Installation, Start-Up and Service Instructions

CONTENTS

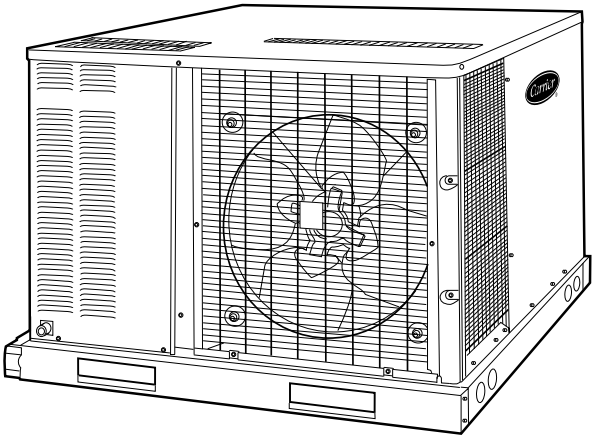


Fig. 1 — Unit 50SX With Optional Base Rail Shown

NOTE TO INSTALLER — Before the installation, READ THESE INSTRUCTIONS CAREFULLY AND COMPLETELY. Also, make sure the Owner's Manual and Service Instructions are left with the unit after installation.

SAFETY CONSIDERATIONS

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

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

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

⚠ WARNING

Before performing service or maintenance operations on system, turn off main power to unit. Turn off accessory heater power switch if applicable. Electrical shock can cause personal injury.

General — 50SS,SX cooling units are fully self-contained and designed for outdoor installation. See Fig. 1. As shown in Fig. 2-9, both small- and large-cabinet units are shipped in a horizontal-discharge configuration for installation on a ground-level slab. All units can be converted to downflow discharge configurations for rooftop applications. See Fig. 10 for roof curb dimensions.

Instructions continued on page 13.

REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL — in. (mm)

Unit Top	14 (356)
Duct Side of Unit	2 (51)
Side Opposite Ducts	14 (356)
Bottom of Unit	0
Vertical Discharge First 12 in. (305) of Supply Duct	1 (25)

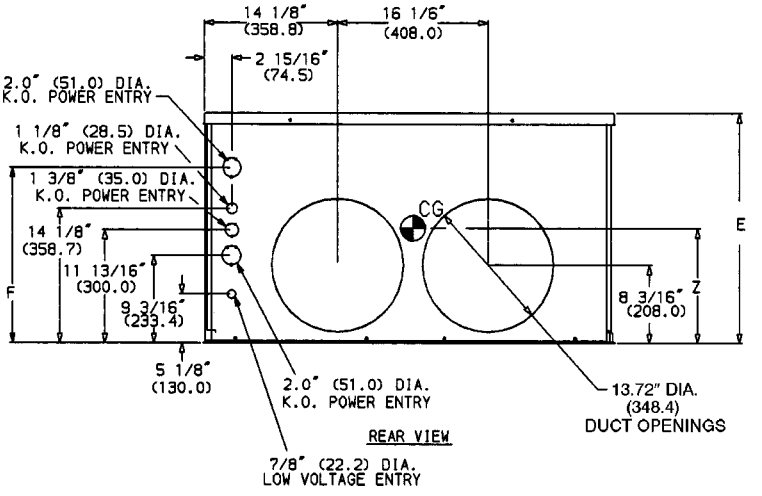
NECESSARY REQUIRED CLEARANCES — in. (mm)

Between Units, Control Box Side	42 (1067)
Unit and Ungrounded Surfaces, Control Box Side	36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side	42 (1067)

REQUIRED CLEARANCES FOR SERVICING — in. (mm)

Evaporator Coil Access Side	30 (762)
Control Box Access Side (Except for Necessary Requirements)	30 (762)
Unit Top	36 (914)
Side Opposite Ducts	30 (762)

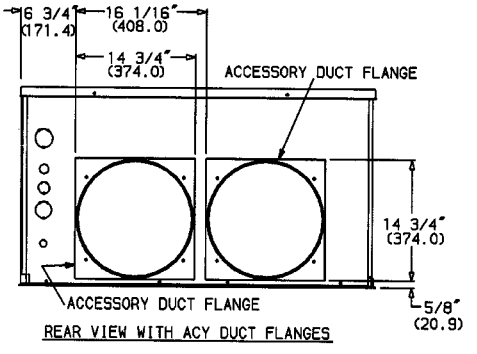
UNIT 50SS	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
018	19.6/499	21.7/551	10.6/269
024	22.5/570	20.9/530	10.0/254
030	22.1/561	20.3/516	10.0/253
036	21.2/538	19.9/506	9.9/251
042	21.3/540	19.9/506	11.3/286

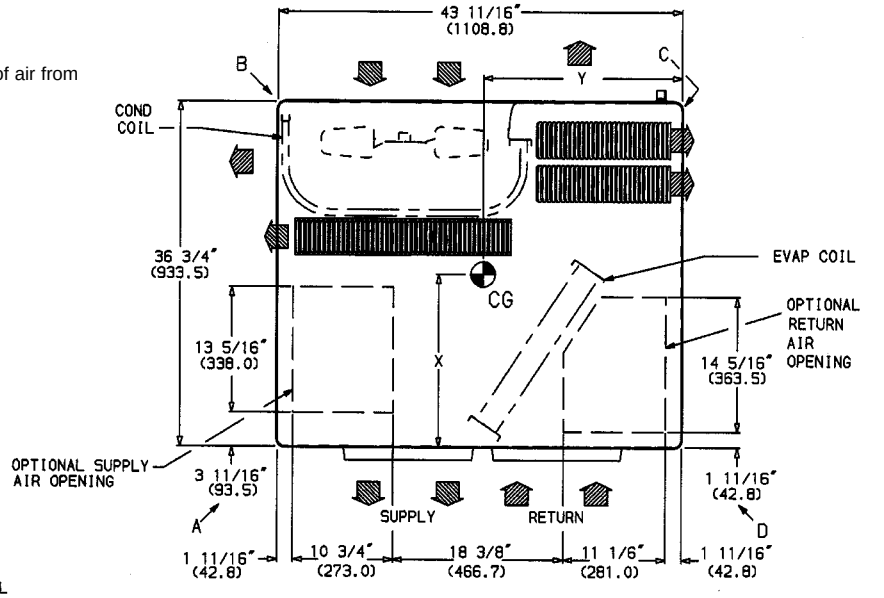


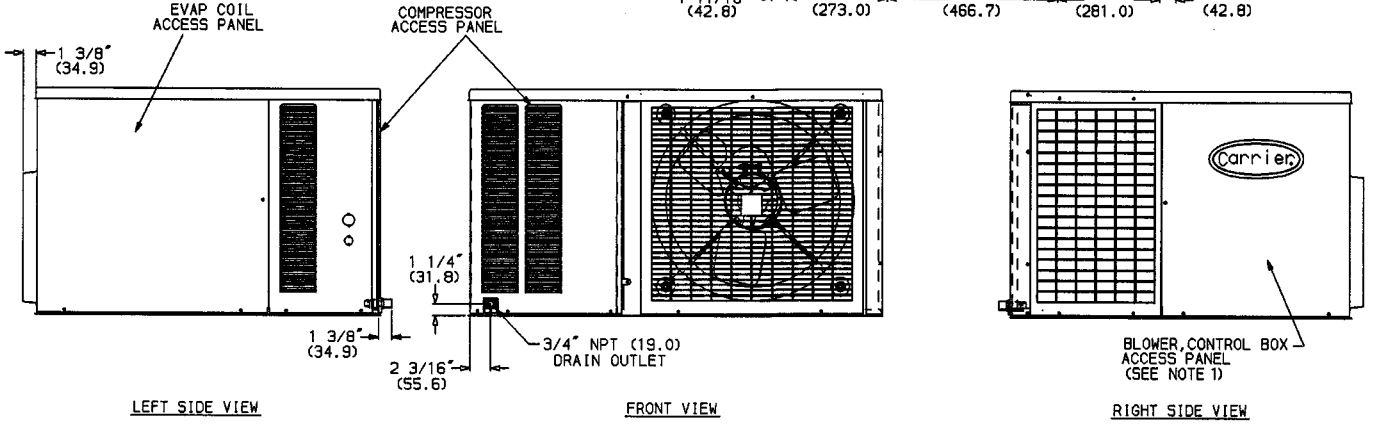
LEGEND

CG — Center of Gravity
COND — Condenser
MAT'L — Material
NEC — National Electrical Code
REQ'D — Required

NOTES:
1. Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.
2. Dimensions in ( ) are in millimeters.







UNIT 50SS	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)				UNIT HEIGHT (in./mm)	DIMENSION (in./mm)
		Lb	Kg	A	B	C	D	E	F
018	208/230-1-60	208	95	61/28	43/20	69/31	35/16	24.1/613	18.2/462
024	208/230-1-60	237	108	60/27	54/25	92/42	31/14	24.1/613	18.2/462
030	208/230-1-60, 208/230-3-60	254	115	61/28	58/26	96/44	39/18	24.1/613	18.2/462
036	208/230-1-60, 208/230-3-60, 460-3-60	270	123	75/35	48/22	109/50	37/17	24.1/613	18.2/462
042	208/230-1-60, 208/230-3-60, 460-3-60	300	135	81/40	57/26	117/53	45/20	28.1/714	22.2/563

Fig. 2 — Dimensions; Units 50SS018-042 Without Base Rail

REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL — in. (mm)

Unit Top	14 (356)
Duct Side of Unit	2 (51)
Side Opposite Ducts	14 (356)
Bottom of Unit	0
Vertical Discharge First 12 in. (305) of Supply Duct	1 (25)

NECESSARY REQUIRED CLEARANCES — in. (mm)

Between Units, Control Box Side	42 (1067)
Unit and Ungrounded Surfaces, Control Box Side	36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side	42 (1067)

REQUIRED CLEARANCES FOR SERVICING — in. (mm)

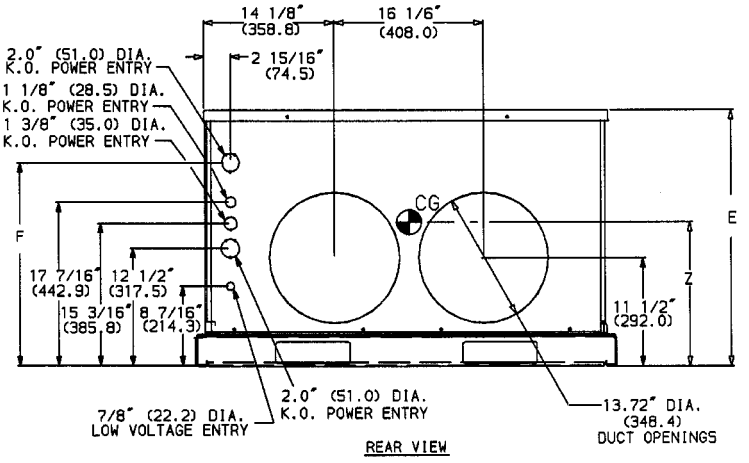
Evaporator Coil Access Side	30 (762)
Control Box Access Side	30 (762)
(Except for Necessary Requirements)	
Unit Top	36 (914)
Side Opposite Ducts	30 (762)

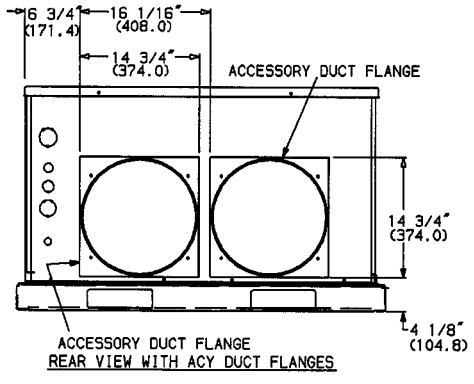
UNIT 50SS	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
018	19.5/495	21.7/551	12.9/328
024	22.1/562	20.9/532	12.3/313
030	21.8/554	20.4/519	12.3/312
036	21.0/533	20.1/509	12.2/310
042	21.0/532	20.1/510	13.6/344

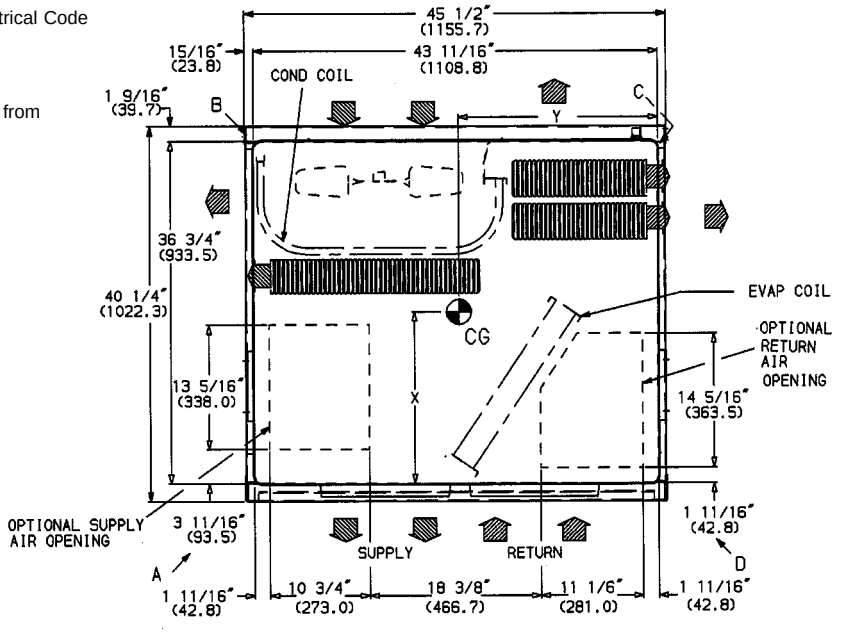
LEGEND

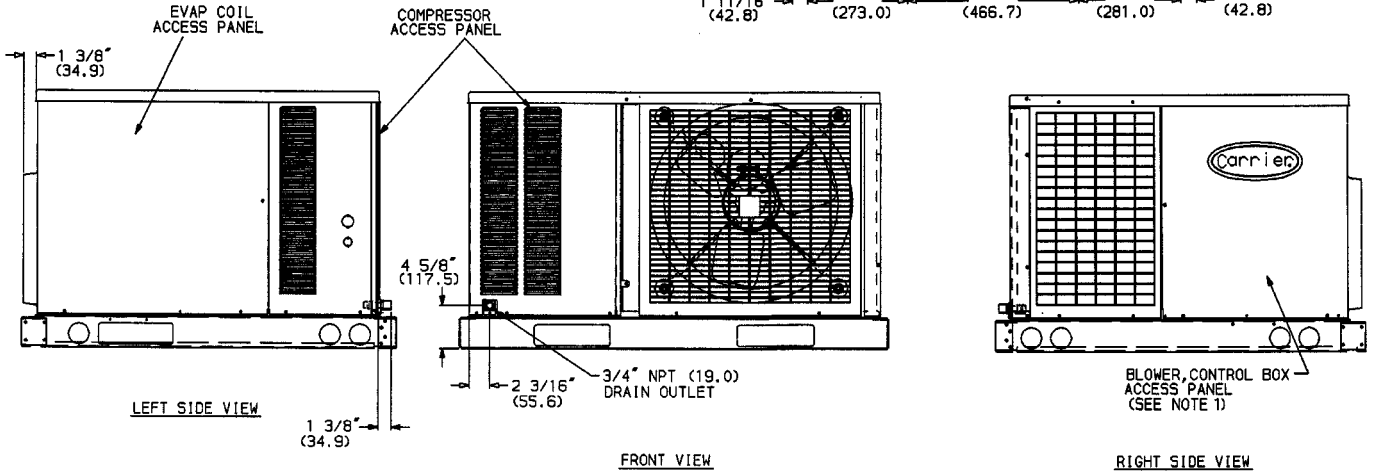
CG — Center of Gravity
COND — Condenser
MAT'L — Material
NEC — National Electrical Code
REQ'D — Required

NOTES:
1. Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.
2. Dimensions in ( ) are in millimeters.



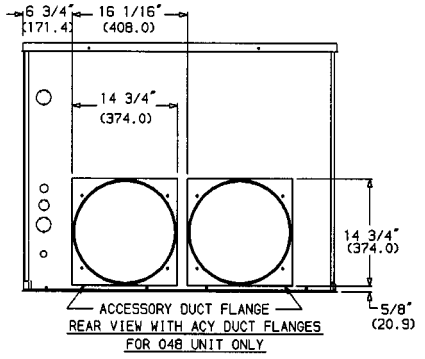


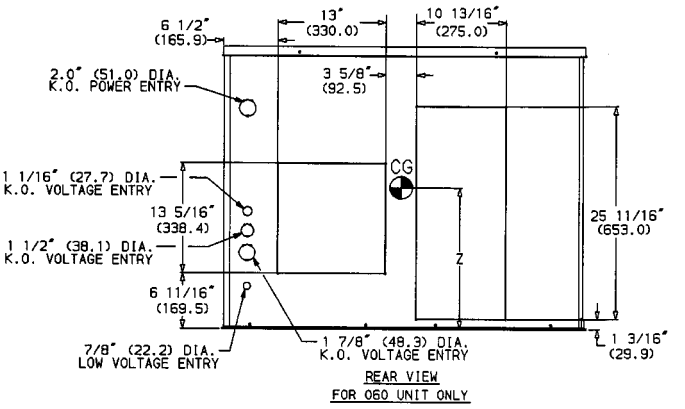


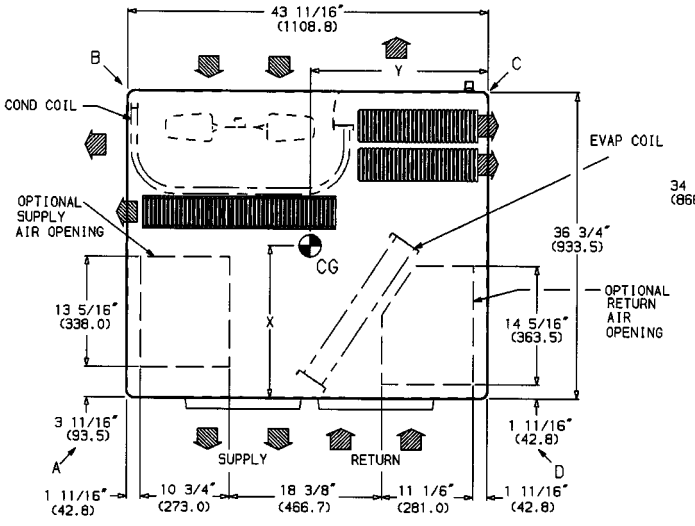


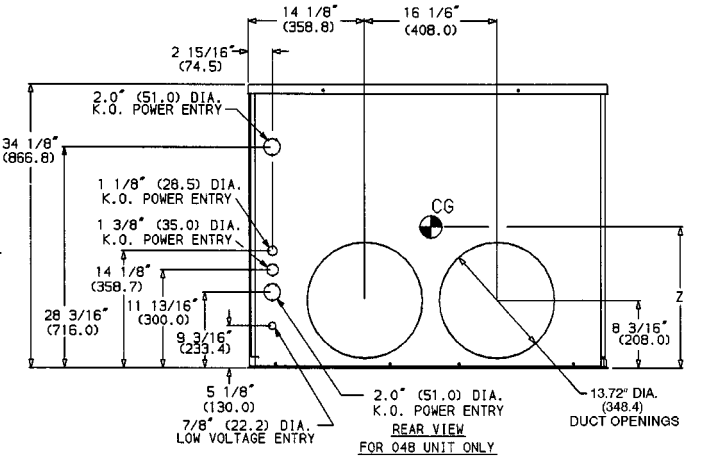
UNIT 50SS	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)				UNIT HEIGHT (in./mm)	DIMENSION (in./mm)
		Lb	Kg	A	B	C	D	E	F
018	208/230-1-60	228	104	66/30	48/22	74/34	40/18	27.4/697	21.5/546
024	208/230-1-60	257	117	65/30	59/27	97/44	36/16	27.4/697	21.5/546
030	208/230-1-60, 208/230-3-60	274	125	66/30	63/29	101/46	44/20	27.4/697	21.5/546
036	208/230-1-60, 208/230-3-60, 460-3-60	290	132	81/37	53/24	114/52	42/19	27.4/697	21.5/546
042	208/230-1-60, 208/230-3-60, 460-3-60	320	146	86/39	62/28	122/55	50/23	31.4/798	25.5/648

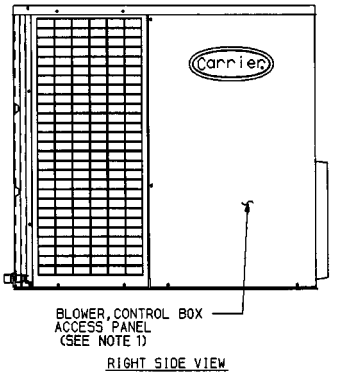
Fig. 3 — Dimensions; Units 50SS018-042 with Optional Base Rail

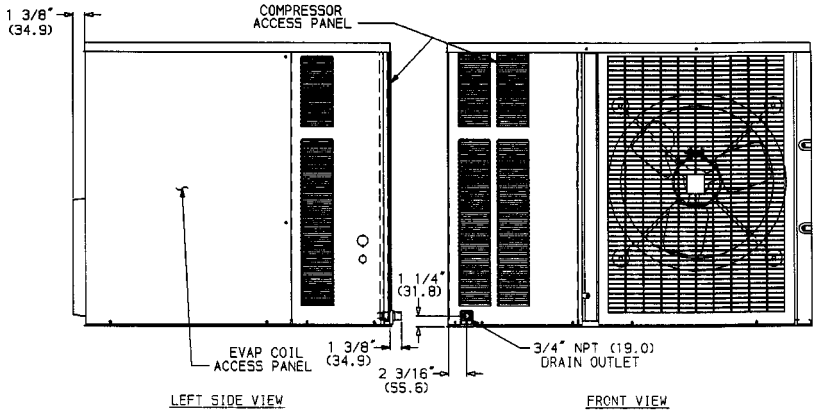












REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL — in. (mm)

Unit Top	14 (356)
Duct Side of Unit	2 (51)
Side Opposite Ducts	14 (356)
Bottom of Unit	0
Vertical Discharge First 12 in. (305) of Supply Duct	1 (25)

NECESSARY REQUIRED CLEARANCES — in. (mm)

Between Units, Control Box Side	42 (1067)
Unit and Ungrounded Surfaces, Control Box Side	36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side	42 (1067)

REQUIRED CLEARANCES FOR SERVICING — in. (mm)

Evaporator Coil Access Side	30 (762)
Control Box Access Side (Except for Necessary Requirements)	30 (762)
Unit Top	36 (914)
Side Opposite Ducts	30 (762)

UNIT 50SS	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
048	21.9/555	19.6/498	13.4/341
060	22.2/565	19.8/503	13.4/340

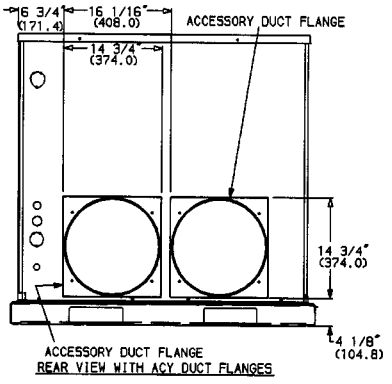
LEGEND

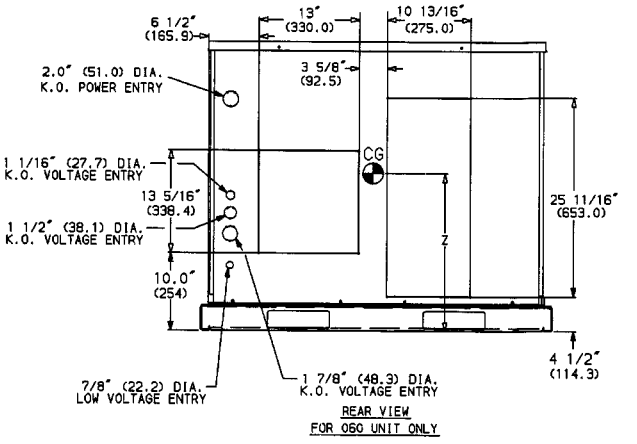
CG	— Center of Gravity	NEC	— National Electrical Code
COND	— Condenser	REQ'D	— Required
MAT'L	— Material		

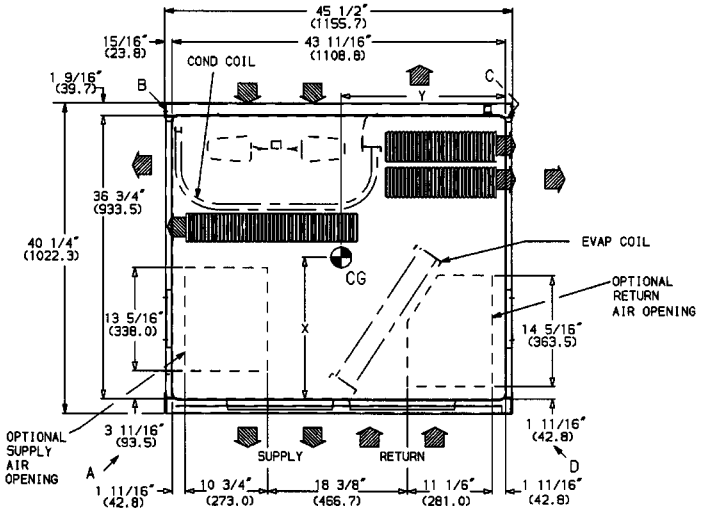
NOTES:
1. Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.
2. Dimensions in ( ) are in millimeters.

