Installation, Start-Up and Service Instructions

CONTENTS

SAFETY CONSIDERATIONS

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

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

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

⚠ WARNING

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

⚠ CAUTION

Ensure voltage listed on unit data plate agrees with electrical supply provided for the unit.

INSTALLATION

Unit is shipped in the vertical discharge configuration. To convert to horizontal configuration, remove screws from side duct opening covers and remove covers. Using the same screws, install covers on vertical duct openings with the insulation-side down. Seals around duct openings must be tight. See Fig. 1.

Step 1 — Provide Unit Support

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

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

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

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

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

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

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

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

A minimum clearance to combustibles is not required around ductwork on vertical discharge units. On horizontal discharge units, a minimum clearance of 1 in. is required for the first 12 in. of ductwork. Cabinet return-air static shall not exceed –.20 in. wg with EconoMi$er2 or –.45 in. wg without economizer.

Step 3 — Install External Trap for Condensate Drain — The unit's $^3/_4$-in. condensate drain connections are located at the bottom and side of the unit. Unit discharge connections do not determine the use of drain connections; either drain connection can be used with vertical or horizontal applications.

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

To use the bottom drain connection for a roof curb installation, relocate the factory-installed red plug from the bottom connection to the side connection. See Fig. 4. The piping for the condensate drain and external trap can be completed after the unit is in place. The center drain plug looks like a star connection, however it can be removed with a $^1/_2$-in. socket drive extension.

All units must have an external trap for condensate drainage. Install a trap at least 4 in. deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1 in. per 10 ft of run. Do not use a pipe size smaller than the unit connection ($^3/_4$-in.).

Step 4 — Rig and Place Unit — Inspect unit for transportation damage. File any claim with transportation agency. Keep unit upright and do not drop. Spreader bars are not required if top crating is left on unit. Rollers may be used to move unit across a roof. Level by using unit frame as a reference. See Tables 1A and 1B and Fig. 5 for additional information. Operating weight is shown in Tables 1A and 1B and Fig. 6A and 6B.

Lifting holes are provided in base rails as shown in Fig. 6A and 6B. Refer to rigging instructions on unit.

⚠ CAUTION

All panels must be in place when rigging.

POSITIONING — Maintain clearance around and above unit to provide proper airflow and service access. See Fig. 6A and 6B. A properly positioned unit will have the following clearances: $^1/_4$-in. clearance between roof curb and base rails on each side and duct end of unit; $^1/_4$-in. clearance between roof curb and condenser coil end of unit. (See Fig. 2, section C-C.)

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

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

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

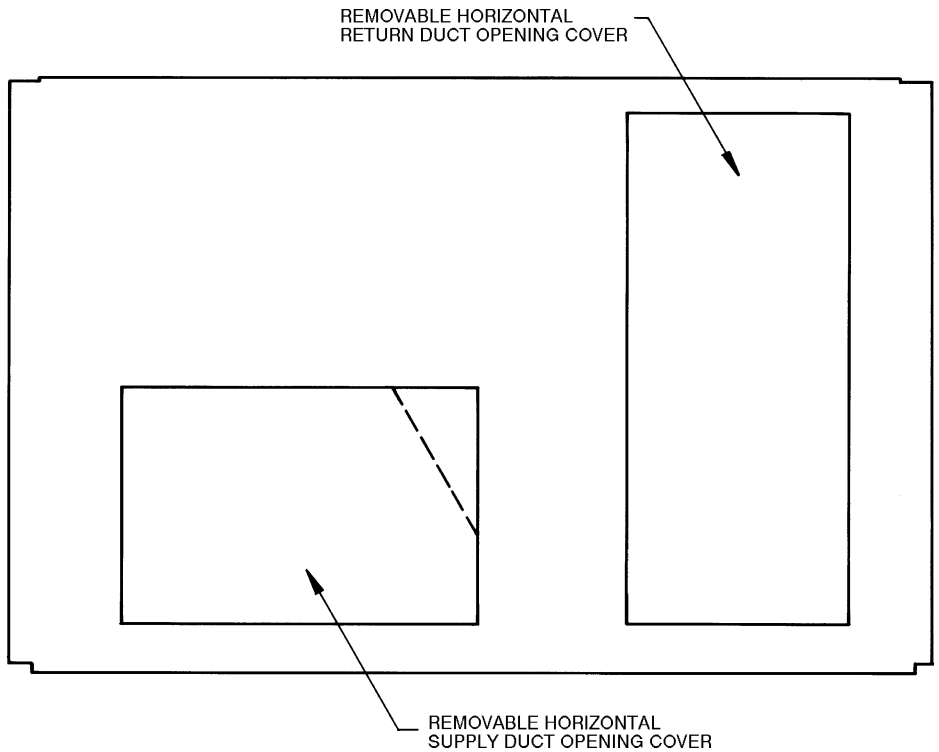


Fig. 1 — Horizontal Conversion Panels

CONNECTOR PKG. ACCY.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL
CRBTMPWR001A00	1′-9 11/16″ [551]	1′-4″ [406]	1 3/4″ [44.5]	3/4″ [19] NPT	3/4″ [19] NPT	1/2″ [12.7]
CRBTMPWR002A00					1 1/4″ [31.7]	
CRBTMPWR003A00				1/2″ [12.7] NPT	3/4″ [19] NPT	1/2″ [12.7]
CRBTMPWR004A00				3/4″ [19] NPT	1 1/4″ [31.7]	

ROOF CURB ACCESSORY	A	UNIT SIZE
CRRFCURB001A00	1′-2″ [356]	50TFF,TM 004-007
CRRFCURB002A00	2′-0″ [610]	

NOTES:
1. Roof curb accessory is shipped disassembled.
2. Insulated panels.
3. Dimensions in [ ] are in millimeters.
4. Roof curb: galvanized steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance: 4 ft on each side.
7. Direction of airflow.
8. Connector packages CRBTMPWR001A00 and 002A00 are for thru-the-curb type gas. Packages CRBTMPWR003A00 and 004A00 are for thru-the-bottom type gas connections.

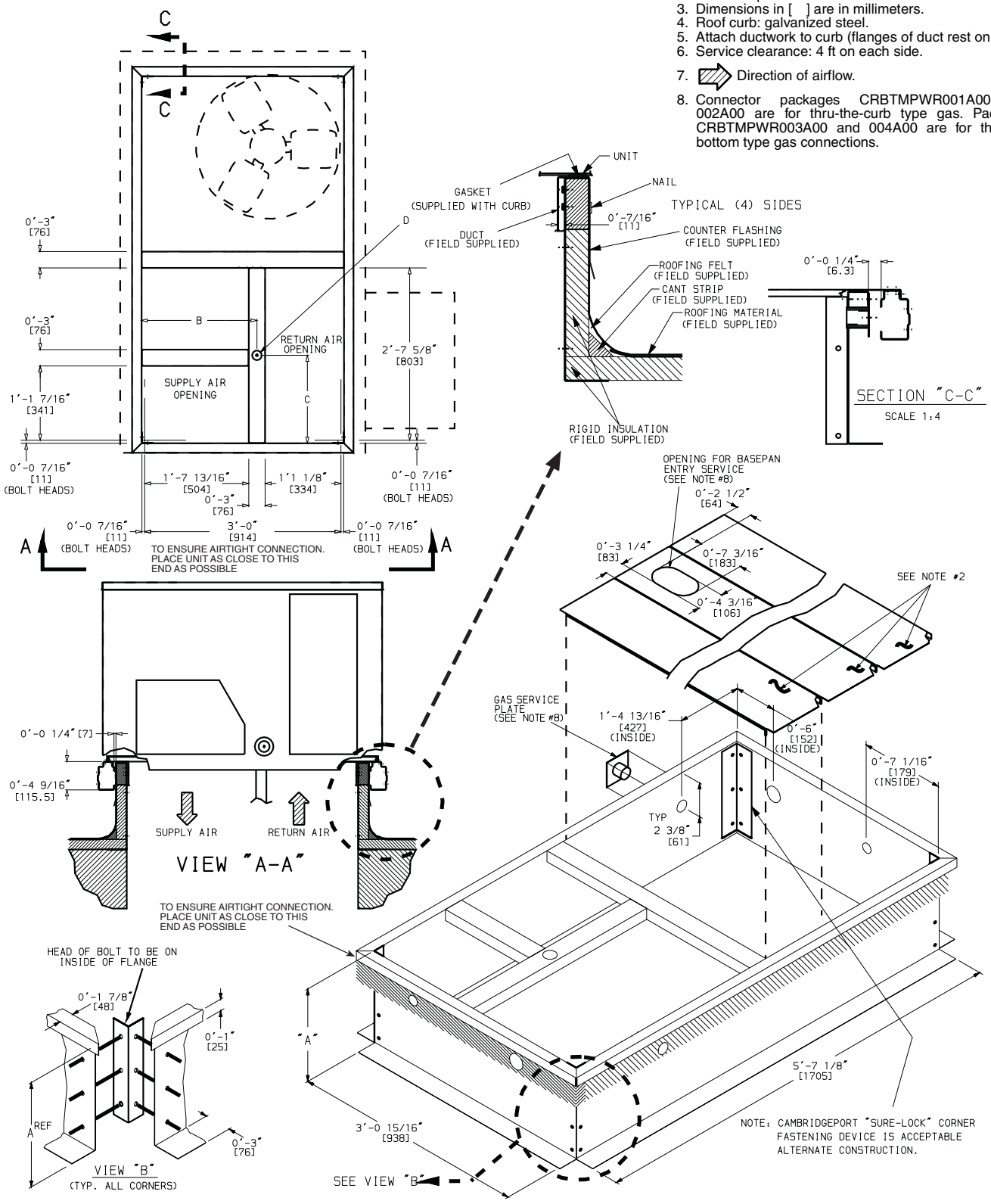
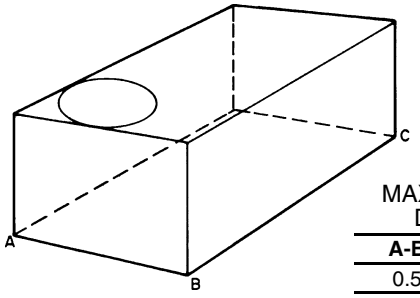


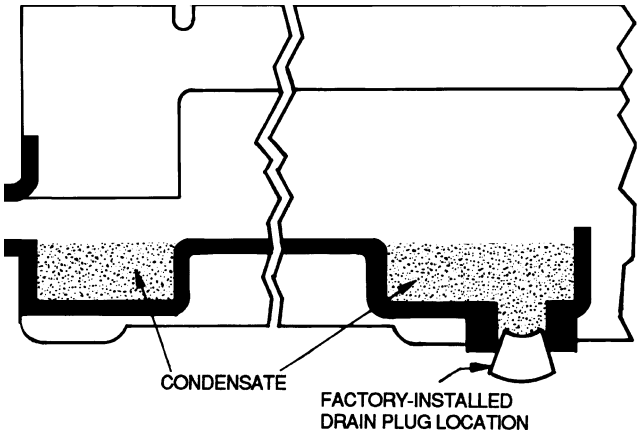
Fig. 2 — Roof Curb Details



MAXIMUM ALLOWABLE DIFFERENCE (in.)

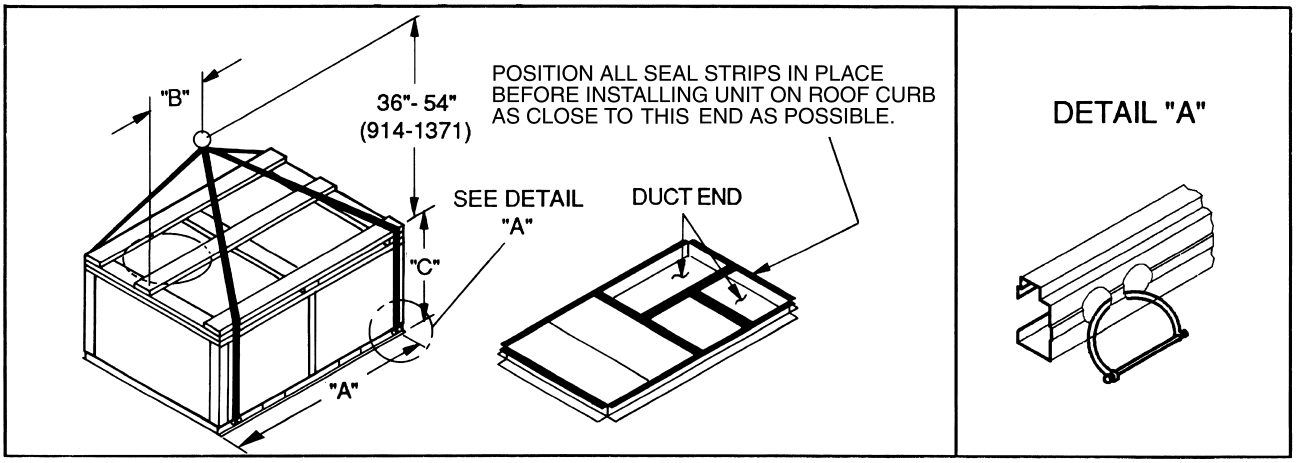
A-B	B-C	A-C
0.5	1.0	1.0

Fig. 3 — Unit Leveling Tolerances



NOTE: Drain plug is shown in factory-installed position.

Fig. 4 — Condensate Drain Connection



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

⚠ CAUTION

All panels must be in place when rigging.

UNIT	MAX WEIGHT		DIMENSIONS					
			"A"		"B"		"C"	
	lb	kg	in.	mm	in.	mm	in.	mm
50TFF,TM004	415	188	73.69	1872	35.00	889	33.35	847
50TFF,TM005	425	193	73.69	1872	35.00	889	33.35	847
50TFF,TM006	445	202	73.69	1872	35.00	889	33.35	847
50TFF007	520	236	73.69	1872	35.00	889	33.35	847
50TM007	570	259	73.69	1872	35.00	889	33.35	847

Fig. 5 — Rigging Details

UNIT	STD. UNIT WEIGHT		DURABLADE ECON WEIGHT		ECONOMI$ER2 WEIGHT		ECONOMI$ER2 W/ P.E. WEIGHT		(A) CORNER WEIGHT		(B) CORNER WEIGHT		(C) CORNER WEIGHT		(D) CORNER WEIGHT		"A" PANEL LENGTH
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	
50T__004	365	165.6	34	15.4	50	22.7	90	40.9	126	57.2	89	40.4	111	50.3	39	17.7	1'-10 3/8" [568.0]
50T__005	375	170.1	↓	↓	↓	↓	↓	↓	128	58.1	90	40.8	114	51.7	43	19.5	1'-10 3/8" [568.0]
50T__006	395	179.2	↓	↓	↓	↓	↓	↓	132	59.9	94	42.6	120	54.4	49	22.2	1'-0 3/8" [315.0]
50TFF007	470	213.2	↓	↓	↓	↓	↓	↓	148	67.1	103	46.7	155	70.3	64	29.0	1'-0 3/8" [315.0]

BOTTOM POWER CHART:
THESE HOLES REQ'D FOR USE WITH ACCESSORY PACKAGES - CRBTMPWR001A00, 3A00 (1/2",3/4")

THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
1/2" 3/4"	24V POWER	7/8" [22.2] 1 1/8" [28.4]

	CONNECTION SIZES
A	1 3/8" DIA. [35] FIELD POWER SUPPLY HOLE
B	2" DIA. [51] POWER SUPPLY KNOCK-OUT
C	2 1/2" DIA. [64] POWER SUPPLY KNOCK-OUT
D	7/8" DIA. [22] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN

NOTES:
1. Dimensions in [ ] are in millimeters.
2. Center of gravity.
3. Direction of airflow.
4. On vertical discharge units, ductwork to be attached to accessory roof curb only. For horizontal discharge units, field-supplied flanges should be attached to horizontal discharge openings, and all ductwork should be attached to the flanges.
5. Minimum clearance (local codes or jurisdiction may prevail):
   a. Bottom of unit to combustible surfaces (when not using curb), 1 inch. Bottom of base rail to combustible surfaces (when not using curb) 0 inches.
   b. Condenser coil, for proper airflow, 36 in. one side, 12 in. the other. The side getting the greater clearance is optional.
   c. Overhead, 60 in. to assure proper condenser fan operation.
   d. Between units, control box side, 42 in. per NEC (National Electrical Code).
   e. Between unit and ungrounded surfaces, control box side, 36 in. per NEC.
   f. Between unit and block or concrete walls and other grounded surfaces, control box side, 42 in. per NEC.
   g. Horizontal supply and return end, 0 in. when the alternate condensate drain is used.
6. With the exception of the clearance for the condenser coil and combustion side as stated in notes 5a, b and c, a removable fence or barricade requires no clearance.
7. Units may be installed on combustible floors made from wood or Class A, B, or C roof covering material if set on base rail.
8. The vertical center of gravity is 1'-6" [457] up from the bottom of the base rail.

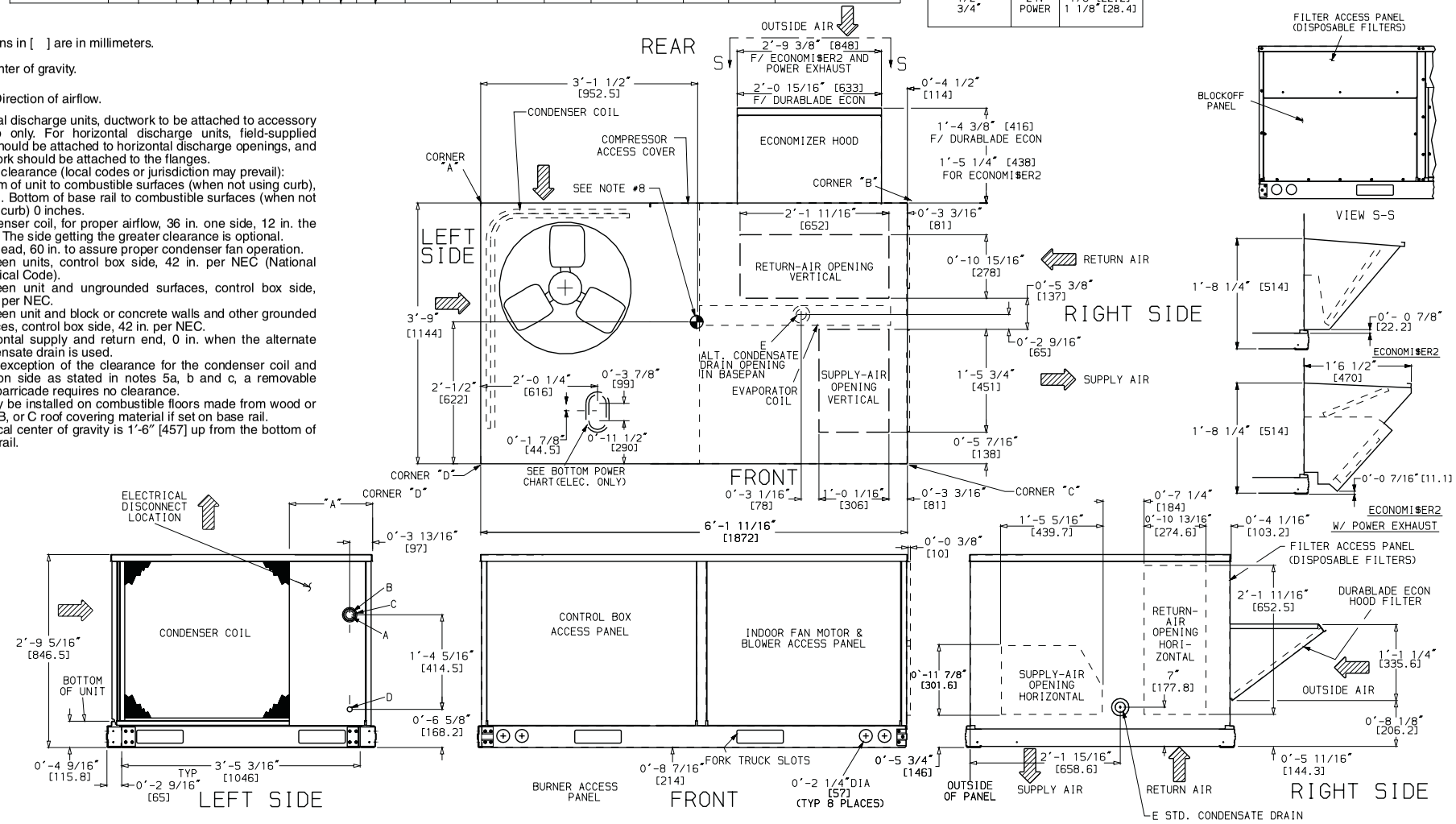


Fig. 6A — Base Unit Dimensions — 50TFF004-007 and 50TM004-006 Units

UNIT	STD. UNIT WEIGHT		DURABLADE ECON WEIGHT		ECONOMI$ER2 WEIGHT		ECONOMI$ER2 W/ P.E. WEIGHT		(A) CORNER WEIGHT		(B) CORNER WEIGHT		(C) CORNER WEIGHT		(D) CORNER WEIGHT		"J"	
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	FT.-IN.	MM
50TM007	520	236	34	15.4	50	22.7	90	40.9	149	67.6	127	57.6	112	50.8	132	59.9	2'-9 5/16"	846.5

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

BOTTOM POWER CHART:
THESE HOLES REQ'D FOR USE WITH ACCESSORY PACKAGES - CRBTMPWR001A00 (1/2",3/4") OR CRBTMPWR002A00 (1/2",1 1/4")

THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
1/2"	24V	7/8" [22.2]
3/4"	POWER*	1 1/8" [28.4]
1 1/4"	POWER*	1 3/4" [44.4]

* - SELECT EITHER 3/4" OR 1 1/4" FOR POWER, DEPENDING ON WIRE SIZE.

	CONNECTION SIZES
A	1 3/8" DIA. [35] FIELD POWER SUPPLY HOLE
B	2" DIA. [51] POWER SUPPLY KNOCK-OUT
C	1 3/4" DIA. [44] CHARGING PORT HOLE
D	7/8" DIA. [22] FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	2 1/2" DIA. [64] POWER SUPPLY KNOCK-OUT

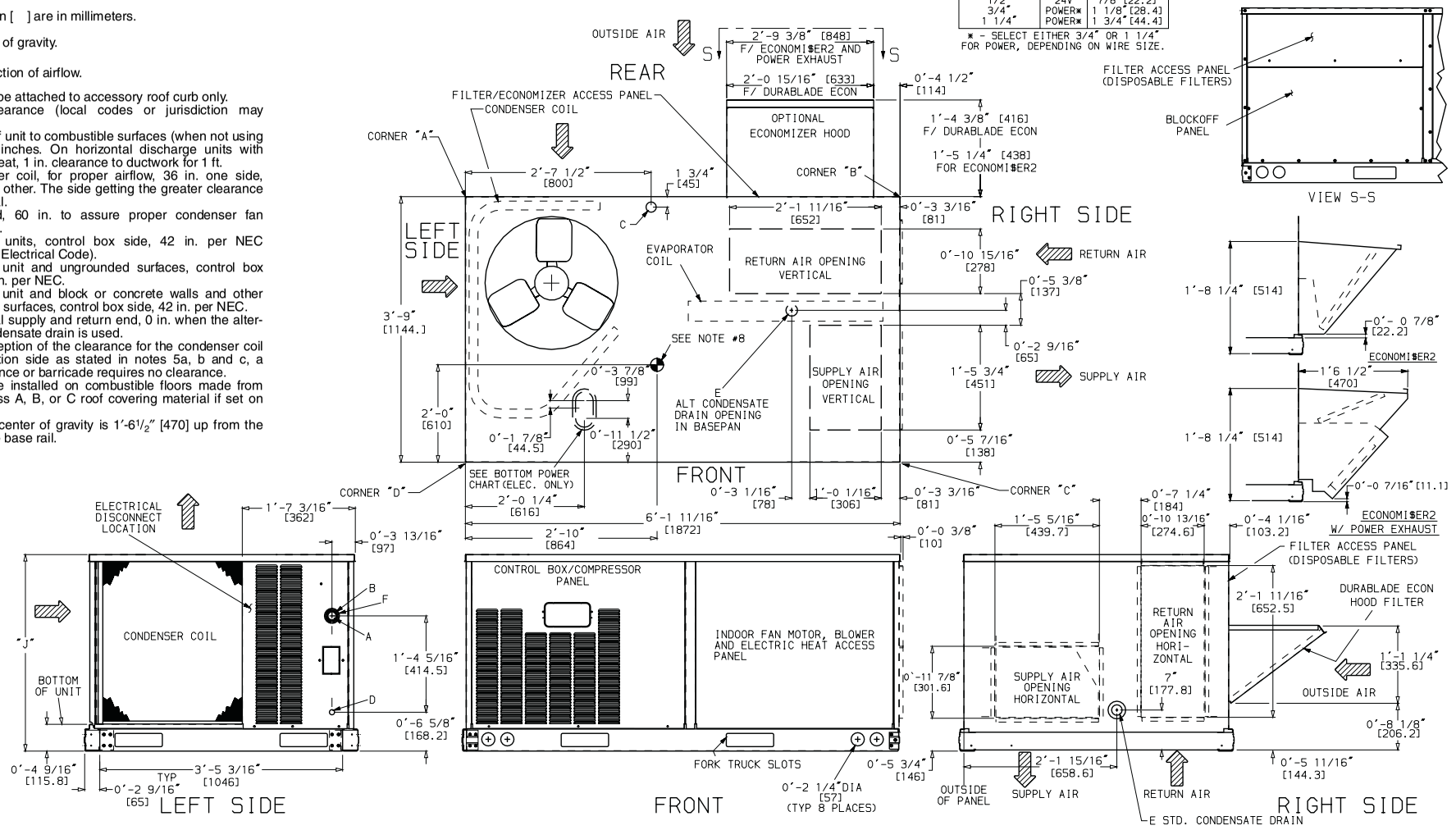


Fig. 6B — Base Unit Dimensions — 50TM007 Units

Table 1A — Physical Data — 50TFF004-007

UNIT SIZE 50TFF		004	005	006	007
NOMINAL CAPACITY (tons)		3	4	5	6
OPERATING WEIGHT (lb)					
Unit					
Al/Al*		365	375	395	470
Al/Cu*		370	381	402	479
Cu/Cu*		373	387	410	490
EconoMi$er2		50	50	50	50
Roof Curb†		115	115	115	115
COMPRESSOR		Reciprocating			Scroll
Quantity		1	1	1	1
No. Cylinders (per circuit)		2	2	2	2
Oil (oz)		50	50	50	54
REFRIGERANT TYPE		R-22			
Operating Charge (lb-oz)					
Circuit 1		4-4	6-6	6-14	9-0
Circuit 2		—	—	—	—
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins			
Rows...Fins/in.		1...17	2...17	2...17	2...17
Total Face Area (sq ft)		8.36	8.36	10.42	10.42
CONDENSER FAN		Propeller Type			
Nominal Cfm		3500	4000	4000	4000
Quantity...Diameter (in.)		1...22.0	1...22.0	1...22.0	1...22.0
Motor Hp...Rpm		1/4...1100	1/4...1100	1/4...1100	1/4...1100
Watts Input (Total)		325	325	325	325
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins			
Expansion Device		Acutrol™ Metering Device			
Rows...Fins/in.		2...15	2...15	3...15	4...15
Total Face Area (sq ft)		4.17	5.5	5.5	5.5
EVAPORATOR FAN		Centrifugal Type			
Quantity...Size (in.)	Std	1...10 x 10	1...10 x 10	1...11 x 10	1...10 x 10
	Alt	1...10 x 10	1...10 x 10	1...10 x 10	—
	High-Static	1...10 x 10	1...10 x 10	1...10 x 10	1...10 x 10
Type Drive	Std	Direct	Direct	Direct	Belt
	Alt	Belt	Belt	Belt	—
	High-Static	Belt	Belt	Belt	Belt
Nominal Cfm		1200	1600	2000	2100
Maximum Continuous Bhp	Std	.34	.75	1.20	2.40
	Alt	1.00	1.00	1.30/2.40**	—
	High-Static	2.40	2.40	2.90	2.90
Motor Frame Size	Std	48	48	48	56
	Alt	48	48	56	—
	High-Static	56	56	56	56
Nominal Rpm High/Low	Std	860/800	1075/970	1075/970	—
	Alt	1620	1620	1725	—
	High-Static	1725	1725	1725	1725
Fan Rpm Range	Std	—	—	—	1070-1460
	Alt	760-1000	835-1185	900-1300	—
	High-Static	1075-1455	1075-1455	1300-1685	1300-1685
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	Std	—	—	—	2.8/3.8
	Alt	1.9/2.9	1.9/2.9	2.4/3.4	—
	High-Static	2.8/3.8	2.8/3.8	3.4/4.4	3.4/4.4
Nominal Motor Shaft Diameter (in.)	Std	1/2	1/2	1/2	5/8
	Alt	1/2	1/2	5/8	—
	High-Static	5/8	5/8	5/8	5/8
Fan Pulley Pitch Diameter (in.)	Std	—	—	—	4.5
	Alt	4.5	4.0	4.5	—
	High-Static	4.5	4.5	4.5	4.5
Belt, Quantity...Type...Length (in.)	Std	—	—	—	1...A...40
	Alt	1...A...34	1...A...34	1...A...39	—
	High-Static	1...A...39	1...A...39	1...A...40	1...A...40
Pulley Center Line Distance (in.)	Std	—	—	—	14.7-15.5
	Alt	10.0-12.4	10.0-12.4	14.7-15.5	—
	High-Static	10.0-12.4	10.0-12.4	14.7-15.5	14.7-15.5
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Std	—	—	—	80
	Alt	48	70	80	—
	High-Static	65	65	60	60
Movable Pulley Maximum Full Turns From Closed Position	Std	—	—	—	5
	Alt	5	5	6	—
	High-Static	6	6	5	5
Factory Setting	Std	—	—	—	3
	Alt	3	3	3	—
	High-Static	3 1/2	3 1/2	3 1/2	3 1/2
Factory Speed Setting (rpm)	Std	—	—	—	1225
	Alt	856	975	1060	—
	High-Static	1233	1233	1396	1396
Fan Shaft Diameter at Pulley (in.)		5/8	5/8	5/8	5/8
HIGH-PRESSURE SWITCH (psig)					
Standard Compressor Internal Relief (Differential)			450 ± 50		500 ± 50
Cutout			428		428
Reset (Auto.)			320		320
LOSS-OF-CHARGE (LOW-PRESSURE) SWITCH (psig)					
Cutout			7 ± 3		
Reset (Auto.)			22 ± 7		
FREEZE-PROTECTION THERMOSTAT (F)					
Opens			30 ± 5		
Closes			45 ± 5		
OUTDOOR-AIR INLET SCREENS			Cleanable		
Quantity...Size (in.)			1...20 x 24 x 1		
RETURN-AIR FILTERS			Throwaway		
Quantity...Size (in.)			2...16 x 25 x 2		

LEGEND

Al — Aluminum
Bhp — Brake Horsepower
Cu — Copper

*Evaporator coil fin material/condenser coil fin material. Contact your local representative for details about coated fins.
†Weight of 14-in. roof curb.
**Single phase/three phase.

Table 1B — Physical Data — 50TM004-007

UNIT SIZE 50TM		004	005	006	007
NOMINAL CAPACITY (tons)		3	4	5	6
OPERATING WEIGHT (lb)					
Unit					
Al/Al*		365	375	395	520
EconoMi$er2		50	50	50	50
Roof Curb†		115	115	115	115
COMPRESSOR		Reciprocating			Scroll
Quantity		1	1	1	1
No. Cylinders (per circuit)		2	2	2	2
Oil (oz)		50	50	50	60
REFRIGERANT TYPE		R-22			
Operating Charge (lb-oz)					
Circuit 1		4-5	6-6	7-14	9-10
Circuit 2		—	—	—	—
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins			
Rows...Fins/in.		1...17	2...17	2...17	2...17
Total Face Area (sq ft)		8.36	8.36	10.42	16.50
CONDENSER FAN		Propeller Type			
Nominal Cfm		3500	4000	4000	4100
Quantity...Diameter (in.)		1...22.0	1...22.0	1...22.0	1...22.0
Motor Hp...Rpm		1/4...1100	1/4...1100	1/4...1100	1/4...1100
Watts Input (Total)		325	325	325	320
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Face Split			
Expansion Device		Acutrol™ Metering Device			
Rows...Fins/in.		2...15	2...15	3...15	4...15
Total Face Area (sq ft)		4.17	5.5	5.5	5.5
EVAPORATOR FAN		Centrifugal Type			
Quantity...Size (in.)	Std	1...10 x 10	1...10 x 10	1...11 x 10	1...10 x 10
	Alt	1...10 x 10	1...10 x 10	1...10 x 10	—
	High-Static	1...10 x 10	1...10 x 10	1...10 x 10	1...10 x 10
Type Drive	Std	Direct	Direct	Direct	Belt
	Alt	Belt	Belt	Belt	—
	High-Static	Belt	Belt	Belt	Belt
Nominal Cfm		1200	1600	2000	2100
Maximum Continuous Bhp	Std	.34	.75	1.20	2.40
	Alt	1.00	1.00	1.30/2.40**	—
	High-Static	2.40	2.40	2.90	2.90
Motor Frame Size	Std	48	48	48	56
	Alt	48	48	56	—
	High-Static	56	56	56	56
Nominal Rpm High/Low	Std	860/800	1075/970	1075/970	—
	Alt	1620	1620	1725	—
	High-Static	1725	1725	1725	1725
Fan Rpm Range	Std	—	—	—	1070-1460
	Alt	760-1000	835-1185	900-1300	—
	High-Static	1075-1455	1075-1455	1300-1685	1300-1685
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	Std	—	—	—	2.8/3.8
	Alt	1.9/2.9	1.9/2.9	2.4/3.4	—
	High-Static	2.8/3.8	2.8/3.8	3.4/4.4	3.4/4.4
Nominal Motor Shaft Diameter (in.)	Std	1/2	1/2	1/2	5/8
	Alt	1/2	1/2	5/8	—
	High-Static	5/8	5/8	5/8	5/8
Fan Pulley Pitch Diameter (in.)	Std	—	—	—	4.5
	Alt	4.5	4.0	4.5	—
	High-Static	4.5	4.5	4.5	4.5
Belt, Quantity...Type...Length (in.)	Std	—	—	—	1...A...40
	Alt	1...A...34	1...A...34	1...A...39	—
	High-Static	1...A...39	1...A...39	1...A...40	1...A...40
Pulley Center Line Distance (in.)	Std	—	—	—	14.7-15.5
	Alt	10.0-12.4	10.0-12.4	14.7-15.5	—
	High-Static	10.0-12.4	10.0-12.4	14.7-15.5	14.7-15.5
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Std	—	—	—	80
	Alt	48	70	80	—
	High-Static	65	65	60	60
Movable Pulley Maximum Full Turns From Closed Position	Std	—	—	—	5
	Alt	5	5	6	—
	High-Static	6	6	5	5
Factory Setting	Std	—	—	—	3
	Alt	3	3	3	—
	High-Static	3 1/2	3 1/2	3 1/2	3 1/2
Factory Speed Setting (rpm)	Std	—	—	—	1225
	Alt	856	975	1060	—
	High-Static	1233	1233	1396	1396
Fan Shaft Diameter at Pulley (in.)		5/8	5/8	5/8	5/8
HIGH-PRESSURE SWITCH (psig)					
Standard Compressor Internal Relief (Differential)			450 ± 50		500 ± 50
Cutout			428		428
Reset (Auto.)			320		320
LOSS-OF-CHARGE (LOW-PRESSURE) SWITCH (psig)					
Cutout			7 ± 3		
Reset (Auto.)			22 ± 7		
FREEZE-PROTECTION THERMOSTAT (F)					
Opens			30 ± 5		
Closes			45 ± 5		
OUTDOOR-AIR INLET SCREENS			Cleanable		
Quantity...Size (in.)			1...20 x 24 x 1		
RETURN-AIR FILTERS			Throwaway		
Quantity...Size (in.)			2...16 x 25 x 2		

LEGEND

Al — Aluminum
Bhp — Brake Horsepower
Cu — Copper

*Evaporator coil fin material/condenser coil fin material. Contact your local representative for details about coated fins.
†Weight of 14-in. roof curb.
**Single phase/three phase.

Step 5 — Make Electrical Connections

⚠ WARNING

Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC (National Electrical Code), ANSI/NFPA (American National Standards Institute/National Fire Protection Association), latest edition (in Canada, Canadian Electrical Code CSA [Canadian Standards Association] C22.1), and local electrical codes. Failure to follow this warning could result in the installer being liable for personal injury of others.

FIELD POWER SUPPLY — All units except 208/230-v units are factory wired for the voltage shown on the nameplate. If the 208/230-v unit is to be connected to a 208-v power supply, the transformer *must* be rewired by moving the black wire from 230-v $^1/_4$-in. spade terminal and connecting it to 200-v $^1/_4$-in. spade terminal of transformer.

See Tables 2A and 2B. Refer to unit label diagram for additional information. Pigtails are provided for field wire connections. Use factory-supplied splices or UL (Underwriters' Laboratories) approved copper/aluminum connector.

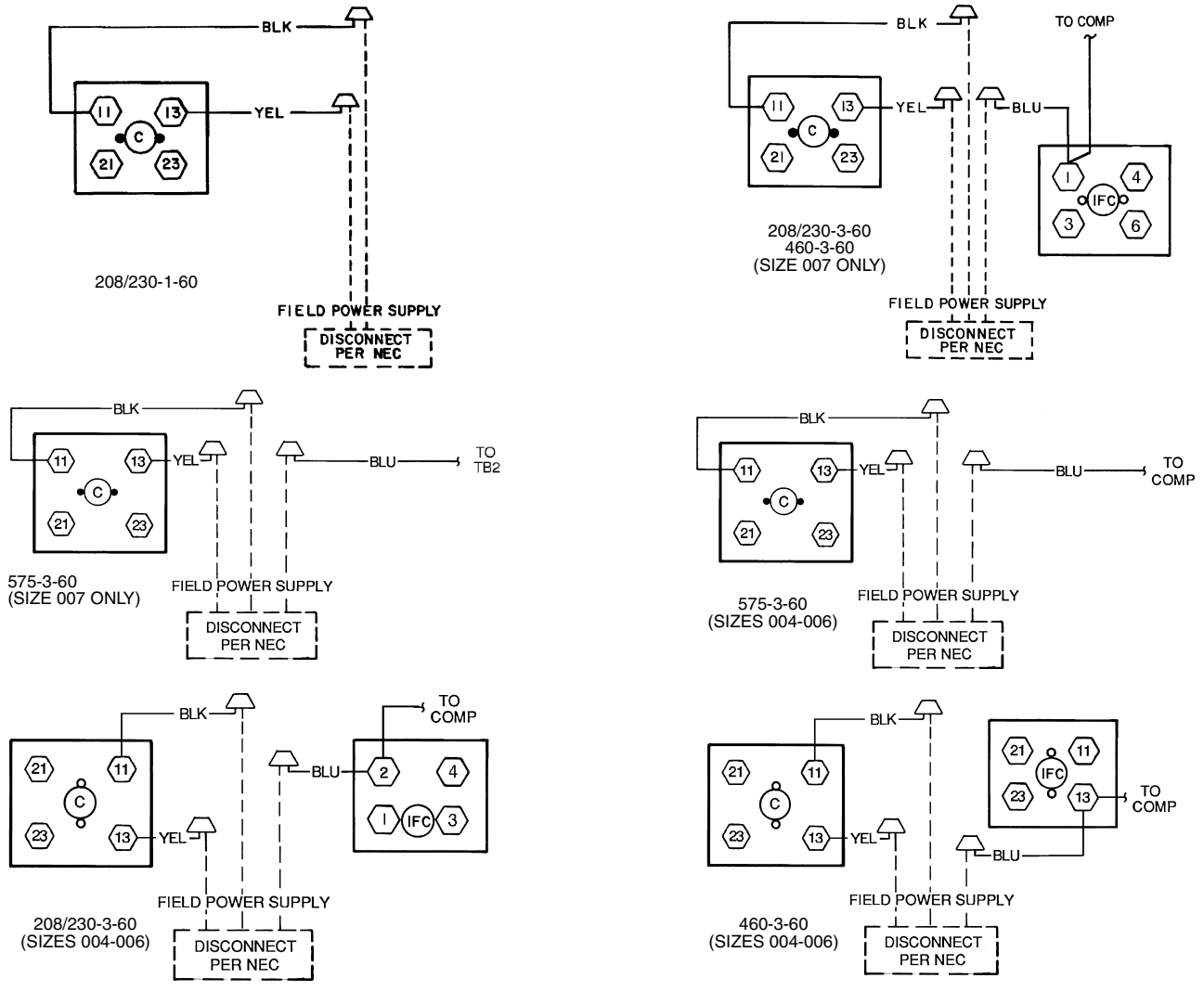
When installing units, provide a disconnect per NEC.

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

Install field wiring as follows:

1. Install conduit through side panel openings. For units without electric heat, install conduit between disconnect and control box.
2. Install power lines to terminal connections as shown in Fig. 7.

Power wiring leads are located inside power wiring access panel.



LEGEND

C — Contactor
COMP — Compressor
IFC — Indoor (Evaporator) Fan Contactor
NEC — National Electrical Code
TB — Terminal Block

Fig. 7 — Power Wiring Connections

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

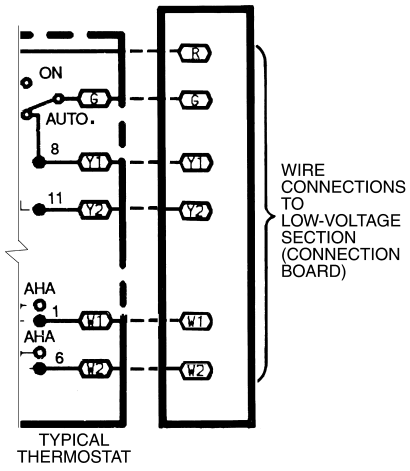
Route thermostat cable or equivalent single leads of colored wire from subbase terminals to low-voltage connections on unit (shown in Fig. 8).

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

Pass the control wires through the hole provided in the corner post; then feed wires through the raceway built into the corner post to the 24-v barrier located on the left side of the control box. See Fig. 9. The raceway provides the UL required clearance between high- and low-voltage wiring.

NOTE: If thru-the-bottom power connections are used refer to the accessory installation instructions for information on power wiring. Refer to Fig. 6A and 6B for drilling holes in basepan.

IMPORTANT: Optional factory-installed, alternate evaporator-fan motors are not available for 50TFF, TM007 units. Contact your local Carrier representative for more information about field-installed motors.



LEGEND

AHA — Adjustable Heat Anticipator
– – – – Field Wiring
——— Factory Wiring

NOTES:
1. Connect Y2 when unit is equipped with an economizer.
2. Connect W1 when unit is equipped with an accessory 1-module heater package. Connect W2 when unit is equipped with an accessory 2-module heater package.

Fig. 8 — Low-Voltage Connections

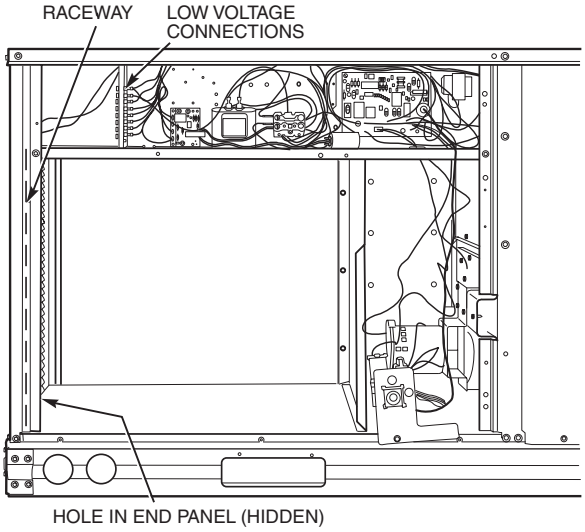


Fig. 9 — Field Control Wiring Raceway

Table 2A — Electrical Data (Without Convenience Outlet)

UNIT 50TFF, TM	NOMINAL V-PH-Hz	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (ea)			OFM (ea)			IFM FLA	HEATER MODEL NO. CRHEATER---A00	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE†		SINGLE POINT BOX P/N CRSINGLE---A00
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA			Nominal kW	FLA	MCA	MOCP*	FLA	LRA	
004	208/230-1-60	STD	187	254	1	16.2	96	1	1/4	1.4	3.5	NONE	—/—	—/—	25.2/25.2	30/30	24/24	106/106	—
												001	3.3/ 4.4	15.9/18.3	25.2/27.3	30/30	24/25	106/106	—
												002	4.9/ 6.5	23.5/27.1	33.7/38.2	35/40	31/35	106/106	—
												003	6.4/ 8.7	31.4/36.3	43.6/49.7	45/50	40/46	106/106	—
												004	7.9/10.5	37.9/43.8	51.8/59.1	60/60	48/54	106/106	—
												002 and 002	9.8/13.0	46.9/54.2	63.0/72.1	70/80	58/66	106/106	004
		ALT									4.9	NONE	—/—	—/—	26.6/26.6	35/35	26/26	111/111	—
												001	3.3/ 4.4	15.9/18.3	26.6/29.0	35/35	26/27	111/111	—
												002	4.9/ 6.5	23.5/27.1	35.5/40.0	40/40	33/37	111/111	—
												003	6.5/ 8.7	31.4/36.3	45.4/51.4	50/60	42/47	111/111	—
												004	7.9/10.5	37.9/43.8	53.5/60.8	60/70	49/56	111/111	004
												002 and 002	9.8/13.0	46.9/54.2	64.8/73.8	70/80	60/68	111/111	004
	208/230-3-60	STD	187	254	1	10.2	75	1	1/4	1.4	3.5	NONE	—/—	—/—	17.7/17.7	25/25	17/17	85/ 85	—
												001	3.3/ 4.4	9.2/10.6	17.7/17.7	25/25	17/17	85/ 85	—
												002	4.9/ 6.5	13.6/15.6	21.3/23.9	25/25	20/22	85/ 85	—
												003	6.5/ 8.7	18.1/20.9	27.0/30.5	30/35	25/28	85/ 85	—
												004	7.9/10.5	21.9/25.3	31.7/35.9	35/40	29/33	85/ 85	—
												005	12.2/16.0	33.4/38.4	46.1/52.4	50/60	42/48	85/ 85	—
		ALT									4.9	NONE	—/—	—/—	19.1/19.1	25/25	19/19	90/ 90	—
												001	3.3/ 4.4	9.2/10.6	19.1/19.4	25/25	19/19	90/ 90	—
												002	4.9/ 6.5	13.6/15.6	23.1/25.7	25/30	21/24	90/ 90	—
												003	6.5/ 8.7	18.1/20.9	28.8/32.3	30/35	26/30	90/ 90	—
												004	7.9/10.5	21.9/25.3	33.5/37.7	35/40	31/35	90/ 90	—
												005	12.3/16.0	33.4/38.4	47.8/54.2	50/60	44/50	90/ 90	—
		HIGH									5.2	NONE	—/—	—/—	19.4/19.4	25/25	19/19	109/109	—
												001	3.3/ 4.4	9.2/10.6	19.4/19.7	25/25	19/19	109/109	—
												002	4.9/ 6.5	13.6/15.6	23.4/26.0	30/30	22/24	109/109	—
												003	6.5/ 8.7	18.1/20.9	29.2/32.7	30/35	27/30	109/109	—
												004	7.9/10.5	21.9/25.3	33.9/38.1	35/40	31/35	109/109	—
												005	12.3/16.0	33.4/38.4	48.2/54.6	50/60	44/50	109/109	—
	460-3-60	STD	414	508	1	4.4	40	1	1/4	0.8	1.3	NONE	—	—	7.6	15	7	44	—
												006	6.0	7.2	10.6	15	10	45	—
												007	8.8	10.6	14.9	15	14	45	—
												008	11.5	13.8	18.9	20	17	45	—
												009	14.0	16.8	22.7	25	21	45	—
		ALT									2.1	NONE	—	—	8.4	15	8	48	—
												006	6.0	7.2	11.6	15	11	48	—
												007	8.8	10.6	15.9	20	15	48	—
												008	11.5	13.8	19.9	20	18	48	—
												009	14.0	16.8	23.7	25	22	48	—
		HIGH									2.6	NONE	—	—	8.9	15	9	57	—
												006	6.0	7.2	12.3	15	11	57	—
												007	8.8	10.6	16.5	20	15	57	—
												008	11.5	13.8	20.5	25	19	57	—
												009	14.0	16.8	24.3	25	22	57	—
	575-3-60	STD	518	632	1	3.7	31	1	1/4	0.8	1.3	NONE	—	—	5.5	15	6	34	—
		ALT									2.1	NONE	—	—	6.0	15	7	37	—
		HIGH									2.6	NONE	—	—	6.3	15	7	56	—

LEGEND

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

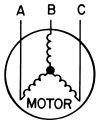
*Used to determine minimum disconnect per NEC.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.



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

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

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

   $$= 457$$

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. For units with power exhaust: If a single power source is to be used, size wire to include power exhaust MCA and MOCP. Check MCA and MOCP when power exhaust is powered through the unit (must be in accordance with NEC and/or local codes). Determine the new MCA including the power exhaust using the following formula:

   MCA New = MCA unit only + MCA of Power Exhaust

   For example, using a 50TFF006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A00 power exhaust.

   MCA New = 28.9 amps + 1.6 amps = 30.5 amps

   If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps, the MCA New is below 35, therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH030A00	1.6	N/A	0.64	15
CRPWREXH021A00	N/A	0.9	N/A	15
CRPWREXH022A00	3.3	N/A	1.32	15
CRPWREXH023A00	N/A	1.8	N/A	15
CRPWREXH028A00	1.7	N/A	0.68	15
CRPWREXH029A00	N/A	1.0	N/A	15

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

UNIT 50TFF, TM	NOMINAL V-PH-Hz	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (ea)			OFM (ea)			IFM FLA	HEATER MODEL NO CRHEATER---A00	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE†		SINGLE POINT BOX P/N CRSINGLE---A00
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA			Nominal kW	FLA	MCA	MOCP*	FLA	LRA	
005	208/230-1-60	STD	187	254	1	23.3	118	1	1/4	1.4	3.5	NONE	—/—	—/—	34.0/ 34.0	40/ 40	32/ 32	129/129	—
												001	3.3/ 4.4	15.9/18.3	34.0/ 34.0	40/ 40	32/ 32	129/129	—
												003	6.5/ 8.7	31.4/36.3	43.6/ 49.7	45/ 50	40/ 46	129/129	—
												002 and 002	9.3/13.0	46.9/54.2	63.0/ 72.1	70/ 80	58/ 66	129/129	004
												003 and 003	13.1/17.4	62.8/72.5	82.9/ 95.0	90/100	76/ 87	129/129	004
												004 and 004	15.8/21.0	75.8/87.5	99.2/113.8	100/125	91/105	129/129	004
		ALT									4.9	NONE	—/—	—/—	35.4/ 35.4	45/ 45	34/ 34	133/133	—
												001	3.3/ 4.4	15.9/18.3	35.4/ 35.4	45/ 45	34/ 34	133/133	—
												003	6.5/ 8.7	31.4/36.3	45.4/ 51.4	50/ 60	42/ 47	133/133	—
												002 and 002	9.3/13.0	46.9/54.2	64.8/ 73.8	70/ 80	60/ 68	133/133	004
												003 and 003	13.1/17.4	62.8/72.5	84.7/ 96.8	90/100	78/ 89	133/133	004
												004 and 004	15.8/21.0	75.8/87.5	100.9/115.5	110/125	93/106	133/133	004
	208/230-3-60	STD	187	254	1	15.4	90	1	1/4	1.4	3.5	NONE	—/—	—/—	24.2/ 24.2	30/ 30	23/ 23	101/101	—
												002	4.9/ 6.5	13.6/15.6	24.2/ 24.2	30/ 30	23/ 23	101/101	—
												003	6.5/ 8.7	18.1/20.9	27.0/ 30.5	30/ 35	25/ 28	101/101	—
												005	12.0/16.0	33.4/38.4	46.1/ 52.4	50/ 60	42/ 48	101/101	—
												004 and 004	15.8/21.0	43.8/50.5	59.1/ 67.5	60/ 70	54/ 62	101/101	002
		ALT									4.9	NONE	—/—	—/—	25.6/ 25.6	30/ 30	25/ 25	105/105	—
												002	4.9/ 6.5	13.6/15.6	25.6/ 25.7	30/ 30	25/ 25	105/105	—
												003	6.5/ 8.7	18.1/20.9	28.8/ 32.3	30/ 35	26/ 30	105/105	—
												005	12.0/16.0	33.4/38.4	47.8/ 54.2	50/ 60	44/ 50	105/105	—
												004 and 004	15.8/21.0	43.8/50.5	60.8/ 69.3	70/ 70	56/ 64	105/105	002
		HIGH									5.2	NONE	—/—	—/—	25.9/ 25.9	30/ 30	25/ 25	124/124	—
												002	4.9/ 6.5	13.6/15.6	25.9/ 26.0	30/ 30	25/ 25	124/124	—
												003	6.5/ 8.7	18.1/20.9	29.2/ 32.7	30/ 35	27/ 30	124/124	—
												005	12.0/16.0	33.4/38.4	48.2/ 54.6	50/ 60	44/ 50	124/124	—
												004 and 004	15.8/21.0	43.8/50.5	61.2/ 69.6	70/ 70	56/ 64	124/124	002
	460-3-60	STD	414	508	1	8.3	45	1	1/4	0.8	1.8	NONE	—	—	13.0	20	13	51	—
												006	6.0	7.2	13.0	20	13	51	—
												008	11.5	13.8	19.5	20	18	51	—
												009	14.0	16.8	23.3	25	21	51	—
												008 and 008	23.0	27.7	36.8	40	34	51	—
		ALT									2.1	NONE	—	—	13.3	20	13	53	—
												006	6.0	7.2	13.3	20	13	53	—
												008	11.5	13.8	19.9	20	18	53	—
												009	14.0	16.8	23.7	25	22	53	—
												008 and 008	23.0	27.7	37.2	40	34	53	—
		HIGH									2.6	NONE	—	—	13.8	20	13	62	—
												006	6.0	7.2	13.8	20	13	62	—
												008	11.5	13.8	20.5	25	19	62	—
												009	14.0	16.8	24.3	25	22	62	—
												008 and 008	23.0	27.7	37.8	40	35	62	—
	575-3-60	STD	518	632	1	6.4	36	1	1/4	0.8	1.8	NONE	—	—	9.2	15	10	41	—
		ALT									2.1	NONE	—	—	9.3	15	10	42	—
		HIGH									2.6	NONE	—	—	9.7	15	10	49	—

LEGEND

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

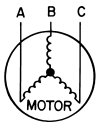
*Used to determine minimum disconnect per NEC.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

% Voltage Imbalance

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

Example: Supply voltage is 460-3-60.



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

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

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

$$= 457$$

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

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

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

$$= 1.53\%$$

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

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

3. For units with power exhaust: If a single power source is to be used, size wire to include power exhaust MCA and MOCP. Check MCA and MOCP when power exhaust is powered through the unit (must be in accordance with NEC and/or local codes). Determine the new MCA including the power exhaust using the following formula:

MCA New = MCA unit only + MCA of Power Exhaust

For example, using a 50TFF006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A00 power exhaust.

MCA New = 28.9 amps + 1.6 amps = 30.5 amps

If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps, the MCA New is below 35, therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH030A00	1.6	N/A	0.64	15
CRPWREXH021A00	N/A	0.9	N/A	15
CRPWREXH022A00	3.3	N/A	1.32	15
CRPWREXH023A00	N/A	1.8	N/A	15
CRPWREXH028A00	1.7	N/A	0.68	15
CRPWREXH029A00	N/A	1.0	N/A	15

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

UNIT 50TFF, TM	NOMINAL V-PH-Hz	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (ea)			OFM (ea)			IFM FLA	HEATER MODEL NO. CRHEATER---A00	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE†		SINGLE POINT BOX P/N CRSINGLE---A00
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA			Nominal kW	FLA	MCA	MOCP*	FLA	LRA	
006	208/230-1-60	STD	187	254	1	28.8	147	1	1/4	1.4	5.9	NONE	—/—	—/—	43.3/ 43.3	60/ 60	42/ 42	161/161	—
												002	4.9/ 6.5	23.5/27.1	43.3/ 43.3	60/ 60	42/ 42	161/161	—
												003	6.5/ 8.7	31.4/36.3	46.6/ 52.7	50/ 60	43/ 48	161/161	—
												002 and 002	9.8/13.0	46.9/54.2	66.0/ 75.1	70/ 80	61/ 69	161/161	004
												003 and 003	13.1/17.4	62.8/72.5	85.9/ 98.0	90/100	79/ 90	161/161	004
												004 and 004	15.8/21.0	75.8/87.5	102.2/116.8	110/125	94/107	161/161	004
		ALT									6.6	NONE	—/—	—/—	44.0/ 44.0	60/ 60	42/ 42	184/184	
												002	4.9/ 6.5	23.5/27.1	44.0/ 44.0	60/ 60	42/ 42	184/184	—
												003	6.5/ 8.7	31.4/36.3	47.5/ 53.6	50/ 60	44/ 49	184/184	—
												002 and 002	9.8/13.0	46.9/54.2	66.9/ 76.0	70/ 80	62/ 70	184/184	004
												003 and 003	13.1/17.4	62.8/72.5	86.8/ 98.9	90/100	80/ 91	184/184	004
												004 and 004	15.8/21.0	75.8/87.5	103.0/117.6	110/125	95/108	184/184	004
	208/230-3-60	STD	187	254	1	16	114	1	1/4	1.4	5.9	NONE	—/—	—/—	27.3/ 27.3	35/ 35	27/ 27	128/128	—
												002	4.9/ 6.5	13.6/15.6	27.3/ 27.3	35/ 35	27/ 27	128/128	—
												004	7.9/10.5	21.9/25.3	34.7/ 38.9	40/ 40	32/ 36	128/128	—
												005	12.0/16.0	33.4/38.4	49.1/ 55.4	50/ 60	45/ 51	128/128	—
												004 and 004	15.8/21.0	43.8/50.5	62.1/ 70.5	70 80	57/ 65	128/128	—
												004 and 005	19.9/26.5	55.2/63.8	76.4/ 87.1	80/ 90	70/ 80	128/128	—
		ALT									5.2	NONE	—/—	—/—	26.6/ 26.6	35/ 35	26/ 26	148/148	—
												002	4.9/ 6.5	13.6/15.6	26.6/ 26.6	35/ 35	26/ 26	148/148	—
												004	7.9/10.5	21.9/25.3	33.9/ 38.1	35/ 40	31/ 35	148/148	—
												005	12.0/16.0	33.4/38.4	48.2/ 54.6	50/ 60	44/ 50	148/148	—
												004 and 004	15.8/21.0	43.8/50.5	61.2/ 69.6	70/ 70	56/ 64	148/148	—
												004 and 005	19.9/26.5	55.2/63.8	75.6/ 86.2	80/ 90	70/ 79	148/148	—
		HIGH									7.5	NONE	—/—	—/—	28.9/ 28.9	35/ 35	29/ 29	174/174	—
												002	4.9/ 6.5	13.6/15.6	28.9 28.9	35/ 35	29/ 29	174/174	—
												004	7.9/10.5	21.9/25.3	36.7/ 40.9	40/ 45	34/ 38	174/174	—
												005	12.0/16.0	33.4/38.4	51.1/ 57.4	60/ 60	47/ 53	174/174	—
												004 and 004	15.8/21.0	43.8/50.5	64.1/ 72.5	70/ 80	59/ 67	174/174	002
												004 and 005	19.9/26.5	55.2/63.8	78.4/ 89.1	80/ 90	72/ 82	174/174	002
	460-3-60	STD	414	508	1	7.4	64	1	1/4	0.8	3.1	NONE	—	—	13.2	20	13	71	—
												006	6.0	7.2	13.2	20	13	72	—
												008	11.5	13.8	21.2	25	19	72	—
												009	14.0	16.8	24.9	25	23	72	—
												008 and 008	23.0	27.7	38.5	40	35	72	—
												008 and 009	25.0	30.1	41.5	45	38	72	—
		ALT									2.6	NONE	—	—	13.5	20	13	81	—
												006	6.0	7.2	13.5	20	13	81	—
												008	11.5	13.8	21.5	25	20	81	—
												009	14.0	16.8	25.3	30	23	81	—
												008 and 008	23.0	27.7	38.8	40	36	81	—
												008 and 009	25.0	30.1	41.8	45	38	81	—
		HIGH									3.4	NONE	—	—	13.5	20	13	93	—
												006	6.0	7.2	13.5	20	13	94	—
												008	11.5	13.8	21.5	25	20	94	—
												009	14.0	16.8	25.3	30	23	94	—
												008 and 008	23.0	27.7	38.8	40	36	94	—
												008 and 009	25.0	30.1	41.8	45	38	94	—
	575-3-60	STD	518	632	1	6.2	52	1	1/4	0.8	3.1	NONE	—	—	9.7	15	11	58	—
		ALT									2.6	NONE	—	—	9.9	15	11	65	—
		HIGH									3.4	NONE	—	—	9.9	15	11	75	—

LEGEND

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

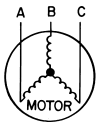
*Used to determine minimum disconnect per NEC.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.



