward evaporator coil.
9. Remove motor mounting nuts D and E (both sides).
10. Lift motor up through top of unit.
- 11 Reverse above procedure to reinstall motor.
12. Check and adjust belt tension as necessary.



**Fig. 19 – Evaporator-Fan Pulley Alignment and Adjustment**



**Fig. 20 – 50HJ015 Evaporator-Fan Motor Section**

## Evaporator Fan, 50HJ024 Units

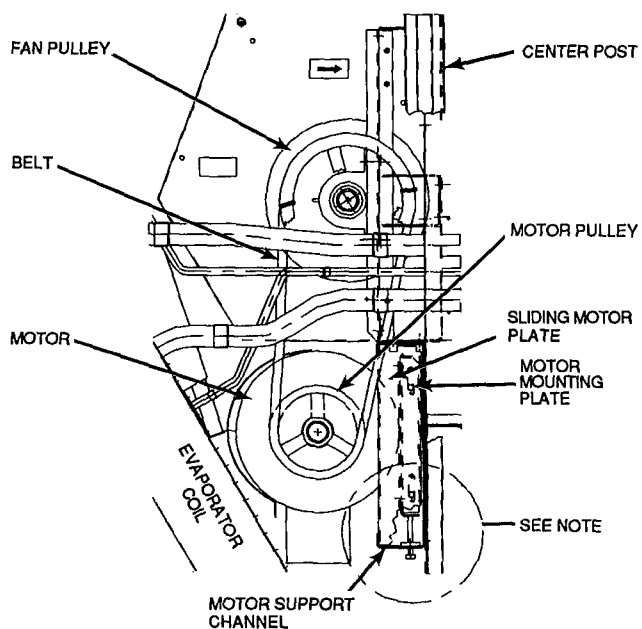
**PERFORMANCE ADJUSTMENT** — The 50HJ024 unit has fixed pulleys. Fan speed can be adjusted (if necessary) only by changing the pulley(s) and belt. See Table 8 for alternate drive selection.

To align fan and motor pulleys (see Fig. 19):

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

**SERVICE AND REPLACEMENT** (See Fig. 21) — The 50HJ024 unit uses a fan motor mounting system that features a slide-out motor mounting plate. To replace or service the motor, slide out the bracket.

1. Remove the evaporator-fan access panel and the heating control access panel.
2. Remove the center post (located between the evaporator fan and heating control access panels) and all screws securing it
3. Loosen nuts on the two carriage bolts in the motor mounting base.
4. Using jacking bolt under motor base, raise motor to top of slide and remove belt. Secure motor in this position by tightening the nuts on the carriage bolts.
5. Remove the belt drive.
6. Remove jacking bolt and tapped jacking bolt plate.
7. Remove the 2 screws that secure the motor mounting plate to the motor support channel.
8. Remove the 3 screws from the end of the motor support channel that interfere with the motor slide path.
9. Slide out the motor and motor mounting plate.
10. Disconnect wiring connections and remove the 4 mounting bolts.
11. Remove the motor.
12. To install the new motor, reverse Steps 1-11.



**NOTE:** A 3½-in. bolt and threaded plate are included in the installer's packet. They can be added to the motor support channel below the motor mounting plate to aid in raising the motor.

**Fig. 21 – 50HJ024 Evaporator-Fan Motor Section**

**Table 8 – Alternate Drive Components Table, 50HJ024**

UNIT 50HJ	MOTOR HP	DRIVE SOURCE	FAN RPM	MOTOR SHEAVE DATUM DIMENSION* (in.)	MOTOR SHEAVE PART NO.†	BLOWER SHEAVE DATUM DIMENSION* (in.)	BLOWER SHEAVE PART NO.†	BELT PART NO.†
024	7½	Field	1181	5.6	BK62	8.4	BK90	BX50
	7½	Field	1244	5.9	BK65	8.4	BK90	BX51
	7½	Factory	1287	6.1	BK67	8.4	BK90	BX51
	7½	Field	1379	6.6	BK72	8.4	BK90	BX52

**LEGEND**

**MPTA** — Mechanical Power Transmission Association

**RMA** — Rubber Manufacturers' Association

\*Datum dimension is equal to the old pitch diameter per RMA/MPTA Standard IP20-1977. To convert to new pitch diameter per RMA/

MPTA Standard IP20-1988, add 0.3 in. to the sheave datum dimension.

†Part numbers for motor sheave, blower sheave, and belt are Browning Catalog part numbers. The motor sheaves have Browning fixed bore sheaves supplied with factory drive package.

