Installation Start-Up and Service Instructions

CONTENTS

SAFETY CONSIDERATIONS

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

Untrained personnel can perform the basic maintenance functions of 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.

IMPORTANT: Units have high ambient temperature operating limits. If limits are exceeded, the units will automatically lock the compressor out of operation. Manual reset will be required to restart the compressor.

INSTALLATION

Step 1 — Provide Unit Support

ROOF CURB — Assemble or install accessory roof curb in accordance with instructions shipped with this accessory. See Fig. 1. Install insulation, cant strips, roofing, and counter flashing as shown. Ductwork can be installed to roof curb before unit is set in place. Ductwork must be attached to curb and not to unit. Curb must be level. This is necessary to permit unit drain to function properly. Unit leveling tolerance is ± 1/16 in. per linear ft in any direction. Refer to Accessory Roof Curb Installation Instructions for additional information as required. When accessory roof curb is used, unit may be installed on class A, B, or C roof covering material. Carrier roof curb accessories are for flat roofs or slab mounting.

IMPORTANT: The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket with the roof curb as shown in Fig. 1. Improperly applied gasket can also result in air leaks and poor unit performance. Do not slide unit to position on roof curb.

ALTERNATE UNIT SUPPORT — When a curb cannot be used, install unit on a noncombustible surface. 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.

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

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

Step 2 — Remove Shipping Rails — Remove shipping rails prior to lowering unit onto roof curb. See Fig. 2. The rails are attached to the unit at both the return end and condenser end. Remove the screws from both ends of each rail. Be careful not to drop the rails onto any surface that could be damaged. Discard the rails. It is important to replace the screws into the unit to avoid any air or water leakage.

⚠ CAUTION

Do not allow the shipping rail to drop on the roof surface. Damage to the roof surface may result.

Step 3 — Rig and Place Unit — Inspect unit for transportation damage. See Tables 1-3 for physical data. File any claim with transportation agency.

⚠ CAUTION

All panels must be in place when rigging. Unit is not designed for handling by fork truck. Damage to unit can result.

Do not drop unit; keep upright. 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 ± 1/16 in. per linear ft in any direction. See Fig. 3 for additional information. Unit rigging weight is shown in Fig. 3.

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

POSITIONING — Maintain clearance, per Fig. 4, around and above unit to provide minimum distance from combustible materials, proper airflow, and service access.

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. Unit operating weight is shown in Table 1.

INSTALLATION ONTO CURB — The 50HJ units are designed to fit on the accessory full perimeter curb. Correct placement of the unit onto the curb is critical to operating performance. To aid in correct positioning, 3/8-in. diameter locating holes have been added to the unit base rails. When placing the unit, these holes should line up with the roof curb edge as shown in Fig. 5 and 6, to assure proper duct opening alignment. For placement on the curb, use the alignment holes located approximately 2-in. from the end of the base rail on the return end of the unit. See labels on the side of the unit for more details.

⚠ CAUTION

Do not slide unit to position it when it is sitting on the curb. Curb gasketing material may be damaged and leaks may result.

ROOFCURB ACCESSORY	CURB HEIGHT	DESCRIPTION	C	D
CRRFCURB018C00	1'-2" [356]	ROOF CURB 14" HIGH	3'-1 15/16" [963]	9'-6 7/16" [2906]
CRRFCURB019C00	2'-0" [610]	ROOF CURB 24" HIGH	3'-1 15/16" [963]	9'-6 7/16" [2906]

NOTES:
1. ROOFCURB ACCESSORY IS SHIPPED DISASSEMBLED.
2. DIMENSIONS IN ( ) ARE IN MILLIMETERS.
3. ⇨ DIRECTION OF AIRFLOW.
4. ROOF CURB: 16 GA. (VA03-56) STEEL.
5. TO PREVENT THE HAZARD OF STAGNANT WATER BUILD-UP IN THE UNIT DO NOT EXCEED CURB LEVELING TOLERANCES.
6. CLEARANCE BETWEEN UNIT BASE RAIL AND CURB FLANGE IS 1/4-IN. (6 MM) ON EACH SIDE.

MAX CURB LEVELING TOLERANCES:

ROOFCURB	A		B	
	DEG.	IN.	DEG.	IN.
CRRFCURB018C00 CRRFCURB019C00	.28	.57	.28	.42

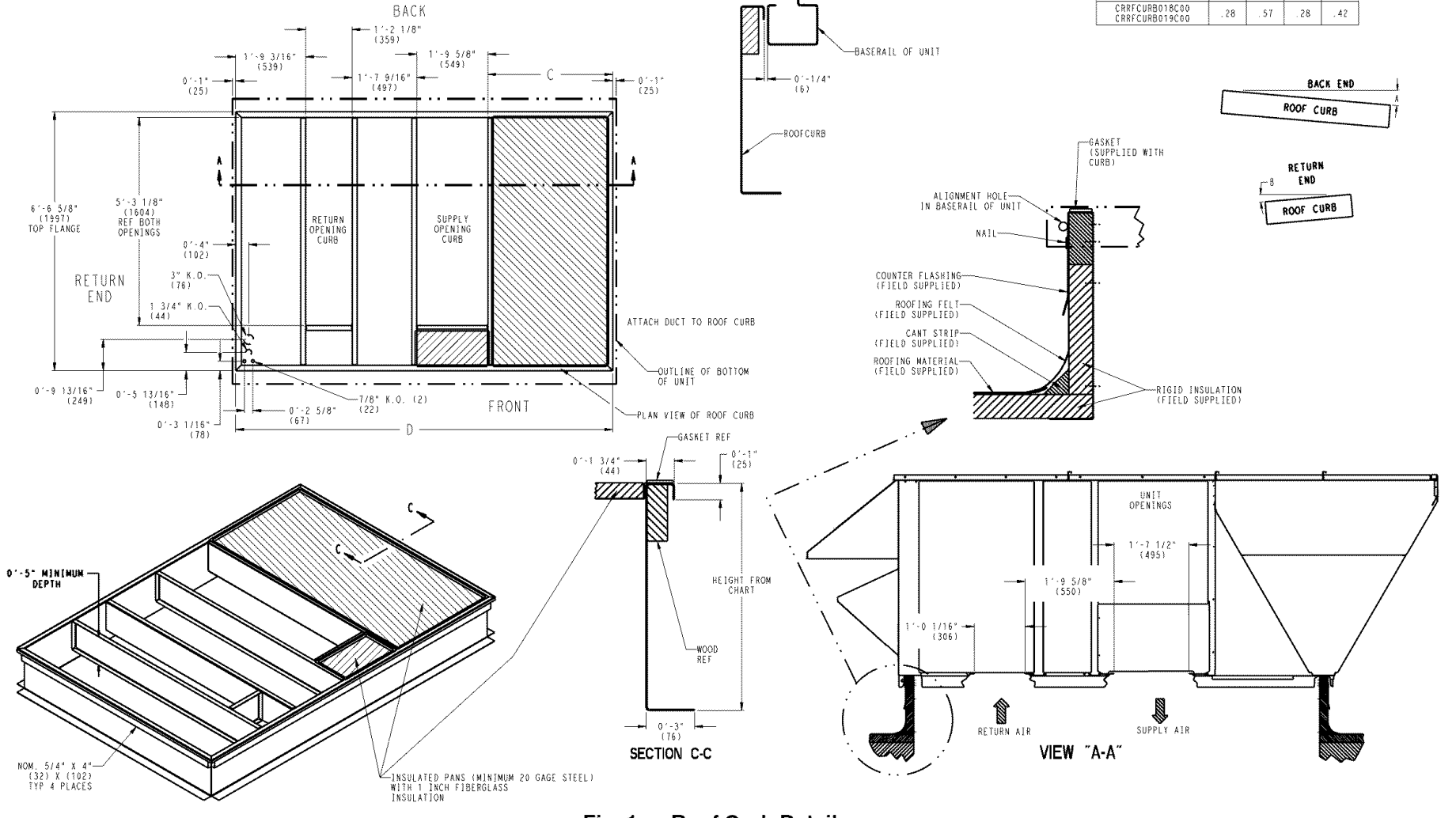


Fig. 1 — Roof Curb Details

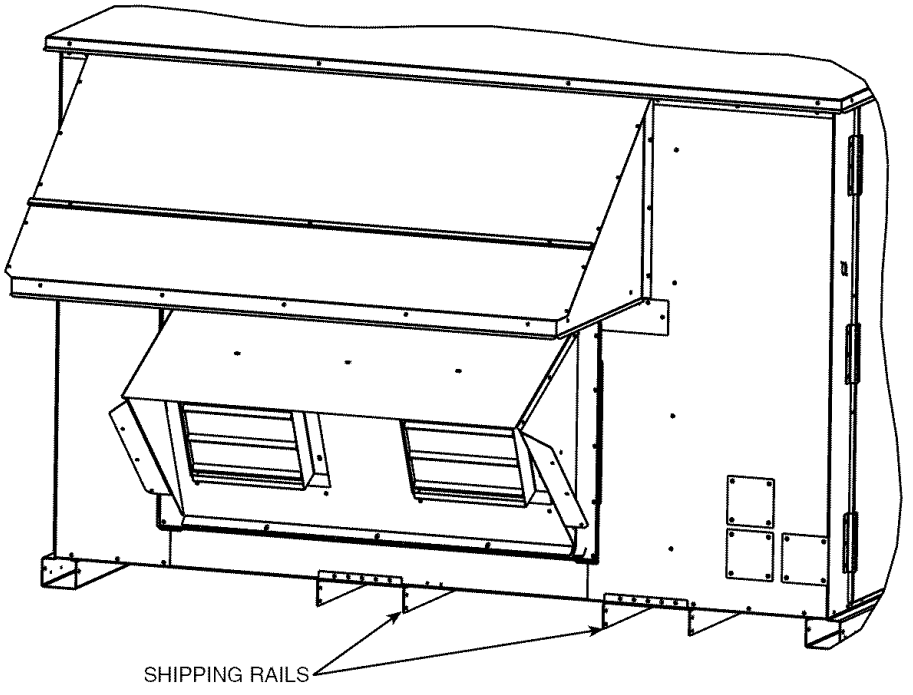


Fig. 2 — Shipping Rail Removal

CAUTION - NOTICE TO RIGGERS:

ALL PANELS MUST BE IN PLACE WHEN RIGGING.

NOTICE TO RIGGERS: Rig by inserting hooks into unit base rails as shown. Maintain a distance of 120 inches (3048 MM) from top of unit to eyehook. Leave coil cover attached to unit while rigging to protect coil of unit from damage.

50HJ UNIT SIZE	MAX WEIGHT (lb)	CENTER OF GRAVITY (in.)		
		X	Y	Z
020	3358	63.9	34.0	30.5
024	3380	63.9	34.5	30.5
028	3769	67.8	35.0	35.0

NOTES:
1. Add 150 lb (68 kg) for domestic crating.
2. See label for unit location on roof curb.

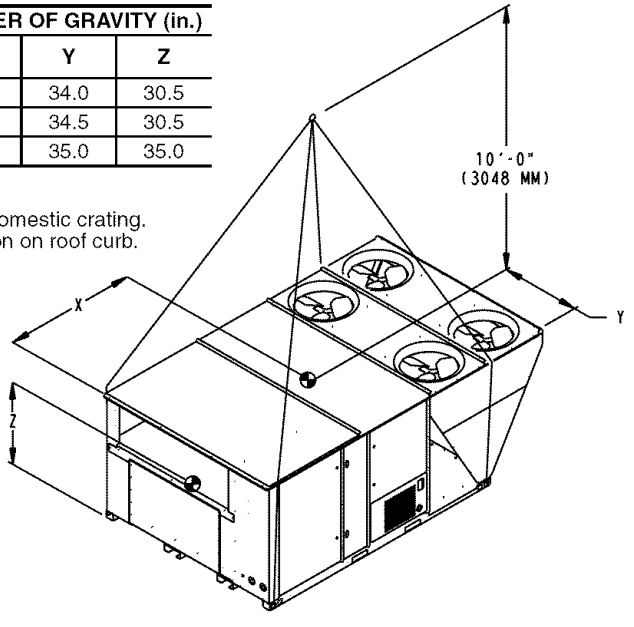


Fig. 3 — Rigging Details

NOTES:
1. For outdoor use only.
2. Weights shown are for 50HJ cooling only unit with manual 25% outdoor air option, aluminum coils, and standard drive. For weights of optional equipment refer to weight adders table in product data literature.
3. Min clearances to be:
   Right Side: 6'-0" [1829] condenser air
   Left Side: 10'-0" [3048] outside air
   Front Side: 3'-0" [915] service
   6'-0" [1829] condenser air
   8'-0" [2438] coil removal
   Rear Side: 6'-0" [1829] condenser air
   6'-6" [1981] economizer removal
   Top: 6'-0" [1829] condenser fan
   Bottom: 1'-2" [356] combustible surfaces (without curb)
4. For smaller service and operational clearances, contact Carrier Application Engineering Department.
5. Down shot ducts designed to be attached to accessory roof curb only. If unit is mounted side supply, it is recommended the ducts must be supported by cross braces as done on accessory roof curb.
6. Dimensions in [ ] are in millimeters.
7. With the exception of clearance for the condenser coil and the damper/power exhaust as stated in Note 3, a removable fence or barricade requires no clearance.
8. Dimensions are from outside of base rail. Allow $0^{5}/_{16}$" [8] on each side for top cover drip edge.
9. A field-supplied 90 degree elbow duct must be installed in the supply ductwork below the unit discharge connection.

UNIT SIZE	OPERATING WT. WITHOUT HEAT (50HJ)		UNIT HEIGHT	CENTER OF GRAVITY LOCATION			CORNER WEIGHT LB [KG]			
			W	X	Y	Z				
	LB	[KG]	IN. [MM]	IN. [MM]	IN. [MM]	IN. [MM]	A	B	C	D
HJ020	2139	[972]	58-1/8 [1476]	64 [1626]	34 [864]	30-1/2 [775]	583 [264]	714 [324]	378 [171]	464 [210]
HJ024	2187	[994]	58-1/8 [1476]	64 [1626]	34-1/2 [876]	30-1/2 [775]	598 [271]	723 [328]	392 [178]	474 [215]
HJ028	2446	[1109]	70-1/8 [1781]	68 [1727]	35 [889]	35 [889]	634 [288]	823 [374]	430 [195]	559 [254]

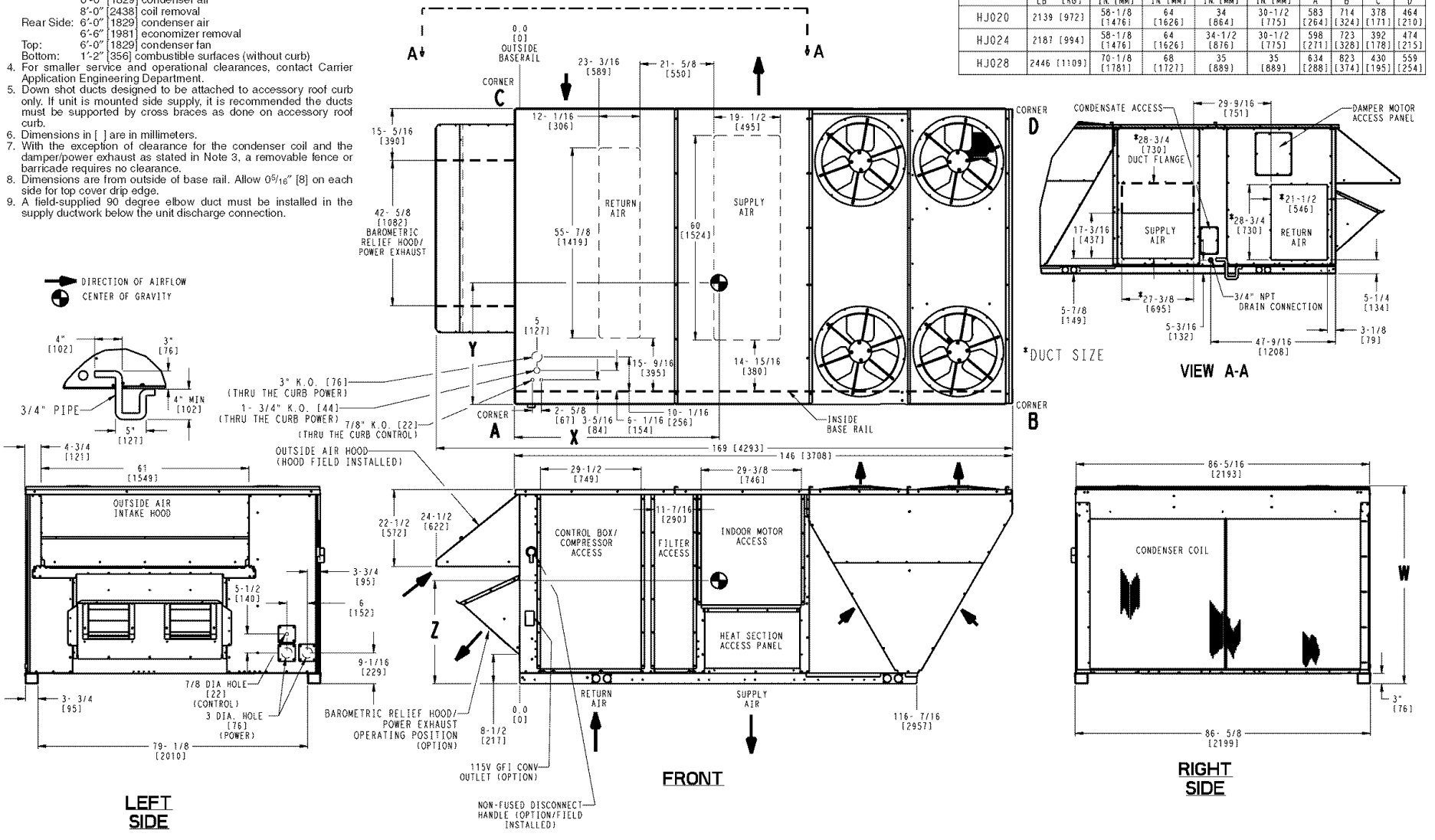


Fig. 4 — Base Unit Dimensions

Table 1 — Physical Data

UNIT 50HJ	020	024	028
NOMINAL CAPACITY (tons)	18	20	25
OPERATING WEIGHT (lb)			
Al/Al*	2139	2187	2446
COMPRESSOR			
Quantity	3	3	2
Number of Refrigerant Circuits	3	3	2
Oil (ounces) Ckt A...Ckt B...Ckt C	68...68...90	90...90...90	110...110...N/A
REFRIGERANT TYPE			
Expansion Device	TXV	TXV	TXV
Operating Charge (lb)			
Circuit A	13.1	13.8	21.8
Circuit B	12.7	13.9	20.3
Circuit C	15.2	15.5	N/A
CONDENSER FAN			
Nominal Cfm (Total, all fans)	14,000	14,000	21,000
Quantity...Diameter (in.)	4...22	4...22	6...22
Motor Hp...Rpm	1/4...1100	1/4...1100	1/4...1100
Watts Input (Total)	1400	1400	2100
CONDENSER COIL			
Rows...Fins/in.	2...17	2...17	2...17
Total Face Area (sq ft)	57.78	57.78	66.67
EVAPORATOR FAN			
Quantity...Size	2...15x11	2...15x11	2...15x11
Type Drive	Belt	Belt	Belt
Nominal Cfm	7000	8000	10,000
Motor Bearing Type	Ball	Ball	Ball
Maximum Allowable Fan Rpm	1400	1400	1400
EVAPORATOR COIL			
Rows...Fins/in.	3...15	4...15	4...15
Total Face Area (sq ft)	23.33	23.33	27.22
HIGH-PRESSURE SWITCH (psig)			
Cutout	426	426	426
Reset (Auto)	320	320	320
OUTDOOR-AIR INLET SCREENS			
Quantity...Size (in.)	3...20x25	3...20x25	3...20x25
RETURN-AIR FILTERS			
Quantity...Size (in.)	9...16x25	9...16x25	9...18x24

LEGEND

N/A — Not Applicable
TXV — Thermostatic Expansion Valve

*Aluminum evaporator coil and aluminum condenser coil.

Table 2 — Fan Motor and Drive Data — Vertical Supply/Return

50HJ	020		024		028	
	208/230 and 460 v	575 v	208/230 and 460 v	575 v	208/230 and 460 v	575 v
LOW RANGE						
Motor Hp	N/A	N/A	3.7	5	5	5
Drive Motor Nominal Rpm	N/A	N/A	1725	1745	1745	1745
Drive Maximum Continuous Bhp	N/A	N/A	4.25	5.75	5.75	5.75
Drive Maximum Continuous Watts	N/A	N/A	3698	4900	4900	4900
Motor Frame Size	N/A	N/A	56HZ	184T	S184T	184T
Motor Shaft Diameter (in.)	N/A	N/A	7/8	1 1/8	1 1/8	1 1/8
Fan Rpm Range	N/A	N/A	685-939	751-954	687-873	687-873
Motor Pulley Min. Pitch Diameter (in.)	N/A	N/A	2.7	3.7	3.7	3.7
Motor Pulley Max. Pitch Diameter (in.)	N/A	N/A	3.7	4.7	4.7	4.7
Blower Pulley Pitch Diameter (in.)	N/A	N/A	6.8	8.6	9.4	9.4
Blower Pulley Shaft Diameter (in.)	N/A	N/A	1.1875	1.1875	1.1875	1.1875
Blower Pulley Type	N/A	N/A	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	N/A	N/A	11.293-13.544	9.81-13.055	9.81-13.055	9.81-13.055
Belt, Quantity...Type...Length (in.)	N/A	N/A	1...BX...38	1...BX...40	1...BX...41	1...BX...41
Speed Change per Turn - Moveable Pulley (rpm)	N/A	N/A	42	34	31	31
Moveable Pulley Maximum Full Turns	N/A	N/A	6	6	6	6
Factory Speed Setting (rpm)	N/A	N/A	812	853	780	780
MID-LOW RANGE						
Motor Hp	3.7	3	5	5	5	5
Motor Nominal Rpm	1725	1725	1745	1745	1745	1745
Maximum Continuous Bhp	4.25	3.45	5.75	5.75	5.75	5.75
Maximum Continuous Watts	3698	3149	4900	4900	4900	4900
Motor Frame Size	56HZ	56HZ	S184T	184T	S184T	184T
Motor Shaft Diameter (in.)	7/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8
Fan Rpm Range	647-886	810-1072	949-1206	949-1206	805-1007	805-1007
Motor Pulley Min. Pitch Diameter (in.)	2.7	3.1	3.7	3.7	4.8	4.8
Motor Pulley Max. Pitch Diameter (in.)	3.7	4.1	4.7	4.7	6.0	6.0
Blower Pulley Pitch Diameter (in.)	7.2	6.6	6.8	6.8	10.4	10.4
Blower Pulley Shaft Diameter (in.)	1.1875	1.1875	1.1875	1.1875	1.1875	1.1875
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	11.293-13.544	11.286-14.475	9.81-13.055	9.81-13.055	9.81-13.055	9.81-13.055
Belt, Quantity...Type...Length (in.)	1...BX...38	1...BX...38	1...BX...38	1...BX...38	1...BX...45	1...BX...45
Speed Change per Turn - Moveable Pulley (rpm)	40	44	43	43	34	34
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	767	941	1078	1078	906	906
MID-HIGH RANGE						
Motor Hp	5	5	7.5	7.5	7.5	7.5
Motor Nominal Rpm	1745	1745	1745	1745	1745	1745
Maximum Continuous Bhp	5.75	5.75	8.63	8.63	8.63	8.63
Maximum Continuous Watts	4900	4900	7267	7267	7267	7267
Motor Frame Size	S184T	184T	S213T	S213T	S213T	S213T
Motor Shaft Diameter (in.)	1 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8
Fan Rpm Range	897-1139	873-1108	941-1176	941-1176	941-1176	941-1176
Motor Pulley Min. Pitch Diameter (in.)	3.7	3.7	4.8	4.8	4.8	4.8
Motor Pulley Max. Pitch Diameter (in.)	4.7	4.7	6.0	6.0	6.0	6.0
Blower Pulley Pitch Diameter (in.)	7.2	7.4	8.9	8.9	8.9	8.9
Blower Pulley Shaft Diameter (in.)	1.1875	1.1875	1.1875	1.1875	1.1875	1.1875
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	9.81-13.055	9.81-13.055	9.025-12.179	9.025-12.179	9.025-12.179	9.025-12.179
Belt, Quantity...Type...Length (in.)	1...BX...38	1...BX...38	1...BX...42	1...BX...42	1...BX...42	1...BX...42
Speed Change per Turn - Moveable Pulley (rpm)	40	39	39	39	39	39
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	1018	991	1059	1059	1059	1059
HIGH RANGE						
Motor Hp	7.5	7.5	10	10	10	10
Motor Nominal Rpm	1745	1745	1745	1745	1745	1745
Maximum Continuous Bhp	8.63	8.63	11.5	11.5	11.5	11.5
Maximum Continuous Watts	7267	7267	9582	9582	9582	9582
Motor Frame Size	S213T	S213T	S215T	S215T	S215T	S215T
Motor Shaft Diameter (in.)	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Fan Rpm Range	1078-1274	1078-1274	1014-1297	1014-1297	1014-1297	1014-1297
Motor Pulley Min. Pitch Diameter (in.)	5.5	5.5	4.3	4.3	4.3	4.3
Motor Pulley Max. Pitch Diameter (in.)	6.5	6.5	5.5	5.5	5.5	5.5
Blower Pulley Pitch Diameter (in.)	8.9	8.9	7.4	7.4	7.4	7.4
Blower Pulley Shaft Diameter (in.)	1.1875	1.1875	1.1875	1.1875	1.1875	1.1875
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	9.025-12.179	9.025-12.179	9.025-12.179	9.025-12.179	9.025-12.179	9.025-12.179
Belt, Quantity...Type...Length (in.)	1...BX...42	1...BX...42	2...BX...38	2...BX...38	2...BX...38	2...BX...38
Speed Change per Turn - Moveable Pulley (rpm)	33	33	47	47	47	47
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	1176	1176	1156	1156	1156	1156

LEGEND

Bhp — Brake Horsepower
N/A — Not Applicable

Table 3 — Fan Motor and Drive Data — Horizontal Supply/Return

50HJ	020		024		028	
	208/230 and 460 v	575 v	208/230 and 460 v	575 v	208/230 and 460 v	575 v
LOW RANGE						
Motor Hp	N/A	N/A	3.7	5	5	5
Motor Nominal Rpm	N/A	N/A	1725	1745	1745	1745
Maximum Continuous Bhp	N/A	N/A	4.25	5.75	5.75	5.75
Maximum Continuous Watts	N/A	N/A	3698	4900	4900	4900
Motor Frame Size	N/A	N/A	56HZ	184T	S184T	184T
Motor Shaft Diameter (in.)	N/A	N/A	7/8	1 1/8	1 1/8	1 1/8
Fan Rpm Range	N/A	N/A	685-939	751-954	687-873	687-873
Motor Pulley Min. Pitch Diameter (in.)	N/A	N/A	2.7	3.7	3.7	3.7
Motor Pulley Max. Pitch Diameter (in.)	N/A	N/A	3.7	4.7	4.7	4.7
Blower Pulley Pitch Diameter (in.)	N/A	N/A	6.8	8.6	9.4	9.4
Blower Pulley Shaft Diameter (in.)	N/A	N/A	1.1875	1.1875	1.1875	1.1875
Blower Pulley Type	N/A	N/A	Fixed	Fixed	Fixed	Fixed
Drive Pulley Center Line Distance (in.)	N/A	N/A	11.293-13.544	9.81-13.055	9.81-13.055	9.81-13.055
Drive Belt, Quantity...Type...Length (in.)	N/A	N/A	1...BX...38	1...BX...40	1...BX...41	1...BX...41
Drive Speed Change per Turn - Moveable Pulley (rpm)	N/A	N/A	42	34	31	31
Drive Moveable Pulley Maximum Full Turns	N/A	N/A	6	6	6	6
Drive Factory Speed Setting (rpm)	N/A	N/A	812	853	780	780
MID-LOW RANGE						
Motor Hp	3.7	3	5	5	5	5
Motor Nominal Rpm	1725	1725	1745	1745	1745	1745
Maximum Continuous Bhp	4.25	3.45	5.75	5.75	5.75	5.75
Maximum Continuous Watts	3698	3149	4900	4900	4900	4900
Motor Frame Size	56HZ	56HZ	S184T	184T	S184T	184T
Motor Shaft Diameter (in.)	7/8	7/8	1 1/8	1 1/8	1 1/8	1 1/8
Fan Rpm Range	647-886	810-1072	949-1206	949-1206	805-1007	805-1007
Motor Pulley Min. Pitch Diameter (in.)	2.7	3.1	3.7	3.7	4.8	4.8
Motor Pulley Max. Pitch Diameter (in.)	3.7	4.1	4.7	4.7	6.0	6.0
Blower Pulley Pitch Diameter (in.)	7.2	6.6	6.8	6.8	10.4	10.4
Blower Pulley Shaft Diameter (in.)	1.1875	1.1875	1.1875	1.1875	1.1875	1.1875
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	11.293-13.544	11.286-14.475	9.81-13.055	9.81-13.055	9.81-13.055	9.81-13.055
Belt, Quantity...Type...Length (in.)	1...BX...38	1...BX...38	1...BX...38	1...BX...38	1...BX...45	1...BX...45
Speed Change per Turn - Moveable Pulley (rpm)	40	44	43	43	34	34
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed setting (rpm)	767	941	1078	1078	906	906
MID-HIGH RANGE						
Motor Hp	5	5	7.5	7.5	7.5	7.5
Motor Nominal Rpm	1745	1745	1745	1745	1745	1745
Maximum Continuous Bhp	5.75	5.75	8.63	8.63	8.63	8.63
Maximum Continuous Watts	4900	4900	7267	7267	7267	7267
Motor Frame Size	S184T	184T	S213T	S213T	S213T	S213T
Motor Shaft Diameter (in.)	1 1/8	1 1/8	1 3/8	1 3/8	1 3/8	1 3/8
Fan Rpm Range	897-1139	873-1108	941-1176	941-1176	941-1176	941-1176
Motor Pulley Min. Pitch Diameter (in.)	3.7	3.7	4.8	4.8	4.8	4.8
Motor Pulley Max. Pitch Diameter (in.)	4.7	4.7	6.0	6.0	6.0	6.0
Blower Pulley Pitch Diameter (in.)	7.2	7.4	8.9	8.9	8.9	8.9
Blower Pulley Shaft Diameter (in.)	1.1875	1.1875	1.1875	1.1875	1.1875	1.1875
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Drive Pulley Center Line Distance (in.)	9.81-13.055	9.81-13.055	9.025-12.179	9.025-12.179	9.025-12.179	9.025-12.179
Belt, Quantity...Type...Length (in.)	1...BX...38	1...BX...38	1...BX...42	1...BX...42	1...BX...42	1...BX...42
Speed Change per Turn - Moveable Pulley (rpm)	40	39	39	39	39	39
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	1018	991	1059	1059	1059	1059
HIGH RANGE						
Motor Hp	7.5	7.5	10	10	10	10
Motor Nominal Rpm	1745	1745	1745	1745	1745	1745
Maximum Continuous Bhp	8.63	8.63	11.5	11.5	11.5	11.5
Maximum Continuous Watts	7267	7267	9582	9582	9582	9582
Motor Frame Size	S213T	S213T	S215T	S215T	S215T	S215T
Motor Shaft Diameter (in.)	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Fan Rpm Range	1078-1274	1078-1274	1014-1297	1014-1297	1014-1297	1014-1297
Motor Pulley Min. Pitch Diameter (in.)	5.5	5.5	4.3	4.3	4.3	4.3
Motor Pulley Max. Pitch Diameter (in.)	6.5	6.5	5.5	5.5	5.5	5.5
Blower Pulley Pitch Diameter (in.)	8.9	8.9	7.4	7.4	7.4	7.4
Blower Pulley Shaft Diameter (in.)	1.1875	1.1875	1.1875	1.1875	1.1875	1.1875
Blower Pulley Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Pulley Center Line Distance (in.)	9.025-12.179	9.025-12.179	9.025-12.179	9.025-12.179	9.025-12.179	9.025-12.179
Belt, Quantity...Type...Length (in.)	1...BX...42	1...BX...42	2...BX...38	2...BX...38	2...BX...38	2...BX...38
Speed Change per Turn - Moveable Pulley (rpm)	33	33	47	47	47	47
Moveable Pulley Maximum Full Turns	6	6	6	6	6	6
Factory Speed Setting (rpm)	1176	1176	1156	1156	1156	1156

LEGEND

Bhp — Brake Horsepower
N/A — Not Applicable

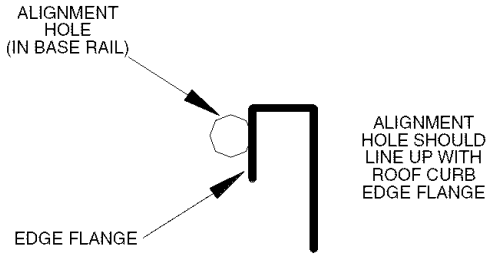


Fig. 5 — Alignment Hole Details

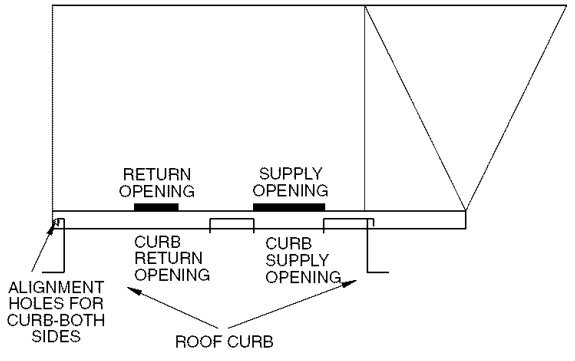


Fig. 6 — Alignment Hole Location

Step 4 — Field Fabricate Ductwork — On vertical 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 secured to the flanges. Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes.

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

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

A minimum clearance is not required around ductwork. Cabinet return-air static pressure (a negative condition) shall not exceed 0.35 in. wg with economizer or 0.45 in. wg without economizer.

These units are designed for a minimum continuous return-air temperature in heating of 50 F (dry bulb), or an intermittent operation down to 45 F (dry bulb), such as when used with a night set-back thermostat.

To operate at lower return-air temperatures, a field-supplied outdoor-air temperature control must be used to initiate both stages of heat when the temperature is below 45 F. Indoor comfort may be compromised when these lower air temperatures are used with insufficient heating temperature rise.

Step 5 — Make Unit Duct Connections

VERTICAL CONFIGURATION — Unit is shipped for thru-the-bottom duct connections. Ductwork openings are shown in Fig. 1 and 4. Duct connections for vertical supply and return configuration are shown in Fig. 7. Field-fabricated concentric ductwork may be connected as shown in Fig. 8 and 9. The unit is designed to attach the ductwork to the roof curb. Do not attach duct directly to the unit.

⚠ WARNING

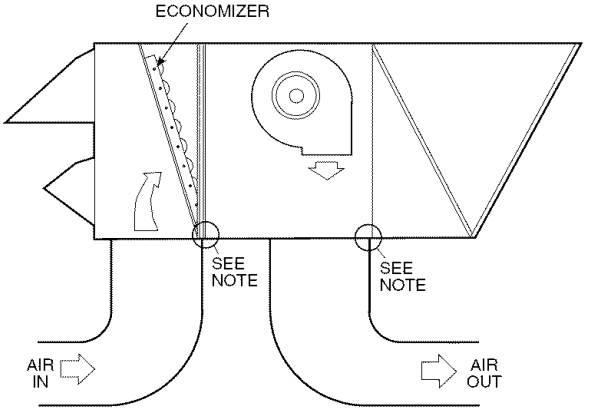
For vertical supply and return units, tools or parts could drop into ductwork and cause an injury. Install a 90-degree turn in the return ductwork between the unit and the conditioned space. If a 90-degree elbow cannot be installed, then a grille of sufficient strength and density should be installed to prevent objects from falling into the conditioned space.

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.

NOTE: A 90-degree elbow must be provided in the supply ductwork to comply with UL (Underwriters' Laboratories) codes for use with electric heat.

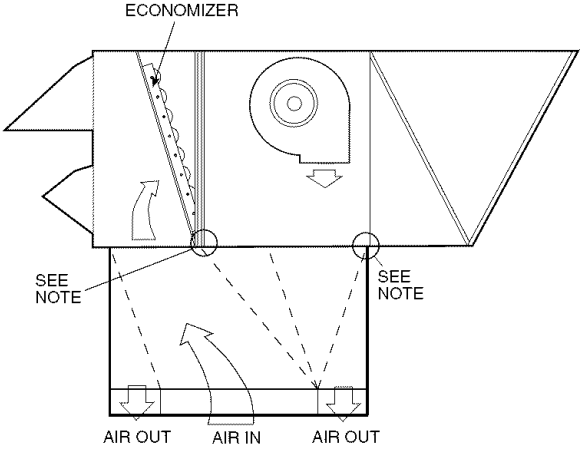
HORIZONTAL APPLICATIONS — Horizontal units are shipped with outer panels that allow for side by side horizontal duct connections. If specified during ordering, the unit will be shipped with the vertical duct openings blocked off from the factory, ready for side supply installation. If the horizontal option was not specified at time of ordering the unit, a field-installed accessory kit is required to convert the vertical unit into a horizontal supply configuration.

Installation of the duct block-off covers should be completed prior to placing the unit unless sufficient side clearance is available. A minimum of 66 in. is required between the unit and any obstruction to install the duct block-off covers.



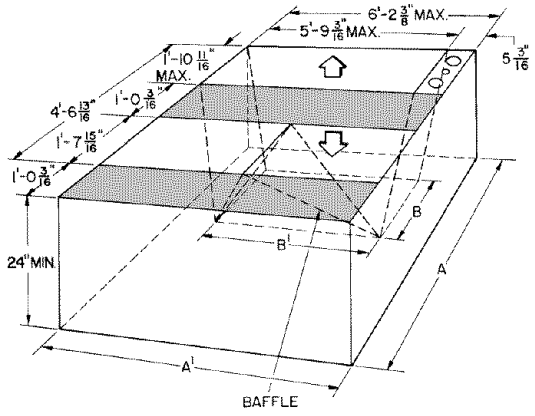
NOTE: Do not drill in this area; damage to basepan may result in water leak.

Fig. 7 — Air Distribution — Vertical Supply and Return



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

Fig. 8 — Air Distribution — Concentric Duct



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

Shaded areas indicate block-off pans.

Fig. 9 — Concentric Duct Details

Side supply duct dimensions and locations are shown on Fig. 4. Connect ductwork to horizontal duct flange connections on side of unit.

Step 6 — Trap Condensate Drain — See Fig. 10 for drain location. One 3/4-in. half coupling is provided outside unit evaporator section for condensate drain connection. A trap at least 4-in. deep must be used. See Fig. 11.

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

Step 7 — Make Electrical Connections

FIELD POWER SUPPLY — Unit is factory wired for voltage shown on unit nameplate. Be sure to check for correct voltage.

When installing units, provide disconnect per NEC (National Electrical Code) of adequate size (MOCP [Maximum Overcurrent protection] of unit is on the informative plate). See Tables 4A and 4B. All field wiring must comply with NEC and local codes. Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. See Fig. 12 for power wiring connections to the unit power terminal block and equipment grounds.

Route power and ground lines through control box end panel or unit basepan (see Fig. 4) to connections as shown on unit wiring diagram and Fig. 12.

⚠ CAUTION

The correct power phasing is critical to the operation of the scroll compressors. An incorrect phasing will result in compressor shutdown on thermal overload and possible damage to compressor. Should this occur, power phase correction must be made to the incoming power.

⚠ 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, 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 wiring must conform to temperature limitations for type "T" wire. All field wiring must comply with NEC and local requirements.

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%.

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

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

Route thermostat cable or equivalent single leads of colored wire from subbase terminals through conduit into unit to low-voltage connections as shown on unit label wiring diagram and in Fig. 13.

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 at the thermostat and will require a junction box and splice at the thermostat.

Text continued on page 23.

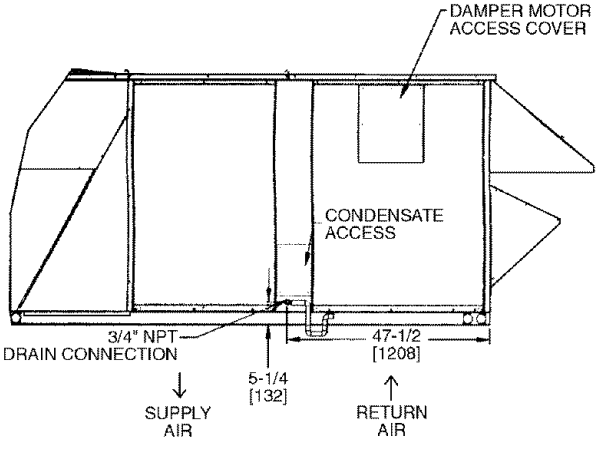
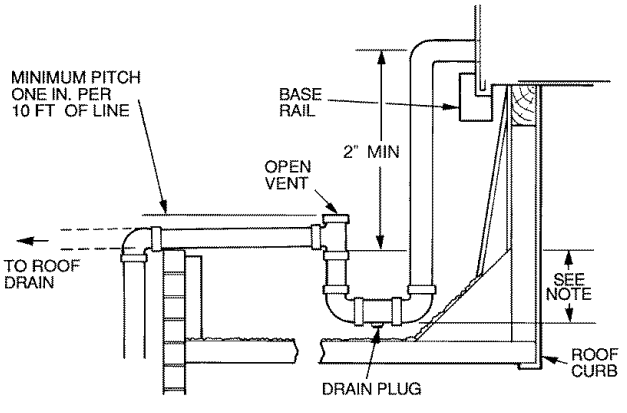


Fig. 10 — Condensate Drain Details



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

Fig. 11 — Condensate Drain Piping Details

Table 4A — Electrical Data — Units Without Convenience Outlet

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR No. 1		COMPRESSOR No. 2		COMPRESSOR No. 3		OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
020	208/230	187	253	16.7	130	16.7	130	22.4	184	4	0.25	1.5	—	—	3.7	10.6/9.6	—	—	—	78/ 77	100/ 90	83/ 82
																	2	1	5.9	90/ 89	100/100	97/ 96
															5	16.7/15.2	—	—	—	84/ 83	100/100	90/ 89
																	2	1	5.9	96/ 94	100/100	104/102
															7.5	24.2/22	—	—	—	92/ 89	100/100	99/ 96
																	2	1	5.9	104/101	125/110	112/110
													19/25	52/ 60	3.7	10.6/9.6	—	—	—	78/ 87	100/ 90	83/ 82
																	2	1	5.9	93/102	100/110	97/ 96
															5	16.7/15.2	—	—	—	86/ 94	100/100	90/ 89
																	2	1	5.9	101/109	110/110	104/102
															7.5	24.2/22	—	—	—	95/103	100/110	99/ 96
																	2	1	5.9	110/117	125/125	112/110
													38/50	104/120	3.7	10.6/9.6	—	—	—	143/132	150/150	132/149
																	2	1	5.9	158/147	175/150	145/163
															5	16.7/15.2	—	—	—	151/139	175/150	139/155
																	2	1	5.9	166/154	175/175	152/169
															7.5	24.2/22	—	—	—	160/148	175/150	147/163
																	2	1	5.9	175/162	200/175	161/177
													56/75†	156/180	3.7	10.6/9.6	—	—	—	78/ 77	100/ 90	83/ 82
																	2	1	5.9	90/ 89	100/100	97/ 96
															5	16.7/15.2	—	—	—	84/ 83	100/100	90/ 89
																	2	1	5.9	96/ 94	100/100	104/102
															7.5	24.2/22	—	—	—	92/ 89	100/100	99/ 96
																	2	1	5.9	104/101	125/110	112/110
	460	414	506	9	70	9	70	10.7	90	4	0.25	0.7	—	—	3.7	4.8	—	—	—	39	45	42
																	2	1	3.1	45	50	49
															5	7.6	—	—	—	42	50	45
																	2	1	3.1	48	50	52
															7.5	11	—	—	—	45	50	49
																	2	1	3.1	51	60	56
													25	30	3.7	4.8	—	—	—	44	45	42
																	2	1	3.1	51	60	49
															5	7.6	—	—	—	47	50	45
																	2	1	3.1	55	60	52
															7.5	11	—	—	—	51	60	49
																	2	1	3.1	59	60	56
													50	60	3.7	4.8	—	—	—	66	80	75
																	2	1	3.1	74	80	82
															5	7.6	—	—	—	70	80	78
																	2	1	3.1	77	80	85
															7.5	11	—	—	—	74	80	82
																	2	1	3.1	82	90	89
													75	90	3.7	4.8	—	—	—	96	100	109
																	2	1	3.1	104	110	116
															5	7.6	—	—	—	100	110	112
																	2	1	3.1	107	125	119
															7.5	11	—	—	—	104	125	116
																	2	1	3.1	112	125	123

LEGEND

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

*Fuse or HACR circuit breaker.

†208/230 v 75-kW Electric Heat units must use dual-point wiring. The main table lists the branch circuit values for the refrigeration part of the system. The following two tables list the branch circuit values for the electric heat and values for a feeder circuit for both branch circuits.

NOTES:

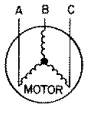
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**

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

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.

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

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

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

   $$= 457$$

   Determine maximum deviation from average voltage.

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. The 75-kW 208/240-v electric heat can be factory installed but it must be wired separately in the field.
4. The convenience outlet full load amps (FLA) are 5, 3 and 3 for 208/230, 460, 575-v units, respectively.
5. The FLA load amps provided in the table for electric heaters are based on 208/240, 480 and 600 v.
6. MCA calculation for 50HJ units with electric heaters over 50 kW is = 1.25 x (IFM + Power Exhaust + Convenience Outlet FLA amps) + 1.00 x (Electric Heater FLA).

Table 4A — Electrical Data — Units Without Convenience Outlet (cont)

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
020	575	518	633	7	55	7	55	9.3	73	4	0.25	0.7	—	—	3	3.9	—	—	—	32	40	35
																	2	1	2.4	37	45	40
															5	6.1	—	—	—	35	40	37
																	2	1	2.4	39	45	43
															7.5	9	—	—	—	37	45	40
																	2	1	2.4	42	50	46
													24.8	24	3	3.9	—	—	—	35	40	35
																	2	1	2.4	41	45	40
															5	6.1	—	—	—	38	40	37
																	2	1	2.4	44	45	43
															7.5	9	—	—	—	41	45	40
																	2	1	2.4	47	50	46
													48.3	46	3	3.9	—	—	—	62	70	57
																	2	1	2.4	68	70	63
															5	6.1	—	—	—	65	70	60
																	2	1	2.4	71	80	65
															7.5	9	—	—	—	69	70	63
																	2	1	2.4	75	80	69
													78	75	3	3.9	—	—	—	80	90	91
																	2	1	2.4	86	90	96
															5	6.1	—	—	—	83	90	93
																	2	1	2.4	89	100	99
															7.5	9	—	—	—	86	100	97
																	2	1	2.4	92	100	102

ELECTRIC HEAT BRANCH CIRCUIT 208/240 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
020	208/240	187	253	—	—	—	—	—	—	—	—	—	56/75	156/180	—	—	—	—	—	156/180	175/200	179/207

FEEDER CIRCUIT FOR 208/230 UNIT WITH 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
020	208/230	187	253	16.7	130	16.7	130	22.4	184	4	0.25	1.5	56/75	156/180	3.7	10.6/ 9.6	—	—	—	169/192	200/225	192/218
																	2	1	5.9	184/207	200/225	205/232
															5	16.7/15.2	—	—	—	177/199	200/225	199/224
																	2	1	5.9	192/214	200/225	212/238
															7.5	24.2/22.0	—	—	—	186/208	200/225	207/232
																	2	1	5.9	201/222	225/225	221/246

LEGEND

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

*Fuse or HACR circuit breaker.

†208/230 v 75-kW Electric Heat units must use dual-point wiring. The main table lists the branch circuit values for the refrigeration part of the system. The following two tables list the branch circuit values for the electric heat and values for a feeder circuit for both branch circuits.

NOTES:

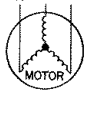
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**

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

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.



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

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

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

   $$= 457$$

   Determine maximum deviation from average voltage.

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. The 75-kW 208/240-v electric heat can be factory installed but it must be wired separately in the field.
4. The convenience outlet full load amps (FLA) are 5, 3 and 3 for 208/230, 460, 575-v units, respectively.
5. The FLA load amps provided in the table for electric heaters are based on 208/240, 480 and 600 v.
6. MCA calculation for 50HJ units with electric heaters over 50 kW is = 1.25 x (IFM + Power Exhaust + Convenience Outlet FLA amps) + 1.00 x (Electric Heater FLA).

Table 4A — Electrical Data — Units Without Convenience Outlet (cont)

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
024	208/230	187	253	22.4	184	22.4	184	22.4	184	4	0.25	1.5	—	—	3.7	10.6/9.6	—	—	—	89/ 88	100/100	96/ 95
																	2	1	5.9	101/100	110/110	110/109
															5	16.7/15.2	—	—	—	96/ 94	100/100	103/102
																	2	1	5.9	107/106	125/125	117/115
															7.5	24.2/22	—	—	—	103/101	125/110	112/109
																	2	1	5.9	115/113	125/125	126/123
															10	30.8/28	—	—	—	112/108	125/125	120/116
																	2	1	5.9	124/120	150/125	133/130
													19/25	52/60	3.7	10.6/9.6	—	—	—	89/ 88	100/100	96/ 95
																	2	1	5.9	101/102	110/110	110/109
															5	16.7/15.2	—	—	—	96/ 94	100/100	103/102
																	2	1	5.9	107/109	125/125	117/115
															7.5	24.2/22	—	—	—	103/103	125/110	112/109
																	2	1	5.9	115/117	125/125	126/123
															10	30.8/28	—	—	—	112/110	125/125	120/116
																	2	1	5.9	124/125	150/125	133/130
													38/50	104/120	3.7	10.6/9.6	—	—	—	143/132	150/150	132/149
																	2	1	5.9	158/147	175/150	145/163
															5	16.7/15.2	—	—	—	151/139	175/150	139/155
																	2	1	5.9	166/154	175/175	152/169
															7.5	24.2/22	—	—	—	160/148	175/150	147/163
																	2	1	5.9	175/162	200/175	161/177
															10	30.8/28	—	—	—	169/155	175/175	155/170
																	2	1	5.9	183/170	200/175	169/184
													56/75†	156/180	3.7	10.6/9.6	—	—	—	89/ 88	100/100	96/ 95
																	2	1	5.9	101/100	110/110	110/109
															5	16.7/15.2	—	—	—	96/ 94	100/100	103/102
																	2	1	5.9	107/106	125/125	117/115
															7.5	24.2/22	—	—	—	103/101	125/110	112/109
																	2	1	5.9	115/113	125/125	126/123
															10	30.8/28	—	—	—	112/108	125/125	120/116
																	2	1	5.9	124/120	150/125	133/130
	460	414	506	10.7	90	10.7	90	10.7	90	4	0.25	0.7	—	—	3.7	4.8	—	—	—	42	50	46
																	2	1	3.1	49	50	53
															5	7.6	—	—	—	45	50	49
																	2	1	3.1	51	60	56
															7.5	11	—	—	—	49	50	53
																	2	1	3.1	55	60	60
															10	14	—	—	—	52	60	56
																	2	1	3.1	59	60	63
													25	30	3.7	4.8	—	—	—	44	50	46
																	2	1	3.1	51	60	53
															5	7.6	—	—	—	47	50	49
																	2	1	3.1	55	60	56
															7.5	11	—	—	—	51	60	53
																	2	1	3.1	59	60	60
															10	14	—	—	—	55	60	56
																	2	1	3.1	63	70	63
													50	60	3.7	4.8	—	—	—	66	80	75
																	2	1	3.1	74	80	82
															5	7.6	—	—	—	70	80	78
																	2	1	3.1	77	80	85
															7.5	11	—	—	—	74	80	82
																	2	1	3.1	82	90	89
															10	14	—	—	—	78	90	85
																	2	1	3.1	85	90	92
													75	90	3.7	4.8	—	—	—	96	100	109
																	2	1	3.1	104	110	116
															5	7.6	—	—	—	100	110	112
																	2	1	3.1	107	125	119
															7.5	11	—	—	—	104	125	116
																	2	1	3.1	112	125	123
															10	14	—	—	—	108	125	120
																	2	1	3.1	115	125	127

See legend and notes on next page.

Table 4A — Electrical Data — Units Without Convenience Outlet (cont)

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR No. 1		COMPRESSOR No. 2		COMPRESSOR No. 3		OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
024	575	518	633	9.3	73	9.3	73	9.3	73	4	0.25	0.7	—	—	5	6.1	—	—	—	39	45	42
																	2	1	2.4	44	50	48
															7.5	9	—	—	—	42	50	46
																	2	1	2.4	47	50	51
															10	11	—	—	—	44	50	48
																	2	1	2.4	49	60	53
													24.8	24	5	6.1	—	—	—	39	45	42
																	2	1	2.4	44	50	48
															7.5	9	—	—	—	42	50	46
																	2	1	2.4	47	50	51
															10	11	—	—	—	44	50	48
																	2	1	2.4	50	60	53
													48.3	46	5	6.1	—	—	—	65	70	60
																	2	1	2.4	71	80	65
															7.5	9	—	—	—	69	70	63
																	2	1	2.4	75	80	69
															10	11	—	—	—	71	80	66
																	2	1	2.4	77	80	71
													78	75	5	6.1	—	—	—	83	90	93
																	2	1	2.4	89	100	99
															7.5	9	—	—	—	86	100	97
																	2	1	2.4	92	100	102
															10	11	—	—	—	89	100	99
																	2	1	2.4	95	100	104

ELECTRIC HEAT BRANCH CIRCUIT 208/240 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR No. 1		COMPRESSOR No. 2		COMPRESSOR No. 3		OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
024	208/240	187	253	—	—	—	—	—	—	—	—	—	56/75	156/180	—	—	—	—	—	156/180	175/200	179/207

FEEDER CIRCUIT FOR 208/230 UNIT WITH 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR No. 1		COMPRESSOR No. 2		COMPRESSOR No. 3		OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
024	208/230	187	253	22.4	184	22.4	184	22.4	184	4	0.25	1.5	56/75	156/180	3.7	10.6/9.6	—	—	—	169/192	200/225	192/218
																	2	1	5.9	184/207	200/225	205/232
															5	16.7/15.2	—	—	—	177/199	200/225	199/224
																	2	1	5.9	192/214	200/225	212/238
															7.5	24.2/22	—	—	—	186/208	200/225	207/232
																	2	1	5.9	201/222	225/225	221/246
															10	30.8/28	—	—	—	195/215	225/225	215/239
																	2	1	5.9	209/230	225/250	228/253

LEGEND

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

*Fuse or HACR circuit breaker.

