50TFF008-014
50TM008-014
Single-Package Rooftop Cooling Units

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 tag. 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 horizontal duct opening covers and remove covers. Using the same screws, install covers on duct openings in basepan of unit with the insulation-side down. Seals around duct openings must be tight. See Fig. 1.

Confirm before installation of unit that voltage, amperage and circuit protection requirements listed on unit data plate agree with power supply provided.

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 control power is to be routed through the basepan, attach the accessory thru-the-bottom service connections to the roof curb 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 6-in. gravel apron in front of outdoor-coil air inlet to prevent grass and foliage from obstructing airflow.

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

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

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

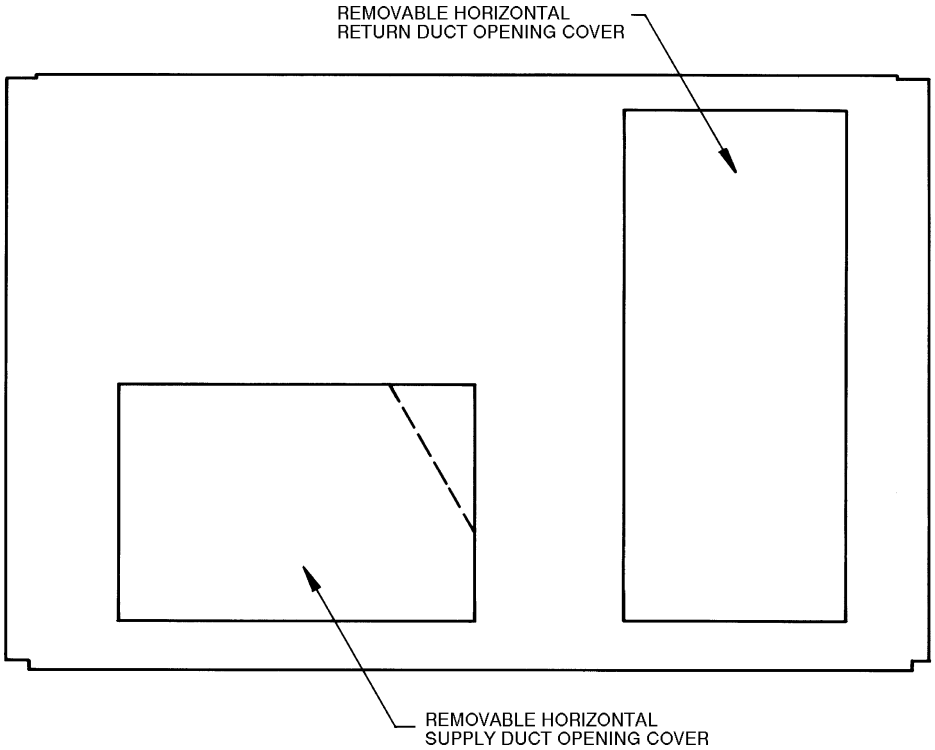


Fig. 1 — Horizontal Conversion Panels

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

If electrical connections are to be routed through the bottom of the unit, attach accessory thru-the-bottom service connections to the basepan in accordance with installation instructions.

⚠ CAUTION

Concentric ducts may only be installed on units without electric heat. Personal injury or unit damage may result with improper installation.

A minimum clearance to combustibles is not required around ductwork on vertical discharge units. On horizontal discharge units, a minimum clearance of 1 in. is required for the first 12 in. of ductwork. Cabinet return-air static shall not exceed –.35 in. wg with EconoMi$er2 or –.45 in. wg without economizer.

ALTERNATE UNIT SUPPORT — When the curb or adapter cannot be used, support unit with sleepers using unit curb or adapter support area. If sleepers cannot be used, support long sides of unit with a minimum of three 4-in. x 4-in. pads. Pads should be placed at the corners and at the unit's center of gravity. If more than 3 pads are used, equally space the pads along the sides.

Step 3 — Install External Trap for Condensate Drain — The unit's $^3/_4$-in. condensate drain connections are located on 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, ensure the plug in the alternate bottom connection (in center of pan) is tight before installing the unit.

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

All units must have an external trap for condensate drainage. Install a trap at least 4 in. deep and protect against freeze-up. See Fig. 5. If a drain line is installed downstream from the external trap, pitch the line away from the unit at 1 in. per 10 ft of run. Do not use a pipe size smaller than the unit connection.

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

Lifting holes are provided in base rails as shown in Fig. 6 and 7A and 7B. Refer to rigging instructions on unit.

⚠ CAUTION

All panels must be in place when rigging and lifting.

POSITIONING — Maintain clearance around and above unit to provide proper airflow and service access. See Fig. 7A and 7B.

Position unit on roof curb so that the following clearances are maintained: $^1/_4$-in. clearance between roof curb and base rails on duct end, front and back of unit; $3^5/_{16}$-in. clearance between roof curb and condenser fan end of unit (see Fig. 2, sections A-A and C-C).

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

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

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

CONNECTOR PKG. ACCY.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL
CRBTMPWR001A00	2′-8 7/16″ [827]	1′-10 15/16″ [583]	1 3/4″ [44.5]	3/4″ [19] NPT	3/4″ [19] NPT	1/2″ [12.7] NPT
CRBTMPWR002A00					1 1/4″ [31.7]	
CRBTMPWR003A00				1/2″ [12.7] NPT	3/4″ [19] NPT	1/2″ [12.7] NPT
CRBTMPWR004A00				3/4″ [19] NPT	1 1/4″ [31.7]	

ROOF CURB ACCESSORY	"A"	UNIT SIZE
CRRFCURB003A00	1′-2″ [356]	50TF,TM008-014
CRRFCURB004A00	2′-0″ [610]	

NOTES:
1. Roof curb accessory is shipped disassembled.
2. Insulated panels: 1-in. thick polyurethane foam, 1 3/4 lb density.
3. Dimensions in [ ] are in millimeters.
4. Roof curb: 16-gage steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance 4 ft on each side.
7. Direction of airflow.

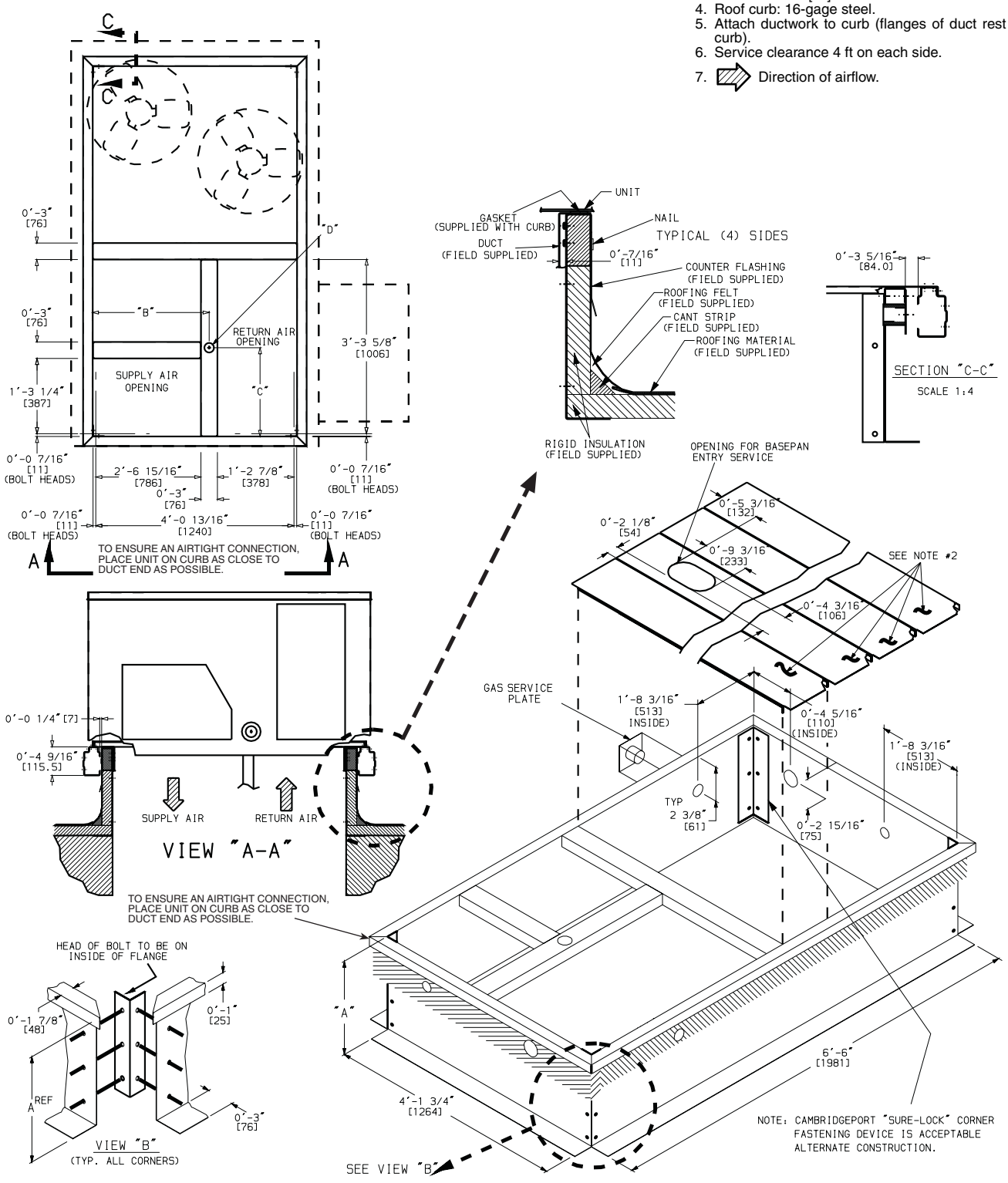
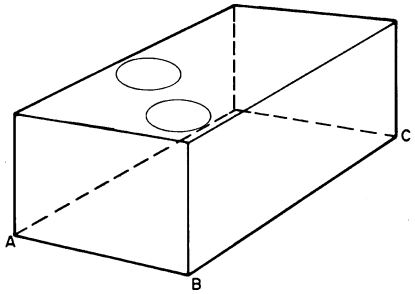


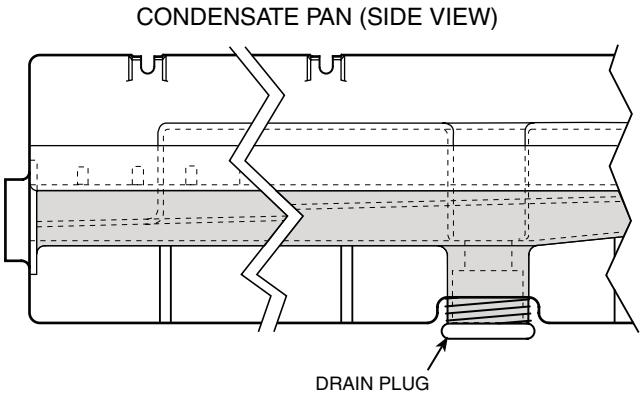
Fig. 2 — Roof Curb Details



MAXIMUM ALLOWABLE DIFFERENCE (in.)

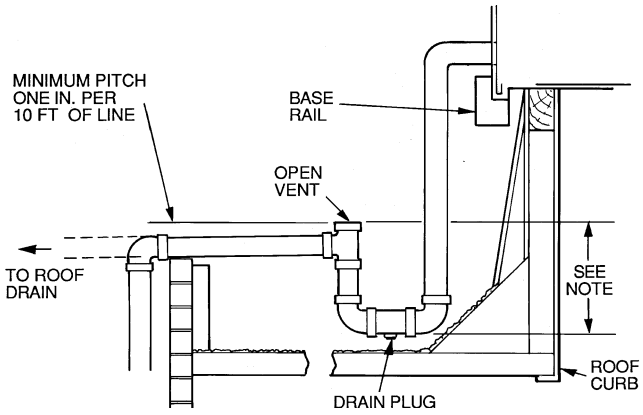
A-B	B-C	A-C
0.5	1.0	1.0

Fig. 3 — Unit Leveling Tolerance



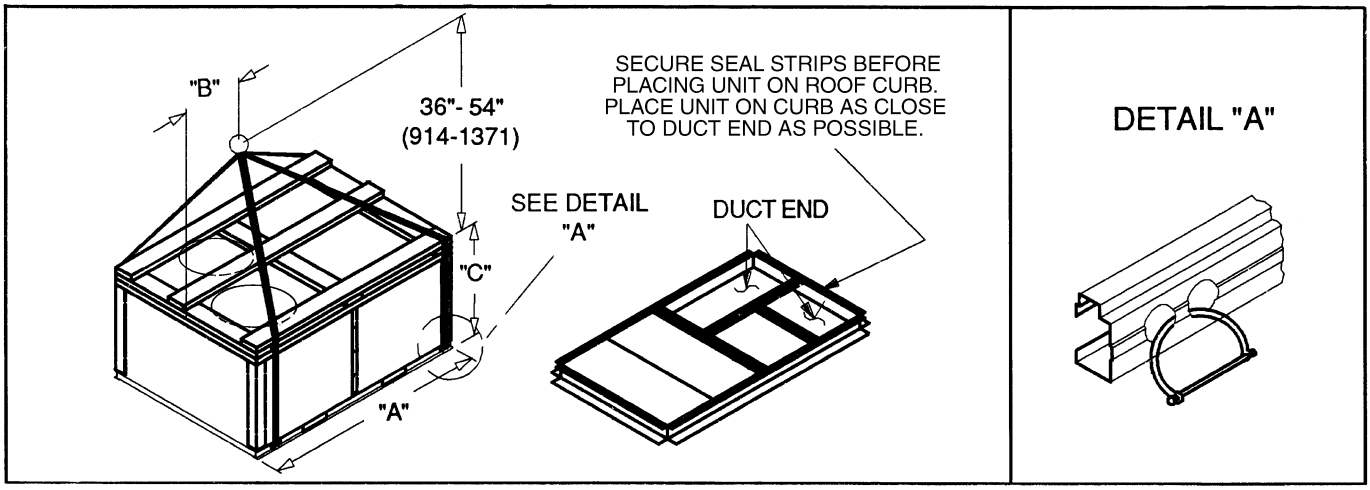
NOTE: Drain plug is shown in factory-installed position.

Fig. 4 — Condensate Drain Connection



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

Fig. 5 — External Trap Condensate Drain



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

⚠ CAUTION

All panels must be in place when rigging.

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

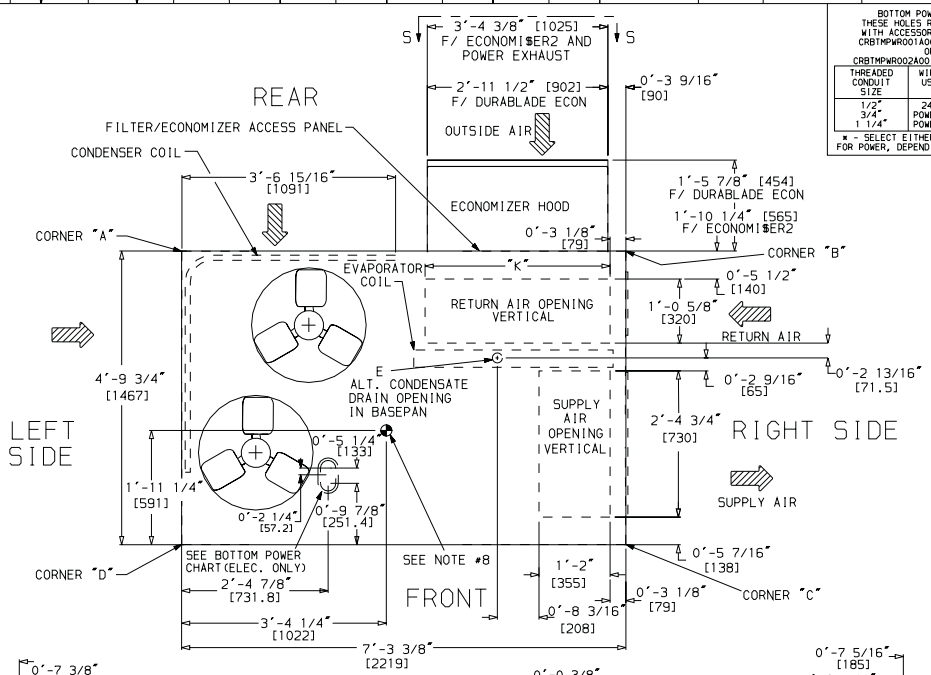
Fig. 6 — Rigging Details

UNIT	STD. UNIT WEIGHT		DURABLADE ECON WEIGHT		ECONOMI$ER2 WEIGHT		ECONOMI$ER2 W/ P.E. WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		"H"		"J"		"K"	
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	FT.-IN.	MM	FT.-IN.	MM	FT.-IN.	MM
50TFF008	755	342	44	20	75	34.1	145	65.9	164	74	140	64	208	94	243	110	1′-2 7/8″	378	3′-5 5/16″	1050	2′-9 11/16″	856
50TFF009	760	345	↓	↓	↓	↓	↓	↓	165	75	141	64	209	94	245	111	3′-3 7/8″	1013	3′-5 5/16″	1050	2′-9 11/16″	856
50TFF012	915	415	↓	↓	↓	↓	↓	↓	199	90	170	77	252	114	294	134	2′-5 7/8″	759	4′-1 5/16″	1253	3′-0 3/8″	924
50TFF014	930	422	↓	↓	↓	↓	↓	↓	202	92	172	78	256	116	300	136	1′-2 7/8″	378	4′-1 5/16″	1253	3′-0 3/8″	924

NOTES:

1. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. ⊕ CENTER OF GRAVITY.
3. ⇒ DIRECTION OF AIR FLOW.
4. DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY.
5. MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
   a. BOTTOM TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES, ON HORIZONTAL DISCHARGE UNITS WITH ELECTRIC HEAT 1 INCH CLEARANCE TO DUCTWORK FOR 1 FOOT.
   b. CONDENSER COIL, FOR PROPER AIR FLOW, 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
   c. OVERHEAD, 60 INCHES TO ASSURE PROPER CONDENSER FAN OPERATION.
   d. BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC.
   e. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
   f. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
   g. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES WHEN THE ALTERNATE CONDENSATE DRAIN IS USED.
6. WITH THE EXCEPTION OF THE CLEARANCE FOR THE CONDENSER COIL AS STATED IN NOTES 5a, b, AND c, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
7. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL.
8. THE VERTICAL CENTER OF GRAVITY IS 1′-7 1/2″ [495] FOR 008 AND 009, 2′-0″ [610] FOR 012 AND 014 UP FROM THE BOTTOM OF THE BASE RAIL.

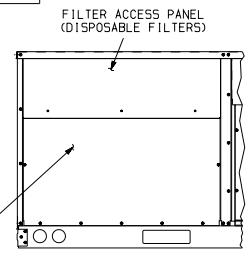
	CONNECTION SIZES
A	1 3/8″ DIA. [35] FIELD POWER SUPPLY HOLE
B	2 1/2″DIA [64] POWER SUPPLY KNOCK-OUT
C	1 3/4″DIA [44] CHARGING PORT HOLE
D	7/8″ DIA. [22] FIELD CONTROL WIRING HOLE
E	3/4″-14 NPT CONDENSATE DRAIN
F	2″ DIA [51] POWER SUPPLY KNOCK-OUT

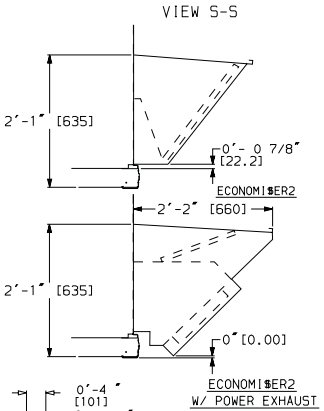


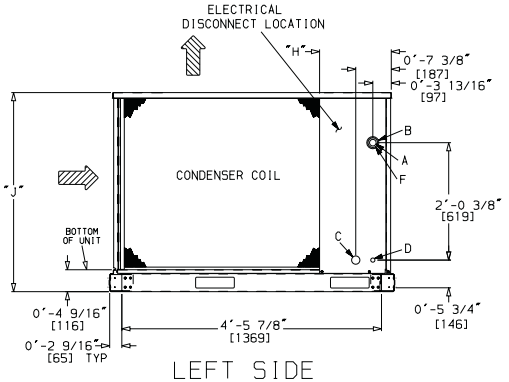
BOTTOM POWER CHART: THESE HOLES REQ'D FOR USE WITH ACCESSORY PACKAGES - CRBTMPWR001A00 (1/2″,3/4″) OR CRBTMPWR002A00 (1/2″,1 1/4″)

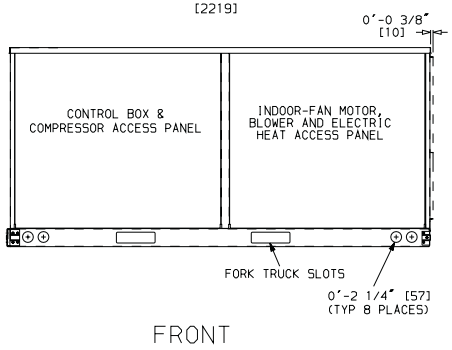
THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
1/2″	24V	7/8″[22.2]
3/4″	POWER*	1 1/8″[28.4]
1 1/4″	POWER*	1 3/4″[44.4]

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









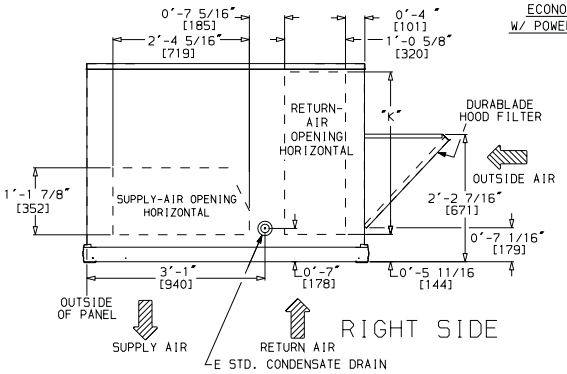


Fig. 7A — Base Unit Dimensions — 50TFF008-014

UNIT	STD. UNIT WEIGHT		DURABLADE ECON WEIGHT		ECONOMI$ER2 WEIGHT		ECONOMI$ER2 W/ P.E. WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		"H"		"J"		"K"	
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	FT.-IN.	MM	FT.-IN.	MM	FT.-IN.	MM
50HJ/TM008	755	342	44	20	75	34.1	145	65.9	164	74	140	64	208	94	243	110	2′-0 7/8″	632	3′-5 5/16″	1050	2′-9 11/16″	856
50HJ/TM009	760	345	↓	↓	↓	↓	↓	↓	165	75	141	64	209	94	245	111	1′-2 7/8″	378	3′-5 5/16″	1050	2′-9 11/16″	856
50HJ/TM012	915	415	↓	↓	↓	↓	↓	↓	199	90	170	77	252	114	294	134	2′-10 7/8″	885	4′-1 5/16″	1253	3′-0 3/8″	924
50HJ/TM014	930	422	↓	↓	↓	↓	↓	↓	202	92	172	78	256	116	300	136	1′-2 7/8″	378	4′-1 5/16″	1253	3′-0 3/8″	924

NOTES:

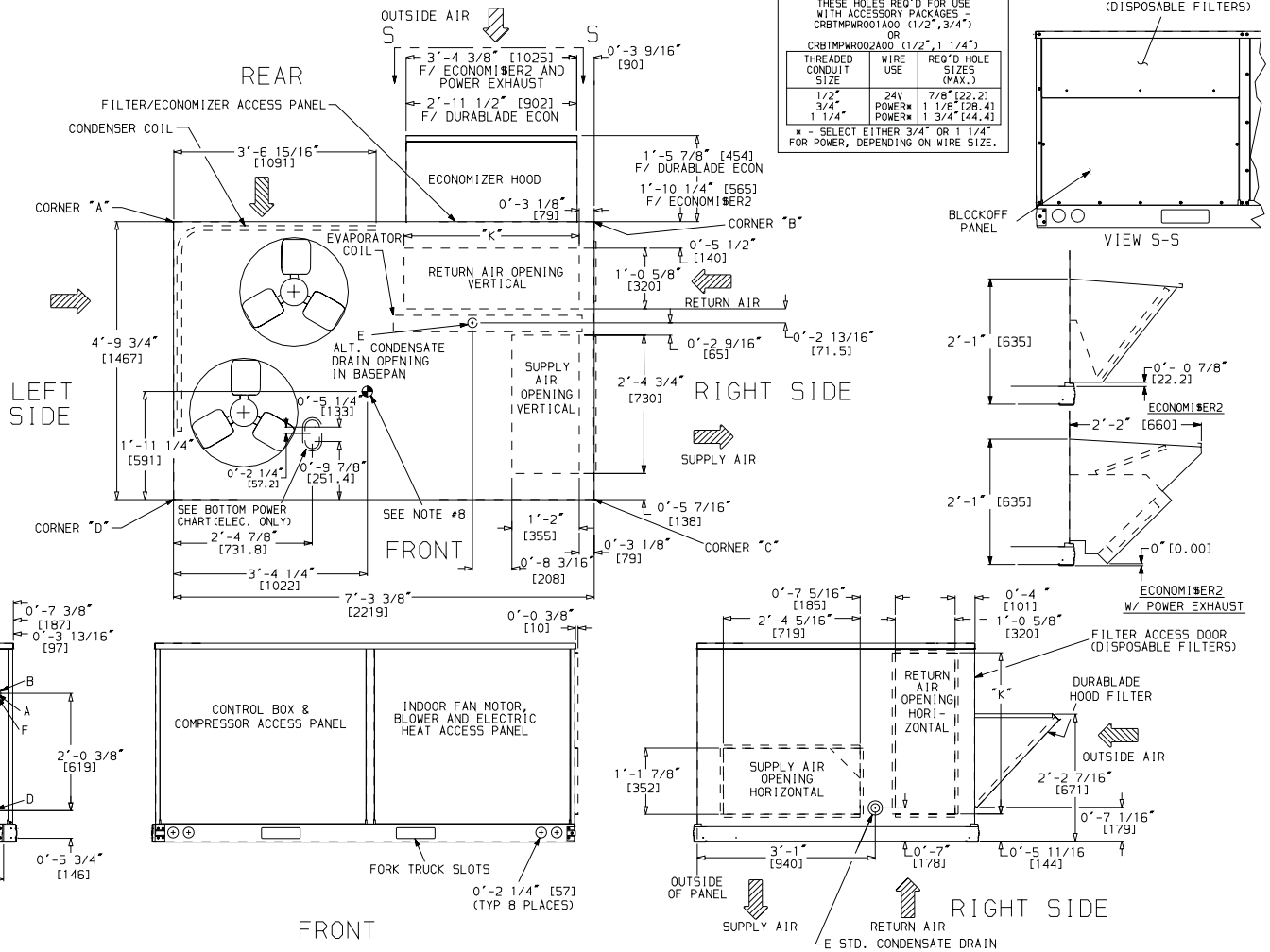
1. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. ⊕ CENTER OF GRAVITY.
3. ⇒ DIRECTION OF AIR FLOW.
4. DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY.
5. MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
   a. BOTTOM TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES, ON HORIZONTAL DISCHARGE UNITS WITH ELECTRIC HEAT 1 INCH CLEARANCE TO DUCTWORK FOR 1 FOOT.
   b. CONDENSER COIL, FOR PROPER AIR FLOW, 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
   c. OVERHEAD, 60 INCHES TO ASSURE PROPER CONDENSER FAN OPERATION.
   d. BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC.
   e. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
   f. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
   g. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES WHEN THE ALTERNATE CONDENSATE DRAIN IS USED.
6. WITH THE EXCEPTION OF THE CLEARANCE FOR THE CONDENSER COIL AS STATED IN NOTES 5a, b, AND c, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
7. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL.
8. THE VERTICAL CENTER OF GRAVITY IS 1′-7 1/2″ [495] FOR 008 AND 009, 2′-0″ [610] FOR 012 AND 014 UP FROM THE BOTTOM OF THE BASE RAIL.

	CONNECTION SIZES
A	1 3/8″ DIA. [35] FIELD POWER SUPPLY HOLE
B	2 1/2″DIA [64] 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″ DIA [51] POWER SUPPLY KNOCK-OUT

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.



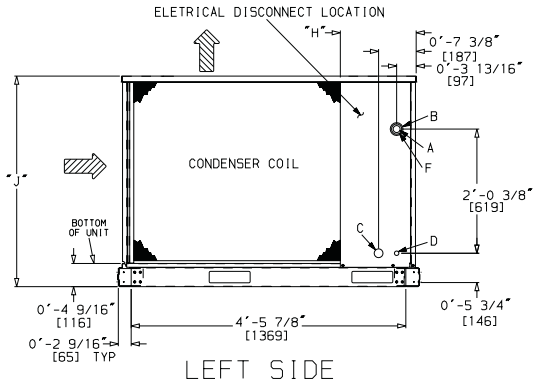


Fig. 7B — Base Unit Dimensions — 50TM008-014

Table 1A — Physical Data — 50TFF008-014

UNIT SIZE 50TFF		008	009	012	014
NOMINAL CAPACITY (tons)		7 1/2	8 1/2	10	12 1/2
OPERATING WEIGHT (lb)					
Unit					
Al/Al*		755	760	915	930
Al/Cu*		766	776	937	957
Cu/Cu*		778	787	960	980
EconoMi$er2		75	75	75	75
Roof Curb†		143	143	143	143
COMPRESSOR		Reciprocating	Reciprocating	Reciprocating	Scroll
Quantity		2	2	2	2
No. Cylinders (per circuit)		2	2	2	2
Oil (oz)		42 ea	65 ea	54 ea	54 ea
REFRIGERANT TYPE		R-22, Acutrol™ Metering Device			
Operating Charge (lb-oz)					
Circuit 1		4-13	6-14	7- 3	8-10
Circuit 2		4-14	9- 2	7-13	8- 6
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins			
Rows...Fins/in.		1...17	2...17	2...17	2...17
Total Face Area (sq ft)		20.50	18.00	20.47	25.00
CONDENSER FAN		Propeller Type			
Nominal Cfm		6400	6400	7000	7000
Quantity...Diameter (in.)		2...22	2...22	2...22	2...22
Motor Hp...Rpm		1/4...1100	1/4...1100	1/4...1100	1/4...1100
Watts Input (Total)		600	600	600	600
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Acutrol™ Metering Device, Face Split			
Rows...Fins/in.		3...15	3...15	3...15	4...15
Total Face Area (sq ft)		8.0	8.0	10.0	11.1
EVAPORATOR FAN		Centrifugal Type			
Quantity...Size (in.)	Std	1...15 x 15	1...15 x 15	1...15 x 15	1...15 x 15
	Alt	1...15 x 15	—	1...15 x 15	1...15 x 15
	High-Static	1...15 x 15	1...15 x 15	1...15 x 15	—
Type Drive	Std	Belt	Belt	Belt	Belt
	Alt	Belt	—	Belt	Belt
	High-Static	Belt	Belt	Belt	—
Nominal Cfm		3000	3100	4000	5000
Maximum Continuous Bhp	Std	2.40	2.40	2.40	3.70
	Alt	2.40	—	2.90	5.25
	High-Static	3.70	3.70	5.25	—
Motor Frame Size	Std	56	56	56	56
	Alt	56	—	56	56
	High-Static	56	56	56	—
Fan Rpm Range	Std	590- 840	685- 935	685- 935	860-1080
	Alt	685- 935	—	835-1085	900-1260
	High-Static	860-1080	860-1080	830-1130	—
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	Std	2.4/3.4	2.8/3.8	2.8/3.8	4.0/5.0
	Alt	2.8/3.8	—	3.4/4.4	3.1/4.1
	High-Static	4.0/5.0	4.0/5.0	2.8/3.8	—
Nominal Motor Shaft Diameter (in.)	Std	5/8	5/8	5/8	7/8
	Alt	5/8	—	7/8	7/8
	High-Static	7/8	7/8	7/8	—
Fan Pulley Pitch Diameter (in.)	Std	7.0	7.0	7.0	8.0
	Alt	7.0	—	7.0	5.9
	High-Static	8.0	8.0	5.8	—
Belt, Quantity...Type...Length (in.)	Std	1...A...49	1...A...49	1...A...49	1...A...52
	Alt	1...A...49	—	1...A...49	1...BX...46
	High-Static	1...A...55	1...A...55	1...BX...46	—
Pulley Center Line Distance (in.)	Std	16.75-19.25	16.75-19.25	15.85-17.50	15.85-17.50
	Alt	15.75-19.25	—	15.85-17.50	15.85-17.50
	High-Static	15.75-19.25	16.75-19.25	15.85-17.50	—
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Std	50	50	50	44
	Alt	50	—	50	50
	High-Static	60	60	60	—
Movable Pulley Maximum Full Turns From Closed Position	Std	5	5	5	5
	Alt	5	—	5	6
	High-Static	5	5	6	—
Factory Setting	Std	5	5	5	5
	Alt	5	—	5	5
	High-Static	5	5	5	—
Factory Speed Setting (rpm)	Std	590	685	685	860
	Alt	685	—	835	960
	High-Static	860	860	887	—
Fan Shaft Diameter at Pulley (in.)		1	1	1	1
HIGH-PRESSURE SWITCH (psig)					
Standard Compressor Internal Relief (Differential)			450 ± 50		500 ± 50
Cutout			428		428
Reset (Auto.)			320		320
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 25 x 1 1...16 x 25 x 1		
RETURN-AIR FILTERS		Throwaway			
Quantity...Size (in.)		4...16 x 20 x 2	4...16 x 20 x 2	4...20 x 20 x 2	4...20 x 20 x 2

LEGEND

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.