**Belt Tension Adjustment — To adjust belt tension:**

1. Loosen fan motor bolts.
2. a. 015 units:  
Move motor mounting plate up or down for proper belt tension (½ in. deflection with one finger).
- b. 024 units:  
Turn motor jacking bolt to move motor mounting plate up or down for proper belt tension (¾ in. deflection at midspan with one finger [9 lb force]).
3. Tighten nuts.
4. Adjust bolts and nut on mounting plate to secure motor in fixed position.

**Condenser-Fan Adjustment (Fig. 22)**

1. Shut off unit power supply.
2. Remove fan top-grille assembly and loosen fan hub screws.
3. Adjust fan height on unit, using a straightedge placed across the fan orifice.
4. Tighten setscrews and replace rubber hubcap to prevent hub from rusting to motor shaft.
5. Fill hub recess with permagum if rubber hubcap is missing.

**Economizer Adjustment —** Refer to Tables 9 and 10 for economizer checkout procedures. Make certain the outdoor-air damper is fully closed and the return-air damper is fully open before completing the following steps.

1. Turn on power to the unit.
2. Turn the thermostat fan switch to the ON position. The damper will go to the vent position.
3. Adjust the vent position with the minimum position adjustment on the economizer control module. See Fig. 14.

4. Set the system selector switch to COOL position and set the cooling temperature selector to its lowest setting.

**NOTE:** The cooling mode may also be simulated by removing the thermostat wires from terminals Y1 and Y2 and installing a jumper between terminals R and Y1. Refer to unit label diagram for terminal locations.

5. Set the outdoor-air thermostat (OAT) located in the economizer section of the unit to 75 F.
6. If the outdoor temperature is below 75 F, the economizer will control the mixed air with the mixed-air sensor. If the outdoor air is above 75 F, place a jumper around the contacts of the OAT
7. Jumper terminal T to terminal T1 on the module (see Fig. 14). The economizer will go to the full open position. The outdoor-air damper will go to the full open position, and the return-air damper will go to the full closed position.
8. Adjust mechanical linkage, if necessary, for correct positioning. It may be necessary to remove the filters to adjust the linkage.
9. Remove the jumper from around the contacts of the OAT if installed in Step 6. Remove the jumper from terminals T and T1 installed in Step 7.
10. If the cooling mode was simulated to operate the unit in Step 4, remove the jumper and reconnect the thermostat wires to terminals Y1 and Y2.

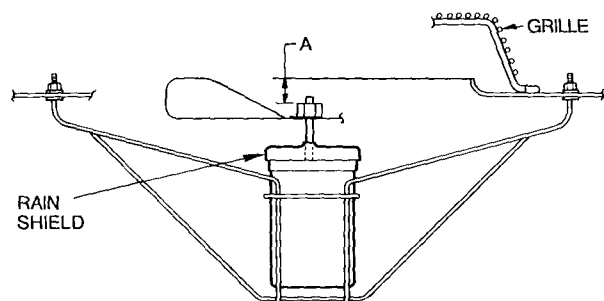
**Power Failure —** Dampers have a spring return. In event of power failure, dampers will return to fully closed position until power is restored. *Do not manually operate damper motor.*

**Refrigerant Charge —** Amount of refrigerant charge is listed on unit nameplate and in Table 1. Refer to Carrier GTAC II; Module 5; Charging, Recovery, Recycling, and Reclamation section for charging methods and 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 —** Using appropriate cooling charging chart (see Fig. 23 and 24), add refrigerant until conditions of the chart are met. Note that charging charts are different from those normally used. Charts are based on charging units to correct superheat for various operating conditions. An accurate pressure gage and temperature sensing device are required. Connect temperature sensing device to service port on suction line and insulate it so that outdoor ambient temperature does not affect reading. Indoor-air cfm must be within normal operating range of unit.