†208/230 v 75-kW Electric Heat units must use dual-point wiring. The main table lists the branch circuit values for the refrigeration part of the system. The following two tables list the branch circuit values for the electric heat and values for a feeder circuit for both branch circuits.

NOTES:

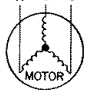
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**

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

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.



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

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

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

   $$= 457$$

   Determine maximum deviation from average voltage.

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. The 75-kW 208/240-v electric heat can be factory installed but it must be wired separately in the field.
4. The convenience outlet full load amps (FLA) are 5, 3 and 3 for 208/230, 460, 575-v units, respectively.
5. The FLA load amps provided in the table for electric heaters are based on 208/240, 480 and 600 v.
6. MCA calculation for 50HJ units with electric heaters over 50 kW is = 1.25 x (IFM + Power Exhaust + Convenience Outlet FLA amps) + 1.00 x (Electric Heater FLA).

Table 4A — Electrical Data — Units Without Convenience Outlet (cont)

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
028	208/230	187	253	47.1	245	47.1	245	—	—	6	0.25	1.5	—	—	5	16.7/15.2	—	—	—	132/130	175/175	138/136
																	2	1	5.9	143/142	175/175	151/150
															7.5	24.2/22	—	—	—	139/137	175/175	147/144
																	2	1	5.9	151/149	175/175	160/158
															10	30.8/28	—	—	—	146/143	175/175	154/151
																	2	1	5.9	158/155	200/200	168/164
													19/25	52/60	5	16.7/15.2	—	—	—	132/130	175/175	138/136
																	2	1	5.9	143/142	175/175	151/150
															7.5	24.2/22	—	—	—	139/137	175/175	147/144
																	2	1	5.9	151/149	175/175	160/158
															10	30.8/28	—	—	—	146/143	175/175	154/151
																	2	1	5.9	158/155	200/200	168/164
													38/50	104/120	5	16.7/15.2	—	—	—	151/139	175/175	139/155
																	2	1	5.9	166/154	175/175	152/169
															7.5	24.2/22	—	—	—	160/148	175/175	147/163
																	2	1	5.9	175/162	200/175	161/177
															10	30.8/28	—	—	—	169/155	175/175	155/170
																	2	1	5.9	183/170	200/200	169/184
													56/75†	156/180	5	16.7/15.2	—	—	—	132/130	175/175	138/136
																	2	1	5.9	143/142	175/175	151/150
															7.5	24.2/22	—	—	—	139/137	175/175	147/144
																	2	1	5.9	151/149	175/175	160/158
															10	30.8/28	—	—	—	146/143	175/175	154/151
																	2	1	5.9	158/155	200/200	168/164
	460	414	506	19.6	125	19.6	125	—	—	6	0.25	0.7	—	—	5	7.6	—	—	—	56	60	59
																	2	1	3.1	62	80	66
															7.5	11	—	—	—	59	60	63
																	2	1	3.1	66	80	70
															10	14	—	—	—	62	80	66
																	2	1	3.1	69	80	73
													25	30	5	7.6	—	—	—	56	60	59
																	2	1	3.1	62	80	66
															7.5	11	—	—	—	59	60	63
																	2	1	3.1	66	80	70
															10	14	—	—	—	62	80	66
																	2	1	3.1	69	80	73
													50	60	5	7.6	—	—	—	70	80	78
																	2	1	3.1	77	80	85
															7.5	11	—	—	—	74	80	82
																	2	1	3.1	82	90	89
															10	14	—	—	—	78	90	85
																	2	1	3.1	85	90	92
													75	90	5	7.6	—	—	—	100	110	112
																	2	1	3.1	107	125	119
															7.5	11	—	—	—	104	125	116
																	2	1	3.1	112	125	123
															10	14	—	—	—	108	125	120
																	2	1	3.1	115	125	127

LEGEND

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

*Fuse or HACR circuit breaker.

†208/230 v 75-kW Electric Heat units must use dual-point wiring. The main table lists the branch circuit values for the refrigeration part of the system. The following two tables list the branch circuit values for the electric heat and values for a feeder circuit for both branch circuits.

NOTES:

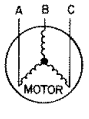
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**

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

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.

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

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

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

   $$= 457$$

   Determine maximum deviation from average voltage.

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. The 75-kW 208/240-v electric heat can be factory installed but it must be wired separately in the field.
4. The convenience outlet full load amps (FLA) are 5, 3 and 3 for 208/230, 460, 575-v units, respectively.
5. The FLA load amps provided in the table for electric heaters are based on 208/240, 480 and 600 v.
6. MCA calculation for 50HJ units with electric heaters over 50 kW is = 1.25 x (IFM + Power Exhaust + Convenience Outlet FLA amps) + 1.00 x (Electric Heater FLA).

Table 4A — Electrical Data — Units Without Convenience Outlet (cont)

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR No. 1		COMPRESSOR No. 2		COMPRESSOR No. 3		OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
028	575	518	633	15.8	100	15.8	100	—	—	6	0.25	0.7	—	—	5	6.1	—	—	—	46	60	48
																	2	1	2.4	51	60	54
															7.5	9	—	—	—	49	60	52
																	2	1	2.4	54	60	57
															10	11	—	—	—	51	60	54
																	2	1	2.4	56	60	59
													24.8	24	5	6.1	—	—	—	46	60	48
																	2	1	2.4	51	60	54
															7.5	9	—	—	—	49	60	52
																	2	1	2.4	54	60	57
															10	11	—	—	—	51	60	54
																	2	1	2.4	56	60	59
													48.3	46	5	6.1	—	—	—	65	70	60
																	2	1	2.4	71	80	65
															7.5	9	—	—	—	69	70	63
																	2	1	2.4	75	80	69
															10	11	—	—	—	71	80	66
																	2	1	2.4	77	80	71
													78	75	5	6.1	—	—	—	83	90	93
																	2	1	2.4	89	100	99
															7.5	9	—	—	—	86	100	97
																	2	1	2.4	92	100	102
															10	11	—	—	—	89	100	99
																	2	1	2.4	95	100	104

ELECTRIC HEAT BRANCH CIRCUIT 208/240 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR No. 1		COMPRESSOR No. 2		COMPRESSOR No. 3		OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
028	208/240	187	253	—	—	—	—	—	—	—	—	—	56/75	156/180	—	—	—	—	—	156/180	175/200	179/207

FEEDER CIRCUIT FOR 208/230 UNIT WITH 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR No. 1		COMPRESSOR No. 2		COMPRESSOR No. 3		OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
028	208/230	187	253	47.1	245	47.1	245	—	—	6	0.25	1.5	56/75	156/180	5	16.7/15.2	—	—	—	177/199	200/225	199/224
																	2	1	5.9	192/214	200/225	212/238
															7.5	24.2/22	—	—	—	186/208	200/225	207/232
																	2	1	5.9	201/222	225/225	221/246
															10	30.8/28	—	—	—	195/215	225/225	215/239
																	2	1	5.9	209/230	225/250	228/253

LEGEND

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

*Fuse or HACR circuit breaker.

†208/230 v 75-kW Electric Heat units must use dual-point wiring. The main table lists the branch circuit values for the refrigeration part of the system. The following two tables list the branch circuit values for the electric heat and values for a feeder circuit for both branch circuits.

NOTES:

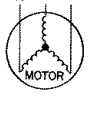
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**

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

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.



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

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

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

   $$= 457$$

   Determine maximum deviation from average voltage.

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. The 75-kW 208/240-v electric heat can be factory installed but it must be wired separately in the field.
4. The convenience outlet full load amps (FLA) are 5, 3 and 3 for 208/230, 460, 575-v units, respectively.
5. The FLA load amps provided in the table for electric heaters are based on 208/240, 480 and 600 v.
6. MCA calculation for 50HJ units with electric heaters over 50 kW is = 1.25 x (IFM + Power Exhaust + Convenience Outlet FLA amps) + 1.00 x (Electric Heater FLA).

Table 4B — Electrical Data — Units With Optional Convenience Outlet

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR No. 1		COMPRESSOR No. 2		COMPRESSOR No. 3		OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
020	208/230	187	253	16.7	130	16.7	130	22.4	184	4	0.25	1.5	—	—	3.7	10.6/9.6	—	—	—	83/ 82	100/100	89/ 88
																	2	1	5.9	95/ 94	100/100	103/101
															5	16.7/15.2	—	—	—	89/ 88	100/100	96/ 94
																	2	1	5.9	101/ 99	110/100	110/108
															7.5	24.2/22	—	—	—	97/ 94	100/100	105/102
																	2	1	5.9	109/106	125/125	118/116
													19/25	52/60	3.7	10.6/9.6	—	—	—	85/ 93	100/100	89/ 88
																	2	1	5.9	99/108	100/110	103/101
															5	16.7/15.2	—	—	—	92/100	100/110	96/ 94
																	2	1	5.9	107/115	110/125	110/108
															7.5	24.2/22	—	—	—	102/109	110/110	105/102
																	2	1	5.9	116/124	125/125	118/116
													38/50	104/120	3.7	10.6/9.6	—	—	—	150/138	150/150	138/155
																	2	1	5.9	164/153	175/175	151/168
															5	16.7/15.2	—	—	—	157/145	175/150	145/161
																	2	1	5.9	172/160	175/175	158/175
															7.5	24.2/22	—	—	—	167/154	175/175	153/169
																	2	1	5.9	181/169	200/175	167/183
													56/75†	156/180	3.7	10.6/9.6	—	—	—	83/ 82	100/100	89/ 88
																	2	1	5.9	95/ 94	100/100	103/101
															5	16.7/15.2	—	—	—	89/ 88	100/100	96/ 94
																	2	1	5.9	101/ 99	110/100	110/108
															7.5	24.2/22	—	—	—	97/ 94	100/100	105/102
																	2	1	5.9	109/106	125/125	118/116
	460	414	506	9	70	9	70	10.7	90	4	0.25	0.7	—	—	3.7	4.8	—	—	—	42	50	45
																	2	1	3.1	48	50	52
															5	7.6	—	—	—	45	50	48
																	2	1	3.1	51	60	56
															7.5	11	—	—	—	48	50	52
																	2	1	3.1	54	60	59
													25	30	3.7	4.8	—	—	—	47	50	45
																	2	1	3.1	55	60	52
															5	7.6	—	—	—	51	60	48
																	2	1	3.1	59	60	56
															7.5	11	—	—	—	55	60	52
																	2	1	3.1	63	70	59
													50	60	3.7	4.8	—	—	—	70	80	78
																	2	1	3.1	78	80	85
															5	7.6	—	—	—	73	80	81
																	2	1	3.1	81	90	88
															7.5	11	—	—	—	78	80	85
																	2	1	3.1	85	90	92
													75	90	3.7	4.8	—	—	—	100	110	112
																	2	1	3.1	108	125	120
															5	7.6	—	—	—	103	125	116
																	2	1	3.1	111	125	123
															7.5	11	—	—	—	108	125	120
																	2	1	3.1	115	125	127

LEGEND

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

*Fuse or HACR circuit breaker.

†208/230 v 75-kW Electric Heat units must use dual-point wiring. The main table lists the branch circuit values for the refrigeration part of the system. The following two tables list the branch circuit values for the electric heat and values for a feeder circuit for both branch circuits.

NOTES:

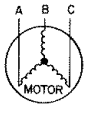
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**

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

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.

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

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

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

   $$= 457$$

   Determine maximum deviation from average voltage.

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. The 75-kW 208/240-v electric heat can be factory installed but it must be wired separately in the field.
4. The convenience outlet full load amps (FLA) are 5, 3 and 3 for 208/230, 460, 575-v units, respectively.
5. The FLA load amps provided in the table for electric heaters are based on 208/240, 480 and 600 v.
6. MCA calculation for 50HJ units with electric heaters over 50 kW is = 1.25 x (IFM + Power Exhaust + Convenience Outlet FLA amps) + 1.00 x (Electric Heater FLA).

Table 4B — Electrical Data — Units With Optional Convenience Outlet (cont)

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
020	575	518	633	7	55	7	55	9.3	73	4	0.25	0.7	—	—	3	3.9	—	—	—	35	40	38
																	2	1	2.4	40	45	43
															5	6.1	—	—	—	38	45	40
																	2	1	2.4	42	50	46
															7.5	9	—	—	—	40	45	44
																	2	1	2.4	45	50	49
													24.8	24	3	3.9	—	—	—	39	40	38
																	2	1	2.4	45	45	43
															5	6.1	—	—	—	41	45	40
																	2	1	2.4	47	50	46
															7.5	9	—	—	—	45	50	44
																	2	1	2.4	51	60	49
													48.3	46	3	3.9	—	—	—	66	70	61
																	2	1	2.4	72	80	66
															5	6.1	—	—	—	69	70	63
																	2	1	2.4	75	80	69
															7.5	9	—	—	—	73	80	67
																	2	1	2.4	79	80	72
													78	75	3	3.9	—	—	—	84	90	94
																	2	1	2.4	90	100	100
															5	6.1	—	—	—	86	100	97
																	2	1	2.4	92	100	102
															7.5	9	—	—	—	90	100	100
																	2	1	2.4	96	100	106

ELECTRIC HEAT BRANCH CIRCUIT 208/240 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
020	208/240	187	253	—	—	—	—	—	—	—	—	—	56/75	156/180	—	—	—	—	—	156/180	175/200	179/207

FEEDER CIRCUIT FOR 208/230 UNIT WITH 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
020	208/230	187	253	16.7	130	16.7	130	22.4	184	4	0.25	1.5	56/75	156/180	3.7	10.6/9.6	—	—	—	176/198	200/225	197/224
																	2	1	5.9	190/213	200/225	211/237
															5	16.7/15.2	—	—	—	183/205	200/225	204/230
																	2	1	5.9	198/220	200/225	218/244
															7.5	24.2/22	—	—	—	193/214	200/225	213/238
																	2	1	5.9	207/229	225/250	227/252

LEGEND

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

*Fuse or HACR circuit breaker.

†208/230 v 75-kW Electric Heat units must use dual-point wiring. The main table lists the branch circuit values for the refrigeration part of the system. The following two tables list the branch circuit values for the electric heat and values for a feeder circuit for both branch circuits.

NOTES:

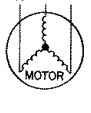
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**

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

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.



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

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

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

   $$= 457$$

   Determine maximum deviation from average voltage.

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. The 75-kW 208/240-v electric heat can be factory installed but it must be wired separately in the field.
4. The convenience outlet full load amps (FLA) are 5, 3 and 3 for 208/230, 460, 575-v units, respectively.
5. The FLA load amps provided in the table for electric heaters are based on 208/240, 480 and 600 v.
6. MCA calculation for 50HJ units with electric heaters over 50 kW is = 1.25 x (IFM + Power Exhaust + Convenience Outlet FLA amps) + 1.00 x (Electric Heater FLA).

Table 4B — Electrical Data — Units With Optional Convenience Outlet (cont)

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR No. 1		COMPRESSOR No. 2		COMPRESSOR No. 3		OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
024	208/230	187	253	22.4	184	22.4	184	22.4	184	4	0.25	1.5	—	—	3.7	10.6/9.6	—	—	—	94 /93	100/100	102/101
																	2	1	5.9	106/105	125/125	116/115
															5	16.7/15.2	—	—	—	101/ 99	110/100	109/107
																	2	1	5.9	112/111	125/125	123/121
															7.5	24.2/22	—	—	—	108/106	125/125	118/115
																	2	1	5.9	120/118	125/125	131/129
															10	30.8/28	—	—	—	117/113	125/125	125/122
																	2	1	5.9	129/125	150/150	139/136
													19/25	52/60	3.7	10.6/9.6	—	—	—	94/ 93	100/100	102/101
																	2	1	5.9	106/108	125/125	116/115
															5	16.7/15.2	—	—	—	101/100	110/110	109/107
																	2	1	5.9	112/115	125/125	123/121
															7.5	24.2/22	—	—	—	108/109	125/125	118/115
																	2	1	5.9	120/124	125/125	131/129
															10	30.8/28	—	—	—	117/116	125/125	125/122
																	2	1	5.9	129/131	150/150	139/136
													38/50	104/120	3.7	10.6/9.6	—	—	—	150/138	150/150	138/155
																	2	1	5.9	164/153	175/175	151/168
															5	16.7/15.2	—	—	—	157/145	175/150	145/161
																	2	1	5.9	172/160	175/175	158/175
															7.5	24.2/22	—	—	—	167/154	175/175	153/169
																	2	1	5.9	181/169	200/175	167/183
															10	30.8/28	—	—	—	175/161	175/175	161/176
																	2	1	5.9	190/176	200/200	174/190
													56/75†	156/180	3.7	10.6/9.6	—	—	—	94/ 93	100/100	102/101
																	2	1	5.9	106/105	125/125	116/115
															5	16.7/15.2	—	—	—	101/ 99	110/100	109/107
																	2	1	5.9	112/111	125/125	123/121
															7.5	24.2/22	—	—	—	108/106	125/125	118/115
																	2	1	5.9	120/118	125/125	131/129
															10	30.8/28	—	—	—	117/113	125/125	125/122
																	2	1	5.9	129/125	150/150	139/136
	460	414	506	10.7	90	10.7	90	10.7	90	4	0.25	0.7	—	—	3.7	4.8	—	—	—	45	50	49
																	2	1	3.1	52	60	56
															5	7.6	—	—	—	48	50	52
																	2	1	3.1	54	60	59
															7.5	11	—	—	—	52	60	56
																	2	1	3.1	58	60	63
															10	14	—	—	—	55	60	60
																	2	1	3.1	62	70	67
													25	30	3.7	4.8	—	—	—	47	50	49
																	2	1	3.1	55	60	56
															5	7.6	—	—	—	51	60	52
																	2	1	3.1	59	60	59
															7.5	11	—	—	—	55	60	56
																	2	1	3.1	63	70	63
															10	14	—	—	—	59	60	60
																	2	1	3.1	67	70	67
													50	60	3.7	4.8	—	—	—	70	80	78
																	2	1	3.1	78	80	85
															5	7.6	—	—	—	73	80	81
																	2	1	3.1	81	90	88
															7.5	11	—	—	—	78	80	85
																	2	1	3.1	85	90	92
															10	14	—	—	—	81	90	89
																	2	1	3.1	89	100	96
													75	90	3.7	4.8	—	—	—	100	110	112
																	2	1	3.1	108	125	120
															5	7.6	—	—	—	103	125	116
																	2	1	3.1	111	125	123
															7.5	11	—	—	—	108	125	120
																	2	1	3.1	115	125	127
															10	14	—	—	—	111	125	123
																	2	1	3.1	119	125	130

See legend and notes on next page.

Table 4B — Electrical Data — Units With Optional Convenience Outlet (cont)

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
024	575	518	633	9.3	73	9.3	73	9.3	73	4	0.25	0.7	—	—	5	6.1	—	—	—	42	50	46
																	2	1	2.4	47	50	51
															7.5	9	—	—	—	45	50	49
																	2	1	2.4	50	50	55
															10	11	—	—	—	47	50	51
																	2	1	2.4	52	60	57
													24.8	24	5	6.1	—	—	—	42	50	46
																	2	1	2.4	47	50	51
															7.5	9	—	—	—	45	50	49
																	2	1	2.4	51	60	55
															10	11	—	—	—	48	50	51
																	2	1	2.4	54	60	57
													48.3	46	5	6.1	—	—	—	69	70	63
																	2	1	2.4	75	80	69
															7.5	9	—	—	—	73	80	67
																	2	1	2.4	79	80	72
															10	11	—	—	—	75	80	69
																	2	1	2.4	81	90	75
													78	75	5	6.1	—	—	—	86	100	97
																	2	1	2.4	92	100	102
															7.5	9	—	—	—	90	100	100
																	2	1	2.4	96	100	106
															10	11	—	—	—	93	100	102
																	2	1	2.4	99	100	108

ELECTRIC HEAT BRANCH CIRCUIT 208/240 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
024	208/240	187	253	—	—	—	—	—	—	—	—	—	56/75	156/180	—	—	—	—	—	156/180	175/200	179/207

FEEDER CIRCUIT FOR 208/230 UNIT WITH 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
024	208/230	187	253	22.4	184	22.4	184	22.4	184	4	0.25	1.5	56/75	156/180	3.7	10.6/9.6	—	—	—	176/198	200/225	197/224
																	2	1	5.9	190/213	200/225	211/237
															5	16.7/15.2	—	—	—	183/205	200/225	204/230
																	2	1	5.9	198/220	200/225	218/244
															7.5	24.2/22	—	—	—	193/214	200/225	213/238
																	2	1	5.9	207/229	225/250	227/252
															10	30.8/28	—	—	—	201/221	225/225	221/245
																	2	1	5.9	216/236	225/250	234/259

LEGEND

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

*Fuse or HACR circuit breaker.

†208/230 v 75-kW Electric Heat units must use dual-point wiring. The main table lists the branch circuit values for the refrigeration part of the system. The following two tables list the branch circuit values for the electric heat and values for a feeder circuit for both branch circuits.

NOTES:

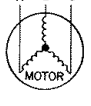
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**

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

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.

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

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

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

   $$= 457$$

   Determine maximum deviation from average voltage.

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. The 75-kW 208/240-v electric heat can be factory installed but it must be wired separately in the field.
4. The convenience outlet full load amps (FLA) are 5, 3 and 3 for 208/230, 460, 575-v units, respectively.
5. The FLA load amps provided in the table for electric heaters are based on 208/240, 480 and 600 v.
6. MCA calculation for 50HJ units with electric heaters over 50 kW is = 1.25 x (IFM + Power Exhaust + Convenience Outlet FLA amps) + 1.00 x (Electric Heater FLA).

Table 4B — Electrical Data — Units With Optional Convenience Outlet (cont)

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
028	208/230	187	253	47.1	245	47.1	245	—	—	6	0.25	1.5	—	—	5	16.7/15.2	—	—	—	137/135	175/175	144/142
																	2	1	5.9	148/147	175/175	157/155
															7.5	24.2/22	—	—	—	144/142	175/175	152/150
																	2	1	5.9	156/154	200/200	166/163
															10	30.8/28	—	—	—	151/148	175/175	160/157
																	2	1	5.9	163/160	200/200	173/170
													19/25	52/60	5	16.7/15.2	—	—	—	137/135	175/175	144/142
																	2	1	5.9	148/147	175/175	157/155
															7.5	24.2/22	—	—	—	144/142	175/175	152/150
																	2	1	5.9	156/154	200/200	166/163
															10	30.8/28	—	—	—	151/148	175/175	160/157
																	2	1	5.9	163/160	200/200	173/170
													38/50	104/120	5	16.7/15.2	—	—	—	157/145	175/175	145/161
																	2	1	5.9	172/160	175/175	158/175
															7.5	24.2/22	—	—	—	167/154	175/175	153/169
																	2	1	5.9	181/169	200/200	167/183
															10	30.8/28	—	—	—	175/161	175/175	161/176
																	2	1	5.9	190/176	200/200	174/190
													56/75†	156/180	5	16.7/15.2	—	—	—	137/135	175/175	144/142
																	2	1	5.9	148/147	175/175	157/155
															7.5	24.2/22	—	—	—	144/142	175/175	152/150
																	2	1	5.9	156/154	200/200	166/163
															10	30.8/28	—	—	—	151/148	175/175	160/157
																	2	1	5.9	163/160	200/200	173/170
	460	414	506	19.6	125	19.6	125	—	—	6	0.25	0.7	—	—	5	7.6	—	—	—	59	60	62
																	2	1	3.1	65	80	69
															7.5	11	—	—	—	62	80	66
																	2	1	3.1	69	80	73
															10	14	—	—	—	65	80	69
																	2	1	3.1	72	90	77
													25	30	5	7.6	—	—	—	59	60	62
																	2	1	3.1	65	80	69
															7.5	11	—	—	—	62	80	66
																	2	1	3.1	69	80	73
															10	14	—	—	—	65	80	69
																	2	1	3.1	72	90	77
													50	60	5	7.6	—	—	—	73	80	81
																	2	1	3.1	81	90	88
															7.5	11	—	—	—	78	80	85
																	2	1	3.1	85	90	92
															10	14	—	—	—	81	90	89
																	2	1	3.1	89	100	96
													75	90	5	7.6	—	—	—	103	125	116
																	2	1	3.1	111	125	123
															7.5	11	—	—	—	108	125	120
																	2	1	3.1	115	125	127
															10	14	—	—	—	111	125	123
																	2	1	3.1	119	125	130

LEGEND

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

*Fuse or HACR circuit breaker.

†208/230 v 75-kW Electric Heat units must use dual-point wiring. The main table lists the branch circuit values for the refrigeration part of the system. The following two tables list the branch circuit values for the electric heat and values for a feeder circuit for both branch circuits.

NOTES:

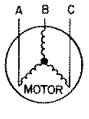
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**

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

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.

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

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

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

   $$= 457$$

   Determine maximum deviation from average voltage.

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. The 75-kW 208/240-v electric heat can be factory installed but it must be wired separately in the field.
4. The convenience outlet full load amps (FLA) are 5, 3 and 3 for 208/230, 460, 575-v units, respectively.
5. The FLA load amps provided in the table for electric heaters are based on 208/240, 480 and 600 v.
6. MCA calculation for 50HJ units with electric heaters over 50 kW is = 1.25 x (IFM + Power Exhaust + Convenience Outlet FLA amps) + 1.00 x (Electric Heater FLA).

Table 4B — Electrical Data — Units With Optional Convenience Outlet (cont)

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
028	575	518	633	15.8	100	15.8	100	—	—	6	0.25	0.7	—	—	5	6.1	—	—	—	49	60	52
																	2	1	2.4	54	60	57
															7.5	9	—	—	—	52	60	55
																	2	1	2.4	57	60	60
															10	11	—	—	—	54	60	57
																	2	1	2.4	59	60	63
													24.8	24	5	6.1	—	—	—	49	60	52
																	2	1	2.4	54	60	57
															7.5	9	—	—	—	52	60	55
																	2	1	2.4	57	60	60
															10	11	—	—	—	54	60	57
																	2	1	2.4	59	60	63
													48.3	46	5	6.1	—	—	—	69	70	63
																	2	1	2.4	75	80	69
															7.5	9	—	—	—	73	80	67
																	2	1	2.4	79	80	72
															10	11	—	—	—	75	80	69
																	2	1	2.4	81	90	75
													78	75	5	6.1	—	—	—	86	100	97
																	2	1	2.4	92	100	102
															7.5	9	—	—	—	90	100	100
																	2	1	2.4	96	100	106
															10	11	—	—	—	93	100	102
																	2	1	2.4	99	100	108

ELECTRIC HEAT BRANCH CIRCUIT 208/240 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
028	208/240	187	253	—	—	—	—	—	—	—	—	—	56/75	156/180	—	—	—	—	—	156/180	175/200	179/207

FEEDER CIRCUIT FOR 208/230 UNIT WITH 75-kW ELECTRIC HEAT†

UNIT SIZE 50HJ	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE		COMPRESSOR						OFM			ELECTRIC HEAT		IFM		POWER EXHAUST			POWER SUPPLY		DISCONNECT SIZE
				No. 1		No. 2		No. 3														
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	kW	FLA	Hp	FLA	Qty	Hp	FLA (ea)	MCA	MOCP*	FLA
028	208/230	187	253	47.1	245	47.1	245	—	—	6	0.25	1.5	56/75	156/180	5	16.7/15.2	—	—	—	183/205	200/225	204/230
																	2	1	5.9	198/220	200/225	218/244
															7.5	24.2/22	—	—	—	193/214	200/225	213/238
																	2	1	5.9	207/229	225/250	227/252
															10	30.8/28	—	—	—	201/221	225/225	221/245
																	2	1	5.9	216/236	225/250	234/259

LEGEND

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

*Fuse or HACR circuit breaker.

†208/230 v 75-kW Electric Heat units must use dual-point wiring. The main table lists the branch circuit values for the refrigeration part of the system. The following two tables list the branch circuit values for the electric heat and values for a feeder circuit for both branch circuits.

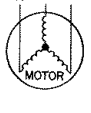
NOTES:

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. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%.
   Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.



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

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

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

   $$= 457$$

   Determine maximum deviation from average voltage.
   (AB) 457 – 452 = 5 v
   (BC) 464 – 457 = 7 v
   (AC) 457 – 455 = 2 v

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

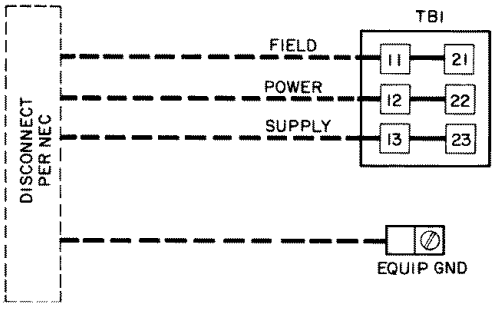
   $$\text{\% Voltage Imbalance} = 100 \times \frac{7}{457}$$

   $$= 1.53\%$$

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

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

3. The 75-kW 208/240-v electric heat can be factory installed but it must be wired separately in the field.
4. The convenience outlet full load amps (FLA) are 5, 3 and 3 for 208/230, 460, 575-v units, respectively.
5. The FLA load amps provided in the table for electric heaters are based on 208/240, 480 and 600 v.
6. MCA calculation for 50HJ units with electric heaters over 50 kW is = 1.25 x (IFM + Power Exhaust + Convenience Outlet FLA amps) + 1.00 x (Electric Heater FLA).



LEGEND

EQUIP	—	Equipment
GND	—	Ground
NEC	—	National Electrical Code
TB	—	Terminal Board

NOTE: The maximum wire size for TB1 is 2/0.

Fig. 12 — Field Power Wiring Connections

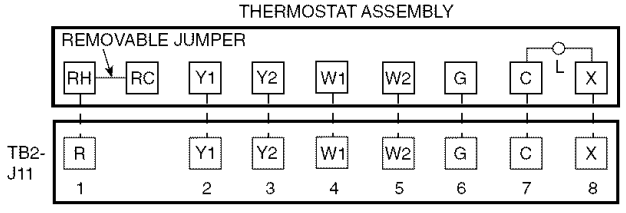


Fig. 13 — Field Control Thermostat Wiring

Set heat anticipator settings as shown in Table 5.

Table 5 — Heat Anticipator Settings

UNIT SIZE 50HJ	ELECTRIC HEAT (kW)	STAGE 1 (W1) ON			STAGES 1 AND 2 (W1 and W2) ON		
		Voltage			Voltage		
		208/240	480	600	208/240	480	600
020-028	25	0.2	0.2	0.2	0.4	0.4	0.4
	50	0.4	0.2	0.2	0.8	0.4	0.4
	75	0.4	0.2	0.2	0.8	0.4	0.4

Settings may be changed slightly to provide a greater degree of comfort for a particular installation.

Step 8 — Install Outdoor-Air Hood — Perform

the following procedure to install the outdoor-air hood on units equipped with an economizer, two-position damper, or outdoor-air damper:

1. Remove blank panel from return end of unit (hood section). Save the screws. See Fig. 14 for shipping location of components.
2. Hood sides are fastened to sides of outdoor air opening. Remove the hood sides and save the screws (3 each side).
3. Remove the bracket holding the bottom half of the hood in the shipping position. Remove the hood bottom half and filters (or manual dampers on units so equipped) from outdoor section.

   NOTE: On units without economizers, the components are attached to the unit basepan. To access the components, remove the panel below the outdoor air intake section.
4. Remove inner filter track from shipping position in outdoor section. Position inner filter track so the track is facing outward from the unit. Install the filter track with 4 screws provided.
5. Apply seal strip (provided) to back flange of both hood sides where hood side connects to the unit back panel. See Fig. 15.
6. Apply seal strip (provided) to top flange of both hood sides where hood sides connect to the hood top panels. See Fig. 15.
7. Install hood sides to the back panels using the screws from Step 2. The sloped flanges point outward. The drip edges of the side panels should face outward as well. The filter guides should face inward to hold the filters in place. See Fig. 15.
8. Apply seal strip along the entire length of the bottom flange of the hood top. See Fig. 15.
9. Install the bottom part of the hood top using 4 screws provided. See Fig. 15.
10. Remove the packaging from filters (3) and install into the filter tracks. Slide the filters to the sides then place the last filter into the center of the filter track.

NOTE: For units with manual dampers, replace the end filters with the manual dampers. Install the filter in the center between the manual dampers.

11. Install the filter retainer track along the bottom edge of the outdoor air hood using 4 screws provided. See Fig. 15.
12. Install top section of the outdoor-air hood using 9 screws provided. See Fig. 15. See Fig. 16 for a picture of the assembled outdoor-air hood.

NOTE: For filter removal, remove the four screws holding the filter retainer. The filters can then be removed, cleaned, or replaced. Install the filters by reversing the procedure.

MANUAL DAMPER ASSEMBLY — For units equipped with manual dampers, the assembly process is similar to the outdoor-air hood for units with economizers. There are two slide dampers shipped with the unit to allow for manual setting of the outside air volume. When assembling the hood, place one of the manual slide dampers in each of the end positions and the remaining filter in the center position. The manual dampers can then be moved to the appropriate position and then locked into place using the screws mounted in the adjustment slots. See Fig. 17.

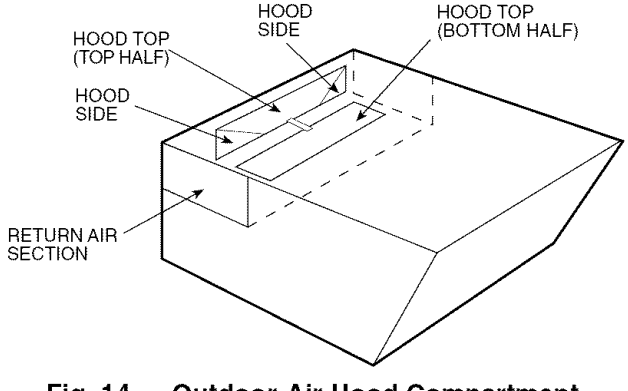
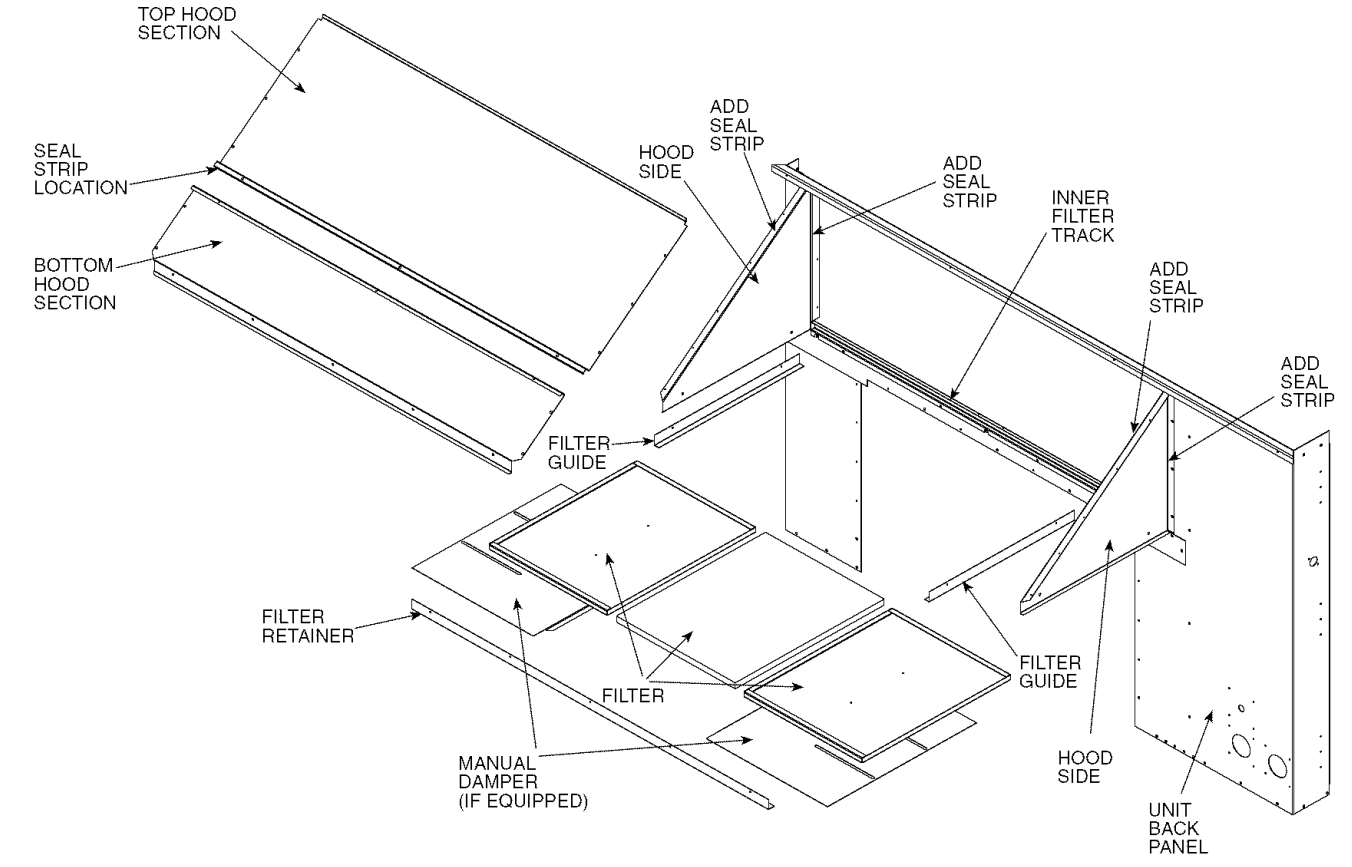


Fig. 14 — Outdoor-Air Hood Compartment Shipping Location



NOTE: Units with manual damper only use one filter.

Fig. 15 — Outdoor-Air Hood Details

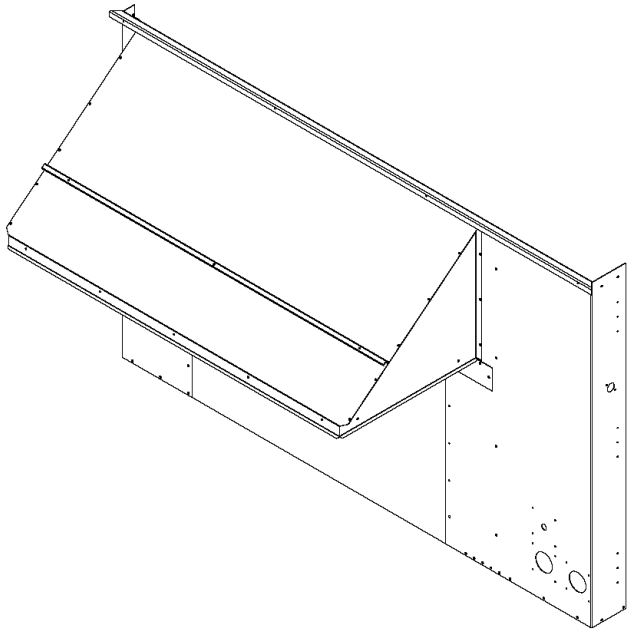


Fig. 16 — Outdoor-Air Hood Assembled

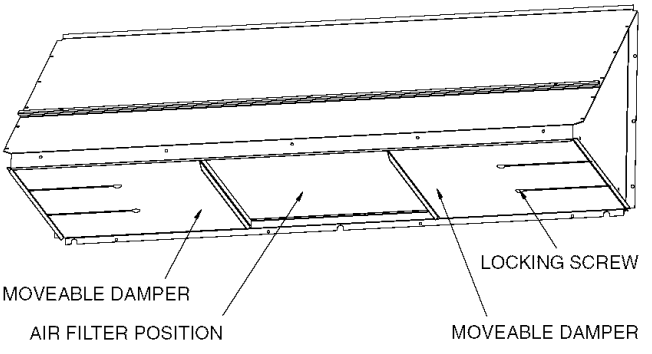


Fig. 17 — Manual Damper Details

Step 9 — Position Optional Power Exhaust or Barometric Relief Damper Hood — The optional power exhaust or barometric relief dampers are shipped assembled and tilted back into the unit for shipping. Brackets and extra screws are shipped in shrink wrap around the dampers.

1. Remove 9 screws holding each damper assembly in place. See Fig. 18. Each damper assembly is secured with 3 screws on each side and 3 screws along the bottom. Save screws.

⚠ CAUTION

Use care when tilting blower assembly. Hoods and blowers are heavy and can cause injury if dropped.

2. Pivot the damper assembly outward until top edge of damper assembly rests against inside wall of unit.
3. Secure each damper assembly to unit with 6 screws across top (3 screws provided) and bottom (3 screws from Step 1) of damper.
4. With screws saved from Step 1, install brackets on each side of damper assembly. See Fig. 19.
5. Remove tape from damper blades.

Step 10 — Non-Fused Disconnect — The handle for the factory-installed non-fused disconnect is shipped inside the unit to prevent the handle from damage during shipping. Follow these steps to complete installation of the handle.

⚠ WARNING

Be sure power is shut off to the unit from the building power supply. Electrical shock could cause personal injury.

1. Open the control box access door.
2. Remove the small cover plate located on the unit corner post near the control section.
3. Remove the inner control box cover. The handle and shaft are located in a plastic bag at the bottom of the control box.
4. Insert the square shaft into the disconnect with the pins vertical. On the 100 amp disconnect the shaft is keyed into the disconnect and can only be installed one way with the pins vertical.
5. Insert the handle through the corner post and onto the shaft with the handle positioned so that "OFF" is on top.
6. Rotate the handle to the "ON" position to lock the pins into the handle.
7. From the inside of the corner post, attach the handle mounting screws to the handle. Slide the shaft fully into the handle and tighten the set screws(s) on the disconnect to lock the shaft. Tighten the screws that attach the handle to the corner post.
8. Rotate the handle back to the "OFF" position.
9. Replace all panels and doors.
10. Restore power to unit.

Step 11 — Install All Accessories — After all of the factory-installed options have been adjusted, install all field-installed accessories. Refer to the accessory installation instructions included with each accessory. Consult the Carrier Price Pages for accessory package numbers for particular applications.

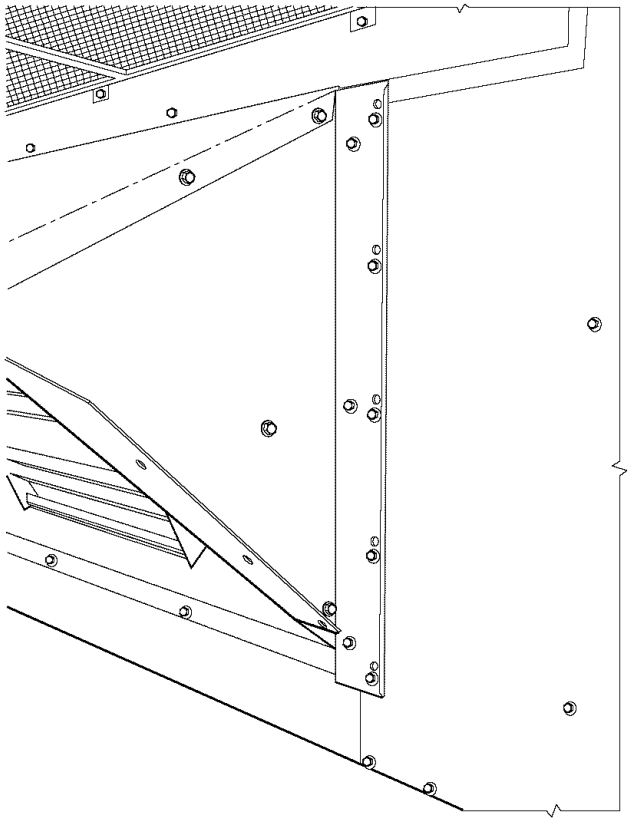


Fig. 19 — Bracket and Hood Positioning

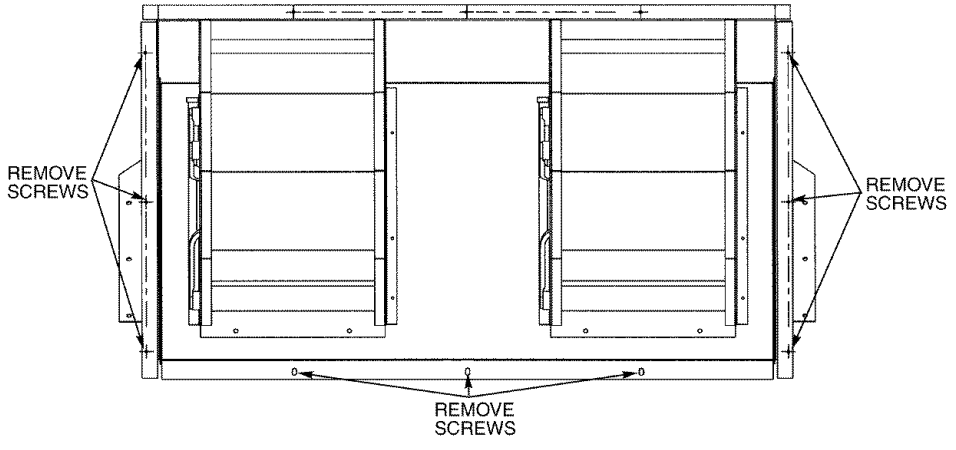


Fig. 18 — Power Exhaust or Barometric Relief Damper Mounting Details

PRE-START-UP

⚠ WARNING

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

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

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

1. Remove all access panels.
2. Read and follow instructions on all WARNING, CAUTION, and INFORMATION labels attached to or shipped with unit.
3. Make the following inspections:
   a. Inspect for shipping and handling damages such as broken lines, loose parts, or disconnected wires.
   b. Inspect for oil at all refrigerant tubing connections and on unit base. Detecting oil generally indicates a refrigerant leak. Leak-test all refrigerant tubing connections using electronic leak detector, halide torch, or liquid-soap solution.
   c. Inspect all field-wiring and factory-wiring connections. Be sure that connections are completed and tight.
   d. Inspect coil fins. If damaged during shipping and handling, carefully straighten fins with a fin comb.
4. Verify the following:
   a. Make sure that condenser-fan blades are correctly positioned in fan orifice. Refer to Condenser-Fan Adjustment section on page 45 for more details.
   b. Make sure that air filters are in place.
   c. Make sure that condensate drain trap is filled with water to ensure proper drainage.
   d. Make sure that all tools and miscellaneous loose parts have been removed.
   e. Make sure that the start-up checklist has been performed and filled out.

NOTE: Ensure wiring does not contact any refrigerant tubing.

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

Refrigerant Service Ports — Each independent refrigerant system has a total of 3 Schrader-type service gage ports per circuit. One port is located on the suction line, one on the compressor discharge line, and one on the liquid line. Be sure that caps on the ports are tight.

Crankcase Heater(s) — Crankcase heaters are energized as long as there is power to the unit and the compressor is not operating.

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

Compressor Phasing

⚠ CAUTION

Improper wiring will cause compressor stoppage and possible unit damage. Correct wiring by switching leads as indicated below.

On 3-phase units, it is important to be certain the compressors are rotating in the proper direction. To determine whether or not compressors are rotating in the proper direction, use a phase-rotation meter on the unit input power to check for L1-L2-L3 or clockwise rotation. If the compressor is rotating in the wrong direction, the suction pressure will not drop and the discharge pressure will not rise.

NOTE: Indoor or outdoor fan rotation direction may not indicate proper input power phase sequence, as some 3-phase units use single-phase fan motors. Check fan rotation where applicable.

To correct the wrong compressor rotation direction, perform the following procedure:

1. Turn off power to the unit and lock out the power.
2. Switch any two of the incoming unit power leads.
3. Turn on power to the unit.
4. Verify corrected compressor rotation and fan rotation where applicable.

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

Evaporator Fan — Fan belt and variable pulleys are factory-installed. See Tables 6-12 for fan performance data. Be sure that fans rotate in the proper direction. See Table 13 for air quantity limits. See Table 14 for evaporator fan motor specifications. See Table 15 for fan rpm at various motor pulley settings. See Table 16 for electric resistance heater data. See Tables 17 and 18 for accessory/FIOP static pressure.To alter fan performance, see Evaporator Fan Performance Adjustment section on page 44.

Condenser Fans and Motors — Condenser fans and motors are factory set. Refer to Condenser-Fan Adjustment section (page 45) 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.

NOTE: For units with 4-in. filter option, units are shipped with standard 2-in. filters. To install 4-in. filters, the filter spacers must be removed.

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

Table 6 — Fan Performance — 50HJ020 Vertical Discharge Units*

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3500	423	522	0.60	521	715	0.82	605	906	1.04	679	1093	1.26	747	1278	1.47
4000	454	675	0.78	545	884	1.02	625	1093	1.26	697	1299	1.49	762	1502	1.73
4500	487	859	0.99	572	1082	1.24	648	1307	1.50	717	1529	1.76	780	1750	2.01
5000	522	1077	1.24	601	1311	1.51	673	1550	1.78	739	1789	2.06	800	2026	2.33
5500	559	1330	1.53	632	1573	1.81	700	1826	2.10	763	2080	2.39	822	2332	2.68
6000	598	1621	1.86	664	1873	2.15	729	2137	2.46	789	2405	2.77	846	2671	3.07
6500	637	1953	2.25	698	2212	2.54	759	2486	2.86	817	2766	3.18	871	3046	3.50
7000	677	2327	2.68	734	2593	2.98	791	2876	3.31	846	3167	3.64	898	3459	3.98
7500	718	2745	3.16	770	3018	3.47	824	3309	3.81	876	3609	4.15	926	3913	4.50
8000	759	3209	3.69	808	3489	4.01	858	3787	4.36	907	4095	4.71	956	4410	5.07
8500	801	3722	4.28	846	4007	4.61	893	4311	4.96	940	4628	5.32	986	4952	5.69

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3500	810	1461	1.68	868	1642	1.89	923	1821	2.09	975	1999	2.30	1024	2176	2.50
4000	823	1703	1.96	880	1902	2.19	934	2100	2.42	985	2296	2.64	1034	2490	2.86
4500	839	1969	2.26	894	2185	2.51	947	2400	2.76	997	2613	3.01	1045	2826	3.25
5000	857	2261	2.60	911	2494	2.87	962	2726	3.14	1011	2956	3.40	1058	3185	3.66
5500	877	2583	2.97	930	2832	3.26	979	3080	3.54	1027	3326	3.83	1073	3570	4.11
6000	899	2937	3.38	950	3202	3.68	999	3465	3.98	1045	3726	4.29	1090	3986	4.58
6500	923	3327	3.83	972	3606	4.15	1020	3883	4.47	1065	4159	4.78	1108	4434	5.10
7000	948	3753	4.32	996	4045	4.65	1042	4337	4.99	1086	4627	5.32	1128	4917	5.65
7500	975	4219	4.85	1021	4525	5.20	1066	4829	5.55	1109	5134	5.90	1150	5436	6.25
8000	1002	4727	5.44	1047	5045	5.80	1091	5362	6.17	1133	5680	6.53	1173	5995	6.90
8500	1031	5280	6.07	1075	5609	6.45	1117	5938	6.83	1158	6268	7.21	1197	6596	7.59

LEGEND

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

*Motor drive ranges:
Low Range: Not Used
Mid-Low Range: 647-886 (208/230 and 460-v), 810-1072 (575-v)
Mid-High Range: 897-1139 (208/230 and 460-v), 873-1108 (575-v)
High Range: 1078-1274
All other rpms require field-supplied drive.

NOTES:
1. Maximum continuous bhp is:
   Low Range: Not Used
   Mid-Low Range: 4.25 (208/230 and 460-v), 3.45 (575-v)
   Mid-High Range: 5.75
   High Range: 8.63
2. See below for general fan performance notes.

GENERAL FAN PERFORMANCE NOTES

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Tables 17 and 18 for accessory/factory-installed option static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Evaporator-Fan Motor Performance in Table 14 on page 33 for additional information.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
4. Interpolation is permissible. Do not extrapolate.

Table 7 — Fan Performance — 50HJ024 Vertical Discharge Units*

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
5,000	533	1106	1.27	611	1342	1.54	682	1582	1.82	748	1822	2.10	808	2059	2.37
5,500	571	1366	1.57	643	1613	1.86	711	1867	2.15	773	2121	2.44	832	2374	2.73
6,000	610	1666	1.92	676	1922	2.21	740	2188	2.52	800	2456	2.82	857	2724	3.13
6,500	650	2007	2.31	712	2271	2.61	772	2548	2.93	829	2829	3.25	883	3110	3.58
7,000	691	2391	2.75	748	2663	3.06	805	2949	3.39	859	3242	3.73	911	3536	4.07
7,500	732	2820	3.24	786	3100	3.57	839	3395	3.91	891	3698	4.25	941	4004	4.61
8,000	775	3297	3.79	824	3585	4.12	874	3887	4.47	924	4200	4.83	972	4516	5.19
8,500	817	3823	4.40	863	4118	4.74	911	4428	5.09	958	4749	5.46	1003	5075	5.84
9,000	860	4400	5.06	904	4702	5.41	948	5019	5.77	993	5347	6.15	1036	5683	6.54
9,500	903	5031	5.79	944	5339	6.14	986	5663	6.51	1028	5998	6.90	1070	6343	7.29
10,000	947	5715	6.57	985	6030	6.93	1025	6360	7.32	1065	6703	7.71	1105	7055	8.11

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
5,000	865	2294	2.64	918	2527	2.91	969	2760	3.17	1018	2990	3.44	1065	3219	3.70
5,500	886	2625	3.02	938	2875	3.31	988	3123	3.59	1035	3369	3.87	1081	3614	4.16
6,000	910	2990	3.44	960	3254	3.74	1008	3518	4.05	1054	3779	4.35	1099	4040	4.65
6,500	935	3391	3.90	984	3670	4.22	1030	3948	4.54	1075	4224	4.86	1118	4499	5.18
7,000	961	3830	4.40	1008	4123	4.74	1054	4415	5.08	1098	4706	5.41	1140	4996	5.75
7,500	989	4311	4.96	1035	4617	5.31	1079	4922	5.66	1122	5227	6.01	1163	5530	6.36
8,000	1018	4835	5.56	1062	5153	5.93	1105	5472	6.29	1147	5790	6.66	1187	6106	7.02
8,500	1048	5405	6.22	1091	5735	6.60	1133	6065	6.98	1173	6396	7.36	1212	6725	7.73
9,000	1079	6022	6.93	1121	6364	7.32	1161	6706	7.71	1201	7048	8.11	1239	7390	8.50
9,500	1112	6691	7.70	1152	7042	8.10	1191	7395	8.51	1229	7749	8.91	1266	8102	9.32
10,000	1145	7412	8.52	1184	7773	8.94	1222	8135	9.36	1259	8500	9.78	1295	8864	10.20

LEGEND

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

*Motor drive ranges:
Low Range: 685-939 (208/230 and 460-v), 751-954 (575-v)
Mid-Low Range: 949-1206
Mid-High Range: 941-1176
High Range: 1014-1297
All other rpms require field-supplied drive.

NOTES:

1. Maximum continuous bhp is:
   Low Range: 4.25 (208/230 and 460-v), 5.75 (575-v)
   Mid-Low Range: 5.75
   Mid-High Range: 8.63
   High Range: 11.50
2. See page 27 for general fan performance notes.

Table 8 — Fan Performance — 50HJ028 Vertical Discharge Units*

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,500	734	2384	2.74	752	2482	2.85	803	2,752	3.16	848	2,998	3.45	891	3,250	3.74
7,000	728	2506	2.88	792	2911	3.35	844	3,220	3.70	887	3,484	4.01	928	3,742	4.30
7,500	746	2738	3.15	831	3375	3.88	884	3,734	4.29	927	4,023	4.63	966	4,293	4.94
8,000	786	3148	3.62	869	3868	4.45	925	4,292	4.94	968	4,612	5.30	1006	4,901	5.64
8,500	827	3611	4.15	905	4384	5.04	964	4,891	5.63	1008	5,251	6.04	1046	5,564	6.40
9,000	870	4125	4.74	940	4921	5.66	1003	5,529	6.36	1049	5,939	6.83	1086	6,281	7.22
9,500	913	4691	5.40	975	5480	6.30	1042	6,202	7.13	1089	6,674	7.68	1127	7,053	8.11
10,000	957	5312	6.11	1010	6073	6.98	1079	6,906	7.94	1128	7,453	8.57	1167	7,876	9.06
10,500	1002	5988	6.89	1047	6715	7.72	1115	7,635	8.78	1167	8,275	9.52	1207	8,751	10.06
11,000	1047	6719	7.73	1086	7416	8.53	1150	8,388	9.65	1205	9,133	10.50	1247	9,674	11.13
11,500	1092	7507	8.63	1126	8180	9.41	1185	9,163	10.54	1242	10,025	11.53	1286	10,642	12.24
12,000	1137	8356	9.61	1168	9009	10.36	1220	9,975	11.47	1278	10,945	12.59	1325	11,654	13.40
12,500	1182	9264	10.65	1210	9903	11.39	1256	10,835	12.46	1314	11,891	13.68	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,500	934	3,521	4.05	978	3,822	4.40	1023	4,160	4.78	1071	4,540	5.22	1119	4,961	5.71
7,000	967	4,010	4.61	1007	4,297	4.94	1048	4,612	5.30	1090	4,960	5.70	1134	5344	6.15
7,500	1003	4,565	5.25	1040	4,847	5.57	1078	5,148	5.92	1116	5,474	6.30	1155	5,830	6.71
8,000	1041	5,181	5.96	1076	5,465	6.29	1111	5,762	6.63	1146	6,076	6.99	1181	6,412	7.37
8,500	1081	5,859	6.74	1114	6,150	7.07	1147	6,448	7.42	1179	6,756	7.77	1212	7,081	8.14
9,000	1121	6,595	7.59	1153	6,899	7.93	1184	7,202	8.28	1215	7,512	8.64	1246	7,832	9.01
9,500	1161	7,390	8.50	1193	7,710	8.87	1223	8,025	9.23	1253	8,340	9.59	1282	8,660	9.96
10,000	1202	8,244	9.48	1233	8,584	9.87	1263	8,913	10.25	1291	9,237	10.62	1319	9,563	11.00
10,500	1242	9,154	10.53	1273	9,519	10.95	1303	9,866	11.35	1331	10,203	11.73	1358	10,537	12.12
11,000	1282	10,118	11.64	1314	10,514	12.09	1343	10,884	12.52	1371	11,237	12.92	1397	11,584	13.32
11,500	1322	11,136	12.81	1354	11,568	13.30	1384	11,964	13.76	—	—	—	—	—	—
12,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive ranges:
Low Range: 687-873
Mid-Low Range: 805-1007
Mid-High Range: 941-1176
High Range: 1014-1297
All other rpms require field-supplied drive.

NOTES:
1.Maximum continuous bhp is:
Low Range: 5.75
Mid-Low Range: 5.75
Mid-High Range: 8.63
High Range: 11.50

2.See page 27 for general fan performance notes.

Table 9 — Fan Performance — 50HJ020 Horizontal Discharge Units*

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3500	445	546	0.63	526	712	0.82	603	892	1.03	681	1102	1.27	761	1346	1.55
4000	484	718	0.83	559	896	1.03	627	1079	1.24	694	1280	1.47	763	1505	1.73
4500	524	923	1.06	596	1116	1.28	658	1308	1.50	717	1508	1.73	777	1724	1.98
5000	566	1166	1.34	634	1373	1.58	692	1576	1.81	747	1781	2.05	800	1996	2.30
5500	608	1450	1.67	672	1667	1.92	729	1884	2.17	780	2099	2.41	829	2318	2.67
6000	651	1777	2.04	712	2002	2.30	766	2232	2.57	815	2459	2.83	862	2686	3.09
6500	695	2152	2.47	753	2381	2.74	805	2623	3.02	852	2863	3.29	897	3100	3.57
7000	740	2576	2.96	794	2807	3.23	844	3059	3.52	890	3312	3.81	933	3561	4.10
7500	785	3051	3.51	836	3282	3.77	885	3544	4.08	929	3807	4.38	971	4069	4.68
8000	831	3581	4.12	878	3810	4.38	925	4077	4.69	969	4352	5.01	1009	4625	5.32
8500	878	4167	4.79	922	4394	5.05	966	4664	5.36	1008	4948	5.69	1048	5233	6.02

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
3500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4000	833	1759	2.02	—	—	—	—	—	—	—	—	—	—	—	—
4500	838	1961	2.26	900	2223	2.56	962	2507	2.88	—	—	—	—	—	—
5000	854	2226	2.56	909	2473	2.84	964	2740	3.15	1020	3029	3.48	—	—	—
5500	878	2546	2.93	927	2787	3.21	976	3042	3.50	1026	3315	3.81	1077	3606	4.15
6000	907	2918	3.36	952	3158	3.63	996	3408	3.92	1041	3672	4.22	1087	3950	4.54
6500	939	3339	3.84	981	3583	4.12	1022	3834	4.41	1063	4094	4.71	1105	4364	5.02
7000	974	3809	4.38	1013	4059	4.67	1052	4314	4.96	1090	4575	5.26	1128	4843	5.57
7500	1010	4328	4.98	1047	4587	5.28	1084	4848	5.58	1120	5112	5.88	1156	5382	6.19
8000	1047	4896	5.63	1083	5165	5.94	1118	5435	6.25	1153	5706	6.56	1187	5980	6.88
8500	1085	5515	6.34	1120	5795	6.66	1154	6074	6.99	1187	6353	7.31	1220	6634	7.63

LEGEND

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

*Motor drive ranges:
Low Range: Not Used
Mid-Low Range: 647-886 (208/230 and 460-v), 810-1072 (575-v)
Mid-High Range: 897-1139 (208/230 and 460-v), 873-1108 (575-v)
High Range: 1078-1274
All other rpms require field-supplied drive.

NOTES:
1. Maximum continuous bhp is:
   Low Range: Not Used
   Mid-Low Range: 4.25 (208/230 and 460-v), 3.45 (575-v)
   Mid-High Range: 5.75
   High Range: 8.63
2. See page 27 for general fan performance notes.

Table 10 — Fan Performance — 50HJ024 Horizontal Discharge Units*

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
5,000	575	1193	1.37	642	1400	1.61	700	1603	1.84	754	1810	2.08	808	2028	2.33
5,500	619	1483	1.71	682	1702	1.96	737	1918	2.21	788	2134	2.45	837	2355	2.71
6,000	663	1817	2.09	723	2046	2.35	776	2276	2.62	825	2503	2.88	871	2731	3.14
6,500	708	2198	2.53	765	2435	2.80	816	2677	3.08	863	2916	3.35	906	3155	3.63
7,000	753	2629	3.02	807	2871	3.30	857	3125	3.59	902	3377	3.88	944	3626	4.17
7,500	800	3112	3.58	850	3357	3.86	898	3621	4.16	942	3885	4.47	982	4146	4.77
8,000	847	3650	4.20	894	3897	4.48	940	4169	4.80	982	4445	5.11	1022	4717	5.43
8,500	894	4244	4.88	939	4491	5.17	982	4770	5.49	1024	5056	5.82	1062	5340	6.14
9,000	941	4896	5.63	983	5145	5.92	1025	5428	6.24	1065	5723	6.58	1103	6018	6.92
9,500	989	5610	6.45	1029	5858	6.74	1069	6145	7.07	1108	6447	7.41	1144	6753	7.77
10,000	1037	6386	7.34	1075	6634	7.63	1113	6923	7.96	1150	7231	8.32	1186	7546	8.68

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
5,000	862	2260	2.60	917	2510	2.89	972	2781	3.20	1028	3073	3.53	1084	3384	3.89
5,500	886	2586	2.97	935	2829	3.25	985	3089	3.55	1035	3365	3.87	1086	3660	4.21
6,000	916	2965	3.41	960	3207	3.69	1005	3461	3.98	1050	3728	4.29	1096	4009	4.61
6,500	949	3395	3.90	990	3641	4.19	1032	3894	4.48	1073	4157	4.78	1114	4430	5.10
7,000	984	3875	4.46	1023	4127	4.75	1062	4383	5.04	1100	4647	5.34	1139	4918	5.66
7,500	1021	4406	5.07	1059	4666	5.37	1095	4928	5.67	1131	5195	5.98	1167	5468	6.29
8,000	1059	4988	5.74	1095	5258	6.05	1130	5528	6.36	1165	5800	6.67	1199	6077	6.99
8,500	1099	5623	6.47	1133	5903	6.79	1167	6182	7.11	1200	6463	7.43	1232	6745	7.76
9,000	1138	6312	7.26	1172	6603	7.59	1205	6893	7.93	1237	7182	8.26	1268	7472	8.59
9,500	1179	7057	8.12	1212	7359	8.46	1244	7660	8.81	1275	7959	9.15	1305	8258	9.50
10,000	1220	7860	9.04	1252	8174	9.40	1283	8485	9.76	1313	8794	10.11	1342	9103	10.47

LEGEND

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

*Motor drive ranges:
Low Range: 685-939 (208/230 and 460-v), 751-954 (575-v)
Mid-Low Range: 949-1206
Mid-High Range: 941-1176
High Range: 1014-1297
All other rpms require field-supplied drive.

NOTES:
1. Maximum continuous bhp is:
   Low Range: 4.25 (208/230 and 460-v), 5.75 (575-v)
   Mid-Low Range: 5.75
   Mid-High Range: 8.63
   High Range: 11.50
2. See page 27 for general fan performance notes.

Table 11 — Fan Performance — 50HJ028 Horizontal Discharge Units*

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,500	759	2,517	2.89	804	2,753	3.17	844	2,975	3.42	883	3,202	3.68	922	3,445	3.96
7,000	810	3,020	3.47	853	3,274	3.77	891	3,509	4.04	928	3,743	4.30	964	3,986	4.58
7,500	862	3,581	4.12	903	3,856	4.43	939	4,105	4.72	974	4,348	5.00	1008	4,596	5.29
8,000	913	4,206	4.84	953	4,500	5.18	988	4,765	5.48	1021	5,019	5.77	1053	5,274	6.07
8,500	965	4,894	5.63	1003	5,209	5.99	1037	5,491	6.32	1069	5,758	6.62	1100	6,022	6.93
9,000	1017	5,651	6.50	1054	5,988	6.89	1087	6,285	7.23	1118	6,567	7.55	1147	6,841	7.87
9,500	1069	6,477	7.45	1105	6,834	7.86	1137	7,150	8.22	1167	7,446	8.56	1195	7,733	8.89
10,000	1121	7,376	8.48	1156	7,755	8.92	1187	8,089	9.30	1216	8,400	9.66	1243	8,699	10.01
10,500	1173	8,350	9.60	1207	8,751	10.06	1238	9,103	10.47	1266	9,430	10.85	1292	9,744	11.21
11,000	1226	9,401	10.81	1259	9,823	11.30	1288	10,194	11.72	1316	10,538	12.12	1342	10,866	12.50
11,500	1278	10,532	12.11	1310	10,975	12.62	1339	11,366	13.07	1366	11,726	13.49	—	—	—
12,000	1331	11,745	13.51	—	—	—	—	—	—	—	—	—	—	—	—
12,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp	Rpm	Watts	Bhp
6,500	962	3,710	4.27	1003	4,005	4.61	1045	4,334	4.98	1090	4,701	5.41	1135	5,103	5.87
7,000	1000	4,245	4.88	1037	4,527	5.21	1075	4,836	5.56	1115	5,174	5.95	1155	5,547	6.38
7,500	1041	4,854	5.58	1075	5,129	5.90	1110	5,424	6.24	1145	5,744	6.61	1182	6,091	7.01
8,000	1085	5,535	6.37	1116	5,808	6.68	1148	6,096	7.01	1180	6,403	7.36	1214	6,733	7.74
8,500	1129	6,289	7.23	1159	6,563	7.55	1189	6,849	7.88	1219	7,149	8.22	1249	7,467	8.59
9,000	1175	7,115	8.18	1204	7,394	8.50	1232	7,681	8.83	1260	7,978	9.18	1288	8,289	9.53
9,500	1222	8,016	9.22	1249	8,301	9.55	1276	8,591	9.88	1302	8,890	10.22	1329	9,198	10.58
10,000	1270	8,993	10.34	1296	9,286	10.68	1321	9,582	11.02	1346	9,884	11.37	1371	10,193	11.72
10,500	1318	10,048	11.56	1343	10,351	11.90	1367	10,655	12.25	1391	10,960	12.61	—	—	—
11,000	1366	11,183	12.86	1390	11,496	13.22	—	—	—	—	—	—	—	—	—
11,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive ranges:
Low Range: 687-873
Mid-Low Range: 805-1007
Mid-High Range: 941-1176
High Range: 1014-1297
All other rpms require field-supplied drive.

NOTES:
1. Maximum continuous bhp is:
   Low Range: 5.75
   Mid-Low Range: 5.75
   Mid-High Range: 8.63
   High Range: 11.50
2. See page 27 for general fan performance notes.

Table 12 — Power Exhaust Fan Performance

AIRFLOW (Cfm)	LOW SPEED						MEDIUM SPEED						HIGH SPEED					
	208 V			230,460,575 V			208 V			230,460,575 V			208 V			230,460,575 V		
	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts
3250	0.32	1.41	1580	0.70	1.49	1670	—	—	—	—	—	—	—	—	—	—	—	—
3350	0.23	1.44	1610	0.63	1.52	1700	0.60	1.51	1690	0.82	1.62	1810	—	—	—	—	—	—
3450	0.17	1.46	1635	0.59	1.55	1730	0.55	1.54	1720	0.78	1.64	1840	—	—	—	—	—	—
3550	0.13	1.47	1645	0.56	1.56	1745	0.49	1.56	1750	0.73	1.67	1870	—	—	—	—	—	—
3650	0.09	1.49	1665	0.53	1.58	1765	0.43	1.59	1780	0.68	1.70	1900	—	—	—	—	—	—
3750	—	—	—	0.51	1.60	1790	0.39	1.62	1815	0.64	1.72	1930	—	—	—	—	—	—
3850	—	—	—	0.48	1.62	1810	0.33	1.64	1835	0.59	1.74	1950	0.60	1.85	2070	0.73	1.99	2230
3950	—	—	—	0.45	1.64	1835	0.27	1.66	1860	0.54	1.76	1975	0.56	1.87	2095	0.69	2.01	2255
4050	—	—	—	0.40	1.67	1865	0.22	1.68	1885	0.49	1.79	2000	0.51	1.89	2120	0.65	2.04	2280
4250	—	—	—	—	—	—	0.17	1.74	1945	0.40	1.84	2060	0.41	1.92	2145	0.56	2.06	2310
4450	—	—	—	—	—	—	0.00	1.79	2005	0.30	1.89	2115	0.31	1.97	2205	0.47	2.12	2370
4650	—	—	—	—	—	—	—	—	—	0.22	1.94	2170	0.20	2.04	2280	0.37	2.19	2450
4850	—	—	—	—	—	—	—	—	—	0.16	1.98	2215	0.11	2.09	2335	0.30	2.24	2505
5050	—	—	—	—	—	—	—	—	—	0.12	2.02	2260	0.04	2.13	2385	0.23	2.28	2555
5250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.17	2.33	2610
5450	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.12	2.38	2665
5650	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	2.40	2690
5850	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	2.42	2710

LEGEND

Bhp — Brake Horsepower
ESP — External Static Pressure (in. wg)

Table 13 — Operation Air Quantity Limits

50HJ UNIT SIZE	COOLING		ELECTRIC HEAT	ELECTRIC HEAT (Vertical) MINIMUM CFM	ELECTRIC HEAT (Horizontal) MINIMUM CFM
	Minimum Cfm	Maximum Cfm			
020	5,400	9,000	High Heat (75 kW)	4,500	5,400
			Medium Heat (50 kW)	3,750	4,800
			Low Heat (25 kW)	3,750	3,750
024	5,500	10,000	High Heat (75 kW)	4,500	5,400
			Medium Heat (50 kW)	3,750	4,800
			Low Heat (25 kW)	3,750	3,750
028	6,000	11,500	High Heat (75 kW)	4,500	5,400
			Medium Heat (50 kW)	3,750	4,800
			Low Heat (25 kW)	3,750	3,750

Table 14 — Evaporator Fan Motor Specifications

50HJ UNIT SIZE	DRIVE	ORIENTATION	MOTOR P/N	NOMINAL HP	VOLTAGE	MAX WATTS	EFFICIENCY %	MAX BHP	MAX BkW	MAX AMPS
020	Low	Vertical	N/A	N/A	208	N/A	N/A	N/A	N/A	N/A
			N/A	N/A	230	N/A	N/A	N/A	N/A	N/A
			N/A	N/A	460	N/A	N/A	N/A	N/A	N/A
			N/A	N/A	575	N/A	N/A	N/A	N/A	N/A
	Mid-Low	Vertical	HD60FK651	3.7	208	3698	85.8	4.25	3.17	10.6
			HD60FK651	3.7	230	3698	85.8	4.25	3.17	9.6
			HD60FK651	3.7	460	3698	85.8	4.25	3.17	4.8
			HD58DL575	3	575	3149	81.7	3.45	2.57	3.9
	Mid-High	Vertical	HD60FL650	5	208	4900	87.5	5.75	4.29	16.7
			HD60FL650	5	230	4900	87.5	5.75	4.29	15.2
			HD60FL650	5	460	4900	87.5	5.75	4.29	7.6
			HD60FL575	5	575	4900	87.5	5.75	4.29	6.1
	High	Vertical	HD62FL650	7.5	208	7267	88.5	8.63	6.43	24.2
			HD62FL650	7.5	230	7267	88.5	8.63	6.43	22
			HD62FL650	7.5	460	7267	88.5	8.63	6.43	11
			HD62FL575	7.5	575	7267	88.5	8.63	6.43	9
	Low	Horizontal	N/A	N/A	208	N/A	N/A	N/A	N/A	N/A
			N/A	N/A	230	N/A	N/A	N/A	N/A	N/A
			N/A	N/A	460	N/A	N/A	N/A	N/A	N/A
			N/A	N/A	575	N/A	N/A	N/A	N/A	N/A
	Mid-Low	Horizontal	HD60FK651	3.7	208	3698	85.8	4.25	3.17	10.6
			HD60FK651	3.7	230	3698	85.8	4.25	3.17	9.6
			HD60FK651	3.7	460	3698	85.8	4.25	3.17	4.8
			HD58DL575	3	575	3149	81.7	3.45	2.57	3.9
	Mid-High	Horizontal	HD60FL650	5	208	4900	87.5	5.75	4.29	16.7
			HD60FL650	5	230	4900	87.5	5.75	4.29	15.2
			HD60FL650	5	460	4900	87.5	5.75	4.29	7.6
			HD60FL575	5	575	4900	87.5	5.75	4.29	6.1
	High	Horizontal	HD62FL650	7.5	208	7267	88.5	8.63	6.43	24.2
			HD62FL650	7.5	230	7267	88.5	8.63	6.43	22
			HD62FL650	7.5	460	7267	88.5	8.63	6.43	11
			HD62FL575	7.5	575	7267	88.5	8.63	6.43	9

LEGEND

Bhp — Brake Horsepower
N/A — Not Applicable
P/N — Part Number

Table 14 — Evaporator Fan Motor Specifications (cont)

50HJ UNIT SIZE	DRIVE	ORIENTATION	MOTOR P/N	NOMINAL HP	VOLTAGE	MAX WATTS	EFFICIENCY %	MAX BHP	MAX BkW	MAX AMPS
024	Low	Vertical	HD60FK651	3.7	208	3698	85.8	4.25	3.17	10.6
			HD60FK651	3.7	230	3698	85.8	4.25	3.17	9.6
			HD60FK651	3.7	460	3698	85.8	4.25	3.17	4.8
			HD60FL575	5	575	4900	87.5	5.75	4.29	6.1
	Mid-Low	Vertical	HD60FL650	5	208	4900	87.5	5.75	4.29	16.7
			HD60FL650	5	230	4900	87.5	5.75	4.29	15.2
			HD60FL650	5	460	4900	87.5	5.75	4.29	7.6
			HD60FL575	5	575	4900	87.5	5.75	4.29	6.1
	Mid-High	Vertical	HD62FL650	7.5	208	7267	88.5	8.63	6.43	24.2
			HD62FL650	7.5	230	7267	88.5	8.63	6.43	22
			HD62FL650	7.5	460	7267	88.5	8.63	6.43	11
			HD62FL575	7.5	575	7267	88.5	8.63	6.43	9
	High	Vertical	HD64FL650	10	208	9582	89.5	11.5	8.58	30.8
			HD64FL650	10	230	9582	89.5	11.5	8.58	28
			HD64FL650	10	460	9582	89.5	11.5	8.58	14
			HD64FL575	10	575	9582	89.5	11.5	8.58	11
	Low	Horizontal	HD60FK651	3.7	208	3698	85.8	4.25	3.17	10.6
			HD60FK651	3.7	230	3698	85.8	4.25	3.17	9.6
			HD60FK651	3.7	460	3698	85.8	4.25	3.17	4.8
			HD60FL575	5	575	4900	87.5	5.75	4.29	6.1
	Mid-Low	Horizontal	HD60FL650	5	208	4900	87.5	5.75	4.29	16.7
			HD60FL650	5	230	4900	87.5	5.75	4.29	15.2
			HD60FL650	5	460	4900	87.5	5.75	4.29	7.6
			HD60FL575	5	575	4900	87.5	5.75	4.29	6.1
	Mid-High	Horizontal	HD62FL650	7.5	208	7267	88.5	8.63	6.43	24.2
			HD62FL650	7.5	230	7267	88.5	8.63	6.43	22
			HD62FL650	7.5	460	7267	88.5	8.63	6.43	11
			HD62FL575	7.5	575	7267	88.5	8.63	6.43	9
	High	Horizontal	HD64FL650	10	208	9582	89.5	11.5	8.58	30.8
			HD64FL650	10	230	9582	89.5	11.5	8.58	28
			HD64FL650	10	460	9582	89.5	11.5	8.58	14
			HD64FL575	10	575	9582	89.5	11.5	8.58	11
028	Low	Vertical	HD60FL650	5	208	4900	87.5	5.75	4.29	16.7
			HD60FL650	5	230	4900	87.5	5.75	4.29	15.2
			HD60FL650	5	460	4900	87.5	5.75	4.29	7.6
			HD60FL575	5	575	4900	87.5	5.75	4.29	6.1
	Mid-Low	Vertical	HD60FL650	5	208	4900	87.5	5.75	4.29	16.7
			HD60FL650	5	230	4900	87.5	5.75	4.29	15.2
			HD60FL650	5	460	4900	87.5	5.75	4.29	7.6
			HD60FL575	5	575	4900	87.5	5.75	4.29	6.1
	Mid-High	Vertical	HD62FL650	7.5	208	7267	88.5	8.63	6.43	24.2
			HD62FL650	7.5	230	7267	88.5	8.63	6.43	22
			HD62FL650	7.5	460	7267	88.5	8.63	6.43	11
			HD62FL575	7.5	575	7267	88.5	8.63	6.43	9
	High	Vertical	HD64FL650	10	208	9582	89.5	11.5	8.58	30.8
			HD64FL650	10	230	9582	89.5	11.5	8.58	28
			HD64FL650	10	460	9582	89.5	11.5	8.58	14
			HD64FL575	10	575	9582	89.5	11.5	8.58	11
	Low	Horizontal	HD60FL650	5	208	4900	87.5	5.75	4.29	16.7
			HD60FL650	5	230	4900	87.5	5.75	4.29	15.2
			HD60FL650	5	460	4900	87.5	5.75	4.29	7.6
			HD60FL575	5	575	4900	87.5	5.75	4.29	6.1
	Mid-Low	Horizontal	HD60FL650	5	208	4900	87.5	5.75	4.29	16.7
			HD60FL650	5	230	4900	87.5	5.75	4.29	15.2
			HD60FL650	5	460	4900	87.5	5.75	4.29	7.6
			HD60FL575	5	575	4900	87.5	5.75	4.29	6.1
	Mid-High	Horizontal	HD62FL650	7.5	208	7267	88.5	8.63	6.43	24.2
			HD62FL650	7.5	230	7267	88.5	8.63	6.43	22
			HD62FL650	7.5	460	7267	88.5	8.63	6.43	11
			HD62FL575	7.5	575	7267	88.5	8.63	6.43	9
	High	Horizontal	HD64FL650	10	208	9582	89.5	11.5	8.58	30.8
			HD64FL650	10	230	9582	89.5	11.5	8.58	28
			HD64FL650	10	460	9582	89.5	11.5	8.58	14
			HD64FL575	10	575	9582	89.5	11.5	8.58	11

Table 15 — Fan Rpm and Motor Pulley Settings*

50HJ UNIT SIZE	RANGE	MOTOR PULLEY TURNS OPEN												
		0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
020 (230 and 460 volt)	Low Range Vertical	—	—	—	—	—	—	—	—	—	—	—	—	—
	Mid-Low Range Vertical	647	667	687	707	727	747	767	786	806	826	846	866	886
	Mid-High Range Vertical	897	917	937	958	978	998	1018	1038	1058	1079	1099	1119	1139
	High Range Vertical	1078	1094	1111	1127	1143	1160	1176	1192	1209	1225	1241	1258	1274
	Low Range Horizontal	—	—	—	—	—	—	—	—	—	—	—	—	—
	Mid-Low Range Horizontal	647	667	687	707	727	747	767	786	806	826	846	866	886
	Mid-High Range Horizontal	897	917	937	958	978	998	1018	1038	1058	1079	1099	1119	1139
	High Range Horizontal	1078	1094	1111	1127	1143	1160	1176	1192	1209	1225	1241	1258	1274
020 (575 volt)	Low Range Vertical	—	—	—	—	—	—	—	—	—	—	—	—	—
	Mid-Low Range Vertical	810	832	854	876	897	919	941	963	985	1007	1028	1050	1072
	Mid-High Range Vertical	873	893	912	932	951	971	991	1010	1030	1049	1069	1088	1108
	High Range Vertical	1078	1094	1111	1127	1143	1160	1176	1192	1209	1225	1241	1258	1274
	Low Range Horizontal	—	—	—	—	—	—	—	—	—	—	—	—	—
	Mid-Low Range Horizontal	810	832	854	876	897	919	941	963	985	1007	1028	1050	1072
	Mid-High Range Horizontal	873	893	912	932	951	971	991	1010	1030	1049	1069	1088	1108
	High Range Horizontal	1078	1094	1111	1127	1143	1160	1176	1192	1209	1225	1241	1258	1274
024 (230 and 460 volt)	Low Range Vertical	685	706	727	749	770	791	812	833	854	876	897	918	939
	Mid-Low Range Vertical	949	970	992	1013	1035	1056	1078	1099	1120	1142	1163	1185	1206
	Mid-High Range Vertical	941	961	980	1000	1019	1039	1059	1078	1098	1117	1137	1156	1176
	High Range Vertical	1014	1038	1061	1085	1108	1132	1156	1179	1203	1226	1250	1273	1297
	Low Range Horizontal	685	706	727	749	770	791	812	833	854	876	897	918	939
	Mid-Low Range Horizontal	949	970	992	1013	1035	1056	1078	1099	1120	1142	1163	1185	1206
	Mid-High Range Horizontal	941	961	980	1000	1019	1039	1059	1078	1098	1117	1137	1156	1176
	High Range Horizontal	1014	1038	1061	1085	1108	1132	1156	1179	1203	1226	1250	1273	1297
024 (575 volt)	Low Range Vertical	751	768	785	802	819	836	853	869	886	903	920	937	954
	Mid-Low Range Vertical	949	970	992	1013	1035	1056	1078	1099	1120	1142	1163	1185	1206
	Mid-High Range Vertical	941	961	980	1000	1019	1039	1059	1078	1098	1117	1137	1156	1176
	High Range Vertical	1014	1038	1061	1085	1108	1132	1156	1179	1203	1226	1250	1273	1297
	Low Range Horizontal	751	768	785	802	819	836	853	869	886	903	920	937	954
	Mid-Low Range Horizontal	949	970	992	1013	1035	1056	1078	1099	1120	1142	1163	1185	1206
	Mid-High Range Horizontal	941	961	980	1000	1019	1039	1059	1078	1098	1117	1137	1156	1176
	High Range Horizontal	1014	1038	1061	1085	1108	1132	1156	1179	1203	1226	1250	1273	1297
028 (all voltages)	Low Range Vertical	687	703	718	734	749	765	780	796	811	827	842	858	873
	Mid-Low Range Vertical	805	822	839	856	872	889	906	923	940	957	973	990	1007
	Mid-High Range Vertical	941	961	980	1000	1019	1039	1059	1078	1098	1117	1137	1156	1176
	High Range Vertical	1014	1038	1061	1085	1108	1132	1156	1179	1203	1226	1250	1273	1297
	Low Range Horizontal	687	703	718	734	749	765	780	796	811	827	842	858	873
	Mid-Low Range Horizontal	805	822	839	856	872	889	906	923	940	957	973	990	1007
	Mid-High Range Horizontal	941	961	980	1000	1019	1039	1059	1078	1098	1117	1137	1156	1176
	High Range Horizontal	1014	1038	1061	1085	1108	1132	1156	1179	1203	1226	1250	1273	1297

*Approximate fan rpm shown.

Table 16 — Electric Resistance Heater Data

50HJ UNIT SIZE	HEATER kW							HEATER STAGES	% HEAT PER STAGE	MAXIMUM STAGES*	MINIMUM Heating Cfm		HEATER AMPS						
	Unit Voltages																		
	208	230	240	460	480	575	600				Cfm	L/s	208	230	240	460	480	575	600
020, 024,028	19	23	25	23	25	23	25	2	50/50	2	4800	2265	52.0	58.0	60.0	29.0	30.0	23.0	24.0
	38	46	50	46	50	44	48	2	50/50	2			104.0	115.0	120.0	58.0	60.0	44.0	46.0
	56	69	75	69	75	72	78	2	50/50	2			156.0	173.0	180.0	86.0	90.0	72.0	75.0

*Maximum number of stages using accessory low-ambient temperature kit or head pressure control device and low-ambient temperature kit.

NOTE: Heaters are rated at 208, 240, 480, and 600 v.

Table 17 — Accessory/FIOP EconoMi$er IV Static Pressure (in. wg)*

COMPONENT	CFM								
	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000
EconoMi$er IV	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10

COMPONENT	CFM							
	8,500	9,000	9,500	10,000	10,500	11,000	11,500	12,000
EconoMi$er IV	0.11	0.12	0.13	0.15	0.16	0.17	0.19	0.20

LEGEND

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 tables to determine blower rpm and watts.

Table 18 — Accessory Electric Heat Static Pressure (in. wg)

UNIT 50HJ	ELECTRIC HEATERS							
	Unit Voltages	Cfm	Nominal Heater Size (kW)	Pressure Drop (in. wg)	Nominal Heater Size (kW)	Pressure Drop (in. wg)	Nominal Heater Size (kW)	Pressure Drop (in. wg)
020, 024,028	208/240-3-60	4,800	25	0.01	50	0.02	75	0.03
		5,000		0.01		0.02		0.04
		6,000		0.02		0.04		0.06
		7,000		0.03		0.06		0.08
		8,000		0.04		0.08		0.12
		9,000		0.05		0.10		0.15
		10,000		0.06		0.13		0.20
		11,500		0.09		0.18		0.27
	480-3-60	4,800		0.01		0.02		0.03
		5,000		0.01		0.02		0.04
		6,000		0.02		0.04		0.06
		7,000		0.03		0.06		0.08
		8,000		0.04		0.08		0.12
		9,000		0.05		0.10		0.15
		10,000		0.06		0.13		0.20
		11,500		0.09		0.18		0.27
	575-3-60	4,800		0.01		0.02		0.03
		5,000		0.01		0.02		0.04
		6,000		0.02		0.04		0.06
		7,000		0.03		0.06		0.08
		8,000		0.04		0.08		0.12
		9,000		0.05		0.10		0.15
		10,000		0.06		0.13		0.20
		11,500		0.09		0.18		0.27

LEGEND

Bhp — Brake Horsepower
FIOP — Factory-Installed Option

NOTES:
1. Heaters are rated at 240 v, 480 v, and 600 v.
2. 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, bhp, and watts.

**Optional EconoMi$er IV —** See Fig. 20 for EconoMi$er IV component locations. The optional EconoMi$er IV comes from the factory fully wired and assembled. No field wiring or assembly is required for standard outdoor dry bulb changeover operation. Field wiring of accessory sensors is required for different operational modes.

ECONOMI$ER IV STANDARD SENSORS

Outdoor Air Temperature (OAT) Sensor — The outdoor air temperature sensor (HH57AC074) is a 10 to 20 mA device used to measure the outdoor-air temperature. The outdoor-air temperature is used to determine when the EconoMi$er IV can be used for free cooling. The sensor is factory-installed on the EconoMi$er IV in the outdoor airstream. See Fig. 21. The operating range of temperature measurement is 40 to 100 F.

Supply-Air Temperature (SAT) Sensor — The supply-air temperature sensor is a 3 K thermistor located at the outlet of the indoor fan. See Fig. 21. This sensor is factory installed. The operating range of temperature measurement is 0° to 158 F.

The temperature sensor is a short probe with blue wires running to it.

Outdoor Air Lockout Sensor — The Economi$er IV is equipped with an ambient temperature lockout switch located in the outdoor airstream which is used to lock out the compressors below a 42 F ambient temperature.

ECONOMI$ER IV CONTROLLER WIRING AND OPERATIONAL MODES — Determine the EconoMi$er IV control mode before set up of the control. Some modes of operation may require different sensors. Refer to Table 19. The EconoMi$er IV is supplied from the factory with a supply-air temperature sensor and an outdoor air temperature sensor. This allows for operation of the EconoMi$er IV with outdoor air dry bulb changeover control. Additional accessories can be added to allow for different types of changeover control and operation of the EconoMi$er IV and unit.

Outdoor Dry Bulb Changeover — The standard controller is shipped from the factory configured for outdoor dry bulb changeover control. The outdoor air and supply-air temperature sensors are included as standard. For this control mode, the outdoor temperature is compared to an adjustable set point selected on the control. If the outdoor-air temperature is above the set point, the EconoMi$er IV will adjust the outdoor-air dampers to minimum position. If the outdoor-air temperature is below the set point, the position of the outdoor-air dampers will be controlled to provide free cooling using outdoor air. When in this mode, the LED next to the free cooling set point potentiometer will be on. The changeover temperature set point is controlled by the free cooling set point potentiometer located on the control. The scale on the potentiometer is A, B, C, and D. See Fig. 22 for the corresponding temperature changeover values.

Table 19 — EconoMi$er IV Sensor Usage

APPLICATION	ECONOMI$ER IV WITH OUTDOOR AIR DRY BULB SENSOR			ECONOMI$ER IV WITH SINGLE ENTHALPY SENSOR		
	Accessories Required			Accessories Required		
Outdoor Air Dry Bulb	None. The outdoor air dry bulb sensor is factory installed.			CRTEMPSN002A00*		
Differential Dry Bulb	CRTEMPSN002A00*			(2) CRTEMPSN002A00*		
Single Enthalpy	HH57AC078			None. The single enthalpy sensor is factory installed.		
Differential Enthalpy	HH57AC078 and CRENTDIF004A00*			CRENTDIF004A00*		
CO_2 for DCV Control using a Wall-Mounted CO_2 Sensor	33ZCSENCO2			33ZCSENCO2		
CO_2 for DCV Control using a Duct-Mounted CO_2 Sensor	33ZCSENCO2† and 33ZCASPCO2**	OR	CRCBDIOX005A00††	33ZCSENCO2† and 33ZCASPCO2**	OR	CRCBDIOX005A00††

*CRENTDIF004A00 and CRTEMPSN002A00 accessories are used on many different base units. As such, these kits may contain parts that will not be needed for installation.
†33ZCSENCO2 is an accessory CO_2 sensor.
**33ZCASPCO2 is an accessory aspirator box required for duct-mounted applications.
††CRCBDIOX005A00 is an accessory that contains both 33ZCSENCO2 and 33ZCASPCO2 accessories.

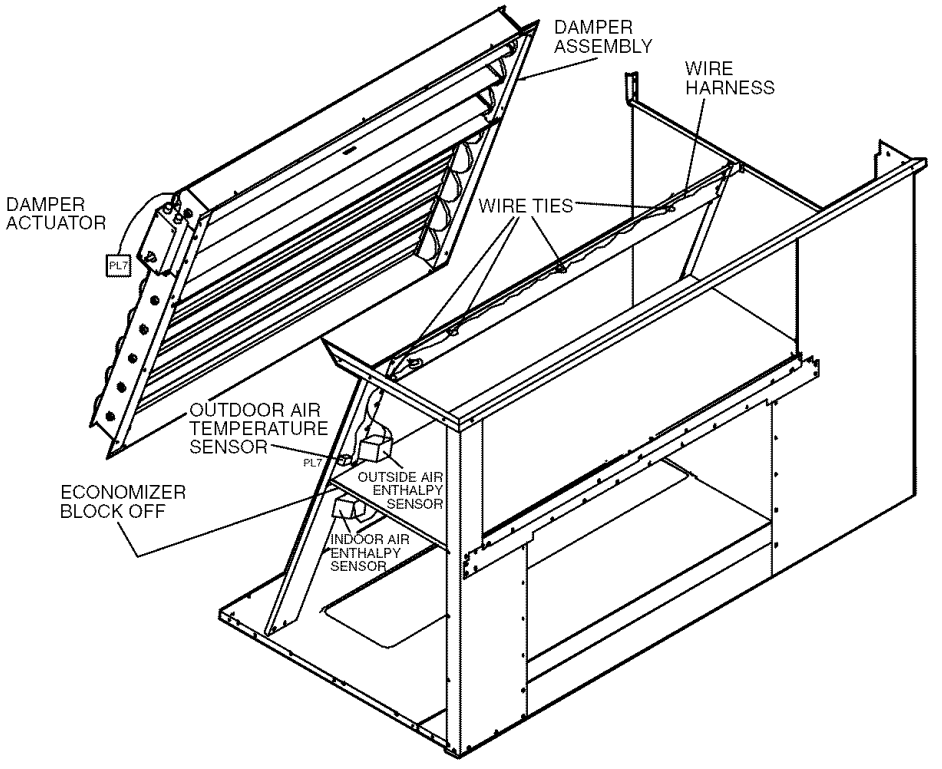


Fig. 20 — EconoMi$er IV Component Locations (Exploded View)

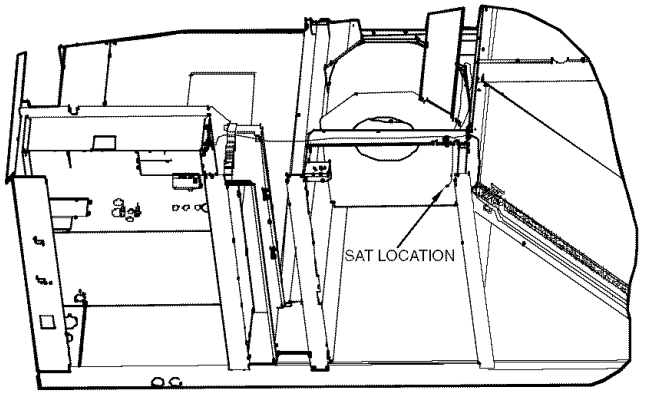


Fig. 21 — Supply-Air Temperature Sensor Location

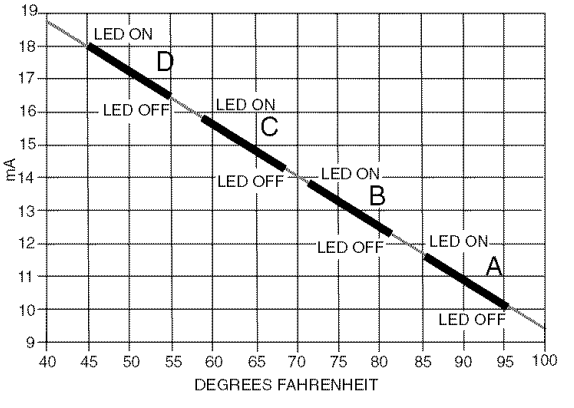


Fig. 22 — Outdoor-Air Temperature Changeover Set Points

Differential Dry Bulb Control — For differential dry bulb control the standard outdoor dry bulb sensor is used in conjunction with an additional accessory dry bulb sensor (part number CRTEMPSN002A00). The accessory sensor must be mounted in the return airstream. Wiring is provided in the EconoMi$er IV wiring harness. See Fig. 23.

In this mode of operation, the outdoor-air temperature is compared to the return-air temperature and the lower temperature airstream is used for cooling. When using this mode of changeover control, turn the enthalpy set point potentiometer fully clockwise to the D setting.

Outdoor Enthalpy Changeover — For enthalpy control, accessory enthalpy sensor (part number HH57AC078) is required. Replace the standard outdoor dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. When the outdoor air enthalpy rises above the outdoor enthalpy changeover set point, the outdoor-air damper moves to its minimum position. The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er IV controller. The set points are A, B, C, and D. See Fig. 24. The factory-installed 620-ohm jumper must be in place across terminals S_R and + on the EconoMi$er IV controller. See Fig. 23.

Differential Enthalpy Control — For differential enthalpy control, the EconoMi$er IV controller uses two enthalpy sensors (HH57AC078 and CRENTDIF004A00), one in the outside air and one in the return air duct. The EconoMi$er IV controller compares the outdoor air enthalpy to the return air enthalpy to determine EconoMi$er IV use. The controller selects the lower enthalpy air (return or outdoor) for cooling. For example, when the outdoor air has a lower enthalpy than the return air, the EconoMi$er IV opens to bring in outdoor air for free cooling.

Replace the standard outside air dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. Mount the return air enthalpy sensor in the return air duct. Wiring is provided in the EconoMi$er IV wiring harness. See Fig. 23. The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er IV controller. When using this mode of changeover control, turn the enthalpy set point potentiometer fully clockwise to the D setting. See Fig. 25.

Indoor Air Quality (IAQ) Sensor Input — The IAQ input can be used for demand control ventilation control based on the level of CO_2 measured in the space or return air duct.

Mount the optional IAQ sensor according to manufacturer specifications. The IAQ sensor should be wired to the AQ and AQ1 terminals of the controller. Adjust the DCV (demand controlled ventilation) potentiometers to correspond to the DCV voltage output of the indoor air quality sensor at the user-determined set point. See Fig. 26.

If a separate field-supplied transformer is used to power the IAQ sensor, the sensor must not be grounded or the EconoMi$er IV control board will be damaged.

Exhaust Set Point Adjustment — The exhaust set point will determine when the exhaust fan runs based on damper position (if accessory power exhaust is installed). The set point is modified with the Exhaust Fan Set Point (EXH SET) potentiometer. See Fig. 25. The set point represents the damper position above which the exhaust fans will be turned on. When there is a call for exhaust, the EconoMi$er IV controller provides a 45 ± 15 second delay before exhaust fan activation to allow the dampers to open. This delay allows the damper to reach the appropriate position to avoid unnecessary fan overload.

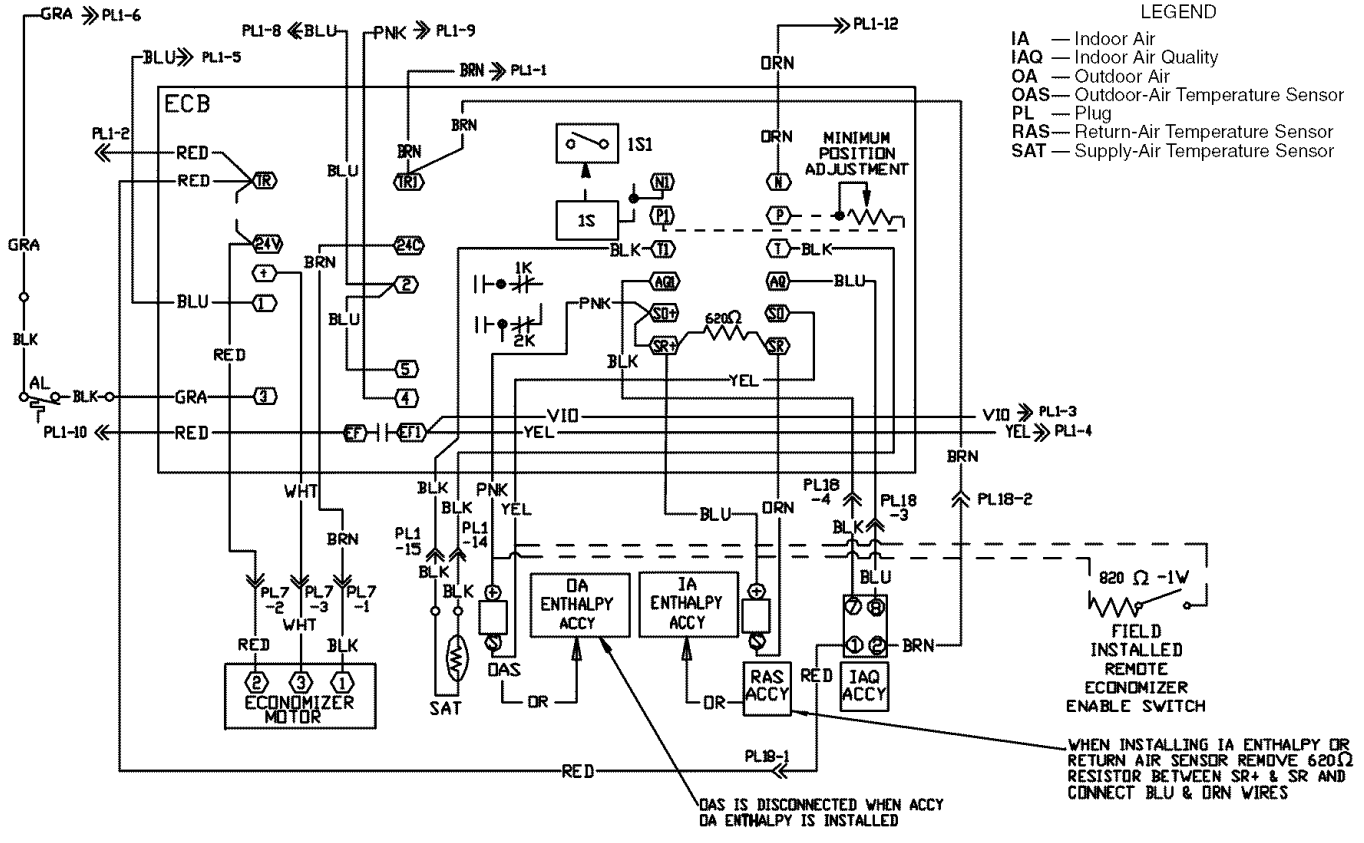


Fig. 23 — EconoMi$er IV Wiring

CONTROL CURVE	CONTROL POINT APPROX. °F (°C) AT 50% RH
A	73 (23)
B	70 (21)
C	67 (19)
D	63 (17)

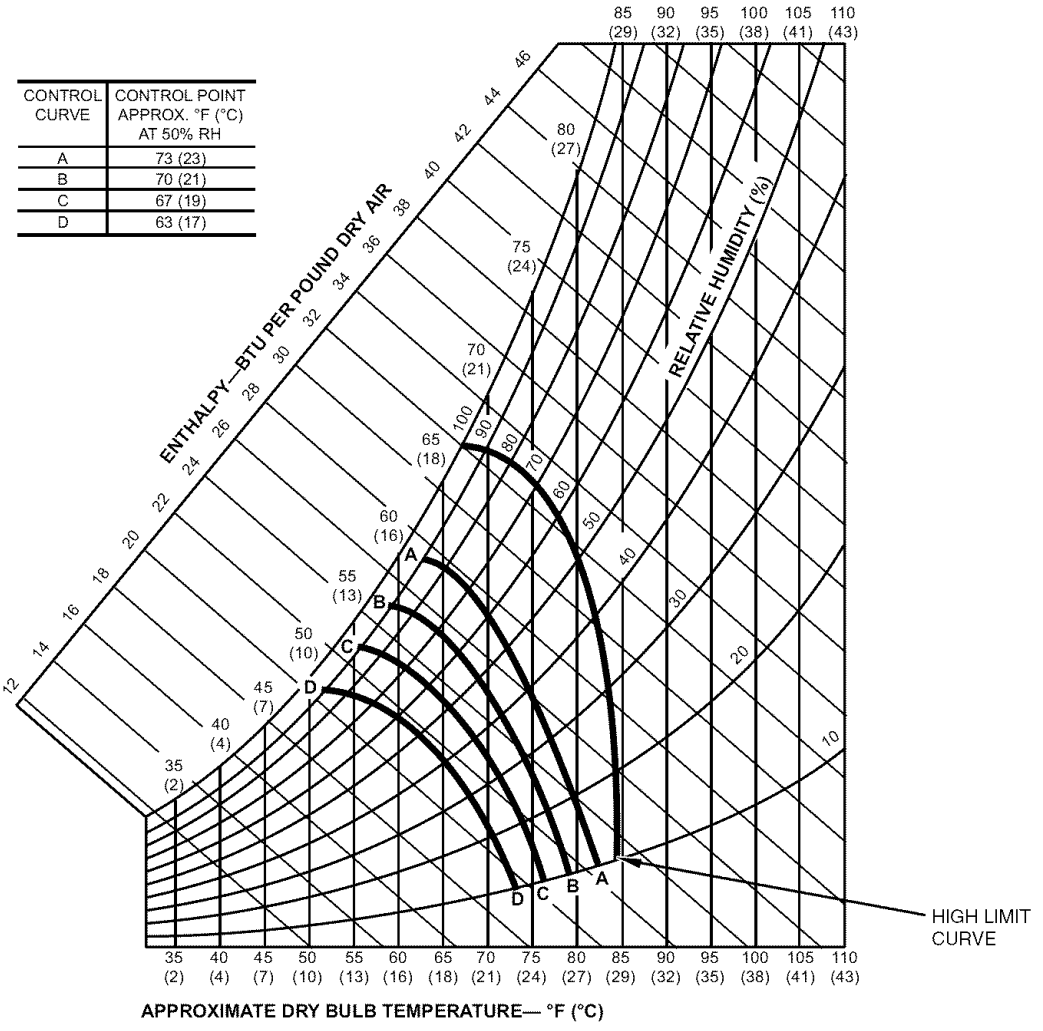


Fig. 24 — Enthalpy Changeover Set Points

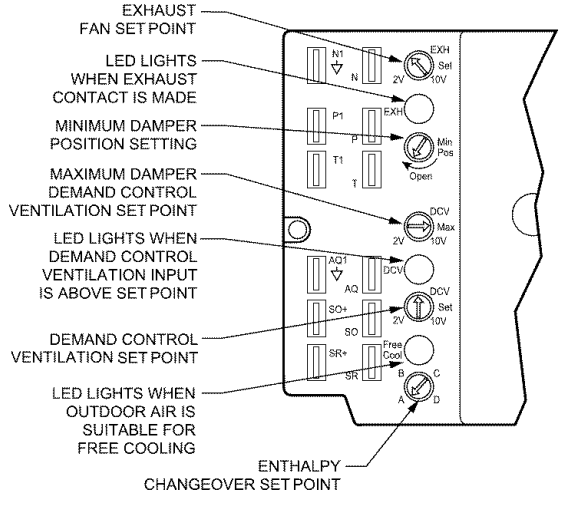


Fig. 25 — EconoMi$er IV Controller Potentiometer and LED Locations

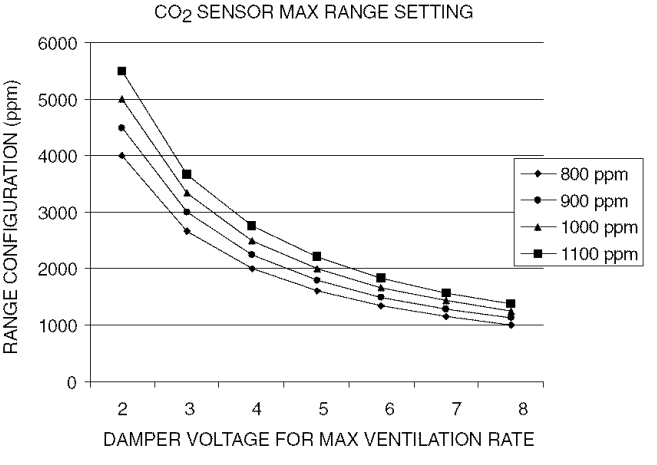


Fig. 26 — CO_2 Sensor Maximum Range Setting

Minimum Position Control — There is a minimum damper position potentiometer on the EconoMi$er IV controller. See Fig. 25. The minimum damper position maintains the minimum airflow into the building during the occupied period.

When using demand ventilation, the minimum damper position represents the minimum ventilation position for VOC (volatile organic compounds) ventilation requirements. The maximum demand ventilation position is used for fully occupied ventilation.

When demand ventilation control is not being used, the minimum position potentiometer should be used to set the occupied ventilation position. The maximum demand ventilation position should be turned fully clockwise.

Adjust the minimum position potentiometer to allow the minimum amount of outdoor air, as required by local codes, to enter the building. Make minimum position adjustments with at least 10° F temperature difference between the outdoor and return-air temperatures. To determine the minimum position setting, perform the following procedure:

1. Calculate the appropriate mixed air temperature using the following formula:

$$(T_O \times \frac{OA}{100}) + (T_R \times \frac{RA}{100}) = T_M$$

T_O = Outdoor-Air Temperature
OA = Percent of Outdoor Air
T_R = Return-Air Temperature
RA = Percent of Return Air
T_M = Mixed-Air Temperature

As an example, if local codes require 10% outdoor air during occupied conditions, outdoor-air temperature is 60 F, and return-air temperature is 75 F.

(60 x .10) + (75 x .90) = 73.5 F

2. Disconnect the supply-air sensor from terminals T and T1.
3. Ensure that the factory-installed jumper is in place across terminals P and P1. If remote damper positioning is being used, make sure that the terminals are wired according to Fig. 23 and that the minimum position potentiometer is turned fully clockwise.
4. Connect 24 vac across terminals TR and TR1.
5. Carefully adjust the minimum position potentiometer until the measured mixed-air temperature matches the calculated value.
6. Reconnect the supply-air sensor to terminals T and T1.

Remote control of the EconoMi$er IV damper is desirable when requiring additional temporary ventilation. If a field-supplied remote potentiometer (Honeywell part number S963B1128) is wired to the EconoMi$er IV controller, the minimum position of the damper can be controlled from a remote location.

To control the minimum damper position remotely, remove the factory-installed jumper on the P and P1 terminals on the EconoMi$er IV controller. Wire the field-supplied potentiometer to the P and P1 terminals on the EconoMi$er IV controller. See Fig. 23.

Damper Movement — Damper movement from full open to full closed (or vice versa) takes up to 2½ minutes.

Thermostats — The EconoMi$er IV control works with conventional thermostats that have a Y1 (cool stage 1), Y2 (cool stage 2), W1 (heat stage 1), W2 (heat stage 2), and G (fan). The EconoMi$er IV control does not support space temperature sensors like the T55 or T56. Connections are made at the thermostat terminal connection board located in the main control box.

Occupancy Control — The factory default configuration for the EconoMi$er IV control is occupied mode. Occupied status is provided by the black jumper from terminal TR to terminal N. When unoccupied mode is desired, install a field-supplied timeclock function in place of the jumper between TR and N. See Fig. 23. When the timeclock contacts are closed, the EconoMi$er IV control will be in occupied mode. When the timeclock contacts are open (removing the 24-v signal from terminal N), the EconoMi$er IV will be in unoccupied mode.

Demand Control Ventilation — When using the EconoMi$er IV for demand control ventilation, there are some equipment selection criteria which should be considered. When selecting the heat capacity and cool capacity of the equipment, the maximum ventilation rate must be evaluated for design conditions. The maximum damper position must be calculated to provide the desired fresh air.

Typically the maximum ventilation rate will be about 5 to 10% more than the typical cfm required per person, using normal outside air design criteria.

A proportional anticipatory strategy should be taken with the following conditions: a zone with a large area, varied occupancy, and equipment that cannot exceed the required ventilation rate at design conditions. Exceeding the required ventilation rate means the equipment can condition air at a maximum ventilation rate that is greater than the required ventilation rate for maximum occupancy. A proportional-anticipatory strategy will cause the fresh air supplied to increase as the room CO_2 level increases even though the CO_2 set point has not been reached. By the time the CO_2 level reaches the set point, the damper will be at maximum ventilation and should maintain the set point.

In order to have the CO_2 sensor control the economizer damper in this manner, first determine the damper voltage output for minimum or base ventilation. Base ventilation is the ventilation required to remove contaminants during unoccupied periods. The following equation may be used to determine the percent of outside-air entering the building for a given damper position. For best results there should be at least a 10 degree difference in outside and return-air temperatures.

$$(T_O \times \frac{OA}{100}) + (T_R \times \frac{RA}{100}) = T_M$$

T_O = Outdoor-Air Temperature
OA = Percent of Outdoor Air
T_R = Return-Air Temperature
RA = Percent of Return Air
T_M = Mixed-Air Temperature

Once base ventilation has been determined, set the minimum damper position potentiometer to the correct position.

The same equation can be used to determine the occupied or maximum ventilation rate to the building. For example, an output of 3.6 volts to the actuator provides a base ventilation rate of 5% and an output of 6.7 volts provides the maximum ventilation rate of 20% (or base plus 15 cfm per person). Use Fig. 26 to determine the maximum setting of the CO_2 sensor. For example, a 1100 ppm set point relates to a 15 cfm per person design. Use the 1100 ppm curve on Fig. 26 to find the point when the CO_2 sensor output will be 6.7 volts. Line up the point on the graph with the left side of the chart to determine that the range configuration for the CO_2 sensor should be 1800 ppm. The EconoMi$er IV controller will output the 6.7 volts from the CO_2 sensor to the actuator when the CO_2 concentration in the space is at 1100 ppm. The DCV set point may be left at 2 volts since the CO_2 sensor voltage will be ignored by the EconoMi$er IV controller until it rises above the 3.6 volt setting of the minimum position potentiometer.

Once the fully occupied damper position has been determined, set the maximum damper demand control ventilation potentiometer to this position. Do not set to the maximum position as this can result in over-ventilation to the space and potential high-humidity levels.

CO_2 Sensor Configuration — The CO_2 sensor has preset standard voltage settings that can be selected anytime after the sensor is powered up. See Table 20.

Use setting 1 or 2 for Carrier equipment. See Table 20.

1. Press Clear and Mode buttons. Hold at least 5 seconds until the sensor enters the Edit mode.
2. Press Mode twice. The STDSET Menu will appear.
3. Use the Up/Down button to select the preset number. See Table 20.
4. Press Enter to lock in the selection.
5. Press Mode to exit and resume normal operation.

The custom settings of the CO_2 sensor can be changed anytime after the sensor is energized. Follow the steps below to change the non-standard settings:

1. Press Clear and Mode buttons. Hold at least 5 seconds until the sensor enters the Edit mode.
2. Press Mode twice. The STDSET Menu will appear.
3. Use the Up/Down button to toggle to the NONSTD menu and press Enter.
4. Use the Up/Down button to toggle through each of the nine variables, starting with Altitude, until the desired setting is reached.
5. Press Mode to move through the variables.
6. Press Enter to lock in the selection, then press Mode to continue to the next variable.

Dehumidification of Fresh Air with DCV Control — Information from ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) indicates that the largest humidity load on any zone is the fresh air introduced. For some applications, a device such as a 62AQ energy recovery unit is added to reduce the moisture content of the fresh air being brought into the building when the enthalpy is high. In most cases, the normal heating and cooling processes are more than adequate to remove the humidity loads for most commercial applications.

If normal rooftop heating and cooling operation is not adequate for the outdoor humidity level, an energy recovery and/or a dehumidification option should be considered.

Operating Sequence

COOLING, UNITS WITHOUT ECONOMIZER — When the thermostat calls for one stage of cooling, Y1 and G are energized. The indoor-fan contactor (IFC) and compressor contactor(s) (C.A1 and C.B1 on three-compressor units or C.A1 only on two-compressor units), and outdoor-fan contactors (OFC1 and OFC2 when outdoor temperature is above FCS [fan control switch] setting) are energized and the indoor-fan motor, compressor(s) (A1 and B1 on three-compressor units or A1 only on two-compressor units), and outdoor fans controlled by OFC1 are started. If the outdoor temperature is above the setting of the fan control switch, the outdoor fans controlled by OFC2 are also started.

If more cooling is required, the thermostat will call for a second stage of cooling, energizing Y2. This will allow relay CR1 to energize, which in turn energizes the compressor contactor (C.C1 on three-compressor units or C.B1 on two-compressor units). The second stage compressor (C1 on three-compressor units or B1 on two-compressor units is then started.

HEATING, UNITS WITHOUT ECONOMIZER

NOTE: The 50HJ020-028 units have 2 stages of electric heat.

When the thermostat calls for one stage of heating, W1 is energized. The thermostat must be configured such that the blower output (G) is energized when there is a W1 call for heating. The indoor-fan contactor (IFC) and first stage electric heat contactor(s) are energized and the indoor-fan motor, and first stage electric heater are started.

If additional heating is required, the thermostat will call for a second stage of heating, energizing W2. This will energize the second stage of electric heat.

COOLING, UNITS WITH ECONOMI$ER IV — When free cooling is not available, the compressors will be controlled by the zone thermostat. When free cooling is available, the outdoor-air damper is modulated by the EconoMi$er IV control to provide a 50 to 55 F mixed-air temperature into the zone. As the mixed-air temperature fluctuates above 55 or below 50 F, the dampers will be modulated (open or close) to bring the mixed-air temperature back within control.

Table 20 — CO_2 Sensor Standard Settings

SETTING	EQUIPMENT	OUTPUT	VENTILATION RATE (cfm/Person)	ANALOG OUTPUT	CO_2 CONTROL RANGE (ppm)	OPTIONAL RELAY SETPOINT (ppm)	RELAY HYSTERESIS (ppm)
1	Interface w/Standard Building Control System	Proportional	Any	0-10V 4-20 mA	0-2000	1000	50
2		Proportional	Any	2-10V 7-20 mA	0-2000	1000	50
3		Exponential	Any	0-10V 4-20 mA	0-2000	1100	50
4	Economizer	Proportional	15	0-10V 4-20 mA	0-1100	1100	50
5		Proportional	20	0-10V 4-20 mA	0- 900	900	50
6		Exponential	15	0-10V 4-20 mA	0-1100	1100	50
7		Exponential	20	0-10V 4-20 mA	0- 900	900	50
8	Health & Safety	Proportional	—	0-10V 4-20 mA	0-9999	5000	500
9	Parking/Air Intakes/ Loading Docks	Proportional	—	0-10V 4-20 mA	0-2000	700	50

LEGEND

ppm — Parts Per Million

Above 50 F supply-air temperature, the dampers will modulate from 100% open to the minimum open position. From 50 F to 45 F supply-air temperature, the dampers will maintain at the minimum open position. Below 45 F the dampers will be completely shut. As the supply-air temperature rises, the dampers will come back open to the minimum open position once the supply-air temperature rises to 48 F.

If optional power exhaust is installed, as the outdoor-air damper opens and closes, the power exhaust fans will be energized and deenergized.

If field-installed accessory CO_2 sensors are connected to the EconoMi$er IV control, a demand controlled ventilation strategy will begin to operate. As the CO_2 level in the zone increases above the CO_2 set point, the minimum position of the damper will be increased proportionally. As the CO_2 level decreases because of the increase in fresh air, the outdoor-air damper will be proportionally closed.

For EconoMi$er IV operation, there must be a thermostat call for the fan (G). This will move the damper to its minimum position.

When the EconoMi$er IV control is in the occupied mode and a call for cooling exists (Y1 on the thermostat), the control will first check for indoor fan operation. If the fan is not on, then cooling will not be activated. If the fan is on, then the control will open the EconoMi$er IV damper to the minimum position.

Damper movement from full closed to full open (or vice versa) will take between $1^1/_2$ and $2^1/_2$ minutes.

If free cooling can be used as determined from the appropriate changeover command (switch, dry bulb, enthalpy curve, differential dry bulb, or differential enthalpy), then the control will modulate the dampers open to maintain the mixed air temperature set point at 50 to 55 F.

If there is a further demand for cooling (cooling second stage — Y2 is energized), then the control will bring on compressor stage 1 to maintain the mixed-air temperature set point. The EconoMi$er IV damper will be open at maximum position. EconoMi$er IV operation is limited to a single compressor.

HEATING, UNITS WITH ECONOMI$ER IV — When the room temperature calls for heat, the heating controls are energized as described in the Heating, Units Without Economizer section. The IFM is energized and the EconoMi$er IV damper modulates to the minimum position. When the thermostat is satisfied, the damper modulates closed.

SERVICE

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. 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 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 the start of the cooling season. In winter, keep drains and traps dry. An access panel is located above the condensate connection to allow easy clean out of the condensate pan. The first time the panel is removed, the insulation behind the access panel will need to be cut away. Carefully cut the insulation with a knife or blade on three sides so the insulation can be folded out of the way during cleaning. Be careful not to damage components behind the insulation while cutting. Once cleaning is completed, fold the insulation back into place and secure the access panel in the original position.

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 throwaway filters in place of screens. See Table 1 for quantity and size.

Lubrication

COMPRESSORS — Each compressor is charged with the correct amount of oil at the factory. Conventional white oil (Zerol 150T or Sontex SA32) is used. White oil is compatible with 3GS oil, and 3GS oil may be used if the addition of oil is required. See compressor nameplate for original oil charge. Oil recharge amount is shown in Table 1. When a compressor is exchanged in the field it is possible that a major portion of the oil from the replaced compressor may still be in the system. While this will not affect the reliability of the replacement compressor, the extra oil will add rotor drag and increase power usage. To remove this excess oil, an access valve may be added to the lower portion of the suction line at the inlet of the compressor. The compressor should then be run for 10 minutes, shut down and the access valve opened until no oil flows. This should be repeated twice to make sure the proper oil level has been achieved.

FAN SHAFT BEARINGS — Lubricate bearings at least every 6 months with suitable bearing grease. 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 Service and Replacement — The 50HJ units feature a slide-out fan deck for easy servicing of the indoor-fan motor, pulleys, belt, and bearings. To service components in this section, perform the following procedure:

1. Shut off unit power supply.
2. Open the fan section access panel.
3. Remove three no. 10 screws at front of slide-out fan deck. Save screws. See Fig. 27.
4. Disconnect the electrical plugs and wires connected to the slide-out fan deck (evaporator fan plug, supply air thermistor, and fan status switch, if installed). Wires may be damaged if not disengaged.
5. Fan deck can now be slid out to access serviceable components.

⚠ CAUTION

DO NOT SLIDE FAN DECK OUT PAST THE STOP BRACKET. If further access is required, the fan deck must be supported. Make sure plugs and wiring are not pinched between fan housing and unit center post. Damage to unit may result.

6. To replace fan deck to operating position, slide fan deck back into the unit. Secure with the three no. 10 screws removed in Step 3.
7. Re-attach electrical plugs and wires.
8. Close fan section access door.
9. Restore power to unit.

Evaporator Fan Performance Adjustment (Fig. 27 and 28) — Fan motor pulleys are factory set for speed shown in Table 1.

To change fan speeds:

1. Shut off unit power supply.
2. Loosen nuts on the 4 carriage bolts in the mounting base. Using adjusting bolts and plate, slide motor and remove belt.
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.

   See Table 13 for air quantity limits.
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.)
6. Replace and tighten belts (see Belt Tension Adjustment section below).
7. Restore power to unit.

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.
4. Restore power to unit.

Belt Tension Adjustment — To adjust belt tension:

1. Shut off power to unit.
2. Slide out fan deck to service position as shown in Evaporator Fan Service and Replacement section above.
3. Loosen fan motor bolts.
4. Move motor mounting plate to adjust to proper belt tension. See Table 21. Motor adjuster bolts may be used to tighten belts. See Fig. 27.
5. Check for proper belt alignment. Adjust if necessary.
6. Tighten motor mounting plate bolts to lock motor in proper position.
7. Return fan deck back into operating position.
8. Restore power to unit.

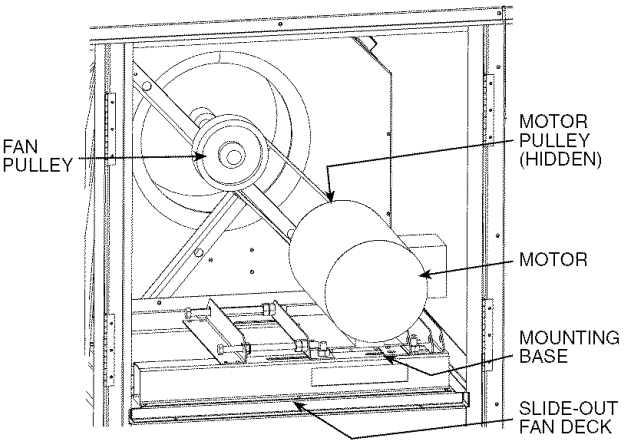


Fig. 27 — Evaporator-Fan Motor Adjustment

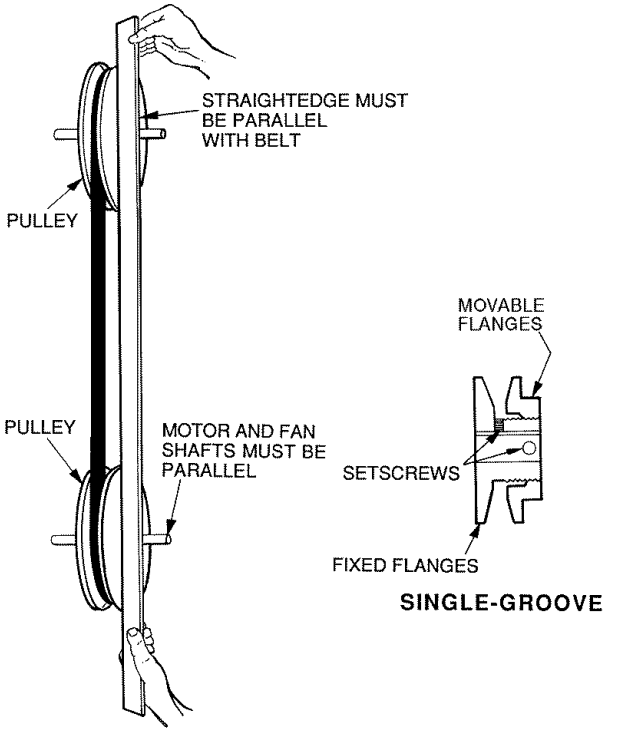


Fig. 28 — Evaporator-Fan Alignment and Adjustment

Table 21 — Belt Tension Adjustment

50HJ	VOLTAGE	BELT TENSION (lb) Unit Model Number Position 10							
		A,J	B,K	C,L	D,M	E,N	F,P	G,Q	H,R
020	208/230	NA	4.9	5.1	5.7	NA	4.9	5.1	5.7
	460	NA	4.9	5.1	5.7	NA	4.9	5.1	5.7
	575	NA	3.9	5.2	5.7	NA	3.9	5.2	5.7
024	208/230	4.8	5.1	5.6	4.5	4.8	5.1	5.6	4.5
	460	4.8	5.1	5.6	4.5	4.8	5.1	5.6	4.5
	575	5.3	5.1	5.6	4.5	5.3	5.1	5.6	4.5
028	208/230	4.5	5.4	5.9	4.5	4.5	5.4	5.9	4.5
	460	4.5	5.4	5.9	4.5	4.5	5.4	5.9	4.5
	575	4.5	5.4	5.9	4.5	4.5	5.4	5.9	4.5

Condenser-Fan Adjustment (Fig. 29)

1. Shut off unit power supply.
2. Remove condenser-fan assembly (grille, motor, motor cover, and fan) and loosen fan hub setscrews.
3. Adjust fan height as shown in Fig. 29.
4. Tighten setscrews and replace condenser-fan assembly.

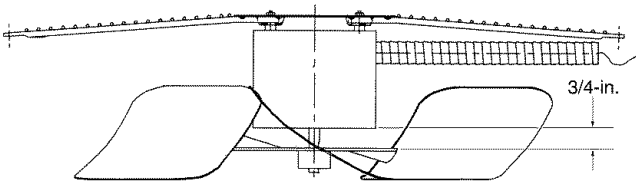


Fig. 29 — Condenser-Fan Adjustment

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.

NOTE: Do not use recycled refrigerant as it may contain contaminants.

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

LOW CHARGE COOLING — Using cooling charging chart (see Fig. 30-32), add or remove refrigerant until conditions of the chart are met. An accurate pressure gage and temperature-sensing device is required. Charging is accomplished by ensuring the proper amount of liquid subcooling. Measure liquid line pressure at the liquid line service valve using pressure gage. Connect temperature sensing device to the liquid line near the liquid line service valve and insulate it so that outdoor ambient temperature does not affect reading.

TO USE THE COOLING CHARGING CHART — Use the above temperature and pressure readings, and find the intersection point on the cooling charging chart. If intersection point on chart is above line, add refrigerant. If intersection point on chart is below line, carefully recover some of the charge. Recheck suction pressure as charge is adjusted.

NOTE: Indoor-air cfm must be within normal operating range of unit. All outdoor fans must be operating.

The TXV (thermostatic expansion valve) is set to maintain between 10 and 15 degrees of superheat at the compressors. The valves are factory set and should not require re-adjustment.

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

Protective Devices

COMPRESSOR PROTECTION

Overcurrent — Each compressor has internal line break motor protection.

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

Compressor Lockout — If any of the safeties (high-pressure, 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.

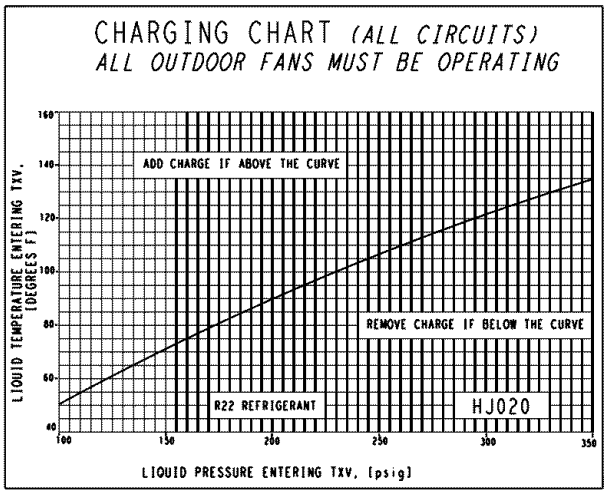


Fig. 30 — Cooling Charging Chart — 50HJ020 Units

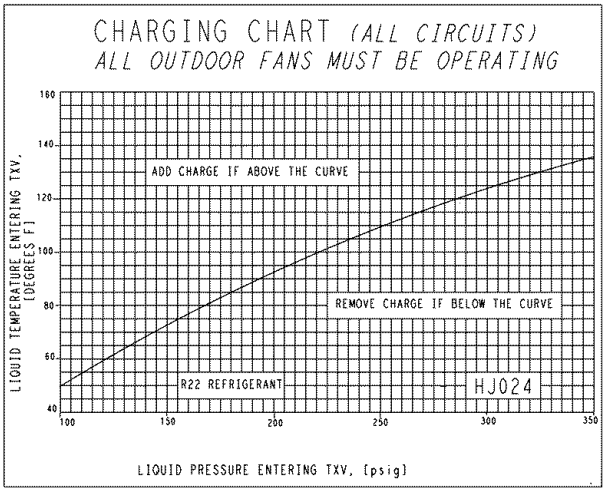


Fig. 31 — Cooling Charging Chart — 50HJ024 Units

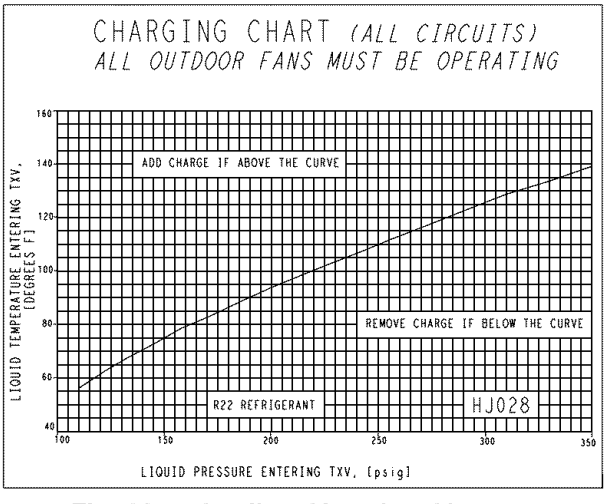


Fig. 32 — Cooling Charging Chart — 50HJ028 Units

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.

Fuses are also located in the control box and feed power to the condenser fan motors. Always replace blown fuses with the correct size fuse as indicated on the unit fuse label.

HIGH-PRESSURE 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 top and bottom of the evaporator coil. It detects frost build-up and turns off the compressor, allowing the coil to clear. Once the frost has melted, the compressor can be reenergized.

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 — Each 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. See Fig. 33-35 for unit wiring.

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

LEGEND

Fig. 33 — Low Voltage Control Schematic, Fig. 34 — Power Schematic and Fig. 35 — Component Arrangement

__.A	—	Circuit A
AHA	—	Adjustable Heat Anticipator
AUX	—	Auxiliary Contact
__.B	—	Circuit B
__.C	—	Circuit C
C	—	Compressor, Contactor
CAP	—	Capacitor
CB	—	Circuit Breaker
CCH	—	Crankcase Heater
CLO	—	Compressor Lockout
COMP	—	Compressor
CR	—	Compressor Relay
ECB	—	EconoMi$er Control Board
FCS	—	Fan Cycling Switch
FIOP	—	Factory-Installed Option
FPT	—	Freeze Protection Thermostat
FU	—	Fuse
GND	—	Ground
HACR	—	Heating, Air Conditioning and Refrigeration
HERM	—	Hermetic
HPS	—	High-Pressure Switch
IA	—	Indoor Air
IAQ	—	Indoor Air Quality
IFC	—	Indoor-Fan Contactor
IFCB	—	Indoor Fan Circuit Breaker
IFM	—	Indoor-Fan Motor
LPS	—	Low-Pressure Switch
OA	—	Outdoor Air
OFC	—	Outdoor-Fan Contactor
OFM	—	Outdoor-Fan Motor
PEC	—	Power Exhaust Contactor
PEM	—	Power Exhaust Motor
QT	—	Quadruple Terminal
RAS	—	Return-Air Sensor
RAT	—	Return-Air Thermistor
SAT	—	Supply-Air Temperature
TB	—	Terminal Block
TRAN	—	Transformer

○	Terminal (Unmarked)
[X]	Terminal Block
●	Splice
———	Factory Wiring
- - - -	Field Wiring
—·—·—	To Indicate FIOP or Accessory
▬▬▬	To Indicate Common Potential Only, Not To Represent Wiring

THERMOSTAT MARKINGS

C	—	Common	W2	—	2nd Stage of Heating
G	—	Fan	X	—	Alarm Output
R	—	Thermostat Power	Y1	—	1st Stage of Cooling
W1	—	1st Stage of Heating	Y2	—	2nd Stage of Cooling

NOTES:
1. Factory wiring is in accordance with the National Electrical Codes. Any field modifications or additions must be in compliance with all applicable codes.
2. Use 75° C minimum wire for field power supply. Use copper wires for all units.
3. All circuit breakers "Must Trip Amps" are equal to or less than 156% RLA (rated load amps).
4. Compressor and fan motors are thermally protected. Three-phase motors protected against primary single phase conditions.
5. The CLO locks out the compressor to prevent short cycling on compressor overload and safety devices. Before replacing CLO, check these devices.

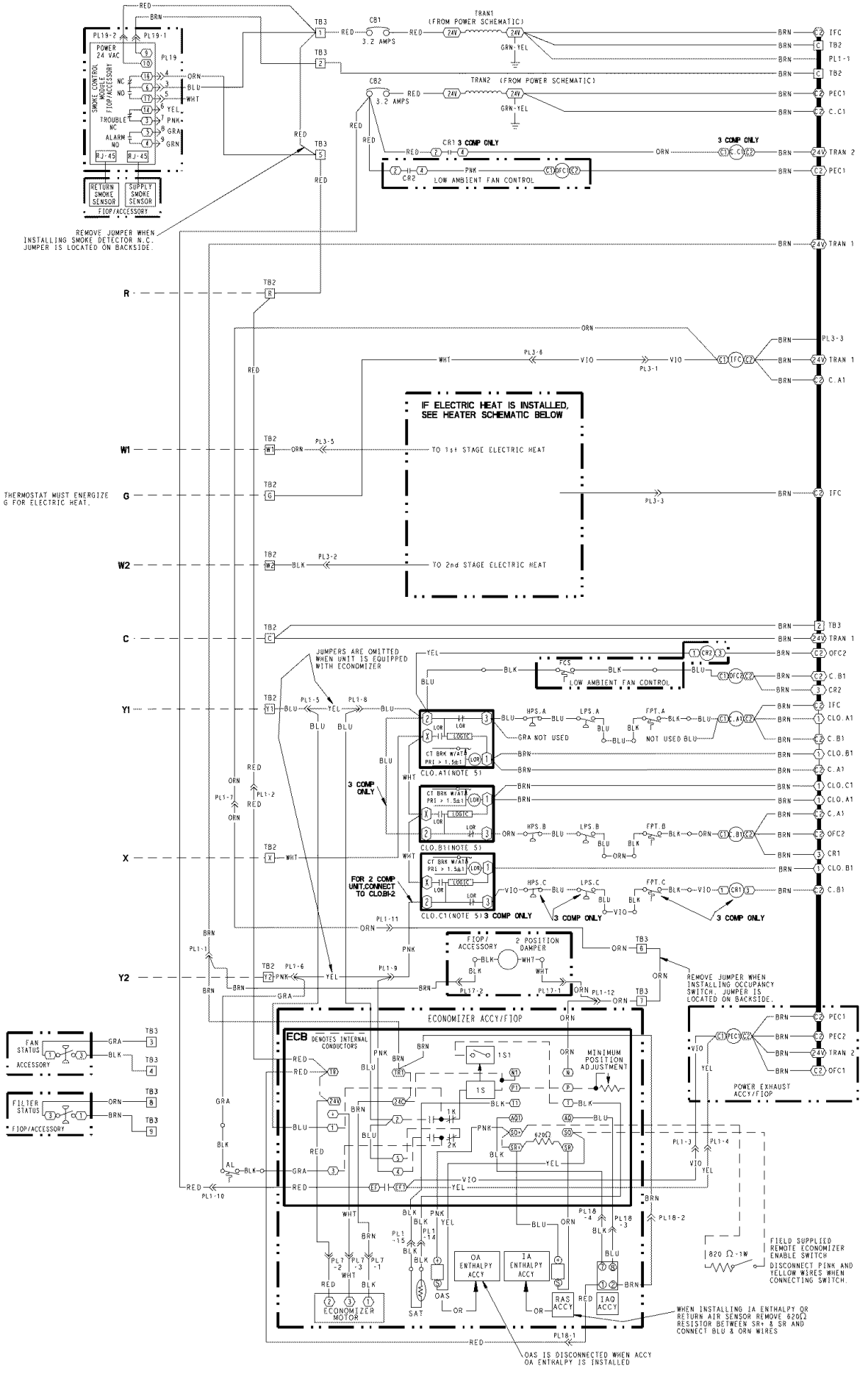


Fig. 33 — Low Voltage Control Schematic

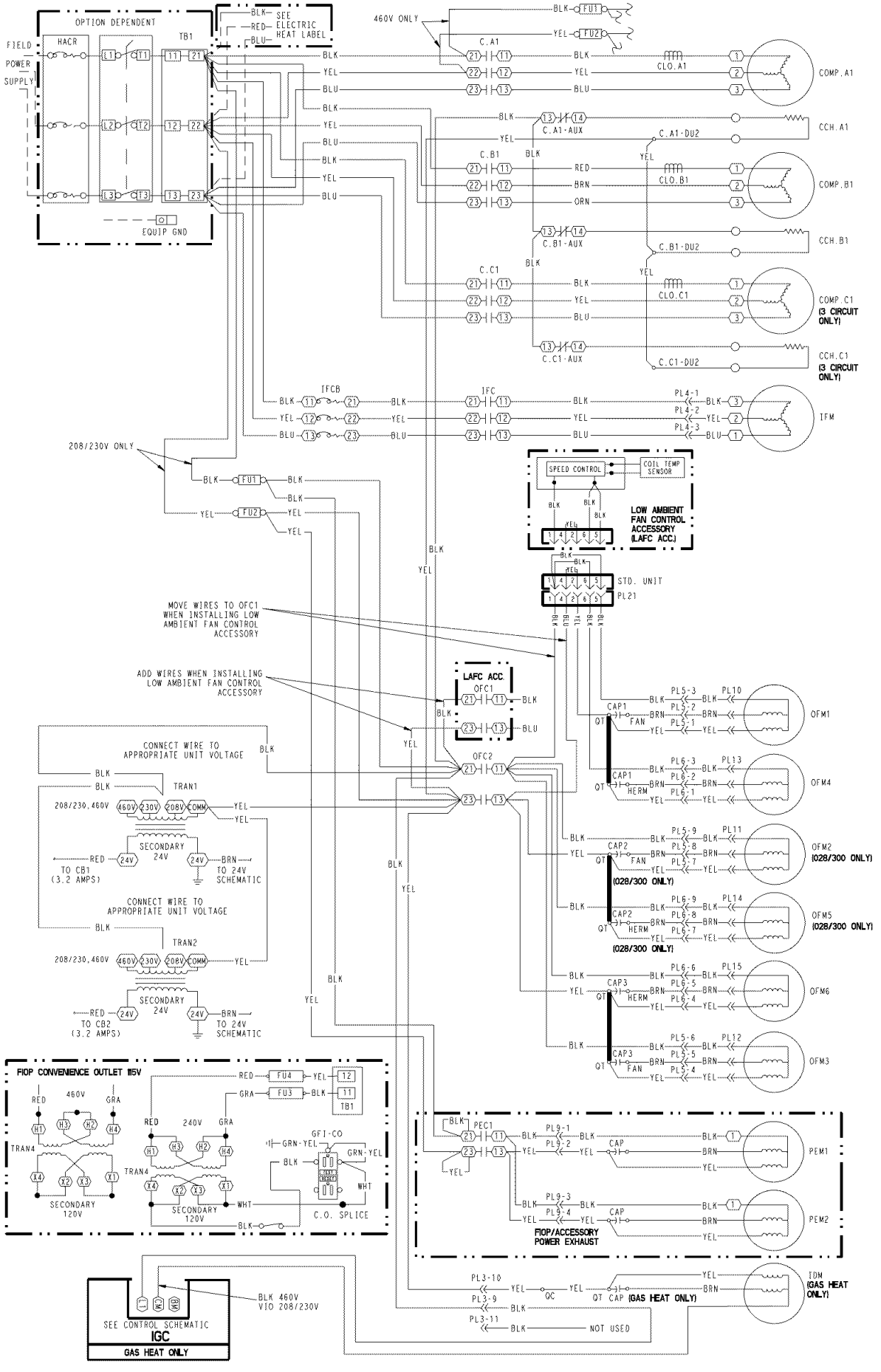


Fig. 34 — Power Schematic

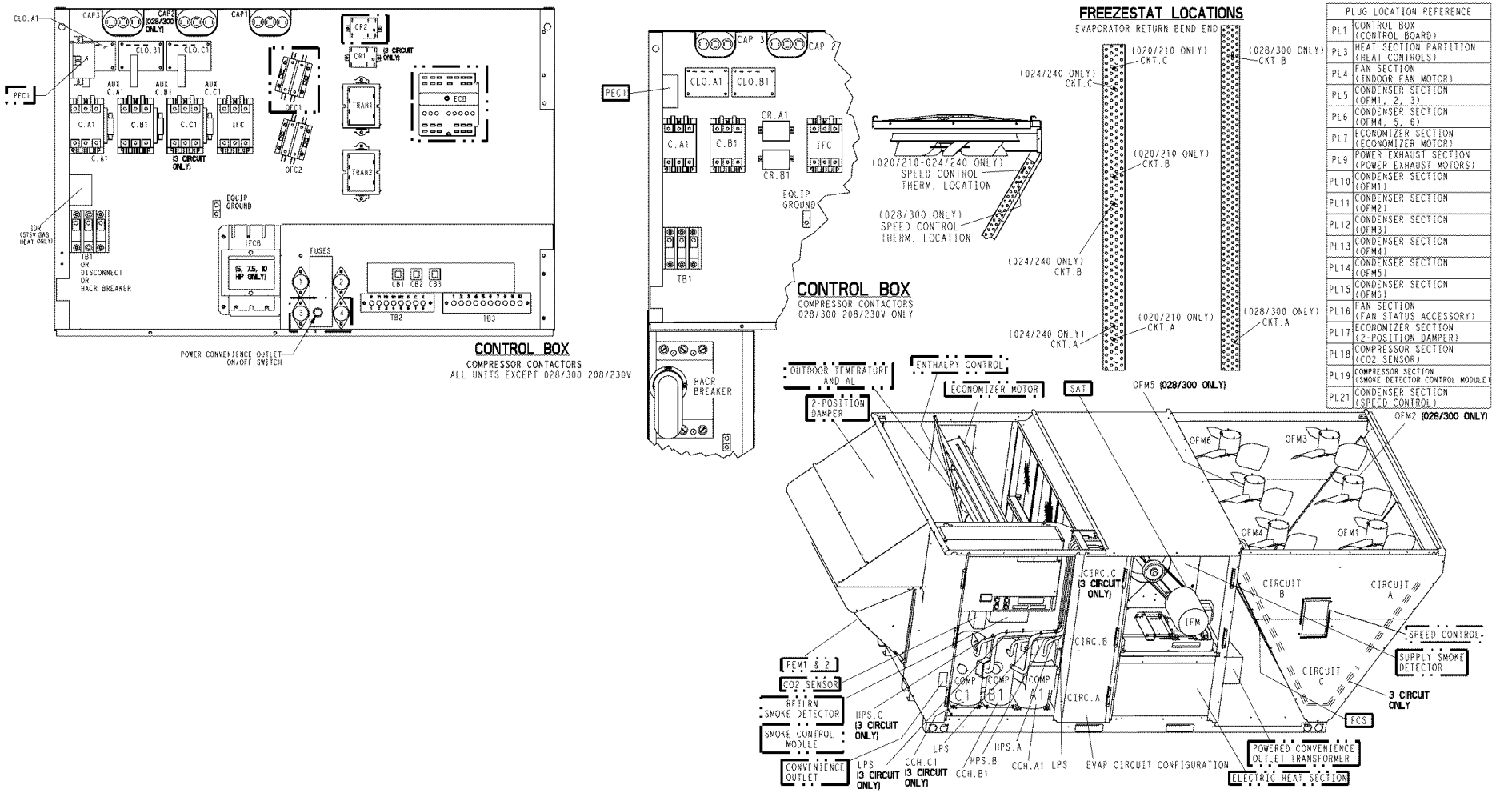


Fig. 35 — Component Arrangement

TROUBLESHOOTING

Unit Troubleshooting — Refer to Tables 22 and 23 for troubleshooting details.

Table 22 — 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 overload.	Determine cause and replace.
	Compressor locked out	Determine cause for safety trip and reset lockout.
	One leg of 3-phase power dead.	Replace fuse or reset circuit breaker. Determine cause.
Compressor Cycles (other than normally satisfying thermostat).	Refrigerant overcharge or undercharge.	Recover refrigerant, evacuate system, and recharge to nameplate.
	Defective compressor.	Replace and determine cause.
	Insufficient line voltage.	Determine cause and correct.
	Blocked condenser.	Determine cause and correct.
	Defective overload.	Determine cause and replace.
	Defective thermostat.	Replace thermostat.
	Faulty condenser-fan motor.	Replace.
	Restriction in refrigerant system.	Locate restriction and remove.
Compressor Operates Continuously.	Dirty air filter.	Replace filter.
	Unit undersized for load.	Decrease load or increase unit size.
	Thermostat set too low.	Reset thermostat.
	Low refrigerant charge.	Locate leak, repair, and recharge.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser coil dirty or restricted.	Clean coil or remove restriction.
Excessive Head Pressure.	Dirty air filter.	Replace filter.
	Dirty condenser coil.	Clean coil.
	Refrigerant overcharged.	Recover excess refrigerant.
	Faulty TXV.	1. Check TXV bulb mounting and secure tightly to suction line. 2. Replace TXV if stuck open or closed.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser air restricted or air short-cycling.	Determine cause and correct.
Head Pressure Too Low.	Low refrigerant charge.	Check for leaks, repair, and recharge.
	Restriction in liquid tube.	Remove restriction.
Excessive Suction Pressure.	High heat load.	Check for source and eliminate.
	Faulty TXV.	1. Check TXV bulb mounting and secure tightly to suction line. 2. Replace TXV if stuck open or closed.
	Refrigerant overcharged.	Recover 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.
	Faulty TXV.	1. Check TXV bulb mounting and secure tightly to suction line. 2. Replace TXV if stuck open or closed.
	Insufficient evaporator airflow.	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
	Field-installed filter drier restricted.	Replace.

LEGEND

TXV — Thermostatic Expansion Valve

Table 23 — Heating Service Analysis

PROBLEM	CAUSE	REMEDY
No Heat.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped. CB1, CB2, CB3.	Replace fuse or reset circuit breaker.
	Thermostat not calling for heating.	Check thermostat.
	No 24 vac at primary contactor.	Check transformer and circuit breaker.
	No power (high voltage) to L2 of primary contactor.	Check safety switches, one shot backup, and auto limit.
	Bad electrical elements.	With power off, remove high voltage wires and check resistance of heater. Replace if open.

**EconoMi$er IV Troubleshooting —** See Table 24 for EconoMi$er IV logic.

ECONOMI$ER IV PREPARATION — This procedure is used to prepare the EconoMi$er IV for troubleshooting. No troubleshooting or testing is done by performing the following procedure.

A functional view of the EconoMi$er IV is shown in Fig. 36. Typical settings, sensor ranges, and jumper positions are also shown. An EconoMi$er IV simulator program is available from Carrier to help with EconoMi$er IV training and troubleshooting.

NOTE: This procedure requires a 9-v battery, 1.2 kilo-ohm resistor, and a 5.6 kilo-ohm resistor which are not supplied with the EconoMi$er IV.

IMPORTANT: Be sure to record the positions of all potentiometers before starting troubleshooting.

1. Disconnect power at TR and TR1. All LEDs should be off. Exhaust fan contacts should be open.
2. Disconnect device at P and P1.
3. Jumper P to P1.
4. Disconnect wires at T and T1. Place 5.6 kilo-ohm resistor across T and T1.
5. Jumper TR to 1.
6. Jumper TR to N.
7. If connected, remove sensor from terminals S_O and +. Connect 1.2 kilo-ohm 4074EJM checkout resistor across terminals S_O and +.
8. Put 620-ohm resistor across terminals S_R and +.
9. Set minimum position, DCV set point, and exhaust potentiometers fully CCW (counterclockwise).
10. Set DCV maximum position potentiometer fully CW (clockwise).
11. Set enthalpy potentiometer to D.
12. Apply power (24 vac) to terminals TR and TR1.

DIFFERENTIAL ENTHALPY — To check differential enthalpy:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Place 620-ohm resistor across S_O and +.
3. Place 1.2 kilo-ohm resistor across S_R and +. The Free Cool LED should be lit.
4. Remove 620-ohm resistor across S_O and +. The Free Cool LED should turn off.
5. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

SINGLE ENTHALPY — To check single enthalpy:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Set the enthalpy potentiometer to A (fully CCW). The Free Cool LED should be lit.
3. Set the enthalpy potentiometer to D (fully CW). The Free Cool LED should turn off.
4. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

DCV (Demand Controlled Ventilation) AND POWER EXHAUST — To check DCV and Power Exhaust:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Ensure terminals AQ and AQ1 are open. The LED for both DCV and Exhaust should be off. The actuator should be fully closed.
3. Connect a 9-v battery to AQ (positive node) and AQ1 (negative node). The LED for both DCV and Exhaust should turn on. The actuator should drive to between 90 and 95% open.
4. Turn the Exhaust potentiometer CW until the Exhaust LED turns off. The LED should turn off when the potentiometer is approximately 90%. The actuator should remain in position.
5. Turn the DCV set point potentiometer CW until the DCV LED turns off. The DCV LED should turn off when the potentiometer is approximately 9 v. The actuator should drive fully closed.
6. Turn the DCV and Exhaust potentiometers CCW until the Exhaust LED turns on. The exhaust contacts will close 30 to 120 seconds after the Exhaust LED turns on.
7. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

DCV MINIMUM AND MAXIMUM POSITION — To check the DCV minimum and maximum position:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Connect a 9-v battery to AQ (positive node) and AQ1 (negative node). The DCV LED should turn on. The actuator should drive to between 90 and 95% open.
3. Turn the DCV Maximum Position potentiometer to midpoint. The actuator should drive to between 20 and 80% open.
4. Turn the DCV Maximum Position potentiometer to fully CCW. The actuator should drive fully closed.
5. Turn the Minimum Position potentiometer to midpoint. The actuator should drive to between 20 and 80% open.
6. Turn the Minimum Position Potentiometer fully CW. The actuator should drive fully open.
7. Remove the jumper from TR and N. The actuator should drive fully closed.

8. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

SUPPLY-AIR INPUT — To check supply-air input:

1. Make sure EconoMi$er IV preparation procedure has been performed.
2. Set the Enthalpy potentiometer to A. The Free Cool LED turns on. The actuator should drive to between 20 and 80% open.
3. Remove the 5.6 kilo-ohm resistor and jumper T to T1. The actuator should drive fully open.
4. Remove the jumper across T and T1. The actuator should drive fully closed.
5. Return EconoMi$er IV settings and wiring to normal after completing troubleshooting.

ECONOMI$ER IV TROUBLESHOOTING COMPLETION — This procedure is used to return the EconoMi$er IV to operation. No troubleshooting or testing is done by performing the following procedure.

1. Disconnect power at TR and TR1.
2. Set enthalpy potentiometer to previous setting.
3. Set DCV maximum position potentiometer to previous setting.
4. Set minimum position, DCV set point, and exhaust potentiometers to previous settings.
5. Remove 620-ohm resistor from terminals S_R and +.
6. Remove 1.2 kilo-ohm checkout resistor from terminals S_O and +. If used, reconnect sensor from terminals S_O and +.
7. Remove jumper from TR to N.
8. Remove jumper from TR to 1.
9. Remove 5.6 kilo-ohm resistor from T and T1. Reconnect wires at T and T1.
10. Remove jumper from P to P1. Reconnect device at P and P1.
11. Apply power (24 vac) to terminals TR and TR1.

Table 24 — EconoMi$er IV Input/Output Logic

INPUTS					OUTPUTS			
Demand Control Ventilation (DCV)	Enthalpy*		Y1	Y2	Compressor		N Terminal†	
	Outdoor	Return			Stage 1	Stage 2	Occupied	Unoccupied
							Damper	
Below set (DCV LED Off)	High (Free Cooling LED Off)	Low	On	On	On	On	Minimum position	Closed
			On	Off	On	Off		
			Off	Off	Off	Off		
	Low (Free Cooling LED On)	High	On	On	On	Off	Modulating** (between min. position and full-open)	Modulating** (between closed and full-open)
			On	Off	Off	Off		
			Off	Off	Off	Off	Minimum position	Closed
Above set (DCV LED On)	High (Free Cooling LED Off)	Low	On	On	On	On	Modulating†† (between min. position and DCV maximum)	Modulating†† (between closed and DCV maximum)
			On	Off	On	Off		
			Off	Off	Off	Off		
	Low (Free Cooling LED On)	High	On	On	On	Off	Modulating***	Modulating†††
			On	Off	Off	Off		
			Off	Off	Off	Off		

*For single enthalpy control, the module compares outdoor enthalpy to the ABCD set point.
†Power at N terminal determines Occupied/Unoccupied setting: 24 vac (Occupied), no power (Unoccupied).
**Modulation is based on the supply-air sensor signal.
††Modulation is based on the DCV signal.
***Modulation is based on the greater of DCV and supply-air sensor signals, between minimum position and either maximum position (DCV) or fully open (supply-air signal).
†††Modulation is based on the greater of DCV and supply-air sensor signals, between closed and either maximum position (DCV) or fully open (supply-air signal).

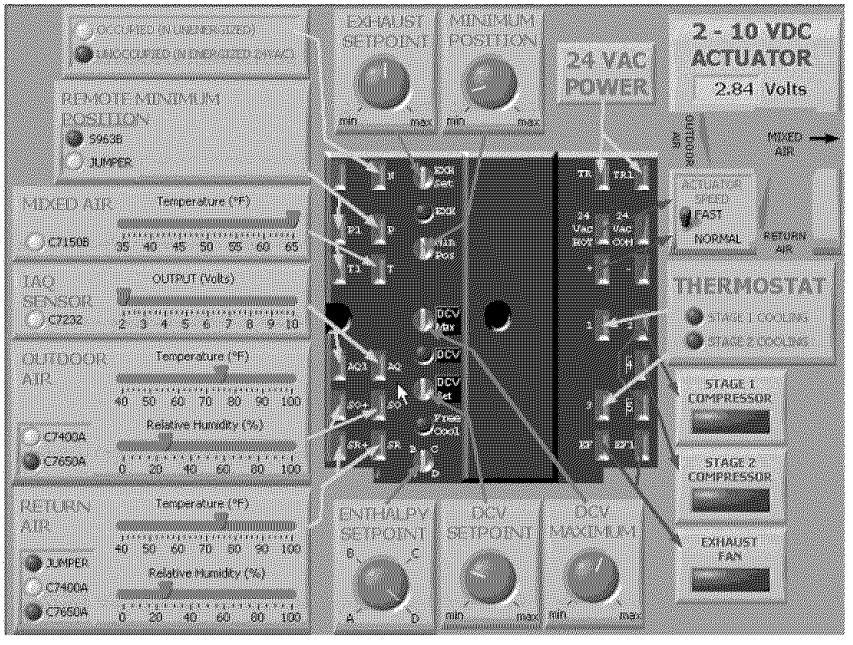


Fig. 36 — EconoMi$er IV Functional View

SERVICE TRAINING

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

- Unit Familiarization
- Maintenance
- Installation Overview
- Operating Sequence

A large selection of product, theory, and skills programs are available, using popular video-based formats and materials. All include video and/or slides, plus companion book.

Classroom Service Training which includes "hands-on" experience with the products in our labs can mean increased confidence that really pays dividends in faster troubleshooting and fewer callbacks. Course descriptions and schedules are in our catalog.

CALL FOR FREE CATALOG 1-800-644-5544

[ ] Packaged Service Training [ ] Classroom Service Training

START-UP CHECKLIST

MODEL NO.:_____ SERIAL NO.:_____

DATE:_____ TECHNICIAN: _____

I. PRE-START-UP:

- ☐ VERIFY THAT ALL PACKING MATERIALS HAVE BEEN REMOVED FROM UNIT
- ☐ VERIFY INSTALLATION OF OUTDOOR AIR HOOD
- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTRUCTIONS
- ☐ VERIFY THAT ALL ELECTRICAL CONNECTIONS AND TERMINALS ARE TIGHT
- ☐ CHECK THAT RETURN-AIR FILTERS ARE CLEAN AND IN PLACE
- ☐ CHECK THAT OUTDOOR AIR INLET SCREENS ARE IN PLACE
- ☐ VERIFY THAT UNIT IS LEVEL
- ☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE, AND VERIFY SETSCREW IS TIGHT
- ☐ VERIFY THAT FAN SHEAVES ARE ALIGNED AND BELTS ARE PROPERLY TENSIONED
- ☐ VERIFY THAT SCROLL COMPRESSORS ARE ROTATING IN THE CORRECT DIRECTION
- ☐ VERIFY INSTALLATION OF THERMOSTAT/SPACE SENSOR
- ☐ VERIFY THAT CRANKCASE HEATERS HAVE BEEN ENERGIZED FOR AT LEAST 24 HOURS

II. START-UP

ELECTRICAL

SUPPLY VOLTAGE L1-L2 _____ L2-L3 _____ L3-L1 _____

COMPRESSOR AMPS — COMPRESSOR A1 L1 _____ L2 _____ L3 _____
— COMPRESSOR B1 L1 _____ L2 _____ L3 _____
— COMPRESSOR C1 (020, 024 ONLY) L1 _____ L2 _____ L3 _____

SUPPLY FAN AMPS _____

ELECTRIC HEAT AMPS (IF EQUIPPED) 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 (IF EQUIPPED) _____ F

PRESSURES

REFRIGERANT SUCTION CIRCUIT A _____ PSIG
CIRCUIT B _____ PSIG
CIRCUIT C _____ PSIG (020, 024 ONLY)

REFRIGERANT DISCHARGE CIRCUIT A _____ PSIG
CIRCUIT B _____ PSIG
CIRCUIT C _____ PSIG (020, 024 ONLY)

☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS ON PAGE 45.

GENERAL

☐ ECONOMIZER MINIMUM VENT AND CHANGEOVER SETTINGS TO JOB REQUIREMENTS

☐ VERIFY INSTALLATION OF ALL OPTIONS AND ACCESSORIES

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE