50HJQ004−007
50HEQ003−006
Single−Package Rooftop Heat Pump Units

Carrier®
Turn to the Experts℠

Installation, Start−Up and Service Instructions

CONTENTS

SAFETY CONSIDERATIONS

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

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

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

⚠ WARNING

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

NOTE: Ensure that the voltage listed on the unit information plate agrees with the electrical supply to the unit.

INSTALLATION

Unit is shipped in the vertical discharge configuration. To convert to horizontal configuration, remove horizontal duct opening 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.

STEP 1 —PROVIDE UNIT SUPPORT

ROOF CURB

Assemble and install the accessory roof curb in accordance with the instructions shipped with the curb. (See Fig. 1.) Install insulation, cant strips, roofing felt, and counter flashing as shown. *Ductwork must be attached to the curb, not to the unit.* If electric or control power will be routed through the basepan, attach the accessory thru-the-bottom service connections to the basepan and roof curb in accordance with the accessory installation instructions. Install connections before the unit is set on the roof curb.

IMPORTANT: The gasketing of the unit to the roof curb is critical for water-tightness. Install the gasket supplied with the roof curb as shown in Fig. 1. An improperly applied gasket can also result in air leaks and poor unit performance.

The roof curb should be level to ensure that the unit drain functions properly. Unit leveling tolerances are shown in Fig. 2.

CONNECTOR PKG. ACCY.	B	C	D ALT DRAIN HOLE	GAS	POWER	CONTROL	ACCESSORY POWER
CRBTMPWR001A01	1 -9 11/16 [551]	1 -4 [406]	1 3/4 [44.5]	3/4 [19] NPT	3/4 [19] NPT	1/2 [12.7] NPT	1/2 [12.7] NPT
CRBTMPWR002A01					1 1/4 [31.7]		
CRBTMPWR003A01				1/2 [12.7] NPT	3/4 [19] NPT		
CRBTMPWR004A01				3/4 [19] NPT	1 1/4 [31.7]		

ROOF CURB ACCESSORY	A	UNIT SIZE
CRRFCURB001A01	1 -2 [356]	50HJQ 004-007
CRRFCURB002A01	2 -0 [610]	

NOTES:
1. Roof curb accessory is shipped disassembled.
2. Insulated panels.
3. Dimensions in [ ] are in millimeters.
4. Roof curb: galvanized steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance: 4 ft on each side.
7. Direction of airflow.
8. Connector packages CRBTMPWR001A01 and 002A01 are for thru-the-curb type gas. Packages CRBTMPWR003A01 and 004A01 are for thru-the-bottom type gas connections.

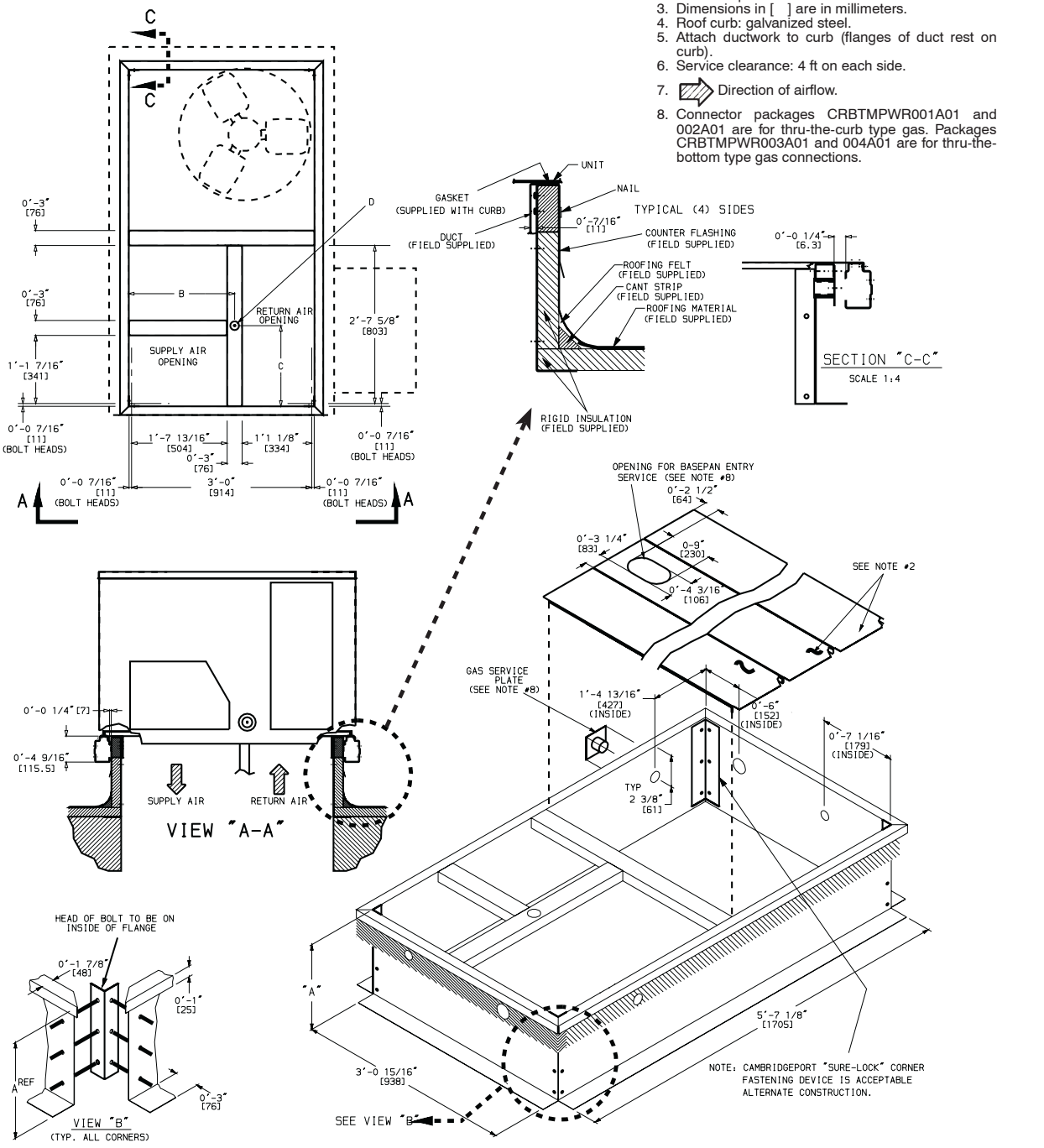

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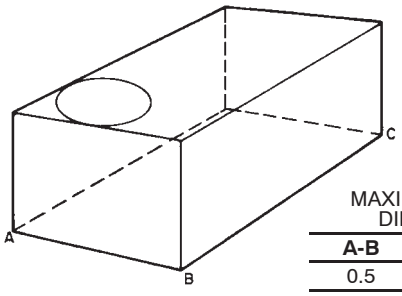
Fig. 1 – Roof Curb Details



MAXIMUM ALLOWABLE DIFFERENCE (in.)		
A-B	B-C	A-C
0.5	1.0	1.0

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Fig. 2 – Unit Leveling Tolerances

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 the unit cabinet. Install a gravel apron in front of the condenser coil air inlet to prevent grass and foliage from obstructing airflow.

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

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 the long sides of the unit with a minimum of 3 equally spaced 4-in. x 4-in. pads on each side.

STEP 2 —FIELD-FABRICATED DUCTWORK

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

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

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

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

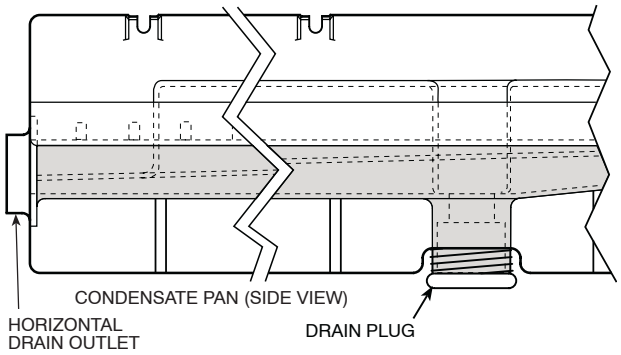
STEP 3 —INSTALL CONDENSATE DRAIN LINE AND EXTERNAL TRAP

Condensate drain connections are located at the bottom and side of the unit. Unit discharge connections do not determine the use of drain connections; either drain connection can be used with vertical or horizontal discharge units.

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

To use the bottom drain connection for a roof curb installation, relocate the factory-installed plug (red) from the bottom connection to the side connection. The center drain plug looks like a star connection, but can be removed with a $^1/_2$-in. socket drive extension. (See Fig. 3.) Complete the piping for the condensate drain and external trap 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 it against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the 50HJQ unit at $^1/_4$ in. per ft of run. Do not use a pipe size smaller than the unit connection ($^3/_4$-in.). (See Fig. 4.)



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

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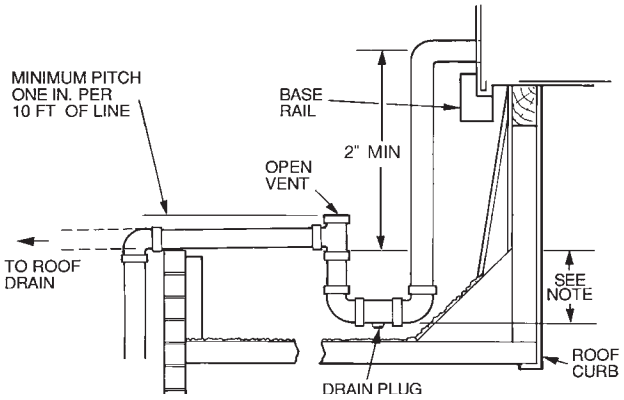
Fig. 3 – Condensate Drain Connection (Side View)



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

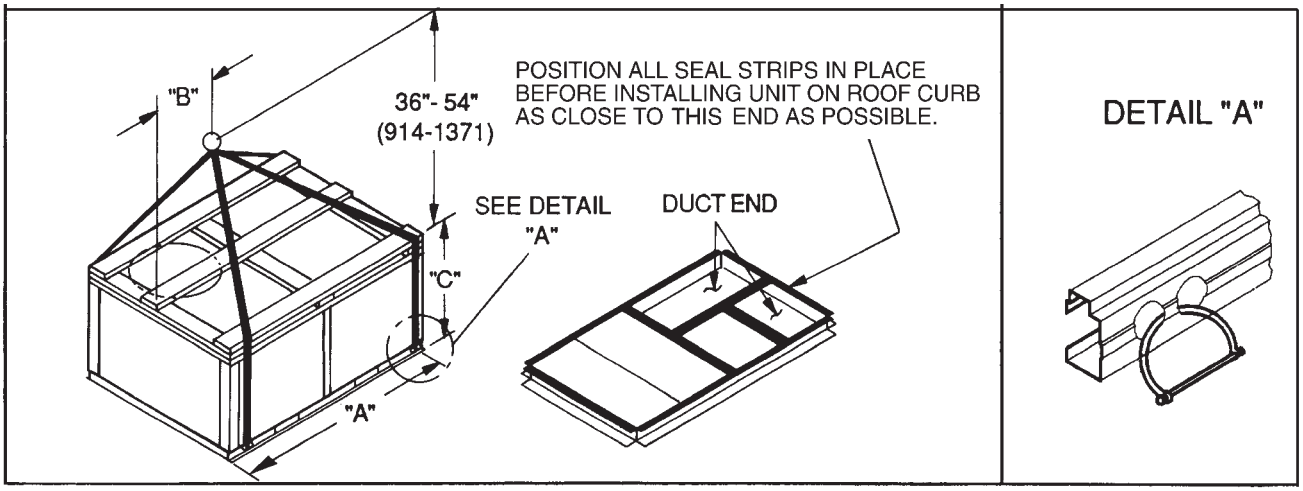
C06004

Fig. 4 – Condensate Drain Piping Details

STEP 4 —RIG AND PLACE UNIT

Inspect the unit for transportation damage, and file any claim with the transportation agency. Keep the unit upright and do not drop. Spreader bars are not required if top crating is left on the unit, and rollers may be used to move the unit across a roof. Level by using the unit frame as a reference. See Table 1 and 2 and Fig. 5 for additional information. Operating weight is shown in Table 1 and 2 and Fig. 5.

Lifting holes are provided in the base rails as shown in Fig. 5 and 6. Refer to rigging instructions on the unit.



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 Table 1 for economizer weights.

C06005

50HJQ UNIT SIZE	OPERATING WEIGHT		DIMENSIONS					
			"A"		"B"		"C"	
	lb	kg	in.	mm	in.	mm	in.	mm
004	550	227	73.69	1872	35.50	902	33.31	847
005	550	249	73.69	1872	35.50	902	33.31	847
006	630	268	73.69	1872	35.50	902	33.31	847
007	630	268	73.69	1872	35.50	902	41.33	1050

50HEQ UNIT SIZE	OPERATING WEIGHT		DIMENSIONS					
			"A"		"B"		"C"	
	lb	kg	in.	mm	in.	mm	in.	mm
003	550	227	73.69	1872	35.50	902	33.31	847
004	550	227	73.69	1872	35.50	902	33.31	847
005	550	249	73.69	1872	35.50	902	33.31	847
006	630	268	73.69	1872	35.50	902	33.31	847

Fig. 5 – Rigging Details

⚠ CAUTION

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

POSITIONING

A properly positioned unit will have the following clearances: $^1/_4$-in. clearance between the roof curb and the base rails on each side and duct end of the unit; $^1/_4$-in. clearance between the roof curb and the condenser end of the unit. (See Fig. 1, section C-C.)

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

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

After the unit is in position, remove the polyethylene shipping wrapper and top crating.

STEP 5 —MAKE ELECTRICAL CONNECTIONS

⚠ WARNING

Failure to follow this warning could result in the installer being liable for personal injury of others.

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) 70 (latest year), and local electrical codes.

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 disconnecting the black wire from the 230-v $^1/_4$-in. male spade terminal on the transformer and connecting it to the 208-v $^1/_4$-in. male spade terminal from the transformer. Refer to the unit label diagram for additional information. Pigtails are provided for field wire connections. Use factory-supplied splices or a UL (Underwriters' Laboratories) approved copper/aluminum connector.

When installing units, provide a disconnect per the NEC. All field wiring must comply with the NEC and local requirements.

Install field wiring as follows:

1. Install conduit through the side panel openings. For units without electric heat, install conduit between the disconnect and control box.
2. Install power lines to the terminal connections as shown in Fig. 7.
3. For units with electric heat, refer to Table 3 and Accessory Electric Heat Installation Instructions.

During operation, voltage to compressor terminals must be within the range indicated on the unit nameplate (also see Tables 4A-4D and 5A-5D). On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in Tables 4A-4D and 5A-5D, 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 invalidates any applicable Carrier warranty.

NOTE: If the unit is mounted on a roof curb and electrical power will be run up "thru-the-bottom," be sure to use the proper connection kit listed in Fig. 1. This kit, available from your local distributor, ensures a reliable watertight connection. Refer to the thru-the-bottom accessory installation instructions for information on wiring the unit.

UNIT	STD UNIT WEIGHT		ECONOMI$ER IV WEIGHT		VERT. ECON IV W/P.E. WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		"J"	
	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG	FT -IN.	MM
50HJQ004	550	249	50	22.7	90	40.9	135	61	140	64	139	63	136	62	2'-9 5/16"	846.5
50HJQ005	560	254					137	62	143	64	142	64	138	63	2'-9 5/16"	846.5
50HJQ006	630	286					155	70	160	73	159	72	156	71	3'-5 5/16"	1050
50HJQ007	630	286					155	70	160	73	159	72	156	71	3'-5 5/16"	1050

BOTTOM POWER CHART:
THESE HOLES REQ'D FOR USE WITH ACCESSORY PACKAGES - CRBTMPWR001A01, 2A01

THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
1/2"	ACC.	7/8" [22.2]
1/2"	24V	7/8" [22.2]
3/4" (001)	POWER*	1 1/8" [28.4]
1 1/4" (002)	POWER*	1 3/4" [44.4]

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

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

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. OUTDOOR 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 OUTDOOR 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 OUTDOOR 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'-6 1/2"[470] UP FROM THE BOTTOM OF THE BASE RAIL.

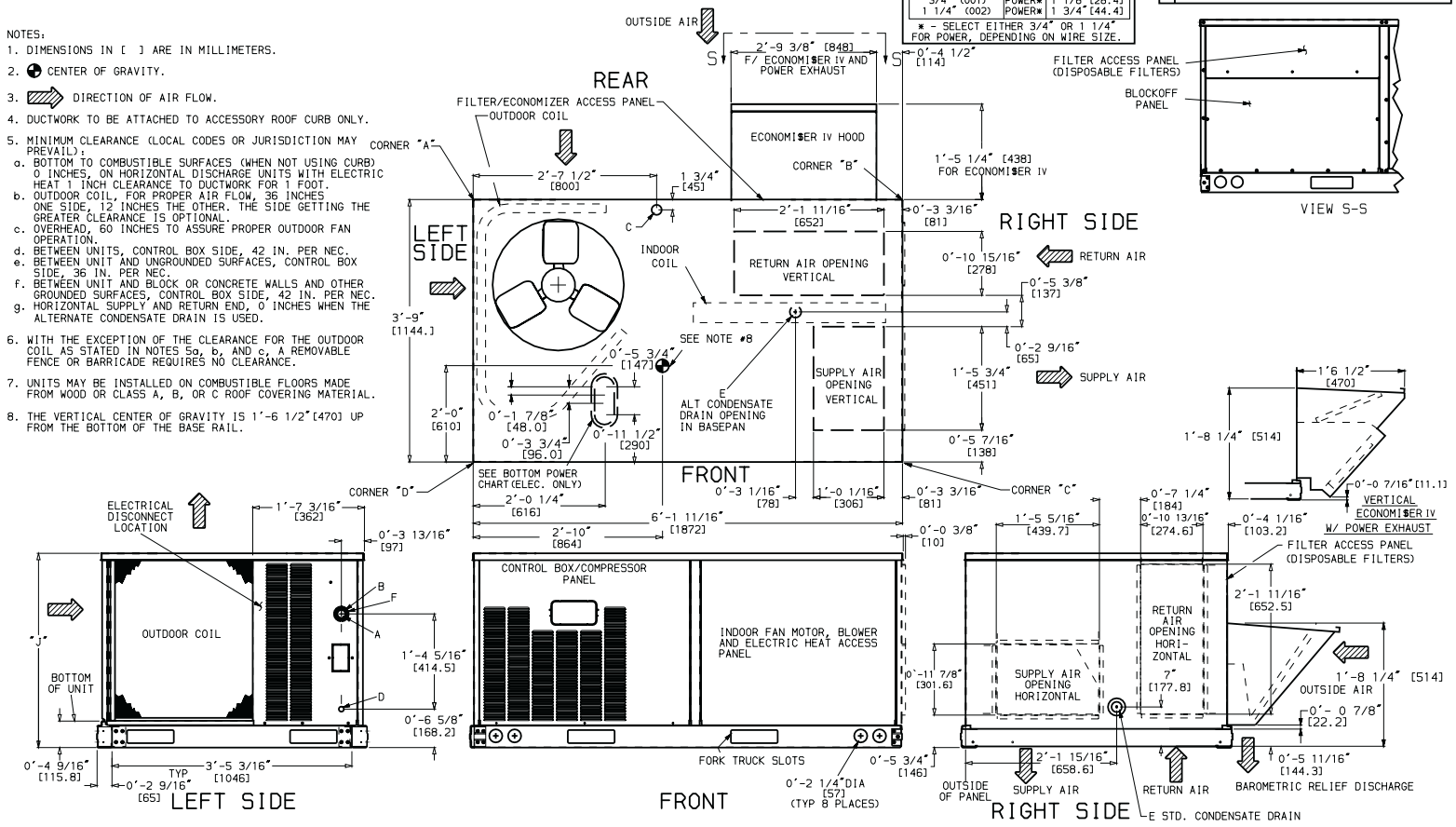


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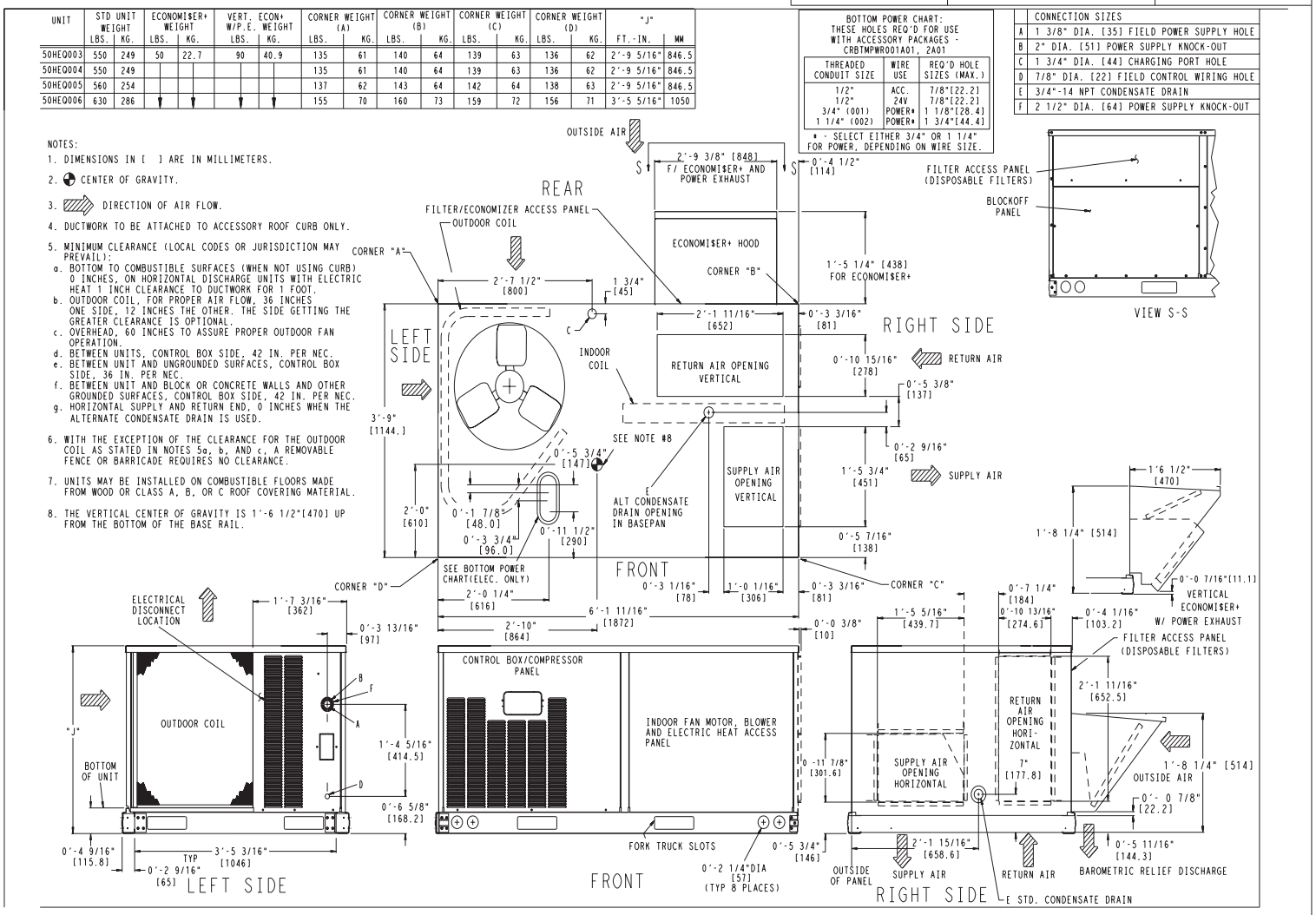
Fig. 6 – 50HJQ Base Unit Dimensions



UNIT	STD UNIT WEIGHT LBS.	STD UNIT WEIGHT KG.	ECONOMI$ER+ WEIGHT LBS.	ECONOMI$ER+ WEIGHT KG.	VERT. ECON+ W/P.E. WEIGHT LBS.	VERT. ECON+ W/P.E. WEIGHT KG.	CORNER WEIGHT (A) LBS.	CORNER WEIGHT (A) KG.	CORNER WEIGHT (B) LBS.	CORNER WEIGHT (B) KG.	CORNER WEIGHT (C) LBS.	CORNER WEIGHT (C) KG.	CORNER WEIGHT (D) LBS.	CORNER WEIGHT (D) KG.	"J" FT.-IN.	"J" MM
50HEQ003	550	249	50	22.7	90	40.9	135	61	140	64	139	63	136	62	2'-9 5/16"	846.5
50HEQ004	550	249					135	61	140	64	139	63	136	62	2'-9 5/16"	846.5
50HEQ005	560	254					137	62	143	64	142	64	138	63	2'-9 5/16"	846.5
50HEQ006	630	286					155	70	160	73	159	72	156	71	3'-5 5/16"	1050

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Fig. 7 – 50HEQ Base Unit Dimensions

Table 1—Physical Data 50HJQ004-007

50HJQ UNIT SIZE		004	005	006	007
NOMINAL CAPACITY (tons)		3	4	5	6
OPERATING WEIGHT (lb)					
Unit		550	560	630	630
EconoMi$er IV		50	50	50	50
Roof Curb		115	115	115	115
COMPRESSOR		Scroll			
Quantity		1	1	1	1
Oil (oz)		42	42	53	80
REFRIGERANT TYPE		R-22			
Operating Charge (lb)		12.0	12.0	18.3	17.7
OUTDOOR FAN		Propeller Type			
Quantity...Diameter (in.)		1...22	1...22	1...22	1...22
Nominal Cfm		3500	3500	3500	3500
Motor Hp...Rpm		1/8...825	1/8...825	1/4...1100	1/4...1100
OUTDOOR COIL		Enhanced Copper Tubes, Aluminum Fins, Acutrol™ Metering Device			
Rows...Fins/in.		2...17	2...17	2...17	2...17
Total Face Area (sq ft)		16.53	16.53	21.25	21.25
INDOOR FAN		Centrifugal Type			
Quantity...Size (in.)	Std	1...10 x 10	1...10 x 10	1...10 x 10	1...10 x 10
	High-Static	1...10 x 10	1...10 x 10	1...10 x 10	1...10 x 10
Type Drive	Std	Belt	Belt	Belt	Belt
	High-Static	Belt	Belt	Belt	Belt
Nominal Cfm		1200	1600	2000	2400
Maximum Continuous Bhp	Std	1.20	1.20	1.30/2.40*	2.40
	High-Static	2.40	2.40	2.90	2.90
Motor Frame Size	Std	48	48	56	56
	High-Static	56	56	56	56
Nominal Rpm High/Low	Std	1620	1620	1725	—
	High-Static	1725	1725	1725	1725
Fan Rpm Range	Std	680-1044	770-1185	1035-1460	1119-1585
	High-Static	1075-1455	1075-1455	1300-1685	1300-1685
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	Std	1.9/2.9	1.9/2.9	2.4/3.4	2.4/3.4
	High-Static	2.8/3.8	2.8/3.8	3.4/4.4	3.4/4.4
Nominal Motor Shaft Diameter (in.)	Std	1/2	1/2	5/8	5/8
	High-Static	5/8	5/8	5/8	5/8
Fan Pulley Pitch Diameter (in.)	Std	4.5	4.0	4.5	3.7
	High-Static	4.5	4.5	4.5	4.5
Belt, Quantity...Type...Length (in.)	Std	1...A...34	1...A...34	1...A...39	1...A...40
	High-Static	1...A...39	1...A...39	1...A...40	1...A...40
Pulley Center Line Distance (in.)	Std	10.0-12.4	10.0-12.4	14.7-15.5	14.7-15.5
	High-Static	10.0-12.4	10.0-12.4	14.7-15.5	14.7-15.5
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Std	48	70	80	80
	High-Static	65	65	60	60
Movable Pulley Maximum Full Turns From Closed Position	Std	5	5	6	5
	High-Static	6	6	5	5
Factory Setting	Std	3	3	3	3
	High-Static	3 1/2	3 1/2	3 1/2	3 1/2
Factory Speed Setting (rpm)	Std	826	936	1214	1259
	High-Static	1265	1265	1416	1416
Fan Shaft Diameter at Pulley (in.)		5/8	5/8	5/8	5/8
INDOOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Acutrol Metering Device			
Rows...Fins/in.		2...15	3...15	4...15	4...15
Total Face Area (sq ft)		5.5	5.5	7.33	7.33
HIGH-PRESSURE SWITCH (psig)					
Standard Compressor Internal Relief		625			
Cutout		428			
Reset (Auto.)		320			
LOSS OF CHARGE (Liquid Line) (psig)					
Cutout		7 ± 3			
Reset (Auto.)		22 ± 5			
FREEZE PROTECTION THERMOSTAT					
Opens (F)		30			
Closes (F)		45			
OUTDOOR-AIR INLET SCREENS		Cleanable.			
		Screen quantity and size varies with option selected.			
RETURN-AIR FILTERS		Throwaway			
Quantity...Size (in.)		2...16 x 25 x 2			

BHP – Brake Horsepower

* Single phase/three phase

Table 2—Physical Data 50HEQ003-006

50HEQ UNIT SIZE		003	004	005	006
NOMINAL CAPACITY (tons)		2	3	4	5
OPERATING WEIGHT (lb)					
Unit		550	550	560	630
EconoMi$er IV		50	50	50	50
Roof Curb		115	115	115	115
COMPRESSOR		Scroll			
Quantity		1	1	1	1
Oil (oz)		80	42	42	53
REFRIGERANT TYPE		R-22			
Operating Charge (lb)		5.2	12.0	12.0	18.3
OUTDOOR FAN		Propeller Type			
Quantity...Diameter (in.)		1...22	1...22	1...22	1...22
Nominal Cfm		3000	3500	3500	3500
Motor Hp...Rpm		1/8...760	1/8...825	1/8...825	1/4...1100
OUTDOOR COIL		Enhanced Copper Tubes, Aluminum Fins, Acutrol™ Metering Device			
Rows...Fins/in.		1...17	2...17	2...17	2...17
Total Face Area (sq ft)		14.58	16.53	16.53	21.25
INDOOR FAN		Centrifugal Type			
Quantity...Size (in.)	Std	1...10 x 10	1...10 x 10	1...10 x 10	1...10 x 10
	High-Static	–	1...10 x 10	1...10 x 10	1...10 x 10
Type Drive	Std	Belt	Belt	Belt	Belt
	High-Static	–	Belt	Belt	Belt
Nominal Cfm		800	1200	1600	2000
Maximum Continuous Bhp	Std	.58	1.20	1.20	1.30/2.40*
	High-Static	–	2.40	2.40	2.90
Motor Frame Size	Std	39	48	48	56
	High-Static	–	56	56	56
Nominal Rpm High/Low	Std	1620	1620	1620	1725
	High-Static	–	1725	1725	1725
Fan Rpm Range	Std	639–936	680-1044	770-1185	1035-1460
	High-Static	–	1075-1455	1075-1455	1300-1685
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Allowable Rpm		2100	2100	2100	2100
Motor Pulley Pitch Diameter Min/Max (in.)	Std	1.9/2.9	1.9/2.9	1.9/2.9	2.4/3.4
	High-Static	–	2.8/3.8	2.8/3.8	3.4/4.4
Nominal Motor Shaft Diameter (in.)	Std	1/2	1/2	1/2	5/8
	High-Static	–	5/8	5/8	5/8
Fan Pulley Pitch Diameter (in.)	Std	5.2	4.5	4.0	4.5
	High-Static	–	4.5	4.5	4.5
Belt, Quantity...Type...Length (in.)	Std	1...A...36	1...A...34	1...A...34	1...A...39
	High-Static	–	1...A...39	1...A...39	1...A...40
Pulley Center Line Distance (in.)	Std	10.0–12.4	10.0-12.4	10.0-12.4	14.7-15.5
	High-Static	–	10.0-12.4	10.0-12.4	14.7-15.5
Speed Change per Full Turn of Movable Pulley Flange (rpm)	Std	60	48	70	80
	High-Static	–	65	65	60
Movable Pulley Maximum Full Turns From Closed Position	Std	5	5	5	6
	High-Static	–	6	6	5
Factory Setting	Std	3	3	3	3
	High-Static	–	3 1/2	3 1/2	3 1/2
Factory Speed Setting (rpm)	Std	756	826	936	1249
	High-Static	–	1233	1233	1416
Fan Shaft Diameter at Pulley (in.)		5/8	5/8	5/8	5/8
INDOOR COIL		Enhanced Copper Tubes, Aluminum Double–Wavy Fins, Acutrol™ Metering Device			
Rows...Fins/in.		2...15	2...15	3...15	4...15
Total Face Area (sq ft)		5.5	5.5	5.5	7.33
HIGH-PRESSURE SWITCH (psig)					
Standard Compressor Internal Relief		625			
Cutout		428			
Reset (Auto.)		320			
LOSS OF CHARGE (Liquid Line) (psig)					
Cutout		7 ± 3			
Reset (Auto.)		22 ± 5			
FREEZE PROTECTION THERMOSTAT					
Opens (F)		30			
Closes (F)		45			
OUTDOOR–AIR INLET SCREENS		Cleanable			
		Screen quantity and size varies with option selected			
RETURN-AIR FILTERS		Throwaway			
Quantity...Size (in.)		2...16 x 25 x 2			

BHP – Brake Horsepower

* Single phase/three phase

Table 3—Electric Heating Capacities

UNIT SIZE	VOLTAGE (60 Hz)	ACCESSORY (kW)	ACCESSORY HEATER PART NUMBER CRHEATER– –A00 (or – –B00 where indicated)	SINGLE POINT BOX PACKAGE NO. CRSINGLE– –A00
003 (2 Tons)	208/230 (single phase)	3.3/4.4 4.9/6.5 6.5/8.7 7.9/10.5	001 002 003B00 004B00	– – – – 004 004
004 (3 Tons)	208/230/240 (single phase)	3.3/ 4.0/ 4.4 4.9/ 5.8/ 6.5 6.5/ 8.0/ 8.7 7.9/ 9.6/10.5 9.8/11.6/13.0*	001 002 003B00 004B00 002 & 002	– – – – 004 004 005
	208/230/240 (3 phase)	3.3/ 4.0/ 4.4 4.9/ 5.8/ 6.5 6.5/ 8.0/ 8.7 7.9/ 9.6/10.5 12.0/14.7/16.0	001 002 003B00 004B00 005	– – – – – – – – 002
	460/480 (3 phase)	5.5/ 6.0 8.1/ 8.8 10.6/11.5 12.9/14.0	006 007 008 009	– – – – – – – –
005 (4 Tons)	208/230/240 (single phase)	3.3/ 4.0/ 4.4 6.5/ 8.0/ 8.7 9.8/11.6/13.0* 13.1/16.0/17.4* 15.8/19.3/21.0*	001 003B00 002 & 002 003B00 & 003B00 004B00 & 004B00**	– – 004 005 005 005
	208/230/240 (3 phase)	4.9/ 5.8/ 6.5 6.5/ 8.0/ 8.7 12.0/14.7/16.0 15.8/19.3/21.0*	002 003 005 004B00 & 004B00**	– – – – 002 003
	460/480 (3 phase)	5.5/ 6.0 10.6/11.5 12.9/14.0 21.1/23.0*	006 008 009 008 & 008	– – – – – – – –
006 (5 Tons)	208/230/240 (single phase)	4.9/ 5.8/ 6.5 6.5/ 8.0/ 8.7 9.8/11.6/13.0* 13.1/16.0/17.4* 15.8/19.3/21.0*	002 003B00 002 & 002 003B00 & 003B00 004B00 & 004B00	004 004 005 005 005
	208/230/240 (3 phase)	4.9/ 5.8/ 6.5 7.9/ 9.6/10.5 12.0/14.7/16.0 15.8/19.3/21.0* 19.9/24.3/26.5*	002 004B00 005 004B00 & 004B00 004 & 005	– – 002 002 003 002
	460/480 (3 phase)	5.5/ 6.0 10.6/11.5 12.9/14.0 21.1/23.0* 23.4/25.5*	006 008 009 008 & 008 008 & 009	– – – – – – – – – –
007 (6 Tons)	208/230/240 (3 phase)	4.9/ 5.8/ 6.5 7.9/ 9.6/10.5 12.0/14.7/16.0 15.8/19.3/21.0* 19.9/24.3/26.5*	002 004B00 005 004B00 & 004B00 004B00 & 006	– – 002 002 003 003
	460/480 (3 phase)	5.5/ 6.0 10.6/11.5 12.9/14.0 21.1/23.0* 23.4/25.5*	006 008 009 008 & 008 008 & 009	– – – – – – – – – –

*Two heater packages required to provide kW indicated.

** Minimum airflow is 350 cfm/ton (1400 cfm) when two CRHEATER004B00 heaters are installed on a 4 ton, 230v heat pump.

NOTES:

1. The rated heater voltage is 240 and 480 v. If power distribution voltage varies from rated heater voltage, heater kW will vary accordingly.
2. To determine heater kW at voltages other than those shown in table, use the following formula:
   Heater kWnew = Heater kW rated x (unit power distribution voltage/rated heater voltage)^2
   As an example:
   For a 16 kW heater rated at 240 v with a power distribution voltage of 215 v
   kWnew = 16 kW (215/240)2
   kWnew = 12.8 kW (rating at 215 v)

Table 4A — 50HJQ Electrical Data — Standard Motor Units Without Electrical Convenience Outlet

UNIT SIZE	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP**	FLA	LRA
004 (3 Tons)	208/230-1-60	187	254	16.0	88.0	0.7	4.9	—/—	—/—	25.6/ 25.6	30/ 30	25/ 25	101/101
								3.3/ 4.4	15.9/18.3	45.5/ 48.5	50/ 50	43/ 46	117/120
								4.9/ 6.5	23.6/27.1	55.1/ 59.5	60/ 60	52/ 56	125/128
								6.5/ 8.7	31.3/36.3	64.7/ 71.0	70/ 80	61/ 67	133/138
								7.9/10.5	38.0/43.8	73.1/ 80.4	80/ 90	69/ 75	139/145
								9.8/13.0	47.1/54.2	84.5/ 93.4	90/100	79/ 87	148/155††
	208/230-3-60	187	254	10.3	77.0	0.7	4.9	—/—	—/—	18.5/ 18.5	20/20	18/ 18	90/ 90
								3.3/ 4.4	9.2/10.6	30.0/ 31.7	30/35	29/ 30	99/101
								4.9/ 6.5	13.6/15.6	35.5/ 38.0	40/40	34/ 36	104/106
								6.5/ 8.7	18.0/20.9	41.0/ 44.6	45/45	39/ 42	108/111
								7.9/10.5	21.9/25.3	45.9/ 50.1	50/60	43/ 47	112/116
								12.0/16.0	33.3/38.5	60.1/ 66.6	70/70	57/ 63	124/129
	460-3-60	414	508	5.1	39.0	0.4	2.2	—	—	9.0	15	9	46
								6.0	7.2	18.0	20	17	53
								8.8	10.6	22.2	25	21	57
								11.5	13.8	26.2	30	25	60
								14.0	16.8	30.0	30	28	63
005 (4 Tons)	208/230-1-60	187	254	18.3	109.0	0.7	4.9	—/—	—/—	28.5/ 28.5	30/ 30	27/ 27	122/122
								3.3/ 4.4	15.9/18.3	48.4/ 51.4	50/ 60	46/ 49	138/141
								6.5/ 8.7	31.3/36.3	67.6/ 73.9	70/ 80	63/ 69	154/159
								9.8/13.0	47.1/54.2	87.4/ 96.2	90/100	82/ 90	169/176††
								13.1/17.4	63.0/72.5	107.2/119.1	110/125	100/111	185/195††
								15.8/21.0	76.0/87.5	123.5/137.9	125/150	115/128	198/210††
	208/230-3-60	187	254	12.4	88.0	0.7	4.9	—/—	—/—	21.1/21.1	25/25	21/ 21	101/101
								4.9/ 6.5	13.6/15.6	38.1/40.6	40/45	36/ 39	115/117
								6.5/ 8.7	18.0/20.9	43.6/47.2	45/50	41/ 45	119/122
								12.0/16.0	33.3/38.5	62.7/69.2	70/70	59/ 65	135/140
								15.8/21.0	43.9/50.5	76.0/84.2	80/90	71/ 79	145/152
	460-3-60	414	508	6.4	44.0	0.4	2.2	—	—	10.6	15	10	51
								6.0	7.2	19.6	20	19	58
								11.5	13.8	27.9	30	26	65
								14.0	16.8	31.6	35	30	68
								23.0	27.7	45.2	50	42	79
006 (5 Tons)	208/230-1-60	187	254	25.0	150.0	1.5	7.6	—/—	—	40.4/ 40.4	45/ 45	39/ 39	188/188
								4.9/ 6.5	23.6/27.1	69.9/ 74.2	70/ 80	66/ 70	211/215
								6.5/ 8.7	31.3/36.3	79.5/ 85.7	80/ 90	75/ 81	219/224††
								9.8/16.0	47.1/54.2	99.2/108.1	100/110	93/102	235/242††
								13.1/17.4	63.0/72.5	119.1/131.0	125/150	112/123	251/260††
								15.8/21.0	76.0/87.5	135.4/149.7	150/150	127/140	264/275††
	208/230-3-60	187	254	17.3	123.0	1.5	5.8	—/—	—/—	28.9/ 28.9	30/ 30	28/ 28	168/168
								4.9/ 6.5	13.6/15.6	45.9/ 48.4	50/ 50	44/ 46	181/183
								7.9/10.5	21.9/25.3	56.3/ 60.6	60/ 70	53/ 57	190/193
								12.0/16.0	33.3/38.5	70.6/ 77.1	80/ 80	67/ 73	201/208
								15.8/21.0	43.9/50.5	83.8/ 92.1	90/100	79/ 86	212/218††
								19.9/26.5	55.2/63.8	97.9/108.7	100/110	92/102	223/232††
	460-3-60	414	508	9.0	62.0	0.8	2.6	—	—	13.9	15	14	92
								6.0	7.2	22.9	25	22	100
								11.5	13.8	31.2	35	29	106
								14.0	16.8	34.9	35	33	109
								23.0	27.7	48.5	50	45	120
								25.5	30.7	51.5	60	48	123
007 (6 Tons)	208/230-3-60	187	254	20.5	156.0	1.4	5.8	—/—	—/—	32.8/ 32.8	35/ 35	32/ 32	200/200
								4.9/ 6.5	13.6/15.6	49.8/ 52.3	50/ 60	47/ 50	214/216
								7.9/10.5	21.9/25.3	60.2/ 64.5	70/ 70	57/ 61	222/225
								12.0/16.0	33.3/38.5	74.5/ 81.0	80/ 90	70/ 76	233/239
								15.8/21.0	43.9/50.5	87.7/ 96.0	90/100	82/ 90	244/251††
								19.9/26.5	55.2/63.8	101.8/112.6	110/125	95/105	255/264††
	460-3-60	414	508	9.6	70.0	0.6	2.6	—	—	15.2	20	15	92
								6.0	7.2	24.2	25	23	99
								11.5	13.8	32.5	35	31	106
								14.0	16.8	36.2	40	34	109
								23.0	27.7	49.8	50	47	120
								25.5	30.7	53.6	60	50	123

See Legend on page 15

Table 4B — 50HJQ Electrical Data — High-Static Motor Units Without Electrical Convenience Outlet

UNIT SIZE	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP**	FLA	LRA
004 (3 Tons)	208/230-3-60	187	254	10.3	77.0	0.7	5.8	—/—	—/—	19.4/ 19.4	20/20	19/ 19	120/120
								3.3/ 4.4	9.2/10.6	30.9/ 32.6	35/35	30/ 32	129/130
								4.9/ 6.5	13.6/15.6	36.4/ 38.9	40/40	35/ 37	133/135
								6.5/ 8.7	18.0/20.9	41.9/ 45.5	45/50	40/ 43	138/141
								7.9/10.5	21.9/25.3	46.8/ 51.0	50/60	45/ 48	142/145
								12.0/16.0	33.3/38.5	61.0/ 67.5	70/70	58/ 64	153/158
	460-3-60	414	508	5.1	39.0	0.4	2.6	—	—	9.4	15	9	60
								6.0	7.2	18.4	20	18	68
								8.8	10.6	22.6	25	22	71
								11.5	13.8	26.6	30	25	74
								14.0	16.8	30.4	35	29	77
005 (4 Tons)	208/230-3-60	187	254	12.4	88.0	0.7	5.8	—/—	—/—	22.0/ 22.0	25/ 25	22/ 22	131/131
								4.9/ 6.5	13.6/15.6	39.0/ 41.5	40/ 45	37/ 40	144/146
								6.5/ 8.7	18.0/20.9	44.5/ 48.1	45/ 50	42/ 46	149/152
								12.0/16.0	33.3/38.5	63.6/ 70.1	70/ 80	60/ 66	164/169
								15.8/21.0	43.9/50.5	76.9/ 85.1	80/ 90	72/ 80	175/181††
	460-3-60	414	508	6.4	44.0	0.4	2.6	—	—	11.0	15	11	65
								6.0	7.2	20.0	20	19	73
								11.5	13.8	28.3	30	27	79
								14.0	16.8	32.0	35	30	82
								23.0	27.7	45.6	50	43	93
006 (5 Tons)	208/230-3-60	187	254	17.3	123.0	1.5	7.5	—/—	—/—	30.6/ 30.6	35/ 35	30/ 30	187/187
								4.9/ 6.5	13.6/15.6	47.6/ 50.1	50/ 60	46/ 48	200/202
								7.9/10.5	21.9/25.3	58.0/ 62.3	60/ 70	55/ 59	209/212
								12.0/16.0	33.3/38.5	72.3/ 78.8	80/ 80	69/ 75	220/225
								15.8/21.0	43.9/50.5	85.5/ 93.8	90/100	81/ 88	231/237**
								19.9/26.5	55.2/63.8	99.6/110.4	100/125	94/104	242/251**
	460-3-60	414	508	8.4	70.0	0.8	3.4	—	—	14.7	15	14	102
								6.0	7.2	23.7	25	23	109
								11.5	13.8	32.0	35	30	116
								14.0	16.8	35.7	40	34	119
								23.0	27.7	49.3	50	46	130
								25.5	30.7	52.3	60	49	132
007 (6 Tons)	208/230-3-60	187	254	20.5	156.0	1.4	7.5	—/—	—/—	34.5/ 34.5	35/ 35	34/ 34	219/219
								4.9/ 6.5	13.6/15.6	51.5/ 54.0	60/ 60	49/ 52	233/235
								7.9/10.5	21.9/25.3	61.9/ 66.2	70/ 70	59/ 63	241/244
								12.0/16.0	33.3/38.5	76.2/ 82.7	80/ 90	72/ 78	252/258
								15.8/21.0	43.9/50.5	89.4/ 97.7	90/100	84/ 92	263/270**
								19.9/26.5	55.2/63.8	103.5/114.3	110/125	97/107	274/283**
	460-3-60	414	508	9.6	70.0	0.6	3.4	—	—	16.0	20	16	107
								6.0	7.2	25.0	25	24	114
								11.5	13.8	33.3	35	32	120
								14.0	16.8	37.0	40	35	123
								23.0	27.7	50.6	60	47	134
								25.5	30.7	54.4	60	51	137

See Legend on page 15

Table 4C — 50HJQ Electrical Data — Standard Motor Units With Electrical Convenience Outlet

UNIT SIZE	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP**	FLA	LRA
004 (3 Tons)	208/230-1-60	187	254	16.0	88.0	0.7	4.9	—/—	—	30.4/ 30.4	35/ 35	30/ 30	106/106
								3.3/ 4.4	15.9/18.3	50.3/ 53.3	60/ 60	49/ 51	122/124
								4.9/ 6.5	23.6/27.1	59.9/ 64.3	60/ 70	58/ 62	130/133
								6.5/ 8.7	31.3/36.3	69.5/ 75.8	70/ 80	66/ 72	137/142
								7.9/10.5	38.0/43.8	77.9/ 85.2	80/ 90	74/ 81	144/150††
								9.8/13.0	47.1/54.2	89.3/ 98.2	90/100	85/ 93	153/160††
	208/230-3-60	187	254	10.3	77.0	0.7	4.9	—/—	—/—	23.3/ 23.3	25/ 25	24/ 24	95/ 95
								3.3/ 4.4	9.2/10.6	34.8/ 36.5	35/ 40	34/ 36	104/106
								4.9/ 6.5	13.6/15.6	40.3/ 42.8	45/ 45	39/ 42	109/111
								6.5/ 8.7	18.0/20.9	45.8/ 49.4	50/ 50	45/ 48	113/116
								7.9/10.5	21.9/25.3	50.7/ 54.9	60/ 60	49/ 53	117/120
								12.0/16.0	33.3/38.5	64.9/ 71.4	70/ 80	62/ 68	128/134
	460-3-60	414	508	5.1	39.0	0.4	2.2	—	—	11.2	15	11	48
								6.0	7.2	20.2	25	20	55
								8.8	10.6	24.4	25	24	59
								11.5	13.8	28.4	30	27	62
								14.0	16.8	32.2	35	31	65
005 (4 Tons)	208/230-1-60	187	254	18.3	109.0	0.7	4.9	—/—	—/—	33.3/ 33.0	35/ 35	33/ 33	127/127
								3.3/ 4.4	15.9/18.3	53.2/ 56.2	60/ 60	51/ 54	143/145
								6.5/ 8.7	31.3/36.3	72.4/ 78.7	80/ 80	69/ 75	158/163††
								9.8/13.0	47.1/54.2	92.2/101.0	100/110	87/ 95	174/181††
								13.1/17.4	63.0/72.5	112.0/123.9	125/125	105/116	190/200††
								15.8/21.0	76.0/87.5	128.3/142.7	150/150	120/134	203/215††
	208/230-3-60	187	254	12.4	88.0	0.7	4.9	—/—	—/—	25.9/ 25.9	30/ 30	26/ 26	106/106
								4.9/ 6.5	13.6/15.6	42.9/ 45.4	45/ 50	42/ 44	120/122
								6.5/ 8.7	18.0/20.9	48.4/ 52.0	50/ 60	47/ 50	124/127
								12.0/16.0	33.3/38.5	67.5/ 74.0	70/ 80	65/ 71	139/145
								15.8/21.0	43.9/50.5	80.8/ 89.0	90/ 90	77/ 84	150/157††
	460-3-60	414	508	6.4	44.0	0.4	2.2	—	—	12.8	15	13	53
								6.0	7.2	21.8	25	21	60
								11.5	13.8	30.0	35	29	67
								14.0	16.8	33.8	35	32	70
								23.0	27.7	47.4	50	45	81
006 (5 Tons)	208/230-1-60	187	254	25.0	150.0	1.5	7.6	—/—	—	45.2/ 45.2	50/ 50	45/ 45	193/193
								4.9/ 6.5	23.6/27.1	74.7/ 79.0	80/ 80	72/ 76	216/220††
								6.5/ 8.7	31.3/36.3	84.3/ 90.5	90/100	81/ 86	224/229††
								9.8/16.0	47.1/54.2	104.0/112.9	110/125	99/107	240/247††
								13.1/17.4	63.0/72.5	123.9/135.8	125/150	117/128	256/265††
								15.8/21.0	76.0/87.5	140.2/154.5	150/175	132/145	269/280††
	208/230-3-60	187	254	17.3	123.0	1.5	5.8	—/—	—/—	33.7/ 33.7	35/ 35	34/ 34	173/173
								4.9/ 6.5	13.6/15.6	50.7/ 53.2	60/ 60	49/ 52	186/188
								7.9/10.5	21.9/25.3	61.1/ 65.4	70/ 70	59/ 63	194/198
								12.0/16.0	33.3/38.5	75.4/ 81.9	80/ 90	72/ 78	206/211
								15.8/21.0	43.9/50.5	88.6/ 96.9	90/100	84/ 92	216/223††
								19.9/26.5	55.2/63.8	102.7/113.5	110/125	97/107	228/236††
	460-3-60	414	508	9.0	62.0	0.8	2.6	—	—	16.1	20	16	95
								6.0	7.2	25.1	30	24	102
								11.5	13.8	33.3	35	32	108
								14.0	16.8	37.1	40	35	111
								23.0	27.7	50.7	60	48	122
								25.5	30.7	53.7	60	51	125
007 (6 Tons)	208/230-3-60	187	254	20.5	156.0	1.4	5.8	—/—	—/—	37.6/ 37.6	40/ 40	37/ 37	205/205
								4.9/ 6.5	13.6/15.6	54.6/ 57.1	60/ 60	53/ 55	219/221
								7.9/10.5	21.9/25.3	65.0/ 69.3	70/ 70	63/ 66	227/230
								12.0/16.0	33.3/38.5	79.3/ 85.8	80/ 90	76/ 82	238/243††
								15.8/21.0	43.9/50.5	92.5/100.8	100/110	88/ 95	249/255††
								19.9/26.5	55.2/63.8	106.6/117.4	110/125	101/111	260/269††
	460-3-60	414	508	9.6	70.0	0.6	2.6	—	—	17.4	20	17	99
								6.0	7.2	26.4	30	26	106
								11.5	13.8	34.6	35	33	113
								14.0	16.8	38.4	40	37	116
								23.0	27.7	52.0	60	49	127
								25.5	30.7	55.8	60	53	130

Table 4D — 50HJQ Electrical Data — High-Static Motor Units With Electrical Convenience Outlet

UNIT SIZE	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP**	FLA	LRA
004 (3 Tons)	208/230-3-60	187	254	10.3	77.0	0.7	5.8	—/—	—/—	24.2/ 24.2	25/ 25	25/ 25	124/124
								3.3/ 4.4	9.2/10.6	35.7/ 37.4	40/ 40	35/ 37	134/135
								4.9/ 6.5	13.6/15.6	41.2/ 43.7	45/ 45	40/ 43	138/140
								6.5/ 8.7	18.0/20.9	46.7/ 50.3	50/ 60	46/ 49	142/145
								7.9/10.5	21.9/25.3	51.6/ 55.8	60/ 60	50/ 54	146/150
								12.0/16.0	33.3/38.5	65.8/ 72.3	70/ 80	63/ 69	158/163
	460-3-60	414	508	5.1	39.0	0.4	2.6	—	—	11.6	15	12	63
								6.0	7.2	20.6	25	20	70
								8.8	10.6	24.8	25	24	73
								11.5	13.8	28.8	30	28	76
								14.0	16.8	33.6	35	31	79
005 (4 Tons)	208/230-3-60	187	254	12.4	88.0	0.7	5.8	—/—	—/—	26.8/ 26.8	30/ 30	27/ 27	135/135
								4.9/ 6.5	13.6/15.6	43.8/ 46.3	45/ 50	43/ 45	149/151
								6.5/ 8.7	18.0/20.9	49.3/ 52.9	50/ 60	48/ 51	153/156
								12.0/16.0	33.3/38.5	68.4/ 74.9	70/ 80	66/ 72	169/174
								15.8/21.0	43.9/50.5	81.7/ 89.9	90/ 90	78/ 85	179/186††
	460-3-60	414	508	6.4	44.0	0.4	2.6	—	—	13.2	15	13	68
								6.0	7.2	22.2	25	22	75
								11.5	13.8	28.9	30	28	80
								14.0	16.8	34.2	35	33	84
								23.0	27.7	47.8	50	45	95
006 (5 Tons)	208/230-3-60	187	254	17.3	123.0	1.5	7.5	—/—	—/—	35.4/ 35.4	40/ 40	36/ 36	192/192
								4.9/ 6.5	13.6/15.6	52.4/ 54.9	60/ 60	51/ 54	205/207
								7.9/10.5	21.9/25.3	62.8/ 67.1	70/ 70	61/ 65	213/217
								12.0/16.0	33.3/38.5	77.1/ 83.6	80/ 90	74/ 80	225/230††
								15.8/21.0	43.9/50.5	90.3/ 98.6	100/100	86/ 94	235/242††
								19.9/26.5	55.2/63.8	104.4/115.2	110/125	99/109	247/255††
	460-3-60	414	508	8.4	70.0	0.8	3.4	—	—	16.9	20	17	104
								6.0	7.2	25.9	30	25	111
								11.5	13.8	34.1	35	33	118
								14.0	16.8	37.9	40	36	121
								23.0	27.7	51.5	60	49	132
								25.5	30.7	54.5	60	52	134
007 (6 Tons)	208/230-3-60	187	254	20.5	156.0	1.4	7.5	—/—	—/—	39.3/ 39.3	40/ 40	39/ 39	224/224
								4.9/ 6.5	13.6/15.6	56.3/ 58.8	60/ 60	55/ 57	238/240
								7.9/10.5	21.9/25.3	66.7/ 71.0	70/ 80	65/ 68	246/249
								12.0/16.0	33.3/38.5	81.0/ 87.5	90/ 90	78/ 84	257/262††
								15.8/21.0	43.9/50.5	94.2/102.5	100/110	90/ 97	268/274††
								19.9/26.5	55.2/63.8	108.3/119.1	110/125	103/113	279/288††
	460-3-60	414	508	9.6	70.0	0.6	3.4	—	—	18.2	20	18	109
								6.0	7.2	27.2	30	26	116
								11.5	13.8	35.4	40	34	123
								14.0	16.8	39.2	40	37	126
								23.0	27.7	52.8	60	50	136
								25.5	30.7	56.6	60	53	139

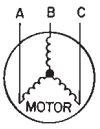
See Legend on page 15

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

*Heater capacity (kW) is based on heater voltage of 208 v, 240 v, or 480 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.
†Heaters are field installed only.
**Fuse or HACR circuit breaker.
††Electrical disconnect cannot be used if electric heater is installed.
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.
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 percentage 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.

Table 5A — 50HEQ Electrical Data — Standard Motor Units Without Electrical Convenience Outlet

UNIT SIZE	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP	FLA	LRA
003 (3 Tons)	208/230-1-60	187	254	10.9	63.0	0.7	2.0	—/—	—/—	16.3/ 16.3	20/ 20**	16/ 16	69/69
								3.3/ 4.4	15.9/18.3	36.2/ 39.2	40/ 40**	34/ 37	84/87
								4.9/ 6.5	23.6/27.1	45.8/ 50.2	50/ 60**	43/ 47	92/96
								6.5/ 8.7	31.3/36.3	55.5/ 61.7	60/ 70	52/ 57	100/105
								7.9/10.5	38.0/43.8	63.8/ 71.1	70/ 80	59/ 66	107/112
004 (3 Tons)	208/230-1-60	187	254	16.0	88.0	0.7	4.9	—/—	—/—	25.6/ 25.6	30/ 30**	25/ 25	101/101
								3.3/ 4.4	15.9/18.3	45.5/ 48.5	50/ 50**	43/ 46	117/120
								4.9/ 6.5	23.6/27.1	55.1/ 59.5	60/ 60**	52/ 56	125/128
								6.5/ 8.7	31.3/36.3	64.7/ 71.0	70/ 80	61/ 67	133/138
								7.9/10.5	38.0/43.8	73.1/ 80.4	80/ 90	69/ 75	139/145
								9.8/13.0	47.1/54.2	84.5/ 93.4	90/100	79/ 87	148/155††
	208/230-3-60	187	254	10.3	77.0	0.7	4.9	—/—	—/—	18.5/ 18.5	20/20**	18/ 18	90/ 90
								3.3/ 4.4	9.2/10.6	30.0/ 31.7	30/35**	29/ 30	99/101
								4.9/ 6.5	13.6/15.6	35.5/ 38.0	40/40**	34/ 36	104/106
								6.5/ 8.7	18.0/20.9	41.0/ 44.6	45/45**	39/ 42	108/111
								7.9/10.5	21.9/25.3	45.9/ 50.1	50/60**	43/ 47	112/116
								12.0/16.0	33.3/38.5	60.1/ 66.6	70/70	57/ 63	124/129
	460-3-60	414	508	5.1	39.0	0.4	2.2	—	—	9.0	15**	9	46
								6.0	7.2	18.0	20**	17	53
								8.8	10.6	22.2	25**	21	57
								11.5	13.8	26.2	30**	25	60
								14.0	16.8	30.0	30**	28	63
005 (4 Tons)	208/230-1-60	197	254	21	115.0	0.7	4.9	—/—	—/—	31.9/ 31.9	35/ 35**	31/ 31	128/128
								3.3/ 4.4	15.9/18.3	51.7/ 54.7	60/ 60**	49/ 52	144/147
								6.5/ 8.7	31.3/36.3	71.0/ 77.2	80/ 80	67/ 72	160/165
								9.8/13.0	47.1/54.2	90.7/ 99.6	100/100	85/ 93	175/182††
								13.1/17.4	63.0/72.5	110.6/122.5	125/125	103/114	191/201††
								15.8/21.0	76.0/87.5	126.9/141.2	150/150	118/131	204/216††
	208/230-3-60	187	254	14.1	95.0	0.7	4.9	—/—	—/—	23.2/23.2	25/25**	23/ 23	108/108
								4.9/ 6.5	13.6/15.6	40.2/42.7	45/45**	38/ 41	122/124
								6.5/ 8.7	18.0/20.9	45.7/49.4	50/50**	43/ 47	126/129
								12.0/16.0	33.3/38.5	64.9/71.4	70/80	61/ 67	142/147
								15.8/21.0	43.9/50.5	78.1/86.4	80/90	73/ 81	152/159
	460-3-60	414	508	7.1	45.0	0.4	2.2	—	—	11.5	15**	11	52
								6.0	7.2	20.5	25**	19	59
								11.5	13.8	28.7	30**	27	66
								14.0	16.8	32.5	35**	30	69
								23.0	27.7	46.1	50**	43	80
006 (5 Tons)	208/230-1-60	187	254	25.0	150.0	1.5	7.6	—/—	—	40.4/ 40.4	45/ 45**	39/ 39	188/188
								4.9/ 6.5	23.6/27.1	69.9/ 74.2	70/ 80	66/ 70	211/215
								6.5/ 8.7	31.3/36.3	79.5/ 85.7	80/ 90	75/ 81	219/224††
								9.8/16.0	47.1/54.2	99.2/108.1	100/110	93/102	235/242††
								13.1/17.4	63.0/72.5	119.1/131.0	125/150	112/123	251/260††
								15.8/21.0	76.0/87.5	135.4/149.7	150/150	127/140	264/275††
	208/230-3-60	187	254	17.3	123.0	1.5	5.8	—/—	—/—	28.9/ 28.9	30/ 30**	28/ 28	168/168
								4.9/ 6.5	13.6/15.6	45.9/ 48.4	50/ 50**	44/ 46	181/183
								7.9/10.5	21.9/25.3	56.3/ 60.6	60/ 70	53/ 57	190/193
								12.0/16.0	33.3/38.5	70.6/ 77.1	80/ 80	67/ 73	201/206
								15.8/21.0	43.9/50.5	83.8/ 92.1	90/100	79/ 86	212/218††
								19.9/26.5	55.2/63.8	97.9/108.7	100/110	92/102	223/232††
	460-3-60	414	508	8.4	70.0	0.8	2.6	—	—	13.9	15**	14	92
								6.0	7.2	22.9	25**	22	100
								11.5	13.8	31.2	35**	29	106
								14.0	16.8	34.9	35**	33	109
								23.0	27.7	48.5	50**	45	120
								25.0	30.1	51.5	60**	48	123

See Legend on page 20

Table 5B — 50HEQ Electrical Data — High-Static Motor Units Without Electrical Convenience Outlet

UNIT SIZE	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP**	FLA	LRA
004 (3 Tons)	208/230-3-60	187	254	10.3	77.0	0.7	5.8	—/—	—/—	19.4/ 19.4	20/20	19/ 19	120/120
								3.3/ 4.4	9.2/10.6	30.9/ 32.6	35/35	30/ 32	129/130
								4.9/ 6.5	13.6/15.6	36.4/ 38.9	40/40	35/ 37	133/135
								6.5/ 8.7	18.0/20.9	41.9/ 45.5	45/50	40/ 43	138/141
								7.9/10.5	21.9/25.3	46.8/ 51.0	50/60	45/ 48	142/145
								12.0/16.0	33.3/38.5	61.0/ 67.5	70/70	58/ 64	153/158
	460-3-60	414	508	5.1	39.0	0.4	2.6	—	—	9.4	15	9	60
								6.0	7.2	18.4	20	18	68
								8.8	10.6	22.6	25	22	71
								11.5	13.8	26.6	30	25	74
								14.0	16.8	30.4	35	29	77
005 (4 Tons)	208/230-3-60	187	254	14.1	95.0	0.7	5.8	—/—	—/—	24.1/ 24.1	25/ 25	24/ 24	138/138
								4.9/ 6.5	13.6/15.6	41.1/ 43.6	45/ 45	39/ 42	151/153
								6.5/ 8.7	18.0/20.9	46.6/ 50.3	50/ 60	44/ 48	159/159
								12.0/16.0	33.3/38.5	65.8/ 72.3	70/ 80	62/ 68	171/176
								15.8/21.0	43.9/50.5	79.0/ 87.3	80/ 90	74/ 82	182/188††
	460-3-60	414	508	7.1	45.0	0.4	2.6	—	—	11.9	15	12	66
								6.0	7.2	20.9	25	20	74
								11.5	13.8	29.1	30	27	80
								14.0	16.8	32.9	35	31	83
								23.0	27.7	46.5	50	43	94
006 (5 Tons)	208/230-3-60	187	254	17.3	123.0	1.5	7.5	—/—	—/—	30.6/ 30.6	35/ 35	30/ 30	187/187
								4.9/ 6.5	13.6/15.6	47.6/ 50.1	50/ 60	46/ 48	200/202
								7.9/10.5	21.9/25.3	58.0/ 62.3	60/ 70	55/ 59	209/212
								12.0/16.0	33.3/38.5	72.3/ 78.8	80/ 80	69/ 75	220/225
								15.8/21.0	43.9/50.5	85.5/ 93.8	90/100	81/ 88	231/237**
								19.9/26.5	55.2/63.8	99.6/110.4	100/125	94/104	242/251**
	460-3-60	414	508	8.4	70.0	0.8	3.4	—	—	14.7	15	14	102
								6.0	7.2	23.7	25	23	109
								11.5	13.8	32.0	35	30	116
								14.0	16.8	35.7	40	34	119
								23.0	27.7	49.3	50	46	130
								25.5	30.1	52.3	60	49	132

See Legend on page 20

Table 5C — 50HEQ Electrical Data — Standard Motor Units With Electrical Convenience Outlet

UNIT SIZE	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP**	FLA	LRA
003 (3 Tons)	208/230-1-60	187	254	10.9	63.0	0.7	2.0	—/—	—	21.1/ 21.1	25/ 25	21/ 21	73/73
								3.3/ 4.4	15.9/18.3	41.0/ 44.0	45/ 45	39/ 42	89/92
								4.9/ 6.5	23.6/27.1	50.6/ 55.0	60/ 60	48/ 52	97/100
								6.5/ 8.7	31.3/36.3	60.3/ 66.5	70/ 70	57/ 63	105/110
								7.9/10.5	38.0/43.8	68.6/ 75.9	70/ 80	65/ 72	111/117
004 (3 Tons)	208/230-1-60	187	254	16.0	88.0	0.7	4.9	—/—	—	30.4/ 30.4	35/ 35	30/ 30	106/106
								3.3/ 4.4	15.9/18.3	50.3/ 53.3	60/ 60	49/ 51	122/124
								4.9/ 6.5	23.6/27.1	59.9/ 64.3	60/ 70	58/ 62	130/133
								6.5/ 8.7	31.3/36.3	69.5/ 75.8	70/ 80	66/ 72	137/142
								7.9/10.5	38.0/43.8	77.9/ 85.2	80/ 90	74/ 81	144/150††
								9.8/13.0	47.1/54.2	89.3/ 98.2	90/100	85/ 93	153/160††
	208/230-3-60	187	254	10.3	77.0	0.7	4.9	—/—	—/—	23.3/ 23.3	25/ 25	24/ 24	95/ 95
								3.3/ 4.4	9.2/10.6	34.8/ 36.5	35/ 40	34/ 36	104/106
								4.9/ 6.5	13.6/15.6	40.3/ 42.8	45/ 45	39/ 42	109/111
								6.5/ 8.7	18.0/20.9	45.8/ 49.4	50/ 50	45/ 48	113/116
								7.9/10.5	21.9/25.3	50.7/ 54.9	60/ 60	49/ 53	117/120
								12.0/16.0	33.3/38.5	64.9/ 71.4	70/ 80	62/ 68	128/134
	460-3-60	414	508	5.1	39.0	0.4	2.2	—	—	11.2	15	11	48
								6.0	7.2	20.2	25	20	55
								8.8	10.6	24.4	25	24	59
								11.5	13.8	28.4	30	27	62
								14.0	16.8	32.2	35	31	65
005 (4 Tons)	208/230-1-60	197	254	21.0	115.0	0.7	4.9	—/—	—/—	36.7/ 36.7	40/ 40	36/ 36	133/133
								3.3/ 4.4	15.9/18.3	56.5/ 59.5	60/ 60	54/ 57	149/151
								6.5/ 8.7	31.3/36.3	75.8/ 82.0	80/ 90	72/ 78	164/169††
								9.8/13.0	47.1/54.2	95.5/104.4	100/110	90/ 98	180/187††
								13.1/17.4	63.0/72.5	115.4/127.3	125/150	109/119	196/206††
								15.8/21.0	76.0/87.5	131.7/146.0	150/150	124/137	209/221††
	208/230-3-60	187	254	14.1	95.0	0.7	4.9	—/—	—/—	28.0/ 28.0	30/ 30	28/ 28	113/113
								4.9/ 6.5	13.6/15.6	45.0/ 47.5	50/ 50	44/ 46	127/129
								6.5/ 8.7	18.0/20.9	50.5/ 54.2	60/ 60	49/ 52	134/134
								12.0/16.0	33.3/38.5	69.7/ 76.2	70/ 80	66/ 72	146/152
								15.8/21.0	43.9/50.5	82.9/ 91.2	90/ 100	79/ 86	157/164††
	460-3-60	414	508	7.1	45.0	0.4	2.2	—	—	13.7	15	14	54
								6.0	7.2	22.7	25	22	61
								11.5	13.8	30.9	35	30	68
								14.0	16.8	34.7	35	33	71
								23.0	27.7	48.3	50	46	82
006 (5 Tons)	208/230-1-60	187	254	25.0	150.0	1.5	7.6	—/—	—	45.2/ 45.2	50/ 50	45/ 45	193/193
								4.9/ 6.5	23.6/27.1	74.7/ 79.0	80/ 80	72/ 76	216/220††
								6.5/ 8.7	31.3/36.3	84.3/ 90.5	90/100	81/ 86	224/229††
								9.8/13.0	47.1/54.2	104.0/112.9	110/125	99/107	240/247††
								13.1/17.4	63.0/72.5	123.9/135.8	125/150	117/128	256/265††
								15.8/21.0	76.0/87.5	140.2/154.5	150/175	132/145	269/280††
	208/230-3-60	187	254	17.3	123.0	1.5	5.8	—/—	—/—	33.7/ 33.7	35/ 35	34/ 34	173/173
								4.9/ 6.5	13.6/15.6	50.7/ 53.2	60/ 60	49/ 52	186/188
								7.9/10.5	21.9/25.3	61.1/ 65.4	70/ 70	59/ 63	194/198
								12.0/16.0	33.3/38.5	75.4/ 81.9	80/ 90	72/ 78	206/211
								15.8/21.0	43.9/50.5	88.6/ 96.9	90/100	84/ 92	216/223††
								19.9/26.5	55.2/63.8	102.7/113.5	110/125	97/107	228/236††
	460-3-60	414	508	8.4	70.0	0.8	2.6	—	—	16.1	20	16	95
								6.0	7.2	25.1	30	24	102
								11.5	13.8	33.3	35	32	108
								14.0	16.8	37.1	40	35	111
								23.0	27.7	50.7	60	48	122
								25.0	30.1	53.7	60	51	125

See Legend on page 20

Table 5D — 50HEQ Electrical Data — High-Static Motor Units With Electrical Convenience Outlet

UNIT SIZE	NOMINAL VOLTAGE V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OFM	IFM	ELECTRIC HEAT*		POWER SUPPLY		MINIMUM UNIT DISCONNECT SIZE	
		Min	Max	RLA	LRA	FLA	FLA	kW†	FLA	MCA	MOCP**	FLA	LRA
004 (3 Tons)	208/230-3-60	187	254	10.3	77.0	0.7	5.8	—/—	—/—	24.2/ 24.2	25/ 25	25/ 25	124/124
								3.3/ 4.4	9.2/10.6	35.7/ 37.4	40/ 40	35/ 37	134/135
								4.9/ 6.5	13.6/15.6	41.2/ 43.7	45/ 45	40/ 43	138/140
								6.5/ 8.7	18.0/20.9	46.7/ 50.3	50/ 60	46/ 49	142/145
								7.9/10.5	21.9/25.3	51.6/ 55.8	60/ 60	50/ 54	146/150
								12.0/16.0	33.3/38.5	65.8/ 72.3	70/ 80	63/ 69	158/163
	460-3-60	414	508	5.1	39.0	0.4	2.6	—	—	11.6	15	12	63
								6.0	7.2	20.6	25	20	70
								8.8	10.6	24.8	25	24	73
								11.5	13.8	28.8	30	28	76
								14.0	16.8	32.6	35	31	79
005 (4 Tons)	208/230-3-60	187	254	14.1	95.0	0.7	5.8	—/—	—/—	24.1/ 24.1	25/ 25	24/ 24	138/138
								4.9/ 6.5	13.6/15.6	41.1/ 43.6	45/ 45	39/ 42	151/153
								6.5/ 8.7	18.0/20.9	46.6/ 50.3	50/ 60	44/ 48	156/159
								12.0/16.0	33.3/38.5	65.8/ 72.3	70/ 80	62/ 68	171/176
								15.8/21.0	43.9/50.5	79.0/ 87.3	80/ 90	74/ 82	182/188††
	460-3-60	414	508	7.1	45.0	0.4	2.6	—	—	14.1	15	14	69
								6.0	7.2	23.1	25	22	76
								10.5	12.6	29.8	30	29	81
								14.0	16.8	35.1	40	33	85
								23.0	27.7	48.7	50	46	96
006 (5 Tons)	208/230-3-60	187	254	17.3	123.0	1.5	7.5	—/—	—/—	35.4/ 35.4	40/ 40	36/ 36	192/192
								4.9/ 6.5	13.6/15.6	52.4/ 54.9	60/ 60	51/ 54	205/207
								7.9/10.5	21.9/25.3	62.8/ 67.1	70/ 70	61/ 65	213/217
								12.0/16.0	33.3/38.5	77.1/ 83.6	80/ 90	74/ 80	225/230††
								15.8/21.0	43.9/50.5	90.3/ 98.6	100/100	86/ 94	235/242††
								19.9/26.5	55.2/63.8	104.4/115.2	110/125	99/109	247/255††
	460-3-60	414	508	8.4	70.0	0.8	3.4	—	—	16.9	20	17	104
								6.0	7.2	25.9	30	25	111
								11.5	13.8	34.1	35	33	118
								14.0	16.8	37.9	40	36	121
								23.0	27.7	51.5	60	49	132
								25.0	30.1	54.5	60	52	134

See Legend on page 20.

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

*Heater capacity (kW) is based on heater voltage of 208 v, 240 v, or 480 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.

†Heaters are field installed only.

**Fuse or HACR circuit breaker.

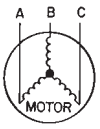
††Electrical disconnect cannot be used if electric heater is installed.

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.
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 percentage 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

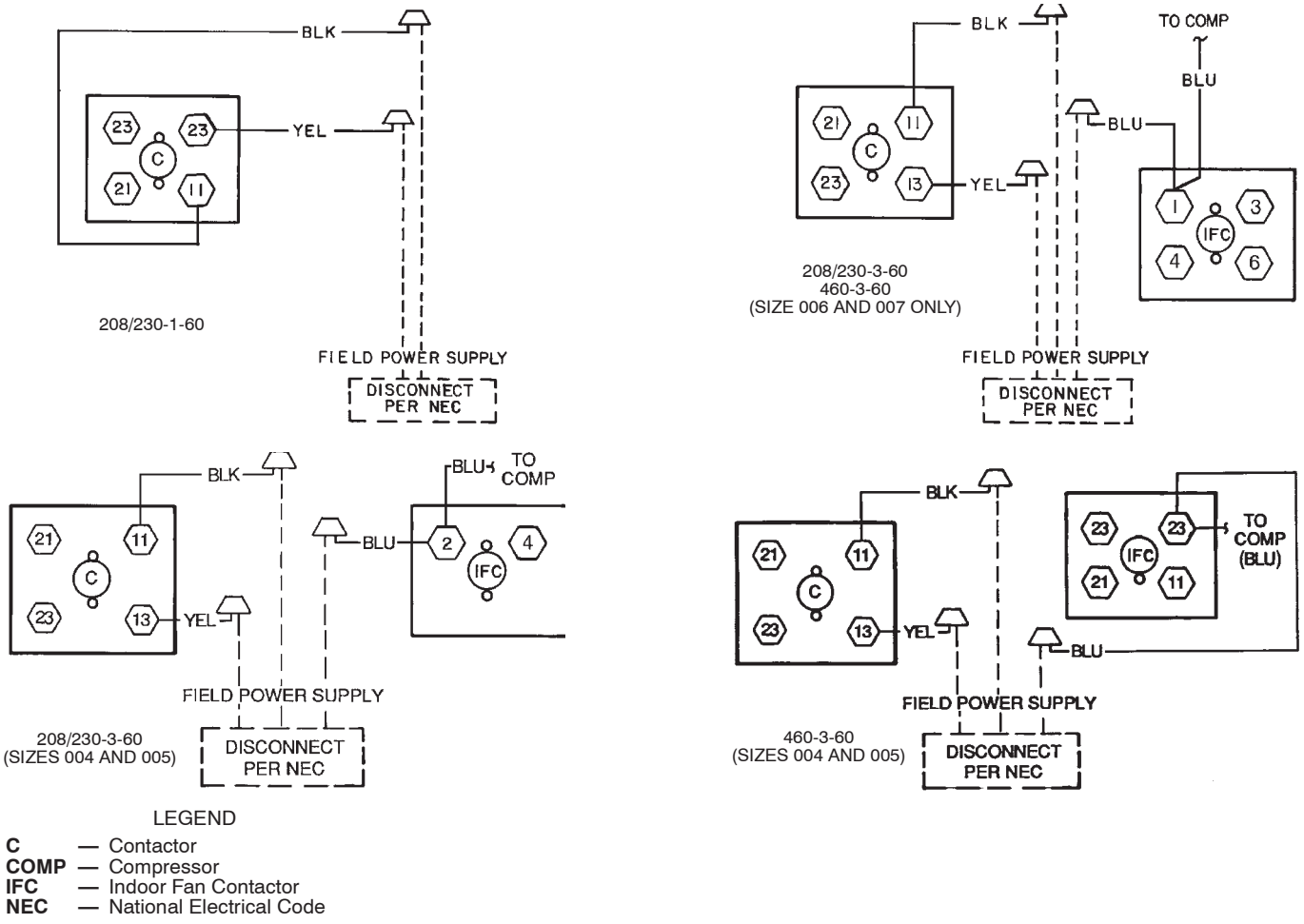
Maximum deviation is 7 v.

Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100 \times \frac{7}{457} = 1.53\%$$

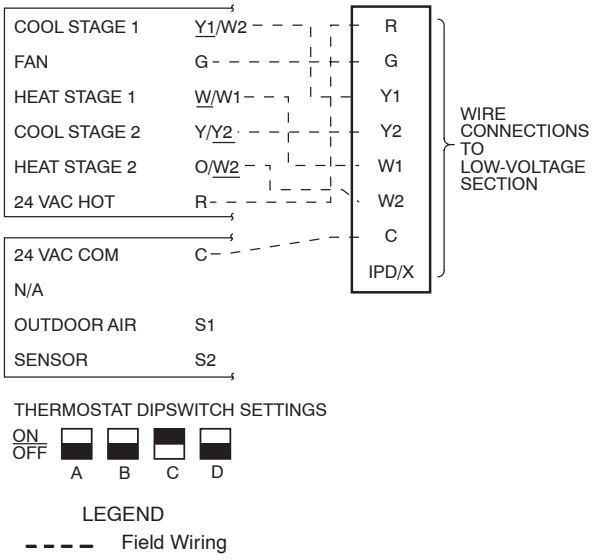
This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

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



C06007

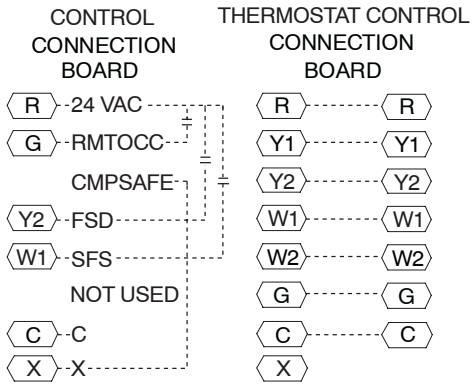
Fig. 8 – Power Wiring Connections



NOTE: Underlined letter indicates active thermostat output when configured for A/C operation.

C06008

Fig. 9 – Low-Voltage Connections With or Without Economizer or Two-Position Damper



C06009

Fig. 10 – Low Voltage Connections (Units with PremierLink™ Controls)

FIELD CONTROL WIRING

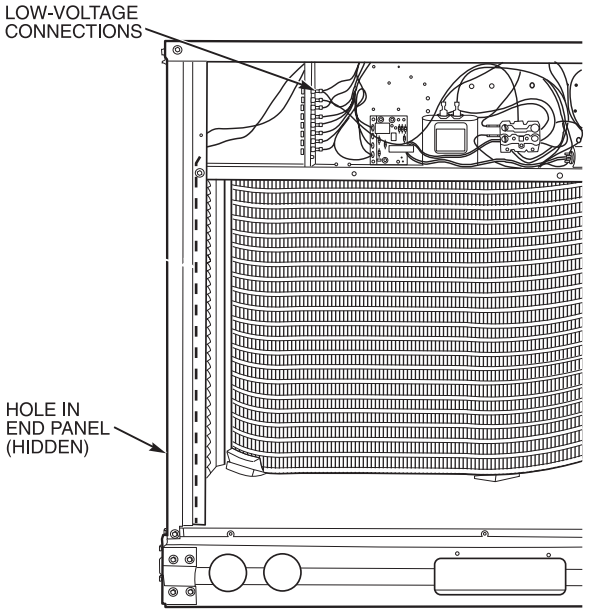
Install a Carrier-approved accessory thermostat assembly according to the installation instructions included with the thermostat. Locate the thermostat assembly on a solid wall in the conditioned space to sense the average temperature in accordance with thermostat installation instructions.

NOTE: If using a Carrier electronic thermostat, set the thermostat configuration for "non-heat pump operation." This family of products does not require the O terminal to energize the reversing valve.

Route the thermostat cable or equivalent single leads of colored wire from the subbase terminals to the low-voltage connections on the unit (shown in Fig. 9 and 10) as described in Steps 1 and 2 below.

NOTE: For wire runs up to 50 ft, use no. 18 AWG (American Wire gauge) 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. Connect the thermostat wires to the screw terminals on the low voltage connection board.
2. Feed the control wires through one of the provided holes in control box. Some models may be equipped with a raceway built into the corner post located on the left side of control box (See Fig. 11.) This raceway provides the required clearance between high-voltage and low voltage wiring. For models without a raceway, ensure to provide the NEC required clearance between the high-voltage and low-voltage wiring.

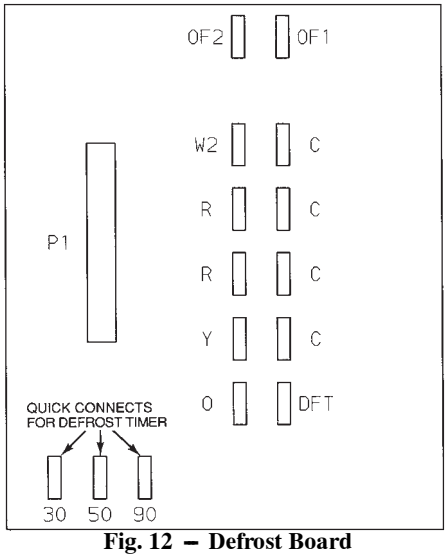


C06010

Fig. 11 – Field Control Wiring

DEFROST BOARD

The defrost board timer is factory set for a 30 minute defrost cycle. To adjust it to a 50 or 90 minute cycle, remove the wire connected to the 30 minute quick connect on the defrost board. (See Fig. 12.) Connect the lead to the 50 or 90 minute quick connect on the defrost board, depending on the application.



C06011

Fig. 12 – Defrost Board

STEP 6 —ADJUST FACTORY-INSTALLED OPTIONS

DISCONNECT SWITCH

The optional disconnect switch is non-fused. The switch can be locked in place for safety purposes. The disconnect switch is only available for limited applications. See Electrical Data Tables 4A-4D and 5A-5D for disconnect switch usage.

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 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 the amount of ventilation required for the building. Record the amount for use in Step 8.
2. Remove the filter access panel by raising the panel and swinging it outward. The panel is now disengaged from the track and can be removed. No tools are required to remove the filter access panel. Remove the outdoor-air opening panel. Save the panels and screws. (See Fig. 13.)
3. Separate the hood and screen from the basepan by removing the screws and brackets securing them. Save all screws and discard the brackets.
4. Replace the outdoor air opening panel.
5. Place the hood on the front of the outdoor air opening panel. See Fig. 14 for hood details. Secure the top of the hood with the 6 screws removed in Step 3. (See Fig. 15.)

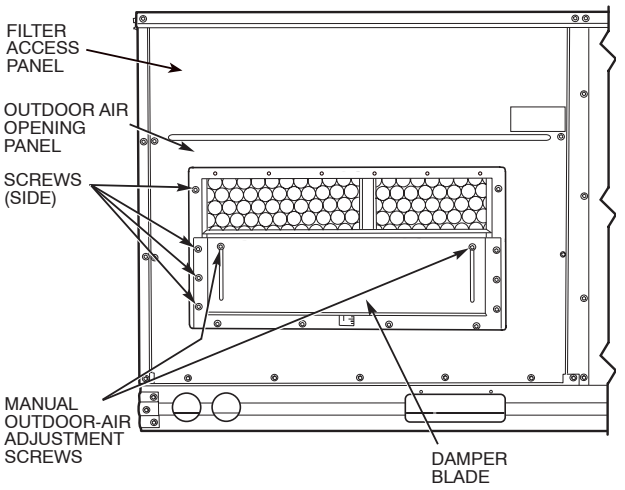


Fig. 13 – Damper Panel with Manual Outdoor-Air Damper Installed

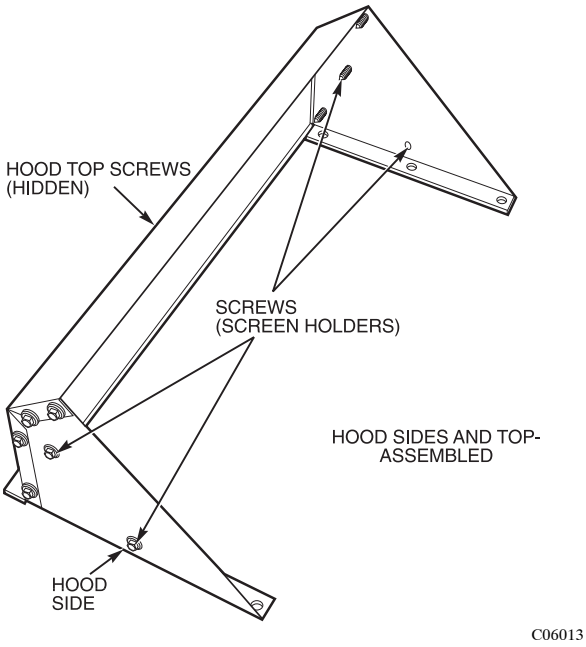


Fig. 14 – Outdoor-Air Hood Details

6. Remove and save the 8 screws (4 on each side) from the sides of the manual outdoor-air damper.
7. Align the screw holes on the hood with the screw holes on the side of manual outdoor-air damper. (See Fig. 14 and 15.) Secure the hood with 8 screws from Step 6.
8. Adjust the minimum position setting of the damper blade by adjusting the manual outdoor-air adjustment screws on the front of the damper blade. (See Fig. 13.) Slide the blade vertically until it is in the appropriate position determined by Fig. 16. Tighten the screws.
9. Remove and save the screws currently on the sides of hood. Insert the screen. Secure the screen to the hood using the screws. (See Fig. 15.)
10. Replace the filter access panel. Ensure that the filter access panel slides along the tracks and is securely engaged.

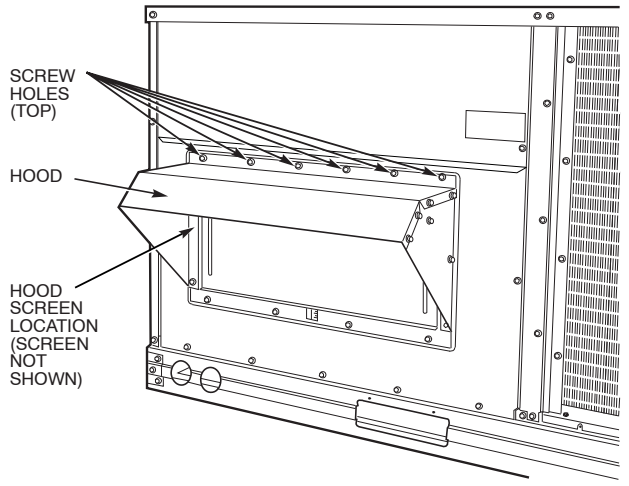


Fig. 15 – Optional Manual Outdoor-Air Damper with Hood Attached

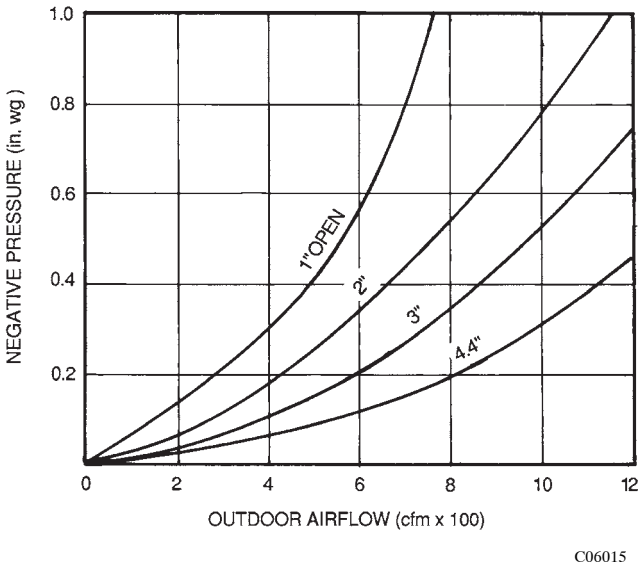


Fig. 16 – Outdoor Air Damper Position Setting

PREMIERLINK™ CONTROL

The PremierLink controller (See Fig. 17 and 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). No sensors are supplied with the field-mounted PremierLink control. The factory-installed PremierLink control includes only the supply-air sensor (SAT) and the outdoor air temperature sensor (OAT) as standard. An indoor air quality (CO_2) sensor can be added as an option. Refer to Table 6 for sensor usage. Refer to Fig. 19 for PremierLink controller wiring. The PremierLink control may be mounted in the control panel or an area below the control panel.

NOTE: PremierLink controller versions 1.3 and later are shipped in sensor mode. If used with a thermostat, the PremierLink controller must be configured to Thermostat mode.

Install the Supply Air Temperature Sensor (SAT)

When the unit is supplied with a factory-mounted PremierLink control, 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

Table 6 — PremierLink™ Sensor Usage

APPLICATION	OUTDOOR AIR TEMPERATURE SENSOR	RETURN AIR TEMPERATURE SENSOR	OUTDOOR AIR ENTHALPY SENSOR	RETURN AIR ENTHALPY SENSOR
Dry Bulb Temperature with PremierLink* (PremierLink requires 4-20 mA Actuator)	Included – HH79NZ017	—	—	—
Differential Dry Bulb Temperature with PremierLink* (PremierLink requires 4-20 mA Actuator)	Included – 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

*PremierLink control requires Supply Air Temperature sensor 33ZCSENSAT and Outdoor Air Temperature sensor HH79NZ017
— 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 set point.
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 and Outdoor Air Temperature Sensor HH79NZ017)
Compressor Lockout Sensor — 50HJ540570 — Opens at 35°F, closes at 50°F.

The SAT probe is wire-tied to the supply-air opening (on the horizontal opening end) in its shipping position. Remove the sensor for installation. Re-position the sensor in the flange of the supply-air opening or in the supply air duct (as required by local codes). Drill or punch a 1/2-in. hole in the flange or duct. Use two field-supplied, self-drilling screws to secure the sensor probe in a horizontal orientation.

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

Outdoor Air Temperature Sensor (OAT)

When the unit is supplied with a factory-mounted PremierLink control, the outdoor-air temperature sensor (OAT) is factory-supplied and wired.

Install the Indoor Air Quality (CO_2) Sensor

Mount the optional indoor air quality (CO_2) sensor according to manufacturer specifications.

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

Wire the CO_2 sensor to the COM and IAQI terminals of J5 on the PremierLink controller. Refer to the PremierLink Installation, Start-up, and Configuration Instructions for detailed wiring and configuration information.

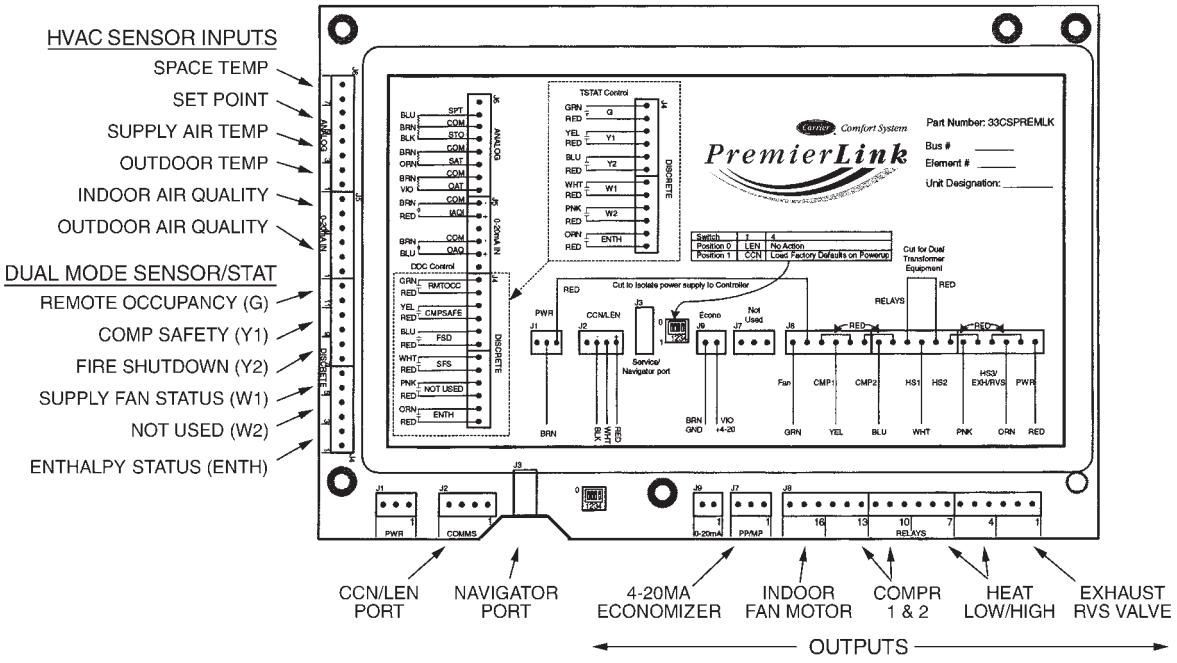
Enthalpy Sensors and Control

The enthalpy control (HH57AC077) is supplied as a field-installed accessory to be used with the economizer damper control option. The outdoor air enthalpy sensor is part of the enthalpy control. The separate field-installed accessory return air enthalpy sensor (HH57AC078) is required for differential enthalpy control.

NOTE: The enthalpy control must be set to the "D" setting for differential enthalpy control to work properly.

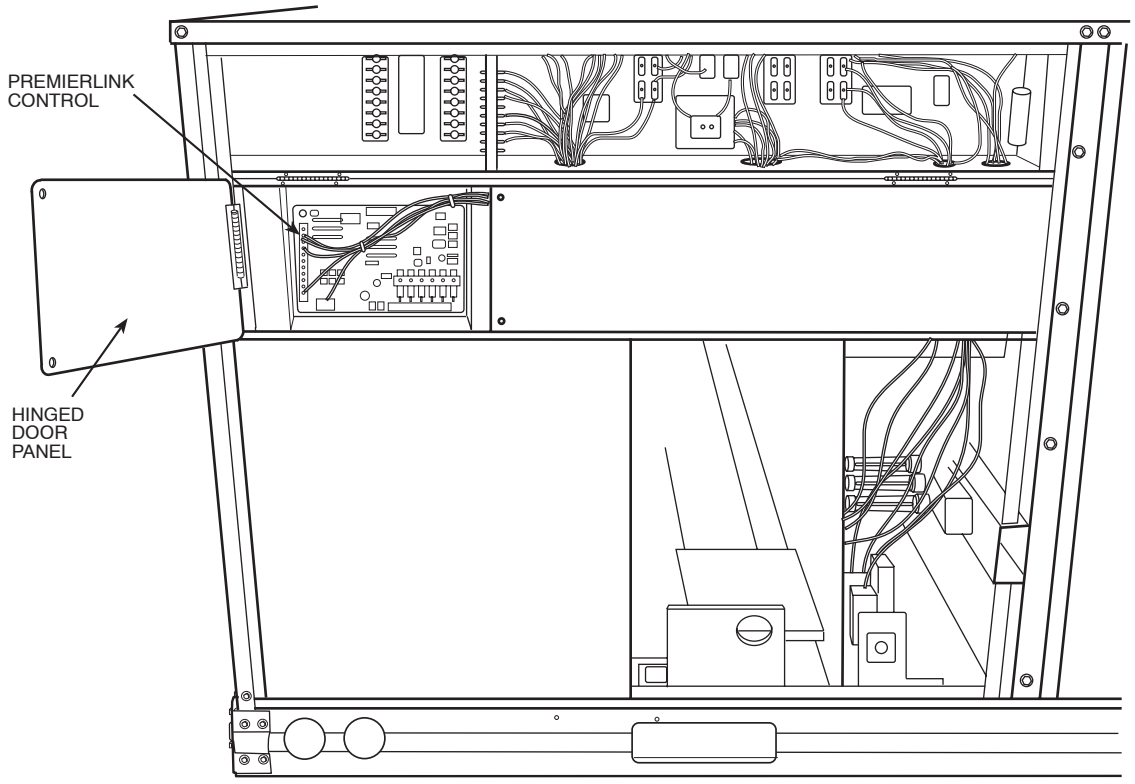
The enthalpy control receives the indoor and return enthalpy from the outdoor and return air enthalpy sensors and provides a dry contact switch input to the PremierLink controller. Locate the controller in place of an existing economizer controller or near the actuator. The mounting plate may not be needed if existing bracket is used.

A closed contact indicates that outside air is preferred to the return air. An open contact indicates that the economizer should remain at minimum position.



C06016

Fig. 17 – Factory Installed PremierLink™ Controller



C06017

Fig. 18 – Factory Installed PremierLink™
(Shown Installed on Unit with Hinged Access Panel Option)

Outdoor Air Enthalphy Sensor/Enthalpy Controller (HH57AC077)

To wire the outdoor air enthalpy sensor, perform the following (See Fig. 20 and 21):

NOTE: The outdoor air sensor can be removed from the back of the enthalpy controller and mounted remotely.

1. Use a 4-conductor, 18 or 20 AWG cable to connect the enthalpy control to the PremierLink™ controller and power transformer.
2. Connect the following 4 wires from the wire harness located in rooftop unit to the enthalpy controller:
   a. Connect the BRN wire to the 24 vac terminal (TR1) on enthalpy control and to pin 1 on 12-pin harness.

b. Connect the RED wire to the 24 vac GND terminal (TR) on enthalpy sensor and to pin 4 on 12-pin harness.

c. Connect the GRAY/ORN wire to J4-2 on PremierLink controller and to terminal (3) on enthalpy sensor.

d. Connect the GRAY/RED wire to J4-1 on PremierLink controller and to terminal (2) on enthalpy sensor.

NOTE: If installing in a Carrier rooftop, use the two gray wires provided from the control section to the economizer to connect PremierLink controller to terminals 2 and 3 on enthalpy sensor.

Return Air Enthalpy Sensor

Mount the return-air enthalpy sensor (HH57AC078) in the return-air duct. The return air sensor is wired to the enthalpy controller (HH57AC077). The outdoor enthalpy changeover set point is set at the controller.

To wire the return air enthalpy sensor, perform the following (See Fig. 20):

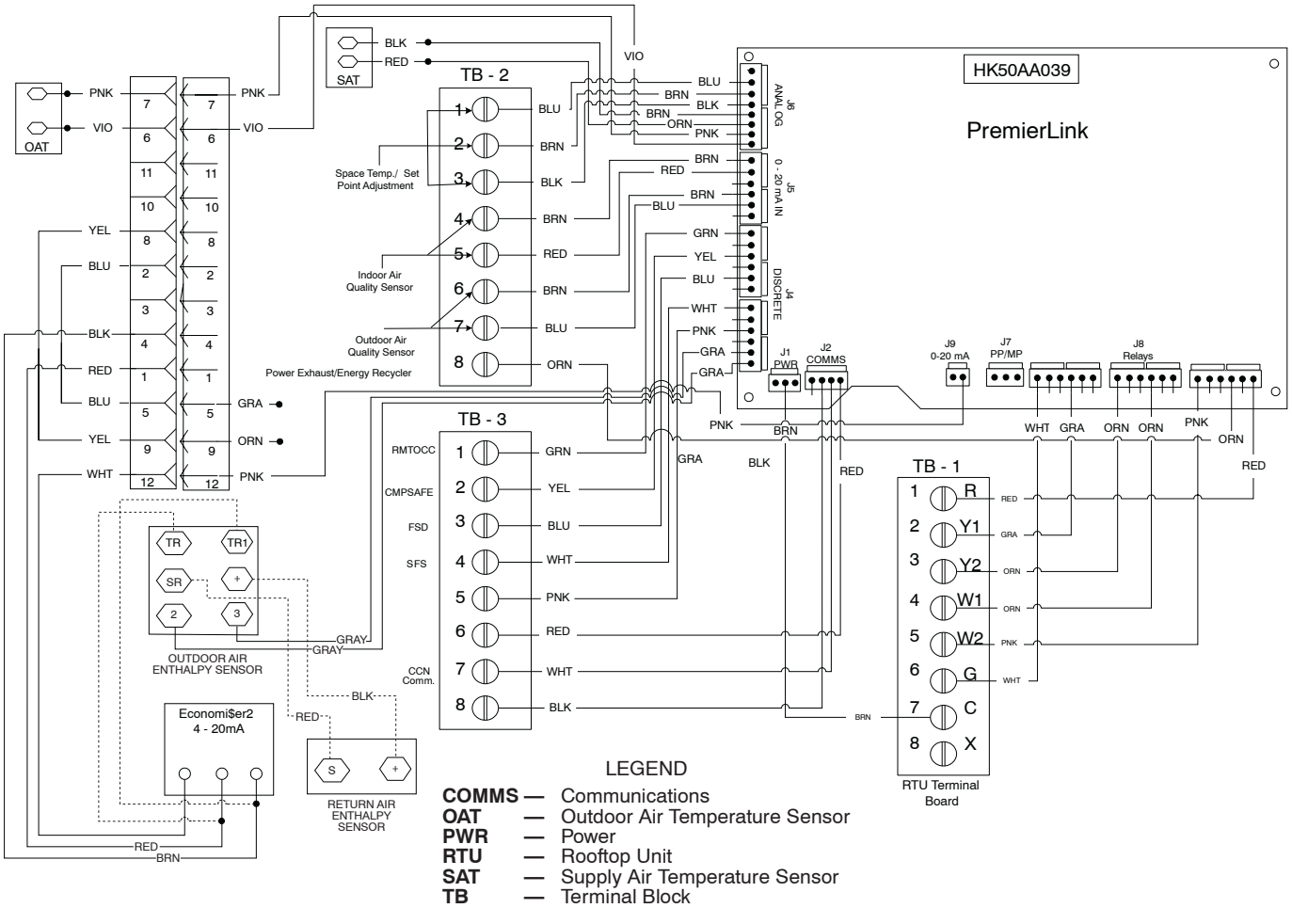
1. Use a 2-conductor, 18 or 20 AWG, twisted pair cable to connect the return air enthalpy sensor to the enthalpy controller.
2. At the enthalpy control remove the factory-installed resistor from the (SR) and (+) terminals.
3. Connect the field-supplied RED wire to (+) spade connector on the return air enthalpy sensor and the (SR+) terminal on the enthalpy controller. Connect the BLK wire to (S) spade connector on the return air enthalpy sensor and the (SR) terminal on the enthalpy controller.

OPTIONAL ECONOMI$ER IV AND ECONOMI$ER2

See Fig. 22 for EconoMi$er IV component locations. See Fig. 23 for EconoMi$er2 component locations.

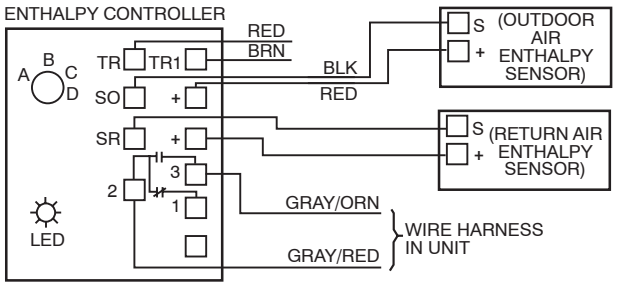
NOTE: These instructions are for installing the optional EconoMi$er IV and EconoMi$er2 only. Refer to the accessory EconoMi$er IV or EconoMi$er2 installation instructions when field installing an EconoMi$er IV or EconoMi$er2 accessory.

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. 24.)
2. The box with the economizer hood components is shipped in the compartment behind the economizer. The EconoMi$er IV controller is mounted on top of the EconoMi$er IV in the position shown in Fig. 22. The optional EconoMi$er2 with 4 to 20 mA actuator signal control does not include the EconoMi$er IV controller. To remove the component box from its shipping position, remove the screw holding the hood box bracket to the top of the economizer. Slide the hood box out of the unit. (See Fig. 25.)



C06018

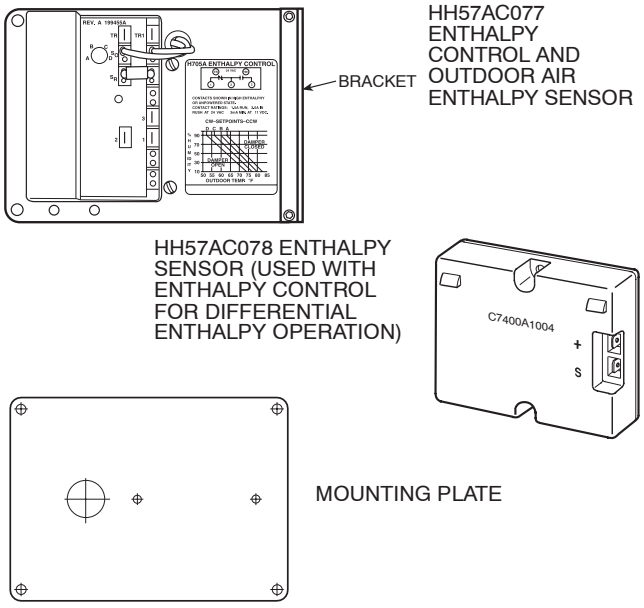
Fig. 19 – Typical PremierLink Control Wiring



NOTES:
1. Remove factory-installed jumper across SR and + before connecting wires from return air sensor.
2. Switches shown in high outdoor air enthalpy state. Terminals 2 and 3 close on low outdoor air enthalpy relative to indoor air enthalpy.
3. Remove sensor mounted on back of control and locate in outside air-stream.

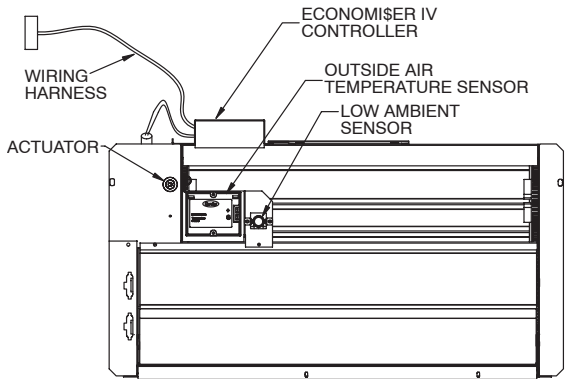
C06019

Fig. 20 – Outside and Return Air Sensor Wiring Connections for Differential Enthalpy Control



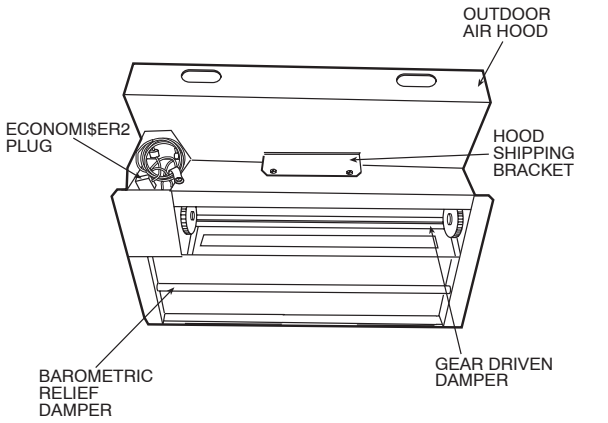
C06020

Fig. 21 – Differential Enthalpy Control, Sensor and Mounting Plate (33AMKITENT006)



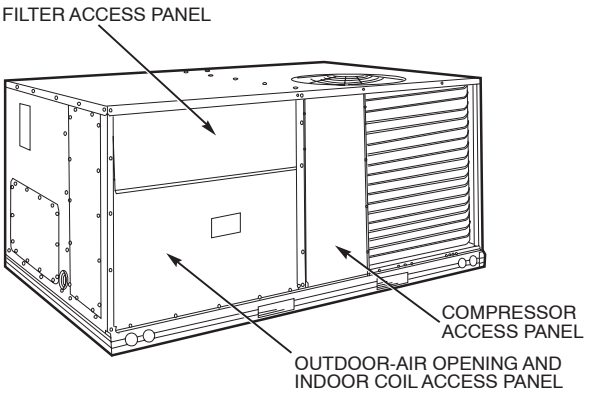
C06021

Fig. 22 – EconoMi$er IV Component Locations



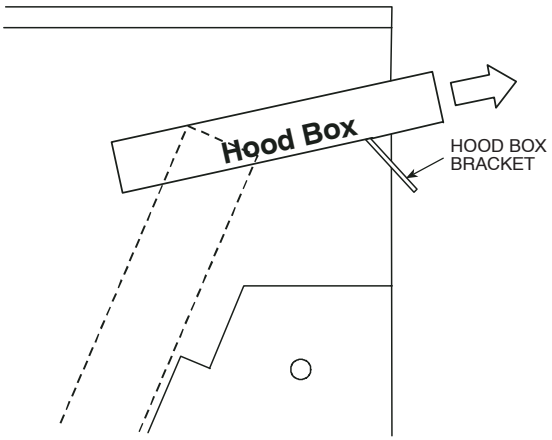
C06022

Fig. 23 – EconoMi$er2 Component Locations



C06023

Fig. 24 – Typical Access Panel Locations



C06024

Fig. 25 – Hood Box Removal

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 hood assembly.

3. The indoor coil access panel will be used as the top of the hood. Remove the screws along the sides and bottom of the indoor coil access panel. (See Fig. 26.)
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. 27.)
5. Remove the shipping tape holding the economizer barometric relief damper in place.

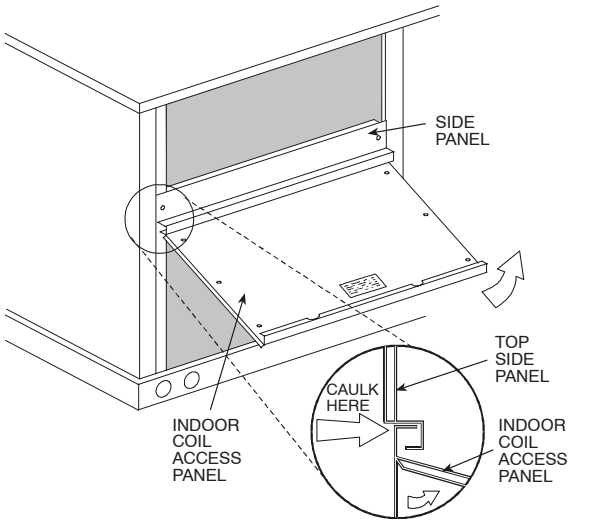


Fig. 26 – Indoor Coil Access Panel Relocation

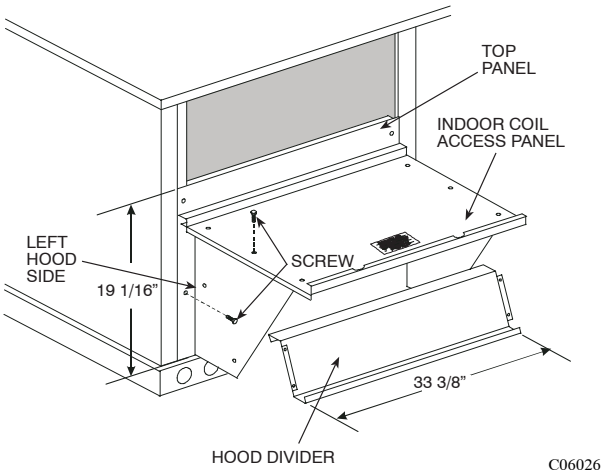


Fig. 27 – Outdoor-Air Hood Construction

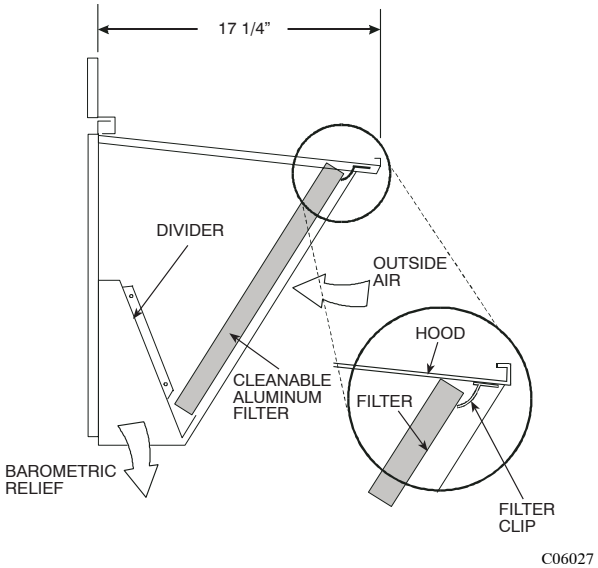


Fig. 28 – Filter Installation

6. Insert the hood divider between the hood sides. (See Fig. 27 and 28.) 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. 28.)
8. Caulk the ends of the joint between the unit top panel and the hood top. (See Fig. 26.)
9. Replace the filter access panel.
10. Install all EconoMi$er IV accessories. EconoMi$er IV wiring is shown in Fig. 29. EconoMi$er2 wiring is shown in Fig. 30.

Barometric flow capacity is shown in Fig. 31. Outdoor air leakage is shown in Fig. 32. Return air pressure drop is shown in Fig. 33.

ECONOMI$ER IV STANDARD SENSORS

Outdoor Air Temperature (OAT) Sensor

The outdoor air temperature sensor (HH57AC074) is a 10 to 20 mA device used to measure the outdoor-air temperature. The outdoor-air temperature is used to determine when the EconoMi$er IV can be used for free cooling. The sensor is factory-installed on the EconoMi$er IV in the outdoor airstream. (See Fig. 22.) The operating range of temperature measurement is 40° to 100°F.

Supply Air Temperature (SAT) Sensor

The supply air temperature sensor is a 3 K thermistor located at the inlet of the indoor fan. (See Fig. 33.) This sensor is factory installed. The operating range of temperature measurement is 0° to 158°F. See Table 7 for sensor temperature/resistance values.

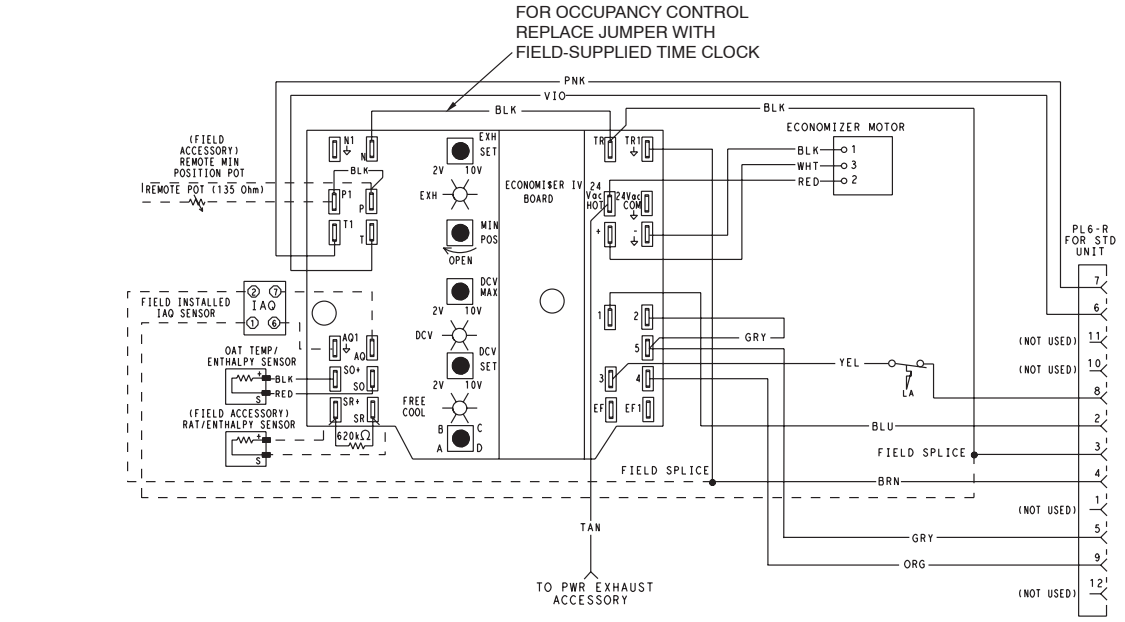
Table 7 — Supply Air Sensor Temperature/ Resistance Values

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

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

Outdoor Air Lockout Sensor

The Economi$er IV is equipped with an ambient temperature lockout switch located in the outdoor air stream which is used to lockout the compressors below a 42°F ambient temperature. (See Fig. 22.)



LEGEND

DCV— Demand Controlled Ventilation
IAQ — Indoor Air Quality
LA — Low Ambient Lockout Device
OAT — Outdoor-Air Temperature
POT — Potentiometer
RAT — Return-Air Temperature

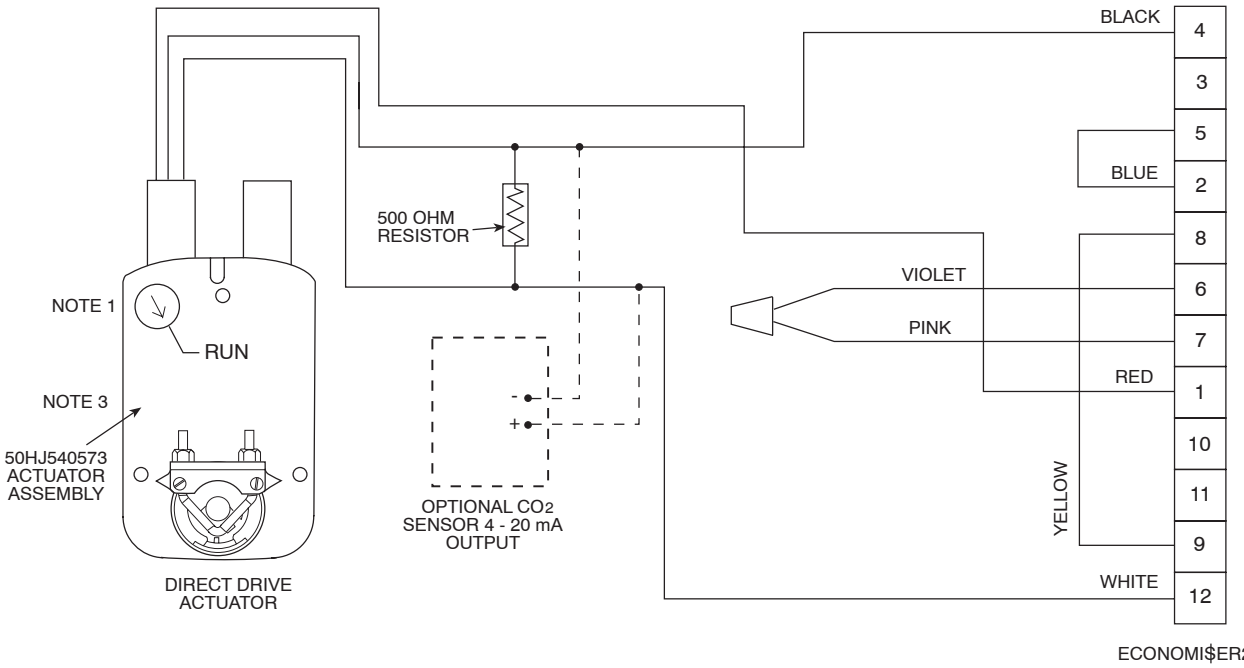
Potentiometer Defaults Settings:

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

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

C06028

Fig. 29 – EconoMi$er IV 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.

C06029

Fig. 30 – EconoMi$er2 with 4 to 20 mA Control Wiring

ECONOMI$ER IV CONTROL MODES

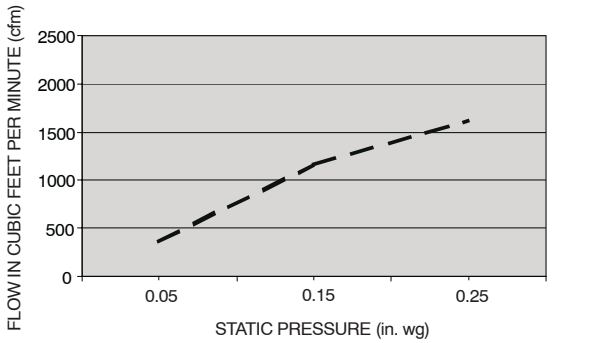
IMPORTANT: The optional EconoMi$er2 does not include a controller. The EconoMi$er2 is operated by a 4 to 20 mA signal from an existing field-supplied controller (such as PremierLink™ control). See Fig. 30 for wiring information.

Determine the EconoMi$er IV control mode before set up of the control. Some modes of operation may require different sensors. Refer to Table 8. The EconoMi$er IV is supplied from the factory with a supply-air temperature sensor and an outdoor-air temperature sensor. This allows for operation of the EconoMi$er IV with outdoor air dry bulb changeover control. Additional accessories can be added to allow for different types of changeover control and operation of the EconoMi$er IV and unit.

Table 8 — EconoMi$er IV Sensor Usage

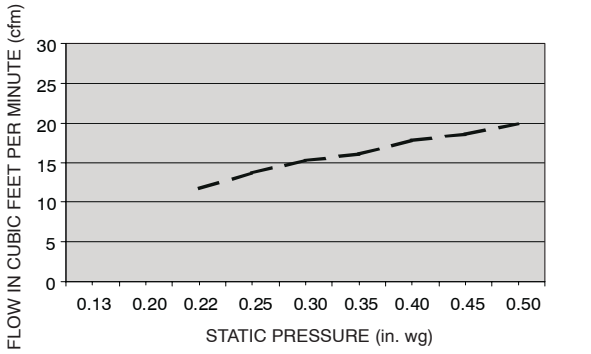
APPLICATION	ECONOMI$ER IV WITH OUTDOOR AIR DRY BULB SENSOR		
	Accessories Required		
Outdoor Air Dry Bulb	None. The outdoor air dry bulb sensor is factory installed.		
Differential Dry Bulb	CRTEMPSN002A00*		
Single Enthalpy	HH57AC078		
Differential Enthalpy	HH57AC078 and CRENTDIF004A00*		
CO_2 for DCV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

NOTE: Only one of each part number is required per each Economi$er IV.
*CRENTDIF004A00 and CRTEMPSN002A00 accessories are used on many different base units. As such, these kits may contain parts that will not be needed for installation.
† 33ZCSENCO2 is an accessory CO_2 sensor.
** 33ZCASPCO2 is an accessory aspirator box required for duct-mounted applications.
†† CRCBDIOX005A00 is an accessory that contains both 33ZCSENCO2 and 33ZCASPCO2 accessories.



C06030

Fig. 31 — Barometric Flow Capacity

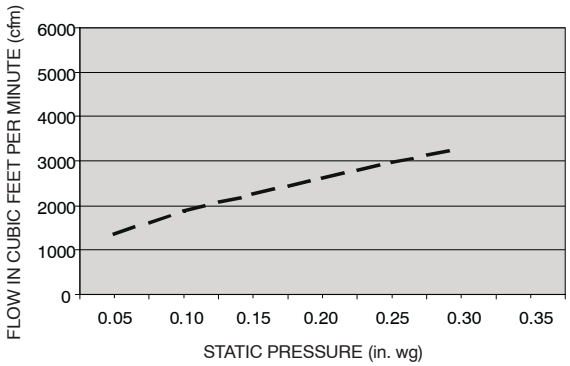


C06031

Fig. 32 — Outdoor-Air Damper Leakage

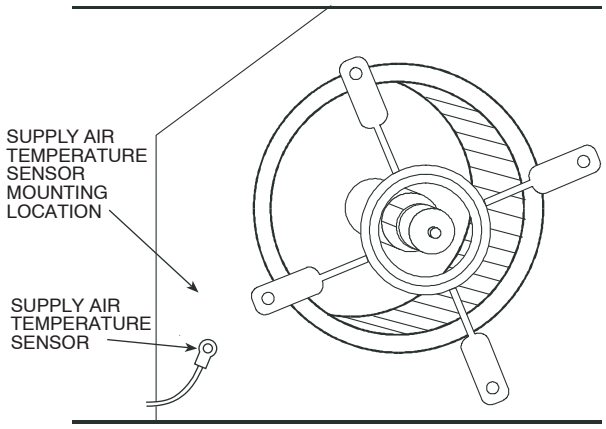
Outdoor Dry Bulb Changeover

The standard controller is shipped from the factory configured for outdoor dry bulb changeover control. The outdoor-air and supply-air temperature sensors are included as standard. For this control mode, the outdoor temperature is compared to an adjustable set point selected on the control. If the outdoor-air temperature is above the set point, the EconoMi$er IV will adjust the outdoor-air dampers to minimum position. If the outdoor air temperature is below the set point, the position of the outdoor air dampers will be controlled to provide free cooling using outdoor air. When in this mode, the LED next to the free cooling set point potentiometer will be on. The changeover temperature set point is controlled by the free cooling set point potentiometer located on the control. (See Fig. 35.) The scale on the potentiometer is A, B, C, and D. See Fig. 36 for the corresponding temperature changeover values.



C06032

Fig. 33 — Return-Air Pressure Drop



C06033

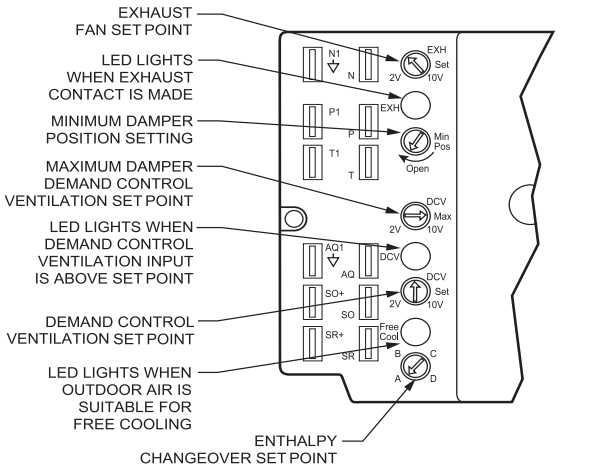
Fig. 34 — Supply Air Sensor Location

Differential Dry Bulb Control

For differential dry bulb control the standard outdoor dry bulb sensor is used in conjunction with an additional accessory dry bulb sensor (part number CRTEMPSN002A00). The accessory sensor must be mounted in the return airstream. (See Fig. 37.) Wiring is provided in the EconoMi$er IV wiring harness. (See Fig. 29.)

In this mode of operation, the outdoor-air temperature is compared to the return-air temperature and the lower temperature

airstream is used for cooling. When using this mode of changeover control, turn the enthalpy setpoint potentiometer fully clockwise to the D setting. (See Fig. 35.)



C06034

Fig. 35 – EconoMi$er IV Controller Potentiometer and LED Locations

Outdoor Enthalpy Changeover

For enthalpy control, accessory enthalpy sensor (part number HH57AC078) is required. Replace the standard outdoor dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. (See Fig. 22.) When the outdoor air enthalpy rises above the outdoor enthalpy changeover set point, the outdoor-air damper moves to its minimum position. The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er IV controller. The set points are A, B, C, and D. (See Fig. 38.) The factory-installed 620-ohm jumper must be in place across terminals SR and SR+ on the EconoMi$er IV controller. (See Fig. 22 and 39.)

Differential Enthalphy Control

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

Replace the standard outside air dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. (See Fig. 22.) Mount the return air enthalpy sensor in the return air duct. (See Fig. 37.) Wiring is provided in the EconoMi$er IV wiring harness. (See Fig. 29.) The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er IV controller. When using this mode of changeover control, turn the enthalpy setpoint potentiometer fully clockwise to the D setting.

Indoor Air Quality (IAQ) Sensor Input

The IAQ input can be used for demand control ventilation control based on the level of CO_2 measured in the space or return air duct.

Mount the accessory IAQ sensor according to manufacturer specifications. The IAQ sensor should be wired to the AQ and AQ1 terminals of the controller. Adjust the DCV potentiometers to correspond to the DCV voltage output of the indoor air quality sensor at the user-determined set point. (See Fig. 40.)

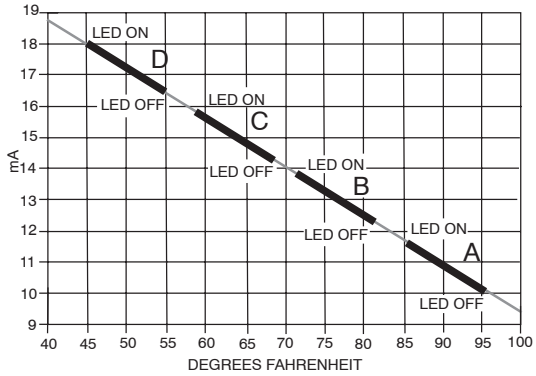
If a separate field-supplied transformer is used to power the IAQ sensor, the sensor must not be grounded or the EconoMi$er IV control board will be damaged.

Exhaust Set Point Adjustment

The exhaust set point will determine when the exhaust fan runs based on damper position (if accessory power exhaust is installed). The set point is modified with the Exhaust Fan Set Point (EXH SET) potentiometer. (See Fig. 35.) The set point represents the damper position above which the exhaust fans will be turned on. When there is a call for exhaust, the EconoMi$er IV controller provides a 45 ± 15 second delay before exhaust fan activation to allow the dampers to open. This delay allows the damper to reach the appropriate position to avoid unnecessary fan overload.

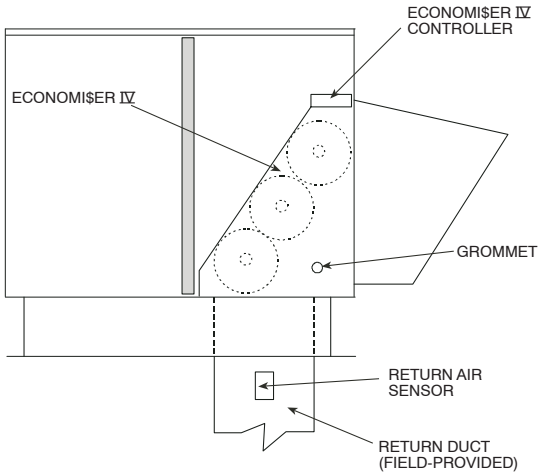
Minimum Position Control

There is a minimum damper position potentiometer on the EconoMi$er IV controller. (See Fig. 35.) The minimum damper position maintains the minimum airflow into the building during the occupied period.



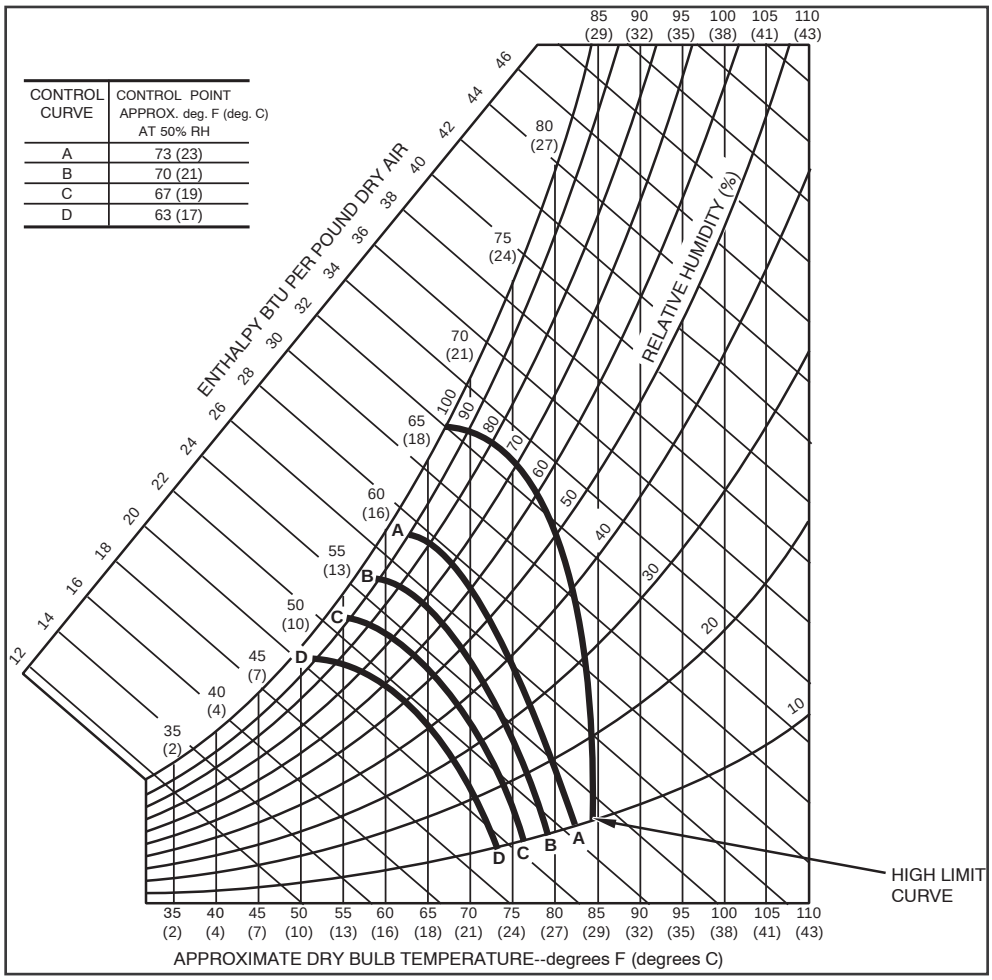
C06035

Fig. 36 – Outside Air Temperature Changeover Set Points



C06036

Fig. 37 – Return Air Temperature or Enthalpy Sensor Mounting Location



C06037

Fig. 38 – Enthalpy Changeover Set Points

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

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

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

To determine the minimum position setting, perform the following procedure:

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

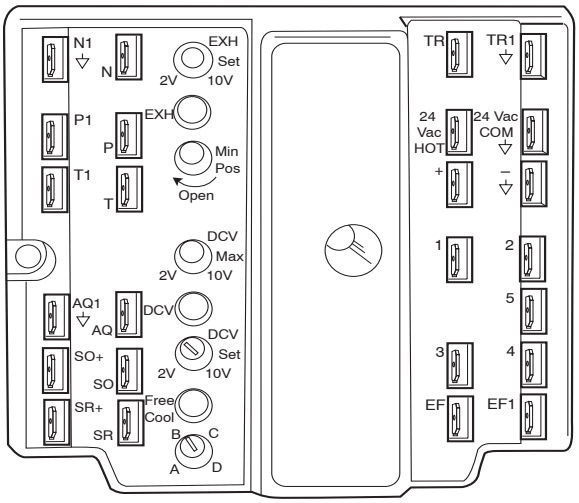
$$(T_O \times \frac{OA}{100}) + (TR \times \frac{RA}{100}) = T_M$$

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

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

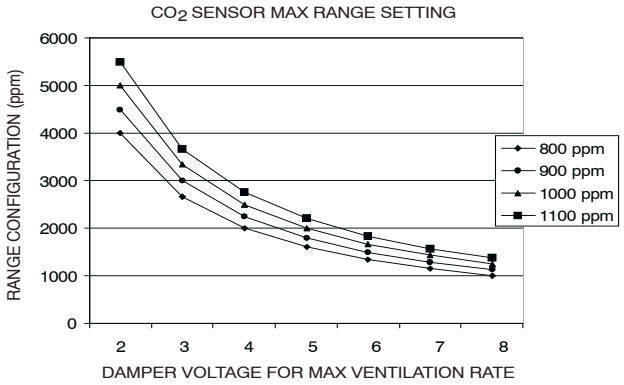
(60 x .10) + (75 x .90) = 73.5°F

2. Disconnect the supply air sensor from terminals T and T1.
3. Ensure that the factory-installed jumper is in place across terminals P and P1. If remote damper positioning is being used, make sure that the terminals are wired according to Fig. 29 and that the minimum position potentiometer is turned fully clockwise.
4. Connect 24 vac across terminals TR and TR1.
5. Carefully adjust the minimum position potentiometer until the measured supply air temperature matches the calculated value.
6. Reconnect the mixed air sensor to terminals T and T1.



C06038

Fig. 39 – EconoMi$er IV Control



C06039

Fig. 40 – CO_2 Sensor Maximum Range Setting

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

To control the minimum damper position remotely, remove the factory-installed jumper on the P and P1 terminals on the EconoMi$er IV controller. Wire the field-supplied potentiometer to the P and P1 terminals on the EconoMi$er IV controller. (See Fig. 39.)

Damper Movement

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

Thermostats

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

Occupancy Control

The factory default configuration for the EconoMi$er IV control is occupied mode. Occupied mode is provided by the black jumper from terminal TR to terminal N. When unoccupied mode is desired, install a field-supplied timeclock function in place of the jumper between TR and N. (See Fig. 29.) When the timeclock contacts are closed, the EconoMi$er IV control will be in occupied mode. When the timeclock contacts are open (removing the 24-v signal from terminal N), the EconoMi$er IV will be in unoccupied mode.

Demand Controlled Ventilation (DCV)

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

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

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

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

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

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

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

The same equation can be used to determine the occupied or maximum ventilation rate to the building. For example, an output of 3.6 volts to the actuator provides a base ventilation rate of 5% and an output of 6.7 volts provides the maximum ventilation rate of 20% (or base plus 15 cfm per person). Use Fig. 40 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. 38 to find the point when the CO_2 sensor output will be 6.7 volts. Line up the point on the graph with the left side of the chart to determine that the range configuration for the CO_2 sensor should be 1800 ppm. The EconoMi$er IV controller will output the 6.7 volts from the CO_2 sensor to the actuator when the CO_2 concentration in the space is at 1100 ppm. The DCV set point may be left at 2 volts since the CO_2 sensor voltage will be ignored by the EconoMi$er IV controller until it rises above the 3.6 volt setting of the minimum position potentiometer.

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

Table 9 — CO_2 Sensor Standard Settings

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

LEGEND
ppm — Parts Per Million

Table 10 — Fan Rpm at Motor Pulley Settings*

50HJQ 50HEQ UNIT SIZE	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
003	936	906	876	846	816	786	756	726	696	666	639	—	—
004	1044	1008	971	935	898	862	826	789	753	716	680	—	—
004†	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
005	1185	1144	1102	1061	1019	978	936	895	853	812	770	—	—
005†	1455	1423	1392	1360	1328	1297	1265	1233	1202	1170	1138	1107	1075
006	1460	1425	1390	1355	1319	1284	1249	1214	1179	1144	1108	1073	1035
006†	1685	1647	1608	1570	1531	1493	1454	1416	1377	1339	1300	—	—
007	1585	1538	1492	1445	1399	1352	1305	1259	1212	1166	1119	—	—
007†	1685	1647	1608	1570	1531	1493	1454	1416	1377	1339	1300	—	—

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

CO_2 Sensor Configuration

The CO_2 sensor has preset standard voltage settings that can be selected anytime after the sensor is powered up. (See Table 9.)

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

1. Press Clear and Mode buttons. Hold at least 5 seconds until the sensor enters the Edit mode.
2. Press Mode twice. The STDSET Menu will appear.
3. Use the Up/Down button to select the preset number. (See Table 9.)
4. Press Enter to lock in the selection.
5. Press Mode to exit and resume normal operation.

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

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

Dehumidification of Fresh Air with DCV Control

Information from ASHRAE indicates that the largest humidity load on any zone is the fresh air introduced. For some applications, a device such as a 62AQ energy recovery unit is added to reduce the moisture content of the fresh air being brought into the building when the enthalpy is high. In most cases, the normal heating and cooling processes are more than adequate to remove the humidity loads for most commercial applications.

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

STEP 7 —ADJUST INDOOR-FAN SPEED

Adjust indoor-fan rpm to meet job site conditions.

Table 10 shows fan rpm at motor pulley settings for the 50HJQ004-007 and 50HEQ003-006 units. Tables 11 and 12 show data for indoor-fan motors. Refer to Tables 13A and 13B for accessory and option static pressure drops, see Table 14 for indoor-fan motor efficiency; see Tables 15-34 to determine fan speed settings.

For units with electric heating, required minimum cfm is 900 for 50HJQ004; 1200 for 50HJQ005; 1500 for 50HJQ006 and 1800 for 50HJQ007.

BELT DRIVE MOTORS

Fan motor pulleys are factory-set for speed shown in Table 1. Check pulley alignment and belt tension prior to start-up.

To change fan speed:

1. Shut off the unit power supply and tag disconnect.
2. Loosen the belt by loosening the fan motor mounting nuts. (See Fig. 41.)

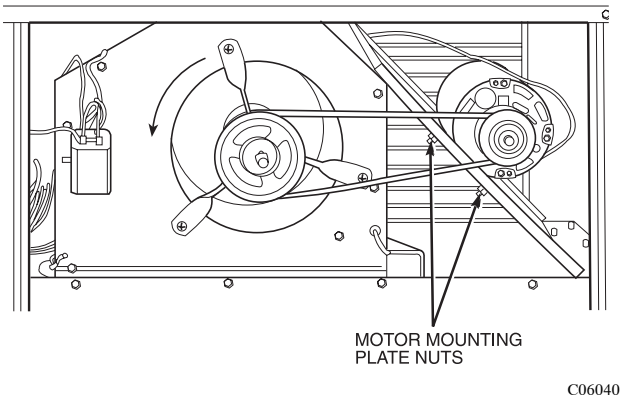


Fig. 41 – Belt Drive Motor Mounting

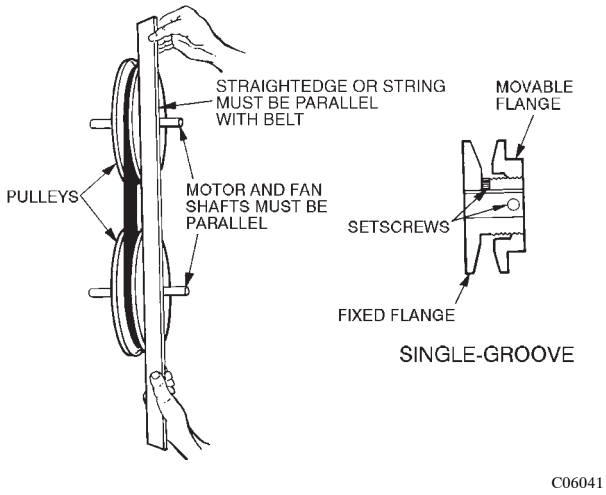


Fig. 42 – Indoor-Fan Pulley Adjustment

3. Loosen the movable pulley flange setscrew. (See Fig. 42.)
4. Screw the movable flange toward the fixed flange to increase speed or away from the fixed flange to decrease speed. Increasing fan speed increases the load on the motor. Do not exceed the maximum speed specified in Table 1.
5. Set the movable flange at the nearest keyway of the pulley hub and tighten the setscrew. (See Table 1 for speed change for each full turn of the pulley flange.)

To align the fan and motor pulleys (See Fig. 42.):

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

To adjust belt tension:

1. Loosen the fan motor mounting nuts.
2. Slide the motor mounting plate away from the fan scroll for proper belt tension ($^5/_8$-in. deflection with 7 to 10 lb force).
3. Tighten the motor mounting nuts.
4. Adjust the bolt and tighten the nut to secure the motor in fixed position.

Table 11 — Indoor-Fan Motor Performance — Standard Motors

50HJQ 50HEQ UNIT SIZE	UNIT VOLTAGE	MAXIMUM CONTINUOUS BHP*	MAXIMUM OPERATING WATTS*	MAXIMUM AMP DRAW	MOTOR EFFICIENCY
003	ALL	0.58	580	2.0	75.0
004	208/230-3-60	1.20	1195	4.9	75.0
	460-3-60			2.3	75.0
005	208/230-1-60	1.20	1195	4.9	75.0
	208/230-3-60	1.20	1195	4.9	75.0
	460-3-60			2.3	75.0
006	208/230-1-60	1.30	1290	7.6	74.0
	208/230-3-60	2.40	2120	6.0	84.0
	460-3-60			3.0	84.0
007	208/230-3-60	2.40	2120	6.0	84.0
	460-3-60			3.0	84.0

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

Table 12 — Indoor-Fan Motor Performance — High-Static Motors

UNIT 50HJQ 50HEQ	UNIT PHASE	MAXIMUM CONTINUOUS BHP*	MAXIMUM OPERATING WATTS*	UNIT VOLTAGE	MAXIMUM AMP DRAW
004	Three	2.40	2120	208/230	6.0
				460	3.0
005	Three	2.40	2120	208/230	6.0
				460	3.0
006	Three	2.90	2615	208/230	8.6
				460	3.9
007	Three	2.90	2615	208/230	8.6
				460	3.9

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

Table 13A — Accessory Electric Heaters Static Pressure Drop (in. wg) — 50HJQ004-007 and 50HEQ003-006

COMPONENT	CFM									
	600	900	1200	1400	1600	1800	2000	2200	2400	2600
1 Heater Module	0.03	0.05	0.07	0.09	0.09	0.10	0.11	0.11	0.12	0.13
2 Heater Modules	0.14	0.15	0.16	0.16	0.16	0.17	0.17	0.17	0.18	0.18

Table 13B — Accessory/FIOP EconoMi$er IV and EconoMi$er2 Static Pressure* (in. wg) — 50HJQ004-007 and 50HEQ003-006

COMPONENT	CFM							
	1250	1500	1750	2000	2250	2500	2750	3000
Vertical EconoMi$er IV and EconoMi$er2	0.045	0.065	0.08	0.12	0.145	0.175	0.22	0.255
Horizontal EconoMi$er IV and EconoMi$er2	—	—	0.1	0.125	0.15	0.18	0.225	0.275

LEGEND
FIOP – Factory–Installed Option
*The static pressure must be added to external static pressure. The sum and the indoor entering-air cfm should be used in conjunction with the Fan Performance tables to determine indoor blower rpm and watts.

Table 14 — Indoor-Fan Motor Efficiency

MOTOR 50HJQ	EFFICIENCY
003,004,005	75
006	74/84*
007	84

*Single-phase/3-phase.
NOTE: Convert watts to bhp using the following formula:

$$bhp = \frac{\text{watts input x motor efficiency}}{746}$$

GENERAL NOTES FOR FAN PERFORMANCE DATA TABLES

1. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the wattage ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. For additional information on motor performance, refer to Tables 11 and 12.
2. Values include losses for filters, unit casing, and wet coils. See Tables 13A and 13B for accessory/FIOP static pressure information.
3. Use of a field-supplied motor may affect wire sizing. Contact your Carrier representative for details.
4. Interpolation is permissible. Do not extrapolate.
5. Performance includes clean filters and wet coil data.

Table 15 — Fan Performance 50HEQ003 — Vertical Discharge Units; Standard Motor (Belt Drive)**

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	0.1		0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
600	500	0.08	531	0.08	607	0.14	713	0.21	788	0.29	878	0.37
700	529	0.09	567	0.09	633	0.16	739	0.24	816	0.32	902	0.41
800	547	0.1	592	0.12	660	0.19	761	0.27	845	0.37	937	0.47
900	570	0.13	620	0.14	691	0.22	793	0.32	870	0.42	957	0.53
1000	599	0.15	650	0.16	717	0.26	818	0.36	894	0.47	981	0.58

Table 16 — Fan Performance 50HEQ004, 50HJQ004 — Vertical Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	566	0.14	142	690	0.23	228	791	0.32	320	879	0.42	418	957	0.52	522
1000	598	0.17	173	718	0.27	267	817	0.37	366	903	0.47	471	981	0.58	581
1100	632	0.21	210	748	0.31	311	844	0.42	418	929	0.53	530	1006	0.65	646
1200	666	0.25	252	778	0.36	361	873	0.48	476	956	0.60	594	1031	0.72	718
1300	701	0.30	300	809	0.42	418	902	0.54	540	983	0.67	665	1057	0.80	796
1400	737	0.36	355	842	0.48	481	932	0.61	610	1012	0.75	744	1085	0.89	881
1500	774	0.42	417	875	0.55	551	962	0.69	689	1041	0.83	830	1112	0.98	974

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1029	0.63	630	1095	0.75	742	1157	0.86	859	1216	0.99	980	1272	1.11	1105
1000	1052	0.70	695	1118	0.82	814	1179	0.94	937	1237	1.07	1064	1293	1.20	1195
1100	1076	0.77	767	1141	0.90	892	1202	1.03	1021	1260	1.16	1154	—	—	—
1200	1100	0.85	845	1165	0.98	977	1225	1.12	1112	—	—	—	—	—	—
1300	1126	0.94	930	1189	1.07	1069	—	—	—	—	—	—	—	—	—
1400	1152	1.03	1023	1215	1.17	1168	—	—	—	—	—	—	—	—	—
1500	1179	1.13	1123	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

NOTES:

Shaded cells indicate field-supplied drive is required.
See General Fan Performance Notes.
* Factory provided drive range 680–1044 rpm. All other rpms require field–supplied drive. Max continuous motor bhp is 1.20.
** Factory provided drive range 639–936 rpm. All other rpms require field–supplied drive. Max continuous motor bhp is 0.58.

Table 17 — Fan Performance 50HEQ004, 50HJQ004 — Vertical Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	566	0.14	142	690	0.23	228	791	0.32	320	879	0.42	418	957	0.52	522
1000	598	0.17	173	718	0.27	267	817	0.37	366	903	0.47	471	981	0.58	581
1100	632	0.21	210	748	0.31	311	844	0.42	418	929	0.53	530	1006	0.65	646
1200	666	0.25	252	778	0.36	361	873	0.48	476	956	0.60	594	1031	0.72	718
1300	701	0.30	300	809	0.42	418	902	0.54	540	983	0.67	665	1057	0.80	796
1400	737	0.36	355	842	0.48	481	932	0.61	610	1012	0.75	744	1085	0.89	881
1500	774	0.42	417	875	0.55	551	962	0.69	689	1041	0.83	830	1112	0.98	974

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1029	0.63	630	1095	0.75	742	1157	0.86	859	1216	0.99	980	1272	1.11	1105
1000	1052	0.70	695	1118	0.82	814	1179	0.94	937	1237	1.07	1064	1293	1.20	1195
1100	1076	0.77	767	1141	0.90	892	1202	1.03	1021	1260	1.16	1154	1314	1.30	1291
1200	1100	0.85	845	1165	0.98	977	1225	1.12	1112	1282	1.26	1252	1337	1.40	1395
1300	1126	0.94	930	1189	1.07	1069	1249	1.22	1211	1306	1.36	1356	1360	1.51	1506
1400	1152	1.03	1023	1215	1.17	1168	1274	1.32	1317	1330	1.48	1469	1384	1.63	1625
1500	1179	1.13	1123	1241	1.28	1275	1300	1.44	1431	1355	1.60	1590	1408	1.76	1752

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor
* Motor drive range: 680 to 1044 rpm. All other rpms require field-supplied drive.
NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 1.20.
See General Fan Performance Notes.

Table 18 — Fan Performance 50HEQ005, 50HJQ005 — Vertical Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	666	0.25	252	778	0.36	361	873	0.48	476	956	0.60	594	1031	0.72	718
1300	701	0.30	300	809	0.42	418	902	0.54	540	983	0.67	665	1057	0.80	796
1400	737	0.36	355	842	0.48	481	932	0.61	610	1012	0.75	744	1085	0.89	881
1500	774	0.42	417	875	0.55	551	962	0.69	689	1041	0.83	830	1112	0.98	974
1600	811	0.49	487	909	0.63	629	994	0.78	774	1071	0.93	923	1141	1.08	1076
1700	849	0.57	565	943	0.72	715	1026	0.87	869	1101	1.03	1025	1170	1.19	1185
1800	887	0.65	651	978	0.81	810	1059	0.98	972	1133	1.14	1136	—	—	—
1900	926	0.75	746	1014	0.92	914	1092	1.09	1084	—	—	—	—	—	—
2000	965	0.86	852	1050	1.03	1028	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1100	0.85	845	1165	0.98	977	1225	1.12	1112	—	—	—	—	—	—
1300	1126	0.94	930	1189	1.07	1069	—	—	—	—	—	—	—	—	—
1400	1152	1.03	1023	1215	1.17	1168	—	—	—	—	—	—	—	—	—
1500	1179	1.13	1123	—	—	—	—	—	—	—	—	—	—	—	—
1600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor
* Motor drive range: 770 to 1185 rpm. All other rpms require field-supplied drive.
NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 1.20.
See General Fan Performance Notes.

Table 19 — Fan Performance 50HEQ005, 50HJQ005 — Vertical Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	666	0.25	252	778	0.36	361	873	0.48	476	956	0.60	594	1031	0.72	718
1300	701	0.30	300	809	0.42	418	902	0.54	540	983	0.67	665	1057	0.80	796
1400	737	0.36	355	842	0.48	481	932	0.61	610	1012	0.75	744	1085	0.89	881
1500	774	0.42	417	875	0.55	551	962	0.69	689	1041	0.83	830	1112	0.98	974
1600	811	0.49	487	909	0.63	629	994	0.78	774	1071	0.93	923	1141	1.08	1076
1700	849	0.57	565	943	0.72	715	1026	0.87	869	1101	1.03	1025	1170	1.19	1185
1800	887	0.65	651	978	0.81	810	1059	0.98	972	1133	1.14	1136	1200	1.31	1304
1900	926	0.75	746	1014	0.92	914	1092	1.09	1084	1164	1.26	1257	1231	1.44	1432
2000	965	0.86	852	1050	1.03	1028	1127	1.21	1206	1197	1.39	1387	1262	1.58	1570

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1100	0.85	845	1165	0.98	977	1225	1.12	1112	1282	1.26	1252	1337	1.40	1395
1300	1126	0.94	930	1189	1.07	1069	1249	1.22	1211	1306	1.36	1356	1360	1.51	1506
1400	1152	1.03	1023	1215	1.17	1168	1274	1.32	1317	1330	1.48	1469	1384	1.63	1625
1500	1179	1.13	1123	1241	1.28	1275	1300	1.44	1431	1355	1.60	1590	1408	1.76	1752
1600	1206	1.24	1231	1268	1.40	1391	1326	1.56	1553	1381	1.73	1719	1433	1.90	1888
1700	1235	1.36	1349	1295	1.52	1515	1352	1.69	1685	1407	1.87	1858	1459	2.04	2034
1800	1264	1.48	1475	1323	1.66	1649	1380	1.84	1826	1434	2.02	2006	1485	2.20	2189
1900	1293	1.62	1611	1352	1.80	1792	1408	1.99	1976	1461	2.17	2163	1512	2.37	2353
2000	1324	1.77	1756	1381	1.96	1945	1436	2.15	2137	1489	2.34	2332	—	—	—

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor

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

NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 2.40.
See General Fan Performance Notes.

Table 20 — Fan Performance 50HEQ006, 50HJQ006 — Vertical Discharge Units; Standard Motor (Belt Drive)* — Single-Phase Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	790	0.40	353	897	0.53	471	991	0.68	600	1075	0.83	739	1152	1.00	888
1600	828	0.46	412	931	0.60	536	1022	0.75	670	1104	0.92	813	1180	1.09	966
1700	866	0.54	478	966	0.68	608	1054	0.84	747	1134	1.01	895	1208	1.19	1053
1800	905	0.62	551	1001	0.77	687	1087	0.94	832	1165	1.11	985	1238	1.29	1148
1900	944	0.71	633	1037	0.87	774	1120	1.04	925	1197	1.22	1084	—	—	—
2000	983	0.81	723	1073	0.98	870	1154	1.16	1026	—	—	—	—	—	—
2100	1023	0.92	821	1110	1.10	975	1189	1.28	1137	—	—	—	—	—	—
2200	1063	1.05	929	1147	1.23	1089	—	—	—	—	—	—	—	—	—
2300	1104	1.18	1046	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1224	1.18	1045	—	—	—	—	—	—	—	—	—	—	—	—
1600	1250	1.27	1128	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor
* Motor drive range: 1035 to 1460 rpm. All other rpms require field-supplied drive.
NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 1.30.
See General Fan Performance Notes.

Table 21 — Fan Performance 50HEQ006, 50HJQ006 — Vertical Discharge Units; Standard Motor (Belt Drive)* — Three-Phase Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	790	0.40	353	897	0.53	471	991	0.68	600	1075	0.83	739	1152	1.00	888
1600	828	0.46	412	931	0.60	536	1022	0.75	670	1104	0.92	813	1180	1.09	966
1700	866	0.54	478	966	0.68	608	1054	0.84	747	1134	1.01	895	1208	1.19	1053
1800	905	0.62	551	1001	0.77	687	1087	0.94	832	1165	1.11	985	1238	1.29	1148
1900	944	0.71	633	1037	0.87	774	1120	1.04	925	1197	1.22	1084	1268	1.41	1251
2000	983	0.81	723	1073	0.98	870	1154	1.16	1026	1229	1.34	1190	1299	1.53	1362
2100	1023	0.92	821	1110	1.10	975	1189	1.28	1137	1262	1.47	1306	1330	1.67	1483
2200	1063	1.05	929	1147	1.23	1089	1224	1.41	1256	1295	1.61	1431	1362	1.82	1614
2300	1104	1.18	1046	1185	1.37	1212	1260	1.56	1386	1329	1.76	1567	1395	1.98	1754
2400	1145	1.32	1174	1223	1.52	1346	1296	1.72	1526	1364	1.93	1712	1428	2.15	1905
2500	1185	1.48	1311	1262	1.68	1490	1333	1.89	1676	1399	2.10	1868	1462	2.33	2067

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1224	1.18	1045	1291	1.36	1212	1354	1.56	1387	1414	1.77	1570	1472	1.98	1761
1600	1250	1.27	1128	1316	1.46	1299	1379	1.66	1478	1438	1.87	1664	1495	2.09	1858
1700	1278	1.37	1219	1343	1.57	1394	1405	1.77	1576	1463	1.99	1766	1520	2.21	1964
1800	1306	1.48	1318	1370	1.69	1497	1431	1.90	1683	1489	2.11	1877	1545	2.34	2078
1900	1335	1.61	1426	1398	1.81	1609	1458	2.03	1799	1515	2.25	1997	—	—	—
2000	1364	1.74	1542	1427	1.95	1730	1486	2.17	1925	1542	2.39	2126	—	—	—
2100	1395	1.88	1668	1456	2.09	1860	1514	2.32	2060	—	—	—	—	—	—
2200	1426	2.03	1804	1486	2.25	2001	—	—	—	—	—	—	—	—	—
2300	1457	2.19	1949	—	—	—	—	—	—	—	—	—	—	—	—
2400	1489	2.37	2106	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor
* Motor drive range: 1035 to 1460 rpm. All other rpms require field-supplied drive.
NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 2.40.
See General Fan Performance Notes.

Table 22 — Fan Performance 50HEQ006, 50HJQ006 — Vertical Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	790	0.40	353	897	0.53	471	991	0.68	600	1075	0.83	739	1152	1.00	888
1600	828	0.46	412	931	0.60	536	1022	0.75	670	1104	0.92	813	1180	1.09	966
1700	866	0.54	478	966	0.68	608	1054	0.84	747	1134	1.01	895	1208	1.19	1053
1800	905	0.62	551	1001	0.77	687	1087	0.94	832	1165	1.11	985	1238	1.29	1148
1900	944	0.71	633	1037	0.87	774	1120	1.04	925	1197	1.22	1084	1268	1.41	1251
2000	983	0.81	723	1073	0.98	870	1154	1.16	1026	1229	1.34	1190	1299	1.53	1362
2100	1023	0.92	821	1110	1.10	975	1189	1.28	1137	1262	1.47	1306	1330	1.67	1483
2200	1063	1.05	929	1147	1.23	1089	1224	1.41	1256	1295	1.61	1431	1362	1.82	1614
2300	1104	1.18	1046	1185	1.37	1212	1260	1.56	1386	1329	1.76	1567	1395	1.98	1754
2400	1145	1.32	1174	1223	1.52	1346	1296	1.72	1526	1364	1.93	1712	1428	2.15	1905
2500	1185	1.48	1311	1262	1.68	1490	1333	1.89	1676	1399	2.10	1868	1462	2.33	2067

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1224	1.18	1045	1291	1.36	1212	1354	1.56	1387	1414	1.77	1570	1472	1.98	1761
1600	1250	1.27	1128	1316	1.46	1299	1379	1.66	1478	1438	1.87	1664	1495	2.09	1858
1700	1278	1.37	1219	1343	1.57	1394	1405	1.77	1576	1463	1.99	1766	1520	2.21	1964
1800	1306	1.48	1318	1370	1.69	1497	1431	1.90	1683	1489	2.11	1877	1545	2.34	2078
1900	1335	1.61	1426	1398	1.81	1609	1458	2.03	1799	1515	2.25	1997	1570	2.48	2202
2000	1364	1.74	1542	1427	1.95	1730	1486	2.17	1925	1542	2.39	2126	1596	2.63	2335
2100	1395	1.88	1668	1456	2.09	1860	1514	2.32	2060	1570	2.55	2265	1623	2.79	2478
2200	1426	2.03	1804	1486	2.25	2001	1543	2.48	2204	1598	2.72	2415	—	—	—
2300	1457	2.19	1949	1516	2.42	2151	1573	2.66	2360	1627	2.90	2574	—	—	—
2400	1489	2.37	2106	1547	2.60	2312	1603	2.84	2526	—	—	—	—	—	—
2500	1522	2.56	2272	1579	2.80	2484	—	—	—	—	—	—	—	—	—

LEGEND

Bhp – Brake Horsepower Input to Fan

Watts – Input Watts to Motor

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

NOTES:

Grey box indicates field-supplied drive is required.

Maximum continuous bhp is 2.90.

See page 29 for General Fan Performance Notes.

Table 23 — Fan Performance 50HJQ007 — Vertical Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	907	0.63	558	1006	0.80	708	1092	0.97	860	1169	1.14	1015	1239	1.32	1174
1900	945	0.72	638	1042	0.90	796	1126	1.08	956	1201	1.26	1119	1271	1.45	1285
2000	984	0.82	727	1078	1.00	892	1160	1.19	1060	1235	1.39	1230	1303	1.58	1403
2100	1024	0.93	823	1115	1.12	997	1195	1.32	1173	1268	1.52	1350	1335	1.72	1531
2200	1063	1.05	929	1152	1.25	1111	1230	1.46	1294	1302	1.67	1480	1368	1.88	1668
2300	1103	1.18	1044	1189	1.39	1234	1266	1.60	1425	1337	1.82	1618	1402	2.04	1814
2400	1143	1.32	1168	1227	1.54	1367	1302	1.76	1566	1371	1.99	1767	1435	2.22	1970
2500	1183	1.47	1303	1265	1.70	1510	1339	1.93	1717	1406	2.17	1926	—	—	—
2600	1224	1.63	1448	1303	1.87	1663	1375	2.12	1878	1442	2.36	2095	—	—	—
2700	1264	1.81	1604	1342	2.06	1828	1412	2.31	2051	—	—	—	—	—	—
2800	1305	1.99	1772	1381	2.26	2003	—	—	—	—	—	—	—	—	—
2900	1346	2.20	1951	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1304	1.51	1337	1365	1.69	1503	1422	1.88	1674	1477	2.08	1848	1528	2.28	2025
1900	1335	1.64	1454	1395	1.83	1627	1452	2.03	1804	1506	2.23	1984	—	—	—
2000	1366	1.78	1580	1426	1.98	1760	1482	2.19	1943	1535	2.40	2130	—	—	—
2100	1398	1.93	1715	1457	2.14	1901	1512	2.35	2091	—	—	—	—	—	—
2200	1430	2.09	1858	1488	2.31	2052	—	—	—	—	—	—	—	—	—
2300	1462	2.27	2012	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor

* Motor drive range: 1119 to 1585 rpm. All other rpms require field-supplied drive.

NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 2.40.
See General Fan Performance Notes.

Table 24 — Fan Performance 50HJQ007 — Vertical Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	907	0.63	558	1006	0.80	708	1092	0.97	860	1169	1.14	1015	1239	1.32	1174
1900	945	0.72	638	1042	0.90	796	1126	1.08	956	1201	1.26	1119	1271	1.45	1285
2000	984	0.82	727	1078	1.00	892	1160	1.19	1060	1235	1.39	1230	1303	1.58	1403
2100	1024	0.93	823	1115	1.12	997	1195	1.32	1173	1268	1.52	1350	1335	1.72	1531
2200	1063	1.05	929	1152	1.25	1111	1230	1.46	1294	1302	1.67	1480	1368	1.88	1668
2300	1103	1.18	1044	1189	1.39	1234	1266	1.60	1425	1337	1.82	1618	1402	2.04	1814
2400	1143	1.32	1168	1227	1.54	1367	1302	1.76	1566	1371	1.99	1767	1435	2.22	1970
2500	1183	1.47	1303	1265	1.70	1510	1339	1.93	1717	1406	2.17	1926	1470	2.41	2136
2600	1224	1.63	1448	1303	1.87	1663	1375	2.12	1878	1442	2.36	2095	1504	2.60	2313
2700	1264	1.81	1604	1342	2.06	1828	1412	2.31	2051	1478	2.56	2275	1539	2.82	2501
2800	1305	1.99	1772	1381	2.26	2003	1450	2.52	2235	1514	2.78	2467	—	—	—
2900	1346	2.20	1951	1420	2.47	2191	1488	2.74	2431	—	—	—	—	—	—
3000	1387	2.41	2142	1459	2.69	2391	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1304	1.51	1337	1365	1.69	1503	1422	1.88	1674	1477	2.08	1848	1528	2.28	2025
1900	1335	1.64	1454	1395	1.83	1627	1452	2.03	1804	1506	2.23	1984	1557	2.44	2168
2000	1366	1.78	1580	1426	1.98	1760	1482	2.19	1943	1535	2.40	2130	1586	2.61	2319
2100	1398	1.93	1715	1457	2.14	1901	1512	2.35	2091	1565	2.57	2284	1616	2.79	2481
2200	1430	2.09	1858	1488	2.31	2052	1543	2.53	2249	1596	2.76	2449	—	—	—
2300	1462	2.27	2012	1520	2.49	2212	1574	2.72	2416	—	—	—	—	—	—
2400	1495	2.45	2175	1552	2.68	2383	—	—	—	—	—	—	—	—	—
2500	1529	2.64	2349	1585	2.89	2564	—	—	—	—	—	—	—	—	—
2600	1562	2.85	2533	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

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

NOTES:

Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 2.90.
See General Fan Performance Notes.

Table 25 — Fan Performance 50HEQ003 — Horizontal Discharge Units; Standard Motor (Belt Drive)**

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)											
	0.1		0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
600	490	0.08	521	0.08	597	0.14	703	0.21	788	0.29	868	0.37
700	519	0.09	557	0.09	623	0.16	729	0.24	816	0.32	892	0.41
800	537	0.1	582	0.12	650	0.19	751	0.27	845	0.37	927	0.47
900	560	0.13	610	0.14	681	0.22	783	0.32	870	0.42	947	0.53
1000	589	0.15	640	0.16	707	0.26	808	0.36	894	0.47	971	0.58

Table 26 — Fan Performance 50HEQ004, 50HJQ004 — Horizontal Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	554	0.14	134	681	0.22	222	783	0.32	316	870	0.42	416	947	0.53	523
1000	583	0.16	163	707	0.26	257	808	0.36	358	894	0.47	465	971	0.58	578
1100	612	0.20	195	735	0.30	298	834	0.41	406	919	0.52	519	995	0.64	638
1200	643	0.23	233	762	0.35	344	860	0.46	459	944	0.58	579	1020	0.71	705
1300	674	0.28	276	791	0.40	395	887	0.52	517	970	0.65	645	1045	0.78	777
1400	706	0.33	324	820	0.45	451	914	0.59	582	997	0.72	717	1071	0.86	857
1500	738	0.38	379	849	0.52	515	942	0.66	653	1024	0.80	796	1097	0.95	942

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1017	0.64	635	1082	0.76	753	1143	0.88	876	1200	1.01	1004	1254	1.14	1136
1000	1041	0.70	696	1105	0.82	820	1166	0.95	948	1223	1.09	1081	—	—	—
1100	1065	0.77	763	1129	0.90	892	1189	1.03	1026	1245	1.17	1165	—	—	—
1200	1089	0.84	835	1153	0.98	971	1212	1.12	1111	—	—	—	—	—	—
1300	1114	0.92	915	1177	1.06	1056	—	—	—	—	—	—	—	—	—
1400	1139	1.01	1000	1202	1.15	1149	—	—	—	—	—	—	—	—	—
1500	1164	1.10	1093	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor

NOTES:
Grey box indicates field-supplied drive is required.
See General Fan Performance Notes.
* Factory provided drive range 680 to 1044 rpm. All other rpms require field-supplied drive. Max continuous bhp is 1.20.
**Factory provided drive range 639 to 936 rpm. All other rpms require field-supplied drive. Max continuous bhp is 0.58.

Table 27 — Fan Performance 50HEQ004, 50HJQ004 — Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	554	0.14	134	681	0.22	222	783	0.32	316	870	0.42	416	947	0.53	523
1000	583	0.16	163	707	0.26	257	808	0.36	358	894	0.47	465	971	0.58	578
1100	612	0.20	195	735	0.30	298	834	0.41	406	919	0.52	519	995	0.64	638
1200	643	0.23	233	762	0.35	344	860	0.46	459	944	0.58	579	1020	0.71	705
1300	674	0.28	276	791	0.40	395	887	0.52	517	970	0.65	645	1045	0.78	777
1400	706	0.33	324	820	0.45	451	914	0.59	582	997	0.72	717	1071	0.86	857
1500	738	0.38	379	849	0.52	515	942	0.66	653	1024	0.80	796	1097	0.95	942

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
900	1017	0.64	635	1082	0.76	753	1143	0.88	876	1200	1.01	1004	1254	1.14	1136
1000	1041	0.70	696	1105	0.82	820	1166	0.95	948	1223	1.09	1081	1276	1.23	1219
1100	1065	0.77	763	1129	0.90	892	1189	1.03	1026	1245	1.17	1165	1299	1.32	1308
1200	1089	0.84	835	1153	0.98	971	1212	1.12	1111	1269	1.26	1256	1322	1.41	1404
1300	1114	0.92	915	1177	1.06	1056	1236	1.21	1202	1292	1.36	1353	1346	1.52	1508
1400	1139	1.01	1000	1202	1.15	1149	1261	1.31	1301	1316	1.47	1457	1369	1.63	1618
1500	1164	1.10	1093	1227	1.25	1248	1285	1.41	1407	1341	1.58	1570	1394	1.75	1736

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor
* Motor drive range: 1075 to 1455 rpm. All other rpms require field-supplied drive.
NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 2.40.
See General Fan Performance Notes.

Table 28 — Fan Performance 50HEQ005, 50HJQ005 — Horizontal Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	643	0.23	233	762	0.35	344	860	0.46	459	944	0.58	579	1020	0.71	705
1300	674	0.28	276	791	0.40	395	887	0.52	517	970	0.65	645	1045	0.78	777
1400	706	0.33	324	820	0.45	451	914	0.59	582	997	0.72	717	1071	0.86	857
1500	738	0.38	379	849	0.52	515	942	0.66	653	1024	0.80	796	1097	0.95	942
1600	771	0.44	440	879	0.59	584	971	0.74	731	1051	0.89	881	1124	1.04	1035
1700	804	0.51	507	910	0.66	661	1000	0.82	816	1079	0.98	974	1151	1.14	1136
1800	837	0.59	582	941	0.75	745	1029	0.91	909	1107	1.08	1075	—	—	—
1900	871	0.67	665	972	0.84	837	1059	1.02	1010	1136	1.19	1184	—	—	—
2000	906	0.76	756	1004	0.94	938	1089	1.12	1119	—	—	—	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1089	0.84	835	1153	0.98	971	1212	1.12	1111	—	—	—	—	—	—
1300	1114	0.92	915	1177	1.06	1056	—	—	—	—	—	—	—	—	—
1400	1139	1.01	1000	1202	1.15	1149	—	—	—	—	—	—	—	—	—
1500	1164	1.10	1093	—	—	—	—	—	—	—	—	—	—	—	—
1600	1190	1.20	1193	—	—	—	—	—	—	—	—	—	—	—	—
1700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor
* Motor drive range: 770 to 1185 rpm. All other rpms require field-supplied drive.
NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 1.20.
See page 29 for General Fan Performance Notes.

Table 29 — Fan Performance 50HEQ005, 50HJQ005 — Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	643	0.23	233	762	0.35	344	860	0.46	459	944	0.58	579	1020	0.71	705
1300	674	0.28	276	791	0.40	395	887	0.52	517	970	0.65	645	1045	0.78	777
1400	706	0.33	324	820	0.45	451	914	0.59	582	997	0.72	717	1071	0.86	857
1500	738	0.38	379	849	0.52	515	942	0.66	653	1024	0.80	796	1097	0.95	942
1600	771	0.44	440	879	0.59	584	971	0.74	731	1051	0.89	881	1124	1.04	1035
1700	804	0.51	507	910	0.66	661	1000	0.82	816	1079	0.98	974	1151	1.14	1136
1800	837	0.59	582	941	0.75	745	1029	0.91	909	1107	1.08	1075	1178	1.25	1244
1900	871	0.67	665	972	0.84	837	1059	1.02	1010	1136	1.19	1184	1206	1.37	1361
2000	906	0.76	756	1004	0.94	938	1089	1.12	1119	1165	1.31	1301	1234	1.49	1486

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1200	1089	0.84	835	1153	0.98	971	1212	1.12	1111	1269	1.26	1256	1322	1.41	1404
1300	1114	0.92	915	1177	1.06	1056	1236	1.21	1202	1292	1.36	1353	1346	1.52	1508
1400	1139	1.01	1000	1202	1.15	1149	1261	1.31	1301	1316	1.47	1457	1369	1.63	1618
1500	1164	1.10	1093	1227	1.25	1248	1285	1.41	1407	1341	1.58	1570	1394	1.75	1736
1600	1190	1.20	1193	1252	1.36	1355	1311	1.53	1520	1366	1.70	1690	1418	1.87	1863
1700	1217	1.31	1301	1278	1.48	1470	1336	1.65	1642	1391	1.83	1818	1443	2.01	1998
1800	1244	1.42	1417	1305	1.60	1593	1362	1.78	1772	1416	1.97	1955	1468	2.15	2141
1900	1271	1.55	1541	1331	1.73	1724	1388	1.92	1911	1442	2.11	2101	1494	2.31	2294
2000	1298	1.68	1674	1358	1.87	1865	1415	2.07	2059	1468	2.27	2256	—	—	—

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor

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

NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 2.40.
See General Fan Performance Notes.

Table 30 — Fan Performance 50HEQ006, 50HJQ006 — Horizontal Discharge Units; Standard Motor (Belt Drive)* — Single-Phase Units

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watt	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	724	0.33	295	837	0.45	402	937	0.59	524	1028	0.74	660	1111	0.91	808
1600	757	0.39	343	866	0.51	455	962	0.65	580	1050	0.81	719	1132	0.98	870
1700	790	0.45	398	894	0.58	514	988	0.72	643	1074	0.88	784	1154	1.06	938
1800	823	0.52	458	924	0.65	579	1015	0.80	712	1099	0.96	857	1177	1.14	1013
1900	857	0.59	525	955	0.73	650	1043	0.89	787	1125	1.05	936	1201	1.23	1096
2000	892	0.67	599	986	0.82	729	1072	0.98	870	1151	1.15	1022	—	—	—
2100	927	0.77	680	1017	0.92	815	1101	1.08	960	1178	1.26	1116	—	—	—
2200	962	0.87	769	1050	1.02	909	1131	1.19	1059	—	—	—	—	—	—
2300	997	0.97	865	1082	1.14	1010	—	—	—	—	—	—	—	—	—
2400	1033	1.09	970	1115	1.26	1120	—	—	—	—	—	—	—	—	—
2500	1069	1.22	1084	—	—	—	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1188	1.09	970	1261	1.29	1143	—	—	—	—	—	—	—	—	—
1600	1208	1.16	1033	—	—	—	—	—	—	—	—	—	—	—	—
1700	1229	1.24	1103	—	—	—	—	—	—	—	—	—	—	—	—
1800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor

* Motor drive range: 1035 to 1460 rpm. All other rpms require field-supplied drive.

NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 1.30.
See General Fan Performance Notes.

Table 31 — Fan Performance 50HEQ006, 50HJQ006 — Horizontal Discharge Units; Standard Motor (Belt Drive)* — Three-Phase 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
1500	724	0.33	295	837	0.45	402	937	0.59	524	1028	0.74	660	1111	0.91	808
1600	757	0.39	343	866	0.51	455	962	0.65	580	1050	0.81	719	1132	0.98	870
1700	790	0.45	398	894	0.58	514	988	0.72	643	1074	0.88	784	1154	1.06	938
1800	823	0.52	458	924	0.65	579	1015	0.80	712	1099	0.96	857	1177	1.14	1013
1900	857	0.59	525	955	0.73	650	1043	0.89	787	1125	1.05	936	1201	1.23	1096
2000	892	0.67	599	986	0.82	729	1072	0.98	870	1151	1.15	1022	1226	1.33	1185
2100	927	0.77	680	1017	0.92	815	1101	1.08	960	1178	1.26	1116	1251	1.44	1283
2200	962	0.87	769	1050	1.02	909	1131	1.19	1059	1206	1.37	1218	1277	1.56	1389
2300	997	0.97	865	1082	1.14	1010	1161	1.31	1165	1235	1.50	1329	1304	1.69	1503
2400	1033	1.09	970	1115	1.26	1120	1192	1.44	1279	1264	1.63	1448	1332	1.83	1625
2500	1069	1.22	1084	1149	1.39	1239	1223	1.58	1403	1293	1.77	1576	1360	1.98	1757

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1188	1.09	970	1261	1.29	1143	1330	1.49	1327	1395	1.71	1523	1457	1.95	1729
1600	1208	1.16	1033	1279	1.36	1208	1347	1.57	1394	1412	1.79	1590	1474	2.02	1797
1700	1229	1.24	1103	1299	1.44	1280	1366	1.65	1468	1429	1.88	1665	1490	2.11	1873
1800	1250	1.33	1181	1319	1.53	1360	1385	1.74	1549	1448	1.97	1748	1508	2.20	1957
1900	1273	1.43	1266	1341	1.63	1447	1405	1.84	1638	1467	2.07	1839	1527	2.31	2050
2000	1296	1.53	1359	1363	1.74	1542	1427	1.95	1736	1488	2.18	1939	—	—	—
2100	1320	1.64	1459	1386	1.85	1646	1448	2.07	1842	1508	2.30	2047	—	—	—
2200	1345	1.77	1568	1409	1.98	1758	1471	2.20	1956	—	—	—	—	—	—
2300	1371	1.90	1686	1434	2.11	1878	1494	2.34	2080	—	—	—	—	—	—
2400	1397	2.04	1812	1459	2.26	2008	—	—	—	—	—	—	—	—	—
2500	1424	2.19	1948	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor

* Motor drive range: 1035 to 1460 rpm. All other rpms require field-supplied drive.

NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 2.40.
See General Fan Performance Notes.

Table 32 — Fan Performance 50HEQ006, 50HJQ006 — Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	724	0.33	295	837	0.45	402	937	0.59	524	1028	0.74	660	1111	0.91	808
1600	757	0.39	343	866	0.51	455	962	0.65	580	1050	0.81	719	1132	0.98	870
1700	790	0.45	398	894	0.58	514	988	0.72	643	1074	0.88	784	1154	1.06	938
1800	823	0.52	458	924	0.65	579	1015	0.80	712	1099	0.96	857	1177	1.14	1013
1900	857	0.59	525	955	0.73	650	1043	0.89	787	1125	1.05	936	1201	1.23	1096
2000	892	0.67	599	986	0.82	729	1072	0.98	870	1151	1.15	1022	1226	1.33	1185
2100	927	0.77	680	1017	0.92	815	1101	1.08	960	1178	1.26	1116	1251	1.44	1283
2200	962	0.87	769	1050	1.02	909	1131	1.19	1059	1206	1.37	1218	1277	1.56	1389
2300	997	0.97	865	1082	1.14	1010	1161	1.31	1165	1235	1.50	1329	1304	1.69	1503
2400	1033	1.09	970	1115	1.26	1120	1192	1.44	1279	1264	1.63	1448	1332	1.83	1625
2500	1069	1.22	1084	1149	1.39	1239	1223	1.58	1403	1293	1.77	1576	1360	1.98	1757

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1500	1188	1.09	970	1261	1.29	1143	1330	1.49	1327	1395	1.71	1523	1457	1.95	1729
1600	1208	1.16	1033	1279	1.36	1208	1347	1.57	1394	1412	1.79	1590	1474	2.02	1797
1700	1229	1.24	1103	1299	1.44	1280	1366	1.65	1468	1429	1.88	1665	1490	2.11	1873
1800	1250	1.33	1181	1319	1.53	1360	1385	1.74	1549	1448	1.97	1748	1508	2.20	1957
1900	1273	1.43	1266	1341	1.63	1447	1405	1.84	1638	1467	2.07	1839	1527	2.31	2050
2000	1296	1.53	1359	1363	1.74	1542	1427	1.95	1736	1488	2.18	1939	1546	2.42	2151
2100	1320	1.64	1459	1386	1.85	1646	1448	2.07	1842	1508	2.30	2047	1566	2.55	2262
2200	1345	1.77	1568	1409	1.98	1758	1471	2.20	1956	1530	2.44	2164	1587	2.68	2380
2300	1371	1.90	1686	1434	2.11	1878	1494	2.34	2080	1553	2.58	2290	1609	2.83	2509
2400	1397	2.04	1812	1459	2.26	2008	1518	2.49	2213	1576	2.73	2425	—	—	—
2500	1424	2.19	1948	1484	2.42	2147	1543	2.65	2355	1599	2.89	2571	—	—	—

LEGEND

Bhp – Brake Horsepower Input to Fan

Watts – Input Watts to Motor

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

NOTES:

Grey box indicates field-supplied drive is required.

Maximum continuous bhp is 2.90.

See General Fan Performance Notes.

Table 33 — Fan Performance 50HJQ007 — Horizontal Discharge Units; Standard Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	822	0.51	455	927	0.66	589	1018	0.82	728	1100	0.98	873	1174	1.15	1024
1900	855	0.59	520	957	0.74	659	1046	0.91	805	1127	1.08	956	1200	1.25	1113
2000	889	0.66	591	988	0.83	737	1075	1.00	888	1154	1.18	1045	1226	1.36	1208
2100	923	0.75	668	1019	0.92	821	1104	1.10	979	1182	1.29	1142	1253	1.48	1310
2200	957	0.85	753	1051	1.03	912	1134	1.21	1077	1210	1.40	1245	1280	1.60	1419
2300	992	0.95	845	1083	1.14	1011	1164	1.33	1182	1239	1.53	1357	1308	1.73	1537
2400	1026	1.06	945	1115	1.26	1118	1195	1.46	1295	1268	1.66	1476	1336	1.87	1662
2500	1061	1.19	1053	1148	1.39	1233	1226	1.59	1416	1297	1.81	1604	1364	2.02	1796
2600	1097	1.32	1169	1181	1.53	1356	1257	1.74	1546	1327	1.96	1740	1393	2.18	1938
2700	1132	1.46	1294	1214	1.67	1487	1289	1.90	1684	1358	2.12	1885	1422	2.35	2089
2800	1168	1.61	1428	1247	1.83	1629	1320	2.06	1832	1388	2.30	2039	—	—	—
2900	1204	1.77	1572	1281	2.00	1779	1353	2.24	1989	—	—	—	—	—	—
3000	1240	1.94	1725	1315	2.18	1939	—	—	—	—	—	—	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1244	1.33	1182	1308	1.51	1345	1369	1.70	1513	1427	1.90	1687	1483	2.10	1867
1900	1268	1.44	1275	1332	1.63	1443	1393	1.82	1617	1450	2.02	1796	1505	2.23	1979
2000	1294	1.55	1376	1357	1.74	1549	1417	1.95	1727	1474	2.15	1911	1528	2.36	2100
2100	1320	1.67	1483	1382	1.87	1662	1441	2.08	1845	1498	2.29	2034	—	—	—
2200	1346	1.80	1598	1408	2.01	1782	1466	2.22	1971	—	—	—	—	—	—
2300	1372	1.94	1721	1434	2.15	1911	1491	2.37	2105	—	—	—	—	—	—
2400	1400	2.09	1852	1460	2.31	2047	—	—	—	—	—	—	—	—	—
2500	1427	2.24	1992	—	—	—	—	—	—	—	—	—	—	—	—
2600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND
Bhp – Brake Horsepower Input to Fan
Watts – Input Watts to Motor
* Motor drive range: 1119 to 1585 rpm. All other rpms require field-supplied drive.
NOTES:
Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 2.40.
See General Fan Performance Notes.

Table 34 — Fan Performance 50HJQ007 — Horizontal Discharge Units; High-Static Motor (Belt Drive)*

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	0.2			0.4			0.6			0.8			1.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	822	0.51	455	927	0.66	589	1018	0.82	728	1100	0.98	873	1174	1.15	1024
1900	855	0.59	520	957	0.74	659	1046	0.91	805	1127	1.08	956	1200	1.25	1113
2000	889	0.66	591	988	0.83	737	1075	1.00	888	1154	1.18	1045	1226	1.36	1208
2100	923	0.75	668	1019	0.92	821	1104	1.10	979	1182	1.29	1142	1253	1.48	1310
2200	957	0.85	753	1051	1.03	912	1134	1.21	1077	1210	1.40	1245	1280	1.60	1419
2300	992	0.95	845	1083	1.14	1011	1164	1.33	1182	1239	1.53	1357	1308	1.73	1537
2400	1026	1.06	945	1115	1.26	1118	1195	1.46	1295	1268	1.66	1476	1336	1.87	1662
2500	1061	1.19	1053	1148	1.39	1233	1226	1.59	1416	1297	1.81	1604	1364	2.02	1796
2600	1097	1.32	1169	1181	1.53	1356	1257	1.74	1546	1327	1.96	1740	1393	2.18	1938
2700	1132	1.46	1294	1214	1.67	1487	1289	1.90	1684	1358	2.12	1885	1422	2.35	2089
2800	1168	1.61	1428	1247	1.83	1629	1320	2.06	1832	1388	2.30	2039	1452	2.53	2249
2900	1204	1.77	1572	1281	2.00	1779	1353	2.24	1989	1419	2.48	2202	1482	2.72	2419
3000	1240	1.94	1725	1315	2.18	1939	1385	2.43	2156	1451	2.68	2376	—	—	—

AIRFLOW (Cfm)	EXTERNAL STATIC PRESSURE (in. wg)														
	1.2			1.4			1.6			1.8			2.0		
	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts	Rpm	Bhp	Watts
1800	1244	1.33	1182	1308	1.51	1345	1369	1.70	1513	1427	1.90	1687	1483	2.10	1867
1900	1268	1.44	1275	1332	1.63	1443	1393	1.82	1617	1450	2.02	1796	1505	2.23	1979
2000	1294	1.55	1376	1357	1.74	1549	1417	1.95	1727	1474	2.15	1911	1528	2.36	2100
2100	1320	1.67	1483	1382	1.87	1662	1441	2.08	1845	1498	2.29	2034	1552	2.51	2227
2200	1346	1.80	1598	1408	2.01	1782	1466	2.22	1971	1522	2.44	2165	1575	2.66	2363
2300	1372	1.94	1721	1434	2.15	1911	1491	2.37	2105	1547	2.59	2304	1600	2.82	2507
2400	1400	2.09	1852	1460	2.31	2047	1517	2.53	2247	1572	2.76	2451	—	—	—
2500	1427	2.24	1992	1487	2.47	2192	1543	2.70	2398	—	—	—	—	—	—
2600	1455	2.41	2140	1514	2.64	2346	1570	2.88	2557	—	—	—	—	—	—
2700	1483	2.59	2297	1541	2.83	2509	—	—	—	—	—	—	—	—	—
2800	1512	2.77	2463	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LEGEND

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

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

NOTES:

Grey box indicates field-supplied drive is required.
Maximum continuous bhp is 2.90.
See General Fan Performance Notes.

PRE-START-UP

⚠ WARNING

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

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

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

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

START-UP

STEP 1 —UNIT PREPARATION

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

STEP 2 —RETURN-AIR FILTERS

Make sure the correct filters are installed in the unit (See Table 1). Do not operate the unit without return-air filters.

STEP 3 —OUTDOOR-AIR INLET SCREENS

Outdoor-air inlet screen(s) must be in place before operating the unit.

STEP 4 —COMPRESSOR MOUNTING

Compressors are internally spring mounted. Do not loosen or remove the compressor holddown bolts.

STEP 5 —INTERNAL WIRING

Check all electrical connections in unit control boxes; tighten them as required.

STEP 6 —REFRIGERANT SERVICE PORTS

Each unit system has 3 Schrader-type service ports: one on the suction line, one on the liquid line, and one on the compressor discharge line. Be sure that the caps on the ports are tight.

STEP 7 —HIGH FLOW VALVES

Located on the compressor hot gas and suction tubes are High Flow Valves. Large black plastic caps distinguish these valves with o-rings located inside the caps. These valves cannot be accessed for service in the field. To prevent refrigerant leakage, ensure the plastic caps are in place and tight.

STEP 8 —COMPRESSOR ROTATION

On 3-phase units be certain that the compressor is rotating in the proper direction. To determine whether or not compressor is rotating in the proper direction:

1. Connect the service gauges 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 indoor fan (006 and 007 three-phase units only) is probably also rotating in the wrong direction.
2. Turn off power to the unit and tag disconnect.
3. Reverse any two of the unit power leads.
4. Turn on power to the unit and energize the compressor.

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 more noise and does not provide cooling.

STEP 9 —COOLING

Set the space thermostat to the OFF position. Set the system selector switch at COOL position and the fan switch at AUTO position. Adjust the thermostat to a setting below room temperature. The compressor starts when contactor closes.

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

Reset the thermostat at a position above room temperature. The compressor will shut off.

To Shut Off Unit - Set the system selector switch at OFF position. Resetting the thermostat at a position above room temperature shuts off the unit temporarily until the space temperature exceeds the thermostat setting. Units are equipped with a Cycle-LOC™ protection device. The unit shuts down on any safety trip and remains off; an indicator light on the thermostat comes on. Check the reason for the safety trip.

Compressor restart is accomplished by manual reset at the thermostat by turning the selector switch to OFF position and then to ON position.

Allow unit to operate a minimum of 10 minutes before checking refrigerant charge.

STEP 10 —HEATING

To start unit, turn on main power supply.

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

First stage of thermostat energizes the indoor fan, compressor, and outdoor fan; second stage energizes electric heater elements, if installed. Check heating effects at air supply grille(s).

If electric heaters do not energize, reset limit switch (located on indoor-fan scroll) by depressing button located between terminals on the switch.

To Shut Off Unit – Set system selector switch at OFF position. Resetting thermostat at a position below room temperature temporarily shuts off unit until space temperature falls below thermostat setting.

STEP 11 —SAFETY RELIEF

A soft solder joint at the suction line fitting provides pressure relief under abnormal temperature and pressure conditions.

STEP 12 —VENTILATION

Set fan and system selector switches at ON and OFF positions, respectively. Indoor fan operates continuously to provide constant air circulation.

STEP 13 —OPERATING SEQUENCE

COOLING - UNITS WITHOUT ECONOMIZER

When thermostat calls for cooling, terminals G and Y1 are energized. The indoor-fan contactor (IFC), reversing valve solenoid (RVS) and compressor contactor are energized and indoor-fan motor, compressor, and outdoor fan starts. The outdoor fan motor runs continuously while unit is cooling.

HEATING - UNITS WITHOUT ECONOMIZER

Upon a request for heating from the space thermostat, terminal W1 will be energized with 24 v. The IFC, outdoor-fan contactor (OFC), C1, and C2 will be energized. The indoor fan, outdoor fan, and compressor no. 1 and compressor no. 2 are energized. The RVS is deenergized and switches position.

If the space temperature continues to fall while W1 is energized, W2 will be energized with 24 v, and the heater contactor(s) (HC) will be energized, which will energize the electric heater(s).

When the space thermostat is satisfied, W2 will be deenergized first, and the electric heater(s) will be deenergized.

Upon a further rise in space temperature, W1 will be deenergized.

COOLING - UNITS WITH ECONOMI$ER IV

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

Integrated EconoMi$er IV operation on single-stage units requires a 2-stage thermostat (Y1 and Y2).

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

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

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

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

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

If free cooling can be used as determined from the appropriate changeover command (switch, dry bulb, enthalpy curve, differential dry bulb, or differential enthalpy), a call for cooling (Y1 closes at the thermostat) will cause the control to modulate the dampers open to maintain the supply-air temperature set point at 50° to 55°F.

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

HEATING - UNITS WITH ECONOMI$ER IV

When the room temperature calls for heat, the heating controls are energized as described in the Heating, Units Without Economizer section. When the thermostat is satisfied, the economizer damper moves to the minimum position.

COOLING - UNITS WITH ECONOMI$ER2, PREMIER-LINK™ CONTROL AND A THERMOSTAT

When free cooling is not available, the compressors will be controlled by the PremierLink control in response to the Y1 and Y2 inputs from the thermostat.

The PremierLink control will use the following information to determine if free cooling is available:

- Indoor fan has been on for at least 30 seconds.
- The SPT, SAT, and OAT inputs must have valid readings.
- OAT must be less than 75°F.
- OAT must be less than SPT.
- Enthalpy must be LOW (may be jumpered if an enthalpy sensor not available).
- Economizer position is NOT forced.

Pre-cooling occurs when there is no call from the thermostat except G. Pre-cooling is defined as the economizer modulates to provide 70°F supply air.

When free cooling is available the PremierLink control will control the compressors and economizer to provide a supply-air temperature determined to meet the Y1 and Y2 calls from the thermostat using the following three routines. The three control routines are based on OAT.

The 3 routines are based on OAT where:

SASP = Supply Air Set Point

DXCTLO = Direct Expansion Cooling Lockout Set Point

PID = Proportional Integral

Routine 1 (OAT < DXCTLO)

- Y1 energized – economizer maintains a SASP = (SATLO1 + 3).
- Y2 energized – economizer maintains a SASP = (SATLO2 + 3).

Routine 2 (DXCTLO < OAT < 68°F)

- If only Y1 energized, the economizer maintains a SASP = (SATLO1 + 3).
- If SAT > SASP + 5 and economizer position > 80%, economizer will go to minimum position for 3 minutes or until SAT > 68°F.
- First stage of mechanical cooling will be energized.
- Integrator resets.
- Economizer opens again and controls to current SASP after stage one on for 90 seconds.
- With Y1 and Y2 energized Economizer maintains an SASP = SATLO2 + 3.
- If SAT > SASP + 5 and economizer position >80%, economizer will go to minimum position for 3 minutes or until SAT > 68°F.
- If compressor one is on then second stage of mechanical cooling will be energized; otherwise the first stage will be energized.
- Integrator resets.
- Economizer opens again and controls to SASP after stage one on for 90 seconds.

Routine 3 (OAT > 68)

- Economizer is opened 100%.
- Compressors 1 and 2 are cycled based on Y1 and Y2 using minimum on and off times and watching the supply air temperature as compared to SATLO1 and SATLO2 set points.

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

If field-installed accessory CO_2 sensors are connected to the PremierLink™ control, a PID-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, PREMIER-LINK CONTROL AND A THERMOSTAT

When the thermostat calls for heating, terminal W1 is energized. The PremierLink control will move the economizer damper to the minimum position if there is a call for G and closed if there is a call for W1 without G. In order to prevent thermostat from short cycling, the unit is locked into the heating mode for at least 10 minutes when W1 is energized. The reversing valve(s) deenergizes and switches position.

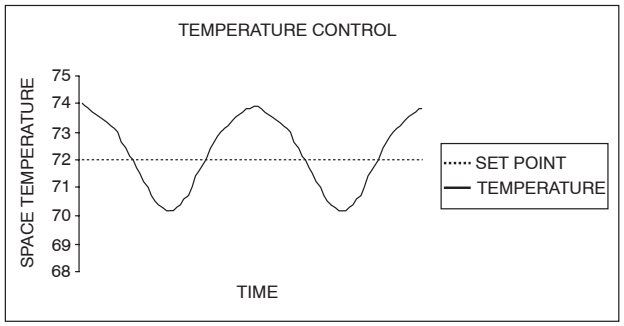
On units equipped for two stages of heat, when additional heat is needed, W2 is energized and electric heat (if supplied) comes on. When the thermostat is satisfied W1 and W2 are deenergized, the IFM stops.

COOLING - UNITS WITH ECONOMI$ER2, PREMIER-LINK CONTROL AND A ROOM SENSOR

When free cooling is not available, the compressors will be controlled by the PremierLink controller using a PID Error reduction calculation as indicated by Fig 43.

The PremierLink controller will use the following information to determine if free cooling is available:

- Indoor fan has been on for at least 30 seconds.
- The SPT, SAT, and OAT inputs must have valid readings.
- OAT must be less than 75°F.
- OAT must be less than SPT.
- Enthalpy must be LOW (may be jumpered if and enthalpy sensor is not available).
- Economizer position is NOT forced.



NOTE: PremierLink control performs smart staging of 2 stages of DX cooling and up to 3 stages of heat.

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Fig. 43 – DX Cooling Temperature Control Example

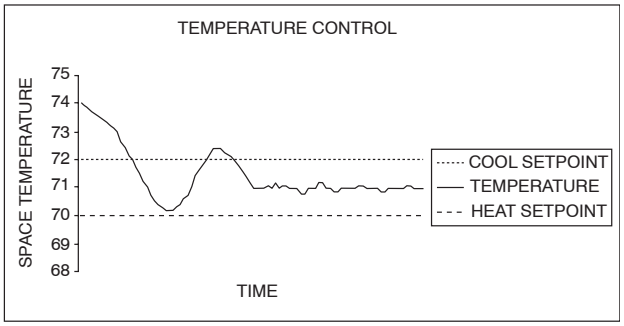

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Fig. 44 – Economizer Temperature Control Example

When free cooling is available, the outdoor-air damper is positioned through the use of a Proportional Integral (PID) control process to provide a calculated supply-air temperature into the zone. The supply air will maintain the space temperature between the heating and cooling set points as indicated in Fig. 44.

The PremierLink controller will integrate the compressors stages (and energized the reversing valve[s]) with the economizer based on similar logic as the three routines listed in the previous section. The SASP will float up and down based on the error reduction calculations that compare space temperature and space set point.

When outdoor-air temperature conditions require the economizer to close for a compressor stage-up sequence, the economizer control integrator is reset to zero after the stage-up sequence is completed. This prevents the supply-air temperature from dropping too quickly and creating a freeze condition that would make the compressor turn off prematurely.

The high space set point is used for DX (direct expansion) cooling control, while the economizer space set point is a calculated value between the heating and cooling set points. The economizer set point will always be at least one degree below the cooling set point, allowing for a smooth transition from mechanical cooling with economizer assist, back to economizer cooling as the cooling set point is achieved. The compressors may be used for initial cooling then the PremierLink controller will modulate the economizer using an error reduction calculation to hold the space temperature between the heating and cooling set points. (See Fig. 45.)

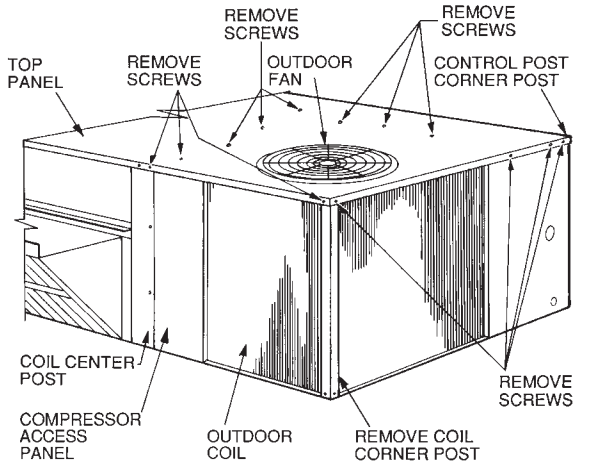

Fig. 45 – Cleaning Outdoor Coil

The controller uses the following conditions to determine economizer cooling:

- Enthalpy is Low
- SAT reading is available
- OAT reading is available
- SPT reading is available
- OAT ≤ SPT
- Economizer Position is NOT forced

If any of the above conditions are **not** met, the economizer submaster reference (ECSR) is set to maximum limit and the damper moves to minimum position. The operating sequence is complete. The ECSR is recalculated every 30 seconds.

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

If field-installed accessory CO_2 sensors are connected to the PremierLink™ control, a PID-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 - UNIT WITH ECONOMI$ER2, PREMIER-LINK CONTROL AND A ROOM SENSOR

Every 40 seconds the controller will calculate the required heat stages (maximum of 3) to maintain Supply-Air Temperature (SAT) if the following qualifying conditions are met:

- Indoor fan has been on for at least 30 seconds.
- COOL mode is not active.
- OCCUPIED, TEMP. COMPENSATED START or HEAT mode is active.
- SAT reading is available.
- Fire shutdown mode is not active.

If all of the above conditions are met, the number of heat stages is calculated; otherwise the required number of heat stages will be set to 0.

If the PremierLink controller determines that heat stages are required, the economizer damper will be moved to minimum position if occupied and closed if unoccupied.

Staging should be as follows:

If Heating PID STAGES=2

- HEAT STAGES=1 (50% capacity) will energize HS1
- HEAT STAGES=2 (100% capacity) will energize HS2

If Heating PID STAGES=3 and AUXOUT = HS3

- HEAT STAGES=1 (33% capacity) will energize HS1
- HEAT STAGES=2 (66% capacity) will energize HS2
- HEAT STAGES=3 (100% capacity) will energize HS3

In order to prevent short cycling, the unit is locked into the Heating mode for at least 10 minutes when HS1 is deenergized. On units equipped for two stages of heat, electric heat will come on (if supplied). When the space condition is satisfied and HS1 is deenergized the IFM stops. The fan will run continuously in the occupied mode as required by national energy and fresh air standards.

SERVICE

⚠ WARNING

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

STEP 1 —CLEANING

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

INDOOR COIL

1. Turn unit power off and install a lockout tag. Remove the filter access panel and indoor coil access panel.
2. If accessory economizer is installed, remove the economizer by disconnecting the Molex plug and removing the economizer mounting screws.
3. Slide the filters out of the unit.
4. Clean the coil using a commercial coil cleaner or dishwasher detergent in a pressurized spray canister. Wash both sides of the coil and flush it with clean water. For best results, back-flush toward the return-air section to remove foreign material. Flush the condensate pan after completion.
5. Reinstall the economizer and filters.
6. Reconnect the wiring.
7. Replace the access panels.

OUTDOOR COIL

Inspect the coil monthly. Clean the outdoor coil annually, and as required by location or outdoor-air conditions.

One-Row Coils

Wash the coil with commercial coil cleaner. It is not necessary to remove the top panel.

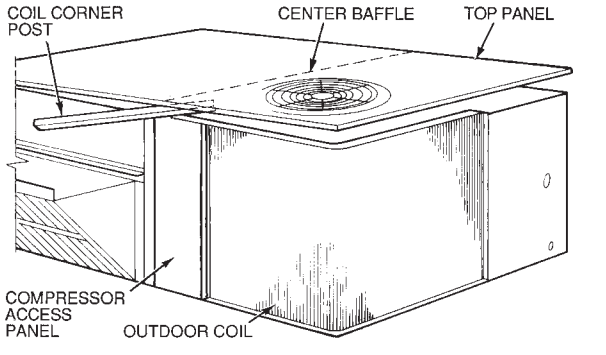

Fig. 46 – Propping Up Top Panel

2-Row Coils

Clean the coil as follows:

1. Turn off unit power and tag disconnect.
2. Remove the top panel screws on the outdoor end of unit.

3. Remove the outdoor coil corner post. (See Fig. 45.) To hold the top panel open, place the coil corner post between the top panel and center post. (See Fig. 46.)
4. Remove the device holding the coil sections together at the return end of outdoor coil. Carefully separate the outer coil section 3 to 4 in. from the inner coil section. (See Fig. 47.)
5. 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.
6. Secure the sections together. Reposition the outer coil section, and remove the coil corner post from between the top panel and center post. Install the coil corner and center posts, and replace all screws.

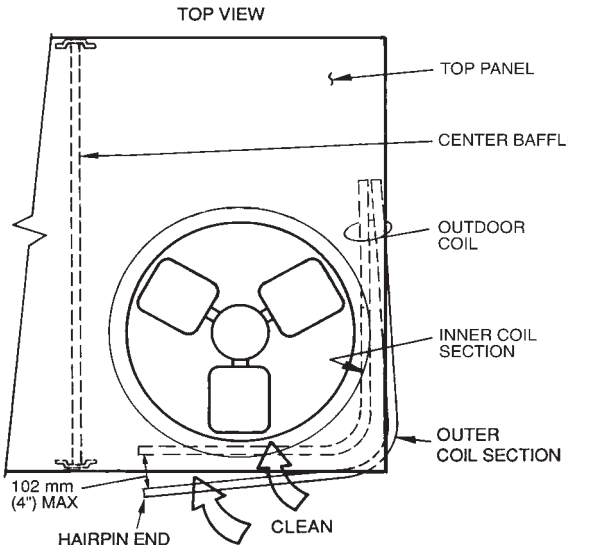

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Fig. 47 – Separating Coil Sections

CONDENSATE DRAIN

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

FILTERS

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

OUTDOOR-AIR INLET SCREENS

Clean the screens with steam or hot water and a mild detergent. Do not use disposable filters in place of screens.

STEP 2 —LUBRICATION

COMPRESSOR

The compressor is charged with the correct amount of oil at the factory.

FAN MOTOR BEARINGS

Fan motor bearings are permanently lubricated. No further lubrication of outdoor-fan or indoor-fan motors is required.

STEP 3 —HIGH-PRESSURE SWITCH

The high-pressure switch is mounted on a fitting containing a Schrader core, and is located on the compressor hot gas line. This switch opens at 428 psig and closes at 320 psig. No adjustment is necessary.

STEP 4 —LOSS-OF-CHARGE SWITCH

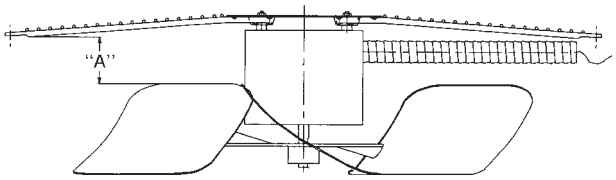
The loss-of-charge switch is mounted on fitting containing a Schrader core, and is located on the compressor hot gas line. This switch opens at 7 psig and closes at 22 psig. No adjustment is necessary.

STEP 5 —FREEZE-STAT

The freeze-stat is a bimetal temperature-sensing switch located on the "hair pin" end of the indoor coil. The switch protects the indoor coil from freeze-up due to lack of airflow. The switch opens at 30°F and closes at 45°F. No adjustment is necessary.

STEP 6 —OUTDOOR-FAN ADJUSTMENT

1. Shut off unit power supply and tag disconnect.
2. Remove the outdoor-fan assembly (grille, motor, motor cover, and fan) by removing the screws and flipping the assembly onto the unit's top cover.
3. Loosen the fan hub setscrews.
4. Adjust the fan height as shown in Fig. 48.
5. Tighten the setscrews.
6. Replace the outdoor-fan assembly.



UNIT 50HJQ	FAN HEIGHT (in.) — "A"
004-006 AND 007 (208/230 v)	2.75
007 (460 v)	3.50

C06047

Fig. 48 – Outdoor-Fan Adjustment

STEP 7 —BLOWER BELT ADJUSTMENT

Inspect the blower belt for wear, proper belt tension, and pulley alignment as conditions require, or at the beginning of each heating and air conditioning season. Refer to Step 7 — Adjust Indoor-Fan Speed for adjustment and alignment procedures.

STEP 8 —ECONOMI$ER IV ADJUSTMENT

Refer to the Optional EconoMi$er IV and EconoMi$er2 section.

STEP 9 —REFRIGERANT CHARGE

Amount of refrigerant charge is listed on unit nameplate (also refer to Table 1). Refer to Carrier Refrigerant Service Techniques Manual, Refrigerants section.

Unit panels must be in place when the unit is operating during charging procedure. The compressor must run a minimum of 10 minutes before checking or adjusting the refrigerant charge.

NO CHARGE

Refer to Carrier Refrigerant Service Techniques. Use standard evacuating techniques. After evacuating the system to 500 microns, weigh in the specified amount of refrigerant. (Refer to Table 1.)

CHARGING, HEATING MODE

Do not attempt to adjust the refrigerant charge while the unit is operating in the Heating mode. If the refrigerant charge amount is suspect, evacuate the refrigerant system to 500 microns and weigh in the refrigerant amount listed on the unit's data plate.

LOW CHARGE COOLING

Use Cooling Charging Charts, Fig. 49-56. Vary the refrigerant until the conditions of the charts are met. Note that the charging charts are different from the type normally used. Charts are based on charging the units to the correct superheat for the various operating conditions. An accurate pressure gauge and temperature sensing device are required. Connect the pressure gauge to the

service port on the suction line. Mount the temperature sensing device on the suction line and insulate it so that outdoor ambient temperature does not affect the reading. Indoor-air cfm must be within the unit's normal operating range.

NOTE: Do not use mercury or dial type pocket thermometers as they are not designed for this type of temperature measurement.

TO USE COOLING CHARGING CHARTS

Take the outdoor ambient temperature and read the suction pressure gauge. Refer to the charts to determine what the suction temperature should be. If the suction temperature is high, add refrigerant. If the suction temperature is low, carefully recover some of the charge. Recheck the suction pressure as the charge is adjusted.

Example: (Fig. 49)

Outdoor Temperature . . . . . 85°F

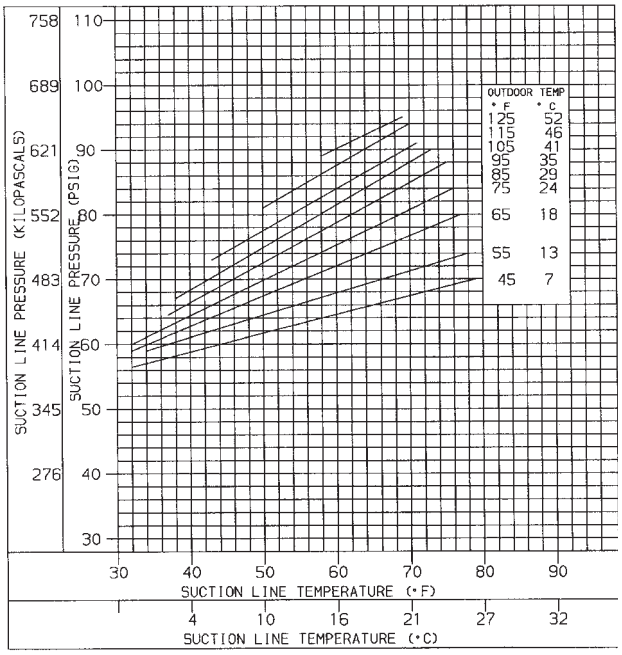
Suction Pressure . . . . . 74 psig

Suction Temperature should be . . . . . 52°F

(Suction Temperature may vary ± 5° F.)

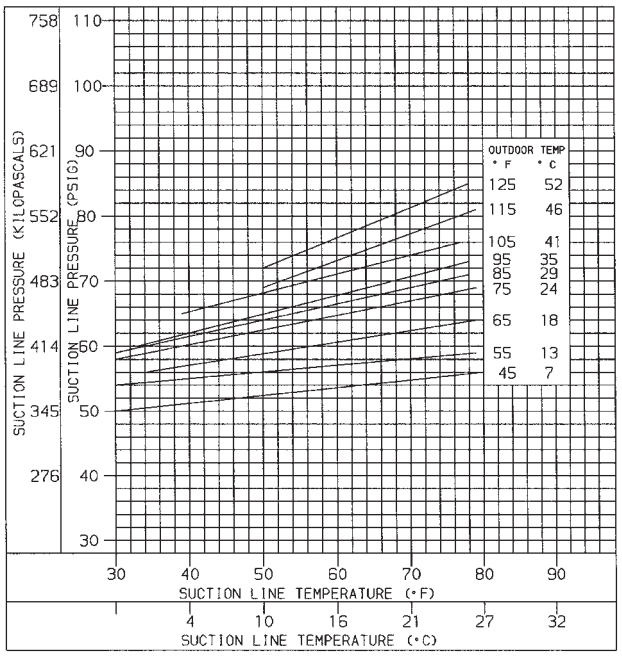
STEP 10 —REPLACEMENT PARTS

A complete list of replacement parts may be obtained from any Carrier distributor.



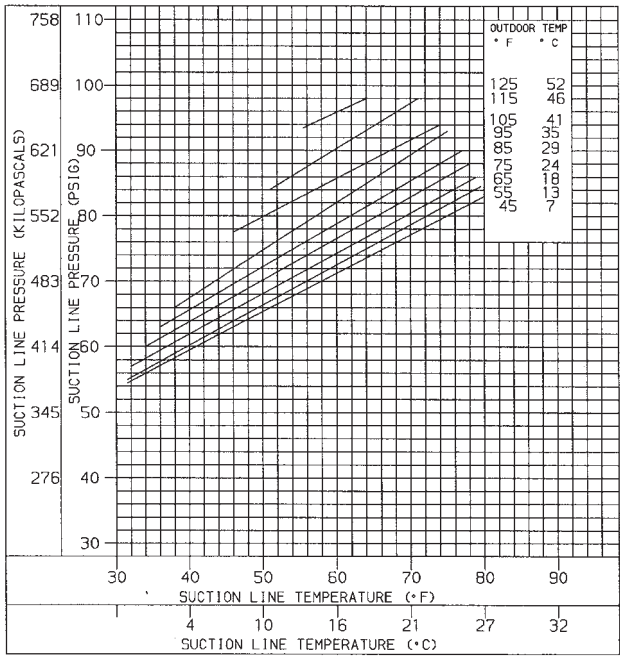
C06048

Fig. 49 – Cooling Charging Chart--50HJQ004



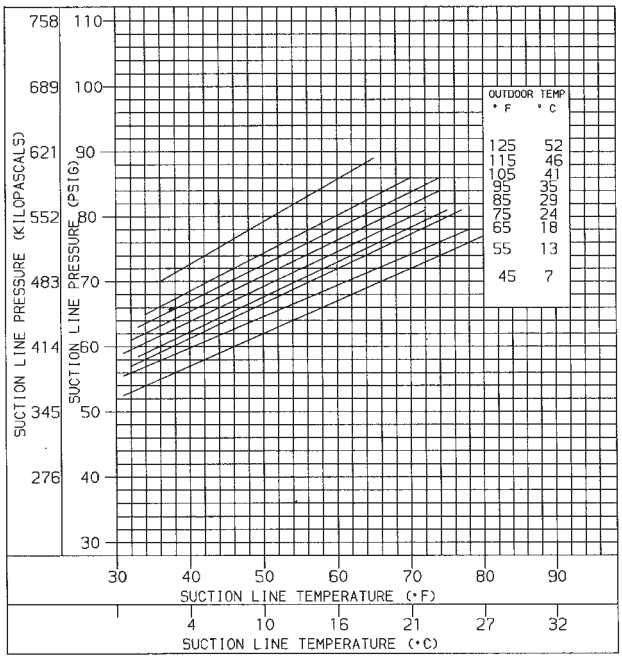
C06049

Fig. 50 – Cooling Charging Chart--50HJQ005



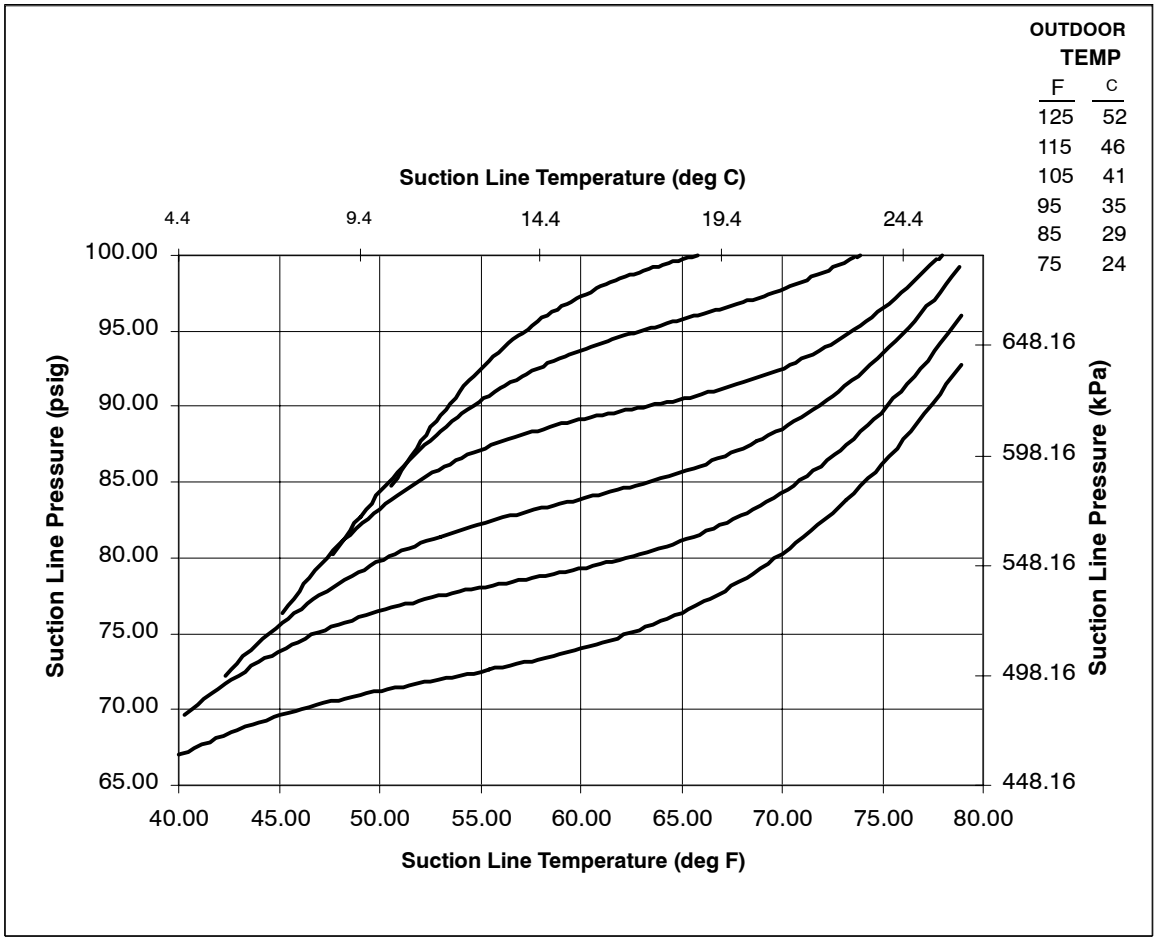
C06050

Fig. 51 – Cooling Charging Chart--50HJQ006



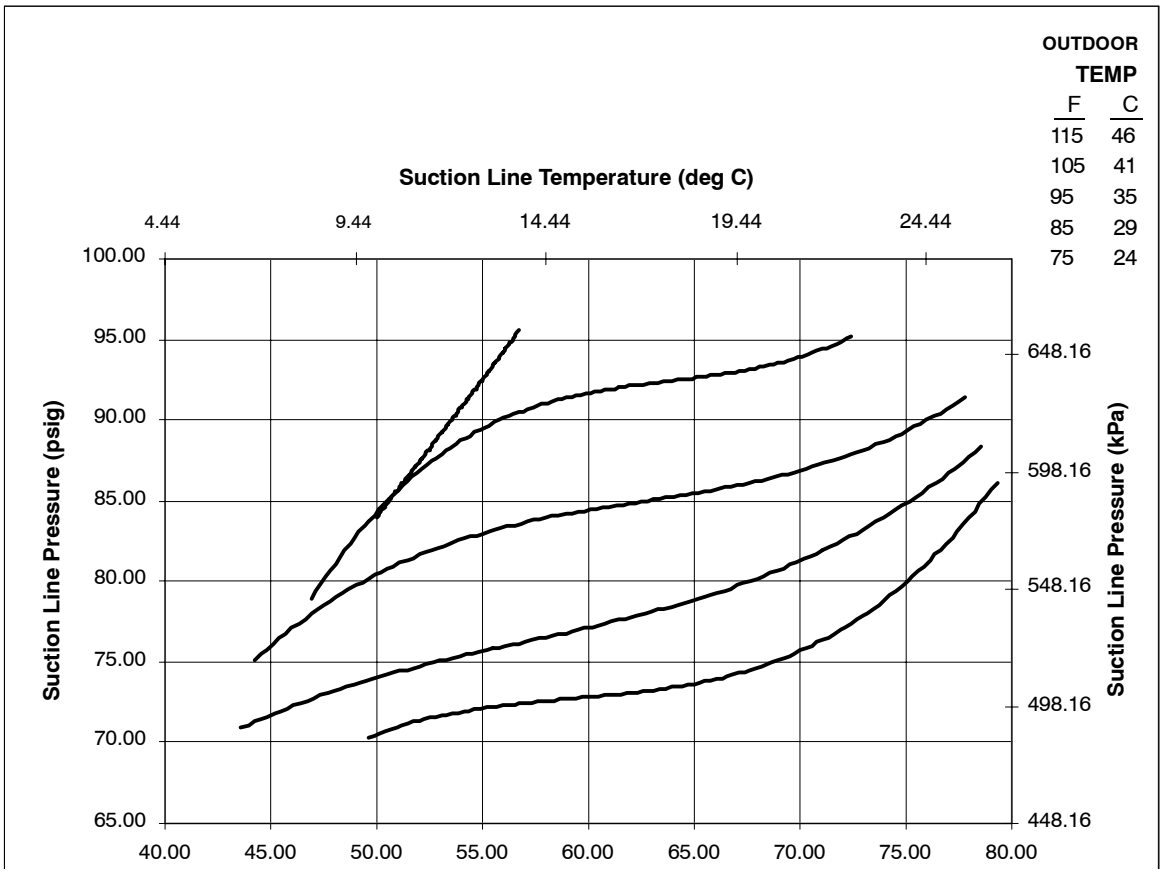
C06051

Fig. 52 – Cooling Charging Chart--50HJQ007



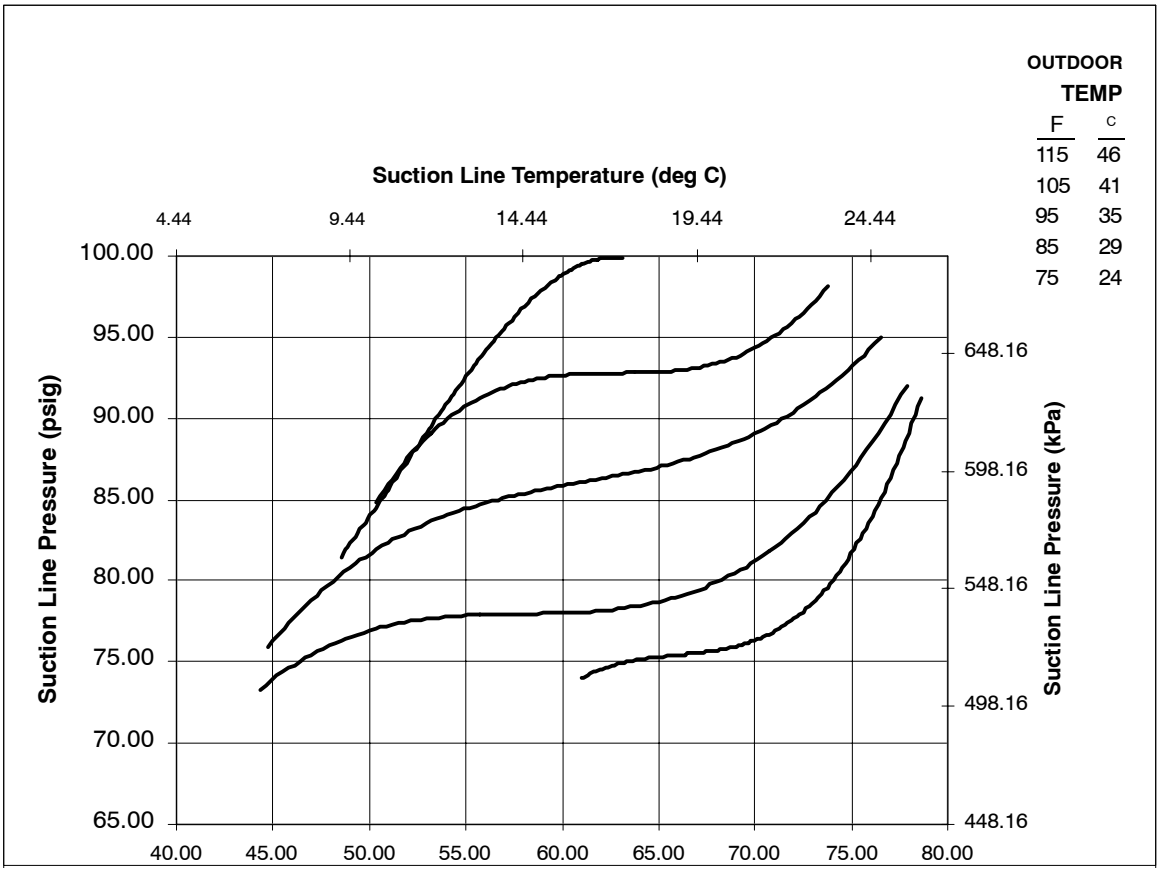
C06054

Fig. 53 – Cooling Charging Chart--50HEQ003



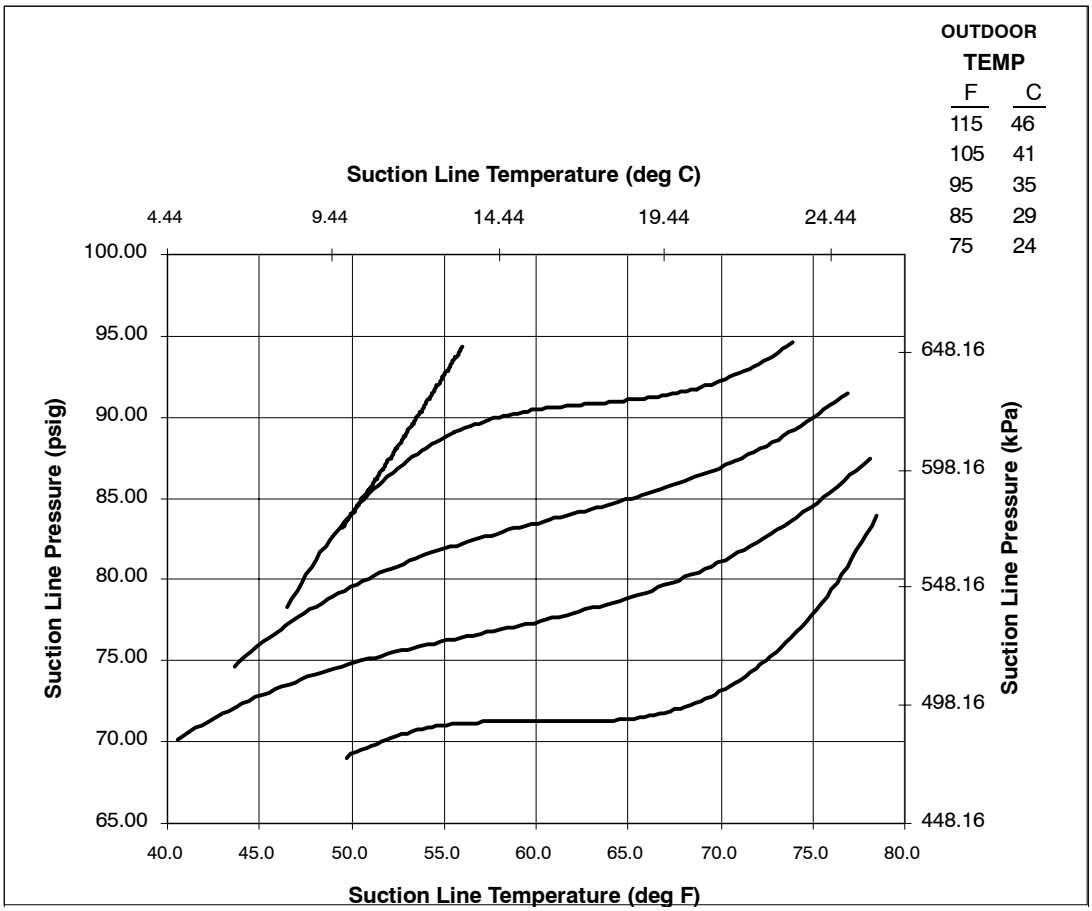
C06055

Fig. 54 – Cooling Charging Chart--50HEQ004



C06056

Fig. 55 – Cooling Charging Chart--50HEQ005



C06057

Fig. 56 – Cooling Charging Chart--50HEQ006

TROUBLESHOOTING

STEP 1 —UNIT TROUBLESHOOTING

Refer to Fig. 57 and Table 35 for unit troubleshooting information.

STEP 2 —ECONOMI$ER IV TROUBLESHOOTING

See Table 33 for EconoMi$er IV logic.

A functional view of the EconoMi$er IV is shown in Fig. 58. Typical settings, sensor ranges, and jumper positions are also shown. An EconoMi$er IV simulator program is available from Carrier to help with EconoMi$er IV training and troubleshooting.

ECONOMI$ER IV PREPARATION

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

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

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

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

DIFFERENTIAL ENTHALPY

To check differential enthalpy:

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

SINGLE ENTHALPY

To check single enthalpy:

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

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

DCV (DEMAND CONTROLLED VENTILATION) AND POWER EXHAUST

To check DCV and Power Exhaust:

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

DCV MINIMUM AND MAXIMUM POSITION

To check the DCV minimum and maximum position:

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

SUPPLY-AIR INPUT

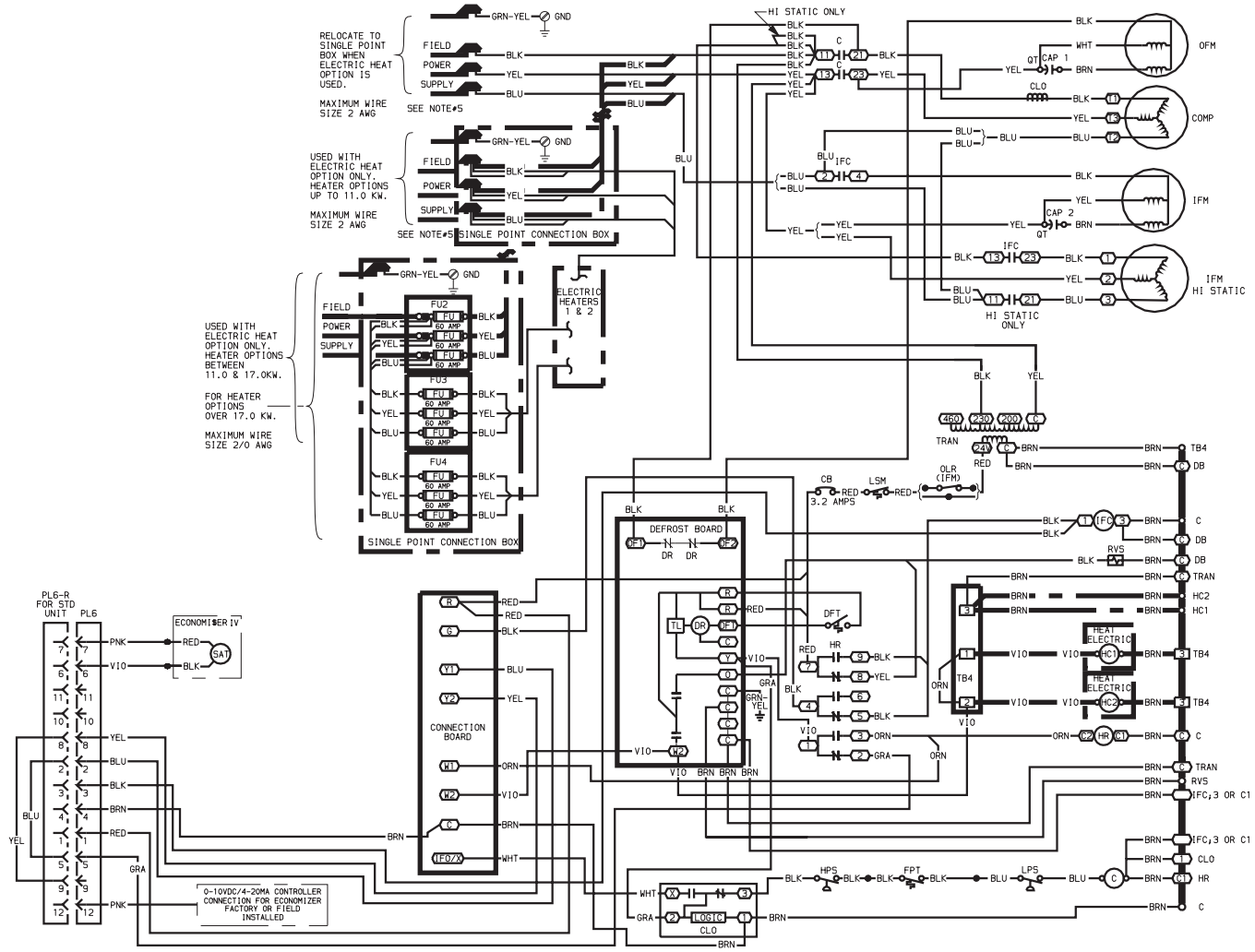
To check supply-air input:

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

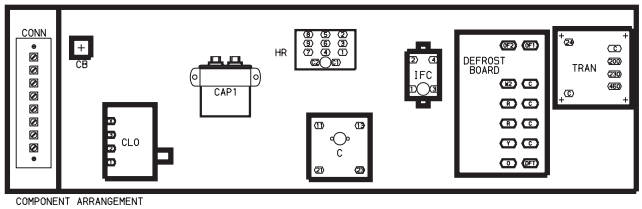
ECONOMI$ER IV TROUBLESHOOTING COMPLETION

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

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



NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with type 90 C wire or its equivalent.
2. Three-phase motors are protected under primary single phasing conditions.
3. Use copper conductors only.
4. Use copper, copper-clad aluminum or aluminum conductors.
5.



COMPONENT ARRANGEMENT

VOLTAGE RATING	CB MFG. PT. NO.	MUST TRIP AMPS
24V	POTTER & BRUMFIELD W28X-1024-3.2	3.2

LEGEND

AWG	— American Wire Gage	
C	— Contactor, Compressor	
CAP	— Capacitor	
CB	— Circuit Breaker	
CLO	— Compressor Lockout	
COMP	— Compressor Motor	
DB	— Defrost Board	
DFT	— Defrost Thermostat	
EQUIP	— Equipment	
FPT	— Freeze Up Protection Thermostat	
FU	— Fuse	
GND	— Ground	
HC	— Heat Contactor	
HPS	— High-Pressure Switch	
HR	— Heat Relay	
IFM	— Indoor-Fan Motor	
LPS	— Low-Pressure Switch	
LSM	— Limit Switch (Manual Reset)	
OFM	— Outdoor-Fan Motor	
OLR	— Overload Relay	
P	— Plug	
PL	— Plug Assembly	
QT	— Quadruple Terminal	
RVS	— Reversing Valve Solenoid	
SAT	— Supply Air Temperature Sensor	
TB	— Terminal Board	
TRAN	— Transformer	

Field Splice
Marked Wire (X)
Terminal (Marked) (X)

Terminal (Unmarked)
Terminal Block (X)
Splice
Splice (Marked)
Factory Wiring
Field Control Wiring
Field Power Wiring
Accessory or Optional Wiring
To indicate common potential only; not to represent wiring.

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Fig. 57 – Typical Schematic and Component Arrangement (Size 004,005, 208/230-3-60 Shown)

Table 35 — Heating and Cooling Troubleshooting

PROBLEM	CAUSE	REMEDY
Compressor and Outdoor Fan Will Not Start.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker. Determine root cause.
	Defective thermostat, contactor, transformer, control relay, or capacitor.	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.
	High pressure switch tripped.	See problem ''Excessive head pressure.''
	Low pressure switch tripped.	Check system for leaks. Repair as necessary.
	Freeze-up protection thermostat tripped.	See problem ''Suction pressure too low.''
Compressor Will Not Start But Outdoor Fan Runs.	Faulty wiring or loose connections in compressor circuit.	Check wiring and repair or replace.
	Compressor motor burned out, seized, or internal overload open.	Determine cause. Replace compressor or allow enough time for internal overload to cool and reset.
	Defective run/start capacitor, overload, start relay.	Determine cause and replace compressor.
	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 outdoor coil or dirty air filter.	Determine cause and correct.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace.
	Defective thermostat.	Replace thermostat.
	Faulty outdoor-fan (cooling) or indoor-fan (heating) 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.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Outdoor coil dirty or restricted.	Clean coil or remove restriction.
Compressor Makes Excessive Noise.	Compressor rotating in the wrong direction.	Reverse the 3-phase power leads as described in Start-Up, page 39.
Excessive Head Pressure.	Dirty outside air or return air filter.	Replace filter.
	Dirty outdoor coil.	Clean coil.
	Refrigerant overcharged.	Recover excess refrigerant.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condensing air restricted or air short-cycling.	Determine cause and correct.
Head Pressure Too Low.	Low refrigerant charge.	Check for leaks; repair and recharge.
	Compressor scroll plates defective.	Replace compressor.
	Restriction in liquid tube.	Remove restriction.
Excessive Suction Pressure.	High heat load.	Check for source and eliminate.
	Compressor scroll plates defective.	Replace compressor.
	Refrigerant overcharged.	Recover excess refrigerant.
Suction Pressure Too Low.	Dirty air filter (cooling) or dirty outdoor coil (heating).	Replace filter.
	Low refrigerant charge.	Check for leaks; repair and recharge.
	Metering device or low side restricted.	Remove source of restriction.
	Insufficient indoor airflow (cooling mode).	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
	Field-installed filter drier restricted.	Replace.
	Outdoor ambient below 25°F.	Install low-ambient kit.

Table 36 — EconoMi$er IV Input/Output Logic

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

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

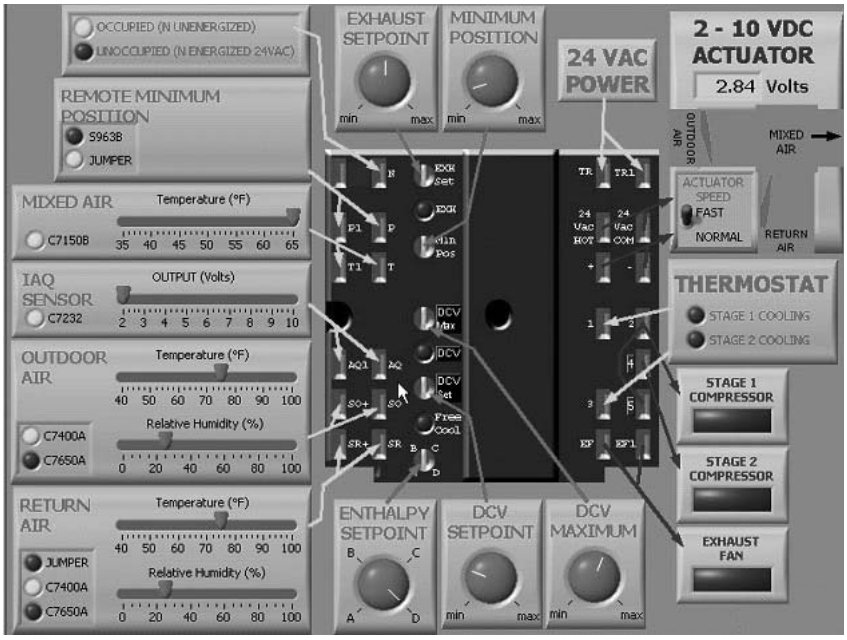

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Fig. 58 – EconoMi$er IV Functional View

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

I. PRELIMINARY INFORMATION

MODEL NO.: _____ SERIAL NO.: _____

DATE: _____ TECHNICIAN: _____

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

☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTALLATION INSTRUCTIONS

☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS

☐ CHECK THAT INDOOR AIR FILTER IS CLEAN AND IN PLACE

☐ VERIFY THAT UNIT INSTALLATION IS LEVEL

☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS

☐ CHECK PULLEY ALIGNMENT AND BELT TENSION PER INSTALLATION INSTRUCTIONS

☐ VERIFY INSTALLATION OF ECONOMIZER HOOD (IF EQUIPPED)

III. START-UP

ELECTRICAL

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

TEMPERATURES

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

PRESSURES (Cooling Mode)

REFRIGERANT SUCTION		PSIG		F
REFRIGERANT DISCHARGE		PSIG		F

☐ VERIFY THAT 3-PHASE SCROLL COMPRESSOR IS ROTATING IN THE CORRECT DIRECTION

☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS

GENERAL

☐ SET ECONOMIZER MINIMUM VENT AND CHANGEOVER SETTINGS TO MATCH JOB REQUIREMENTS (IF EQUIPPED)

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