DIMENSION	UNIT SIZE	
	015	024
A	0.25 ± 0.12	0 ± 0.125

**Fig. 22 — Condenser-Fan Adjustment**

**Table 9 – Economizer Checkout Procedures**

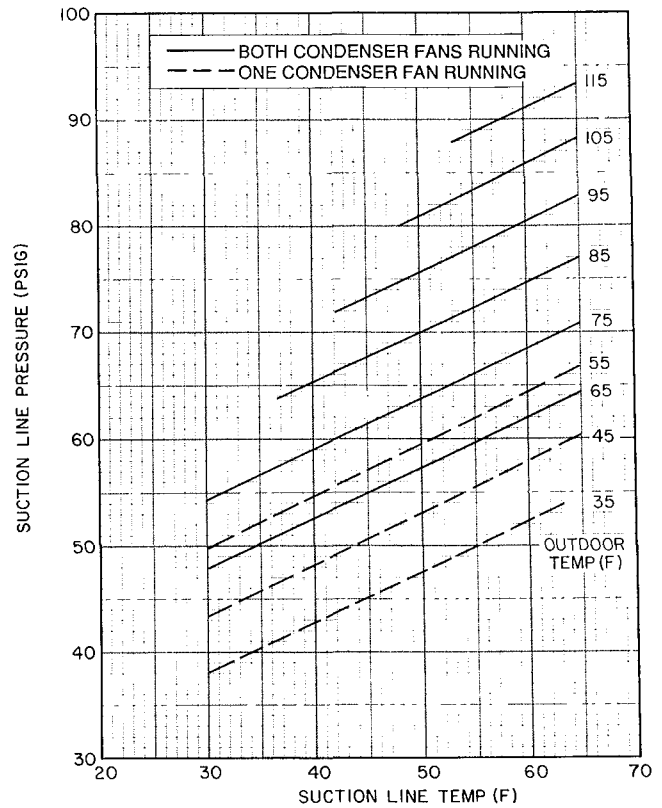
TEST PROCEDURE	RESULTS
A Disconnect power at TR and TR1 Disconnect jumper between P and P1. See Fig 14 B. Jumper TR to 1 C. Jumper T1 to T. D. Disconnect outdoor-air thermostat connections from S <sub>O</sub> and + Factory-installed 800 ohm resistor should remain connected to S <sub>R</sub> and +. E Reconnect power to terminals TR and TR1	1. LED (light-emitting diode) should be off. 2. Motor is in closed position
TEST PROCEDURE	RESULTS
A Disconnect factory-installed resistor from terminals S <sub>R</sub> and +	1 LED (light-emitting diode) should be on 2. Motor drives toward open

**Table 10 – High and Low Outdoor-Air Temperature Simulation**

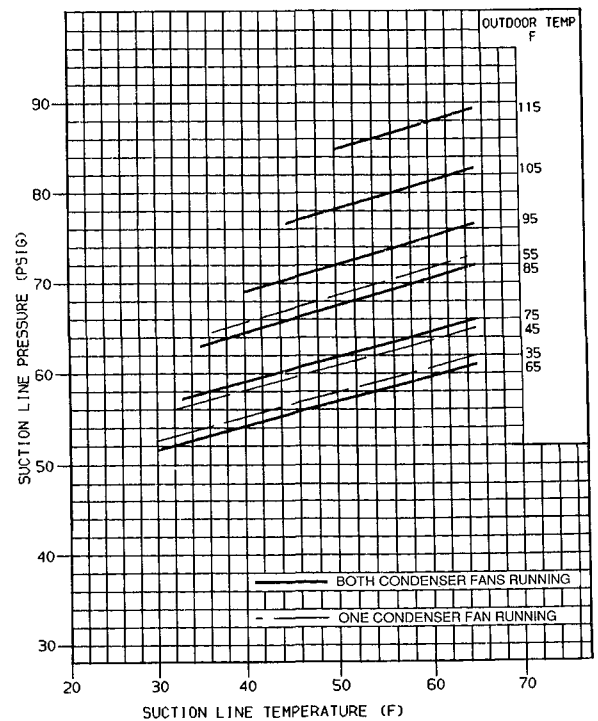
TEST PROCEDURE	RESULTS
A Reconnect factory-installed 800 ohm resistor between terminals S <sub>R</sub> and + B. Connect 1200 ohm checkout resistor between terminals S <sub>O</sub> and +. C. Turn set point potentiometer to position A	Low outdoor-air temperature test results: 1 LED (light-emitting diode) should be on 2 Motor drives toward open
D. Turn set point potentiometer to position D E Disconnect 1200 ohm checkout resistor	High outdoor-air temperature test results 1 LED should be off 2 Motor drives toward closed.

**TO USE COOLING CHARGING CHART —** Take outdoor ambient temperature and read the suction pressure gage. Refer to appropriate chart to determine correct suction temperature. If suction temperature is high, add refrigerant. If suction temperature is low, carefully reclaim some of the charge. Recheck suction pressure as charge is adjusted

**Filter Drier —** Replace whenever refrigerant system is exposed to atmosphere.



**Fig. 23 – Cooling Charging Chart – 50HJ015**



**Fig. 24 – Cooling Charging Chart – 50HJ024**

## Protective Devices

### COMPRESSOR PROTECTION

**Overcurrent** — Each compressor has one manual reset, calibrated trip, magnetic circuit breaker. Do not bypass connections or increase the size of the circuit breaker to correct trouble. Determine the cause and correct it before resetting the breaker.

**Overtemperature** — Each compressor has an internal protector to protect it against excessively high discharge gas temperatures.

**Crankcase Heaters** — Each compressor has 125-watt crankcase heaters to prevent absorption of liquid refrigerant by oil in the crankcase when the compressor is idle. Since power for the crankcase heaters is drawn from the unit incoming power, main unit power must be on for the heaters to be energized.

**IMPORTANT:** After a prolonged shutdown or service job, energize the crankcase heaters for 24 hours before starting the compressors

**Compressor Lockout**— If any of the safeties (high- or low-pressure, freeze protection thermostat, compressor internal thermostat) trip, or if there is loss of power to the compressors, the CLO (compressor lockout) will lock the compressors off. To reset, manually move the thermostat setting.

**EVAPORATOR-FAN MOTOR PROTECTION** — A manual reset, calibrated trip, magnetic circuit breaker protects against overcurrent. Do not bypass connections or increase the size of the breaker to correct trouble. Determine the cause and correct it before resetting the breaker.

**CONDENSER-FAN MOTOR PROTECTION** — Each condenser-fan motor is internally protected against overtemperature.

**HIGH- AND LOW-PRESSURE SWITCHES** — If either switch trips, or if the compressor overtemperature switch activates, that refrigerant circuit will be automatically locked out by the CLO. To reset, manually move the thermostat setting.

**FREEZE PROTECTION THERMOSTAT (FPT)** — An FPT is located on the evaporator coil. It detects frost buildup and turns off the compressor, allowing the coil to clear. Once the frost has melted, the compressor can be reenergized by resetting the CLO from the thermostat.

**Relief Devices** — All units have relief devices to protect against damage from excessive pressures (i.e., fire). These devices protect the high and low side.

**Control Circuit, 24-V** — This control circuit is protected against overcurrent by a 3.2-amp circuit breaker. Breaker can be reset. If it trips, determine cause of trouble before resetting.

**Replacement Parts** — A complete list of replacement parts may be obtained from any Carrier distributor upon request.



## 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 with Job File)

MODEL NO.: \_\_\_\_\_

SERIAL NO.: \_\_\_\_\_

DATE: \_\_\_\_\_

TECHNICIAN: \_\_\_\_\_

## PRE-START-UP:

- VERIFY THAT ALL PACKING MATERIALS HAVE BEEN REMOVED FROM UNIT
- REMOVE ALL SHIPPING HOLDDOWN BOLTS AND BRACKETS PER INSTRUCTIONS
- VERIFY INSTALLATION OF ECONOMIZER HOOD
- VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTRUCTIONS
- VERIFY THAT ALL ELECTRICAL CONNECTIONS AND TERMINALS ARE TIGHT
- CHECK THAT INDOOR-AIR FILTER IS CLEAN AND IN PLACE
- VERIFY THAT UNIT IS LEVEL
- CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE, AND VERIFY SET SCREW IS TIGHT
- VERIFY THAT FAN SHEAVES ARE ALIGNED AND BELTS ARE PROPERLY TENSIONED

## START-UP

### ELECTRICAL

SUPPLY VOLTAGE L1-L2 \_\_\_\_\_ L2-L3 \_\_\_\_\_ L3-L1 \_\_\_\_\_

COMPRESSOR AMPS — COMPRESSOR NO. 1 L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

— COMPRESSOR NO. 2 L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

SUPPLY FAN AMPS \_\_\_\_\_ EXHAUST FAN AMPS \_\_\_\_\_

ELECTRIC HEAT AMPS L1 \_\_\_\_\_ L2 \_\_\_\_\_ L3 \_\_\_\_\_

### TEMPERATURES

OUTDOOR-AIR TEMPERATURE \_\_\_\_\_ F DB (Dry-Bulb)

RETURN-AIR TEMPERATURE \_\_\_\_\_ F DB \_\_\_\_\_ F WB (Wet-Bulb)

COOLING SUPPLY AIR \_\_\_\_\_ F

ELECTRIC HEAT SUPPLY AIR \_\_\_\_\_ F

### PRESSURES

REFRIGERANT SUCTION CIRCUIT NO. 1 \_\_\_\_\_ PSIG CIRCUIT NO. 2 \_\_\_\_\_ PSIG

REFRIGERANT DISCHARGE CIRCUIT NO. 1 \_\_\_\_\_ PSIG CIRCUIT NO. 2 \_\_\_\_\_ PSIG

- VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS ON PAGE 15.

### GENERAL

- ECONOMIZER MINIMUM VENT AND CHANGEOVER SETTINGS TO JOB REQUIREMENTS

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