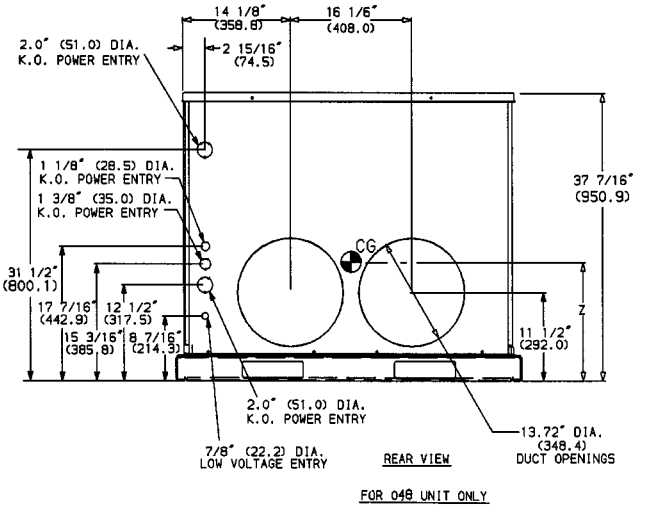
UNIT 50SS	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)			
		Lb	Kg	A	B	C	D
048	208/230-1-60, 208/230-3-60, 460-3-60	332	151	82/37	68/31	131/60	51/23
060	208/230-1-60, 208/230-3-60, 460-3-60	359	163	65/30	99/45	120/55	75/34

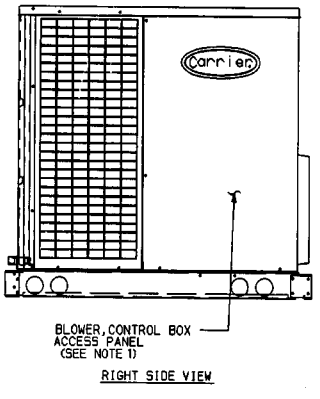
Fig. 4 — Dimensions; Units 50SS048,060 Without Base Rail

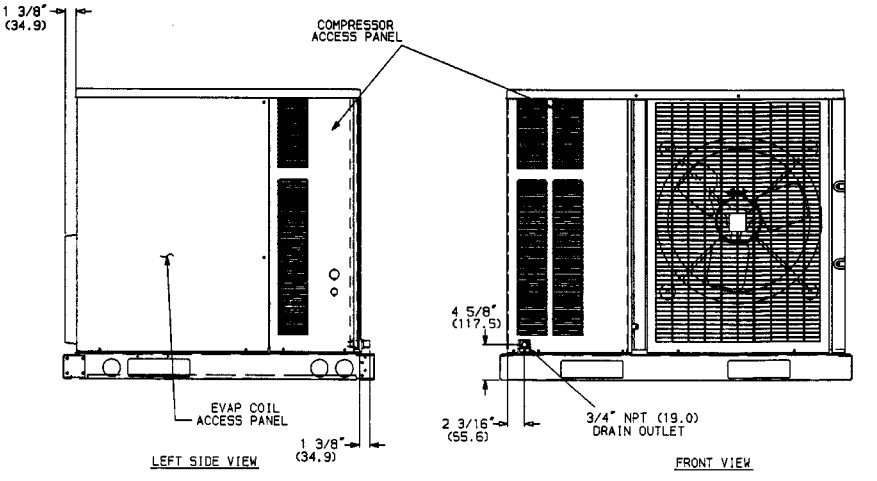












REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL — in. (mm)

Unit Top	14 (356)
Duct Side of Unit	2 (51)
Side Opposite Ducts	14 (356)
Bottom of Unit	0
Vertical Discharge First 12 in. (305) of Supply Duct	1 (25)

NECESSARY REQUIRED CLEARANCES — in. (mm)

Between Units, Control Box Side	42 (1067)
Unit and Ungrounded Surfaces, Control Box Side	36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side	42 (1067)

REQUIRED CLEARANCES FOR SERVICING — in. (mm)

Evaporator Coil Access Side	30 (762)
Control Box Access Side	30 (762)
(Except for Necessary Requirements)	
Unit Top	36 (914)
Side Opposite Ducts	30 (762)

UNIT 50SS	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
048	21.7/550	19.7/501	15.7/400
060	22.0/560	19.9/506	15.7/399

LEGEND

CG	— Center of Gravity	NEC	— National Electrical Code
COND	— Condenser	REQ'D	— Required
MAT'L	— Material		

NOTES:
1. Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.
2. Dimensions in ( ) are in millimeters.

UNIT 50SS	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)			
		Lb	Kg	A	B	C	D
048	208/230-1-60, 208/230-3-60, 460-3-60	352	160	87/40	73/33	136/62	56/25
060	208/230-1-60, 208/230-3-60, 460-3-60	379	172	70/32	104/47	125/57	80/36

Fig. 5 — Dimensions; Units 50SS048,060 With Optional Base Rail

REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL — in. (mm)

Unit Top	14 (356)
Duct Side of Unit	2 (51)
Side Opposite Ducts	14 (356)
Bottom of Unit	0
Vertical Discharge First 12 in. (305) of Supply Duct	1 (25)

NECESSARY REQUIRED CLEARANCES — in. (mm)

Between Units, Control Box Side	42 (1067)
Unit and Ungrounded Surfaces, Control Box Side	36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side	42 (1067)

REQUIRED CLEARANCES FOR SERVICING — in. (mm)

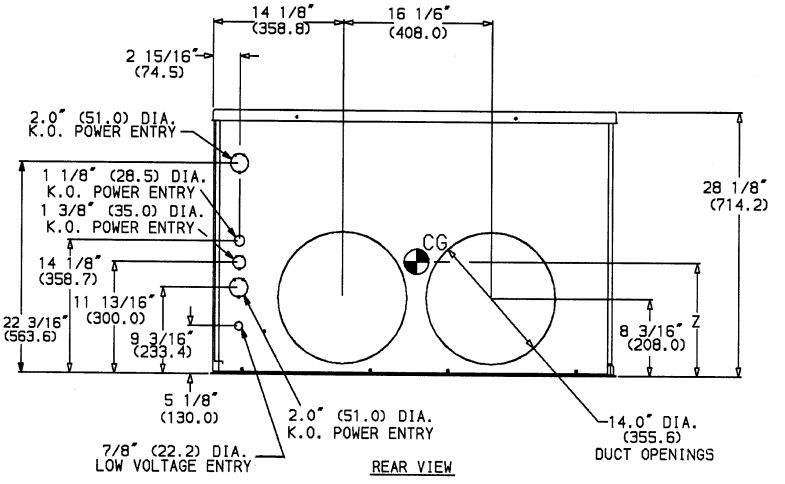
Evaporator Coil Access Side	30 (762)
Control Box Access Side	30 (762)
(Except for Necessary Requirements)	
Unit Top	36 (914)
Side Opposite Ducts	30 (762)

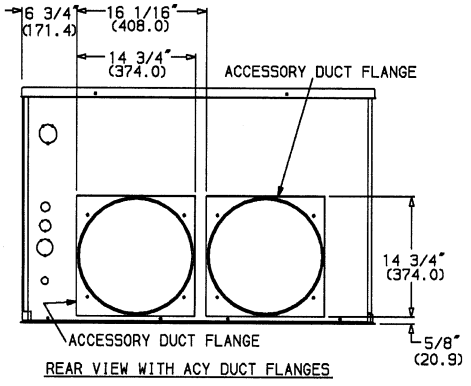
NOTES:
1. Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.
2. Dimensions in ( ) are in millimeters.

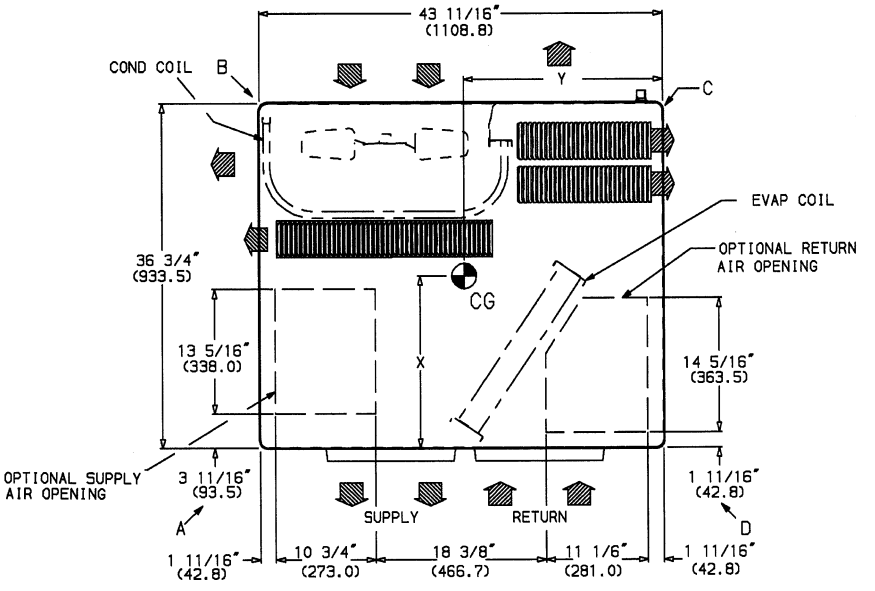
UNIT 50SX	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
024	21.7/552	20.7/527	12.7/321
030	21.9/556	20.7/525	12.7/321
036	20.8/528	20.0/507	12.7/321

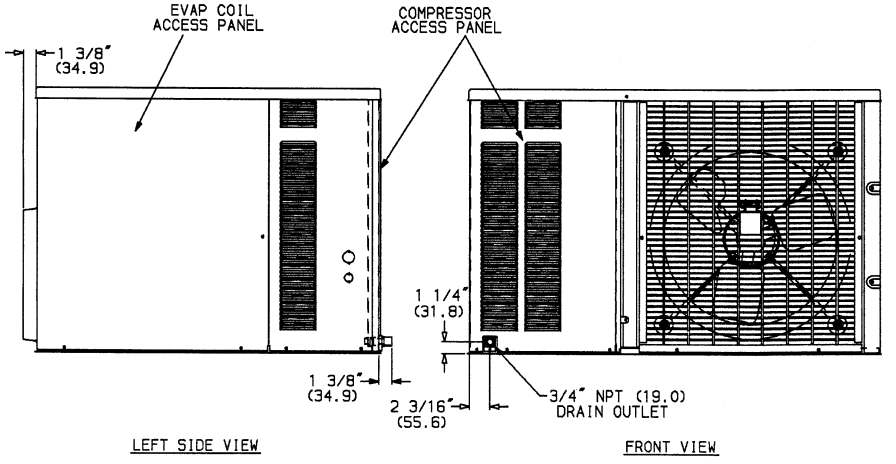
LEGEND

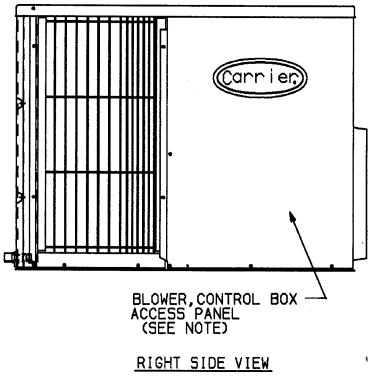
CG	— Center of Gravity	**NEC**	— National Electrical Code
COND	— Condenser	**REQ'D**	— Required
MAT'L	— Material		











UNIT 50SX	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)			
		Lb	Kg	A	B	C	D
024	208/230-1-60	270	123	67/30	62/28	99/45	42/19
030	208/230-1-60	273	124	66/30	64/29	100/45	43/20
036	208/230-1-60, 208/230-3-60, 460-3-60	291	132	80/36	54/25	112/51	45/20

Fig. 6 — Dimensions; Units 50SX024-036 Without Base Rail

REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL — in. (mm)

Unit Top	14 (356)
Duct Side of Unit	2 (51)
Side Opposite Ducts	14 (356)
Bottom of Unit	0
Vertical Discharge First 12 in. (305) of Supply Duct	1 (25)

NECESSARY REQUIRED CLEARANCES — in. (mm)

Between Units, Control Box Side	42 (1067)
Unit and Ungrounded Surfaces, Control Box Side	36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side	42 (1067)

REQUIRED CLEARANCES FOR SERVICING — in. (mm)

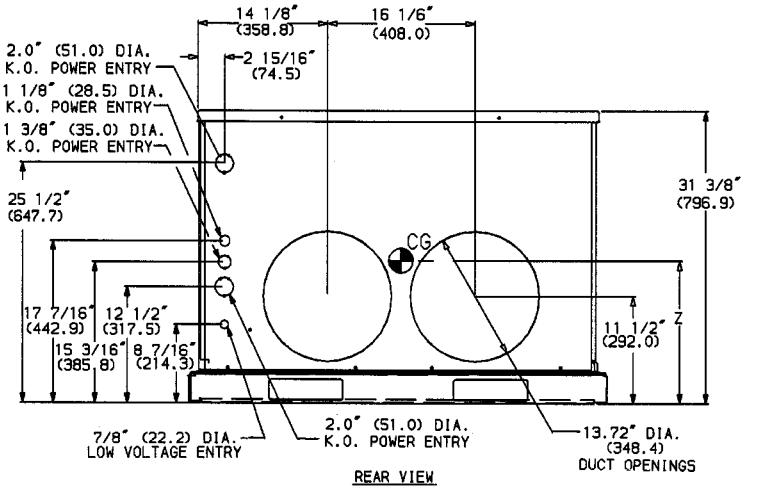
Evaporator Coil Access Side	30 (762)
Control Box Access Side	30 (762)
(Except for Necessary Requirements)	
Unit Top	36 (914)
Side Opposite Ducts	30 (762)

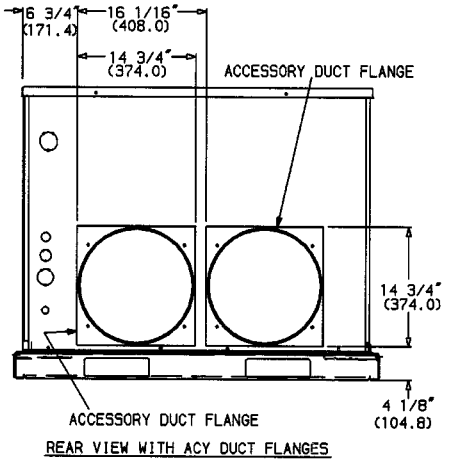
NOTES:
1. Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.
2. Dimensions in ( ) are in millimeters.

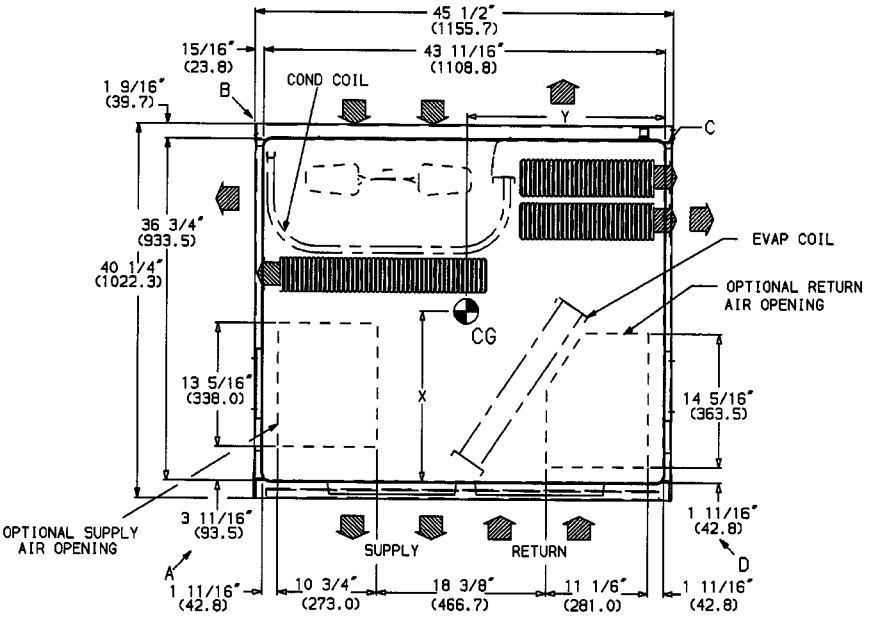
UNIT 50SX	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
024	21.5/546	20.8/528	15.0/380
030	21.7/550	20.7/527	15.0/380
036	20.6/524	20.1/510	15.0/380

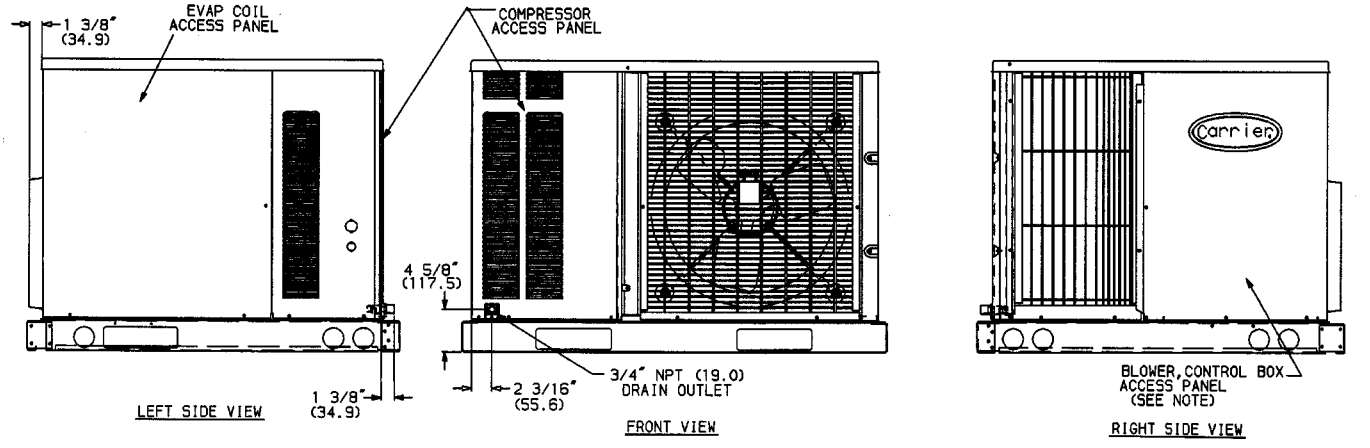
LEGEND

CG	— Center of Gravity	NEC	— National Electrical Code
COND	— Condenser	REQ'D	— Required
MAT'L	— Material		









UNIT 50SX	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)			
		Lb	Kg	A	B	C	D
024	208/230-1-60	290	132	72/33	67/30	104/47	47/21
030	208/230-1-60	293	133	71/32	69/31	105/48	48/22
036	208/230-1-60, 208/230-3-60, 460-3-60	311	142	85/39	59/27	117/53	50/23

Fig. 7 — Dimensions; Units 50SX024-036 With Optional Base Rail

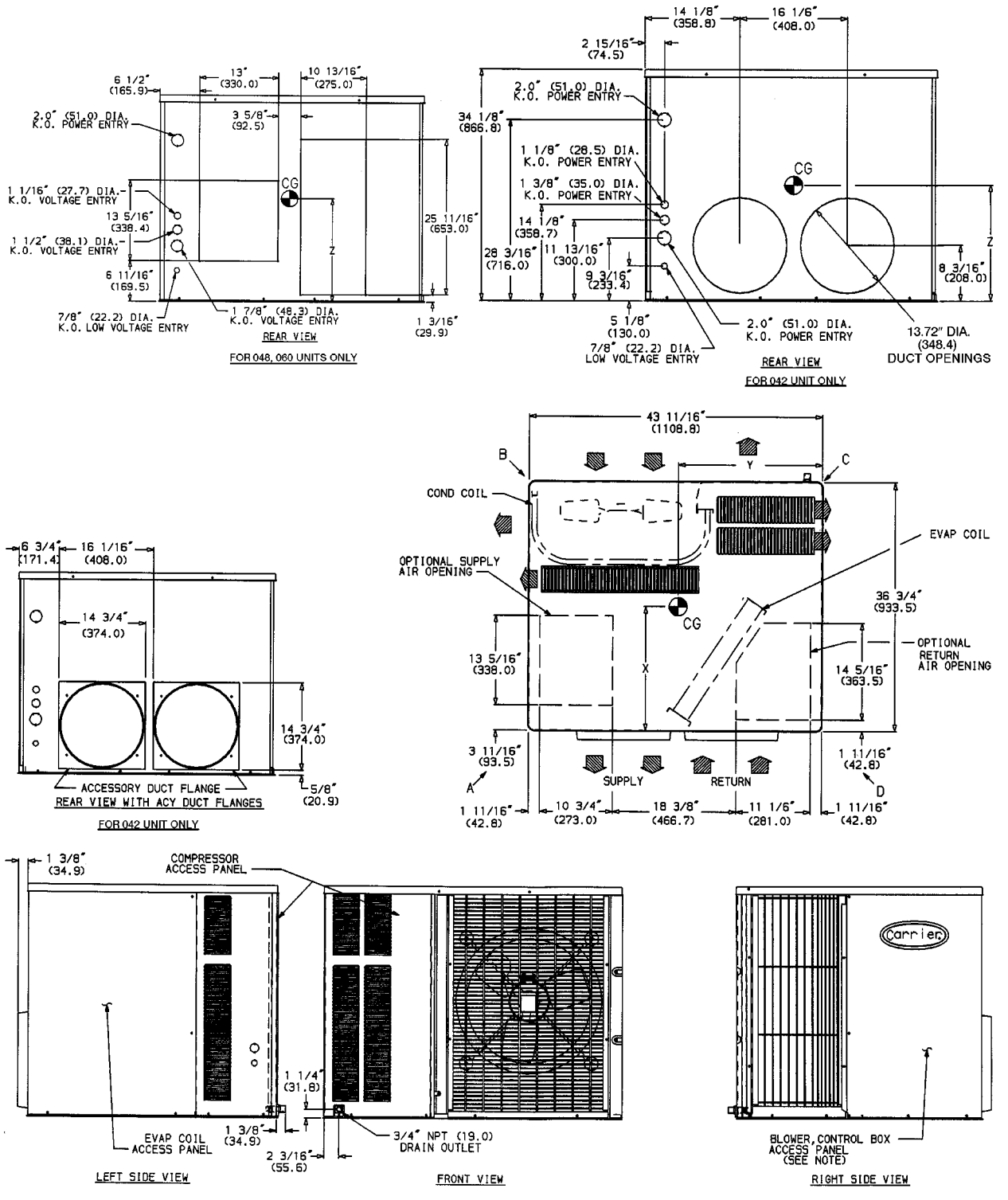


Fig. 8 — Dimensions; Units 50SX042-060 Without Base Rail

LEGEND

CG	— Center of Gravity	**NEC**	— National Electrical Code
COND	— Condenser	**REQ'D**	— Required
MAT'L	— Material		

REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL — in. (mm)

Unit Top 14 (356)
Duct Side of Unit 2 (51)
Side Opposite Ducts 14 (356)
Bottom of Unit 0
Vertical Discharge First 12 in. (305) of Supply Duct 1 (25)

NECESSARY REQUIRED CLEARANCES — in. (mm)

Between Units, Control Box Side 42 (1067)
Unit and Ungrounded Surfaces, Control Box Side 36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side 42 (1067)

REQUIRED CLEARANCES FOR SERVICING — in. (mm)

Evaporator Coil Access Side 30 (762)
Control Box Access Side 30 (762)
(Except for Necessary Requirements)
Unit Top 36 (914)
Side Opposite Ducts 30 (762)

NOTES:
1. Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.
2. Dimensions in ( ) are in millimeters.

UNIT 50SX	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
042	21.0/533	20.1/510	15.4/390
048	21.8/553	19.7/499	15.4/390
060	22.2/565	19.8/503	13.4/340

UNIT 50SX	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)			
		Lb	Kg	A	B	C	D
042	208/230-1-60, 208/230-3-60, 460-3-60	309	140	84/38	59/27	119/54	47/21
048	208/230-1-60, 208/230-3-60, 460-3-60	340	155	84/38	70/32	133/60	53/24
060	208/230-1-60, 208/230-3-60	359	163	65/30	99/45	120/55	75/34

Fig. 8 — Dimensions; Units 50SX042-060 Without Base Rail (cont)

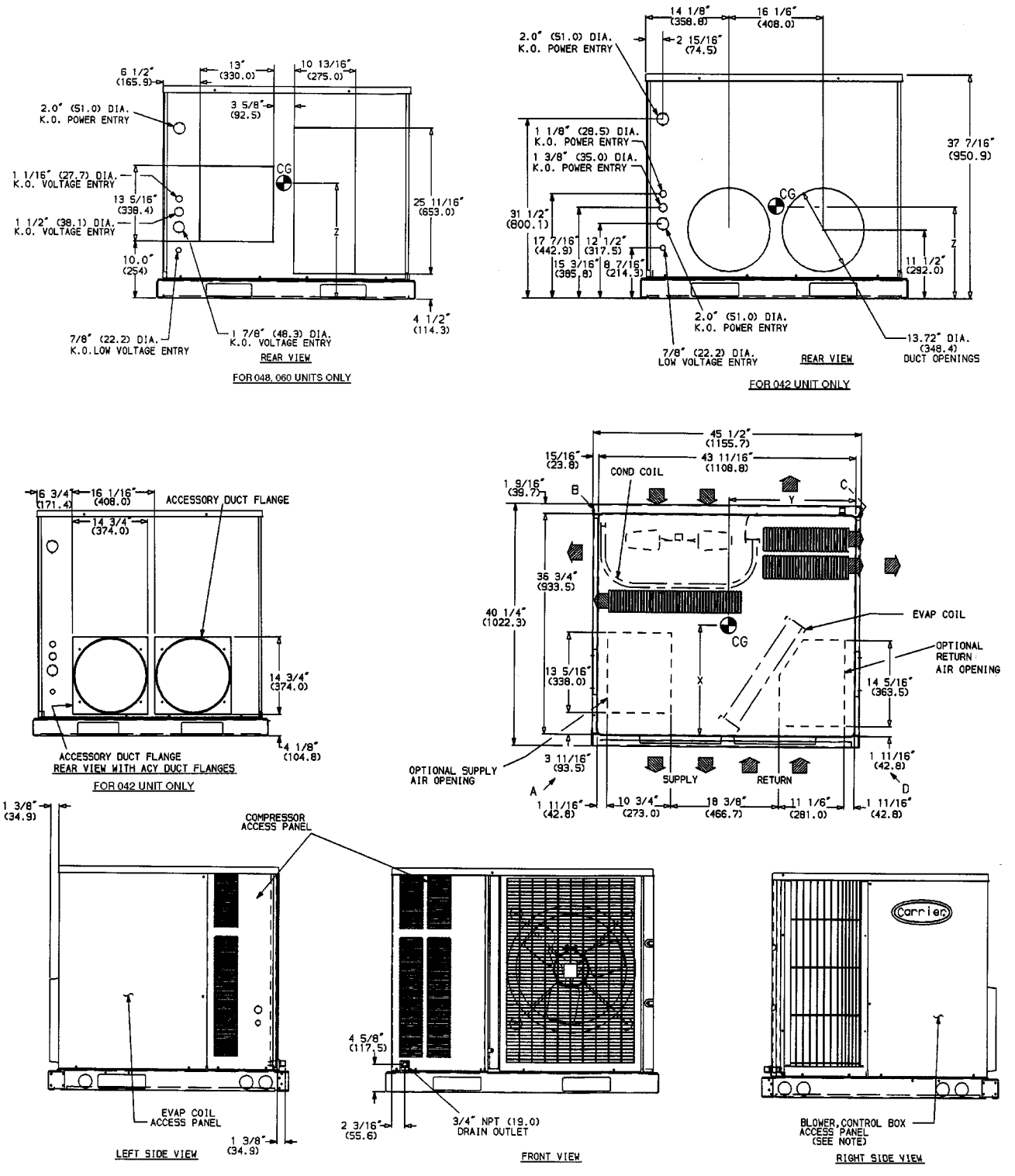


Fig. 9 — Dimensions; Units 50SX042-060 With Optional Base Rail

LEGEND

CG	— Center of Gravity	**NEC**	— National Electrical Code
COND	— Condenser	**REQ'D**	— Required
MAT'L	— Material		

REQUIRED CLEARANCES TO COMBUSTIBLE MATERIAL — in. (mm)

Unit Top 14 (356)
Duct Side of Unit 2 (51)
Side Opposite Ducts 14 (356)
Bottom of Unit 0
Vertical Discharge First 12 in. (305) of Supply Duct 1 (25)

NECESSARY REQUIRED CLEARANCES — in. (mm)

Between Units, Control Box Side 42 (1067)
Unit and Ungrounded Surfaces, Control Box Side 36 (914)
Unit and Block or Concrete Walls and Other Grounded Surfaces, Control Box Side 42 (1067)

REQUIRED CLEARANCES FOR SERVICING — in. (mm)

Evaporator Coil Access Side 30 (762)
Control Box Access Side 30 (762)
(Except for Necessary Requirements)
Unit Top 36 (914)
Side Opposite Ducts 30 (762)

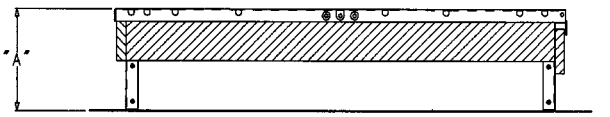
NOTES:
1. Clearances must be maintained to prevent recirculation of air from outdoor-fan discharge.
2. Dimensions in ( ) are in millimeters.

UNIT 50SX	CENTER OF GRAVITY (in./mm)		
	X	Y	Z
042	20.8/529	20.2/512	17.3/440
048	21.6/548	19.8/502	17.3/440
060	22.0/560	19.9/506	15.7/399

UNIT 50SX	ELECTRICAL CHARACTERISTICS	UNIT WT		CORNER WT (Lb/Kg)			
		Lb	Kg	A	B	C	D
042	208/230-1-60, 208/230-3-60, 460-3-60	329	150	89/40	64/29	124/56	52/24
048	208/230-1-60, 208/230-3-60, 460-3-60	360	164	89/40	75/34	138/63	58/26
060	208/230-1-60, 208/230-3-60	379	172	70/32	104/47	125/57	80/36

Fig. 9 — Dimensions; Units 50SX042-060 With Optional Base Rail (cont)

	PART NUMBER	"A"
FLAT CURB	CPRFCURB001A00	8″ [203]
	CPRFCURB002A00	11″ [279]
	CPRFCURB003A00	14″ [356]



FLAT CURB

NOTES:
1. Roof curb must be set up for unit being installed.
2. Seal strip must be applied as required for unit being installed.
3. Dimensions in [ ] are in millimeters.
4. Roof curb is made of 16 gage steel.
5. Attach ductwork to curb (flanges of duct rest on curb).
6. Service clearance 4 ft on each side.
7. ⇨ direction of airflow.
8. Insulated panels, 1-in. thick, fiberglass 1-lb density.

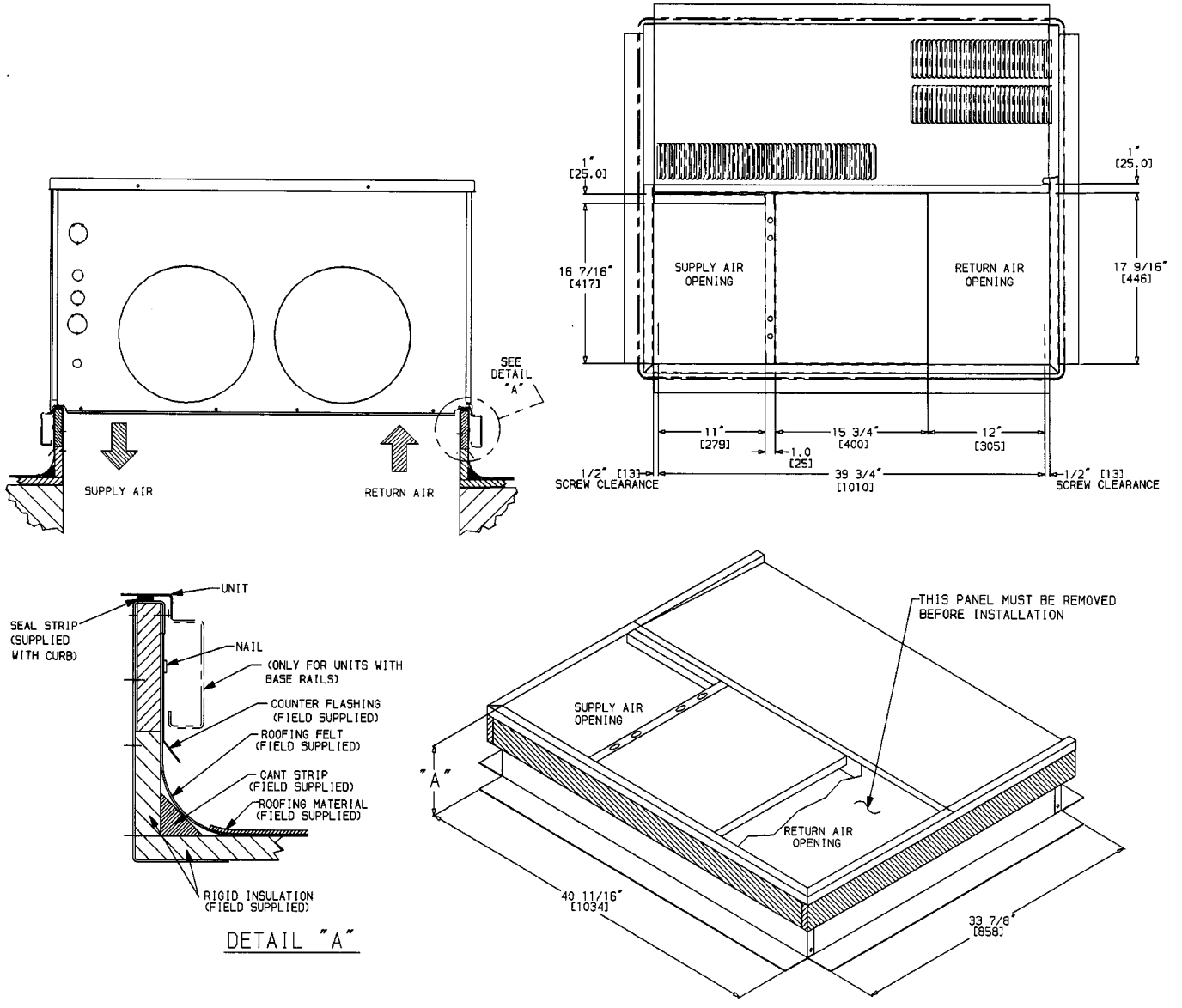


Fig. 10 — Roof Curb Dimensions

RECEIVING AND INSTALLATION

Step 1 — Check Equipment

IDENTIFY UNIT — The unit model number and serial number are stamped on the unit identification 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 Carrier Air Conditioning office if any item is missing.

To prevent loss or damage, leave all parts in original packages until installation.

Step 2 — Provide Unit Support

ROOF CURB — Install accessory roof curb in accordance with instructions shipped with curb. See Fig. 10. 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 watertight 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 ¼ inch. 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. thick with 2 in. above grade. The slab should extend approximately 2 in. beyond the casing on all 4 sides of the unit. Install a 6-in. gravel apron in front of condenser-air inlet to prevent obstruction of airflow by grass or shrubs. Do not secure the unit to the slab *except* when required by local codes.

Step 3 — Provide Clearances — The required minimum service clearances and clearances to combustibles are shown in Fig. 2-9. Adequate ventilation and condenser air must be provided.

The condenser fan pushes air through the condenser coil and discharges it through louvers on the top cover, the decorative grille, and the compressor access panel. 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 48 in. above the unit top. The maximum horizontal extension of a partial overhang must not exceed 48 inches.

⚠ CAUTION

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

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. The unit may be installed on wood flooring or on Class A, B, or C roof covering materials.

Step 4 — Rig and Place Unit — Use spreader bars or crate top when rigging the unit. The units must be rigged for lifting as shown in Fig. 11 and 12. Refer to Fig. 11 and 12 for rigging weights and Tables 1 and 2 for operating weights. *Use extreme caution to prevent damage when moving the unit. Unit must remain in an upright position during all rigging and moving operations.* The unit must be level for proper condensate drainage; the ground-level pad or accessory roof curb must be level before setting the unit in place. When a field-fabricated support is used, be sure that the support is level and that it properly supports the unit.

UNITS WITHOUT BASE RAILS — Accessory rigging brackets are recommended to be used for rigging. Install brackets as follows:

⚠ WARNING

Secure screws and paint protectors solidly against unit basepan to hold lifting brackets in position.

Never use lifting brackets when the temperature is below −10 F (−23 C).

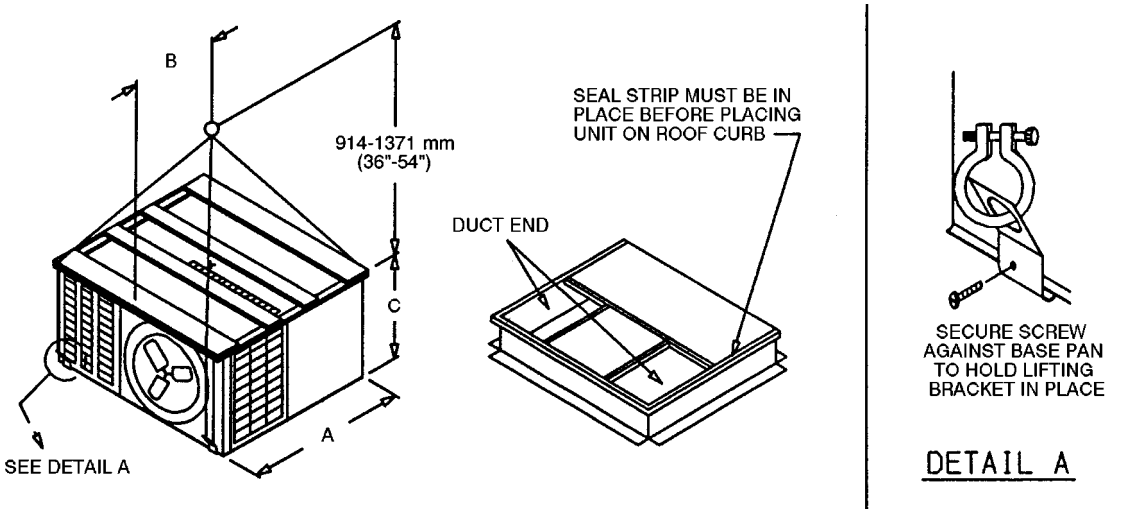
Never exceed 200 lbs per bracket of lifting force.

Never use lifting brackets for lifting other models of air conditioning units.

Lifting point should be directly over the unit center of gravity.

1. Position brackets as close to the corners of unit as possible. Be sure brackets are well outside of center of gravity. (See Fig. 2, 4, 6, 8, and 11.)
2. Position paint protectors and foam strips between screws and painted surface of unit. Tighten screws until they make contact with the paint protectors.
3. Secure device or hook of sufficient strength to hole in bracket as shown in detail ‘‘A’’ of Fig. 11.
4. If wood top is available, use it for a spreader bar to prevent straps from damaging unit. If wood top is not available, use spreader bars of sufficient length.

UNITS WITH OPTIONAL BASE RAILS — Keep unit upright and do not drop. Use spreader bars or top crate when rigging unit. Rollers may be used to move unit across roof. Level unit for proper condensate disposal. See Fig. 3, 5, 7, and 9 for additional information. Lifting holes are provided in base rails as shown in Fig. 12. Refer to rigging instructions on unit.



NOTICE TO RIGGERS

Hook rigging shackles through holes in lifting brackets, as shown in Detail "A," lifting brackets to be centered around the unit center of gravity. Use wood top skid when rigging, to prevent rigging straps from damaging unit.

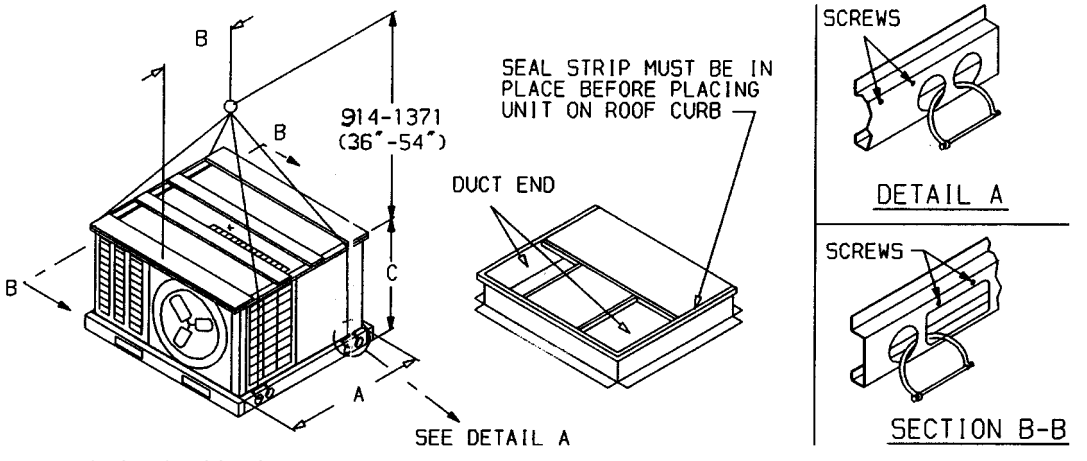
⚠ CAUTION

All panels must be in place when rigging.

UNIT SIZE 50SS	SHIPPING WEIGHT		A		B		C	
	Lb	Kg	in.	mm	in.	mm	in.	mm
018	260	118	36¾	934	18	457	24⅛	613
024	289	131	36¾	934	16¾	426	24⅛	613
030	306	139	36¾	934	16 5/16	415	24⅛	613
036	322	146	36¾	934	16¼	412	24⅛	613
042	333	151	36¾	934	16 7/16	416	28⅛	714
048	384	174	36¾	934	16¼	412	34⅛	867
060	411	186	36¾	934	16¼	412	34⅛	867

UNIT SIZE 50SX	SHIPPING WEIGHT		A		B		C	
	Lb	Kg	in.	mm	in.	mm	in.	mm
024	322	146	36¾	934	14¾	375	28⅛	714
030	325	147	36¾	934	14½	368	28⅛	714
036	343	155	36¾	934	15⅝	397	28⅛	714
042	361	164	36¾	934	15½	394	34⅛	867
048	392	178	36¾	934	14 11/16	373	34⅛	867
060	411	186	36¾	934	16¼	412	34⅛	867

Fig. 11 — Suggested Rigging for Units Without Base Rail



NOTICE TO RIGGERS

Hook rigging shackles through holes in lifting brackets, as shown in Detail "A," lifting brackets to be centered around the unit center of gravity. Use wood top skid when rigging, to prevent rigging straps from damaging unit. Remove 4 screws to slide wood support through rectangular hole in rail.

UNIT SIZE 50SS	SHIPPING WEIGHT		A		B		C	
	Lb	Kg	in.	mm	in.	mm	in.	mm
018	247	112	36.5	926.0	17.0	431	28.2	715
024	276	125	36.5	926.0	14.3	364	28.2	715
030	293	133	36.8	926.0	14.7	372	28.2	715
036	309	140	36.5	926.0	15.5	393	28.2	715
042	339	154	36.5	926.0	15.5	394	32.2	817
048	371	168	36.5	926.0	14.8	376	38.2	969
060	398	180	36.5	926.0	14.4	366	38.2	969

⚠ CAUTION

All panels must be in place when rigging.

UNIT SIZE 50SX	SHIPPING WEIGHT		A		B		C	
	Lb	Kg	in.	mm	in.	mm	in.	mm
024	309	140	36.5	926.0	15.0	380	32.2	817
030	312	141	36.5	926.0	14.8	376	32.2	817
036	330	150	36.5	926.0	15.8	402	32.2	817
042	348	158	36.5	926.0	15.6	397	38.2	969
048	379	172	36.5	926.0	14.9	378	38.2	969
060	398	180	36.5	926.0	14.4	366	38.2	969

Fig. 12 — Suggested Rigging for Units with Optional Base Rail

Table 1 — Physical Data — Unit 50SS

UNIT 50SS	018	024	030	036	042	048	060
REFRIGERANT	R-22						
Metering Device	Acutrol™ System						
Charge (lb)	2.60	2.75	3.40	4.30	5.20	6.50	7.00
OPERATING WEIGHT (lb)							
Without Base Rails	208	237	254	270	300	332	359
With Optional Base Rails	228	257	274	290	320	352	379
COMPRESSOR TYPE	Rotary	Reciprocating	Reciprocating	Reciprocating	Reciprocating	Scroll	Scroll
EVAPORATOR FAN	Centrifugal — Direct Drive						
Speeds	2	3	3	3	2	2	2
Nominal Rpm	825	1075	1100	1100	1100	1100	1100
Diameter (in.)	10	10	10	10	10	10	10
Width (in.)	9	9	9	9	9	9	9
Nominal Airflow (Cfm)	600	800	1000	1200	1400	1600	1995
Motor Hp	1/4	1/4	1/2	1/2	3/4	3/4	1
EVAPORATOR COIL							
Rows...Fins/in.	3...15	3...15	3...15	3...15	3...15	3...15	4...15
Face Area (sq ft)	1.83	2.29	2.29	3.06	3.60	4.44	4.44
CONDENSER FAN	Propeller — Direct Drive						
Cfm	1700	1700	1900	1900	1900	2400	2400
Nominal Rpm	850	850	1050	1050	1050	1050	1050
Diameter (in.)	18	18	18	18	18	20	20
Motor Hp	1/8	1/8	1/4	1/4	1/4	1/3	1/3
CONDENSER COIL							
Rows...Fins/in.	1...17	1...17	2...17	2...17	2...17	2...17	2...17
Face Area (sq ft)	5.95	5.95	5.95	5.95	7.00	8.66	8.66
FILTER SIZE (in.)*							
Throwaway	20x20	20x20	20x24	20x24	24x24	24x30	24x30

*Recommended field-supplied filters are 1 in. thick.

Table 2 — Physical Data — Unit 50SX

UNIT 50SX	024	030	036	042	048		060
REFRIGERANT	R-22						
Metering Device	Acutrol™ System						
Charge (lb)	3.9	4.5	5.4	5.7	5.8		6.5
OPERATING WEIGHT (lb)							
Without Base Rails	270	273	291	309	340		359
With Optional Base Rails	290	293	311	329	360		379
COMPRESSOR TYPE	Scroll						
EVAPORATOR FAN	Centrifugal — Direct Drive						
Motor Type	Std	Std	Std	Std	Std*	ICM	ICM
Speeds	3	3	3	3	2	Variable	Variable
Nominal Rpm	1075	1075	1100	1100	1125	—	—
Diameter (in.)	10	10	10	10	10	10	10
Width (in.)	9	9	9	9	9	9	9
Nominal Airflow (Cfm)	800	1000	1200	1400	1600	1600	1995
Motor Hp	1/4	1/4	1/2	1/2	3/4	1	1
EVAPORATOR COIL							
Rows...Fins/in.	2...15	3...15	4...15	3...15	4...15		4...15
Face Area (sq ft)	3.60	2.70	3.60	4.44	4.44		4.44
CONDENSER FAN	Propeller — Direct Drive						
Cfm	2200	2200	2200	2400	2400		2400
Nominal Rpm	1100	1100	1100	1100	1100		1050
Diameter (in.)	20	20	20	20	20		20
Motor Hp	1/4	1/4	1/4	1/4	1/4		1/3
CONDENSER COIL							
Rows...Fins/in.	2...17	2...17	2...17	2...17	2...17		2...17
Face Area (sq ft)	7.00	7.00	7.00	8.66	8.66		8.66
FILTER SIZE (in.)†							
Throwaway	24x24	24x24	24x24	24x30	24x30		24 x 30

LEGEND

ICM — Integrated Control Motor

*460 v only.
†Recommended field-supplied filters are 1 in. thick.

NOTE: Standard motors are non-integrated control motors.

Step 5 — Select and Install Ductwork — The design and installation of the duct system must be in accordance with the standards of the NFPA (National Fire Protection Association) for installation of nonresidence-type air conditioning and ventilating systems, NFPA 90A or residence-type, NFPA 90B; and/or local codes and residence-type, NFPA 90B; and/or local codes and ordinances.

Select and size ductwork, supply-air registers and return-air grilles according to ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) recommendations.

The unit has duct flanges on the supply- and return-air openings on the side of the unit. See Fig. 2-9 for connection sizes and locations.

When designing and installing ductwork, consider the following:

⚠ CAUTION

When connecting ductwork to units, do not drill deeper than ½ inch in shaded area shown in Fig. 13 or coil may be damaged.

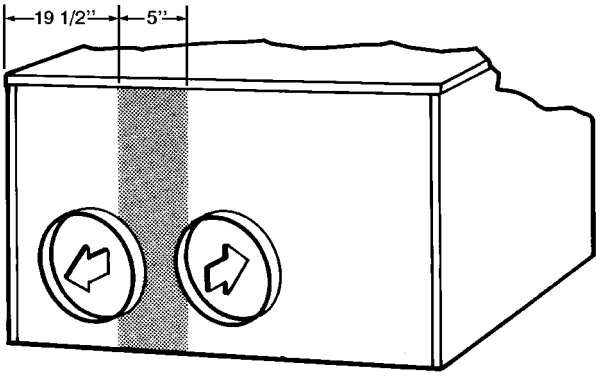


Fig. 13 — Area Not To Be Drilled

- All units should have field-supplied filters or accessory filter rack installed in the return-air side of the unit. Recommended sizes for filters are shown in Tables 1 and 2.
- Avoid abrupt duct size increases and reductions. Abrupt change in duct size adversely affects air performance.

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 fireproof 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) should extend 24-in. from electric heater element.

- Size ductwork for cooling air quantity (cfm). The minimum air quantity for proper electric heater operation is listed in Table 3. Heater limit switches may trip at air quantities below those recommended.
- Insulate and weatherproof all external ductwork. Insulate and cover with a vapor barrier all ductwork passing through conditioned spaces. Follow latest Sheet Metal and Air Conditioning Contractors National Association (SMACNA) and Air Conditioning Contractors Association (ACCA) minimum installation standards for residential heating and air conditioning systems.
- Secure all ducts to building structure. Flash, weatherproof, and vibration-isolate duct openings in wall or roof according to good construction practices.

Figure 14 shows a typical duct system with 50SS,SX installed.

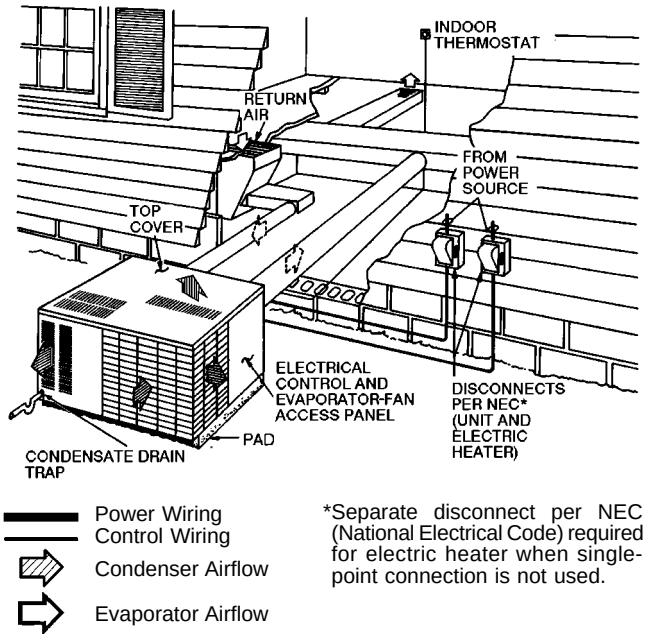


Fig. 14 — Typical Installation

Table 3 — Minimum Airflow for Safe Electric Heater Operation (Cfm)

SIZE						
018*	024	030	036	042	048	060
700	700	875	1200	1225	1400	1750

*Unit 50SS only.

CONVERTING HORIZONTAL DISCHARGE UNITS TO DOWNFLOW (VERTICAL) DISCHARGE — STD (Non-Integrated Control Motor [Non-ICM] UNITS — Units are shipped in a horizontal configuration. To convert a horizontal unit for downflow (vertical) discharge, perform the following steps:

⚠ WARNING

Before performing service or maintenance operations on system, turn off main power to unit. Turn off accessory heater power switch if applicable. Electrical shock can cause personal injury.

1. Open all electrical disconnects before starting any service work.
2. Remove evaporator coil access panel (Fig. 15).
3. Locate lances in basepan insulation that are placed over the perimeter of the vertical duct opening cover (Fig. 16).
4. Using a straight edge and sharp knife, cut and remove the insulation around the perimeter of the cover. Remove the screws securing the cover to the basepan and slide out the cover. Discard the cover (Fig. 17).

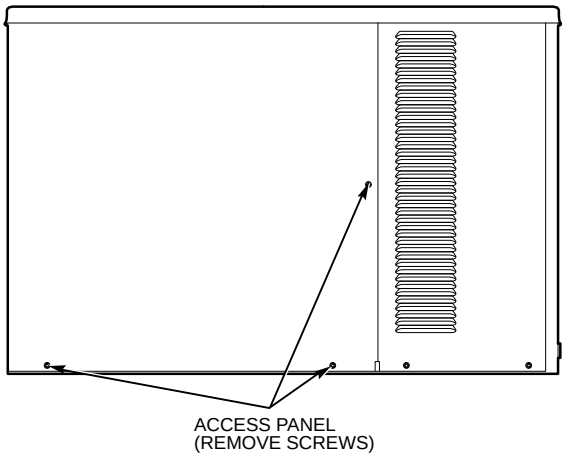


Fig. 15 — Evaporator Coil Access Panel

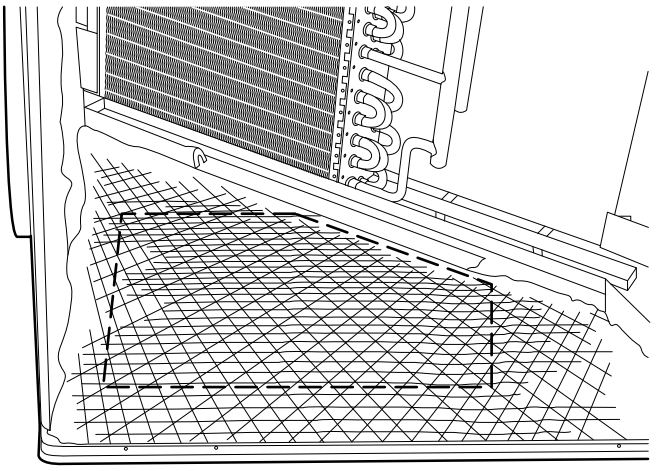


Fig. 16 — Basepan Insulation Over Vertical Duct Opening

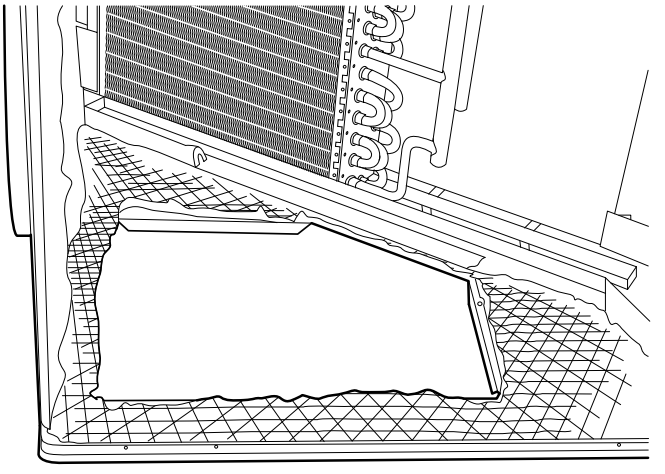


Fig. 17 — Insulation and Cover Removed from Vertical Duct Opening

5. Remove indoor blower access panel (Fig. 18).
6. Disconnect evaporator-fan motor leads from evaporator-fan relay and unit contactor. Carefully disengage wire tie containing evaporator-fan motor leads from the unit control box (Fig. 19).
7. Remove screws (Fig. 20) securing evaporator blower housing to blower shelf and carefully slide out blower housing. There is a filler bracket attached to the blower shelf; remove this filler bracket and retain for later use.
8. Locate lances in basepan insulation that are placed over the perimeter of the vertical discharge opening cover (Fig. 21).
9. Using a straight edge and sharp knife, cut the insulation around the perimeter of the cover. Remove the screws securing the cover to the basepan and slide out the cover (Fig. 22). Discard the cover. Install filler bracket removed in Step 7.
10. If unit ductwork is to be attached to vertical opening flanges on the unit basepan (jackstand applications only), do so at this time.
11. It is recommended that the basepan insulation around the perimeter of the vertical opening be secured to the basepan with aluminum tape to prevent the insulation from tearing or bunching up when the blower housing is installed in the vertical discharge position.
12. Orient blower housing for vertical airflow (blower motor adjacent to horizontal duct opening) and slide into vertical opening making sure the flanges on the blower side plates engage the tabs in the unit basepan.

    Resistance will be felt as the blower housing contacts the basepan insulation; this can be overcome by applying a slight force to the base of the blower. Continue sliding blower in until hole in side plate flange aligns with the hole in the basepan. Secure using screw removed in Step 7. Reconnect evaporator-fan motor leads and insert wire tie back into unit control box (Fig. 19).
13. Cover the horizontal duct openings. Duct covers can be ordered as an accessory or be field-fabricated as shown in Fig. 23.
14. Reinstall the evaporator coil and indoor blower access panels.
15. After completing unit installation, perform all safety checks and power up unit.

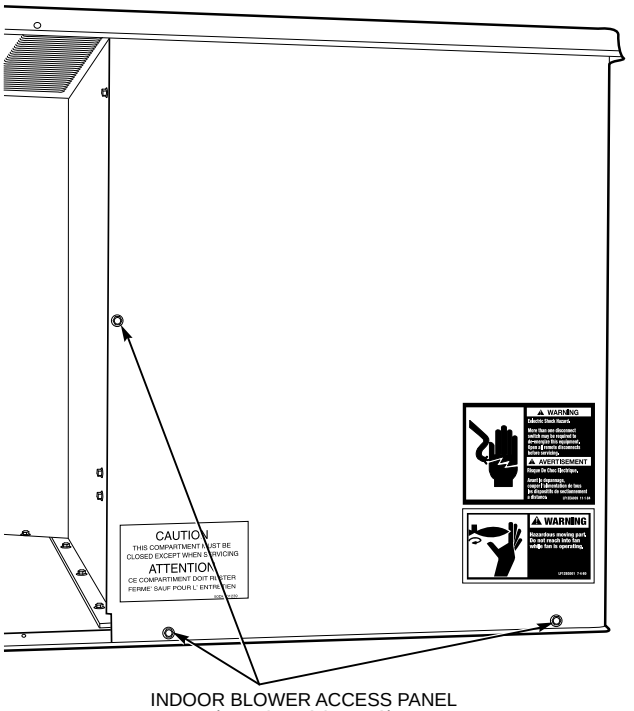


Fig. 18 — Indoor Blower Access Panel

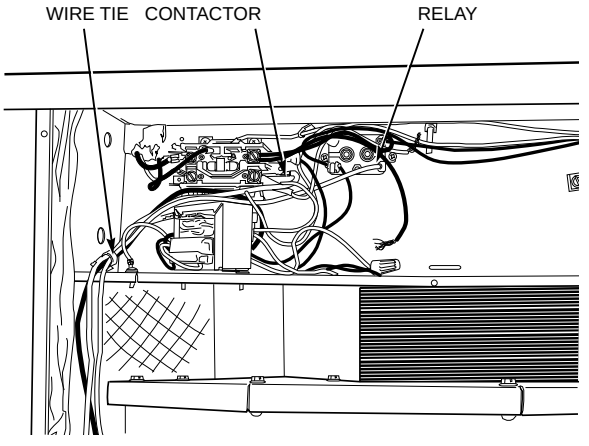


Fig. 19 — Fan Motor Leads

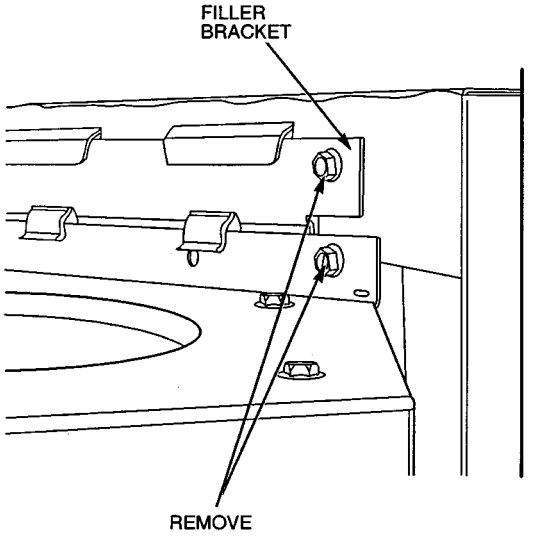


Fig. 20 — Blower Shelf and Housing

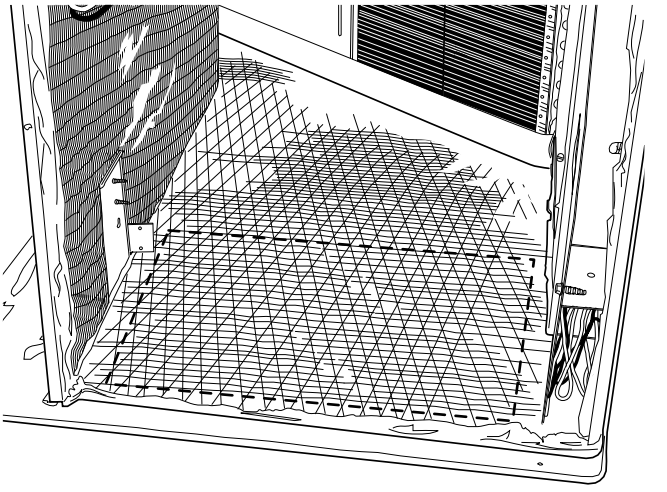


Fig. 21 — Basepan Insulation Over Vertical Discharge Opening

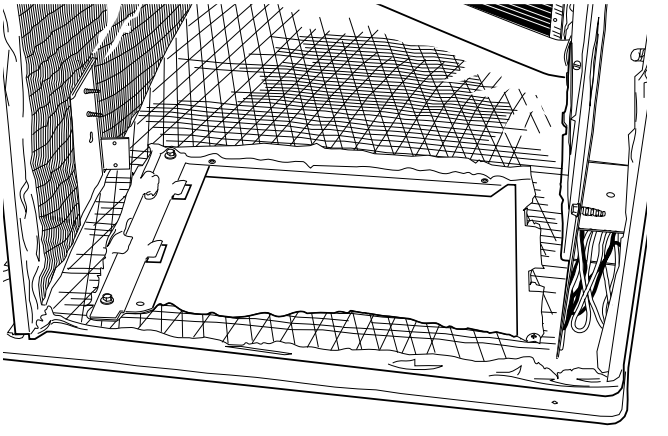


Fig. 22 — Insulation and Cover Removed from Vertical Discharge Opening

CONVERTING HORIZONTAL DISCHARGE UNITS TO DOWNFLOW (VERTICAL) DISCHARGE — ICM (Integrated Control Motor) UNITS — Units are shipped in a horizontal configuration. To convert a horizontal unit for downflow (vertical) discharge, perform the following steps:

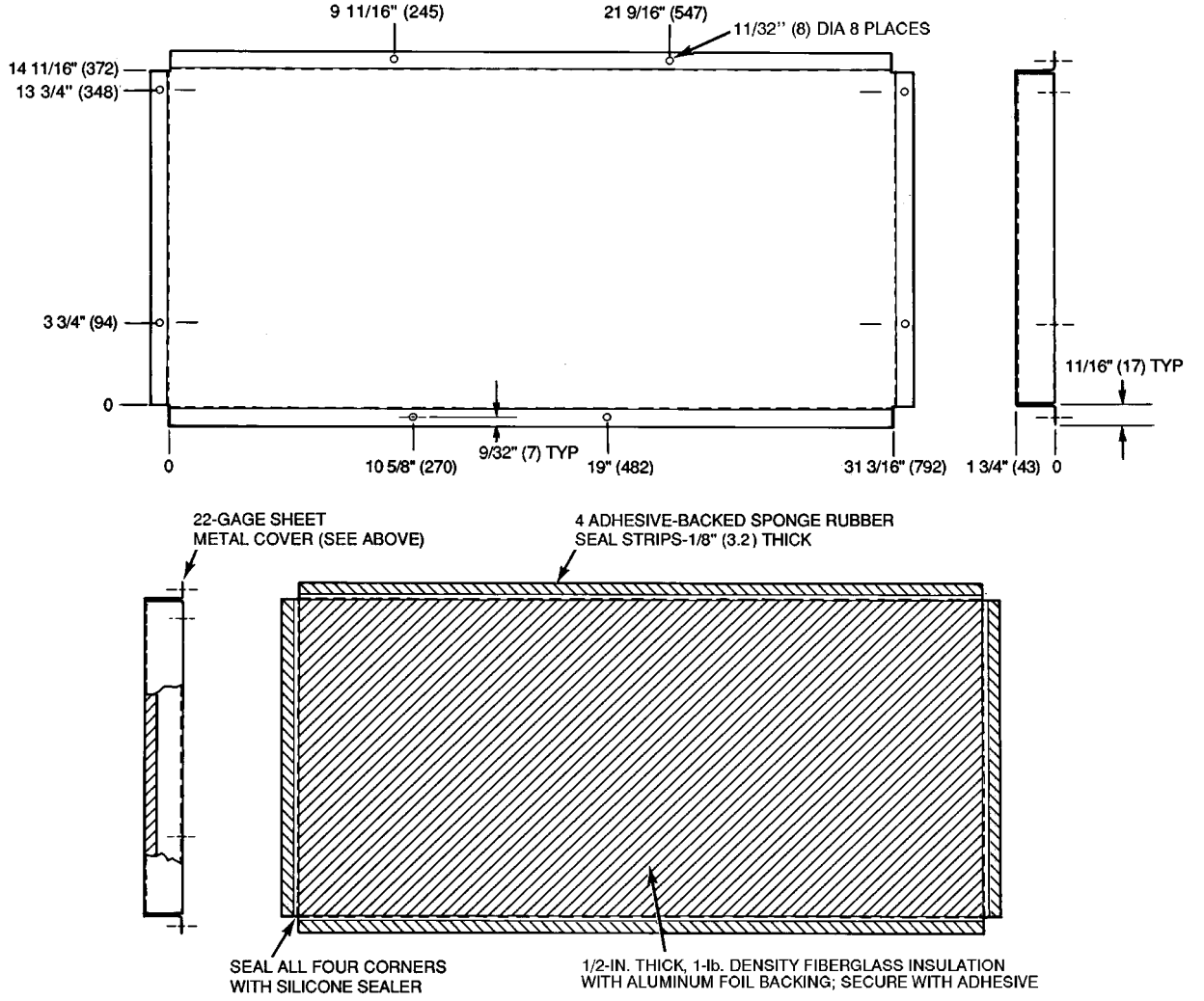
⚠ WARNING

Before performing service or maintenance operations on system, turn off main power to unit. Turn off accessory heater power switch if applicable. Electrical shock can cause personal injury.

1. Open all electrical disconnects before starting any service work.
2. Remove evaporator coil access panel (Fig. 15).
3. Locate lances in basepan insulation that are placed over the perimeter of the vertical duct opening cover (Fig. 16).
4. Using a straight edge and sharp knife, cut and remove the insulation around the perimeter of the cover. Remove the screws securing the cover to the basepan and slide out the cover. Discard the cover (Fig. 17).
5. Remove evaporator blower access panel (Fig. 18).
6. Remove screws (Fig. 20) securing evaporator blower housing to blower shelf and carefully slide out blower housing. Disconnect the plug assemblies (Fig. 24) from the evaporator-fan motor. There is a filler bracket attached to the blower shelf; remove this filler bracket and retain for later use. (See Fig. 24).

7. Remove screws securing blower shelf to duct panel. Discard the blower shelf.
8. Locate lances in basepan insulation that are placed over the perimeter of the vertical discharge opening cover (Fig. 21).
9. Using a straight edge and sharp knife, cut the insulation around the perimeter of the cover. Remove the screws securing the cover to the basepan and slide out the cover (Fig. 22). Discard the cover. Install filler bracket removed in Step 6.
10. If unit ductwork is to be attached to vertical opening flanges on the unit basepan (jackstand applications only), do so at this time.
11. It is recommended that the basepan insulation around the perimeter of the vertical opening be secured to the basepan with aluminum tape to prevent the insulation from tearing or bunching up when the blower housing is installed in the vertical discharge position.
12. Remove screws securing the high-voltage raceway to duct panel. See Fig. 24. Temporarily place raceway on top of unit until blower housing is installed.
13. Orient blower housing for vertical airflow (blower motor adjacent to horizontal duct opening). See Fig. 25. Reconnect the plug assemblies. Slide blower housing into vertical opening making sure the flanges on the blower side plates engage the tabs in the unit basepan.

    Resistance will be felt as the blower housing contacts the basepan insulation; this can be overcome by applying a slight force to the base of the blower. Continue sliding blower in until hole in side plate flange aligns with the hole in the basepan. Secure using screws removed in Step 6.
14. Reinstall the high-voltage raceway removed in Step 12.
15. Cover the horizontal duct openings. Duct covers can be ordered as an accessory or be field-fabricated.
16. Reinstall the evaporator coil and evaporator blower access panels.
17. After completing unit installation, perform all safety checks and power up unit.



NOTES:
1. An accessory duct cover is available as an alternative to field fabrication.
2. Construct duct cover out of 22-gage sheet metal.
3. Dimensions in ( ) are in millimeters.

Fig. 23 — Field-Fabricated Duct Cover

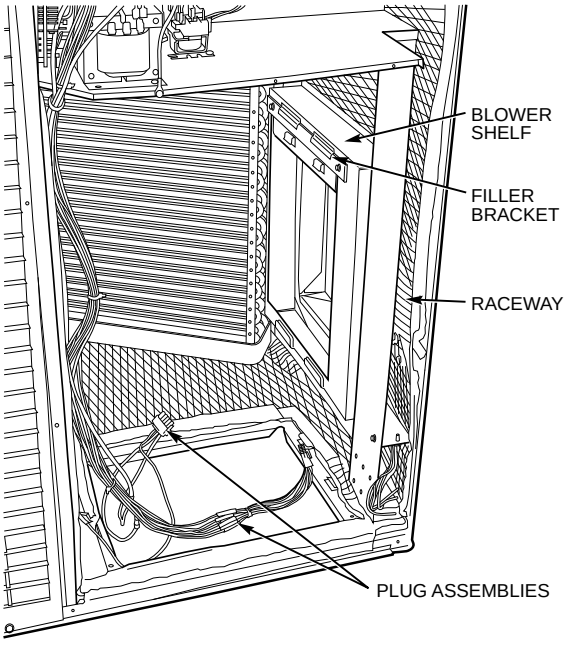


Fig. 24 — Filler Bracket and Blower Shelf

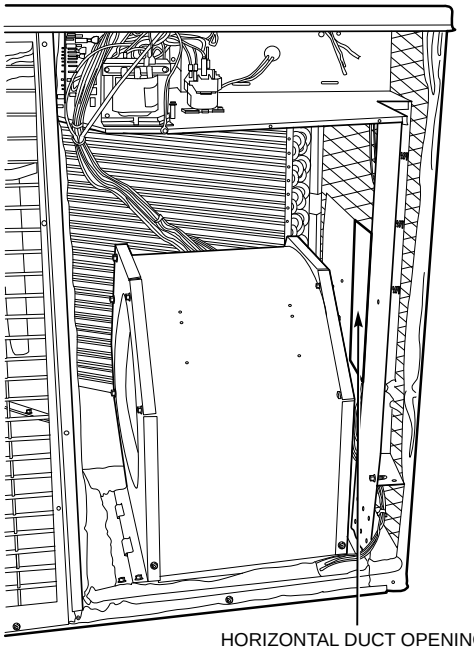


Fig. 25 — Housing Placed for Vertical Airflow

ACCESSORY DUCT FLANGE KIT INSTALLATION — Refer to Fig. 26 for duct adapter dimensions and hole locations.

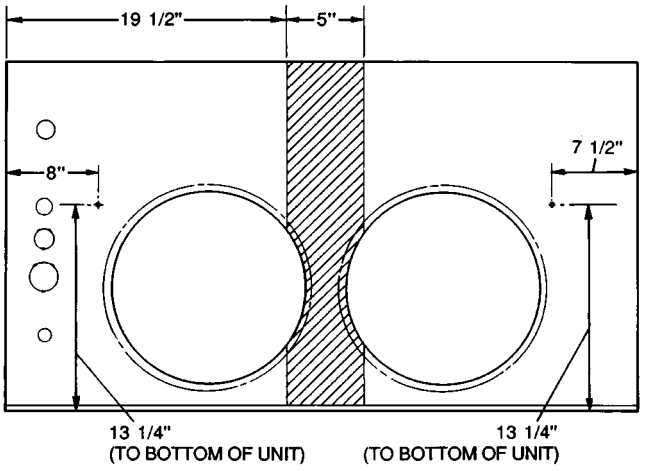
1. Mark hole locations shown in Fig. 26.
2. At marked locations, drill holes using a no. 26 (.147-in.) twist drill.
3. Partially secure duct flanges using two of the no. 10, ½-in. screws provided.
4. See the following caution. Using remaining holes in duct flanges as templates, drill the remaining holes with the no. 26 (.147-in.) drill.

⚠ CAUTION

Do not drill deeper than ½-in. into shaded area shown in Fig. 26. Damage to refrigerant coil could result.

5. Fully secure the duct flanges using the remaining screws provided.

The finished kit installation accommodates a 14¾-in. x 14¾-in. duct.



NOTE: Do not drill more than ½-in. deep in shaded area.

Fig. 26 — Duct Flange Kit — Locating Holes (Typical)

Step 6 — Provide for Condensate Disposal

NOTE: Be sure that condensate-water disposal methods comply with local codes, restrictions, and practices.

Unit disposes of condensate through a ¾-in. NPT fitting which exits through the compressor access panel. See Fig. 2-9 for location of condensate connection.

Condensate water can be drained directly onto the roof in rooftop installations (where permitted) or onto a gravel apron in ground-level 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. lower than the drain-pan condensate connection to prevent the pan from overflowing. See Fig. 27. Prime the trap with water. When using a gravel apron, make sure it slopes away from the unit.

If the installation requires draining the condensate water away from the unit, install a 2-in. trap using a ¾-in. FPT connection. See Fig. 27. Make sure that the outlet of the trap is at least 1 in. lower than the unit drain-pan condensate connection to prevent the pan from overflowing. Prime the trap with water. Connect a drain tube using a minimum of ¾-in. PVC, ¾-in. CPVC, or ¾-in. copper pipe (all field supplied). Do not undersize the tube. Pitch the drain tube downward at a slope of at least 1 in. for every 10 ft of horizontal run. Be sure to check the drain tube for leaks. Prime trap at the beginning of the cooling season start-up.

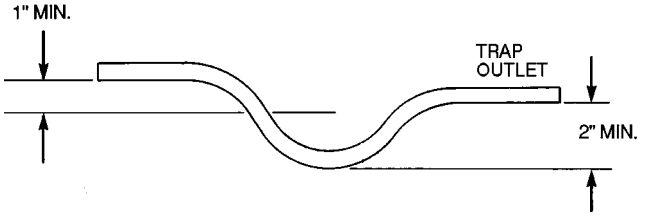


Fig. 27 — Condensate Trap

Step 7 — Install Electrical Connections

⚠ WARNING

The 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 an electrical wire connected to the unit wire-binding screw in the control compartment, or conduit approved for electrical ground when installed in accordance with NEC (National Electrical Code), ANSI/NFPA (latest edition) (in Canada, Canadian Electrical Code CSA C22.1) and local electrical codes. Failure to adhere to this warning could result in personal injury or death.

⚠ CAUTION

Failure to follow these precautions could result in damage to the unit being installed:

1. Make all electrical connections in accordance with NEC ANSI/NFPA (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. On 3-phase units, ensure that phases are balanced within 2%. Consult local power company for correction of improper voltage and/or phase imbalance.
4. Insulate low-voltage wires for highest voltage contained within conduit when low-voltage control wires are run 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. See Tables 4A and 4B for electrical data.

The field-supplied disconnect may be mounted on the unit over the high-voltage inlet hole. See Fig. 2-9.

If the unit has an electric heater, a second disconnect may be required. Consult the Installation, Start-Up and Service Instructions provided with the accessory for electrical service connections.

⚠ CAUTION

Operation of unit on improper line voltage constitutes abuse and may cause unit damage that could affect warranty.

ROUTING POWER LEADS INTO UNIT — Use only copper wire between disconnect and unit. The high-voltage leads should be in a conduit until they enter the duct panel; conduit termination at the duct panel must be watertight. Run the high-voltage leads through the knockout on the duct panel (see Fig. 28 for location and size). When the leads are inside the unit, run leads up the high-voltage raceway to the line wiring splice box (Fig. 29). For single-phase units, connect leads to the black and yellow wires; for 3-phase units, connect the leads to the black, yellow, and blue wires (see Fig. 30).

CONNECTING GROUND LEAD TO WIRE-BINDING SCREW — Refer to Fig. 29 and 30. Connect the ground lead to the chassis using the wire-binding screw in the wiring splice box.

ROUTING CONTROL POWER WIRES — STD NON-ICM UNITS (24 v) — For all units except 50SS060, form a drip-loop with the thermostat leads before routing them into the unit. Route the thermostat leads through grommeted hole provided in unit (see Fig. 28) into unit control power splice box. Connect thermostat leads to unit control power leads as shown in Fig. 31.

For 50SS060 units, remove knockout in the duct panel (see Fig. 28).

Remove the rubber grommet from the installer's packet (included with unit) and install it in the knockout opening. Route thermostat wires through grommet providing a drip loop at the panel. Connect low-voltage leads to the thermostat as shown in Fig. 31.

The unit transformer supplies 24-v power for complete system including accessory electrical heater. Transformer is factory wired for 230-v operation. If supply voltage is 208 v, rewire transformer primary as described in the Special Procedures for 208-v Operation section on page 24.

Table 4A — Electrical Data — 50SS Units

UNIT SIZE 50SS	V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OUTDOOR-FAN MOTOR	INDOOR-FAN MOTOR	POWER SUPPLY		AWG 60C MIN WIRE SIZE	MAX WIRE LENGTH (ft)
		Min	Max	RLA	LRA	FLA	FLA	MCA	MOCP*		
018	208/230-1-60	187	253	8.3	45.0	0.7	1.8	12.0	15	14	75
024	208/230-1-60	187	253	12.4	61.0	0.7	2.0	18.2	30	12	80
030	208/230-1-60	187	253	14.4	82.0	1.4	2.3	21.8	30	10	100
	208/230-3-60	187	253	9.4	65.5	1.4	2.3	15.5	25	12	80
036	208/230-1-60	187	253	18.0	96.0	1.4	2.8	26.7	40	10	90
	208/230-3-60	187	253	11.7	75.0	1.4	2.8	18.8	30	12	65
	460-3-60	414	506	5.6	40.0	0.8	1.4	9.2	10	14	100
042	208/230-1-60	187	253	20.4	104.0	1.4	4.0	30.9	50	8	100
	208/230-3-60	187	253	14.0	91.0	1.4	4.0	22.9	35	10	85
	460-3-60	414	506	6.4	42.0	0.8	2.0	10.8	15	14	100
048	208/230-1-60†	187	253	21.8	124.0	2.1	5.0	40.1	60	6	100
	208/230-1-60**	187	253	26.4	129.0	2.1	5.0	40.1	60	6	100
	208/230-3-60†	187	253	12.8	93.0	2.1	5.0	23.1	35	10	75
	208/230-3-60**	187	253	15.0	99.0	2.1	5.0	25.9	40	10	75
	460-3-60†	414	506	16.0	125.0	2.1	6.8	33.0	40	8	90
	460-3-60**	414	506	19.3	123.0	2.1	6.8	33.0	50	8	90
060	208/230-1-60†	187	253	28.9	165.0	2.1	6.8	49.0	60	6	100
	208/230-1-60**	187	253	32.1	169.0	2.1	6.8	49.0	60	6	100
	208/230-3-60†	187	253	6.4	46.5	1.1	2.3	11.4	15	14	100
	208/230-3-60**	187	253	8.2	49.5	1.1	2.3	13.7	20	14	100
	460-3-60†	414	506	8.0	66.5	1.1	3.2	16.8	20	12	100
	460-3-60**	414	506	10.0	62.0	1.1	3.2	16.8	25	12	100

LEGEND

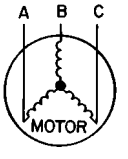
AWG — American Wire Gage
BRKR — Breaker
CUL — Canadian Underwriters' Laboratories
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
RLA — Rated Load Amps

*Fuse or HACR Breaker.
†Carrier Scroll Compressor.
**Copeland Scroll Compressor.

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. The CUL units may be fuse or circuit breaker.
2. Minimum wire size is based on 60 C copper wire. If other than 60 C wire is used, or if length exceeds wire length in table, determine size from NEC.
3. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.

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

EXAMPLE: Supply voltage is 460-3-60.



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

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3} = \frac{1371}{3} = 457$$

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

Determine percent of voltage imbalance.

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

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

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

Table 4B — Electrical Data — 50SX Units

UNIT SIZE 50SX	V-PH-Hz	VOLTAGE RANGE		COMPRESSOR		OUTDOOR-FAN MOTOR	INDOOR-FAN MOTOR	POWER SUPPLY		AWG 60C MIN WIRE SIZE	MAX WIRE LENGTH (ft)
		Min	Max	RLA	LRA	FLA	FLA	MCA	MOCP*		
024	208/230-1-60	187	253	12.9	62.5	1.4	2.0	19.5	30	12	75
030	208/230-1-60	187	253	15.0	76.0	1.4	2.6	22.8	30	10	100
036	208/230-1-60	187	253	16.7	95.0	1.4	2.8	25.1	30	10	95
	208/230-3-60	187	253	10.9	75.0	1.4	2.8	17.8	25	12	70
	460-3-60	414	506	5.4	40.0	0.8	1.4	9.0	10	14	100
042	208/230-1-60	187	253	20.0	104.0	1.4	3.1	29.5	45	10	80
	208/230-3-60	187	253	13.9	88.0	1.4	3.1	21.9	30	10	60
	460-3-60	414	506	6.8	44.0	0.8	1.6	10.9	15	14	100
048	208/230-1-60	187	253	26.4	129.0	1.4	7.2	41.6	60	6	100
	208/230-3-60	187	253	15.0	99.0	1.4	7.2	27.4	40	10	70
	460-3-60	414	506	8.2	49.5	0.8	2.3	13.4	20	14	100
060	208/230-1-60	187	253	32.1	169.0	2.1	7.2	49.4	60	6	100
	208/230-3-60	187	253	19.3	123.0	2.1	7.2	33.4	50	8	90

LEGEND

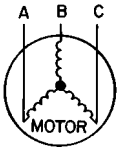
AWG — American Wire Gage
BRKR — Breaker
CUL — Canadian Underwriters' Laboratories
FLA — Full Load Amps
HACR — Heating, Air Conditioning and Refrigeration
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
NEC — National Electrical Code
RLA — Rated Load Amps

*Fuse or HACR Breaker.
†Carrier Scroll Compressor.
**Copeland Scroll Compressor.

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. The CUL units may be fuse or circuit breaker.
2. Minimum wire size is based on 60 C copper wire. If other than 60 C wire is used, or if length exceeds wire length in table, determine size from NEC.
3. **Unbalanced 3-Phase Supply Voltage**
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the percentage of voltage imbalance.

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

EXAMPLE: Supply voltage is 460-3-60.



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

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3} = \frac{1371}{3} = 457$$

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

Determine percent of voltage imbalance.

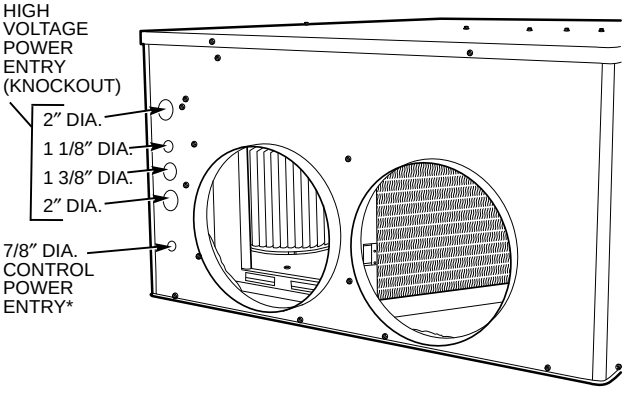
$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457} = 1.53\%$$

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

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

ROUTING CONTROL POWER WIRES — ICM UNITS (24 v) — Remove knockout in the duct panel (see Fig. 28). Remove the rubber grommet from the installer's packet (included with unit) and install it in the knockout opening. Route thermostat wires through grommet providing a drip loop at the panel. Connect low-voltage leads to the thermostat as shown in Fig. 31-34.

The Easy Select interface board is located in the return-air section and is attached to the duct panel. The Easy Select interface board is factory wired to the motor and factory default selections are preset.



*Knockout on rectangular-duct panel units; entry hole on round-duct panel units.

NOTE: For rectangular duct knockout sizes, see Fig. 2-9.

Fig. 28 — Typical Duct Panel Knockouts

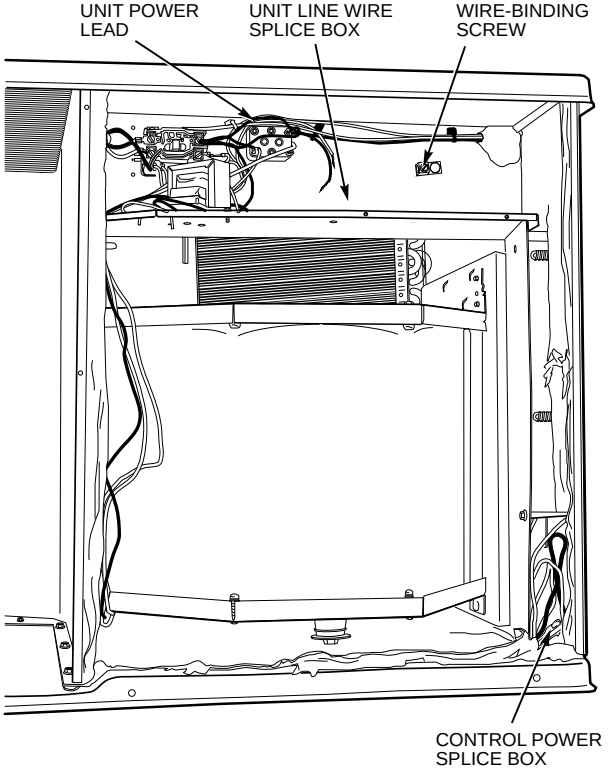


Fig. 29 — Wiring Splice Boxes

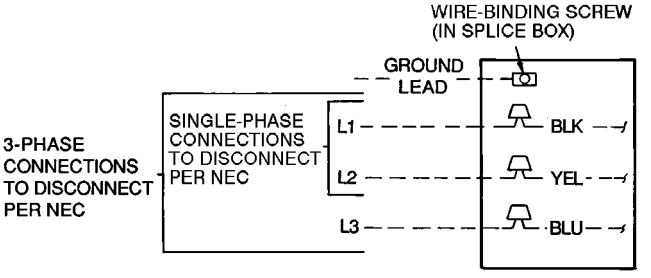
SPECIAL PROCEDURES FOR 208-V OPERATION

⚠ WARNING

Make sure that the power supply to the unit is switched OFF before making any wiring changes. Electrical shock can cause personal injury or death.

1. Disconnect the orange transformer-primary lead from the contactor. See unit wiring label.
2. Remove the wirenut from the terminal on the end of the red transformer-primary lead.
3. Save the wirenut.
4. Connect the red lead to the contactor terminal from which the orange lead was disconnected.
5. Using the wirenut removed from the red lead, insulate the loose terminal on the orange lead.
6. Wrap the wirenut with electrical tape so that the metal terminal cannot be seen.

Indoor blower-motor speeds may need to be changed for 208-v operation. Refer to Indoor Airflow and Airflow Adjustments section on page 34.



NEC — National Electrical Code

NOTE: Use copper wire only.

Fig. 30 — Line Power Connections

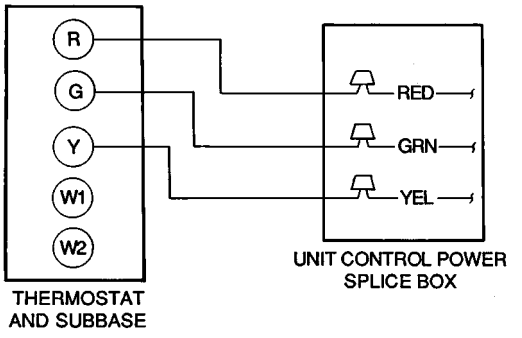
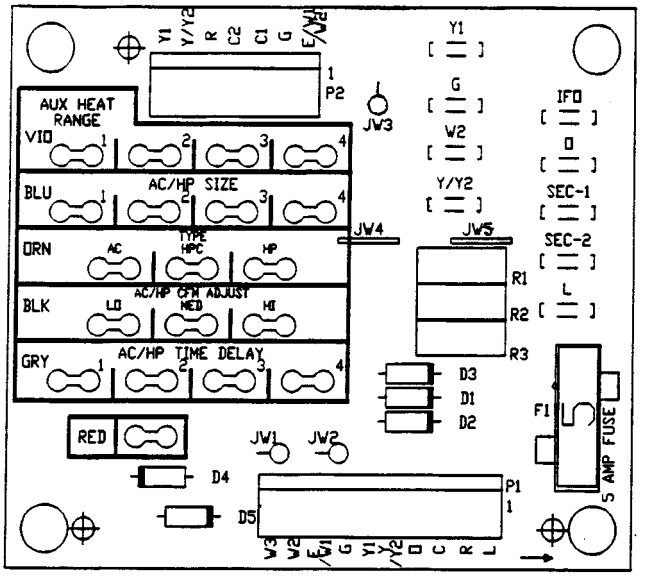


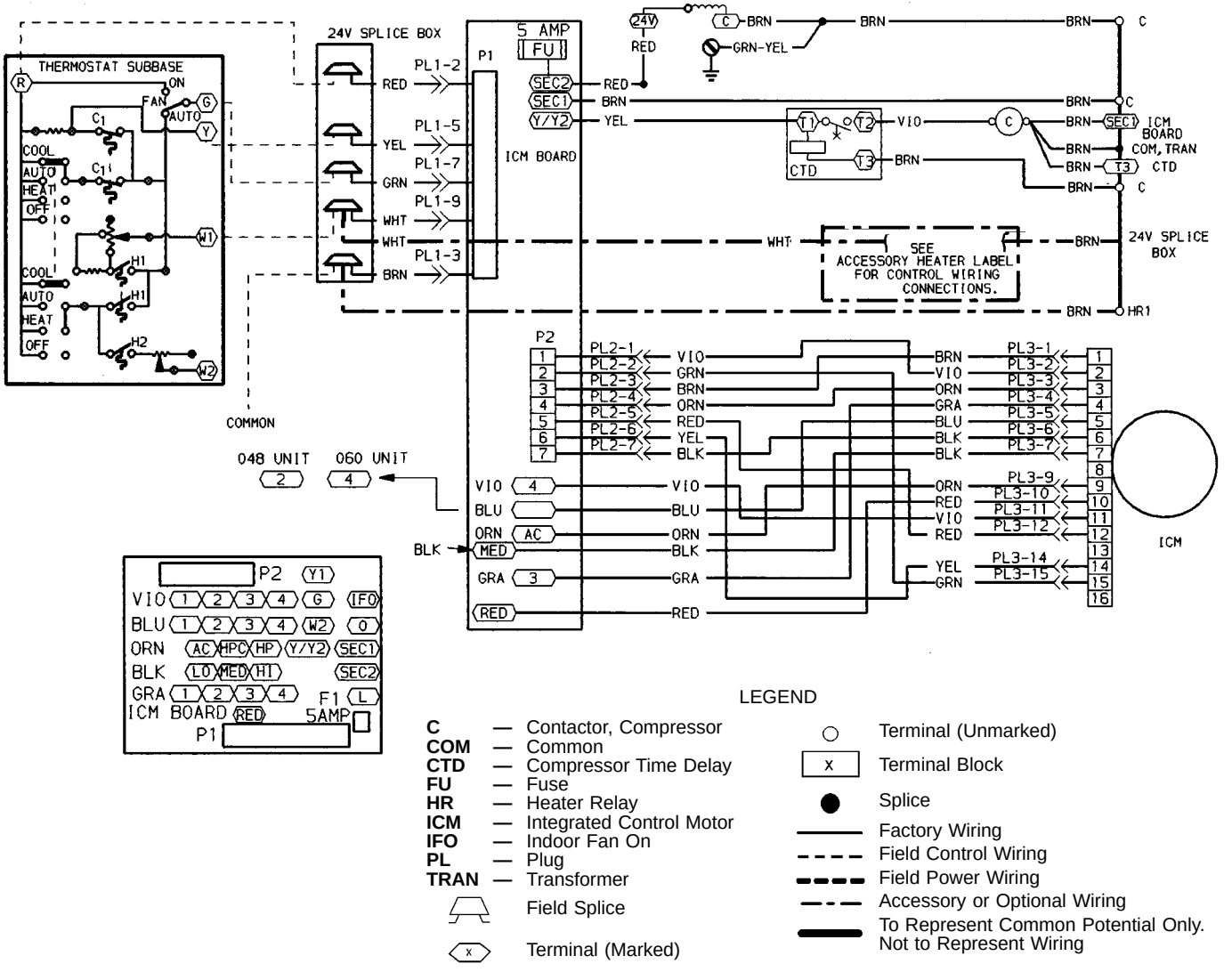
Fig. 31 — Control Connections



LEGEND

IFO — Indoor Fan On
JW — Jumper Wire

Fig. 32 — Easy Select Interface Board



LEGEND

C — Contactor, Compressor
COM — Common
CTD — Compressor Time Delay
FU — Fuse
HR — Heater Relay
ICM — Integrated Control Motor
IFO — Indoor Fan On
PL — Plug
TRAN — Transformer

Field Splice

Terminal (Marked)

Terminal (Unmarked)

Terminal Block

Splice

Factory Wiring

Field Control Wiring

Field Power Wiring

Accessory or Optional Wiring

To Represent Common Potential Only. Not to Represent Wiring

Fig. 33 — Units 50SX048,060 — 208/230-1-60, Integrated Control Motor Wiring Schematic

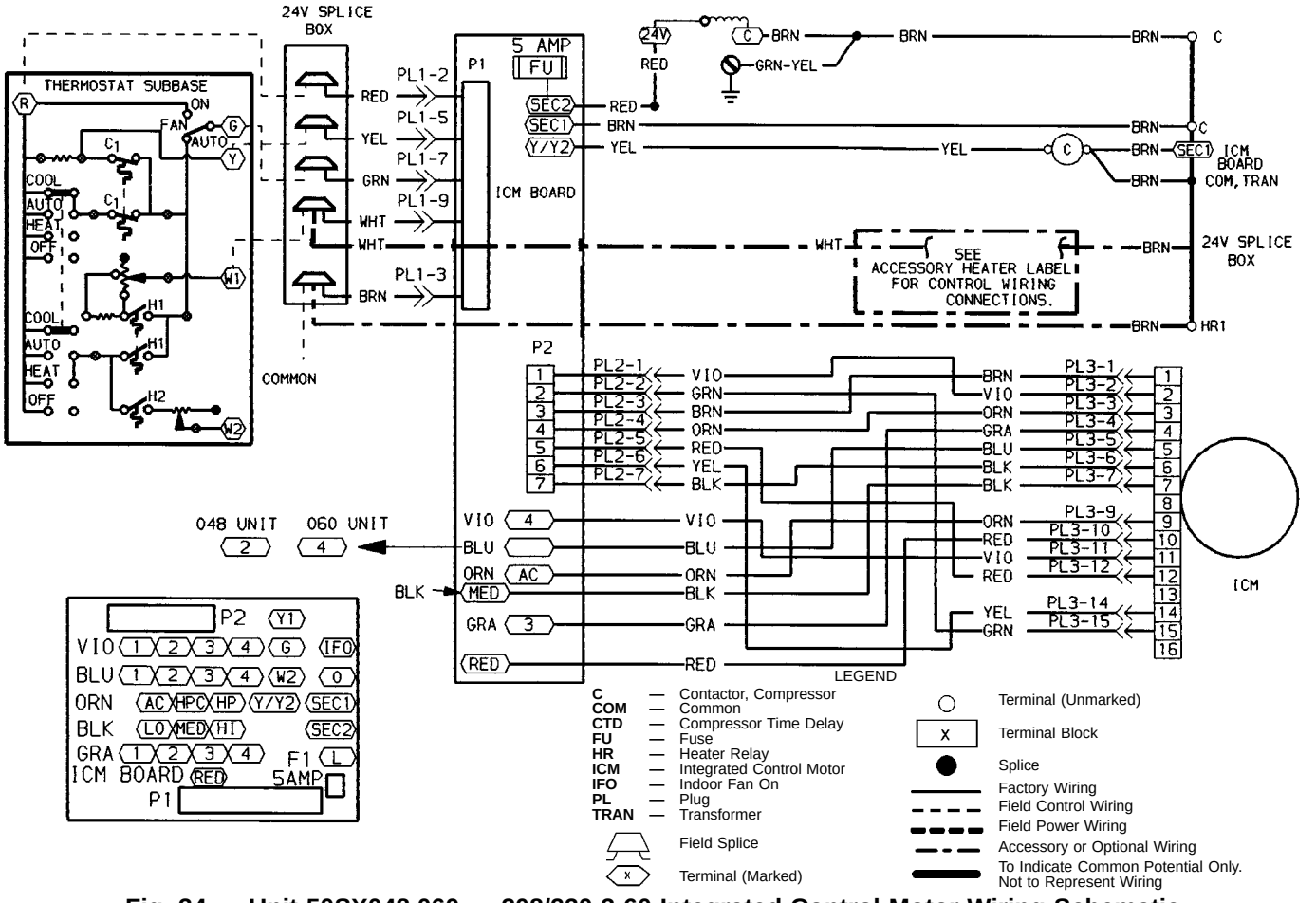


Fig. 34 — Unit 50SX048,060 — 208/230-3-60 Integrated Control Motor Wiring Schematic

PRE-START-UP

⚠ WARNING

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

1. Follow recognized safety practices and wear protective goggles when checking or servicing 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.
4. Relieve all pressure from both high- and low-pressure sides of the 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.
   b. Relieve all pressure from system using both high- and low-pressure ports. Use accepted methods to recover refrigerant.
   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 torch flame.

Use the Start-Up Checklist supplied at the end of this book and 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.

   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, or liquid-soap solution. If a refrigerant leak is detected, see following Check for Refrigerant Leaks section.
   c. Inspect all field- and factory-wiring connections. Be sure that connections are completed and tight.
   d. Inspect coil fins. If damaged during shipping and handling, carefully straighten fins with a fin comb.
3. Verify the following conditions:
   a. Make sure that outdoor-fan blade is correctly positioned in fan orifice. Leading edge of blade should be 2 in. back from condenser inlet grille or ½ in. maximum from fan deck.
   b. Make sure that air filter(s) is in place.
   c. Make sure that condensate drain pan and trap are filled with water to ensure proper drainage.
   d. Make sure that all tools and miscellaneous loose parts have been removed.

4. If the unit is equipped with a crankcase heater, start the heater 24 hours before starting the unit. To start the heater only, turn the thermostat to the OFF position and energize the electrical disconnect to the unit.

START-UP

Use the Start-Up Checklist supplied at the end of this book, and proceed as follows:

Check for Refrigerant Leaks — Locate and repair refrigerant leaks and charge the unit as follows:

1. Using both high- and low-pressure ports, locate leaks and reclaim remaining refrigerant to relieve system pressure.
2. Repair leak following accepted practices.

   NOTE: Install a filter drier whenever the system has been opened for repair.
3. Check system for leaks using an approved method.
4. Evacuate refrigerant system and reclaim refrigerant if no additional leaks are found.
5. Charge unit with R-22 refrigerant, using a volumetric-charging cylinder or accurate scale. *Refer to unit rating plate for required charge.* Be sure to add extra refrigerant to compensate for internal volume of filter drier.

Start-Up Cooling Section and Make Adjustments

⚠ CAUTION

Complete the required procedures given in the Pre-Start-Up section page 25 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 40 F (unless accessory low-ambient kit is installed).

Do not rapid-cycle the compressor. Allow 5 minutes between ''on'' cycles to prevent compressor damage.

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.
3. When using an automatic changeover room thermostat, place both SYSTEM and FAN switches in AUTO. positions. Observe that unit operates in Cooling mode when temperature control is set to ''call for cooling'' (below room temperature).

IMPORTANT: Three-phase, scroll compressors in the 50SS048,060 and 50SX036-060 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 will shut 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 dramatically lower than normal.

CHECKING AND ADJUSTING REFRIGERANT CHARGE — The refrigerant system is fully charged with R-22 refrigerant, and is tested and factory sealed.

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

A superheat charging label is attached to the outside of the compressor access door. The label includes a ''Superheat Charging Table'' and a ''Required Suction-Tube Temperature (F)'' chart.

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

⚠ CAUTION

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

Proceed as follows:

1. Remove caps from low- and high-pressure service fittings.
2. Using hoses with valve core depressors, attach low- and high-pressure gage hoses to low- and high-pressure service fittings, respectively.
3. Start unit in cooling mode and let unit run until system pressures stabilize.
4. Measure and record the following:
   a. Outdoor ambient-air temperature (F db).
   b. Evaporator inlet-air temperature (F wb).

c. Suction-tube temperature (F) at low-side service fitting.

d. Suction (low-side) pressure (psig).

5. Using ‘‘Superheat Charging Table,’’ compare outdoor-air temperature (F db) with evaporator inlet-air temperature (F wb) to determine desired system operating superheat temperature. See Tables 5A-5I and 6A-6F.
6. Using ‘‘Required Suction-Tube Temperature (F)’’ table, compare desired superheat temperature with suction (low-side) operating pressure (psig) to determine proper suction-tube temperature. See Table 7.
7. Compare actual suction-tube temperature with proper suction-tube temperature. Using a tolerance of ±3° F, add refrigerant if actual temperature is more than 3° F higher than proper suction-tube temperature, or remove refrigerant if actual temperature is more than 3° F lower than required suction-tube temperature.

NOTE: If the problem causing the inaccurate readings is a refrigerant leak, refer to Check for Refrigerant Leaks section on page 27.

Table 5A — Superheat Charging Table, 50SS018

TEMP (F) AIR ENT COND		EVAP AIR — CFM 600 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	17.3	18.5	19.6	20.8	24.2	27.7	28.5	29.3	29.3	29.3	29.3	29.3
70	SPH	13.8	14.9	16.1	17.3	20.7	24.1	25.7	27.3	27.3	27.3	27.3	27.3
75	SPH	10.2	11.4	12.5	13.7	17.1	20.6	22.9	25.2	25.2	25.2	25.2	25.2
80	SPH	8.2	8.8	9.5	10.2	13.6	17.0	20.1	23.1	23.9	24.1	25.4	26.1
85	SPH	6.1	6.2	6.5	6.6	10.0	13.5	17.3	21.1	22.6	24.1	25.6	27.1
90	SPH	*	*	*	5.0	8.1	11.4	15.2	19.0	20.5	22.0	23.5	25.0
95	SPH	*	*	*	*	6.2	9.4	13.2	17.0	18.5	20.0	21.5	23.0
100	SPH	*	*	*	*	*	7.3	11.1	14.9	17.2	19.5	21.7	24.0
105	SPH	*	*	*	*	*	5.3	9.1	12.9	15.9	18.9	21.9	24.9
110	SPH	*	*	*	*	*	*	6.7	10.8	13.8	16.8	19.8	22.8
115	SPH	*	*	*	*	*	*	*	8.8	11.8	14.8	17.8	20.8

LEGEND

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Table 5B — Superheat Charging Table, 50SS024

TEMP (F) AIR ENT COND		EVAP AIR — CFM 800 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	18.2	19.0	19.9	20.7	22.5	24.2	25.1	25.9	26.6	27.2	27.9	28.6
70	SPH	17.1	17.6	18.1	18.6	20.4	22.1	23.0	23.9	24.9	26.0	27.1	28.1
75	SPH	16.0	16.2	16.4	16.6	18.3	20.1	21.0	21.8	23.3	24.8	26.2	27.7
80	SPH	14.8	14.7	14.6	14.5	16.3	18.0	19.7	21.3	22.4	23.5	24.6	25.8
85	SPH	13.7	13.3	12.9	12.5	14.3	16.0	18.4	20.7	21.5	22.3	23.1	23.8
90	SPH	11.1	10.9	10.7	10.4	12.2	13.9	16.3	18.7	19.9	21.0	22.2	23.4
95	SPH	8.5	8.4	8.4	8.4	10.1	11.9	14.3	16.6	18.2	19.8	21.4	23.0
100	SPH	7.3	7.5	7.7	7.9	8.9	9.9	12.2	14.6	16.6	18.6	20.6	22.6
105	SPH	6.2	6.6	6.9	7.3	7.6	7.8	10.2	12.5	14.9	17.3	19.7	22.1
110	SPH	*	*	*	5.3	5.5	5.8	8.1	10.5	13.3	16.1	18.9	21.7
115	SPH	*	*	*	*	*	*	6.1	8.4	11.6	14.9	18.1	21.3

LEGEND

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Table 5C — Superheat Charging Table, 50SS030

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1000 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	14.2	15.1	16.1	17.1	19.2	21.3	23.3	24.7	25.9	27.2	27.8	28.5
70	SPH	13.6	14.1	14.6	15.0	17.1	19.2	21.3	22.8	24.2	25.7	26.3	26.9
75	SPH	13.0	13.0	13.0	13.0	15.1	17.2	19.2	20.9	22.6	24.2	24.8	25.4
80	SPH	10.9	11.0	11.0	10.9	13.6	16.1	18.7	20.1	21.4	22.7	23.6	24.4
85	SPH	8.9	8.9	8.9	8.9	12.0	15.1	18.2	19.2	20.2	21.2	22.4	23.5
90	SPH	8.3	8.4	8.4	8.3	10.9	13.6	16.2	17.7	19.2	20.8	21.6	22.5
95	SPH	7.8	7.8	7.8	7.8	9.9	12.0	14.1	16.1	18.2	20.2	20.9	21.7
100	SPH	7.3	7.3	7.3	7.3	9.3	11.4	13.6	15.6	17.6	19.7	20.2	20.7
105	SPH	6.7	6.7	6.7	6.7	8.8	10.9	13.0	15.0	17.1	19.1	19.4	19.8
110	SPH	*	*	*	*	6.7	8.9	10.9	13.0	15.0	17.1	18.0	18.9
115	SPH	*	*	*	*	*	6.8	8.9	10.9	13.0	15.0	16.5	18.0

LEGEND

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Table 5D — Superheat Charging Table, 50SS036

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1200 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	8.4	8.4	8.4	8.4	12.5	16.7	18.7	20.7	22.0	23.4	24.8	26.1
70	SPH	5.0	5.0	5.0	5.0	9.0	13.1	15.9	18.6	20.0	21.3	22.7	24.0
75	SPH	*	*	*	*	5.4	9.6	13.1	16.6	17.9	19.3	20.6	22.0
80	SPH	*	*	*	*	*	6.0	10.3	14.5	15.9	17.3	18.6	20.0
85	SPH	*	*	*	*	*	*	7.5	12.5	13.9	15.2	16.5	17.9
90	SPH	*	*	*	*	*	*	5.4	10.4	12.5	14.6	16.8	18.8
95	SPH	*	*	*	*	*	*	*	8.4	11.3	14.1	17.0	19.8
100	SPH	*	*	*	*	*	*	*	6.4	10.0	13.5	17.1	20.7
105	SPH	*	*	*	*	*	*	*	*	8.7	13.0	17.3	21.7
110	SPH	*	*	*	*	*	*	*	*	9.3	12.4	15.6	18.7
115	SPH	*	*	*	*	*	*	*	*	10.0	11.9	13.8	15.8

LEGEND

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Table 5E — Superheat Charging Table, 50SS042

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1400 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	11.0	11.0	11.0	14.0	17.0	20.0	22.0	24.0	26.0	26.0	27.7	28.6
70	SPH	7.5	7.5	7.5	10.4	13.4	16.4	18.9	21.4	24.0	25.0	26.1	27.1
75	SPH	*	*	*	6.9	9.9	12.9	15.9	18.9	21.9	23.2	24.4	25.7
80	SPH	*	*	*	5.9	8.4	10.8	13.8	16.8	19.8	21.3	22.8	24.3
85	SPH	*	*	*	5.0	6.9	8.8	11.8	14.8	17.8	19.5	21.1	22.8
90	SPH	*	*	*	*	6.0	6.8	10.2	13.7	17.3	18.6	20.0	21.4
95	SPH	*	*	*	*	*	5.0	8.7	12.7	16.7	17.8	18.9	20.0
100	SPH	*	*	*	*	*	*	6.5	10.5	14.6	16.4	18.2	20.0
105	SPH	*	*	*	*	*	*	*	8.4	12.6	15.1	17.6	20.0
110	SPH	*	*	*	*	*	*	*	8.0	12.0	14.2	16.4	18.6
115	SPH	*	*	*	*	*	*	*	7.7	11.5	13.4	15.3	17.2

LEGEND

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

Table 5F — Superheat Charging Table, 50SS048 (Carrier Scroll Compressor)

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1600 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	15.5	15.5	15.6	15.6	17.6	19.6	21.6	22.8	24.0	25.2	25.2	25.3
70	SPH	11.7	11.8	11.8	11.8	13.9	16.0	18.0	20.1	22.2	24.3	24.3	24.3
75	SPH	8.0	8.0	8.0	8.0	10.2	12.3	14.5	17.4	20.4	23.3	23.3	23.3
80	SPH	6.0	6.0	6.0	6.0	8.7	11.3	13.9	16.3	18.6	20.9	21.5	22.0
85	SPH	*	*	*	*	7.2	10.3	13.4	15.1	16.8	18.5	19.7	20.8
90	SPH	*	*	*	*	5.6	7.7	9.9	12.4	15.0	17.6	18.7	19.8
95	SPH	*	*	*	*	*	5.2	6.3	9.8	13.2	16.7	17.7	18.8
100	SPH	*	*	*	*	*	*	5.8	9.1	12.5	15.8	17.1	18.4
105	SPH	*	*	*	*	*	*	5.2	8.4	11.7	14.9	16.5	18.1
110	SPH	*	*	*	*	*	*	6.2	8.8	11.4	14.0	15.9	17.8
115	SPH	*	*	*	*	*	*	7.1	9.1	11.1	13.1	15.3	17.5

LEGEND

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

Table 5G — Superheat Charging Table, 50SS048 (Copeland Scroll Compressor)

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1600 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	19.0	19.0	19.0	19.0	21.7	24.3	26.0	27.7	27.9	28.2	28.4	28.6
70	SPH	15.4	15.4	15.4	15.4	18.1	20.8	22.5	24.1	25.1	26.1	27.1	28.1
75	SPH	11.9	11.9	11.9	11.9	14.6	17.2	18.9	20.6	22.3	24.0	25.8	27.5
80	SPH	8.4	8.4	8.4	8.4	11.0	13.7	15.4	17.0	19.5	22.0	24.5	27.0
85	SPH	5.0	5.0	5.0	5.0	7.5	10.1	11.8	13.5	16.7	20.0	23.2	26.4
90	SPH	*	*	*	*	*	6.6	9.0	11.4	14.7	17.9	21.1	24.4
95	SPH	*	*	*	*	*	*	6.2	9.4	12.6	15.9	19.1	22.3
100	SPH	*	*	*	*	*	*	*	7.3	10.6	13.8	17.0	20.3
105	SPH	*	*	*	*	*	*	*	5.3	8.5	11.8	15.0	18.2
110	SPH	*	*	*	*	*	*	*	*	6.9	11.2	15.5	19.8
115	SPH	*	*	*	*	*	*	*	*	5.3	10.6	16.0	21.3

LEGEND

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

Table 5H — Superheat Charging Table, 50SS060 (Carrier Scroll Compressor)

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1600 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	8.9	8.9	9.0	9.0	12.1	15.2	18.3	20.4	22.4	24.5	24.5	24.5
70	SPH	5.0	5.0	5.0	5.0	7.4	11.1	14.7	17.3	19.9	22.5	22.9	23.3
75	SPH	*	*	*	*	*	6.9	11.2	14.3	17.3	20.4	21.3	22.1
80	SPH	*	*	*	*	*	*	5.6	9.4	13.1	16.8	18.4	19.9
85	SPH	*	*	*	*	*	*	*	*	8.9	13.3	15.4	17.6
90	SPH	*	*	*	*	*	*	*	*	6.4	11.3	13.3	15.3
95	SPH	*	*	*	*	*	*	*	*	*	9.2	11.1	13.1
100	SPH	*	*	*	*	*	*	*	*	*	7.2	9.7	12.3
105	SPH	*	*	*	*	*	*	*	*	*	5.1	8.3	11.5
110	SPH	*	*	*	*	*	*	*	*	*	*	6.9	10.8
115	SPH	*	*	*	*	*	*	*	*	*	*	5.5	10.0

LEGEND

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

Table 5I — Superheat Charging Table, 50SS060 (Copeland Scroll Compressor)

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1995 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	20.1	20.1	20.1	20.1	20.1	20.1	22.6	25.2	25.6	26.1	26.6	27.0
70	SPH	16.5	16.5	16.5	16.5	17.3	18.0	20.6	23.1	24.0	24.8	25.6	26.5
75	SPH	13.0	13.0	13.0	13.0	14.5	16.0	18.5	21.1	22.3	23.5	24.7	25.9
80	SPH	10.9	10.9	10.9	10.9	12.4	13.9	16.5	19.0	20.6	22.2	23.8	25.4
85	SPH	8.9	8.9	8.9	8.9	10.4	11.9	14.4	17.0	18.9	20.9	22.9	24.9
90	SPH	6.9	6.9	6.9	6.9	8.4	9.9	12.4	14.9	17.3	19.6	22.0	24.3
95	SPH	5.0	5.0	5.0	5.0	6.3	7.8	10.3	12.9	15.6	18.3	21.1	23.8
100	SPH	*	*	*	*	*	5.8	8.3	10.8	13.9	17.0	20.1	23.2
105	SPH	*	*	*	*	*	*	6.2	8.8	12.3	15.7	19.2	22.7
110	SPH	*	*	*	*	*	*	*	6.7	10.6	14.4	18.3	22.2
115	SPH	*	*	*	*	*	*	*	*	8.9	13.1	17.4	21.6

LEGEND

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Table 6A — Superheat Charging Table, 50SX024

TEMP (F) AIR ENT COND		EVAP AIR — CFM 800 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	22.1	22.1	22.8	23.2	25.3	27.4	29.5	29.8	30.2	30.5	31.3	32.1
70	SPH	18.5	18.9	19.3	19.6	22.2	24.8	27.5	28.3	29.1	30.0	30.0	30.0
75	SPH	15.0	15.4	15.7	16.1	19.2	22.3	25.4	26.7	28.1	29.4	28.7	28.0
80	SPH	9.2	9.5	9.7	9.9	14.4	18.9	23.3	24.7	26.0	27.3	27.4	27.4
85	SPH	*	*	*	*	9.6	15.5	21.3	22.6	24.0	25.3	26.1	26.8
90	SPH	*	*	*	*	7.2	12.5	17.8	20.1	22.4	24.8	25.1	25.5
95	SPH	*	*	*	*	*	9.4	14.2	17.5	20.9	24.2	24.2	24.2
100	SPH	*	*	*	*	*	7.1	10.6	14.5	18.3	22.1	22.9	23.6
105	SPH	*	*	*	*	*	*	7.1	11.4	15.8	20.1	21.6	23.1
110	SPH	*	*	*	*	*	*	*	8.4	13.2	18.0	19.5	21.0
115	SPH	*	*	*	*	*	*	*	5.3	10.7	16.0	17.5	19.0

LEGEND

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Table 6B — Superheat Charging Table, 50SX030

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1000 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	11.2	11.2	11.2	11.2	14.9	18.6	22.3	22.4	22.5	22.7	22.9	23.1
70	SPH	7.6	7.7	7.7	7.7	12.1	16.6	21.1	21.6	22.0	22.4	22.5	22.5
75	SPH	*	*	*	*	9.4	14.7	20.0	20.7	21.4	22.1	22.1	22.0
80	SPH	*	*	*	*	8.5	13.5	18.5	19.3	20.2	21.0	21.6	22.1
85	SPH	*	*	*	*	7.6	12.3	17.0	18.0	18.9	19.9	21.1	22.3
90	SPH	*	*	*	*	*	10.0	14.2	16.0	17.8	19.6	20.7	21.8
95	SPH	*	*	*	*	*	7.7	11.5	14.1	16.7	19.2	20.2	21.2
100	SPH	*	*	*	*	*	*	5.7	9.9	14.0	18.2	19.4	20.6
105	SPH	*	*	*	*	*	*	*	5.7	11.4	17.1	18.6	20.1
110	SPH	*	*	*	*	*	*	*	*	8.9	13.5	15.8	18.0
115	SPH	*	*	*	*	*	*	*	*	*	10.0	13.0	16.0

LEGEND

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Table 6C — Superheat Charging Table, 50SX036

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1200 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	21.3	21.3	21.3	21.3	22.0	22.6	23.3	23.5	23.7	23.8	23.3	22.8
70	SPH	19.3	19.3	19.3	19.3	20.2	21.2	22.2	22.3	22.5	22.6	22.0	21.5
75	SPH	17.2	17.2	17.2	17.2	18.5	19.7	21.0	21.1	21.3	21.4	20.7	20.1
80	SPH	13.6	13.6	13.6	13.6	15.1	16.6	18.0	18.5	18.9	19.3	19.4	19.5
85	SPH	10.1	10.1	10.1	10.1	11.7	13.4	15.0	15.8	16.5	17.3	18.1	19.0
90	SPH	6.5	6.5	6.5	6.5	8.8	11.2	13.5	14.6	15.7	16.8	17.2	17.6
95	SPH	*	*	*	*	6.0	9.0	12.0	13.4	14.8	16.2	16.2	16.2
100	SPH	*	*	*	*	*	*	6.0	8.7	11.4	14.1	14.9	15.6
105	SPH	*	*	*	*	*	*	*	*	8.0	12.1	13.6	15.1
110	SPH	*	*	*	*	*	*	*	*	*	10.0	11.5	13.0
115	SPH	*	*	*	*	*	*	*	*	*	8.0	9.5	11.0

LEGEND

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

Table 6D — Superheat Charging Table, 50SX042

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1400 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	23.9	23.9	23.9	23.9	24.4	24.9	25.5	25.8	26.1	26.5	25.6	24.7
70	SPH	21.9	21.9	21.9	21.9	22.4	22.9	23.4	23.7	24.1	24.5	24.0	23.5
75	SPH	19.8	19.8	19.8	19.8	20.3	20.8	21.3	21.7	22.0	22.4	22.4	22.4
80	SPH	16.3	16.3	16.3	16.3	17.9	19.6	21.3	21.5	21.7	21.8	21.8	21.8
85	SPH	12.7	12.7	12.7	12.7	15.6	18.4	21.3	21.3	21.3	21.3	21.3	21.3
90	SPH	9.2	9.2	9.2	9.2	12.0	14.9	17.8	18.7	19.7	20.8	20.8	20.8
95	SPH	5.6	5.6	5.6	5.6	8.5	11.3	14.2	16.2	18.2	20.2	20.2	20.2
100	SPH	*	*	*	*	*	8.0	10.6	13.1	15.6	18.1	18.9	19.6
105	SPH	*	*	*	*	*	*	7.1	10.1	13.1	16.1	17.6	19.1
110	SPH	*	*	*	*	*	*	*	7.0	10.5	14.0	15.5	17.0
115	SPH	*	*	*	*	*	*	*	*	8.0	12.0	13.5	15.0

LEGEND

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

Table 6E — Superheat Charging Table, 50SX048

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1600 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	27.2	27.2	27.2	27.2	27.0	26.7	26.5	26.0	25.6	25.1	24.5	24.0
70	SPH	25.0	25.0	25.0	25.0	24.8	24.6	24.5	24.5	24.5	24.6	23.8	23.1
75	SPH	22.8	22.8	22.8	22.8	22.7	22.5	22.4	22.9	23.5	24.0	23.1	22.2
80	SPH	20.6	20.6	20.6	20.6	20.5	20.4	20.3	21.4	22.4	23.5	22.4	21.4
85	SPH	18.3	18.3	18.3	18.3	18.3	18.3	18.3	19.8	21.4	22.9	21.8	20.6
90	SPH	13.3	13.3	13.3	13.3	14.2	15.2	16.3	17.8	19.3	20.9	20.4	19.9
95	SPH	8.2	8.2	8.2	8.2	10.2	12.2	14.2	15.7	17.3	18.8	19.0	19.2
100	SPH	*	*	*	*	6.3	8.4	10.6	12.9	15.2	17.5	18.1	18.7
105	SPH	*	*	*	*	*	*	7.1	10.1	13.1	16.1	17.1	18.2
110	SPH	*	*	*	*	*	*	*	7.1	10.5	14.0	15.3	16.6
115	SPH	*	*	*	*	*	*	*	*	8.0	12.0	13.5	15.0

LEGEND

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

Table 6F — Superheat Charging Table, 50SX060

TEMP (F) AIR ENT COND		EVAP AIR — CFM 1995 Evap Air — Ewb (F)											
		54	56	58	60	62	64	66	68	70	72	74	76
65	SPH	20.1	20.1	20.1	20.1	20.1	20.1	22.6	25.2	25.6	26.1	26.6	27.0
70	SPH	16.5	16.5	16.5	16.5	17.3	18.0	20.6	23.1	24.0	24.8	25.6	26.5
75	SPH	13.0	13.0	13.0	13.0	14.5	16.0	18.5	21.1	22.3	23.5	24.7	25.9
80	SPH	10.9	10.9	10.9	10.9	12.4	13.9	16.5	19.0	20.6	22.2	23.8	25.4
85	SPH	8.9	8.9	8.9	8.9	10.4	11.9	14.4	17.0	18.9	20.9	22.9	24.9
90	SPH	6.9	6.9	6.9	6.9	8.4	9.9	12.4	14.9	17.3	19.6	22.0	24.3
95	SPH	5.0	5.0	5.0	5.0	6.3	7.8	10.3	12.9	15.6	18.3	21.1	23.8
100	SPH	*	*	*	*	*	5.8	8.3	10.8	13.9	17.0	20.1	23.2
105	SPH	*	*	*	*	*	*	6.2	8.8	12.3	15.7	19.2	22.7
110	SPH	*	*	*	*	*	*	*	6.7	10.6	14.4	18.3	22.2
115	SPH	*	*	*	*	*	*	*	*	8.9	13.1	17.4	21.6

LEGEND

Ewb — Entering Wet Bulb
SPH — Superheat at Compressor (F)

*Do not attempt to charge system under these conditions — refrigerant slugging may occur.

Table 7 — Required Suction-Tube Temperature (F)*

SUPERHEAT TEMP (F)	SUCTION PRESSURE AT SERVICE PORT (psig)								
	61.5	64.2	67.1	70.0	73.0	76.0	79.2	82.4	85.7
0	35	37	39	41	43	45	47	49	51
2	37	39	41	43	45	47	49	51	53
4	39	41	43	45	47	49	51	53	55
6	41	43	45	47	49	51	53	55	57
8	43	45	47	49	51	53	55	57	59
10	45	47	49	51	53	55	57	59	61
12	47	49	51	53	55	57	59	61	63
14	49	51	53	55	57	59	61	63	65
16	51	53	55	57	59	61	63	65	67
18	53	55	57	59	61	63	65	67	69
20	55	57	59	61	63	65	67	69	71
22	57	59	61	63	65	67	69	71	73
24	59	61	63	65	67	69	71	73	75
26	61	63	65	67	69	71	73	75	77
28	63	65	67	69	71	73	75	77	79
30	65	67	69	71	73	75	77	79	81
32	67	69	71	73	75	77	79	81	83
34	69	71	73	75	77	79	81	83	85
36	71	73	75	77	79	81	83	85	87
38	73	75	77	79	81	83	85	87	89
40	75	77	79	81	83	85	87	89	91

*Temperature at suction service valve.

INDOOR AIRFLOW AND AIRFLOW ADJUSTMENTS

⚠ CAUTION

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

Tables 8-11 show airflows at several external static pressures. Table 12 shows airflow for Fan Only and Cooling modes for ICM units. Tables 13-15 show accompanying pressure drops for wet coils, electric heaters, and filters. 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

Disconnect electrical power to the unit before changing blower speed. Electrical shock can cause personal injury or death.

Airflow can be changed by changing the lead connections of the blower motor.

Unit 50SS two- or 3-speed motors are factory wired for low speed operation. Units 50SX024, 036 and 048 (460 v) two- or 3-speed motors are factory wired for low speed. Units 50SX030 and 042 are factory wired for medium speed.

For 208/230-v and A.O. Smith 460-v Blower Motors:

The motor leads are color-coded as follows:

3-SPEED	2-SPEED
black = high speed	black = high speed
blue = medium speed	red = low speed
red = low speed	

To change the speed of the blower motor, remove the fan motor speed leg lead from the indoor (evaporator) fan relay (IFR) and replace with lead for desired blower motor speed. *Insulate the removed lead to avoid contact with chassis parts.*

For 460-v GE Motors:

The motor leads are color coded as follows:

3-SPEED	2-SPEED
black = high	black = high
blue = jumper	blue = jumper
orange = medium	red = low
red = low	

To change the speed of the blower motor, remove red fan motor speed lead from the indoor (evaporator) fan relay (IFR). The motor speed lead is attached to terminal BM. *Insulate removed lead end to avoid contact with chassis parts.* On 3-speed motors only, connect orange lead to IFR. To select high speed, separate the black (female QC) from the blue lead (male QC) and connect the black lead to IFR. *Insulate the blue lead to avoid contact with any chassis parts.*

For Integrated Control Motors (ICM) — To configure the 50SX unit, move the 5 Easy Select board wires to the terminals which control the airflow. Refer to the Easy Select interface board (Fig. 32) located next to the terminal and to Fig. 33 and 34.

Perform the following steps for basic system configuration.

AUX HEAT RANGE (VIO)

NOTE: If no heater is installed, this step can be omitted.

The airflow for electric heat is selected with the AUX HEAT RANGE terminals. Refer to Table 3 and the installation instructions for electric heaters for minimum airflow required for safe heater operation. Refer to table below for the available airflows. Each select pin is configured for a certain airflow. The airflow will be supplied in the Heating mode on air conditioners when electric heat is the primary heating source. The preset factory default selection is the highest airflow.

TERMINAL	1	2	3	4
Available Airflow (Cfm)	1365	1470	1680	1840

AC/HP SIZE (BLU) — The preset factory default selection for AC/HP SIZE (air conditioner/heat pump) is set to 400 cfm/ton. The selection pins are configured for 350 cfm/ton and 400 cfm/ton.

TYPE (ORN) — The TYPE is a preset factory default selection. The preset factory default setting is AC for the 50SX units. Default setting should not be altered.

AC/HP CFM ADJUST (BLK) — The preset factory default selection is MED. Selections HI and LO will adjust the airflow supplied for all operational modes (see table below). The selection options allow installer to adjust airflow to meet such individual needs as noise and static compensation, etc.

MODE	FAN ONLY	COOLING	HEATING
LO - Adjust	−15%	−10%	−10%
HI - Adjust	15%	10%	10%

AC/HP TIME DELAY (GRY) — Four motor operation delay options are provided to customize system operation. See listing below:

OPTION	DESCRIPTION
30-Sec On/60-Sec Off Delay Profile (Terminal 1)	Used when it is desirable to allow system coils time to heat up or cool down prior to airflow.
No Delay Option (Terminal 2)	Used for servicing or when other components are used to perform the delay function.
30-Sec Off Delay (Terminal 3)	Preset factory default setting for 50SX units.
45-Sec Off Delay (Terminal 4)	Enhances system efficiency.

UNIT CONTROLS — All compressors have the following internal-protection controls.

High-Pressure Relief Valve — This valve opens when the pressure differential between the low and high side becomes excessive.

Compressor Overload — This overload interrupts power to the compressor when either the current or internal temperature become excessive, and automatically resets when the internal temperature drops to a safe level.

This overload may require up to 60 minutes (or longer) to reset; therefore, if the internal overload is suspected of being open, disconnect the electrical power to the unit and check the circuit through the overload with an ohmmeter or continuity tester.

SEQUENCE OF OPERATION — STD NON-ICM UNITS

Cooling

NOTE: With the FAN switch in the ON position, 24 v is supplied to the IFR through the G terminal on the thermostat. This voltage energizes the coil of the contactor, closing the normally-open set of contacts which provide continuous power to the indoor (evaporator) fan motor (IFM). Moving the FAN switch back to the AUTO. position, providing there is not a call for cooling, deenergizes the IFR, opens the IFR contacts, and deenergizes the IFM. The FAN switch in AUTO. position cycles upon a call for cooling.

On a call for cooling, 24 v is supplied to the compressor contactor (C) and IFR simultaneously through the Y and G terminals of the thermostat, respectively. On units with a compressor time delay relay, there is a built-in, 5-minute (± 45 seconds) delay between compressor starts. Energizing the contactor closes the normally-open set of contacts supplying power to both the compressor and outdoor (condenser) fan motor (OFM). Energizing the IFR closes the normally-open set of contacts providing power to the IFM. On the loss of the call for cooling, 24 v is removed from both the Y and G terminals of the thermostat (providing the FAN switch is in the AUTO. position), deenergizing both the contactor and IFR and opening both the contacts supplying power to compressor/OFM and IFM.

Heating — If accessory electric heaters are installed, on a call for heat, circuit R-W is made through the thermostat contacts. Circuit R-G is made which energizes the IFR. If the heaters are staged, then the thermostat closes a second set of contacts W2 when second stage is required. When thermostat is satisfied, contacts open, deenergizing the heater relay and the IFR.

SEQUENCE OF OPERATION — ICM UNITS

Evaporator Fan — With the fan switch in the ON position, 24 v is supplied to the ICM motor through the ''G'' terminal on the thermostat. This voltage provides continuous power to the indoor (evaporator) fan motor (IFM). If the fan switch is moved back to the AUTO position and there is not a call for heating or cooling, 24 v is removed from the ''G'' terminal and the evaporator fan remains energized for the delay timing. When the fan switch is in AUTO, the fan cycles with either the call for heating or cooling.

Cooling — On a call for cooling, 24 v is supplied to the compressor contactor (C) and IFM simultaneously through the ''Y'' and ''G'' terminals of the thermostat. Energizing the contactor closes the normally open set of contacts supplying power to both the compressor and outdoor (condenser) fan motor (OFM). On the loss of the call for cooling, 24 v is removed from the ''Y'' and ''G'' terminals of the thermostat, deenergizing the compressor and OFM. The evaporator fan remains energized for the delay timing.

NOTE: Once the compressor has started and then stopped, it cannot be restarted again until 5 minutes have elapsed.

Heating — If accessory electric heaters are installed, on a call for heat, circuits R-W and R-G are made through the thermostat contacts, energizing the heater relay and IFM. If the heaters are staged, then the thermostat closes the second set of contacts, W2, when the second stage is required. When the thermostat is satisfied, contacts open, deenergizing the heater relay and the IFM.

Table 8 — Dry Coil Air Delivery* — Horizontal Discharge (Deduct 10% for 208 v) — Unit 50SS

UNIT SIZE	MOTOR SPEED		230 AND 460 V HORIZONTAL DISCHARGE										
			External Static Pressure (in. wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
018	Low	Watts	230	225	220	210	195	170	—	—	—	—	—
		Cfm	760	745	725	695	640	540	—	—	—	—	—
	High	Watts	—	—	—	—	270	235	200	—	—	—	—
		Cfm	—	—	—	—	850	700	450	—	—	—	—
024	Low	Watts	280	275	265	255	250	245	240	—	—	—	—
		Cfm	820	810	755	700	660	600	560	—	—	—	—
	Med	Watts	365	360	350	345	340	330	320	310	300	—	—
		Cfm	1025	1010	975	940	900	850	800	720	630	—	—
	High	Watts	—	—	490	480	470	460	445	430	410	390	380
		Cfm	—	—	1300	1255	1200	1150	1080	1005	915	790	620
030	Low	Watts	—	460	450	420	400	380	360	335	—	—	—
		Cfm	—	1240	1190	1125	1060	995	920	840	—	—	—
	Med	Watts	—	—	—	480	460	435	410	375	—	—	—
		Cfm	—	—	—	1280	1200	1115	1020	910	—	—	—
	High	Watts	—	—	—	—	—	560	530	510	490	460	—
		Cfm	—	—	—	—	—	1270	1180	1080	1000	870	—
036	Low	Watts	470	460	455	445	430	415	400	380	350	—	—
		Cfm	1280	1250	1230	1200	1150	1100	1050	980	890	—	—
	Med	Watts	550	535	520	500	480	460	440	410	385	—	—
		Cfm	1500	1450	1400	1330	1270	1190	1120	1030	940	—	—
	High	Watts	—	—	—	—	625	595	550	520	500	470	425
		Cfm	—	—	—	—	1540	1440	1325	1220	1110	1000	800
042	Low	Watts	730	700	680	645	615	580	535	490	430	—	—
		Cfm	1620	1590	1550	1510	1460	1390	1310	1210	1050	—	—
	High	Watts	—	—	—	—	—	850	800	750	700	650	610
		Cfm	—	—	—	—	—	1780	1670	1550	1400	1230	1050
048	Low	Watts	1080	1040	1020	970	910	840	785	730	680	620	540
		Cfm	2100	2090	2080	2060	1980	1900	1810	1710	1590	1450	1200
	High	Watts	1230	1190	1125	1060	1010	940	880	820	760	710	660
		Cfm	2390	2340	2280	2210	2150	2030	1900	1770	1630	1480	1300
060	Low	Watts	1150	1100	1050	1010	950	900	850	800	730	650	—
		Cfm	2500	2410	2330	2260	2170	2080	1990	1880	1750	1580	—
	High	Watts	—	—	—	—	—	1170	1110	1050	990	920	880
		Cfm	—	—	—	—	—	2470	2340	2200	2040	1870	1700

*Air delivery values are based on operating voltage of 230 v or 460 v, dry coil, without filter or electric heater. Deduct wet coil, filter, and electric heater pressure drops to obtain external static pressure available for ducting.

NOTES:
1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Evaporator coil frosting may occur at airflows below this point.
2. Dashes indicate portions of table that are beyond the blower motor capacity or are not recommended.

Table 9 — Dry Coil Air Delivery* — Vertical Discharge (Deduct 10% for 208 v) — Unit 50SS

UNIT SIZE	MOTOR SPEED		230 AND 460 V VERTICAL DISCHARGE										
			External Static Pressure (in. wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
018	Low	Watts	230	225	220	210	195	170	—	—	—	—	—
		Cfm	760	745	725	695	640	540	—	—	—	—	—
	High	Watts	—	—	—	—	270	235	200	—	—	—	—
		Cfm	—	—	—	—	850	700	450	—	—	—	—
024	Low	Watts	280	275	265	255	250	245	240	—	—	—	—
		Cfm	820	810	755	700	660	600	560	—	—	—	—
	Med	Watts	365	360	350	345	340	330	320	310	300	—	—
		Cfm	1025	1010	975	940	900	850	800	720	630	—	—
	High	Watts	—	—	490	480	470	460	445	430	410	390	380
		Cfm	—	—	1300	1255	1200	1150	1080	1005	915	790	620
030	Low	Watts	—	460	450	420	400	380	360	335	—	—	—
		Cfm	—	1240	1190	1125	1060	995	920	840	—	—	—
	Med	Watts	—	—	—	480	460	435	410	375	—	—	—
		Cfm	—	—	—	1280	1200	1115	1020	910	—	—	—
	High	Watts	—	—	—	—	—	560	530	510	490	460	—
		Cfm	—	—	—	—	—	1270	1180	1080	1000	870	—
036	Low	Watts	470	460	455	445	430	415	400	380	350	—	—
		Cfm	1280	1250	1230	1200	1150	1100	1050	980	890	—	—
	Med	Watts	550	535	520	500	480	460	440	410	385	—	—
		Cfm	1500	1450	1400	1330	1270	1190	1120	1030	940	—	—
	High	Watts	—	—	—	—	625	595	550	520	500	470	425
		Cfm	—	—	—	—	1540	1440	1325	1220	1110	1000	800
042	Low	Watts	730	700	680	645	615	580	535	490	430	—	—
		Cfm	1620	1590	1550	1510	1460	1390	1310	1210	1050	—	—
	High	Watts	—	—	—	—	—	850	800	750	700	650	610
		Cfm	—	—	—	—	—	1780	1670	1550	1400	1230	1050
048	Low	Watts	1080	1040	1020	970	910	840	785	730	680	620	540
		Cfm	2100	2090	2080	2060	1980	1900	1810	1710	1590	1450	1200
	High	Watts	1230	1190	1125	1060	1010	940	880	820	760	710	660
		Cfm	2390	2340	2280	2210	2150	2030	1900	1770	1630	1480	1300
060	Low	Watts	890	850	810	780	740	710	660	630	580	—	—
		Cfm	2500	2410	2330	2260	2170	2080	1970	1860	1700	—	—
	High	Watts	—	—	—	1000	960	910	870	830	790	750	—
		Cfm	—	—	—	2480	2370	2250	2120	2000	1850	1690	—

Table 10 — Dry-Coil Air Delivery* — Horizontal Discharge (Deduct 10% for 208 V) — Unit 50SX

UNIT 50SX	MOTOR SPEED	AIR DELIVERY	230 AND 460 VOLT HORIZONTAL DISCHARGE										
			External Static Pressure (in. wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
024, 030	Low	Watts	280	275	265	255	250	245	240	—	—	—	—
		Cfm	820	810	755	700	660	600	560	—	—	—	—
	Med	Watts	365	360	350	345	340	330	320	310	300	—	—
		Cfm	1025	1010	975	940	900	850	800	720	630	—	—
	High	Watts	—	—	490	480	470	460	445	430	410	390	380
		Cfm	—	—	1300	1255	1200	1150	1080	1005	915	790	620
036	Low	Watts	520	495	474	458	445	425	—	—	—	—	—
		Cfm	1375	1335	1290	1240	1200	1140	—	—	—	—	—
	Med	Watts	575	560	535	510	480	460	440	425	—	—	—
		Cfm	1520	1490	1450	1400	1380	1300	1200	1080	—	—	—
	High	Watts	—	—	—	—	650	614	575	540	510	480	—
		Cfm	—	—	—	—	1560	1500	1380	1280	1170	1060	—
042	Low	Watts	490	480	470	460	450	430	410	390	—	—	—
		Cfm	1400	1380	1340	1300	1250	1200	1140	1070	—	—	—
	Med	Watts	590	580	560	545	525	505	480	450	420	—	—
		Cfm	1600	1560	1540	1470	1430	1360	1300	1220	1120	—	—
	High	Watts	—	—	—	—	—	700	670	640	600	560	500
		Cfm	—	—	—	—	—	1780	1670	1600	1480	1340	1100
048†	Low	Watts	1050	1000	970	930	870	810	750	680	600	—	—
		Cfm	1850	1830	1800	1785	1750	1700	1640	1500	1330	—	—
	High	Watts	—	—	—	1050	1000	930	870	810	740	665	—
		Cfm	—	—	—	2000	1940	1850	1750	1635	1500	1300	—

LEGEND AND NOTES FOR TABLES 9 AND 10

*Air delivery values are based on operating voltage of 230 v or 460 v, dry coil, without filter or electric heater. Deduct wet coil, filter, and electric heater pressure drops to obtain external static pressure available for ducting.
†Size 048 is 460 v.

NOTES:
1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Evaporator-coil frosting may occur at airflows below this point.
2. Dashes indicate portions of the table that are beyond the blower motor capacity or are not recommended.

Table 11 — Dry-Coil Air Delivery* — Vertical Discharge (Deduct 10% for 208 V) — Unit 50SX

UNIT SIZE 50SX	MOTOR SPEED	AIR DELIVERY	230 AND 460 VOLT VERTICAL DISCHARGE										
			External Static Pressure (in. wg)										
			0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
024, 030	Low	Watts	280	275	265	255	250	245	240	—	—	—	—
		Cfm	820	810	755	700	660	600	560	—	—	—	—
	Med	Watts	365	360	350	345	340	330	320	310	300	—	—
		Cfm	1025	1010	975	940	900	850	800	720	630	—	—
	High	Watts	—	—	490	480	470	460	445	430	410	390	380
		Cfm	—	—	1300	1255	1200	1150	1080	1005	915	790	620
036	Low	Watts	520	495	474	458	445	425	—	—	—	—	—
		Cfm	1375	1335	1290	1240	1200	1140	—	—	—	—	—
	Med	Watts	575	560	535	510	480	460	440	425	—	—	—
		Cfm	1520	1490	1450	1400	1380	1300	1200	1080	—	—	—
	High	Watts	—	—	—	—	650	614	575	540	510	480	—
		Cfm	—	—	—	—	1560	1500	1380	1280	1170	1060	—
042	Low	Watts	490	480	470	460	450	430	410	390	—	—	—
		Cfm	1400	1380	1340	1300	1250	1200	1140	1070	—	—	—
	Med	Watts	590	580	560	545	525	505	480	450	420	—	—
		Cfm	1600	1560	1540	1470	1430	1360	1300	1220	1120	—	—
	High	Watts	—	—	—	—	—	700	670	640	600	560	500
		Cfm	—	—	—	—	—	1780	1670	1600	1480	1340	1100
048†	Low	Watts	1050	1000	970	930	870	810	750	680	600	—	—
		Cfm	1850	1830	1800	1785	1750	1700	1640	1500	1330	—	—
	High	Watts	—	—	—	1050	1000	930	870	810	740	665	—
		Cfm	—	—	—	2000	1940	1850	1750	1635	1500	1300	—

*Air delivery values are based on operating voltage of 230 v or 460 v, dry coil, without filter or electric heater. Deduct wet coil, filter, and electric heater pressure drops to obtain external static pressure available for ducting.
†Size 048 is 460 v.

NOTES:
1. Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Evaporator coil frosting may occur at airflows below this point.
2. Dashes indicate portions of table that are beyond the blower motor capacity or are not recommended.

Table 12 — Dry-Coil Air Delivery* — Fan Only and Cooling; Horizontal and Vertical Discharge for Integrated Control Motor Units at 230 V (Deduct 10% from Cfm for 208-V Operation)

UNIT 50SX	FAN ONLY (Cfm)	COOLING (Cfm)
048	1400	1600
060	1750	2000

*Air delivery values are for dry coil at 230 v. Airflow is independent of external static pressure within ±5% of table values up to 0.8 in. wg.

NOTE: Do not operate the unit at a cooling airflow that is less than 350 cfm for each 12,000 Btuh of rated cooling capacity. Evaporator-coil icing may occur at airflows below this point. Water blow-off may occur at airflows above 450 cfm per 12,000 Btuh of rated cooling capacity.

Table 13 — Wet Coil Pressure Drop

UNIT SIZE	AIRFLOW (cfm)	PRESSURE DROP (in. wg)
018*	600	0.069
	700	0.082
	800	0.102
	900	0.116
024	600	0.039
	700	0.058
	800	0.075
	900	0.088
030	900	0.088
	1000	0.095
	1200	0.123
036	1000	0.068
	1200	0.088
	1400	0.108
	1600	0.123
042	1000	0.048
	1200	0.069
	1400	0.088
	1600	0.102
048	1400	0.068
	1600	0.075
	1800	0.088
060	1700	0.082
	1900	0.095
	2100	0.108
	2300	0.123

*Unit 50SS only.

Table 14 — Accessory Electric Heater Pressure Drop (in. wg)

HEATER kW	CFM								
	600	800	1000	1200	1400	1600	1800	2000	2200
5-20	0.030	0.033	0.037	0.042	0.047	0.052	0.060	0.067	0.075

Table 15 — Filter Pressure Drop (in. wg)

UNIT SIZE 50SS	FILTER SIZE (in.)	CFM																		
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
018, 024	20 x 20	0.05	0.07	0.08	0.10	0.12	0.13	—	—	—	—	—	—	—	—	—	—	—	—	—
030, 036	20 x 24	—	—	—	—	—	0.10	0.11	0.13	0.14	—	—	—	—	—	—	—	—	—	—
042	24 x 24	—	—	—	—	—	—	—	—	0.11	0.12	0.14	0.15	—	—	—	—	—	—	—
048, 060	24 x 30	—	—	—	—	—	—	—	—	—	—	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.17	0.18

UNIT SIZE 50SX	FILTER SIZE (in.)	CFM																		
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
024-036	24 x 24	—	—	0.06	0.06	0.07	0.07	0.08	0.09	0.10	—	—	—	—	—	—	—	—	—	—
042-060	24 x 30	—	—	—	—	—	—	—	—	0.08	0.09	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.17	0.18

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 cooling of units, refer to Troubleshooting chart in back of book.

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

⚠ WARNING

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 User's Manual. FAILURE TO HEED THIS WARNING COULD RESULT IN SERIOUS PERSONAL INJURY AND POSSIBLE DAMAGE TO THIS EQUIPMENT.

The minimum maintenance requirements for this equipment are as follows:

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

⚠ WARNING

Failure to follow these warnings could result in serious personal injury:

1. Turn off electrical power to the unit before performing any maintenance or service on the unit.
2. Use extreme caution when removing panels and parts. As with any mechanical equipment, personal injury can result from sharp edges.
3. Never place anything combustible either on, or in contact with, the unit.

Air Filter

⚠ CAUTION

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 Tables 1 and 2 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 cooling season or whenever the filters become clogged with dust and lint.

Replace filters with the same dimensional size and type as originally provided, when necessary.

Unit Top Removal

NOTE: When performing maintenance or service procedures that require removal of the unit top, be sure to perform *all* of the routine maintenance procedures that require top removal, including coil inspection and cleaning, and condensate drain pan inspection and cleaning.

Only qualified service personnel should perform maintenance and service procedures that require unit top removal. Refer to the following top removal procedures:

1. Remove 7 screws on unit top cover surface. (Save all screws.)
2. Remove 4 screws on unit top cover flange. (Save all screws.)
3. Lift top from unit carefully. Set top on edge and make sure that top is supported by unit side that is opposite duct (or plenum) side.
4. Carefully replace and secure unit top to unit, using screws removed in Steps 1 and 2, when maintenance and/or service procedures are completed.

Evaporator Blower and Motor

NOTE: Motors without oilers 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.

Lubricate the motor every 5 years if the motor is used intermittently (thermostat FAN switch in AUTO. position), or every 2 years if the motor is used continuously (thermostat FAN switch in ON position).

⚠ WARNING

Disconnect and tag electrical power to the unit before cleaning and lubricating the blower motor and wheel. Failure to adhere to this warning could cause personal injury or death.

To clean and lubricate the blower motor and wheel:

1. Remove and disassemble blower assembly as follows:
   a. Remove blower access door.
   b. For standard non-ICM units, disconnect motor lead from IFR. Disconnect yellow motor lead from terminal L2 of the contactor.
   c. Remove blower assembly from all units. 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) which secure wheel to motor shaft. Remove screws that secure motor mount brackets to housing and slide motor and motor mount out of housing.
2. Lubricate motor as follows:
   a. Thoroughly clean all accumulations of dirt or grease from motor housing.
   b. Remove dust caps or plugs from oil ports located at each end of motor.
   c. Use a good grade of SAE 20 nondetergent motor oil and put one teaspoon (1⁄16 oz. or 16 to 25 drops) in each oil port.
   d. Allow time for oil to be absorbed by each bearing, then wipe excess oil from motor housing.
   e. Replace dust caps or plugs in oil ports.
3. Remove and clean blower wheel as follows:
   a. Ensure proper reassembly by marking wheel orientation and cutoff plate location.
   b. Remove screws holding cut-off plate, and remove plate from housing.

c. Lift wheel from housing. When handling and/or cleaning blower wheel, be sure not to disturb balance weights (clips) on blower wheel vanes.

d. 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.

e. Reassemble wheel and cut-off plate into housing.

f. Reassemble motor into housing. Be sure setscrews are tightened on motor-shaft flats and not on round part of shaft.

Condenser Coil, Evaporator Coil, and Condensate Drain Pan — Inspect the condenser coil, evaporator coil, and condensate drain pan at least once each year. Proper inspection and cleaning requires the removal of the unit top. See Unit Top Removal section on page 40.

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 a 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

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

1. Remove 2 screws at bottom of condenser air intake grille and remove plastic grille.
2. Inspect the fan blades for cracks or bends.
3. If fan needs to be removed, loosen the setscrew and slide the fan off the motor shaft.
4. When replacing fan blade, position blade so that leading edge is 2 in. back from condenser inlet grille or ½ in. maximum from fan deck. See Fig. 35.
5. Ensure that setscrew engages the flat area on the motor shaft when tightening.

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 the control/blower and compressor compartment access panels 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.

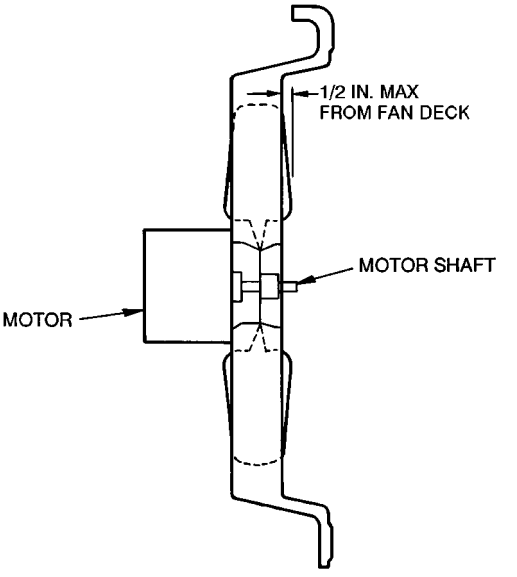


Fig. 35 — Fan Blade Clearance

After inspecting the electrical controls and wiring, replace all the panels. Start the unit, and observe at least one complete cooling cycle to ensure proper operation. If discrepancies are observed in operating cycle, 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 Cooling Sequence of Operation section on page 35, 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.

If oil is detected or if low cooling performance is suspected, leak-test all refrigerant tubing using an electronic leak-detector, or liquid-soap solution. If a refrigerant leak is detected, refer to Check for Refrigerant Leaks section on page 27.

If no refrigerant leaks are found and low cooling performance is suspected, refer to Checking and Adjusting Refrigerant Charge section on page 27.

Evaporator Airflow — The cooling airflow 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 on page 34 to check the system airflow.

Metering Devices — Refrigerant metering devices are fixed orifices and are located in the inlet header to the evaporator coil.

Liquid Line Strainer — The liquid line strainer (to protect metering device) is made of wire mesh and is located in the liquid line on the inlet side of the metering device.

TROUBLESHOOTING COOLING CHART

SYMPTOM	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.
	Single-phase units with scroll compressor (50SS048,060 and 50SX) have a 5-minute time delay	DO NOT bypass this compressor time delay — wait for 5 minutes until time-delay relay is deenergized.
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, or 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 (50SS048, 060; 50SX036-060 units only) 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 the 3-phase power leads to the unit.
Compressor cycles (other than normally satisfying thermostat).	Refrigerant overcharge or undercharge	Reclaim 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.
	Leaking valves in compressor	Replace compressor.
	Air in system	Reclaim 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	Reclaim excess refrigerant.
	Air in system	Reclaim 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	Reclaim 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 40 F	Install low-ambient kit.
	Field-installed filter-drier restricted	Replace.

TROUBLESHOOTING COOLING CHART (cont)

SYMPTOM	CAUSE	REMEDY
Integrated control motor (units 50SX048 208/230 v and 50SX060) IFM does not run.	Blower wheel not secured to shaft.	Properly tighten blower wheel to shaft.
	Insufficient voltage at motor	Determine cause and correct.
	Power connectors not properly seated	Connectors should snap easily; do not force.
Integrated control motor (units 50SX048 208/230 v and 50SX060) IFM runs when it should be off.	Motor programmed with a delay profile	Allow a few minutes for motor to shut off.
	With thermostat in OFF the voltage on G,Y1,Y/Y2,W with respect to common, should be less than ½ of actual low voltage supply	If measured voltage is more than ½, the thermostat is incompatible with motor. If voltage is less than ½, the motor has failed.
Integrated control motor (units 50SX048 208/230 v and 50SX060) IFM operation is intermittent.	Water dripping into motor	Verify proper drip loops in connector wires.
	Connectors not firmly seated	Gently pull wires individually to be sure they are crimped into the housing.

IFM — Indoor (Evaporator) Fan Motor

PACKAGED SERVICE TRAINING

Our packaged service training programs provide an excellent way to increase your knowledge of the equipment discussed in this manual. Product programs cover:

- Unit Familiarization
- Installation Overview
- Maintenance
- Operating Sequence

A large selection of product, theory, and skills programs is available. All programs include a video cassette and/or slides and a companion booklet. Use these for self teaching or to conduct full training sessions.

For a free Service Training Material Catalog (STM), call 1-800-962-9212. Ordering instructions are included.

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

I. PRELIMINARY INFORMATION

MODEL NO.: _____ SERIAL NO.: _____

DATE: _____ TECHNICIAN: _____

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

☐ VERIFY THAT ALL PACKING MATERIALS HAVE BEEN REMOVED FROM UNIT

☐ REMOVE ALL SHIPPING HOLDDOWN BOLTS AND BRACKETS PER INSTALLATION INSTRUCTIONS

☐ VERIFY THAT CONDENSATE CONNECTION IS INSTALLED PER INSTALLATION INSTRUCTIONS

☐ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS

☐ CHECK THAT INDOOR AIR FILTER IS CLEAN AND IN PLACE

☐ VERIFY THAT UNIT INSTALLATION IS LEVEL

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

III. START-UP

ELECTRICAL

SUPPLY VOLTAGE L1-L2 _____ L2-L3 _____ L3-L1 _____

COMPRESSOR AMPS L1 _____ L2 _____ L3 _____

INDOOR FAN AMPS _____

TEMPERATURES

OUTDOOR-AIR TEMPERATURE _____ DB

RETURN-AIR TEMPERATURE _____ DB _____ WB

COOLING SUPPLY AIR _____

PRESSURES

REFRIGERANT SUCTION _____ PSIG

REFRIGERANT DISCHARGE _____ PSIG

☐ VERIFY THAT 3-PHASE SCROLL COMPRESSOR (50SS048,060; 50SX036-060 UNITS ONLY) IS ROTATING IN CORRECT DIRECTION

☐ VERIFY REFRIGERANT CHARGE USING CHARGING CHARTS ON PAGES 28-33.

CUT ALONG DOTTED LINE