50XP
Performance™ 13 SEER Single–Packaged Air Conditioner System with Puron® Refrigerant Single and Three Phase 2–5 Nominal Tons (Sizes 024–060)

Carrier®
Turn to the Experts.

Installation Instructions

NOTE: Read the entire instruction manual before starting the installation.

NOTE: Installer: Make sure the Owner's Manual and Service Instructions are left with the unit after installation.

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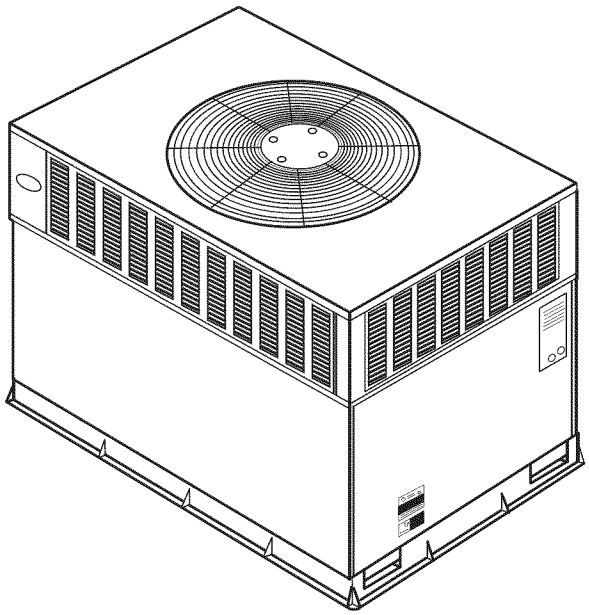

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Fig. 1 - Model 50XP

SAFETY CONSIDERATIONS

Improper installation adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes, the current editions of the National Electrical Code (NEC) NFPA 70.

In Canada refer to the current editions of the Canadian electrical Code CSA C22.1.

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 these 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 hazards 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.

The power supply (volts, phase, and hertz) must correspond to that specified on unit rating plate.

INTRODUCTION

The 50XP units are fully self-contained, and designed for outdoor installation (see Fig. 1). See Fig. 2 and 3 for unit dimensions. All unit sizes have discharge openings for both horizontal and down-flow configurations, and are factory shipped with all duct openings covered. Units may be installed either on a rooftop, ground-level cement slab, or directly on the ground if local codes permit. See Fig. 4 for roof curb dimensions.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch. Turn off accessory heater power switch if applicable.

⚠ CAUTION

UNIT OPERATION AND SAFETY HAZARD

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

Puron (R-410A) systems operate at higher pressures than standard R-22 systems. DO NOT use R-22 service equipment or components on Puron (R-410A) equipment. Ensure service equipment is rated for Puron (R-410A).

RECEIVING AND INSTALLATION

Step 1 — Check Equipment

IDENTIFY UNIT

The unit model number and serial number are printed on the unit informative plate. Check this information against shipping papers.

INSPECT SHIPMENT

Inspect for shipping damage while unit is still on shipping pallet. If unit appears to be damaged or is torn loose from its anchorage, have it examined by transportation inspectors before removal. Forward claim papers directly to transportation company. Manufacturer is not responsible for any damage incurred in transit. Check all items against shipping list. Immediately notify the nearest equipment distribution office if any item is missing. To prevent loss or damage, leave all parts in original packages until installation.

Step 2 — Provide Unit Support

For hurricane tie downs, contact distributor for details and PE (Professional Engineering) Certificate , if required.

ROOF CURB

Install accessory roof curb in accordance with instructions shipped with curb (see Fig. 4). Install insulation, cant strips, roofing, and flashing. Ductwork must be attached to curb.

IMPORTANT: The gasketing of the unit to the roof curb is critical for a water tight seal. Install gasketing material supplied with the roof curb. Improperly applied gasketing also can result in air leaks and poor unit performance.

Curb should be level to within 1/4 in. (6 mm) (see Fig. 8). This is necessary for unit drain to function properly. Refer to accessory roof curb installation instructions for additional information as required.

SLAB MOUNT

Place the unit on a solid, level concrete pad that is a minimum of 4 in. (102 mm) thick, with 2 in. (51 mm) above grade. The slab should extend approximately 2 in. (51 mm) beyond the casing on all 4 sides of the unit. Do not secure the unit to the slab *except* when required by local codes.

GROUND LEVEL

The unit may be installed either on a slab or placed directly on the ground if local codes permit. Place the unit on level ground prepared with gravel for condensate discharge.

Step 3 — Field Fabricate Ductwork

Secure all ducts to roof curb and building structure on vertical discharge units. Do not connect ductwork to unit. For horizontal applications, unit is provided with flanges on the horizontal openings. All ductwork should be 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 shall not exceed -.25 in. wc.

Step 4 — Provide Clearances

The required minimum operating and service clearances are shown in Fig. 2 and 3. Adequate ventilation and condenser air must be provided.

⚠ CAUTION

UNIT HAZARD

Failure to follow this caution could result in equipment damage.

Do not restrict condenser airflow. An air restriction at either the outdoor-air inlet or the fan discharge can be detrimental to compressor life.

The condenser fan draws air through the condenser coil and discharges it through the top fan grill. Be sure that the fan discharge does not recirculate to the condenser coil. Do not locate the unit in either a corner or under an overhead obstruction. The minimum clearance under a partial overhang (such as a normal house overhang) is 36-in. (914 mm) above the unit top. The maximum horizontal extension of a partial overhang must not exceed 48 in. (1219 mm).

Do not place the unit where water, ice, or snow from an overhang or roof will damage or flood the unit. Do not install the unit on carpeting, tile, or other combustible materials.

UNIT	ELECTRICAL CHARACTERISTICS	UNIT WT.		UNIT HEIGHT	CENTER OF GRAVITY MM/IN		
		LBS.	KG.	"A"	X	Y	Z
50XP024	208-230-1-60, 208/230-3-60	308	140	1091.7[42.98]	495.3[19.5]	447.6[17.6]	457.2[18.0]
50XP030	208-230-1-60, 208/230-3-60	312	142	1142.5[44.98]	495.3[19.5]	447.6[17.6]	457.2[18.0]
50XP036	208-230-1-60, 208/230-3-60	330	150	1193.3[46.98]	533.4[21.0]	508.0[20.0]	442.0[17.6]

CORNER WEIGHT LBS./KG.				
	"1"	"2"	"3"	"4"
024	62/28	49/22	74/34	123/56
030	62/28	50/23	75/34	125/57
036	66/30	53/24	79/36	132/60

REQUIRED CLEARANCES TO COMBUSTIBLE MATL.

	MILLIMETERS [IN]
TOP OF UNIT	355.6 [14.00]
DUCT SIDE OF UNIT	50.8 [2.00]
SIDE OPPOSITE DUCTS	355.6 [14.00]
BOTTOM OF UNIT	0.0 [0.00]
ELECTRIC HEAT PANEL	914.4 [36.00]

NEC. REQUIRED CLEARANCES.

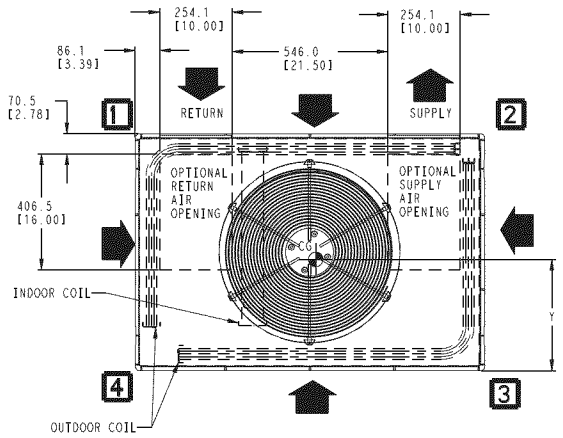
	MILLIMETERS [IN]
BETWEEN UNITS, POWER ENTRY SIDE	1066.8 [42.00]
UNIT AND UNGROUNDED SURFACES, POWER ENTRY SIDE	914.0 [36.00]
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, POWER ENTRY SIDE	1066.8 [42.00]

REQUIRED CLEARANCE FOR OPERATION AND SERVICING

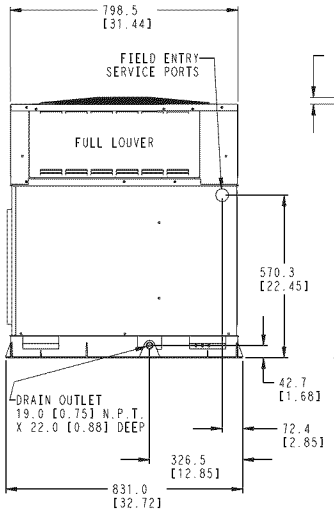
	MILLIMETERS [IN]
EVAP. COIL ACCESS SIDE	914.0 [36.00]
POWER ENTRY SIDE	914.0 [36.00]
(EXCEPT FOR NEC REQUIREMENTS)	
UNIT TOP	1219.2 [48.00]
SIDE OPPOSITE DUCTS	914.0 [36.00]
DUCT PANEL	304.8 [12.00]*

*MINIMUM DISTANCES: IF UNIT IS PLACED LESS THAN 304.8 [12.00] FROM WALL SYSTEM, THEN SYSTEM PERFORMANCE MAYBE COMPROMISED.

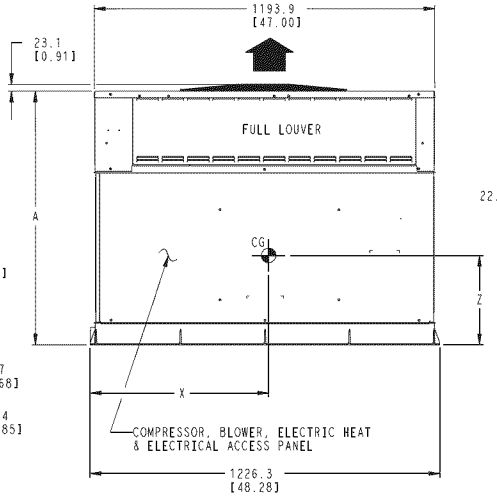
DIMENSIONS IN [] ARE IN INCHES



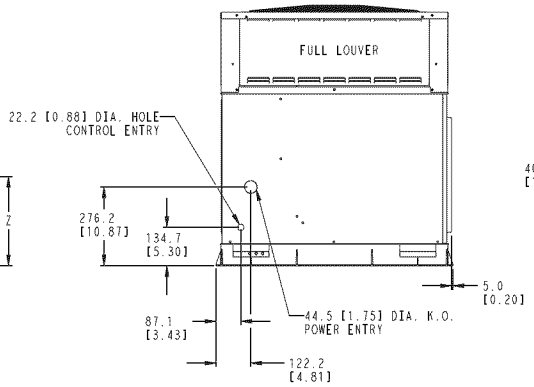
TOP VIEW



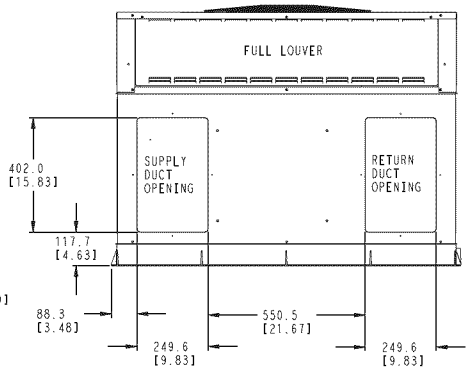
LEFT SIDE VIEW



FRONT VIEW



RIGHT SIDE VIEW



REAR VIEW

Fig. 2 - 50XP024-036 Unit Dimensions

50XP500017	REV. 3.0

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50XP

UNIT	ELECTRICAL CHARACTERISTICS	UNIT WT.		UNIT HEIGHT	CENTER OF GRAVITY MM/IN		
		LBS.	KG.	"A"	X	Y	Z
50XP042	208-230-1-60, 208/230-3-60	388	176	1091.7[42.98]	495.3[19.5]	447.6[17.6]	457.2[18.0]
50XP048	208-230-1-60, 208/230-3-60	422	192	1142.5[44.98]	495.3[19.5]	447.6[17.6]	457.2[18.0]
50XP060	208-230-1-60, 208/230-3-60	467	212	1193.3[46.98]	533.4[21.0]	508.0[20.0]	442.0[17.6]

CORNER WEIGHT LBS./KG.				
	"1"	"2"	"3"	"4"
042	78/35	62/28	93/42	155/70
048	84/38	68/31	101/46	169/77
060	93/42	75/34	112/51	187/85

REQUIRED CLEARANCES TO COMBUSTIBLE MATL.

	MILLIMETERS [IN]
TOP OF UNIT	355.6 [14.00]
DUCT SIDE OF UNIT	50.8 [2.00]
SIDE OPPOSITE DUCTS	355.6 [14.00]
BOTTOM OF UNIT	0.0 [0.00]
ELECTRIC HEAT PANEL	914.4 [36.00]

NEC. REQUIRED CLEARANCES.

	MILLIMETERS [IN]
BETWEEN UNITS, POWER ENTRY SIDE	1066.8 [42.00]
UNIT AND UNGROUNDED SURFACES, POWER ENTRY SIDE	914.0 [36.00]
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, POWER ENTRY SIDE	1066.8 [42.00]

REQUIRED CLEARANCE FOR OPERATION AND SERVICING

	MILLIMETERS [IN]
EVAP. COIL ACCESS SIDE	914.0 [36.00]
POWER ENTRY SIDE (EXCEPT FOR NEC REQUIREMENTS)	914.0 [36.00]
UNIT TOP	1219.2 [48.00]
SIDE OPPOSITE DUCTS	914.0 [36.00]
DUCT PANEL	304.8 [12.00]♦

♦MINIMUM DISTANCES: IF UNIT IS PLACED LESS THAN 304.8 [12.00] FROM WALL SYSTEM, THEN SYSTEM PERFORMANCE MAYBE COMPROMISED.

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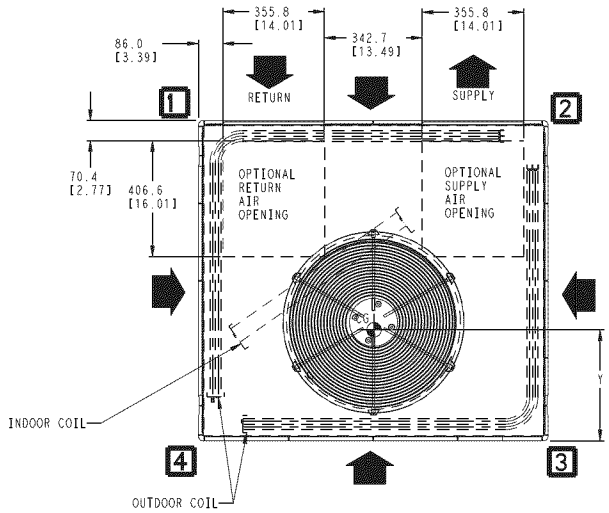
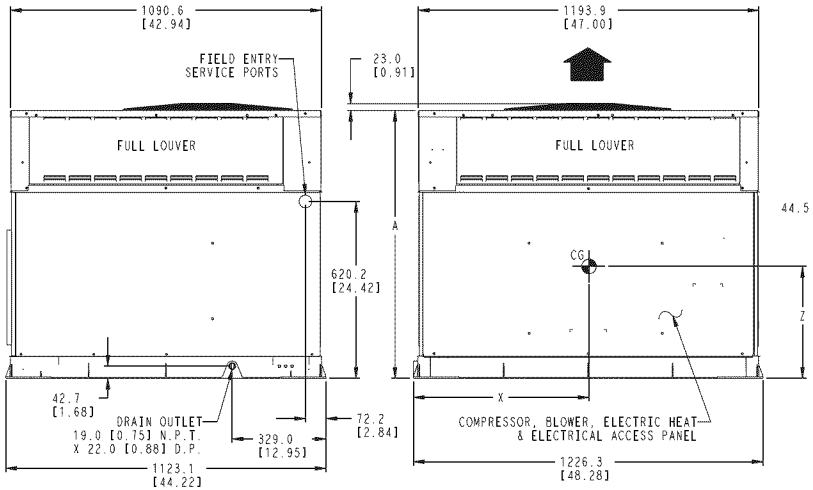
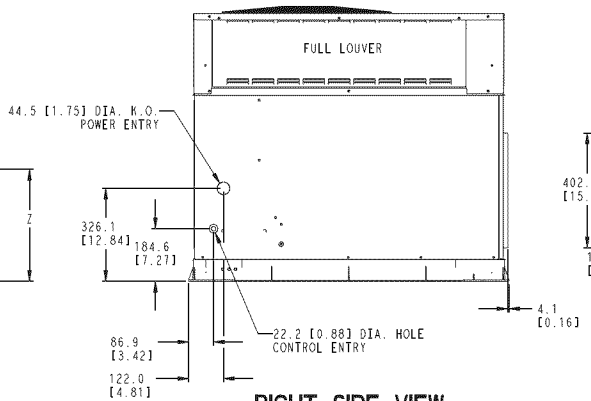


TOP VIEW

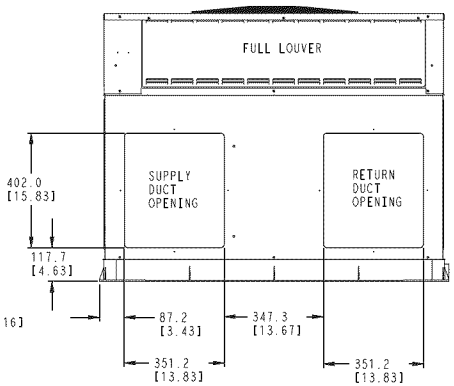


LEFT SIDE VIEW

FRONT VIEW



RIGHT SIDE VIEW



REAR VIEW

Fig. 3 - 50XP042-060 Unit Dimensions

50XP500018	REV 3.0

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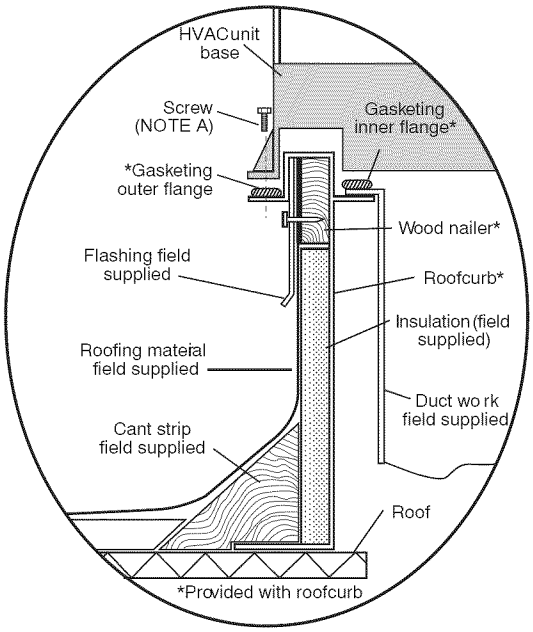
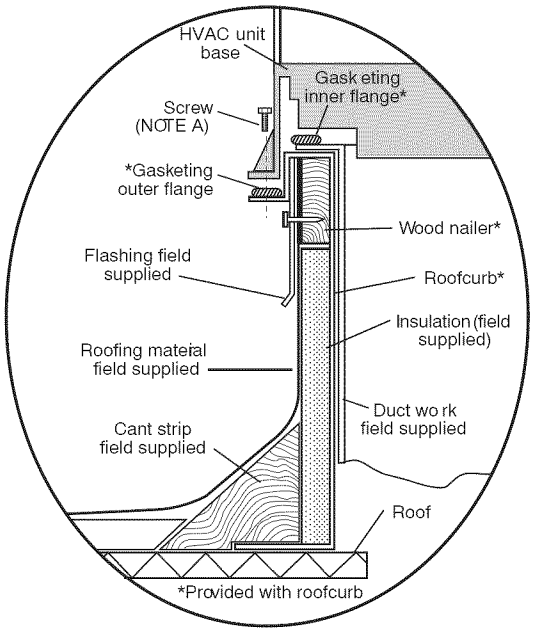


Roof Curb for Small Cabinet

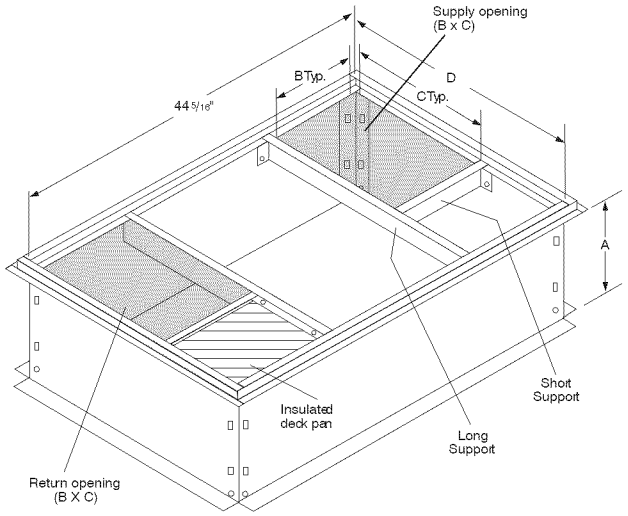
Note A: When unit mounting screw is used retainer bracke t must also be used.

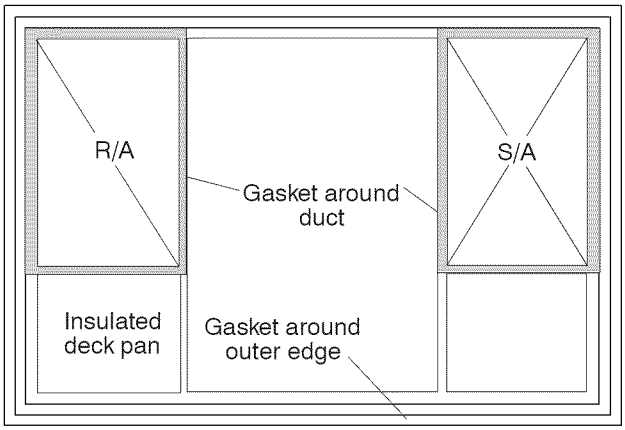


Roof Curb for Large Cabinet

Note A: When unit mounting screw is used retainer bracket must also be used.

50XP





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50XP	UNIT SIZE	ODS CATALOG NUMBER	A IN. (MM)	B IN. (MM)	C IN. (MM)	D IN. (MM)
ROOF CURB	024-036	CPRFCURB006A00	8 (203)	11 (279)	16-1/2 (419)	28-3/4 (730)
		CPRFCURB007A00	14 (356)	11 (279)	16-1/2 (419)	28-3/4 (730)
	042-060	CPRFCURB008A00	8 (203)	16-3/16 (411)	17-3/8 (441)	40-1/4 (1022)
		CPRFCURB009A00	14 (356)	16-3/16 (411)	17-3/8 (441)	40-1/4 (1022)

NOTES:

1. Roof curb must be set up for unit being installed.
2. Seal strip must be applied, as required, to unit being installed.
3. Roof curb is made of 16-gauge steel.
4. Attach ductwork to curb (flanges of duct rest on curb).
5. Insulated panels: 1-in. (25mm) thick fiberglass 1 lb. (.45 kg) density.

Fig. 4 - Roof Curb Dimensions

Unit*	SMALL CABINET							Unit*	LARGE CABINET					
	024	024	030	030	036	036			042	042	048	048	060	060
	lb	kg	lb	kg	lb	kg			lb	kg	lb	kg	lb	kg
Rigging Weight	319	145	323	147	341	155		Rigging Weight	399	181	433	196	478	217

NOTE: See dimensional drawing for corner weights

Fig. 5 - Rigging Weights

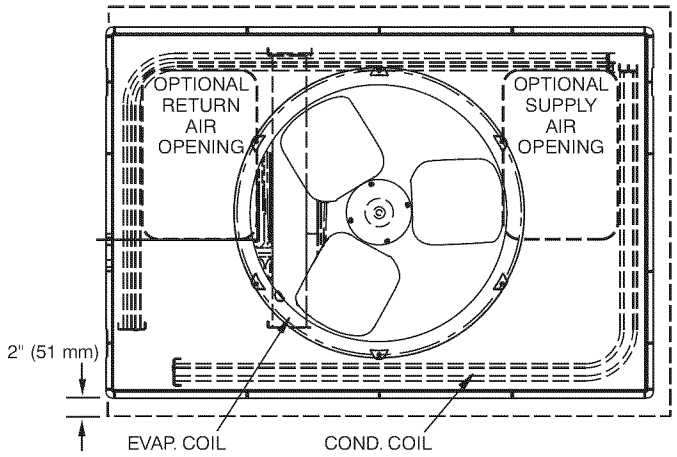

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Fig. 6 - Slab Mounting Details

Step 5 — Rig and Place Unit

Rigging and handling of this equipment can be hazardous for many reasons due to the installation location (roofs, elevated structures, etc.)

Follow all applicable safety codes. Wear safety shoes and work gloves.

⚠ WARNING

UNIT FALLING HAZARD

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

When installing the unit on a rooftop, be sure the roof will support the additional weight.

Never stand beneath rigged units or lift over people.

Only trained, qualified crane operators and ground support staff should handle and install this equipment.

When working with this equipment, observe precautions in the literature, on tags, stickers, and labels attached to the equipment, and any other safety precautions that might apply.

⚠ WARNING

PROPERTY DAMAGE HAZARD

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

Rigging brackets for one unit use only. When removing a unit at the end of its useful life, use a new set of brackets.

Never exceed 200 lb. (91 kg) per bracket lifting force.

INSPECTION

Prior to initial use, and at monthly intervals, all rigging brackets and straps should be visually inspected for any damage, evidence of wear, structural deformation, or cracks. Particular attention should be paid to excessive wear at hoist hooking points and load support areas. Brackets or straps showing any kind of wear in these areas must not be used and should be discarded.

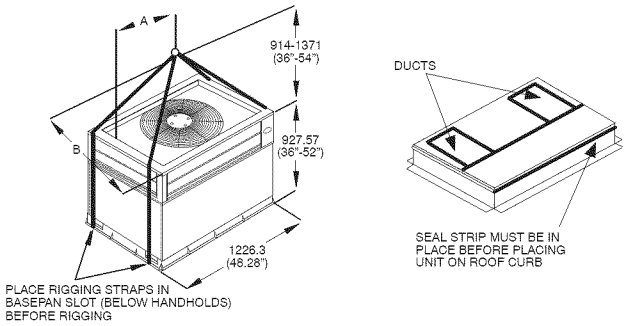

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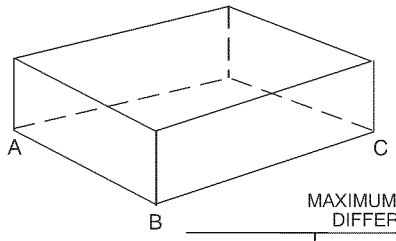
Fig. 7 - Suggested Rigging

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch. Turn off accessory heater power switch if applicable. Tag disconnect switch with a suitable warning label.



MAXIMUM ALLOWABLE DIFFERENCE in. (mm)		
A-B	B-C	A-C
1/4 (6.35)	1/4 (6.35)	1/4 (6.35)

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Fig. 8 - Unit Leveling Tolerances

INSTALLATION

6. Remove unit from shipping carton. Leave top shipping skid on the unit as a spreader bar to prevent the rigging straps fromdamaging the unit. If the wood skid is not available, use a spreader bar of sufficient length to protect unit from damage.
7. Position the lifting bracket assembly around the base of the unit. Be sure the strap does not twist.
8. Place each of the 4 metal lifting brackets into the rigging holds in the composite unit base.
9. Thread lifting bracket strapping around bottom perimeter of unit as follows:
   a. Open lever of tension buckle (ratchet type).
   b. Feed strapping through tension buckle (See Fig. 9).

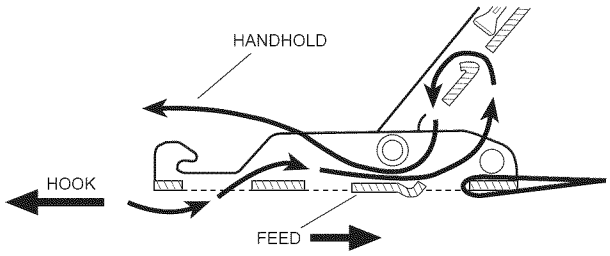

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Fig. 9 - Belt Threading

   c. Pull strapping through tension buckle unit taut.
   d. Snap lever down to lock strap in tension buckle. To release strapping, squeeze safety latch, lift lever, and pull webbing outward.
10. Tighten the tension buckle until it is taut. Lifting brackets must be secure in the rigging holds.
11. Attach field-supplied clevis or hook of sufficient strength to hole in the lifting bracket (See Fig. 10).
12. Attach the 2 safety straps directly to the clevis or hook at the 4 rigging brackets. DO NOT attach the safety straps to the lifting brackets (See Fig. 10).
13. Position lifting point directly over the unit's center of gravity.

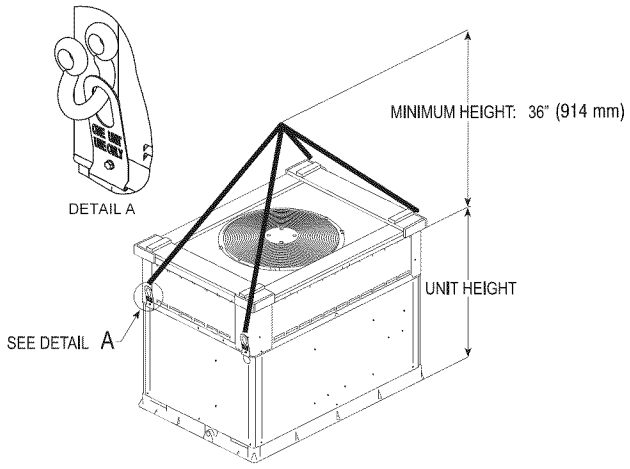

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Fig. 10 - Lifting Point

14. Lift unit. When unit is directly over the roof curb, remove the 2 safety straps. Lower the equipment onto the roof curb.

⚠ WARNING

PROPERTY DAMAGE HAZARD

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

Rigging bracket MUST be under the rain lip to provide adequate lifting.

⚠ WARNING

PROPERTY DAMAGE HAZARD

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

Do not strip screws when re-securing the unit. If a screw is stripped, replace the stripped one with a larger diameter screw (included).

⚠ WARNING

UNIT FALLING HAZARD

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

When straps are taut, the clevis should be a minimum of 36 in. (914 mm) above the unit top cover.

Table 1 – Physical Data - Unit 50XP

UNIT SIZE	024	030	036	042	048	060
NOMINAL CAPACITY (ton)	2	2–1/2	3	3–1/2	4	5
SHIPPING WEIGHT (lb)	356	360	378	436	470	515
SHIPPING WEIGHT (kg)	161	163	171	198	213	234
COMPRESSORS	Scroll					
Quantity	1					
REFRIGERANT (R–410A)						
Quantity (lb.)	7.3	8.0	9.5	10.7	11.25	13.2
Quantity (kg)	3.3	3.6	4.3	4.9	5.1	6.0
REFRIGERANT METERING DEVICE	TXV					
OUTDOOR COIL						
Rows...Fins/in.	2...21	2...21	2...21	2...21	2...21	2...21
Face Area (sq ft)	11.95	12.0	13.6	15.4	17.4	19.3
OUTDOOR FAN						
Nominal Cfm	2350	2700	2350	2800	3300	3300
Diameter (in.)	22	22	22	22	22	22
Diameter (mm)	558.8	558.8	558.8	558.8	558.8	558.8
Motor Hp (Rpm)	1/8 (825)	1/8 (825)	1/8 (825)	1/8 (825)	1/4 (1100)	1/4 (1100)
INDOOR COIL						
Rows...Fins/in.	3...15	3...15	4...15	3...15	4...15	4...17
Face Area (sq ft)	3.7	3.7	3.7	4.7	4.7	5.7
INDOOR BLOWER						
Nominal Cooling Airflow (Cfm)	800	1000	1100	1400	1400	1750
Size (in.)	10x10	10x10	11x10	11x10	11x10	11x10
Size (mm.)	254x254	254x254	279.4x254	279.4x254	279.4x254	279.4x254
Motor HP (RPM)	1/2 (1050)	1/2 (1050)	3/4 (1000)	3/4 (1075)	3/4 (1075)	1.0 (1040)
HIGH–PRESSURE SWITCH (psig) Cut–out Reset (Auto)	650 +/– 15 420 +/– 25					
LOSS–OF–CHARGE / LOW–PRESSURE SWITCH (Liquid Line) (psig) cut–out Reset (auto)	20 +/– 5 45 +/– 10					
RETURN–AIR FILTERS†‡						
Throwaway Size (in.)	20x20x1		20x24x1	24x30x1		
Throwaway Size (mm)	508x508x25		508x610x25	610x762x25		

† Required filter sizes shown are based on the larger of the ARI (Air Conditioning and Refrigeration Institute) rated cooling airflow or the heating airflow velocity of 300 ft/minute for throwaway type or 450 ft/minute for high–capacity type. Air filter pressure drop for non–standard filters must not exceed 0.08 IN. W.C..

‡ If using accessory filter rack refer to the filter rack installation instructions for correct filter sizes and quantity.

Step 6 — Connect Condensate Drain

NOTE: When installing condensate drain connection be sure to comply with local codes and restrictions.

Model 50XP disposes of condensate water through a 3/4 in. NPT fitting which exits through the base on the evaporator coil access side (See Fig. 2 and 3 for location).

Condensate water can be drained directly onto the roof in rooftop installations (where permitted) or onto a gravel apron in groundlevel installations. Install a field-supplied condensate trap at end of condensate connection to ensure proper drainage. Make sure that the outlet of the trap is at least 1 in. (25 mm) lower than the drainpan condensate connection to prevent the pan from overflowing (See Fig. 11). When using a gravel apron, make sure it slopes away from the unit.

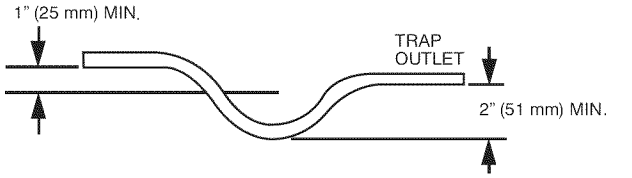


Fig. 11 - Condensate Trap

Connect a drain tube using a minimum of 3/4 -in. PVC or 3/4 -in. copper pipe (all field-supplied) at the outlet end of the 2-in. (51 mm) trap. Do not undersize the tube. Pitch the drain tube downward at a slope of at least 1-in. (25 mm) for every 10ft (3 m) of horizontal run. Be sure to check the drain tube for leaks. Prime trap at the beginning of the cooling season start-up.

Table 2 – Minimum Airflow for Safe Electric Heater Operation (Cfm)

SIZE					
024	030	036	042	048	060
800	1000	1200	1400	1600	2000

Step 7 — Install Duct Connections

The unit has duct flanges on the supply- and return-air openings on the side and bottom of the unit. For downshot applications, the ductwork can be connected to the roof curb (See Fig. 2 and 3 for connection sizes and locations).

IMPORTANT: Use flexible connectors between ductwork and unit to prevent transmission of vibration. Use suitable gaskets to ensure weathertight and airtight seal. When electric heat is installed, use fire proof canvas (or similar heat resistant material) connector between ductwork and unit discharge connection. If flexible duct is used, insert a sheet metal sleeve inside duct. Heat resistant duct connector (or sheet metal sleeve) must extend 24-in. (610 mm) from the unit discharge connection flange into the ductwork.

CONFIGURING UNITS FOR DOWNFLOW(VERTICAL) DISCHARGE

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch. Turn off accessory heater power switch if applicable. Tag disconnect switch with a suitable warning label.

1. Open all electrical disconnects before starting any service work.
2. Remove side duct covers to access bottom return and supply knock out covers (See Fig. 13).
3. To remove supply and return duct covers, use screwdriver and a hammer.
4. If unit ductwork is to be attached to vertical opening flanges on the unit base (jackstand applications only), do so at this time. Collect ALL screws that were removed. Do not leave screws on rooftop as permanent damage to the roof may occur.

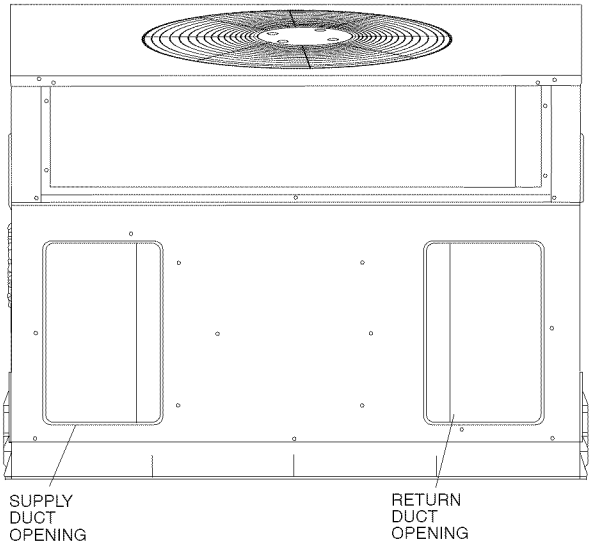


Fig. 12 - Supply and Return Duct Opening

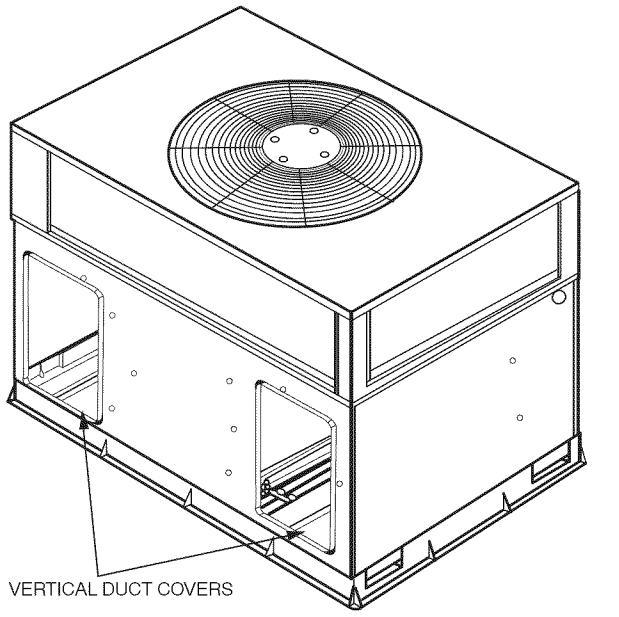


Fig. 13 - Vertical Duct Cover Removed

5. It is recommended that the unit base insulation around the perimeter of the vertical return-air opening be secured to the unit base with aluminum tape. Applicable local codes may require aluminum tape to prevent exposed fiberglass.
6. Cover both horizontal duct openings with the duct covers shipped on the unit from the factory. Ensure opening is air-and watertight.
7. After completing unit conversion, perform all safety checks and power up unit.

NOTE: The design and installation of the duct system must be in accordance with the standards of the NFPA for installation of nonresidence-type air conditioning and ventilating systems, NFPA 90A or residence-type, NFPA 90B; and/or local codes and ordinances.

8. Select and size ductwork, supply-air registers, and return-air grilles according to American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) recommendations.
9. Use flexible transition between rigid ductwork and unit to prevent transmission of vibration. The transition may be screwed or bolted to duct flanges. Use suitable gaskets to ensure weathertight and airtight seal.
10. All units must have field-supplied filters or accessory filter rack installed in the return-air side of the unit. Recommended sizes for filters are shown in Table 1.
11. Size all ductwork for maximum required airflow (either heating or cooling) for unit being installed. Avoid abrupt duct size increases or decreases or performance may be affected.
12. Adequately insulate and weatherproof all ductwork located outdoors. Insulate ducts passing through unconditioned space, and use vapor barrier in accordance with latest issue of Sheet Metal and Air Conditioning Contractors National Association (SMACNA) and Air Conditioning Contractors of America (ACCA) minimum installation standards for heating and air conditioning systems. Secure all ducts to building structure.
13. Flash, weatherproof, and vibration-isolate all openings in building structure in accordance with local codes and good building practices.

Step 8 — Install Electrical Connection

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

The unit cabinet must have an uninterrupted, unbroken electrical ground. This ground may consist of an electrical wire connected to the unit ground screw in the control compartment, or conduit approved for electrical ground when installed in accordance with NEC, ANSI/NFPA 70 American National Standards Institute/National Fire Protection Association (latest edition) (in Canada, Canadian Electrical Code CSA C22.1) and local electrical codes.

⚠ CAUTION

UNIT COMPONENT DAMAGE HAZARD

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

1. Make all electrical connections in accordance with NEC ANSI/NFPA 70 (latest edition) and local electrical codes governing such wiring. In Canada, all electrical connections must be in accordance with CSA standard C22.1 Canadian Electrical Code Part 1 and applicable local codes. Refer to unit wiring diagram.
2. Use only copper conductor for connections between field-supplied electrical disconnect switch and unit. DO NOT USE ALUMINUM WIRE.
3. Be sure that high-voltage power to unit is within operating voltage range indicated on unit rating plate.
4. Insulate low-voltage wires for highest voltage contained within conduit when low-voltage control wires are in same conduit as high-voltage wires.
5. Do not damage internal components when drilling through any panel to mount electrical hardware, conduit, etc.

HIGH-VOLTAGE CONNECTIONS

The unit must have a separate electrical service with a field supplied, waterproof, disconnect switch mounted at, or within sight from, the unit. Refer to the unit rating plate for maximum fuse/circuit breaker size and minimum circuit amps (ampacity) for wire sizing.

The field-supplied disconnect switch box may be mounted on the unit over the high-voltage inlet hole when the standard power and low-voltage entry points are used (See Fig. 2 and 3 for acceptable location).

See unit wiring label and Fig. 14 for reference when making high voltage connections. Proceed as follows to complete the connections to the unit.

Single phase units:

1. Run the high-voltage (L1, L2) and ground leads into the control box.
2. Connect ground lead to chassis ground connection.

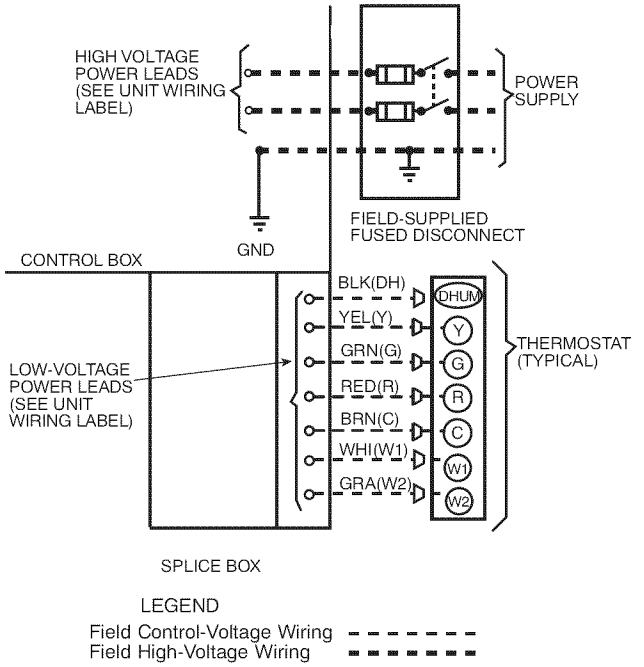


Fig. 14 - High- and Control-Voltage Connections

3. Connect L1 to pressure lug connection 11 of the compressor contactor.
4. Connect L2 to pressure lug connection 23 of the compressor contactor.

Three phase units:

1. Run the high-voltage (L1, L2, L3) and ground leads into the control box.
2. Connect ground lead to chassis ground connection.
3. Locate the black and yellow wires connected to the lines side of the contactor.
4. Connect field L1 to black wire on connection 11 of the compressor contactor.
5. Connect field wire L2 to yellow wire on connection 13 of the compressor contactor.
6. Connect field wire L3 to Blue wire from compressor.

SPECIAL PROCEDURES FOR 208-V OPERATION

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Before installing or servicing system, always turn off main power to system. With disconnect switch open, move yellow wire from transformer (3/16 in.) terminal marked 230 to terminal marked 208. This retaps transformer to primary voltage of 208 vac.

CONTROL VOLTAGE CONNECTIONS

NOTE: Do not use any type of power-stealing thermostat. Unit control problems may result.

Use no. 18 American Wire Gage (AWG) color-coded, insulated (35 C minimum) wires to make the control voltage connections between the thermostat and the unit. If the thermostat is located more than 100 ft (30 m) from the unit (as measured along the control voltage wires), use no. 16 AWG color-coded, insulated (35 C minimum) wires.

EASY SELECT™ - 50XP EASY SELECT CONFIGURATION TAPS FOR 50XP

Easy Select taps are used by the installer to configure a system. The ECM motor uses the selected taps to modify its operation to a pre-programmed table of airflows.

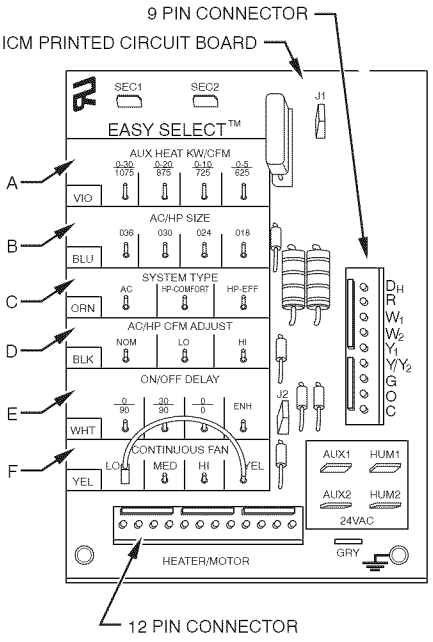
The unit must be configured to operate properly with system components with which it is installed. To successfully configure a basic system (see information printed on circuit board label located next to select pins), move the 6 select wires to the pins which match the components used.

a. AUX HEAT kW/CFM-SELECT HEATER RANGE FOR SIZE OF ELECTRIC HEATER INSTALLED
Installer must select the auxiliary heat airflow approved for application with kW size heater installed. If no heater is installed, this step can be skipped. Each select pin is marked with a range of heaters for which airflow (also marked), is approved. For increased comfort, select the narrowest kW range matching the heater size, for example, 0-10 for 10-kW heater. This airflow must be greater than the minimum for CFM for electric heater application with the size system installed for safe and continuous operation. (See Tables 2 & 4-6 for airflow delivery and minimum CFM.) Note that airflow marked is the airflow which will be supplied in emergency heat mode and heating mode on air conditioners when electric heat is the primary heating source. In heat pump heating mode when electric heaters are energized, the ECM will run the higher of heat pump heating airflow and electric heater airflow to ensure safe heater operation. The factory selection is the largest heater range approved (See Fig. 15, A as indicated).

b. AC/HP SIZE- SELECT SYSTEM SIZE INSTALLED
The factory setting for air conditioner or heat pump size is the size which matches the model of packaged unit installed. Installer should verify air conditioner size to ensure that airflow delivered falls within proper range for the size unit installed. This applies to all operational modes with the exception of electric heat modes (See Fig. 15, B as indicated).

c. SYSTEM TYPE-SELECT SYSTEM TYPE INSTALLED
The type of system will be factory selected (see below for details):
(1.) AC-Air conditioner (Factory Selected for 50XP)

d. AC/HP CFM ADJUST—SELECT NOMINAL, LOW, OR HIGH AIRFLOW
The AC/HP CFM Adjust select is factory set to the High-Hi (NOM for 060) tap. The CFM Adjust selections NOM/LO will regulate airflow supplied for all operational modes, except non-heat pump heating modes. HI provides 15 percent airflow over nominal unit size selected and LO provides 10 percent airflow below nominal unit size selected. CFM Adjust selection options are provided to adjust airflow supplied to meet individual installation needs for such things as noise, comfort, and humidity removal (See Fig. 15, D as indicated).



C01033

Fig. 15 - Detail of SPP Printed-Circuit Board

e. ON/OFF DELAY- SELECT DESIRED TIME DELAY PROFILE
Four motor operation delay profiles are provided to customize and enhance system operation (See Fig. 15, E as indicated).
Selection options are:
(1.) The standard 90 sec off delay (Factory Setting) at 100 percent airflow in cooling mode.
(2.) A 30 sec cooling delay with no airflow/90 sec off delay at 100 percent airflow profile is used when it is desirable to allow system coils time to heat-up/cooldown in conjunction with the airflow in cooling mode.
(3.) A no delay option used for servicing unit or when a thermostat is utilized to perform delay functions.
(4.) ENH, enhanced selection, provides a 30 sec cooling on delay with no airflow/ plus 150 sec at 70 percent airflow/ no off delay for added comfort.

f. CONTINUOUS FAN-SELECT DESIRED FAN SPEED WHEN THERMOSTAT IS SET ON CONTINUOUS FAN
(1.) LO speed-Factory setting, 50 percent cooling mode airflow.
(2.) MED speed-Move connector to MED, 65 percent cooling mode airflow.
(3.) HI speed-Move connector to HI, 100 percent cooling mode airflow (See Fig. 15, F as indicated).

g. LOW-VOLTAGE CIRCUIT FUSING AND REFERENCE
The low-voltage circuit is fused by a board-mounted 5-amp automotive fuse placed in series with the transformer SEC2 and the R circuit. The C circuit of the transformer is referenced to chassis ground through a printed circuit run at SEC1 connected to metal standoff marked with ground symbol.

h. BASIC UNIT CONFIGURATION
The following basic configuration of the indoor motor will provide ARI rated performance of the System. This BASIC CONFIGURATION should be used when the rated ARI performance is required, or if system enhancements such as super dehumidify are not needed.
(1.) AUX HEAT kW/CFM-Select the heater range for the size of electric heater installed (skip this step if no heater is installed).

(2.) AC/HP SIZE-Factory selected to match system size installed, please verify.
(3.) SYSTEM TYPE-Factory selected AC (50XP).
(4.) AC/HP CFM ADJUST-Select HIGH for 042 & 048, NOM for 036 & 060, and LO for 024 & 030.
(5.) ON/OFF DELAY-Select 0/90 profile.
(6.) CONTINUOUS FAN-Select desired fan speed when thermostat is set to continuous fan.