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

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

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

$$= 457$$

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

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

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

$$= 1.53\%$$

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

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

3. For units with power exhaust: If a single power source is to be used, size wire to include power exhaust MCA and MOCP. Check MCA and MOCP when power exhaust is powered through the unit (must be in accordance with NEC and/or local codes). Determine the new MCA including the power exhaust using the following formula:

   MCA New = MCA unit only + MCA of Power Exhaust

   For example, using a 50TFF006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A00 power exhaust.

   MCA New = 28.9 amps + 1.6 amps = 30.5 amps

   If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps, the MCA New is below 35, therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH030A00	1.6	N/A	0.64	15
CRPWREXH021A00	N/A	0.9	N/A	15
CRPWREXH022A00	3.3	N/A	1.32	15
CRPWREXH023A00	N/A	1.8	N/A	15
CRPWREXH028A00	1.7	N/A	0.68	15
CRPWREXH029A00	N/A	1.0	N/A	15

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

UNIT 50TFF, TM	NOMINAL V-PH-Hz	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (ea)			OFM (ea)			IFM FLA	HEATER MODEL NO. CRHEATER---A00	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE†		SINGLE POINT BOX P/N CRSINGLE---A00
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA			Nominal kW	FLA	MCA	MOCP*	FLA	LRA	
007	208/230-3-60	STD	187	254	1	20.6	146	1	1/4	1.4	5.2	NONE	—/—	—/—	32.4/32.4	40/40	31/31	180/180	—
												002	4.9/ 6.5	13.6/15.6	32.4/32.4	40/40	31/31	180/180	—
												004	7.9/10.5	21.9/25.3	33.9/38.1	35/40	31/35	180/180	—
												005	12.0/16.0	33.4/38.4	48.2/54.6	50/60	44/50	180/180	—
												004 and 004	15.8/21.0	43.8/50.5	61.2/69.6	70/70	56/64	180/180	—
												004 and 005	19.9/26.5	55.2/63.8	75.6/86.2	80/90	70/79	180/180	—
		HIGH									7.5	NONE	—/—	—/—	34.7/34.7	40/40	34/34	205/205	—
												002	4.9/ 6.5	13.6/15.6	34.7/34.7	40/40	34/34	205/205	—
												004	7.9/10.5	21.9/25.3	36.7/40.9	40/45	34/38	205/205	—
												005	12.0/16.0	33.4/38.4	51.1/57.4	60/60	47/53	205/205	—
												004 and 004	15.8/21.0	43.8/50.5	64.1/72.5	70/80	59/67	205/205	002
												004 and 005	19.9/26.5	55.2/63.8	78.4/89.1	80/90	72/82	205/205	002
	460-3-60	STD	414	508	1	9.5	73	1	1/4	0.9	2.6	NONE	—	—	15.4	20	15	90	—
												006	6.0	7.2	15.4	20	15	90	—
												008	11.5	13.8	20.5	25	19	90	—
												009	14.0	16.8	24.3	25	22	90	—
												008 and 008	23.0	27.7	37.8	40	35	90	—
												008 and 009	25.5	30.7	41.6	45	38	90	—
		HIGH									3.4	NONE	—	—	16.2	20	16	103	—
												006	6.0	7.2	16.2	20	16	103	—
												008	11.5	13.8	21.5	25	20	103	—
												009	14.0	16.8	25.3	30	23	103	—
												008 and 008	23.0	27.7	38.8	40	36	103	—
												008 and 009	25.5	30.7	42.6	45	39	103	—
	575-3-60	STD	518	632	1	7.6	62	1	1/4	0.9	2.6	NONE	—	—	11.4	15	12	75	—
		HIGH									3.4	NONE	—	—	11.9	15	13	86	—

LEGEND

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

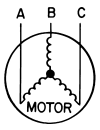
*Used to determine minimum disconnect per NEC.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.



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

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

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

   $$= 457$$

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. For units with power exhaust: If a single power source is to be used, size wire to include power exhaust MCA and MOCP. Check MCA and MOCP when power exhaust is powered through the unit (must be in accordance with NEC and/or local codes). Determine the new MCA including the power exhaust using the following formula:

   MCA New = MCA unit only + MCA of Power Exhaust

   For example, using a 50TFF006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A00 power exhaust.

   MCA New = 28.9 amps + 1.6 amps = 30.5 amps

   If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps, the MCA New is below 35, therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH030A00	1.6	N/A	0.64	15
CRPWREXH021A00	N/A	0.9	N/A	15
CRPWREXH022A00	3.3	N/A	1.32	15
CRPWREXH023A00	N/A	1.8	N/A	15
CRPWREXH028A00	1.7	N/A	0.68	15
CRPWREXH029A00	N/A	1.0	N/A	15

Table 2B — Electrical Data (With Convenience Outlet)

UNIT 50TFF TM	NOMINAL V-PH-Hz	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (ea)			OFM (ea)			IFM FLA	HEATER MODEL NO. CRHEATER---A00	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE†		SINGLE POINT BOX P/N CRSINGLE---A00
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA			Nominal kW	FLA	MCA	MOCP*	FLA	LRA	
004	208/230-1-60	STD	187	254	1	16.2	96	1	1/4	1.4	3.5	NONE	—/—	—/—	31.2/31.2	35/35	30/30	111/111	—
												001	3.3/ 4.4	15.9/18.3	31.2/32.3	35/35	30/31	111/111	—
												002	4.9/ 6.5	23.5/27.1	38.7/43.2	40/45	37/41	111/111	—
												003	6.4/ 8.7	31.4/36.3	48.6/54.7	50/60	46/51	111/111	—
												004	7.9/10.5	37.9/43.8	56.8/64.1	60/70	53/60	111/111	004
												002 and 002	9.8/13.0	46.9/54.2	68.0/77.1	70/80	64/72	111/111	004
		ALT									4.9	NONE	—/—	—/—	32.6/32.6	40/40	31/31	116/116	—
												001	3.3/ 4.4	15.9/18.3	32.6/34.0	40/40	31/32	116/116	—
												002	4.9/ 6.5	23.5/27.1	40.5/45.0	45/45	38/42	116/116	—
												003	6.5/ 8.7	31.4/36.3	50.4/56.4	60/60	47/53	116/116	—
												004	7.9/10.5	37.9/43.8	58.5/65.8	60/70	55/61	116/116	004
												002 and 002	9.8/13.0	46.9/54.2	69.8/78.8	70/80	65/73	116/116	004
	208/230-3-60	STD	187	254	1	10.2	75	1	1/4	1.4	3.5	NONE	—/—	—/—	22.5/22.5	30/30	23/23	90/ 90	—
												001	3.3/ 4.4	9.2/10.6	22.5/23.0	30/30	23/23	90 90	—
												002	4.9/ 6.5	13.6/15.6	27.3/29.4	30/30	25/28	90/ 90	—
												003	6.5/ 8.7	18.1/20.9	33.1/36.0	35/40	30/34	90/ 90	—
												004	7.9/10.5	21.9/25.3	37.7/42.0	40/45	35/39	90/ 90	—
												005	12.2/16.0	33.4/38.4	52.1/57.9	60/60	48/54	90/ 90	—
		ALT									4.9	NONE	—/—	—/—	23.9/23.9	30/30	25/25	95/ 95	—
												001	3.3/ 4.4	9.2/10.6	23.9/24.8	30/30	25/25	95/ 95	—
												002	4.9/ 6.5	13.6/15.6	29.1/31.1	30/35	27/29	95/ 95	—
												003	6.5/ 8.7	18.1/20.9	34.8/37.7	35/40	32/35	95/ 95	—
												004	7.9/10.5	21.9/25.3	39.5/43.7	40/45	36/40	95/ 95	—
												005	12.3/16.0	33.4/38.4	53.8/59.6	60/60	50/55	95/ 95	—
		HIGH									5.2	NONE	—/—	—/—	24.2/24.2	30/30	25/25	114/114	—
												001	3.3/ 4.4	9.2/10.6	24.2/25.2	30/30	25/25	114/114	—
												002	4.9/ 6.5	13.6/15.6	29.5/31.5	35/35	27/29	114/114	—
												003	6.5/ 8.7	18.1/20.9	35.2/38.1	40/40	32/36	114/114	—
												004	7.9/10.5	21.9/25.3	39.9/44.1	40/45	37/41	114/114	—
												005	12.3/16.0	33.4/38.4	54.2/60.0	60/60	50/56	114/114	—
	460-3-60	STD	414	508	1	4.4	40	1	1/4	0.8	1.3	NONE	—	—	9.8	15	10	47	—
												006	6.0	7.2	13.4	15	12	47	—
												007	8.8	10.6	17.6	20	16	47	—
												008	11.5	13.8	21.6	25	20	47	—
												009	14.0	16.8	25.4	30	23	47	—
		ALT									2.1	NONE	—	—	10.6	15	11	50	—
												006	6.0	7.2	14.4	15	13	50	—
												007	8.8	10.6	18.6	20	17	50	—
												008	11.5	13.8	22.6	25	21	50	—
												009	14.0	16.8	26.4	30	24	50	—
		HIGH									2.6	NONE	—	—	11.1	15	11	59	—
												006	6.0	7.2	15.0	20	14	59	—
												007	8.8	10.6	19.2	20	18	59	—
												008	11.5	13.8	23.3	25	21	59	—
												009	14.0	16.8	27.0	30	25	59	—
	575-3-60	STD	518	632	1	3.7	31	1	1/4	0.8	1.3	NONE	—	—	7.2	15	8	36	—
		ALT									2.1	NONE	—	—	7.7	15	9	39	—
		HIGH									2.6	NONE	—	—	8.0	15	9	58	—

LEGEND

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

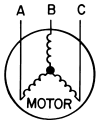
*Used to determine minimum disconnect per NEC.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.



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

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

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

   $$= 457$$

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. For units with power exhaust: If a single power source is to be used, size wire to include power exhaust MCA and MOCP. Check MCA and MOCP when power exhaust is powered through the unit (must be in accordance with NEC and/or local codes). Determine the new MCA including the power exhaust using the following formula:

   MCA New = MCA unit only + MCA of Power Exhaust

   For example, using a 50TFF006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A00 power exhaust.

   MCA New = 28.9 amps + 1.6 amps = 30.5 amps

   If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps, the MCA New is below 35, therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH030A00	1.6	N/A	0.64	15
CRPWREXH021A00	N/A	0.9	N/A	15
CRPWREXH022A00	3.3	N/A	1.32	15
CRPWREXH023A00	N/A	1.8	N/A	15
CRPWREXH028A00	1.7	N/A	0.68	15
CRPWREXH029A00	N/A	1.0	N/A	15

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

UNIT 50TFF, TM	NOMINAL V-PH-Hz	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (ea)			OFM (ea)			IFM FLA	HEATER MODEL NO. CRHEATER---A00	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE†		SINGLE POINT BOX P/N CRSINGLE---A00
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA			Nominal kW	FLA	MCA	MOCP*	FLA	LRA	
005	208/230-1-60	STD	187	254	1	23.3	118	1	1/4	1.4	3.5	NONE	—/—	—/—	40.0/ 40.0	45/ 45	38/ 38	134/134	—
												001	3.3/ 4.4	15.9/18.3	40.0/ 40.0	45/ 45	38/ 38	134/134	—
												003	6.5/ 8.7	31.4/36.3	48.6/ 54.7	50/ 60	46/ 51	134/134	—
												002 and 002	9.3/13.0	46.9/54.2	68.0/ 77.1	70/ 80	64/ 72	134/134	004
												003 and 003	13.1/17.4	62.8/72.5	87.9/100.0	90/100	82/ 93	134/134	004
												004 and 004	15.8/21.0	75.8/87.5	104.2/118.8	110/125	97/110	134/134	004
		ALT									4.9	NONE	—/—	—/—	41.4/ 41.4	50/ 50	40/ 40	138/138	—
												001	3.3/ 4.4	15.9/18.3	41.4/ 41.4	50/ 50	40/ 40	138/138	—
												003	6.5/ 8.7	31.4/36.3	50.4/ 56.4	60/ 60	47/ 53	138/138	—
												002 and 002	9.3/13.0	46.9/54.2	69.8/ 78.8	70/ 80	65/ 73	138/138	004
												003 and 003	13.1/17.4	62.8/72.5	89.7/101.8	90/110	83/ 95	138/138	004
												004 and 004	15.8/21.0	75.8/87.5	105.9/120.5	110/125	98/112	138/138	004
	208/230-3-60	STD	187	254	1	15.4	90	1	1/4	1.4	3.5	NONE	—/—	—/—	29.0/ 29.0	35/ 35	29/ 29	106/106	—
												002	4.9/ 6.5	13.6/15.6	29.0/ 29.4	35 35	29/ 29	106/106	—
												003	6.5/ 8.7	18.1/20.9	33.1/ 36.0	35/ 40	30/ 34	106/106	—
												005	12.0/16.0	33.4/38.4	52.1/ 57.9	60/ 60	48/ 54	106/106	
												004 and 004	15.8/21.0	43.8/50.5	65.1/ 73.5	70/ 80	60/ 68	106/106	002
		ALT									4.9	NONE	—/—	—/—	30.4/ 30.4	35/ 30	30/ 30	110/110	—
												002	4.9/ 6.5	13.6/15.6	30.4/ 31.1	35/ 35	30/ 30	110/110	—
												003	6.5/ 8.7	18.1/20.9	34.8/ 37.7	35/ 40	32/ 35	110/110	—
												005	12.0/16.0	33.4/38.4	53.8/ 59.6	60/ 60	50/ 55	110/110	
												004 and 004	15.8/21.0	43.8/50.5	66.9/ 75.3	70/ 80	62/ 69	110/110	002
		HIGH									5.2	NONE	—/—	—/—	30.7/ 30.7	35/ 35	31/ 31	129/129	—
												002	4.9/ 6.5	13.6/15.6	30.7/ 31.5	35/ 35	31/ 31	129/129	—
												003	6.5/ 8.7	18.1/20.9	35.2/ 38.1	40/ 40	32 /36	129/129	—
												005	12.0/16.0	33.4/38.4	54.2/ 60.0	60/ 60	50/ 56	129/129	—
												004 and 004	15.8/21.0	43.8/50.5	67.2/ 75.7	70/ 80	62/ 70	129/129	002
	460-3-60	STD	414	508	1	8.3	45	1	1/4	0.8	1.8	NONE	—	—	15.2	20	15	53	—
												006	6.0	7.2	15.2	20	15	53	—
												008	11.5	13.8	22.3	25	20	53	—
												009	14.0	16.8	26.0	30	24	53	—
												008 and 008	23.0	27.7	39.6	40	36	53	—
		ALT									2.1	NONE	—	—	15.5	20	15	55	—
												006	6.0	7.2	15.5	20	15	55	—
												008	11.5	13.8	22.6	25	21	55	—
												009	14.0	16.8	26.4	30	24	55	—
												008 and 008	23.0	27.7	39.9	40	37	55	—
		HIGH									2.6	NONE	—	—	16.0	20	16	64	—
												006	6.0	7.2	16.0	20	16	64	—
												008	11.5	13.8	23.3	25	21	64	—
												009	14.0	16.8	27.0	30	25	64	—
												008 and 008	23.0	27.7	40.6	45	37	64	—
	575-3-60	STD	518	632	1	6.4	36	1	1/4	0.8	1.8	NONE	—	—	10.9	15	12	42	—
		ALT									2.1	NONE	—	—	11.1	15	12	44	—
		HIGH									2.6	NONE	—	—	11.4	15	12	51	—

LEGEND

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

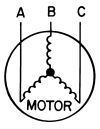
*Used to determine minimum disconnect per NEC.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

% Voltage Imbalance

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

Example: Supply voltage is 460-3-60.



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

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

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

$$= 457$$

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

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

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

$$= 1.53\%$$

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

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

3. For units with power exhaust: If a single power source is to be used, size wire to include power exhaust MCA and MOCP. Check MCA and MOCP when power exhaust is powered through the unit (must be in accordance with NEC and/or local codes). Determine the new MCA including the power exhaust using the following formula:

MCA New = MCA unit only + MCA of Power Exhaust

For example, using a 50TFF006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A00 power exhaust.

MCA New = 28.9 amps + 1.6 amps = 30.5 amps

If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps, the MCA New is below 35, therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH030A00	1.6	N/A	0.64	15
CRPWREXH021A00	N/A	0.9	N/A	15
CRPWREXH022A00	3.3	N/A	1.32	15
CRPWREXH023A00	N/A	1.8	N/A	15
CRPWREXH028A00	1.7	N/A	0.68	15
CRPWREXH029A00	N/A	1.0	N/A	15

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

UNIT 50TFF,TM	NOMINAL V-PH-Hz	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (ea)			OFM (ea)			IFM FLA	HEATER MODEL NO. CRHEATER---A00	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE†		SINGLE POINT BOX P/N CRSINGLE---A00
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA			Nominal kW	FLA	MCA	MOCP*	FLA	LRA	
006	208/230-1-60	STD	187	254	1	28.8	147	1	1/4	1.4	5.9	NONE	—/—	—/—	49.3/ 49.3	60/ 60	47/ 47	166/166	—
												002	4.9/ 6.5	23.5/27.1	49.3/ 49.3	60/ 60	47/ 47	166/166	—
												003	6.5/ 8.7	31.4/36.3	51.6/ 57.7	60/ 60	48/ 54	166/166	—
												002 and 002	9.8/13.0	46.9/54.2	71.0/ 80.1	80/ 90	66/ 75	166/166	004
												003 and 003	13.1/17.4	62.8/72.5	90.9/103.0	100/110	85/ 96	166/166	004
												004 and 004	15.8/21.0	75.8/87.5	107.2/121.8	110/125	100/113	166/166	004
		ALT									6.6	NONE	—/—	—/—	50.0/ 50.0	60/ 60	48/ 48	188/188	—
												002	4.9/ 6.5	23.5/27.1	50.0/ 50.0	60/ 60	48/ 48	188/188	—
												003	6.5/ 8.7	31.4/36.3	52.5/ 58.6	60/ 60	49/ 55	188/188	—
												002 and 002	9.8/13.0	46.9/54.2	71.9/ 81.0	80/ 90	67/ 75	188/188	004
												003 and 003	13.1/17.4	62.8/72.5	91.8/103.9	100/110	85/ 96	188/188	004
												004 and 004	15.8/21.0	75.8/87.5	108.0/122.6	110/125	100/114	188/188	004
	208/230-3-60	STD	187	254	1	16	114	1	1/4	1.4	5.9	NONE	—/—	—/—	32.1/ 32.1	40/ 40	32/ 32	133/133	—
												002	4.9/ 6.5	13.6/15.6	32.1/ 32.4	40/ 40	32/ 32	133/133	—
												004	7.9/10.5	21.9/25.3	40.7/ 44.4	45/ 45	37/ 41	133/133	—
												005	12.0/16.0	33.4/38.4	55.1/ 60.9	60/ 70	51/ 57	133/133	002
												004 and 004	15.8/21.0	43.8/50.5	68.1/ 76.5	70/ 80	63/ 70	133/133	002
												004 and 005	19.9/26.5	55.2/63.8	82.4/ 92.5	90/100	76/ 86	133/133	002
		ALT									5.2	NONE	—/—	—/—	31.4/ 31.4	40/ 40	32/ 32	153/153	—
												002	4.9/ 6.5	13.6/15.6	31.4/ 31.5	40/ 40	32/ 32	153/153	—
												004	7.9/10.5	21.9/25.3	39.9/ 43.5	40/ 45	37/ 41	153/153	—
												005	12.0/16.0	33.4/38.4	54.2/ 60.0	60/ 60	50/ 56	153/153	—
												004 and 004	15.8/21.0	43.8/50.5	67.2/ 75.7	70/ 80	62/ 70	153/153	002
												004 and 005	19.9/26.5	55.2/63.8	81.6/ 91.6	90/100	75/ 85	153/153	002
		HIGH									7.5	NONE	—/—	—/—	33.7/ 33.7	40/ 40	34/ 34	179/179	—
												002	4.9/ 6.5	13.6/15.6	33.7/ 34.4	40/ 40	34/ 34	179/179	—
												004	7.9/10.5	21.9/25.3	42.7/ 46.4	45/ 50	39/4 3	179/179	—
												005	12.0/16.0	33.4/38.4	57.1/ 62.9	60/ 70	53/ 58	179/179	002
												004 and 004	15.8/21.0	43.8/50.5	70.1/ 78.5	80/ 80	65/ 72	179/179	002
												004 and 005	19.9/26.5	55.2/63.8	84.4/ 94.5	90/100	78/ 87	179/179	002
	460-3-60	STD	414	508	1	7.4	64	1	1/4	0.8	3.1	NONE	—	—	15.3	20	15	74	—
												006	6.0	7.2	15.6	20	15	74	—
												008	11.5	13.8	23.9	25	22	74	—
												009	14.0	16.8	27.6	30	25	74	—
												008 and 008	23.0	27.7	41.2	45	38	74	—
												008 and 009	25.0	30.1	44.2	45	41	74	—
		ALT									2.6	NONE	—	—	15.6	20	16	83	—
												006	6.0	7.2	16.0	20	16	83	—
												008	11.5	13.8	24.3	25	22	83	—
												009	14.0	16.8	28.0	30	26	83	—
												008 and 008	23.0	27.7	41.6	45	38	83	—
												008 and 009	25.0	30.1	44.6	45	41	83	—
		HIGH									3.4	NONE	—	—	15.6	20	16	96	—
												006	6.0	7.2	16.0	20	16	96	—
												008	11.5	13.8	24.3	25	22	96	—
												009	14.0	16.8	28.0	30	26	96	—
												008 and 008	23.0	27.7	41.6	45	38	96	—
												008 and 009	25.0	30.1	44.6	45	41	96	—
	575-3-60	STD	518	632	1	6.2	52	1	1/4	0.8	3.1	NONE	—	—	11.5	15	13	60	—
		ALT									2.6	NONE	—	—	11.7	15	13	67	—
		HIGH									3.4	NONE	—	—	11.7	15	13	77	—

LEGEND

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

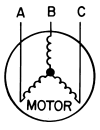
*Used to determine minimum disconnect per NEC.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.



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

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

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

   $$= 457$$

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

   Maximum deviation is 7 v.

   Determine percent of voltage imbalance.

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

   $$= 1.53\%$$

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

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

3. For units with power exhaust: If a single power source is to be used, size wire to include power exhaust MCA and MOCP. Check MCA and MOCP when power exhaust is powered through the unit (must be in accordance with NEC and/or local codes). Determine the new MCA including the power exhaust using the following formula:

   MCA New = MCA unit only + MCA of Power Exhaust

   For example, using a 50TFF006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A00 power exhaust.

   MCA New = 28.9 amps + 1.6 amps = 30.5 amps

   If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps, the MCA New is below 35, therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH030A00	1.6	N/A	0.64	15
CRPWREXH021A00	N/A	0.9	N/A	15
CRPWREXH022A00	3.3	N/A	1.32	15
CRPWREXH023A00	N/A	1.8	N/A	15
CRPWREXH028A00	1.7	N/A	0.68	15
CRPWREXH029A00	N/A	1.0	N/A	15

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

UNIT 50TFF, TM	NOMINAL V-PH-Hz	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (ea)			OFM (ea)			IFM FLA	HEATER MODEL NO. CRHEATER---A00	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE†		SINGLE POINT BOX P/N CRSINGLE---A00
			Min	Max	Qty	RLA	LRA	Qty	Hp	FLA			Nominal kW	FLA	MCA	MOCP*	FLA	LRA	
007	208/230-3-60	STD	187	254	1	20.6	146	1	1/4	1.4	5.2	NONE	—/—	—/—	37.2/37.2	45/ 45	37/37	184/184	—
												002	4.9/ 6.5	13.6/15.6	37.2/37.2	45/ 45	37/37	184/184	—
												004	7.9/10.5	21.9/25.3	37.2/38.1	40/ 45	37/41	184/184	—
												005	12.0/16.0	33.4/38.4	54.2/60.0	60/ 60	50/56	184/184	—
												004 and 004	15.8/21.0	43.8/50.5	67.2/75.7	70/ 80	62/70	184/184	002
												004 and 005	19.9/26.5	55.2/63.8	81.6/91.6	90/100	75/85	184/184	002
		HIGH									7.5	NONE	—/—	—/—	39.5/39.5	45/ 45	39/39	210/210	—
												002	4.9/ 6.5	13.6/15.6	39.5/39.5	45/ 45	39/39	210/210	—
												004	7.9/10.5	21.9/25.3	39.5/40.9	45/ 50	39/43	210/210	—
												005	12.0/16.0	33.4/38.4	57.1/62.9	60/ 70	53/58	210/210	002
												004 and 004	15.8/21.0	43.8/50.5	70.1/78.5	80/ 80	65/72	210/210	002
												004 and 005	19.9/26.5	55.2/63.8	84.4/94.5	90/100	78/87	210/210	002
	460-3-60	STD	414	508	1	9.5	73	1	1/4	0.9	2.6	NONE	—	—	17.6	20	17	92	—
												006	6.0	7.2	17.6	20	17	92	—
												008	11.5	13.8	20.5	25	21	92	—
												009	14.0	16.8	27.0	30	25	92	—
												008 and 008	23.0	27.7	40.6	45	37	92	—
												008 and 009	25.5	30.7	44.3	45	41	92	—
		HIGH									3.4	NONE	—	—	18.4	25	18	105	—
												006	6.0	7.2	18.4	25	18	105	—
												008	11.5	13.8	21.5	25	22	105	—
												009	14.0	16.8	28.0	30	26	105	—
												008 and 008	23.0	27.7	41.6	45	38	105	—
												008 and 009	25.5	30.7	45.3	50	42	105	—
	575-3-60	STD	518	632	1	7.6	62	1	1/4	0.9	2.6	NONE	—	—	13.1	20	14	77	—
		HIGH									3.4	NONE	—	—	13.7	20	15	87	—

LEGEND

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

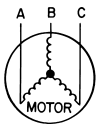
*Used to determine minimum disconnect per NEC.
†Fuse or HACR circuit breaker.

NOTES:
1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percent of voltage imbalance.

   % Voltage Imbalance

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

   Example: Supply voltage is 460-3-60.



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

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

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

$$= 457$$

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

Maximum deviation is 7 v.

Determine percent of voltage imbalance.

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

$$= 1.53\%$$

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

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

3. For units with power exhaust: If a single power source is to be used, size wire to include power exhaust MCA and MOCP. Check MCA and MOCP when power exhaust is powered through the unit (must be in accordance with NEC and/or local codes). Determine the new MCA including the power exhaust using the following formula:

   MCA New = MCA unit only + MCA of Power Exhaust

   For example, using a 50TFF006---5 unit with MCA = 28.9 and MOCP = 35, with CRPWREXH030A00 power exhaust.

   MCA New = 28.9 amps + 1.6 amps = 30.5 amps

   If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 35 amps, the MCA New is below 35, therefore the MOCP is acceptable. If "MCA New" is larger than the published MOCP, raise the MOCP to the next larger size. For separate power, the MOCP for the power exhaust will be 15 amps per NEC.

POWER EXHAUST PART NO.	MCA (230 v)	MCA (460 v)	MCA (575 v)	MOCP (for separate power source)
CRPWREXH030A00	1.6	N/A	0.64	15
CRPWREXH021A00	N/A	0.9	N/A	15
CRPWREXH022A00	3.3	N/A	1.32	15
CRPWREXH023A00	N/A	1.8	N/A	15
CRPWREXH028A00	1.7	N/A	0.68	15
CRPWREXH029A00	N/A	1.0	N/A	15

Step 6 — Adjust Factory-Installed Options

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

Assembly:

1. Determine quantity of ventilation required for building. Record amount for use in Step 8.
2. Remove and save outdoor-air opening panel and screws. See Fig. 10.
3. Separate hood and screen from basepan by removing the 4 screws securing them. Save all screws.
4. Replace outdoor-air opening panel.
5. Place hood on front of outdoor-air opening panel. See Fig. 11 for hood details. Secure top of hood with the 4 screws removed in Step 3. See Fig. 12.
6. Remove and save 6 screws (3 on each side) from sides of the manual outdoor-air damper assembly.
7. Align screw holes on hood with screw holes on side of manual outdoor-air damper assembly. See Fig. 11 and 12. Secure hood with 6 screws from Step 6.
8. Adjust minimum position setting of the damper blade by adjusting the manual outdoor-air adjustment screws on the front of the damper blade. See Fig. 10. Slide blade vertically until it is in the appropriate position determined by Fig. 13. Tighten screws.
9. Remove and save screws currently on sides of hood. Insert screen. Secure screen to hood using the screws. See Fig. 12.

CONVENIENCE OUTLET — An optional convenience outlet provides power for rooftop use. For maintenance personnel safety, the convenience outlet power is off when the unit disconnect is off. Adjacent unit outlets may be used for service tools. An optional "Hot Outlet" is available from the factory as a special order item.

NOVAR CONTROLS — Optional Novar controls (ETM 2024 or ETM 3051) are available for replacement or new construction jobs.

APOLLO CONTROL — The optional Apollo control is used to actively monitor all modes of operation as well as indoor (evaporator) fan status, filter status, and indoor-air quality. The Apollo control is designed to work with Carrier TEMP and VVT® systems.

The thermostat must be wired to the Apollo Control before starting the unit. Refer to the Apollo Control installation instructions for information on installing the thermostat.

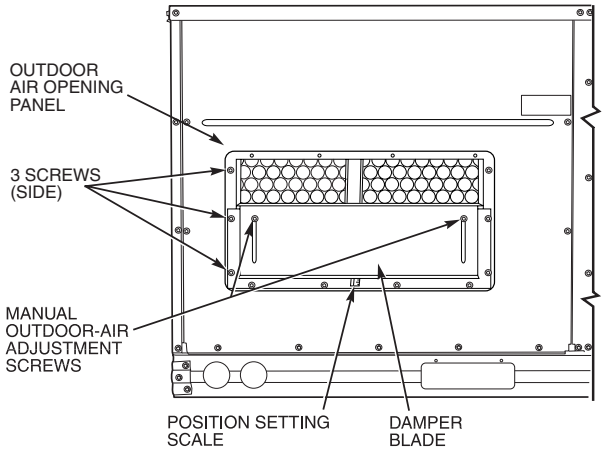


Fig. 10 — Damper Panel with Manual Outdoor-Air Damper Installed

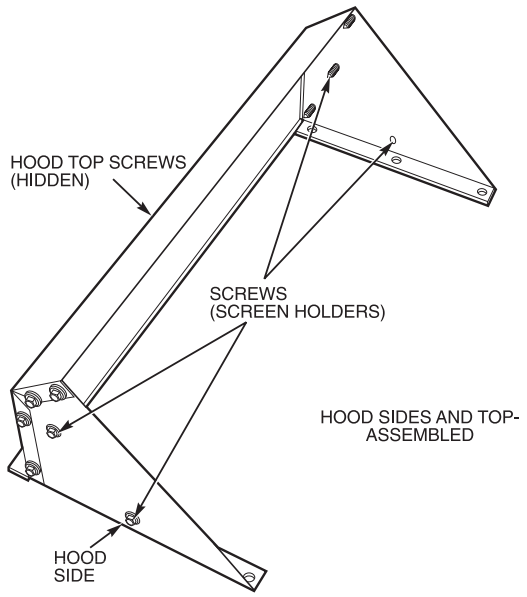


Fig. 11 — Outdoor-Air Hood Details

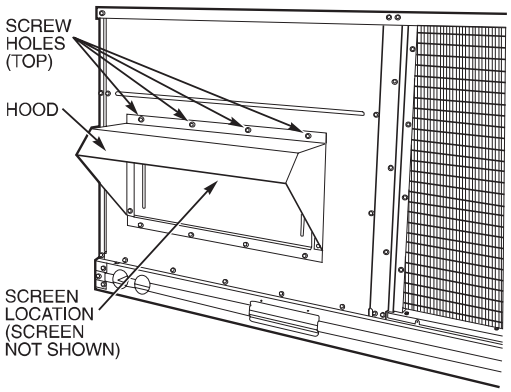


Fig. 12 — Outdoor-Air Damper with Hood Attached

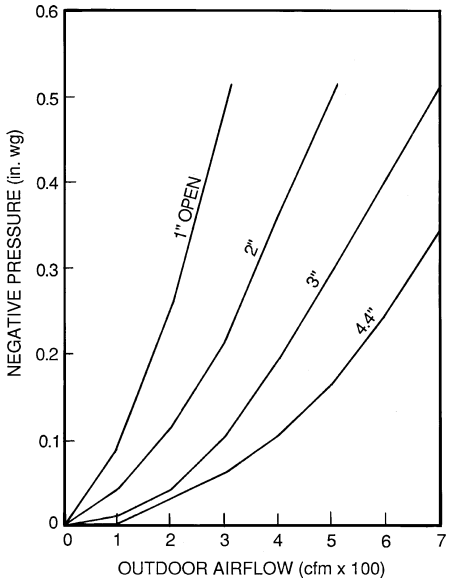


Fig. 13 — Outdoor-Air Damper Position Setting

PREMIERLINK™ CONTROLLER — The PremierLink controller is compatible with the Carrier Comfort Network (CCN). This control is designed to allow users the access and ability to change factory-defined settings, thus expanding the function of the standard unit control board. Carrier's diagnostic standard tier display tools such as Navigator or Scrolling Marquee can be used with the PremierLink controller.

The PremierLink controller (see Fig. 14) requires the use of a Carrier electronic thermostat or a CCN connection for time broadcast to initiate its internal timeclock. This is necessary for broadcast of time of day functions (occupied/unoccupied). Refer to Fig. 15. No sensors are supplied with the field-mounted PremierLink control. The factory-installed PremierLink control includes only the supply-air sensor (SAT) as standard. The PremierLink control may be mounted in the control panel or an area below the control panel. If used with the EconoMi$er2 the standard OAT (outdoor-air temperature) sensor and Compressor Lockout Sensor supplied with the EconoMi$er2 will need to be changed to the PremierLink compatible sensors. Refer to the PremierLink control and EconoMi$er2 Installation, Start-up and Configuration Instructions for more information.

OPTIONAL ECONOMI$ER2 — See Fig. 16 for EconoMi$er2 component locations.

NOTE: These instructions are for installing the optional EconoMi$er2 only. Refer to the accessory EconoMi$er2 installation instructions when field installing an EconoMi$er2 accessory.

1. To remove the existing unit filter access panel, raise the panel and swing the bottom outward. The panel is now disengaged from the track and can be removed. See Fig. 17.
2. The box with the EconoMi$er2 hood components is shipped in the compartment behind the EconoMi$er2. In order to remove the box, the EconoMi$er2 controller must be temporarily moved. This step does not need to be performed on an EconoMi$er2 with 4 to 20 mA control as there is no controller. The entire EconoMi$er2 does not have to be removed to retrieve the hood box. The EconoMi$er2 controller is mounted on top of the EconoMi$er2 in the position shown in Fig. 16.
   a. Remove the screws holding the controller bracket in place. Save screws. Temporarily lower the controller. See Fig. 18. Do not disconnect the controller wiring.
   b. Remove the screw holding the hood box bracket to the top of the EconoMi$er2. Slide the hood box out of the unit. See Fig. 18 and 19.
   c. Reinstall the EconoMi$er2 controller in its original position using the screws saved in Step 2a. Tighten screws.

IMPORTANT: If the power exhaust accessory is to be installed on the unit, the hood shipped with the unit will not be used and must be discarded. Save the aluminum filter for use in the power exhaust.

3. The indoor coil access panel will be used as the top of the hood. Remove the screws along the bottom of the indoor coil access panel. See Fig. 20.
4. Swing out indoor coil access panel and insert the hood sides under the panel (hood top). Use the screws provided to attach the hood sides to the hood top. Use screws provided to attach the hood sides to the unit. See Fig. 21.
5. Remove the shipping tape holding the EconoMi$er2 barometric relief damper in place.
6. Insert the hood divider between the hood sides. See Fig. 22. Secure hood divider with 2 screws on each hood side. The hood divider is also used as the bottom filter rack for the aluminum filter.
7. Open the filter clips which are located underneath the hood top. Insert the aluminum filter into the bottom filter rack (hood divider). Push the filter into position past the open filter clips. Close the filter clips to lock the filter into place. See Fig. 22.
8. Caulk the ends of the joint between the unit side panel and the hood top. See Fig. 20.
9. Replace the filter access panel.
10. Install all EconoMi$er2 accessories. EconoMi$er2 wiring is shown in Fig. 23.

Barometric flow capacity is shown in Fig. 24. Outdoor air leakage is shown in Fig. 25. Return air pressure drop is shown in Fig. 26.

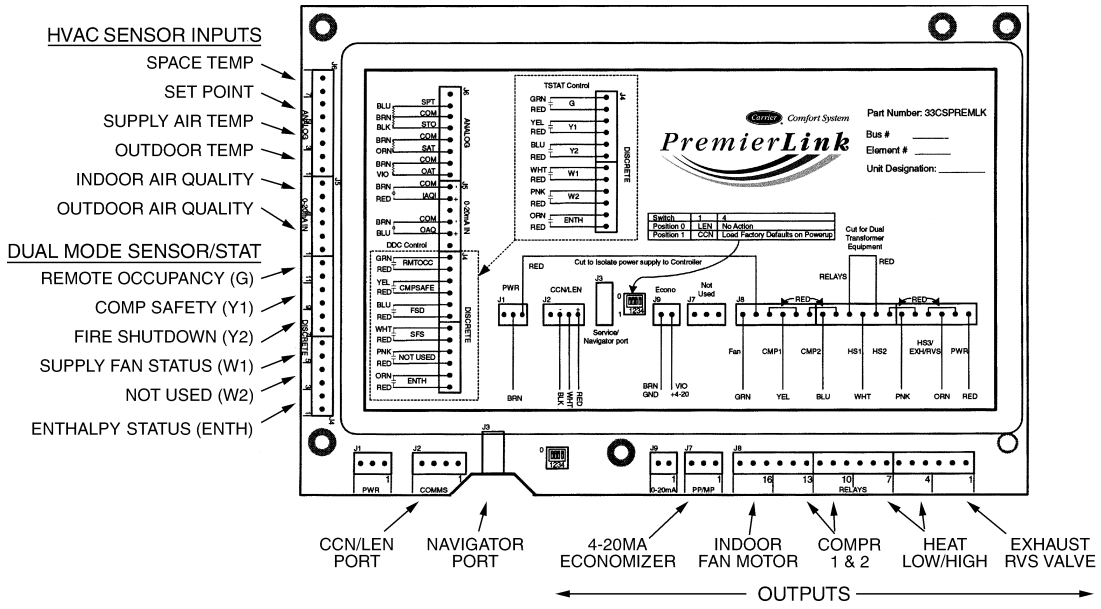
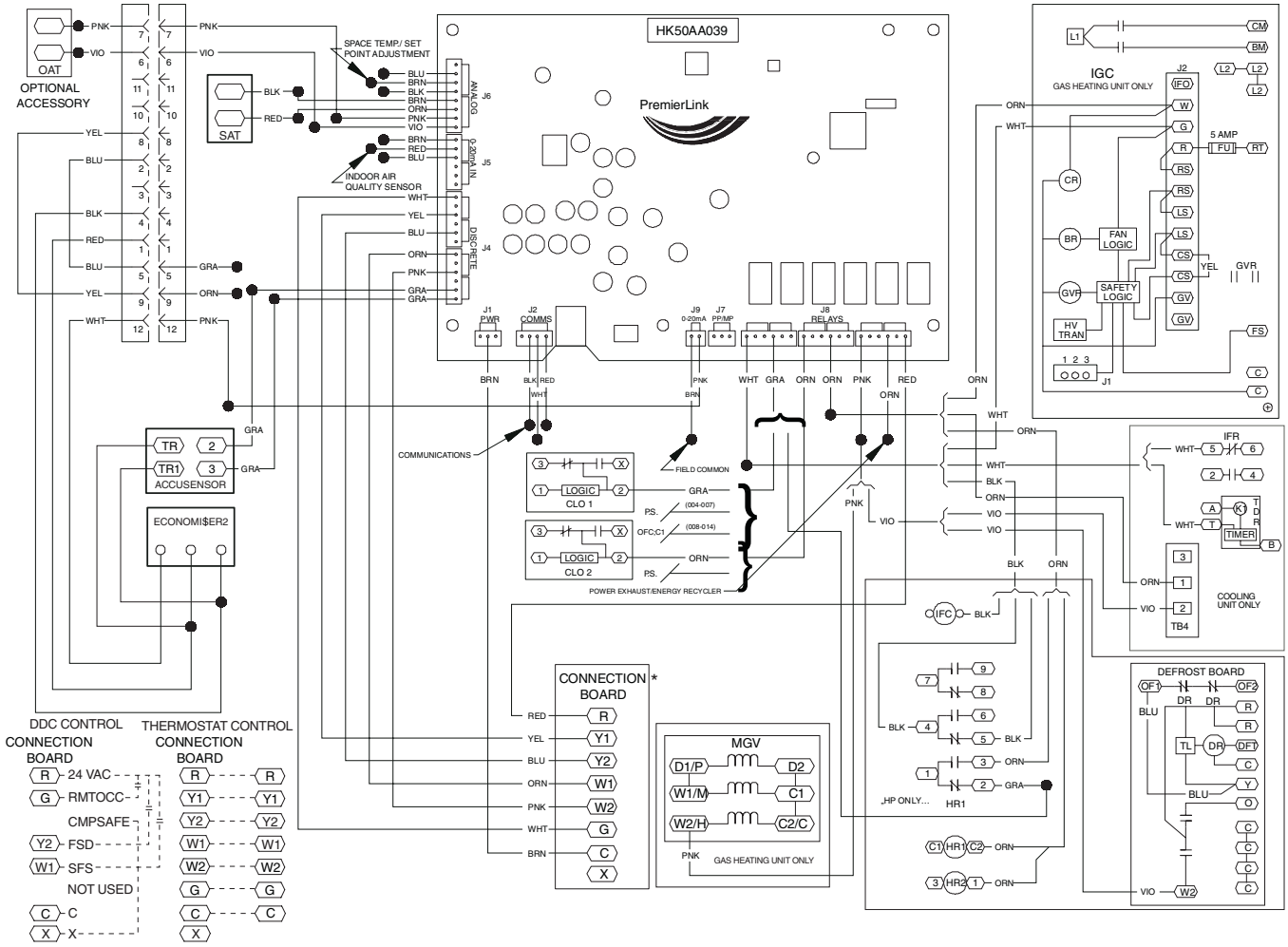


Fig. 14 — PremierLink Controller



LEGEND

CLO	—	Compressor Lockout	**IGC**	—	Integrated Gas Unit Controller
COMMS	—	Communications	**MGV**	—	Main Gas Valve
HR	—	Heating Relay	**OAT**	—	Outdoor Air Temperature Sensor
IFC	—	Indoor Fan Contactor	**PWR**	—	Power
IFR	—	Indoor Fan Relay	**SAT**	—	Supply Air Temperature Sensor

*When connecting DDC or thermostat controls, wire to connection board. Do not wire directly to PremierLink board.

Fig. 15 — Typical PremierLink™ Controls Wiring

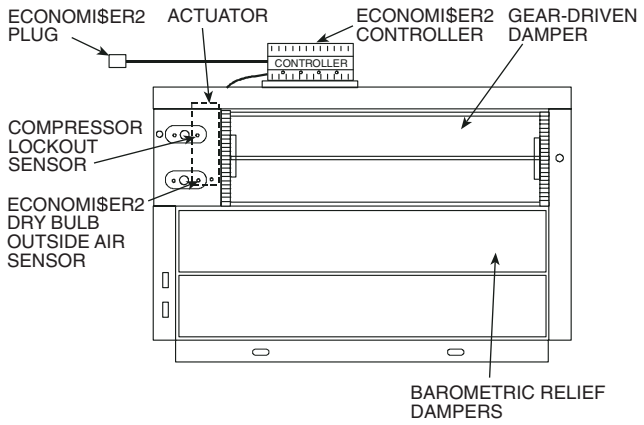


Fig. 16 — EconoMi$er Component Locations

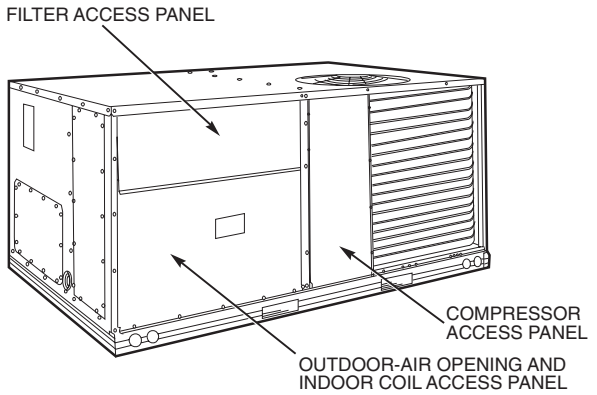


Fig. 17 — Typical Access Panel Locations

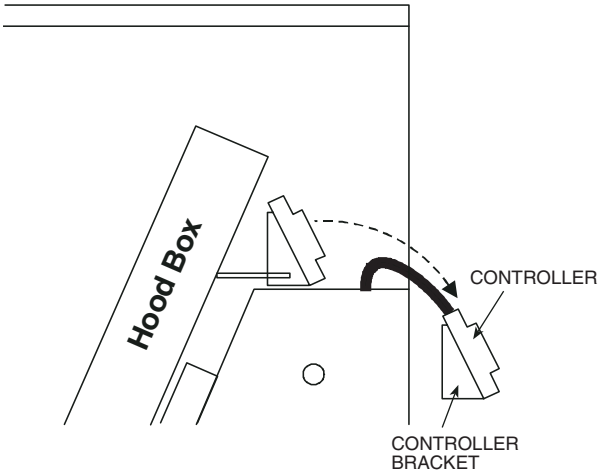


Fig. 18 — Temporary EconoMi$er2 Controller Relocation

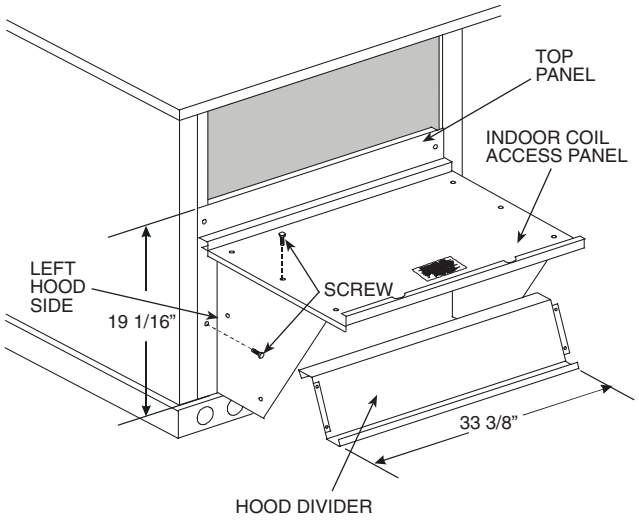


Fig. 21 — Outdoor-Air Hood Construction

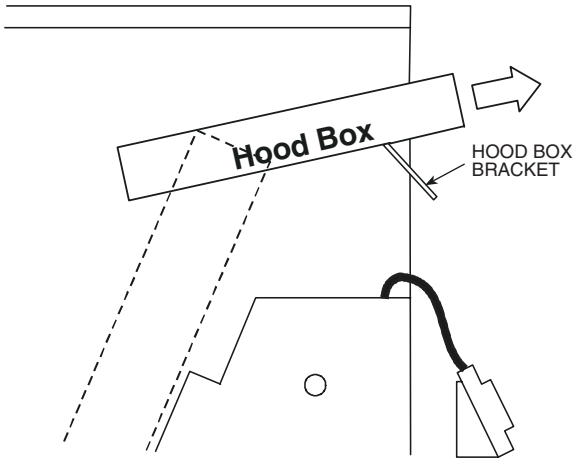


Fig. 19 — Hood Box Removal

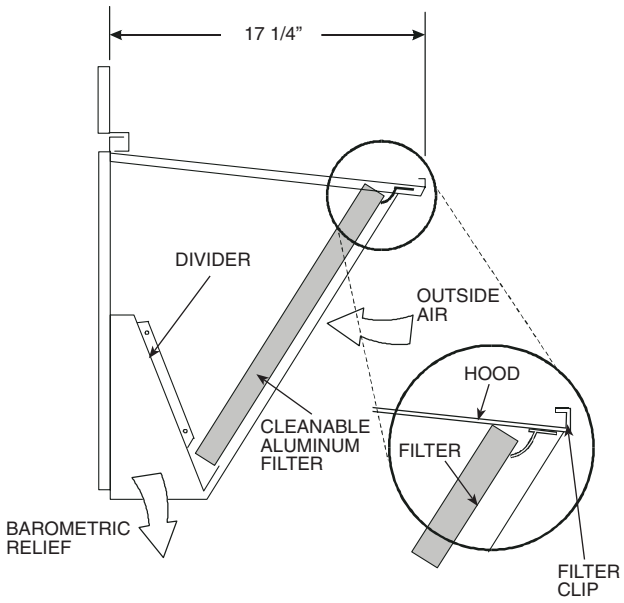


Fig. 22 — Filter Installation

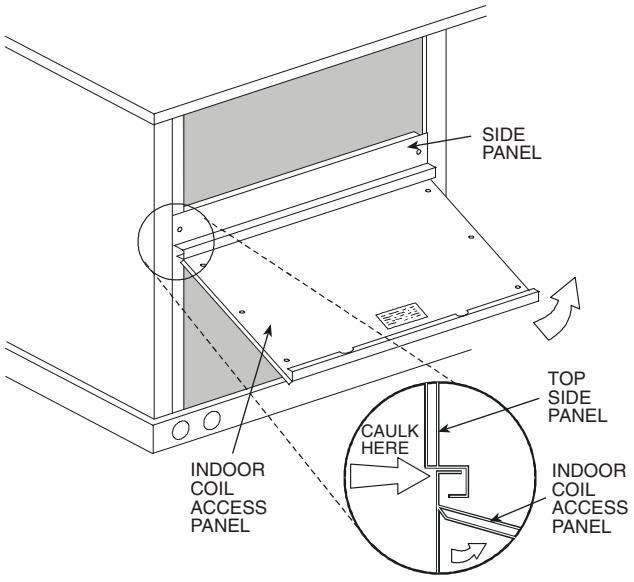
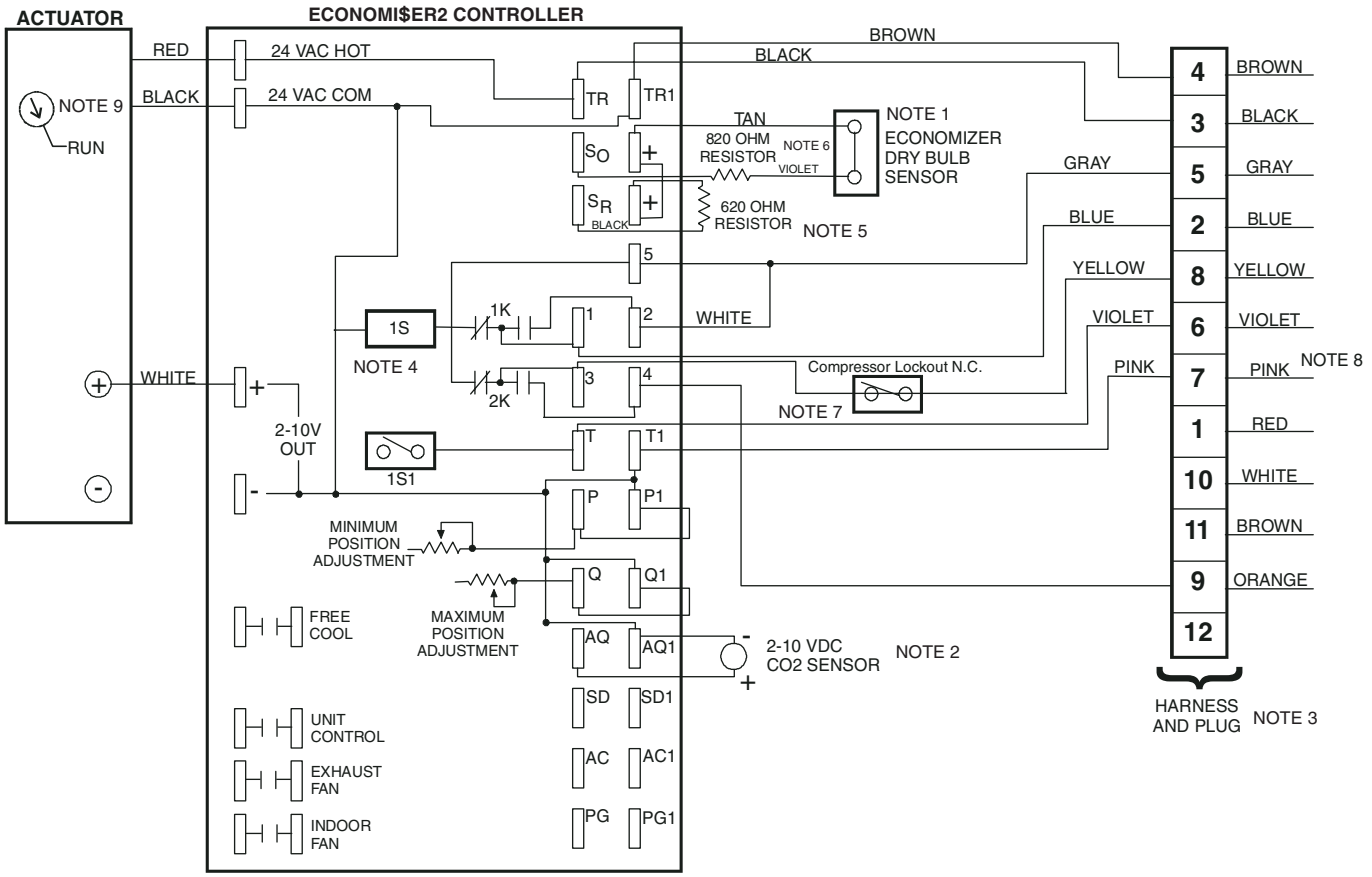


Fig. 20 — Indoor Coil Access Panel Relocation



NOTES:
1. The standard EconoMi$er2 is shipped with a fixed dry bulb sensor. (Open 67 F — Close 52 F.) An adjustable dry bulb or enthalpy sensor can replace the fixed dry bulb. (See Note 6.)
2. CO_2 sensor is optional. Field-installed accessory. See rooftop price pages for ordering data and pricing. Power for CO_2 sensor should be provided by field-supplied transformer.
3. The HVAC unit is shipped with a jumper plug attached to the EconoMi$er2 harness. Remove the jumper plug and save for future use if economizer is removed. Connect the male side of plug (shown above) to the female side in HVAC unit.
4. 1S is an electronic switch that closes when powered by a 24 vac input.
5. Factory-installed 620-ohm, 1 watt, 5% resistor should be removed only when a HH57AC078 enthalpy sensor or CROASENR001A00 adjustable dry bulb is added to SR and + for differential sensing.
6. When replacing the fixed dry bulb sensor with an enthalpy or adjustable dry bulb, remove the 820-ohm resistor.
7. Compressor lockout (Open 35 F — Close 50 F).
8. See EconoMi$er2 Installation Instructions for details on locating and wiring supply air (mixed air) sensor.
9. Switch on actuator must be in run position for economizer to operate.
10. A 2-stage thermostat is recommended.

Fig. 23 — EconoMi$er2 Wiring

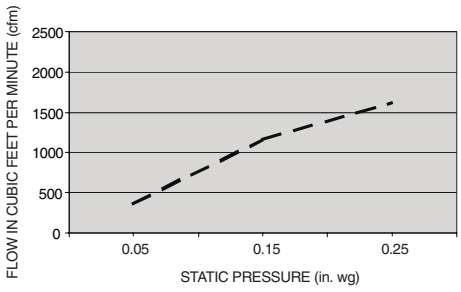


Fig. 24 — Barometric Flow Capacity

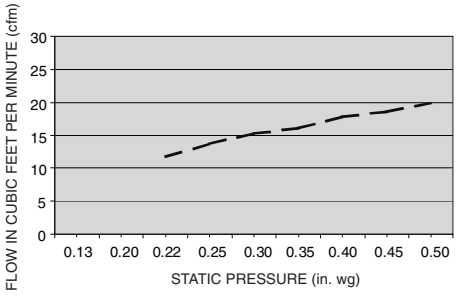


Fig. 25 — Outdoor Air Leakage

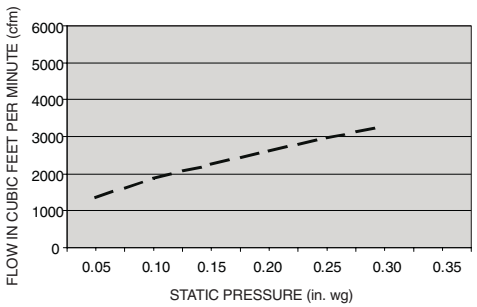


Fig. 26 — Return Air Pressure Drop

ECONOMI$ER2 CONTROLLER WIRING AND CONFIGURATION

IMPORTANT: The optional EconoMi$er2 with 4 to 20 mA actuator signal control does not include the EconoMi$er2 controller. The EconoMi$er2 actuator is operated by a 4 to 20 mA signal from an existing field-supplied controller (such as PremierLink control). See Fig. 27 for wiring information.

Outdoor Air Enthalpy or Dry Bulb Sensor — The EconoMi$er2 controller accepts input from either an accessory enthalpy sensor or dry bulb sensor. When using differential sensing, both sensors must be the same type. The outdoor air sensor is wired to terminals S_O and + on the EconoMi$er2 controller. See Fig. 23.

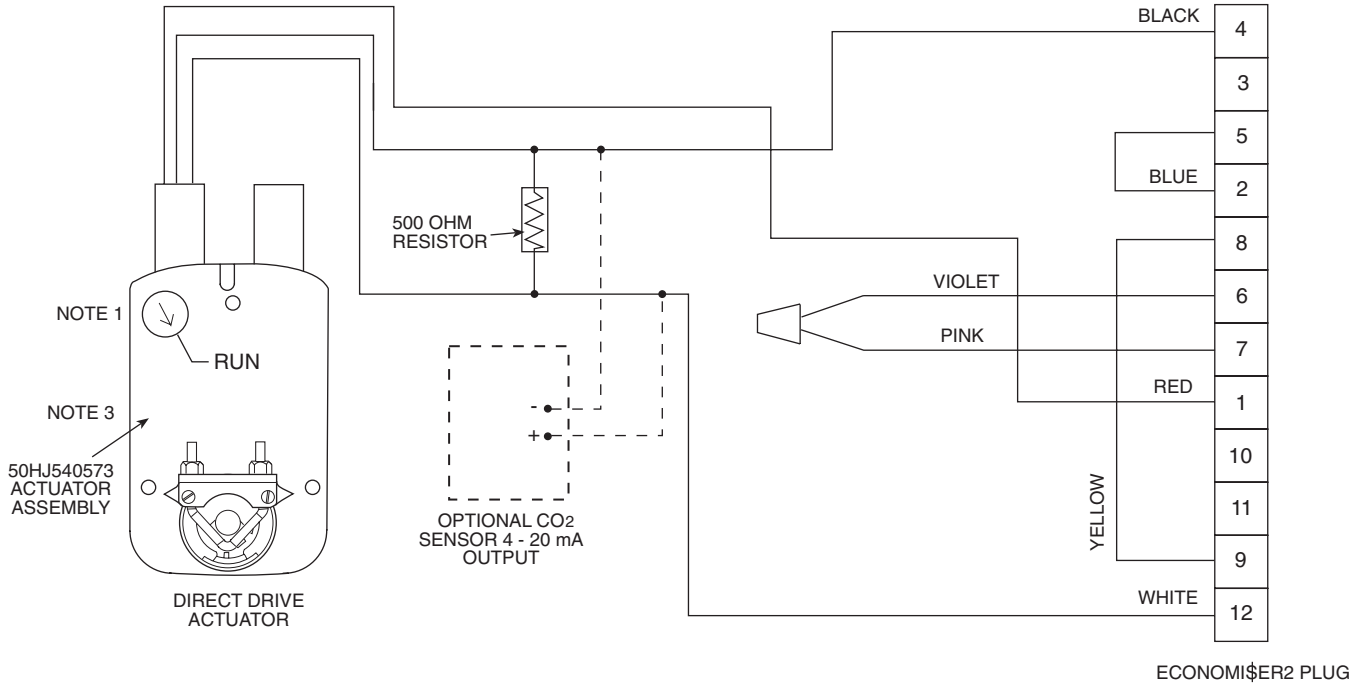
When the outdoor air enthalpy rises above the outdoor enthalpy changeover set point, the outdoor-air damper moves to its minimum position. The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er2 controller. The set points are A, B, C, and D. See Fig. 28. The factory-installed 620-ohm jumper must be in place across terminals S_R and +. See Fig. 23.

Differential Dry Bulb — For differential dry bulb control the standard outdoor dry bulb sensor (refer to Table 3) must be replaced with two CROASENR001A00 sensors. One must be placed in the return air and the other in the outdoor air stream.

An outdoor-air sensor can be mounted in any orientation that exposes it to freely circulating air and protects it from rain, snow and direct sunlight. Connect it to the S_O terminal and to the + terminal. The second sensor should be mounted in the return airstream. Connect it to the S_R terminal (after removing the 620-ohm resistor and to the + terminal on the controller. See Fig. 23.

Differential Enthalpy — For differential sensing, the EconoMi$er2 controller uses two enthalpy sensors, one in the outside air and one in the return air duct. The EconoMi$er2 controller compares the outdoor air enthalpy to the return air enthalpy to determine EconoMi$er2 use. The controller selects the lower enthalpy air (return or outdoor) for cooling. For example, when the outdoor air has a lower enthalpy than the return air, the EconoMi$er2 opens to bring in outdoor air for free cooling.

Mount the return air enthalpy sensor in the return air duct. The return air enthalpy sensor is wired to terminals S_R and + on the EconoMi$er2 controller. See Fig. 29. The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er2 controller. Turn the potentiometer to the D setting for differential enthalpy. See Fig. 30.



NOTES:
1. Switch on actuator must be in run position for economizer to operate.
2. PremierLink™ control requires that the standard 50HJ540569 outside-air sensor be replaced by either the CROASENR001A00 dry bulb sensor or HH57A077 enthalpy sensor.
3. 50HJ540573 actuator consists of the 50HJ540567 actuator and a harness with 500-ohm resistor.

Fig. 27 — EconoMi$er2 with 4 to 20 mA Control Wiring

Table 3 — EconoMi$er2 Sensor Usage

APPLICATION	OUTDOOR AIR TEMPERATURE SENSOR	RETURN AIR TEMPERATURE SENSOR	OUTDOOR AIR ENTHALPY SENSOR	RETURN AIR ENTHALPY SENSOR
Standard Unit*	Included — 50HJ540569	—	—	—
Differential Dry Bulb	Required — CROASENR001A00	Required — CROASENR001A00	—	—
Single Enthalpy	Included — Not Used	—	Required — HH57AC078	—
Differential Enthalpy with Stepper Actuator	Included — Not Used	—	Required — HH57AC078	Required — HH57AC078
Dry Bulb Temperature with PremierLink™† (PremierLink requires 4-20 mA Actuator)	Required — HH79NZ017	—	—	—
Differential Dry Bulb Temperature with PremierLink† (PremierLink requires 4-20 mA Actuator)	Required — HH79NZ017	Required — 33ZCT55SPT or Equivalent	—	—
Single Enthalpy with PremierLink† (PremierLink requires 4-20 mA Actuator)	Included — Not Used	—	Required — HH57AC077	—
Differential Enthalpy with PremierLink† (PremierLink requires 4-20 mA Actuator)	Included — Not Used	—	Required — HH57AC077	Required — HH57AC078

*Optional adjustable Outdoor Air or Return Air Temperature sensor, CROASENR001A00, is available.

†PremierLink control requires Supply Air Temperature sensor 33ZCSENSAT — Included with factory-installed PremierLink control; field-supplied and field-installed with field-installed PremierLink control.

NOTES:

1. CO_2 Sensors (Optional).
   33ZCSENCO2 — Room sensor (adjustable). Aspirator box is required for duct mounting of the sensor.
   33ZCASPCO2 — Aspirator box used for duct-mounted CO_2 room sensor.
   33ZCT55CO2 — Space temperature and CO_2 room sensor with override.
   33ZCT56CO2 — Space temperature and CO_2 room sensor with override and setpoint.
2. All units include the following Standard Sensors:
   Outdoor-Air Sensor — 50HJ540569 — Opens at 67 F, closes at 52 F, not adjustable.
   Mixed-Air Sensor — HH97AZ001 — (PremierLink control requires Supply Air Temperature sensor 33ZCSENSAT)
   Compressor Lockout Sensor — 50HJ540570 — Opens at 35 F, closes at 50 F.

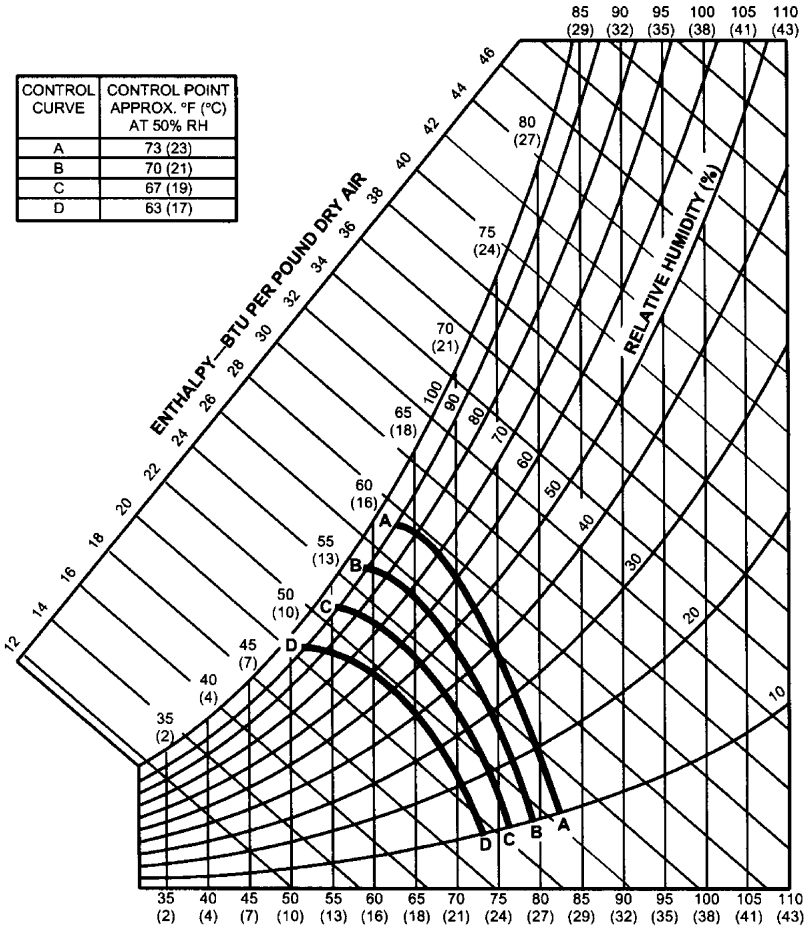
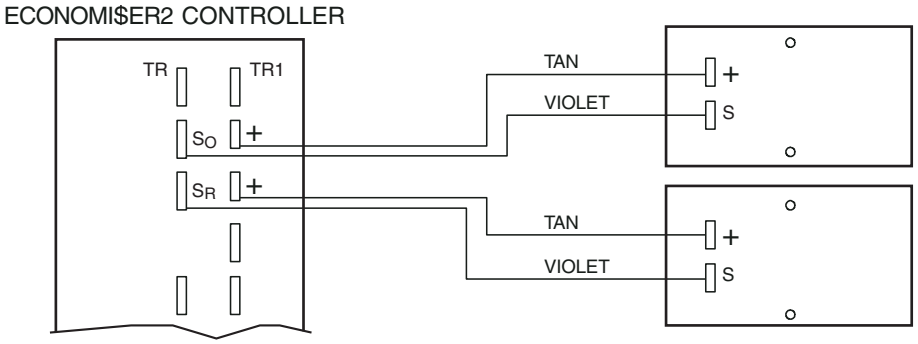


Fig. 28 — Enthalpy Changeover Set Points



NOTE: Remove the 620-ohm resistor between S_R and + before installing a differential enthalpy or adjustable dry bulb sensor.

Fig. 29 — Differential Enthalpy Wiring

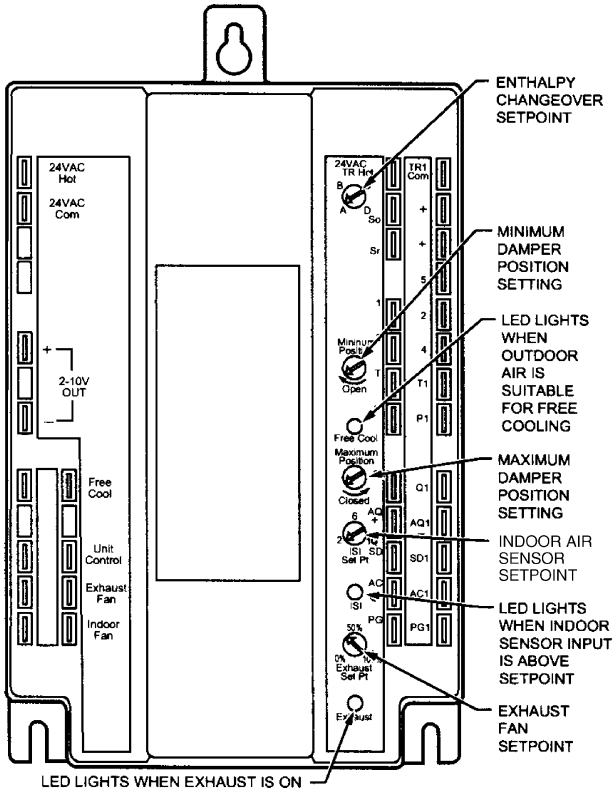


Fig. 30 — EconoMi$er2 Controller Potentiometer and LED Locations

Indoor Air Quality Sensor Input (ISI) — The ISI can be used for any indoor air quality sensor that provides a 2 to 10 vdc output. The controller will modulate the outdoor damper to provide ventilation based on the sensor output and the setting of the ISI potentiometer. The ISI LED will be lit when the ISI signal is above the ISI potentiometer set point.

A separate field-supplied transformer must be used to power the CO_2 sensor.

Mount the optional indoor air quality (CO_2) sensor according to manufacturer specifications. The CO_2 sensor should be wired to the AQ and AQ1 terminals of the controller. Adjust the ISI potentiometer to correspond to the ISI voltage output of the indoor air quality sensor at the user-determined set point. See Fig. 23.

Exhaust Set Point Adjustment — Except during purge, shutdown, and air change, the exhaust set point will determine when the exhaust fan runs based on damper position (if accessory power exhaust is installed). When the ISI calls for exhaust, the EconoMi$er2 controller provides a 45 ± 15 second delay before exhaust fan activation. This delay allows the damper to reach the appropriate position to avoid unnecessary fan overload. The set point is modified with the Exhaust Fan Set Point potentiometer. See Fig. 30.

Minimum and Maximum Position Control — There is a minimum damper position potentiometer and a maximum damper position potentiometer on the EconoMi$er2 controller. See Fig. 30. The minimum damper position maintains the minimum airflow into the building during the occupied period.

NOTE: The minimum position signal takes priority over the maximum position signal. If the maximum damper position is set below the minimum damper position, the EconoMi$er2 controller will maintain the actuator at minimum position.

Adjust the minimum position potentiometer to allow the minimum amount of outdoor air, as required by local codes, to enter the building. Make minimum position adjustments with at least 10 F (6 C) 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:

   $(T_O \times OA) + (T_R \times RA) = T_M$

   T_O = Outdoor-Air Temperature

   OA = Percent of Outdoor Air

   T_R = Return-Air Temperature

   RA = Percent of Return Air

   T_M = Mixed-Air Temperature

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

   (60 x .10) + (75 x .90) = 73.5 F
2. Disconnect the mixed-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. 31 and 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.

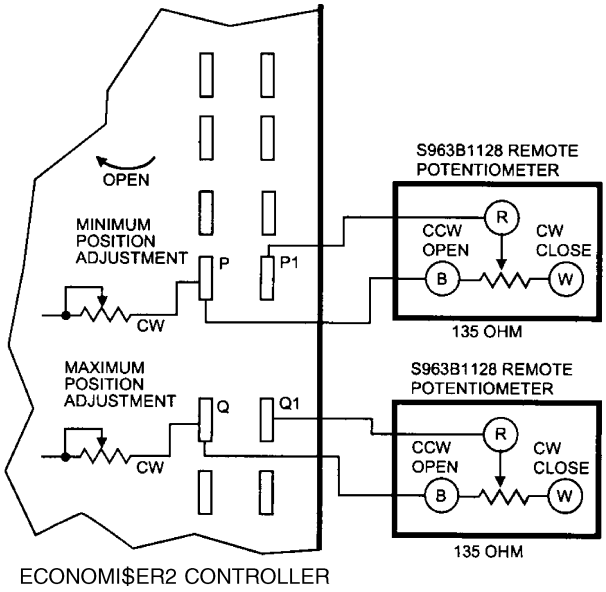


Fig. 31 — Remote Damper Position Potentiometer Wiring

To adjust the maximum position, perform the following procedure:

1. Disconnect the mixed-air sensor from terminals T and T1 and short terminals T and T1.
2. Ensure that the factory-installed jumper is in place across terminals Q and Q1. If remote damper positioning is being used, make sure that the terminals are wired according to Fig. 31 and minimum position potentiometer is turned fully clockwise.
3. Connect 24 vac across terminals TR and TR1.
4. Carefully adjust the maximum position potentiometer until the desired position is reached.

Remote control of the EconoMi$er2 damper is desirable when requiring additional temporary ventilation. If a field-supplied remote potentiometer (Honeywell part number S963B1128) is wired to the EconoMi$er2 controller, the minimum and maximum position of the damper can be controlled from a remote location.

To control the minimum damper position remotely, wire the field-supplied potentiometer to the P and P1 terminals on the EconoMi$er2 controller. See Fig. 31.

To control the maximum damper position remotely, wire the field-supplied potentiometer to the Q and Q1 terminals on the EconoMi$er2 controller. See Fig. 31.

EconoMi$er2 Usage Tracking — The Free Cool contacts on the EconoMi$er2 controller close when the EconoMi$er2 is providing free cooling. See Fig. 23. Free cooling usage time can be tracked by connecting a field-supplied timer to the free cool contacts.

Purge — When terminals PG and PG1 on the EconoMi$er2 controller connect through relay contacts or a jumper, the purge function is energized. See Fig. 32. The EconoMi$er2 damper drives fully closed and the exhaust fan turns on.

Shutdown — When terminals SD and SD1 on the EconoMi$er2 controller connect through relay contacts or a jumper, all systems are shut down. See Fig. 32. The EconoMi$er2 damper drives fully closed, the exhaust fan turns off, and the indoor fans turn off.

Air Change (Evacuation) — When terminals AC and AC1 on the EconoMi$er2 controller connect through relay contacts or a jumper, an air change is initiated. See Fig. 32. The EconoMi$er2 damper drives fully opened, the exhaust fan turns on, and the indoor fans turn on.

Demand Control Ventilation — When using the EconoMi$er2 for demand control ventilation, there are some equipment selection criteria which should be considered. When selecting the heat capacity and cool capacity of the equipment, the maximum ventilation rate must be evaluated for design conditions. The maximum damper position must be calculated to provide the desired fresh air.

Typically the maximum ventilation rate will be about 5 to 10% more than the typical CFM required per person, using normal outside air design criteria. The Ventilator software (demand control ventilation software) may be used to determine the CO_2 recovery rate at maximum ventilation.

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.

$(T_O \times OA) + (T_R \times RA) = T_M$

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

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. 33 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. 33 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$er2 controller will output the 6.7 volts from the CO_2 sensor to the actuator when the CO_2 concentration in the space is at 1100 ppm. The ISI set point may be left at 2 volts since the CO_2 sensor voltage will be ignored by the EconoMi$er2 controller until it gets above the 3.6 volt setting of the minimum position potentiometer. The maximum position potentiometer should be left at full open unless the user wants to limit the damper travel for both CO_2 and EconoMi$er2 operation.

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 4.

NOTE: Use setting 1 or 2 for Carrier equipment. See Table 4.

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 4.
4. Press Enter to lock in the selection.
5. Press Mode to exit and resume normal operation.

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

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

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

This makes the control of the of the dehumidification device simple when using the enthalpy or differential enthalpy sensor. The enthalpy sensor or differential enthalpy sensor is installed on the equipment to determine economizer operation. The high enthalpy signal from the enthalpy sensor or differential enthalpy sensor can be used to turn on the outdoor air moisture removal device any time fresh air is required for the space.

The energy recovery device should be sized for maximum latent and sensible conditioning at maximum ventilation on a design day. A calculation for leaving-air temperature on a low ambient, low ventilation day should also be done to determine the mixed-air temperature of the return and pre-conditioned outside air. The design should produce air temperature somewhat near room conditions to prevent reheat of the air mixture. The energy recovery device should be interlocked with the heat to turn off the device when in the heat mode.

Install the Supply Air Temperature Sensor (SAT) — When the unit is supplied with a factory-mounted PremierLink™ control and an EconoMi$er2, the supply-air temperature (SAT) sensor (33ZCSENSAT) is factory-supplied and wired. The wiring is routed from the PremierLink control over the control box, through a grommet, into the fan section, down along the back side of the fan, and along the fan deck over to the supply-air opening.

The SAT probe is wire-tied to the supply-air opening (on the horizontal opening end) in its shipping position. Remove the sensor for installation. Re-position the sensor in the flange of the supply-air opening or in the supply air duct (as required by local codes). Drill or punch a $^1/_2$-in. hole in the flange or duct. Use two field-supplied, self-drilling screws to secure the sensor probe in a horizontal orientation.

NOTE: The sensor must be mounted in the discharge airstream downstream of the cooling coil and any heating devices. Be sure the probe tip does not come in contact with any of the unit or heat surfaces.

Table 4 — 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

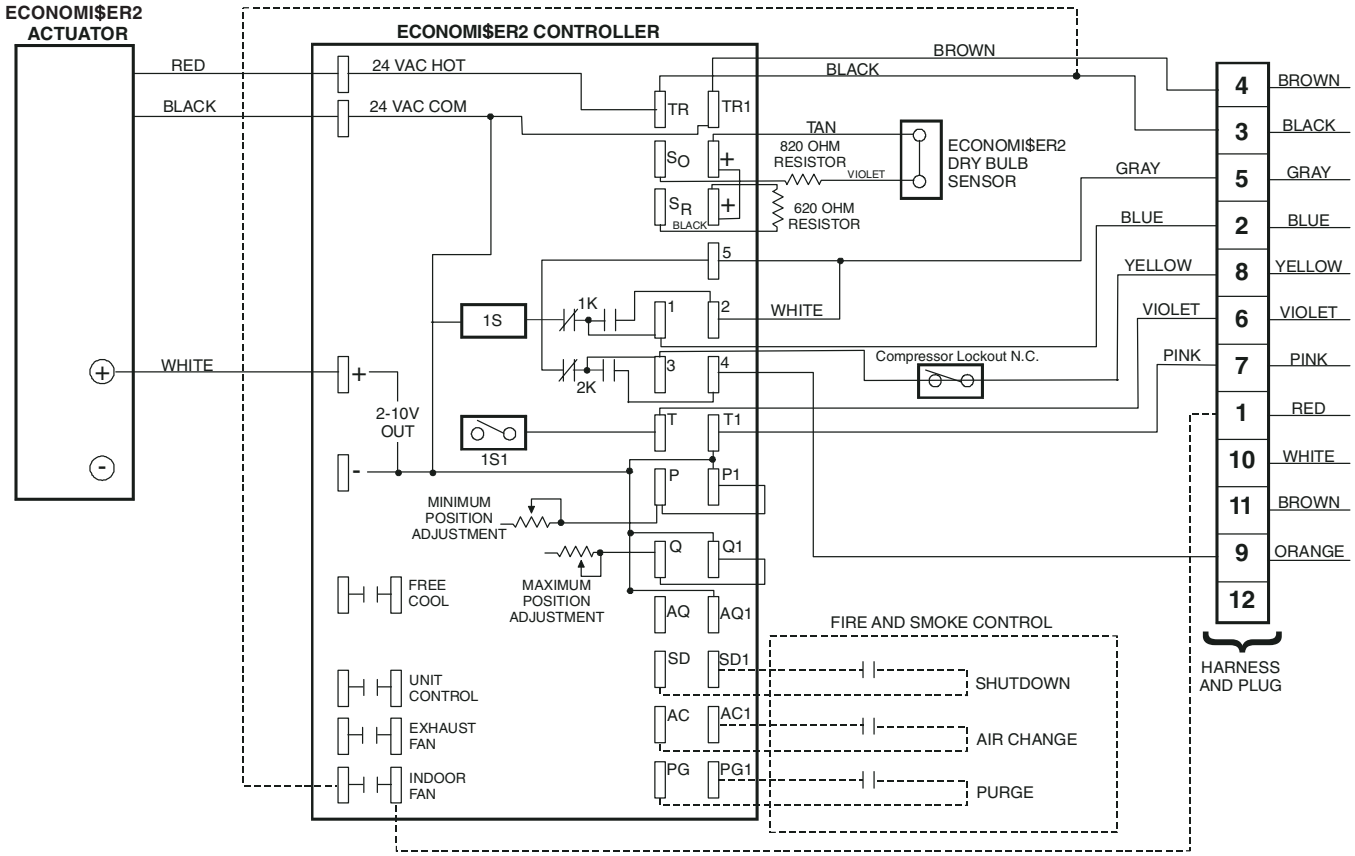


Fig. 32 — Fire and Smoke Control Wiring

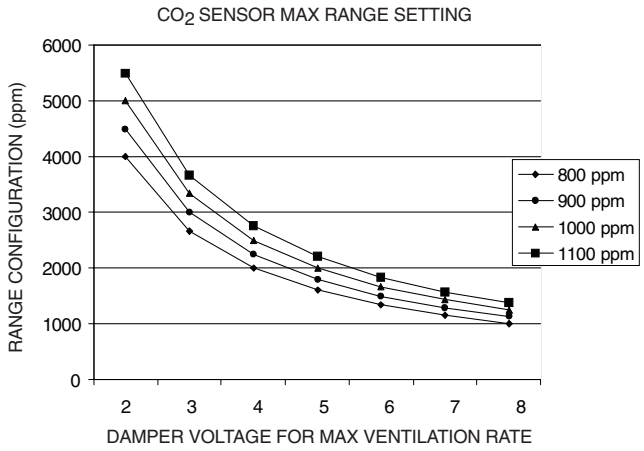


Fig. 33 — CO_2 Sensor Maximum Range Setting

Step 7 — Adjust Evaporator-Fan Speed — Adjust evaporator-fan rpm to meet jobsite conditions. See Table 5 for fan rpm at motor pulley settings. See Table 6 for motor performance data. See Table 7 and Fig. 34 and 35 for static pressure information. Refer to Tables 8-29 to determine fan speed settings.

For units with accessory electric heating, required minimum cfm is 900 for 50TFF,TM004; 1200 for 50TFF,TM005; 1500 for 50TFF,TM006; and 1800 for 50TFF,TM007.

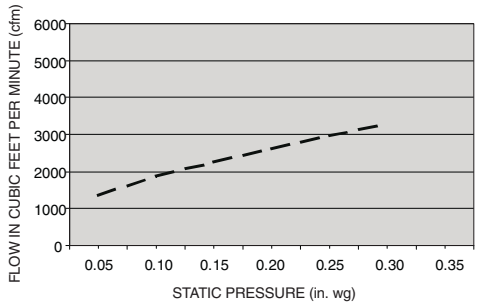


Fig. 34 — Vertical EconoMi$er2 Static Pressure (50TFF,TM004-007)

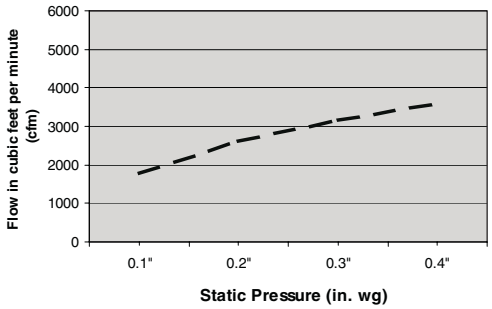


Fig. 35 — Horizontal EconoMi$er2 Static Pressure (50TFF,TM004-007)

DIRECT-DRIVE MOTORS — The evaporator-fan motor factory speed setting is shown on label diagram affixed to base unit. If other than factory setting is desired, refer to label located on motor for motor reconnection. Insert wire into the speed tap corresponding to desired speed.

BELT-DRIVE MOTORS — Fan motor pulleys are factory set for speed shown in Tables 1A and 1B. See Fig. 36.

To change fan rpm:

1. Shut off unit power supply. Install lockout tag.
2. Loosen belt by loosening fan motor mounting nuts.
3. Loosen movable pulley flange setscrew (see Fig. 37).
4. Screw movable flange toward fixed flange to increase fan rpm and away from fixed flange to decrease fan rpm. Increasing fan rpm increases load on motor. Do not exceed maximum speed specified in Tables 1A and 1B.
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.)

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.

To adjust belt tension:

1. Loosen fan motor mounting nuts.
2. Slide motor mounting plate away from fan scroll for proper belt tension ($^1/_2$-in. deflection with 8 to 10 lbs of force).
3. Tighten nuts.
4. Adjust bolt and tighten nut to secure motor in fixed position.
5. Re-inspect pulley alignment.

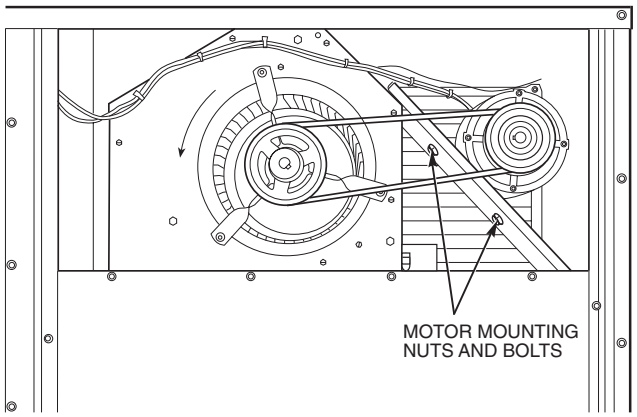


Fig. 36 — Belt-Drive Motor Mounting

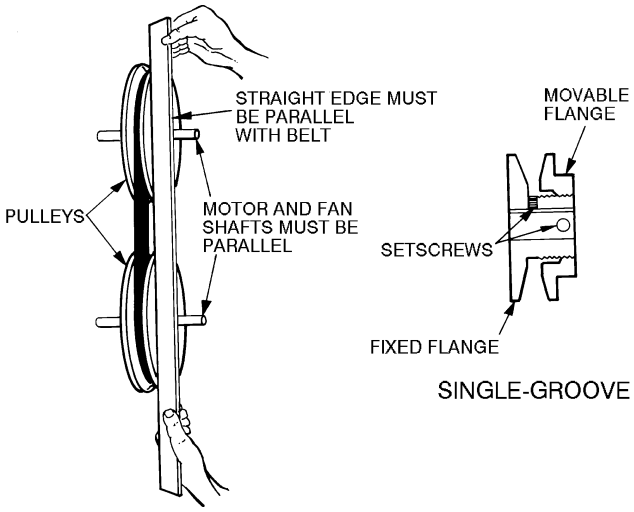


Fig. 37 — Evaporator-Fan Pulley Adjustment

Table 5 — Fan Rpm at Motor Pulley Settings*

UNIT 50TFF,TM	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
004†	1000	976	952	928	904	880	856	832	808	784	760	—	—
004**	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
005†	1185	1150	1115	1080	1045	1010	975	940	905	870	835	—	—
005**	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
006†	1300	1260	1220	1180	1140	1100	1060	1020	980	940	900	—	—
006**	1685	1589	1557	1525	1493	1460	1428	1396	1364	1332	1300	—	—
007††	1460	1420	1380	1345	1305	1265	1225	1185	1150	1110	1070	—	—
007**	1685	1589	1557	1525	1493	1460	1428	1396	1364	1332	1300	—	—

*Approximate fan rpm shown.
**Indicates high-static motor and drive package.
†Indicates alternate motor and drive package.
††Indicates standard motor and drive package.

Table 6 — Evaporator-Fan Motor Performance

UNIT 50TFF,TM	EVAPORATOR-FAN MOTOR	UNIT VOLTAGE	MAXIMUM ACCEPTABLE CONTINUOUS BHP*	MAXIMUM ACCEPTABLE OPERATING WATTS	MAXIMUM AMP DRAW
004	Standard	208/230	0.34	440	2.8
		460			1.3
		575			1.3
	Alternate	208/230	1.00	1000	4.9
		460			2.1
		575			2.1
	High Static	208/230	2.40	2120	6.0
		460			3.0
		575			3.0
005	Standard	208/230	0.75	850	3.5
		460			1.8
		575			1.8
	Alternate	208/230	1.00	1000	4.9
		460			2.1
		575			2.1
	High Static	208/230	2.40	2120	6.0
		460			3.0
		575			3.0
006	Standard	208/230	1.20	1340	5.9
		460			3.2
		575			3.2
	Alternate	208/230	1.30/2.40†	2120	6.6/5.2†
		460			2.6
		575			3.0
	High Static	208/230	2.90	2562	8.6
		460			3.9
		575			3.9
007	Standard	208/230	2.40	2120	5.2
		460			3.0
		575			3.0
	High Static	208/230	2.90	2562	8.6
		460			3.9
		575			3.9

LEGEND

BHP — Brake Horsepower

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

†Single phase/three-phase.

NOTES:

1. All indoor-fan motors 5 hp and larger meet the minimum efficiency requirements as established by the Energy Policy Act of 1992 (EPACT) effective October 24, 1997.
2. High-static motor not available on single-phase units.

Table 7 — Accessory/FIOP Static Pressure* (in. wg) — 50TFF,TM004-007

COMPONENT	CFM									
	900	1200	1400	1600	1800	2000	2200	2400	2600	3000
Durablade Economizer	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05

LEGEND

FIOP — Factory-Installed Option

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

Table 8 — Fan Performance, 50TFF,TM004 Vertical Discharge Units; Standard Motor (Direct Drive)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 9 — Fan Performance, 50TFF,TM004 Vertical Discharge Units; Alternate Motor (Belt Drive)*

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

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

LEGEND

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

*Motor drive range: 760 to 1000 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Maximum usable watts input is 1000 and maximum continuous bhp is 1.00. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 10 — Fan Performance, 50TFF,TM004 Vertical Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**673**	**0.18**	**179**	**805**	**0.25**	**249**	**911**	**0.34**	**338**	**988**	**0.43**	**428**	**1061**	**0.47**	**487**
1000	**709**	**0.22**	**219**	**835**	**0.30**	**298**	**937**	**0.38**	**378**	**1039**	**0.49**	**487**	1086	0.55	547
1100	**746**	**0.26**	**259**	**867**	**0.35**	**348**	**964**	**0.40**	**398**	**1068**	**0.55**	**547**	1109	0.61	607
1200	**785**	**0.32**	**318**	**903**	**0.41**	**408**	**994**	**0.50**	**497**	1090	0.64	637	1156	0.68	676
1300	**826**	**0.38**	**378**	**942**	**0.48**	**477**	**1047**	**0.60**	**597**	1122	0.70	696	1190	0.76	756
1400	**868**	**0.45**	**448**	**984**	**0.57**	**567**	**1067**	**0.67**	**666**	1160	0.84	766	1237	0.85	845
1500	**911**	**0.53**	**527**	**1029**	**0.66**	**656**	1109	0.77	766	1190	1.00	855	1271	0.95	945

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1105	0.57	567	1140	0.63	622	1170	0.68	674	1198	0.73	723	1224	0.77	771
1000	1136	0.63	627	1172	0.69	688	1203	0.75	745	1232	0.80	799	1258	0.86	852
1100	1145	0.67	666	1181	0.73	731	1213	0.80	792	1242	0.85	850	1268	0.91	906
1200	1210	0.74	736	1248	0.81	808	1282	0.88	875	1312	0.94	939	1340	1.01	1000
1300	1266	0.84	836	1306	0.92	917	1341	1.00	993	1373	1.07	1066	1402	1.14	1136
1400	1349	0.93	925	1391	1.02	1015	1429	1.11	1100	**1463**	**1.19**	**1180**	**1494**	**1.26**	**1257**
1500	1383	1.05	1044	1426	1.15	1146	**1465**	**1.25**	**1242**	**1500**	**1.34**	**1332**	**1532**	**1.43**	**1419**

LEGEND

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

*Motor drive range: 1075 to 1455 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Values include losses for filters, unit casings, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
3. Maximum continuous bhp is 2.4, and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 on page 31 for additional information.
4. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
5. Interpolation is permissible. Do not extrapolate.

Table 11 — Fan Performance, 50TFF,TM005 Vertical Discharge Units; Standard Motor (Direct Drive)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 12 — Fan Performance, 50TFF,TM005 Vertical Discharge Units; Alternate Motor (Belt Drive)*

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

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

LEGEND

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

*Motor drive range: 835 to 1185 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied motor drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Maximum usable watts input is 1000 and maximum continuous bhp is 1.00. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 13 — Fan Performance, 50TFF,TM005 Vertical Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**665**	**0.25**	**263**	**779**	**0.36**	**378**	**872**	**0.48**	**504**	**957**	**0.60**	**630**	**1028**	**0.69**	**725**
1300	**699**	**0.30**	**315**	**809**	**0.42**	**441**	**902**	**0.55**	**578**	**984**	**0.67**	**704**	**1058**	**0.80**	**841**
1400	**735**	**0.36**	**378**	**840**	**0.48**	**504**	**933**	**0.62**	**651**	**1011**	**0.75**	**788**	1086	0.89	885
1500	**770**	**0.42**	**441**	**873**	**0.55**	**578**	**963**	**0.69**	**725**	**1041**	**0.84**	**858**	1113	0.99	985
1600	**835**	**0.49**	**515**	**907**	**0.63**	**662**	**993**	**0.77**	**787**	**1072**	**0.93**	**950**	1141	1.09	1084
1700	**873**	**0.57**	**599**	**941**	**0.72**	**757**	**1024**	**0.87**	**889**	1103	1.04	1063	1171	1.20	1194
1800	**881**	**0.66**	**693**	**976**	**0.81**	**851**	**1057**	**0.97**	**991**	1132	1.14	1165	1202	1.32	1313
1900	**919**	**0.75**	**788**	**1011**	**0.92**	**967**	1091	1.08	1104	1162	1.25	1277	1232	1.45	1442
2000	**958**	**0.86**	**904**	**1046**	**1.03**	**1082**	1125	1.21	1237	1195	1.38	1410	1262	1.58	1572

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1083	0.74	778	1134	0.80	935	1185	0.88	965	1331	0.99	1000	1374	1.09	1083
1300	1121	0.89	935	1171	0.94	988	1219	1.00	999	1268	1.10	1029	1309	1.21	1203
1400	1153	1.00	976	1210	1.12	1071	1257	1.17	1105	1307	1.25	1190	1349	1.37	1367
1500	1180	1.13	1081	1241	1.27	1215	1295	1.37	1294	1339	1.43	1350	1382	1.57	1564
1600	1207	1.25	1196	1269	1.40	1339	1326	1.54	1454	1376	1.65	1558	1420	1.81	1805
1700	1235	1.37	1310	1296	1.53	1463	1354	1.70	1605	1407	1.84	1738	1452	2.02	2013
1800	1263	1.49	1425	1323	1.57	1597	1381	1.85	1757	1436	2.02	1907	**1482**	**2.22**	**2210**
1900	1294	1.63	1559	1351	1.81	1731	1408	2.00	1889	**1463**	**2.19**	**2068**	—	—	—
2000	1325	1.78	1702	1362	1.97	1884	1436	2.16	2040	**1489**	**2.36**	**2229**	—	—	—

LEGEND

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

*Motor drive range: 1075 to 1455 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Values include losses for filters, unit casings, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
3. Maximum continuous bhp is 2.4 and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 on page 31 for additional information.
4. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
5. Interpolation is permissible. Do not extrapolate.

Table 14 — Fan Performance, 50TFF,TM006 Vertical Discharge Units; Standard Motor (Direct Drive)

AIRFLOW (Cfm)	LOW SPEED						MEDIUM SPEED						HIGH SPEED					
	208 v			230, 460, 575 v			208 v			230, 460, 575 v			208 v			230, 460, 575 v		
	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts
1500	0.88	0.67	750	1.20	0.71	791	1.19	0.70	782	1.36	0.76	845	1.38	0.79	875	1.44	0.85	949
1600	0.68	0.70	780	1.04	0.74	824	1.04	0.74	821	1.22	0.79	883	1.25	0.82	913	1.33	0.89	988
1700	0.51	0.73	810	0.89	0.77	857	0.89	0.77	861	1.09	0.83	921	1.13	0.85	950	1.22	0.92	1027
1800	0.35	0.75	839	0.73	0.80	891	0.74	0.81	900	0.96	0.86	959	1.00	0.89	988	1.11	0.96	1066
1900	0.26	0.78	873	0.58	0.83	924	0.59	0.84	940	0.86	0.90	997	0.88	0.92	1025	1.00	0.99	1105
2000	0.18	0.81	905	0.42	0.86	957	0.44	0.88	979	0.73	0.93	1035	0.78	0.95	1063	0.92	1.03	1144
2100	0.08	0.84	940	0.27	0.89	990	0.29	0.91	1018	0.59	0.96	1073	0.63	0.99	1101	0.81	1.06	1183
2200	—	—	—	0.19	0.92	1023	0.19	0.93	1035	0.46	1.00	1111	0.49	1.02	1138	0.69	1.10	1222
2300	—	—	—	0.11	0.95	1056	0.11	0.97	1076	0.34	1.03	1149	0.41	1.06	1176	0.59	1.13	1261
2400	—	—	—	0.03	0.98	1096	0.04	1.00	1113	0.19	1.07	1187	0.22	1.09	1213	0.43	1.17	1300
2500	—	—	—	—	—	—	—	—	—	0.09	1.10	1225	0.12	1.12	1251	0.34	1.20	1340

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 15 — Fan Performance, 50TFF,TM006 Vertical Discharge Units; Alternate Motor (Belt Drive)*

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

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

LEGEND

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

*Motor drive range: 900 to 1300 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Maximum usable watts input is 2120 and maximum continuous bhp is 1.30 for single-phase units and 2.40 for 3-phase units. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 16 — Fan Performance, 50TFF,TM006 Vertical Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**808**	**0.42**	**429**	**914**	**0.56**	**572**	**1001**	**0.69**	**705**	**1084**	**0.85**	**869**	**1168**	**1.01**	**1032**
1600	**846**	**0.49**	**501**	**950**	**0.64**	**645**	**1034**	**0.78**	**797**	**1111**	**0.94**	**961**	**1194**	**1.11**	**1134**
1700	**884**	**0.57**	**582**	**983**	**0.72**	**736**	**1068**	**0.88**	**899**	**1145**	**1.03**	**1053**	**1218**	**1.21**	**1237**
1800	**924**	**0.66**	**674**	**1018**	**0.82**	**838**	**1105**	**0.98**	**1001**	**1179**	**1.13**	**1155**	**1246**	**1.32**	**1349**
1900	**965**	**0.76**	**777**	**1057**	**0.92**	**940**	**1143**	**1.10**	**1124**	**1212**	**1.26**	**1288**	**1280**	**1.43**	**1461**
2000	**1008**	**0.87**	**889**	**1096**	**1.04**	**1063**	**1177**	**1.22**	**1247**	**1247**	**1.40**	**1431**	1300	1.57	1604
2100	**1051**	**0.99**	**1012**	**1136**	**1.17**	**1196**	**1210**	**1.35**	**1380**	**1284**	**1.54**	**1574**	1347	1.72	1758
2200	**1095**	**1.12**	**1145**	**1173**	**1.30**	**1328**	**1245**	**1.49**	**1523**	1322	1.70	1737	1380	1.89	1931
2300	**1140**	**1.26**	**1288**	**1210**	**1.47**	**1502**	**1284**	**1.65**	**1686**	1356	1.80	1901	1418	2.07	2115
2400	**1185**	**1.41**	**1441**	**1249**	**1.61**	**1645**	1323	1.80	1860	1389	2.03	2074	1456	2.26	2310
2500	**1231**	**1.57**	**1604**	**1289**	**1.78**	**1819**	1363	2.00	2044	1424	2.22	2269	1500	2.45	2504

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**1199**	**1.19**	**1216**	**1126**	**1.46**	**1492**	**1250**	**1.69**	**1757**	1301	1.91	1944	1349	2.12	2164
1600	**1263**	**1.28**	**1308**	**1275**	**1.49**	**1523**	**1299**	**1.78**	**1800**	1352	2.01	2047	1401	2.23	2280
1700	**1295**	**1.39**	**1420**	1351	1.58	1615	1352	1.80	1850	1407	2.03	2070	1459	2.26	2305
1800	1319	1.52	1553	1389	1.71	1747	1435	1.91	1952	1494	2.15	2197	1548	2.40	2446
1900	1343	1.64	1676	1415	1.80	1891	1478	2.05	2095	1538	2.31	2358	1594	2.57	2625
2000	1374	1.77	1809	1438	1.99	2034	1505	2.21	2258	1566	2.49	2542	1624	2.77	2830
2100	1409	1.91	1952	1465	2.14	2167	1533	2.45	2501	1596	2.77	2821	1654	3.08	3141
2200	1442	2.08	2126	1498	2.30	2350	1568	2.64	2688	1632	2.97	3031	1691	3.31	3375
2300	1475	2.26	2310	1554	2.64	2698	1627	3.03	3091	1693	3.42	3486	1755	3.81	3881
2400	1565	2.47	2524	1649	2.89	2948	1726	3.31	3379	—	—	—	—	—	—
2500	1596	2.95	3010	1682	3.45	3522	1760	3.96	4036	—	—	—	—	—	—

LEGEND

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

*Motor drive range: 1300 to 1685 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Values include losses for filters, unit casings, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2562. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 on page 31 for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 17 — Fan Performance, 50TFF,TM007 Vertical Discharge Units; Standard Motor (Belt Drive)*

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

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

LEGEND

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

*Motor drive range: 1070 to 1460 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Maximum usable watts input is 2120 and maximum continuous bhp is 2.40. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 18 — Fan Performance, 50TFF,TM007 Vertical Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**978**	**0.66**	**700**	**1063**	**0.82**	**771**	**1147**	**0.97**	**891**	**1248**	**1.20**	**1081**	1322	1.33	1190
1900	**1023**	**0.78**	**779**	**1097**	**0.91**	**843**	**1175**	**1.11**	**1006**	**1266**	**1.29**	**1158**	1356	1.47	1310
2000	**1068**	**0.90**	**867**	**1132**	**1.01**	**924**	**1218**	**1.23**	**1106**	1303	1.41	1258	1397	1.52	1353
2100	**1115**	**1.00**	**998**	**1180**	**1.17**	**1056**	**1261**	**1.35**	**1207**	1340	1.53	1361	1428	1.66	1473
2200	**1159**	**1.15**	**1081**	**1214**	**1.28**	**1148**	1310	1.52	1353	1375	1.63	1447	1459	1.80	1595
2300	**1202**	**1.29**	**1140**	**1248**	**1.38**	**1233**	1358	1.69	1499	1410	1.72	1526	1488	1.93	1709
2400	**1237**	**1.41**	**1224**	**1292**	**1.55**	**1378**	1392	1.81	1604	1460	1.90	1683	1532	2.14	1892
2500	**1272**	**1.53**	**1335**	1335	1.71	1517	1427	1.94	1718	1518	2.16	1910	1575	2.35	2076
2600	1320	1.68	1482	1368	1.81	1604	1458	2.06	1823	1562	2.42	2136	1620	2.59	2283
2700	1361	1.82	1595	1400	1.91	1691	1490	2.19	1936	1602	2.64	2326	1666	2.85	2504
2800	1402	1.95	1639	1439	2.08	1840	1543	2.43	2145	1642	2.86	2512	1775	3.62	3290
2900	1446	2.16	1814	1477	2.16	1989	1585	2.65	2335	1753	3.58	3262	—	—	—
3000	1489	2.36	2032	1529	2.52	2223	1598	2.73	2444	1767	3.69	3360	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1395	1.46	1301	1475	1.56	1387	1542	1.71	1517	1607	1.94	1761	1667	2.16	1967
1900	1430	1.58	1404	1504	1.69	1499	1556	1.82	1613	1621	2.06	1874	1682	2.30	2093
2000	1459	1.67	1482	1532	1.82	1613	1588	1.97	1744	1655	2.23	2029	**1717**	**2.49**	**2266**
2100	1489	1.80	1595	1567	1.99	1761	1626	2.16	1910	**1694**	**2.44**	**2224**	**1758**	**2.73**	**2485**
2200	1528	1.95	1726	1603	2.17	1919	1666	2.37	2093	**1736**	**2.68**	**2441**	—	—	—
2300	1561	2.13	1884	1637	2.35	2076	**1710**	**2.54**	**2272**	**1782**	**2.87**	**2616**	—	—	—
2400	1584	2.28	2015	1671	2.55	2249	**1756**	**2.70**	**2467**	—	—	—	—	—	—
2500	1633	2.53	2232	**1698**	**2.72**	**2405**	1779	3.13	2848	—	—	—	—	—	—
2600	1675	2.77	2436	1768	3.26	2964	—	—	—	—	—	—	—	—	—
2700	1775	3.45	3141	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive range: 1300 to 1685 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Values include losses for filters, unit casings, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2562. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 on page 31 for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 19 — Fan Performance, 50TFF,TM004 Horizontal Discharge Units; Standard Motor (Direct Drive)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 20 — Fan Performance, 50TFF,TM004 Horizontal Discharge Units; Alternate Motor (Belt Drive)*

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

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

LEGEND

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

*Motor drive range: 760 to 1000 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Maximum usable watts input is 1000 and maximum continuous bhp is 1.00. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
4. Interpolation is permissible. Do not extrapolate.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 21 — Fan Performance, 50TFF,TM004 Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	**584**	**0.08**	**99**	**734**	**0.22**	**219**	**875**	**0.27**	**269**	**953**	**0.35**	**348**	**1028**	**0.42**	**438**
1000	**627**	**0.13**	**149**	**800**	**0.26**	**259**	**895**	**0.31**	**308**	**977**	**0.39**	**388**	**1064**	**0.48**	**477**
1100	**670**	**0.16**	**189**	**812**	**0.29**	**288**	**914**	**0.35**	**348**	**1005**	**0.43**	**428**	1100	0.52	527
1200	**710**	**0.23**	**229**	**840**	**0.32**	**318**	**938**	**0.40**	**398**	**1038**	**0.50**	**497**	1136	0.59	577
1300	**752**	**0.27**	**269**	**868**	**0.37**	**368**	**963**	**0.45**	**448**	**1061**	**0.56**	**557**	1172	0.65	647
1400	**776**	**0.31**	**308**	**891**	**0.42**	**418**	**983**	**0.51**	**507**	**1071**	**0.60**	**597**	1208	0.70	706
1500	**816**	**0.38**	**378**	**924**	**0.48**	**477**	**1014**	**0.58**	**577**	1097	0.68	676	1245	0.74	776

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1120	0.54	537	1155	0.59	589	1186	0.64	639	1215	0.69	685	1240	0.73	730
1000	1185	0.60	597	1222	0.66	655	1255	0.71	709	1285	0.77	761	1312	0.82	811
1100	1225	0.65	647	1263	0.71	709	1298	0.77	769	1328	0.83	825	1357	0.88	879
1200	1266	0.72	716	1306	0.79	786	1341	0.86	851	1373	0.92	914	1402	0.98	973
1300	1306	0.79	786	1347	0.87	862	1383	0.94	934	1416	1.01	1003	1446	1.07	1068
1400	1347	0.87	865	1389	0.95	950	1427	1.03	1029	**1461**	**1.11**	**1104**	**1492**	**1.18**	**1176**
1500	1385	0.96	955	1428	1.05	1048	**1467**	**1.14**	**1135**	**1502**	**1.22**	**1218**	**1534**	**1.30**	**1298**

LEGEND

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

*Motor drive range: 1075 to 1455 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
3. Maximum continuous bhp is 2.4 and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 on page 31 for additional information.
4. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
5. Interpolation is permissible. Do not extrapolate.

Table 22 — Fan Performance, 50TFF,TM005 Horizontal Discharge Units; Standard Motor (Direct Drive)

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

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 23 — Fan Performance, 50TFF,TM005 Horizontal Discharge Units; Alternate Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																				
	0.1			0.2			0.3			0.4			0.6			0.7			0.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**514**	**0.15**	**158**	**590**	**0.20**	**210**	**657**	**0.25**	**263**	**723**	**0.30**	**315**	**828**	**0.42**	**441**	876	0.49	510	924	0.55	578
1300	**545**	**0.18**	**189**	**615**	**0.23**	**242**	**680**	**0.29**	**305**	**744**	**0.35**	**368**	849	0.47	494	895	0.54	562	940	0.60	630
1400	**577**	**0.21**	**221**	**642**	**0.27**	**284**	**704**	**0.33**	**347**	**766**	**0.39**	**410**	870	0.52	546	915	0.59	620	959	0.66	693
1500	**609**	**0.26**	**273**	**670**	**0.31**	**326**	**729**	**0.38**	**394**	**788**	**0.44**	**462**	892	0.58	609	936	0.65	683	980	0.72	757
1600	**642**	**0.30**	**315**	**699**	**0.36**	**378**	**755**	**0.43**	**447**	**811**	**0.49**	**515**	913	0.64	672	957	0.72	751	1001	0.79	830
1700	**675**	**0.36**	**378**	**728**	**0.42**	**441**	**782**	**0.49**	**510**	836	0.55	578	935	0.71	746	979	0.79	825	1023	0.86	904
1800	**709**	**0.41**	**431**	**759**	**0.48**	**504**	**810**	**0.55**	**578**	860	0.62	651	957	0.78	820	1001	0.86	904	1044	0.94	988
1900	**743**	**0.48**	**504**	**790**	**0.55**	**578**	838	0.62	651	886	0.69	725	980	0.86	904	1023	0.95	993	1066	1.03	1082
2000	**778**	**0.55**	**578**	836	0.62	651	875	0.70	730	913	0.77	809	1004	0.94	988	1046	1.03	1082	1088	1.12	1177

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	1.0			1.1			1.2			1.4			1.6			1.8		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	999	0.66	674	1018	0.67	685	1036	0.68	695	1073	0.71	756	1109	0.75	794	1138	0.79	851
1300	1025	0.74	756	1058	0.79	807	1090	0.84	858	1121	0.87	832	1159	0.90	918	**1193**	**0.95**	**976**
1400	1042	0.81	828	1080	0.88	899	1118	0.95	971	1175	1.06	1014	1206	1.09	1042	1244	1.12	1138
1500	1060	0.88	899	1098	0.96	981	1136	1.04	1063	1205	1.19	1138	1258	1.30	1243	1289	1.34	1282
1600	1080	0.95	971	1117	1.04	1058	1153	1.12	1140	1224	1.29	1234	1287	1.45	1387	1337	1.56	1492
1700	1101	1.03	1053	1137	1.12	1139	1172	1.20	1226	1241	1.38	1320	1307	1.56	1492	1366	1.73	1655
1800	1122	1.11	1134	1157	1.20	1226	1192	1.29	1318	1258	1.48	1415	1323	1.67	1597	1385	1.86	1779
1900	1143	1.21	1237	1179	1.30	1328	1214	1.39	1420	1279	1.58	1511	1341	1.78	1702	1402	1.98	1894
2000	1165	1.31	1339	1200	1.40	1431	1235	1.49	1523	1300	1.69	1616	1361	1.90	1817	1419	2.10	2008

LEGEND

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

*Motor drive range: 835 to 1185 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Maximum usable watts input is 1000 and maximum continuous bhp is 1.00. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
5. Interpolation is permissible. Do not extrapolate.
6. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 24 — Fan Performance, 50TFF,TM005 Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	**641**	**0.23**	**242**	**761**	**0.34**	**357**	**859**	**0.46**	**483**	**943**	**0.58**	**609**	**1030**	**0.70**	**695**
1300	**673**	**0.28**	**294**	**788**	**0.39**	**410**	**887**	**0.52**	**546**	**968**	**0.65**	**683**	**1044**	**0.77**	**736**
1400	**705**	**0.33**	**347**	**817**	**0.45**	**473**	**914**	**0.59**	**620**	**996**	**0.72**	**757**	**1069**	**0.86**	**838**
1500	**738**	**0.38**	**399**	**847**	**0.51**	**536**	**940**	**0.65**	**683**	**1024**	**0.81**	**851**	1095	0.95	930
1600	**772**	**0.44**	**462**	**877**	**0.58**	**609**	**967**	**0.73**	**767**	**1051**	**0.89**	**935**	1123	1.05	1073
1700	**806**	**0.51**	**536**	**908**	**0.66**	**693**	**997**	**0.81**	**851**	1077	1.01	1030	1151	1.15	1185
1800	**841**	**0.59**	**620**	**939**	**0.75**	**788**	**1026**	**0.91**	**956**	1104	1.07	1124	1178	1.26	1318
1900	**876**	**0.68**	**714**	**971**	**0.84**	**883**	**1056**	**1.01**	**1061**	1132	1.18	1240	1204	1.37	1502
2000	**912**	**0.77**	**809**	**1004**	**0.94**	**988**	1087	1.12	1177	1162	1.30	1366	1231	1.48	1604

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1106	0.87	889	1134	0.98	998	1189	1.12	1138	1245	1.21	1358	1292	1.35	1345
1300	1128	0.91	930	1183	1.10	1052	1226	1.23	1215	1297	1.35	1406	1346	1.51	1500
1400	1139	1.01	1012	1218	1.14	1090	1286	1.34	1282	1320	1.48	1463	1370	1.65	1645
1500	1162	1.09	1114	1228	1.24	1186	1303	1.40	1339	1343	1.60	1530	1393	1.79	1778
1600	1185	1.20	1226	1250	1.35	1291	1319	1.51	1444	1382	1.68	1607	1434	1.88	1867
1700	1215	1.31	1339	1276	1.48	1415	1334	1.64	1569	1398	1.80	1722	1451	2.01	2001
1800	1243	1.43	1461	1303	1.61	1540	1359	1.78	1702	1418	1.95	1865	**1471**	**2.18**	**2167**
1900	1271	1.56	1594	1330	1.74	1664	1386	1.93	1846	1439	2.11	2018	**1493**	**2.36**	**2345**
2000	1298	1.69	1727	1358	1.89	1808	1413	2.08	1989	**1466**	**2.27**	**2171**	—	—	—

LEGEND

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

*Motor drive range: 1075 to 1455 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
3. Maximum continuous bhp is 2.4 and the maximum continuous watts are 2120. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 on page 31 for additional information.
4. Interpolation is permissible. Do not extrapolate.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 25 — Fan Performance, 50TFF,TM006 Horizontal Discharge Units; Standard Motor (Direct Drive)

AIRFLOW (Cfm)	LOW SPEED						MEDIUM SPEED						HIGH SPEED					
	208 v			230, 460, 575 v			208 v			230, 460, 575 v			208 v			230, 460, 575 v		
	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts	ESP	Bhp	Watts
1500	1.01	0.67	750	1.25	0.71	791	1.26	0.70	782	1.46	0.76	845	1.46	0.79	875	1.52	0.85	949
1600	0.82	0.70	780	1.09	0.74	824	1.11	0.74	821	1.32	0.79	883	1.33	0.82	913	1.41	0.89	988
1700	0.64	0.73	810	0.97	0.77	857	0.99	0.77	861	1.22	0.83	921	1.24	0.85	950	1.33	0.92	1027
1800	0.44	0.75	839	0.81	0.80	891	0.84	0.80	900	1.09	0.86	959	1.11	0.89	988	1.22	0.96	1066
1900	0.32	0.78	869	0.66	0.83	924	0.69	0.83	940	0.96	0.90	997	0.99	0.92	1025	1.11	0.99	1105
2000	0.21	0.81	899	0.47	0.86	957	0.51	0.86	979	0.80	0.93	1035	0.83	0.95	1063	0.97	1.03	1144
2100	0.13	0.83	929	0.32	0.89	990	0.36	0.89	1018	0.64	0.96	1073	0.71	0.99	1101	0.86	1.06	1183
2200	0.05	0.86	959	0.19	0.92	1023	0.21	0.92	1058	0.50	1.00	1111	0.58	1.02	1138	0.75	1.10	1222
2300	—	—	—	0.08	0.95	1057	0.08	0.95	1097	0.34	1.03	1149	0.39	1.06	1176	0.57	1.13	1261
2400	—	—	—	—	—	—	—	—	—	0.24	1.07	1187	0.29	1.09	1213	0.49	1.17	1300
2500	—	—	—	—	—	—	—	—	—	0.15	1.10	1225	0.15	1.12	1251	0.34	1.20	1340

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure (in. wg)
FIOP — Factory-Installed Option
Watts — Input Watts to Motor

NOTES:
1. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.

Table 26 — Fan Performance, 50TFF,TM006 Horizontal Discharge Units; Alternate Motor (Belt Drive)*

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

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

LEGEND

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

*Motor drive range: 900 to 1300 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Maximum usable watts input is 2120 and maximum continuous bhp is 1.30 for single-phase units and 2.40 for 3-phase units. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 27 — Fan Performance, 50TFF,TM006 Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**789**	**0.40**	**420**	**896**	**0.53**	**557**	**990**	**0.67**	**704**	**1072**	**0.83**	**872**	**1153**	**1.00**	**1051**
1600	**826**	**0.46**	**483**	**931**	**0.61**	**641**	**1020**	**0.75**	**788**	**1101**	**0.91**	**956**	**1178**	**1.09**	**1145**
1700	**865**	**0.54**	**567**	**966**	**0.69**	**725**	**1051**	**0.84**	**883**	**1133**	**1.01**	**1061**	**1205**	**1.18**	**1240**
1800	**905**	**0.62**	**661**	**1002**	**0.78**	**820**	**1084**	**0.93**	**977**	**1163**	**1.10**	**1156**	**1235**	**1.29**	**1355**
1900	**945**	**0.72**	**757**	**1037**	**0.88**	**925**	**1119**	**1.04**	**1093**	**1194**	**1.21**	**1271**	**1266**	**1.40**	**1471**
2000	**984**	**0.82**	**862**	**1072**	**0.98**	**1030**	**1154**	**1.16**	**1219**	**1226**	**1.33**	**1397**	**1297**	**1.53**	**1608**
2100	**1024**	**0.93**	**977**	**1108**	**1.10**	**1156**	**1192**	**1.29**	**1355**	**1259**	**1.47**	**1545**	1327	1.66	1744
2200	**1064**	**1.05**	**1103**	**1145**	**1.22**	**1282**	**1225**	**1.43**	**1503**	**1294**	**1.62**	**1702**	1359	1.80	1902
2300	**1104**	**1.18**	**1240**	**1183**	**1.36**	**1429**	**1260**	**1.57**	**1650**	1330	1.78	1870	1392	1.97	2070
2400	**1145**	**1.32**	**1387**	**1222**	**1.45**	**1524**	**1296**	**1.73**	**1818**	1365	1.94	2038	1426	2.15	2259
2500	**1186**	**1.48**	**1555**	**1262**	**1.68**	**1765**	1331	1.89	1986	1400	2.12	2227	1461	2.34	2459

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	**1221**	**1.17**	**1229**	**1256**	**1.30**	**1366**	**1283**	**1.32**	**1387**	1303	1.22	1282	1345	1.34	1390
1600	**1252**	**1.27**	**1334**	1311	1.45	1524	1340	1.58	1660	1330	1.61	1692	1373	1.77	1834
1700	**1278**	**1.37**	**1439**	1345	1.57	1650	1397	1.76	1849	1424	1.89	1986	1470	2.08	2153
1800	1303	1.48	1555	1371	1.69	1776	1433	1.90	1996	1480	2.09	2196	1528	2.30	2381
1900	1330	1.59	1671	1396	1.80	1902	1460	2.03	2133	1517	2.25	2364	1566	2.47	2563
2000	1362	1.73	1818	1422	1.94	2038	1485	2.16	2270	1544	2.40	2522	1594	2.64	2734
2100	1393	1.87	1965	1452	2.08	2185	1510	2.31	2427	1570	2.55	2674	1620	2.80	2905
2200	1423	2.02	2122	1483	2.24	2354	1538	2.46	2585	1594	2.71	2821	1645	2.98	3087
2300	1454	2.18	2291	1515	2.41	2532	1571	2.64	2758	1623	2.88	2976	1675	3.17	3280
2400	1485	2.36	2480	1544	2.59	2721	1604	2.84	2947	1657	3.07	3152	1710	3.38	3497
2500	1518	2.55	2679	1574	2.78	2905	1633	3.03	3134	1692	3.28	3345	1746	3.61	3736

LEGEND

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

*Motor drive range: 1300 to 1685 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2562. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 on page 31 for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 28 — Fan Performance, 50TFF,TM007 Horizontal Discharge Units; Standard Motor (Belt Drive)*

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

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	1.0			1.2			1.4			1.6		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1178	1.14	1031	1249	1.32	1182	1316	1.52	1353	1382	1.72	1526
1900	1201	1.23	1106	1274	1.43	1275	1338	1.62	1439	1402	1.83	1621
2000	1226	1.33	1990	1297	1.53	1361	1363	1.73	1534	1424	1.94	1718
2100	1252	1.45	1292	1320	1.64	1456	1388	1.85	1639	1448	2.07	1831
2200	1280	1.58	1404	1345	1.77	1569	1410	1.97	1744	**1473**	**2.20**	**1945**
2300	1309	1.71	1517	1372	1.91	1691	1434	2.11	1866	**1496**	**2.34**	**2067**
2400	1336	1.85	1639	1400	2.06	1823	1459	2.26	1997	1519	2.48	2188
2500	1363	2.00	1770	1428	2.22	1962	1486	2.43	2145	1543	2.65	2335
2600	1390	2.15	1901	1456	2.38	2102	1514	2.61	2300	1569	2.83	2487
2700	1418	2.31	2041	1483	2.56	2257	1543	2.80	2462	—	—	—
2800	1446	2.48	2188	1510	2.73	2403	—	—	—	—	—	—
2900	1476	2.67	2352	1537	2.92	2562	—	—	—	—	—	—
3000	1506	2.88	2529	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive range: 1070 to 1460 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Maximum usable watts input is 2120 and maximum continuous bhp is 2.40. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 6 on page 31.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

Table 29 — Fan Performance, 50TFF,TM007 Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	**942**	**0.73**	**700**	**1047**	**0.90**	**835**	**1139**	**1.05**	**956**	**1193**	**1.14**	**1031**	**1276**	**1.30**	**1165**
1900	**982**	**0.83**	**779**	**1084**	**1.02**	**932**	**1160**	**1.11**	**1006**	**1223**	**1.24**	**1114**	1301	1.38	1233
2000	**1022**	**0.94**	**867**	**1121**	**1.12**	**1014**	**1188**	**1.22**	**1097**	**1254**	**1.36**	**1216**	1329	1.44	1284
2100	**1063**	**1.10**	**998**	**1140**	**1.18**	**1064**	**1196**	**1.27**	**1140**	**1272**	**1.45**	**1292**	1354	1.58	1404
2200	**1104**	**1.20**	**1081**	**1159**	**1.23**	**1106**	**1229**	**1.41**	**1258**	1306	1.53	1361	1363	1.70	1508
2300	**1130**	**1.27**	**1140**	**1196**	**1.37**	**1224**	**1264**	**1.56**	**1387**	1340	1.66	1473	1397	1.86	1648
2400	**1174**	**1.37**	**1224**	**1245**	**1.57**	**1396**	1305	1.63	1447	1373	1.84	1630	1440	1.95	1726
2500	**1201**	**1.50**	**1335**	**1284**	**1.65**	**1465**	1338	1.75	1552	1402	1.99	1761	1469	2.04	1805
2600	**1246**	**1.67**	**1482**	1312	1.76	1560	1366	1.96	1735	1435	2.10	1858	1494	2.19	1936
2700	**1285**	**1.80**	**1595**	1354	1.95	1726	1403	2.14	1892	1474	2.21	1954	1536	2.46	2171
2800	1304	1.85	1639	1374	2.12	1875	1459	2.25	1989	1514	2.42	2136	1570	2.66	2343
2900	1345	2.05	1814	1412	2.32	2050	1496	2.54	2240	1529	2.61	2300	1603	2.87	2521
3000	1378	2.30	2032	1451	2.40	2119	1534	2.66	2343	1560	2.81	2470	1611	3.01	2648

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1341	1.40	1250	1413	1.55	1378	1474	1.58	1404	1522	1.74	1564	1566	1.89	1704
1900	1374	1.53	1361	1437	1.62	1439	1490	1.67	1482	1538	1.84	1653	1583	2.00	1801
2000	1396	1.66	1473	1460	1.68	1491	1509	1.77	1569	1558	1.95	1752	1603	2.12	1909
2100	1413	1.75	1552	1475	1.73	1534	1529	1.92	1700	1578	2.11	1901	1624	2.30	2070
2200	1434	1.81	1604	1487	1.85	1639	1554	2.07	1831	1604	2.28	2049	1651	2.48	2232
2300	1459	1.88	1665	1520	2.07	1831	1576	2.24	1980	1627	2.46	2218	1674	2.68	2415
2400	1502	2.06	1823	1552	2.24	1980	1604	2.42	2136	1656	2.66	2396	**1704**	**2.90**	**2609**
2500	1524	2.24	1980	1585	2.42	2136	1638	2.60	2292	**1691**	**2.86**	**2574**	1740	3.12	2804
2600	1552	2.40	2119	1616	2.63	2317	1671	2.80	2462	1725	3.08	2772	1775	3.35	3019
2700	1584	2.61	2300	1646	2.83	2487	1706	2.97	2653	1761	3.27	2941	—	—	—
2800	1624	2.85	2504	1677	2.99	2661	1739	3.33	2998	1795	3.67	3299	—	—	—
2900	1671	3.03	2725	1742	3.43	3090	—	—	—	—	—	—	—	—	—
3000	1692	3.49	3140	1764	3.95	3558	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive range: 1300 to 1685 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates field-supplied motor and drive are required.
3. Values include losses for filters, unit casing, and wet coils. See Table 7 and Fig. 34 and 35 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 2.9 and the maximum continuous watts are 2562. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 6 on page 31 for additional information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
6. Interpolation is permissible. Do not extrapolate.

START-UP

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

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

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

Internal Wiring — Check all electrical connections in unit control boxes; tighten as required. Ensure wiring does not come in contact with sharp metal edges.

Refrigerant Service Ports — To service refrigerant service ports, remove access panel. Each unit system has 4 Schrader-type service ports: one on the suction line, one on the liquid line, and two on the compressor discharge line. Be sure that caps on the ports are tight. The Schrader-type valve that is located under the high-pressure switch does not have a Schrader core.

High Flow Refrigerant Valves — Two high flow valves are located on the hot gas tube coming out of the compressor and the suction tube going into the compressor. Large black plastic caps identify these valves with O-rings inside screwing the cap and onto a brass body. No field access to these valves is available at this time. Ensure the plastic caps remain on the valves and are tight or the possibility of refrigerant leakage could occur.

Compressor Rotation — On 50TFF,TM007 scroll compressor units, it is important to be certain compressor is rotating in the proper direction. To determine whether or not compressor is rotating in the proper direction:

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

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

1. Note that the evaporator fan is probably also rotating in the wrong direction.
2. Turn off power to the unit. Install lock-out tag.
3. Reverse any two of the unit power leads.
4. Reapply power to the unit.

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

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

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

Check cooling effects at a setting below room temperature. Check unit charge. Refer to Refrigerant Charge section, page 48.

Reset thermostat at a position above room temperature. Compressor will shut off.

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

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

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

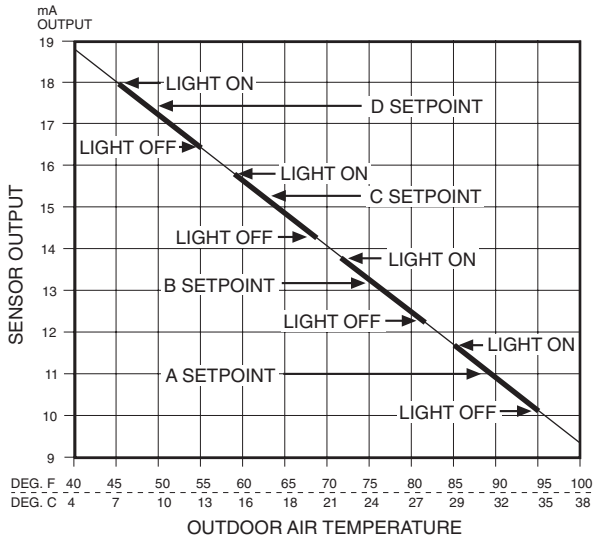
Operating Sequence

COOLING, UNITS WITH ECONOMI$ER2 — 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 positioned through the use of a Proportional-Integral (PI) control process to provide a 55 F supply-air temperature into the zone. As the supply-air temperature fluctuates above or below 55 F, the dampers will be modulated (open or close) to bring the supply-air temperature back within control.

If mechanical cooling is utilized with free cooling, the outdoor-air damper will be locked into its current position at the time the compressor is started. If the increase in cooling capacity causes the supply-air temperature to drop below 45 F, then the outdoor air damper position will be decreased to the minimum position. If the supply-air temperature continues to fall, the outdoor-air damper will close. See Fig. 38 for EconoMi$er2 outdoor-air damper operation.

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$er2 control, a PI-controlled demand 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.



NOTES:
1. Light ON: Outside-air damper will open to allow free cooling below this temperature.
2. Light OFF: Outside-air damper will close to its minimum position and compressor will be energized above this temperature.

Fig. 38 — EconoMi$er2 Outdoor-Air Damper Operation

ACCESSORY HEATING, UNITS WITH ECONOMI$ER2 — Upon a call for heat through W1, the IFC (indoor [evaporator] fan contactor) energizes to start the evaporator fan and the economizer damper blade opens to the minimum position. If the two-position damper is used, the outdoor-air damper opens to the minimum position whenever the evaporator fan runs.

COOLING, UNITS WITHOUT ECONOMI$ER2 — When thermostat calls for cooling, terminals G and Y1 are energized. The indoor (evaporator) fan contactor (IFC), compressor contactor and outdoor (condenser) fan contactor (OFC) are energized and evaporator-fan motor, compressor no. 1, and condenser fan start. The condenser-fan motor runs continuously while unit is cooling. After Y1 is satisfied on 50TFF,TM004-006 units, the evaporator fan remains energized for 30 seconds.

ACCESSORY HEATING, UNITS WITHOUT ECONOMI$ER2 — 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.

SERVICE

⚠ CAUTION

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

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

EVAPORATOR COIL

1. Turn unit power off. Install lockout tag. Remove evaporator coil access panel.
2. If economizer or two-position damper is installed, remove economizer by disconnecting Molex plug and removing mounting screws. Refer to accessory economizer installation instructions or Optional EconoMi$er2 section on page 20 for more information.
3. Slide filters out of unit.
4. Clean coil using a commercial coil cleaner or dishwasher detergent in a pressurized spray canister. Wash both sides of coil and flush with clean water. For best results, back-flush toward return-air section to remove foreign material. Flush condensate pan after completion.
5. Reinstall economizer and filters.
6. Reconnect wiring.
7. Replace access panels.

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

One-Row Coils — Size 004 — Wash coil with commercial coil cleaner. It is not necessary to remove the top panel.

2-Row Coils — Sizes 005-007

Clean coil as follows:

1. Turn off unit power. Install lockout tag.
2. Remove top panel screws on condenser end of unit.
3. Remove condenser coil corner post. See Fig. 39. To hold top panel open, place coil corner post between top panel and center post. See Fig. 40.
4. Remove screws securing coil to compressor plate and compressor access panel.
5. Remove fastener holding coil sections together at return end of condenser coil. Carefully separate the outer coil section 3 to 4 in. from the inner coil section. See Fig. 41.
6. Use a water hose or other suitable equipment to flush down between the 2 coil sections to remove dirt and debris. Clean the outer surfaces with a stiff brush in the normal manner.
7. Secure inner and outer coil rows together with a field-supplied fastener.
8. Reposition the outer coil section and remove the coil corner post from between the top panel and center post. Reinstall the coil corner post and replace all screws.

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

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

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

Lubrication

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

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

Evaporator Fan Belt Inspection — Check condition of evaporator belt or tension during heating and cooling inspections or as conditions require. Replace belt or adjust as necessary. Refer to Step 7 — Adjust Evaporator-Fan Speed on page 30 for proper adjusting procedures and belt tension.

Condenser-Fan Adjustment (Fig. 42)

1. Shut off unit power supply. Install lockout tag.
2. Remove condenser-fan assembly (grille, motor, and fan).
3. Loosen fan hub setscrews.
4. Adjust fan height as shown in Fig. 42.
5. Tighten setscrews.
6. Replace condenser-fan assembly.

Manual Outdoor-Air Damper — If outdoor-air damper blade adjustment is required, see Manual Outdoor-Air Damper section on page 19.

Economizer Adjustment — Refer to Optional EconoMi$er2 section on page 20.

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

Refrigerant Charge — Amount of refrigerant charge is listed on unit nameplate (also refer to Tables 1A and 1B). Refer to Carrier GTAC2-5 Charging, Recovery, Recycling, and Reclamation training manual and the following procedures. Unit panels must be in place when unit is operating during charging procedure.

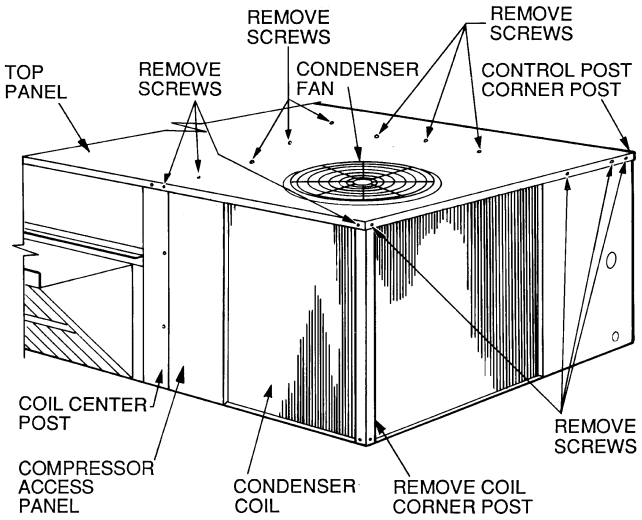


Fig. 39 — Cleaning Condenser Coil

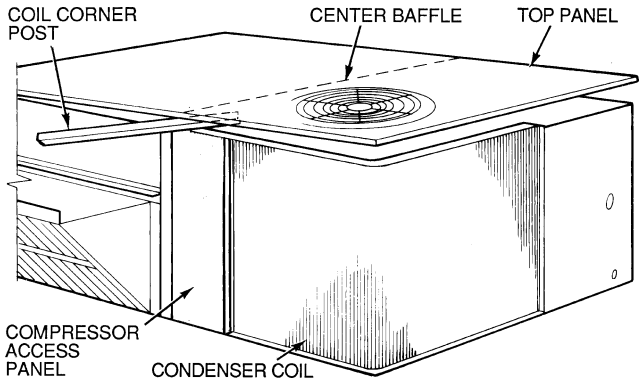


Fig. 40 — Propping Up Top Panel

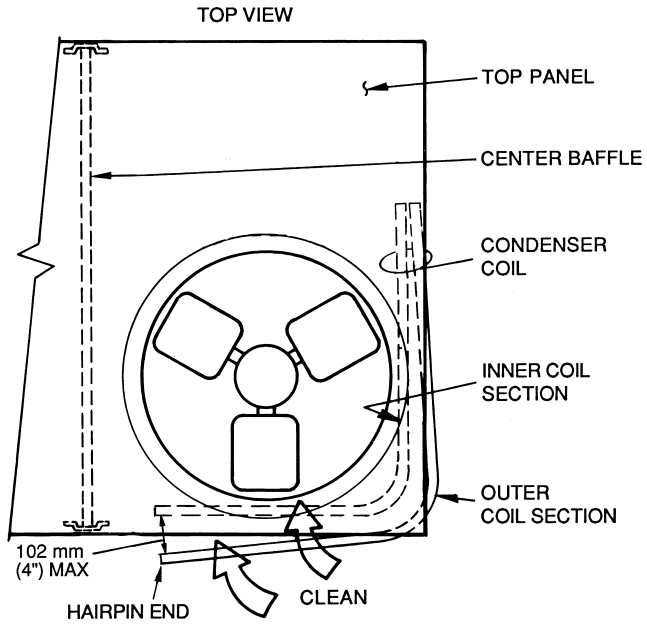


Fig. 41 — Separating Coil Sections

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 — Use Cooling Charging Charts, Fig. 43-46. Vary refrigerant until the conditions of the appropriate chart are met. Note the charging chart is different from type normally used. Chart is based on charging the units to the correct superheat for the various operating conditions. Accurate pressure gage and temperature sensing device are required. Connect the pressure gage to the service port on the suction line. Mount the temperature sensing device on the suction line and insulate it so that outdoor ambient temperature does not affect the reading. Indoor-air cfm must be within the normal operating range of the unit.

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

Example: (Fig. 45)

Outdoor Temperature. . . . . 85 F
Suction Pressure . . . . . 80 psig
Suction Temperature should be . . . . . 77 F
(Suction Temperature may vary ± 5 F.)

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

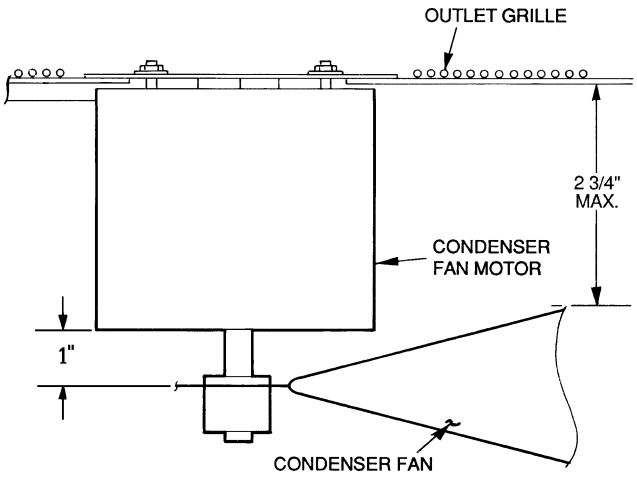


Fig. 42 — Condenser Fan Adjustment

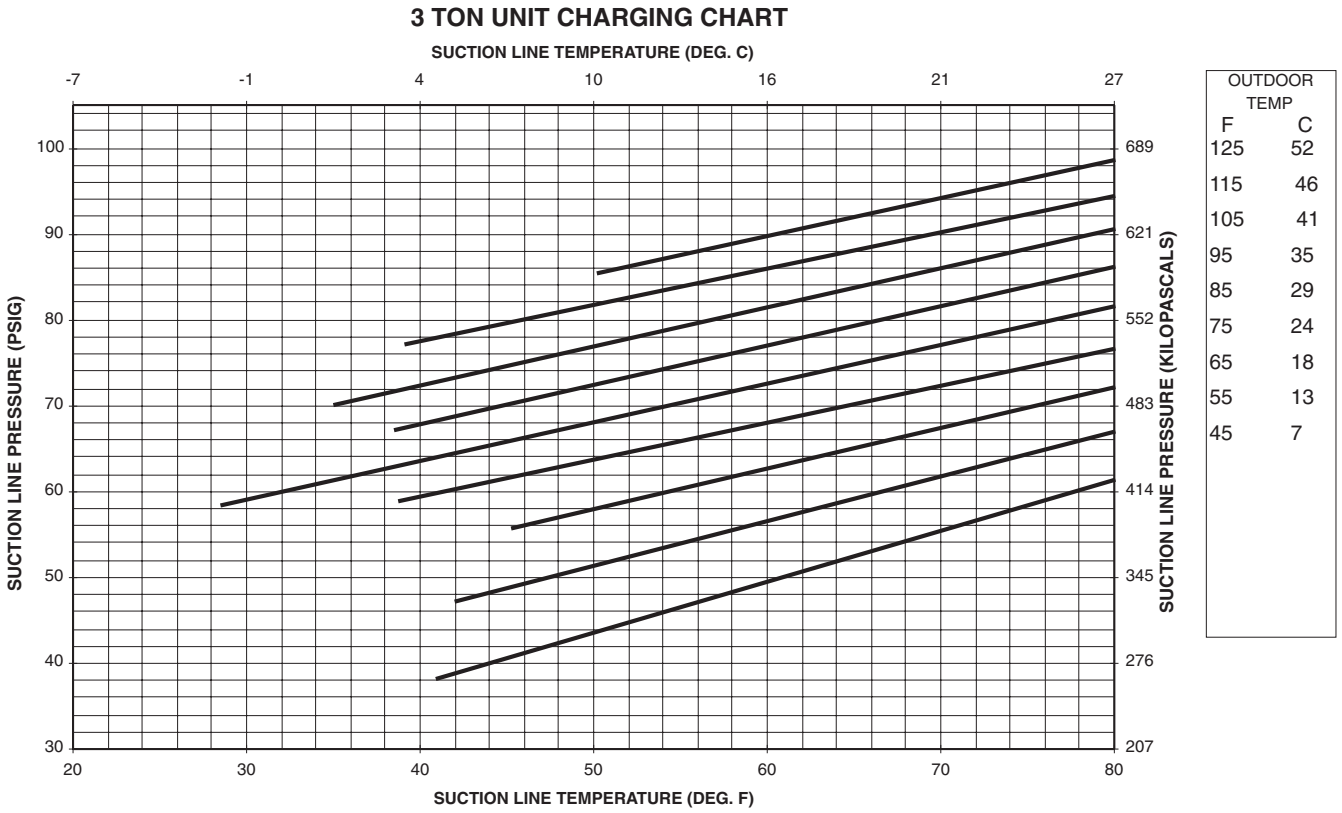


Fig. 43 — Cooling Charging Chart; 50TFF,TM004

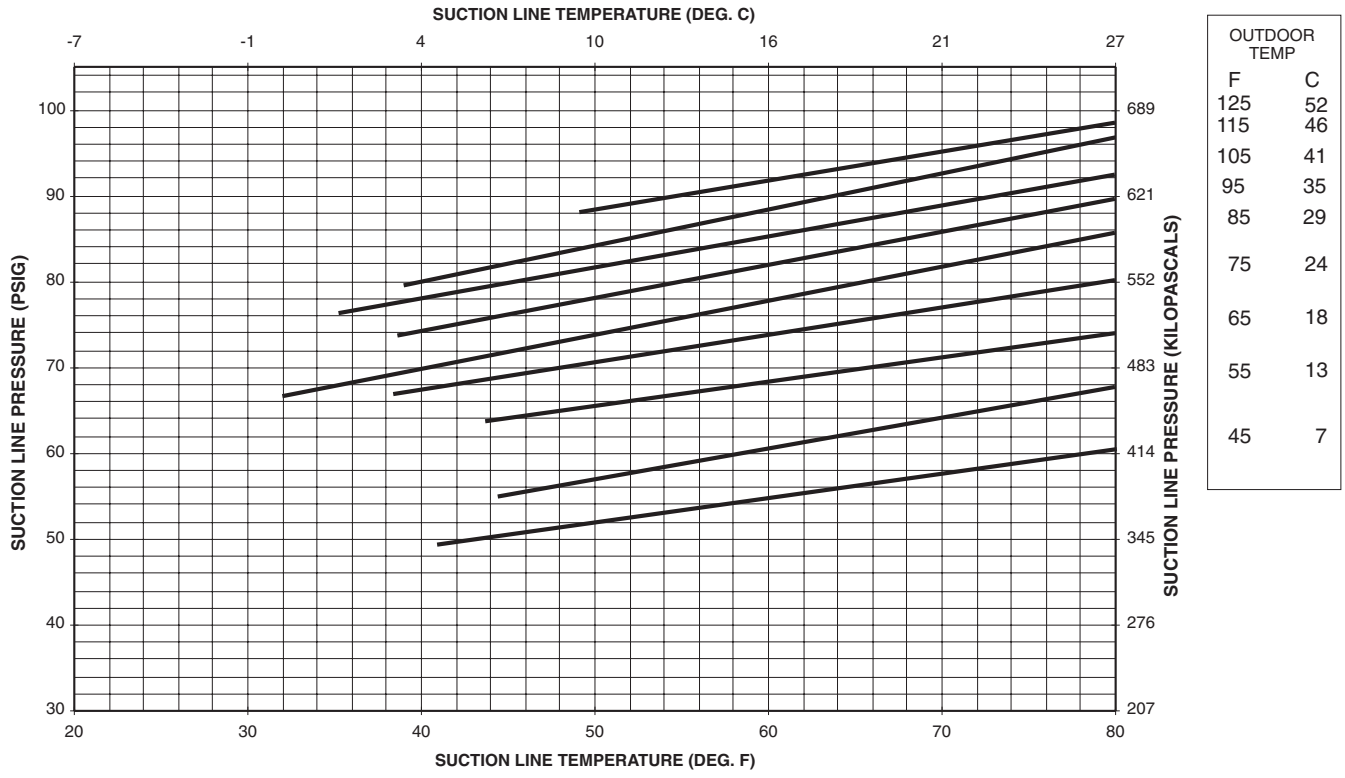


Fig. 44 — Cooling Charging Chart; 50TFF,TM005

5 TON UNIT CHARGING CHART

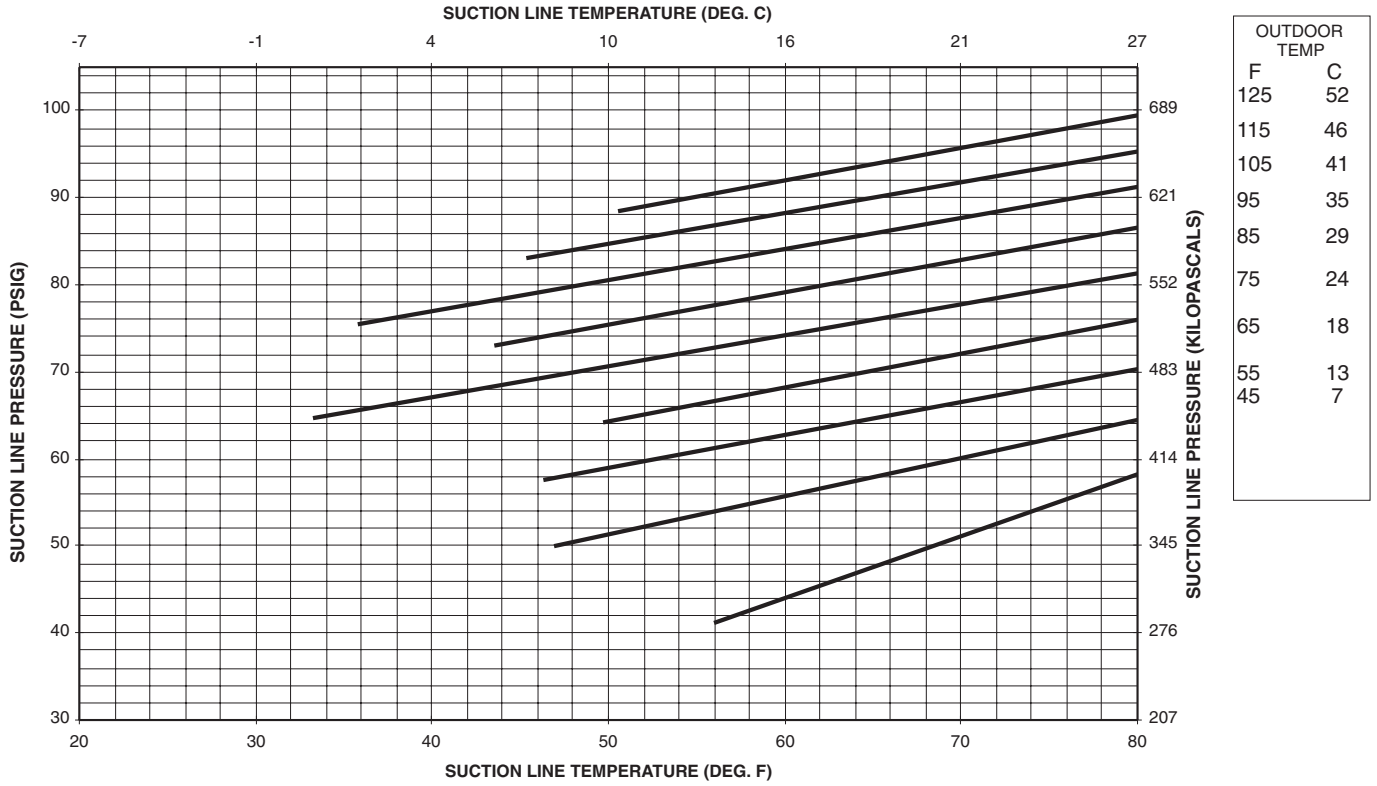


Fig. 45 — Cooling Charging Chart; 50TFF,TM006

6 TON UNIT (60 Hz) CHARGING CHART

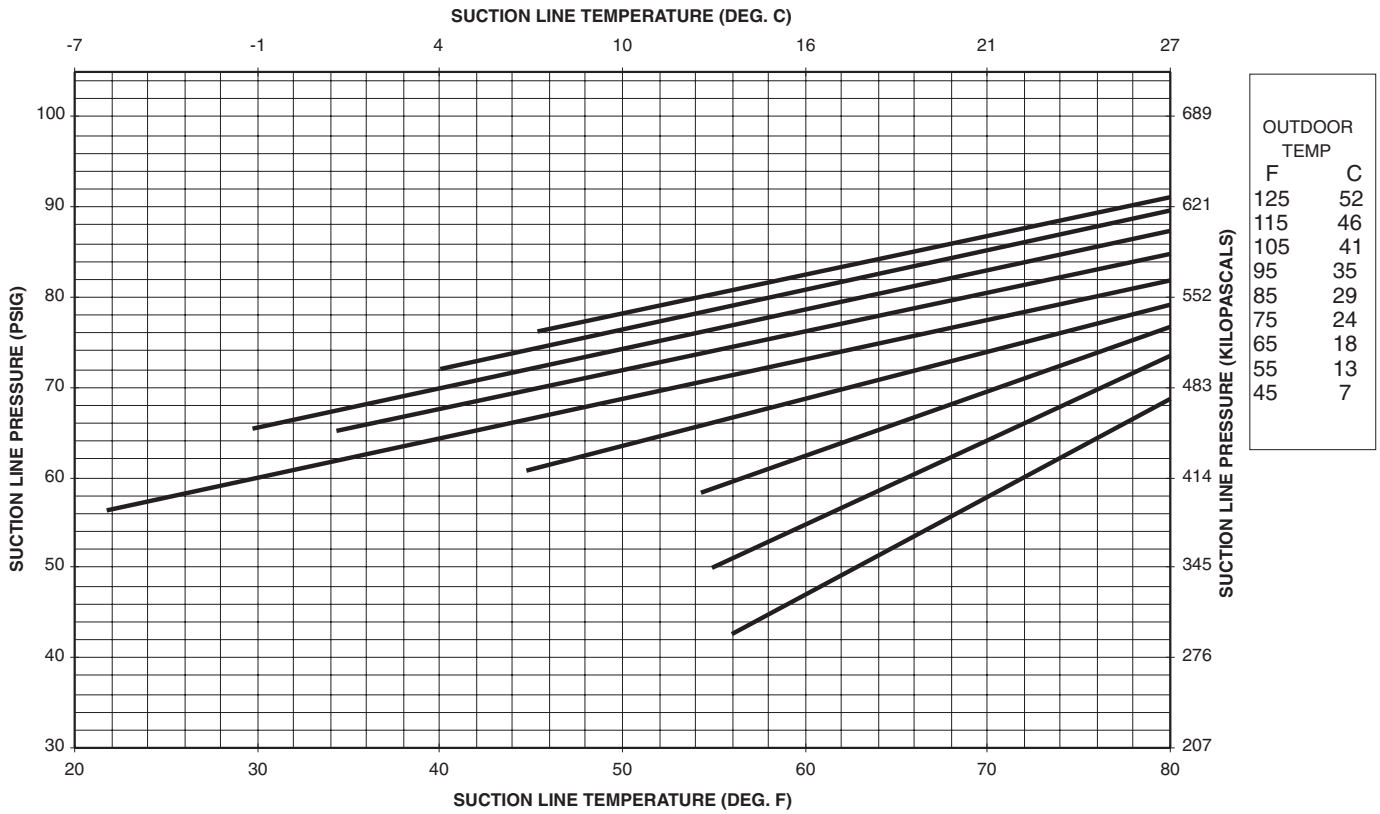


Fig. 46 — Cooling Charging Chart; 50TFF,TM007

TROUBLESHOOTING

Refer to Troubleshooting Table 30 and Fig. 47 and 48 for additional information.

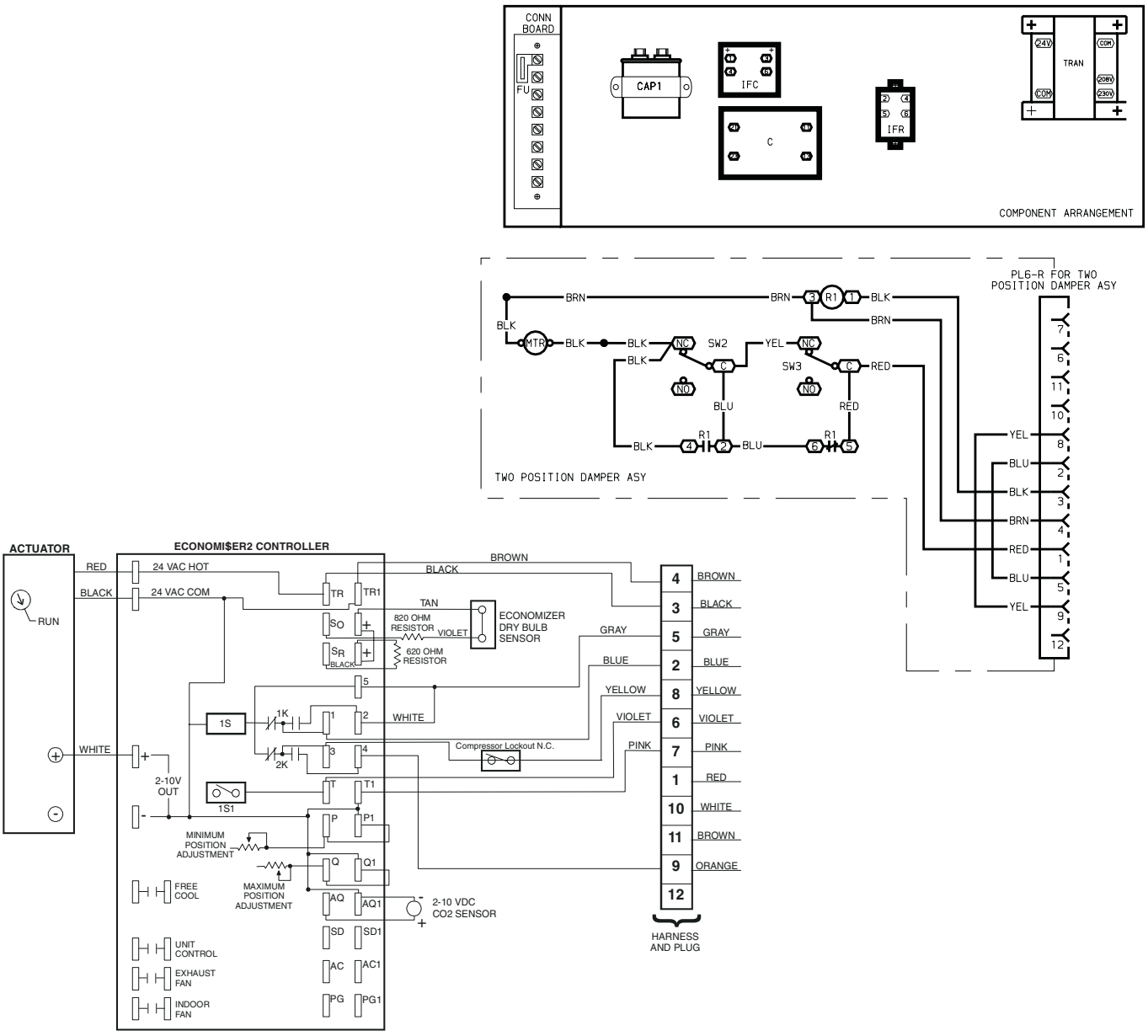


Fig. 47 — EconoMi$er2 and Two-Position Damper Schematic and Component Arrangement

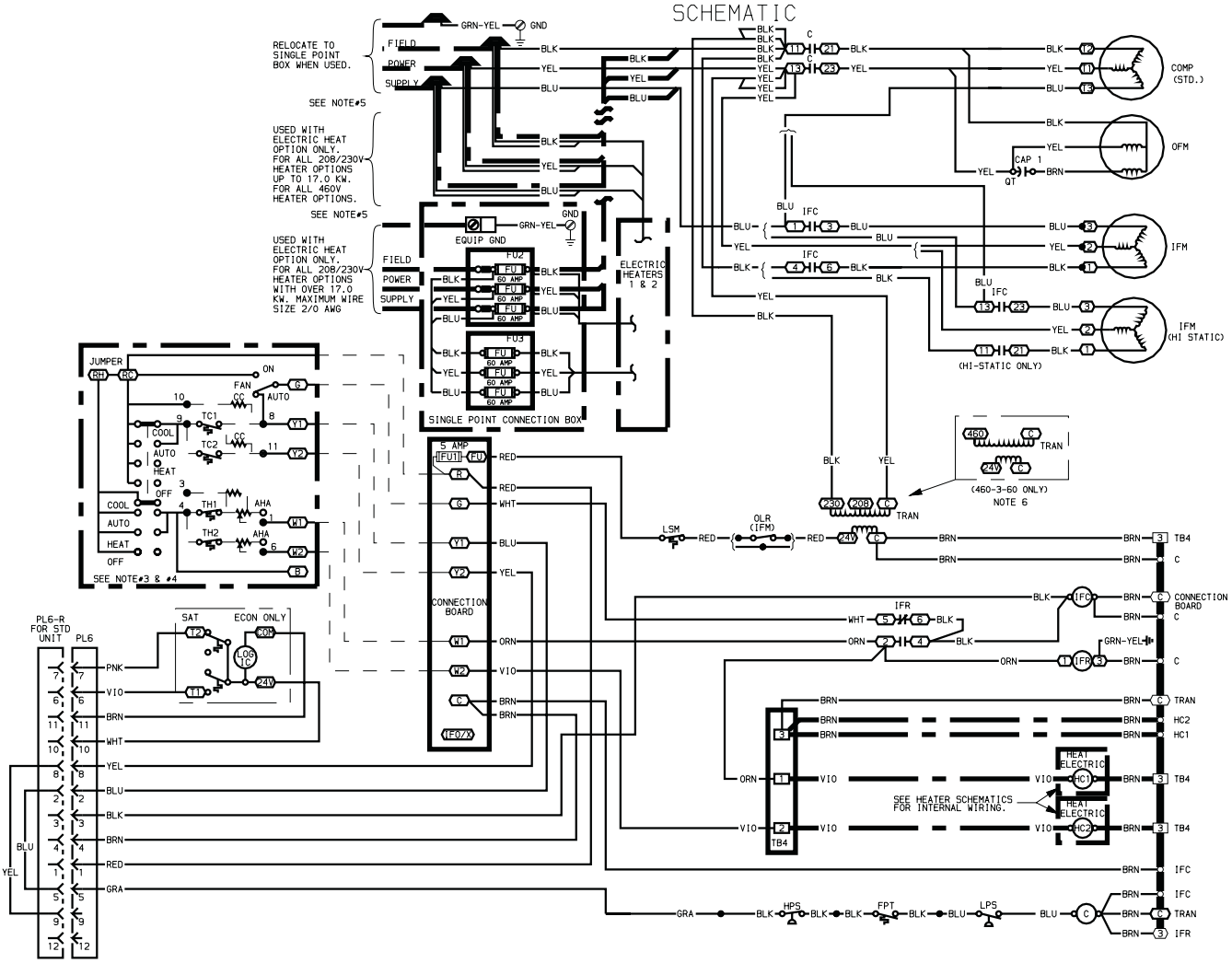


Fig. 48 — Typical Unit Wiring Schematic

LEGEND (Fig. 47 and 48)

AHA	—	Adjustable Heat Anticipator
AWG	—	American Wire Gage
C	—	Contactor, Compressor
CAP	—	Capacitor
CC	—	Cooling Compensator
COMP	—	Compressor Motor
ECON	—	Economizer
EQUIP	—	Equipment
FPT	—	Freeze Up Protection Thermostat
FU	—	Fuse
GND	—	Ground
HC	—	Heater Contactor
HPS	—	High-Pressure Switch
IFC	—	Indoor Fan Contactor
IFM	—	Indoor (Evaporator) Fan Motor
IFR	—	Indoor Fan Relay
LPS	—	Low-Pressure/Loss-of-Charge Switch
LSM	—	Limit Switch (Manual Reset)
MTR	—	Motor
OFM	—	Outdoor (Condenser) Fan Motor
OLR	—	Overload Relay
PL	—	Plug Assembly
QT	—	Quadruple Terminal
R	—	Relay
SAT	—	Supply Air Thermostat
SW1	—	Switch Fully Open
SW2	—	Switch Fully Closed
SW3	—	Switch Min. Vent Position
SW4	—	Switch Max. Vent Position
TB	—	Terminal Block
TC	—	Thermostat-Cooling
TH	—	Thermostat-Heating
TRAN	—	Transformer

Field Splice

Marked Wire

Terminal (Marked)

Terminal (Unmarked)

Terminal Block

Splice

Splice (Marked)

Factory Wiring

Field Control Wiring

Field Power Wiring

Accessory or Optional Wiring

To indicate common potential only; not to represent wiring.

NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with type 90 C wire or its equivalent.
2. Three-phase motors are protected under primary single-phasing conditions.
3. Thermostat: HH07AT170, 172, 174 and P272-2783 Subbase: HH93AZ176, 178 and P272-1882, 1883.
4. Set heat anticipator at .14 amp. For units with 2 stages of heating, set stage two anticipator at .14 amp.
5. Use copper conductors only.
6. TRAN is wired for 230-v unit. If unit is to be run with 208-v power supply, disconnect BLK wire from 230-v tap (ORN) and connect to 208-v tap (RED). Insulate end of 230-v tap.

EconoMi$er2 Troubleshooting

ECONOMI$ER2 CHECKOUT PROCEDURE — Prepare the EconoMi$er2 for troubleshooting by performing the following procedure:

1. Disconnect power at TR and TR1. Free Cool, unit control, indoor fan, and exhaust control contacts should be open.
2. Disconnect device at P and P1.
3. Disconnect device at Q and Q1.
4. Jumper P to P1.
5. Jumper Q to Q1.
6. Turn Minimum Position potentiometer fully CCW (counterclockwise).
7. Turn Maximum Position potentiometer fully CW (clockwise).
8. Place 6.8 Kohm resistor across T and T1.
9. Jumper TR to 1.
10. If connected, remove enthalpy sensor from terminals S_O and +. Connect 1.2 Kohm 4074EJM checkout resistor across terminals S_O and +.
11. Set both ISI and Exhaust potentiometers fully CCW.
12. Put 620-ohm resistor across terminals S_R and +.
13. Set enthalpy potentiometer to D.
14. Apply power (24 vac) to terminals TR and TR1.

DIFFERENTIAL ENTHALPY — To check differential enthalpy:

1. Make sure EconoMi$er2 checkout procedure has been performed.
2. Place 620-ohm resistor across S_O and +.
3. Place 1.2 Kohm resistor across S_R and +. The Free Cool LED should be lit.
4. Remove 620-ohm resistor across S_O and +. The Free Cool LED should turn off.
5. Return EconoMi$er2 settings and wiring to normal after completing troubleshooting.

SINGLE ENTHALPY — To check single enthalpy:

1. Make sure EconoMi$er2 checkout procedure has been performed.
2. Set the enthalpy potentiometer to A (fully CCW). The Free Cool LED should be lit.
3. Set the enthalpy potentiometer to D (fully CW). The Free Cool LED should turn off.
4. Return EconoMi$er2 settings and wiring to normal after completing troubleshooting.

ISI (INDOOR AIR QUALITY) AND POWER EXHAUST — To check ISI and Power Exhaust:

1. Make sure EconoMi$er2 checkout procedure has been performed.
2. Ensure terminals AQ and AQ1 are open. The LED for both ISI and Power Exhaust should be off. The actuator should be fully closed.
3. Connect a 9V battery to AQ (positive node) and AQ1 (negative node). The LED for both ISI and the Exhaust Fan should turn on. The actuator should drive to 90 to 95% open.
4. Turn the exhaust potentiometer CW until the Exhaust LED turns off. The LED should turn off when the potentiometer is approximately 90%. The actuator should remain in position.
5. Turn ISI potentiometer CW until ISI LED turns off. The ISI LED should turn off when the potentiometer is approximately 9V. The actuator should drive fully closed.
6. Turn ISI and Exhaust potentiometers CW until the Exhaust LED turns on. Forty-five seconds after the Exhaust LED turns on, the exhaust contacts will close.
7. Return EconoMi$er2 settings and wiring to normal after completing troubleshooting.

FREEZE PROTECTION — To check freeze protection:

1. Make sure EconoMi$er2 checkout procedure has been performed.
2. Connect a 9V battery to AQ (positive node) and AQ1 (negative node). The LED for both ISI and the Exhaust Fan should turn on. The actuator should drive to 90 to 95% open.
3. Remove the 6.8 Kohm resistor from T and T1. The Exhaust LED should turn off and the actuator should drive fully closed.
4. Replace the 6.8 Kohm resistor across T and T1. The Exhaust LED should turn on and the actuator should drive to 90 to 95% open.
5. Return EconoMi$er2 settings and wiring to normal after completing troubleshooting.

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

1. Make sure EconoMi$er2 checkout procedure has been performed.
2. Connect a 9V battery to AQ (positive node) and AQ1 (negative node). The LED for both ISI and the Exhaust Fan should turn on. The actuator should drive to 90 to 95% open.
3. Turn the Maximum Position potentiometer to midpoint. The actuator should drive to 20 to 80% open.
4. Turn the Maximum Position potentiometer to fully CCW. The actuator should drive fully closed.
5. Turn the Minimum Position potentiometer to midpoint. The actuator should drive 20 to 80% open.
6. Turn the Minimum Position Potentiometer fully CW. The actuator should drive fully open.
7. Return EconoMi$er2 settings and wiring to normal after completing troubleshooting.

AIR CHANGE, SHUTDOWN, AND PURGE — To check air change, shutdown, and purge:

1. Make sure EconoMi$er2 checkout procedure has been performed.
2. Ensure terminals AQ and AQ1 are open.
3. Turn the Minimum Position Potentiometer to midpoint. The actuator should drive 20 to 80% open.
4. Make sure that the Air Change, Purge, and Shutdown terminals are empty. The Exhaust LED should turn on. The Unit Control and Indoor Fan contacts will close.
5. Jumper the Air Change terminals. The exhaust LED turns on. The Unit Control contacts open. The Indoor Fan contacts remain closed. The actuator drives fully open.
6. Remove the jumper from the Air Change terminals. Jumper the Shutdown terminals. The exhaust LED turns off. The Unit Control, Indoor Fan, and Exhaust Fan contacts open. The actuator drives fully closed.
7. Remove the jumper from the Shutdown terminals. Jumper the Purge terminals. The exhaust LED turns off. The Unit Control and Indoor Fan contacts open. The Exhaust Fan contacts close. The actuator drives fully closed.
8. Return EconoMi$er2 settings and wiring to normal after completing troubleshooting.

MIXED AIR INPUT — To check mixed air input:

1. Make sure EconoMi$er2 checkout procedure has been performed.
2. Set the Enthalpy potentiometer to A. The Free Cool LED turns on.
3. Replace the 6.8 Kohm resistor across T and T1 with a 5.6 Kohm resistor. The actuator should drive 20 to 80% open.
4. Remove the 5.6 Kohm resistor and jumper T to T1. The actuator should drive fully open.
5. Remove the jumper across T and T1. The actuator should drive fully closed.
6. Replace the 6.8 Kohm resistor across T and T1. The actuator should remain fully closed.
7. Return EconoMi$er2 settings and wiring to normal after completing troubleshooting.

MIXED-AIR SENSOR — The mixed-air sensor has a negative coefficient. As the ambient temperature increases, the resistance decreases. The sensor changes 70 ohms for every 1 degree change in temperature. See Fig. 49 for a resistance vs. temperature chart which can be used to check sensor calibration and operation.

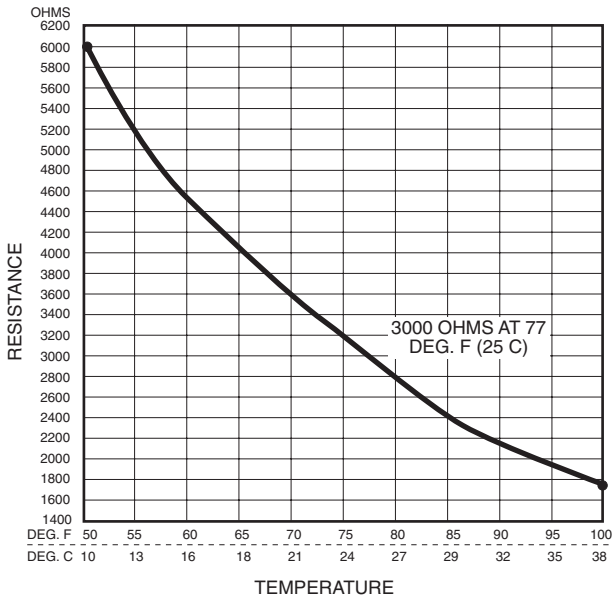


Fig. 49 — Mixed Air Sensor Resistance vs. Temperature Chart

Table 30 — Cooling Service Analysis

PROBLEM	CAUSE	REMEDY
Compressor and condenser fan will not start.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Defective thermostat, contactor, transformer, or control relay.	Replace component.
	Insufficient line voltage.	Determine cause and correct.
	Incorrect or faulty wiring.	Check wiring diagram and rewire correctly.
	Thermostat setting too high.	Lower thermostat setting below room temperature.
Compressor will not start but condenser fan runs.	Faulty wiring or loose connections in compressor circuit.	Check wiring and repair or replace.
	Compressor motor burned out, seized, or internal overload open.	Determine cause. Replace compressor.
	Defective run/start capacitor, overload, start relay.	Determine cause and replace.
	One leg of three-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 run/start capacitor, overload, or start relay.	Determine cause and replace.
	Defective thermostat.	Replace thermostat.
	Faulty condenser-fan motor or capacitor.	Replace.
	Restriction in refrigerant system.	Locate restriction and remove.
Compressor operates continuously.	Dirty air filter.	Replace filter.
	Unit undersized for load.	Decrease load or increase unit size.
	Thermostat set too low.	Reset thermostat.
	Low refrigerant charge.	Locate leak; repair and recharge.
	Leaking valves in compressor.	Replace compressor.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser coil dirty or restricted.	Clean coil or remove restriction.
Compressor makes excessive noise (50TFF,TM007 scroll only).	Compressor rotating in wrong direction.	Reverse the 3-phase power leads as described in Start-Up section on page 47.
Excessive head pressure.	Dirty air filter.	Replace filter.
	Dirty condenser coil.	Clean coil.
	Refrigerant overcharged.	Recover excess refrigerant.
	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.
	Compressor valves leaking.	Replace compressor.
	Restriction in liquid tube.	Remove restriction.
Excessive suction pressure.	High head load.	Check for source and eliminate.
	Compressor valves leaking.	Replace compressor.
	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.
	Insufficient evaporator airflow.	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
	Outdoor ambient below 25 F.	Install low-ambient kit.
Evaporator fan will not shut off. (Sizes 004-006 only.)	Time off delay not finished.	Wait for 30-second off delay.

INDEX

SERVICE TRAINING

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

- Unit Familiarization
- Installation Overview
- Maintenance
- Operating Sequence

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

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

CALL FOR FREE CATALOG 1-800-962-9212

[ ] Packaged Service Training [ ] Classroom Service Training

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

I. PRELIMINARY INFORMATION

MODEL NO. _____ SERIAL NO. _____

DATE: _____ TECHNICIAN: _____

BUILDING LOCATION: _____

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

- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED AS SHOWN IN THE INSTALLATION INSTRUCTIONS
- ☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS
- ☐ CHECK THAT RETURN-AIR FILTERS ARE CLEAN AND IN PLACE
- ☐ VERIFY THAT UNIT INSTALLATION IS LEVEL WITHIN TOLERANCES LISTED IN THE INSTALLATION INSTRUCTIONS
- ☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS
- ☐ CHECK PULLEY ALIGNMENT AND BELT TENSION; REFER TO INSTALLATION INSTRUCTIONS
- ☐ CHECK TO ENSURE THAT ELECTRICAL WIRING IS NOT IN CONTACT WITH REFRIGERANT LINES OR SHARP METAL EDGES.

III. START-UP:

ELECTRICAL

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

TEMPERATURES

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

REFRIGERANT

REFRIGERANT SUCTION	_____	PSIG	_____	°F
REFRIGERANT DISCHARGE	_____	PSIG	_____	°F

- ☐ VERIFY REFRIGERANT CHARGE USING COOLING CHARGING CHARTS ON PAGES 50 AND 51
- ☐ VERIFY 3-PHASE SCROLL COMPRESSOR IS ROTATING IN THE CORRECT DIRECTION (50TFF,TM007 SCROLL ONLY)

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE