50PG08−16
Single Package Rooftop units
Electric Cooling with PURON® (R−410A) Refrigerant
and Electromechanical Controls

Installation Instructions

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SAFETY CONSIDERATIONS

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

Untrained personnel can perform the basic maintenance functions of 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.

Recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies a hazard which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could cause personal injury or death.

Before performing service or maintenance operations on unit, turn off main power switch to unit and install lockout tag. Ensure electrical service to rooftop unit agrees with voltage and amperage listed on the unit rating plate.

⚠ WARNING

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this warning could cause personal injury, death and/or equipment damage.

Puron (R-410a) refrigerant systems operate at higher pressures than standard R-22 systems. Do not use R-22 service equipment or components on Puron refrigerant equipment.

⚠ WARNING

FIRE, EXPLOSION HAZARD

Failure to follow this warning could result in personal injury, death and/or property damage.

1. Improper installation, adjustment, alteration, service, or maintenance can cause property damage, personal injury, or loss of life. Refer to the User's Information Manual provided with this unit for more details.
2. Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

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

Installation 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.

INSTALLATION

Step 1 —Plan for Unit Location

Select a location the unit and its support system (curb or other) that provides minimum clearances required for safety, unit performance and service access below, around and above unit as specified in unit drawings. Consider also the effect of adjacent units.

Do not install unit in an indoor location. Do not locate air inlets near exhaust vents or other sources of contaminated air. Although unit is weatherproof, guard against water from higher level runoff and overhangs.

Select a unit mounting system that provides adequate height to allow installation of condensate trap per requirements. Refer to Step 6 — Install External Trap for Condensate Drain for required trap dimensions.

Roof Mount

Check building codes for weight distribution requirements. Unit operating weight is shown in Tables 1 and 2.

Step 2 —Provide Unit Support

Roof Curb

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

IMPORTANT: The gasketing of the unit to the roof curb is critical for a watertight seal. Install gasket with the roof curb as shown in Fig. 1, 2 and 5. Improperly applied gasket can also result in air leaks and poor unit performance. Do not slide unit to position on roof curb.

Alternate Unit Support

When a curb cannot be used, install unit on a noncombustible surface. Support unit with sleepers, using unit curb support area. If sleepers cannot be used, support long sides of unit with a minimum of 3 equally spaced 4-in. x 4-in. pads on each side.

Step 3 —Rig and Place Unit

Inspect unit for transportation damage. See Tables 1 and 2 for physical data. File any claim with transportation agency.

⚠ WARNING

PROPERTY DAMAGE HAZARD

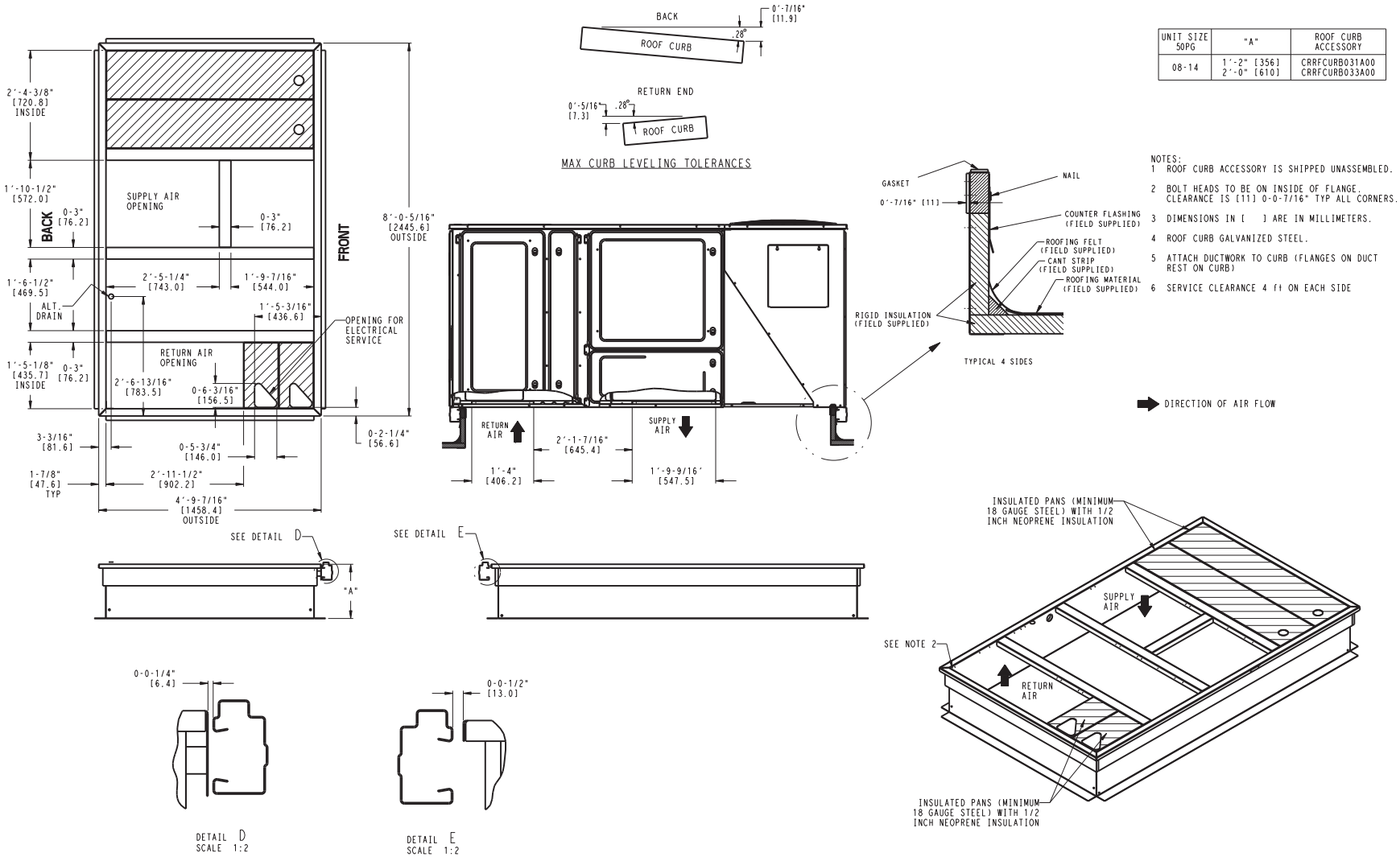
Failure to follow this warning could result in personal injury, death and property damage.

All panels must be in place when rigging and lifting.

Do not drop unit; keep upright. Use wooden top skid or spreader bars over unit to prevent sling or cable damage. Rollers may be used to move unit across a roof. Level by using unit rail as a reference; leveling tolerance is $\pm\ ^1/_{16}$ in. per linear ft in any direction. Unit rigging weight is shown in Fig. 5.

Rigging holes are provided in the unit base rails as shown in Fig. 5. Refer to rigging instructions on unit. See Fig. 3 and 4 for panel and filter locations.

After unit is in position, remove top crating and polyethylene sheet.



UNIT SIZE 50PG	"A"	ROOF CURB ACCESSORY
08-14	1'-2" [356] 2'-0" [610]	CRRFCURB031A00 CRRFCURB033A00

NOTES:
1. ROOF CURB ACCESSORY IS SHIPPED UNASSEMBLED.
2. BOLT HEADS TO BE ON INSIDE OF FLANGE. CLEARANCE IS [11] 0-0-7/16" TYP ALL CORNERS.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
4. ROOF CURB GALVANIZED STEEL.
5. ATTACH DUCTWORK TO CURB (FLANGES ON DUCT REST ON CURB)
6. SERVICE CLEARANCE 4 ft ON EACH SIDE

C06312

Fig. 1 – Roof Curb Details (50PG08-14)

UNIT SIZE 50PG	"A"	ROOF CURB ACCESSORY
16	1′-2" [356] 2′-0" [610]	CRRFCURB034A00 CRRFCURB035A00

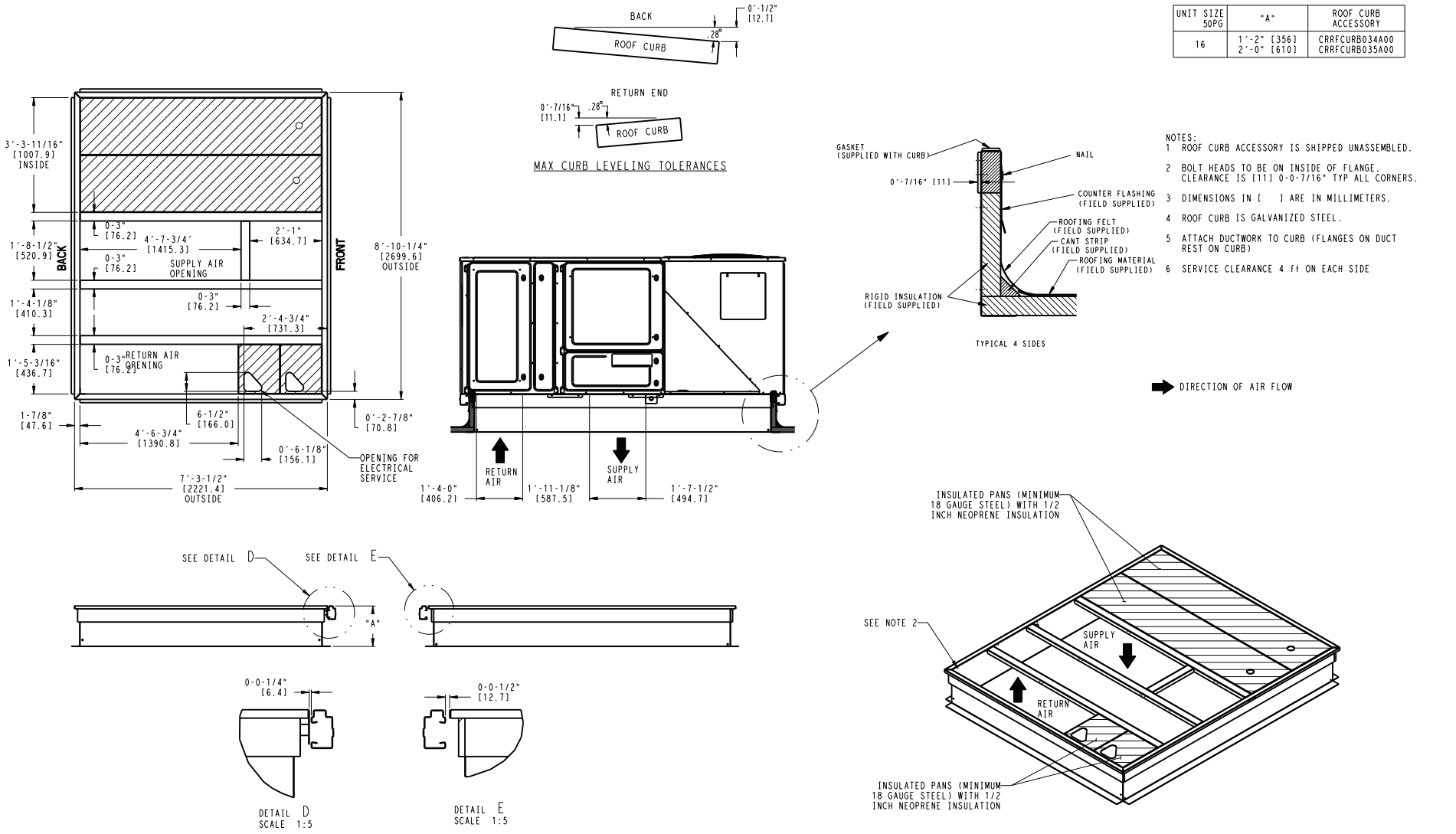


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Fig. 2 – Roof Curb Details (50PG16)

NOTES:

1. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. ⊕ CENTER OF GRAVITY.
3. ➡ DIRECTION OF AIR FLOW.
4. ON VERTICAL DISCHARGE UNITS, DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY. FOR HORIZONTAL DISCHARGE UNITS FIELD SUPPLIED FLANGES SHOULD BE ATTACHED TO HORIZONTAL DISCHARGE OPENINGS, AND ALL DUCTWORK SHOULD BE ATTACHED TO THE FLANGES.
5. MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
   a. ON VERTICAL DISCHARGE UNITS, CLEARANCE TO COMBUSTIBLE FOR FIRST 12" OF DUCT TUBE 1"
   b. BOTTOM OF UNIT TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 1 INCH.
      BOTTOM OF BASE RAIL TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES.
   c. CONDENSER COIL, FOR PROPER AIR FLOW, 36 INCHES ONE SIDE, 12 INCHES THE OTHER. THE SIDE GETTING THE GREATER CLEARANCE IS OPTIONAL.
   d. OVERHEAD, 60 INCHES TO ASSURE PROPER CONDENSER FAN OPERATION.
   e. BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC.
   f. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
   g. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
   h. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES.
6. WITH THE EXCEPTION OF THE CLEARANCE FOR THE CONDENSER COIL, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
7. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL IF SET ON BASE RAIL.
8. THE VERTICAL CENTER OF GRAVITY IS 1'-6"[457] UP FROM FROM THE BOTTOM OF THE BASE RAIL.

UNIT	STD. UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)	
	LB	KG	LB	KG	LB	KG	LB	KG	LB	KG
50PG08	1098	498	243	110	214	97	300	136	341	155
50PG09	1105	501	244	111	215	98	302	137	343	156
50PG12	1199	544	265	120	234	106	328	149	372	169
50PG14	1310	594	290	131	235	116	358	163	407	185

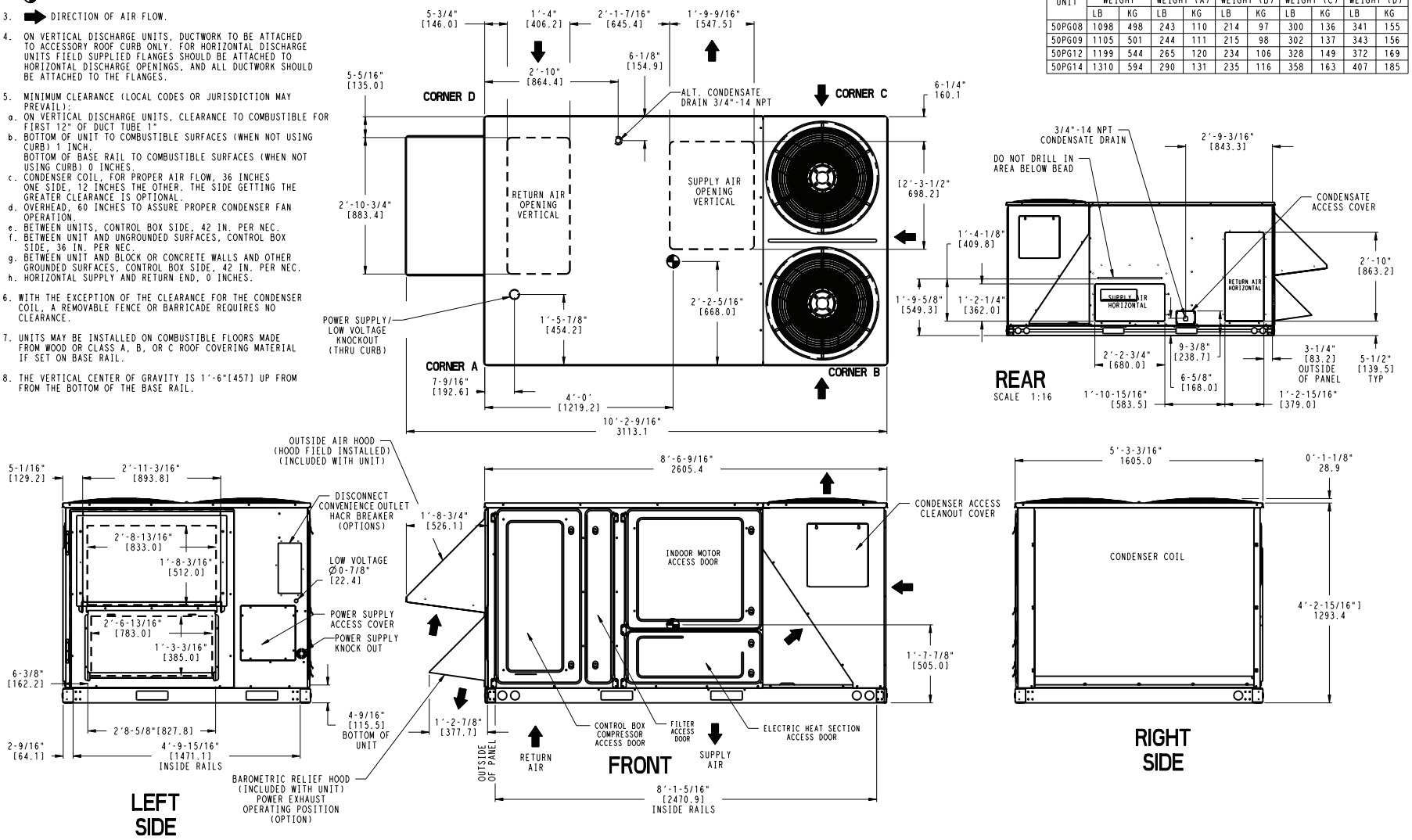

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Fig. 3 – Base Unit Dimensions (50PG08-14)

NOTES:

1. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. ⊕ CENTER OF GRAVITY.
3. ➡ DIRECTION OF AIR FLOW.
4. ON VERTICAL DISCHARGE UNITS, DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY.
5. MINIMUM CLEARANCE (LOCAL CODES OR JURISDICTION MAY PREVAIL):
   a. ON VERTICAL DISCHARGE UNITS, CLEARANCE TO COMBUSTIBLE FOR FIRST 12" OF DUCT TUBE 1"
   b. BOTTOM OF UNIT TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 1 INCH.
      BOTTOM OF BASE RAIL TO COMBUSTIBLE SURFACES (WHEN NOT USING CURB) 0 INCHES.
   c. CONDENSER COIL, FOR PROPER AIR FLOW, 36 INCHES FRONT,REAR AND RIGHT SIDE.
   d. OVERHEAD, 60 INCHES TO ASSURE PROPER CONDENSER FAN OPERATION.
   e. BETWEEN UNITS, CONTROL BOX SIDE, 42 IN. PER NEC.
   f. BETWEEN UNIT AND UNGROUNDED SURFACES, CONTROL BOX SIDE, 36 IN. PER NEC.
   g. BETWEEN UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, CONTROL BOX SIDE, 42 IN. PER NEC.
   h. HORIZONTAL SUPPLY AND RETURN END, 0 INCHES.
6. WITH THE EXCEPTION OF THE CLEARANCE FOR THE CONDENSER COIL, A REMOVABLE FENCE OR BARRICADE REQUIRES NO CLEARANCE.
7. UNITS MAY BE INSTALLED ON COMBUSTIBLE FLOORS MADE FROM WOOD OR CLASS A, B, OR C ROOF COVERING MATERIAL IF SET ON BASE RAIL.

UNIT	STD. UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)	
50PG16	1771	805	604.2	275	502.1	228	301.7	137	363.1	165
-	-	-	-	-	-	-	-	-	-	-

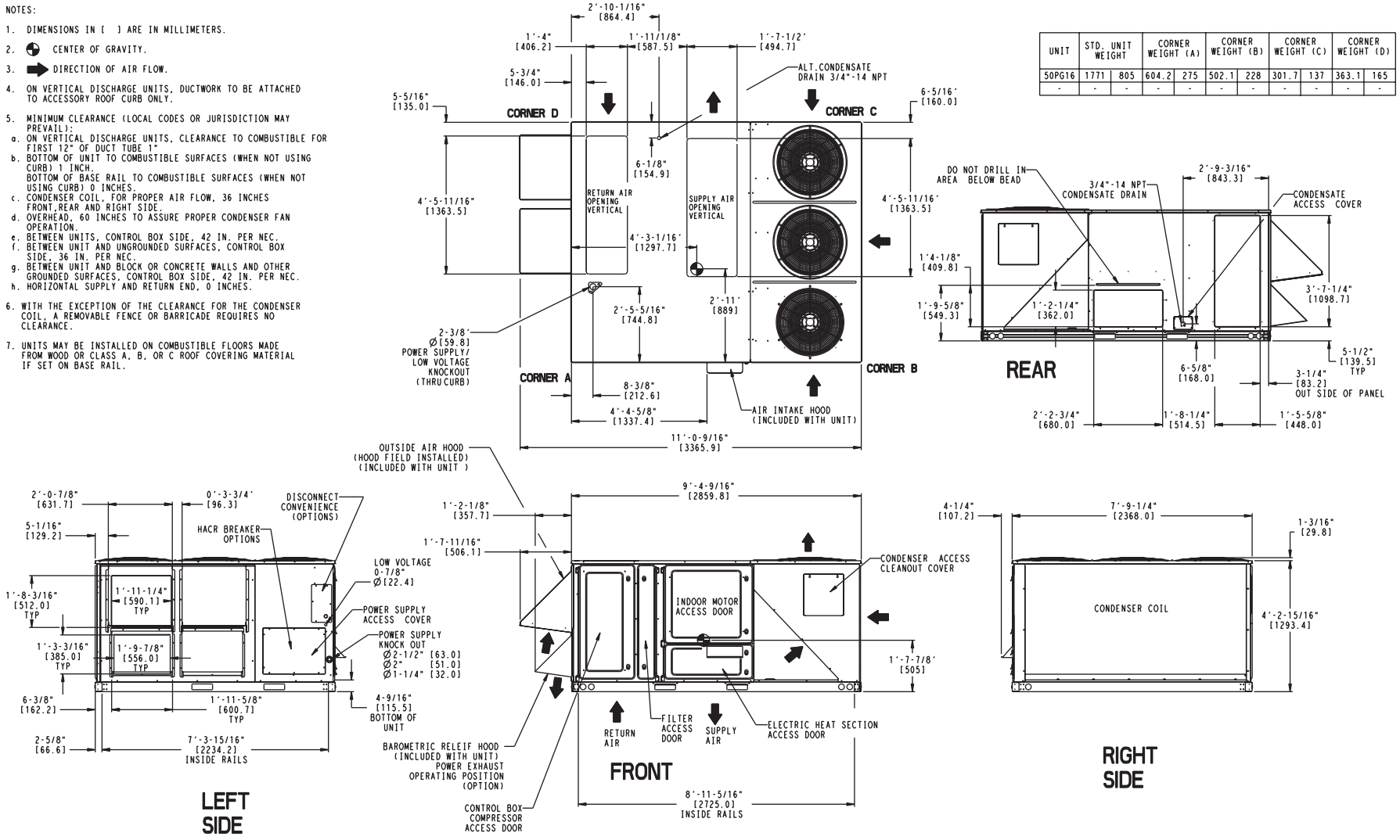

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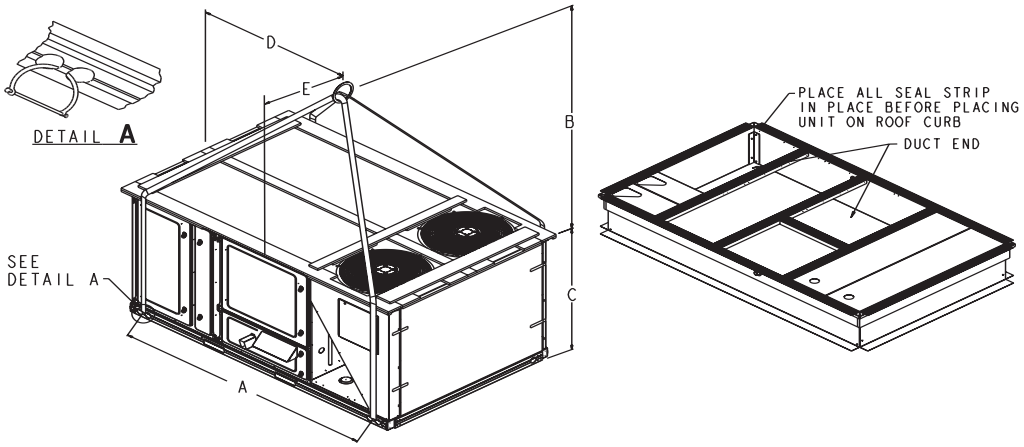
Fig. 4 – Base Unit Dimensions (50PG16)

⚠ CAUTION - NOTICE TO RIGGERS:
ACCESS PANEL MUST BE IN PLACE WHEN RIGGING.

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.



UNIT SIZE	A		B		C		D		E		MAX. WEIGHT	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
08–14	90.4	2296	36–54	914–1371	52.4	1331	48.0	1219	26.5	668	1572	713
16	100.4	2550	36–54	914–1371	52.4	1331	51.0	1245	35.0	889	1895	861

C06253

Fig. 5 – 50PG Rigging Label

Table 1—Physical Data (50PG08-14)

BASE UNIT 50PG		08	09	12	14
NOMINAL CAPACITY (Tons)		7.5	8.5	10	12.5
OPERATING WEIGHT (lb)					
Unit*		1098	1105	1199	1310
Economizer					
Vertical		57	57	57	57
Horizontal		59	59	59	59
Roof Curb					
14-in.		180	180	180	180
24-in.		268	268	268	268
COMPRESSOR		Fully Hermetic Scroll			
Quantity		2	2	2	2
Oil Type Sys A		Copeland 3MA	Copeland 3MA	Copeland 3MA	Copeland 3MA
Sys B		Copeland 3MA	Copeland 3MA	Copeland 3MA	Copeland 3MA
Number of Refrigerant Circuits		2	2	2	2
Oil (oz) Sys A		42	42	66	56
Sys B		42	42	66	56
REFRIGERANT TYPE		R-410A (Puron® Refrigerant)			
Expansion Device		TXV	TXV	TXV	TXV
Operating Charge (lb) Sys A		11.8	11.3	13.7	17.2
Sys B		11.8	11.3	13.7	17.2
Operating Charge Total All Systems (lb)		23.5	22.6	27.4	34.4
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins, Face Split			
Condenser A (Outer)					
Rows...Fins/in.		2…17	2…17	2…17	3…17
Face Area (sq ft)		17.4	17.4	17.4	17.4
Condenser B (Inner)					
Rows...Fins/in.		2...17	2...17	2...17	3...17
Face Area (sq ft)		17.4	17.4	17.4	17.4
CONDENSER FAN		Propeller			
Quantity…Diameter (in.)		2...24	2...24	2...24	2...24
Nominal Cfm (Total, all fans)		7204	7204	8341	7300
Motor Hp		1/4	1/4	1/3	1/3
Nominal Rpm — High Speed		1100	1100	1100	1100
Nominal Rpm — Low Speed		900	900	900	900
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Face Split			
Rows…Fins/in.		3…15	3…15	4…15	4…15
Face Area (sq ft)		14.9	14.9	14.9	14.9
EVAPORATOR FAN		Centrifugal Type, Belt Drive			
Quantity…Size (in.)	Low	1...15 x 15	1...15 x 15	1...15 x 15	1...15 x 15
	High	1...15 x 15	1...15 x 15	1...15 x 15	1...15 x 15
Type Drive	Low	Belt	Belt	Belt	Belt
	High	Belt	Belt	Belt	Belt
Nominal Cfm		3000	3400	4000	5000
Maximum Continuous Bhp	Low	2.40	2.40	3.10	3.70
	High	3.10	3.70	3.70	5.25
Motor Nominal Rpm		1725	1725	1725	1725
Motor Frame Size	Low	56Y	56Y	56Y	56Y
	High	56Y	56Y	56Y	56Y
Fan Rpm Range	Low	568-771	568-771	690-893	690-893
	High	812-1015	812-1015	852-1055	852-1055
Motor Bearing Type		Ball	Ball	Ball	Ball
Maximum Fan Rpm		1600	1600	1600	1600
Motor Pulley Pitch Diameter Range (in.)	Low	2.8-3.8	2.8-3.8	3.4-4.4	3.4-4.4
	High	4.0-5.0	4.0-5.0	4.6-5.6	4.6-5.6
Fan Pulley Pitch Diameter	Low	8.5	8.5	8.5	8.5
	High	8.5	8.5	8.5	8.5
Nominal Motor Shaft Diameter (in.)	Low	5/8	5/8	7/8	7/8
	High	7/8	7/8	7/8	7/8
Belt…Pitch Length (in.)	Low	63.3	63.3	63.3	63.3
	High	65.3	65.3	65.3	65.3
Belt…Type	Low	AX	AX	AX	AX
	High	AX	AX	AX	AX
Pulley Center Line Distance Min. (in.)	Low	21.0	21.0	21.0	21.0
	High	21.0	21.0	21.0	21.0
Pulley Center Line Distance Max. (in.)	Low	23.4	23.4	23.4	23.4
	High	23.4	23.4	23.4	23.4
Speed Change per Full Turn of	Low	41	41	41	41
Movable Pulley Flange (rpm)	High	41	41	41	41
Movable Pulley Maximum Full	Low	5	5	5	5
Turns from Closed Position	High	5	5	5	5
Factory Pulley Setting (rpm)	Low	568	568	690	690
	High	812	812	852	852
Fan Shaft Diameter at Pulley (in.)		1	1	1	1
HIGH-PRESSURE SWITCH (psig)					
Cutout		660 ± 10	660 ± 10	660 ± 10	660 ± 10
Reset (Auto.)		505 ± 20	505 ± 20	505 ± 20	505 ± 20
LOW-PRESSURE SWITCH (psig)					
Cutout		40 ± 7	40 ± 7	40 ± 7	40 ± 7
Reset (Auto.)		80 ± 7	80 ± 7	80 ± 7	80 ± 7
FREEZE PROTECTION THERMOSTAT (F)					
Cutout		30 ± 5	30 ± 5	30 ± 5	30 ± 5
Reset (Auto.)		45 ± 5	45 ± 5	45 ± 5	45 ± 5
RETURN-AIR FILTERS		Throwaway Type			
Quantity…Size (in.)		4...20 x 25 x 2	4...20 x 25 x 2	4...20 x 25 x 2	4...20 x 25 x 2

LEGEND

TXV — Thermostatic Expansion

*Aluminum evaporator/aluminum condenser coil fin material

Table 2—Physical Data (50PG16)

BASE UNIT 50PG		16
NOMINAL CAPACITY (Tons)		15.0
OPERATING WEIGHT (lb)		
Unit*		1771
Economizer		149
Humidi-MiZer™ System		64
Roof Curb		
14-in.		240
24-in.		360
COMPRESSOR		Fully Hermetic Scroll
Quantity		3
Oil Type Sys A		Copeland 3MA
Sys B		Copeland 3MA
Sys C		Copeland 3MA
Number of Refrigerant Circuits		3
Oil (oz) Sys A		66
Sys B		66
Sys C		66
REFRIGERANT TYPE		R-410A (Puron® Refrigerant)
Expansion Device		TXV
Operating Charge (lb) Sys A		13.5
Sys B		15.0
Sys C		15.0
Operating Charge Total All Systems (lb)		43.5
Unit with Humidi-MiZer System		
Operating Charge (lb) Sys A		18.8
Sys B		16.7
Sys C		18.8
Total All Systems (lb)		54.3
CONDENSER COIL		Enhanced Copper Tubes, Aluminum Lanced Fins, Face Split
Condenser A (Outer)		
Rows...Fins/in.		2…17
Face Area (sq ft)		26.6
Condenser B (Inner)		
Rows...Fins/in.		2...17
Face Area (sq ft)		30.2
Humidi-MiZer Coil		Enhanced Copper Tubes, Aluminum Lanced Fins
Rows...Fins/in.		1...17
Face Area (sq ft)		22.2
CONDENSER FAN		Propeller
Quantity…Diameter (in.)		3...24
Nominal Cfm (Total, all fans)		12,500
Motor Hp		1/3
Nominal Rpm		1100
EVAPORATOR COIL		Enhanced Copper Tubes, Aluminum Double-Wavy Fins, Face Split 3…15
Rows…Fins/in.		22.2
Face Area (sq ft)		
EVAPORATOR FAN		Centrifugal Type, Belt Drive
Quantity…Size (in.)	Low	1...15 x 15, 1...12 x 12
	Mid-Low	1...15 x 15, 1...12 x 12
	High	1...15 x 15, 1...12 x 12
Type Drive	Low	Belt
	Mid-Low	Belt
	High	Belt
Nominal Cfm		6000
Maximum Continuous Bhp	Low	3.7
	Mid-Low	5.25
	High	7.5
Motor Frame Size	Low	56
	Mid-Low	56
	HIgh	S213T
Fan Rpm Range	Low	710-879
	Mid-Low	872-1066
	High	1066-1260
Motor Bearing Type		Ball
Motor Pulley Pitch Diameter Min (in.)	Low	4.2
	Mid-Low	4.2
	High	5.2
Motor Pulley PItch Diameter Max (in.)	Low	5.2
	Mid-Low	5.2
	High	6.2
Fan Pulley Pitch Diameter	Low	10.2
	Mid-Low	8.5
	High	8.5
Nominal Motor Shaft Diameter (in.)	Low	7/8
	Mid-Low	7/8
	High	1 3/8
Belt…Pitch Length (in.)	Low	49.3
	Mid-Low	47.8
	High	43.8

Table 2 — Physical Data (50PG16) (Cont)

EVAPORATOR FAN (Continued)		
Belt…Type	Low	AX
	Mid-Low	BX
	High	BX
Pulley Center Line Distance Min. (in.)	Low	14.2
	Mid-Low	10.8
	High	8.6
Pulley Center Line Distance Max. (in.)	Low	10.8
	Mid-Low	14.2
	High	12
Speed Change (rpm)	Low	34
	Mid-Low	41
	High	41
Movable Turns	Low	5
	Mid-Low	5
	High	5
Factory Pulley Setting (rpm)	Low	812
	Mid-Low	983
	High	1191
Fan Shaft Diameter at Pulley (in.)		1 3/16
HIGH- PRESSURE SWITCH (psig)		
Cutout		660 ± 10
Reset (Auto.)		505 ± 20
RETURN- AIR FILTERS		Throwaway Type
Quantity…Size (in.)		8...20 x 20 x 2

LEGEND

TXV — Thermostatic Expansion

*Aluminum evaporator/aluminum condenser coil fin material

Installation Onto Curb

The 50PG units are designed to fit on the accessory full perimeter curb. In either case, correct placement of the unit onto the curb is critical to operating performance. To aid in correct positioning, place unit on roof curb to maintain $^1/_4$-in. gap between the inside of rail and roof curb on long sides and a $^1/_2$-in. gap between the inside of rail and roof curb on both duct and condenser ends. Refer to Fig. 1–4, to assure proper duct opening alignment.

NOTE: Make sure the bottom drain condensate connection plug is tight before installing unit on curb. See Step 6 — Install External Trap for Condensate Drain.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

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

Slab Mount (Horizontal Units Only)

Provide a level concrete slab that extends a minimum of 6-in. beyond unit cabinet. Install a gravel apron in front of condenser-coil air inlet to prevent grass and foliage from obstructing airflow.

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

Step 4 —Field Fabricate Ductwork

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

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

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

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

Step 5 —Make Unit Duct Connections

Vertical Supply/Return Configuration

Unit is shipped in vertical supply/return configuration. Ductwork openings are shown in Fig. 1–4. Attach the ductwork to the roof curb. Do not attach duct directly to the unit.

⚠ WARNING

ELECTRICAL OPERATION HAZARD

Failure to follow this warning could result in personal injury or death.

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

Units with electric heat require a 1-in. clearance for the first 24 in. of ductwork. Outlet grilles must not lie directly below unit discharge.

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

Horizontal Supply/Return Applications (Sizes 08–14 Only)

Unit can be field-converted from vertical supply/return to horizontal supply/return. Remove all screws securing horizontal duct covers to duct panel. Save panels. Apply a bead of RTV around flange of cover (painted side). Install duct covers in the vertical duct openings in the basepan with the insulation side up. Covers will drop into openings and can be secured using field-supplied self-tapping screws. Ductwork can be attached to duct flanges provided on unit. When securing ductwork to unit, do not drill in area below bead or above top edge of duct opening.

NOTE: On the 16 size, an accessory is available (CRHORZON005AA00) to convert from vertical supply/return to horizontal. Follow instructions provided with kit.

Step 6 —Install External Trap for Condensate Drain

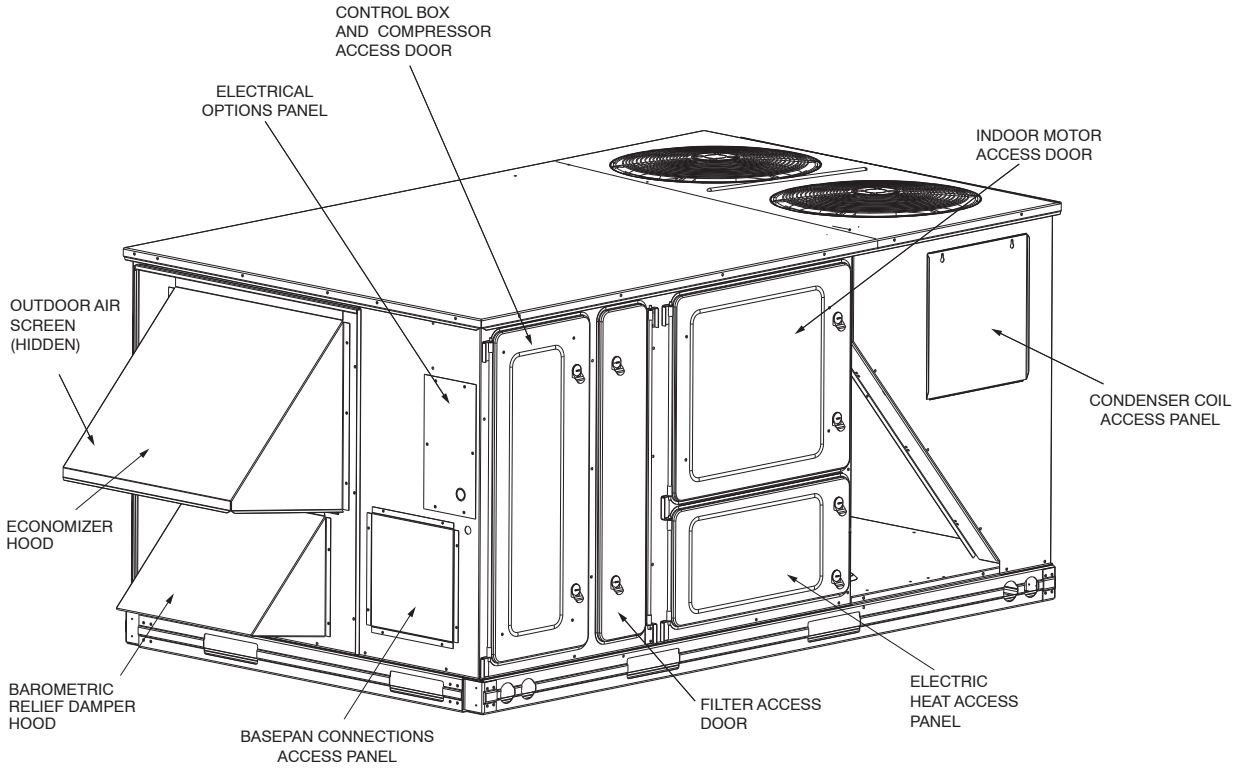
The unit's $^3/_4$-in. condensate drain connections are located on the bottom and side of the unit. If the down drain is used, drill a minimum of a 5/8-in. diameter hole but not larger than a $^3/_4$-in. diameter hole through the drain pan. A dimple of 2 mm in diameter and 1.5 mm deep will be provided in the drain pan to help locate the drill bit and to start the hole. Do not cut through the PVC pipe threads. Unit discharge connections do not determine the use of drain connections; either drain connection can be used with vertical or horizontal applications. See Fig. 3 and 4 for locations.

When using the standard side drain connection, make sure the plug (red) in the alternate bottom connection is tight before installing the unit. (See Fig. 8.)

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. A $^1/_2$-in. socket extension can be used to remove the plug. (See Fig. 8.) The piping for the condensate drain and external trap can be completed after the unit is in place.

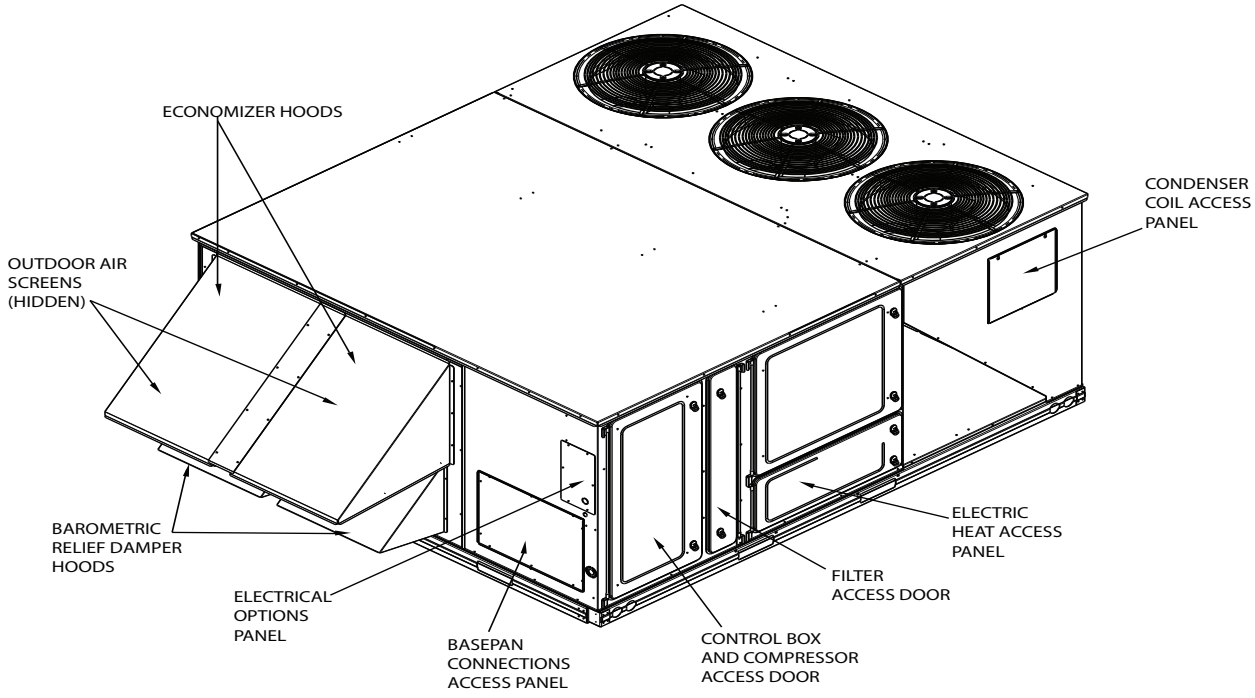
All units must have an external trap for condensate drainage. Install a trap at least 4-in. deep and protect against freeze-up. If drain line is installed downstream from the external trap, pitch the line away from the unit at 1-in. per 10 ft of run. Do not use a pipe size smaller than the unit connection ($^3/_4$-in.). (See Fig. 9 and 10.)

The 50PG units are provided with a removable condensate pan for ease of cleaning. It is recommended that a union be placed between the unit and condensate drainage to ease the removal of the pan during servicing. Adequate clearance should be allowed if removal of condensate pan is required. Allow 64 in. (08-14) or 93-in. (16) between condensate pan access panel and any obstruction for complete removal.



C06315

Fig. 6 – Panel and Filter Locations (50PG08-14)



C06309

Fig. 7 – Panel and Filter Locations (50PG16)

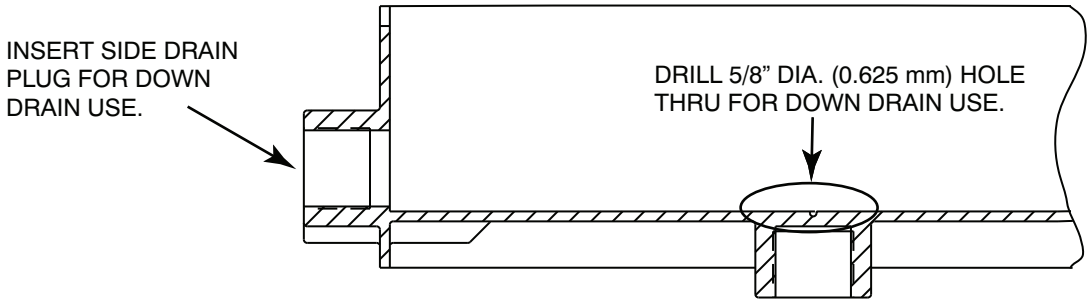
Step 7 —Make Electrical Connections

Field Power Supply

All 208/230-v units are factory wired for 230-v power supply. If the 208/230-v unit is to be connected to a 208-v power supply, the transformer must be rewired by moving the black wire with the $^1/_4$-in. female quick connect from the 230-volt connection and moving to the 200-volt $^1/_4$-in. male terminal on the primary side of the transformer.

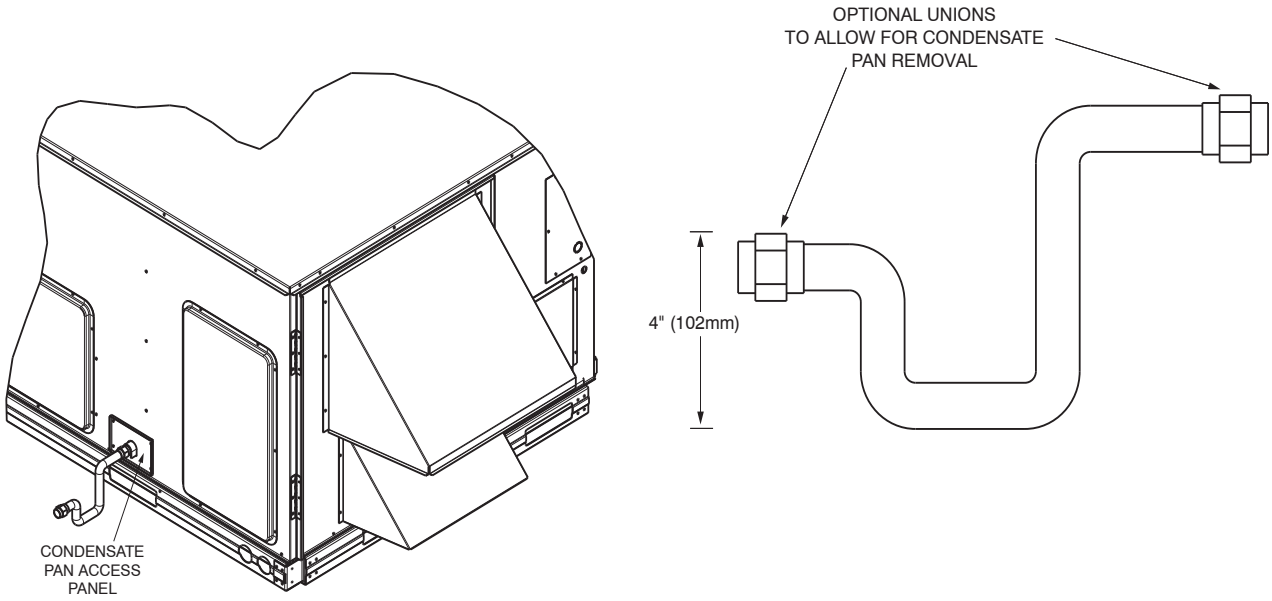
Refer to unit label diagram for additional information.

All field wiring must comply with NEC (National Electrical Code) and local codes. Size wire based on MCA (Minimum Circuit Amps) on the unit informative plate. Leads are provided for field wire connections. Use UL (Underwriters' Laboratories) approved copper/aluminum connector.



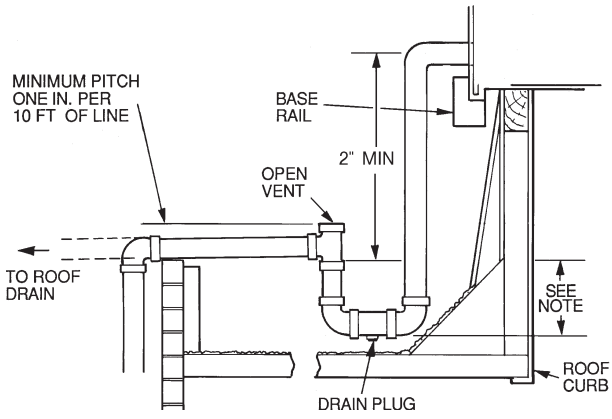
C10321

Fig. 8 – Condensate Drain Pan



C06234

Fig. 9 – External Trap for Condensate Drain



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

C06235

Fig. 10 – Condensate Drain Piping Details

When installing units, provide safety disconnect per NEC Article 440 or local codes. For non-fused disconnects, size the disconnect according to the sizing data provided in the electrical data tables. If a fused disconnect is used, determine the minimum size for the switch based on the disconnect sizing data provided in the electrical data tables and then coordinate the disconnect housing size to accommodate the Maximum Overcurrent Protection (MOCP) device size as marked on the unit informative plate. (See Tables 3 and 4.)

See Fig. 11 for power wiring connection to unit leads and equipment ground.

Route power and ground lines through control box end panel or unit basepan (see Fig. 3 and 4) to connections as shown on unit wiring diagram and Fig. 8. Factory leads may be wired directly to the disconnect.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in damage to the unit.

The correct power phasing is critical to the operation of the scroll compressors. An incorrect phasing will result in an alarm and compressor operation lockout. Should this occur, power phase correction must be made to the incoming power. Damage to compressor could result.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC; ANSI/NFPA (National Fire Protection Association), latest edition, and local electrical codes.

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

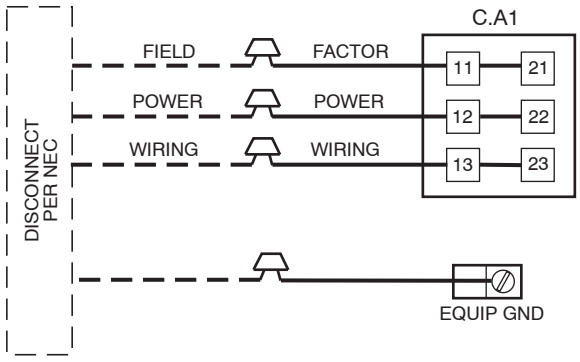
Operating voltage to compressor must be within voltage range indicated on unit nameplate. Voltages between phases must be balanced within 2%.

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

Field Control Wiring

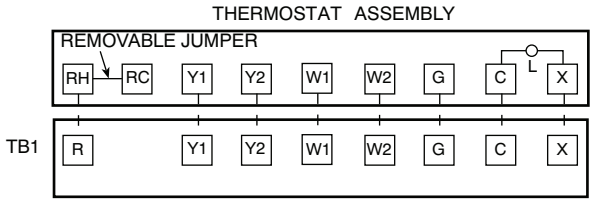
Unit can be controlled with a Carrier-approved accessory thermostat. Install thermostat according to the installation instructions included with accessory. Locate thermostat assembly on a solid interior wall in the conditioned space to sense average temperature.

Route thermostat cable or equivalent single leads of colored wire from subbase terminals through conduit into unit to low-voltage connections as shown on unit label wiring diagram and in Fig. 12.



C06237

Fig. 11 – Field Power Wiring Connections



C06238

Fig. 12 – Field Control Thermostat Wiring

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

Set heat anticipator settings as follows:

VOLTAGE	STAGE 1 (W1) ON	STAGE 1 AND 2 (W1 AND W2) ON
All	0.2	0.4

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

Table 3—Electrical Data — Units Without Optional Powered Convenience Outlet

UNIT 50PG	NOMINAL POWER SUPPLY VOLTS-PH-HZ	VOLTAGE RANGE		COMPRESSOR (EA.)		OFM FLA	IFM FLA	POWER EXHAUST FLA	IFM TYPE	ELECTRIC HEAT			POWER SUPPLY		DISCONNECT SIZE	
		MIN	MAX	RLA	LRA					CRHEATER PART NO.	FLA	NOMINAL KW*	MCA	MOCP†	FLA	LRA
08	208/230-3-60	187	253	13.5	88	1.5	5.2	—	Low	—	—	—/—	38.5/ 38.5	50/ 50	40/ 40	212/212
										225A00	20.0/23.1	7.5/10.0	38.5/ 38.5	50/ 50	40/ 40	212/212
										226A00	30.0/34.6	11.3/15.0	44.0/ 49.8	50/ 50	41/ 46	212/212
										227A00	50.0/57.7	18.8/25.0	69.0/ 78.7	70/ 80	64/ 72	212/212
										228A00	70.0/80.8	26.3/35.0	94.1/107.5	100/110	87/ 99	212/212
										229A00	80.0/92.4	30.0/40.0	106.6/122.0	110/125	98/112	212/212
							7.5		High	—	—	—/—	40.8/ 40.8	50/ 50	43/ 43	238/238
										225A00	20.0/23.1	7.5/10.0	40.8/ 40.8	50/ 50	43/ 43	238/238
										226A00	30.0/34.6	11.3/15.0	46.9/ 52.7	50/ 60	43/ 48	238/238
										227A00	50.0/57.7	18.8/25.0	71.9/ 81.5	80/ 90	66/ 75	238/238
										228A00	70.0/80.8	26.3/35.0	96.9/110.4	100/125	89/102	238/238
										229A00	80.0/92.4	30.0/40.0	109.4/124.8	110/125	101/115	238/238
							5.2	3.0	Low	—	—	—/—	41.5/ 41.5	50/ 50	44/ 44	216/216
										225A00	20.0/23.1	7.5/10.0	41.5/ 41.5	50/ 50	44/ 44	216/216
										226A00	30.0/34.6	11.3/15.0	47.8/ 53.6	50/ 60	44/ 49	216/216
										227A00	50.0/57.7	18.8/25.0	72.8/ 82.4	80/ 90	67/ 76	216/216
										228A00	70.0/80.8	26.3/35.0	97.8/111.3	100/125	90/102	216/216
										229A00	80.0/92.4	30.0/40.0	110.3/125.7	125/150	101/116	216/216
							7.5		High	—	—	—/—	43.8/ 43.8	50/ 50	46/ 46	242/242
										225A00	20.0/23.1	7.5/10.0	43.8/ 43.8	50/ 50	46/ 46	242/242
										226A00	30.0/34.6	11.3/15.0	50.6/ 56.4	60/ 60	47/ 52	242/242
										227A00	50.0/57.7	18.8/25.0	75.7/ 85.3	80/ 90	70/ 78	242/242
										228A00	70.0/80.8	26.3/35.0	100.7/114.2	110/125	93/105	242/242
										229A00	80.0/92.4	30.0/40.0	113.2/128.6	125/150	104/118	242/242
	460-3-60	414	506	6.4	39	0.8	2.6	—	Low	—	—	—	18.6	25	20	96
										232A00	11.5	10.0	18.6	25	20	96
										233A00	17.3	15.0	24.9	25	23	96
										234A00	28.9	25.0	39.3	40	36	96
										235A00	40.4	35.0	53.8	60	49	96
										236A00	46.2	40.0	61.0	70	56	96
							3.4		High	—	—	—	19.4	25	20	109
										232A00	11.5	10.0	19.4	25	20	109
										233A00	17.3	15.0	25.9	30	24	109
										234A00	28.9	25.0	40.3	45	37	109
										235A00	40.4	35.0	54.8	60	50	109
										236A00	46.2	40.0	62.0	70	57	109
							2.6	1.2	Low	—	—	—	19.8	25	21	99
										232A00	11.5	10.0	19.8	25	21	99
										233A00	17.3	15.0	26.4	30	24	99
										234A00	28.9	25.0	40.8	45	38	99
										235A00	40.4	35.0	55.3	60	51	99
										236A00	46.2	40.0	62.5	70	57	99
							3.4		High	—	—	—	20.6	25	22	112
										232A00	11.5	10.0	20.6	25	22	112
										233A00	17.3	15.0	27.4	30	25	112
										234A00	28.9	25.0	41.8	45	38	112
										235A00	40.4	35.0	56.3	60	52	112
										236A00	46.2	40.0	63.5	70	58	112
	575-3-60	518	632	6.4	30.0	0.8	2.0	—	Low	—	—	—	18.0	20	19	84
										239A00	13.9	15.0	20.1	20	19	84
										240A00	23.1	25.0	31.4	35	29	84
										241A00	32.3	35.0	42.9	45	39	84
										242A00	37.0	40.0	48.7	50	45	84
									High	—	—	—	18.8	20	20	102
										239A00	13.9	15.0	20.8	25	20	102
										240A00	23.1	25.0	32.4	35	30	102
										241A00	32.3	35.0	43.9	45	40	102
										242A00	37.0	40.0	49.7	50	46	102
							2.8	3.0	Low	—	—	—	18.1	20	19	86
										239A00	13.9	15.0	23.6	25	22	86
										240A00	23.1	25.0	35.1	40	32	86
										241A00	32.3	35.0	46.7	50	43	86
										242A00	37.0	40.0	52.4	60	48	86
									High	—	—	—	18.9	25	20	98
										239A00	13.9	15.0	24.6	25	23	98
										240A00	23.1	25.0	36.1	40	33	98
										241A00	32.3	35.0	47.7	50	44	98
										242A00	37.0	40.0	53.4	60	49	98