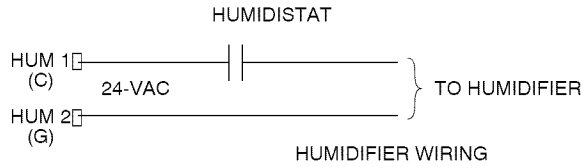
i. COMFORT OPTIONS-SUPER DEHUMIDIFY (See Quick Reference Guide)
The Super Dehumidify option is possible when this unit is installed with a field supplied Thermidistat™ control (Super Dehumidify does not require an outdoor temperature sensor). The following configuration is recommended for maximum cooling/dehumidifying comfort: This configuration will improve the comfort provided by the air conditioning system if more humidity removal is desired. While providing this improved comfort, the system will operate efficiently, but not at the published HSPF or ARI SEER efficiency.
The following system configuration is recommended for maximum heating and cooling/dehumidifying comfort (See Fig. 15).
(1.) AUX HEAT kW/CFM-Select the narrowest heater range to match size of electric heater installed (skip this step if no heater is installed).
(2.) AC/HP Size-Factory selected to match system size installed, please verify AC selection.
(3.) SYSTEM TYPE-Select AC (for air conditioner system).
(4.) AC/HP CFM ADJUST-Select NOM (Lo for 060).
(5.) ON/OFF DELAY-Select ENH profile.
(6.) CONTINUOUS FAN-Select desired fan speed when thermostat is set to continuous fan.
(7.) DEHUMIDIFY MODE-Remove J1 jumper to activate.
(8.) LOW VOLTAGE CONNECTIONS-Make connections as shown in ELECTRICAL CONNECTIONS section.
(9.) CONFIGURE THERMIDISTAT™ (or capable zoning system)-Following its installation instructions for Super Dehumidify and Super Comfort Heat operation. This configuration provides the following comfort enhancements:
(a.) A 30 sec blower on delay with 150 sec at 70 percent airflow to allow the indoor coil to warm up or cool down before the blower is asked to deliver 100 percent airflow reducing the cold blow sensation at start up in heating and allowing the indoor coil to more quickly reach wet coil operating conditions in cooling.
(b.) A no blower off delay eliminates cold blow which may be associated with running the blower after shut down of the compressor and avoids reevaporation of condensed moisture after cooling/dehumidifying operation.
(c.) Lower airflow while the compressor is running to reduce draft effects and increase heating air temperature and improved humidity control during cooling operation.

ACCESSORY INSTALLATION

a. ACCESSORY ELECTRIC HEATERS
Electric heaters may be installed with the 50XP units per instructions supplied with electric heater package. See unit rating plate for factory-approved electric heater kits.

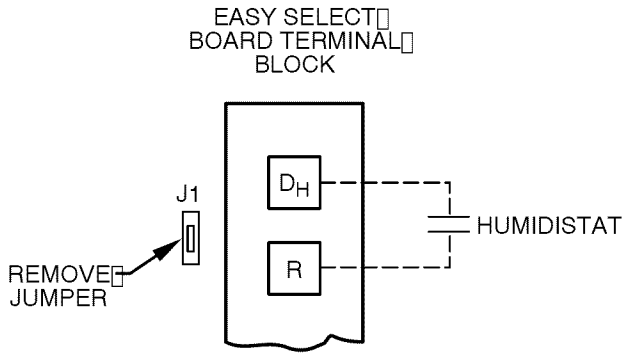
b. AUXILIARY TERMINALS
The AUX and HUM terminals on the Easy Select Board are tied directly to the G terminal, and provide a 24-v. signal whenever the G terminal is energized (See Fig. 15). During Super dehumidify mode, the G signal is not present and the auxiliary terminals are not energized. If the installation includes the use of the operating mode, do not use these terminals to control accessories. See Electronic Air Cleaner and Humidifier sections for further information.

c. ELECTRONIC AIR CLEANER CONNECTIONS The AUX1 and AUX2 terminals are not always energized during blower operations, as described above. When using an electronic air cleaner with the unit, use Airflow Sensor (See Air Cleaner Price Pages for Part Number). The airflow sensor turns on electronic air cleaner when the blower is operating.



A95317

Fig. 16 - Humidifier Wiring for 50XP



A95316

Fig. 17 - Humidistat Wiring for De-Humidify Mode for 50XP

d. HUMIDIFIER/HUMIDISTAT CONNECTIONS Easy Select Board terminals HUM1 and HUM2 are provided for direct connection to the low-voltage control of a humidifier through a standard humidistat (See Fig. 15). These terminals are energized with 24-v. when G thermostat signal is present. (See Fig. 15, 16 & 17). Alternately, the 24-v. signal may be sourced from the W and C circuit board connections. When using a Thermidistat Control, Zone Comfort Plus or Comfort Zone II, the 24-v. signal may be sourced directly from the Thermidistat HUM terminal.

e. DEHUMIDIFY CAPABILITY WITH STANDARD HUMIDISTAT CONNECTION
Latent capacities for these units are better than average systems. If increased latent capacity is an application requirement, the circuit board provides connection terminals for use of a standard humidistat. The unit will detect the humidistat contacts opening on increasing humidity and reduce its airflow to approximately 80 percent of nominal
cooling mode airflow. This reduction will increase the system latent capacity until the humidity falls to a level which causes the humidistat to close its contacts. When the contacts close, the airflow will return to 100 percent of selected cooling airflow. To activate this mode, remove jumper J1 and wire in a standard humidistat (See Fig. 15).

f. DEHUMIDIFY AND SUPER DEHUMIDIFY CAPABILITIES
These models are capable of responding to a signal from indoor system control (thermostat, Thermidistat, zoning

control) to operate in comfort control modes such as Super Dehumidify Mode. Consult literature provided with indoor system control to determine if these operating modes are available, and to see control set up instructions. No special setup or wiring of unit is required.

STANDARD CONNECTION

Locate the seven low voltage thermostat leads in 24 volt splice box. See Fig. 14 for connection diagram. Run the low-voltage leads from the thermostat, through the control wiring inlet hole grommet (Fig. 2 and 3), and into the low-voltage splice box. Provide a drip loop before running wires through panel. Secure and strain relief all wires so that they do not interfere with operation of unit.

If an accessory electric heater is installed, low voltage leads from heater must be connected to factory supplied control leads from Indoor Fan Board. Factory wires are provided for electric heat staging W1 and W2. If room thermostat has only one stage of supplemental heat, connect white and gray wires shown in Fig. 14 to second stage heat field wire. Some electric heaters have four control wires (plus common wire). Consult unit wiring diagram and electric heater wiring diagram for additional details.

TRANSFORMER PROTECTION

The transformer is of the energy-limiting type. It is set to withstand a 30-second overload or shorted secondary condition.

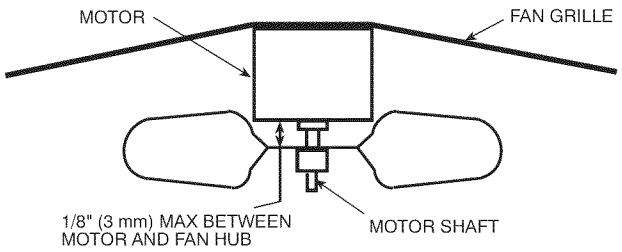


Fig. 18 - Fan Blade Clearance

PRE-START-UP

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL SHOCK HAZARD

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

1. Follow recognized safety practices and wear protective goggles when checking or servicing refrigerant 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 tagged.
4. Relieve and recover all refrigerant from system before touching or disturbing anything inside terminal box if refrigerant leak is suspected around compressor terminals.
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.
7. To remove a component, wear protective goggles and proceed as follows:
   a. Shut off electrical power to unit and install lockout tag.
   b. Relieve and reclaim all refrigerant from system using both high- and low-pressure ports.
   c. Cut component connecting tubing with tubing cutter and remove component from unit.
   d. Carefully unsweat remaining tubing stubs when necessary. Oil can ignite when exposed to flame.

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

1. Remove access panel.
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, disconnected wires, etc.
   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. If a refrigerant leak is detected, see Check for Refrigerant Leaks section under Start-Up.
   c. c. Inspect all field- and factory-wiring connections. Be sure that connections are completed and tight.
   d. d. Inspect coil fins. If damaged during shipping and handling, carefully straighten fins with a fin comb.

   Verify the following conditions:
   a. Make sure that condenser-fan blade is correctly positioned in fan orifice. Leading edge of condenser-fan blade should be 1/2 in. (13 mm) maximum from fan orifice (see Fig. 18).
   b. Make sure that air filter(s) is 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.

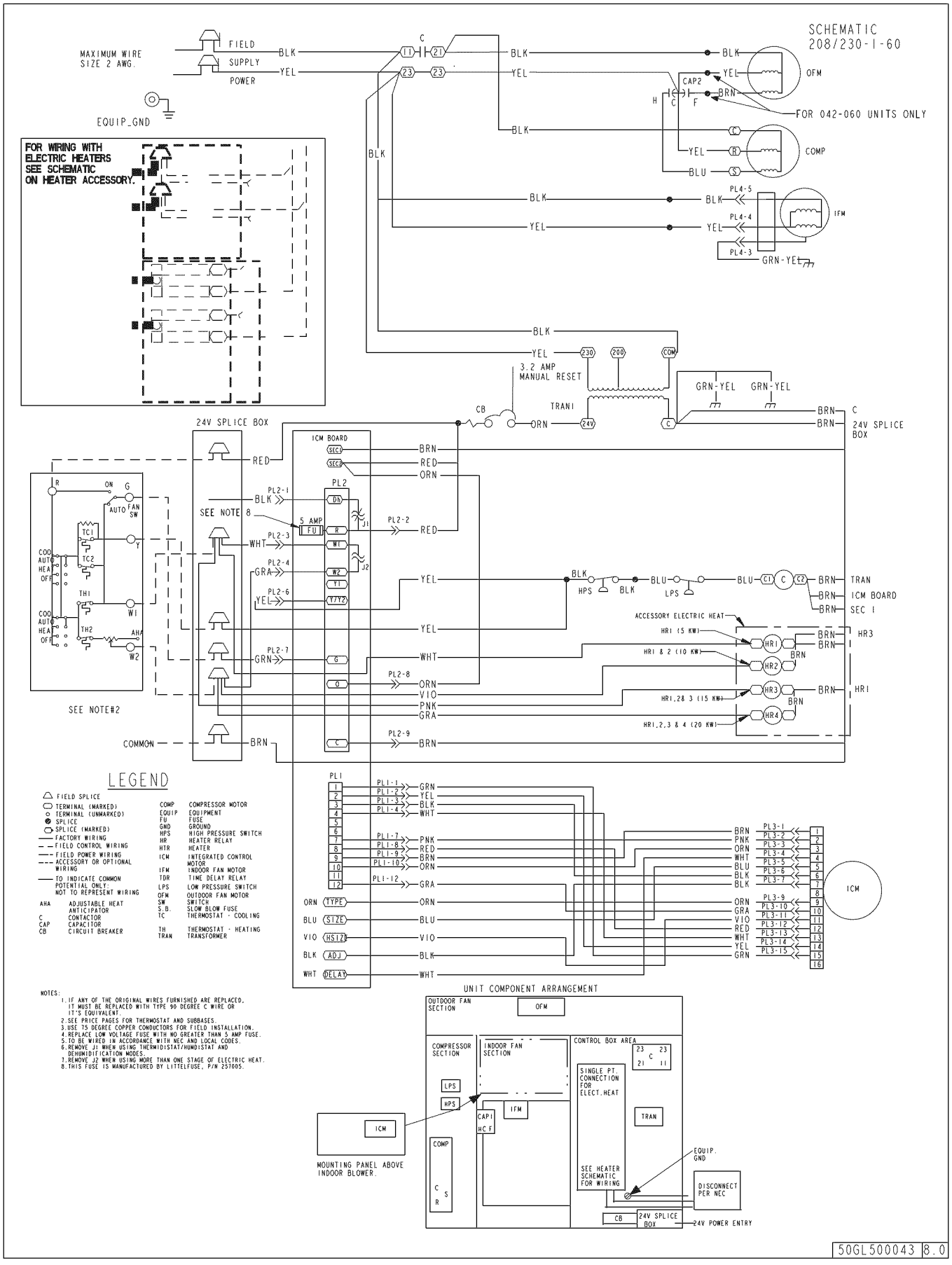


Fig. 19 - Wiring Diagram 208/230 Single Phase

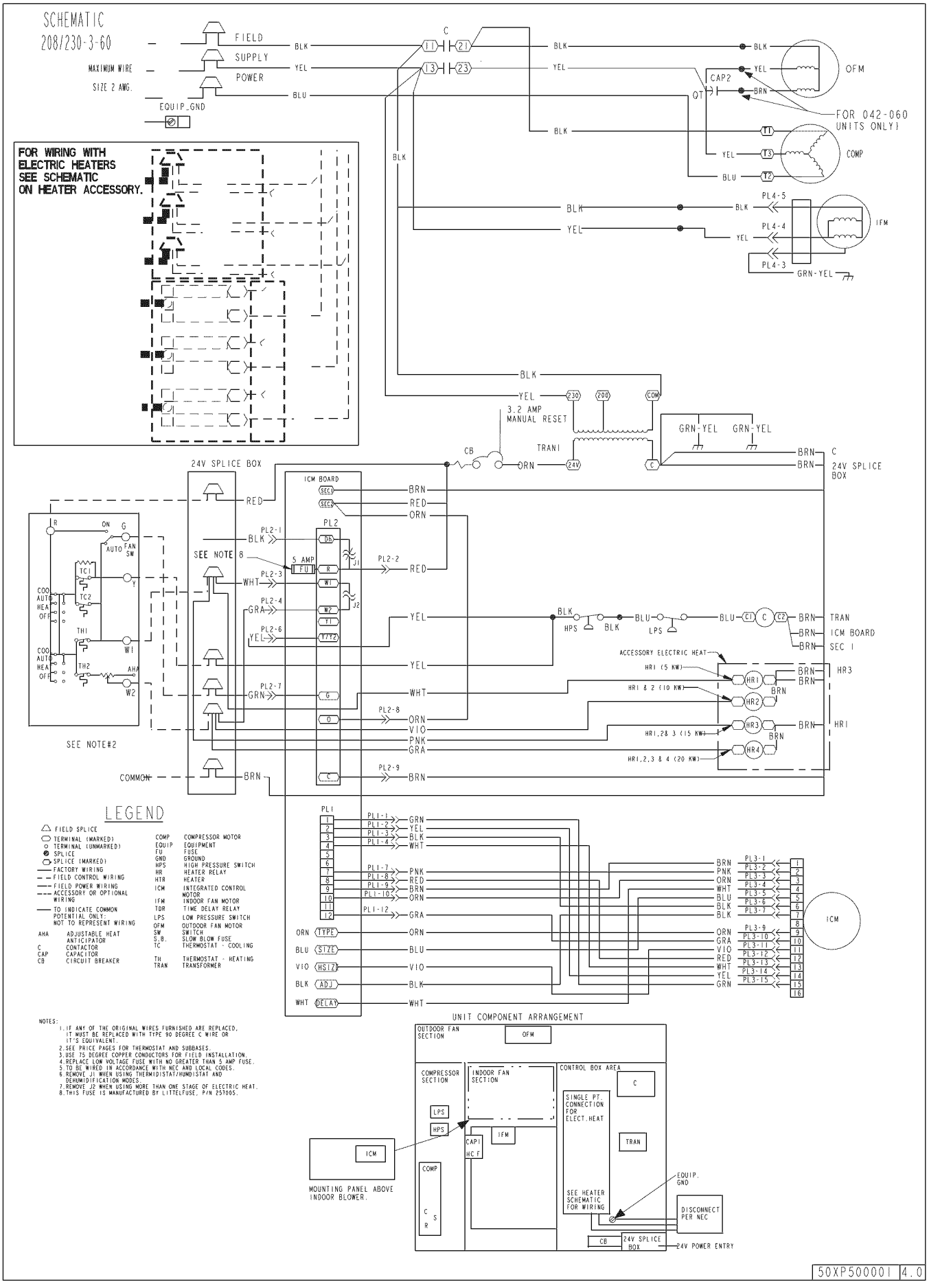


Fig. 20 - Wiring Diagram 208/230 Three Phase

START-UP

CHECK FOR REFRIGERANT LEAKS

Proceed as follows to locate and repair a refrigerant leak and to charge the unit:

1. Locate leak and make sure that refrigerant system pressure has been relieved and reclaimed from both high- and low-pressure ports.
2. Repair leak following accepted practices.

NOTE: Replace filter drier whenever the system has been opened for repair.

3. Charge unit with R-410A refrigerant, using a volumetriccharging cylinder or accurate scale. Refer to unit rating plate for required charge.

START UP COOLING SECTION AND MAKE ADJUSTMENTS

⚠ CAUTION

UNIT COMPONENT DAMAGE HAZARD

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

Complete the required procedures given in the Pre-Start-Up section before starting the unit. Do not jumper any safety devices when operating the unit. Do not operate the compressor when the outdoor temperature is below 55°F (13°C) (unless accessory low-ambient kit is installed). Do not rapid-cycle the compressor. To prevent compressor damage allow 5 minutes between "on" cycles.

50XP: START-UP

IMPORTANT: Three-phase, scroll compressor units are direction-oriented. These units must be checked to ensure proper compressor 3-phase power lead orientation. If not corrected within 5 minutes, the internal protector shuts off the compressor. The 3-phase power leads to the unit must be reversed to correct rotation. When turning backwards, scroll compressors emit elevated noise levels, and the difference between compressor suction and discharge pressures may be zero.

CHECKING COOLING CONTROL OPERATION

Start and check the unit for proper cooling control operation as follows:

1. Place room thermostat SYSTEM switch in OFF position. Observe that blower motor starts when FAN switch is placed in ON position and shuts down when FAN switch is placed in AUTO position.
2. Place SYSTEM switch in COOL position and FAN switch in AUTO position. Set cooling control below room temperature. Observe that compressor, condenser fan, and evaporator blower motors start. Observe that cooling cycle shuts down when control setting is satisfied. The evaporator fan will continue to run for the selected off delay.
3. When using an auto-changeover room thermostat, place both SYSTEM and FAN switches in AUTO positions. Observe that unit operates in heating mode when temperature control is set to "call for heating" (above room temperature) and operates in cooling mode when temperature control is set to "call for cooling" (below room temperature).

NOTE: Once the compressor has started and then has stopped, it will not start again until 5 minutes have elapsed. (The cooling cycle remains "on" until the room temperature drops to point that is slightly below the cooling control setting of the room thermostat. At this point, the thermostat "breaks" the circuit between thermostat terminal R to terminals Y and G.) These open circuits de-energize contactor coil C and ECM board. The condenser and compressor motors stop. After the time delay setting selected on the Easy Select board (See Easy Select Section) , the blower motor stops. The unit is in a "standby" condition, waiting for the next "call for cooling" from the room thermostat.

CHECKING AND ADJUSTING REFRIGERANT CHARGE

The refrigerant system is fully charged with R-410A refrigerant, tested, and factory-sealed.

⚠ CAUTION

UNIT OPERATION AND SAFETY HAZARD

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

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

NOTE: Adjustment of the refrigerant charge is not required unless the unit is suspected of not having the proper R-410A charge. The charging label and the tables shown refer to system temperatures and pressures.

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

Refrigerant charge

The amount of refrigerant charge is listed on the unit nameplate. Refer to the Refrigeration Service Techniques Manual, Refrigerants section.

Unit panels must be in place when unit is operating during charging procedures.

No charge

Check for leak. Use standard evacuating techniques. After evacuating system, weigh in the specified amount of refrigerant (refer to system data plate).

Low charge cooling

Use Cooling Charging Chart (Fig. 21). Vary refrigerant until the conditions of the chart are met. Note that charging charts are different from type normally used. Charts are based on charging the units to correct subcooling for the various operating conditions. Accurate pressure gauge and temperature sensing devices are required. Connect the pressure gauge to the service port on the suction line. Mount the temperature sensing device on the suction line and insulate it so that the outdoor ambient does not affect the reading. Indoor air CFM must be within the normal operating range of the unit.

To use cooling charging charts

Take the liquid line temperature and read the manifold pressure gauges. Refer to the chart to determine what the liquid line temperature should be.

NOTE: If the problem causing the inaccurate readings is a refrigerant leak, refer to Check for Refrigerant Leaks section.

Required Subcooling oF (oC)						Required Liquid Line Temperature for a Specific Subcooling (R-410A)											
Model Size	Outdoor Ambient Temperature						Required Subcooling (°F)						Required Subcooling (°C)				
	75 (24)	82 (28)	85 (29)	95 (35)	105 (41)	Pressure (psig)	5	10	15	20	25	Pressure (kPa)	3	6	8	11	14
024	10.3 (5.7)	9.8 (5.4)	9.4 (5.2)	9 (5)	8.6 (4.7)	189	61	56	51	46	41	1303	16	13	11	8	5
030	9.3 (5.2)	8.8 (4.9)	8.6 (4.8)	7.8 (4.3)	7 (3.9)	196	63	58	53	48	43	1351	17	15	12	9	6
036	17.6 (9.8)	16.8 (9.3)	16.5 (9.2)	15.4 (8.6)	14.3 (7.9)	203	66	61	56	51	46	1399	19	16	13	10	8
042	12.8 (7.1)	12.7 (7.1)	12.7 (7.1)	12.6 (7)	12.6 (7)	210	68	63	58	53	48	1448	20	17	14	11	9
048	17.5 (9.7)	16.9 (9.4)	16.6 (9.2)	15.7 (8.7)	14.8 (8.2)	217	70	65	60	55	50	1496	21	18	15	13	10
060	13.7 (7.6)	13 (7.2)	13 (7.2)	14.5 (8.1)	11.5 (6.4)	224	72	67	62	57	52	1544	22	19	16	14	11
						231	74	69	64	59	54	1593	23	20	18	15	12
						238	76	71	66	61	56	1641	24	21	19	16	13
						245	77	72	67	62	57	1689	25	22	20	17	14
						252	79	74	69	64	59	1737	26	23	21	18	15
						260	81	76	71	66	61	1792	27	25	22	19	16
						268	83	78	73	68	63	1848	29	26	23	20	17
						276	85	80	75	70	65	1903	30	27	24	21	19
						284	87	82	77	72	67	1958	31	28	25	22	20
						292	89	84	79	74	69	2013	32	29	26	23	21
						300	91	86	81	76	71	2068	33	30	27	24	22
						309	93	88	83	78	73	2130	34	31	28	26	23
						318	95	90	85	80	75	2192	35	32	29	27	24
						327	97	92	87	82	77	2254	36	33	31	28	25
						336	99	94	89	84	79	2316	37	34	32	29	26
						345	101	96	91	86	81	2378	38	35	33	30	27
						354	103	98	93	88	83	2440	39	36	34	31	28
						364	105	100	95	90	85	2509	40	38	35	32	29
						374	107	102	97	92	87	2578	41	39	36	33	30
						384	108	103	98	93	88	2647	42	40	37	34	31
						394	110	105	100	95	90	2716	44	41	38	35	32
						404	112	107	102	97	92	2785	45	42	39	36	33
						414	114	109	104	99	94	2854	46	43	40	37	34
						424	116	111	106	101	96	2923	47	44	41	38	35
						434	118	113	108	103	98	2992	48	45	42	39	36
						444	119	114	109	104	99	3061	48	46	43	40	37
						454	121	116	111	106	101	3130	49	47	44	41	38
						464	123	118	113	108	103	3199	50	48	45	42	39
						474	124	119	114	109	104	3268	51	48	46	43	40
						484	126	121	116	111	106	3337	52	49	47	44	41
						494	127	122	117	112	107	3406	53	50	47	45	42
						504	129	124	119	114	109	3475	54	51	48	46	43
						514	131	126	121	116	111	3544	55	52	49	46	44
						524	132	127	122	117	112	3612	56	53	50	47	45
						534	134	129	124	119	114	3681	56	54	51	48	45

Charging Procedure

1- Measure Discharge line pressure by attaching a gauge to the service port.

2- Measure the Liquid line temperature by attaching a temperature sensing device to it.

3- Insulate the temperature sensing device so that the Outdoor Ambient doesn't affect the reading.

4- Refer to the required Subcooling in the table based on the model size and the Outdoor Ambient temperature.

5- Interpolate if the Outdoor ambient temperature lies in between the table values. Extrapolate if the temperature lies beyond the table range.

6- Find the Pressure Value in the table corresponding to the the measured Pressure of the Compressor Discharge line.

7- Read across from the Pressure reading to obtain the Liquid line temperature for a required Subcooling

8- Add Charge if the measured temperature is higher than the table value.

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Fig. 21 - Cooling Charging Table-Subcooling

INDOOR AIRFLOW AND AIRFLOW ADJUSTMENTS

NOTE: For cooling operation, the recommended airflow is 350 to 450 cfm for each 12,000 Btuh of rated cooling capacity.

Table 3 & 4 show cooling airflows at various external static pressures. Refer to these tables to determine the airflow for the system being installed.

NOTE: Be sure that all supply- and return-air grilles are open, free from obstructions, and adjusted properly.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Disconnect electrical power to the unit before changing blower speed.

Airflow can be changed by changing the selection pins. To change the speed of the blower motor (BM), change pin selection on the Easy Select Board.

50XP SEQUENCE OF OPERATION

a. CONTINUOUS FAN

1. Thermostat closes circuit R to G-The Blower runs at continuous fan airflow.

b. COOLING MODE-LOW HUMIDITY

2. If indoor temperature is above temperature set point and humidity is below humidity set point, thermostat closes circuits R to G, R to Y/Y2 and R to O-The unit delivers cooling airflow.

c. COOLING MODE-DEHUMIDIFICATION

1. If indoor temperature is above temperature set point and humidity is above humidity set point, thermostat or Thermidistat closes circuits R to G, R to O, and R to Y/Y2 and humidistat or Thermidistat opens R to DH-The unit delivers airflow which is approximately 80 percent of the nominal cooling airflow to increase the latent capacity of the system.

d. COOLING MODE-SUPER DEHUMIDIFY OPERATION

(see quick reference guide)

NOTE: The indoor control used, such as a Thermidistat, must be capable of providing Super Dehumidify operation mode and control must be configured as outlined in its installation instructions. Consult indoor control literature to determine if control is capable of providing Super Dehumidify inputs and for configuration instruction.

1. If the indoor temperature is below the temperature set point and the humidity is above the humidity set point, the Thermidistat closes circuit R to O, opens circuits R to DH and R to G, and cycles circuit R to Y/Y2. If circuit R to G is closed (24-v.), the motor will deliver airflow at the full cooling or cooling plus dehumidify mode requested value. If circuit R to G is open (0-v.) for super dehumidify mode, the motor delivers reduced airflow to maximize the humidity removal of the system while minimizing over cooling.

Table 3 – 50XP Cooling Dry Coil ECM Airflow Small Cabinet

UNIT SIZE	CFM ADJUST PIN SELECT	LO PIN			NOM PIN			HI PIN		
	EXTERNAL STATIC PRESSURE RANGE	0.0-0.39	0.4-0.69	0.7-1.0	0.0-0.39	0.4-0.69	0.7-1.0	0.0-0.39	0.4-0.69	0.7-1.0
024	COOLING	800	725	-	885	805	730	990	930	855
	COOLING DEHUMIDIFY	715	670	-	715	695	645	795	775	745
030	COOLING	1010	920	825	1105	1030	930	1255	1160	1050
	COOLING DEHUMIDIFY	890	845	795	890	865	825	1010	980	925
036	COOLING	1110	1025	970	1235	1175	1115	1400	1355	1280
	COOLING DEHUMIDIFY	990	960	910	990	975	940	1125	1110	1085

Table 4 – 50XP Cooling & Heating Dry Coil ECM Airflow Large Cabinet

UNIT SIZE	CFM ADJUST PIN SELECT	LO PIN	NOM PIN	NOM PIN
	EXTERNAL STATIC PRESSURE RANGE	0.1-1.0	0.1-1.0	0.1-1.0
042	COOLING	1100	1225	1410
	COOLING DEHUMIDIFY	980	980	1125
048	COOLING	1260	1400	1610
	COOLING DEHUMIDIFY	1120	1120	1290
060	COOLING	1575	1750	2010
	COOLING DEHUMIDIFY	1400	1400	1610

Table 5 – ECM Wet Coil Pressure Drop (in. wc)

UNIT SIZE	STANDARD CFM (SCFM)															
	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100
024	0.005	0.007	0.010	0.012	0.015	–	–	–	–	–	–	–	–	–	–	–
030	–	0.007	0.010	0.012	0.015	0.018	0.021	0.024	–	–	–	–	–	–	–	–
036	–	–	–	0.019	0.023	0.027	0.032	0.037	0.042	0.047	–	–	–	–	–	–
042	–	–	–	–	0.014	0.017	0.020	0.024	0.027	0.031	0.035	0.039	0.043	–	–	–
048	–	–	–	–	–	–	0.027	0.032	0.036	0.041	0.046	0.052	0.057	0.063	0.068	–
060	–	–	–	–	–	–	–	–	–	0.029	0.032	0.036	0.040	0.045	0.049	0.053

Table 6 – Filter Pressure Drop Table (in. wc)

FILTER SIZE in. (mm)	CFM																		
	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
20X20X1 (508X508X25)	0.05	0.07	0.08	0.10	0.12	0.13	0.14	0.15	—	—	—	—	—	—	—	—	—	—	—
20X24X1 (508X610x25)	—	—	—		0.09	0.10	0.11	0.13	0.14	0.15	0.16	—	—	—	—	—	—	—	—
24X30X1 (610X762x25)	—	—	—	—	—	—	—	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18

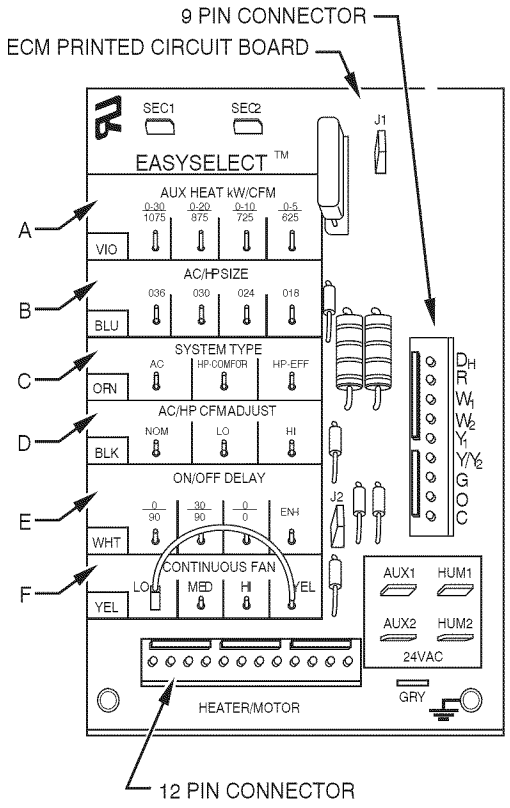
Table 7 – Electric Heat Pressure Drop Table
Small Cabinet: 024-036 cfm

	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
5kw	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.06	0.07
7.5 kw	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.05	0.07	0.08	0.09
10 kw	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.06	0.07	0.09	0.10	0.11
15 kw	0.00	0.00	0.00	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18
20 kw	0.00	0.00	0.02	0.04	0.06	0.08	0.09	0.11	0.13	0.15	0.17	0.19

Table 8 – Electric Heat Pressure Drop Table
Large Cabinet: 042-060 cfm

	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
5kw	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12
7.5 kw	0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13
10 kw	0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13
15 kw	0.00	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
20 kw	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16

QUICK REFERENCE GUIDE
SET-UP INSTRUCTIONS FOR EASY SELECT BOARD (SUPER HUMIDITY CONTROL IN COOLING)



EASY SELECT BOARD

1. Configuration Taps
   (See Installation Instructions, for detailed description)
   A. AUX HEAT - Set for heater size if applicable
      (EX: 0-10 for 10kW)
   B. AC/HP SIZE - Set for size of outdoor unit (Cooling Size)
   C. SYSTEM TYPE - Select "AC" for Packaged AC Units
   D. AC/HP CFM ADJUST - Select "LO"
   E. ON/OFF DELAY - Select "ENH"
   F. CONTINUOUS FAN - Select desired speed
2. Remove Jumper J1 to activate all dehumidify modes
3. Complete wiring and install outdoor temperature sensor according to Installation Instructions

THERMIDISTAT CONTROL SETTINGS

1. Set "DIP Switches" - Set the dip switches (back of Thermidistat Control Board) appropriately for specific system being installed.

2. Thermidistat Control Configurations
   (See Thermidistat Control Installation Instructions for detailed description)
   * Option 5 (Variable Speed Indoor Motor) - Set to ON
   * Option 7 (Super Dehumidify) - Set to ON
   * Option 17 - Select Programmable or non-programmable mode.

3. Set desired humidity level on fron of Thermidistat (50 to 55 % RH recommended). For dehumidification in cooling, both "dhu" and "cool" must be displayed.

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Fig. 22 - ECM ID Blower Motor-Quick Reference Guide

e. ELECTRIC HEATING MODE

1. Thermostat closes circuit R to W/W1, or W2-The unit delivers the selected electric heat airflow. There are no on or off delays.

f. HEATING MODE-SUPER COMFORT HEAT OPERATION

NOTE: The indoor control used, such as a Thermidistat, must be capable of providing Super Comfort Heat operation mode and control must be configured as outlined in its installation instructions. The system must be installed with appropriate outdoor temperature sensor. Consult indoor control literature to determine if control is capable and for configuration instructions. Consult indoor control instructions and sensor instructions for sensor installation details.

If the outdoor temperature is in the range of 12°F to 40°F (11°C to 4°C), the Thermidistat closes circuit R to Y/Y2 and opens circuit R to G. If circuit R to G is closed (24-v.), the motor will deliver airflow at the full heating requested value. If circuit R to G is open (0-v.) for maximum heating comfort, the motor delivers reduced airflow to maximize the temperature and minimize the draft effect of the heated air leaving the unit.

MAINTENANCE

To ensure continuing high performance, and to minimize the possibility of premature equipment failure, periodic maintenance must be performed on this equipment. This cooling unit should be inspected at least once each year by a qualified service person. To troubleshoot heating or cooling of units, refer to tables at the back of the book.

NOTE: TO EQUIPMENT OWNER-Consult your local dealer about the availability of a maintenance contract.

⚠ WARNING

PERSONAL INJURY AND UNIT DAMAGE HAZARD

Failure to follow this warning could result in personal injury or death and possible unit component damage.

The ability to properly perform maintenance on this equipment requires certain expertise, mechanical skills, tools and equipment. If you do not possess these, do not attempt to perform any maintenance on this equipment, other than those procedures recommended in the Owner's Manual.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow these warnings could result in personal injury or death:

1. Turn off electrical power to the unit before performing any maintenance or service on this unit.
2. Use extreme caution when removing panels and parts.
3. Never place anything combustible either on or in contact with the unit.

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Errors made when reconnecting wires may cause improper and dangerous operation. Label all wires prior to disconnecting when servicing.

The minimum maintenance requirements for this equipment are as follows:

1. Inspect air filter(s) each month. Clean or replace when necessary.
2. Each cooling season, inspect indoor coil, drain pan, and condensate drain for cleanliness. Clean when necessary.
3. Inspect blower motor and wheel for cleanliness and check lubrication each heating and cooling season. Clean when necessary.
4. Check electrical connections for tightness and controls for proper operation each heating and cooling season. Service when necessary.

AIR FILTER

NOTE: Never operate the unit without a suitable air filter in the return-air duct system. Always replace the filter with the same dimensional size and type as originally installed (See Table 1 for recommended filter sizes).

Inspect air filter(s) at least once each month and replace (throwaway-type) or clean (cleanable-type) at least twice during each heating and cooling season or whenever the filter(s) becomes clogged with dust and lint.

EVAPORATOR BLOWER AND MOTOR

NOTE: All motors are prelubricated. Do not attempt to lubricate these motors.

For longer life, operating economy, and continuing efficiency, clean accumulated dirt and grease from the blower wheel and motor annually.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Disconnect and tag electrical power to the unit before cleaning and lubricating the blower motor and wheel.

To clean the blower motor and wheel:

1. Remove and disassemble blower assembly as follows:
   a. Remove unit access panel.
   b. Disconnect motor lead from blower relay (BR). Disconnect yellow lead from terminal L2 of the contactor.
   c. On all units, remove blower assembly from unit. Remove screws securing blower to blower partition and slide assembly out. Be careful not to tear insulation in blower compartment.
   d. Ensure proper reassembly by marking blower wheel and motor in relation to blower housing before disassembly.
   e. Loosen setscrew(s) that secures wheel to motor shaft, remove screws that secure motor mount brackets to housing, and slide motor and motor mount out of housing.
2. Remove and clean blower wheel as follows:
   a. a. Ensure proper reassembly by marking wheel orientation.
   b. Lift wheel from housing. When handling and/or cleaning blower wheel, be sure not to disturb balance weights (clips) on blower wheel vanes.
   c. Remove caked-on dirt from wheel and housing with a brush. Remove lint and/or dirt accumulations from wheel and housing with vacuum cleaner, using soft brush attachment. Remove grease and oil with mild solvent.
   d. Reassemble wheel into housing.
   e. Reassemble motor into housing. Be sure setscrews are tightened on motor shaft flats and not on round part of shaft.
   f. Reinstall unit access panel.
3. Restore electrical power to unit. Start unit and check for proper blower rotation and motor speeds during heating and cooling cycles.

CONDENSER COIL, EVAPORATOR COIL, AND CONDENSATE DRAIN PAN

Inspect the condenser coil, evaporator coil, and condensate drain pan at least once each year.

The coils are easily cleaned when dry; therefore, inspect and clean the coils either before or after each cooling season. Remove all obstructions, including weeds and shrubs, that interfere with the airflow through the condenser coil.

Straighten bent fins with a fin comb. If coated with dirt or lint, clean the coils with a vacuum cleaner, using the soft brush attachment. Be careful not to bend the fins. If coated with oil or grease, clean the coils with a mild detergent-and-water solution. Rinse coils with clear water, using a garden hose. Be careful not to splash water on motors, insulation, wiring, or air filter(s). For best results, spray condenser coil fins from inside to outside the unit. On units with an outer and inner condenser coil, be sure to clean between the coils. Be sure to flush all dirt and debris from the unit base.

Inspect the drain pan and condensate drain line when inspecting the coils. Clean the drain pan and condensate drain by removing all foreign matter from the pan. Flush the pan and drain tube with clear water. Do not splash water on the insulation, motor, wiring, or air filter(s). If the drain tube is restricted, clear it with a plumbers snake or similar probe device. Ensure that the auxiliary drain port above the drain tube is also clear.

CONDENSER FAN

⚠ CAUTION

UNIT OPERATION HAZARD

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

Keep the condenser fan free from all obstructions to ensure proper cooling operation. Never place articles on top of the unit.

1. Remove 6 screws holding condenser grille and motor to top cover.
2. Turn motor/grille assembly upside down on top cover to expose the fan blade.
3. Inspect the fan blades for cracks or bends.
4. If fan needs to be removed, loosen the setscrew and slide the fan off the motor shaft.
5. When replacing fan blade, position blade so that the hub is 1/8 in. (3 mm) away from the motor end (1/8 in. [3 mm] of motor shaft will be visible).
6. Ensure that setscrew engages the flat area on the motor shaft when tightening
7. Replace grille.

ELECTRICAL CONTROLS AND WIRING

Inspect and check the electrical controls and wiring annually. Be sure to turn off the electrical power to the unit.

Remove access panel to locate all the electrical controls and wiring. Check all electrical connections for tightness. Tighten all screw connections. If any smoky or burned connections are noticed, disassemble the connection, clean all the parts, restrip the wire end and reassemble the connection properly and securely.

After inspecting the electrical controls and wiring, replace the access panel. Start the unit, and observe at least one complete heating cycle and one complete cooling cycle to ensure proper operation. If discrepancies are observed in either or both operating cycles, or if a suspected malfunction has occurred, check each electrical component with the proper electrical instrumentation. Refer to the unit wiring label when making these checkouts.

NOTE: Refer to the heating and/or cooling sequence of operation in this publication as an aid in determining proper control operation

REFRIGERANT CIRCUIT

Inspect all refrigerant tubing connections and the unit base for oil accumulations annually. Detecting oil generally indicates a refrigerant leak.

⚠ WARNING

UNIT OPERATION AND SAFETY HAZARD

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

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

If oil is detected or if low cooling performance is suspected, leak-test all refrigerant tubing using an electronic leak-detector, halide torch, or liquid-soap solution. If a refrigerant leak is detected, refer to Check for Refrigerant Leaks section.

If no refrigerant leaks are found and low cooling performance is suspected, refer to Checking and Adjusting Refrigerant Charge section.

EVAPORATOR AIRFLOW

The heating and/or cooling air-flow does not require checking unless improper performance is suspected. If a problem exists, be sure that all supply- and return-air grilles are open and free from obstructions, and that the air filter is clean. When necessary, refer to Indoor Airflow and Airflow Adjustments section to check the system airflow.

METERING DEVICE-TXV

The indoor metering device is a TXV type device.

PRESSURE SWITCHES

Pressure switches are protective devices wired into the control circuit (low voltage). They shut off compressor if abnormally high or low pressures are present in the refrigeration circuit. These pressure switches are specifically designed to operate with Puron (R-410A) systems. R-22 pressure switches must not be used as replacements for the Puron (R-410A) air conditioner.

LOSS OF CHARGE/LOW-PRESSURE SWITCH (AIR CONDITIONER ONLY)

This switch is located on the liquid line and protects against low suction pressures caused by such events as loss of charge, low airflow across indoor coil, dirty filters, etc. It opens on a pressure drop at about 20 psig. If system pressure is above this, switch should be closed.

To check switch:

1. Turn off all power to unit.
2. Disconnect leads on switch.
3. Apply ohmmeter leads across switch. You should have continuity on a good switch.

NOTE: Because these switches are attached to refrigeration system under pressure, it is not advisable to remove this device for troubleshooting unless you are reasonably certain that a problem exists. If switch must be removed, remove and recover all system charge so that pressure gauges read 0 psig. Never open system without breaking vacuum with dry nitrogen.

HIGH-PRESSURE SWITCH

The high-pressure switch is located in the discharge line and protects against excessive condenser coil pressure. It opens at 650 psig. High pressure may be caused by a dirty condenser coil, failed fan motor, or condenser air recirculation.

To check switch:

1. Turn off all power to unit.
2. Disconnect leads on switch.
3. Apply ohmmeter leads across switch. You should have continuity on a good switch.

COPELAND SCROLL COMPRESSOR (PURON REFRIGERANT)

The compressor used in this product is specifically designed to operate with Puron (R-410A) refrigerant and cannot be interchanged.

The compressor is an electrical (as well as mechanical) device. Exercise extreme caution when working near compressors. Power should be shut off, if possible, for most troubleshooting techniques. Refrigerants present additional safety hazards.

⚠ WARNING

EXPLOSION HAZARD

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

Wear safety glasses and gloves when handling refrigerants. Keep torches and other ignition sources away from refrigerants and oils.

The scroll compressor pumps refrigerant throughout the system by the interaction of a stationary and an orbiting scroll. The scroll compressor has no dynamic suction or discharge valves, and it is more tolerant of stresses caused by debris, liquid slugging, and flooded starts. The compressor is equipped with an anti-rotational device and an internal pressure relief port. The anti-rotational device prevents the scroll from turning backwards and replaces the need for a cycle protector. The pressure relief port is a safety device, designed to protect against extreme high pressure. The relief port has an operating range between 550 and 625 psig differential pressure.

REFRIGERANT

⚠ WARNING

UNIT OPERATION AND SAFETY HAZARD

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

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

This system uses Puron (R-410A) refrigerant which has higher operating pressures than R-22 and other refrigerants. No other refrigerant may be used in this system. Gage set, hoses, and recovery system must be designed to handle Puron. If you are unsure, consult the equipment manufacturer. Failure to use Puron compatible servicing equipment or replacement components may result in property damage or injury.

COMPRESSOR OIL

The Copeland scroll compressor uses 3MAF POE oil. If additional oil is needed, use Uniqema RL32-3MAF. If this oil is not available, use Copeland Ultra 32 CC or Mobil Arctic EAL22 CC. This oil is extremely hygroscopic, meaning it absorbs water readily. 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. Take all necessary precautions to avoid exposure of the oil to the atmosphere.

SERVICING SYSTEMS ON ROOFS WITH SYNTHETIC MATERIALS

POE (polyolester) compressor lubricants are known to cause long term damage to some synthetic roofing materials. Exposure, even if immediately cleaned up, may cause embrittlement (leading to cracking) to occur in one year or more. When performing any service that may risk exposure of compressor oil to the roof, take appropriate precautions to protect roofing. Procedures which risk oil leakage include, but are not limited to, compressor replacement, repairing refrigerant leaks, replacing refrigerant components such as filter drier, pressure switch, metering device, coil, accumulator, or reversing valve.

Synthetic Roof Precautionary Procedure

1. Cover extended roof working area with an impermeable polyethylene (plastic) drip cloth or tarp. Cover an approximate 10 x 10 ft (3 x 3 m) area.
2. Cover area in front of the unit service panel with a terry cloth shop towel to absorb lubricant spills, prevent run-offs, and protect drop cloth from tears caused by tools or components.
3. Place terry cloth shop towel inside unit immediately under component(s) to be serviced and prevent lubricant run-offs through the louvered openings in the unit base.
4. Perform required service.
5. Remove and dispose of any oil contaminated material per local codes.

LIQUID LINE FILTER DRIER

The filter drier is specifically designed to operate with Puron. Use only factory-authorized components. Filter drier must be replaced whenever the refrigerant system is opened. When removing a filter drier, use a tubing cutter to cut the drier from the system. Do not unsweat a filter drier from the system. Heat from unsweating will release moisture and contaminants from drier into system.

PURON (R-410A) REFRIGERANT CHARGING

Refer to unit information plate and charging chart. Some R-410A refrigerant cylinders contain a dip tube to allow liquid refrigerant to flow from cylinder in upright position. For cylinders equipped with a dip tube, charge Puron units with cylinder in upright position and a commercial metering device in manifold hose. Charge refrigerant into suction-line.

TROUBLESHOOTING

Refer to the Troubleshooting-Cooling chart (Table 9) for troubleshooting information.

AIR CONDITIONER WITH PURON (R-410A) QUICK REFERENCE GUIDE

Puron refrigerant operates at 50-70 percent higher pressures than R-22. Be sure that servicing equipment and replacement components are designed to operate with Puron. Puron refrigerant cylinders are rose colored.

- Puron refrigerant cylinders manufactured prior to March 1, 1999, have a dip tube that allows liquid to flow out of cylinder in upright position.

  Cylinders manufactured March 1, 1999 and later DO NOT have a dip tube and MUST be positioned upside down to allow liquid to flow.
- Recovery cylinder service pressure rating must be 400 psig. DOT 4BA400 or DOT BW400.
- 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.
- Puron, as with other HFCs, is only compatible with POE oils.
- Vacuum pumps will not remove moisture from oil.
- Only use factory specified liquid-line filter driers with rated working pressures no less than 600 psig.
- Do not install a suction-line filter drier in liquid line.
- POE oils absorb moisture rapidly. Do not expose oil to atmosphere.
- POE oils may cause damage to certain plastics and roofing materials.
- Wrap all filter driers and service valves with wet cloth when brazing.
- A Puron liquid-line filter drier is required on every unit.
- Do not use an R-22 TXV.
- Never open system to atmosphere while it is under a vacuum.
- When system must be opened for service, break vacuum with dry nitrogen and replace filter driers.
- Always replace filter drier after opening system for service.
- Do not vent Puron into the atmosphere.
- Observe all warnings, cautions, and bold text.
- Do not leave Puron suction line driers in place for more than 72 hrs.

Table 9 – Troubleshooting Chart

SYMPTOM	CAUSE	REMEDY
Compressor and outdoor fan will not start	Power Failure	Call power company
	Fuse blown or circuit breaker tripped	Replace fuse or reset circuit breaker
	Defective thermostat, contactor, transformer, control relay, high pressure or loss-of-charge switch	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
Three-phase scroll compressor (50XP030–060) makes excessive noise and there may be a low pressure differential	Scroll compressor is rotating in the wrong direction	Correct the direction of rotation by reversing two of the 3-phase power leads to the unit. Shut down unit to allow pressures to equalize
Compressor cycles (other than normally satisfying thermostat)	Refrigerant overcharge or undercharge	Recover refrigerant, evacuate system, and recharge to capacities shown on 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
	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
	Restriction in liquid tube	Remove restriction
Excessive suction pressure	High Heat load	Check for source and eliminate
	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 – replace if necessary
	Temperature too low in conditioned area	Reset thermostat
	Outdoor ambient below 55°F (13°C)	Install low-ambient kit
	Field-installed filter-drier restricted	Replace

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

I. Preliminary Information

MODEL NO.:_____

SERIAL NO.:_____

DATE:_____

TECHNICIAN:_____

II. PRE-START-UP (Insert check mark in box as each item is completed)

( ) VERIFY THAT ALL PACKING MATERIALS HAVE BEEN REMOVED FROM UNIT

( ) REMOVE ALL SHIPPING HOLD DOWN BOLTS AND BRACKETS PER INSTALLATION INSTRUCTIONS

( ) CHECK ALL ELECTRICAL CONNECTIONS AND TERMINAL FOR TIGHTNESS

( ) CHECK THAT INDOOR (EVAPORATOR) AIR FILTER IS CLEAN AND IN PLACE

( ) VERIFY THAT UNIT INSTALLATION IS LEVEL

( ) CHECK FAN WHEEL, AND PROPELLER FOR LOCATIONS IN HOUSING/ORIFICE AND SETSCREW TIGHTNESS

III. START-UP

ELECTRICAL

SUPPLY VOLTAGE_____

COMPRESSOR AMPS_____

INDOOR (EVAPORATOR) FAN AMPS_____

TEMPERATURES

OUTDOOR (CONDENSER) AIR TEMPERATURE_____DB

RETURN-AIR TEMPERATURE_____DB_____WB

COOLING SUPPLY AIR_____DB _____WB

ELECTRIC HEAT SUPPLY AIR_____

PRESSURES

REFRIGERANT SUCTION_____PSIG SUCTION LINE TEMP*_____

REFRIGERANT DISCHARGE_____PSIG DISCHARGE TEMP†_____

( ) VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS

*Measured at suction inlet to compressor.

†Measured at liquid line leaving condenser.

IV. EASY SELECT SETTINGS

FULL UNIT MODEL NUMBER:_____

ENTER AVAILABLE HEAT SETTINGS

ENTER AVAILABLE AIRFLOW HEAT AIR PIN CONNECTION SETTING_____

TYPE PIN CONNECTION SETTING_____

ADJUST PIN CONNECTION SETTING_____

(0/0 or 0/90 for gas/electric models)

CONTINUOUS FAN PIN CONNECTION SETTING_____

EASY SELECT			
Heat Settings			
AC HP Size			
System Type			
AC	HP-Comfort		HP EFF
AC/HP CFM Adjust			
Norm	Lo		Hi
On/Off Delay			
0/90	30/90	0/0	ENH
Continuous Fan			
Lo	Med		Hi

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