NOTES:
1. The 50TFF units have a loss-of-charge switch located in the liquid line.
2. High-static motor not available on size 014 units.

Table 1B — Physical Data — 50TM008-014

UNIT SIZE 50TM		008	009	012	014
NOMINAL CAPACITY (tons)		7 1/2	8 1/2	10	12 1/2
OPERATING WEIGHT (lb)					
Unit					
Al/Al*		755	760	915	930
Al/Cu*		766	776	937	957
Cu/Cu*		778	787	960	980
Economizer					
EconoMi$er2		75	75	75	75
Roof Curb†		143	143	143	143
COMPRESSOR		Reciprocating	Scroll	Scroll	Scroll
Quantity		2	2	2	2
No. Cylinders (per Circuit)		2	2	2	2
Oil (oz) (each compressor)		42	53	50	60
REFRIGERANT TYPE		R-22			
Expansion Device		Acutrol™ Metering Device			
Operating Charge (lb-oz)					
Circuit 1		7-10	7-14	8-10	9-8
Circuit 2		8-2	8-5	8-8	9-5
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins			
Rows...Fins/in.		2...17	2...17	2...17	2...17
Total Face Area (sq ft)		20.50	20.50	25.00	25.00
CONDENSER FAN		Propeller Type			
Nominal Cfm		6500	6500	7000	7000
Quantity...Diameter (in.)		2...22	2...22	2...22	2...22
Motor Hp...Rpm		1/4...1100	1/4...1100	1/4...1100	1/4...1100
Watts Input (Total)		650	650	650	650
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Face Split			
Rows...Fins/in.		3...15	3...15	3...15	4...15
Total Face Area (sq ft)		8.9	8.9	10.0	11.1
EVAPORATOR FAN		Centrifugal Type			
Quantity...Size (in.)	Std	1...15 x 15	1...15 x 15	1...15 x 15	1...15 x 15
	Alt	1...15 x 15	—	1...15 x 15	1...15 x 15
	High-Static	1...15 x 15	1...15 x 15	1...15 x 15	—
Type Drive	Std	Belt	Belt	Belt	Belt
	Alt	Belt	—	Belt	Belt
	High-Static	Belt	Belt	Belt	—
Nominal Cfm		2900	3000	3200	5000
Maximum Continuous Bhp	Std	2.40	2.40	2.40	3.70
	Alt	2.40	—	2.90	5.25
	High-Static	3.70	3.70	5.25	—
Motor Frame Size	Std	56	56	56	56
	Alt	56	—	56	56
	High-Static	56	56	56	—
Fan Rpm Range	Std	590-840	685-935	685-935	860-1080
	Alt	685-935	—	835-1085	900-1260
	High-Static	860-1080	860-1080	830-1130	—
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	Std	2.4/3.4	2.8/3.8	2.8/3.8	4.0/5.0
	Alt	2.8/3.8	—	3.4/4.4	3.1/4.1
	High-Static	4.0/5.0	4.0/5.0	2.8/3.8	—
Nominal Motor Shaft Diameter (in.)	Std	5/8	5/8	5/8	7/8
	Alt	5/8	—	7/8	7/8
	High-Static	7/8	7/8	7/8	—
Fan Pulley Pitch Diameter (in.)	Std	7.0	7.0	7.0	8.0
	Alt	7.0	—	7.0	5.9
	High-Static	8.0	8.0	5.8	—
Belt, Quantity...Type...Length (in.)	Std	1...A...49	1...A...49	1...A...49	1...A...52
	Alt	1...A...49	—	1...A...49	1...BX...46
	High-Static	1...A...55	1...A...55	1...BX...46	—
Pulley Center Line Distance (in.)	Std	16.75-19.25	16.75-19.25	15.85-17.50	15.85-17.50
	Alt	16.75-19.25	—	15.85-17.50	15.85-17.50
	High-Static	16.75-19.25	16.75-19.25	15.85-17.50	—
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Std	50	50	50	44
	Alt	50	—	50	50
	High-Static	60	60	60	—
Movable Pulley Maximum Full Turns From Closed Position	Std	5	5	5	5
	Alt	5	—	5	6
	High-Static	5	5	6	—
Factory Setting	Std	5	5	5	5
	Alt	5	—	5	5
	High-Static	5	5	5	—
Factory Speed Setting (rpm)	Std	590	685	685	860
	Alt	685	—	835	960
	High-Static	860	860	887	—
Fan Shaft Diameter at Pulley (in.)		1	1	1	1
HIGH-PRESSURE SWITCH (psig)					
Standard Compressor			450 ± 50		500 ± 50
Internal Relief (Differential)					
Cutout			428		428
Reset (Auto.)			320		320
LOW-PRESSURE SWITCH (psig)			7 ± 3		
Cutout					
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 1...16 x 25 x 1		
RETURN-AIR FILTERS			Throwaway		
Quantity...Size (in.)		4...16 x 20 x 2	4...16 x 20 x 2	4...20 x 20 x 2	4...20 x 20 x 2

LEGEND

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.

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, and local electrical codes. Failure to follow this warning could result in the installer being liable for personal injury of others.

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

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

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

NOTE: When accessory thru-the-bottom connections are used, refer to the accessory installation instructions for information on power wiring. Refer to Fig. 7A and 7B for drilling locations.

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

Install field wiring as follows (see Fig. 8, 9, and 10):

1. Install conduit through side panel openings between disconnect and single point box (see Fig. 9 and 10).
2. Install power wires to terminal connections as shown in Fig. 8.

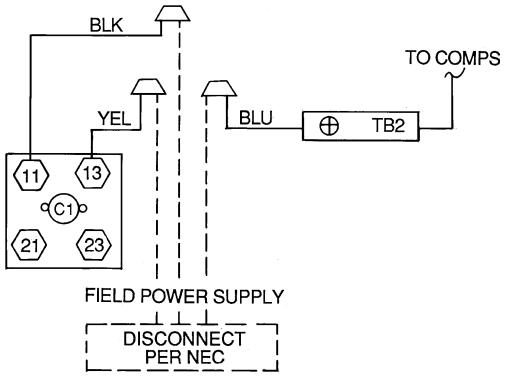
Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate (see Table 2A-2C). On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in the legend for Table 2A-2C, Note 2 to determine the percentage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

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

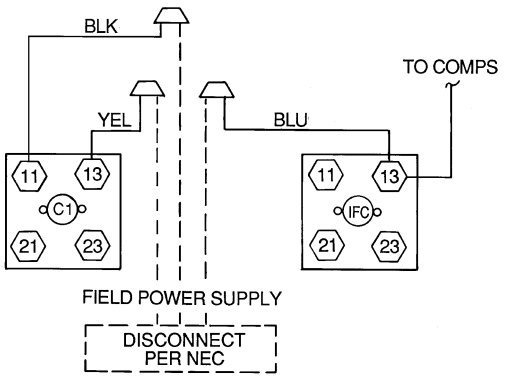
Route thermostat cable or equivalent single leads of colored wire from subbase terminals to low-voltage connections on unit (shown in Fig. 11A and 11B) as described in Steps 1-5 below.

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

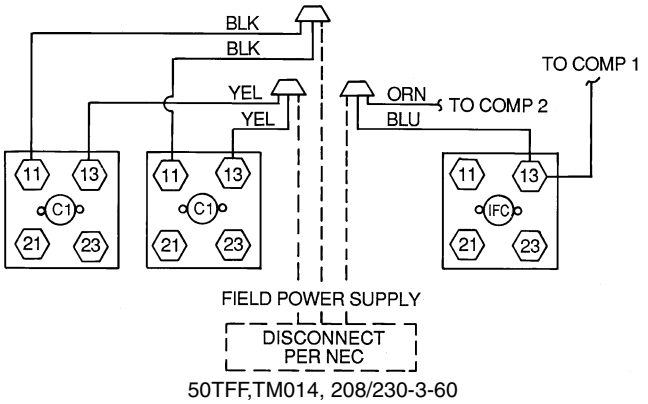
1. If unit is mounted on roof curb and accessory thru-the-bottom connection is used, route wire through connector provided in accessory kit through the unit basepan.
2. Pass control wires through the hole provided on unit (see connection D, Connection Sizes Table, Fig. 7A and 7B).
3. Feed wire through the raceway built into the corner post to the 24-v barrier located on the left side of the control box. See Fig. 12. The raceway provides the UL-required (Underwriters' Laboratories) clearance between the high- and low-voltage wiring.
4. Connect thermostat wires to screw terminals of low-voltage terminal board.
5. If unit is to be equipped with electric resistance heat, ensure thermostat on a call for heat "W" energizes "G" output. This allows fan operation on a call for heat.



50TFF,TM008-014, 575-3-60



50TFF,TM008-012, 208/230-3-60; 50TFF,TM008-014, 460-3-60



50TFF,TM014, 208/230-3-60

LEGEND

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

Fig. 8 — Power Wiring Connections

Table 2A — Electrical Data — 50TFF Units Without Convenience Outlet

UNIT 50TFF	NOMINAL V-Ph-Hz	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (ea)		OFM (ea)			IFM FLA	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE*	
			Min	Max	RLA	LRA	Qty	Hp	FLA		Nominal kW	FLA	MCA	MOCP†	FLA	LRA
008	208/230-3-60	Std and Alt	187	254	14.0	91.0	2	1/4	1.4	5.8	—/— 7.8/10.4 12.0/16.0 18.6/24.8 24.0/32.0 31.9/42.4	—/— 21.7/ 25.0 33.4/ 38.5 51.7/ 59.7 66.7/ 77.0 88.4/102.0	40.1/ 40.1 40.1/ 40.1 48.9/ 55.4 71.9/ 81.8 90.6/103.5 117.7/134.8	45/ 45 45/ 45 50/ 60 80/ 90** 100/110** 125/150**	42/ 42 42/ 42 45/ 51 66/ 75 83/ 95 108/124	229/229
		High								10.6	—/— 7.8/10.4 12.0/16.0 18.6/24.8 24.0/32.0 31.9/42.4	—/— 21.7/ 25.0 33.4/ 38.5 51.7/ 59.7 66.7/ 77.0 88.4/102.0	44.9/ 44.9 44.9/ 44.9 54.9/ 61.4 77.9/ 87.8 96.6/109.5 123.7/140.8	50/ 50 50/ 50 60/ 70** 80/ 90** 100/110** 125/150**	48/ 48 48/ 48 51/ 56 72/ 81 89/101 114/129	273/273
	460-3-60	Std and Alt	414	508	6.4	42.0	2	1/4	0.7	2.8	— 13.9 16.5 27.8 33.0 41.7	— 16.7 19.8 33.4 39.7 50.2	18.4 26.9 28.1 45.0 52.9 65.9	20 30 30 50 60 70**	19 25 26 41 49 61	138
		High								4.8	— 13.9 16.5 27.8 33.0 41.7	— 16.7 19.8 33.4 39.7 50.2	20.6 26.9 30.8 47.8 55.6 68.7	25 30 35 50 60 70**	22 25 28 44 51 63	130
	575-3-60	Std and Alt	518	632	5.2	39.0	2	1/4	0.7	2.6	— 17.0 34.0	— 17.1 34.1	14.9 23.9 45.3	20 25 50	16 22 42	97
		High								4.8	— 17.0 34.0	— 17.1 34.1	16.7 26.1 47.5	20 30 50	18 24 44	114
009	208/230-3-60	Std	187	254	16.0	137.0	2	1/4	1.4	5.8	—/— 7.8/10.4 12.0/16.0 18.6/24.8 24.0/32.0 31.9/42.4	—/— 21.7/ 25.0 33.4/ 38.5 51.7/ 59.7 66.7/ 77.0 88.4/102.0	44.6/ 44.6 44.6/ 44.6 48.9/ 55.4 71.9/ 81.8 90.6/103.5 117.7/134.8	50/ 50 50/ 50 50/ 60 80/ 90** 100/110** 125/150**	47/ 47 47/ 47 47/ 51 66/ 75 83/ 95 108/124	321/321
		High								10.6	—/— 7.8/10.4 12.0/16.0 18.6/24.8 24.0/32.0 31.9/42.4	—/— 21.7/ 25.0 33.4/ 38.5 51.7/ 59.7 66.7/ 77.0 88.4/102.0	49.4/ 49.4 49.4/ 49.4 54.9/ 61.4 77.9/ 87.8 96.6/109.5 123.7/140.8	60/ 60 60/ 60 60/ 70** 80/ 90** 100/110** 125/150**	52/ 52 52/ 52 52/ 56 72/ 81 89/101 114/129	365/365
	460-3-60	Std	414	508	8.3	69.0	2	1/4	0.7	2.6	— 13.9 16.5 27.8 33.0 41.7	— 16.7 19.8 33.4 39.7 50.2	22.7 24.1 28.1 45.0 52.9 65.9	25 25 30 50 60 70**	24 24 26 41 49 61	161
		High								4.8	— 13.9 16.5 27.8 33.0 41.7	— 16.7 19.8 33.4 39.7 50.2	24.9 26.9 30.8 47.8 55.6 68.7	30 30 35 50 60 70**	26 26 28 44 51 63	184
	575-3-60	Std	518	632	6.4	58.0	2	1/4	0.7	2.6	— 17.0 34.0	— 17.1 34.1	17.6 23.9 45.3	20 25 50	18 22 42	135
		High								4.8	— 17.0 34.0	— 17.1 34.1	19.4 26.1 47.5	25 30 50	20 24 44	152
012	208/230-3-60	Std	187	254	15.8	130.0	2	1/4	1.4	5.8	—/— 7.8/10.4 12.0/16.0 24.0/32.0 31.9/42.4 37.5/50.0	—/— 21.7/ 25.0 33.4/ 38.5 66.7/ 77.0 88.4/102.0 104.2/120.3	44.2/ 44.2 44.2/ 44.2 48.9/ 55.4 90.6/103.5 117.7/134.8 137.5/157.6	50/ 50 50/ 50 60/ 60 100/110** 125/150** 150/175**	46/ 46 45/ 45 45/ 51 83/ 95 108/124 127/147	307/307
		Alt								7.5	—/— 7.8/10.4 12.0/16.0 24.0/32.0 31.9/42.4 37.5/50.0	—/— 21.7/ 25.0 33.4/ 38.5 66.7/ 77.0 88.4/102.0 104.2/120.3	45.9/ 45.9 45.9/ 45.9 51.1/ 57.5 92.8/105.6 119.9/136.9 139.7/159.7	50/ 50 50/ 50 60/ 60 100/110** 125/150** 150/175**	48/ 48 47/ 47 47/ 53 85/ 97 110/126 128/147	326/326
		High								15.0	—/— 7.8/10.4 12.0/16.0 24.0/32.0 31.9/42.4 37.5/50.0	—/— 21.7/ 25.0 33.4/ 38.5 66.7/ 77.0 88.4/102.0 104.2/120.3	53.4/ 53.4 53.4/ 53.4 60.4/ 66.9 102.1/115.0 129.2/146.3 149.0/169.0	50/ 50 60/ 60 60/ 80** 110/125** 150/150** 150/175**	57/ 57 56/ 56 56/ 62 94/106 119/135 137/156	374/374

See Legend and Notes on page 11.

Table 2A — Electrical Data — 50TFF Units Without Convenience Outlet (cont)

UNIT 50TFF	NOMINAL V-Ph-Hz	IFM TYPE	VOLTAGE RANGE		COMPRESSOR (ea)		OFM (ea)			IFM FLA	ELECTRIC HEAT		POWER SUPPLY		DISCONNECT SIZE*	
			Min	Max	RLA	LRA	Qty	Hp	FLA		Nominal kW	FLA	MCA	MOCP†	FLA	LRA
012	460-3-60	Std	414	508	7.9	64.0	2	1/4	0.7	2.6	— 16.5 27.8 33.0 41.7 50.0	— 19.8 33.4 39.7 50.2 60.1	21.8 28.1 45.0 52.9 65.9 63.4	25 30 50 60 70** 70**	23 26 41 49 61 72	152
		Alt								3.4	— 16.5 27.8 33.0 41.7 50.0	— 19.8 33.4 39.7 50.2 60.1	22.6 29.1 46.0 53.9 66.9 64.4	25 30 50 60 70** 70**	24 27 42 50 62 73	191
		High								7.4	— 16.5 27.8 33.0 41.7 50.0	— 19.8 33.4 39.7 50.2 60.1	26.6 34.1 51.0 58.9 71.9 69.4	30 35 60 60 80** 80**	28 31 47 54 66 78	185
	575-3-60	Std	518	632	6.6	52.0	2	1/4	0.7	2.6	— 17.0 34.0 51.0	— 17.1 34.1 51.2	18.9 23.9 45.3 55.8	25 25 50 60	20 22 42 61	126
		Alt								3.4	— 17.0 34.0 51.0	— 17.1 34.1 51.2	19.7 24.7 46.1 54.6	25 25 50 60	21 23 42 62	152
		High								7.4	— 17.0 34.0 51.0	— 18.0 36.0 51.2	23.7 28.7 50.1 58.6	30 35 60 70**	25 26 46 66	160
014	208/230-3-60	Std	187	254	23.0	146.0	2	1/4	1.4	10.6	—/— 7.8/10.4 12.0/16.0 24.0/32.0 31.9/42.4 37.5/50.0	—/— 21.7/ 25.0 33.4/ 38.5 66.7/ 77.0 88.4/102.0 104.2/120.3	65.2/ 65.2 65.2/ 65.2 65.2/ 65.2 96.6/109.5 123.7/140.8 143.5/163.6	80/ 80** 80/ 80** 70/ 70** 100/110** 125/150** 150/175**	68/ 68 68/ 68 68/ 68 89/101 114/129 132/151	383/383
		Alt								15.0	—/— 7.8/10.4 12.0/16.0 24.0/32.0 31.9/42.4 37.5/50.0	—/— 21.7/ 25.0 33.4/ 38.5 66.7/ 77.0 88.4/102.0 104.2/120.3	69.6/ 69.6 69.6/ 69.6 69.6/ 69.6 102.1/115.0 129.2/146.3 149.0/169.0	80/ 80** 80/ 80** 80/ 80** 110/125** 150/150** 150/175**	73/ 73 73/ 73 73/ 73 94/106 119/135 137/156	406/406
	460-3-60	Std	414	508	10.4	73.0	2	1/4	0.7	4.8	— 16.5 27.8 33.0 41.7 50.0	— 19.8 33.4 39.7 50.2 60.1	29.6 30.8 47.8 55.6 68.7 66.1	40 40 50 60 70** 80**	31 31 44 51 63 75	192
		Alt								7.4	— 16.5 27.8 33.0 41.7 50.0	— 19.8 33.4 39.7 50.2 60.1	32.2 34.1 51.0 58.9 71.9 69.4	45 45 60 60 80** 80**	34 34 47 54 66 78	203
	575-3-60	Std	518	632	8.3	58.4	2	1/4	0.7	4.8	— 17.0 34.0 51.0	— 17.1 34.1 51.2	23.6 26.1 47.5 56.0	30 30 50 60	25 25 44 53	153
		Alt								7.4	— 17.0 34.0 51.0	— 17.1 34.1 51.2	25.7 28.7 50.1 58.6	30 35 60 70**	27 27 46 66	162

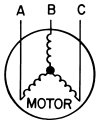
LEGEND

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 per NEC.
**Fuse only.
††Compressor no. 1 is shown in table.
208/230-3-60: Compressor no. 2 RLA is 14.1 amps and LRA is 105 amps.
460-3-60: Compressor no. 2 RLA is 7.1 amps and LRA is 55 amps.
575-3-60: Compressor no. 2 RLA is 6.4 amps and LRA is 40 amps.

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.

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



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 50TM008 unit with MCA = 40.1 and MOCP = 45, with CRPWREXH030A00 power exhaust.
MCA New = 40.1 amps + 1.6 amps = 41.7 amps
If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 45 amps, the MCA New is below 45, 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)
CRPWREXH021A00	N/A	0.9	N/A	15
CRPWREXH022A00	3.3	N/A	1.32	15
CRPWREXH023A00	N/A	1.8	N/A	15
CRPWREXH024A00	1.6	N/A	0.64	15
CRPWREXH025A00	N/A	0.9	N/A	15
CRPWREXH026A00	3.3	N/A	1.32	15
CRPWREXH027A00	N/A	1.8	N/A	15
CRPWREXH028A00	1.7	N/A	0.68	15
CRPWREXH029A00	N/A	1.0	N/A	15
CRPWREXH030A00	1.6	N/A	0.64	15

4. Determine heater capacity using multiplication factors table below:

HEATER RATING VOLTAGE	ACTUAL HEATER VOLTAGE										
	200	208	230	240	380	440	460	480	550	575	600
240	0.694	0.751	0.918	1.000	—	—	—	—	—	—	—
480	—	—	—	—	0.626	0.840	0.918	1.000	—	—	—
600	—	—	—	—	—	—	—	—	0.840	0.918	1.000

NOTE: The following equation converts kW of heat energy to Btuh: kW x 3.412 = Btuh.
EXAMPLE: 32.0 kW (at 240 v) heater on 208 v
= 32.0 (.751 mult factor)
= 24.0 kW capacity at 208 v
5. For 50TFF electrical data with convenience outlet, see unit nameplate or contact service engineering.

Table 2B — Electrical Data — 50TM Units Without Convenience Outlet

UNIT 50TM	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	
008	208/230-3-60	STD	187	254	2	14	91	2	1/4	1.4	5.8	NONE	—/—	—/—	40.1/ 40.1	45/ 45	42/ 42	229/229	—
												017	7.8/10.4	21.7/25	40.1/ 40.1	45/ 45	42/ 42	229/229	006
												010	12/16	33.4/38.5	48.9/ 55.4	50/ 60	45/ 51	229/229	006
												011	18.4/24.8	51.7/59.7	71.9/ 81.8	80/ 90**	66/ 75	229/229	007
												012	24/32	66.7/77	90.6/103.5	100/110**	83/ 95	229/229	007
												012 and 017	31.8/42.4	88.4/102	117.7/134.8	125/150**	108/124	229/229	009
		ALT									5.8	NONE	—/—	—/—	40.1/ 40.1	45/ 45	42/ 42	229/229	—
												017	7.8/10.4	21.7/25	40.1/ 40.1	45/ 45	42/ 42	229/229	006
												010	12/16	33.4/38.5	48.9/ 55.4	50/ 60	45/ 51	229/229	006
												011	18.6/24.8	51.7/59.7	71.9/ 81.8	80/ 90**	66/ 75	229/229	006
												012	24/32	66.7/77	90.6/103.5	100/110**	83/ 95	229/229	007
												012 and 017	31.8/42.4	88.4/102	117.7/134.8	125/150**	108/124	229/229	009
		HIGH									10.6	NONE	—/—	—/—	44.9/ 44.9	50/ 50	48/ 48	273/273	—
												017	7.8/10.4	21.7/25	44.9/ 44.9	50/ 50	48/ 48	273/273	006
												010	12/16	33.4/38.5	54.9/ 61.4	60/ 70**	51/ 56	273/273	007
												011	18.6/24.8	51.7/59.7	77.9/ 87.8	80/ 90**	72/ 81	273/273	007
												012	24/32	66.7/77	96.6/109.5	100/110**	89/101	273/273	007
												012 and 017	32.3/42.4	88.4/102	123.7/140.8	125/150**	114/129	273/273	009
	460-3-60	STD	414	508	2	6.4	42	2	1/4	0.7	2.6	NONE	—	—	18.4	20	19	108	—
												016	13.9	16.7	24.1	25	22	108	006
												013	16.5	19.8	28.1	30	26	108	006
												014	27.8	33.4	45.0	50	41	108	006
												015	33	39.7	52.9	60	49	108	006
												014 and 016	41.7	50.2	65.9	70**	61	108	008
		ALT									2.6	NONE	—	—	18.4	20	19	108	—
												016	13.9	16.7	24.1	25	22	108	006
												013	16.5	19.8	28.1	30	26	108	006
												014	27.8	33.4	45.0	50	41	108	006
												015	33	39.7	52.9	60	49	108	006
												014 and 016	41.7	50.2	65.9	70**	61	108	008
		HIGH									4.8	NONE	—	—	20.6	25	22	130	—
												016	13.9	16.7	26.9	30	25	130	006
												013	16.5	19.8	30.8	35	28	130	006
												014	27.8	33.4	47.8	50	44	130	006
												015	33	39.7	55.6	60	51	130	006
												014 and 016	41.7	50.2	68.7	70**	63	110	008
	575-3-60	STD	518	632	2	5.2	39	2	1/4	0.7	2.6	NONE	—	—	14.9	20	16	97	—
												018	17	17.1	23.9	25	22	97	006
												019	34	34.1	45.3	40	42	97	006
		ALT									2.6	NONE	—	—	14.9	20	16	97	—
												018	17	17.1	23.9	25	22	97	006
												019	34	34.1	45.3	40	42	97	006
		HIGH									4.8	NONE	—	—	16.7	20	18	114	—
												018	17	17.1	26.1	30	24	114	006
												019	34	34.1	47.5	45	44	114	006
009	208/230-3-60	STD	187	254	2	17.3††	120††	2	1/4	1.4	5.8	NONE	—/—	—/—	44.3/ 44.3	50/ 50	46/ 46	272/272	—
												017	7.8/10.4	21.7/25	44.3/ 44.3	50/ 50	46/ 46	272/272	006
												010	12/16	33.4/38.5	48.9/ 55.4	50/ 60	46/ 51	272/272	006
												011	18.6/24.8	51.7/59.7	71.9/ 81.8	80/ 90**	66/ 75	272/272	007
												012	24/32	66.7/77	90.6/103.5	100/110**	83/ 95	272/272	007
												012 and 017	31.8/42.4	88.4/102	117.7/134.8	125/150**	108/124	272/272	009
		HIGH									10.6	NONE	—/—	—/—	49.1/ 49.1	60/ 60	52/ 52	316/316	—
												017	7.8/10.4	21.7/25	49.1/ 49.1	60/ 60	52/ 52	316/316	006
												010	12/16	33.4/38.5	54.9/ 61.4	60/ 70**	52/ 56	316/316	007
												011	18.6/24.8	51.7/59.7	77.9/ 87.8	80/ 90**	72/ 81	316/316	007
												012	24/32	66.7/77	96.6/109.5	100/110**	89/101	316/316	007
												012 and 017	31.8/42.4	88.4/102	123.7/140.8	125/150**	114/129	316/316	009
	460-3-60	STD	414	508	2	7.9††	70††	2	1/4	0.7	2.6	NONE	—	—	21.0	25	22	149	—
												016	13.9	16.7	24.1	25	22	149	006
												013	16.5	19.8	28.1	30	26	149	006
												014	27.8	33.4	45.0	50	41	149	006
												015	33	39.7	52.9	60	49	149	006
												014 and 016	41.7	50.2	65.9	70**	61	149	008
		HIGH									4.8	NONE	—	—	23.2	30	24	171	—
												016	13.9	16.7	26.9	30	25	171	006
												013	16.5	19.8	30.8	35	28	171	006
												014	27.8	33.4	47.8	50	44	171	006
												015	33	39.7	55.6	60	51	171	006
												014 and 016	41.7	50.2	68.7	70**	63	171	008
	575-3-60	STD	518	632	2	5.5††	50††	2	1/4	0.7	2.6	NONE	—	—	16.7	20	17	109	—
												018	17	17.1	23.9	25	22	109	006
												019	34	34.1	45.3	40	42	109	006
		HIGH									4.8	NONE	—	—	18.5	25	19	126	—
												018	17	17.1	26.1	30	24	126	006
												019	34	34.1	47.5	45	44	126	006

See Legend and Notes on page 13.

Table 2B — Electrical Data — 50TM Units Without Convenience Outlet (cont)

UNIT 50TM	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	
012	208/230-3-60	STD	187	254	2	16	125	2	1/4	1.4	5.8	NONE	—/—	—/—	44.6/ 44.6	50/ 50	47/ 47	297/297	—
												017	7.8/10.4	21.7/25	44.6/ 44.6	50/ 50	47/ 47	297/297	011
												010	12/16	33.4/ 38.5	48.9/ 55.4	50/ 60	47/ 51	297/297	011
												012	24/32	66.7/77	90.6/103.5	100/110**	83/ 95	297/297	012
												012 and 017	31.8/42.4	88.4/102	117.7/134.8	125/150**	108/124	297/297	015
												010 and 012	37.6/50	104.2/120.3	137.5/157.6	150/175**	127/145	297/297	015
		ALT									7.5	NONE	—/—	—/—	46.3/ 46.3	60/ 60	49/ 49	316/316	—
												017	7.8/10.4	21.7/25	46.3/ 46.3	60/ 60	49/ 49	316/316	011
												010	12/16	33.4/ 38.5	51.1/ 57.5	60/ 60	49/ 53	316/316	011
												012	24/32	66.7/77	92.8/105.6	100/110**	85/ 97	316/316	012
												012 and 017	31.8/42.4	88.4/102	119.9/136.9	125/150**	110/126	316/316	015
												010 and 012	37.6/50	104.2/120.3	139.7/159.7	150/175**	128/147	316/316	015
		HIGH									15	NONE	—/—	—/—	53.8/ 53.8	60/ 60	57/ 57	364/364	—
												017	7.8/10.4	21.7/25	53.8/ 53.8	60/ 60	57/ 57	364/364	011
												010	12/16	33.4/ 38.5	60.4/ 66.9	70/ 80**	57/ 62	364/364	012
												012	22.9/32	66.7/77	102.1/115.0	110/125**	94/106	364/364	012
												012 and 017	31.8/42.4	88.4/102	129.2/146.3	150/150**	119/135	364/364	015
												010 and 012	37.6/50	104.2/120.3	149.0/169.1	150/175**	137/156	364/364	015
	460-3-60	STD	414	508	2	8	62.5	2	1/4	0.7	2.6	NONE	—	—	22.0	25	23	149	—
												013	16.5	19.8	28.1	30	26	149	011
												014	27.8	33.4	45.0	40	41	149	011
												015	33	39.7	52.9	60	49	149	011
												014 and 016	41.7	50.2	65.9	70**	61	149	014
												013 and 015	50	60.1	78.4	80**	72	149	014
		ALT									3.4	NONE	—	—	22.8	25	24	188	—
												013	16.5	19.8	29.1	30	27	188	011
												014	27.8	33.4	46.0	45	42	188	011
												015	33	39.7	53.9	60	50	188	011
												014 and 016	41.7	50.2	66.9	70**	62	188	014
												013 and 015	50	60.1	79.4	80**	73	188	014
		HIGH									7.4	NONE	—	—	26.8	30	29	182	—
												013	16.5	19.8	34.1	40	31	182	011
												014	27.8	33.4	51.0	60	47	182	011
												015	33	39.7	58.9	60	54	182	011
												014 and 016	41.7	50.2	71.9	80**	66	182	014
												013 and 015	50	60.1	84.4	90**	78	182	014
	575-3-60	STD	518	632	2	6.3	50	2	1/4	0.7	2.6	NONE	—	—	17.4	20	18	119	—
												018	17	17.1	23.9	25	22	119	011
												019	34	34.1	45.3	40	42	119	011
												018 and 019	51	51.2	66.6	70**	61	119	014
		ALT									3.4	NONE	—	—	18.0	20	19	151	—
												018	17	17.1	24.7	25	23	151	011
												019	34	34.1	46.1	45	42	151	011
												018 and 019	51	51.2	67.4	70**	62	151	014
		HIGH									7.4	NONE	—	—	21.2	25	23	146	—
												018	17	17.1	28.7	35	26	146	011
												019	34	34.1	50.1	50	46	146	011
												018 and 019	51	51.2	71.4	80**	66	146	014

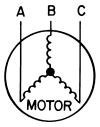
LEGEND

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 per NEC.
**Fuse only.
††Compressor no. 1 is shown in table.
208/230-3-60: Compressor no. 2 RLA is 14.1 amps and LRA is 105 amps.
460-3-60: Compressor no. 2 RLA is 7.1 amps and LRA is 55 amps.
575-3-60: Compressor no. 2 RLA is 6.4 amps and LRA is 40 amps.

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.

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



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 50TM008 unit with MCA = 40.1 and MOCP = 45, with CRPWREXH030A00 power exhaust.

MCA New = 40.1 amps + 1.6 amps = 41.7 amps

If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 45 amps, the MCA New is below 45, 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)
CRPWREXH021A00	N/A	0.9	N/A	15
CRPWREXH022A00	3.3	N/A	1.32	15
CRPWREXH023A00	N/A	1.8	N/A	15
CRPWREXH024A00	1.6	N/A	0.64	15
CRPWREXH025A00	N/A	0.9	N/A	15
CRPWREXH026A00	3.3	N/A	1.32	15
CRPWREXH027A00	N/A	1.8	N/A	15
CRPWREXH028A00	1.7	N/A	0.68	15
CRPWREXH029A00	N/A	1.0	N/A	15
CRPWREXH030A00	1.6	N/A	0.64	15

4. Determine heater capacity using multiplication factors table below:

HEATER RATING VOLTAGE	ACTUAL HEATER VOLTAGE										
	200	208	230	240	380	440	460	480	550	575	600
240	0.694	0.751	0.918	1.000	—	—	—	—	—	—	—
480	—	—	—	—	0.626	0.840	0.918	1.000	—	—	—
600	—	—	—	—	—	—	—	—	0.840	0.918	1.000

NOTE: The following equation converts kW of heat energy to Btuh: kW x 3.412 = Btuh.
EXAMPLE: 32.0 kW (at 240 v) heater on 208 v
= 32.0 (.751 mult factor)
= 24.0 kW capacity at 208 v

5. For 50TFF electrical data with convenience outlet, see unit nameplate or contact service engineering.

Table 2B — Electrical Data — 50TM Units Without Convenience Outlet (cont)

UNIT 50TM	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	
014	208/230-3-60	STD	187	254	2	19	156	2	1/4	1.4	10.6	NONE	—/—	—/—	56.2/ 56.2	70/ 70**	59/ 59	359/359	—
												017	7.8/10.4	21.7/25	56.2/ 56.2	70/ 70**	59/ 59	359/359	012
												010	12/16	33.4/ 38.5	56.2/ 61.4	70/ 70**	59/ 59	359/359	012
												012	24/32	66.7/77	96.6/109.5	100/110**	89/101	359/359	012
												012 and 017	31.8/42.4	88.4/102	123.7/140.8	125/150**	114/129	359/359	015
												010 and 012	37.6/50	104.2/120.3	143.5/163.6	150/175**	132/151	359/359	015
		ALT									15	NONE	—/—	—/—	60.6/ 60.6	70/ 70**	64/ 64	378/378	—
												017	7.8/10.4	21.7/25	60.6/ 60.6	70/ 70**	64/ 64	378/378	012
												010	12/16	33.4/ 38.5	60.6/ 66.9	70/ 80**	64/ 64	378/378	012
												012	24/32	66.7/77	102.1/115.0	110/125**	94/106	378/378	012
												012 and 017	31.8/42.4	88.4/102	129.2/146.3	150/150**	119/135	378/378	015
												010 and 012	37.6/50	104.2/120.3	149.0/169.1	150/175**	137/156	378/378	015
	460-3-60	STD	414	508	2	9	75	2	1/4	0.7	4.8	NONE	—	—	26.5	30	28	174	—
												013	16.5	19.8	30.8	35	28	174	011
												014	27.8	33.4	47.8	45	44	174	011
												015	33	39.7	55.6	60	51	174	011
												014 and 016	41.7	50.2	68.7	70**	63	174	014
												013 and 015	50	60.1	81.2	90**	75	174	014
		ALT									7.4	NONE	—	—	29.1	35	31	213	—
												013	16.5	19.8	34.1	40	31	213	011
												014	27.8	33.4	51.0	60	47	213	011
												015	33	39.7	58.9	60	54	213	011
												014 and 016	41.7	50.2	71.9	80**	66	213	014
												013 and 015	50	60.1	84.4	90**	78	213	014
	575-3-60	STD	518	632	2	7.4	54	2	1/4	0.7	4.8	NONE	—	—	21.6	25	23	127	—
												018	17	17.1	26.1	30	24	127	011
												019	34	34.1	47.5	45	44	127	011
												018 and 019	51	51.2	68.8	70**	63	127	014
		ALT									7.4	NONE	—	—	23.7	30	25	159	—
												018	17	17.1	28.7	35	26	159	011
												019	34	34.1	50.1	50	46	159	011
												018 and 019	51	51.2	71.4	80**	66	159	014

LEGEND

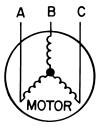
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
IFM — Indoor (Evaporator) Fan Motor
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
OFM — Outdoor (Condenser) Fan Motor
RLA — Rated Load Amps

*Used to determine minimum disconnect per NEC.
†Fuse or HACR circuit breaker per NEC.
**Fuse only.
††Compressor no. 1 is shown in table.
208/230-3-60: Compressor no. 2 RLA is 14.1 amps and LRA is 105 amps.
460-3-60: Compressor no. 2 RLA is 7.1 amps and LRA is 55 amps.
575-3-60: Compressor no. 2 RLA is 6.4 amps and LRA is 40 amps.

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.

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

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 50TM008 unit with MCA = 40.1 and MOCP = 45, with CRPWREXH030A00 power exhaust.
MCA New = 40.1 amps + 1.6 amps = 41.7 amps
If the new MCA does not exceed the published MOCP, then MOCP would not change. The MOCP in this example is 45 amps, the MCA New is below 45, 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)
CRPWREXH021A00	N/A	0.9	N/A	15
CRPWREXH022A00	3.3	N/A	1.32	15
CRPWREXH023A00	N/A	1.8	N/A	15
CRPWREXH024A00	1.6	N/A	0.64	15
CRPWREXH025A00	N/A	0.9	N/A	15
CRPWREXH026A00	3.3	N/A	1.32	15
CRPWREXH027A00	N/A	1.8	N/A	15
CRPWREXH028A00	1.7	N/A	0.68	15
CRPWREXH029A00	N/A	1.0	N/A	15
CRPWREXH030A00	1.6	N/A	0.64	15

4. Determine heater capacity using multiplication factors table below:

HEATER RATING VOLTAGE	ACTUAL HEATER VOLTAGE										
	200	208	230	240	380	440	460	480	550	575	600
240	0.694	0.751	0.918	1.000	—	—	—	—	—	—	—
480	—	—	—	—	0.626	0.840	0.918	1.000	—	—	—
600	—	—	—	—	—	—	—	—	0.840	0.918	1.000

NOTE: The following equation converts kW of heat energy to Btuh: kW x 3.412 = Btuh.
EXAMPLE: 32.0 kW (at 240 v) heater on 208 v
= 32.0 (.751 mult factor)
= 24.0 kW capacity at 208 v

5. For 50TFF electrical data with convenience outlet, see unit nameplate or contact service engineering.

Table 2C — Electrical Data — 50TM Units With Convenience Outlet

UNIT 50TM	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	
008	208/230-3-60	STD	187	254	2	14	91	2	1/4	1.4	5.8	NONE	—/—	—/—	44.9/ 44.9	50/ 50	48/ 48	234/234	—
												017	7.8/10.4	21.7/25	44.9/ 44.9	50/ 50	48/ 48	234/234	006
												010	12/16	33.4/38.5	55.0/ 60.8	60/ 60	51/ 56	234/234	006
												011	18.4/24.8	51.7/59.7	77.9/ 87.3	80/ 90**	72/ 81	234/234	007
												012	24/32	66.7/77	96.6/108.9	100/110**	89/101	234/234	009
												012 and 017	31.8/42.4	88.4/102	123.7/140.2	125/150**	114/130	234/234	009
		ALT									5.8	NONE	—/—	—/—	44.9/ 44.9	50/ 50	48/ 48	234/234	—
												017	7.8/10.4	21.7/25	44.9/ 44.9	50/ 50	48/ 48	234/234	006
												010	12/16	33.4/38.5	55.0/ 60.8	60/ 60	51/ 56	234/234	006
												011	18.6/24.8	51.7/59.7	77.9/ 87.3	80/ 90**	72/ 81	234/234	007
												012	24/32	66.7/77	96.6/108.9	100/110**	89/101	234/234	007
												012 and 017	31.8/42.4	88.4/102	123.7/140.2	125/150**	114/130	234/234	009
		HIGH									10.6	NONE	—/—	—/—	49.7/ 49.7	60/ 60	53/ 53	277/277	—
												017	7.8/10.4	21.7/25	49.7/ 50.0	60/ 60	53/ 53	277/277	006
												010	12/16	33.4/38.5	61.0/ 66.8	70/ 70**	56/ 61	277/277	007
												011	18.6/24.8	51.7/59.7	83.9/ 93.3	90/100**	77/ 86	277/277	007
												012	24/32	66.7/77	102.6/114.9	110/125**	94/106	277/277	007
												012 and 017	32.3/42.4	88.4/102	129.7/146.2	150/150**	119/135	277/277	009
	460-3-60	STD	414	508	2	6.4	42	2	1/4	0.7	2.6	NONE	—	—	20.6	25	22	110	—
												016	13.9	16.7	26.9	25	25	110	006
												013	16.5	19.8	28.1	30	28	110	006
												014	27.8	33.4	47.8	50	44	110	006
												015	33	39.7	55.6	60	51	110	006
												014 and 016	41.7	50.2	68.7	70**	63	110	008
		ALT									2.6	NONE	—	—	20.6	25	22	110	—
												016	13.9	16.7	26.9	25	25	110	006
												013	16.5	19.8	28.1	30	28	110	006
												014	27.8	33.4	47.8	50	44	110	006
												015	33	39.7	55.6	60	51	110	006
												014 and 016	41.7	50.2	68.7	70**	63	110	008
		HIGH									4.8	NONE	—	—	22.8	25	24	132	—
												016	13.9	16.7	29.6	30	27	132	006
												013	16.5	19.8	30.8	35	31	132	006
												014	27.8	33.4	50.5	60	46	132	006
												015	33	39.7	58.3	60	54	132	006
												014 and 016	41.7	50.2	71.4	80**	66	132	008
	575-3-60	STD	518	632	2	5.2	39	2	1/4	0.7	2.6	NONE	—	—	16.6	20	18	99	—
												018	17	17.1	26.1	25	24	99	006
												019	34	34.1	47.4	45	44	99	006
		ALT									2.6	NONE	—	—	16.6	20	18	99	—
												018	17	17.1	26.1	25	24	99	006
												019	34	34.1	47.4	45	44	99	006
		HIGH									4.8	NONE	—	—	18.4	20	20	116	—
												018	17	17.1	28.3	30	26	116	006
												019	34	34.1	49.6	45	46	116	006
009	208/230-3-60	STD	187	254	2	17.3††	120††	2	1/4	1.4	5.8	NONE	—/—	—/—	49.1/ 49.1	60/ 60	52/ 52	277/277	—
												017	7.8/10.4	21.7/25	49.1/ 49.1	60/ 60	52/ 52	277/277	006
												010	12/16	33.4/38.5	55.0/ 60.8	60/ 60	52/ 56	277/277	006
												011	18.6/24.8	51.7/59.7	77.9/ 87.3	80/ 90**	72/ 81	277/277	007
												012	24/32	66.7/77	96.6/108.9	100/110**	89/101	277/277	007
												012 and 017	31.8/42.4	88.4/102	123.7/140.2	125/150**	114/130	277/277	009
		HIGH									10.6	NONE	—/—	—/—	53.9/ 53.9	60/ 60	57/ 57	320/320	—
												017	7.8/10.4	21.7/25	53.9/ 53.9	60/ 60	57/ 57	320/320	006
												010	12/16	33.4/38.5	61.0/ 66.8	70/ 70**	57/ 61	320/320	007
												011	18.6/24.8	51.7/59.7	83.9/ 93.3	90/100**	77/ 86	320/320	007
												012	24/32	66.7/77	102.6/114.9	110/125**	94/106	320/320	007
												012 and 017	31.8/42.4	88.4/102	129.7/146.2	150/150**	119/135	320/320	009
	460-3-60	STD	414	508	2	7.9††	70††	2	1/4	0.7	2.6	NONE	—	—	23.2	30	24	151	—
												016	13.9	16.7	26.9	30	25	151	006
												013	16.5	19.8	28.1	30	28	151	006
												014	27.8	33.4	47.8	50	44	151	006
												015	33	39.7	55.6	60	51	151	006
												014 and 016	41.7	50.2	68.7	70**	63	151	008
		HIGH									4.8	NONE	—	—	25.4	30	27	173	—
												016	13.9	16.7	29.6	30	27	173	006
												013	16.5	19.8	30.8	35	31	173	006
												014	27.8	33.4	50.5	60	46	173	006
												015	33	39.7	58.3	60	54	173	006
												014 and 016	41.7	50.2	71.4	80**	66	173	008
	575-3-60	STD	518	632	2	5.5††	50††	2	1/4	0.7	2.6	NONE	—	—	18.4	25	19	111	—
												018	17	17.1	26.1	25	24	111	006
												019	34	34.1	47.4	45	44	111	006
		HIGH									4.8	NONE	—	—	20.2	25	21	128	—
												018	17	17.1	28.3	30	26	128	006
												019	34	34.1	49.6	45	46	128	006

See Legend and Notes on page 14.

Table 2C — Electrical Data — 50TM Units With Convenience Outlet (cont)

UNIT 50TM	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	
012	208/230-3-60	STD	187	254	2	16	125	2	1/4	1.4	5.8	NONE	—/—	—/—	49.4/ 49.4	60/ 60	52/ 52	302/302	—
												017	7.8/10.4	21.7/25	49.4/ 49.4	60/ 60	52/ 52	302/302	011
												010	12/16	33.4/38.5	55.0/ 60.8	60/ 60	52/ 56	302/302	011
												012	24/32	66.7/77	96.6/108.9	100/110**	89/101	302/302	012
												012 and 017	31.8/42.4	88.4/102	123.7/140.2	125/150**	114/130	302/302	015
												010 and 012	37.6/50	104.2/120.3	143.6/163.0	150/175**	132/151	302/302	015
		ALT									7.5	NONE	—/—	—/—	51.1/ 51.1	60/ 60	54/ 54	321/321	—
												017	7.8/10.4	21.7/25	51.1/ 51.1	60/ 60	54/ 54	321/321	011
												010	12/16	33.4/38.5	57.1/ 62.9	60/ 60	54/ 58	321/321	011
												012	24/32	66.7/77	98.8/111.0	100/125**	91/103	321/321	012
												012 and 017	31.8/42.4	88.4/102	125.9/142.3	150/150**	116/131	321/321	015
												010 and 012	37.6/50	104.2/120.3	145.7/165.2	150/175**	134/152	321/321	015
		HIGH									15	NONE	—/—	—/—	58.6/ 68.6	70/ 70**	63/ 63	369/369	—
												017	7.8/10.4	21.7/25	58.6/ 58.6	70/ 70**	63/ 63	369/369	012
												010	12/16	33.4/38.5	66.5/ 72.3	80/ 80**	63/ 67	369/369	012
												012	22.9/32	66.7/77	108.1/120.4	110/125**	99/111	369/369	012
												012 and 017	31.8/42.4	88.4/102	135.2/151.7	150/175**	124/140	369/369	015
												010 and 012	37.6/50	104.2/120.3	155.1/174.5	175/175**	143/161	369/369	015
	460-3-60	STD	414	508	2	8	62.5	2	1/4	0.7	2.6	NONE	—	—	24.2	30	26	151	—
												013	16.5	19.8	30.8	30	28	151	011
												014	27.8	33.4	45.0	40	44	151	011
												015	33	39.7	55.6	60	51	151	011
												014 and 016	41.7	50.2	68.7	70**	63	151	014
												013 and 015	50	60.1	81.1	90**	75	151	014
		ALT									3.4	NONE	—	—	25.0	30	26	190	—
												013	16.5	19.8	31.8	30	29	190	011
												014	27.8	33.4	46.0	45	45	190	011
												015	33	39.7	56.6	60	52	190	011
												014 and 016	41.7	50.2	69.7	70**	64	190	014
												013 and 015	50	60.1	82.1	90**	76	190	014
		HIGH									7.4	NONE	—	—	29.0	35	31	184	—
												013	16.5	19.8	36.8	40	34	184	011
												014	27.8	33.4	51.0	60	49	184	011
												015	33	39.7	61.6	70**	57	184	014
												014 and 016	41.7	50.2	74.7	80**	69	184	014
												013 and 015	50	60.1	87.1	90**	80	184	014
	575-3-60	STD	518	632	2	6.3	50	2	1/4	0.7	2.6	NONE	—	—	19.1	25	20	121	—
												018	17	17.1	26.1	25	24	121	011
												019	34	34.1	47.4	45	44	121	011
												018 and 019	51	51.2	68.8	70**	63	121	014
		ALT									3,4	NONE	—	—	19.7	25	21	152	—
												018	17	17.1	26.9	25	25	152	011
												019	34	34.1	48.2	45	44	152	011
												018 and 019	51	51.2	69.6	70**	64	152	014
		HIGH									7.4	NONE	—	—	22.9	25	25	148	—
												018	17	17.1	30.9	35	28	148	011
												019	34	34.1	52.2	50	48	148	011
												018 and 019	51	51.2	73.6	80**	68	148	014
014	208/230-3-60	STD	187	254	2	19	156	2	1/4	1.4	10.6	NONE	—/—	—/—	61.0/ 61.0	70/ 70**	65/ 65	364/364	—
												017	7.8/10.4	21.7/25	61.0/ 61.0	70/ 70**	65/ 65	364/364	012
												010	12/16	33.4/38.5	61.0/ 66.8	70/ 70**	65/ 65	364/364	012
												012	24/32	66.7/77	102.6/114.9	110/125**	94/106	364/364	012
												012 and 017	31.8/42.4	88.4/102	129.7/146.2	150/150**	119/135	364/364	015
												010 and 012	37.6/50	104.2/120.3	149.6/169.0	150/175**	138/156	364/364	015
		ALT									15	NONE	—/—	—/—	65.4/ 65.4	80/ 80**	70/ 70	383/383	—
												017	7.8/10.4	21.7/25	65.4/ 65.4	80/ 80**	70/ 70	383/383	012
												010	12/16	33.4/38.5	66.5/ 72.3	80/ 80**	70/ 70	383/383	012
												012	24/32	66.7/77	108.1/120.4	110/125**	99/111	383/383	012
												012 and 017	31.8/42.4	88.4/102	135.2/151.7	150/175**	124/140	383/383	015
												010 and 012	37.6/50	104.2/120.3	155.1/174.5	175/175**	143/161	383/383	015
	460-3-60	STD	414	508	2	9	75	2	1/4	0.7	4.8	NONE	—	—	28.7	35	30	176	—
												013	16.5	19.8	33.5	35	31	176	011
												014	27.8	33.4	47.8	45	46	176	011
												015	33	39.7	58.3	60	54	176	011
												014 and 016	41.7	50.2	71.4	80**	66	176	014
												013 and 015	50	60.1	83.9	90**	77	176	014
		ALT									7.4	NONE	—	—	31.3	35	33	215	—
												013	16.5	19.8	36.8	40	34	215	011
												014	27.8	33.4	51.0	60	49	215	011
												015	33	39.7	61.6	70**	57	215	014
												014 and 016	41.7	50.2	74.7	80**	69	215	014
												013 and 015	50	60.1	87.1	90**	80	215	014
	575-3-60	STD	518	632	2	7.4	54	2	1/4	0.7	4.8	NONE	—	—	23.3	30	25	129	—
												018	17	17.1	28.3	30	26	129	011
												019	34	34.1	49.6	45	46	129	011
												018 and 019	51	51.2	71.0	80**	65	129	014
		ALT									7.4	NONE	—	—	25.4	30	27	160	—
												018	17	17.1	30.9	35	28	160	011
												019	34	34.1	52.2	50	48	160	011
												018 and 019	51	51.2	73.6	80**	68	160	014

See Legend and Notes on page 14.

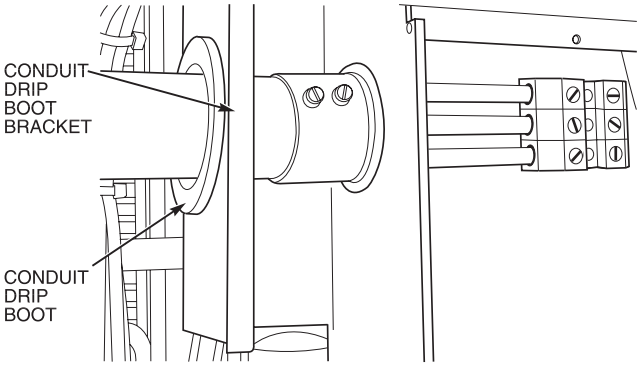
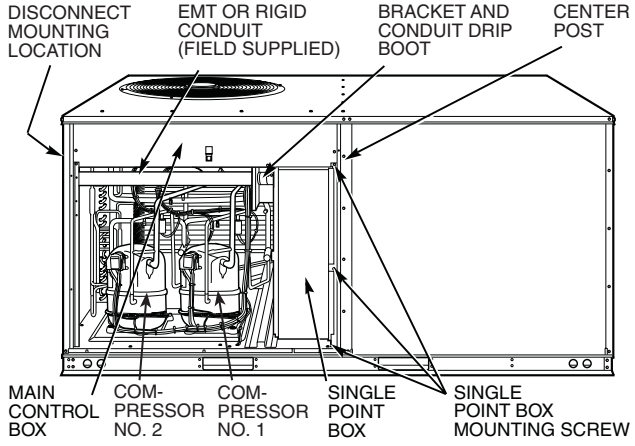
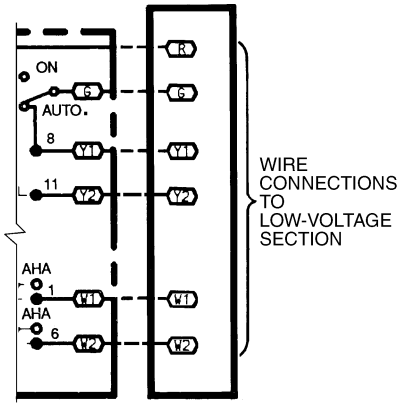


Fig. 9 — Conduit Installation



EMT — Electro-Metallic Tubing

Fig. 10 — Typical Component Location



LEGEND

AHA — Adjustable Heat Anticipator
Field Wiring
Factory Wiring

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

Fig. 11A — Low-Voltage Connections (Standard Controls)

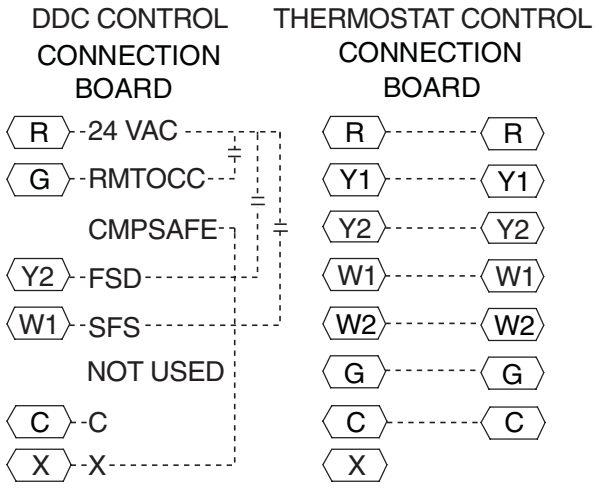


Fig. 11B — Low Voltage Connections (Units with PremierLink™ Controls)

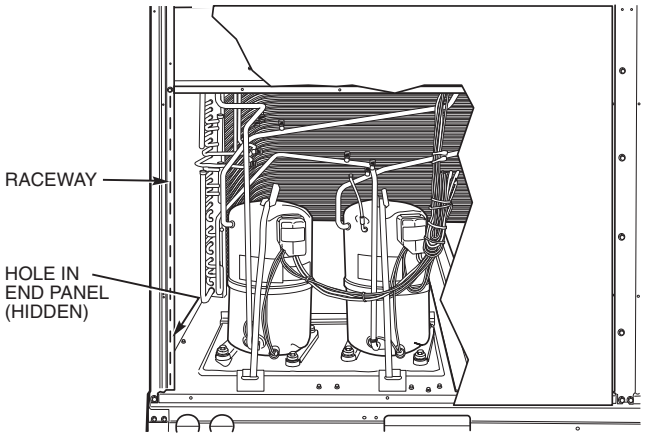


Fig. 12 — Field Control Wiring Raceway

Step 6 — Adjust Factory-Installed Options

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. See Fig. 13 for Apollo location.

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.

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 filter access panel by raising panel and swinging panel outward. Panel is now disengaged from track and can be removed. No tools are required to remove the filter access panel. Remove outdoor-air opening panel. Save panels and screws. See Fig. 14.
3. Separate hood and screen from basepan by removing the screws and brackets securing them. Save all screws and discard brackets.
4. Replace outdoor air opening panel.
5. Place hood on front of outdoor air opening panel. See Fig. 15 for hood details. Secure top of hood with the 6 screws removed in Step 3. See Fig. 16.
6. Remove and save 8 screws (4 on each side) from sides of the manual outdoor-air damper.
7. Align screw holes on hood with screw holes on side of manual outdoor-air damper. See Fig. 15 and 16. Secure hood with 8 screws from Step 6.
8. Adjust minimum position setting of the damper blade by adjusting the manual outdoor-air adjustment screws on the front of the damper blade. See Fig. 14. Slide blade vertically until it is in the appropriate position determined by Fig. 17. Tighten screws.
9. Remove and save screws currently on sides of hood. Insert screen. Secure screen to hood using the screws. See Fig. 16.
10. Replace filter access panel. Ensure filter access panel slides along the tracks and is securely engaged.

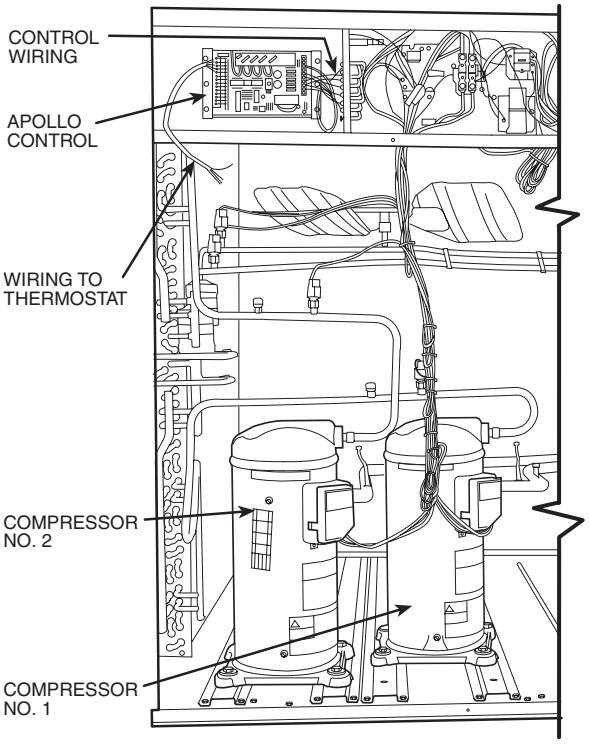


Fig. 13 — Apollo Control Factory-Installed in Typical Unit

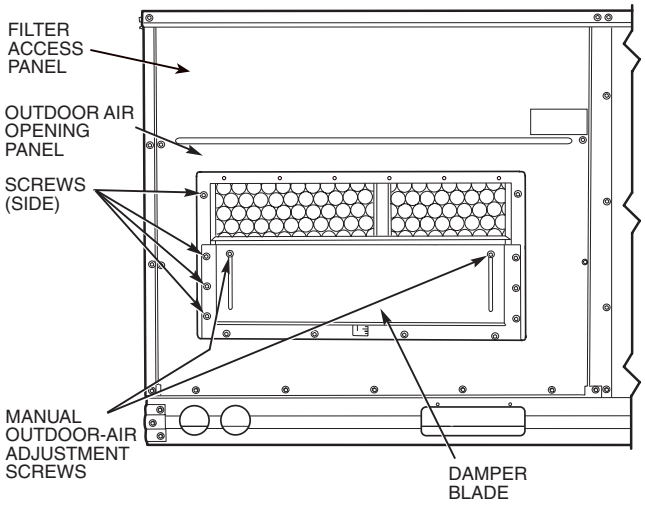


Fig. 14 — Damper Panel with Manual Outdoor-Air Damper Installed

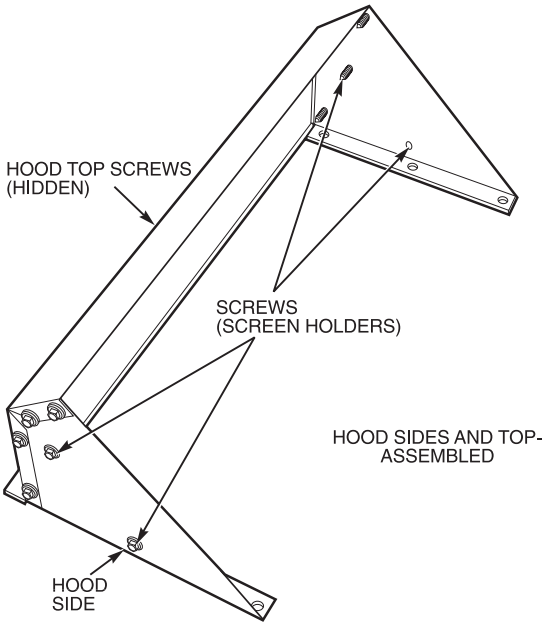


Fig. 15 — Outdoor-Air Hood Details

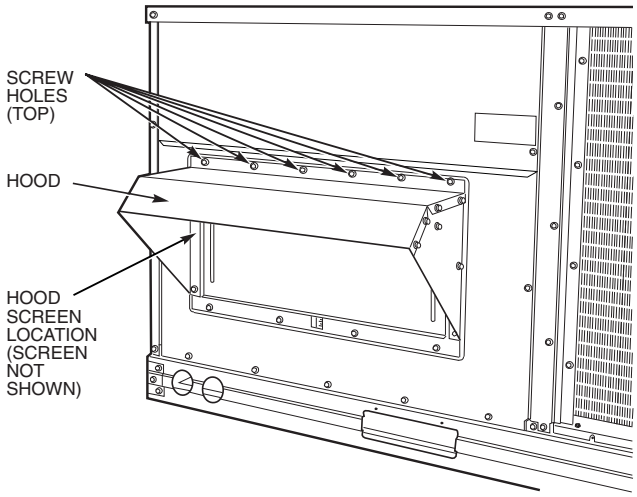


Fig. 16 — Optional Manual Outdoor-Air Damper with Hood Attached

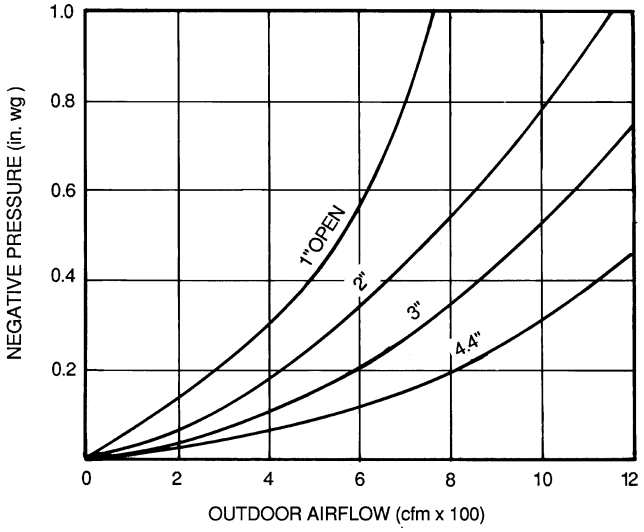


Fig. 17 — Outdoor Air Damper Position Setting

PREMIERLINK™ CONTROL — 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. 18) 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. 19. 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$ER2 — See Fig. 20 for EconoMi$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. 21.
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$er2 in the position shown in Fig. 20.
   a. Remove the screws holding the controller bracket in place. Save screws. Temporarily lower the controller. See Fig. 22. Do not disconnect the controller wiring.
   b. Remove the screw holding the hood box bracket to the top of the EconoMi$er2. Slide the hood box out of the unit. See Fig. 22 and 23.
   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. 24.

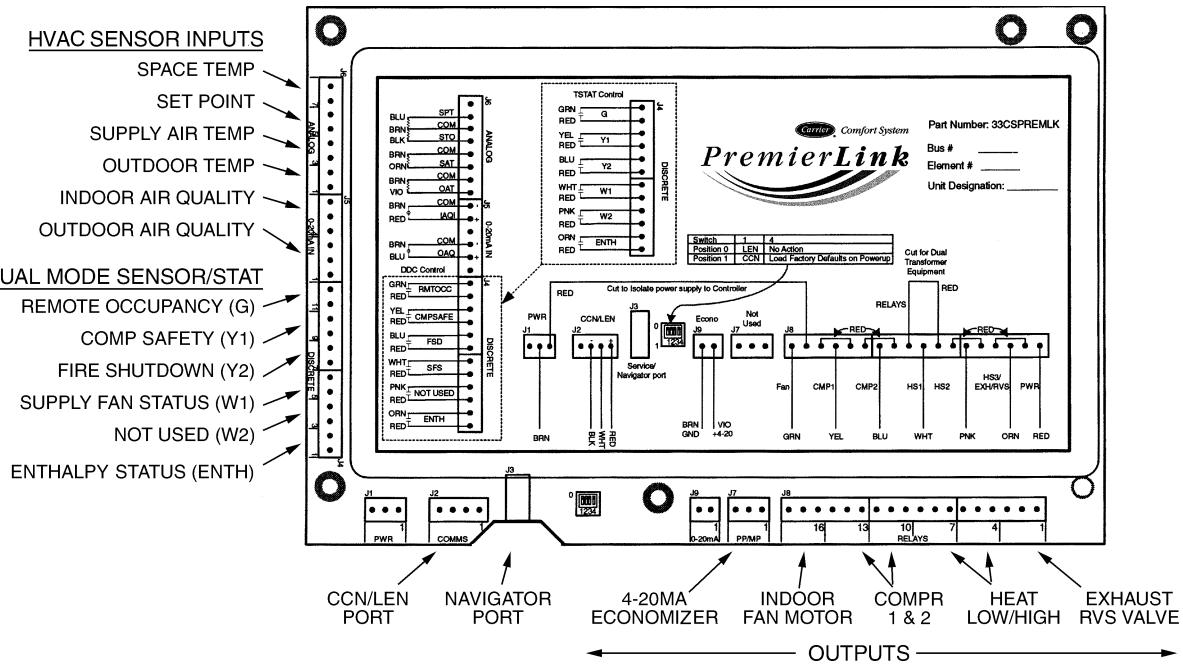
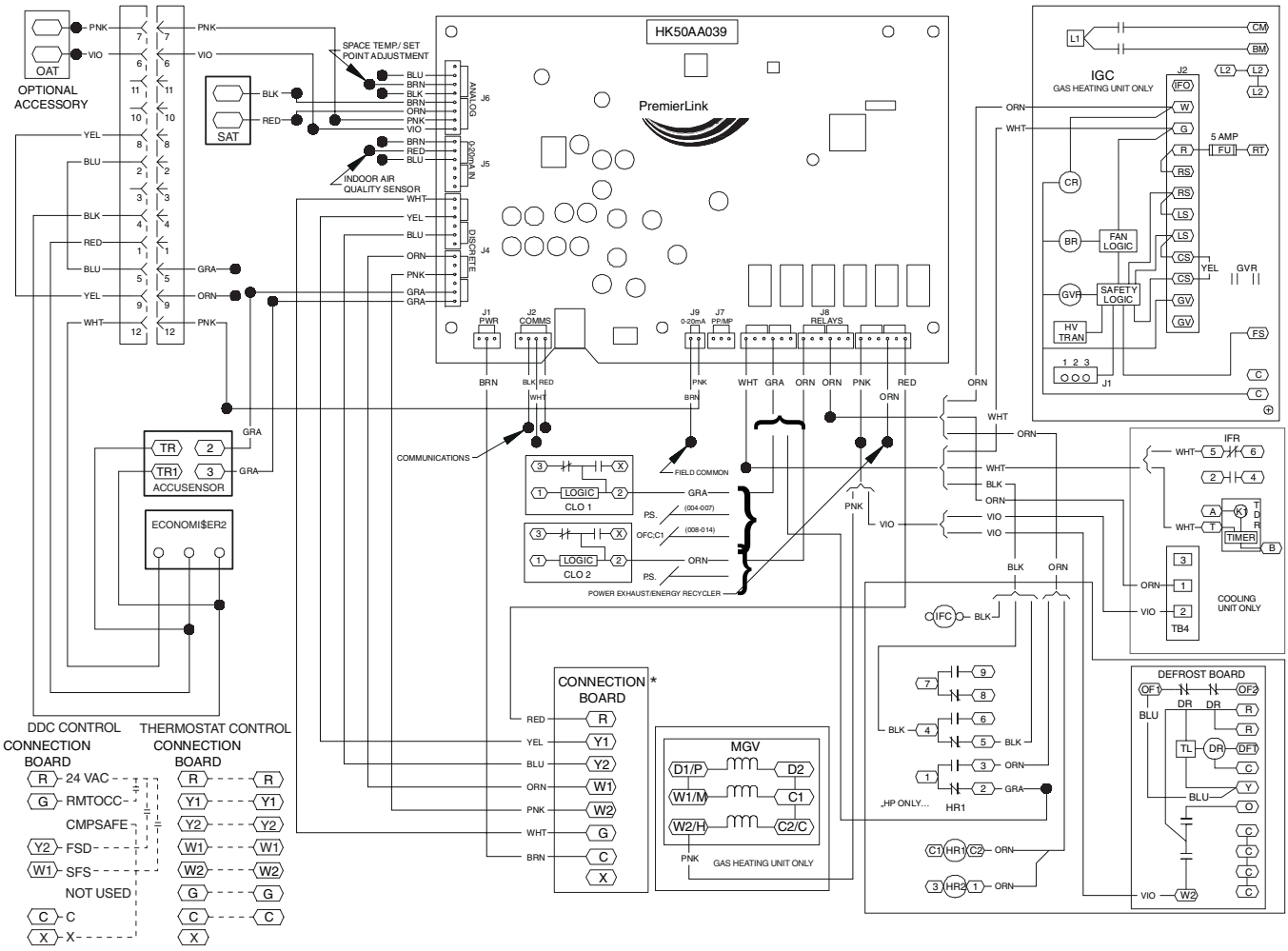


Fig. 18 — PremierLink Controller



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. 19 — Typical PremierLink™ Controls Wiring

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. 25.
5. Remove the shipping tape holding the EconoMi$er2 barometric relief damper in place.
6. Insert the hood divider between the hood sides. See Fig. 25 and 26. Secure hood divider with 2 screws on each hood side. The hood divider is also used as the bottom filter rack for the aluminum filter.
7. Open the filter clips which are located underneath the hood top. Insert the aluminum filter into the bottom filter rack (hood divider). Push the filter into position past the open filter clips. Close the filter clips to lock the filter into place. See Fig. 26.
8. Caulk the ends of the joint between the unit side panel and the hood top. See Fig. 24.
9. Replace the filter access panel.
10. Install all EconoMi$er2 accessories. EconoMi$er2 wiring is shown in Fig. 27 and 28.

Barometric flow capacity is shown in Fig. 29. Outdoor air leakage is shown in Fig. 30. Return air pressure drop is shown in Fig. 31.

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. 28 for wiring information.

Mixed Air Sensor — The mixed air sensor is pre-wired and mounted at the factory. See Fig. 32 for mixed air sensor location.

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. 27.

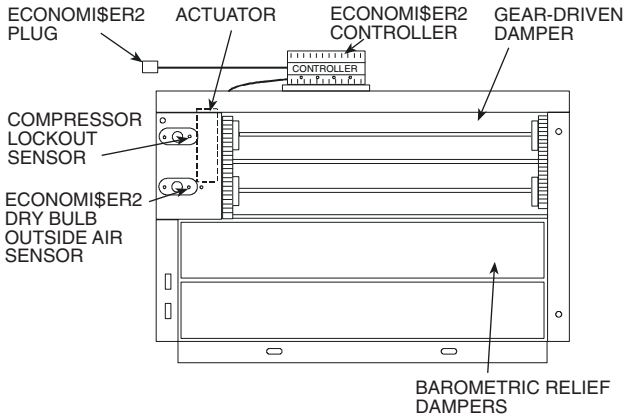


Fig. 20 — EconoMi$er2 Component Locations

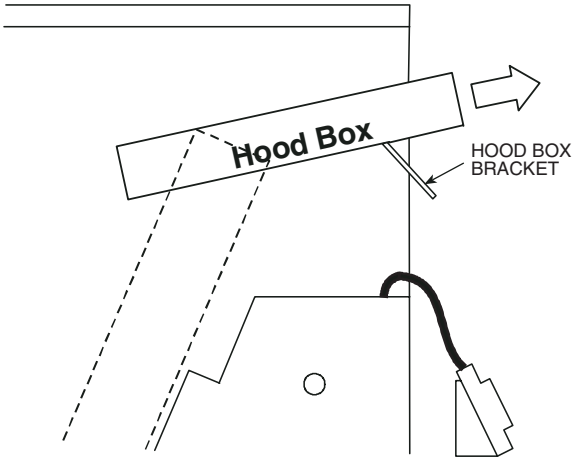


Fig. 23 — Hood Box Removal

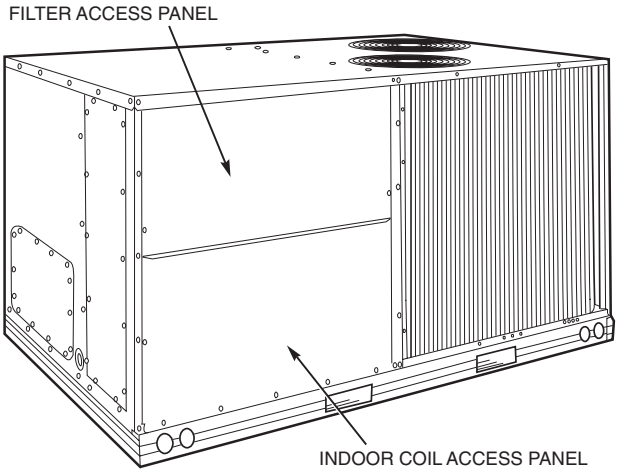


Fig. 21 — Typical Access Panel Locations

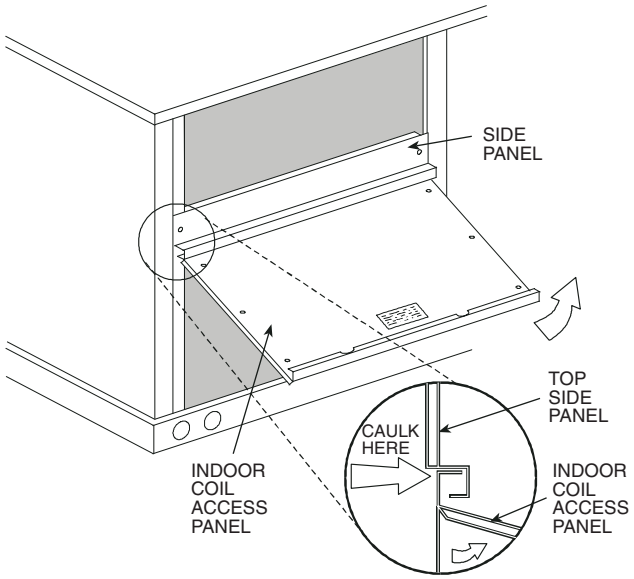


Fig. 24 — Indoor Coil Access Panel Relocation

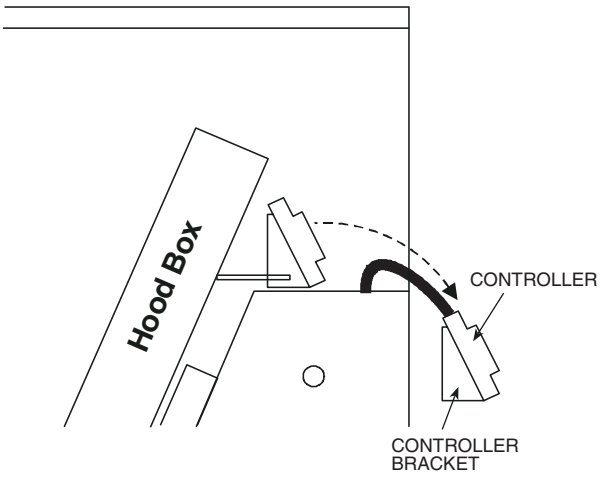


Fig. 22 — Temporary EconoMi$er2 Controller Relocation

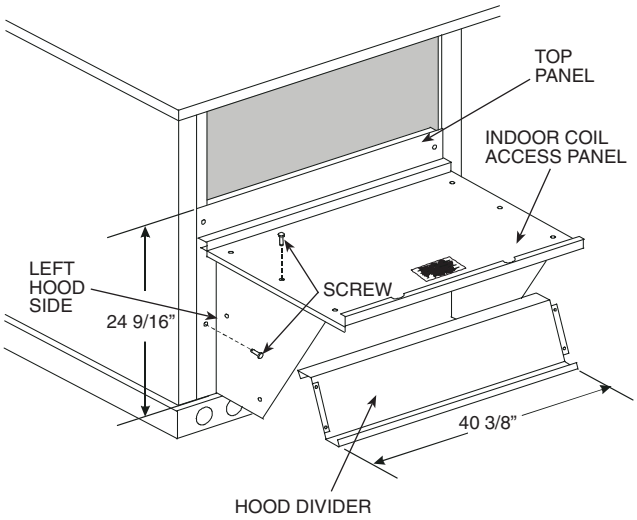


Fig. 25 — Outdoor-Air Hood Construction

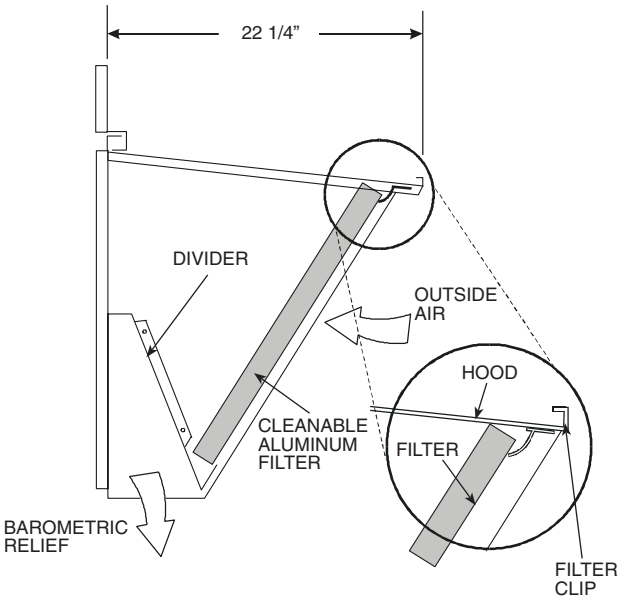


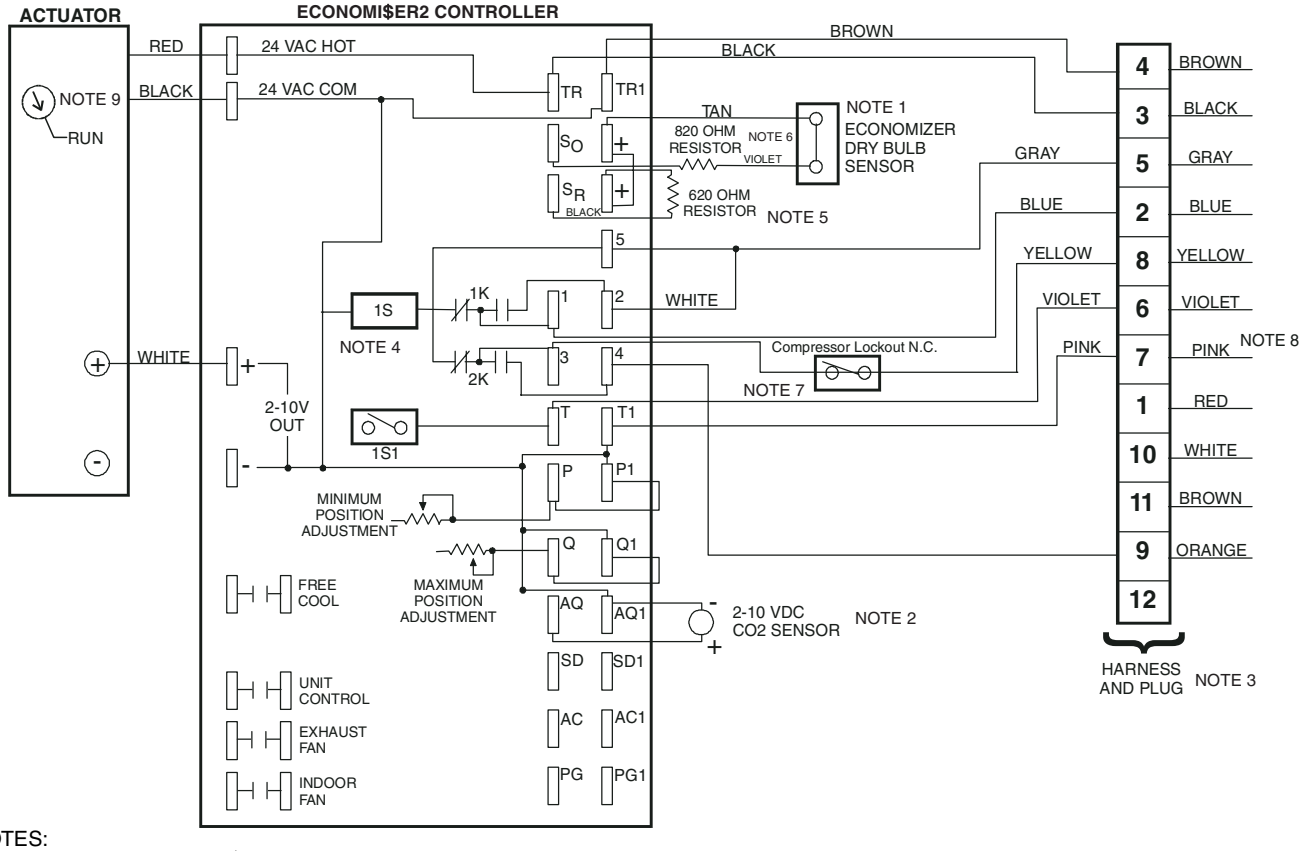
Fig. 26 — Filter Installation

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. 33. The factory-installed 620-ohm jumper must be in place across terminals S_R and +. See Fig. 27.

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.

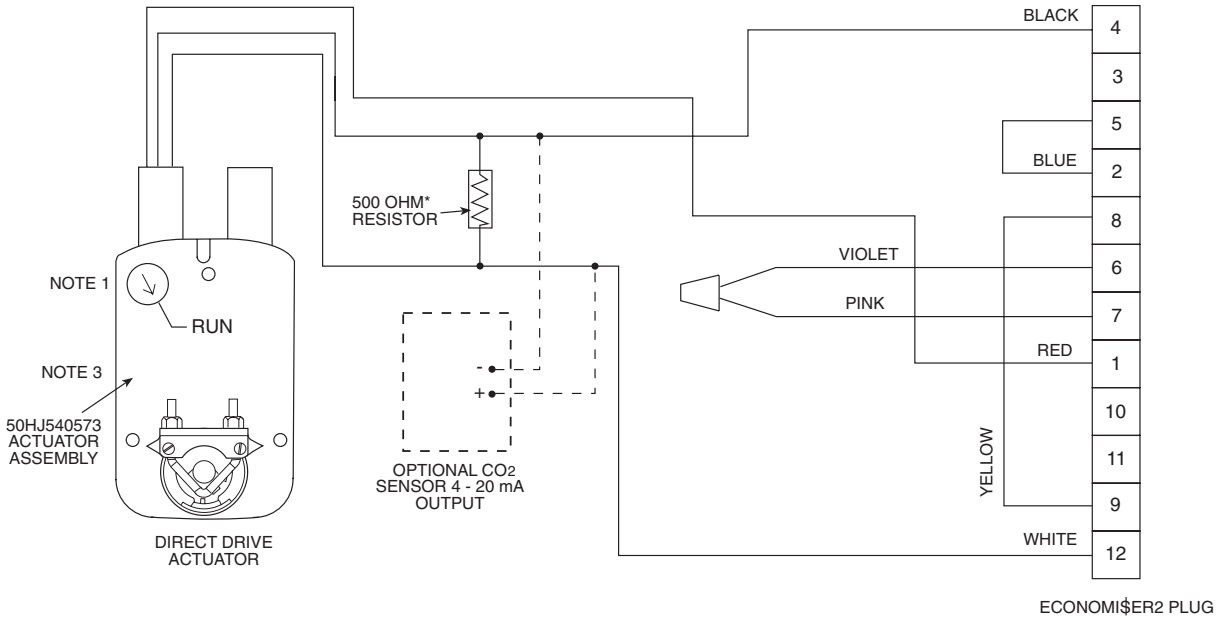
An outdoor-air sensor can be mounted in any orientation that exposes it to freely circulating air and protects it from rain, snow and direct sunlight. Connect it to the S_O terminal and to the + terminal. The second sensor should be mounted in the return airstream. Connect it to the S_R terminal (after removing the 620-ohm resistor) and to the + terminal on the controller. See Fig. 27.

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.



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. 27 — EconoMi$er2 Wiring



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

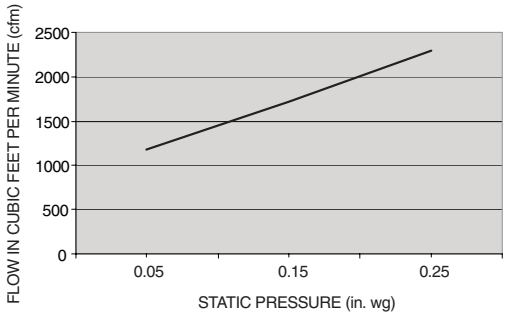


Fig. 29 — Barometric Relief Flow Capacity

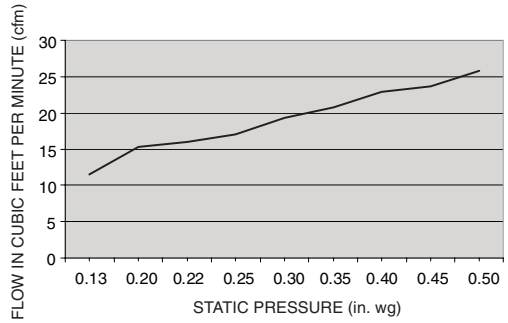


Fig. 30 — Outdoor Air Damper Leakage

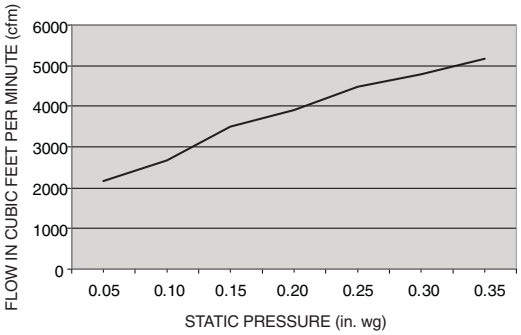


Fig. 31 — Return Air Pressure Drop

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$er2 controller. See Fig. 34. The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er2 controller. Turn the potentiometer to the D setting for differential enthalpy. See Fig. 33.

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. 27 and 35.

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. 36.

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. 36. 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.

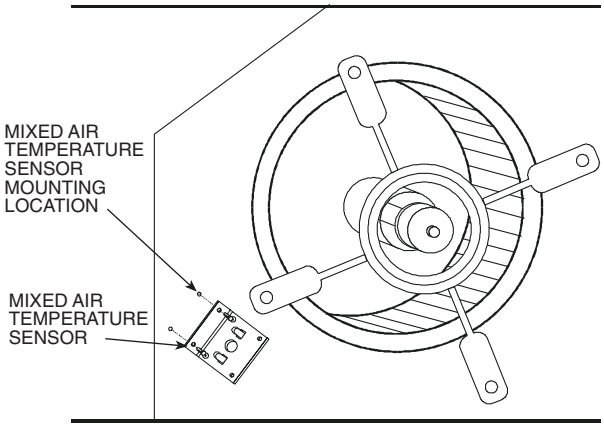


Fig. 32 — Mixed Air Sensor Location

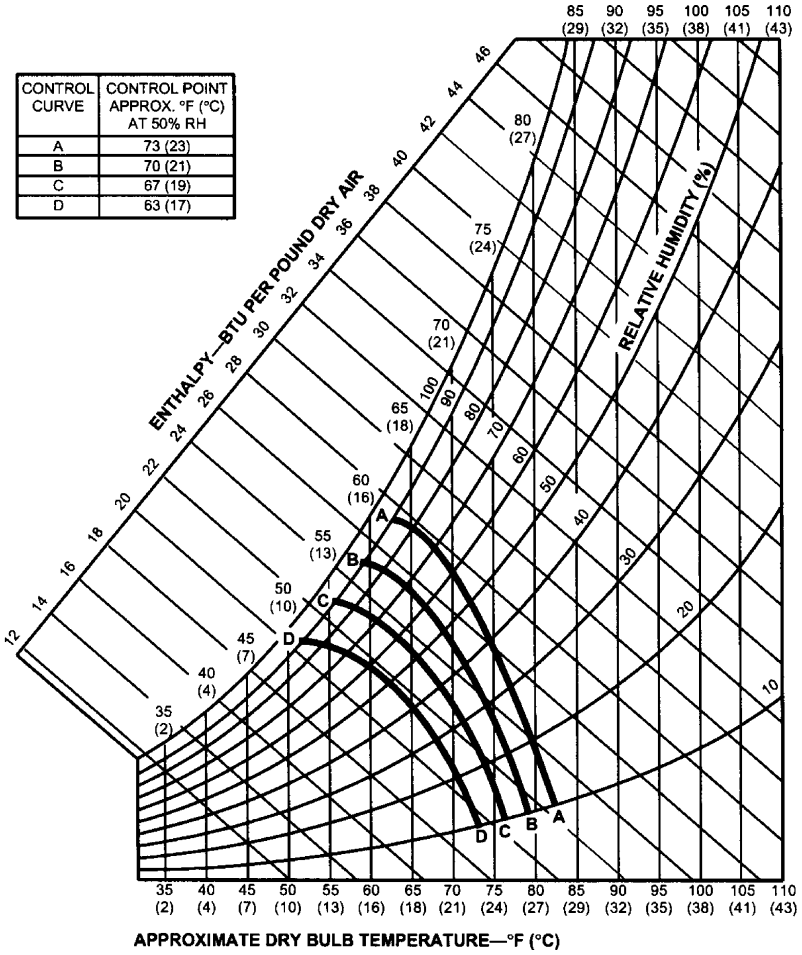
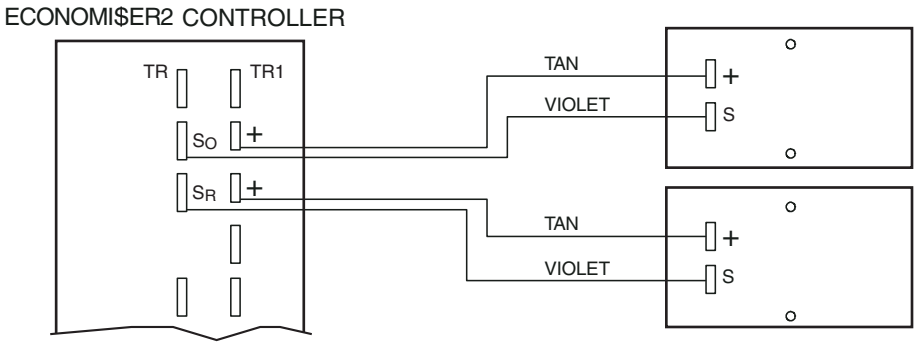


Fig. 33 — Enthalpy Changeover Set Points



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

Fig. 34 — Differential Enthalpy Wiring

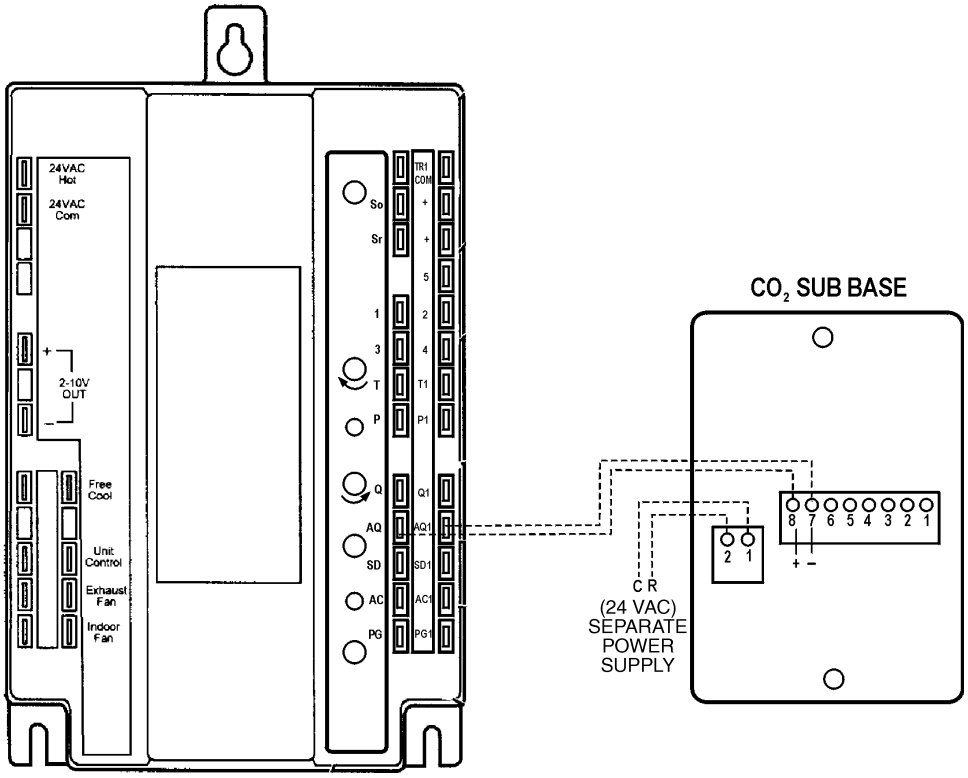


Fig. 35 — Indoor Air Quality Sensor Wiring

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.

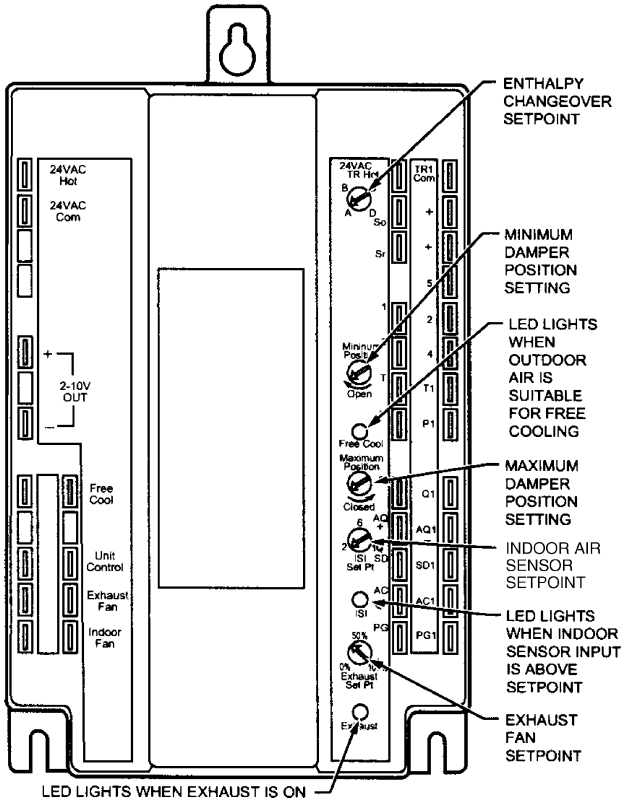


Fig. 36 — EconoMi$er2 Controller Potentiometer and LED Locations

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.
   $(60 \times .10) + (75 \times .90) = 73.5$ 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. 37 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.

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. 37 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. 37.

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. 37.

EconoMi$er2 Usage Tracking — The Free Cool contacts on the EconoMi$er2 controller close when the EconoMi$er2 is providing free cooling. See Fig. 27. 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$er2 controller connect through relay contacts or a jumper, the purge function is energized. See Fig. 38. The EconoMi$er2 damper drives fully closed and the exhaust fan turns on.

Shutdown — When terminals SD and SD1 on the EconoMi$er2 controller connect through relay contacts or a jumper, all systems are shut down. See Fig. 38. The EconoMi$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$er2 controller connect through relay contacts or a jumper, an air change is initiated. See Fig. 38. The EconoMi$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. 39 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. 39 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.

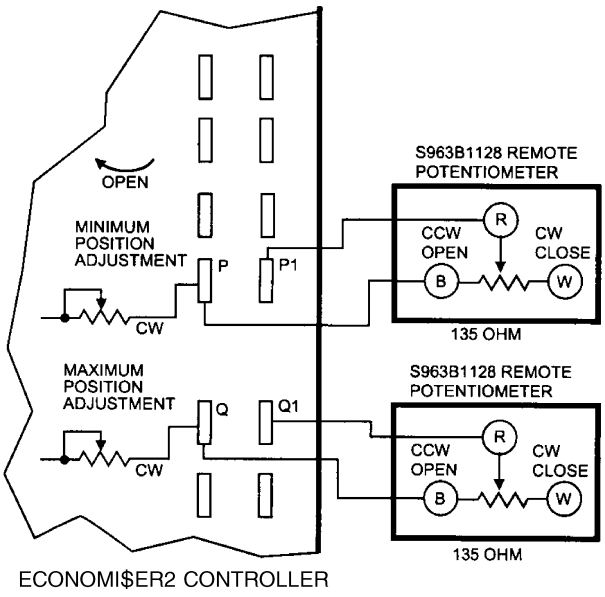


Fig. 37 — Remote Damper Position Potentiometer Wiring

Dehumidification of Fresh Air with DCV Control — Information from ASHRAE 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.

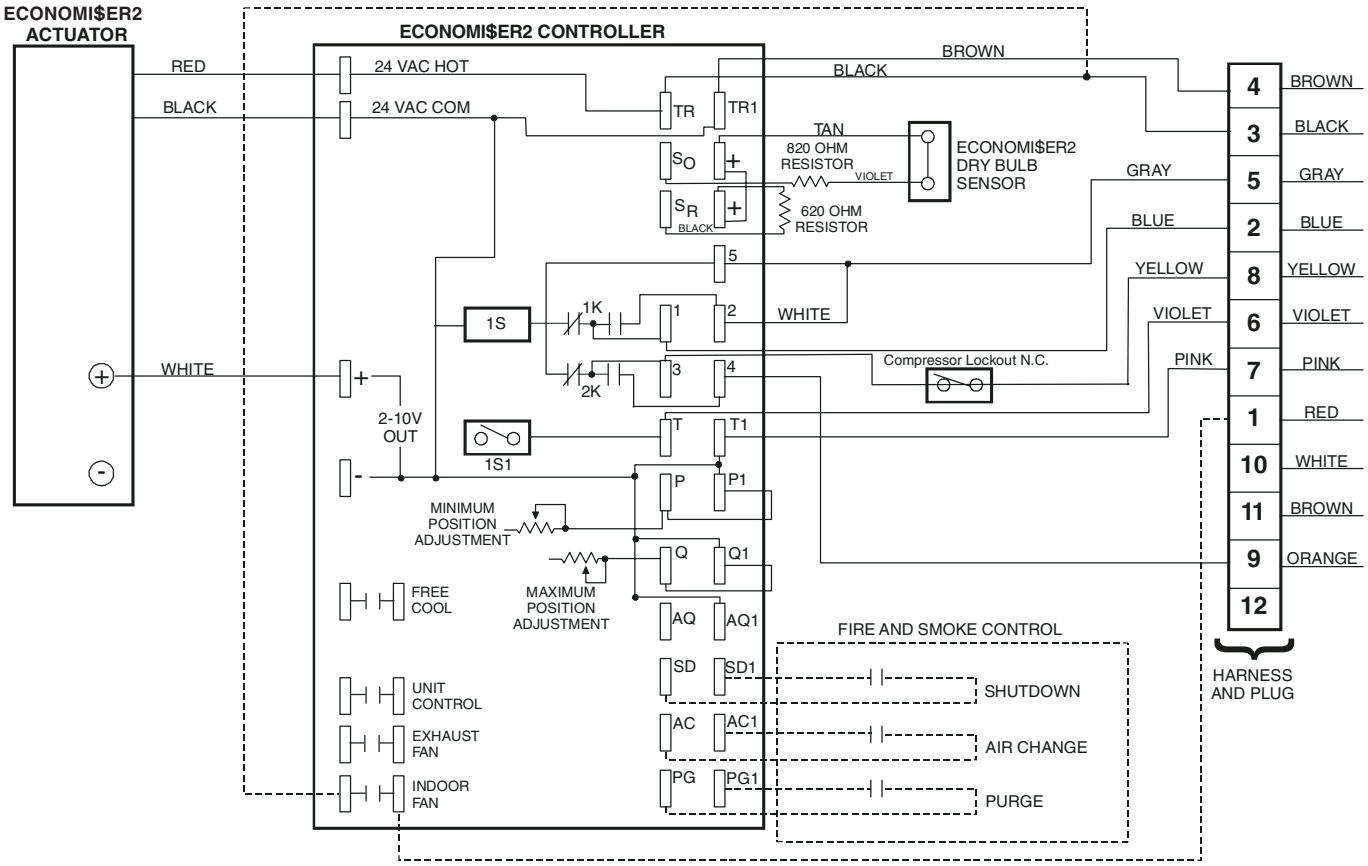


Fig. 38 — Fire and Smoke Control Wiring

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

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 airsteam 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.

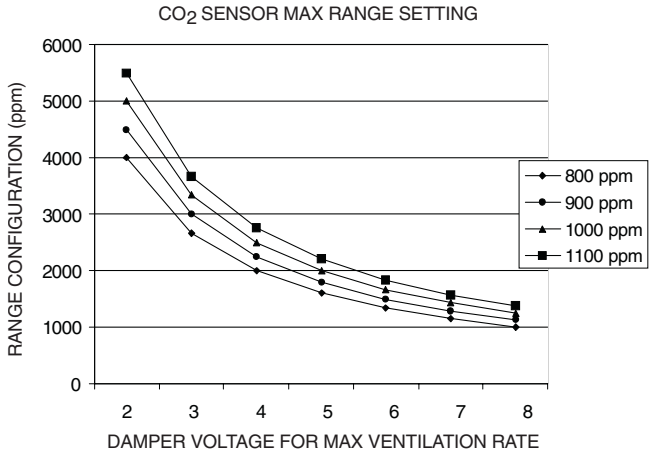


Fig. 39 — CO_2 Sensor Maximum Range Setting

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

Table 5 shows fan rpm at motor pulley settings, Table 6 shows motor efficiencies and Table 7 gives accessory static pressure drops. Table 8 shows motor performance. Refer to Tables 9-20 to determine fan speed settings. Fan motor pulleys are factory set for speed shown in Tables 1A and 1B.

To change fan speed:

1. Shut off unit power supply and install lockout tag.
2. Loosen belt by loosening fan motor mounting plate nuts (see Fig. 40 and 41).
3. Loosen movable pulley flange setscrew (see Fig. 42).
4. Screw movable flange toward fixed flange to increase speed and away from fixed flange to decrease fan speed. Increasing fan speed increases load on motor. Do not exceed maximum speed specified in Tables 1A and 1B.
5. Set movable flange at nearest flat 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 plate.

To adjust belt tension (see Fig. 40 and 41):

1. Loosen fan motor mounting plate nuts.
2. *Units 008,009* — Slide motor mounting plate away from fan scroll for proper belt tension ($^1/_2$-in. deflection with 8 to 10 lbs of force) and tighten mounting nuts (see Fig. 40).

   Units 012,014 — Slide motor mounting plate downward to tighten belt tension ($^1/_2$-in. deflection with 5 to 10 lbs of force). Secure motor mounting plate nuts. See Fig. 41.
3. Adjust bolt and nut on mounting plate to secure motor in fixed position.
4. Check pulley alignment and realign pulleys if necessary.

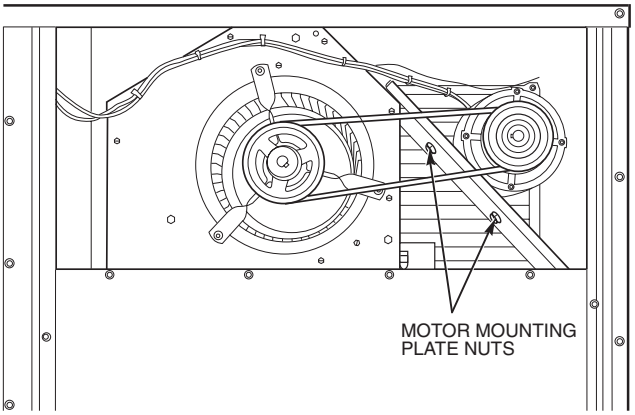


Fig. 40 — Typical Belt-Drive Motor Mounting for Sizes 008,009

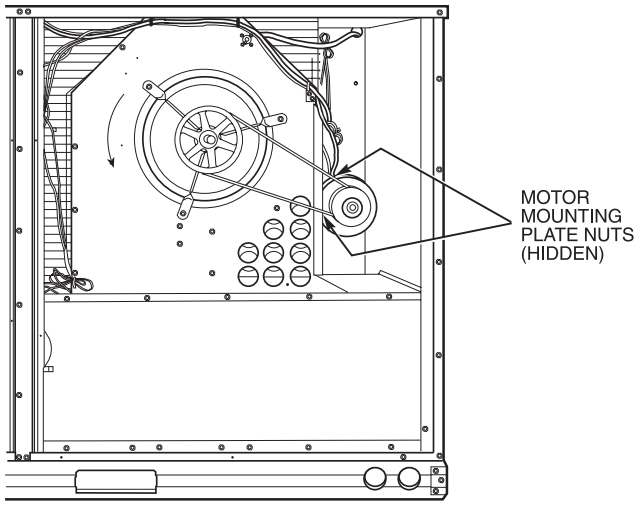


Fig. 41 — Typical Belt-Drive Motor Mounting for Sizes 012,014

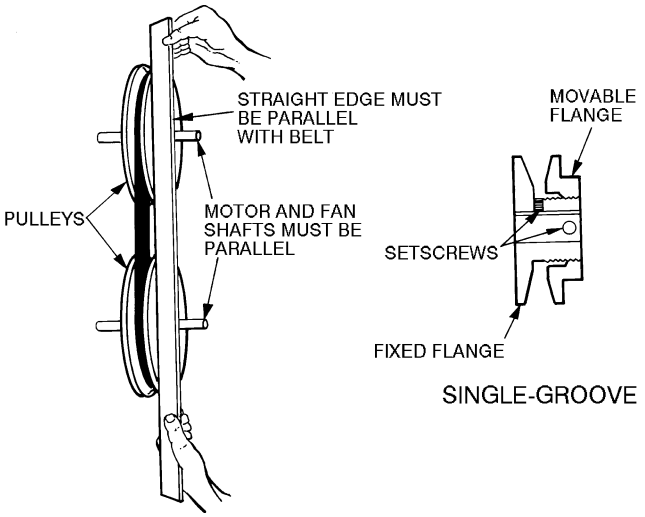


Fig. 42 — Evaporator-Fan Pulley Adjustment

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
008†	840	815	790	765	740	715	690	665	635	615	590	—	—
008**	935	910	885	860	835	810	785	760	735	710	685	—	—
008††	1080	1025	1007	988	970	952	933	915	897	878	860	—	—
009†	935	910	885	860	835	810	785	760	735	710	685	—	—
009††	1080	1025	1007	988	970	952	933	915	897	878	860	—	—
012†	935	910	885	860	835	810	785	760	735	710	685	—	—
012ll	1085	1060	1035	1010	985	960	935	910	885	860	835	—	—
012††	1130	1112	1087	1062	1037	1012	987	962	937	912	887	862	830
014†	1080	1060	1035	1015	990	970	950	925	905	880	860	—	—
014ll	1260	1220	1185	1155	1130	1100	1075	1045	1015	990	960	930	900

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

Table 6 — Evaporator-Fan Motor Efficiency

UNIT 50TFF,TM	EFFICIENCY (%)
008-012	80
014	87

NOTE: Convert bhp to watts using the following formula:

$$\text{watts} = \frac{\text{bhp (746)}}{\text{motor efficiency}}$$

Table 7 — Accessory Static/FIOP Pressure* (in. wg) 50TFF008-014, 50TM008-014

COMPONENT	CFM									
	2250	2500	3000	3500	4000	4500	5000	5500	6000	6250
1 Heater Module	0.02	0.03	0.05	0.07	0.08	0.10	0.12	0.14	0.16	0.17
2 Heater Modules	0.03	0.05	0.07	0.09	0.12	0.14	0.16	0.19	0.21	0.20
Durablade Economizer	0.02	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.09
Vertical EconoMi$er2	0.06	0.075	0.115	0.15	0.195	0.25	0.325	—	—	—
Horizontal EconoMi$er2	—	0.10	0.15	0.21	0.275	0.34	—	—	—	—

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 — Motor Data

UNIT 50TFF,TM	EVAPORATOR-FAN MOTOR	UNIT VOLTAGE	MAXIMUM ACCEPTABLE CONTINUOUS BHP*	MAXIMUM ACCEPTABLE OPERATING WATTS	MAXIMUM AMP DRAW
008	Standard, Alternate	208/230	2.40	2120	6.7
		460			3.0
		575			3.0
	High Static	208/230	3.70	3313	12.2
		460			5.5
		575			5.5
009	Standard	208/230	2.40	2120	6.7
		460			3.0
		575			3.0
	High Static	208/230	3.70	3313	12.2
		460			5.5
		575			5.5
012	Standard	208/230	2.40	2120	6.7
		460			3.0
		575			3.0
	Alternate	208/230	2.90	2615	8.6
		460			3.9
		575			3.9
	High Static	208/230	5.25	4400	17.3
		460			8.5
		575			8.5
014	Standard	208/230	3.70	3313	12.2
		460			5.5
		575			5.5
	Alternate	208/230	5.25	4400	17.3
		460			8.5
		575			8.5

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.

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 9 — Fan Performance, 50TFF,TM008 Standard Motor and Drive and Alternate Drive — Vertical Discharge Units*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.2			0.4			0.6			0.8			1.0			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	**511**	**0.52**	**539**	592	0.74	708	659	0.95	875	722	1.19	1072	778	1.43	1275	829	1.68	1491
2300	**518**	**0.55**	**562**	599	0.77	731	665	0.98	899	727	1.22	1097	783	1.47	1310	834	1.72	1526
2400	**534**	**0.61**	**607**	613	0.84	787	677	1.06	965	738	1.30	1165	794	1.55	1378	844	1.81	1604
2500	**549**	**0.67**	**653**	627	0.90	835	690	1.14	1031	750	1.38	1233	805	1.64	1456	855	1.91	1691
2550	**557**	**0.71**	**684**	633	0.94	867	697	1.18	1064	756	1.42	1267	811	1.69	1499	861	1.96	1735
2600	**565**	**0.74**	**708**	639	0.97	891	703	1.22	1097	761	1.46	1301	816	1.74	1543	866	2.01	1779
2700	**581**	**0.81**	**763**	652	1.04	948	717	1.31	1173	773	1.55	1378	827	1.83	1621	878	2.12	1875
2800	597	0.89	827	665	1.12	1014	733	1.40	1250	786	1.66	1473	839	1.93	1709	889	2.23	1971
2900	613	0.97	891	679	1.20	1081	745	1.50	1335	799	1.76	1560	850	2.04	1805	900	2.34	2067
3000	629	1.06	965	694	1.29	1156	759	1.59	1413	812	1.88	1665	862	2.15	1901	911	2.46	2171
3100	646	1.15	1039	709	1.39	1241	772	1.70	1508	825	1.99	1761	875	2.28	2015	923	2.58	2275
3200	662	1.25	1123	724	1.50	1335	785	1.80	1595	840	2.11	1866	887	2.41	2128	934	2.71	2386
3300	679	1.35	1207	740	1.61	1430	798	1.91	1691	854	2.24	1980	900	2.54	2240	946	2.85	2504
3400	696	1.46	1301	756	1.73	1534	811	2.02	1788	868	2.37	2093	914	2.69	2369	959	3.00	2629
3500	712	1.57	1396	771	1.85	1639	824	2.14	1892	881	2.50	2206	928	2.84	2495	971	3.16	2759
3600	729	1.69	1499	787	1.98	1753	839	2.21	2006	894	2.64	2326	942	2.99	2620	984	3.22	2886
3700	746	1.85	1613	803	2.12	1875	854	2.42	2136	907	2.78	2445	956	3.15	2751	997	3.49	3017
3750	755	1.89	1674	811	2.20	1945	862	2.49	2197	914	2.85	2504	963	3.23	2815	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2250	884	1.97	1744	**937**	**2.33**	**2058**	947	2.66	2343	1022	3.10	2710
2300	885	2.00	1770	**939**	**2.36**	**2084**	979	2.69	2369	1025	3.12	2727
2400	892	2.08	1840	**944**	**2.40**	**2119**	987	2.76	2428	1039	3.20	2791
2500	902	2.18	1927	949	2.48	2188	1002	2.84	2495	1041	3.25	2831
2550	908	2.24	1980	953	2.53	2232	1003	2.87	2521	1045	3.28	2854
2600	913	2.29	2023	957	2.58	2275	1004	2.91	2554	1050	3.31	2878
2700	924	2.40	2120	967	2.70	2377	1010	3.01	2637	1056	3.37	2925
2800	935	2.52	2223	978	2.62	2479	1019	3.13	2735	1061	3.47	3002
2900	946	2.65	2335	989	2.96	2595	1030	3.27	2847	—	—	—
3000	957	2.78	2445	1000	3.09	2702	1040	3.41	2956	—	—	—
3100	968	2.91	2554	1011	3.24	2832	—	—	—	—	—	—
3200	980	3.04	2661	1022	3.38	2933	—	—	—	—	—	—
3300	991	3.18	2775	—	—	—	—	—	—	—	—	—
3400	1003	3.32	2886	—	—	—	—	—	—	—	—	—
3500	1014	3.48	3009	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

*Standard motor drive range: 590 to 840 rpm. Alternate motor drive range: 685 to 935 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 8.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 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,TM008 High-Static Motor — Vertical Discharge Units*

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
2250	**514**	**0.55**	**562**	**593**	**0.76**	**723**	**662**	**0.99**	**907**	**724**	**1.22**	**1097**	**781**	**1.48**	**1318**
2300	**521**	**0.57**	**577**	**600**	**0.79**	**747**	**668**	**1.02**	**932**	**730**	**1.26**	**1131**	**786**	**1.50**	**1335**
2400	**536**	**0.63**	**623**	**613**	**0.85**	**795**	**680**	**1.09**	**989**	**741**	**1.34**	**1199**	**796**	**1.59**	**1413**
2500	**551**	**0.69**	**669**	**626**	**0.93**	**859**	**693**	**1.17**	**1056**	**753**	**1.43**	**1275**	**808**	**1.69**	**1499**
2550	**559**	**0.72**	**692**	**634**	**0.97**	**891**	**700**	**1.21**	**1089**	**759**	**1.48**	**1318**	**814**	**1.74**	**1543**
2600	**567**	**0.75**	**716**	**641**	**1.00**	**916**	**706**	**1.25**	**1123**	**764**	**1.52**	**1353**	**819**	**1.79**	**1587**
2700	**582**	**0.83**	**779**	**655**	**1.08**	**981**	**719**	**1.34**	**1199**	**776**	**1.61**	**1430**	**831**	**1.89**	**1674**
2800	**598**	**0.90**	**835**	**670**	**1.17**	**1056**	**732**	**1.43**	**1275**	**789**	**1.71**	**1617**	**842**	**2.00**	**1770**
2900	**614**	**0.98**	**899**	**684**	**1.25**	**1123**	**745**	**1.53**	**1361**	**802**	**1.81**	**1604**	**854**	**2.11**	**1866**
3000	**630**	**1.07**	**973**	**699**	**1.35**	**1207**	**759**	**1.63**	**1147**	**815**	**1.92**	**1700**	866	2.23	1971
3100	**646**	**1.16**	**1047**	**714**	**1.45**	**1292**	**773**	**1.74**	**1543**	**828**	**2.04**	**1805**	878	2.35	2076
3200	**662**	**1.28**	**1131**	**729**	**1.55**	**1378**	**787**	**1.86**	**1648**	**841**	**2.16**	**1910**	891	2.48	2188
3300	**679**	**1.36**	**1216**	**744**	**1.66**	**1473**	**801**	**1.98**	**1753**	**854**	**2.29**	**2023**	904	2.61	2300
3400	**695**	**1.47**	**1310**	**759**	**1.78**	**1578**	**816**	**2.10**	**1868**	867	2.42	2136	917	2.75	2420
3500	**712**	**1.59**	**1413**	**774**	**1.90**	**1683**	**830**	**2.23**	**1971**	881	2.56	2257	930	2.90	2546
3600	**729**	**1.71**	**1617**	**790**	**2.03**	**1796**	**845**	**2.37**	**2093**	895	2.71	2386	943	3.05	2670
3700	**745**	**1.84**	**1630**	**805**	**2.17**	**1919**	**860**	**2.52**	**2223**	909	2.87	2521	956	3.22	2807
3750	**754**	**1.91**	**1691**	**813**	**2.24**	**1980**	868	2.59	2283	917	2.95	2587	963	3.30	2870

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
2250	**841**	**1.81**	**1604**	902	2.25	1989	939	2.60	2292	979	2.94	2589	1015	3.29	2892
2300	**843**	**1.83**	**1621**	905	2.28	2015	943	2.52	2309	983	2.96	2609	1020	3.31	2914
2400	**848**	**1.88**	**1665**	910	2.31	2041	952	2.74	2411	992	3.10	2729	1029	3.46	3048
2500	**859**	**1.96**	**1735**	912	2.31	2050	963	2.81	2470	1004	3.18	2798	1041	3.55	3126
2550	864	2.01	1779	915	2.34	2067	968	2.81	2479	1009	3.18	2798	1047	3.55	3126
2600	869	2.06	1823	918	2.37	2093	973	2.81	2487	1014	3.18	2798	1052	3.55	3126
2700	880	2.17	1919	927	2.47	2180	976	2.84	2495	1017	3.21	2828	1055	3.59	3159
2800	892	2.29	2023	938	2.58	2275	983	2.92	2562	1024	3.30	2908	1063	3.69	3248
2900	903	2.42	2136	949	2.71	2386	993	3.03	2653	1035	3.43	3017	1074	3.83	3370
3000	915	2.54	2240	961	2.85	2504	1003	3.17	2767	1045	3.59	3157	1084	4.01	3526
3100	926	2.67	2352	972	3.00	2629	1015	3.32	2886	1058	3.76	3306	1097	4.20	3693
3200	938	2.81	2470	983	3.14	2743	1026	3.47	3002	1069	3.93	3456	—	—	—
3300	950	2.95	2587	995	3.30	2870	1043	3.80	3341	—	—	—	—	—	—
3400	963	3.10	2710	1007	3.45	2987	1055	3.97	3493	—	—	—	—	—	—
3500	976	3.25	2831	1030	3.82	3362	—	—	—	—	—	—	—	—	—
3600	988	3.41	2956	1043	4.01	3528	—	—	—	—	—	—	—	—	—
3700	1019	3.90	3431	—	—	—	—	—	—	—	—	—	—	—	—
3750	1026	4.00	3517	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive range: 860 to 1080 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 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 3.7 and the maximum continuous watts are 3313. 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 8 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 11 — Fan Performance, 50TFF,TM009 Standard Motor — Vertical Discharge Units*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.2			0.4			0.6			0.8			1.0			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2550	**557**	**0.71**	**684**	**633**	**0.94**	**867**	697	1.18	1064	756	1.42	1267	811	1.69	1499	861	1.96	1735
2600	**565**	**0.74**	**708**	**639**	**0.97**	**891**	703	1.22	1097	761	1.46	1301	816	1.74	1543	866	2.01	1779
2700	**581**	**0.81**	**763**	**652**	**1.04**	**948**	717	1.31	1173	773	1.55	1378	827	1.83	1621	878	2.12	1875
2800	**597**	**0.89**	**827**	**665**	**1.12**	**1014**	733	1.40	1250	786	1.66	1473	839	1.93	1709	889	2.23	1971
2900	**613**	**0.97**	**891**	**679**	**1.20**	**1081**	745	1.50	1335	799	1.76	1560	850	2.04	1805	900	2.34	2067
3000	**629**	**1.06**	**965**	694	1.29	1156	759	1.59	1413	812	1.88	1665	862	2.15	1901	911	2.46	2171
3100	**646**	**1.15**	**1039**	709	1.39	1241	772	1.70	1508	825	1.99	1761	875	2.28	2015	923	2.58	2275
3200	**662**	**1.25**	**1123**	724	1.50	1335	785	1.80	1595	840	2.11	1866	887	2.41	2128	934	2.71	2386
3300	**679**	**1.35**	**1207**	740	1.61	1430	798	1.91	1691	854	2.24	1980	900	2.54	2240	946	2.85	2504
3400	696	1.46	1301	756	1.73	1534	811	2.02	1788	868	2.37	2093	914	2.69	2369	959	3.00	2629
3500	712	1.57	1396	771	1.85	1639	824	2.14	1892	881	2.50	2206	928	2.84	2495	971	3.16	2759
3600	729	1.69	1499	787	1.98	1753	839	2.27	2006	894	2.64	2326	942	2.99	2620	984	3.32	2886
3700	746	1.82	1613	803	2.12	1875	854	2.42	2136	907	2.78	2445	956	3.15	2751	997	3.49	3017
3750	755	1.89	1674	811	2.20	1945	862	2.49	2197	914	2.85	2504	963	3.23	2815	—	—	—
3800	763	1.95	1726	819	2.27	2006	869	2.56	2257	920	2.92	2562	970	3.31	2878	—	—	—
3900	780	2.09	1849	835	2.42	2136	884	2.72	2394	933	3.07	2686	983	3.48	3009	—	—	—
4000	796	2.23	1971	851	2.56	2257	900	2.89	2537	946	3.23	2815	—	—	—	—	—	—
4100	813	2.39	2110	867	2.74	2411	915	3.06	2678	960	3.40	2948	—	—	—	—	—	—
4200	830	2.55	2249	883	2.91	2554	931	3.24	2823	—	—	—	—	—	—	—	—	—
4250	839	2.63	2317	892	3.00	2629	939	3.34	2902	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
2550	908	2.24	1980	953	2.53	2232	1003	2.87	2521	1045	3.28	2854
2600	913	2.29	2023	957	2.58	2275	1004	2.91	2554	1050	3.31	2878
2700	924	2.40	2120	967	2.70	2377	1010	3.01	2637	1056	3.37	2925
2800	935	2.52	2223	978	2.62	2479	1019	3.13	2735	1061	3.41	3002
2900	946	2.65	2335	989	2.96	2595	1030	3.27	2847	—	—	—
3000	957	2.78	2445	1000	3.09	2702	1040	3.41	2956	—	—	—
3100	968	2.91	2554	1011	3.24	2832	—	—	—	—	—	—
3200	980	3.04	2661	1022	3.38	2933	—	—	—	—	—	—
3300	991	3.18	2775	—	—	—	—	—	—	—	—	—
3400	1003	3.52	2886	—	—	—	—	—	—	—	—	—
3500	1014	3.48	3009	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—
3750	—	—	—	—	—	—	—	—	—	—	—	—
3800	—	—	—	—	—	—	—	—	—	—	—	—
3900	—	—	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—
4100	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—
4250	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive range: 685 to 935 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 8.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative to verify.
6. Interpolation is permissible. Do not extrapolate.

Table 12 — Fan Performance, 50TFF,TM009 High-Static Motor — Vertical Discharge Units*

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
2550	**559**	**0.72**	**692**	**634**	**0.97**	**891**	**700**	**1.21**	**1089**	**759**	**1.48**	**1318**	**814**	**1.74**	**1543**
2600	**567**	**0.76**	**716**	**641**	**1.00**	**916**	**706**	**1.25**	**1123**	**764**	**1.52**	**1353**	**819**	**1.79**	**1587**
2700	**582**	**0.83**	**779**	**655**	**1.08**	**981**	**719**	**1.34**	**1199**	**776**	**1.61**	**1430**	**831**	**1.89**	**1674**
2800	**598**	**0.90**	**835**	**670**	**1.17**	**1056**	**732**	**1.43**	**1275**	**789**	**1.71**	**1517**	**842**	**2.00**	**1770**
2900	**614**	**0.98**	**899**	**684**	**1.25**	**1123**	**745**	**1.53**	**1361**	**802**	**1.81**	**1604**	**854**	**2.11**	**1866**
3000	**630**	**1.07**	**973**	**690**	**1.35**	**1207**	**759**	**1.63**	**1147**	**816**	**1.92**	**1700**	866	2.23	1971
3100	**646**	**1.16**	**1047**	**714**	**1.45**	**1292**	**773**	**1.74**	**1543**	**828**	**2.04**	**1805**	878	2.35	2076
3200	**662**	**1.26**	**1131**	**729**	**1.55**	**1378**	**787**	**1.86**	**1648**	**841**	**2.16**	**1910**	891	2.48	2188
3300	**679**	**1.36**	**1216**	**744**	**1.66**	**1473**	**801**	**1.98**	**1753**	**854**	**2.29**	**2023**	904	2.61	2300
3400	**695**	**1.47**	**1310**	**759**	**1.78**	**1578**	**816**	**2.10**	**1958**	867	2.42	2136	917	2.75	2420
3500	**712**	**1.59**	**1413**	**774**	**1.90**	**1683**	**830**	**2.23**	**1971**	881	2.56	2257	930	2.90	2546
3600	**729**	**1.71**	**1517**	**790**	**2.03**	**1796**	**845**	**2.37**	**2093**	895	2.71	2386	943	3.05	2670
3700	**745**	**1.84**	**1630**	**805**	**2.17**	**1919**	860	2.52	2223	909	2.87	2521	956	3.22	2807
3750	**754**	**1.91**	**1691**	**813**	**2.24**	**1980**	868	2.59	2283	917	2.95	2587	963	3.30	2870
3800	**762**	**1.98**	**1753**	**821**	**2.31**	**2041**	875	2.66	2343	924	3.03	2653	970	3.38	2933
3900	**779**	**2.12**	**1875**	**836**	**2.46**	**2171**	890	2.82	2479	938	3.19	2783	981	3.65	3209
4000	**796**	**2.27**	**2006**	**852**	**2.61**	**2300**	905	2.98	2612	953	3.37	2925	996	3.85	3390
4100	**813**	**2.42**	**2136**	868	2.78	2445	920	3.15	2751	974	3.74	3294	—	—	—
4200	**830**	**2.59**	**2283**	884	2.95	2587	935	3.33	2894	990	3.96	3482	—	—	—
4250	**839**	**2.68**	**2360**	890	3.04	2661	965	3.88	3412	—	—	—	—	—	—

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
2550	864	2.01	1779	915	2.34	2067	968	2.81	2479	991	3.02	2654	1012	3.21	2827
2600	869	2.06	1823	918	2.37	2093	973	2.81	2487	996	3.02	2654	1017	3.21	2827
2700	880	2.17	1919	927	2.47	2180	976	2.84	2495	999	3.05	2682	1021	3.25	2857
2800	892	2.29	2023	938	2.58	2275	983	2.92	2562	1006	3.13	2758	1028	3.34	2938
2900	903	2.42	2136	949	2.71	2386	993	3.03	2653	1017	3.25	2862	1038	3.46	3048
3000	915	2.54	2240	961	2.85	2504	1003	3.17	2767	1027	3.40	2994	1049	3.62	3189
3100	926	2.67	2352	972	3.00	2629	1016	3.32	2886	1040	3.56	3136	1062	3.80	3340
3200	938	2.81	2470	983	3.14	2743	1026	3.47	3002	1050	3.72	3277	1073	3.97	3491
3300	950	2.95	2587	995	3.30	2870	1022	3.58	3146	1046	3.84	3377	1069	4.09	3597
3400	963	3.10	2710	1007	3.45	2987	1034	3.74	3289	1059	4.01	3530	—	—	—
3500	976	3.25	2831	1007	3.56	3137	1034	3.85	3399	1058	4.15	3648	—	—	—
3600	988	3.41	2956	1019	3.74	3292	1047	4.05	3566	—	—	—	—	—	—
3700	992	3.59	3161	1023	3.94	3467	—	—	—	—	—	—	—	—	—
3750	999	3.68	3240	1030	4.04	3554	—	—	—	—	—	—	—	—	—
3800	1006	3.77	3318	1038	4.14	3640	—	—	—	—	—	—	—	—	—
3900	1017	4.07	3580	—	—	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive range: 860 to 1080 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 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 3.7 and the maximum continuous watts are 3313. 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 8 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 13 — Fan Performance, 50TFF,TM012 — Vertical Discharge Units*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.2			0.4			0.6			0.8			1.0			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	532	0.64	630	605	0.81	763	670	0.97	891	725	1.12	1014	778	1.28	1148	825	1.43	1275
3100	544	0.70	677	616	0.86	803	680	1.03	940	735	1.20	1081	787	1.36	1216	835	1.52	1353
3200	557	0.75	716	628	0.93	859	690	1.10	998	746	1.28	1148	796	1.44	1284	844	1.61	1430
3300	570	0.81	763	639	0.99	907	700	1.18	1064	757	1.36	1216	805	1.52	1353	854	1.70	1508
3400	583	0.88	818	651	1.06	965	711	1.25	1123	767	1.44	1284	815	1.61	1430	863	1.79	1587
3500	596	0.94	867	663	1.14	1031	721	1.33	1190	777	1.52	1353	826	1.71	1517	871	1.88	1665
3600	609	1.01	924	674	1.22	1097	732	1.42	1267	787	1.61	1430	836	1.80	1595	880	1.98	1753
3700	622	1.09	989	686	1.30	1165	744	1.50	1335	797	1.70	1508	847	1.91	1691	890	2.09	1849
3800	635	1.16	1047	698	1.39	1241	755	1.59	1413	808	1.80	1595	857	2.01	1779	901	2.20	1945
3900	649	1.25	1123	713	1.48	1318	767	1.68	1491	818	1.90	1683	867	2.11	1866	912	2.32	2050
4000	662	1.33	1190	722	1.57	1396	778	1.78	1578	829	2.01	1779	878	2.22	1962	922	2.44	2203
4100	675	1.42	1267	734	1.67	1482	790	1.89	1674	839	2.12	1875	888	2.33	2058	933	2.56	2309
4200	689	1.52	1353	746	1.77	1569	801	1.99	1761	851	2.23	1971	898	2.45	2212	943	2.69	2424
4300	702	1.61	1430	759	1.88	1665	813	2.11	1866	862	2.34	2067	908	2.58	2326	953	2.81	2533
4400	715	1.72	1526	772	1.99	1761	825	2.22	1962	873	2.46	2221	919	2.71	2442	**963**	**2.94**	**2651**
4500	729	1.83	1621	785	2.10	1858	837	2.35	2076	885	2.59	2335	929	2.85	2569	**973**	**3.08**	**2782**
4600	742	1.94	1718	797	2.22	1962	848	2.48	2238	896	2.72	2451	**940**	**2.98**	**2688**	**984**	**3.22**	**2914**
4700	756	2.06	1823	810	2.34	2067	860	2.61	2353	908	2.86	2578	**951**	**3.12**	**2727**	**994**	**3.38**	**3068**
4800	770	2.18	1927	823	2.46	2221	872	2.75	2505	**919**	**3.00**	**2707**	**963**	**3.27**	**2847**	**1003**	**3.43**	**3202**
4900	783	2.31	2041	836	2.60	2344	884	2.89	2605	**931**	**3.14**	**2838**	**974**	**3.41**	**2956**	**1013**	**3.59**	**3349**
5000	797	2.44	2203	849	2.73	2460	**897**	**3.04**	**2661**	**943**	**3.30**	**2870**	**984**	**3.44**	**3211**	**1023**	**3.75**	**3501**

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3000	874	1.60	1422	926	1.82	1613	974	2.11	1920	1012	2.41	2134
3100	880	1.68	1491	933	1.87	1656	983	2.16	1963	1017	2.44	2177
3200	888	1.77	1569	934	1.94	1718	988	2.18	1980	1025	2.47	2230
3300	897	1.86	1648	940	2.03	1853	989	2.24	2031	1032	2.53	2282
3400	907	1.97	1744	947	2.14	1946	991	2.32	2099	1038	2.57	2318
3500	916	2.07	1831	956	2.25	2039	997	2.43	2195	1043	2.64	2380
3600	926	2.18	1927	966	2.41	2134	1004	2.54	2291	1045	2.74	2478
3700	934	2.28	2015	976	2.48	2238	1013	2.66	2397	1051	2.85	2569
3800	943	2.41	2160	985	2.60	2334	1023	2.79	2514	**1059**	**2.98**	**2688**
3900	952	2.51	2265	994	2.72	2451	**1032**	**2.92**	**2633**	**1068**	**3.12**	**2819**
4000	962	2.63	2371	1003	2.84	2560	**1042**	**3.06**	**2763**	**1078**	**3.26**	**2952**
4100	973	2.77	2496	**1011**	**2.97**	**2679**	**1051**	**3.20**	**2895**	**1087**	**3.41**	**3097**
4200	**983**	**2.91**	**2624**	**1021**	**3.11**	**2810**	**1060**	**3.34**	**3029**	**1090**	**3.51**	**3276**
4300	**994**	**3.05**	**2754**	**1031**	**3.25**	**2943**	**1068**	**3.48**	**3166**	**1097**	**3.70**	**3453**
4400	**1004**	**3.19**	**2885**	**1042**	**3.41**	**3097**	**1080**	**3.63**	**3388**	**1105**	**3.91**	**3642**
4500	**1015**	**3.33**	**2020**	**1051**	**3.45**	**3218**	**1090**	**3.75**	**3493**	**1112**	**4.12**	**3843**
4600	**1025**	**3.48**	**3166**	**1060**	**3.61**	**3369**	**1100**	**3.92**	**3655**	**1119**	**4.35**	**4057**
4700	**1037**	**3.58**	**3335**	**1070**	**3.84**	**3325**	**1111**	**4.10**	**3822**	**1126**	**4.59**	**4284**
4800	**1048**	**3.75**	**3494**	**1080**	**3.95**	**3686**	**1121**	**4.28**	**3995**	**1133**	**4.85**	**4523**
4900	**1060**	**3.92**	**3659**	**1089**	**4.13**	**3854**	**1132**	**4.48**	**4174**	**1140**	**5.12**	**4775**
5000	**1072**	**4.11**	**3830**	**1099**	**4.32**	**4027**	**1144**	**4.67**	**4359**	—	—	—

LEGEND

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

*Standard motor drive range: 685 to 935 rpm. Alternate motor drive range: 835 to 1085 rpm. High-static motor drive range is 830 to 1130 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates high-static motor and drive are required.
2. Maximum usable watts input is 2120 with standard motor, 2615 with alternate motor, and 4400 for the high-static motor. Maximum continuous bhp is 2.40 with standard motor, 2.90 with alternate motor, and 5.25 for the high-static motor. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 8.
3. Values include losses for filters, unit casings, and wet coils. See Table 7 for accessory/FIOP static pressure 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,TM014 — Vertical Discharge Units*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)																	
	0.2			0.4			0.6			0.8			1.0			1.2		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	654	1.12	1065	714	1.31	1218	767	1.50	1373	815	1.67	1514	861	1.85	1666	906	2.08	1862
3800	668	1.20	1129	727	1.40	1291	780	1.60	1456	827	1.77	1598	873	1.95	1751	916	2.18	1948
3900	683	1.28	1194	741	1.49	1365	793	1.70	1540	839	1.88	1691	884	2.05	1836	927	2.28	2035
4000	697	1.37	1267	754	1.59	1448	806	1.80	1624	851	1.99	1785	895	2.16	1931	938	2.38	2123
4100	711	1.46	1340	767	1.69	1531	819	1.90	1708	864	2.10	1879	907	2.28	2035	949	2.49	2219
4200	726	1.56	1423	780	1.80	1624	832	2.01	1802	877	2.22	1983	919	2.41	2149	960	2.60	2316
4300	741	1.66	1506	794	1.91	1717	845	2.12	1897	889	2.35	2096	931	2.54	2263	971	2.72	2433
4400	755	1.77	1598	808	2.03	1819	858	2.24	2000	902	2.48	2210	943	2.68	2387	983	2.86	2548
4500	770	1.89	1700	821	2.15	1923	871	2.37	2114	915	2.61	2325	955	2.82	2512	995	3.01	2683
4600	784	2.00	1794	835	2.27	2027	884	2.49	2219	928	2.75	2450	968	2.96	2638	1006	3.17	2828
4700	799	2.13	1905	849	2.40	2140	897	2.63	2343	941	2.88	2566	981	3.11	2773	1018	3.32	2964
4800	814	2.25	2009	863	2.53	2254	910	2.77	2468	954	3.02	2692	993	3.27	2919	1030	3.48	3111
4900	829	2.39	2131	877	2.67	2378	923	2.92	2602	967	3.17	2828	1006	3.43	3065	1043	3.65	3267
5000	843	2.52	2246	892	2.81	2503	937	3.08	2746	980	3.32	2964	1019	3.60	3221	**1055**	**3.82**	**3424**
5100	858	2.67	2378	906	2.95	2629	950	3.24	2891	993	3.48	3111	**1032**	**3.76**	**3368**	**1068**	**4.00**	**3590**
5200	873	2.82	2512	920	3.10	2764	963	3.40	3037	1006	3.65	3267	**1045**	**3.93**	**3525**	**1081**	**4.19**	**3767**
5300	888	2.97	2647	934	3.26	2910	977	3.57	3193	**1019**	**3.82**	**3424**	**1058**	**4.11**	**3692**	**1094**	**4.38**	**3943**
5400	903	3.13	2792	949	3.43	3065	**991**	**3.75**	**3359**	**1032**	**4.00**	**3590**	**1071**	**4.29**	**3860**	**1106**	**4.57**	**4120**
5500	918	3.30	2946	963	3.59	3212	**1004**	**3.92**	**3516**	**1045**	**4.18**	**3757**	**1084**	**4.47**	**4027**	**1119**	**4.77**	**4307**
5600	933	3.47	3101	**978**	**3.77**	**3377**	**1018**	**4.11**	**3692**	**1058**	**4.38**	**3943**	**1097**	**4.66**	**4204**	**1132**	**4.97**	**4493**
5700	948	3.65	3267	**992**	**3.95**	**3544**	**1032**	**4.30**	**3869**	**1072**	**4.58**	**4130**	**1110**	**4.86**	**4391**	**1145**	**5.18**	**4689**
5800	**963**	**3.83**	**3433**	**1006**	**4.14**	**3720**	**1046**	**4.50**	**4055**	**1085**	**4.79**	**4326**	**1123**	**5.07**	**4586**	—	—	—
5900	**978**	**4.00**	**3590**	**1021**	**4.34**	**3906**	**1060**	**4.69**	**4232**	**1098**	**5.01**	**4531**	—	—	—	—	—	—
6000	**993**	**4.22**	**3795**	**1035**	**4.54**	**4093**	**1074**	**4.91**	**4419**	**1112**	**5.23**	**4735**	—	—	—	—	—	—
6100	**1008**	**4.42**	**3981**	**1050**	**4.75**	**4288**	**1089**	**5.10**	**4616**	—	—	—	—	—	—	—	—	—
6200	**1023**	**4.63**	**4176**	**1065**	**4.96**	**4484**	—	—	—	—	—	—	—	—	—	—	—	—
6300	**1038**	**4.85**	**4382**	**1079**	**5.19**	**4698**	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
3700	950	2.27	2027	991	2.47	2202	1030	2.65	2361	1064	2.82	2512
3800	959	2.38	2123	1001	2.58	2299	1040	2.78	2476	1075	2.96	2638
3900	969	2.50	2228	1010	2.70	2405	1049	2.91	2593	1085	3.11	2773
4000	979	2.62	2334	1020	2.83	2521	1059	3.04	2710	1095	3.25	2901
4100	989	2.74	2441	1029	2.96	2638	1068	3.18	2837	1105	3.39	3028
4200	1000	2.86	2548	1039	3.10	2764	1077	3.31	2955	1114	3.54	3166
4300	1011	2.97	2647	1049	3.23	2882	1087	3.46	3092	1124	3.69	3304
4400	1022	3.10	2764	1059	3.37	3010	1097	3.61	3230	**1133**	**3.84**	**3442**
4500	1033	3.23	2882	1070	3.51	3138	**1107**	**3.76**	**3368**	**1143**	**4.00**	**3590**
4600	1044	3.37	3010	1081	3.64	3258	**1117**	**3.92**	**3516**	**1152**	**4.17**	**3748**
4700	1056	3.52	3147	**1092**	**3.78**	**3387**	**1127**	**4.07**	**3655**	**1162**	**4.33**	**3897**
4800	1057	3.69	3304	**1103**	**3.93**	**3525**	**1138**	**4.23**	**3804**	**1172**	**4.50**	**4055**
4900	**1079**	**3.87**	**3470**	**1114**	**4.09**	**3674**	**1149**	**4.37**	**3934**	**1182**	**4.68**	**4223**
5000	**1091**	**4.05**	**3637**	**1126**	**4.25**	**3822**	**1160**	**4.53**	**4083**	**1193**	**4.85**	**4382**
5100	**1103**	**4.23**	**3804**	**1137**	**4.45**	**4009**	**1171**	**4.70**	**4242**	**1204**	**5.01**	**4531**
5200	**1115**	**4.42**	**3981**	**1149**	**4.65**	**4195**	**1182**	**4.91**	**4409**	**1215**	**5.18**	**4689**
5300	**1127**	**4.62**	**4167**	**1161**	**4.85**	**4382**	**1194**	**5.07**	**4586**	—	—	—
5400	**1139**	**4.82**	**4354**	**1173**	**5.06**	**4577**	—	—	—	—	—	—
5500	**1152**	**5.03**	**4549**	—	—	—	—	—	—	—	—	—
5600	**1165**	**5.24**	**4746**	—	—	—	—	—	—	—	—	—
5700	—	—	—	—	—	—	—	—	—	—	—	—
5800	—	—	—	—	—	—	—	—	—	—	—	—
5900	—	—	—	—	—	—	—	—	—	—	—	—
6000	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

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

NOTES:
1. **Boldface** indicates alternate motor and drive are required.
2. Maximum usable watts input is 3313 with standard motor and 4400 with alternate motor. Maximum continuous bhp is 3.70 with standard motor and 5.25 with alternate motor. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Table 8.
3. Values include losses for filters, unit casings, and wet coils. See Table 7 for accessory/FIOP static pressure 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 15 — Fan Performance, 50TFF,TM008 Standard Motor and Drive and Alternate Drive — Horizontal Discharge Units*

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
2250	**465**	**0.43**	**473**	**554**	**0.64**	**630**	630	0.86	803	695	1.09	989	757	1.34	1199
2300	**471**	**0.45**	**487**	**559**	**0.66**	**646**	635	0.89	827	699	1.12	1014	760	1.37	1224
2400	**482**	**0.50**	**524**	**569**	**0.71**	**684**	645	0.95	875	708	1.18	1064	768	1.44	1284
2500	**494**	**0.54**	**554**	**581**	**0.76**	**723**	654	1.01	924	717	1.25	1123	776	1.51	1344
2550	**501**	**0.57**	**577**	**587**	**0.79**	**747**	659	1.05	956	722	1.29	1156	780	1.55	1378
2660	**507**	**0.59**	**592**	592	0.82	771	663	1.08	981	727	1.32	1182	784	1.58	1404
2700	**520**	**0.65**	**638**	604	0.89	827	672	1.14	1031	737	1.40	1250	793	1.66	1473
2800	**533**	**0.71**	**684**	615	0.95	875	683	1.20	1081	747	1.49	1327	802	1.75	1552
2900	**546**	**0.77**	**731**	626	1.02	932	693	1.27	1140	756	1.57	1396	813	1.84	1630
3000	**559**	**0.83**	**779**	637	1.09	989	704	1.35	1207	765	1.66	1473	823	1.94	1718
3100	**572**	**0.90**	**835**	648	1.17	1056	715	1.43	1275	775	1.74	1543	832	2.05	1814
3200	**585**	**0.96**	**883**	660	1.24	1114	727	1.52	1353	785	1.83	1321	841	2.15	1901
3300	598	1.03	940	671	1.32	1182	739	1.62	1439	795	1.91	1691	851	2.26	1997
3400	610	1.10	998	682	1.41	1258	750	1.72	1526	806	2.01	1779	860	2.36	2084
3500	623	1.17	1056	694	1.50	1335	761	1.82	1613	817	2.11	1866	870	2.47	2180
3600	636	1.25	1123	707	1.60	1422	772	1.93	1709	828	2.23	1971	880	2.57	2266
3700	649	1.33	1190	720	1.71	1517	783	2.03	1796	840	2.35	2076	890	2.69	2369
3750	655	1.37	1224	727	1.77	1569	789	2.09	1849	846	2.42	2136	896	2.75	2420

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
2250	810	1.62	1439	850	1.91	1691	873	2.20	1945	883	2.50	2206	895	2.78	2445
2300	816	1.65	1465	859	1.94	1718	888	2.24	1980	903	2.55	2249	911	2.85	2504
2400	824	1.72	1526	872	2.01	1779	909	2.32	2050	931	2.64	2326	935	2.96	2595
2500	832	1.79	1587	882	2.09	1849	925	2.40	2119	955	2.72	2394	972	3.06	2678
2550	836	1.83	1621	887	2.13	1884	931	2.45	2162	964	2.77	2436	986	3.11	2718
2660	839	1.87	1656	891	2.17	1919	936	2.49	2197	973	2.82	2479	999	3.16	2759
2700	846	1.95	1726	898	2.26	1997	946	2.58	2275	987	2.91	2554	1019	3.26	2839
2800	855	2.04	1805	906	2.35	2076	954	2.67	2352	997	3.01	2637	1034	3.36	2917
2900	863	2.13	1884	913	2.44	2154	961	2.77	2436	1006	3.12	2727	—	—	—
3000	872	2.22	1962	921	2.54	2240	969	2.88	2529	1014	3.22	2807	—	—	—
3100	882	2.33	2058	930	2.65	2335	976	2.99	2620	1021	3.34	2902	—	—	—
3200	892	2.45	2162	939	2.76	2428	984	3.10	2710	—	—	—	—	—	—
3300	902	2.57	2266	948	2.88	2529	993	3.21	2799	—	—	—	—	—	—
3400	912	2.69	2369	958	3.01	2637	1002	3.34	2902	—	—	—	—	—	—
3500	921	2.82	2479	968	3.15	2751	—	—	—	—	—	—	—	—	—
3600	930	2.95	2587	978	3.29	2862	—	—	—	—	—	—	—	—	—
3700	940	3.07	2686	—	—	—	—	—	—	—	—	—	—	—	—
3750	945	3.14	2743	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive range: 590 to 840 rpm. Alternate motor drive range: 685 to 935 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates high-static 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 8.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 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,TM008 High-Static Motor — Horizontal Discharge Units*

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
2250	**507**	**0.53**	**547**	**586**	**0.73**	**700**	**658**	**0.97**	**891**	**722**	**1.22**	**1097**	**783**	**1.46**	**1301**
2300	**513**	**0.55**	**562**	**592**	**0.76**	**723**	**663**	**1.00**	**916**	**727**	**1.26**	**1131**	**786**	**1.49**	**1327**
2400	**528**	**0.60**	**600**	**606**	**0.83**	**779**	**674**	**1.06**	**965**	**738**	**1.34**	**1199**	**795**	**1.58**	**1404**
2500	**542**	**0.68**	**648**	**619**	**0.90**	**835**	**686**	**1.13**	**1022**	**748**	**1.41**	**1258**	**806**	**1.68**	**1491**
2550	**550**	**0.69**	**669**	**627**	**0.94**	**867**	**692**	**1.17**	**1056**	**754**	**1.45**	**1292**	**812**	**1.74**	**1543**
2660	**557**	**0.72**	**692**	**634**	**0.97**	**891**	**698**	**1.21**	**1089**	**759**	**1.49**	**1327**	**816**	**1.79**	**1587**
2700	**573**	**0.79**	**747**	**648**	**1.05**	**956**	**711**	**1.29**	**1156**	**770**	**1.58**	**1404**	**827**	**1.88**	**1665**
2800	**588**	**0.86**	**803**	**662**	**1.13**	**1022**	**723**	**1.38**	**1233**	**782**	**1.66**	**1473**	**837**	**1.98**	**1763**
2900	**604**	**0.94**	**867**	**676**	**1.21**	**1089**	**737**	**1.48**	**1318**	**794**	**1.76**	**1560**	**849**	**2.08**	**1840**
3000	**620**	**1.02**	**932**	**690**	**1.30**	**1165**	**750**	**1.58**	**1404**	**806**	**1.86**	**1648**	**849**	**2.18**	**1927**
3100	**636**	**1.11**	**1006**	**704**	**1.39**	**1241**	**764**	**1.69**	**1499**	**818**	**1.97**	**1744**	870	2.29	2023
3200	**652**	**1.21**	**1089**	**718**	**1.49**	**1327**	**778**	**1.90**	**1595**	**831**	**2.09**	**1849**	882	2.40	2119
3300	**668**	**1.31**	**1173**	**732**	**1.59**	**1413**	**793**	**1.92**	**1700**	**844**	**2.21**	**1954**	894	2.53	2232
3400	**684**	**1.41**	**1258**	**747**	**1.70**	**1508**	**807**	**2.04**	**1805**	**857**	**2.35**	**2076**	907	2.66	2343
3500	**701**	**1.53**	**1361**	**762**	**1.82**	**1613**	**821**	**2.16**	**1010**	871	2.48	2188	919	2.80	2462
3600	**717**	**1.65**	**1465**	**777**	**1.94**	**1718**	**835**	**2.29**	**2023**	885	2.63	2317	932	2.95	2587
3700	**733**	**1.77**	**1569**	**792**	**2.07**	**1831**	**849**	**2.42**	**2136**	899	2.78	2445	945	3.11	2718
3750	**742**	**1.84**	**1630**	**800**	**2.14**	**1892**	**856**	**2.49**	**2197**	907	2.86	2512	952	3.20	2719

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
2250	**843**	**1.81**	**1604**	908	2.25	1989	955	2.59	2283	991	2.89	2543	1023	3.19	2805
2300	**846**	**1.84**	**1630**	910	2.25	2015	959	2.61	2300	995	2.91	2563	1028	3.21	2827
2400	**853**	**1.88**	**1665**	912	2.31	2041	967	2.68	2360	1003	2.99	2631	1036	3.30	2902
2500	**859**	**1.94**	**1718**	919	2.37	2093	971	2.73	2403	1007	3.05	2681	1041	3.36	2956
2550	864	1.99	1761	920	2.39	2110	974	2.76	2428	1010	3.08	2710	1044	3.40	2989
2660	868	2.04	1805	921	2.41	2136	976	2.78	2445	1012	3.10	2730	1046	3.42	3011
2700	878	2.16	1910	928	2.45	2162	983	2.88	2529	1020	3.21	2828	1053	3.54	3119
2800	889	2.29	2023	937	2.57	2266	986	2.91	2554	1023	3.25	2857	1057	3.58	3181
2900	900	2.41	2128	947	2.70	2377	993	3.01	2637	1030	3.36	2955	1064	3.70	3260
3000	910	2.52	2223	958	2.85	2504	1002	3.15	2751	1039	3.51	3093	1074	3.88	3411
3100	920	2.64	2326	968	2.99	2620	1012	3.30	2870	1050	3.68	3240	1084	4.06	3574
3200	931	2.76	2428	979	3.13	2735	1023	3.47	3002	1061	3.87	3407	—	—	—
3300	942	2.89	2537	989	3.26	2839	1034	3.63	3121	1072	4.05	3564	—	—	—
3400	954	3.02	2645	1000	3.40	2948	1044	3.79	3237	—	—	—	—	—	—
3500	966	3.15	2751	1011	3.55	3062	1054	3.94	3340	—	—	—	—	—	—
3600	978	3.30	2870	1022	3.69	3165	1065	4.10	3445	—	—	—	—	—	—
3700	990	3.45	2987	1034	3.84	3272	—	—	—	—	—	—	—	—	—
3750	997	3.54	3055	1040	3.93	3333	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive range: 860 to 1080 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 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 3.7 and the maximum continuous watts are 3313. 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 8 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,TM009 Standard Motor — Horizontal Discharge Units*

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
2550	**501**	**0.57**	**577**	**587**	**0.79**	**747**	**659**	**1.05**	**956**	722	1.29	1156	780	1.55	1378
2660	**507**	**0.59**	**592**	**592**	**0.82**	**771**	**663**	**1.08**	**981**	727	1.32	1182	784	1.58	1404
2700	**520**	**0.65**	**638**	**604**	**0.89**	**827**	**672**	**1.14**	**1031**	737	1.40	1250	793	1.66	1473
2800	**533**	**0.71**	**684**	**615**	**0.95**	**875**	**683**	**1.20**	**1081**	747	1.49	1327	802	1.75	1552
2900	**546**	**0.77**	**731**	**626**	**1.02**	**932**	693	1.27	1140	756	1.57	1396	813	1.84	1630
3000	**559**	**0.83**	**779**	**637**	**1.09**	**989**	704	1.35	1207	765	1.66	1473	823	1.94	1718
3100	**572**	**0.90**	**835**	**648**	**1.17**	**1056**	715	1.43	1275	775	1.74	1543	832	2.05	1814
3200	**585**	**0.96**	**883**	**660**	**1.24**	**1114**	727	1.52	1353	785	1.83	1321	841	2.15	1901
3300	**598**	**1.03**	**940**	**671**	**1.32**	**1182**	739	1.62	1439	795	1.91	1691	851	2.26	1997
3400	**610**	**1.10**	**998**	**682**	**1.41**	**1258**	750	1.72	1526	806	2.01	1779	860	2.36	2084
3500	**623**	**1.17**	**1056**	694	1.50	1335	761	1.82	1613	817	2.11	1866	870	2.47	2180
3600	**636**	**1.25**	**1123**	707	1.60	1422	772	1.93	1709	828	2.23	1971	880	2.57	2266
3700	**649**	**1.33**	**1190**	720	1.71	1517	783	2.03	1796	840	2.35	2076	890	2.69	2369
3750	**655**	**1.37**	**1224**	727	1.77	1569	789	2.09	1849	846	2.42	2136	896	2.75	2420
3800	**661**	**1.41**	**1258**	733	1.82	1613	795	2.15	1901	852	2.48	2188	901	2.80	2462
3900	**674**	**1.49**	**1327**	746	1.93	1709	806	2.26	1997	863	2.61	2300	912	2.93	2571
4000	687	1.57	1396	759	2.05	1814	817	2.38	2102	874	2.75	2420	923	3.08	2694
4100	699	1.60	1473	772	2.17	1919	828	2.50	2206	885	2.88	2529	935	3.23	2815
4200	712	1.75	1552	785	2.30	2032	840	2.64	2326	897	3.03	2653	947	3.39	2940
4250	719	1.80	1595	792	2.37	2093	846	2.71	2386	903	3.10	2710	—	—	—

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
2550	836	1.83	1621	887	2.13	1884	931	2.45	2162	964	2.77	2436	986	3.11	2718
2660	839	1.87	1656	891	2.17	1919	936	2.49	2197	973	2.82	2479	999	3.16	2759
2700	846	1.95	1726	898	2.26	1997	946	2.58	2275	987	2.91	2554	1019	3.26	2839
2800	855	2.04	1805	906	2.35	2076	954	2.67	2352	997	3.01	2637	1034	3.36	2917
2900	863	2.13	1884	913	2.44	2154	961	2.77	2436	1006	3.12	2727	—	—	—
3000	872	2.22	1962	921	2.54	2240	969	2.88	2529	1014	3.22	2807	—	—	—
3100	882	2.33	2058	930	2.65	2335	976	2.99	2620	1021	3.34	2902	—	—	—
3200	892	2.45	2162	939	2.76	2428	984	3.10	2710	—	—	—	—	—	—
3300	902	2.57	2266	948	2.88	2529	993	3.21	2799	—	—	—	—	—	—
3400	912	2.69	2369	958	3.01	2637	1002	3.34	2902	—	—	—	—	—	—
3500	921	2.82	2479	968	3.15	2751	—	—	—	—	—	—	—	—	—
3600	930	2.95	2587	978	3.29	2862	—	—	—	—	—	—	—	—	—
3700	940	3.07	2686	—	—	—	—	—	—	—	—	—	—	—	—
3750	945	3.14	2743	—	—	—	—	—	—	—	—	—	—	—	—
3800	949	3.20	2781	—	—	—	—	—	—	—	—	—	—	—	—
3900	959	3.33	2894	—	—	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive range: 685 to 935 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 8.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 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,TM009 High-Static Motor — Horizontal Discharge Units*

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
2550	**550**	**0.69**	**669**	**627**	**0.94**	**867**	**692**	**1.17**	**1056**	**754**	**1.45**	**1292**	**812**	**1.74**	**1543**
2660	**557**	**0.72**	**692**	**634**	**0.97**	**891**	**698**	**1.21**	**1089**	**759**	**1.49**	**1327**	**816**	**1.79**	**1587**
2700	**573**	**0.79**	**747**	**648**	**1.05**	**956**	**711**	**1.29**	**1156**	**770**	**1.58**	**1404**	**827**	**1.88**	**1665**
2800	**588**	**0.86**	**803**	**662**	**1.13**	**1022**	**723**	**1.38**	**1233**	**782**	**1.66**	**1473**	**837**	**1.98**	**1753**
2900	**604**	**0.94**	**867**	**676**	**1.21**	**1089**	**737**	**1.48**	**1318**	**794**	**1.76**	**1560**	**848**	**2.08**	**1840**
3000	**620**	**1.02**	**932**	**690**	**1.30**	**1165**	**750**	**1.58**	**1404**	**806**	**1.86**	**1648**	**849**	**2.18**	**1927**
3100	**636**	**1.11**	**1006**	**704**	**1.39**	**1241**	**764**	**1.69**	**1499**	**818**	**1.97**	**1744**	870	2.29	2023
3200	**652**	**1.21**	**1089**	**718**	**1.49**	**1327**	**778**	**1.80**	**1595**	**831**	**2.09**	**1849**	882	2.40	2119
3300	**668**	**1.31**	**1173**	**732**	**1.59**	**1413**	**793**	**1.92**	**1700**	**844**	**2.21**	**1954**	894	2.53	2232
3400	**684**	**1.41**	**1258**	**747**	**1.70**	**1508**	**807**	**2.04**	**1805**	**857**	**2.35**	**2076**	907	2.66	2343
3500	**701**	**1.53**	**1361**	**762**	**1.82**	**1613**	**821**	**2.16**	**1910**	871	2.48	2188	919	2.80	2462
3600	**717**	**1.65**	**1465**	**777**	**1.94**	**1718**	**835**	**2.29**	**2023**	885	2.63	2317	932	2.95	2587
3700	**733**	**1.77**	**1569**	**792**	**2.07**	**1831**	**849**	**2.42**	**2136**	899	2.78	2445	945	3.11	2718
3750	**742**	**1.84**	**1630**	**800**	**2.14**	**1892**	**856**	**2.49**	**2197**	907	2.86	2512	952	3.20	2719
3800	**750**	**1.90**	**1683**	**807**	**2.21**	**1954**	863	2.56	2257	914	2.93	2571	958	3.28	2854
3900	**767**	**2.04**	**1805**	**822**	**2.35**	**2076**	877	2.71	2386	928	3.09	2702	972	3.45	2987
4000	**783**	**2.18**	**1927**	**838**	**2.50**	**2206**	891	2.86	2512	942	3.26	2839	986	3.63	3121
4100	**800**	**2.34**	**2067**	**854**	**2.66**	**2343**	905	3.02	2645	956	3.43	2971	1000	3.81	3251
4200	**817**	**2.49**	**2197**	869	2.82	2479	920	3.19	2783	970	3.60	3099	1015	4.00	3380
4250	**826**	**2.58**	**2275**	877	2.91	2554	928	3.28	2854	977	3.69	3165	1022	4.10	3445

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
2550	864	1.99	1761	920	2.39	2110	974	2.76	2428	1005	3.04	2672	1034	3.31	2910
2660	868	2.04	1805	921	2.41	2136	976	2.78	2445	1008	3.06	2691	1037	3.33	2931
2700	878	2.16	1910	928	2.45	2162	983	2.88	2529	1015	3.17	2788	1044	3.45	3036
2800	889	2.29	2023	937	2.57	2266	986	2.91	2554	1018	3.20	2817	1047	3.49	3068
2900	900	2.41	2128	947	2.70	2377	993	3.01	2637	1025	3.31	2914	1055	3.61	3174
3000	910	2.52	2223	958	2.85	2504	1002	3.15	2751	1034	3.47	3049	1064	3.77	3321
3100	920	2.64	2326	968	2.99	2620	1012	3.30	2870	1045	3.63	3195	1075	3.95	3479
3200	931	2.76	2428	979	3.13	2735	1023	3.47	3002	1056	3.82	3359	1087	4.16	3659
3300	942	2.89	2537	989	3.26	2839	1034	3.63	3121	1067	3.99	3514	—	—	—
3400	954	3.02	2645	1000	3.40	2948	1044	3.79	3237	1078	4.17	3669	—	—	—
3500	966	3.15	2751	1011	3.55	3062	1054	3.94	3340	—	—	—	—	—	—
3600	978	3.30	2870	1022	3.69	3165	1065	4.10	3445	—	—	—	—	—	—
3700	990	3.45	2987	1034	3.84	3272	—	—	—	—	—	—	—	—	—
3750	997	3.54	3055	1040	3.93	3333	—	—	—	—	—	—	—	—	—
3800	1003	3.62	3114	1045	4.01	3387	—	—	—	—	—	—	—	—	—
3900	1015	3.80	3244	1057	4.18	3495	—	—	—	—	—	—	—	—	—
4000	1028	3.99	3373	—	—	—	—	—	—	—	—	—	—	—	—
4100	1042	4.18	3495	—	—	—	—	—	—	—	—	—	—	—	—
4200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

*Motor drive range: 860 to 1080 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 for accessory/FIOP static pressure information.
4. Maximum continuous bhp is 3.7 and the maximum continuous watts are 3313. 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 8 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,TM012 — Horizontal Discharge Units*

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
3000	**484**	**0.55**	**562**	**560**	**0.70**	**677**	**631**	**0.87**	**810**	690	1.03	940	747	1.20	1081
3100	**495**	**0.61**	**607**	**570**	**0.76**	**723**	**638**	**0.92**	**851**	699	1.10	998	755	1.27	1140
3200	**505**	**0.66**	**646**	**579**	**0.81**	**763**	**646**	**0.98**	**899**	708	1.16	1047	761	1.34	1199
3300	**516**	**0.72**	**692**	**589**	**0.87**	**810**	**655**	**1.05**	**956**	717	1.23	1106	767	1.40	1250
3400	**527**	**0.78**	**739**	**599**	**0.93**	**859**	**664**	**1.11**	**1006**	724	1.30	1165	775	1.48	1318
3500	**537**	**0.85**	**795**	**609**	**0.99**	**907**	**672**	**1.18**	**1064**	731	1.36	1216	784	1.56	1387
3600	**548**	**0.92**	**851**	**619**	**1.05**	**956**	**680**	**1.24**	**1114**	738	1.43	1275	794	1.64	1456
3700	**560**	**1.00**	**916**	**629**	**1.12**	**1014**	688	1.31	1173	747	1.51	1344	802	1.73	1534
3800	**571**	**1.08**	**981**	**639**	**1.19**	**1072**	698	1.39	1241	756	1.60	1422	810	1.81	1604
3900	**582**	**1.16**	**1047**	**649**	**1.27**	**1140**	708	1.47	1310	764	1.69	1499	816	1.89	1674
4000	**593**	**1.25**	**1123**	**659**	**1.35**	**1207**	717	1.56	1387	773	1.78	1578	823	1.98	1753
4100	**605**	**1.35**	**1207**	**670**	**1.44**	**1284**	727	1.65	1465	781	1.86	1648	832	2.08	1840
4200	**616**	**1.45**	**1292**	**680**	**1.53**	**1361**	737	1.74	1543	789	1.95	1726	841	2.18	1927
4300	**628**	**1.56**	**1387**	690	1.63	1447	747	1.83	1621	798	2.05	1814	849	2.30	2032
4400	**639**	**1.67**	**1482**	701	1.73	1534	757	1.92	1700	807	2.16	1910	858	2.41	2177
4500	**651**	**1.78**	**1578**	712	1.84	1630	767	2.02	1788	817	2.27	2006	866	2.51	2265
4600	**662**	**1.91**	**1691**	722	1.95	1726	777	2.13	1884	827	2.38	2102	874	2.62	2362
4700	**674**	**2.03**	**1796**	733	2.07	1831	787	2.24	1980	836	2.50	2256	882	2.73	2460
4800	686	2.17	1919	744	2.20	1945	797	2.36	2084	846	2.62	2362	891	2.85	2569
4900	698	2.31	2041	755	2.33	2058	808	2.48	2238	856	2.73	2460	900	2.99	2698
5000	710	2.45	2212	766	2.47	2230	818	2.61	2353	866	2.86	2578	910	3.12	2819

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
3000	800	1.38	1233	850	1.52	1353	879	1.38	1233	925	1.81	1604	964	1.92	1761
3100	805	1.44	1284	857	1.63	1447	896	1.66	1473	935	1.93	1709	975	1.98	1811
3200	812	1.51	1344	862	1.71	1517	908	1.85	1639	944	2.01	1836	984	2.09	1903
3300	819	1.59	1413	867	1.78	1578	915	1.98	1753	952	2.11	1920	993	2.22	2014
3400	827	1.67	1482	873	1.85	1639	920	2.07	1831	963	2.21	2005	1001	2.31	2091
3500	833	1.75	1552	880	1.94	1718	926	2.15	1901	970	2.41	2134	1007	2.46	2221
3600	840	1.83	1621	888	2.04	1805	931	2.23	1971	976	2.47	2230	1017	2.62	2362
3700	847	1.92	1700	895	2.13	1884	938	2.33	2108	981	2.56	2309	1024	2.77	2496
3800	856	2.02	1788	901	2.23	1971	945	2.44	2203	986	2.65	2389	1029	2.89	2605
3900	865	2.12	1875	908	2.32	2050	953	2.55	2300	993	2.75	2478	1034	3.00	2707
4000	875	2.22	1962	915	2.42	2186	960	2.65	2389	1000	2.87	2587	1039	3.10	2800
4100	883	2.32	2050	924	2.54	2291	966	2.76	2487	1008	2.99	2698	1046	3.21	2904
4200	889	2.41	2177	934	2.65	2389	972	2.87	2587	1015	3.12	2819	1053	3.34	3029
4300	896	2.51	2265	943	2.77	2406	980	2.99	2698	1021	3.23	2923	1061	3.48	3166
4400	903	2.62	2362	951	2.89	2603	990	3.12	2819	1028	3.36	3049	1068	3.61	3241
4500	912	2.74	2469	958	3.00	2707	999	3.26	2982	1035	3.51	3161	1074	3.74	3346
4600	921	2.87	2587	965	3.11	2810	1008	3.39	3078	1041	3.68	3295	1081	3.90	3450
4700	930	3.00	2707	972	3.23	2923	1017	3.45	3224	1048	3.80	3436	1088	4.13	3552
4800	938	3.14	2838	980	3.37	3058	1025	3.55	3362	1055	3.85	3584	1095	4.30	3653
4900	946	3.27	2962	990	3.51	3149	1034	3.71	3505	1062	3.98	3741	1101	4.45	3753
5000	954	3.39	3078	998	3.62	3271	1042	3.85	3654	1068	4.08	3907	1108	4.59	3851

LEGEND

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

*Standard motor drive range: 685 to 935 rpm. Alternate motor drive range: 835 to 1085 rpm. High static motor drive range: 830 to 1130 rpm. All other rpms require field-supplied drive.

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates high-static motor and drive are required.
3. Maximum usable watts input is 2120 with standard motor, 2615 with alternate motor, and 4400 for the high-static motor. Maximum continuous bhp is 2.40 with standard motor, 2.90 with a alternate motor, and 5.25 for the high-static motor. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details. For additional information on motor performance, refer to Table 8.
6. Interpolation is permissible. Do not extrapolate.

Table 20 — Fan Performance, 50TFF,TM014 — Horizontal Discharge Units*

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
3700	**607**	**0.97**	**947**	**670**	**1.18**	**1113**	**732**	**1.37**	**1267**	**782**	**1.56**	**1423**	**833**	**1.73**	**1565**
3800	**621**	**1.05**	**1010**	**681**	**1.25**	**1170**	**742**	**1.45**	**1332**	**795**	**1.66**	**1506**	**842**	**1.82**	**1641**
3900	**636**	**1.13**	**1073**	**693**	**1.32**	**1226**	**751**	**1.53**	**1398**	**808**	**1.76**	**1590**	**851**	**1.92**	**1725**
4000	**650**	**1.21**	**1137**	**705**	**1.40**	**1291**	**761**	**1.61**	**1464**	**819**	**1.86**	**1674**	861	2.02	1811
4100	**665**	**1.30**	**1210**	**717**	**1.48**	**1357**	**772**	**1.71**	**1548**	**830**	**1.96**	**1759**	871	2.13	1905
4200	**680**	**1.39**	**1283**	**728**	**1.57**	**1431**	**783**	**1.81**	**1632**	**839**	**2.05**	**1836**	883	2.25	2009
4300	**696**	**1.49**	**1365**	**739**	**1.66**	**1506**	**794**	**1.91**	**1717**	**848**	**2.14**	**1914**	896	2.38	2123
4400	**711**	**1.60**	**1456**	**750**	**1.75**	**1582**	**805**	**2.02**	**1811**	**857**	**2.24**	**2000**	908	2.51	2237
4500	**727**	**1.70**	**1540**	**762**	**1.85**	**1666**	**817**	**2.12**	**1897**	867	2.35	2096	919	2.63	2343
4600	**742**	**1.82**	**1641**	**774**	**1.96**	**1759**	**828**	**2.23**	**1992**	877	2.46	2193	929	2.75	2450
4700	**758**	**1.94**	**1742**	**786**	**2.07**	**1854**	**840**	**2.34**	**2088**	888	2.59	2307	938	2.87	2557
4800	**773**	**2.06**	**1845**	**799**	**2.18**	**1948**	**852**	**2.46**	**2193**	899	2.72	2423	947	2.98	2656
4900	**789**	**2.19**	**1957**	**812**	**2.30**	**2053**	863	2.57	2290	910	2.86	2548	957	3.11	2773
5000	**805**	**2.32**	**2070**	**826**	**2.43**	**2166**	875	2.70	2405	921	2.99	2665	966	3.24	2891
5100	**821**	**2.47**	**2202**	**840**	**2.57**	**2290**	887	2.83	2521	932	3.13	2792	976	3.38	3019
5200	**837**	**2.61**	**2325**	**854**	**2.71**	**2414**	898	2.96	2638	943	3.28	2928	987	3.53	3157
5300	**853**	**2.76**	**2459**	868	2.85	2539	909	3.09	2755	955	3.42	3056	998	3.69	3304
5400	869	2.92	2602	882	3.01	2683	920	3.24	2891	967	3.57	3193	1009	3.86	3461
5500	885	3.09	2755	897	3.17	2828	932	3.38	3019	978	3.72	3331	1029	4.03	3618
5600	901	3.26	2910	911	3.33	2973	943	3.54	3166	990	3.87	3470	1031	4.20	3775
5700	917	3.44	3074	926	3.50	3129	956	3.70	3313	1002	4.03	3618	1042	4.38	3943
5800	933	3.62	3239	941	3.68	3294	968	3.87	3470	1013	4.20	3775	1053	4.56	4111
5900	949	3.81	3414	956	3.87	3470	981	4.05	3637	1025	4.37	3934	1065	4.74	4279
6000	965	4.01	3600	972	4.06	3646	995	4.23	3804	1037	4.55	4102	1076	4.92	4447
6100	981	4.21	3785	987	4.26	3832	1008	4.42	3981	1042	4.73	4270	1088	5.10	4614
6200	997	4.42	3981	1002	4.46	4018	1022	4.62	4167	1058	4.91	4437	—	—	—
6300	1014	4.64	4186	1018	4.68	4223	1036	4.83	4363	1070	5.11	4624	—	—	—

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
3700	879	1.95	1751	927	2.17	1940	973	2.38	2123	1013	2.57	2290	1046	2.73	2432
3800	889	2.03	1819	934	2.26	2018	980	2.48	2210	1022	2.69	2396	1058	2.87	2557
3900	898	2.12	1897	942	2.36	2105	987	2.59	2307	1030	2.81	2503	1068	3.01	2683
4000	908	2.21	1974	950	2.46	2193	994	2.70	2405	1037	2.92	2602	1077	3.14	2801
4100	917	2.32	2070	960	2.55	2272	1001	2.81	2503	1045	3.04	2710	1085	3.21	2919
4200	925	2.44	2175	969	2.65	2370	1009	2.92	2602	1051	3.17	2828	1092	3.40	3037
4300	935	2.56	2281	979	2.77	2468	1018	3.03	2701	1058	3.29	2937	1100	3.53	3157
4400	945	2.68	2387	988	2.89	2575	1028	3.14	2801	1066	3.41	3047	1106	3.67	3285
4500	955	2.82	2512	996	3.02	2692	1037	3.25	2901	1074	3.54	3166	1113	3.81	3414
4600	967	2.96	2638	1005	3.16	2819	1046	3.38	3019	1084	3.66	3276	1121	3.95	3544
4700	980	3.11	2773	1015	3.30	2946	1056	3.52	3147	1093	3.79	3396	1129	4.09	3674
4800	992	3.26	2910	1025	3.45	3083	1064	3.67	3285	1103	3.92	3516	1137	4.22	3795
4900	1003	3.41	3047	1036	3.61	3230	1073	3.83	3433	1112	4.07	3655	1147	4.36	3925
5000	1014	3.56	3184	1049	3.79	3396	1083	4.00	3590	1121	4.23	3804	1157	4.50	4055
5100	1024	3.71	3322	1061	3.96	3553	1093	4.17	3748	1129	4.40	3962	1166	4.66	4202
5200	1033	3.84	3442	1073	4.14	3720	1103	4.34	3906	1138	4.58	4130	1175	4.82	4354
5300	1042	3.98	3572	1084	4.31	3878	1115	4.53	4157	1148	4.76	4326	1184	5.01	4531
5400	1051	4.14	3720	1095	4.49	4046	1128	4.74	4279	1158	4.95	4475	1193	5.20	4707
5500	1061	4.30	3818	1105	4.66	4204	1140	4.94	4465	1168	5.15	4661	—	—	—
5600	1071	4.46	4018	1114	4.81	4344	1152	5.14	4652	—	—	—	—	—	—
5700	1081	4.64	4186	1123	4.98	4503	—	—	—	—	—	—	—	—	—
5800	1092	4.84	4372	1132	5.15	4661	—	—	—	—	—	—	—	—	—
5900	1103	5.04	4558	—	—	—	—	—	—	—	—	—	—	—	—
6000	1114	5.24	4745	—	—	—	—	—	—	—	—	—	—	—	—
6100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

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

NOTES:
1. **Boldface** indicates field-supplied drive is required.
2. ▭ indicates alternate motor and drive are required.
3. Maximum usable watts input is 3313 with standard motor and 4400 with alternate motor. Maximum continuous bhp is 3.70 with standard motor and 5.25 with alternate motor. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using your fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
4. Values include losses for filters, unit casing, and wet coils. See Table 7 for accessory/FIOP static pressure information.
5. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details. For additional information on motor performance, refer to Table 8.
6. Interpolation is permissible. Do not extrapolate.

START-UP

Unit Preparation — Make sure that unit has been installed in accordance with these installation instructions and applicable codes. Ensure Start-Up Checklist on back page of booklet is completely filled out.

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

Outdoor-Air Inlet Screens — Outdoor-air inlet screen(s) must be in place before operating unit.

Compressor Mounting — Compressors are internally spring mounted. Do not loosen or remove compressor hold-down bolts. Remove the tiedown bands that hold the compressors together on 50TFF,TM014 units.

Internal Wiring — Check all electrical connections in unit control boxes; tighten as required. Verify and correct if necessary. Ensure that electrical component wiring does not come in contact with refrigerant tubing or sharp 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. The Schrader-type valve that is located under the high-pressure switch does not have a Schrader core. Be sure that caps on the ports are tight.

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. These valves have O-rings inside which screw the cap onto a brass body to prevent leaks. 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 3-phase 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, tag disconnect.
3. Reverse any two of the unit power leads.
4. Turn on 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 — To start unit, turn on main power supply. Set system selector switch at COOL position and fan switch at AUTO. position. Adjust thermostat to a setting below room temperature. Compressor starts on closure of contactor.

Check unit charge. Refer to Refrigerant Charge section on page 46. Unit must operate a minimum of 10 minutes before adjusting charge.

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

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

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

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

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

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

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

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

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

Operating Sequence

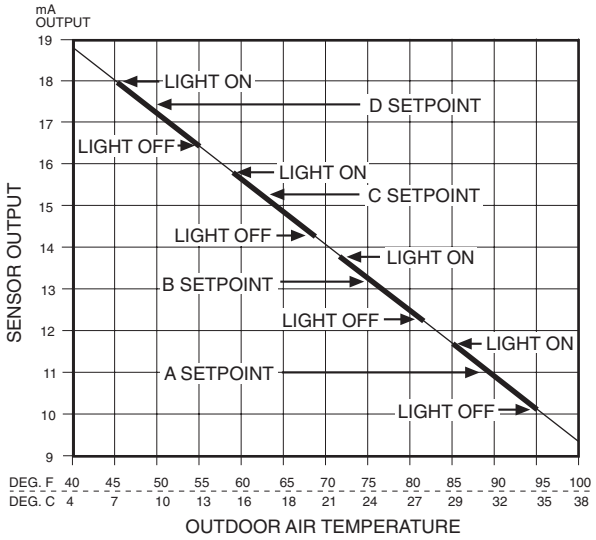
COOLING, UNITS WITHOUT ECONOMI$ER2 — When thermostat calls for cooling, terminals G and Y1 are energized. The indoor (evaporator) fan contactor (IFC), outdoor fan contactor (OFC), and compressor contactor no. 1 (C1) are energized and evaporator-fan motor, condenser fans and compressor no. 1 start. The condenser-fan motors run continuously while unit is cooling. If the thermostat calls for a second stage of cooling by energizing Y2, compressor contactor no. 2 (C2) is energized and compressor no. 2 starts.

HEATING, UNITS WITHOUT ECONOMI$ER2 (If Optional or Accessory Heater is Installed) — Upon a call for heating through terminal W1, IFC and heater contactor no. 1 (HC1) are energized. On units equipped for 2 stages of heat, when additional heat is needed HC2 is energized through W2.

COOLING, UNITS WITH 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. 43 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.



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. 43 — EconoMi$er2 Outdoor-Air Damper Operation

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.

HEATING, UNITS WITH ECONOMI$ER2 — When the room thermostat calls for heat, the heating controls are energized as described in the Heating, Units Without EconoMi$er2 section on page 44. The IFM is energized and the EconoMi$er2 damper modulates to the minimum position. When the thermostat is satisfied, the damper modulates closed.

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 and exterior at the beginning of each heating and cooling season or more frequently as operating conditions require.

EVAPORATOR COIL

1. Turn unit power off, tag disconnect. Remove evaporator coil access panel.
2. If economizer is installed, remove economizer by disconnecting Molex plug and removing economizer mounting screws. Refer to Accessory Economizer Installation Instructions or Optional EconoMi$er2 section, on page 19 for more details.
3. Slide filters out of unit.
4. Clean coil using a commercial coil cleaner or dishwasher detergent in a pressurized spray canister. Wash both sides of coil and flush with clean water. For best results, backflush toward return-air section to remove foreign material.
5. Flush condensate pan after completion.
6. Reinstall economizer and filters.
7. Reconnect economizer wiring.
8. Replace access panels.

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

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

Two-Row Coils — Clean coils as follows:

1. Turn off unit power, tag disconnect.
2. Remove top panel screws on condenser end of unit.
3. Remove condenser coil corner post. See Fig. 44. To hold top panel open, place coil corner post between top panel and center post. See Fig. 45.
4. Remove screws securing coil to center post.
5. Remove fastener holding coil sections together at return end of condenser coil. Carefully separate the outer coil section 3 to 4 in. from the inner coil section. See Fig. 46.
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 fastener removed in Step 5.
8. Reposition the outer coil section and remove the coil corner post between the top panel and center post. Reinstall the coil corner post and replace all screws.

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

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

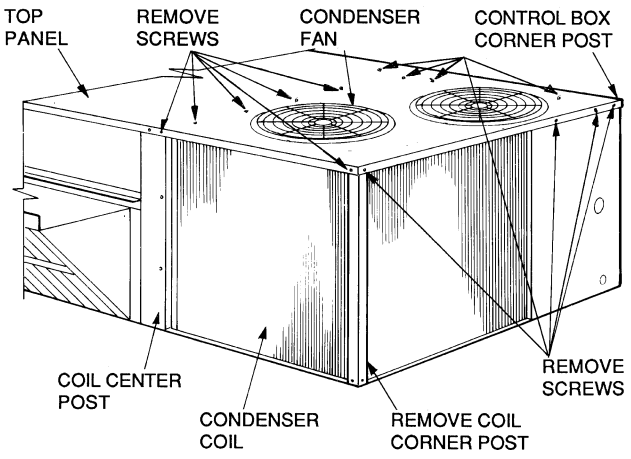


Fig. 44 — Cleaning Condenser Coil

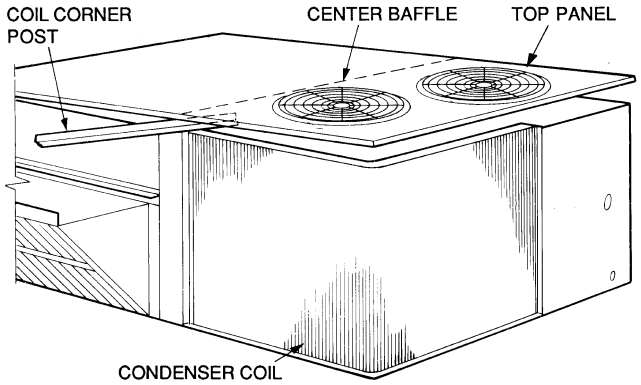


Fig. 45 — Propping Up Top Panel

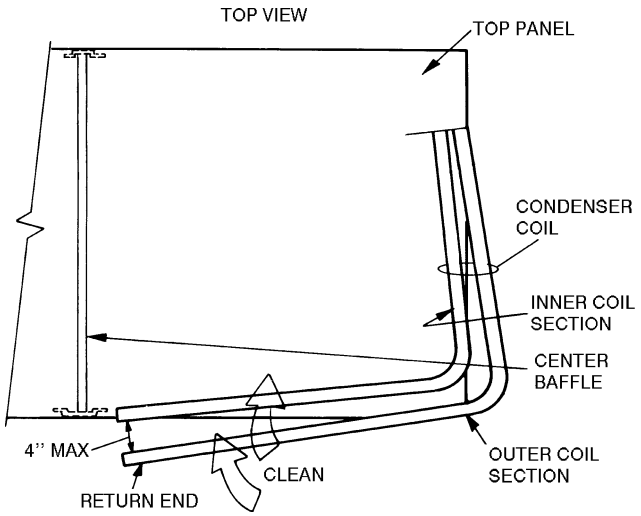


Fig. 46 — Separating Coil Sections

Lubrication

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

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

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 29 for proper adjustment procedures and belt tension.

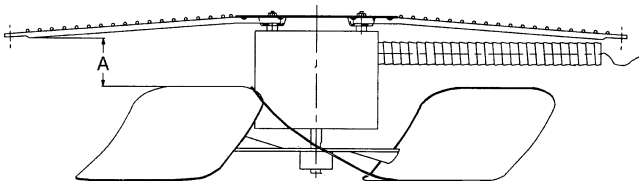
Condenser-Fan Adjustment (Fig. 47)

1. Shut off unit power supply, tag disconnect.
2. Remove condenser-fan assembly (grille, motor, motor cover, and fan) and loosen fan hub setscrews.
3. Adjust fan height as shown in Fig. 47.
4. Tighten setscrews.
5. Replace condenser-fan assembly.

Manual Outdoor-Air Damper — If outdoor-air damper blade adjustment is required, see Manual Outdoor-Air Damper section on page 17.

Economizer Adjustment — Refer to Optional Econo-Mi$er2 section on page 19.

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



50TFF,TM	FAN HEIGHT "A'', in.
208/230 V	2.75
460 and 575 V	3.50

Fig. 47 — Condenser Fan Adjustment

Refrigerant Charge

CHECKING AND ADJUSTING REFRIGERANT CHARGE — The refrigerant system is fully charged with R-22 refrigerant, tested, and factory-sealed. Unit must operate in Cooling mode a minimum of 10 minutes before checking charge.

NOTE: Adjustment of the refrigerant charge is not required unless the unit is suspected of not having the proper R-22 charge.

A superheat charging chart is attached to the outside of the service access panel. The chart includes the required suction line temperature at given suction line pressures and outdoor ambient temperatures.

An accurate superheat, thermocouple- or thermistor-type thermometer, and a gage manifold are required when using the superheat charging method for evaluating the unit charge. *Do not use mercury or small dial-type thermometers because they are not adequate for this type of measurement.*

⚠ CAUTION

When evaluating the refrigerant charge, an indicated adjustment to the specified factory charge must always be very minimal. If a substantial adjustment is indicated, an abnormal condition exists somewhere in the cooling system, such as insufficient airflow across either coil or both coils.

Proceed as follows:

1. Remove caps from low- and high-pressure service fittings.
2. Using hoses with valve core depressors, attach low- and high-pressure gage hoses to low- and high-pressure service fittings, respectively.
3. Start unit in Cooling mode and let unit run until system pressures stabilize.
4. Measure and record the following:
   a. Outdoor ambient-air temperature (F db).
   b. Evaporator inlet-air temperature (F wb).
   c. Suction-tube temperature (F) at low-side service fitting.
   d. Suction (low-side) pressure (psig).
5. Using "Cooling Charging Charts" compare outdoor-air temperature (F db) with the suction line pressure (psig) to determine desired system operating suction line temperature. See Fig. 48-55.
6. Compare actual suction-tube temperature with desired suction-tube temperature. Using a tolerance of ± 3° F, add refrigerant if actual temperature is more than 3° F higher than proper suction-tube temperature, or remove refrigerant if actual temperature is more than 3° F lower than required suction-tube temperature.

TO USE COOLING CHARGING CHARTS — This method is to be used in Cooling mode only. 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. 51; Circuit 1)

Outdoor Temperature. . . . . .85 F

Suction Pressure. . . . . 74 psig

Suction Temperature should be. . . . . .54 F
(Suction Temperature may vary ± 3° F.)

High-Pressure Switch — Located on the compressor hot gas line is a high-pressure switch. This switch opens at 428 psig and closes at 320 psig. No adjustment is necessary. Refer to Tables 1A and 1B.

NOTE: There is no Schrader core in the high-pressure switch.

Loss-of-Charge Switch — Located on the condenser liquid line is a low-pressure switch which functions as a loss-of-charge switch. This switch contains a Schrader core depressor. This switch opens at 7 psig and closes at 22 psig. No adjustment is necessary. Refer to Tables 1A and 1B.

Freezestat — Located on the "hair pin" end of the evaporator coil is a bimetal temperature sensing switch. This switch protects the evaporator coil from freeze-up due to lack of airflow. The switch opens at 30 F and closes at 45 F. No adjustment is necessary. Refer to Tables 1A and 1B.

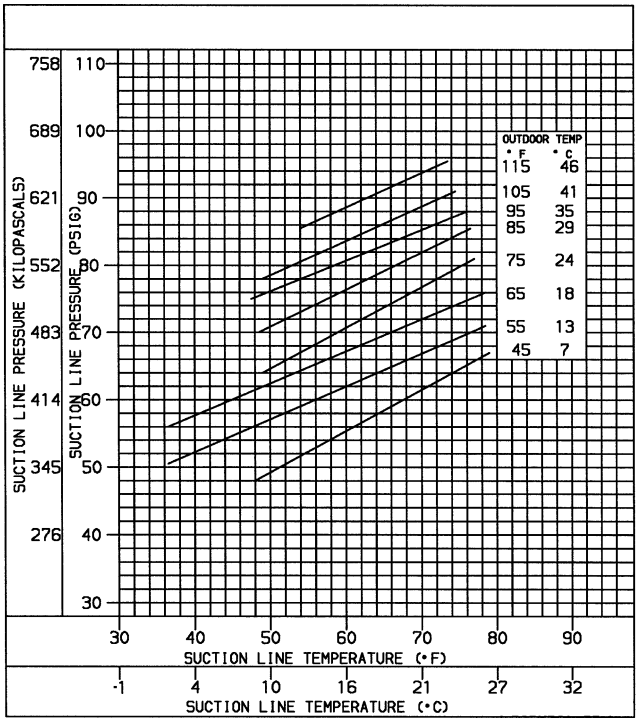


Fig. 48 — Cooling Charging Chart; 50TFF008

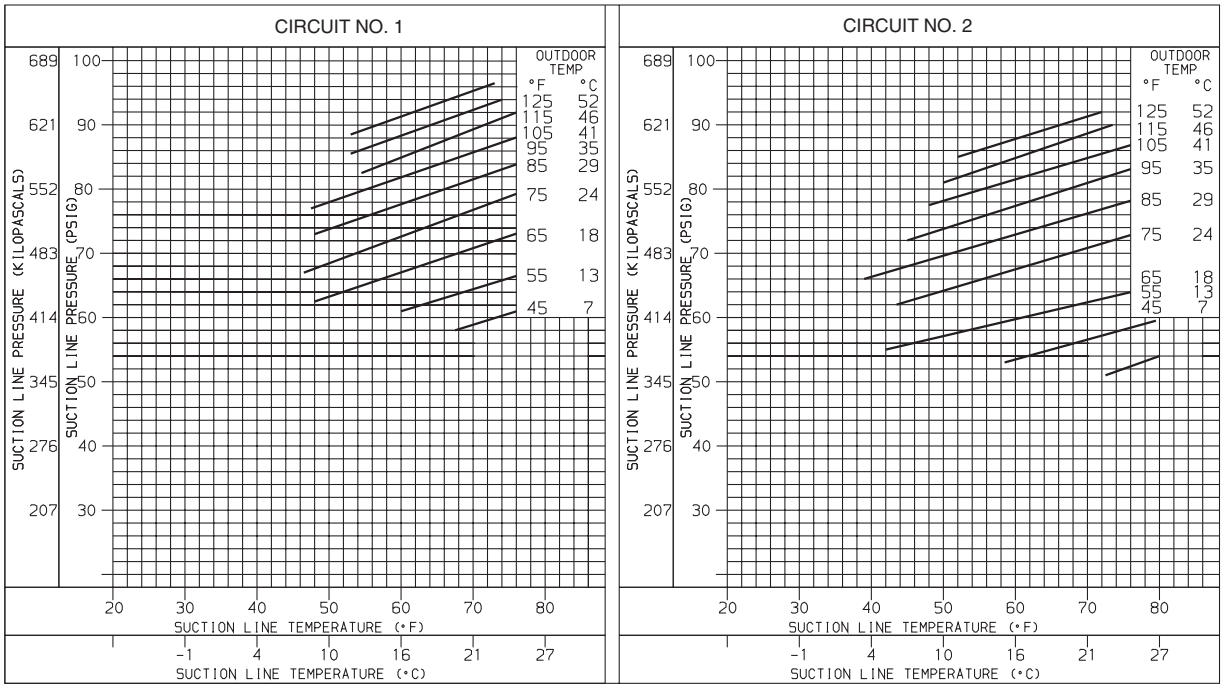


Fig. 49 — Cooling Charging Chart; 50TFF009

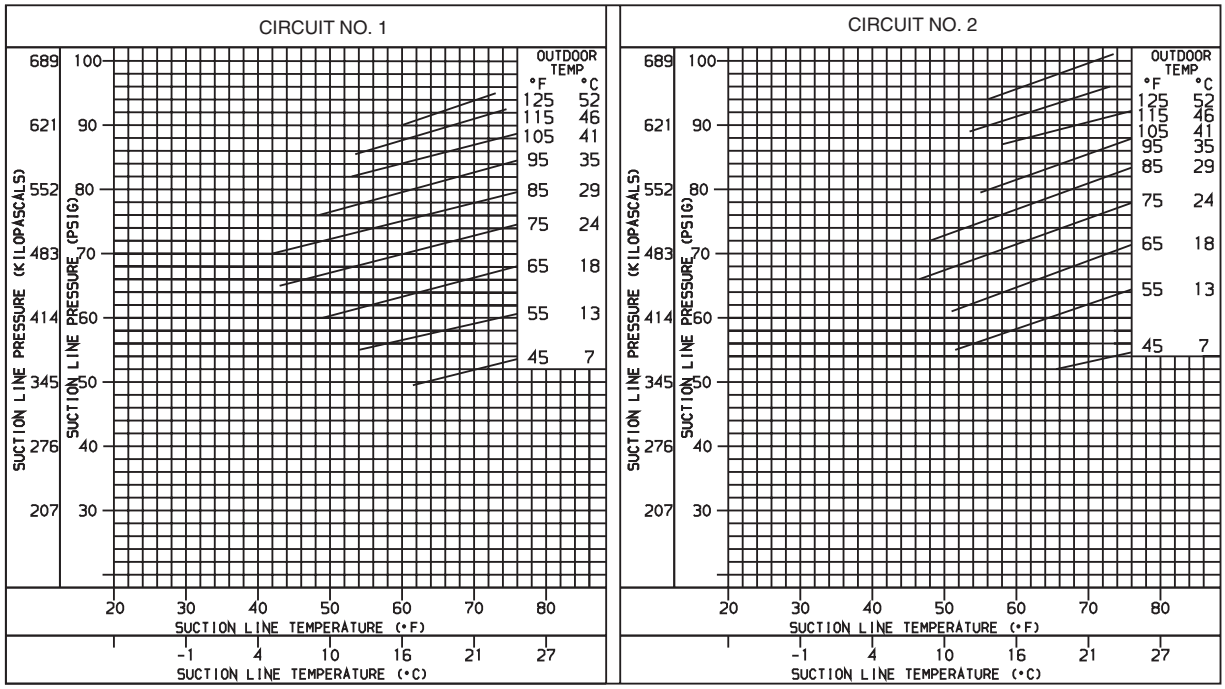


Fig. 50 — Cooling Charging Chart; 50TFF012

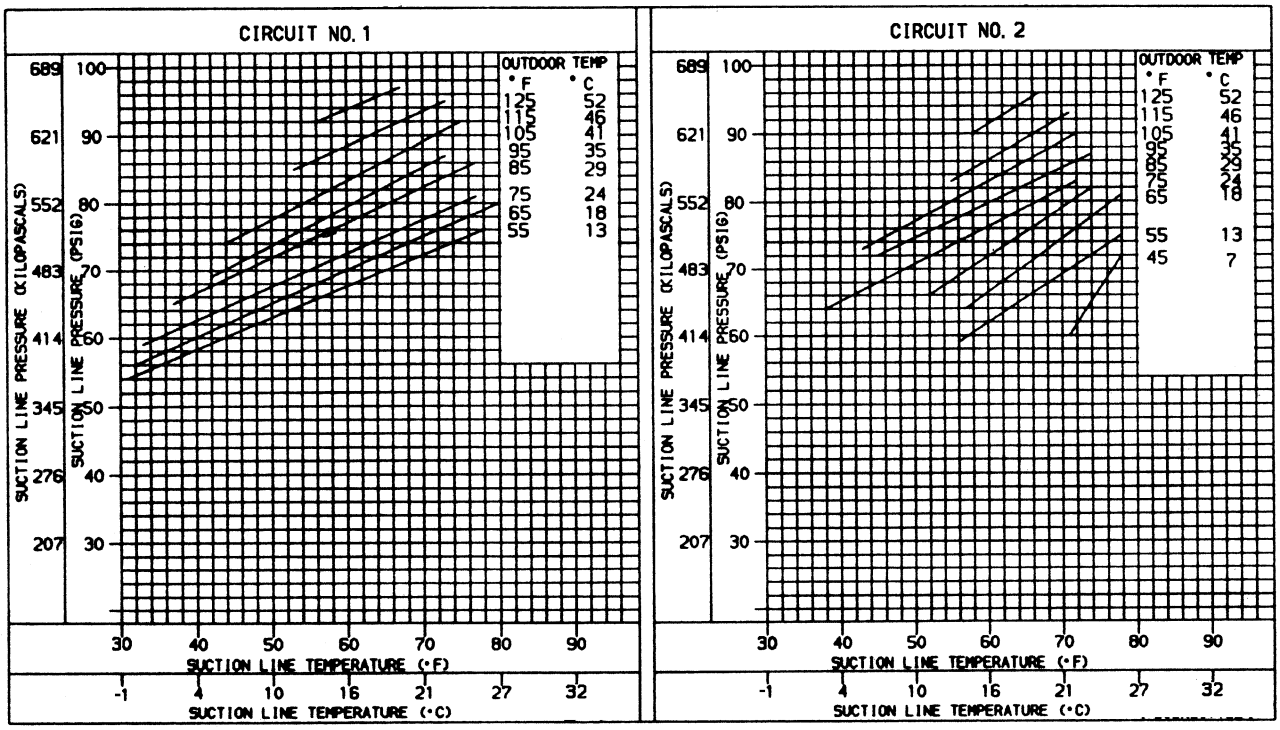


Fig. 51 — Cooling Charging Chart; 50TFF014

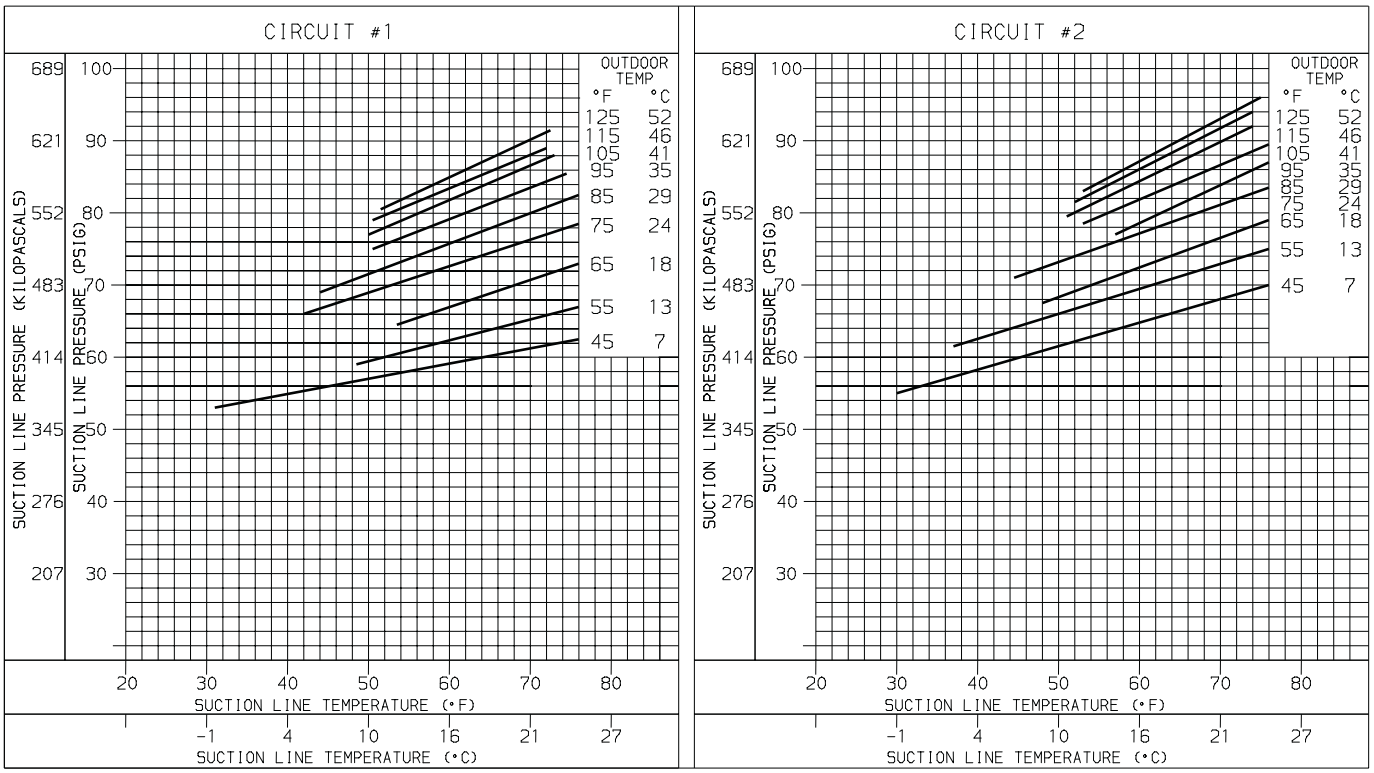


Fig. 52 — Cooling Charging Chart; 50TM008

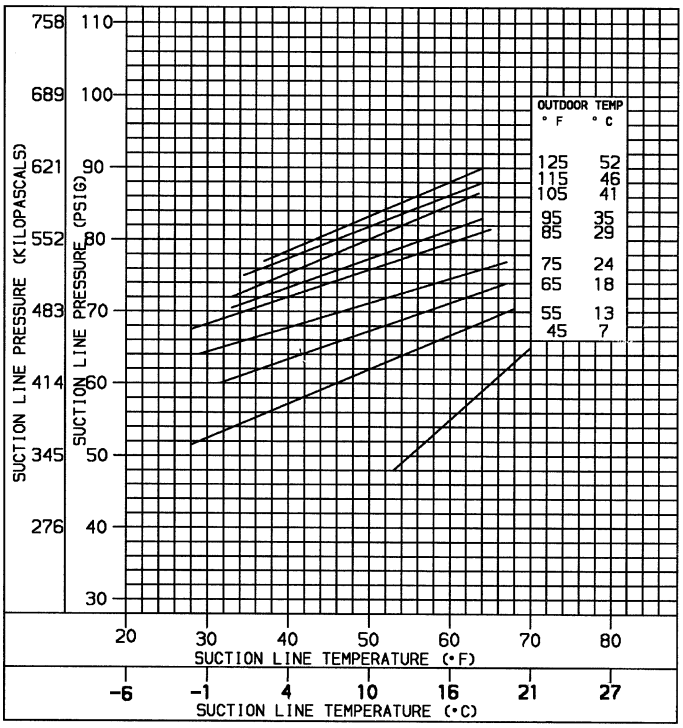


Fig. 53 — Cooling Charging Chart; 50TM009

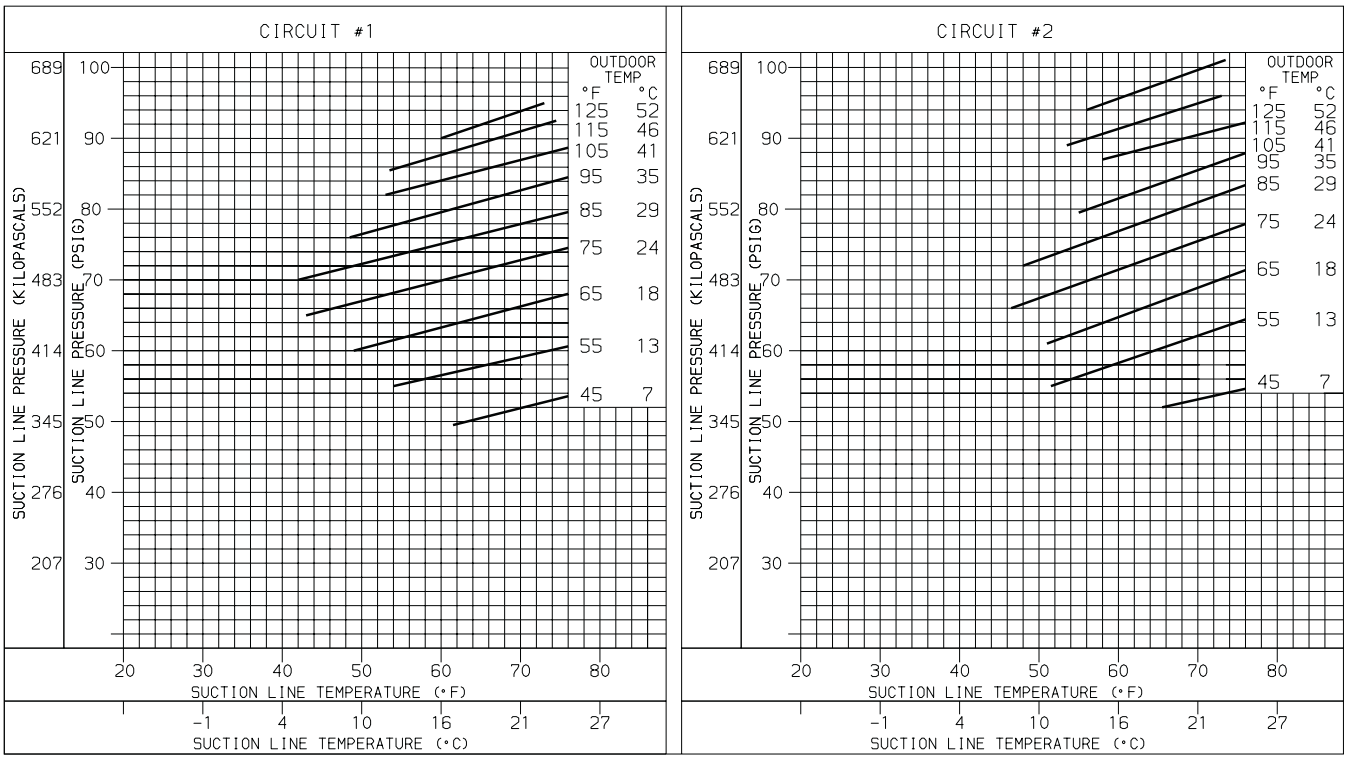


Fig. 54 — Cooling Charging Chart; 50TM012

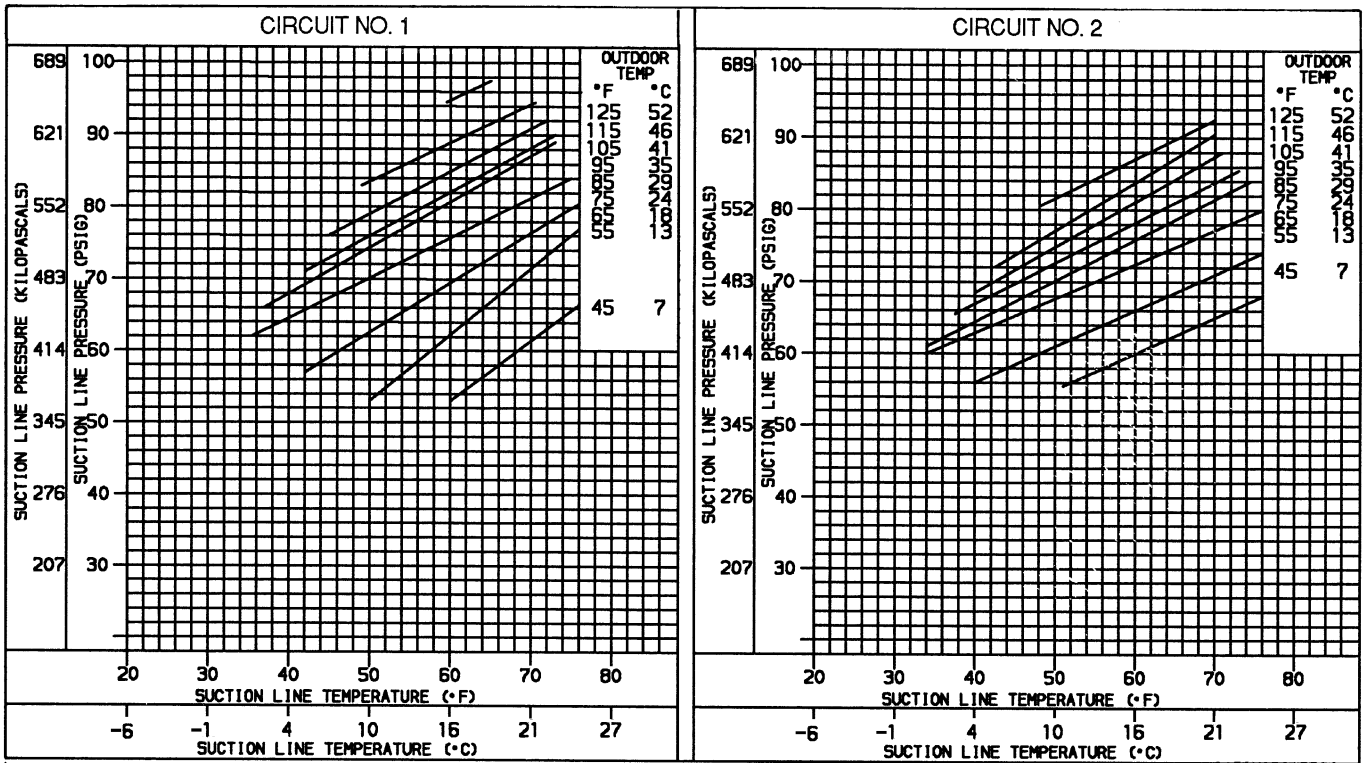


Fig. 55 — Cooling Charging Chart; 50TM014

TROUBLESHOOTING

Refer to Table 21 for unit troubleshooting.

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. 56 for a resistance vs. temperature chart which can be used to check sensor calibration and operation.

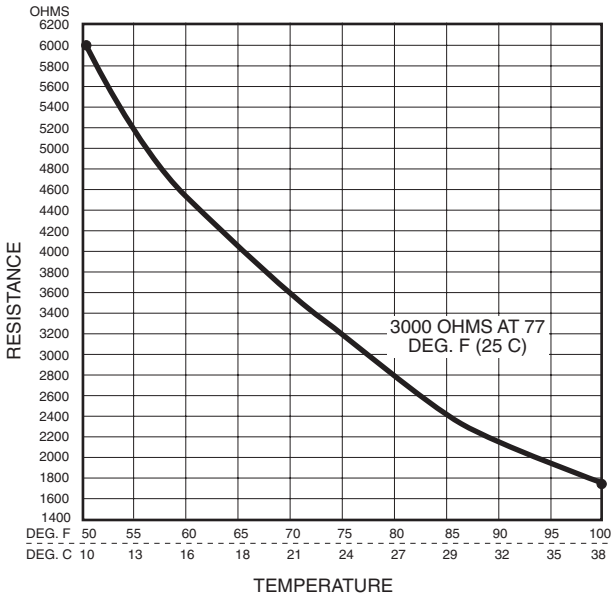


Fig. 56 — Mixed Air Sensor Resistance vs. Temperature Chart

Table 21 — Cooling Service Analysis

PROBLEM	CAUSE	REMEDY
Compressor and condenser fans 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 fans run.	Faulty wiring or loose connections in compressor circuit.	Check wiring and repair or replace.
	Compressor motor burned out, seized, or internal overload open.	Determine cause. Replace compressor.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace.
	One leg of 3-phase power dead.	Replace fuse or reset circuit breaker. Determine cause.
Compressor cycles (other than normally satisfying thermostat).	Refrigerant overcharge or undercharge.	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 (scroll compressors only).	Compressor rotating in wrong direction	Reverse the 3-phase power leads as described in Start-Up section, page 44.
Excessive head pressure.	Dirty air filter.	Replace filter.
	Dirty condenser coil.	Clean coil.
	Refrigerant overcharged.	Remove excess refrigerant.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser air restricted or air short-cycling.	Determine cause and correct.
	Outdoor fan contactor not energized.	Verify outdoor fan coil receiving 24 vac and high voltage contacts close.
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 heat 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.
	Field-installed filter drier restricted.	Replace.
Compressor no. 2 will not run.	Unit in economizer mode.	Proper operation; no remedy necessary.

INDEX

Copyright 2002 Carrier Corporation

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

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)

- ☐ REMOVE COMPRESSOR TIEDOWN BANDS (SIZE 014 ONLY) PER INSTALLATION INSTRUCTIONS
- ☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED AS SHOWN IN THE INSTALLATION INSTRUCTIONS
- ☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS
- ☐ CHECK THAT INDOOR AIR FILTERS ARE CLEAN AND IN PLACE
- ☐ VERIFY THAT UNIT INSTALLATION IS LEVEL WITHIN TOLERANCES LISTED IN THE INSTALLATION INSTRUCTIONS
- ☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS
- ☐ CHECK PULLEY ALIGNMENT AND BELT TENSION; REFER TO INSTALLATION INSTRUCTIONS
- ☐ VERIFY INSTALLATION OF ECONOMI$ER2 HOOD (IF EQUIPPED)

III. START-UP

ELECTRICAL

SUPPLY VOLTAGE	L1-L2	_____	L2-L3	_____	L3-L1	_____
CIRCUIT NO. 1 COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
CIRCUIT NO. 2 COMPRESSOR AMPS	L1	_____	L2	_____	L3	_____
INDOOR FAN AMPS	L1	_____	L2	_____	L3	_____

TEMPERATURES

	BOTH CIRCUITS OPERATING			
OUTDOOR-AIR TEMPERATURE	_____	DB		
RETURN-AIR TEMPERATURE	_____	DB	_____	WB
COOLING SUPPLY AIR	_____	DB	_____	WB

REFRIGERANT

	CIRCUIT NO. 1		CIRCUIT NO. 2	
REFRIGERANT SUCTION	_____	PSIG	_____	PSIG
REFRIGERANT TEMPERATURE SUCTION	_____	°F	_____	°F
REFRIGERANT LIQUID LINE	_____	PSIG	_____	PSIG
REFRIGERANT TEMPERATURE LIQUID LINE	_____	°F	_____	°F

- ☐ VERIFY REFRIGERANT CHARGE USING COOLING CHARGING CHARTS ON PAGES 47-50 (COOLING MODE ONLY)
- ☐ VERIFY 3-PHASE SCROLL COMPRESSOR IS ROTATING IN THE CORRECT DIRECTION

GENERAL

- ☐ SET ECONOMI$ER2 MINIMUM VENT AND CHANGEOVER SETTINGS TO MATCH JOB REQUIREMENTS (IF EQUIPPED)

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

Copyright 2002 Carrier Corporation