Table 3 — Electrical Data — Units Without Optional Powered Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY VOLTS-PH-HZ	VOLTAGE RANGE		COMPRESSOR (EA.)		OFM FLA	IFM FLA	POWER EXHAUST FLA	IFM TYPE	ELECTRIC HEAT			POWER SUPPLY		DISCONNECT SIZE	
		MIN	MAX	RLA	LRA					CRHEATER PART NO.	FLA	NOMINAL KW*	MCA	MOCP†	FLA	LRA
09	208/230-3-60	187	253	16.0	91	1.5	5.2	—	Low	—	—	—/—	44.3/ 44.3	60/ 60	46/ 46	218/218
										225A00	20.0/23.1	7.5/10.0	44.3/ 44.3	60/ 60	46/ 46	218/218
										226A00	30.0/34.6	11.3/15.0	44.3/ 49.8	60/ 60	46/ 46	218/218
										227A00	50.0/57.7	18.8/25.0	69.0/ 78.7	70/ 80	64/ 72	218/218
										228A00	70.0/80.8	26.3/35.0	94.1/107.5	100/110	87/ 99	218/218
										229A00	80.0/92.4	30.0/40.0	106.6/122.0	110/125	98/112	218/218
									High	—	—	—/—	49.3/ 49.3	60/ 60	52/ 52	261/261
										225A00	20.0/23.1	7.5/10.0	49.3/ 49.3	60/ 60	52/ 52	261/261
										226A00	30.0/34.6	11.3/15.0	50.3/ 56.1	60/ 60	52/ 52	261/261
										227A00	50.0/57.7	18.8/25.0	75.3/ 84.9	80/ 90	69/ 78	261/261
										228A00	70.0/80.8	26.3/35.0	100.3/113.8	110/125	92/105	261/261
										229A00	80.0/92.4	30.0/40.0	112.8/128.2	125/150	104/118	261/261
								3.0	Low	—	—	—/—	47.3/ 47.3	60/ 60	50/ 50	222/222
										225A00	20.0/23.1	7.5/10.0	47.3/ 47.3	60/ 60	50/ 50	222/222
										226A00	30.0/34.6	11.3/15.0	47.8/ 53.6	60/ 60	50/ 50	222/222
										227A00	50.0/57.7	18.8/25.0	72.8/ 82.4	80/ 90	67/ 76	222/222
										228A00	70.0/80.8	26.3/35.0	97.8/111.3	100/125	90/102	222/222
										229A00	80.0/92.4	30.0/40.0	110.3/125.7	125/150	101/116	222/222
									High	—	—	—/—	52.3/ 52.3	60/ 60	55/ 55	265/265
										225A00	20.0/23.1	7.5/10.0	52.3/ 52.3	60/ 60	55/ 55	265/265
										226A00	30.0/34.6	11.3/15.0	54.0/ 59.8	60/ 60	55/ 55	265/265
										227A00	50.0/57.7	18.8/25.0	79.0/ 88.7	80/ 90	73/ 82	265/265
										228A00	70.0/80.8	26.3/35.0	104.1/117.5	110/125	96/108	265/265
										229A00	80.0/92.4	30.0/40.0	116.6/132.0	125/150	107/121	265/265
	460-3-60	414	506	7.1	46	0.8	2.6	—	Low	—	—	—	20.1	25	21	110
										232A00	11.5	10.0	20.1	25	21	110
										233A00	17.3	15.0	24.9	25	23	110
										234A00	28.9	25.0	39.3	40	36	110
										235A00	40.4	35.0	53.8	60	49	110
										236A00	46.2	40.0	61.0	70	56	110
							4.8		High	—	—	—	22.3	25	24	132
										232A00	11.5	10.0	22.3	25	24	132
										233A00	17.3	15.0	27.7	30	25	132
										234A00	28.9	25.0	42.1	45	39	132
										235A00	40.4	35.0	56.5	60	52	132
										236A00	46.2	40.0	63.7	70	59	132
							2.6	1.2	Low	—	—	—	21.3	25	22	113
										232A00	11.5	10.0	21.3	25	22	113
										233A00	17.3	15.0	26.4	30	24	113
										234A00	28.9	25.0	40.8	45	38	113
										235A00	40.4	35.0	55.3	60	51	113
										236A00	46.2	40.0	62.5	70	57	113
							4.8		High	—	—	—	23.5	30	25	134
										232A00	11.5	10.0	23.5	30	25	134
										233A00	17.3	15.0	29.2	30	27	134
										234A00	28.9	25.0	43.6	45	40	134
										235A00	40.4	35.0	58.0	60	53	134
										236A00	46.2	40.0	65.2	70	60	134
	575-3-60	518	632	5.6	37.0	0.8	2.0	—	Low	—	—	—	16.2	20	17	98
										239A00	13.9	15.0	20.1	20	18	98
										240A00	23.1	25.0	31.4	35	29	98
										241A00	32.3	35.0	42.9	45	39	98
										242A00	37.0	40.0	48.7	50	45	98
							3.3		High	—	—	—	17.5	20	19	136
										239A00	13.9	15.0	21.4	25	20	136
										240A00	23.1	25.0	33.0	35	30	136
										241A00	32.3	35.0	45.1	45	41	136
										242A00	37.0	40.0	50.3	50	46	136
							2.0	3.0	Low	—	—	—	19.1	25	20	92
										239A00	13.9	15.0	23.6	25	22	92
										240A00	23.1	25.0	35.1	40	32	92
										241A00	32.3	35.0	46.7	50	43	92
										242A00	37.0	40.0	52.4	60	48	92
							3.3		High	—	—	—	19.9	25	21	104
										239A00	13.9	15.0	24.6	25	23	104
										240A00	23.1	25.0	36.1	40	33	104
										241A00	32.3	35.0	47.7	50	44	104
										242A00	37.0	40.0	53.4	60	49	104

LEGEND

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

***** Heater capacity (kW) is based on heater voltage of 208 v, 230 v, 480 v, or 600 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.

† Fuse or HACR circuit breaker.

NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the 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 = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{224 + 231 + 226}{3} = \frac{681}{3} = 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

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 3 — Electrical Data — Units Without Optional Powered Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY VOLTS-PH-HZ	VOLTAGE RANGE		COMPRESSOR (EA.)		OFM FLA	IFM FLA	POWER EXHAUST FLA	IFM TYPE	ELECTRIC HEAT			POWER SUPPLY		DISCONNECT SIZE	
		MIN	MAX	RLA	LRA					CRHEATER PART NO.	FLA	NOMINAL KW*	MCA	MOCP†	FLA	LRA
12	208/230-3-60	187	253	17.6	123	1.9	7.5	—	Low	—	—	—/—	51.0/ 51.0	60/ 60	54/ 54	314/314
										225A00	20.0/ 23.1	7.5/10.0	51.0/ 51.0	60/ 60	54/ 54	314/314
										226A00	30.0/ 34.6	11.3/15.0	51.0/ 52.7	60/ 60	54/ 54	314/314
										227A00	50.0/ 57.7	18.8/25.0	71.9/ 81.5	80/ 90	66/ 75	314/314
										228A00	70.0/ 80.8	26.3/35.0	96.9/110.4	100/125	89/102	314/314
										229A00	80.0/ 92.4	30.0/40.0	109.4/124.8	110/125	101/115	314/314
										230A00	100.1/115.5	37.6/50.0	134.5/124.8	150/150	124/141	314/314
							10.2		High	—	—	—/—	53.7/ 53.7	60/ 60	57/ 57	331/331
										225A00	20.0/ 23.1	7.5/10.0	53.7/ 53.7	60/ 60	57/ 57	331/331
										226A00	30.0/ 34.6	11.3/15.0	53.7/ 56.1	60/ 60	57/ 57	331/331
										227A00	50.0/ 57.7	18.8/25.0	75.3/ 84.9	80/ 90	69/ 78	331/331
										228A00	70.0/ 80.8	26.3/35.0	100.3/113.8	110/125	92/105	331/331
										229A00	80.0/ 92.4	30.0/40.0	112.8/128.2	125/150	104/118	331/331
										230A00	100.1/115.5	37.6/50.0	137.8/128.2	150/150	127/145	331/331
							7.5	3.0	Low	—	—	—/—	54.0/ 54.0	60/ 60	57/ 57	318/318
										225A00	20.0/ 23.1	7.5/10.0	54.0/ 54.0	60/ 60	57/ 57	318/318
										226A00	30.0/ 34.6	11.3/15.0	54.0/ 56.4	60/ 60	57/ 57	318/318
										227A00	50.0/ 57.7	18.8/25.0	75.7/ 85.3	80/ 90	70/ 78	318/318
										228A00	70.0/ 80.8	26.3/35.0	100.7/114.2	110/125	93/105	318/318
										229A00	80.0/ 92.4	30.0/40.0	113.2/128.6	125/150	104/118	318/318
										230A00	100.1/115.5	37.6/50.0	138.2/128.6	150/150	127/145	318/318
							10.2		High	—	—	—/—	56.7/ 56.7	70/ 70	60/ 60	335/335
										225A00	20.0/ 23.1	7.5/10.0	56.7/ 56.7	70/ 70	60/ 60	335/335
										226A00	30.0/ 34.6	11.3/15.0	56.7/ 59.8	70/ 70	60/ 60	335/335
										227A00	50.0/ 57.7	18.8/25.0	79.0/ 88.7	80/ 90	73/ 82	335/335
										228A00	70.0/ 80.8	26.3/35.0	104.1/117.5	110/125	96/108	335/335
										229A00	80.0/ 92.4	30.0/40.0	116.6/132.0	125/150	107/121	335/335
										230A00	100.1/115.5	37.6/50.0	141.6/132.0	150/150	130/148	335/335
	460-3-60	414	506	7.7	50	1.0	3.4	—	Low	—	—	—	22.7	30	24	130
										232A00	11.5	10.0	22.7	30	24	130
										233A00	17.3	15.0	25.9	30	24	130
										234A00	28.9	25.0	40.3	45	37	130
										235A00	40.4	35.0	54.8	60	50	130
										236A00	46.2	40.0	62.0	70	57	130
										237A00	57.7	50.0	62.0	70	70	130
							4.8		High	—	—	—	24.1	30	26	139
										232A00	11.5	10.0	24.1	30	26	139
										233A00	17.3	15.0	27.7	30	26	139
										234A00	28.9	25.0	42.1	45	39	139
										235A00	40.4	35.0	56.5	60	52	139
										236A00	46.2	40.0	63.7	70	59	139
										237A00	57.7	50.0	63.7	70	72	139
							3.4	1.2	Low	—	—	—	23.9	30	25	133
										232A00	11.5	10.0	23.9	30	25	133
										233A00	17.3	15.0	27.4	30	25	133
										234A00	28.9	25.0	41.8	45	38	133
										235A00	40.4	35.0	56.3	60	52	133
										236A00	46.2	40.0	63.5	70	58	133
										237A00	57.7	50.0	63.5	70	72	133
							4.8		High	—	—	—	25.3	30	27	141
										232A00	11.5	10.0	25.3	30	27	141
										233A00	17.3	15.0	29.2	30	27	141
										234A00	28.9	25.0	43.6	45	40	141
										235A00	40.4	35.0	58.0	60	53	141
										236A00	46.2	40.0	65.2	70	60	141
										237A00	57.7	50.0	65.2	70	73	141
	575-3-60	518	632	6.1	40.0	0.8	2.8	—	Low	—	—	—	20.1	20	21	124
										239A00	13.9	15.0	20.8	25	21	124
										240A00	23.1	25.0	32.4	35	32	124
										241A00	32.3	35.0	43.9	45	42	124
										242A00	37.0	40.0	49.7	50	48	124
										243A00	46.2	50.0	49.7	60	58	124
							3.3		High	—	—	—	18.6	20	20	142
										239A00	13.9	15.0	21.4	25	20	142
										240A00	23.1	25.0	33.0	35	30	142
										241A00	32.3	35.0	45.1	45	41	142
										242A00	37.0	40.0	50.3	50	46	142
										243A00	46.2	50.0	50.3	60	57	142
							2.8	3.0	Low	—	—	—	21.1	25	23	110
										239A00	13.9	15.0	24.6	25	23	110
										240A00	23.1	25.0	36.1	40	33	110
										241A00	32.3	35.0	47.7	50	44	110
										242A00	37.0	40.0	53.4	60	49	110
										243A00	46.2	50.0	53.4	60	60	110
							3.3		High	—	—	—	21.1	25	23	110
										239A00	13.9	15.0	24.6	25	23	110
										240A00	23.1	25.0	36.1	40	33	110
										241A00	32.3	35.0	47.7	50	44	110
										242A00	37.0	40.0	53.4	60	49	110
										243A00	46.2	50.0	53.4	60	60	110

Table 3 — Electrical Data — Units Without Optional Powered Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY VOLTS-PH-HZ	VOLTAGE RANGE		COMPRESSOR (EA.)		OFM FLA	IFM FLA	POWER EXHAUST FLA	IFM TYPE	ELECTRIC HEAT			POWER SUPPLY		DISCONNECT SIZE	
		MIN	MAX	RLA	LRA					CRHEATER PART NO.	FLA	NOMINAL KW*	MCA	MOCP†	FLA	LRA
14	208/230-3-60	187	253	22.4	149	1.9	10.2	—	Low	—	—	—/—	64.5/ 64.5	80/ 80	68/ 68	383/383
										225A00	20.0/ 23.1	7.5/10.0	64.5/ 64.5	80/ 80	68/ 68	383/383
										226A00	30.0/ 34.6	11.3/15.0	64.5/ 64.5	80/ 80	68/ 68	383/383
										227A00	50.0/ 57.7	18.8/25.0	75.3/ 84.9	80/ 90	69/ 78	383/383
										228A00	70.0/ 80.8	26.3/35.0	100.3/113.8	110/125	92/105	383/383
										230A00	100.1/115.5	37.6/50.0	137.8/128.2	150/150	127/145	383/383
										231A00	120.1/138.6	45.1/60.0	162.8/151.3	175/175	150/171	383/383
							15.0		High	—	—	—/—	69.3/ 69.3	90/ 90	73/ 73	391/391
										225A00	20.0/ 23.1	7.5/10.0	69.3/ 69.3	90/ 90	73/ 73	391/391
										226A00	30.0/ 34.6	11.3/15.0	69.3/ 69.3	90/ 90	73/ 73	391/391
										227A00	50.0/ 57.7	18.8/25.0	81.3/ 90.9	90/100	75/ 84	391/391
										228A00	70.0/ 80.8	26.3/35.0	106.3/119.8	110/125	98/110	391/391
										230A00	100.1/115.5	37.6/50.0	143.8/134.2	150/150	132/150	391/391
										231A00	120.1/138.6	45.1/60.0	168.8/157.3	175/175	155/177	391/391
							10.2	3.0	Low	—	—	—/—	67.5/ 67.5	80/ 80	71/ 71	387/387
										225A00	20.0/ 23.1	7.5/10.0	67.5/ 67.5	80/ 80	71/ 71	387/387
										226A00	30.0/ 34.6	11.3/15.0	67.5/ 67.5	80/ 80	71/ 71	387/387
										227A00	50.0/ 57.7	18.8/25.0	79.0/ 88.7	80/ 90	73/ 82	387/387
										228A00	70.0/ 80.8	26.3/35.0	104.1/117.5	110/125	96/108	387/387
										230A00	100.1/115.5	37.6/50.0	141.6/132.0	150/150	130/148	387/387
										231A00	120.1/138.6	45.1/60.0	166.6/155.1	175/175	153/175	387/387
							15.0		High	—	—	—/—	72.3/ 72.3	90/ 90	77/ 77	395/395
										225A00	20.0/ 23.1	7.5/10.0	72.3/ 72.3	90/ 90	77/ 77	395/395
										226A00	30.0/ 34.6	11.3/15.0	72.3/ 72.3	90/ 90	77/ 77	395/395
										227A00	50.0/ 57.7	18.8/25.0	85.0/ 94.7	90/100	78/ 87	395/395
										228A00	70.0/ 80.8	26.3/35.0	110.1/123.5	125/125	101/114	395/395
										230A00	100.1/115.5	37.6/50.0	147.6/138.0	150/150	136/153	395/395
										231A00	120.1/138.6	45.1/60.0	172.6/161.1	175/175	159/180	395/395
	460-3-60	414	506	10.6	75	1.0	4.8	—	Low	—	—	—	30.6	40	32	190
										232A00	11.5	10.0	30.6	40	32	190
										233A00	17.3	15.0	30.6	40	32	190
										234A00	28.9	25.0	42.1	45	39	190
										235A00	40.4	35.0	56.5	60	52	190
										237A00	57.7	50.0	63.7	70	72	190
										238A00	69.3	60.0	75.3	90	85	190
							7.4		High	—	—	—	33.2	40	35	194
										232A00	11.5	10.0	33.2	40	35	194
										233A00	17.3	15.0	33.2	40	35	194
										234A00	28.9	25.0	45.3	50	42	194
										235A00	40.4	35.0	59.8	60	55	194
										237A00	57.7	50.0	67.0	80	75	194
										238A00	69.3	60.0	78.5	90	88	194
							4.8	1.2	Low	—	—	—	31.8	40	34	192
										232A00	11.5	10.0	31.8	40	34	192
										233A00	17.3	15.0	31.8	40	34	192
										234A00	28.9	25.0	43.6	45	40	192
										235A00	40.4	35.0	58.0	60	53	192
										237A00	57.7	50.0	65.2	70	73	192
										238A00	69.3	60.0	76.8	90	87	192
							7.4		High	—	—	—	34.4	45	37	197
										232A00	11.5	10.0	34.4	45	37	197
										233A00	17.3	15.0	34.4	45	37	197
										234A00	28.9	25.0	46.8	50	43	197
										235A00	40.4	35.0	61.3	70	56	197
										237A00	57.7	50.0	68.5	80	76	197
										238A00	69.3	60.0	80.0	90	90	197
	575-3-60	518	632	10.6	59.0	0.8	3.3	—	Low	—	—	—	28.7	25	30	180
										239A00	13.9	15.0	28.7	25	30	180
										240A00	23.1	25.0	33.0	35	30	180
										241A00	32.3	35.0	45.1	45	41	180
										242A00	37.0	40.0	50.3	50	46	180
										243A00	46.2	50.0	50.3	60	57	180
										244A00	55.4	60.0	59.6	60	68	180
							5.6		High	—	—	—	31.0	30	33	191
										239A00	13.9	15.0	31.0	30	33	191
										240A00	23.1	25.0	35.9	40	33	191
										241A00	32.3	35.0	47.4	50	44	191
										242A00	37.0	40.0	53.2	60	49	191
										243A00	46.2	50.0	53.2	60	60	191
										244A00	55.4	60.0	62.4	70	70	191
							3.3	3.0	Low	—	—	—	24.7	30	26	138
										239A00	13.9	15.0	24.7	30	26	138
										240A00	23.1	25.0	36.1	40	33	138
										241A00	32.3	35.0	47.7	50	44	138
										242A00	37.0	40.0	53.4	60	49	138
										243A00	46.2	50.0	53.4	60	60	138
										244A00	55.4	60.0	62.7	70	70	138
							5.6		High	—	—	—	27.5	30	29	151
										239A00	13.9	13.9	28.1	30	29	151
										240A00	23.1	23.1	39.6	40	36	151
										241A00	32.3	32.3	51.2	60	47	151
										242A00	37.0	37.0	56.9	60	52	151
										243A00	46.2	46.2	56.9	60	63	151
										244A00	55.4	55.4	66.2	70	74	151

LEGEND

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

***** Heater capacity (kW) is based on heater voltage of 208 v, 230 v, 480 v, or 600 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.

† Fuse or HACR circuit breaker.

NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the 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 = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{224 + 231 + 226}{3} = \frac{681}{3} = 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

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 3 — Electrical Data — Units Without Optional Powered Convenience Outlet (cont)

UNIT 50PG	NOMINAL POWER SUPPLY (V-PH-HZ)	VOLTAGE RANGE		COMPR NO. 1		COMPR NO. 2		COMPR NO. 3		OF MFL A	POWER EXHAUST		IFM TYPE	IFM FLA	ELECTRIC HEAT			POWER SUPPLY		DISCONNECT SIZE	
		MIN	MAX	RLA	LRA	RLA	LRA	RLA	LRA		QTY	FLA			CRHEATER PART NO.	FLA	NOMINAL KW*	MCA	MOCP	FLA	LRA
16	208/230-3-60	187	253	18.1	137	18.1	137	17.6	123	1.9	—	—	Low	10.2	—	—	—/—	74.2/74.2	90/ 90	80/ 80	482/482
															255A00	52.1/60.1	18.8/25.0	77.9/87.9	90/ 90	80/ 81	482/482
															256A00	104.2/120.3	37.6/50.0	143.0/133.0	150/150	132/150	482/482
															257A00	156.3/180.4	56.3/75.0	169.1/193.2	200/225	192/219	482/482
													Mid-Low	15.0	—	—	—/—	79.0/79.0	90/ 90	86/ 86	491/491
															255A00	52.1/60.1	18.8/25.0	83.9/ 93.9	90/100	86/ 86	491/491
															256A00	104.2/120.3	37.6/50.0	149.0/139.0	150/175	137/156	491/491
															257A00	156.3/180.4	56.3/75.0	175.1/199.2	200/225	197/225	491/491
													High	19.4	—	—	—/—	83.4/83.4	100/100	91/91	529/529
															255A00	52.1/ 0.1	18.8/25.0	89.4/99.4	100/100	91/91	529/529
															256A00	104.2/120.3	37.6/50.0	154.5/144.5	175/175	142/161	529/529
															257A00	156.3/180.4	56.3/75.0	180.6/204.7	200/225	202/230	529/529
											2	3.0	Low	10.2	—	—	—/—	77.2/77.2	90/ 90	84/ 84	486/486
															255A00	52.1/60.1	18.8/25.0	81.6/91.7	90/100	84/ 84	486/486
															256A00	104.2/120.3	37.6/50.0	146.8/136.8	150/150	135/154	486/486
															257A00	156.3/180.4	56.3/75.0	172.8/196.9	200/225	195/223	486/486
													Mid-Low	15.0	—	—	—/—	82.0/82.0	100/100	89/ 89	495/495
															255A00	52.1/ 60.1	18.8/25.0	87.6/97.7	100/100	89/ 90	495/495
															256A00	104.2/120.3	37.6/50.0	152.8/142.8	175/175	141/159	495/495
															257A00	156.3/180.4	56.3/75.0	178.8/202.9	200/225	200/228	495/495
													High	19.4	—	—	—/—	86.4/86.4	100/100	94/ 94	533/533
															255A00	52.1/ 60.1	18.8/25.0	93.1/103.2	100/110	94/ 95	533/533
															256A00	104.2/120.3	37.6/50.0	158.3/148.3	175/175	146/164	533/533
															257A00	156.3/180.4	56.3/75.0	184.3/208.4	200/250	206/233	533/533
	460-3-60	414	506	9.0	62	9.0	62	7.7	50	1.0	—	—	Low	4.8	—	—	—/—	35.8	40	39	215
															258A00	30.1	25.0	43.6	45	40	215
															259A00	60.1	50.0	66.1	80	75	215
															260A00	90.2	75.0	96.2	100	109	215
													Mid-Low	7.4	—	—	—/—	38.4	45	42	219
															258A00	30.1	25.0	46.8	50	43	219
															259A00	60.1	50.0	69.4	80	78	219
															260A00	90.2	75.0	99.5	110	112	219
													High	9.7	—	—	—/—	40.7	50	44	238
															258A00	30.1	25.0	49.7	50	46	238
															259A00	60.1	50.0	72.3	80	80	238
															260A00	90.2	75.0	102.3	125	115	238
											2	1.2	Low	4.8	—	—	—/—	37.0	45	40	217
															258A00	30.1	25.0	45.1	50	41	217
															259A00	60.1	50.0	67.6	80	76	217
															260A00	90.2	75.0	97.7	100	111	217
													Mid-Low	7.4	—	—	—/—	39.6	45	43	222
															258A00	30.1	25.0	48.3	50	44	222
															259A00	60.1	50.0	70.9	80	79	222
															260A00	90.2	75.0	101.0	110	114	222
													High	9.7	—	—	—/—	41.9	50	46	241
															258A00	30.1	25.0	51.2	60	47	241
															259A00	60.1	50.0	73.8	80	82	241
															260A00	90.2	75.0	103.8	125	116	241
	575-3-60	518	633	6.8	50	6.8	50	6.1	40	0.8	—	—	Low	2.8	—	—	—/—	26.6	30	29	167
															261A00	24.1	25.0	33.6	35	31	167
															262A00	46.2	50.0	49.7	60	56	167
															263A00	72.2	75.0	75.7	80	86	167
													Mid-Low	5.6	—	—	—/—	29.4	35	32	181
															261A00	24.1	25.0	37.1	40	34	181
															262A00	46.2	50.0	53.2	60	60	181
															263A00	72.2	75.0	79.2	90	89	181
													High	7.8	—	—	—/—	31.6	35	34	196
															261A00	24.1	25.0	39.8	40	37	196
															262A00	46.2	50.0	55.9	60	62	196
															263A00	72.2	75.0	81.9	90	92	196
											2	3.0	Low	2.8	—	—	—/—	29.6	35	32	171
															261A00	24.1	25.0	37.3	40	34	171
															262A00	46.2	50.0	53.4	60	60	171
															263A00	72.2	75.0	79.4	90	90	171
													Mid-Low	5.6	—	—	—/—	32.4	35	35	185
															261A00	24.1	25.0	40.8	45	38	185
															262A00	46.2	50.0	56.9	60	63	185
															263A00	72.2	75.0	82.9	90	93	185
													High	7.8	—	—	—/—	34.6	40	38	200
															261A00	24.1	25.0	43.6	45	40	200
															262A00	46.2	50.0	59.7	70	66	200
															263A00	72.2	75.0	85.7	100	95	200

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

UNIT 50PG	NOMINAL POWER SUPPLY VOLTS-PH-HZ	VOLTAGE RANGE		COMPRESSOR		OFM FLA	IFM FLA	POWER EXHAUST FLA	IFM TYPE	ELECTRIC HEAT			POWER SUPPLY		DISCONNECT SIZE	
		MIN	MAX	RLA	LRA					CRHEATER PART NO.	FLA	NOMINAL KW*	MCA	MOCP†	FLA	LRA
08	208/230-3-60	187	253	13.5	88	1.5	5.2	—	Low	—	—	—/—	43.3/ 43.3	50/ 50	46/ 46	217/217
										225A00	20.0/23.1	7.5/10.0	43.3/ 43.3	50/ 50	46/ 46	217/217
										226A00	30.0/34.6	11.3/15.0	50.0/ 55.2	60/ 60	46/ 51	217/217
										227A00	50.0/57.7	18.8/25.0	75.1/ 84.1	80/ 90	69/ 78	217/217
										228A00	70.0/80.8	26.3/35.0	100.1/113.0	110/125	92/104	217/217
										229A00	80.0/92.4	30.0/40.0	112.6/127.4	125/150	104/118	217/217
							7.5		High	—	—	—/—	45.6/ 45.6	50/ 50	49/ 49	243/243
										225A00	20.0/23.1	7.5/10.0	45.6/ 45.6	50/ 50	49 /49	243/243
										226A00	30.0/34.6	11.3/15.0	52.9/ 58.1	60/ 60	49/ 54	243/243
										227A00	50.0/57.7	18.8/25.0	77.9/ 87.0	80/ 90	72/ 81	243/243
										228A00	70.0/80.8	26.3/35.0	102.9/115.9	110/125	95/107	243/243
										229A00	80.0/92.4	30.0/40.0	115.4/130.3	125/150	106/120	243/243
							5.2	3.0	Low	—	—	—/—	46.3/ 46.3	50/ 50	49/ 49	221/221
										225A00	20.0/23.1	7.5/10.0	46.3/ 46.3	50/ 50	49/ 49	221/221
										226A00	30.0/34.6	11.3/15.0	53.8/ 59.0	60/ 60	49/ 55	221/221
										227A00	50.0/57.7	18.8/25.0	78.8/ 87.9	80/ 90	72/ 81	221/221
										228A00	70.0/80.8	26.3/35.0	103.8/116.7	110/125	96/108	221/221
										229A00	80.0/92.4	30.0/40.0	116.3/131.2	125/150	107/121	221/221
							7.5		High	—	—	—/—	48.6/ 48.6	60/ 60	52/ 52	247/247
										225A00	20.0/23.1	7.5/10.0	48.6/ 48.6	60/ 60	52/ 52	247/247
										226A00	30.0/34.6	11.3/15.0	56.7/ 61.9	60/ 70	52/ 57	247/247
										227A00	50.0/57.7	18.8/25.0	81.7/ 90.7	90/100	75/ 84	247/247
										228A00	70.0/80.8	26.3/35.0	106.7/119.6	110/125	98/111	247/247
										229A00	80.0/92.4	30.0/40.0	119.2/134.0	125/150	110/124	247/247
	460-3-60	414	506	6.4	39	0.8	2.6	—	Low	—	—	—	20.8	25	22	98
										232A00	11.5	10.0	20.8	25	22	98
										233A00	17.3	15.0	27.6	30	25	98
										234A00	28.9	25.0	42.1	45	39	98
										235A00	40.4	35.0	56.5	60	52	98
										236A00	46.2	40.0	63.7	70	59	98
							3.4		High	—	—	—	21.6	25	23	111
										232A00	11.5	10.0	21.6	25	23	111
										233A00	17.3	15.0	28.6	30	26	111
										234A00	28.9	25.0	43.1	45	40	111
										235A00	40.4	35.0	57.5	60	53	111
										236A00	46.2	40.0	64.7	70	60	111
							2.6	1.2	Low	—	—	—	22.0	25	23	101
										232A00	11.5	10.0	22.0	25	23	101
										233A00	17.3	15.0	29.1	30	27	101
										234A00	28.9	25.0	43.6	45	40	101
										235A00	40.4	35.0	58.0	60	53	101
										236A00	46.2	40.0	65.2	70	60	101
							3.4		High	—	—	—	22.8	25	24	114
										232A00	11.5	10.0	22.9	25	24	114
										233A00	17.3	15.0	30.1	35	28	114
										234A00	28.9	25.0	44.6	45	41	114
										235A00	40.4	35.0	59.0	60	54	114
										236A00	46.2	40.0	66.2	70	61	114
	575-3-60	518	632	6.4	30.0	0.8	2.0	—	Low	—	—	—	20.1	20	21	86
										239A00	13.9	15.0	22.0	25	21	86
										240A00	23.1	25.0	33.5	35	31	86
										241A00	32.3	35.0	45.1	50	41	86
										242A00	37.0	40.0	50.9	60	47	86
									High	—	—	—	20.6	20	22	104
										239A00	13.9	15.0	23.0	25	22	104
										240A00	23.1	25.0	34.5	35	32	104
										241A00	32.3	35.0	46.1	50	42	104
										242A00	37.0	40.0	51.9	60	48	104
							2.8	3.0	Low	—	—	—	19.9	25	21	88
										239A00	13.9	15.0	25.7	30	24	88
										240A00	23.1	25.0	37.3	40	34	88
										241A00	32.3	35.0	48.8	50	45	88
										242A00	37.0	40.0	54.6	60	50	88
									High	—	—	—	20.7	25	22	100
										239A00	13.9	15.0	26.7	30	25	100
										240A00	23.1	25.0	38.3	40	35	100
										241A00	32.3	35.0	49.8	50	46	100
										242A00	37.0	40.0	55.6	60	51	100

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

UNIT 50PG	NOMINAL POWER SUPPLY VOLTS-PH-HZ	VOLTAGE RANGE		COMPRESSOR		OFM FLA	IFM FLA	POWER EXHAUST FLA	IFM TYPE	ELECTRIC HEAT			POWER SUPPLY		DISCONNECT SIZE	
		MIN	MAX	RLA	LRA					CRHEATER PART NO.	FLA	NOMINAL KW*	MCA	MOCP†	FLA	LRA
09	208/230-3-60	187	253	16.0	91	1.5	5.2	—	Low	—	—	—/—	49.1/ 49.1	60/ 60	52/ 52	223/223
										225A00	20.0/23.1	7.5/10.0	49.1/ 49.1	60/ 60	52/ 52	223/223
										226A00	30.0/34.6	11.3/15.0	50.0/ 55.2	60/ 60	52/ 52	223/223
										227A00	50.0/57.7	18.8/25.0	75.1/ 84.1	80/ 90	69/ 78	223/223
										228A00	70.0/80.8	26.3/35.0	100.1/113.0	110/125	92/104	223/223
										229A00	80.0/92.4	30.0/40.0	112.6/127.4	125/150	104/118	223/223
							10.2		High	—	—	—/—	54.1/ 54.1	60/ 60	58/ 58	266/266
										225A00	20.0/23.1	7.5/10.0	54.1/ 54.1	60/ 60	58/ 58	266/266
										226A00	30.0/34.6	11.3/15.0	56.3/ 61.5	60/ 70	58/ 58	266/266
										227A00	50.0/57.7	18.8/25.0	81.3/ 90.4	90/100	75/ 84	266/266
										228A00	70.0/80.8	26.3/35.0	106.3/119.2	110/125	98/110	266/266
										229A00	80.0/92.4	30.0/40.0	118.8/133.7	125/150	109/123	266/266
							5.2	3.0	Low	—	—	—/—	52.1/ 52.1	60/ 60	55/ 55	227/227
										225A00	20.0/23.1	7.5/10.0	52.1/ 52.1	60/ 60	55/ 55	227/227
										226A00	30.0/34.6	11.3/15.0	53.8/ 59.0	60/ 60	55/ 55	227/227
										227A00	50.0/57.7	18.8/25.0	78.8/ 87.9	80/ 90	72/ 81	227/227
										228A00	70.0/80.8	26.3/35.0	103.8/116.7	110/125	96/108	227/227
										229A00	80.0/92.4	30.0/40.0	116.3/131.2	125/150	107/121	227/227
							10.2		High	—	—	—/—	57.1/ 57.1	70/ 70	61/ 61	270/270
										225A00	20.0/23.1	7.5/10.0	57.1/ 57.1	70/ 70	61/ 61	270/270
										226A00	30.0/34.6	11.3/15.0	60.0/ 65.2	70/ 70	61/ 61	270/270
										227A00	50.0/57.7	18.8/25.0	85.1/ 94.1	90/100	78/ 87	270/270
										228A00	70.0/80.8	26.3/35.0	110.1/123.0	125/125	101/114	270/270
										229A00	80.0/92.4	30.0/40.0	122.6/137.4	125/150	113/127	270/270
	460-3-60	414	506	7.1	46	0.8	2.6	—	Low	—	—	—	22.2	25	24	112
										232A00	11.5	10.0	22.2	25	24	112
										233A00	17.3	15.0	27.6	30	25	112
										234A00	28.9	25.0	42.1	45	39	112
										235A00	40.4	35.0	56.5	60	52	112
										236A00	46.2	40.0	63.7	70	59	112
							4.8		High	—	—	—	24.4	30	26	134
										232A00	11.5	10.0	24.4	30	26	134
										233A00	17.3	15.0	30.4	35	28	134
										234A00	28.9	25.0	44.8	45	41	134
										235A00	40.4	35.0	59.2	60	54	134
										236A00	46.2	40.0	66.5	70	61	134
							2.6	1.2	Low	—	—	—	23.4	30	25	115
										232A00	11.5	10.0	23.4	30	25	115
										233A00	17.3	15.0	29.1	30	27	115
										234A00	28.9	25.0	43.6	45	40	115
										235A00	40.4	35.0	58.0	60	53	115
										236A00	46.2	40.0	65.2	70	60	115
							4.8		High	—	—	—	25.6	30	27	136
										232A00	11.5	10.0	25.6	30	27	136
										233A00	17.3	15.0	31.9	35	29	136
										234A00	28.9	25.0	46.3	50	43	136
										235A00	40.4	35.0	60.7	70	56	136
										236A00	46.2	40.0	68.0	70	63	136
	575-3-60	518	632	5.6	37.0	0.8	2.0	—	Low	—	—	—	17.9	20	19	100
										239A00	13.9	15.0	22.0	25	20	100
										240A00	23.1	25.0	33.5	35	31	100
										241A00	32.3	35.0	45.1	50	41	100
										242A00	37.0	40.0	50.9	60	47	100
							3.3		High	—	—	—	19.2	25	21	138
										239A00	13.9	15.0	23.6	25	22	138
										240A00	23.1	25.0	35.2	35	32	138
										241A00	32.3	35.0	46.7	50	43	138
										242A00	37.0	40.0	52.5	60	48	138
							2.0	3.0	Low	—	—	—	20.9	25	22	94
										239A00	13.9	15.0	25.7	30	24	94
										240A00	23.1	25.0	37.3	40	34	94
										241A00	32.3	35.0	48.8	50	45	94
										242A00	37.0	40.0	54.6	60	50	94
							3.3		High	—	—	—	21.7	25	23	105
										239A00	13.9	15.0	26.7	30	25	105
										240A00	23.1	25.0	38.3	40	35	105
										241A00	32.3	35.0	49.8	50	46	105
										242A00	37.0	40.0	55.6	60	51	105

LEGEND

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

***** Heater capacity (kW) is based on heater voltage of 208 v, 230 v, 480 v, or 600 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.

† Fuse or HACR circuit breaker.

NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the 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 = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{224 + 231 + 226}{3} = \frac{681}{3} = 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

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

UNIT 50PG	NOMINAL POWER SUPPLY VOLTS-PH-HZ	VOLTAGE RANGE		COMPRESSOR		OFM FLA	IFM FLA	POWER EXHAUST FLA	IFM TYPE	ELECTRIC HEAT			POWER SUPPLY		DISCONNECT SIZE	
		MIN	MAX	RLA	LRA					CRHEATER PART NO.	FLA	NOMINAL KW*	MCA	MOCP†	FLA	LRA
12	208/230-3-60	187	253	17.6	123	1.9	7.5	—	Low	—	—	—/—	55.8/ 55.8	70/ 70	59/ 59	318/318
										225A00	20.0/ 23.1	7.5/10.0	55.8/ 55.8	70/ 70	59/ 59	318/318
										226A00	30.0/ 34.6	11.3/15.0	55.8/ 58.1	70/ 70	59/ 59	318/318
										227A00	50.0/ 57.7	18.8/25.0	77.9/ 87.0	80/ 90	72/ 81	318/318
										228A00	70.0/ 80.8	26.3/35.0	102.9/115.9	110/125	95/107	318/318
										229A00	80.0/ 92.4	30.0/40.0	115.4/130.3	125/150	106/120	318/318
										230A00	100.1/115.5	37.6/50.0	140.5/130.3	150/150	129/147	318/318
							10.2		High	—	—	—/—	58.5/ 58.5	70/ 70	62/ 62	335/335
										225A00	20.0/ 23.1	7.5/10.0	58.5/ 58.5	70/ 70	62/ 62	335/335
										226A00	30.0/ 34.6	11.3/15.0	58.5/ 61.5	70/ 70	62/ 62	335/335
										227A00	50.0/ 57.7	18.8/25.0	81.3/ 90.4	90/100	75/ 84	335/335
										228A00	70.0/ 80.8	26.3/35.0	106.3/119.2	110/125	98/110	335/335
										229A00	80.0/ 92.4	30.0/40.0	118.8/133.7	125/150	109/123	335/335
										230A00	100.1/115.5	37.6/50.0	143.8/133.7	150/150	132/150	335/335
							7.5	3.0	Low	—	—	—/—	58.8/ 58.8	70/ 70	63/ 63	322/322
										225A00	20.0/ 23.1	7.5/10.0	58.8/ 58.8	70/ 70	63/ 63	322/322
										226A00	30.0/ 34.6	11.3/15.0	58.8/ 61.9	70/ 70	63/ 63	322/322
										227A00	50.0/ 57.7	18.8/25.0	81.7/ 90.7	90/100	75/ 84	322/322
										228A00	70.0/ 80.8	26.3/35.0	106.7/119.6	110/125	98/111	322/322
										229A00	80.0/ 92.4	30.0/40.0	119.2/134.0	125/150	110/124	322/322
										230A00	100.1/115.5	37.6/50.0	144.2/134.0	150/150	133/150	322/322
							10.2		High	—	—	—/—	61.5/ 61.5	70/ 70	66/ 66	339/339
										225A00	20.0/ 23.1	7.5/10.0	61.5/ 61.5	70/ 70	66/ 66	339/339
										226A00	30.0/ 34.6	11.3/15.0	61.5/ 65.2	70/ 70	66/ 66	339/339
										227A00	50.0/ 57.7	18.8/25.0	85.1/ 94.1	90/100	78/ 87	339/339
										228A00	70.0/ 80.8	26.3/35.0	110.1/123.0	125/125	101/114	339/339
										229A00	80.0/ 92.4	30.0/40.0	122.6/137.4	125/150	113/127	339/339
										230A00	100.1/115.5	37.6/50.0	147.6/137.4	150/150	136/154	339/339
	460-3-60	414	506	7.7	50	1.0	3.4	—	Low	—	—	—	24.9	30	26	132
										232A00	11.5	10.0	24.9	30	26	132
										233A00	17.3	15.0	28.6	30	26	132
										234A00	28.9	25.0	43.1	45	40	132
										235A00	40.4	35.0	57.5	60	53	132
										236A00	46.2	40.0	64.7	70	60	132
										237A00	57.7	50.0	64.7	70	73	132
							4.8		High	—	—	—	26.3	30	28	141
										232A00	11.5	10.0	26.3	30	28	141
										233A00	17.3	15.0	30.4	35	28	141
										234A00	28.9	25.0	44.8	45	41	141
										235A00	40.4	35.0	59.2	60	54	141
										236A00	46.2	40.0	66.5	70	61	141
							3.4	1.2	Low	—	—	—	26.1	30	28	135
										232A00	11.5	10.0	26.1	30	28	135
										233A00	17.3	15.0	30.1	35	28	135
										234A00	28.9	25.0	44.6	45	41	135
										235A00	40.4	35.0	59.0	60	54	135
										236A00	46.2	40.0	66.2	70	61	135
										237A00	57.7	50.0	66.2	70	74	135
							4.8		High	—	—	—	27.5	30	29	143
										232A00	11.5	10.0	27.5	30	29	143
										233A00	17.3	15.0	31.9	35	29	143
										234A00	28.9	25.0	46.3	50	43	143
										235A00	40.4	35.0	60.7	70	56	143
										236A00	46.2	40.0	68.0	70	63	143
										237A00	57.7	50.0	68.0	80	76	143
	575-3-60	518	632	6.1	40.0	0.8	2.8	—	Low	—	—	—	20.1	25	21	124
										239A00	13.9	15.0	23.0	25	21	124
										240A00	23.1	25.0	34.5	35	32	124
										241A00	32.3	35.0	46.1	50	42	124
										242A00	37.0	40.0	51.9	60	48	124
										243A00	46.2	50.0	51.9	60	58	124
							3.3		High	—	—	—	20.4	25	22	144
										239A00	13.9	15.0	23.6	25	22	144
										240A00	23.1	25.0	35.2	35	32	144
										241A00	32.3	35.0	46.7	50	43	144
										242A00	37.0	40.0	52.5	60	48	144
										243A00	46.2	50.0	52.5	60	59	144
							2.8	3.0	Low	—	—	—	22.8	25	25	111
										239A00	13.9	15.0	26.7	30	25	111
										240A00	23.1	25.0	38.3	40	35	111
										241A00	32.3	35.0	49.8	50	46	111
										242A00	37.0	40.0	55.6	60	51	111
										243A00	46.2	50.0	55.6	60	62	111
							3.3		High	—	—	—	22.8	25	25	111
										239A00	13.9	15.0	26.7	30	25	111
										240A00	23.1	25.0	38.3	40	35	111
										241A00	32.3	35.0	49.8	50	46	111
										242A00	37.0	40.0	55.6	60	51	111
										243A00	46.2	50.0	55.6	60	62	111

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

UNIT 50PG	NOMINAL POWER SUPPLY VOLTS-PH-HZ	VOLTAGE RANGE		COMPRESSOR		OFM FLA	IFM FLA	POWER EXHAUST FLA	IFM TYPE	ELECTRIC HEAT			POWER SUPPLY		DISCONNECT SIZE	
		MIN	MAX	RLA	LRA					CRHEATER PART NO.	FLA	NOMINAL KW*	MCA	MOCP†	FLA	LRA
14	208/230-3-60	187	253	22.4	149	1.9	10.2	—	Low	—	—	—/—	69.3/ 69.3	90/ 90	73/ 73	387/387
										225A00	20.0/ 23.1	7.5/10.0	69.3/ 69.3	90/ 90	73/ 73	387/387
										226A00	30.0/ 34.6	11.3/15.0	69.3/ 69.3	90/ 90	73/ 73	387/387
										227A00	50.0/ 57.7	18.8/25.0	81.3/ 90.4	90/100	75/ 84	387/387
										228A00	70.0/ 80.8	26.3/35.0	106.3/119.2	110/125	98/110	387/387
										230A00	100.1/115.5	37.6/50.0	143.8/133.7	150/150	132/150	387/387
										231A00	120.1/138.6	45.1/60.0	168.9/156.8	175/175	155/177	387/387
							15.0		High	—	—	—/—	74.1/ 74.1	90/ 90	79/ 79	396/396
										225A00	20.0/ 23.1	7.5/10.0	74.1/ 74.1	90/ 90	79/ 79	396/396
										226A00	30.0/ 34.6	11.3/15.0	74.1/ 74.1	90/ 90	79/ 79	396/396
										227A00	50.0/ 57.7	18.8/25.0	87.3/ 96.4	90/100	80/ 89	396/396
										228A00	70.0/ 80.8	26.3/35.0	112.3/125.2	125/150	103/116	396/396
										230A00	100.1/115.5	37.6/50.0	149.8/139.7	150/150	138/156	396/396
										231A00	120.1/138.6	45.1/60.0	174.9/162.8	175/175	161/182	396/396
							10.2	3.0	Low	—	—	—/—	72.3/ 72.3	90/ 90	77/ 77	391/391
										225A00	20.0/ 23.1	7.5/10.0	72.3/ 72.3	90/ 90	77/ 77	391/391
										226A00	30.0/ 34.6	11.3/15.0	72.3/ 72.3	90/ 90	77/ 77	391/391
										227A00	50.0/ 57.7	18.8/25.0	85.1/ 94.1	90/100	78/ 87	391/391
										228A00	70.0/ 80.8	26.3/35.0	110.1/123.0	125/125	101/114	391/391
										230A00	100.1/115.5	37.6/50.0	147.6/137.4	150/150	136/154	391/391
										231A00	120.1/138.6	45.1/60.0	172.6/160.5	175/175	159/180	391/391
							15.0		High	—	—	—/—	77.1/ 77.1	90/ 90	82/ 82	400/400
										225A00	20.0/ 23.1	7.5/10.0	77.1/ 77.1	90/ 90	82/ 82	400/400
										226A00	30.0/ 34.6	11.3/15.0	77.1/ 77.1	90/ 90	82/ 82	400/400
										227A00	50.0/ 57.7	18.8/25.0	91.1/100.1	100/110	84/ 93	400/400
										228A00	70.0/ 80.8	26.3/35.0	116.1/129.0	125/150	107/119	400/400
										230A00	100.1/115.5	37.6/50.0	153.6/143.4	175/150	141/159	400/400
										231A00	120.1/138.6	45.1/60.0	178.6/166.5	200/175	164/186	400/400
	460-3-60	414	506	10.6	75	1.0	4.8	—	Low	—	—	—	32.8	40	35	192
										232A00	11.5	10.0	32.8	40	35	192
										233A00	17.3	15.0	32.8	40	35	192
										234A00	28.9	25.0	44.8	45	41	192
										235A00	40.4	35.0	59.2	60	54	192
										237A00	57.7	50.0	66.5	80	74	192
										238A00	69.3	60.0	78.0	90	88	192
							7.4		High	—	—	—	35.4	45	38	196
										232A00	11.5	10.0	35.4	45	38	196
										233A00	17.3	15.0	35.4	45	38	196
										234A00	28.9	25.0	48.1	50	44	196
										235A00	40.4	35.0	62.5	70	57	196
										237A00	57.7	50.0	69.7	80	77	196
										238A00	69.3	60.0	81.3	90	91	196
							4.8	1.2	Low	—	—	—	34.0	40	36	194
										232A00	11.5	10.0	34.0	40	36	194
										233A00	17.3	15.0	34.0	40	36	194
										234A00	28.9	25.0	46.3	50	43	194
										235A00	40.4	35.0	60.7	70	56	194
										237A00	57.7	50.0	68.0	80	76	194
										238A00	69.3	60.0	79.5	90	89	194
							7.4		High	—	—	—	36.6	45	39	199
										232A00	11.5	10.0	36.6	45	39	199
										233A00	17.3	15.0	36.6	45	39	199
										234A00	28.9	25.0	49.6	50	46	199
										235A00	40.4	35.0	64.0	70	59	199
										237A00	57.7	50.0	71.2	80	79	199
										238A00	69.3	60.0	82.8	90	92	199
	575-3-60	518	632	10.6	59.0	0.8	3.3	—	Low	—	—	—	30.4	30	32	182
										239A00	13.9	15.0	30.4	30	32	182
										240A00	23.1	25.0	35.2	35	32	182
										241A00	32.3	35.0	46.7	50	43	182
										242A00	37.0	40.0	52.5	60	48	182
										243A00	46.2	50.0	52.5	60	59	182
										244A00	55.4	60.0	61.7	70	70	182
							5.6		High	—	—	—	32.7	30	35	193
										239A00	13.9	15.0	32.7	30	35	193
										240A00	23.1	25.0	38.0	40	35	193
										241A00	32.3	35.0	49.6	50	46	183
										242A00	37.0	40.0	55.4	60	51	193
										243A00	46.2	50.0	55.4	60	62	183
										244A00	55.4	60.0	65.1	70	72	193
							3.3	3.0	Low	—	—	—	26.4	30	28	139
										239A00	13.9	15.0	26.7	30	28	139
										240A00	23.1	25.0	38.3	40	35	139
										241A00	32.3	35.0	49.8	50	46	139
										242A00	37.0	40.0	55.6	60	51	139
										243A00	46.2	50.0	55.6	60	62	139
										244A00	55.4	60.0	64.9	70	72	139
							5.6		High	—	—	—	29.2	35	31	153
										239A00	13.9	15.0	30.2	35	31	153
										240A00	23.1	25.0	41.8	45	38	153
										241A00	32.3	35.0	53.3	60	49	153
										242A00	37.0	40.0	59.1	60	54	153
										243A00	46.2	50.0	59.1	60	65	153
										244A00	55.4	60.0	68.4	70	76	153

LEGEND

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

***** Heater capacity (kW) is based on heater voltage of 208 v, 230 v, 480 v, or 600 v. If power distribution voltage to unit varies from rated heater voltage, heater kW will vary accordingly.

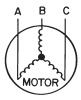
† Fuse or HACR circuit breaker.

NOTES:

1. In compliance with NEC requirements for multimotor and combination load equipment (refer to NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. Canadian units may be fuse or circuit breaker.
2. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the 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 = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{224 + 231 + 226}{3} = \frac{681}{3} = 227$$

Determine maximum deviation from average voltage.
(AB) 227 – 224 = 3 v
(BC) 231 – 227 = 4 v
(AC) 227 – 226 = 1 v
Maximum deviation is 4 v.
Determine percent of voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{227}$$

$$= 1.76\%$$

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

UNIT 50PG	NOMINAL POWER SUPPLY (V-PH-HZ)	VOLTAGE RANGE		COMPR NO. 1		COMPR NO. 2		COMPR NO. 3		OFM	POWER EXHAUST		IFM	IFM	ELECTRIC HEAT			POWER SUPPLY		DISCONNECT SIZE	
		MIN	MAX	RLA	LRA	RLA	LRA	RLA	LRA	FLA	QTY	FLA	TYPE	FLA	CRHEATER PART NO.	FLA	NOMINAL KW*	MCA	MOCP	FLA	LRA
16	208/230-3-60	187	253	18.1	137	18.1	137	17.6	123	1.9	—	—	Low	10.2	—	—	—/—	79.0/ 79.0	90/ 90	86/ 86	487/487
															255A00	52.1/ 60.1	18.8/25.0	83.9/ 93.4	90/100	86/ 86	487/487
															256A00	104.2/120.3	37.6/50.0	149.1/138.5	150/150	137/156	487/487
															257A00	156.3/180.4	56.3/75.0	175.1/198.6	200/225	197/225	487/487
													Mid-Low	15.0	—	—	—/—	83.8/ 83.8	100/100	91/ 91	495/495
															255A00	52.1/ 60.1	18.8/25.0	89.9/ 99.4	100/100	91/ 92	495/495
															256A00	104.2/120.3	37.6/50.0	155.1/144.5	175/175	143/161	495/495
															257A00	156.3/180.4	56.3/75.0	181.1/204.6	200/225	203/230	495/495
													High	19.4	—	—	—/—	88.2/ 88.2	100/100	96/ 96	534/534
															255A00	52.1/ 60.1	18.8/25.0	95.4/104.9	100/110	96/ 97	534/534
															256A00	104.2/120.3	37.6/50.0	160.6/150.0	175/175	148/166	534/534
															257A00	156.3/180.4	56.3/75.0	186.6/210.1	200/250	208/235	534/534
											2	3.0	Low	10.2	—	—	—/—	82.0/ 82.0	100/100	89/ 89	491/491
															255A00	52.1/ 60.1	18.8/25.0	87.7/ 97.1	100/100	89/ 90	491/491
															256A00	104.2/120.3	37.6/50.0	152.8/142.2	175/175	141/159	491/491
															257A00	156.3/180.4	56.3/75.0	178.9/202.4	200/225	201/228	491/491
													Mid-Low	15.0	—	—	—/—	86.8/ 86.8	100/100	95/ 95	499/499
															255A00	52.1/ 60.1	18.8/25.0	93.7/103.1	100/110	95/ 95	499/499
															256A00	104.2/120.3	37.6/50.0	158.8/148.2	175/175	146/165	499/499
															257A00	156.3/180.4	56.3/75.0	184.9/208.4	200/225	206/234	499/499
													High	19.4	—	—	—/—	91.2/ 91.2	100/100	100/100	538/538
															255A00	52.1/ 60.1	18.8/25.0	99.2/108.6	100/110	100/100	538/538
															256A00	104.2/120.3	37.6/50.0	164.3/153.7	175/175	151/170	538/538
															257A00	156.3/180.4	56.3/75.0	190.4/213.9	200/250	211/239	538/538
	460-3-60	414	506	9.0	62	9.0	62	7.7	50	1.0	—	—	Low	4.8	—	—	—/—	37.9	45	41	217
															258A00	30.1	25.0	46.3	50	43	217
															259A00	60.1	50.0	68.9	80	77	217
															260A00	90.2	75.0	98.9	100	112	217
													Mid-Low	7.4	—	—	—/—	40.5	45	44	221
															258A00	30.1	25.0	49.6	50	46	221
															259A00	60.1	50.0	72.1	80	80	221
															260A00	90.2	75.0	102.2	110	115	221
													High	9.7	—	—	—/—	42.8	50	47	240
															258A00	30.1	25.0	52.4	60	48	240
															259A00	60.1	50.0	75.0	80	83	240
															260A00	90.2	75.0	105.1	125	117	240
											2	1.2	Low	4.8	—	—	—/—	39.1	45	42	220
															258A00	30.1	25.0	47.8	50	44	220
															259A00	60.1	50.0	70.4	80	79	220
															260A00	90.2	75.0	100.4	110	113	220
													Mid-Low	7.4	—	—	—/—	41.7	50	45	224
															258A00	30.1	25.0	51.1	60	47	224
															259A00	60.1	50.0	73.6	80	82	224
															260A00	90.2	75.0	103.7	125	116	224
													High	9.7	—	—	—/—	44.0	50	48	243
															258A00	30.1	25.0	53.9	60	50	243
															259A00	60.1	50.0	76.5	80	84	243
															260A00	90.2	75.0	106.6	125	119	243
	575-3-60	518	633	6.8	50	6.8	50	6.1	40	0.8	—	—	Low	2.8	—	—	—/—	28.3	35	31	169
															261A00	24.1	25.0	35.7	40	33	169
															262A00	46.2	50.0	51.9	60	58	169
															263A00	72.2	75.0	77.8	90	88	169
													Mid-Low	5.6	—	—	—/—	31.1	35	34	183
															261A00	24.1	25.0	39.2	40	36	183
															262A00	46.2	50.0	55.4	60	62	183
															263A00	72.2	75.0	81.3	90	91	183
													High	7.8	—	—	—/—	33.3	40	36	198
															261A00	24.1	25.0	42.0	45	39	198
															262A00	46.2	50.0	58.1	60	64	198
															263A00	72.2	75.0	84.1	100	94	198
											2	3.0	Low	2.8	—	—	—/—	31.3	35	34	173
															261A00	24.1	25.0	39.5	40	36	173
															262A00	46.2	50.0	55.6	60	62	173
															263A00	72.2	75.0	81.6	90	92	173
													Mid-Low	5.6	—	—	—/—	34.1	40	37	187
															261A00	24.1	25.0	43.0	45	40	187
															262A00	46.2	50.0	59.1	60	65	187
															263A00	72.2	75.0	85.1	90	95	187
													High	7.8	—	—	—/—	36.3	40	40	202
															261A00	24.1	25.0	45.7	50	42	202
															262A00	46.2	50.0	61.9	70	68	202
															263A00	72.2	75.0	87.8	100	97	202

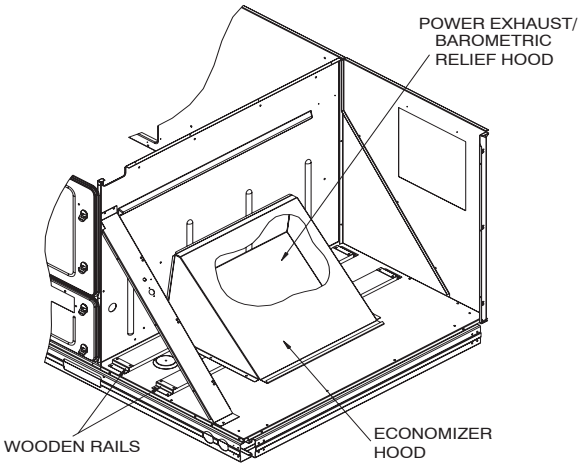
Step 8 —Optional EconoMi$er IV

The optional EconoMi$er IV comes from the factory fully wired. The outdoor air hoods must be installed. No field wiring is required for standard outdoor dry bulb changeover operation. Field wiring of accessory sensors is required for different operational modes.

Install Outdoor Air Hoods

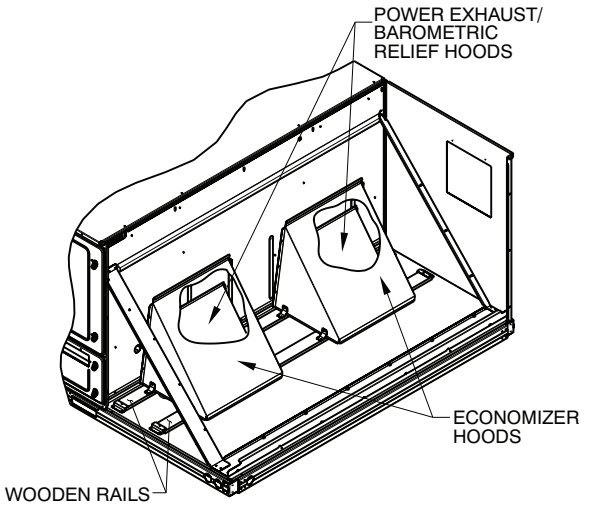
Perform the following procedure to install the outdoor-air hoods:

1. Economizer and barometric relief hoods are located in the condenser section under the slanted coil for shipping. (See Fig. 13 and 14.) Size 16 units also have two 1-in. cleanable filters and a baffle stored between the economizer hoods. Barometric relief/power exhaust hood is shipped inside of economizer hood. Remove screws that secure the wooden rails of the hood assemblies to the unit. Save screws. Slide complete assembly from condenser section. On size 16 units, remove the baffle and save screws.
2. Remove the screws that secure the economizer and barometric relief/power exhaust hoods to the wooden railing. Discard or recycle wooden rails. Save screws.
3. The barometric relief damper is secured to the economizer panel for shipping. Remove the screw holding the barometric relief damper to the panel. Damper should be free to swing open during operation. (See Fig. 15 and 16.) On size 16 units, repeat for second hood.
4. Hang the barometric relief/power exhaust hood on the mounting flange on the economizer panel. Secure hood to panel with screws saved from Step 2. (See Fig. 15-17.) On size 16 units, repeat for second hood.
5. Align hole in flange of economizer panel with left edge of hood. Hang economizer hood on the top flange of the economizer panel by rotating hood until top flange of the economizer hood engages the bent flange on the economizer panel. Rotate hood until hood is flush with the economizer panel. Hood will support itself from flange. Align holes in hood with holes in panel and secure hood to panel with screws saved from Step 2. (See Fig. 13, 14 and 18.)
   Size 16 Only — Loosen screws securing the clip on top of the flange of each opening. Rotate clip 180 degrees and tighten screw. Install 1-in. filter provided by inserting under the clip on the flange and letting filter drop behind bracket holding barometric relief hoods. Repeat for second hood.
6. On size 16 units, install baffle between the outdoor air hoods with the screws saved from Step 1. (See Fig. 16.)



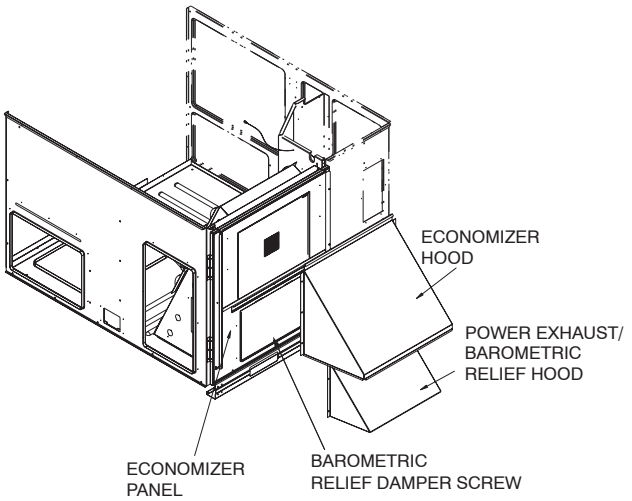
C06290

Fig. 13 – Economizer and Barometric Relief/Power Exhaust Hoods Shipping Positions (50PG08-14)



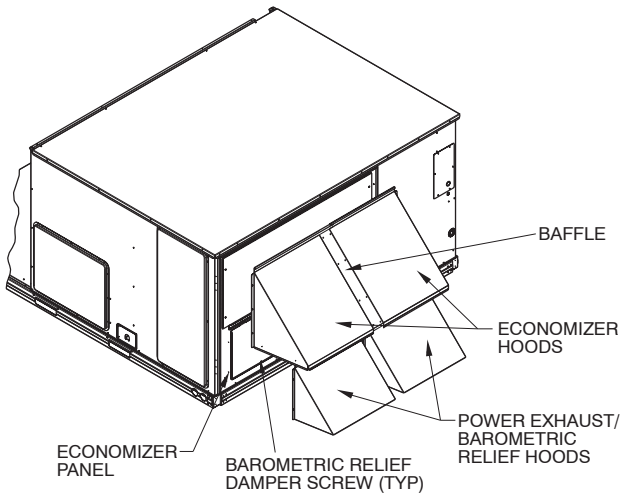
C06259

Fig. 14 – Economizer and Barometric Relief/Power Exhaust Hoods Shipping Positions (50PG16)



C06260

Fig. 15 – Hood Installation (50PG08-14)



C06261

Fig. 16 – Hood Installation (50PG16)

EconoMi$er IV Standard Sensors

Outdoor Air Temperature (OAT) Sensor

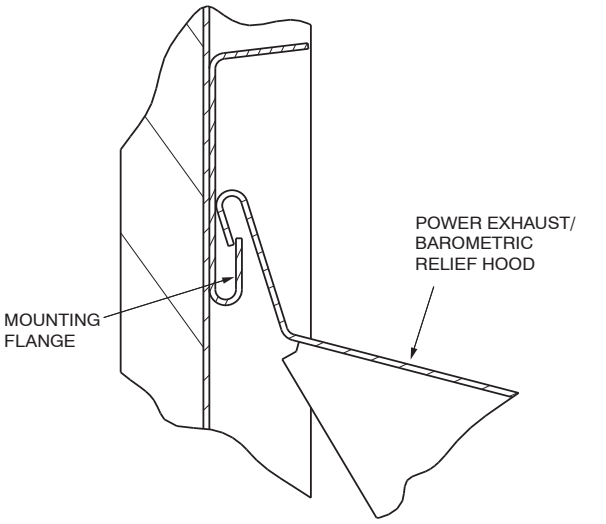
The outdoor air temperature sensor is a 10 to 20 mA device used to measure the outdoor-air temperature. The outdoor-air temperature is used to determine when the EconoMi$er IV can be used for free cooling. The sensor is factory-installed on the EconoMi$er IV in the outdoor airstream. The operating range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

Mixed Air Temperature (MAT) Sensor

The mixed air temperature sensor is a 3 K thermistor located at the discharge of the indoor fan. The sensor is mounted through the side plate of the blower. The sensor is a probe and has blue leads. This sensor is factory installed. The operating range of temperature measurement is 0° to 158°F.

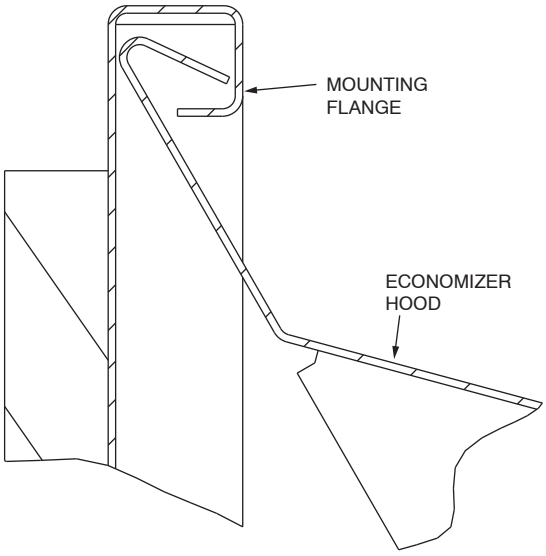
Outdoor Air Lockout Sensor

The EconoMi$er IV is equipped with a temperature limit switch located in the outdoor airstream which is used to lock out the compressors below a 50°F ambient temperature.



C06262

Fig. 17 – Barometric Relief/Power Exhaust Hood Flange



C06263

Fig. 18 – Economizer Flange

EconoMi$er IV Controller Wiring and Operational Modes

Determine the EconoMi$er IV control mode before installing sensors and accessories. Different sensors are required for different control modes, and a number of accessories are available. Refer to Table 5. The EconoMi$er IV is supplied from the factory with a mixed 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. See Fig. 19 for wiring.

Outdoor Dry Bulb Changeover

The standard controller is shipped from the factory configured for outdoor dry bulb changeover control. The outdoor air and mixed 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 outside air dampers to minimum position. If the outdoor-air temperature is below the set point, the position of the outside air dampers will be controlled to provided free cooling using outdoor air. When in this mode, the LED next to the free cooling set point potentiometer will be on. The changeover temperature set point is controlled by the free cooling set point potentiometer located on the control. The scale on the potentiometer is A, B, C, and D. See Fig. 20 for the corresponding temperature changeover values.

Differential Dry Bulb Changeover

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. Connect the return air temperature sensor to the S_R terminal (after removing the 620-ohm resistor) and to the + terminal on the controller. (See Fig. 21.)

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. 22.)

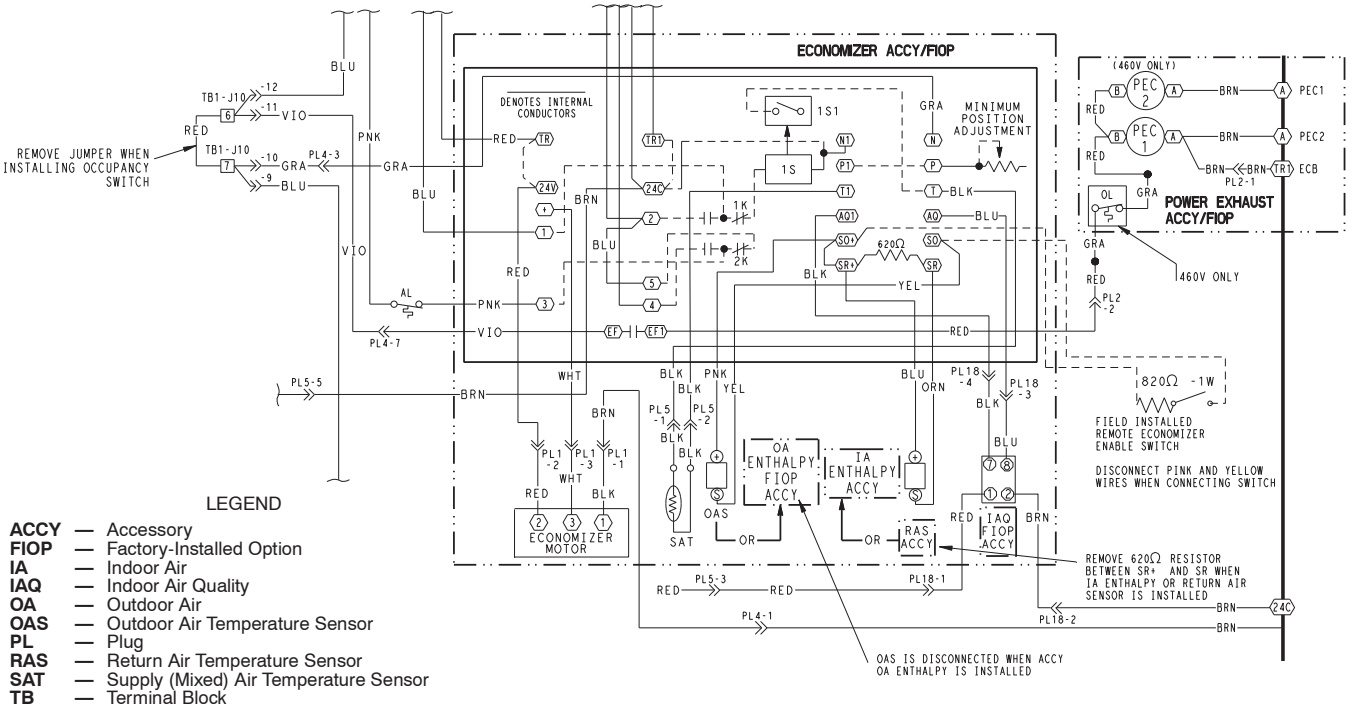
Outdoor Enthalpy Changeover

For enthalpy control, accessory enthalpy sensor (part number HH57AC078) is required. Replace the standard outdoor dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. 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$er IV controller. The set points are A, B, C, and D. (See Fig. 23.) The factory-installed 620-ohm jumper must be in place across terminals S_R and + on the EconoMi$er IV controller. (See Fig. 21.)

Differential Enthalpy Control

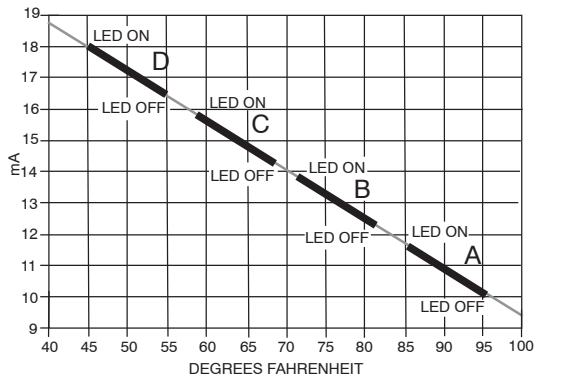
For differential enthalpy control, the EconoMi$er IV controller uses two enthalpy sensors (CRENTDIF004A00), one in the outside air and one in the return air duct. The EconoMi$er IV controller compares the outdoor air enthalpy to the return air enthalpy to determine EconoMi$er IV use. The controller selects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

Replace the standard outside air dry bulb temperature sensor with the accessory enthalpy sensor in the same mounting location. Mount the return air enthalpy sensor in the return air duct. The return air enthalpy sensor is wired to terminals S_R and + on the EconoMi$er IV controller. (See Fig. 21.) The outdoor enthalpy changeover set point is set with the outdoor enthalpy set point potentiometer on the EconoMi$er IV controller. When using this mode of changeover control, turn the enthalpy set point potentiometer fully clockwise to the D setting.



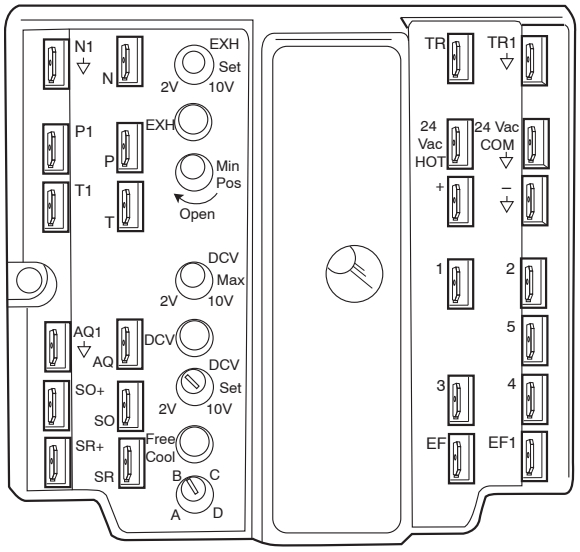
C06163

Fig. 19 – EconoMi$er IV Wiring



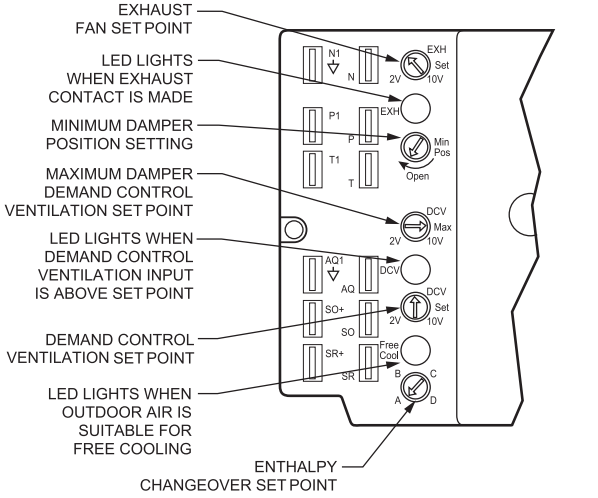
C06035

Fig. 20 – Temperature Changeover Set Points



C06038

Fig. 21 – EconoMi$er IV Control



C06034

Fig. 22 – EconoMi$er IV Controller Potentiometer and LED Locations

Indoor Air Quality (IAQ) Senosr Input

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

Mount the optional IAQ sensor according to manufacturer specifications. The IAQ sensor should be wired to the AQ and AQ1 terminals of the controller. Adjust the DCV potentiometers to correspond to the DCV voltage output of the indoor air quality sensor at the user-determined set point. (See Fig. 24.)

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. (See Fig. 19.)

Power Exhaust

The factory-installed power exhaust will be factory wired and installed. If an accessory power exhaust is to be installed, see the accessory power exhaust installation instructions included with the power exhaust for installation and wiring. The wiring plug on the power exhaust is connected to wiring harness plug PL1-3,4.

Table 5—EconoMi$er IV Sensor Usage

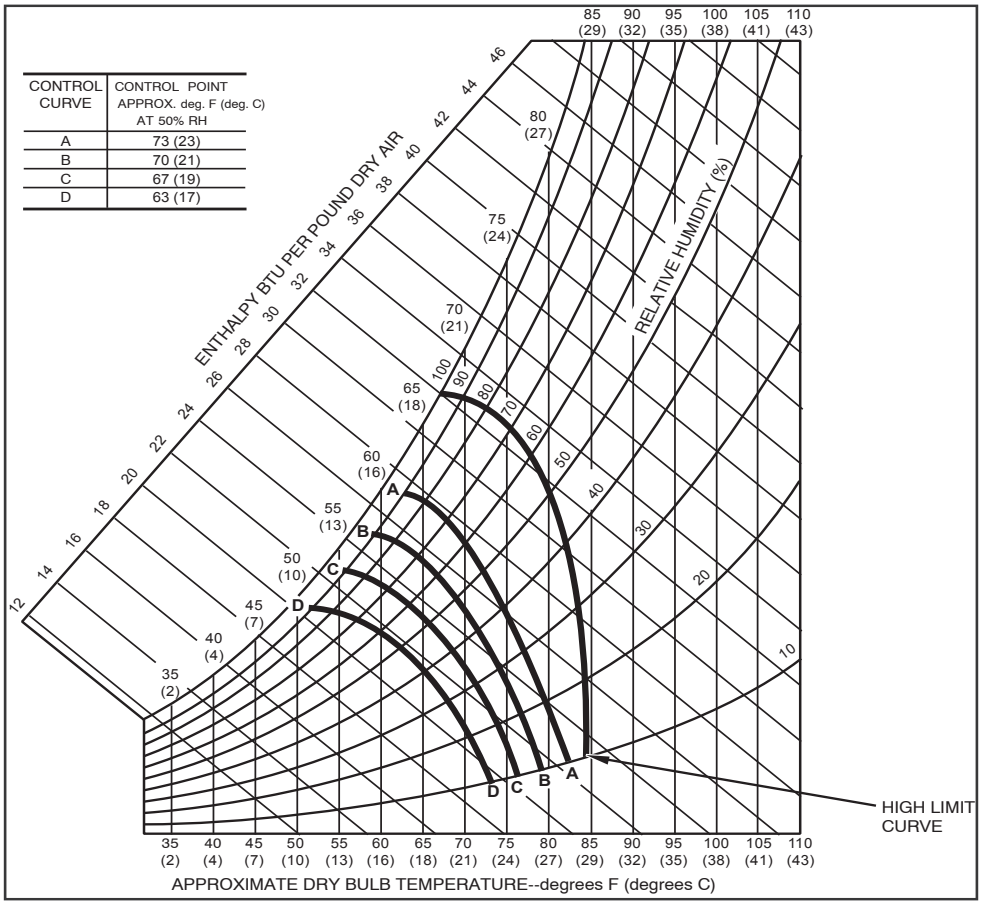
APPLICATION	ECONOMI$ER IV WITH OUTDOOR AIR DRY BULB SENSOR			ECONOMI$ER IV WITH SINGLE ENTHALPY SENSOR		
	Accessories Required			Accessories Required		
Outdoor Air Dry Bulb	None. The outdoor air dry bulb sensor is factory installed.			CRTEMPSN002A00*		
Differential Dry Bulb	CRTEMPSN002A00*			(2) CRTEMPSN002A00*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

*CRENTDIF004A00 and CRTEMPSN002A00 accessories areused on many different base units. As such, these kits may containparts that will not be needed for installation.

**33ZCASPCO2 is an accessory aspirator box required for ductmounted applications.

† 33ZCSENCO2 is an accessory CO2 sensor.

†† CRCBDIOX005A00 is an accessory that contains both 33ZCSENCO2 and 33ZCASPCO2 accessories.



C06037

Fig. 23 – Enthalpy Changeover Set Points

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. 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. 22.) The minimum damper position maintains the minimum airflow into the building during the occupied period.

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

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

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

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

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

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

   T_O = Outdoor-Air Temperature

   OA = Percent of Outdoor Air

   T_R = Return-Air Temperature

   RA = Percent of Return Air

   T_M = Mixed-Air Temperature

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

   (60 x .10) + (75 x .90) = 73.5°F
2. Disconnect the mixed air sensor from terminals T and T1.
3. Ensure that the factory-installed jumper is in place across terminals P and P1. If remote damper positioning is being used, make sure that the terminals are wired according to Fig. 14 and that the minimum position potentiometer is turned fully clockwise.
4. Connect 24 vac across terminals TR and TR1.
5. Carefully adjust the minimum position potentiometer until the measured mixed air temperature matches the calculated value.
6. Reconnect the mixed air sensor to terminals T and T1.

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

To control the minimum damper position remotely, remove the factory-installed jumper on the P and P1 terminals on the EconoMi$er IV controller. Wire the field-supplied potentiometer to the P and P1 terminals on the EconoMi$er IV controller. (See Fig. 21.)

Damper Movement

When the EconoMi$er IV board receives initial power, it can take the damper up to $2^1/_2$ minutes before it begins to position itself. After the initial positioning, subsequent changes to damper position will take up to 30 seconds to initiate. Damper movement from full open to full closed (or vice versa) takes $2^1/_2$ minutes.

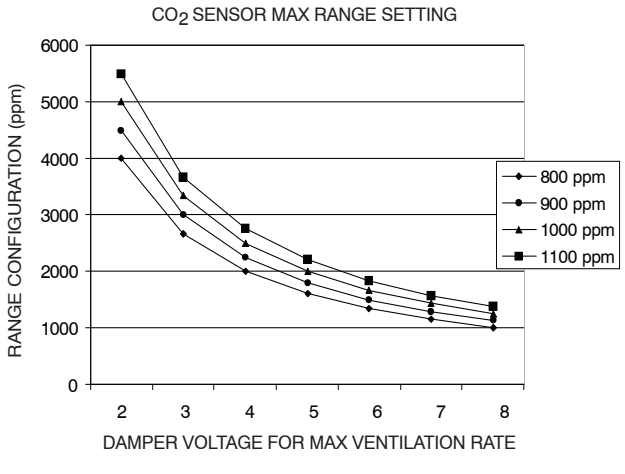


Fig. 24 – CO_2 Sensor Maximum Range Settings

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.

Pressure Drop

See Fig. 25–28 for EconoMi$er IV pressure drop. Evaporator fan may need to be adjusted.

Demand Control Ventilation

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

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

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

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

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

T_O = Outdoor-Air Temperature

OA = Percent of Outdoor Air

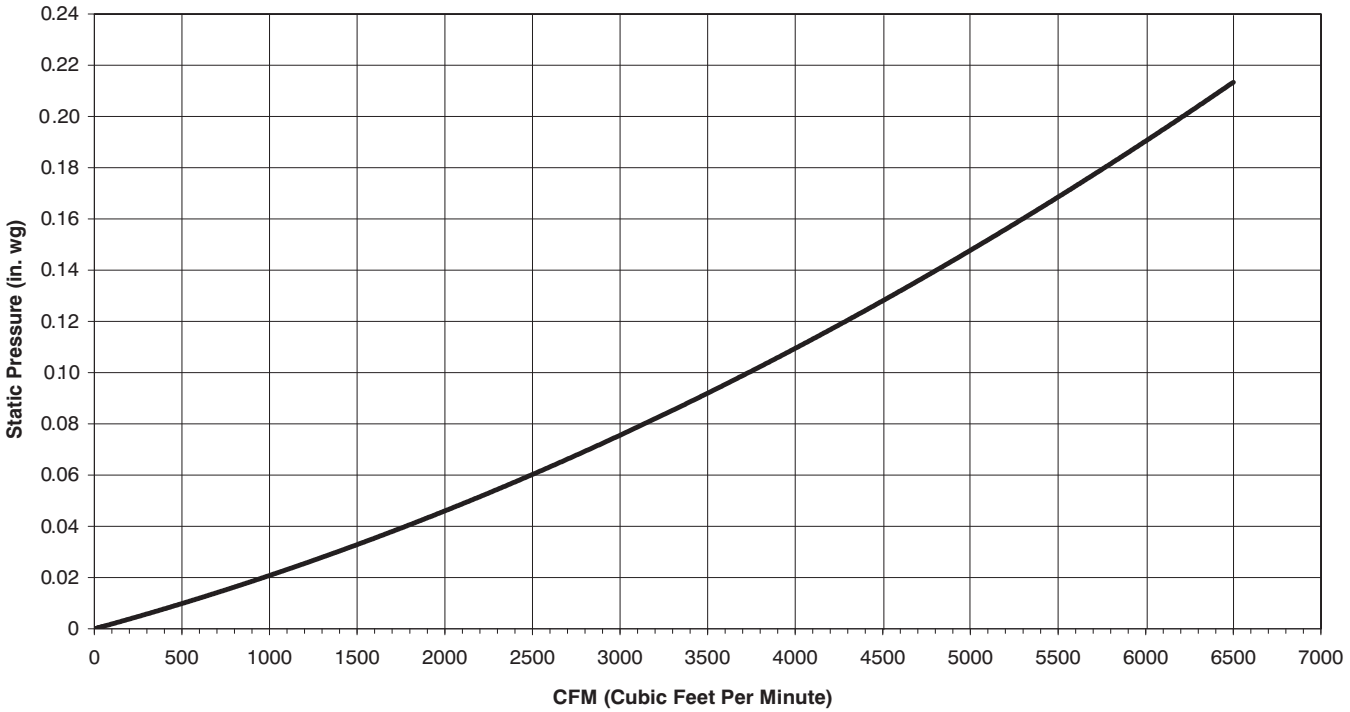
T_R = Return-Air Temperature

RA = Percent of Return Air

T_M = Mixed-Air Temperature

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

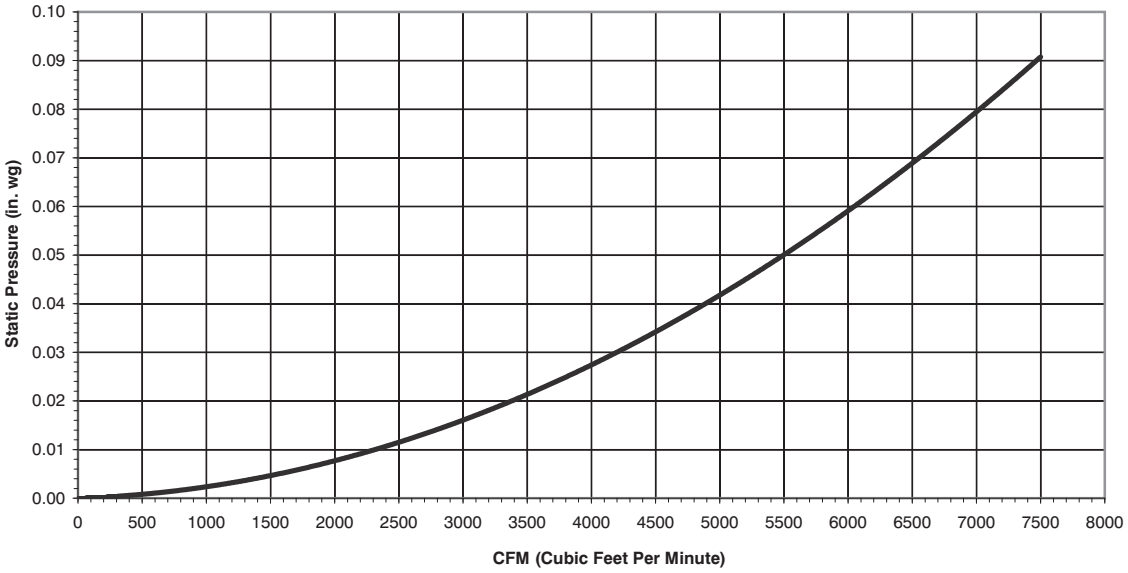
The same equation can be used to determine the occupied or maximum ventilation rate to the building. For example, an output of 3.6 volts to the actuator provides a base ventilation rate of 5% and an output of 6.7 volts provides the maximum ventilation rate of 20% (or base plus 15 cfm per person). Use Fig. 24 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. 24 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.



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

C06248

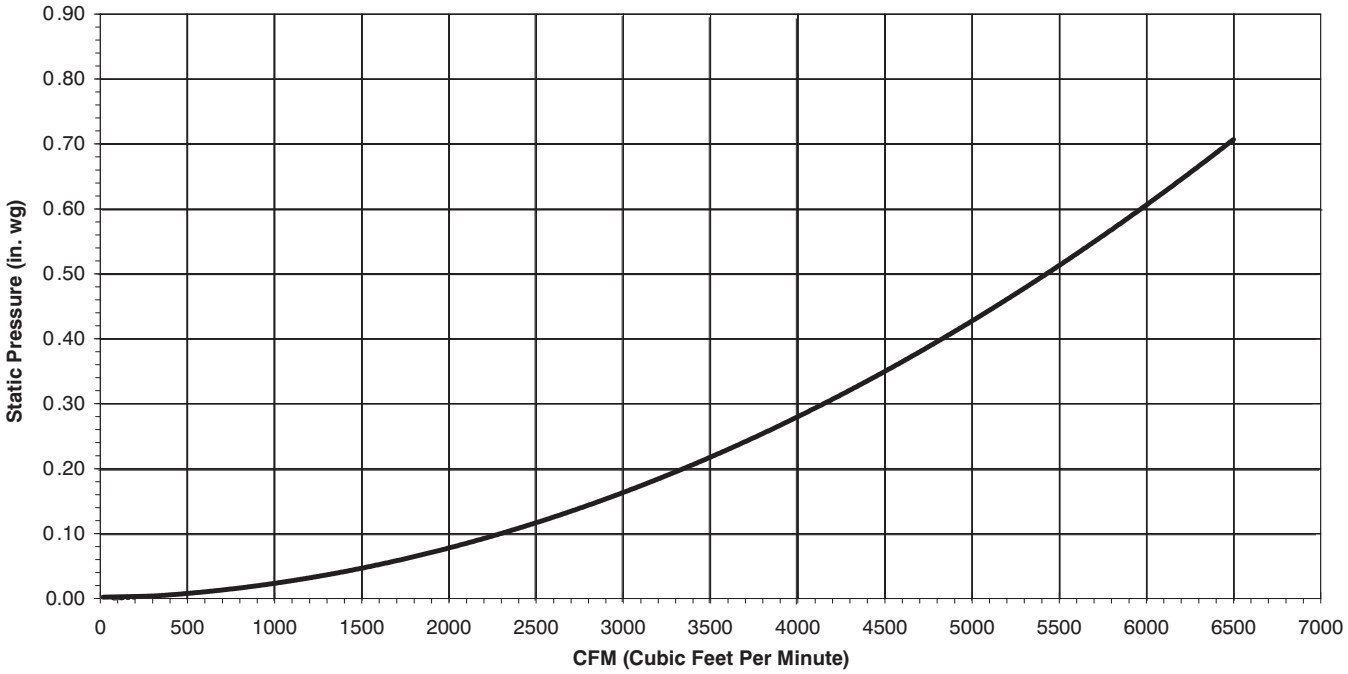
Fig. 25 – Pressure Drop for Vertical Economizer (50PG08-14)



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

C06249

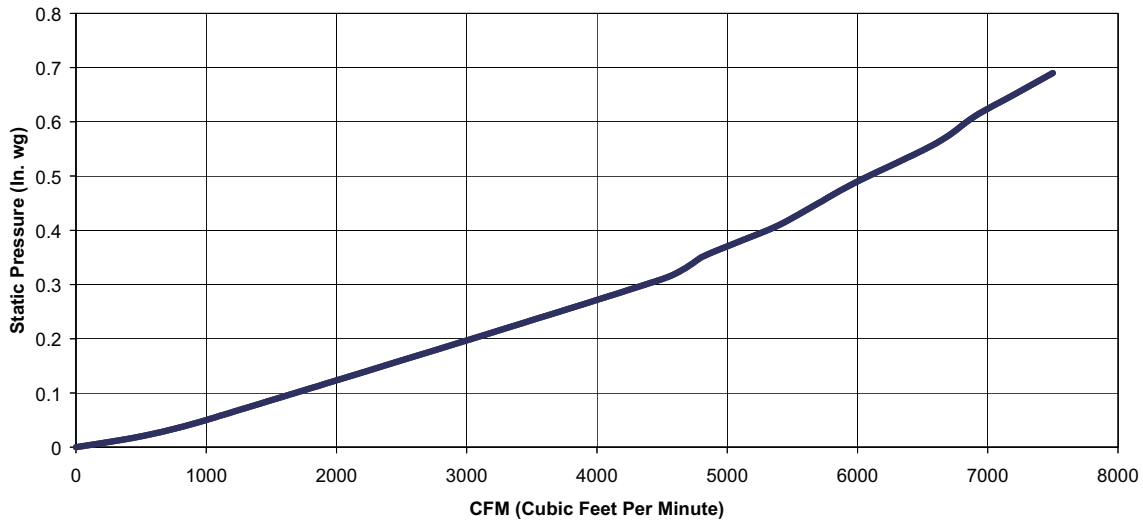
Fig. 26 – Pressure Drop for Vertical Economizer (50PG16)



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

C06251

Fig. 27 – Pressure Drop for Horizontal Economizer (50PG08-14)



NOTE: Economizer damper pressure drop is with outdoor air damper totally closed and return air damper fully open.

C06181

Fig. 28 – Pressure Drop for Horizontal Economizer (50PG16)

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

CO_2 Sensor Configuration

The CO_2 sensor has preset standard voltage settings that can be selected anytime after the sensor is powered up. (See Table 6.)

Use setting 1 or 2 for Carrier equipment.

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 6.)
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 (Demand Controlled Ventilation) Control

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

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

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

Step 9 —Install All Accessories

After all of the factory-installed options have been adjusted, install all field- installed accessories. Refer to the accessory installation instructions included with each accessory. Consult the Carrier Price Pages or RTU (rooftop unit) Building software for accessory package numbers for particular applications. For applications with high outdoor air requirements, it is recommended that the outdoor filter accessory be used to eliminate water entrainment during rainfall.

Table 6—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

PRE-START-UP

⚠ WARNING

ELECTRICAL OPERATION HAZARD

Failure to observe the following warnings could result in personal injury and/or death:

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

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

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

NOTE: Ensure wiring does not contact any refrigerant tubing.

START-UP

Unit Preparation

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

Return-Air Filters

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

Outdoor-Air Inlet Screens

Outdoor-air inlet screens must be in place before operating unit.

Compressor Mounting

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

Internal Wiring

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

Refrigerant Service Ports

Each independent refrigerant system has a total of 4 Schrader-type service gage ports per circuit. One port is located on the suction line, one on the compressor discharge line, and 2 on the liquid line on both sides of the filter drier. Be sure that caps on the ports are tight.

Crankcase Heaters

Crankcase heaters are energized if compressor B1 is not operating.

High Flow Refrigerant

Three high flow refrigerant valves are located on the compressor hot gas tube, suction tube, and the liquid line leaving the condenser. Large black plastic caps distinguish these valves with o-rings located inside the caps. These valves can not be accessed for service in the field. Ensure the plastic caps are in place and tight or the possibility of refrigerant leakage could occur.

Compressor Rotation

On 3-phase units, it is important to be certain the scroll compressor is rotating in the proper direction. To determine whether or not compressor is rotating in the proper direction:

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

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

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

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

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

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in damage to equipment.

Compressor damage will occur if rotation is not immediately corrected.

Evaporator Fan

Fan belt and variable pitch pulleys are factory-installed. See Tables 7–16 for fan performance data. Be sure that fans rotate in the proper direction. See Table 17 for air quantity limits. See Table 18 for evaporator fan motor specifications. See Table 19 for fan rpm at various motor pulley settings. To alter fan performance, see Evaporator Fan Performance Adjustment section. See Table 20 for accessory electric heat static pressure.

Cooling

To start unit, turn on main power supply. Set system selector switch at COOL position and fan switch at AUTO position. Adjust thermostat to a setting below room temperature. Compressor starts on closure of contactor.

Check unit charge. Refer to Refrigerant Charge section.

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

To Shut Off Unit

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

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

Heating If Accessory Heater is Installed)

To start unit, turn on main power supply.

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

First stage of thermostat energizes the first-stage electric heater elements; second stage energizes second-stage electric heater elements. Check heating effects at air supply grille(s).

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

To Shut Off Unit

Set system selector switch at OFF position. Resetting heating selector lever below room temperature temporarily shuts unit off until space temperature falls below thermostat setting.

Safety Relief

A soft solder joint in the suction line at the loss-of-charge/low-pressure switch fitting provides pressure relief under abnormal temperature and pressure conditions.

Ventilation (Continuous Fan)

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

Operating Sequence

Cooling, Units With Economizer

When the thermostat calls for one stage of cooling, Y1 and G are energized. The indoor-fan contactor (IFC) and compressor contactor(s) (C.A1 and C.B1 on three compressor units or C.A1 only on two-compressor units), and outdoor fan contactors (OFC1 and OFC2 when outdoor temperature is above LTS [low temperature switch] setting) are energized and the indoor-fan motor, compressor(s) (A1 and B1 on three-compressor units or A1 only on two-compressor units), and outdoor fans controlled by OFC1 are started. If the outdoor temperature is above the setting of the low temperature switch, the outdoor fans controlled by OFC2 are also started.

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

Heating, Units Without Economizer

NOTE: The 50PG08-16 units have 2 stages of electric heat.

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

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

Cooling, Units With Economi$er IV

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

If the load is high and Y2 is energized, then the first stage of mechanical cooling will be used to supplement the free cooling provided by the economizer. If mechanical cooling is utilized with free cooling, the outdoor-air damper will maintain its current position at the time the compressor is started. If the increase in cooling capacity causes the mixed-air temperature to drop below 45°F, then the outdoor-air damper position will be decreased to the minimum position. If the mixed air temperature continues to fall, the outdoor-air damper will close. Control returns to normal once the mixed-air temperature rises above 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 the position goes above or below the power exhaust set point. When the exhaust fan is required to be on, the LED on the control will be energized.

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 from the minimum damper position to the maximum demand ventilation damper position. As the CO_2 level decreases because of the increase in fresh air, the outdoor-air damper will be proportionally closed.

If there is no G signal then the control will drive the damper to the fully closed position.

The control is also equipped with an occupied/unoccupied input. If the input is closed, then the damper will be driven to the minimum position when G is energized. If the input is open then the damper will remain in the fully closed position unless there is a demand for free cooling of DCV ventilation.

On the initial power to the EconoMi$er IV control, it will take the damper up to $2^1/_2$ minutes before it begins to position itself. Any change in damper position will take up to 30 seconds to initiate. Damper movement from full closed to full open (or vice versa) will take between $1^1/_2$ to $2^1/_2$ minutes.

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

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

Heating, Units With Economi$er IV

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

Table 7—Fan Performance — 50PG08 Vertical Units

AIRFLOW (Cfm)	Available External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2250	439	0.32	519	0.43	592	0.54	659	0.66	721	0.79
2400	455	0.37	532	0.48	602	0.60	667	0.73	728	0.86
2550	471	0.43	546	0.55	613	0.67	676	0.80	735	0.94
2700	488	0.49	560	0.61	625	0.74	686	0.88	743	1.02
2850	505	0.56	574	0.69	638	0.82	697	0.96	753	1.11
3000	522	0.63	589	0.77	651	0.91	708	1.05	763	1.21
3150	539	0.71	605	0.86	664	1.00	720	1.15	773	1.31
3300	557	0.80	620	0.95	679	1.10	733	1.26	785	1.42
3450	575	0.90	636	1.06	693	1.21	746	1.37	797	1.54
3600	593	1.00	653	1.17	708	1.33	760	1.50	809	1.67
3750	611	1.12	669	1.29	723	1.46	774	1.63	822	1.81

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2250	780	0.92	836	1.06	889	1.21	940	1.35	989	1.51
2400	785	1.00	840	1.14	892	1.29	942	1.44	990	1.60
2550	791	1.08	845	1.23	896	1.38	945	1.54	993	1.70
2700	798	1.17	851	1.32	901	1.48	949	1.64	996	1.81
2850	806	1.26	857	1.42	906	1.58	954	1.75	999	1.92
3000	815	1.36	865	1.52	913	1.69	959	1.86	1004	2.04
3150	824	1.47	873	1.64	920	1.81	965	1.99	1009	2.17
3300	834	1.59	882	1.76	928	1.94	972	2.12	1015	2.30
3450	845	1.71	891	1.89	936	2.07	980	2.26	1022	2.45
3600	856	1.85	902	2.03	946	2.21	988	2.40	1030	2.60
3750	868	1.99	912	2.17	955	2.36	997	2.56	1038	2.76

LEGEND

Bhp – Brake Horsepower

High Range Motor/Drive Required

NOTES: 1. Motor drive range is 568 to 771 rpm for low range motor/drive and 812 to 1015 rpm for high range motor/drive. All other rpms require a field–supplied drive.
2. Maximum continuous bhp is 2.40 for low range motor/drive and 3.10 for high range motor/drive.
3. See General Fan Performance Notes.

Table 8—Fan Performance — 50PG09 Vertical Units

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2550	471	0.43	546	0.55	613	0.67	676	0.80	735	0.94
2700	488	0.49	560	0.61	625	0.74	686	0.88	743	1.02
2850	505	0.56	574	0.69	638	0.82	697	0.96	753	1.11
3000	522	0.63	589	0.77	651	0.91	708	1.05	763	1.21
3150	539	0.71	605	0.86	664	1.00	720	1.15	773	1.31
3300	557	0.80	620	0.95	679	1.10	733	1.26	785	1.42
3450	575	0.90	636	1.06	693	1.21	746	1.37	797	1.54
3600	593	1.00	653	1.17	708	1.33	760	1.50	809	1.67
3750	611	1.12	669	1.29	723	1.46	774	1.63	822	1.81
3900	630	1.24	686	1.41	739	1.59	788	1.77	835	1.95
4050	648	1.37	703	1.55	754	1.73	803	1.92	849	2.11
4200	667	1.51	721	1.70	771	1.89	818	2.08	863	2.27

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2550	791	1.08	845	1.23	896	1.38	945	1.54	993	1.70
2700	798	1.17	851	1.32	901	1.48	949	1.64	996	1.81
2850	806	1.26	857	1.42	906	1.58	954	1.75	999	1.92
3000	815	1.36	865	1.52	913	1.69	959	1.86	1004	2.04
3150	824	1.47	873	1.64	920	1.81	965	1.99	1009	2.17
3300	834	1.59	882	1.76	928	1.94	972	2.12	1015	2.30
3450	845	1.71	891	1.89	936	2.07	980	2.26	1022	2.45
3600	856	1.85	902	2.03	946	2.21	988	2.40	1030	2.60
3750	868	1.99	912	2.17	955	2.36	997	2.56	1038	2.76
3900	880	2.14	924	2.33	966	2.52	1007	2.72	1047	2.93
4050	893	2.30	936	2.49	977	2.70	1017	2.90	1056	3.11
4200	906	2.47	948	2.67	988	2.88	1028	3.09	1066	3.30

LEGEND

Bhp – Brake Horsepower

High Range Motor/Drive Required

NOTES: 1. Motor drive range is 568 to 771 rpm for low range motor/drive and 812 to 1015 rpm for high range motor/drive. All other rpms require a field–supplied drive.
2. Maximum continuous bhp is 2.40 for low range motor/drive and 3.70 for high range motor/drive.
3. See General Fan Performance Notes.

Table 9—Fan Performance — 50PG012 Vertical Units

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3000	533	0.65	599	0.79	660	0.93	717	1.08	771	1.23
3200	557	0.77	620	0.91	679	1.06	734	1.21	786	1.37
3400	581	0.90	642	1.05	699	1.21	751	1.37	802	1.53
3600	606	1.04	665	1.20	719	1.36	770	1.53	819	1.71
3800	631	1.20	687	1.37	740	1.54	789	1.71	837	1.89
4000	656	1.37	711	1.55	761	1.73	809	1.91	855	2.10
4200	682	1.56	734	1.75	783	1.94	830	2.13	874	2.32
4400	707	1.77	758	1.96	806	2.16	851	2.36	894	2.57
4600	733	1.99	782	2.20	828	2.41	872	2.62	914	2.83
4800	759	2.24	806	2.45	851	2.67	894	2.89	935	3.11
5000	785	2.50	831	2.73	875	2.95	916	3.18	956	3.41

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3000	822	1.39	872	1.55	920	1.72	966	1.89	1011	2.07
3200	836	1.54	884	1.71	930	1.88	975	2.06	1019	2.24
3400	850	1.70	897	1.88	942	2.06	985	2.24	1028	2.43
3600	866	1.88	911	2.06	955	2.25	997	2.44	1038	2.64
3800	882	2.08	926	2.27	968	2.46	1010	2.66	1050	2.86
4000	899	2.29	942	2.49	983	2.69	1023	2.89	1063	3.10
4200	917	2.52	959	2.72	999	2.93	1038	3.14	1076	3.36
4400	936	2.77	976	2.98	1015	3.19	1054	3.41	1091	3.63
4600	955	3.04	994	3.26	1033	3.48	1070	3.70	—	—
4800	975	3.33	1013	3.55	—	—	—	—	—	—
5000	995	3.63	—	—	—	—	—	—	—	—

LEGEND

Bhp – Brake Horsepower

High Range Motor/Drive Required

NOTES: 1. Motor drive range is 690 to 893 rpm for low range motor/drive and 852 to 1055 rpm for high range motor/drive. All other rpms require a field–supplied drive.
2. Maximum continuous bhp is 3.10 for low range motor/drive and 3.70 for high range motor/drive.
3. See General Fan Performance Notes.

Table 10—Fan Performance — 50PG014 Vertical Units

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3750	625	1.15	682	1.32	735	1.49	785	1.67	832	1.85
3950	650	1.32	705	1.50	756	1.68	804	1.86	851	2.05
4150	675	1.51	728	1.70	778	1.88	825	2.07	870	2.27
4350	701	1.71	752	1.91	800	2.11	846	2.30	889	2.50
4550	727	1.93	776	2.14	823	2.34	867	2.55	909	2.76
4750	753	2.17	800	2.39	846	2.60	889	2.82	930	3.03
4950	779	2.43	825	2.66	869	2.88	911	3.10	951	3.33
5150	805	2.71	850	2.95	892	3.18	933	3.41	972	3.64
5350	831	3.01	875	3.26	916	3.50	956	3.74	994	3.98
5550	858	3.34	900	3.59	940	3.84	979	4.09	1016	4.34
5750	884	3.68	925	3.95	965	4.21	1002	4.47	1039	4.73
5950	911	4.05	951	4.33	989	4.60	1026	4.86	1062	5.13
6150	938	4.45	976	4.73	1014	5.01	—	—	—	—
6250	951	4.66	989	4.94	1026	5.23	—	—	—	—

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3750	878	2.03	922	2.22	965	2.41	1006	2.60	1047	2.80
3950	895	2.24	938	2.43	979	2.63	1020	2.83	1059	3.04
4150	913	2.46	954	2.66	995	2.87	1034	3.08	1073	3.29
4350	931	2.71	972	2.91	1011	3.13	1050	3.34	1087	3.56
4550	950	2.97	990	3.18	1028	3.40	1066	3.63	1102	3.85
4750	970	3.25	1008	3.47	1046	3.70	1082	3.93	1118	4.16
4950	990	3.56	1028	3.79	1064	4.02	1100	4.25	1135	4.49
5150	1010	3.88	1047	4.12	1083	4.36	1118	4.60	1152	4.85
5350	1031	4.23	1067	4.47	1102	4.72	1136	4.97	1170	5.22
5550	1053	4.59	1088	4.85	1122	5.10	—	—	—	—
5750	1074	4.99	1109	5.25	—	—	—	—	—	—
5950	—	—	—	—	—	—	—	—	—	—
6150	—	—	—	—	—	—	—	—	—	—
6250	—	—	—	—	—	—	—	—	—	—

LEGEND

Bhp – Brake Horsepower

High Range Motor/Drive Required

NOTES: 1. Motor drive range is 690 to 893 rpm for low range motor/drive and 852 to 1055 rpm for high range motor/drive. All other rpms require a field–supplied drive.
2. Maximum continuous bhp is 3.70 for low range motor/drive and 5.25 for high range motor/drive.
3. See General Fan Performance Notes.

Table 11—Fan Performance — 50PG016 Vertical Units

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4500	540	0.71	640	1.03	718	1.36	784	1.68	844	2.00
4800	560	0.82	660	1.15	737	1.50	803	1.85	862	2.19
5100	581	0.94	680	1.29	757	1.66	823	2.03	881	2.40
5400	602	1.08	699	1.43	776	1.83	842	2.22	900	2.61
5700	623	1.24	719	1.59	796	2.01	862	2.42	919	2.84
6000	645	1.42	739	1.77	816	2.20	881	2.64	939	3.08
6300	667	1.62	760	1.96	836	2.40	901	2.86	958	3.33
6600	689	1.84	780	2.17	856	2.63	921	3.10	978	3.59
6900	712	2.09	800	2.40	876	2.86	940	3.36	998	3.87
7200	735	2.36	821	2.65	896	3.12	960	3.63	1017	4.16
7500	758	2.66	842	2.93	916	3.39	980	3.92	1037	4.47

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4500	898	2.32	949	2.63	998	2.95	1043	3.27	1087	3.59
4800	916	2.53	967	2.87	1014	3.21	1060	3.55	1103	3.89
5100	935	2.76	985	3.12	1032	3.48	1076	3.84	1119	4.20
5400	953	3.00	1003	3.38	1050	3.76	1094	4.14	1136	4.52
5700	972	3.25	1022	3.65	1068	4.05	1112	4.46	1153	4.86
6000	992	3.51	1040	3.94	1086	4.36	1130	4.79	1171	5.21
6300	1011	3.78	1059	4.23	1105	4.68	1148	5.13	1189	5.58
6600	1030	4.07	1079	4.55	1124	5.02	1167	5.49	1208	5.96
6900	1050	4.37	1098	4.87	1143	5.37	1186	5.86	1226	6.35
7200	1069	4.68	1117	5.21	1162	5.73	1205	6.25	1245	6.76
7500	1089	5.02	1137	5.56	1182	6.11	1224	6.65	1264	7.19

LEGEND

Bhp — Brake Horsepower

Mid – Low Range Motor/Drive Required

High Range Motor/Drive Required

NOTES:
1. Motor drive range is 710 to 879 rpm for low range motor/drive and 872 to 1066 rpm for mid – low range motor/drive, and 1066 to 1260 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 3.70 for low range motor/drive and 5.25 for mid – low range motor/drive, and 7.50 for high range motor/drive.
3. See General Fan Performance Notes.

Table 12—Fan Performance — 50PG08 Horizontal Units

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2250	381	0.26	469	0.36	546	0.47	616	0.58	682	0.71
2400	395	0.30	480	0.41	555	0.52	623	0.64	686	0.77
2550	408	0.34	491	0.46	564	0.58	630	0.70	691	0.83
2700	422	0.39	503	0.51	573	0.64	638	0.77	698	0.91
2850	437	0.45	515	0.58	583	0.71	646	0.84	705	0.98
3000	451	0.51	527	0.64	594	0.78	655	0.92	712	1.07
3150	466	0.57	540	0.72	605	0.86	665	1.00	721	1.15
3300	481	0.64	553	0.79	617	0.94	675	1.09	730	1.25
3450	496	0.72	566	0.88	628	1.03	686	1.19	739	1.35
3600	512	0.80	579	0.97	640	1.13	696	1.29	749	1.46
3750	527	0.89	593	1.07	653	1.24	708	1.41	759	1.58

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2250	743	0.84	801	0.97	856	1.11	908	1.26	958	1.41
2400	746	0.90	803	1.04	857	1.19	908	1.34	957	1.49
2550	750	0.97	805	1.12	858	1.27	909	1.42	958	1.58
2700	755	1.05	809	1.20	861	1.35	911	1.51	958	1.67
2850	760	1.13	813	1.28	864	1.44	913	1.60	960	1.77
3000	767	1.22	818	1.37	868	1.54	916	1.70	962	1.88
3150	774	1.31	824	1.47	873	1.64	920	1.81	966	1.99
3300	781	1.41	831	1.58	879	1.75	925	1.92	969	2.11
3450	790	1.52	838	1.69	885	1.86	930	2.04	974	2.23
3600	799	1.63	846	1.81	892	1.99	936	2.17	979	2.36
3750	808	1.75	854	1.93	899	2.12	943	2.31	985	2.50

LEGEND

Bhp – Brake Horsepower

High Range Motor/Drive Required

NOTES: 1. Motor drive range is 568 to 771 rpm for low range motor/drive and 812 to 1015 rpm for high range motor/drive. All other rpms require a field–supplied drive.
2. Maximum continuous bhp is 2.40 for low range motor/drive and 3.10 for high range motor/drive.
3. See General Fan Performance Notes.

Table 13—Fan Performance — 50PG09 Horizontal Units

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2550	408	0.34	491	0.46	564	0.58	630	0.70	691	0.83
2700	422	0.39	503	0.51	573	0.64	638	0.77	698	0.91
2850	437	0.45	515	0.58	583	0.71	646	0.84	705	0.98
3000	451	0.51	527	0.64	594	0.78	655	0.92	712	1.07
3150	466	0.57	540	0.72	605	0.86	665	1.00	721	1.15
3300	481	0.64	553	0.79	617	0.94	675	1.09	730	1.25
3450	496	0.72	566	0.88	628	1.03	686	1.19	739	1.35
3600	512	0.80	579	0.97	640	1.13	696	1.29	749	1.46
3750	527	0.89	593	1.07	653	1.24	708	1.41	759	1.58
3900	543	0.99	607	1.17	665	1.35	719	1.52	770	1.70
4050	559	1.09	621	1.28	678	1.47	731	1.65	780	1.83
4200	575	1.20	635	1.40	691	1.59	743	1.78	792	1.97

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
2550	750	0.97	805	1.12	858	1.27	909	1.42	958	1.58
2700	755	1.05	809	1.20	861	1.35	911	1.51	958	1.67
2850	760	1.13	813	1.28	864	1.44	913	1.60	960	1.77
3000	767	1.22	818	1.37	868	1.54	916	1.70	962	1.88
3150	774	1.31	824	1.47	873	1.64	920	1.81	966	1.99
3300	781	1.41	831	1.58	879	1.75	925	1.92	969	2.11
3450	790	1.52	838	1.69	885	1.86	930	2.04	974	2.23
3600	799	1.63	846	1.81	892	1.99	936	2.17	979	2.36
3750	808	1.75	854	1.93	899	2.12	943	2.31	985	2.50
3900	817	1.88	863	2.07	907	2.26	950	2.45	991	2.65
4050	827	2.02	872	2.21	916	2.40	958	2.60	998	2.80
4200	838	2.16	882	2.36	925	2.56	966	2.76	1006	2.97

LEGEND

Bhp – Brake Horsepower

High Range Motor/Drive Required

NOTES: 1. Motor drive range is 568 to 771 rpm for low range motor/drive and 812 to 1015 rpm for high range motor/drive. All other rpms require a field–supplied drive.
2. Maximum continuous bhp is 2.40 for low range motor/drive and 3.70 for high range motor/drive.
3. See General Fan Performance Notes.

Table 14—Fan Performance — 50PG012 Horizontal Units

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3000	464	0.53	538	0.66	604	0.80	664	0.94	721	1.09
3200	484	0.62	556	0.77	619	0.91	678	1.06	733	1.21
3400	505	0.72	574	0.88	636	1.03	692	1.19	746	1.35
3600	526	0.84	593	1.00	652	1.17	708	1.33	759	1.50
3800	548	0.96	611	1.14	670	1.31	723	1.48	774	1.66
4000	569	1.10	631	1.29	687	1.47	739	1.65	789	1.83
4200	591	1.25	650	1.45	705	1.64	756	1.83	804	2.02
4400	613	1.42	670	1.63	723	1.83	773	2.03	820	2.23
4600	635	1.60	690	1.82	742	2.03	790	2.24	836	2.44
4800	657	1.80	710	2.02	761	2.24	808	2.46	853	2.68
5000	680	2.01	731	2.24	780	2.48	826	2.70	870	2.93

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3000	775	1.24	826	1.40	876	1.56	923	1.73	969	1.90
3200	785	1.37	835	1.53	883	1.70	929	1.88	974	2.06
3400	796	1.51	845	1.68	892	1.86	937	2.04	981	2.22
3600	809	1.67	856	1.84	901	2.03	945	2.21	988	2.40
3800	822	1.84	868	2.02	912	2.21	955	2.40	996	2.59
4000	835	2.02	880	2.21	923	2.40	965	2.60	1006	2.80
4200	850	2.21	893	2.41	936	2.61	976	2.81	1016	3.02
4400	865	2.43	907	2.63	949	2.84	988	3.05	1027	3.26
4600	880	2.65	922	2.86	962	3.08	1001	3.29	1039	3.51
4800	896	2.89	937	3.11	976	3.33	1014	3.56	—	—
5000	912	3.15	952	3.38	991	3.61	—	—	—	—

LEGEND

Bhp — Brake Horsepower

High Range Motor/Drive Required

NOTES:
1. Motor drive range is 690 to 893 rpm for low range motor/drive and 852 to 1055 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 3.10 for low range motor/drive and 3.70 for high range motor/drive.
3. See General Fan Performance Notes.

Table 15—Fan Performance — 50PG014 Horizontal Units

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3750	542	0.93	607	1.10	665	1.27	719	1.44	770	1.62
3950	564	1.07	626	1.25	683	1.43	735	1.61	785	1.79
4150	586	1.22	645	1.41	701	1.60	752	1.78	800	1.97
4350	608	1.38	665	1.58	719	1.78	769	1.98	816	2.17
4550	630	1.55	685	1.77	737	1.98	786	2.18	832	2.39
4750	652	1.75	705	1.97	756	2.19	804	2.40	849	2.62
4950	674	1.95	726	2.19	775	2.42	822	2.64	866	2.86
5150	697	2.18	747	2.42	794	2.66	840	2.89	883	3.13
5350	719	2.42	767	2.67	814	2.92	858	3.16	901	3.41
5550	742	2.67	789	2.94	834	3.20	877	3.45	918	3.70
5750	765	2.95	810	3.22	854	3.49	896	3.76	936	4.02
5950	788	3.24	831	3.53	874	3.81	915	4.08	955	4.36
6150	811	3.56	853	3.85	894	4.14	935	4.43	973	4.71
6250	822	3.72	864	4.02	905	4.32	944	4.61	983	4.89

AIRFLOW (Cfm)	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
3750	818	1.79	865	1.97	909	2.16	952	2.35	994	2.54
3950	832	1.97	877	2.16	920	2.35	963	2.55	1003	2.75
4150	846	2.16	890	2.36	932	2.56	974	2.76	1014	2.97
4350	861	2.37	904	2.57	945	2.78	985	2.99	1024	3.20
4550	876	2.59	918	2.80	959	3.02	998	3.23	1036	3.45
4750	892	2.83	933	3.05	973	3.27	1011	3.49	1049	3.72
4950	908	3.09	948	3.31	987	3.54	1025	3.77	1061	4.00
5150	924	3.36	964	3.59	1002	3.83	1039	4.06	1075	4.30
5350	941	3.65	980	3.89	1017	4.13	1054	4.38	1089	4.62
5550	958	3.96	996	4.21	1033	4.46	1069	4.71	1103	4.96
5750	975	4.28	1013	4.54	1049	4.80	1084	5.06	—	—
5950	993	4.63	1030	4.89	1065	5.16	—	—	—	—
6150	1011	4.99	—	—	—	—	—	—	—	—
6250	1020	5.18	—	—	—	—	—	—	—	—

LEGEND

Bhp — Brake Horsepower

High Range Motor/Drive Required

NOTES:
1. Motor drive range is 690 to 893 rpm for low range motor/drive and 852 to 1055 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 3.70 for low range motor/drive and 5.25 for high range motor/drive.
3. See General Fan Performance Notes.

Table 16—Fan Performance — 50PG016 Horizontal Units

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4500	592	0.87	670	1.16	732	1.43	787	1.70	837	1.97
4800	619	1.01	696	1.32	758	1.62	812	1.91	861	2.20
5100	647	1.17	723	1.50	784	1.82	838	2.13	886	2.44
5400	675	1.34	750	1.70	810	2.04	863	2.37	911	2.70
5700	704	1.54	776	1.91	837	2.27	889	2.63	936	2.97
6000	733	1.75	804	2.14	863	2.53	915	2.91	962	3.27
6300	762	1.99	831	2.40	890	2.80	941	3.20	988	3.59
6600	792	2.25	858	2.67	917	3.10	968	3.52	1014	3.93
6900	822	2.53	886	2.97	944	3.42	994	3.86	1040	4.29
7200	852	2.84	914	3.29	971	3.76	1021	4.22	1066	4.68
7500	882	3.17	942	3.63	998	4.12	1048	4.61	1093	5.09

Airflow (Cfm)	Available External Static Pressure (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
4500	884	2.25	929	2.52	972	2.80	1014	3.09	1054	3.38
4800	907	2.49	951	2.78	992	3.07	1033	3.37	1072	3.68
5100	931	2.74	973	3.05	1014	3.36	1053	3.68	1091	3.99
5400	955	3.02	997	3.35	1036	3.67	1075	4.00	1112	4.33
5700	980	3.32	1021	3.66	1060	4.00	1097	4.35	1133	4.70
6000	1005	3.64	1045	4.00	1084	4.36	1120	4.72	1156	5.08
6300	1030	3.98	1070	4.35	1108	4.73	1144	5.11	1179	5.49
6600	1056	4.34	1095	4.74	1133	5.13	1168	5.53	1203	5.93
6900	1082	4.72	1121	5.14	1158	5.56	1193	5.97	1227	6.39
7200	1108	5.13	1147	5.57	1183	6.00	1218	6.44	1252	6.87
7500	1134	5.56	1173	6.02	1209	6.48	1244	6.93	1277	7.38

LEGEND

Bhp — Brake Horsepower

Mid – Low Range Motor/Drive Required

High Range Motor Required

NOTES:
1. Motor drive range is 710 to 879 rpm for low range motor/drive and 872 to 1066 rpm for mid – low range motor/drive, and 1066 to 1260 rpm for high range motor/drive. All other rpms require a field-supplied drive.
2. Maximum continuous bhp is 3.70 for low range motor/drive and 5.25 for mid – low range motor/drive, and 7.50 for high range motor/drive.
3. See General Fan Performance Notes.

GENERAL NOTES FOR FAN PERFORMANCE DATA TABLES

1. Values include losses for filters, unit casing, and wet coils. See unit Product Data for accessory/FIOP static pressure information.
2. Extensive motor and electrical testing on these units ensures that the full range of the motor can be utilized with confidence. Using the fan motors up to the bhp ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected. See Table 18 (Evaporator-Fan Motor Specifications) for additional information.
3. Use of a field-supplied motor may affect wire size. Contact the local Carrier representative for details.
4. Interpolation is permissible. Do not extrapolate. (Belt drive units only).

Table 17—Operation Air Quantity Limits

UNIT 50PG	COOLING (cfm)		HEATING (cfm) ELECTRIC HEAT	
	Min	Max	Min	Max
08	2250	3750	2250	3750
09	2550	4250	2550	4250
12	3000	5000	3000	5000
14	3750	6250	3750	6250
16	4500	7500	4500	7500

Table 18—Evaporator Fan Motor Specifications

50PG	DRIVE	VOLTAGE/PHASE	MOTOR P/N	EFFICIENCY	MAX BHP	MAX AMPS
08	Low	208/3ph	HD56FE652	0.80	2.4	6.4
		230/3ph	HD56FE652	0.80	2.4	6.4
		460/3ph	HD56FE652	0.80	2.4	3.2
		575/3ph	HD56FE575	0.80	2.4	2.4
	High	208/3ph	HD58FE653	0.84	3.1	8.8
		230/3ph	HD58FE653	0.84	3.1	8.8
		460/3ph	HD58FE653	0.84	3.1	4.4
		575/3ph	HD58FE576	0.84	3.1	3.9
09	Low	208/3ph	HD56FE652	0.80	2.4	6.4
		230/3ph	HD56FE652	0.80	2.4	6.4
		460/3ph	HD56FE652	0.80	2.4	3.2
		575/3ph	HD56FE575	0.80	2.4	2.4
	High	208/3ph	HD60FE655	0.83	3.7	11.0
		230/3ph	HD60FE655	0.83	3.7	11.0
		460/3ph	HD60FE655	0.83	3.7	5.5
		575/3ph	HD58FE575	0.83	3.7	4.2
12	Low	208/3ph	HD58FE653	0.84	3.1	8.8
		230/3ph	HD58FE653	0.84	3.1	8.8
		460/3ph	HD58FE653	0.84	3.1	4.4
		575/3ph	HD58FE576	0.84	3.1	3.9
	High	208/3ph	HD60FE655	0.83	3.7	11.0
		230/3ph	HD60FE655	0.83	3.7	11.0
		460/3ph	HD60FE655	0.83	3.7	5.5
		575/3ph	HD58FE575	0.83	3.7	4.2
14	Low	208/3ph	HD60FE655	0.83	3.7	11.0
		230/3ph	HD60FE655	0.83	3.7	11.0
		460/3ph	HD60FE655	0.83	3.7	5.5
		575/3ph	HD58FE575	0.83	3.7	4.2
	High	208/3ph	HD60FK650	0.81	5.25	14.8
		230/3ph	HD60FK650	0.81	5.25	14.8
		460/3ph	HD60FK650	0.81	5.25	7.4
		575/3ph	HD60FE575	0.81	5.25	5.9
16	Low	208/3ph	HD60FE655	0.83	3.7	11.0
		230/3ph	HD60FE655	0.83	3.7	11.0
		460/3ph	HD60FE655	0.83	3.7	5.5
		575/3ph	HD58FE576	0.83	3.7	4.2
	Mid-Low	208/3ph	HD60FK650	0.81	5.25	14.8
		230/3ph	HD60FK650	0.81	5.25	14.8
		460/3ph	HD60FK650	0.81	5.25	7.4
		575/3ph	HD60FE575	0.81	5.25	5.9
	High	208/3ph	HD62FL650	0.89	7.5	19.4
		230/3ph	HD62FL650	0.89	7.5	19.4
		460/3ph	HD62FL650	0.89	7.5	9.7
		575/3ph	HD62FL575	0.81	7.5	7.8

NOTES:

1. Extensive motor and electrical testing ensures that the motors can be utilized with confidence up to the maximum applied bhp, watts, and amps. Using the fan motor up to the maximum ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
2. Convert bhp to watts using the following formula:

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

3. The EPACT (Energy Policy Act of 1992) regulates energy requirements for specific types of indoor fan motors. Motors regulated by EPACT include any general purpose, T-frame (three-digit, 143 and larger), single-speed, foot mounted, polyphase, squirrel cage induction motors of NEMA (National Electrical Manufacturers Association) design A and B, manufactured for use in the United States. Ranging from 1 to 200 Hp, these continuous-duty motors operate on 230 and 460 volt, 60 Hz power. If a motor does not fit into these specifications, the motor does not have to be replaced by an EPACT-compliant energy-efficient motor. Variable-speed motors are exempt from EPACT compliance requirements. Therefore, the indoor fan motors for Carrier 50PG units are exempt from these requirements.

Table 19—Fan Rpm at Motor Pulley Settings*

UNIT 50PG	DRIVE	MOTOR PULLEY TURNS OPEN										
		0	1/2	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5
08	Low	771	751	731	710	690	670	649	629	609	589	568
	High	1015	994	974	954	934	913	893	873	852	832	812
09	Low	771	751	731	710	690	670	649	629	609	589	568
	High	1015	994	974	954	934	913	893	873	852	832	812
12	Low	893	873	852	832	812	791	771	751	731	710	690
	High	1055	1035	1015	994	974	954	934	913	893	873	852
14	Low	893	873	852	832	812	791	771	751	731	710	690
	High	1055	1035	1015	994	974	954	934	913	893	873	852
16	Low	879	863	846	829	812	795	778	761	744	727	710
	Mid-Low	1066	1047	1027	1008	988	969	950	930	911	892	872
	High	1260	1240	1221	1202	1182	1163	1144	1124	1105	1085	1066

*Approximate fan rpm shown, based on 1725 rpm motor.
NOTE: Factory pulley speed setting is at 5 turns open for sizes 08-14 and 2 turns open for size 16.

Table 20—Accessory/FIOP Electric Heat Static Pressure (in. wg)

50PG08-14			50PG16	
AIRFLOW (Cfm)	PRESSURE DROP (in. wg)		AIRFLOW (Cfm)	PRESSURE DROP (in. wg)
2250	0.03		4500	0.02
2650	0.05		4800	0.02
3050	0.06		5100	0.03
3450	0.08		5400	0.03
3850	0.10		5700	0.04
4250	0.12		6000	0.04
4650	0.14		6300	0.05
5050	0.17		6600	0.06
5450	0.20		6900	0.07
5850	0.23		7200	0.07
6250	0.26		7500	0.08

SERVICE

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could cause personal injury or death.

Before performing service or maintenance operations on unit, turn off main power switch to unit.

⚠ CAUTION

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this caution may result in personal injury or equipment damage.

Puron® (R-410A) refrigerant systems operate at higher pressures than standard R-22 systems. Do not use R-22 service equipment or components on Puron refrigerant equipment. If service equipment is not rated for Puron refrigerant, equipment damage or personal injury may result.

Cleaning

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

Coil Maintenance and Cleaning Recommendation

Routine cleaning of coil surfaces is essential to maintain proper operation of the unit. Elimination of contamination and removal of harmful residues will greatly increase the life of the coil and extend the life of the unit. The following maintenance and cleaning procedures are recommended as part of the routine maintenance activities to extend the life of the coil.

Remove Surface Loaded Fibers

Surface loaded fibers or dirt should be removed with a vacuum cleaner. If a vacuum cleaner is not available, a soft non-metallic bristle brush may be used. In either case, the tool should be applied in the direction of the fins. Coil surfaces can be easily damaged (fin edges can be easily bent over and damage to the coating of a protected coil) if the tool is applied across the fins.

NOTE: Use of a water stream, such as a garden hose, against a surface loaded coil will drive the fibers and dirt into the coil. This will make cleaning efforts more difficult. Surface loaded fibers must be completely removed prior to using low velocity clean water rinse.

Periodic Clean Water Rinse

A periodic clean water rinse is very beneficial for coils that are applied in coastal or industrial environments. However, it is very important that the water rinse is made with very low velocity water stream to avoid damaging the fin edges. Monthly cleaning as described below is recommended.

Routine Cleaning of Coil Surfaces

Monthly cleaning with Totaline® environmentally sound coil cleaner is essential to extend the life of coils. This cleaner is available from Carrier Replacement parts division as part number P902-0301 for a one gallon container, and part number P902-0305 for a 5 gallon container. It is recommended that all coils, including standard aluminum, pre-coated, copper/copper or E-coated coils be cleaned with the Totaline environmentally sound coil cleaner as described below. Coil cleaning should be part of the unit's regularly scheduled maintenance procedures to ensure long life of the coil. Failure to clean the coils may result in reduced durability in the environment.

Avoid the use of:

- coil brighteners
- acid cleaning prior to painting
- high pressure washers
- poor quality water for cleaning

Totaline environmentally sound coil cleaner is non-flammable, hypoallergenic, nonbacterial, and a USDA accepted biodegradable agent that will not harm the coil or surrounding components such as electrical wiring, painted metal surfaces, or insulation. Use of non-recommended coil cleaners is strongly discouraged since coil and unit durability could be affected.

Totaline® Environmentally Sound Coil Cleaner Application Equipment

- $2^1/_2$ gallon garden sprayer
- water rinse with low velocity spray nozzle

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage.

Harsh chemicals, household bleach or acid or basic cleaners should not be used to clean outdoor or indoor coils of any kind. These cleaners can be very difficult to rinse out of the coil and can accelerate corrosion at the fin/tube interface where dissimilar materials are in contact. If there is dirt below the surface of the coil, use the Totaline environmentally sound coil cleaner as described above.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in reduced unit performance.

High velocity water from a pressure washer, garden hose, or compressed air should never be used to clean a coil. The force of the water or air jet will bend the fin edges and increase airside pressure drop. Reduced unit performance or nuisance unit shutdown may occur.

Totaline Environmentally Sound Coil Cleaner Application Instructions

1. Proper eye protection such as safety glasses is recommended during mixing and application.
2. Remove all surface loaded fibers and dirt with a vacuum cleaner as described above.
3. Thoroughly wet finned surfaces with clean water and a low velocity garden hose, being careful not to bend fins.
4. Mix Totaline environmentally sound coil cleaner in a $2^1/_2$ gallon garden sprayer according to the instructions included with the cleaner. The optimum solution temperature is 100°F.

NOTE: Do NOT USE water in excess of 130°F, as the enzymatic activity will be destroyed.

5. Thoroughly apply Totaline environmentally sound coil cleaner solution to all coil surfaces including finned area, tube sheets and coil headers.
6. Hold garden sprayer nozzle close to finned areas and apply cleaner with a vertical, up-and-down motion. Avoid spraying in horizontal pattern to minimize potential for fin damage.
7. Ensure cleaner thoroughly penetrates deep into finned areas.
8. Interior and exterior finned areas must be thoroughly cleaned.
9. Finned surfaces should remain wet with cleaning solution for 10 minutes.
10. Ensure surfaces are not allowed to dry before rinsing. Reapplying cleaner as needed to ensure 10-minute saturation is achieved.
11. Thoroughly rinse all surfaces with low velocity clean water using downward rinsing motion of water spray nozzle. Protect fins from damage from the spray nozzle.

Condensate Drain Pan

Check and clean each year at the start of the cooling season.

To clean the condensate pan:

1. Disconnect condensate drain system from side or bottom drain connection.
2. Remove and clean trap.
3. Remove 4 screws securing condensate pan access cover to unit. Save screws and panel.
4. Slide condensate pan out from unit and clean. Pan is made of non-corrosive plastic. Use a mild cleaner to remove heavy deposits of dirt and grime.
5. Replace pan in unit.
6. Replace condensate pan access cover with 4 screws saved from Step 3.
7. Re-attach and prime condensate trap.
8. Connect condensate drainage system.

NOTE: During winter in low (subfreezing) temperature regions, add antifreeze solutions to the drain. Protect against contact with children, pets and animals.

Filters

Clean or replace at start of each heating and cooling season, or more often if operating conditions require. Refer to Table 1 and 2 for type and size.

Outdoor-Air Inlet Screens

Clean screens with steam or hot water and a mild detergent.

Lubrication

Compressors

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

⚠ CAUTION

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this caution may result in personal injury and equipment damage.

The compressor is in a Puron® refrigerant system and uses a polyolester (POE) oil. This oil is extremely hygroscopic, meaning it absorbs water readily. POE oils can absorb 15 times as much water as other oils designed for HCFC and CFC refrigerants. Avoid exposure of the oil to the atmosphere.

Polyolester (POE) compressor lubricants are known to cause long term damage to some synthetic roofing materials. Exposure, even if immediately cleaned up, may cause roofing materials to become brittle (leading to cracking) within a year. When performing any service which may risk exposure of compressor oil to the roof, take appropriate precautions to protect roofing. Procedures which risk oil leakage include compressor replacement, repairing refrigerant leaks, and replacing refrigerant components. To prepare rooftop:

1. Cover extended roof work area with an impermeable plastic dropcloth or tarp. Make sure a 10 x 10 ft area around the work area is covered.

2. Cover area in front of the unit service panel with a terry cloth shop towel to absorb lubricant spills and prevent run-offs. Towel will also protect dropcloth from tears caused by tools or components.
3. Place terry cloth shop towel inside the unit directly under components to be serviced to prevent spills through the bottom of the unit.
4. Perform the required service.
5. Remove and dispose of any oil contaminated material per local codes.

Indoor Fan Shaft Bearings (Sizes 08-14)

The indoor fan has permanently sealed bearings. No field lubrication is necessary.

Indoor Fan Shaft Bearings (Size 16)

Lubricate bearings at least every 6 months with suitable bearing grease. Typical lubricants are given below:

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

*Preferred lubricant because it contains rust and oxidation inhibitors.

Condenser and Evaporator-Fan Motor Bearings

The condenser-fan and evaporator-fan motors have permanently sealed bearings, so no field lubrication is necessary.

Evaporator Fan Service and Replacement

The 50PG units feature a slide-out fan deck for easy servicing of the indoor-fan motor, pulleys, belt, and bearings. To service components in this section, perform the following procedure:

1. Turn off unit power.
2. Open the fan section access door.
3. Remove two no. 10 screws at front of slide-out fan deck. Save screws. (See Fig. 29.)
4. Disconnect the electrical wires connected to the slide-out fan deck (supply air thermistor and fan status switch if installed). Wires may be damaged if not disconnected.
5. Fan deck can now be slid out to access serviceable components.

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in unit damage and/or personal injury.

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

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

Evaporator Fan Performance Adjustment (See Fig. 29 and 30.)

Fan motor pulleys are factory set for speed shown in Table 19.

To change fan speeds:

1. Shut off unit power supply.
2. Loosen nuts on the 4 carriage bolts in the mounting base. Using adjusting bolts and plate, slide motor and remove belt.
3. Loosen movable-pulley flange setscrew. (See Fig. 30.)
4. Screw movable flange toward fixed flange to increase speed and away from fixed flange to decrease speed. Increasing fan speed increases load on motor. Do not exceed maximum speed specified in Table 19.

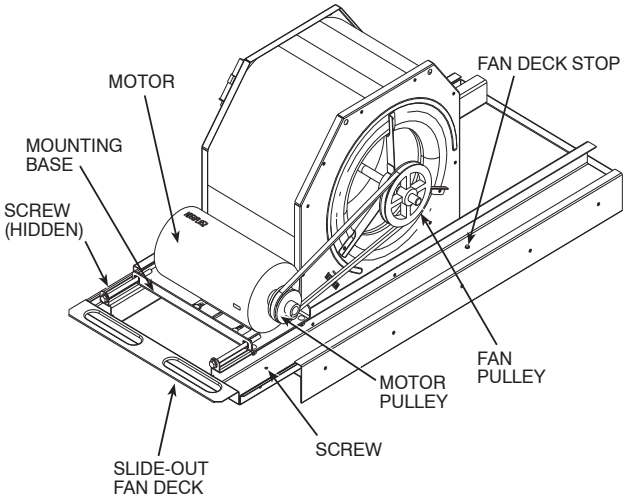


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Fig. 29 – Evaporator-Fan Motor Adjustment (Sizes 08-14 Shown)

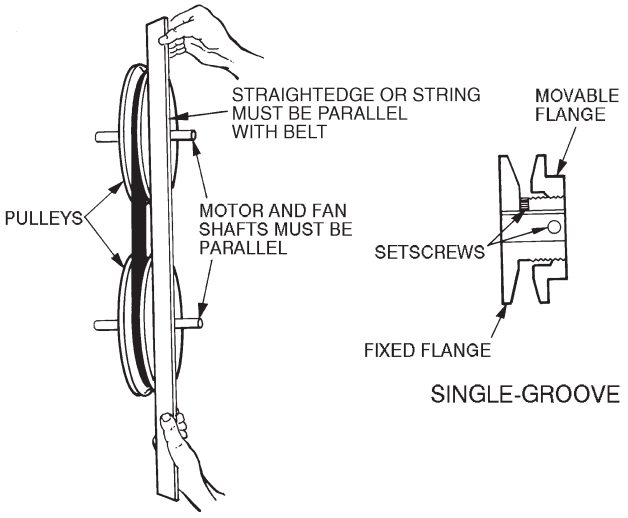

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Fig. 30 – Evaporator-Fan Alignment and Adjustment

See Table 17 for air quantity limits.

5. Set movable flange at nearest keyway of pulley hub and tighten setscrew. (See Table 19 for speed change for each full turn of pulley flange.)
6. Replace belts.
7. Realign fan and motor pulleys:
   a. Loosen fan pulley setscrews.
   b. Slide fan pulley along fan shaft.
   c. Make angular alignment by loosening motor from mounting plate.
8. Tighten belts.
9. Restore power to unit.

Evaporator Fan Belt Tension Adjustment

To adjust belt tension:

1. Turn off unit power.
2. Slide out fan deck to service position as shown in Evaporator Fan Service and Replacement section above.
3. Loosen motor mounting plate bolts.
4. Move motor mounting plate to adjust to proper belt tension. Motor adjuster bolts may be used to tighten belts. (See Fig. 29.) Do not overtighten belt.
5. Check for proper belt alignment. Adjust if necessary.
6. Tighten motor mounting plate bolts to lock motor in proper position.
7. Return fan deck back into operating position.
8. Restore power to unit.

Condenser-Fan Adjustment (See Fig. 31.)

1. Shut off unit power supply.
2. Remove condenser-fan assembly (grille, motor, motor cover, and fan) and loosen fan hub setscrews.
3. Adjust fan height as shown in Fig. 31.
4. Tighten setscrews and replace condenser-fan assembly.
5. Turn on power to unit.

Verify Sensor Performance

Using an ohmmeter and a thermometer, compare measured temperature to the resistance shown in Table 21.

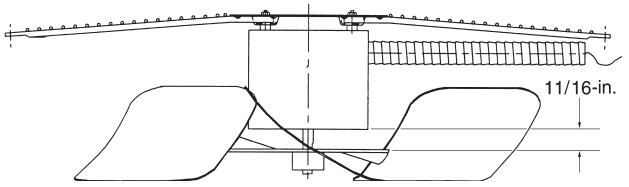

Fig. 31 – Condenser-Fan Adjustment

Table 21—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

Economizer Operation During Power Failure

Dampers have a spring return. In event of power failure, dampers will return to fully closed position until power is restored. *Do not manually operate damper motor.*

Evacuation

Proper evacuation of the system will remove noncondensables and ensure a tight, dry system before charging. Evacuate from both high and low side ports. Never use the system compressor as a vacuum pump. Refrigerant tubes and indoor coil should be evacuated to 500 microns. Always break a vacuum with dry nitrogen. The two possible methods are the deep vacuum method and the triple evacuation method.

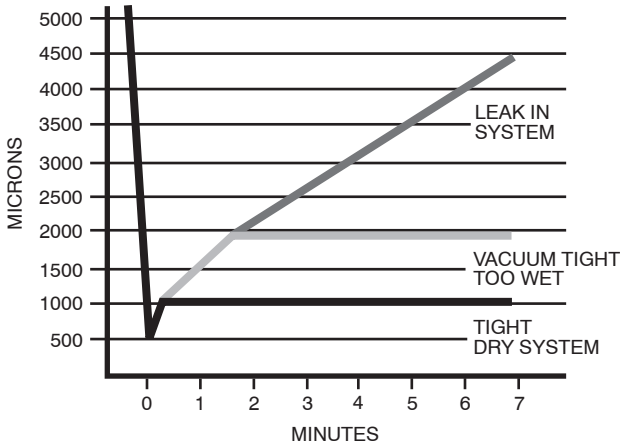

Fig. 32 – Deep Vacuum Graph

Deep Vacuum Method

The deep vacuum method requires a vacuum pump capable of pulling a minimum vacuum of 500 microns and a vacuum gage capable of accurately measuring this vacuum depth. The deep vacuum method is the most positive way of assuring a system is free of air and liquid water. (See Fig. 32.)

Triple Evacuation Method

The triple evacuation method should only be used when vacuum pump is capable of pumping down to 28 in. of mercury and system does not contain any liquid water. Proceed as follows:

1. Pump system down to 28 in. of mercury and allow pump to continue operating for an additional 15 minutes.
2. Close service valves and shut off vacuum pump.
3. Connect a nitrogen cylinder and regulator to system and open until system pressure is 2 psig.
4. Close service valve and allow system to stand for 1 hr. During this time, dry nitrogen will be able to diffuse throughout the system, absorbing moisture.
5. Repeat this procedure. System will then contain minimal amounts of contaminants and water vapor.

Refrigerant Charge

Amount of refrigerant charge is listed on unit nameplate. Refer to Carrier GTAC II; Module 5; Charging, Recovery, Recycling, and Reclamation section for charging methods and procedures. Unit panels must be in place when unit is operating during charging procedure.

Puron® (R-410A) refrigerant cylinders contain a dip tube which allows liquid refrigerant to flow from the cylinder in an upright position. Charge units with cylinder in the upright position and a commercial type metering device in the manifold hose.

⚠ CAUTION

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this caution may result in personal injury or equipment damage.

This system uses Puron® (R-410A) refrigerant which has higher pressures than standard R-22 and other refrigerants. No other refrigerant may be used. Gauge set, hoses, and recovery system must be designed to handle Puron refrigerant. If unsure about equipment, consult the equipment manufacturer.

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

No Charge

Use standard evacuating techniques. After evacuating system, weigh in the specified amount of refrigerant (refer to unit nameplate).

Low Charge Cooling

Using cooling charging chart (see Fig. 33-36), add or remove refrigerant until conditions of the chart are met. An accurate pressure gage and temperature-sensing device is required. Charging is accomplished by ensuring the proper amount of liquid subcooling. Connect pressure gauge to the compressor discharge service valve. Connect temperature sensing device to the liquid line between the condenser and the TXV (thermostatic expansion valve) and insulate it so that ambient temperature does not affect reading.

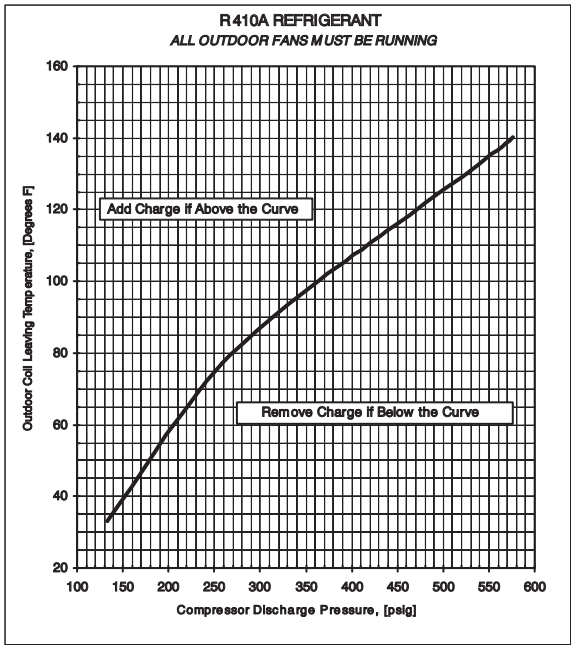

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Fig. 33 – Charging Chart 50PG08 and 09

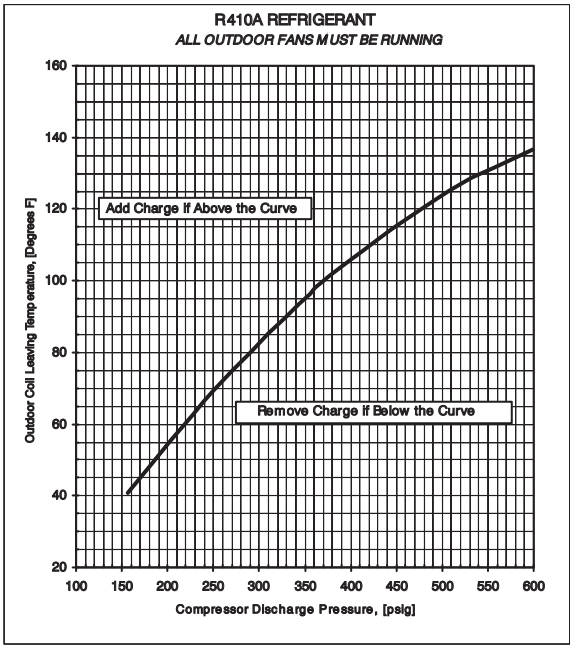

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Fig. 34 – Charging Chart 50PG12

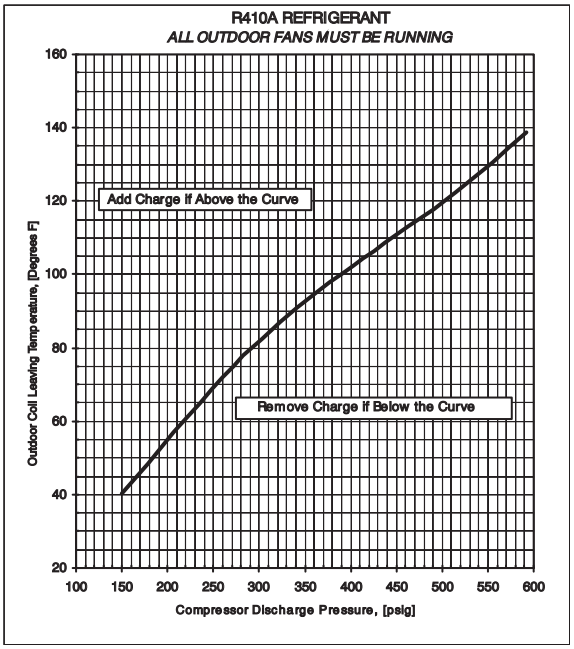

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Fig. 35 – Charging Chart 50PG14

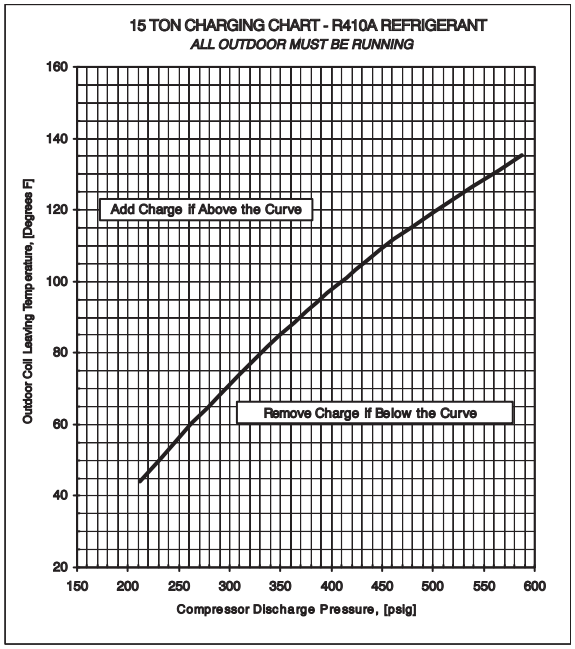

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Fig. 36 – Charging Chart 50PG16

To Use the Cooling Charging Chart

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

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

The TXV is set to maintain between 10 and 15 degrees of superheat at the compressors. The valves are factory set and cannot be adjusted. Do not use an R-22 TXV.

Puron® Refrigerant

Puron refrigerant operates at 50 to 70 percent higher pressures than R-22. Be sure that servicing equipment and replacement components are designed to operate with Puron refrigerant. Do not mix with components that have been used with other refrigerants. Puron refrigerant, as with other HFCs, is only compatible with POE oils.

Recovery cylinder service pressure rating must be 400 psig. Puron systems should be charged with liquid refrigerant. Use a commercial-type metering device in the manifold hose. Manifold sets should be 750 psig high-side and 200 psig low-side with 520 psig low-side retard. Use hoses with 750 psig service pressure rating. Leak detectors should be designed to detect HFC refrigerant.

Filter Drier

Replace whenever refrigerant system is exposed to atmosphere. Only use factory specified liquid-line filter driers with working pressures no less than 650 psig. Do not install a suction-line filter drier in liquid line. A liquid-line filter drier designed for use with Puron refrigerant is required on every unit.

Protective Devices

Compressor Rotation

High Pressure Switch

If the high-pressure switch opens, the compressor will shut down and the compressor lockout (CLO) device will energize to block further compressor operation. The high-pressure switch will reset automatically as the refrigerant pressure drops below its reset level. The CLO will remain energized until manually reset.

Low-Pressure Switch

If the low-pressure switch opens, the compressor will shut down and the compressor lockout (CLO) device will energize to block further compressor operation. The low-pressure switch will reset automatically as the refrigerant pressure rises above its reset level. The CLO will remain energized until manually reset.

Freeze Protection Switch

This switch is installed on each evaporator coil section to provide protection against continued unit operation with a frosted evaporator surface. If the freeze protection switch opens, the compressor on this circuit will shut down and the compressor lockout (CLO) device will energize to block further compressor operation. The freeze protection switch will reset as the evaporator tube temperature rises above its reset level. The CLO will remain energized until manually reset.

Compressor Lockout (CLO) Device

The CLO prevents automatic recycling of the compressor as safety controls reset. If the high-pressure switch, low-pressure switch or freeze protection switch opens, the CLO device will energize to block further compressor operation. To reset the CLO (after all safety switches have reset), either open the thermostat to remove the cooling demand signal (and then re-close) or cycle the control power in the unit.

Overcurrent

Each compressor has internal line break motor protection.

Overtemperature

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

Evaporator Fan Motor Protection

Indoor fan motors less than 5 hp are equipped with internal overcurrent and overtemperature protection. Protection devices reset automatically. Disconnect and lock out power when servicing motor. Indoor fan motors 5 hp and larger are equipped with a manual reset, calibrated trip, magnetic circuit breaker and overcurrent protection. Do not bypass connections or increase the size of the breaker to correct trouble. Determine the cause and correct it before resetting the breaker.

Condenser-Fan Motor Protection

Each condenser-fan motor is internally protected against overtemperature.

Relief Devices

All units have relief devices to protect against damage from excessive pressures (i.e., fire). These devices protect the high and low side and are located at the suction line service port. Protect joint during brazing operations near joint.

Control Circuit, 24-V

Each control circuit is protected against overcurrent by a 3.2 amp circuit breaker. Breaker can be reset. If it trips, determine cause of trouble before resetting. (See Fig. 37 and 38.)

Replacement Parts

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

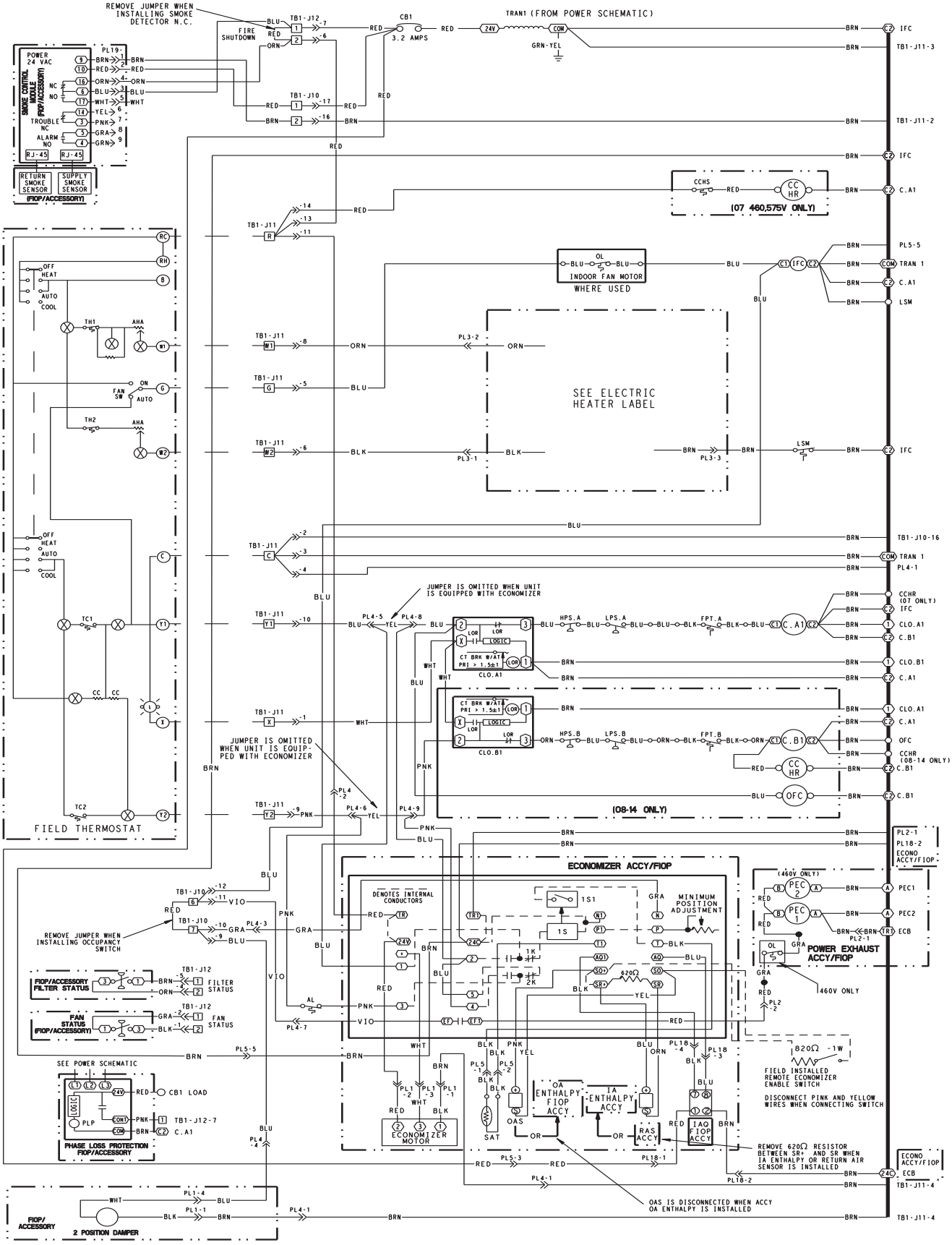

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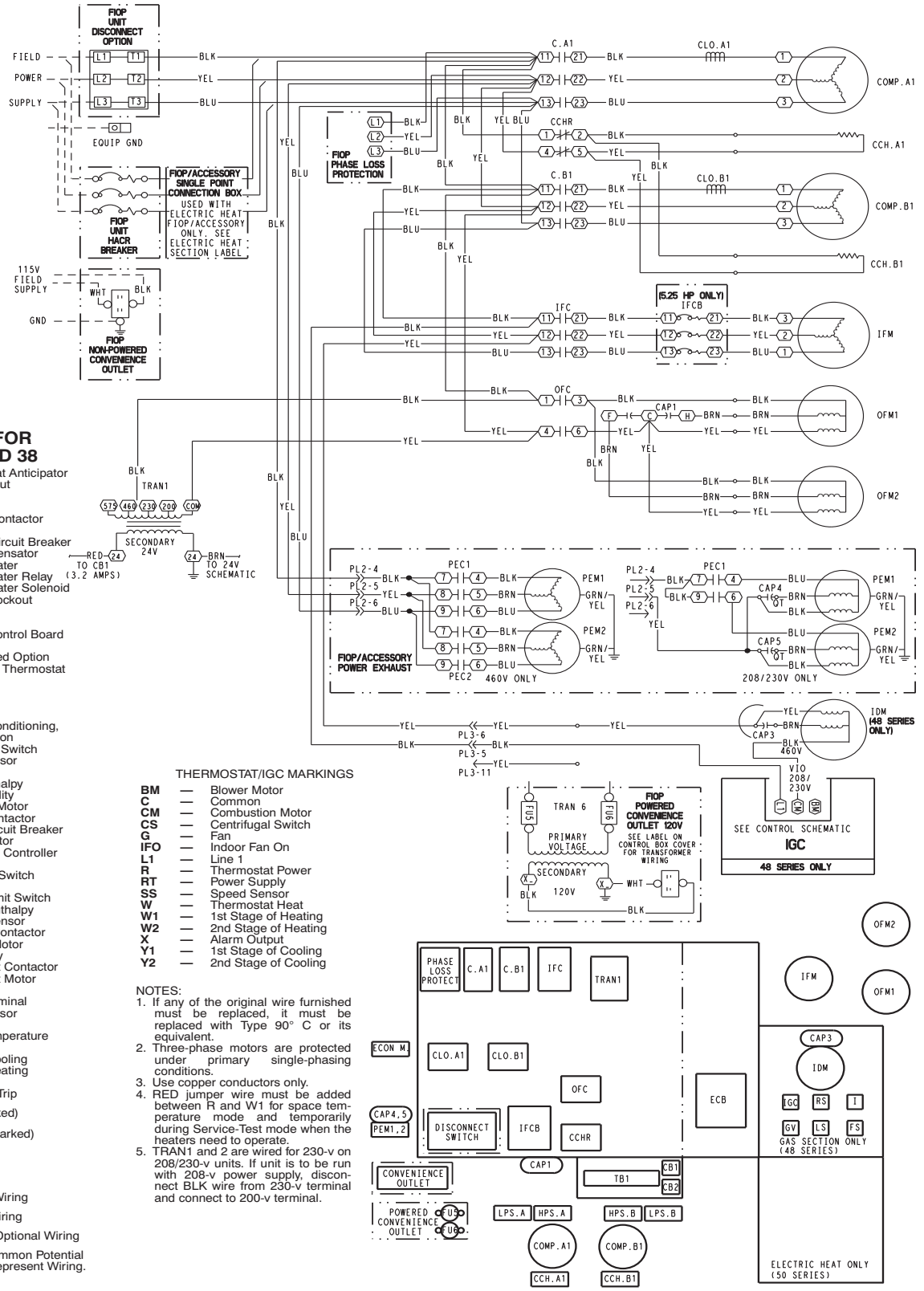
Fig. 37 – Typical Low Voltage Control Schematic



LEGEND FOR FIG. 37 AND 38

AHA	—	Adjustable Heat Anticipator
AL	—	Ambient Lockout
---A	—	Circuit A
---B	—	Circuit B
C	—	Compressor Contactor
CAP	—	Capacitor
CB	—	Compressor Circuit Breaker
CC	—	Cooling Compensator
CCH	—	Crankcase Heater
CCHR	—	Crankcase Heater Relay
CCHS	—	Crankcase Heater Solenoid
CLO	—	Compressor Lockout
COMP	—	Compressor
CT BRK	—	Circuit Breaker
ECB	—	Economizer Control Board
ECON	—	Economizer
FIOP	—	Factory-Installed Option
FPT	—	Freeze Protect Thermostat
FS	—	Flame Sensor
FU	—	Fuse
GND	—	Ground
GV	—	Gas Valve
HACR	—	Heating, Air Conditioning, and Refrigeration
HPS	—	High-Pressure Switch
HS	—	Hall Effect Sensor
I	—	Ignitor
IAE	—	Indoor Air Enthalpy
IAQ	—	Indoor Air Quality
IDM	—	Induced-Draft Motor
IFC	—	Indoor-Fan Contactor
IFCB	—	Indoor Fan Circuit Breaker
IFM	—	Indoor-Fan Motor
IGC	—	Integrated Gas Controller
LOR	—	Lockout Relay
LPS	—	Low-Pressure Switch
LS	—	Limit Switch
LSM	—	Mechanical Limit Switch
OAE	—	Outdoor-Air Enthalpy
OAS	—	Outdoor-Air Sensor
OFC	—	Outdoor-Fan Contactor
OFM	—	Outdoor-Fan Motor
OL	—	Overload Relay
PEC	—	Power Exhaust Contactor
PEM	—	Power Exhaust Motor
PL	—	Plug
QT	—	Quadruple Terminal
RAS	—	Return Air Sensor
RS	—	Rollout Switch
SAT	—	Supply-Air Temperature
TB	—	Terminal Block
TC	—	Thermostat-Cooling
TH	—	Thermostat-Heating
TRAN	—	Transformer
W/AT	—	With Auxiliary Trip

Terminal (Marked)

Terminal (Unmarked)

X Terminal Block

Factory Wiring

Field Control Wiring

Field Power Wiring

Accessory or Optional Wiring

To Indicate Common Potential Only. Not to Represent Wiring.

THERMOSTAT/IGC MARKINGS

BM	—	Blower Motor
C	—	Common
CM	—	Combustion Motor
CS	—	Centrifugal Switch
G	—	Fan
IFO	—	Indoor Fan On
L1	—	Line 1
R	—	Thermostat Power
RT	—	Power Supply
SS	—	Speed Sensor
W	—	Thermostat Heat
W1	—	1st Stage of Heating
W2	—	2nd Stage of Heating
X	—	Alarm Output
Y1	—	1st Stage of Cooling
Y2	—	2nd Stage of Cooling

NOTES:
1. If any of the original wire furnished must be replaced, it must be replaced with Type 90° C or its equivalent.
2. Three-phase motors are protected under primary single-phasing conditions.
3. Use copper conductors only.
4. RED jumper wire must be added between R and W1 for space temperature mode and temporarily during Service-Test mode when the heaters need to operate.
5. TRAN1 and 2 are wired for 230-v on 208/230-v units. If unit is to be run with 208-v power supply, disconnect BLK wire from 230-v terminal and connect to 200-v terminal.

C06271

Fig. 38 – Typical Power Schematic

TROUBLESHOOTING

Unit Troubleshooting – See Table 22 for cooling troubleshooting.
See Table 23 for unit heating troubleshooting.

Table 22—Cooling Service Analysis

PROBLEM	CAUSE	REMEDY
Compressor and Condenser Fan Will Not Start.	Power failure.	Call power company.
	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Defective thermostat, contactor, transformer, or control relay.	Replace component.
	Insufficient line voltage.	Determine cause and correct.
	Incorrect or faulty wiring.	Check wiring diagram and rewire correctly.
	Thermostat setting too high.	Lower thermostat setting below room temperature.
Compressor Will Not Start But Condenser Fan Runs.	Faulty wiring or loose connections in compressor circuit.	Check wiring and repair or replace.
	Compressor motor burned out, seized, or internal overload open.	Determine cause. Replace compressor.
	Defective run/start capacitor, overload, start relay.	Determine cause and replace.
	One leg of 3-phase power dead.	Replace fuse or reset circuit breaker. Determine cause.
Compressor Cycles (Other Than Normally Satisfying Thermostat).	Refrigerant overcharge or undercharge.	Recover refrigerant, evacuate system, and recharge to nameplate.
	Defective compressor.	Replace and determine cause.
	Insufficient line voltage.	Determine cause and correct.
	Blocked condenser.	Determine cause and correct.
	Defective run/start capacitor, overload, or start relay.	Determine cause and replace.
	Defective thermostat.	Replace thermostat.
	Faulty condenser-fan motor or capacitor.	Replace.
	Restriction in refrigerant system.	Locate restriction and remove.
Compressor Operates Continuously.	Dirty air filter.	Replace filter.
	Unit undersized for load.	Decrease load or increase unit size.
	Thermostat set too low.	Reset thermostat.
	Low refrigerant charge.	Locate leak, repair, and recharge.
	Leaking valves in compressor.	Replace compressor.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser coil dirty or restricted.	Clean coil or remove restriction.
Excessive Head Pressure.	Dirty air filter.	Replace filter.
	Dirty condenser coil.	Clean coil.
	Refrigerant overcharged.	Recover excess refrigerant.
	Air in system.	Recover refrigerant, evacuate system, and recharge.
	Condenser air restricted or air short-cycling.	Determine cause and correct.
Head Pressure Too Low.	Low refrigerant charge.	Check for leaks, repair, and recharge.
	Compressor valves leaking.	Replace compressor.
	Restriction in liquid tube.	Remove restriction.
Excessive Suction Pressure.	High heat load.	Check for source and eliminate.
	Compressor valves leaking.	Replace compressor.
	Refrigerant overcharged.	Recover excess refrigerant.
Suction Pressure Too Low.	Dirty air filter.	Replace filter.
	Low refrigerant charge.	Check for leaks, repair, and recharge.
	Metering device or low side restricted.	Remove source of restriction.
	Insufficient evaporator airflow.	Increase air quantity. Check filter and replace if necessary.
	Temperature too low in conditioned area.	Reset thermostat.
	Outdoor ambient below 25°F.	Install low-ambient kit.
Evaporator Fan Will Not Shut Off.	Time off delay not finished.	Wait for 30-second off delay.

Table 23—Heating Service Analysis

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

EconoMi$er IV Troubleshooting

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 Control Ventilation) and Power Exhaust

To check DCV and Power Exhaust:

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

Mixed Air Input

To check mixed 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.

Phase Loss Protection

The phase loss protection option will monitor the three-phase electrical system to provide phase reversal and phase loss protection.

Phase Reversal Protection

If the control senses an incorrect phase relationship, the relay (K1) will be de-energized (opening its contact). If the phase relationship is correct, the relay will be energized. The control has a self-bypass function after a pre-set time. If the control determines that the three phases stay in a correct relationship for 10 consecutive minutes, the relay will stay energized regardless of the phase sequence of three inputs as long as 24-vac control voltage is applied. This self-bypass function will be reset if all three phases are restored in a phase loss event.

Phase Loss Protection

If the reverse rotation board senses any one of the three phase inputs has no AC voltage, the relay will be deenergized (opening its contact). This protection is always active as long as 24-vac control voltage is applied, and is not affected by the self bypass function of the phase sequence monitoring function. However, in the event of phase loss, the relay will be re-energized only if all three phases are restored and the three phases are in the correct sequence.

A red LED is provided to indicate the function of the board. See the table below.

LED STATUS	FUNCTION
On Continuously	Relay contact closed (normal operation).
Blinking	Relay contact open (phase loss or phase reversal has occurred) — No power will be supplied to the control system.
Off	24 vac control power not present (off).

UNIT START-UP CHECKLIST

MODEL NO.: _____ SERIAL NO.: _____

DATE: _____ TECHNICIAN: _____

I. PRE-START-UP:

☐ VERIFY THAT ALL PACKING MATERIALS HAVE BEEN REMOVED FROM UNIT

☐ VERIFY INSTALLATION OF OUTDOOR AIR HOOD

☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTRUCTIONS

☐ VERIFY THAT ALL ELECTRICAL CONNECTIONS AND TERMINALS ARE TIGHT

☐ CHECK THAT INDOOR-AIR FILTERS ARE CLEAN AND IN PLACE

☐ CHECK THAT OUTDOOR AIR INLET SCREENS ARE IN PLACE

☐ VERIFY THAT UNIT IS LEVEL

☐ CHECK FAN WHEEL AND PROPELLER FOR LOCATION IN HOUSING/ORIFICE, AND VERIFY SETSCREW IS TIGHT

☐ VERIFY THAT FAN SHEAVES ARE ALIGNED AND BELTS ARE PROPERLY TENSIONED

☐ VERIFY THAT SCROLL COMPRESSORS ARE ROTATING IN THE CORRECT DIRECTION

☐ VERIFY INSTALLATION OF THERMOSTAT

☐ VERIFY THAT CRANKCASE HEATERS HAVE BEEN ENERGIZED FOR AT LEAST 24 HOURS

II. START-UP

ELECTRICAL

SUPPLY VOLTAGE	L1-L2	_____	L2-L3	_____	L3-L1	_____	
COMPRESSOR AMPS — COMPRESSOR A1			L1	_____	L2	_____	L3 _____
— COMPRESSOR B1			L1	_____	L2	_____	L3 _____
— COMPRESSOR C1 (16)			L1	_____	L2	_____	L3 _____
ELECTRIC HEAT AMPS (IF EQUIPPED)			L1	_____	L2	_____	L3 _____
SUPPLY FAN AMPS			L1		L2		L3

TEMPERATURES

OUTDOOR-AIR TEMPERATURE	_____	F DB (Dry Bulb)	
RETURN-AIR TEMPERATURE	_____	F DB	F WB (Wet Bulb)
COOLING SUPPLY AIR	_____	F	
ELECTRIC HEAT SUPPLY AIR		F	

PRESSURES

REFRIGERANT SUCTION	CIRCUIT A	_____	PSIG
	CIRCUIT B	_____	PSIG
	CIRCUIT C (16)	_____	PSIG
REFRIGERANT DISCHARGE	CIRCUIT A	_____	PSIG
	CIRCUIT B	_____	PSIG
	CIRCUIT C (16)		PSIG

☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS

GENERAL

☐ ECONOMIZER MINIMUM VENT AND CHANGEOVER SETTINGS TO JOB REQUIREMENTS