50TJ016-030
Single-Package Rooftop Units
50 Hz

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 basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguishers available for all brazing operations.

⚠ WARNING

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

IMPORTANT: Units have high ambient operating limits. If limits are exceeded, the unit 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 and install accessory roof curb or horizontal adapter roof curb in accordance with instructions shipped with the curb or horizontal adapter. Accessory roof curb and horizontal adapter roof curb and information required to field fabricate a roof curb or horizontal adapter roof curb are shown in Fig. 1A, 1B and 2. Install insulation, cant strips, roofing felt, and counter flashing as shown. Ductwork can be secured to roof curb or horizontal adapter roof curb before unit is set in place.

IMPORTANT: The gasketing of the unit to the roof curb or horizontal adapter roof curb is critical for a watertight seal. Install gasket supplied with the roof curb or horizontal adapter roof curb as shown in Fig. 1A, 1B and 2. Improperly applied gasket can result in air leaks and poor unit performance.

Curb or horizontal adapter roof curb should be level. This is necessary to permit unit drain to function properly. Unit leveling tolerance is ± 5 mm per linear m (± $^{1}/_{16}$ in. per linear ft) in any direction. Refer to Accessory Roof Curb or Horizontal Adapter Roof Curb Installation Instructions for additional information as required.

ALTERNATE UNIT SUPPORT — When the curb or horizontal adapter roof curb cannot be used, support unit with sleepers using unit curb or adapter roof curb support area. If sleepers cannot be used, support long sides of unit with a minimum of 3 equally spaced 100 mm x 100 mm (4 in. x 4 in.) pads on each side.

Step 2 — Rig and Place Unit — Inspect unit for transportation damage. File any claim with transportation agency. Keep unit upright, and do not drop. Use bumper boards for 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 ± 5 mm per linear m (± $^{1}/_{16}$ in. per linear ft) in any direction. See Fig. 3 for additional information. Unit rigging weight is shown in Fig. 3. Refer to Tables 1A and 1B for operating weights.

Four lifting holes are provided in ends of unit base rails as shown in Fig. 3-6. Refer to rigging instructions on unit.

POSITIONING — Provide clearance around and above unit for airflow, safety, and service access (Fig. 4-6).

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.

PKG. NO. REF.	CURB HEIGHT	DESCRIPTION
CRRFCURB010A00	1′-2″ (305)	Standard Curb 14″ (356) High
CRRFCURB011A00	2′-0″ (610)	Standard Curb for Units Requiring High Installation
CRRFCURB012A00	2′-0″ (610)	Side Supply and Return Curb for High Installation
CRRFCURB013A00	2′-0″ (610)	Horizontal with High-Static Transition Duct

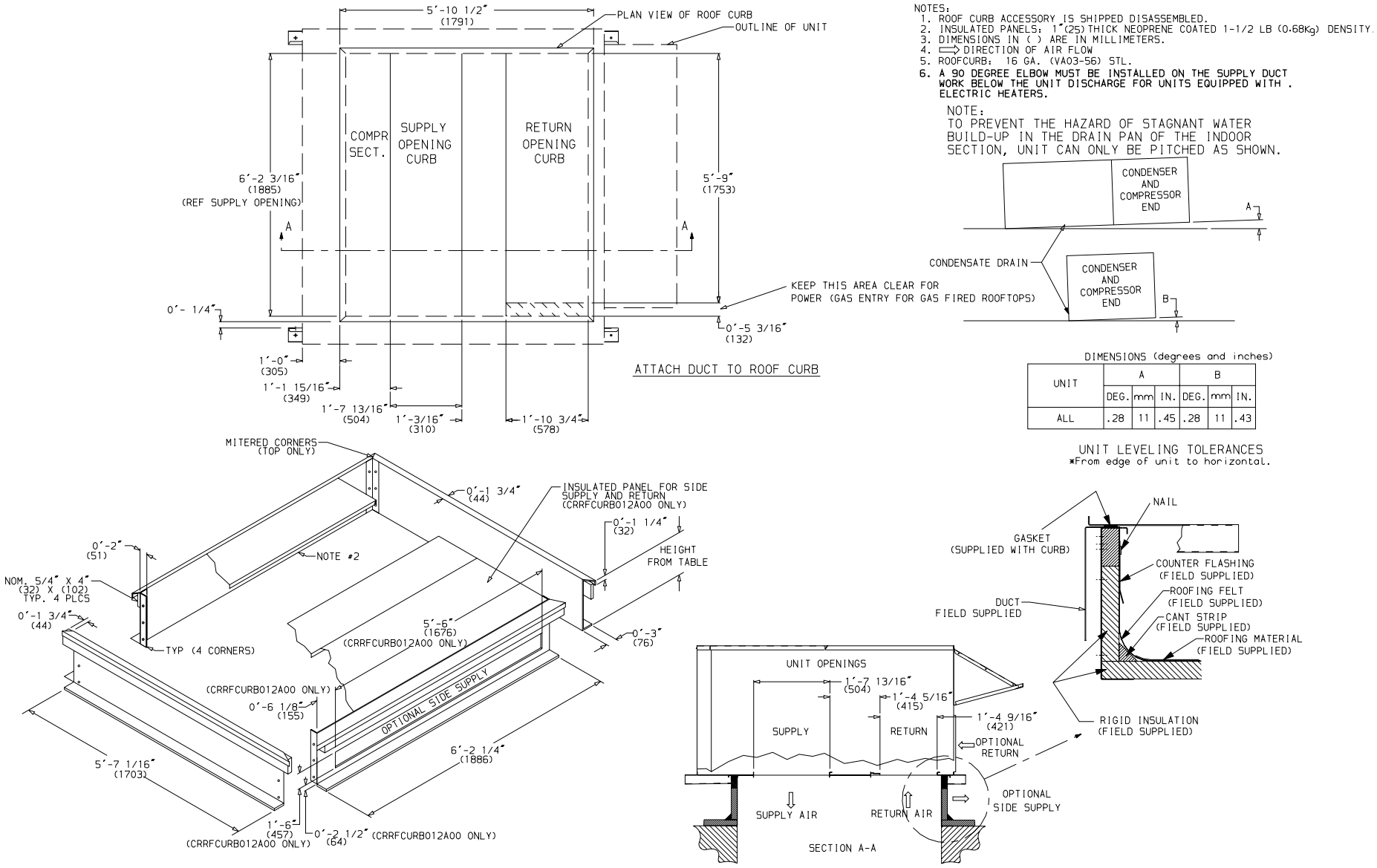
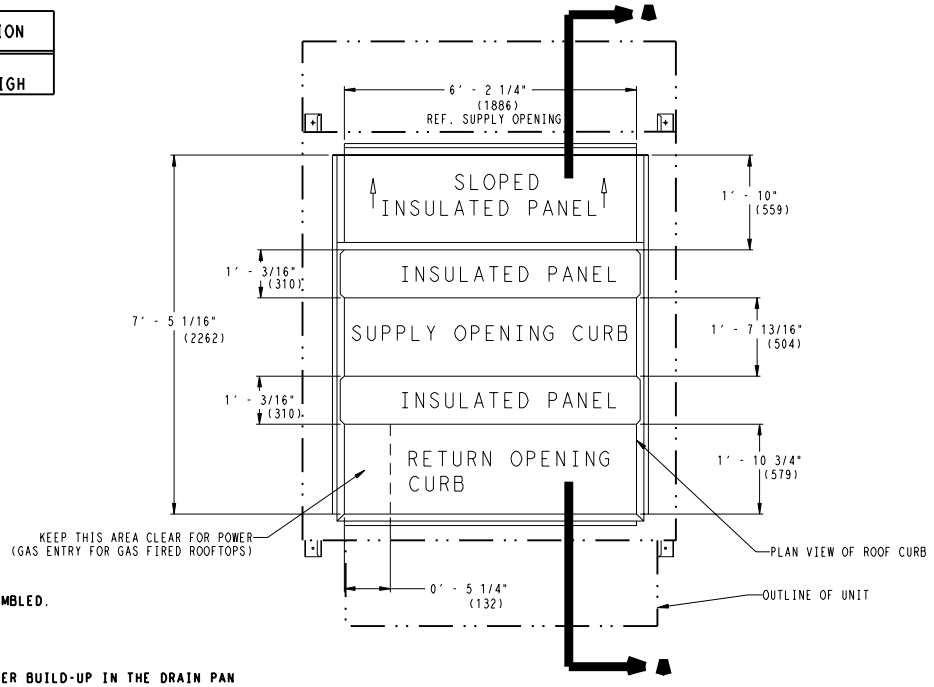


Fig. 1A — Roof Curb Details (50TJ016-028)

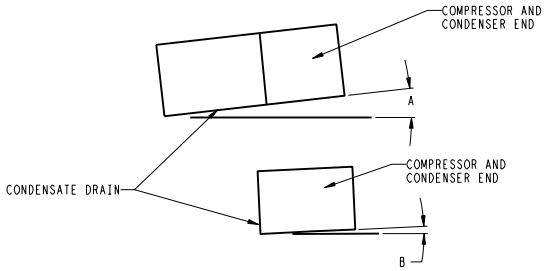
ROOFCURB ACCESSORY	CURB HEIGHT	DESCRIPTION
CRRFCURB025A00	1'-2" [356]	ROOF CURB 14" (356) HIGH



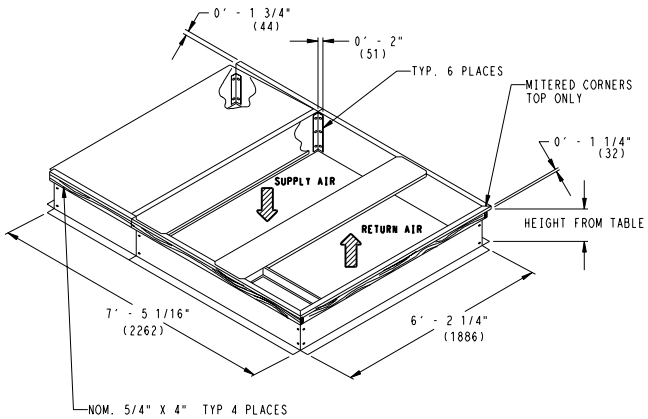
DIMENSIONS (DEGREES AND INCHES)

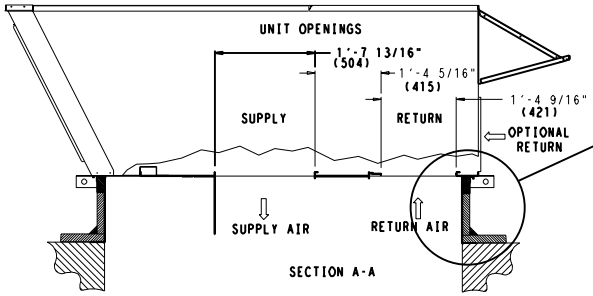
UNIT	A			B		
	DEG.	mm	IN.	DEG.	mm	IN.
ALL	.28	11	.45	.28	11	.43

MAX CURB LEVELING TOLERANCES:
FROM EDGE OF UNIT TO HORIZONTAL



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 DRAIN PAN OF THE INDOOR SECTION, UNIT CAN ONLY BE PITCHED AS SHOWN.
6. INSULATED PANELS: 1" (25) THICK NEOPRENE COATED 1-1/2 LB (0.68Kg) DENSITY.
7. A 90° ELBOW MUST BE INSTALLED ON THE SUPPLY DUCT WORK BELOW THE UNIT DISCHARGE FOR UNITS EQUIPPED WITH ELECTRIC HEATERS.





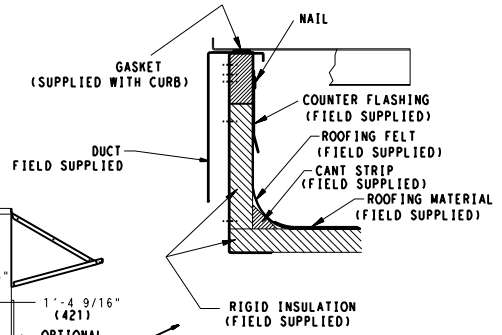
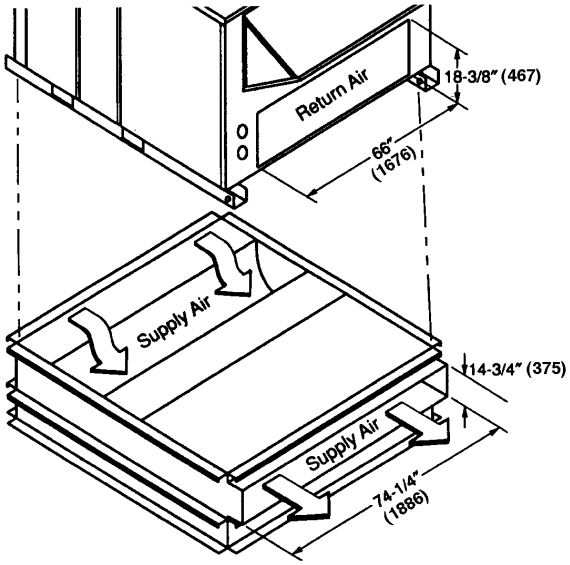
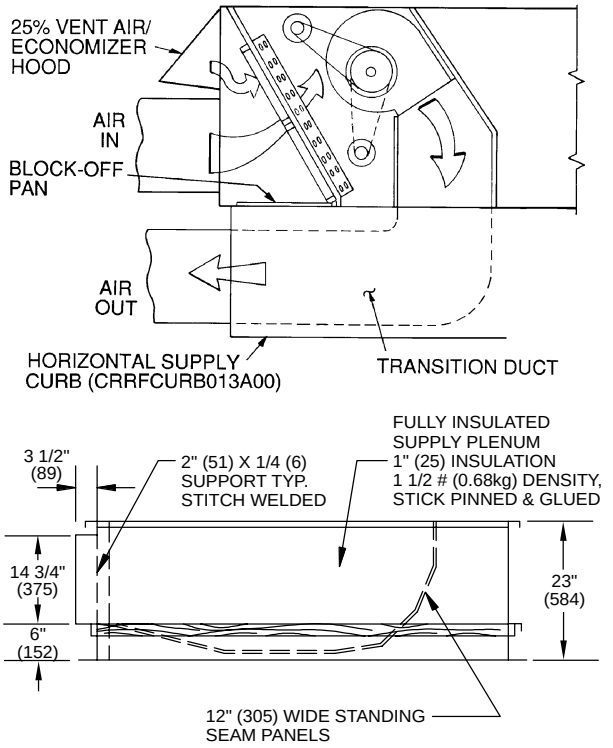


Fig. 1B — Roof Curb Details (50TJ030)



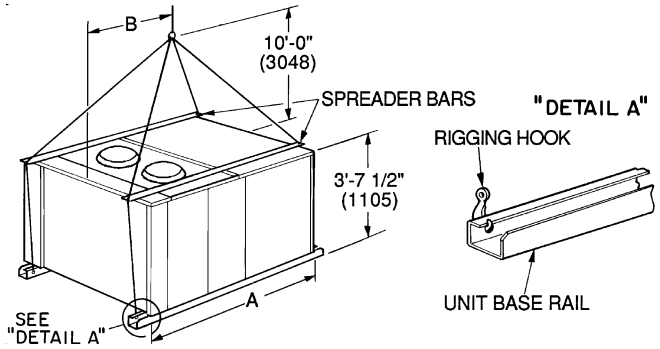
NOTE: CRRFCURB013A00 is a fully factory preassembled horizontal adapter and includes an insulated transition duct. The pressure drop through the adapter curb is negligible. Power exhaust and barometric relief accessory are not available with horizontal adapter.

For horizontal return applications: The power exhaust and barometric relief dampers must be installed in the return air duct.



ACCESSORY PACKAGE NO.	CURB HEIGHT	DESCRIPTION
CRRFCURB013A00	1′-11″ (584)	Pre-Assembled Horizontal Adapter Roof Curb

Fig. 2 — Horizontal Adapter Installation



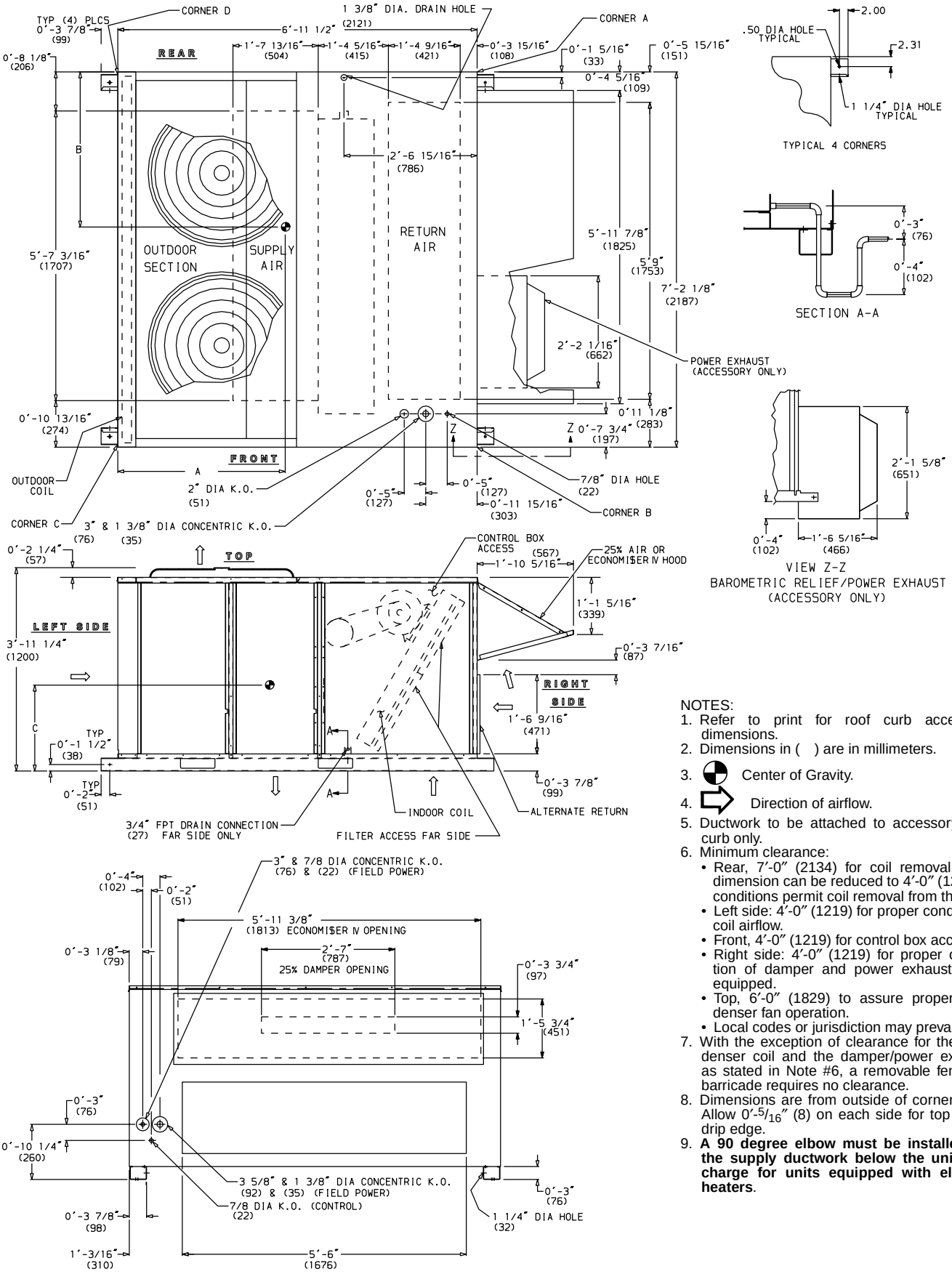
UNIT 50TJ	MAXIMUM SHIPPING WEIGHT		DIMENSIONS			
			A		B	
	lb	kg	ft-in.	mm	ft-in.	mm
016	2170	984	6-11 1/2	2121	4-0	1219
024	2350	1066	6-11 1/2	2121	3-7	1092
028	2500	1134	6-11 1/2	2121	3-5	1041
030	2500	1134	6-11 1/2	2121	3-5	1041

NOTES:
1. Dimensions in ( ) are in millimeters.
2. Refer to Fig. 4-6 for unit operating weights.
3. Remove boards at ends of unit and runners prior to rigging.
4. Rig by inserting hooks into unit base rails as shown. Use corner post from packaging to protect coil from damage. Use bumper boards for spreader bars.
5. Weights do not include optional EconoMi$erIV. See Fig. 4-6 for EconoMi$erIV weight. See Tables 1A and 1B for MoistureMiser weight.
6. Weights given are for aluminum evaporator and condenser coil plate fins.

⚠ CAUTION

All panels must be in place when rigging.

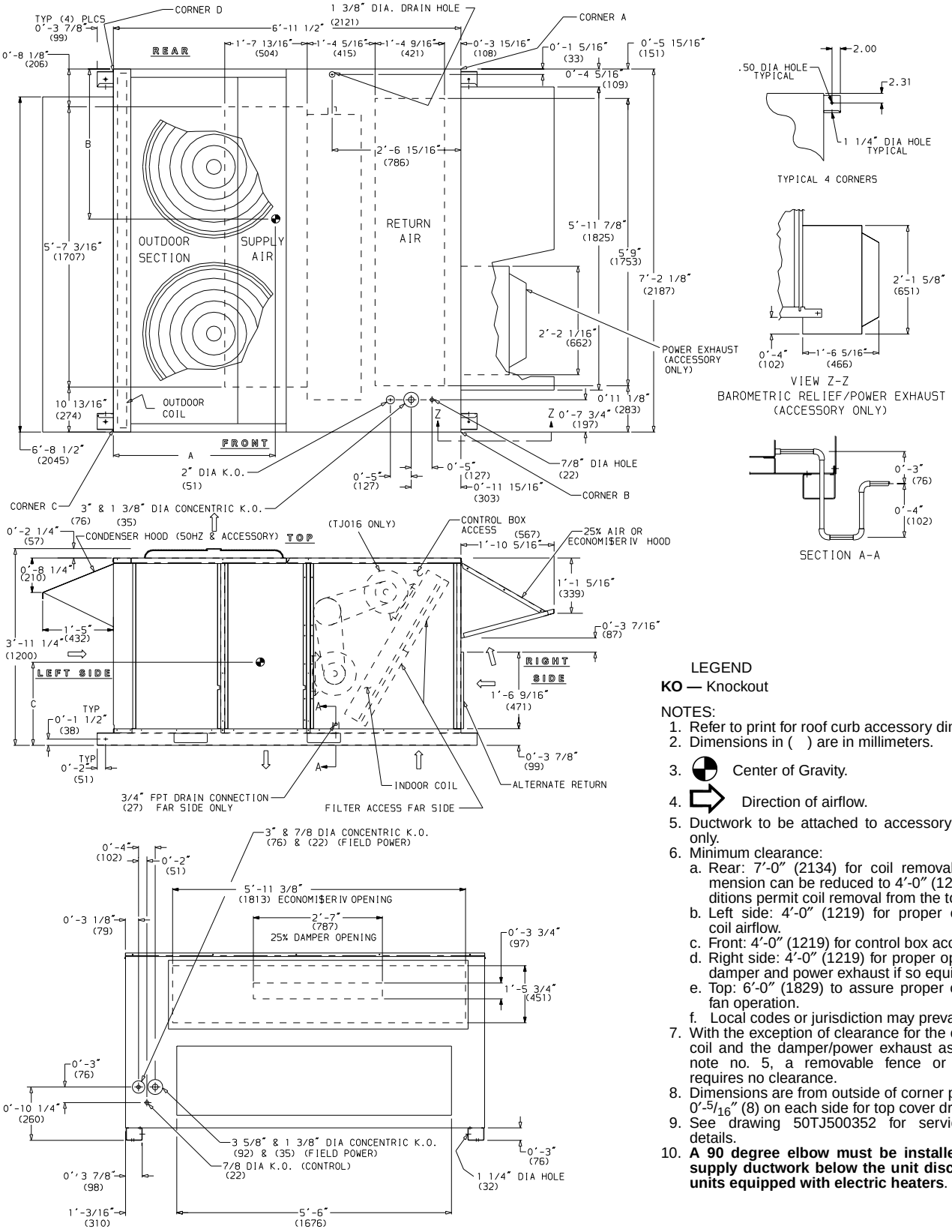
Fig. 3 — Rigging Details



NOTES:
1. Refer to print for roof curb accessory dimensions.
2. Dimensions in ( ) are in millimeters.
3. Center of Gravity.
4. Direction of airflow.
5. Ductwork to be attached to accessory roof curb only.
6. Minimum clearance:
   - Rear, 7′-0″ (2134) for coil removal. This dimension can be reduced to 4′-0″ (1219) if conditions permit coil removal from the top.
   - Left side: 4′-0″ (1219) for proper condenser coil airflow.
   - Front, 4′-0″ (1219) for control box access.
   - Right side: 4′-0″ (1219) for proper operation of damper and power exhaust if so equipped.
   - Top, 6′-0″ (1829) to assure proper condenser fan operation.
   - Local codes or jurisdiction may prevail.
7. With the exception of clearance for the condenser coil and the damper/power exhaust as stated in Note #6, a removable fence or barricade requires no clearance.
8. Dimensions are from outside of corner post. Allow $0'\text{-}5/16''$ (8) on each side for top cover drip edge.
9. **A 90 degree elbow must be installed on the supply ductwork below the unit discharge for units equipped with electric heaters**.

UNIT	STD. UNIT WEIGHT	ECONOMI$ERIV WEIGHT	CORNER A	CORNER B	CORNER C	CORNER D	DIM A	DIM B	DIM C
							ft-in. (mm)		
50TJ016	1560 lb 708 kg	90 lb 41 kg	392 lb 178 kg	366 lb 166 kg	387 lb 176 kg	416 lb 188 kg	3-5 (1041)	3-6 (1067)	1-8 (508)

Fig. 4 — Base Unit Dimensions; 50TJ016



LEGEND

KO — Knockout

NOTES:

1. Refer to print for roof curb accessory dimensions.
2. Dimensions in ( ) are in millimeters.
3. Center of Gravity.
4. Direction of airflow.
5. Ductwork to be attached to accessory roof curb only.
6. Minimum clearance:
   a. Rear: 7′-0″ (2134) for coil removal. This dimension can be reduced to 4′-0″ (1219) if conditions permit coil removal from the top.
   b. Left side: 4′-0″ (1219) for proper condenser coil airflow.
   c. Front: 4′-0″ (1219) for control box access.
   d. Right side: 4′-0″ (1219) for proper operation of damper and power exhaust if so equipped.
   e. Top: 6′-0″ (1829) to assure proper condenser fan operation.
   f. Local codes or jurisdiction may prevail.
7. With the exception of clearance for the condenser coil and the damper/power exhaust as stated in note no. 5, a removable fence or barricade requires no clearance.
8. Dimensions are from outside of corner post. Allow $0'\text{-}5/16''$ (8) on each side for top cover drip edge.
9. See drawing 50TJ500352 for service option details.
10. **A 90 degree elbow must be installed on the supply ductwork below the unit discharge for units equipped with electric heaters**.

UNIT 50TJ	ECONOMI$ERIV WEIGHT		CORNER WEIGHT*								DIMENSIONS			
			A		B		C		D		A		B	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	ft-in.	mm	ft-in.	mm
024	90	41	423	190	412	185	490	220	475	213	3-3	991	3-7	1092
028	90	41	441	200	416	189	533	242	560	254	3-1	940	3-6	1067

*Weights are for unit only (aluminum plate fins) and do not include options or crating.

Fig. 5 — Base Unit Dimensions, 50TJ024,028

UNIT	STD. UNIT WEIGHT	ECONOMI$ER IV WEIGHT	CORNER A	CORNER B	CORNER C	CORNER D	DIM A	DIM B	DIM C
50TJ030	2220 lb 1007 Kg	90 lb 41 Kg	546 lb 248 kg	537 lb 244 kg	583 lb 264 kg	606 lb 275 kg	4′-6″ (1372)	3′-7 1/4″ (1099)	2′-1 1/4″ (641)

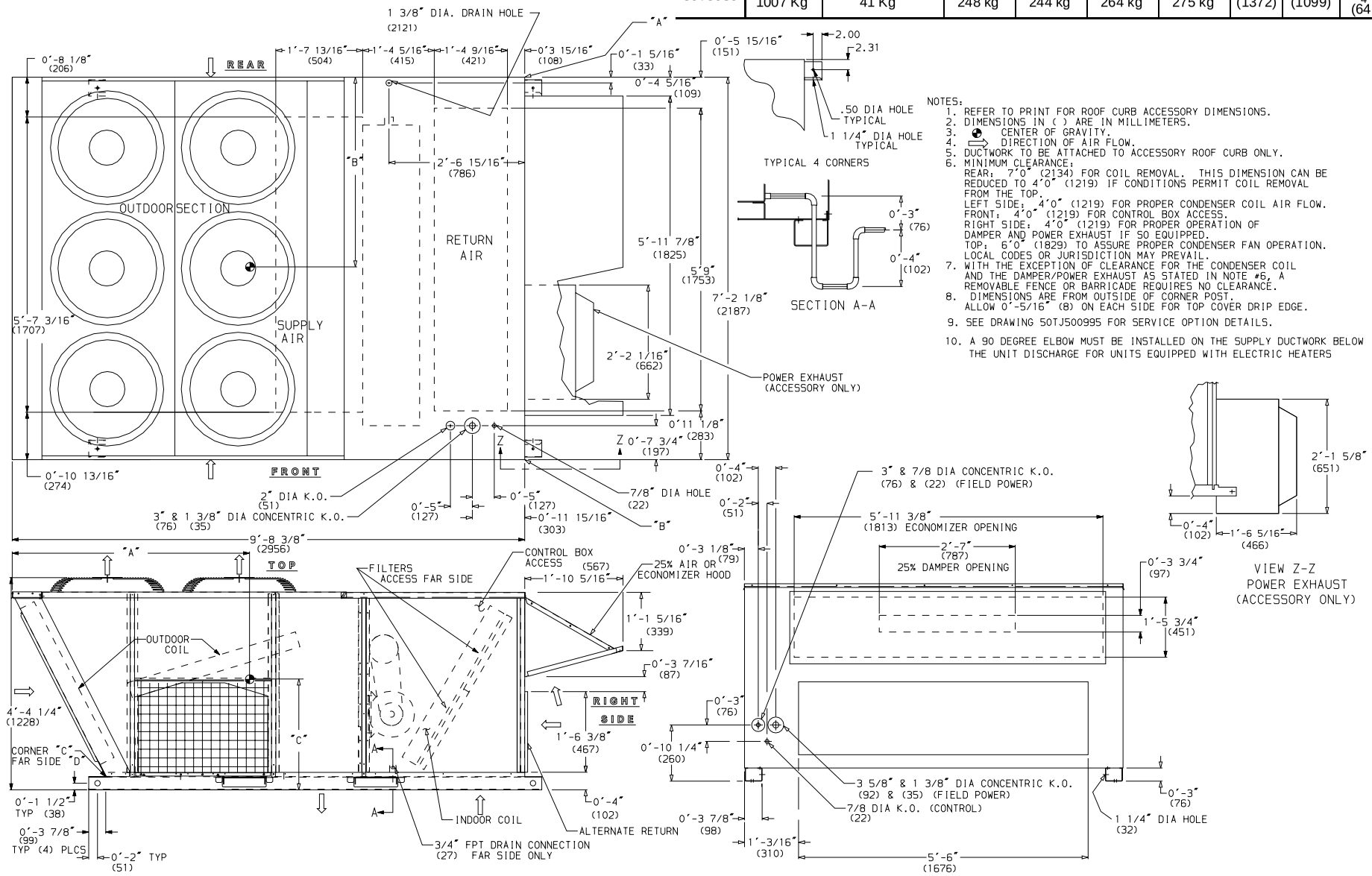


Fig. 6 — Base Unit Dimensions, 50TJ030

Table 1A — Physical Data, 50TJ016-030 (SI)

UNIT SIZE		016	024	028	030
NOMINAL CAPACITY (kW)		52.8	70.3	87.9	87.9
OPERATING WEIGHT (kg)		708	816	885	1005
EconoMi$erIV		41	41	41	41
MoistureMiser Dehumidification Package		18.1	18.1	18.1	18.1
COMPRESSOR				Scroll	
Quantity...Model (Ckt 1, Ckt 2)		2...ZR108KC	1...ZR16M3, 1...ZR125KC	1...ZR19M3, 1...ZR16M3	1...ZRT162KC 1...ZR16M3
Capacity Stages (%)		50/50	55/45	60/40	50/50
Number of Refrigerant Circuits		2	2	2	2
Oil (ml) (Ckt 1, Ckt 2)		3135	4022, 3135	4022, 4022	4022, 3135
REFRIGERANT TYPE				R-22	
Expansion Device				TXV	
Operating Charge (kg)					
Circuit 1*		4.81	6.76	9.07	10.66
Circuit 2		4.81	5.72	6.03	13.15
CONDENSER COIL				Cross-Hatched 3/8-in. Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins	
Rows...Fins/m		2...669	3...590	4...590	3...590 (2)
Total Face Area (sq m)		2.02	2.02	2.02	4.03
CONDENSER FAN				Propeller Type	Propeller Type
Nominal L/s				6700	9911
Quantity...Diameter (mm)				2...762	6...559
Motor BkW...r/s				0.75...17.9	0.37..17.5
Watts Input (Total)				3400	2200
EVAPORATOR COIL				Cross-Hatched 3/8-in. Copper Tubes, Aluminum Lanced or Copper Plate Fins, Face Split	
Rows...Fins/m		2...669	3...590	4...590	4...590
Total Face Area (sq m)		1.63	1.63	1.63	1.63
EVAPORATOR FAN				Centrifugal Type	
Quantity...Size (mm)		2...254 x 254	2...305 x 305	2...305 x 305	2...305 x 305
Type Drive		Belt	Belt	Belt	Belt
Nominal L/s		2832	3776	4720	4720
Motor kW		2.76	5.59	7.46	7.46
Motor Nominal r/s		28.8	29.1	29.0	29.0
Maximum Continuous BkW		3.17 (400 v), 2.57 (220 v)	7.68	9.92 (400 v), 8.60 (220 v)	9.92
Motor Frame Size		56H	213T	215T	215T
Fan r/s Range	**Low-Medium Static**	12.38-16.38	12.8-15.2	14.8-17.8	14.8-17.8
	High Static	17.05-21.67	16.6-20.3	18.6-22.4	18.6-22.4
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable r/s		25.8	25.8	25.8	25.8
Motor Pulley Pitch Diameter (mm)	**Low-Medium Static**	79/104	140/165	125/150	125/150
	High Static	94/119	137/168	125/150	125/150
Nominal Motor Shaft Diameter (mm)		22	35	35	35
Fan Pulley Pitch Diameter (mm)	**Low-Medium Static**	152	239	203	203
	High Static	132	201	163.0	163.0
Nominal Fan Shaft Diameter (mm)		30	36.5	36.5	36.5
Belt, Quantity...Type...Length (mm)	**Low-Medium Static**	1...BX...1067	1...BX...1372	2...BX...1270	2...BX...1270
	High Static	1...BX...1067	1...BX...1270	2...BX...1194	2...BX...1194
Pulley Center Line Distance (mm)		343-394	371-391	371-391	371-391
Speed Change per Full Turn of Movable Pulley Flange (r/s)	**Low-Medium Static**	.80	.47	.60	.60
	High Static	.92	.62	.75	.75
Movable Pulley Maximum Full Turns From Closed Position	**Low-Medium Static**	5	5	5	5
	High Static	5	6	5	5
Factory Setting		3.5	3	3	3
Factory Speed Setting (r/s)	**Low-Medium Static**	13.58	13.75	16.01	16.01
	High Static	18.43	18.42	20.08	20.08
HIGH-PRESSURE SWITCH (kPa)					
Cutout				2951	
Reset (Auto.)				2206	
LOW-PRESSURE SWITCH (kPa)					
Cutout				186	
Reset (Auto.)				303	
FREEZE PROTECTION THERMOSTAT (C)					
Opens				–1 ± 2	
Closes				7 ± 2	
ELECTRONIC PROTECTION MODULE					
Cutout (ohms)		4500 ± 900	4500 ± 900	4500 ± 900	4500 ± 900
Reset (ohms)		2750 ± 450	2750 ± 450	2750 ± 450	2750 ± 450
OUTDOOR-AIR INLET SCREENS				Cleanable	
Quantity...Size (mm)				2...508 x 635 x 25 1...508 x 508 x 25	
RETURN-AIR FILTERS				Throwaway†	
Quantity...Size (mm)				4...508 x 508 x 50 4...406 x 508 x 50	

LEGEND

Bhp — Brake Horsepower
TXV — Thermostatic Expansion Valve

*Circuit 1 uses the lower portion of condenser coil and lower portion of evaporator coils, and Circuit 2 uses the upper portion of both coils.
†The 50TJ028 units requires 50-mm industrial-grade filters capable of handling face velocities of up to 3.2 m/s (such as American Air Filter no. 5700 or equivalent).

Table 1B — Physical Data, 50TJ016-030 (English)

UNIT SIZE		016	024	028	030
NOMINAL CAPACITY (tons)		15	20	25	25
OPERATING WEIGHT (lb)		1560	1800	1950	2200
EconoMi$erIV		90	90	90	90
MoistureMiser Dehumidification Package		40	40	40	40
COMPRESSOR				Scroll	
Quantity...Model (Ckt 1, Ckt 2)		2...ZR108KC	1...ZR16M3, 1...ZR125KC	1...ZR19M3, 1...ZR16M3	1...ZRT162KC, 1...ZR16M3
Capacity Stages (%)		50/50	55/45	60/40	50/50
Number of Refrigerant Circuits		2	2	2	2
Oil (oz) (Ckt 1, Ckt 2)		106	136, 106	136, 136	136, 106
REFRIGERANT TYPE				R-22	
Expansion Device				TXV	
Operating Charge (lb-oz)					
Circuit 1*		10-10	14-14	20-0	23-8
Circuit 2		10-10	12-10	13-5	29-0
CONDENSER COIL				Cross-Hatched 3/8-in. Copper Tubes, Aluminum Lanced, Aluminum Pre-Coated, or Copper Plate Fins	
Rows...Fins/in.		2...17	3...15	4...15	3...15 (2)
Total Face Area (sq ft)		21.7	21.7	21.7	43.4
CONDENSER FAN				Propeller Type	Propeller Type
Nominal Cfm				14,200	21,000
Quantity...Diameter (in.)				2...30	6...22
Motor Hp...Rpm				1...1075	1/2...1050
Watts Input (Total)				3400	2200
EVAPORATOR COIL				Cross-Hatched 3/8-in. Copper Tubes, Aluminum Lanced or Copper Plate Fins, Face Split	
Rows...Fins/in.		2...17	3...15	4...15	4...15
Total Face Area (sq ft)		17.5	17.5	17.5	17.5
EVAPORATOR FAN				Centrifugal Type	
Quantity...Size (in.)		2...10 x 10	2...12 x 12	2...12 x 12	2...12 x 12
Type Drive		Belt	Belt	Belt	Belt
Nominal Cfm		6000	8000	10,000	10,000
Motor Hp		3.7	7.5	10	10
Motor Nominal Rpm		1438	1455	1450	1450
Maximum Continuous Bhp		4.25 (400 v), 3.45 (220 v)	10.3	13.3 (400 v), 11.5 (220 v)	13.3
Motor Frame Size		56H	213T	215T	215T
Fan Rpm Range	**Low-Medium Static**	743- 983	769- 909	888-1069	888-1069
	High Static	1023-1300	994-1216	1114-1341	1114-1341
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		1550	1550	1550	1550
Motor Pulley Pitch Diameter (in.)	**Low-Medium Static**	3.1/4.1	5.5/6.5	4.9/5.9	4.9/5.9
	High Static	3.7/4.7	5.4/6.6	4.9/5.9	4.9/5.9
Nominal Motor Shaft Diameter (in.)		7/8	1 3/8	1 3/8	1 3/8
Fan Pulley Pitch Diameter (in.)	**Low-Medium Static**	6.0	10.4	8.0	8.0
	High Static	5.2	7.9	6.4	6.4
Nominal Fan Shaft Diameter (in.)		13/16	17/16	17/16	17/16
Belt, Quantity...Type...Length (in.)	**Low-Medium Static**	1...BX...42	1...BX...54	2...BX...50	2...BX...50
	High Static	1...BX...42	1...BX...50	2...BX...47	2...BX...47
Pulley Center Line Distance (in.)		13.5-15.5	14.6-15.4	14.6-15.4	14.6-15.4
Speed Change per Full Turn of Movable Pulley Flange (Rpm)	**Low-Medium Static**	48	28	36	36
	High Static	55	37	45	45
Movable Pulley Maximum Full Turns From Closed Position	**Low-Medium Static**	5	5	5	5
	High Static	5	6	5	5
Factory Setting		3.5	3	3	3
Factory Speed Setting (Rpm)	**Low-Medium Static**	815	825	960	960
	High Static	1106	1105	1205	1205
HIGH-PRESSURE SWITCH (psig)					
Cutout				426	
Reset (Auto.)				320	
LOW-PRESSURE SWITCH (psig)					
Cutout				27	
Reset (Auto.)				44	
FREEZE PROTECTION THERMOSTAT (F)					
Opens				30 ± 5	
Closes				45 ± 5	
ELECTRONIC PROTECTION MODULE					
Cutout (ohms)		4500 ± 900	4500 ± 900	4500 ± 900	4500 ± 900
Reset (ohms)		2750 ± 450	2750 ± 450	2750 ± 450	2750 ± 450
OUTDOOR-AIR INLET SCREENS				Cleanable	
Quantity...Size (in.)				2...20 x 25 x 1 1...20 x 20 x 1	
RETURN-AIR FILTERS				Throwaway†	
Quantity...Size (in.)				4...20 x 20 x 2 4...16 x 20 x 2	

LEGEND

Bhp — Brake Horsepower
TXV — Thermostatic Expansion Valve

*Circuit 1 uses the lower portion of condenser coil and lower portion of evaporator coils, and Circuit 2 uses the upper portion of both coils.
†The 50TJ028 units requires 2-in. industrial-grade filters capable of handling face velocities of up to 625 ft/min (such as American Air Filter no. 5700 or equivalent).

Step 3 — Field Fabricate Ductwork — Secure all ducts to building structure. Use flexible duct connectors between unit and ducts as required. Insulate and weatherproof all external ductwork, joints, and roof openings with counter flashing and mastic in accordance with applicable codes.

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

The 50TJ units with electric heat require a 25 mm (1-in.) clearance for the first 610 mm (24 in.) of ductwork.

Outlet grilles must not lie directly below unit discharge.

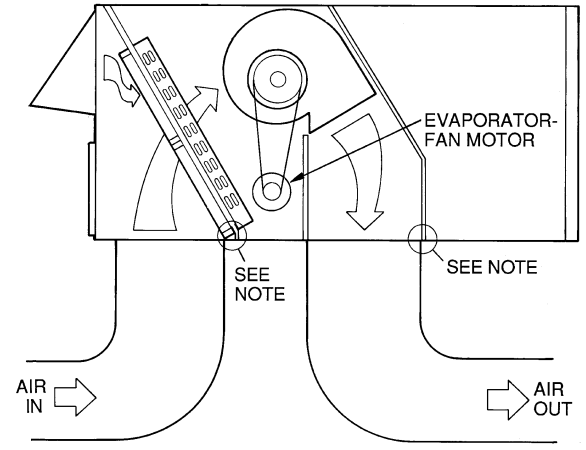
NOTE: A 90-degree elbow **must** be provided in the ductwork to comply with UL (Underwriters Laboratories) codes (U.S.A. Standards) for use with electric heat.

⚠ WARNING

For vertical supply and return units, tools or part 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. Due to electric heater, supply duct will require 90-degree elbow.

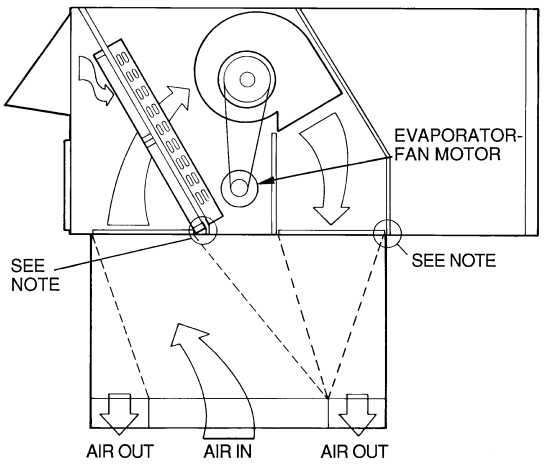
Step 4 — Make Unit Duct Connections — Unit is shipped for through-the-bottom duct connections. Ductwork openings are shown in Fig. 7. Field-fabricated concentric ductwork may be connected as shown in Fig. 8 and 9. See Fig. 2 for horizontal adapter supply/return connections. Attach all ductwork to roof curb and roof curb basepans. Refer to installation instructions shipped with accessory roof curb for more information.

Step 5 — Trap Condensate Drain — See Fig. 4-6 and 10 for drain location. Plug is provided in drain hole and must be removed when unit is operating. One $^3/_4$-in. FPT is provided inside unit evaporator section for condensate drain connection. A 216-mm x 19-mm ($8^1/_2$-in. x $^3/_4$-in.) diameter nipple and a 51-mm x 19-mm (2-in. x $^3/_4$-in.) diameter pipe nipple are coupled to a standard 19-mm ($^3/_4$-in.) diameter elbow to provide a straight path down through holes in unit base rails (see Fig. 11). A trap at least 100 mm (4 in.) deep must be used. If only one drain connection is trapped, other connection must be plugged.



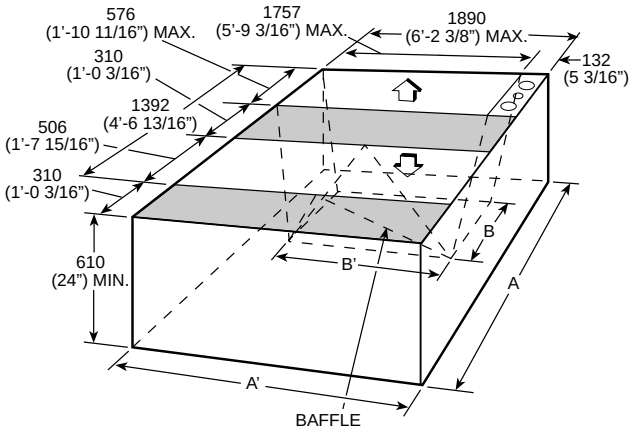
NOTE: Do not drill in this area, as damage to basepan may result in water leak.

Fig. 7 — Air Distribution — Through-the-Bottom (50TJ024,028 Shown)



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

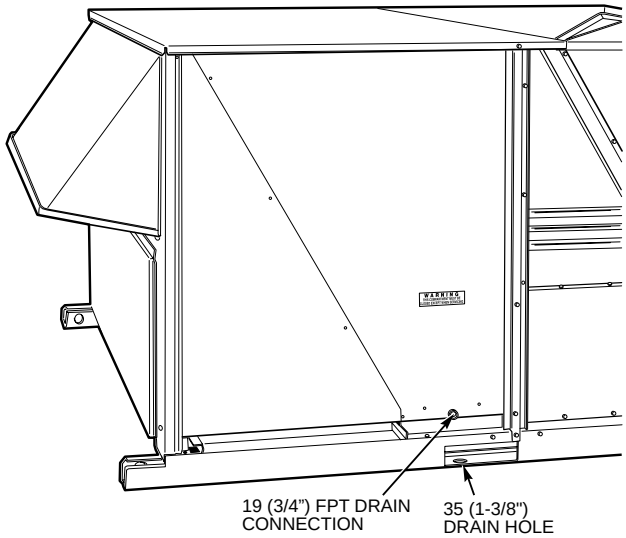
Fig. 8 — Concentric Duct Air Distribution (50TJ024,028 Shown)



Shaded area indicates block-off panels.

NOTES:
1. Dimension A, A′ and B, B′ are obtained from field-supplied ceiling diffuser.
2. Dimensions are in millimeters.

Fig. 9 — Concentric Duct Details



NOTE: Dimensions are in millimeters.

Fig. 10 — Condensate Drain Details

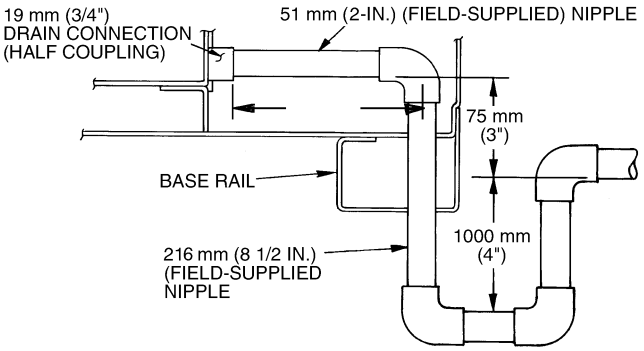


Fig. 11 — Condensate Drain Piping Details

Step 6 — Make Electrical Connections

FIELD POWER SUPPLY — Unit is factory wired for voltage shown on nameplate. Units are provided with terminal block.

When installing units, provide a disconnect of adequate size per local ordinances and codes (see Table 2).

All field wiring must comply with local requirements.

Route power lines through control box end panel or unit basepan (Fig. 4-6) to terminal connections as shown on unit wiring diagram and Fig. 12.

Operating voltage to compressor must be within voltage range indicated on unit nameplate. Voltages between phases must be balanced within 2% and the current must be balanced within 10%.

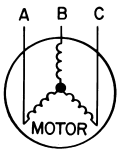
⚠ WARNING

The correct power phasing is critical in the operation of the scroll compressors. An incorrect phasing will cause the compressor to rotate in the wrong direction. This may lead to premature compressor failure.

Use the following formula to determine the percent voltage imbalance.

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

Example: Supply voltage is 400-3-50.



AB = 393 v
BC = 403 v
AC = 396 v

$$\text{Average Voltage} = \frac{393 + 403 + 396}{3}$$

$$= \frac{1192}{3}$$

$$= 397$$

Determine maximum deviation from average voltage:

(AB) 397 – 393 = 4 v
(BC) 403 – 397 = 6 v
(AC) 397 – 396 = 1 v

Maximum deviation is 6 v.

Determine percentage of voltage imbalance:

$$\% \text{ Voltage Imbalance} = 100 \times \frac{6}{397}$$

$$= 1.5\%$$

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

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

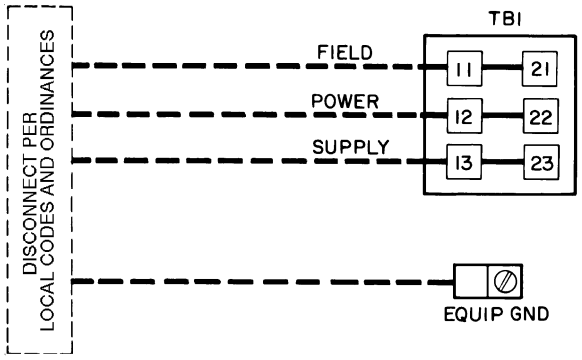
Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components.

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

Route thermostat cable or equivalent single leads of 1.0 mm^2 (no. 18 AWG [American Wire Gage, U.S.A.]) colored wire from subbase terminals through conduit in unit to low-voltage connections as shown on unit label wiring diagram and in Fig. 13.

NOTE: For wire runs up to 15 m (50 ft), use 1.0 mm^2 (no. 18 AWG) insulated wire (35 C minimum). For 15 to 23 m (50 to 75 ft), use 1.5 mm^2 (no. 16 AWG) insulated wire (35 C minimum). For over 23 m (75 ft), use 2.5 mm^2 (no. 14 AWG) insulated wire (35 C minimum). All wire larger than 1.0 mm^2 (no. 18 AWG) cannot be directly connected to the thermostat and will require a junction box and splice at the thermostat. See Table 3 for American/European wire conversions.

Set heat anticipator settings as indicated in Table 4. Settings may be changed slightly to provide a greater degree of comfort for a particular installation.



LEGEND

AWG — American Wire Gage
EQUIP — Equipment
GND — Ground
TB — Terminal Block

NOTE: The maximum wire size for TB1 is 70 mm^2 (2/0 AWG).

Fig. 12 — Field Power Wiring Connections

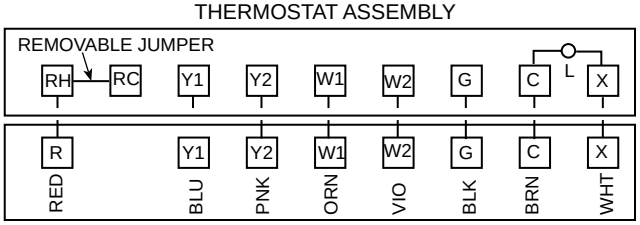


Fig. 13 — Field Control Thermostat Wiring

Table 2 — Electrical Data, 50TJ016-030

UNIT 50TJ	NOMINAL VOLTAGE	VOLTAGE RANGE		COMPRESSOR						OFM			IFM		POWER EXHAUST		ELECTRIC HEAT*		POWER SUPPLY	
				No. 1		No. 1A		No. 2												
		Min	Max	RLA	LRA	RLA	LRA	RLA	LRA	Qty	Hp	FLA (ea)	Hp	FLA	FLA	LRA	kW	FLA	MCA	MOCP†
016	220	198	242	30.1	196	—	—	30.1	196	2	1.0	6.3	3.0	9.8	— 4.7	— 10.5	— —	— —	90 95	110 110
	400	360	440	15.5	111	—	—	15.5	111	2	1.0	3.4	3.0	4.8	— 4.7	— 10.5	— —	— —	47 51	60 60
															4.7	10.5	22.5 22.5	32.5 32.5	47 53	60 60
															— 4.7	— 10.5	38.2 38.2	55.1 55.1	75 81	80 90
															— 4.7	— 10.5	55.4** 55.4**	80.0 80.0	86 92	100 100
024	220	198	242	38.5	293	—	—	37.7	220	2	1.0	6.3	7.5	23.5	— 4.7	— 10.5	— —	— —	121 126	150 150
	400	360	440	21.8	167	—	—	17.2	118	2	1.0	3.4	7.5	12.1	— 4.7	— 10.5	— —	— —	63 68	80 80
															— 4.7	— 10.5	22.5 22.5	32.5 32.5	63 68	80 80
															4.7	10.5	38.2 38.2	55.1 55.1	84 90	90 90
															— 4.7	— 10.5	55.4** 55.4**	80.0 80.0	95 101	100 110
028	220	198	242	45.4	345	—	—	38.5	293	2	1.0	6.3	10.0	32.0	— 4.7	— 10.5	— —	— —	139 144	175 175
	400	360	440	23.7	198	—	—	21.8	167	2	1.0	3.4	10.0	14.0	— 4.7	— 10.5	— —	— —	72 77	90 100
															— 4.7	— 10.5	22.5 22.5	32.5 32.5	72 77	90 100
															— 4.7	— 10.5	38.2 38.2	55.1 55.1	86 92	90 100
															— 4.7	— 10.5	55.4** 55.4**	80.0 80.0	98 103	110 110
030	400	360	440	12.0	101	12.0	101	25	167	6	0.5	0.85	10.0	14.0	— 4.7	— 10.5	— —	— —	74 79	90 100
															— 4.7	— 10.5	22.5 22.5	32.5 32.5	74 79	90 100
															— 4.7	— 10.5	38.2 38.2	55.1 55.1	74 79	90 100
															— 4.7	— 10.5	55.4** 55.4**	80.0 80.0	74 79	110 110

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, U.S.A.
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

*Heater capacity (kW) is based on heater voltage of 400 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.
†Fuse or HACR circuit breaker.
**Heaters are field installed only.

NOTES:
1. In compliance with NEC requirements (U.S.A. Standard) for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker.
2. MCA calculation for units with electric heaters over 50 kW = (1.25 x IFM amps) + (1.00 x heater FLA).

Table 3 — American/European Wire Conversions

AMERICAN		EUROPEAN
Industry Standard Size	American Conversion Size (mm^2)	Industry Standard Size (mm^2)
18 AWG	0.82	1.0
16 AWG	1.30	1.5
14 AWG	2.08	2.5
12 AWG	3.30	4.0
10 AWG	5.25	6.0
8 AWG	6.36	10.0
6 AWG	13.29	16.0
4 AWG	21.14	25.0
3 AWG	26.65	—
2 AWG	33.61	35.0
1 AWG	42.39	50.0
1/0 AWG	53.49	—
2/0 AWG	67.42	70.0
3/0 AWG	85.00	95.0
4/0 AWG	107.19	120.0
250 kcmil	126.64	150.0
300 kcmil	151.97	—
350 kcmil	177.90	185.0
400 kcmil	202.63	240.0
500 kcmil	253.29	300.0
600 kcmil	303.95	—

LEGEND

AWG — American Wire Gage, U.S.A. Standard
kcmil — Thousand Circular Mils

Table 4 — Heat Anticipator Settings

50TJ UNIT	HEATER RATED VOLTAGE	kW	STAGE 1	STAGE 2
All	400-3-50	22.5 38.2 55.4	.40 .40 .66	.40 .66 .66

OPTIONAL INTEGRAL NON-FUSED DISCONNECT — On units with the optional non-fused disconnect, incoming power will be wired into the disconnect switch. Refer to Fig. 14 for wiring for 100 and 200 amp disconnect switches. Units with an MOCP under 100 will use the 100 amp disconnect switch. Units with an MOCP over 100 will use the 200 amp disconnect switch. Refer to the applicable disconnect wiring diagram.

To prevent breakage during shipping, the disconnect handle and shaft are shipped and packaged inside the unit control box. Install the disconnect handle before unit operation. To install the handle and shaft, perform the following procedure:

1. Open the control box door and remove the handle and shaft from shipping location.
2. Loosen the Allen bolt located on the disconnect switch. The bolt is located on the square hole and is used to hold the shaft in place. The shaft cannot be inserted until the Allen bolt is moved.
3. Insert the disconnect shaft into the square hole on the disconnect switch. The end of the shaft is specially cut and the shaft can only be inserted in the correct orientation.
4. Tighten the Allen bolt to lock the shaft into position.
5. Close the control box door.
6. Attach the handle to the external access door with the two screws provided. When the handle is in the ON position, the handle will be vertical. When the handle is in the OFF position, the handle will be horizontal.
7. Turn the handle to the OFF position and close the door. The handle should fit over the end of the shaft when the door is closed.
8. The handle must be in the OFF position to open the control box door.

OPTIONAL CONVENIENCE OUTLET — On units with optional convenience outlet, a 115-v GFI (ground fault interrupt) convenience outlet receptacle is provided for field wiring. Field wiring should be run through the $^{7}/_{8}$-in. knockout provided in the basepan near the return air opening.

Step 7 — Make Outdoor-Air Inlet Adjustments

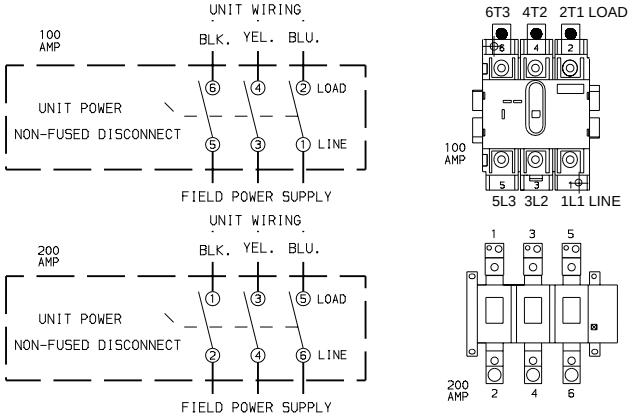
MANUAL OUTDOOR-AIR DAMPER — All units (except those equipped with a factory-installed economizer) have a manual outdoor-air damper to provide ventilation air. Damper can be preset to admit up to 25% outdoor air into return-air compartment. To adjust, loosen securing screws and move damper to desired setting. Then retighten screws to secure damper (Fig. 15).

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

> IMPORTANT: If the unit is equipped with an optional EconoMi$erIV component, move the outdoor air temperature sensor prior to installing the outdoor-air hood. See the Optional EconoMi$erIV section.

NOTE: The hood top panel, upper and lower filter retainers, hood drain pan, baffle (028 and 030), and filter support bracket are secured opposite the condenser end of the unit. The screens, hood side panels, remaining section of filter support bracket, seal strip, and all other hardware are in a package located inside the return-air filter access panel (Fig. 16).

1. Attach seal strip to upper filter retainer. See Fig. 17.
2. Assemble hood top panel and side panels, upper filter retainer, and hood drain pan (Fig. 18).
3. Secure lower filter retainer and long section of filter support bracket to unit. See Fig. 18. Leave screws loose on 028 and 030 units.
4. Slide baffle (size 028 and 030 unit) behind lower filter retainer and tighten screws.



NOTE: The disconnect takes the place of TB-1 as shown on the unit wiring diagram label and the component arrangement label.

Fig. 14 — Optional Non-Fused Disconnect Wiring

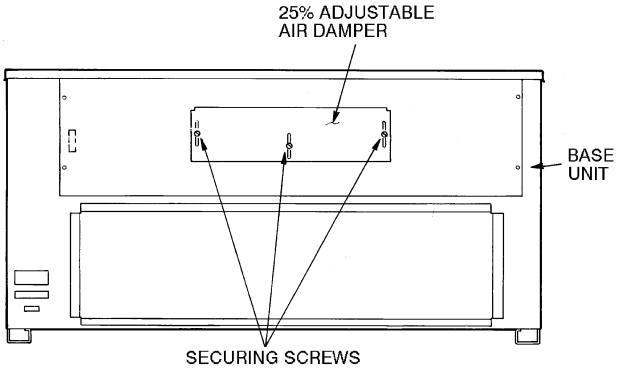


Fig. 15 — 25% Outdoor-Air Section Details

5. Loosen sheet metal screws for base unit top panel located above outdoor-air inlet opening, and remove screws for hood side panels located on the sides of the outdoor-air inlet opening.
6. Match notches in hood top panel to unit top panel screws. Insert hood flange between unit top panel flange and unit. Tighten screws.
7. Hold hood side panel flanges flat against unit, and install screws removed in Step 5.
8. Insert outdoor-air inlet screens and spacer in channel created by lower filter retainer and filter support bracket.
9. Attach remaining short section of filter support bracket.

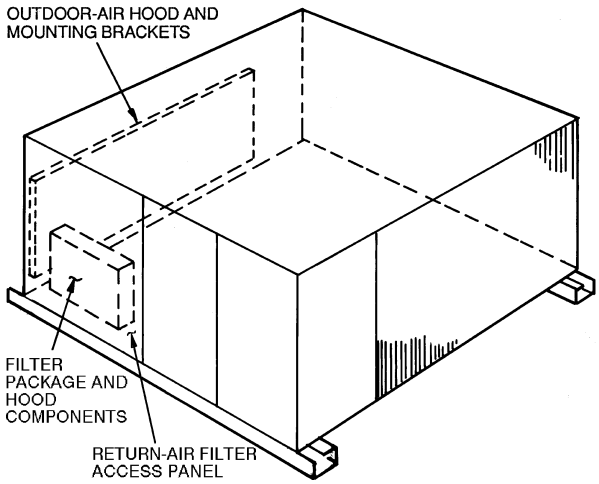


Fig. 16 — Outdoor-Air Hood Component Location

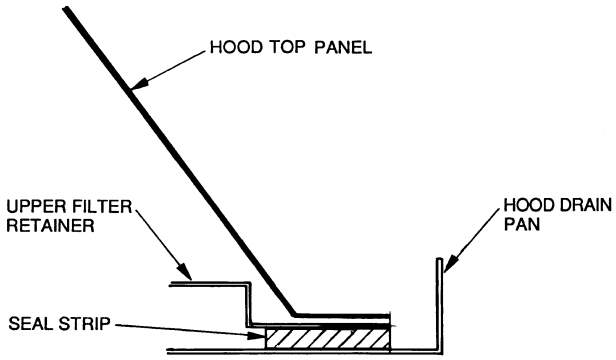
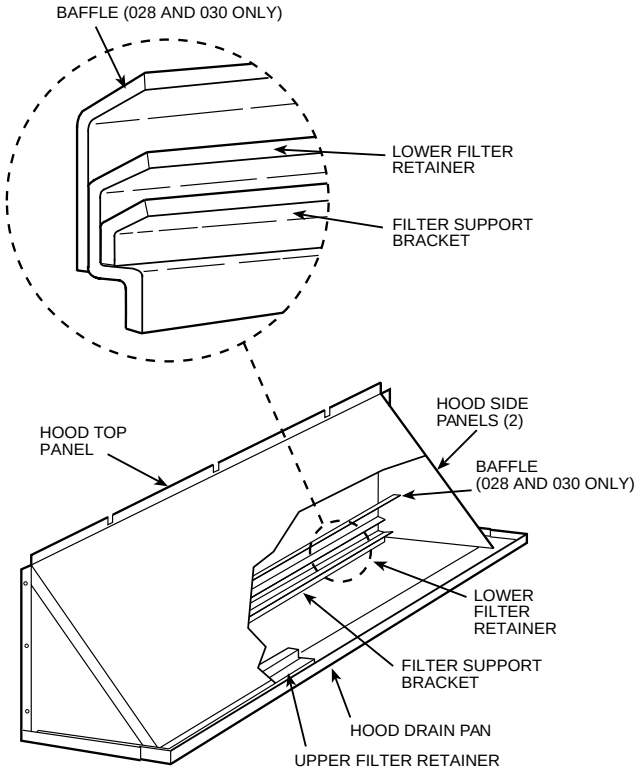


Fig. 17 — Seal Strip Location (Air Hood Cross-Sectional View)



NOTE: The outdoor-air hood comes with a baffle which is used on size 028 and 030 units only; discard baffle for size 016 and 024 units.

Fig. 18 — Outdoor-Air Hood Details

Step 9 — Adjust Factory-Installed Options

OPTIONAL ECONOMI$ERIV — See Fig. 19 and 20 for EconoMi$erIV component locations.

NOTE: These instructions are for installing the optional EconoMi$erIV only. Refer to the accessory EconoMi$erIV installation instructions when field installing an EconoMi$erIV accessory.

To complete installation of the optional EconoMi$erIV, perform the following procedure.

1. Remove the EconoMi$erIV hood. Refer to Step 8 — Install Outdoor-Air Hood on page 13 for information on removing and installing the outdoor-air hood.
2. Relocate outdoor air temperature sensor from shipping position to operation position on EconoMi$erIV. See Fig. 19.

IMPORTANT: Failure to relocate the sensor will result in the EconoMi$erIV not operating properly.

3. Re-install economizer hood.
4. Install all EconoMi$erIV accessories. EconoMi$erIV wiring is shown in Fig. 21.

Outdoor air leakage is shown in Tables 5A and 5B. Return air pressure drop is shown in Tables 6A and 6B.

Table 5A — Outdoor Air Damper Leakage (L/s)

	DAMPER STATIC PRESSURE (Pa)					
	50	100	150	200	250	300
LEAKAGE (L/s)	16	25	31	35	42	48

Table 5B — Outdoor Air Damper Leakage (Cfm)

	DAMPER STATIC PRESSURE (in. wg)					
	0.2	0.4	0.6	0.8	1.0	1.2
LEAKAGE (cfm)	35	53	65	75	90	102

Table 6A — Return Air Pressure Drop (Pa)

L/s					
2125	2395	2550	2830	3400	3540
10	12	15	17	22	25

Table 6B — Return Air Pressure Drop (in. wg)

CFM								
4500	5000	5400	6000	7200	7500	9000	10,000	11,250
0.040	0.050	0.060	0.070	0.090	0.100	0.110	0.120	0.140

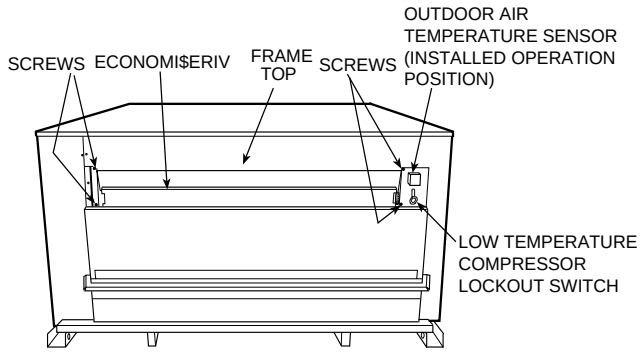


Fig. 19 — EconoMi$erIV Component Locations — End View

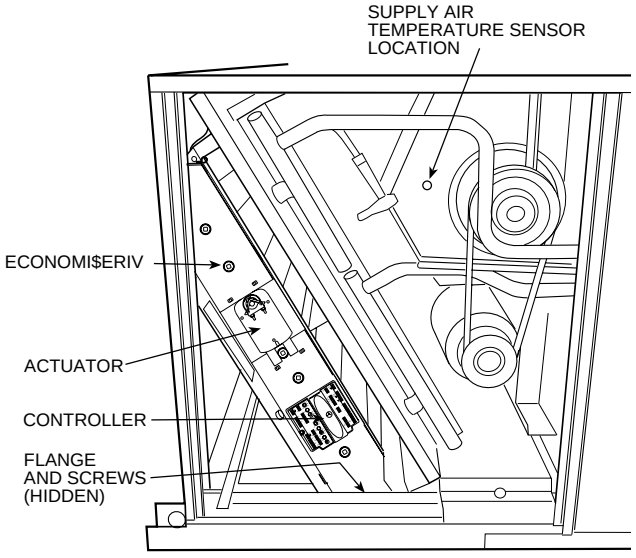
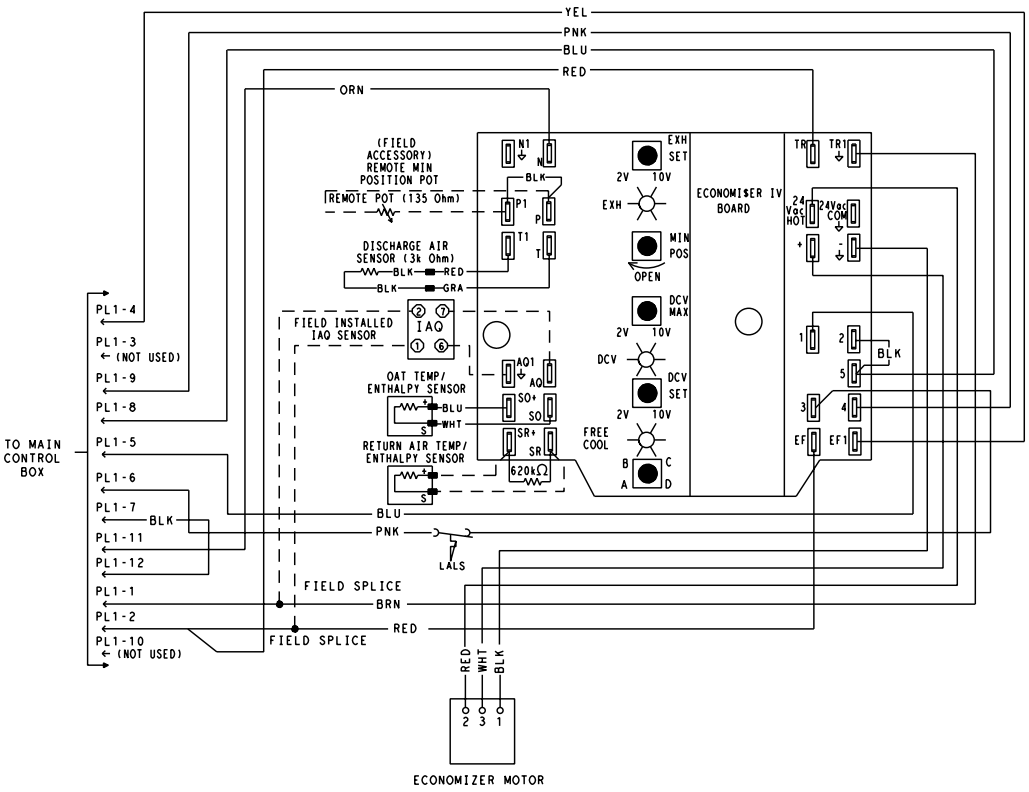


Fig. 20 — EconoMi$erIV Component Locations — Side View



LEGEND

DCV — Demand Controlled Ventilation
IAQ — Indoor Air Quality
LALS — Low Temperature Compressor Lockout Switch
OAT — Outdoor-Air Temperature
POT — Potentiometer

Potentiometer Default Settings:

Power Exhaust	Middle
Minimum Pos.	Fully Closed
DCV Max.	Middle
DCV Set	Middle
Enthalpy	C Setting

NOTES:
1. 620 ohm, 1 watt 5% resistor should be removed only when using differential enthalpy or dry bulb.
2. If a separate field-supplied 24 v transformer is used for the IAQ sensor power supply, it cannot have the secondary of the transformer grounded.
3. For field-installed remote minimum position POT, remove black wire jumper between P and P1 and set control minimum position POT to the minimum position.

Fig. 21 — EconoMi$erIV Wiring

ECONOMI$ERIV 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$erIV can be used for free cooling. The sensor must be relocated. See Fig. 19. The operating range of temperature measurement is 4 to 38 C (40 to 100 F).

Supply Air Temperature (SAT) Sensor — The supply air temperature sensor is a 3 K thermistor located at the inlet of the indoor fan. See Fig. 20. This sensor is factory installed. The operating range of temperature measurement is –17 to 70 C (0° to 158 F). See Table 7 for sensor temperature/resistance values.

The temperature sensor looks like an eyelet terminal with wires running to it. The sensor is located in the "crimp end" and is sealed from moisture.

Low Temperature Compressor Lockout Switch — The EconoMi$erIV is equipped with a low ambient temperature lockout switch located in the outdoor airstream which is used to lock out the compressors below a 6 C (42 F) ambient temperature. See Fig. 19.

ECONOMI$ERIV CONTROL MODES — Determine the EconoMi$erIV control mode before set up of the control. Some modes of operation may require different sensors. Refer to Table 8. The EconoMi$erIV is supplied from the factory with a supply air temperature sensor, a low temperature compressor lockout switch, and an outdoor air temperature sensor. This allows for operation of the EconoMi$erIV 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$erIV and unit.

Table 7 — Supply Air Sensor Temperature/ Resistance Values

TEMPERATURE		RESISTANCE (ohms)
(C)	(F)	
–50	**–58**	200,250
–40	**–40**	100,680
–30	**–22**	53,010
–20	**–4**	29,091
–10	**14**	16,590
0	**32**	9,795
10	**50**	5,970
20	**68**	3,747
25	**77**	3,000
30	**86**	2,416
40	**104**	1,597
50	**122**	1,080
60	**140**	746
70	**158**	525
80	**176**	376
85	**185**	321
90	**194**	274
100	**212**	203
110	**230**	153
120	**248**	116
125	**257**	102
130	**266**	89
140	**284**	70
150	**302**	55

Table 8 — EconoMi$erIV Sensor Usage

APPLICATION	ECONOMI$ERIV WITH OUTDOOR AIR DRY BULB SENSOR		
	Accessories Required		
Outdoor Air Dry Bulb	None. The outdoor air dry bulb sensor is factory installed.		
Differential Dry Bulb	CRTEMPSN002A00*		
Single Enthalpy	HH57AC078		
Differential Enthalpy	HH57AC078 and CRENTDIF004A00*		
CO_2 for DCV Control using a Wall-Mounted CO_2 Sensor	33ZCSENCO2		
CO_2 for DCV Control using a Duct-Mounted CO_2 Sensor	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.

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$erIV 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. See Fig. 22. The scale on the potentiometer is A, B, C, and D. See Fig. 23 for the corresponding temperature changeover values.

Differential Dry Bulb Control — For differential dry bulb control the standard outdoor dry bulb sensor is used in conjunction with an additional accessory return air sensor (part number CRTEMPSN002A00). The accessory sensor must be mounted in the return airstream. See Fig. 24.

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 free cooling/enthalpy set point potentiometer fully clockwise to the D setting. See Fig. 22.

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. See Fig. 19. 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$erIV controller. The set points are A, B, C, and D. See Fig. 25. The factory-installed 620-ohm jumper must be in place across terminals SR and SR+ on the EconoMi$erIV controller. See Fig. 26.

Differential Enthalpy Control — For differential enthalpy control, the EconoMi$erIV controller uses two enthalpy sensors (HH57AC078 and CRENTDIF004A00), one in the outside air and one in the return airstream. The EconoMi$erIV controller compares the outdoor air enthalpy to the return air enthalpy to determine EconoMi$erIV use. The controller

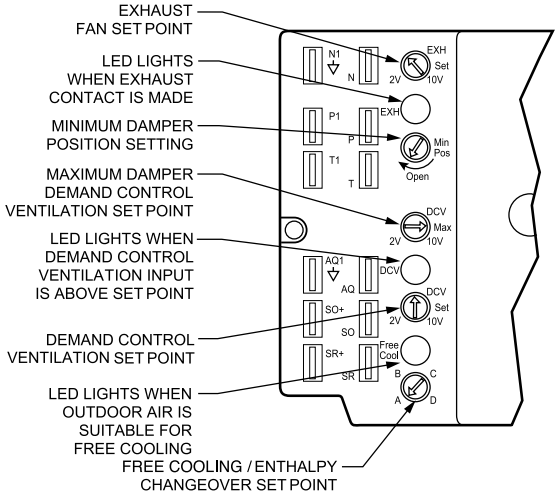


Fig. 22 — EconoMi$erIV Controller Potentiometer and LED Locations

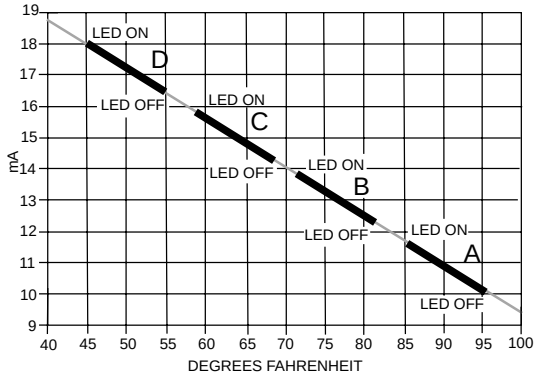


Fig. 23 — Outside Air Temperature Changeover Set Points

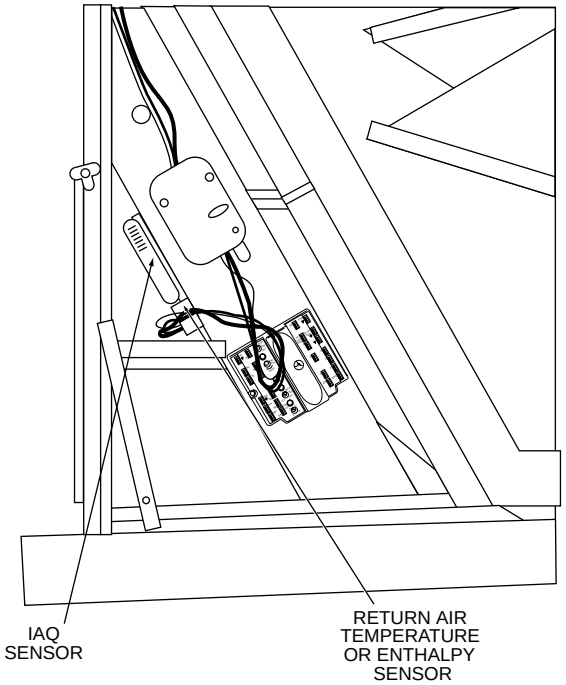


Fig. 24 — Return Air Temperature or Enthalpy Sensor Mounting Location

selects the lower enthalpy air (return or outdoor) for cooling. For example, when the outdoor air has a lower enthalpy than the return air and is below the set point, the EconoMi$erIV 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. See Fig. 19. Mount the return air enthalpy sensor on the EconoMi$erIV. See Fig. 24. When using this mode of changeover control, turn the enthalpy set point potentiometer fully clockwise to the D setting.

NOTE: Remove 620-ohm resistor if differential enthalpy sensor is installed.

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

Mount the accessory IAQ sensor according to manufacturer specifications. The IAQ sensor should be wired to the AQ and AQ1 terminals of the controller. Adjust the DCV potentiometers to correspond to the DCV voltage output of the indoor air quality sensor at the user-determined set point. See Fig. 27.

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

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

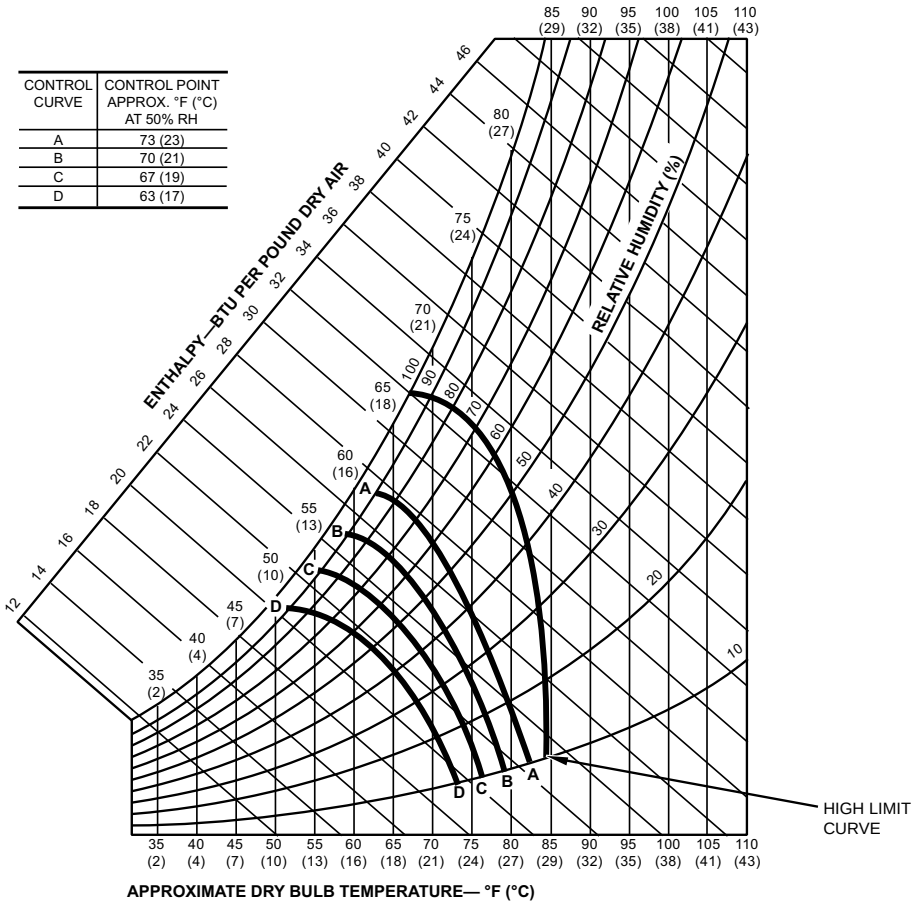


Fig. 25 — Enthalpy Changeover Set Points

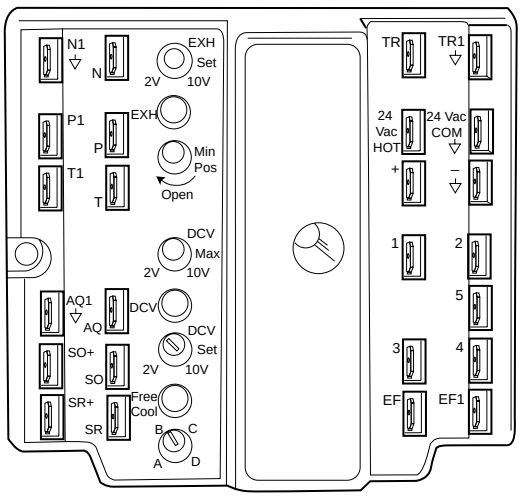


Fig. 26 — EconoMi$erIV Controller

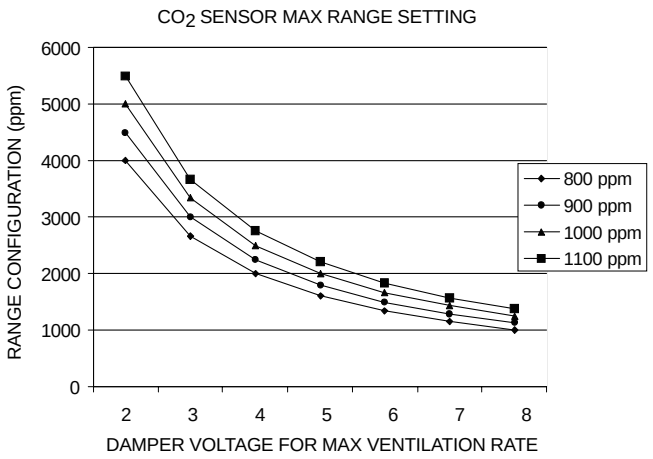


Fig. 27 — CO_2 Sensor Maximum Range Setting

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. 22. The set point represents the damper position above which the exhaust fan will be turned on. When there is a call for exhaust, the EconoMi$erIV 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.

Minimum Position Control — There is a minimum damper position potentiometer on the EconoMi$erIV controller. See Fig. 22. 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 compound) 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 6° C (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:

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

   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 15.5 C (60 F), and return-air temperature is 23.8 C (75 F).

   (15.5 x .10) + (23.8 x .90) = 23.0 C
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. 21 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$erIV damper is desirable when requiring additional temporary ventilation. If a field-supplied remote potentiometer (Honeywell part number S963B1128) is wired to the EconoMi$erIV 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$erIV controller. Wire the field-supplied potentiometer to the P and P1 terminals on the EconoMi$erIV controller. See Fig. 21.

Damper Movement — Damper movement from full open to full closed (or vice versa) takes $2^1/_2$ minutes.

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

Occupancy Control — The factory default configuration for the EconoMi$erIV control is occupied mode. Occupied status is provided by the red jumper from terminal TB2-9 to terminal TB2-10. When unoccupied mode is desired, install a field-supplied timeclock function in place of the jumper between terminals TB2-9 and TB2-10. See Fig. 21. When the timeclock contacts are closed, the EconoMi$erIV control will be in occupied mode. When the timeclock contacts are open (removing the 24-v signal from terminal N), the EconoMi$erIV will be in unoccupied mode.

Demand Controlled Ventilation (DCV) — When using the EconoMi$erIV for demand controlled 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.

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

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. 27 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. 27 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$erIV controller will output the 6.7 volts from the CO_2 sensor to the actuator when the CO_2 concentration in the space is at 1100 ppm. The DCV set point may be left at 2 volts since the CO_2 sensor voltage will be ignored by the EconoMi$erIV 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 9.

Use setting 1 or 2 for Carrier equipment. See Table 9.

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 9.
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 field-supplied 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 unit and/or a dehumidification option should be considered.

Step 10 — Install All Accessories — After all the factory-installed options have been adjusted, install all field-installed accessories. Refer to the accessory installation instructions included with each accessory.

Step 11 — Install Humidistat for Optional MoistureMiser Dehumidification Package — MoistureMiser dehumidification package operation can be controlled by field installation of a Carrier-approved humidistat. To install the humidistat perform the following procedure:

1. Locate humidistat on a solid interior wall in the conditioned space. Location should be a well ventilated area to sense average humidity.
2. Route thermostat cable or equivalent single leads of colored wire from Humidistat terminals through conduit in unit to the low voltage connection on the 2-pole terminal strip (TB3) as shown in Fig. 28 and Fig. 29.

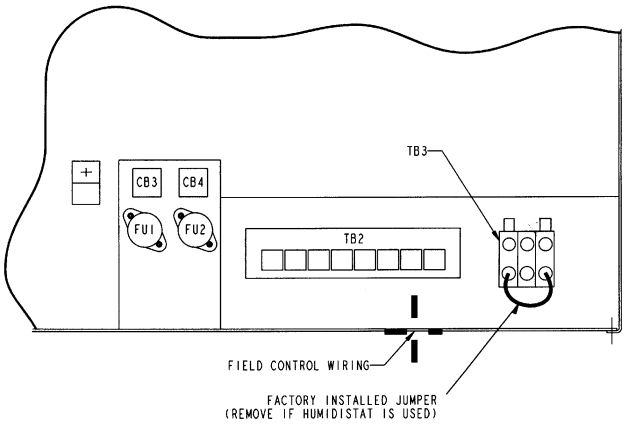


Fig. 28 — Typical MoistureMiser Dehumidification Package Control Box

Table 9 — 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

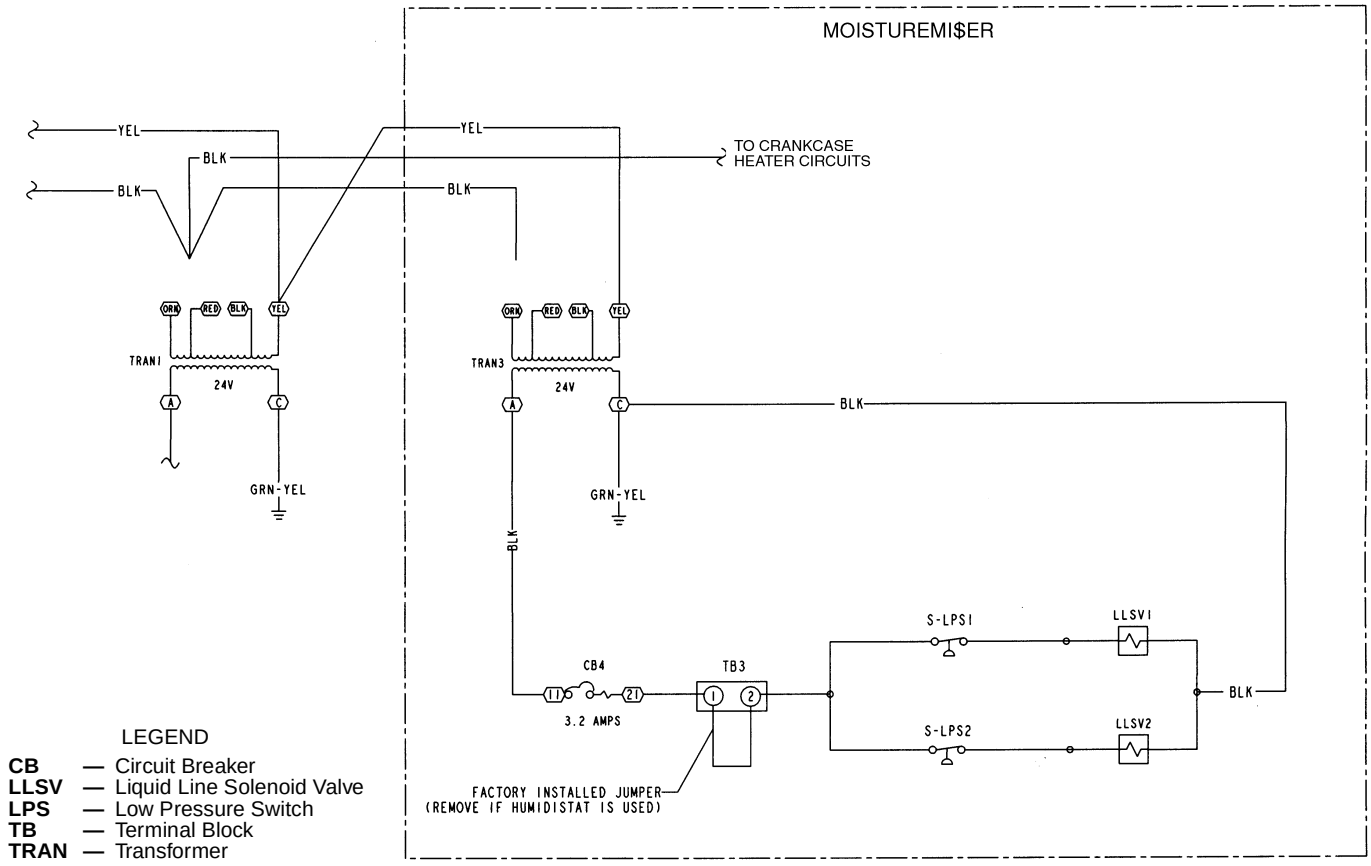


Fig. 29 — Typical MoistureMiser Dehumidification Package Humidistat Wiring Schematic

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 refrigerant system has a total of 3 Schrader-type service gage ports. One port is located on the suction line, one on the compressor discharge line, and one on the liquid line. In addition Schrader-type valves are located underneath the low-pressure switches. Be sure that caps on the ports are tight.

Compressor Rotation — 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:

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

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

1. Note that the evaporator fan is probably also rotating in the wrong direction.
2. Turn off power to the unit.
3. Reverse any two of the incoming power leads.
4. Turn on power to the compressor.

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

NOTE: When compressors are rotating in the wrong direction, the unit will have increased noise levels and will not provide heating and cooling.

After a few minutes of reverse operation, the scroll compressor internal overload protection will open, which will activate the unit's lockout and requires a manual reset. Reset is accomplished by turning the thermostat on and off.

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

Crankcase Heater (Size 028 and Units with MoistureMiser) — Heater is energized as long as there is power to unit and compressor is not operating.

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

Evaporator Fan — Fan belt and variable pulleys are factory installed. Remove tape from the fan pulley. See Table 10 for air quantity limits. See Tables 11-16 for fan performance data. Be sure that fans rotate in the proper direction. See Tables 17A-19B for static pressure information for factory-installed options and field-installed accessories. See Tables 20A and 20B for fan revolutions at various motor pulley settings. See Fig. 30 for fan performance using horizontal adapter. Refer to Table 21 for evaporator-fan motor performance. To alter fan performance, see Evaporator-Fan Performance Adjustment section on page 28.

Condenser Fans and Motors — Fans and motors are factory set. Refer to Condenser-Fan Adjustment section on page 29 as required.

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

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

Base Unit Operation

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

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

Table 10 — Air Quantity Limits

UNIT 50TJ	MINIMUM		MAXIMUM	
	L/s	Cfm	L/s	Cfm
016	2125	4500	3525	7,500
024	2800	6000	4800	10,000
028	3300	7000	5300	11,250
030	3300	7000	5300	11,250

COOLING, UNITS WITH ECONOMI$ERIV — When free cooling is not available, the compressors will be controlled by the zone thermostat. When free cooling is available, the outdoor-air damper is modulated by the EconoMi$er IV control to provide a 10 to 13 C (50 to 55 F) supply-air temperature into the zone. As the supply-air temperature fluctuates above 13 C (55 F) or below 10 C (50 F), the dampers will be modulated (open or close) to bring the supply-air temperature back within the set point limits.

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

Above 10 C (50 F) supply-air temperature, the dampers will modulate from 100% open to the minimum open position. From 10 C (50 F) to 7 C (45 F) supply-air temperature, the dampers will maintain at the minimum open position. Below 7 C (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 9 C (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. Damper position will follow the higher demand condition from DCV mode or free cooling mode.

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), a call for cooling (Y1 closes at the thermostat) will cause the control to modulate the dampers open to maintain the supply air temperature set point at 10 to 13 C (50 to 55 F).

As the supply air temperature drops below the set point range of 10 to 13 C (50 to 55 F), the control will modulate the outdoor-air dampers closed to maintain the proper supply-air temperature.

FREEZE PROTECTION THERMOSTAT(S) — A freeze protection thermostat (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 frost has melted, the compressor can be reenergized by resetting the compressor lockout.

HEATING, UNITS WITH ECONOMI$ERIV (If Accessory or Optional Heater is Installed) — When the room thermostat calls for heat, the heating controls are energized as described in the Heating, Units Without EconoMi$erIV section. The IFM is energized and the EconoMi$erIV damper modulates to the minimum position. When the thermostat is satisfied, the damper modulates closed.

UNITS WITH MOISTUREMISER DEHUMIDIFICATION PACKAGE — When thermostat calls for cooling, terminals G and Y1 and/or Y2 and the compressor contactor C1 and/or C2 are energized. The indoor (evaporator) fan motor (IFM), compressors, and outdoor (condenser) fan motors (OFM) start. The OFMs run continuously while the unit is in cooling. As shipped from the factory, both MoistureMiser dehumidification circuits are always energized.

If MoistureMiser circuit modulation is desired, a field-installed, wall-mounted humidistat is required. If the MoistureMiser humidistat is installed and calls for the MoistureMiser subcooler coil to operate, the humidistat internal switch closes. This energizes the 3-way liquid line solenoid valve coils (LLSV1 for circuit 1 and LLSV2 for circuit 2) of the MoistureMiser circuits, forcing the warm liquid refrigerant of the liquid line to enter the subcooler coils. See Fig. 31.

As the warm liquid passes through the subcooler coils, it is exposed to the cold supply airflow coming off the evaporator coils and the liquid is further cooled to a temperature approaching the evaporator coil leaving-air temperature. The state of the refrigerant leaving the subcooler coils is a highly subcooled liquid refrigerant. The liquid then enters a thermostatic expansion valve (TXV) where the liquid is dropped to the evaporator pressure. The TXVs can throttle the pressure drop of the liquid refrigerant and maintain proper conditions at the compressor suction valves over a wide range of operating conditions. The liquid proceeds to the evaporator coils at a temperature lower than normal cooling operation. This lower temperature is what increases the latent and sensible capacity of the evaporator coils.

The 2-phase refrigerant passes through the evaporators and is changed into a vapor. The air passing over the evaporator coils will become colder than during normal operation as a result of the colder refrigerant temperatures. However, as it passes over the subcooler coils, the air will be warmed, decreasing

the sensible capacity and reducing the sensible heat of the rooftop unit.

As the refrigerant leaves the evaporator, the refrigerant passes a subcooler control low-pressure switch (S-LPS1 for circuit 1 or S-LPS2 for circuit 2) in the suction line. This low-pressure switch will deactivate the MoistureMiser package when the suction pressure reaches 60 psig. The subcooler control low-pressure switch is an added safety device to protect against evaporator coil freeze-up during low ambient operation. The subcooler control low-pressure switch will only deactivate the 3-way liquid line solenoid valve in the MoistureMiser circuit. The compressors will continue to run as long as there is a call for cooling, regardless of the position of the subcooler control low-pressure switch. The 3-way solenoid valve and the MoistureMiser package will be reactivated only when the call for cooling has been satisfied, the subcooler control low-pressure switch has closed above 80 psig, and a new call for cooling exists. The crankcase heaters on the scroll compressors provide additional protection for the compressors due to the additional refrigerant charge in the subcooler.

When the humidistat is satisfied, the humidistat internal switch opens, cutting power to and deenergizing the LLSVs. The refrigerant is routed back through the evaporators and the subcooler coils are removed from the refrigerant loops. When the thermostat is satisfied, C1 and C2 are deenergized and the compressors, IFM, and OFMs shut off. If the thermostat fan selector switch is in the ON position, the IFM will run continuously.

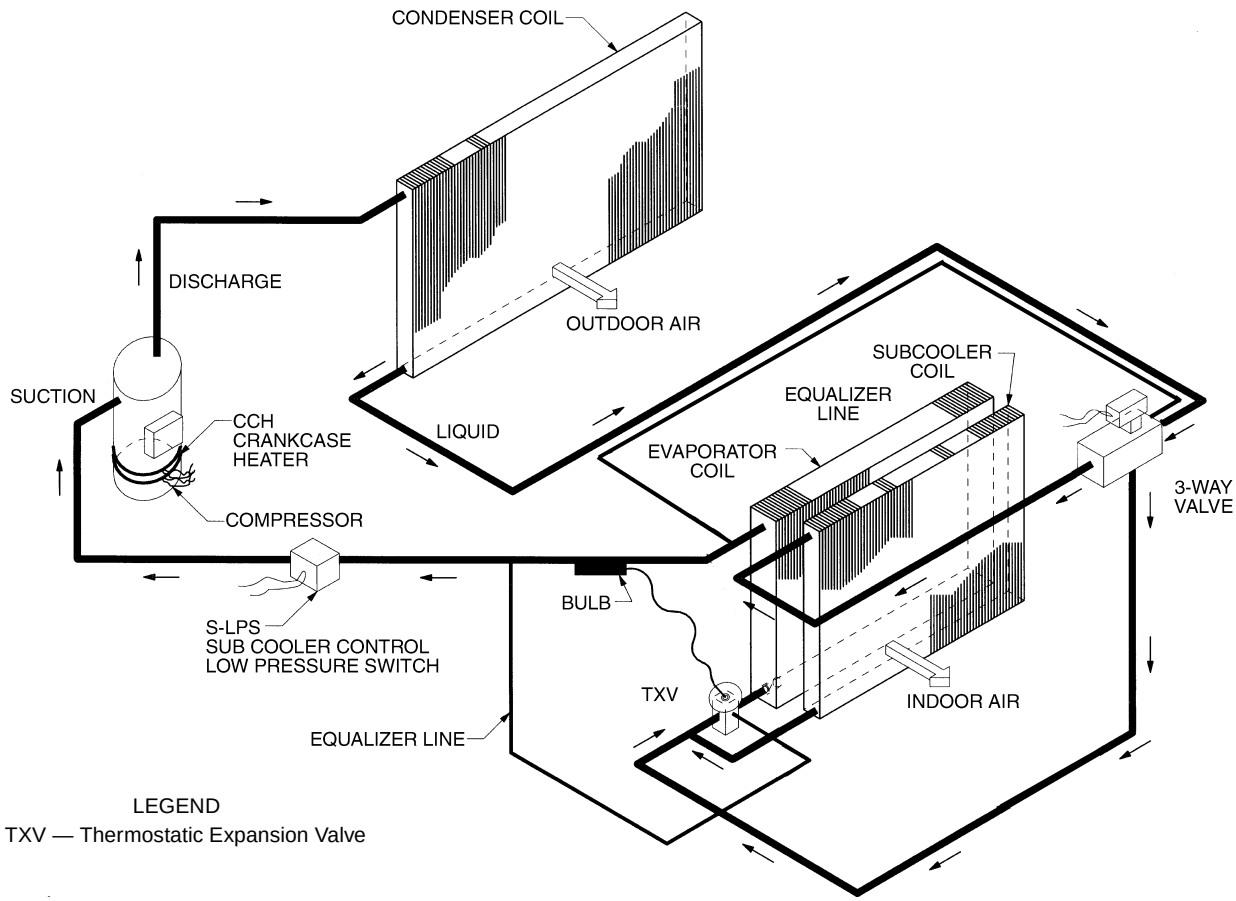


Fig. 31 — MoistureMiser Operation Diagram

Table 11 — Fan Performance Data (SI) — 50TJ016* (52.8 kW)

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)																	
	50			100			149			199			249			299		
	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW
2124	11.4	0.95	1.10	13.2	1.10	1.28	14.8	1.26	1.47	16.3	1.42	1.65	17.7	1.58	1.84	19.0	1.75	2.03
2266	11.9	1.09	1.26	13.6	1.24	1.45	15.2	1.41	1.64	16.6	1.57	1.83	18.0	1.73	2.02	19.2	1.90	2.22
2408	12.4	1.24	1.44	14.1	1.40	1.63	15.6	1.57	1.83	17.0	1.73	2.02	18.3	1.90	2.22	19.5	2.07	2.42
2549	13.0	1.40	1.64	14.5	1.57	1.83	16.0	1.74	2.03	17.3	1.91	2.23	18.6	2.08	2.43	19.8	2.26	2.63
2691	13.5	1.58	1.84	15.0	1.75	2.04	16.4	1.93	2.25	17.7	2.10	2.45	19.0	2.28	2.65	20.1	2.45	2.86
2833	14.1	1.77	2.07	15.5	1.95	2.27	16.9	2.13	2.48	18.1	2.30	2.69	19.3	2.48	2.89	20.5	2.66	3.10
2974	14.6	1.98	2.31	16.0	2.16	2.52	17.3	2.34	2.73	18.5	2.52	2.94	19.7	2.70	3.15	20.8	2.89	3.36
3116	15.2	2.20	2.57	16.5	2.39	2.78	17.8	2.57	2.99	19.0	2.75	3.21	20.1	2.94	3.43	21.2	3.13	3.64
3257	15.8	2.44	2.84	17.0	2.62	3.06	18.3	2.81	3.28	19.4	3.00	3.50	20.5	3.19	3.72	—	—	—
3399	16.3	2.69	3.13	17.6	2.88	3.36	18.8	3.07	3.58	—	—	—	—	—	—	—	—	—
3541	16.9	2.95	3.44	18.1	3.15	3.67	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)														
	349			399			448			473			498		
	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW
2124	20.2	1.91	2.23	21.4	2.08	2.43	22.6	2.26	2.63	23.1	2.35	2.74	23.6	2.44	2.84
2266	20.5	2.07	2.42	21.6	2.25	2.62	22.7	2.42	2.82	23.3	2.51	2.93	23.8	2.60	3.03
2408	20.7	2.25	2.62	21.8	2.42	2.82	22.9	2.60	3.03	23.5	2.69	3.14	24.0	2.78	3.24
2549	21.0	2.43	2.83	22.1	2.61	3.04	23.2	2.79	3.25	23.7	2.88	3.36	24.2	2.97	3.47
2691	21.3	2.63	3.07	22.4	2.81	3.28	23.4	3.00	3.49	23.9	3.09	3.60	24.4	3.18	3.71
2833	21.6	2.84	3.32	22.7	3.03	3.53	23.7	3.21	3.75	—	—	—	—	—	—
2974	21.9	3.07	3.58	—	—	—	—	—	—	—	—	—	—	—	—
3116	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3257	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3399	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3541	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

BkW — Brake Kilowatts
FIOP — Factory-Installed Option
kW — Input Kilowatts to Motor

*Standard drive range for low-medium static drive on 50TJ016 is 12.4 to 16.4 r/s. Standard drive range for high static drive on 50TJ016 is 17.1 to 21.7 r/s. Other r/s require a field-supplied drive.

NOTES:
1. Maximum continuous bkW is 3.17 (400 v) or 2.57 (220 v). The maximum continuous watts is 3775 (400 v) or 3065 (220 v). Do not adjust motor rpm such that motor maximum bkW and/or kW is exceeded at the maximum operating L/s.
2. Static pressure losses (i.e., EconoMi$erIV) must be added to external static pressure before entering fan performance table.
3. Interpolation is permissible. Do not extrapolate.
4. Fan performance is based on wet coils, clean filters, and casing loses. See Table 17A for accessory/FIOP static pressure information.
5. Extensive motor and drive testing on these units ensures that the full brake kilowatt and kW range of the motor can be utilized with confidence. Using fan motors up to the kW or bkW rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
6. Use of a field-supplied motor may affect wiring size. Contact your Carrier representative for details. For additional information on motor performance, refer to Evaporator-Fan Motor Performance Table 21.

Table 12 — Fan Performance Data (SI) — 50TJ024* (70.3 kW)

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)																							
	50			100			149			199			249			299			349			399		
	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW
2595	11.4	1.49	1.68	12.7	1.71	1.92	13.9	1.94	2.18	15.0	2.17	2.44	16.1	2.41	2.71	17.1	2.66	2.99	18.1	2.91	3.28	19.0	3.17	3.57
2833	12.2	1.76	2.01	13.4	1.99	2.26	14.5	2.21	2.52	15.6	2.45	2.78	16.6	2.69	3.06	17.6	2.94	3.34	18.5	3.19	3.62	19.4	3.45	3.92
3069	13.0	2.09	2.37	14.1	2.31	2.63	15.2	2.55	2.89	16.2	2.78	3.16	17.2	3.03	3.44	18.1	3.28	3.72	19.0	3.53	4.01	19.9	3.79	4.30
3305	13.8	2.45	2.78	14.9	2.68	3.04	15.9	2.91	3.31	16.8	3.15	3.58	17.8	3.40	3.86	18.7	3.65	4.15	19.6	3.91	4.44	20.4	4.16	4.73
3541	14.6	2.84	3.23	15.6	3.07	3.49	16.6	3.31	3.77	17.5	3.56	4.04	18.4	3.81	4.33	19.3	4.06	4.61	20.1	4.32	4.91	20.9	4.58	5.20
3777	15.5	3.27	3.72	16.4	3.51	3.99	17.3	3.75	4.26	18.2	4.00	4.54	19.1	4.25	4.83	19.9	4.51	5.12	20.7	4.77	5.41	21.5	5.03	5.71
4013	16.3	3.74	4.24	17.2	3.98	4.52	18.1	4.22	4.80	18.9	4.48	5.09	19.7	4.73	5.38	20.5	4.99	5.67	21.3	5.25	5.97	22.1	5.52	6.27
4249	17.2	4.24	4.82	18.0	4.49	5.10	18.9	4.74	5.38	19.7	4.99	5.67	20.4	5.25	5.96	21.2	5.51	6.26	21.9	5.77	6.56	22.7	6.04	6.86
4485	18.0	4.78	5.43	18.8	5.03	5.72	19.6	5.29	6.01	20.4	5.54	6.30	21.2	5.80	6.60	21.9	6.07	6.90	22.6	6.33	7.20	23.3	6.60	7.51
4721	18.9	5.36	6.09	19.7	5.62	6.38	20.4	5.87	6.68	21.2	6.13	6.97	21.9	6.40	7.27	22.6	6.67	7.57	23.3	6.93	7.88	24.0	7.21	8.19

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)								
	448			473			498		
	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW
2595	20.0	3.43	3.86	20.4	3.57	4.02	20.8	3.71	4.17
2833	20.3	3.71	4.21	20.8	3.84	4.36	21.2	3.97	4.52
3069	20.7	4.05	4.60	21.2	4.18	4.75	21.6	4.32	4.91
3305	21.2	4.43	5.03	21.6	4.56	5.18	22.0	4.70	5.34
3541	21.7	4.84	5.50	22.1	4.98	5.66	22.5	5.11	5.81
3777	22.2	5.30	6.02	22.6	5.43	6.17	23.0	5.57	6.32
4013	22.8	5.78	6.57	23.2	5.92	6.73	23.5	6.06	6.88
4249	23.4	6.31	7.17	23.7	6.45	7.33	24.1	6.59	7.48
4485	24.0	6.88	7.82	24.3	7.02	7.97	24.7	7.15	8.13
4721	24.6	7.48	8.50	—	—	—	—	—	—

LEGEND

BkW — Brake Kilowatts
FIOP — Factory-Installed Option
kW — Input Kilowatts to Motor

*Standard drive range for low-medium static drive on 50TJ024 is 12.8 to 15.2 r/s. Standard drive range for high static drive on 50TJ024 is 16.6 to 20.3 r/s. Other r/s require a field-supplied drive.

NOTES:
1. Maximum continuous bkW is 7.68. The maximum continuous watts is 8640. Do not adjust motor rpm such that motor maximum bkW and/or kW is exceeded at the maximum operating L/s.
2. Static pressure losses (i.e., EconoMi$erIV) must be added to external static pressure before entering fan performance table.
3. Interpolation is permissible. Do not extrapolate.
4. Fan performance is based on wet coils, clean filters, and casing loses. See Table 18A for accessory/FIOP static pressure information.
5. Extensive motor and drive testing on these units ensures that the full brake kilowatt and kW range of the motor can be utilized with confidence. Using fan motors up to the kW or bkW rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
6. Use of a field-supplied motor may affect wiring size. Contact your Carrier representative for details. For additional information on motor performance, refer to Evaporator-Fan Motor Performance Table 21.

Table 13 — Fan Performance Data (SI) — 50TJ028 and 030* (87.9 kW)

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)																				
	50			100			149			199			249			299			349		
	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW	r/s	BkW	kW
3305	14.1	2.41	2.00	15.1	2.67	2.22	16.2	2.93	2.44	17.1	3.20	2.66	18.1	3.48	2.89	19.0	3.76	3.13	19.8	4.05	3.37
3541	14.9	2.82	2.35	15.9	3.09	2.57	16.9	3.36	2.79	17.8	3.63	3.02	18.7	3.92	3.26	19.6	4.20	3.50	20.4	4.50	3.75
3777	15.8	3.28	2.73	16.7	3.55	2.96	17.7	3.83	3.19	18.5	4.11	3.42	19.4	4.40	3.66	20.2	4.69	3.91	21.0	4.99	4.16
4013	16.7	3.78	3.15	17.6	4.06	3.38	18.4	4.34	3.62	19.3	4.63	3.86	20.1	4.93	4.10	20.9	5.22	4.35	21.6	5.53	4.60
4249	17.6	4.33	3.60	18.4	4.61	3.84	19.2	4.90	4.08	20.0	5.20	4.33	20.8	5.50	4.58	21.6	5.80	4.83	22.3	6.11	5.09
4485	18.4	4.92	4.10	19.2	5.21	4.34	20.0	5.51	4.59	20.8	5.81	4.84	21.5	6.12	5.09	22.3	6.43	5.35	23.0	6.74	5.61
4721	19.3	5.56	4.63	20.1	5.86	4.88	20.8	6.16	5.13	21.6	6.47	5.39	22.3	6.78	5.65	23.0	7.10	5.91	23.7	7.42	6.18
4957	20.2	6.25	5.21	20.9	6.56	5.46	21.7	6.87	5.72	22.4	7.18	5.98	23.1	7.50	6.24	23.7	7.82	6.51	24.4	8.14	6.78
5193	21.1	6.99	5.82	21.8	7.30	6.08	22.5	7.62	6.34	23.2	7.94	6.61	23.8	8.26	6.88	24.5	8.59	7.15	25.1	8.92	7.43
5311	21.5	7.38	6.15	22.2	7.69	6.41	22.9	8.01	6.67	23.6	8.34	6.94	24.2	8.66	7.21	24.9	8.99	7.49	25.5	9.32	7.77

AIRFLOW (L/s)	AVAILABLE EXTERNAL STATIC PRESSURE (Pa)					
	399			448		
	r/s	BkW	kW	r/s	BkW	kW
3305	20.7	4.34	3.62	21.5	3.63	3.87
3541	21.2	4.80	4.00	22.0	4.11	4.25
3777	21.8	5.30	4.41	22.5	4.63	4.67
4013	22.4	5.84	4.86	23.1	5.20	5.12
4249	23.0	6.42	5.35	23.7	5.81	5.62
4485	23.7	7.06	5.88	24.4	6.47	6.15
4721	24.4	7.74	6.45	25.0	7.18	6.72
4957	25.1	8.47	7.06	25.7	7.94	7.33
5193	25.8	9.25	7.71	—	—	—
5311	—	—	—	—	—	—

LEGEND

BkW — Brake Kilowatts
FIOP — Factory-Installed Option
kW — Input Kilowatts to Motor

*Standard drive range for low-medium static drive on 50TJ028 and 030 is 14.8 to 17.8 r/s. Standard drive range for high static drive on 50TJ028 and 030 is 18.6 to 22.4 r/s. Other r/s require a field-supplied drive.

NOTES:
1. Maximum continuous bkW is 9.92 (400 v) or 8.60 (220 v, size 028 only). The maximum continuous watts is 11,000 (400 v) or 9,600 (220 v, size 028 only). Do not adjust motor rpm such that motor maximum bkW and/or kW is exceeded at the maximum operating L/s.
2. Static pressure losses (i.e., EconoMi$erIV) must be added to external static pressure before entering fan performance table.
3. Interpolation is permissible. Do not extrapolate.
4. Fan performance is based on wet coils, clean filters, and casing loses. See Table 18A for accessory/FIOP static pressure information.
5. Extensive motor and drive testing on these units ensures that the full brake kilowatt and kW range of the motor can be utilized with confidence. Using fan motors up to the kW or bkW rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
6. Use of a field-supplied motor may affect wiring size. Contact your Carrier representative for details. For additional information on motor performance, refer to Evaporator-Fan Motor Performance Table 21.

Table 14 — Fan Performance Data (English) — 50TJ016* (15 Tons)

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)																	
	0.2			0.4			0.6			0.8			1.0			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
4500	684	1.28	1102	791	1.49	1283	887	1.70	1466	977	1.92	1652	1061	2.13	1841	1139	2.36	2034
4800	715	1.47	1265	817	1.68	1451	910	1.90	1638	997	2.12	1828	1078	2.34	2021	1155	2.57	2217
5100	747	1.67	1442	844	1.89	1633	934	2.12	1825	1018	2.34	2019	1097	2.57	2216	1171	2.80	2416
5400	779	1.90	1635	872	2.12	1831	959	2.35	2027	1040	2.58	2226	1117	2.81	2426	1189	3.05	2629
5700	812	2.14	1844	901	2.37	2044	985	2.60	2245	1063	2.84	2448	1138	3.07	2652	1209	3.31	2858
6000	845	2.40	2068	931	2.64	2273	1011	2.87	2478	1087	3.11	2685	1160	3.35	2893	1229	3.60	3103
6300	878	2.68	2309	961	2.92	2518	1039	3.16	2728	1112	3.41	2939	1183	3.65	3151	1250	3.90	3365
6600	912	2.98	2566	992	3.22	2780	1067	3.47	2994	1138	3.72	3209	1207	3.97	3425	1273	4.22	3642
6900	946	3.29	2841	1023	3.55	3059	1096	3.80	3277	1165	4.05	3496	1232	4.31	3716	—	—	—
7200	981	3.63	3133	1055	3.89	3355	1125	4.15	3578	—	—	—	—	—	—	—	—	—
7500	1016	3.99	3443	1087	4.25	3669	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)														
	1.4			1.6			1.8			1.9			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
4500	1214	2.59	2230	1285	2.82	2430	1353	3.05	2633	1386	3.17	2736	1418	3.29	2839
4800	1228	2.80	2417	1297	3.04	2619	1364	3.27	2825	1396	3.40	2928	1428	3.52	3033
5100	1243	3.04	2618	1311	3.27	2823	1376	3.51	3031	1408	3.64	3136	1439	3.76	3242
5400	1259	3.29	2835	1326	3.53	3043	1390	3.77	3254	1421	3.90	3360	1452	4.02	3467
5700	1277	3.56	3067	1342	3.80	3278	1405	4.05	3492	1435	4.17	3600	1466	4.30	3708
6000	1295	3.84	3316	1359	4.09	3530	1421	4.34	3746	—	—	—	—	—	—
6300	1315	4.15	3580	—	—	—	—	—	—	—	—	—	—	—	—
6600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Standard drive range for low-medium static drive on 50TJ016 is 743 to 983 rpm. Standard drive range for the high static drive on the 50TJ016 is 1023 to 1300 rpm. Other rpms require a field-supplied drive.

NOTES:
1. Maximum continuous bhp is 4.25 (400 v) or 3.45 (220 v). The maximum continuous watts is 3775 (400 v) or 3065 (220 v). Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm.
2. Static pressure losses (i.e., EconoMi$erIV) must be added to external static pressure before entering fan performance table.
3. Interpolation is permissible. Do not extrapolate.
4. Fan performance is based on wet coils, clean filters, and casing loses. See Table 17B for accessory/FIOP static pressure information.
5. Extensive motor and drive testing on these units ensures that the full brake horsepower and watts range of the motor can be utilized with confidence. Using fan motors up to the watts or bhp rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
6. Use of a field-supplied motor may affect wiring size. Contact your Carrier representative for details. For additional information on motor performance, refer to Evaporator-Fan Motor Performance Table 21.

Table 15 — Fan Performance Data (English) — 50TJ024* (20 Tons)

AIRFLOW (cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)																				
	0.2			0.4			0.6			0.8			1.0			1.2			1.4		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
5,500	682	1.99	1675	760	2.29	1922	832	2.59	2177	901	2.90	2441	965	3.22	2712	1027	3.56	2990	1086	3.89	3275
6,000	730	2.38	2005	802	2.68	2257	871	2.99	2516	935	3.31	2783	997	3.63	3057	1056	3.97	3337	1112	4.31	3623
6,500	778	2.82	2373	846	3.13	2630	911	3.44	2893	972	3.76	3164	1031	4.09	3440	1087	4.43	3722	1142	4.77	4010
7,000	828	3.31	2780	892	3.62	3042	953	3.94	3310	1011	4.26	3583	1067	4.59	3863	1121	4.93	4148	1173	5.28	4438
7,500	878	3.84	3227	938	4.15	3494	996	4.48	3766	1051	4.81	4043	1105	5.14	4326	1156	5.49	4613	1207	5.83	4906
8,000	928	4.42	3715	985	4.74	3986	1040	5.07	4263	1093	5.40	4544	1144	5.74	4830	1194	6.09	5120	1242	6.44	5415
8,500	979	5.05	4245	1033	5.38	4521	1085	5.71	4801	1136	6.05	5086	1185	6.39	5375	1232	6.74	5669	1279	7.10	5966
9,000	1030	5.73	4817	1082	6.06	5098	1131	6.40	5382	1180	6.74	5671	1227	7.09	5964	1272	7.44	6260	1317	7.80	6561
9,500	1082	6.46	5433	1131	6.80	5718	1178	7.14	6007	1225	7.49	6299	1270	7.84	6595	1313	8.20	6895	1356	8.56	7198
10,000	1134	7.25	6093	1180	7.59	6382	1226	7.94	6675	1270	8.29	6971	1313	8.65	7271	1356	9.01	7574	1397	9.37	7881

AIRFLOW (cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)											
	1.6			1.8			1.9			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
5,500	1142	4.24	3567	1197	4.59	3864	1223	4.77	4015	1249	4.96	4167
6,000	1167	4.66	3915	1219	5.01	4213	1245	5.19	4364	1270	5.37	4516
6,500	1194	5.12	4304	1245	5.47	4602	1270	5.65	4754	1294	5.83	4906
7,000	1224	5.63	4733	1273	5.98	5033	1296	6.17	5184	1320	6.35	5337
7,500	1255	6.19	5203	1302	6.55	5504	1326	6.73	5657	1348	6.91	5810
8,000	1289	6.80	5714	1334	7.16	6018	1357	7.34	6171	1379	7.52	6325
8,500	1324	7.45	6268	1368	7.82	6573	1389	8.00	6728	1411	8.18	6883
9,000	1360	8.16	6865	1403	8.53	7173	1424	8.71	7328	1445	8.90	7484
9,500	1398	8.93	7505	1440	9.29	7815	1460	9.48	7972	1480	9.67	8129
10,000	1438	9.74	8190	1477	10.11	8503	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Standard drive range for low-medium static drive on 50TJ024 is 769 to 909 rpm. Standard drive range for high static drive on 50TJ024 is 994 to 1216 rpm. Other rpms require a field-supplied drive.

NOTES:
1. Maximum continuous bhp is 10.3. The maximum continuous watts is 8640. Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm.
2. Static pressure losses (i.e., EconoMi$erIV) must be added to external static pressure before entering fan performance table.
3. Interpolation is permissible. Do not extrapolate.
4. Fan performance is based on wet coils, clean filters, and casing loses. See Table 18B for accessory/FIOP static pressure information.
5. Extensive motor and drive testing on these units ensures that the full brake horsepower and watts range of the motor can be utilized with confidence. Using fan motors up to the watts or bhp rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
6. Use of a field-supplied motor may affect wiring size. Contact your Carrier representative for details. For additional information on motor performance, refer to Evaporator-Fan Motor Performance Table 21.

Table 16 — Fan Performance Data (English) — 50TJ028 and 030* (25 Tons)

AIRFLOW (cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)																				
	0.2			0.4			0.6			0.8			1.0			1.2			1.4		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
7,000	845	3.26	2693	909	3.60	2979	969	3.96	3272	1028	4.32	3574	1083	4.70	3883	1137	5.08	4,200	1189	5.47	4,524
7,500	896	3.82	3156	956	4.17	3450	1014	4.54	3752	1069	4.91	4060	1123	5.29	4375	1174	5.68	4,698	1224	6.08	5,026
8,000	948	4.43	3667	1005	4.80	3969	1060	5.17	4278	1112	5.56	4593	1163	5.94	4915	1213	6.34	5,243	1261	6.75	5,577
8,500	1001	5.11	4226	1054	5.49	4537	1106	5.87	4853	1156	6.26	5175	1205	6.66	5504	1253	7.06	5,838	1299	7.47	6,177
9,000	1053	5.85	4836	1104	6.23	5155	1154	6.63	5478	1202	7.02	5808	1248	7.43	6142	1294	7.84	6,483	1338	8.26	6,828
9,500	1106	6.65	5498	1155	7.04	5824	1202	7.44	6155	1248	7.85	6492	1293	8.26	6833	1336	8.68	7,179	1379	9.11	7,530
10,000	1159	7.52	6214	1206	7.92	6547	1251	8.33	6886	1295	8.74	7229	1338	9.16	7577	1380	9.59	7,929	1421	10.02	8,286
10,500	1213	8.45	6984	1257	8.86	7325	1300	9.28	7671	1342	9.70	8020	1384	10.13	8375	1424	10.56	8,733	1464	11.00	9,096
11,000	1266	9.45	7810	1309	9.87	8159	1350	10.29	8511	1391	10.73	8868	1431	11.16	9229	1470	11.60	9,594	1508	12.05	9,963
11,250	1293	9.97	8245	1334	10.40	8597	1375	10.83	8953	1415	11.26	9313	1454	11.70	9677	1493	12.15	10,045	1530	12.60	10,417

AIRFLOW (cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)					
	1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts
7,000	1239	5.87	4,854	1288	4.91	5191
7,500	1272	6.48	5,362	1320	5.56	5703
8,000	1307	7.16	5,917	1353	6.26	6263
8,500	1344	7.89	6,523	1388	7.02	6873
9,000	1382	8.68	7,179	1424	7.85	7534
9,500	1421	9.54	7,887	1462	8.74	8247
10,000	1461	10.46	8,648	1501	9.70	9014
10,500	1503	11.45	9,464	1541	10.73	9835
11,000	1546	12.50	10,336	—	—	—
11,250	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

*Standard drive range for low-medium static drive on 50TJ028 and 030 is 888 to 1069 rpm. Standard drive range for high static drive on 50TJ028 and 030 is 1114 to 1341 rpm. Other rpms require a field-supplied drive.

NOTES:
1. Maximum continuous bhp is 13.3 (400 v) or 11.5 (220 v, size 028 only). The maximum continuous watts is 11,000 (400 v) or 9600 (220 v, size 028 only). Do not adjust motor rpm such that motor maximum bhp and/or watts is exceeded at the maximum operating cfm.
2. Static pressure losses (i.e., EconoMi$erIV) must be added to external static pressure before entering fan performance table.
3. Interpolation is permissible. Do not extrapolate.
4. Fan performance is based on wet coils, clean filters, and casing loses. See Table 18B for accessory/FIOP static pressure information.
5. Extensive motor and drive testing on these units ensures that the full brake horsepower and watts range of the motor can be utilized with confidence. Using fan motors up to the watts or bhp rating shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
6. Use of a field-supplied motor may affect wiring size. Contact your Carrier representative for details. For additional information on motor performance, refer to Evaporator-Fan Motor Performance Table 21.

Table 17A — Accessory/FIOP Static Pressure (Pa) — 50TJ016

COMPONENT	L/s				
	2125	2360	2831	3400	3525
EconoMi$erIV	10	12	17	22	25
Glycol Coil	55	65	87	109	114
Electric Heat (kW)					
22.5	15	17	22	27	30
38.2	19	22	27	35	37
55.4	25	27	35	46	48

LEGEND

FIOP — Factory-Installed Option

NOTES:
1. 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 R/s and watts.
2. Heaters are rated at 400 v.

Table 17B — Accessory/FIOP Static Pressure (in. wg) — 50TJ016

COMPONENT	CFM				
	4500	5000	6000	7200	7500
EconoMi$erIV	0.04	0.05	0.07	0.09	0.10
Glycol Coil	0.22	0.26	0.35	0.44	0.46
Electric Heat (kW)					
22.5	0.06	0.07	0.09	0.11	0.12
38.2	0.08	0.09	0.11	0.14	0.15
55.4	0.10	0.11	0.14	0.18	0.19

LEGEND

FIOP — Factory-Installed Option

NOTES:
1. 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.
2. Heaters are rated at 400 v.

Table 18A — Accessory/FIOP Static Pressure (Pa) — 50TJ024-030

COMPONENT	L/s				
	2800	3400	4247	4719	5300
EconoMi$erIV	17	22	27	30	35
Glycol Coil	86	109	144	164	191
Electric Heat (kW)					
22.5	22	27	37	43	50
38.2	28	35	45	53	61
55.4	36	46	57	65	75

LEGEND

FIOP — Factory-Installed Option

NOTES:
1. 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 R/s and watts.
2. Heaters are rated at 400 v.

Table 18B — Accessory/FIOP Static Pressure (in. wg) — 50TJ024-030

COMPONENT	CFM				
	6000	7200	9000	10,000	11,250
EconoMi$erIV	0.07	0.09	0.11	0.12	0.14
Glycol Coil	0.35	0.44	0.58	0.66	0.77
Electric Heat (kW)					
22.5	0.09	0.11	0.15	0.17	0.20
38.2	0.11	0.14	0.18	0.21	0.25
55.4	0.14	0.18	0.23	0.26	0.30

LEGEND

FIOP — Factory-Installed Option

NOTES:
1. 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.
2. Heaters are rated at 400 v.

Table 19A — MoistureMiser Dehumidification Package Static Pressure Drop (Pa)

UNIT SIZE 50TJ	UNIT NOMINAL kW	L/s PER kW		
		40.6	54	67
016	52.8	9.9	17.7	27.6
024	70.3	17.7	31.4	49.0
028, 030	87.9	27.6	49.0	76.7

Table 19B — MoistureMiser Dehumidification Package Static Pressure Drop (in. wg)

UNIT SIZE 50TJ	UNIT NOMINAL TONS	CFM PER TON		
		300	400	500
016	15	.040	.071	.111
024	20	.071	.126	.197
028, 030	25	.111	.197	.308

Table 20A — Fan R/s at Motor Pulley Settings* (Factory-Supplied Drives) (SI)

UNIT 50TJ	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
016**	16.38	15.99	15.58	15.19	14.78	14.38	13.98	13.58	13.18	12.78	12.38	†	†
016††	21.67	21.20	20.75	20.28	19.82	19.37	18.90	18.43	17.97	17.52	17.05	†	†
024**	15.15	14.92	14.68	14.45	14.22	13.98	13.75	13.52	13.28	13.05	12.82	†	†
024††	20.27	19.97	19.66	19.35	19.03	18.73	18.42	18.12	17.80	17.50	17.19	16.88	16.57
028,030**	17.82	17.52	17.21	16.91	16.61	16.31	16.01	15.71	15.40	15.10	14.80	†	†
028,030††	22.35	21.97	21.59	21.22	20.84	20.46	20.08	19.70	19.32	18.95	18.57	†	†

*Approximate fan r/s shown.
†Due to belt and pulley size, pulley cannot be set to this many turns open.
**Low-medium static drive.
††High static drive.

Table 20B — Fan Rpm at Motor Pulley Settings* (Factory-Supplied Drives) (English)

UNIT 50TJ	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
016**	983	959	935	911	887	863	839	815	791	767	743	†	†
016††	1300	1272	1245	1217	1189	1162	1134	1106	1078	1051	1023	†	†
024**	909	895	881	867	853	839	825	811	797	783	769	†	†
024††	1216	1198	1179	1161	1142	1124	1105	1087	1068	1050	1031	1013	994
028,030**	1069	1051	1033	1015	997	979	960	942	924	906	888	†	†
028,030††	1341	1318	1296	1273	1250	1228	1205	1182	1159	1137	1114	†	†

*Approximate fan rpm shown.
†Due to belt and pulley size, pulley cannot be set to this many turns open.
**Low-medium static drive.
††High static drive.

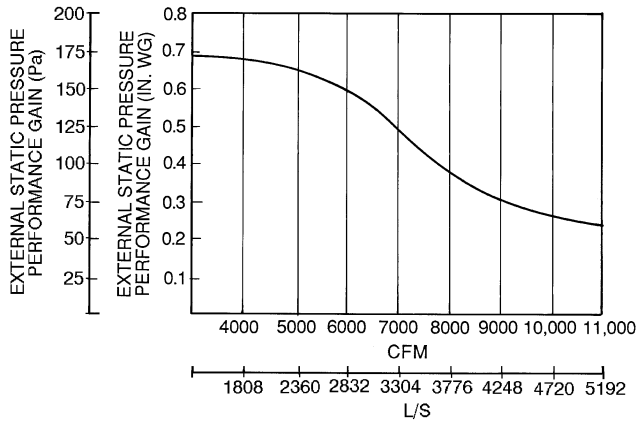
Table 21 — Evaporator-Fan Motor Performance

UNIT 50TJ	UNIT RATED VOLTAGE	MAXIMUM ACCEPTABLE CONTINUOUS BHP*	MAXIMUM ACCEPTABLE CONTINUOUS BkW*	MAXIMUM ACCEPTABLE OPERATING WATTS	MAXIMUM AMP DRAW
016	220	3.45	2.57	3,065	9.4
	400	4.25	3.17	3,775	4.8
024	220	10.30	7.68	8,640	26.0
	400	10.30	7.68	8,640	13.0
028,030	220†	11.50	8.60	9,600	36.0
	400	13.30	9.92	11,000	14.6

LEGEND

Bhp — Brake Horsepower
BkW — Fan Input Watts x Motor Efficiency

*Extensive motor and electrical testing on these units ensures that the full horsepower and kilowatt ranges of the motors can be utilized with confidence. Using your fan motors up to the horsepower or kilowatt ratings shown in this table will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
†Size 028 only.



NOTE: The CRRFCURB013A00 horizontal supply and return adapter accessory improves 50TJ fan performance by increasing external static pressure by amount shown above.

Fig. 30 — Horizontal Supply/Return Fan Performance with CRRFCURB013A00 High-Static Regain Adapter

SERVICE

⚠ WARNING

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

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

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

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

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

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

NOTE: The 50TJ028 unit requires industrial grade throwaway filters capable of withstanding face velocities up to 3.2 m/s (625 fpm). Ensure that replacement filters for the 50TJ028 units are rated for 3.2 m/s (625 fpm).

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

Lubrication

COMPRESSORS — Each compressor is charged with the correct amount of oil at the factory. Conventional white oil (Sontext 200LT) is used. White oil is compatible with 3GS oil, 3GS oil may be used if the addition of oil is required. See compressor nameplate for original oil charge. A complete recharge should be four ounces (89 mL) less than the original oil charge. 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 — For size 016 units, bearings are permanently lubricated. No field lubrication is required. For size 024-030 units, the bearings are of the pillow block type and have grease fittings. The bearing opposite the motor end has an extended tube line so it can be lubricated from the motor side. Lubricate the bearings twice annually.

Typical lubricants are given below:

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

*Preferred lubricant because it contains rust and oxidation inhibitors.

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

NOTE: Field-supplied motors with removable lubrication plug should be lubricated every 6 months.

Evaporator Fan Performance Adjustment (Fig. 32-34) —

Fan motor pulleys are factory set for speed shown in Tables 1A and 1B.

To change fan speeds:

1. Shut off unit power supply.
2. a Size 016 Only: Loosen belt by loosening fan motor mounting plate nuts (see Fig. 33).
   b. Size 024-030 Only: Loosen nuts on the 2 carriage bolts in the motor mounting base. Install jacking bolt and plate under motor base (bolt and plate are shipped in installer's packet). See Fig. 34. Using bolt and plate, raise motor to top of slide and remove belt. Secure motor in this position by tightening the nuts on the carriage bolts.
3. Loosen movable-pulley flange setscrew (see Fig. 32).
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 Tables 1A and 1B. See Table 10 for air quantity limits.
5. Set movable flange at nearest keyway of pulley hub and tighten setscrew. (See Tables 1A and 1B for speed change for each full turn of pulley flange.)
6. Replace and tighten belts. See Belt Tension Adjustment section on page 29.

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.

Evaporator Fan Service and Replacement

50TJ016 UNITS (See Fig. 33)

NOTE: To remove belts only, follow Steps 1-6.

1. Remove filter and supply-air section panels.
2. Remove unit top panel.
3. Loosen carriage nuts A and B holding motor mount assembly to fan scroll side plates.
4. Loosen screw C.
5. Rotate motor mount assembly (with motor attached) as far as possible away from evaporator coil.
6. Remove belt.
7. Rotate motor mount assembly back past original position toward evaporator coil.
8. Remove motor mounting nuts D and E (both sides).
9. Lift motor up through top of unit.
10. Reverse above procedure to reinstall motor.
11. Check and adjust belt tension as necessary.

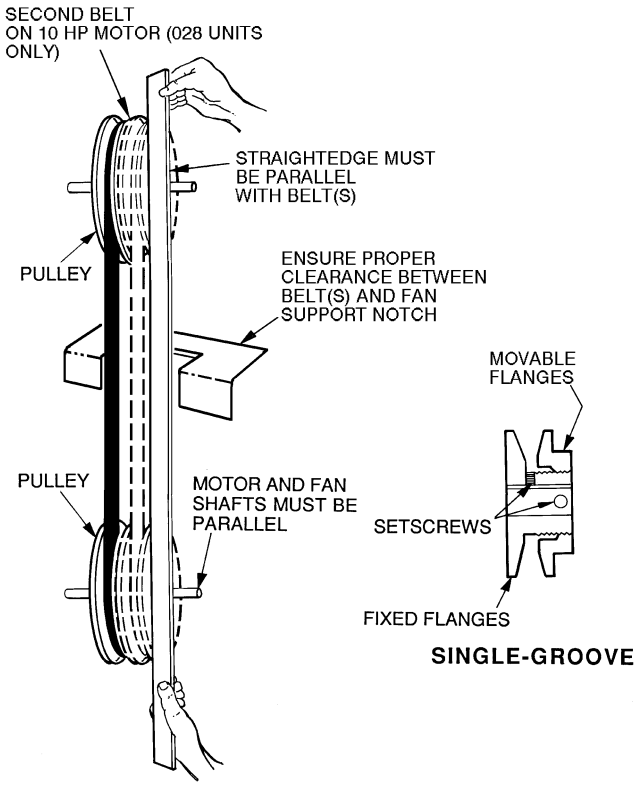


Fig. 32 — Evaporator-Fan Pulley Alignment and Adjustment

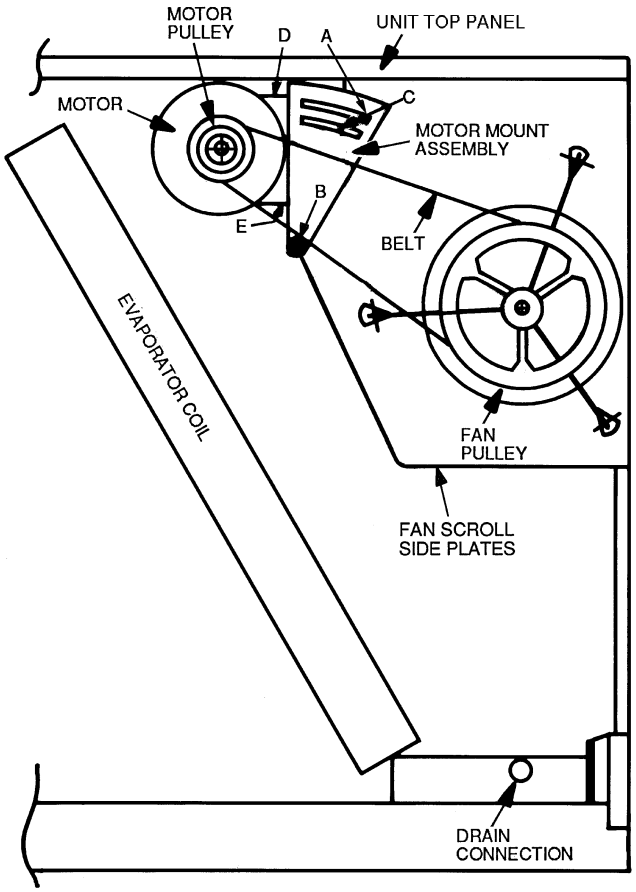


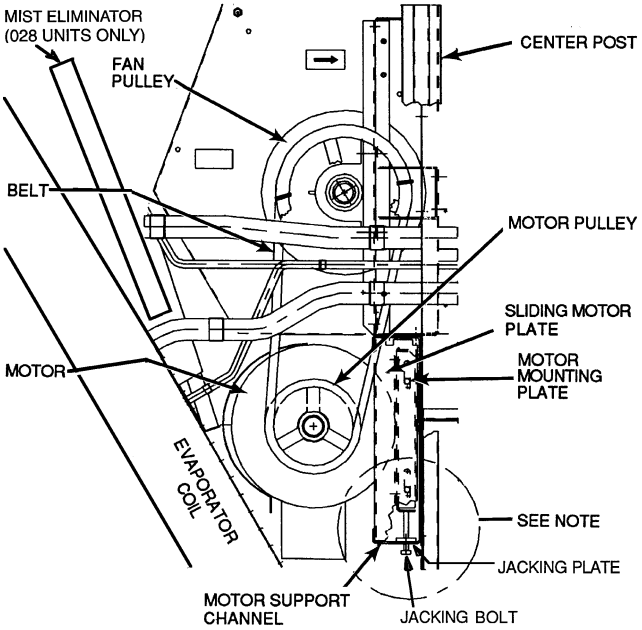
Fig. 33 — 50TJ016 Evaporator-Fan Motor Section

50TJ024-030 UNITS (See Fig. 34) — The 50TJ024-030, units use a fan motor mounting system that features a slide-out motor mounting plate. To replace or service the motor, slide out the bracket.

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

Belt Tension Adjustment — To adjust belt tension:

1. Loosen fan motor bolts.
2. Adjust belt tension:
   a. Size 016 Units: Move motor mounting plate up or down for proper belt tension (13 mm [$^1/_2$ in.] deflection with one finger).



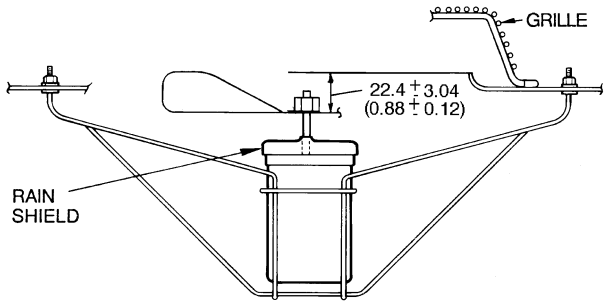
NOTE: A 63-mm ($2^1/_2$-in.) bolt and threaded plate are included in the installer's packet. They should be added to the motor support channel below the motor mounting plate to aid in raising the motor. The plate part no. is 50DP503842. The adjustment bolt is $^3/_8$-16 x $1^3/_4$-inch.

Fig. 34 — 50TJ024-030 Evaporator-Fan Motor Section

   b. Size 024-030 Units: Turn motor jacking bolt to move motor mounting plate up or down for proper belt tension (10 mm [$^3/_8$ in.] deflection at midspan with one finger [4 kg (9 lb) force]).
3. Tighten nuts.
4. Adjust bolts and nut on mounting plate to secure motor in fixed position.

Condenser-Fan Adjustment (Fig. 35)

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



NOTE: Dimensions are in mm (inches).

Fig. 35 — Condenser-Fan Adjustment

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 Tables 1A and 1B).

LOW CHARGE COOLING — Using cooling charging chart (see Fig. 36 and 37), add or remove refrigerant until conditions of the chart are met. Note that charging chart is different from those normally used. 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 15 and 20 degrees of superheat at the compressors. The valves are factory set and should not require re-adjustment.

MOISTUREMISER SYSTEM CHARGING — The system charge for units with the MoistureMiser option is greater than that of the standard unit alone. The charge for units with this option is indicated on the unit nameplate drawing. To charge systems using the MoistureMiser dehumidification package, fully evacuate, recover, and re-charge the system to the nameplate specified charge level. To check or adjust refrigerant charge on systems using the MoistureMiser dehumidification package, charge per the standard subcooling charts. The subcooler MUST be deenergized to use the charging charts. The charts reference a liquid pressure (psig) and temperature at a point between the condenser coil and the subcooler coil. A tap is provided on the unit to measure liquid pressure entering the subcooler (leaving the condenser).

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

Protective Devices

COMPRESSOR PROTECTION

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

Overcurrent — Each compressor has an internal line break motor protection, except the circuit no. 1 on the 50TJ028 unit. Compressor no. 1 on the 50TJ028 unit uses an electronic module located with the compressor junction box, to provide motor protection. This electronic module monitors winding and discharge temperatures. If these temperatures reach the trip values, the module interrupts the control line and causes the compressor to switch off.

Crankcase Heater — Only 50TJ028 and units with MoistureMiser are equipped with a 70-watt crankcase heater to prevent absorption of liquid refrigerant by oil in the crankcase when the compressor is idle. The crankcase heater is energized whenever there is a main power to the unit and the compressor is not energized.

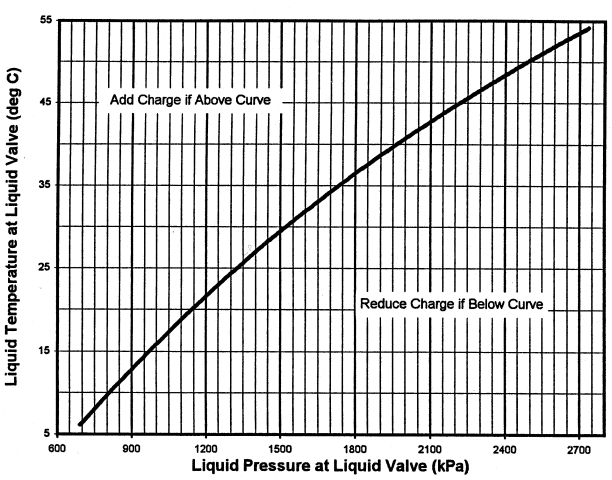


Fig. 36 — Cooling Charging Chart — SI

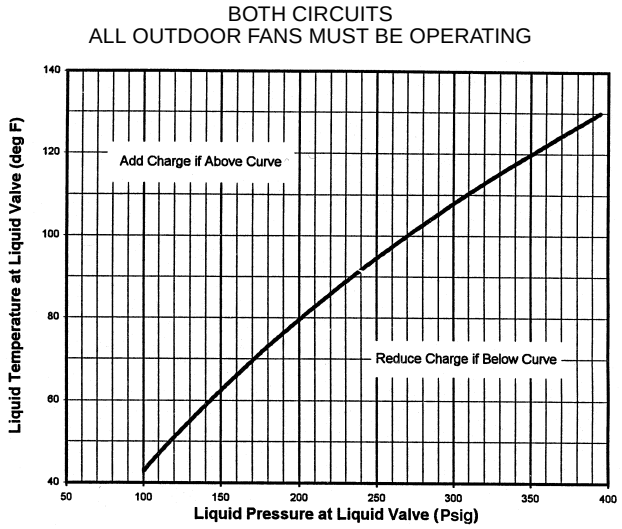


Fig. 37 — Cooling Charging Chart — English

IMPORTANT: After a prolonged shutdown or servicing, energize the crankcase heaters for 24 hours before starting the compressors.

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.

ELECTRONIC MOTOR PROTECTION MODULE — The electronic protection module is used on compressors on 50TJ units. This system utilizes the temperature dependent resistance of thermistors to read motor winding temperature. Four thermistors, connected in series, are embedded in the motor windings. An electronic module processes the resistance values and trips a control relay depending on the thermistor resistance.

For protection in case of blocked rotor, a thermistor (for each phase) is embedded in the winding heads on the upper (suction gas) side of the compressor motor. A fourth thermistor is located in the winding head at the lower end of the motor. A fifth sensor is located in the discharge port to control discharge gas superheat.

The thermistors are connected to the electronic protection module at terminals S1 and S2.

When the resistance of any thermistor reaches tripping value, the electronic protection module interrupts the control line and causes the compressor to switch off. The control line contacts between M1 and M2 are normally open, and close when 24v power is applied to T1 and T2. The electronic protection module will open the contacts between M1 and M2 if the resistance is in excess of 4500 ± 900 ohms, and will reset at 2750 ± 450 ohms.

After the thermistor has cooled off sufficiently, its resistance will drop to the reset value. The electronic protection module, however, resets after a time delay of 30 minutes. In addition, the compressor lockout will need to be reset in order for the compressor to re-start. Resetting of the lockout is accomplished by briefly removing power from Y1 and Y2.

ELECTRONIC PROTECTION MODULE FUNCTIONAL TEST — Prior to start-up of the compressor, a functional check of the electronic protection module should be done. Perform the following procedure to complete the functional check:

1. Switch off unit power at the unit mounted disconnect and lock out handle.
2. Disconnect one terminal, either S1 or S2, from the electronic protection module.
3. Return power to unit. Compressor should not start. If compressor starts, perform electronic protection module failure detection procedure below.
4. Switch off unit power.
5. Reconnect the disconnected thermistor lead.
6. Return power to unit. Compressor should start. If compressor does not start, perform electronic protection module failure detection procedure below.

ELECTRONIC PROTECTION MODULE FAILURE DETECTION — If the compressor does not operate correctly during the functional test, this indicates a disturbance in operation. Perform the following procedure:

1. Switch off unit power at the unit mounted disconnect and lock out handle.
2. Check the connection of the thermistor leads in the electronic protection module terminal box for a loose connection or possible breakage.
3. The resistance of the thermistor chain is measured in a cold condition (after the motor has sufficiently cooled down). Measure resistance of the thermistor at the thermistor leads. Disconnect leads from terminals S1 and S2 and measure between the leads. The resistance must be 1250 ohms or lower. If the thermistor has a higher resistance, it is defective and the compressor must be replaced.

⚠ CAUTION

Use maximum measuring voltage of 3V. Damage to thermistor could occur at higher voltages.

4. If no defect is found with the thermistors, and there is no loose contact or conductor breakage, the electronic protection module should be checked. Before checking the module, remove the connection at terminal M2, then return control voltage to the module.
   a. Check for 24-V between the terminals T1 and T2. If no voltage is found, check unit wiring.

⚠ CAUTION

The voltage should be switched off between voltage tests, in order to avoid short circuiting or accidental touching of contacts.

   b. With the R lead connected to either Y1 or Y2 as appropriate, check for 24-V between M1 and chassis ground. If voltage is not found, check unit wiring.
   c. With the thermistor leads removed from terminals S1 and S2, and 24-V power applied to terminals T1, T2, and M1, there should not be any voltage between terminals T2 and M2. If voltage is present, then the module is defective.
   d. With a jumper across module terminals S1 and S2, and with the R lead connected to either Y1 or Y2 as appropriate, there should be 24 v between terminals M2 and T2. If not, the module is defective.

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

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

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

FREEZE PROTECTION THERMOSTAT (FPT) — An FPT is located on the 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 — This control circuit is protected against overcurrent by a 3.2-amp circuit breaker. Breaker can be reset. If it trips, determine cause of trouble before resetting. See Fig. 38 and 39.

Optional Hinged Access Doors — When the optional service package is ordered or the if the hinged access doors option is ordered, the unit will be provided with external and internal hinged access doors to facilitate service.

Four external hinged access doors are provided. All external doors are provided with 2 large $^1/_4$ turn latches with folding bail-type handles. (Compressor access doors have one latch.) A single door is provided for filter and drive access. One door is provided for control box access. The control box access door is interlocked with the non-fused disconnect which must be in the OFF position to open the door. Two doors are provided for access to the compressor compartment.

Two internal access doors are provided inside the filter/drive access door. The filter access door (on the left) is secured by 2 small $^1/_4$ turn latches with folding bail-type handles. This door must be opened prior to opening the drive access door. The drive access door is shipped with 2 sheet metal screws holding the door closed. Upon initial opening of the door, these screws may be removed and discarded. The door is then held shut by the filter access door, which closes over it.

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

ELECTRIC HEAT				
	400V AMPS	400V KW	380V AMPS	380V KW
A	32.5	22.5	30.9	20.3
B	55.1	38.2	52.3	34.4
C	80	55.4		

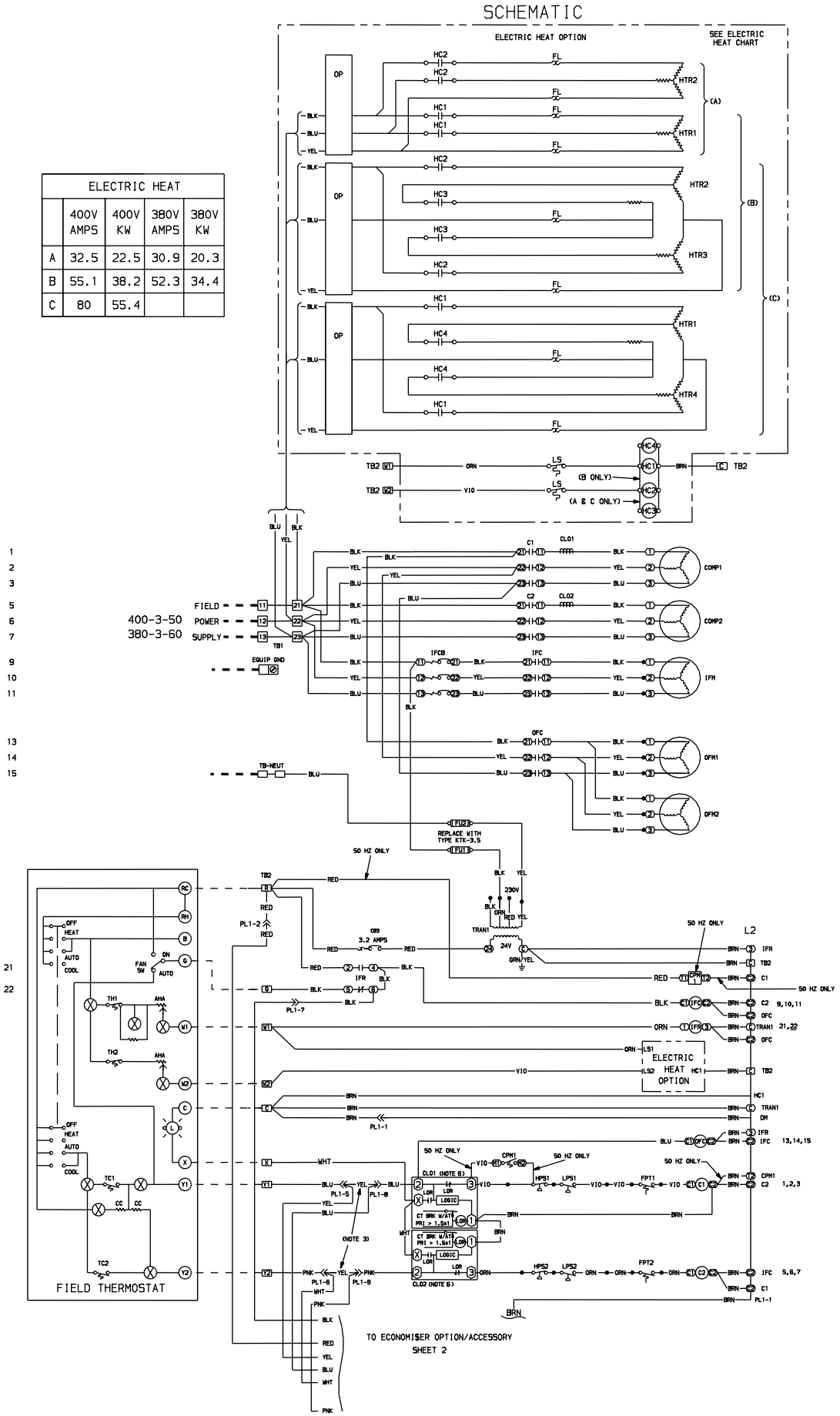


Fig. 38 — Typical Wiring Schematic (50TJ024, 400 V Shown)

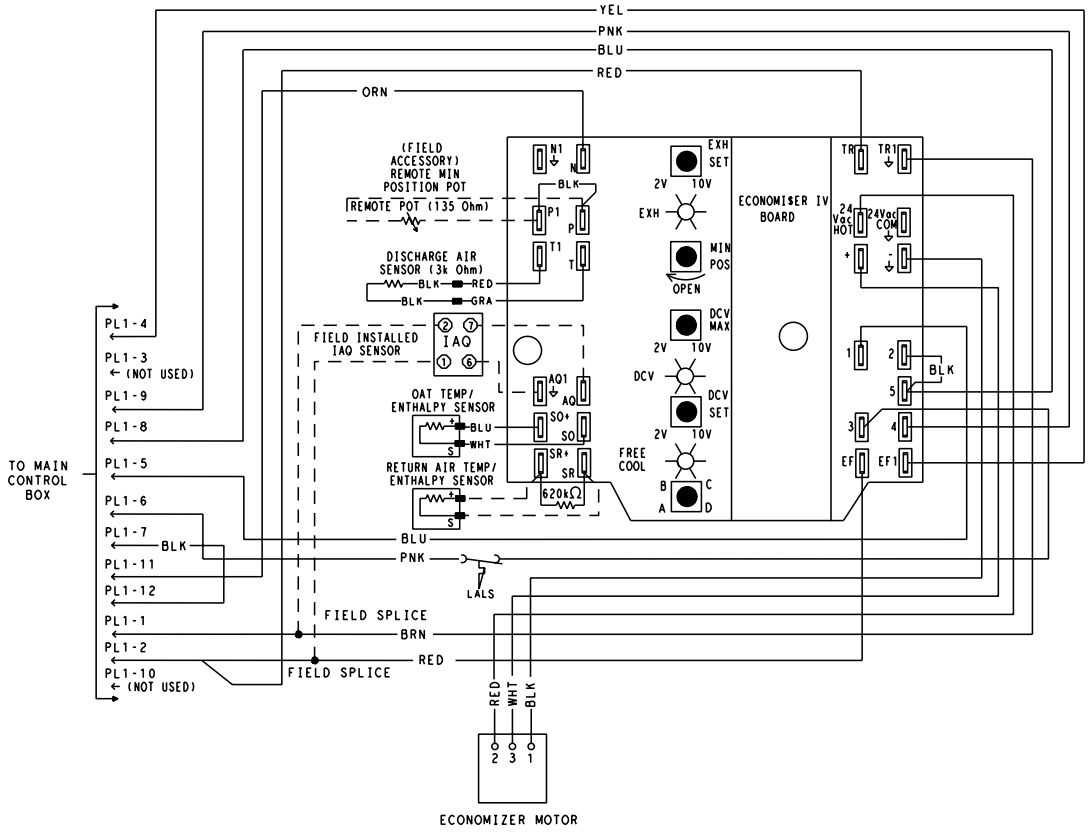


Fig. 38 — Typical Wiring Schematic (50TJ024, 400 V Shown) (cont)

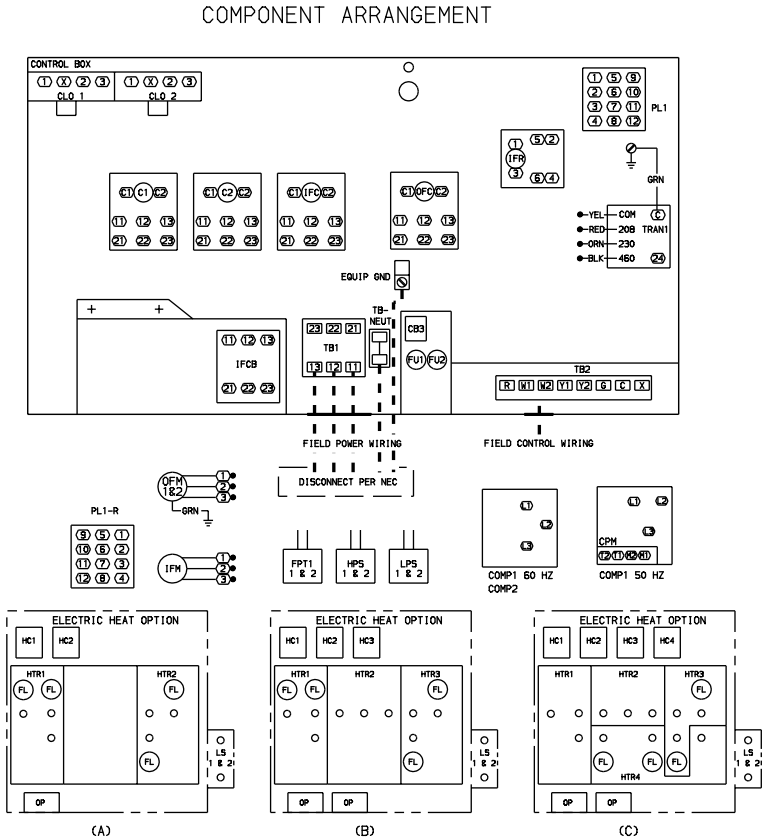


Fig. 39 — Typical Component Arrangement (50TJ024 Shown)

LEGEND AND NOTES FOR FIG. 38 AND 39

LEGEND

AHA — Adjustable Heat Anticipator
AL — Ambient Limit
BKR W/AT — Breaks with Amp Turns
C — Contactor, Compressor
CB — Circuit Breaker
CC — Cooling Compensator
CLO — Compressor Lockout
COMP — Compressor Motor
CPM — Compressor Protection Module
CT — Current Transformer
DM — Damper Motor
ECB — Economizer Control Board
EQUIP — Equipment
FL — Fuse Link
FLA — Full Load Amps
FPT — Freeze Protection Thermostat
FU — Fuse
GND — Ground
HC — Heater Contactor
HPS — High-Pressure Switch
HTR — Heater
IA — Indoor Air
IAQ — Indoor Air Quantity
IFC — Indoor Fan Contactor
IFCB — Indoor Fan Circuit Breaker
IFM — Indoor Fan Motor
IFR — Indoor-Fan Relay
L — Light
LPS — Low-Pressure Switch
LS — Limit Switch
NEC — National Electrical Code
NEUT — Neutral
OA — Outdoor Air
OAS — Outdoor Air Sensor
OFC — Outdoor Fan Contactor
OFM — Outdoor Fan Motor
OP — Overcurrent Protection
PL — Plug Assembly
PRI — Primary
RAS — Return Air Sensor
SAT — Supply Air Temperature
TB — Terminal Block
TC — Thermostat Cooling
TH — Thermostat Heating
TRAN — Transformer


Terminal (Marked)


Terminal (Unmarked)


Terminal Block


Splice

Factory Wiring

Field Control Wiring

Accessory or Optional Wiring

To indicate common potential only; not to represent wiring.

NOTES:
1. Compressor and fan motor(s) thermally protected. Three-phase motors protected against primary single-phasing conditions.
2. If any of the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
3. Jumpers are omitted when unit is equipped with EconoMi$erIV.
5. IFCB must trip amps are equal to or less than 140% FLA.
6. The CLO locks out the compressor to prevent short cycling on compressor overload and safety devices. Before replacing CLO, check these devices.
7. Number(s) indicates the line location of used contacts. A bracket over (2) numbers signifies a single-pole, double-throw contact. An underlined number signifies a normally closed contact. Plain (no line) number signifies a normally open contact.

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 — MoistureMiser Dehumidification Subcooler Service Analysis

PROBLEM	CAUSE	REMEDY
Subcooler Will Not Energize	No power to subcooler control transformer.	Check power source. Ensure all wire connections are tight.
	No power from subcooler control transformer to liquid line three-way valve.	1. Fuse open; check fuse. Ensure continuity of wiring. 2. Subcooler control low pressure switch open. Cycle unit off and allow low-pressure switch to reset. Replace switch if it will not close. 3. Transformer bad; check transformer.
	Liquid line three-way valve will not operate.	1. Solenoid coil defective; replace. 2. Solenoid valve stuck closed; replace.
Subcooler Will Not Deenergize	Liquid line three-way valve will not close.	Valve is stuck open; replace.
Low System Capacity	Low refrigerant charge or frosted coil.	1. Check charge amount. See system charging section. 2. Evaporator coil frosted; check and replace subcooler control low pressure switch if necessary.

**EconoMi$erIV Troubleshooting —** See Table 24 for EconoMi$erIV logic.

A functional view of the EconoMi$erIV is shown in Fig. 40. Typical settings, sensor ranges, and jumper positions are also shown. An EconoMi$erIV simulator program is available from Carrier to help with EconoMi$erIV training and troubleshooting.

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

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$erIV.

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

SINGLE ENTHALPY — To check single enthalpy:

1. Make sure EconoMi$erIV preparation procedure has been performed.
2. Set the enthalpy potentiometer to A (fully CCW). The Free Cool LED should be lit.
3. Set the enthalpy potentiometer to D (fully CW). The Free Cool LED should turn off.
4. Return EconoMi$erIV 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$erIV preparation procedure has been performed.
2. Ensure terminals AQ and AQ1 are open. The LED for both DCV and Exhaust should be off. The actuator should be fully closed.
3. Connect a 9-v battery to AQ (positive node) and AQ1 (negative node). The LED for both DCV and Exhaust should turn on. The actuator should drive to between 90 and 95% open.
4. Turn the Exhaust potentiometer CW until the Exhaust LED turns off. The LED should turn off when the potentiometer is approximately 90%. The actuator should remain in position.
5. Turn the DCV set point potentiometer CW until the DCV LED turns off. The DCV LED should turn off when the potentiometer is approximately 9 v. The actuator should drive fully closed.
6. Turn the DCV and Exhaust potentiometers CCW until the Exhaust LED turns on. The exhaust contacts will close 30 to 120 seconds after the Exhaust LED turns on.
7. Return EconoMi$erIV 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$erIV preparation procedure has been performed.
2. Connect a 9-v battery to AQ (positive node) and AQ1 (negative node). The DCV LED should turn on. The actuator should drive to between 90 and 95% open.
3. Turn the DCV Maximum Position potentiometer to midpoint. The actuator should drive to between 20 and 80% open.
4. Turn the DCV Maximum Position potentiometer to fully CCW. The actuator should drive fully closed.
5. Turn the Minimum Position potentiometer to midpoint. The actuator should drive to between 20 and 80% open.
6. Turn the Minimum Position Potentiometer fully CW. The actuator should drive fully open.
7. Remove the jumper from TR and N. The actuator should drive fully closed.
8. Return EconoMi$erIV settings and wiring to normal after completing troubleshooting.

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

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

ECONOMI$ERIV TROUBLESHOOTING COMPLETION — This procedure is used to return the EconoMi$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$erIV 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).

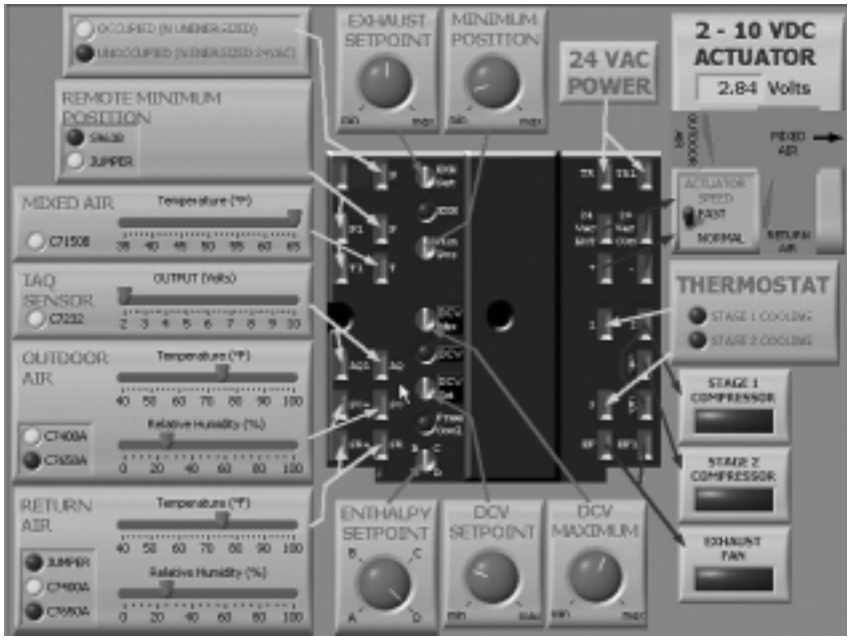


Fig. 40 — EconoMi$erIV Functional View

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 INDOOR FAN MOTOR ADJUSTMENT BOLT (016 UNITS) OR ADJUSTMENT BOLT AND PLATE (024-030 UNITS)
- ☐ VERIFY INSTALLATION OF ECONOMI$ERIV HOOD
- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTRUCTIONS
- ☐ VERIFY THAT ALL ELECTRICAL CONNECTIONS AND TERMINALS ARE TIGHT
- ☐ CHECK THAT FILTERS AND SCREENS ARE CLEAN AND 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 COMPRESSOR IS ROTATING IN THE CORRECT DIRECTION
- ☐ VERIFY THAT CRANKCASE HEATER HAS BEEN ENERGIZED FOR 24 HOURS (SIZE 028 AND UNITS WITH OPTIONAL MOISTUREMISER DEHUMIDIFICATION SYSTEM ONLY)

II. START-UP:

ELECTRICAL

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

COMPRESSOR AMPS — COMPRESSOR NO. 1 L1 _____ L2 _____ L3 _____

— COMPRESSOR NO. 2 L1 _____ L2 _____ L3 _____

SUPPLY FAN AMPS _____ EXHAUST FAN AMPS _____

ELECTRIC HEAT AMPS (IF SO EQUIPPED) L1 _____ L2 _____ L31 _____

TEMPERATURES

OUTDOOR-AIR TEMPERATURE _____ C (F) DB (Dry-Bulb)

RETURN-AIR TEMPERATURE _____ C (F) DB _____ C (F) WB (Wet-Bulb)

COOLING SUPPLY AIR _____ C (F)

ELECTRIC HEAT SUPPLY AIR (IF SO EQUIPPED)_____ C (F)

PRESSURES

REFRIGERANT SUCTION CIRCUIT NO. 1 _____ Pa (PSIG) CIRCUIT NO. 2 _____ Pa (PSIG)

REFRIGERANT DISCHARGE CIRCUIT NO. 1 _____ Pa (PSIG) CIRCUIT NO. 2 _____ Pa (PSIG)

- ☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS ON PAGE 30.

GENERAL

- ☐ ECONOMI$ERIV MINIMUM VENT AND CHANGEOVER SETTINGS TO JOB REQUIREMENTS
- ☐ VERIFY INSTALLATION OF ALL OPTIONS AND ACCESSORIES

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE