Carrier

Omnizone™ 50XCA06-24 Air-Cooled Indoor Self-Contained Systems

Installation, Start-Up and Service Instructions

CONTENTS

SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning components and equipment can be dangerous. Only trained, qualified installers and service mechanics should install, start-up, and service this equipment.

When working on the equipment, observe precautions in the literature and on the tags, stickers, and labels attached to the equipment. Follow all safety codes. Wear safety glasses and work gloves.

⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation and service. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

⚠ CAUTION

Use care in handling, rigging, and setting bulky equipment. Personal injury could result.

⚠ WARNING

DO NOT USE TORCH to remove any component. System contains oil and refrigerant under pressure.

To remove a component, wear protective gloves and goggles and proceed as follows:

a. Shut off electrical power to unit.
b. Recover refrigerant to relieve all pressure from system using both high-pressure and low pressure ports.
c. Traces of vapor should be displaced with nitrogen and the work area should be well ventilated. Refrigerant in contact with an open flame produces toxic gases.
d. Cut component connection tubing with tubing cutter and remove component from unit. Use a pan to catch any oil that may come out of the lines and as a gauge for how much oil to add to the system.
e. Carefully un-sweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Failure to follow these procedures may result in personal injury or death.

⚠ CAUTION

DO NOT re-use compressor oil or any oil that has been exposed to the atmosphere. Dispose of oil per local codes and regulations. DO NOT leave refrigerant system open to air any longer than the actual time required to service the equipment. Seal circuits being serviced and charge with dry nitrogen to prevent oil contamination when timely repairs cannot be completed. Failure to follow these procedures may result in damage to equipment.

GENERAL

Omnizone™ indoor packaged units are designed to provide the flexibility required in replacement, renovation, and new construction. Units are available in 6 sizes from 5 tons to 20 tons. Belt-drive condensers provide adequate static to overcome normal ducting and louver static losses. This allows units to be positioned against an existing window or wall louver, or ducted to the outside as required.

Convenient rear connections allow easy access for outside air connections. Unit supply air discharge is vertical as standard, and horizontal as optional for sizes 12 and 24. These vertical packaged units are fully piped and wired. Units are complete with a belt drive evaporator section and built-in ducted air-cooled condenser.

Most units are designed to fit through most standard doors. See Fig. 1-9 for unit dimensions and see Table 1 for unit operating weights.

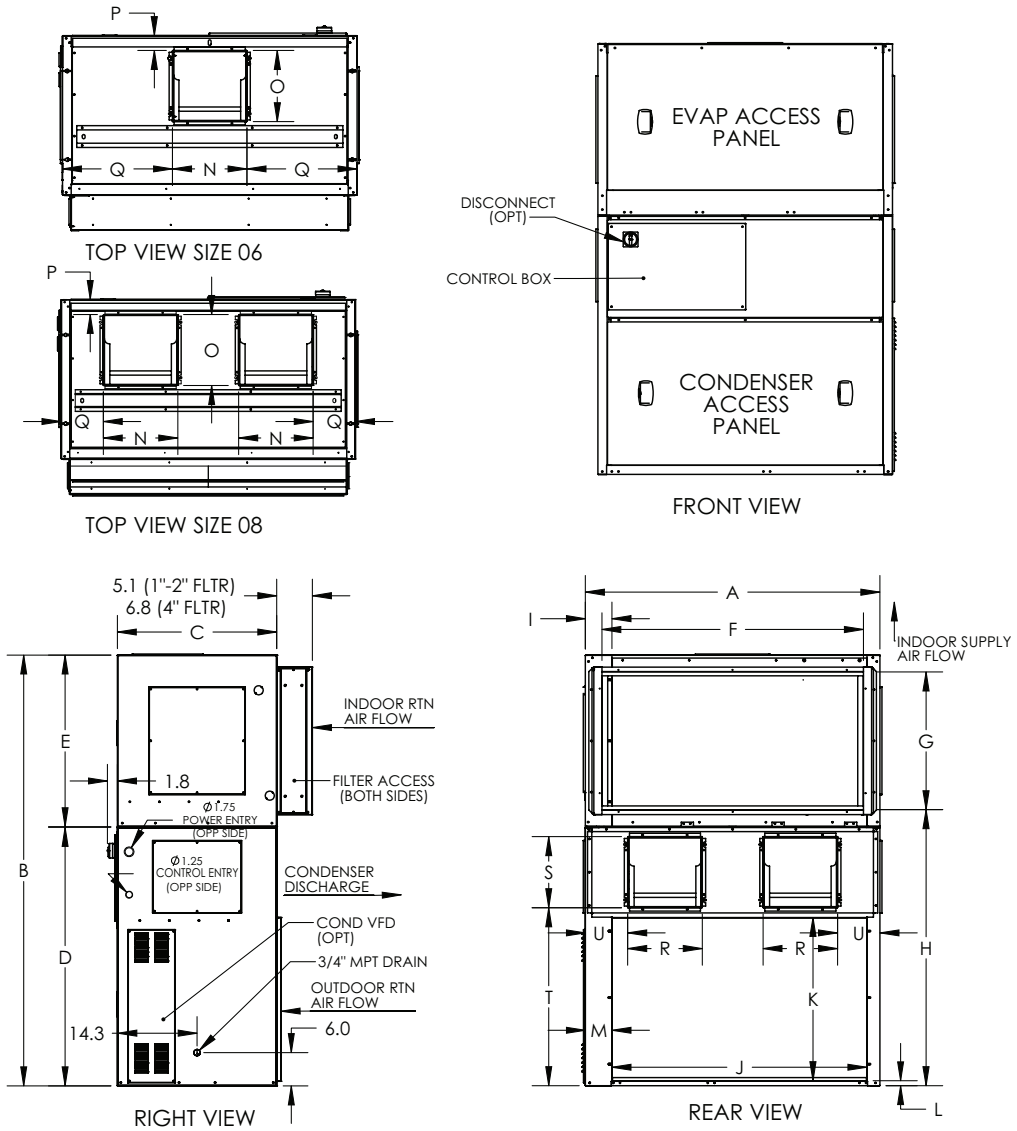
INSTALLATION

Omnizone 50XCA units are intended for indoor installation only. Determine building alterations required to run piping, wiring and ductwork. Follow dimensional drawings for ductwork, piping locations, electrical wiring and overall unit dimensions. Read all installation instructions before installing the unit.

Step 1 — Complete Pre-Installation Checks

Examine unit for damage that might have incurred during shipment. File claim immediately with transit company if damage is found. Check the shipment for completeness. Verify that the nameplate electrical requirements match the available power supply.

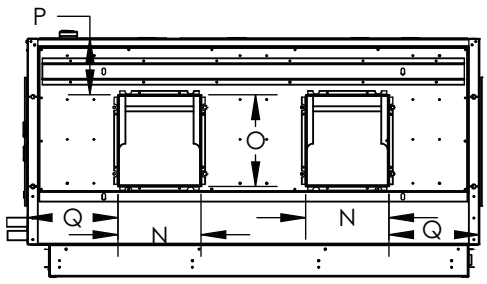
DO NOT place the unit in a horizontal position. Do not allow refrigerant lines to come into contact with wiring or sharp objects or edges. Do not lift or move unit by putting pressure on refrigerant lines, blowers, compressors, motors, or coils.



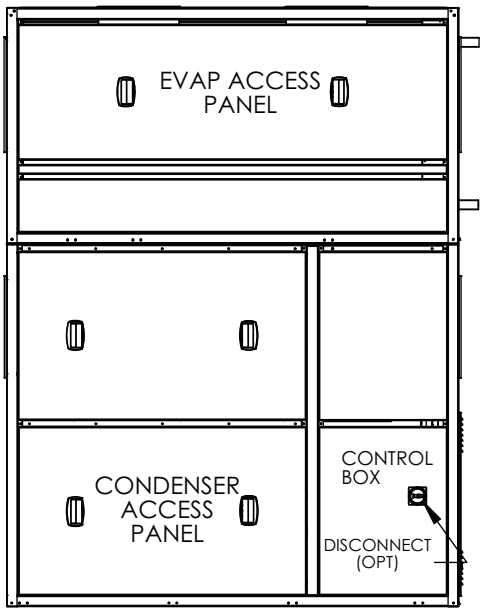
UNIT 50XCA	WIDTH	HEIGHT	DEPTH	COND SECTION	EVAP SECTION	EVAP RETURN DUCT				COND RETURN DUCT				EVAP SUPPLY DUCT (Blower Opening)				COND DISCHARGE DUCT (Blower Opening)			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
06	53.1	77.1	29.0	46.6	31.0	47.2	24.8	49.8	4.8	46	29.4	0.9	4.8	13.4	12.8	2.7	19.8	13.4	12.8	32.1	7.6
08	53.1	77.1	29.0	46.6	31.0	47.2	24.8	49.8	4.8	46	29.4	0.9	4.8	13.4	12.8	2.7	7.6	13.4	12.8	32.1	7.6

NOTE: Dimensions are in inches.

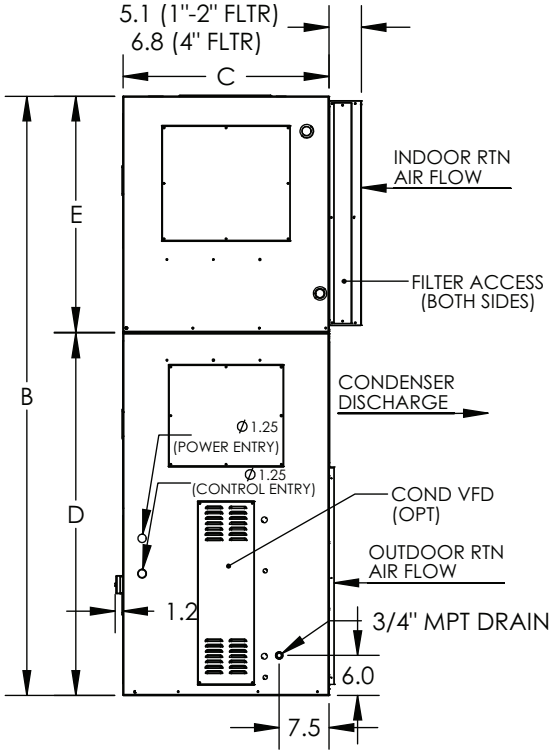
Fig. 1 — Base Unit Dimensions — 50XCA06,08 (Rear Return, Vertical Discharge)



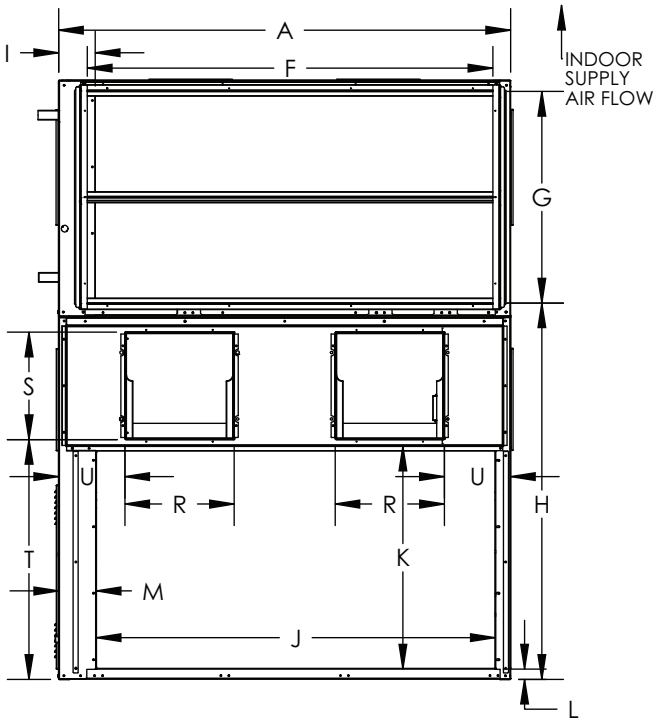
TOP VIEW



FRONT VIEW



RIGHT VIEW

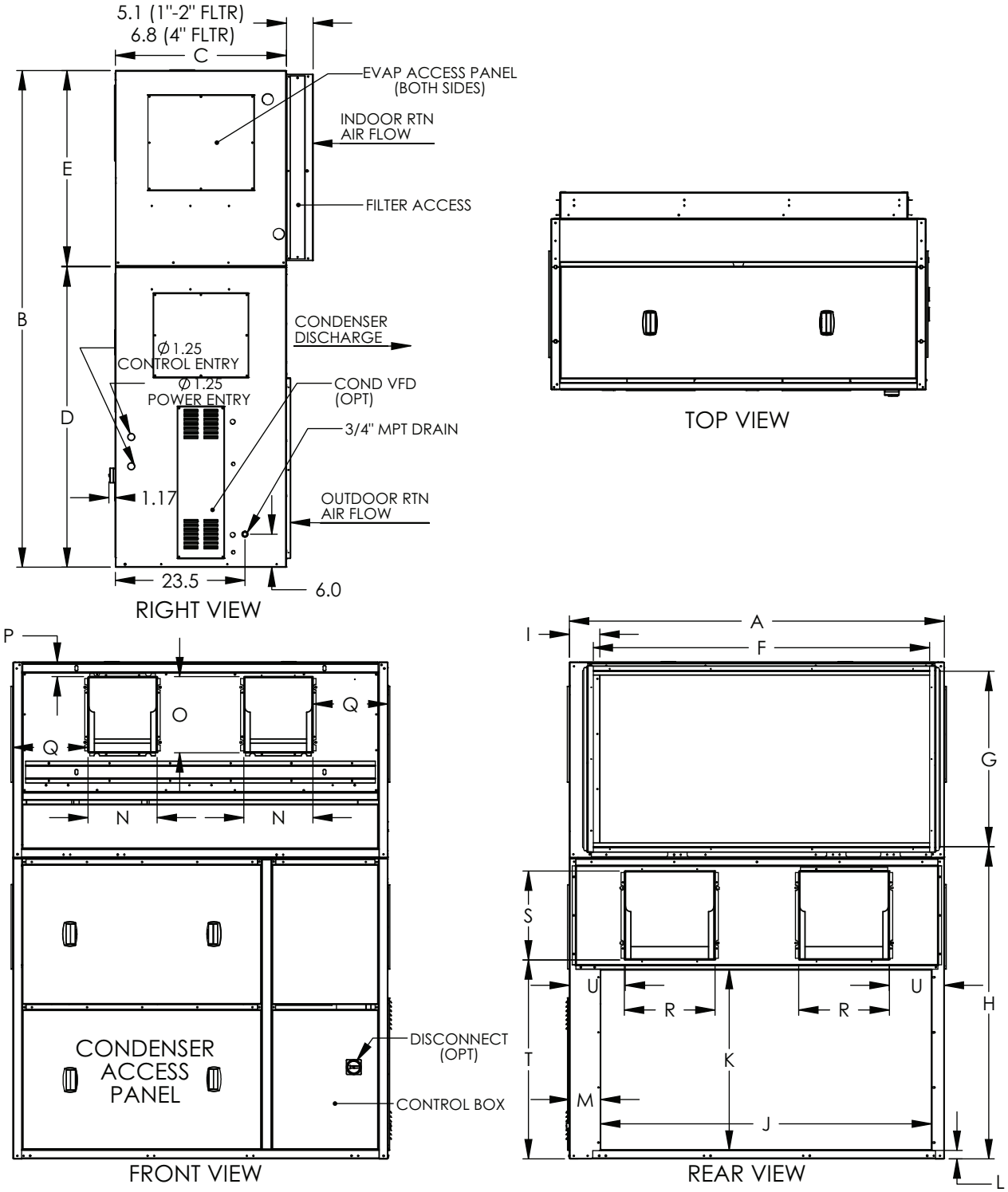


REAR VIEW

UNIT 50XCA	WIDTH	HEIGHT	DEPTH	COND SECTION	EVAP SECTION	EVAP RETURN DUCT				COND RETURN DUCT				EVAP SUPPLY DUCT (Blower Opening)				COND DISCHARGE DUCT (Blower Opening)			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
12	68.0	90.1	31.2	54.5	35.5	61.1	31.8	56.7	5.5	60	32.8	1.5	5.7	12.5	13.8	8.5	13.6	16.4	16.2	36.5	11.5
14	88.0	90.1	31.2	54.5	35.5	81.0	31.8	56.7	2.5	80	32.8	1.5	5.7	12.5	13.8	8.5	23.6	18.9	16.2	36.6	17.2

NOTE: Dimensions are in inches.

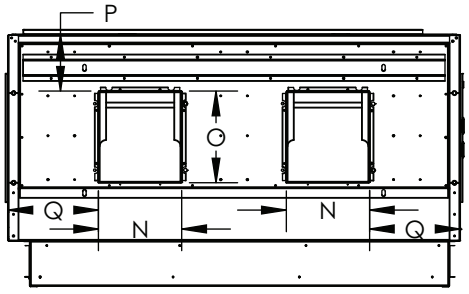
Fig. 2 — Base Unit Dimensions — 50XCA12,14 (Rear Return, Vertical Discharge)



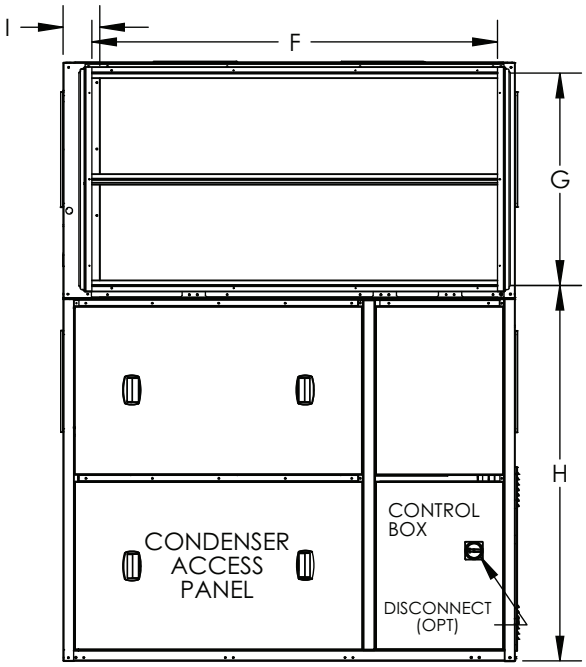
UNIT 50XCA	WIDTH	HEIGHT	DEPTH	COND SECTION	EVAP SECTION	EVAP RETURN DUCT				COND RETURN DUCT				EVAP SUPPLY DUCT (Blower Opening)				COND DISCHARGE DUCT (Blower Opening)			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
12	68.0	90.1	31.2	54.5	35.5	61.1	31.8	56.7	5.5	60	32.8	1.5	5.7	12.5	13.8	2.7	13.6	16.4	16.2	36.5	11.5
14	88.0	90.1	31.2	54.5	35.5	81.0	31.8	56.7	2.5	80	32.8	1.5	5.7	12.5	13.8	2.7	23.6	18.9	16.2	36.6	17.2

NOTE: Dimensions are in inches.

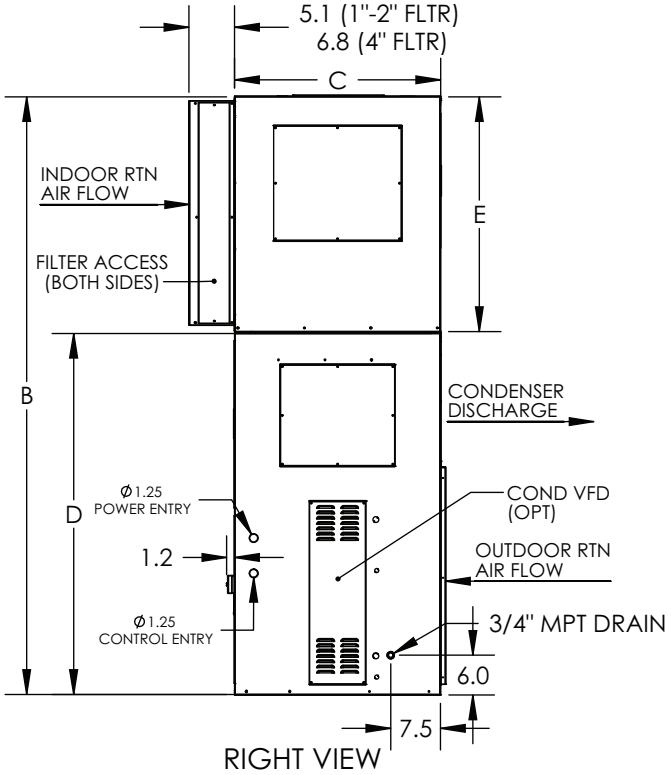
Fig. 3 — Base Unit Dimensions — 50XCA12,14 (Rear Return, Horizontal Discharge)



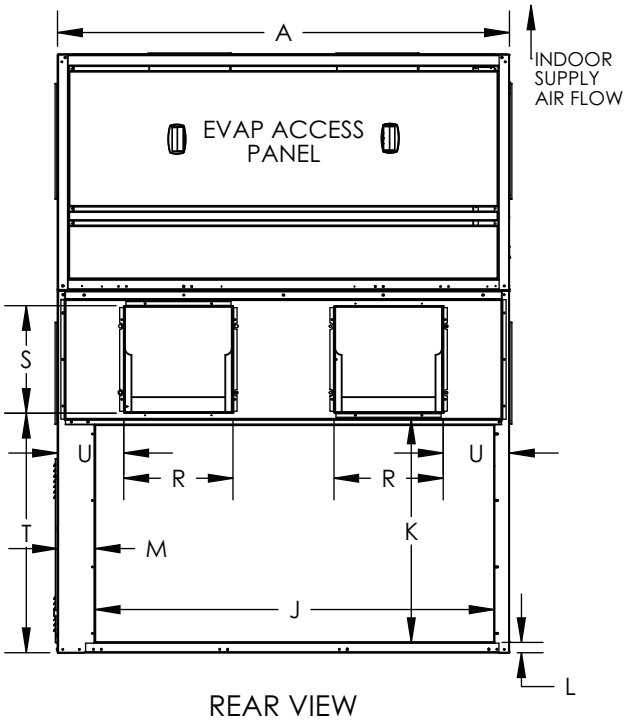
TOP VIEW



FRONT VIEW



RIGHT VIEW

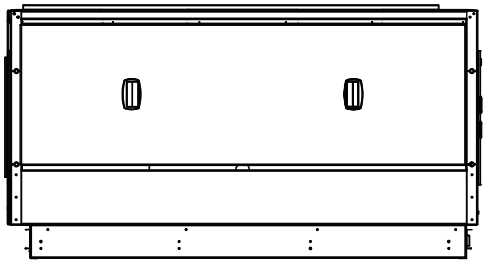


REAR VIEW

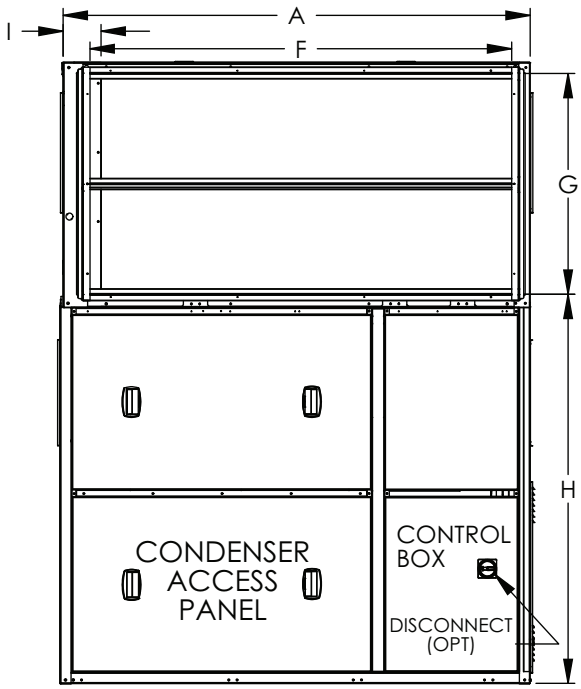
UNIT 50XCA	WIDTH	HEIGHT	DEPTH	COND SECTION	EVAP SECTION	EVAP RETURN DUCT				COND RETURN DUCT				EVAP SUPPLY DUCT (Blower Opening)				COND DISCHARGE DUCT (Blower Opening)			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
12	68.0	90.1	31.2	54.5	35.5	61.1	31.8	56.7	5.5	60	32.8	1.5	5.7	12.5	13.8	8.5	13.6	16.4	16.2	36.5	11.5
14	88.0	90.1	31.2	54.5	35.5	81.0	31.8	56.7	2.5	80	32.8	1.5	5.7	12.5	13.8	8.9	23.6	18.9	16.2	36.6	17.2

NOTE: Dimensions are in inches.

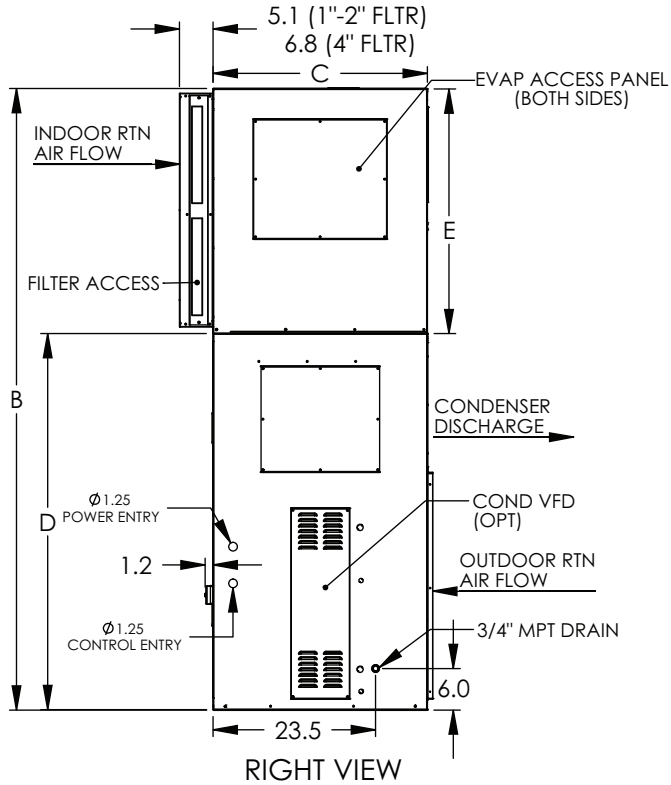
Fig. 4 — Base Unit Dimensions — 50XCA12,14 (Front Return, Vertical Discharge)



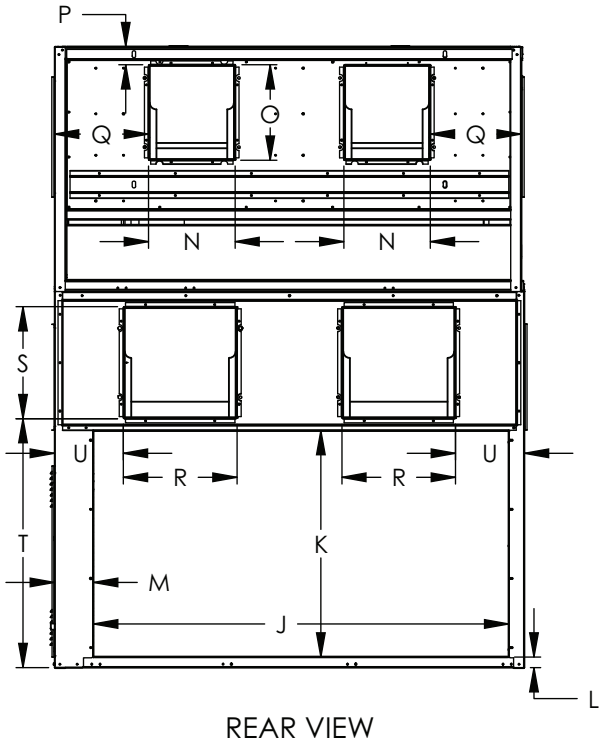
TOP VIEW



FRONT VIEW



RIGHT VIEW

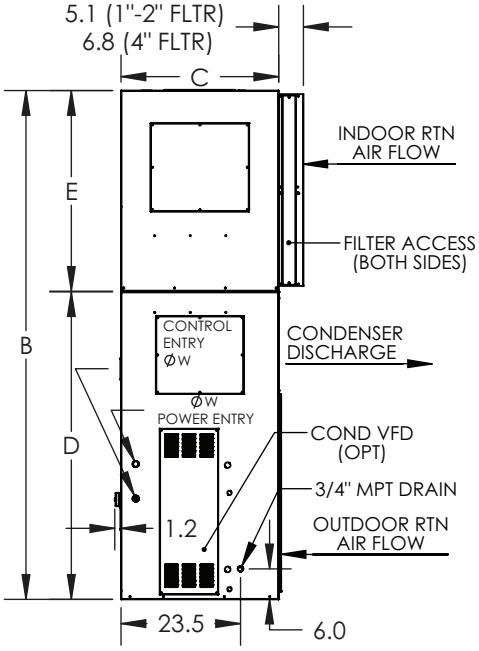


REAR VIEW

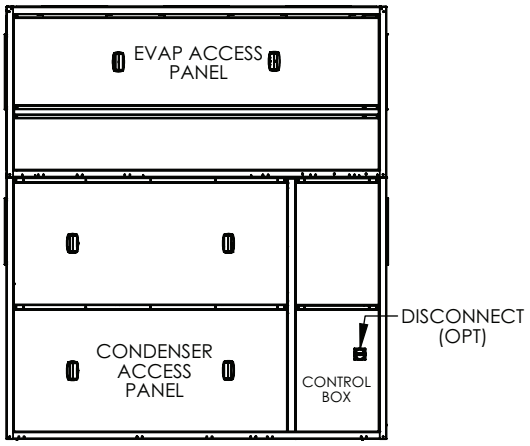
UNIT 50XCA	WIDTH	HEIGHT	DEPTH	COND SECTION	EVAP SECTION	EVAP RETURN DUCT				COND RETURN DUCT				EVAP SUPPLY DUCT (Blower Opening)				COND DISCHARGE DUCT (Blower Opening)			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
12	68.0	90.1	31.2	54.5	35.5	61.1	31.8	56.7	5.5	60	32.8	1.5	5.7	12.5	13.8	2.6	13.6	16.4	16.2	36.5	11.5
14	88.0	90.1	31.2	54.5	35.5	81.0	31.8	56.7	2.5	80	32.8	1.5	5.7	12.5	13.8	2.6	23.6	18.9	16.2	36.6	17.2

NOTE: Dimensions are in inches.

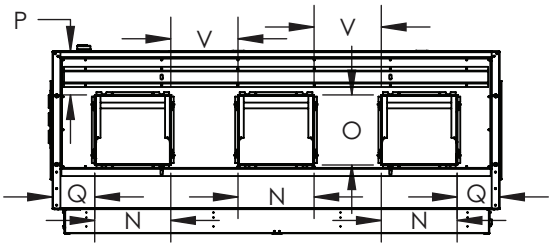
Fig. 5 — Base Unit Dimensions — 50XCA12,14 (Front Return, Horizontal Discharge)



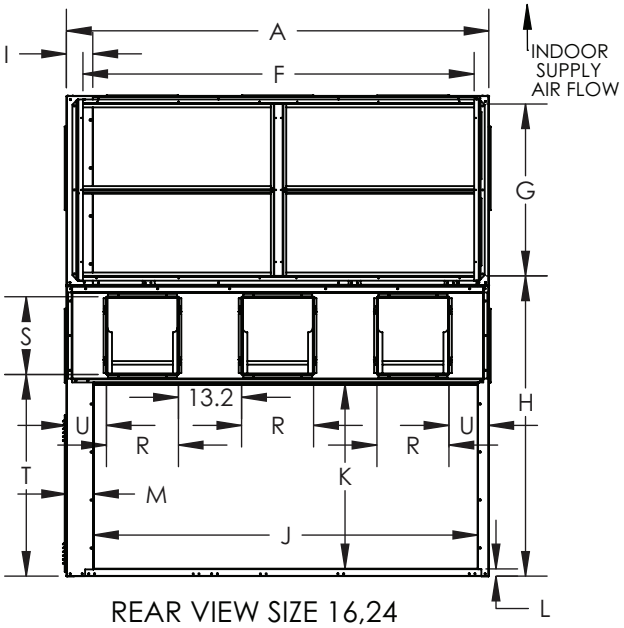
RIGHT VIEW



FRONT VIEW



TOP VIEW

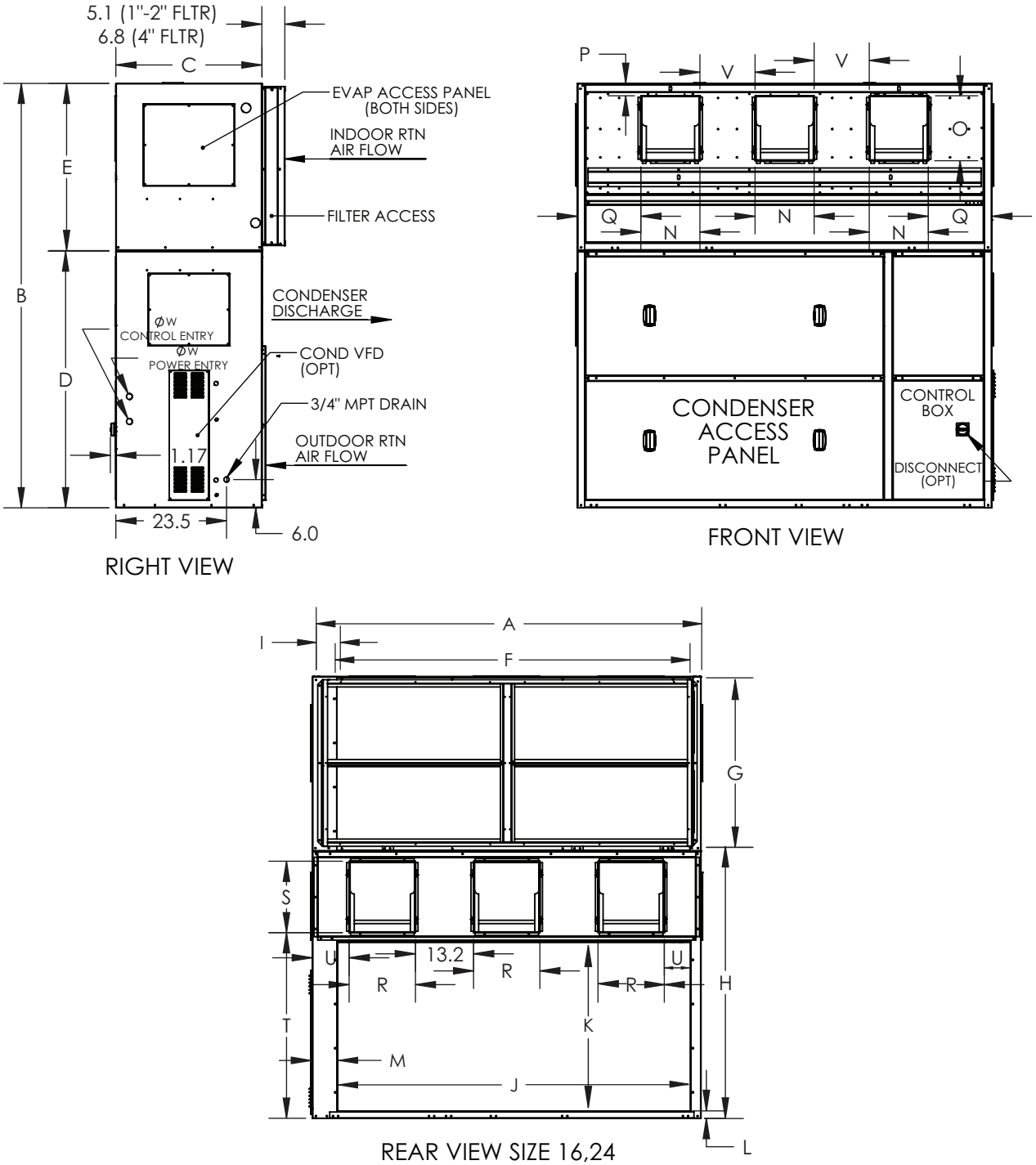


REAR VIEW SIZE 16,24

UNIT 50XCA	WIDTH	HEIGHT	DEPTH	COND SECT	EVAP SECT	EVAP RETURN DUCT				COND RETURN DUCT				EVAP SUPPLY DUCT (Blower Opening)					COND DISCHARGE DUCT (Blower Opening)				P/C
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	V	R	S	T	U	W
16	88.0	90.1	31.2	54.5	35.5	81.0	31.8	56.7	5.5	80	32.8	1.5	5.7	12.5	13.8	8.5	13.5	11.7	18.9	16.2	36.5	16.2	1.25
24	88.0	100.1	31.2	60.5	39.5	81.5	35.8	62.6	5.5	80	38.5	1.5	5.7	14.9	13.8	8.6	8.3	13.2	15.0	16.2	42.0	8.3	2.00

NOTE: Dimensions are in inches.

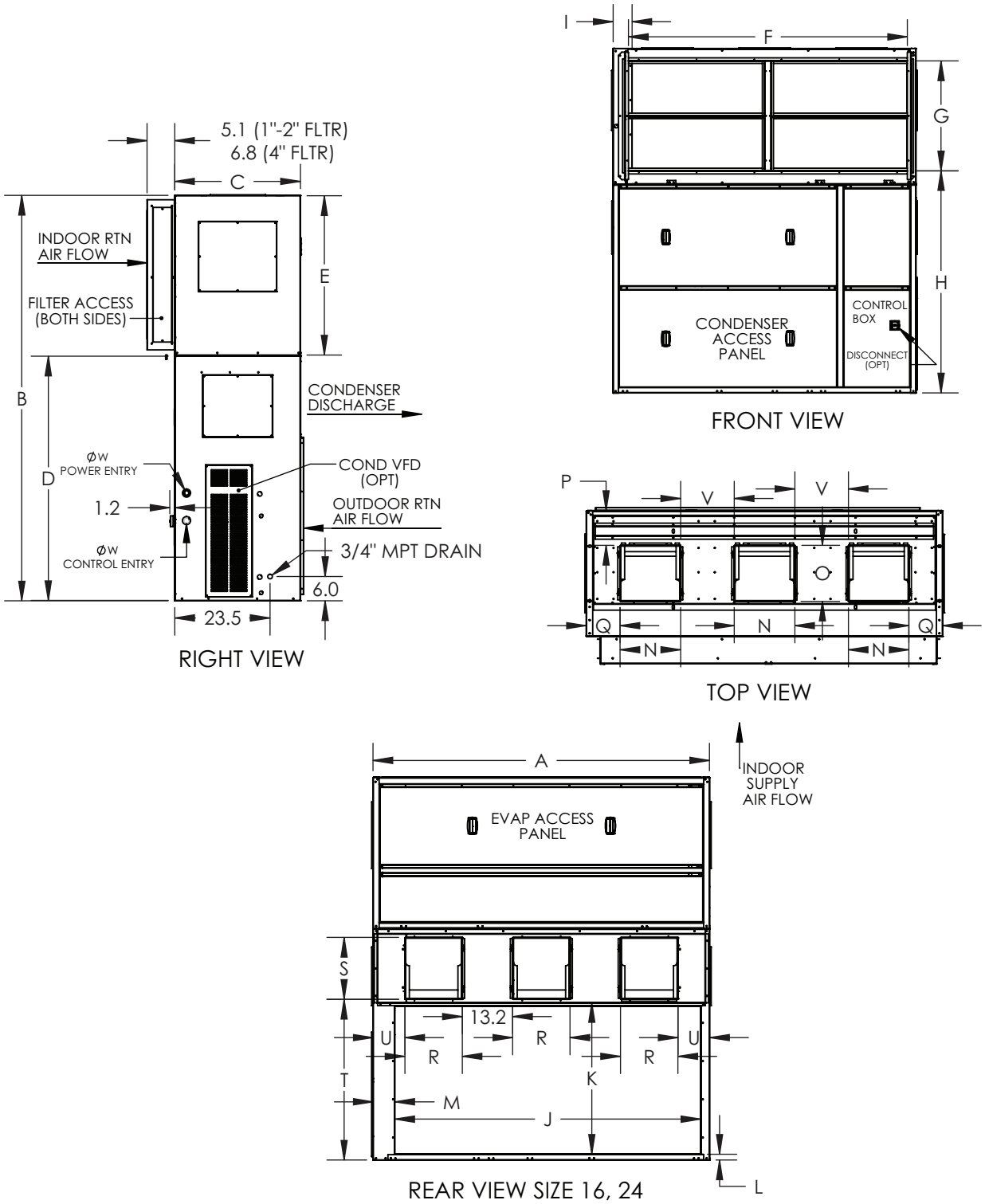
Fig. 6 — Base Unit Dimensions — 50XCA16, 24 (Rear Return, Vertical Discharge)



UNIT 50XCA	WIDTH	HEIGHT	DEPTH	COND SECT	EVAP SECT	EVAP RETURN DUCT				COND RETURN DUCT				EVAP SUPPLY DUCT (Blower Opening)					COND DISCHARGE DUCT (Blower Opening)				P/C
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	V	R	S	T	U	W
16	88.0	90.1	31.2	54.5	35.5	81.0	31.8	56.7	5.5	80	32.8	1.5	5.7	12.5	13.8	2.6	13.5	11.7	18.9	16.2	36.5	16.2	1.25
24	88.0	100.1	31.2	60.5	39.5	81.5	35.8	62.6	5.5	80	38.5	1.5	5.7	14.9	13.8	2.6	8.3	13.2	15.0	16.2	42.0	8.3	2.00

NOTE: Dimensions are in inches.

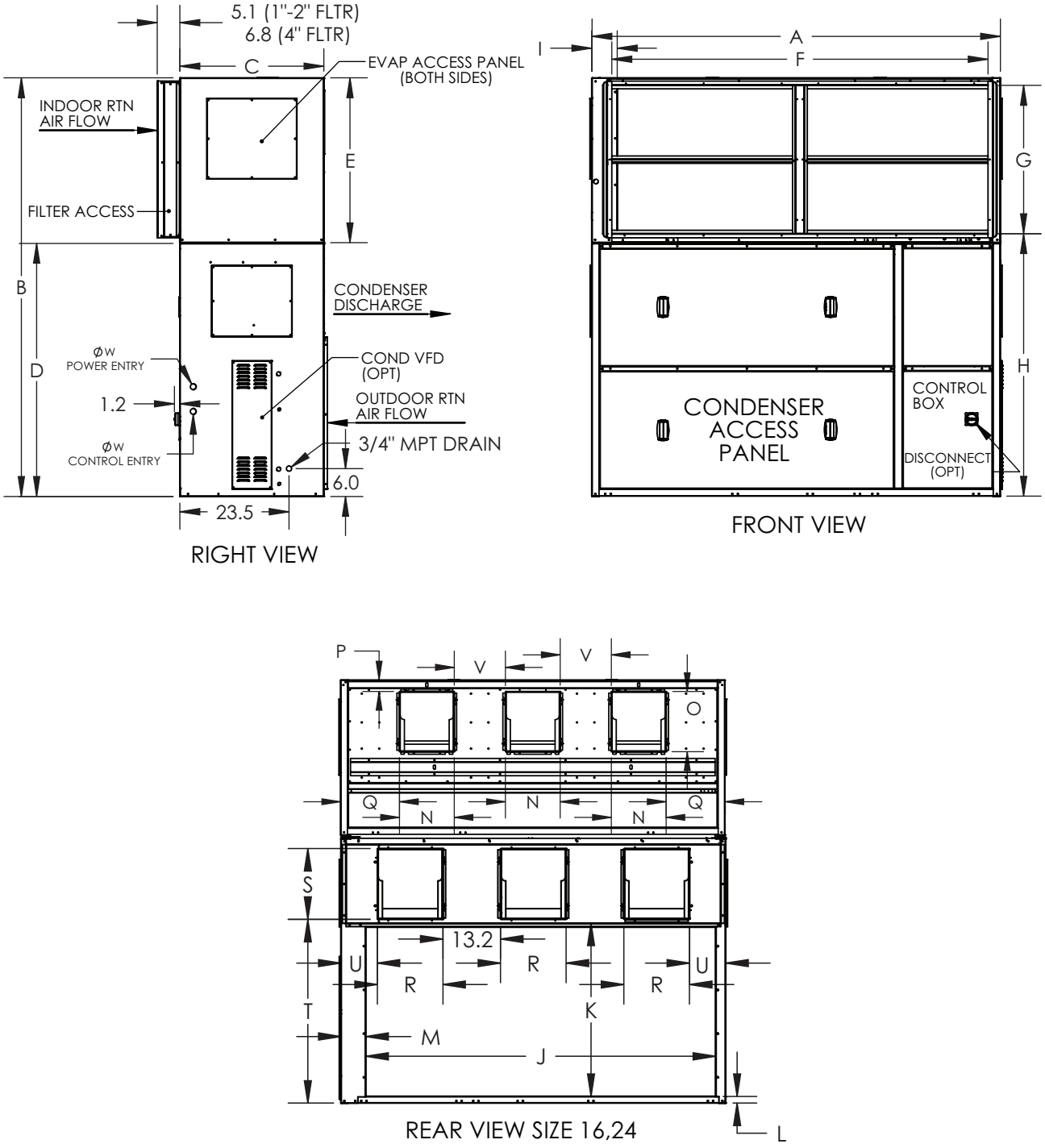
Fig. 7 — Base Unit Dimensions — 50XCA16, 24 (Rear Return, Horizontal Discharge)



UNIT 50XCA	WIDTH	HEIGHT	DEPTH	COND SECT	EVAP SECT	EVAP RETURN DUCT				COND RETURN DUCT				EVAP SUPPLY DUCT (Blower Opening)					COND DISCHARGE DUCT (Blower Opening)				P/C
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	V	R	S	T	U	W
16	88.0	90.1	31.2	54.5	35.5	81.0	31.8	56.7	5.5	80	32.8	1.5	5.7	12.5	13.8	8.5	13.5	11.7	18.9	16.2	36.5	16.2	1.25
24	88.0	100.1	31.2	60.5	39.5	81.5	35.8	62.6	5.5	80	38.5	1.5	5.7	14.9	13.8	8.6	8.3	13.2	15.0	16.2	42.0	8.3	2.00

NOTE: Dimensions are in inches.

Fig. 8 — Base Unit Dimensions — 50XCA16, 24 (Front Return, Vertical Discharge)



UNIT 50XCA	WIDTH	HEIGHT	DEPTH	COND SECT	EVAP SECT	EVAP RETURN DUCT				COND RETURN DUCT				EVAP SUPPLY DUCT (Blower Opening)					COND DISCHARGE DUCT (Blower Opening)				P/C
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	V	R	S	T	U	W
16	88.0	90.1	31.2	54.5	35.5	81.0	31.8	56.7	5.5	80	32.8	1.5	5.7	12.5	13.8	2.6	13.5	11.7	18.9	16.2	36.5	16.2	1.25
24	88.0	100.1	31.2	60.5	39.5	81.5	35.8	62.6	5.5	80	38.5	1.5	5.7	14.9	13.8	2.6	8.3	13.2	15.0	16.2	42.0	8.3	2.00

NOTE: Dimensions are in inches.

Fig. 9 — Base Unit Dimensions — 50XCA16, 24 (Front Return, Horizontal Discharge)

Table 1 — Physical Data

UNIT 50XCA	06	08	12	14	16	24
NOMINAL CAPACITY (tons)	5	7.5	10	12	15	20
BASE UNIT OPERATING WEIGHT (lb)	883	1153	1352	1380	1645	2041
COMPRESSOR	Scroll					
Compressor Model	ZPS60	ZPS60[a] ZPS67[b]	ZP54/ZP49	ZP61/ZP57	ZP91/ZP67	ZP122/ZP91
Quantity	1	1	2	2	2	2
Steps of Control (stages)	1	1	2	2	2	2
Operating Charge R410-A (lb)	19.1	19.2	32.8	42.4	34.1	50.4
EVAPORATOR FAN	Adjustable, Belt Drive, Centrifugal Type					
Nominal cfm	1875	2625	3500	4200	5000	7000
Evaporator Fan Size	110-10R	110-10R	120-9R	120-9R	120-9R	120-11R
Number of Evaporator Fans	1	2	2.0	2	3	3
Max. Allowable rpm	1600	1700	2000	2000	2000	2000
Std Hp	1.0	1.0	1.0	1.5	1.5	3
Hp Range	1 - 2	1 - 2	1 - 3	1.5 - 5	1.5 - 5	3 - 7.5
Fan Shaft Size (in.)	0.75	1	1	1	1.875	1.875
Motor Shaft Size (in.)	0.875	0.875	0.875	0.875	0.875	1.125
Center Distance (in.) - Vertical	15.3	15.3	18.1	18.1	18.1	21.3
Center Distance (in.) - Horizontal	N/A	N/A	15.5	13	15.7	18.1
EVAPORATOR COIL	3/8 in. OD, Enhanced Copper Tube, Aluminum Fins					
Quantity Rows … Fins/in.	3…15	4…15	3…15	4…15	4… 15	4… 15
Fin Block Size (H x L) (in.)	28 x 35	28 x 46	32 x 60	32 x 60	32 x 80	36 x 80
Face Area (sq ft)	6.8	8.9	13.3	13.3	17.7	20
RETURN AIR FILTERS						
Std 1 in., Throwaway	(2) 25 x 25	(2) 25 x 25	(8) 16 x 16	(8) 16 x 16 (2) 16 x 20	(8) 16 x 16 (2) 16 x 20	(4) 18 x 24 (4) 18 x 18
CONDENSER FAN	Adjustable, Belt Drive, Centrifugal Type					
Nominal cfm	3,400	4,000	6,400	6,700	9,000	10,300
Condenser Fan Size	110-10R	110-10R	150-12R	150-15R	150-11R	150-11R
Number of Condenser Fans	2	2	2	2	3	3
Max. Allowable rpm	1700	1700	1700	1600	1700	1700
Belt Type	BX66	BX66	BX75	BX77	BX82	BX87
Hp Range	1 - 1.5	1.5 - 2	2 - 3	2 - 3	3 - 5	5 - 7.5
Fan Shaft Size (in.)	1	1	1	1.1875	1.4375	1.4375
Motor Shaft Size (in.)	0.875	0.875	0.875	0.875	1.125	1.125
Center Distance (in.)	27.1	27.1	29.8	29.8	29.8	35.1
CONDENSER COIL	3/8 in. OD, Enhanced Copper Tube, Aluminum Fins					
Quantity Rows … Fins/in.	6…16	6…16	6…16	6…16	5…16	5… 16
Fin Block Size (H x L) (in.)	30 x 46	30 x 46	32 x 60	32 x 80	34 x 80	40 x 80
Face Area (sq ft)	9.6	9.6	13.3	17.8	18.8	22.22
HIGH-PRESSURE SWITCH	Opens at 595 ± 10 psig; Closes at 443 ± 15 psig				Opens at 650± 10 psig; Closes at 500 ± 15 psig	
LOW-PRESSURE SWITCH	Opens at 53 ± 5 psig; Closes at 80 ± 7 psig					

NOTE(S):

a. With No Low ambient option selected.
b. With Low ambient option selected.

LEGEND

MPT — Male Pipe Thread

Step 2 — Rig and Place Unit

Units are mounted on pallets. Leave unit on pallet until it is in the final position. While on pallet, the unit can be rolled, dragged or forklifted; *do not apply force to the unit.* Use a minimum of 3 rollers when rolling, and raise from above to remove the pallet when unit is in final position. See Fig. 10 for rigging details.

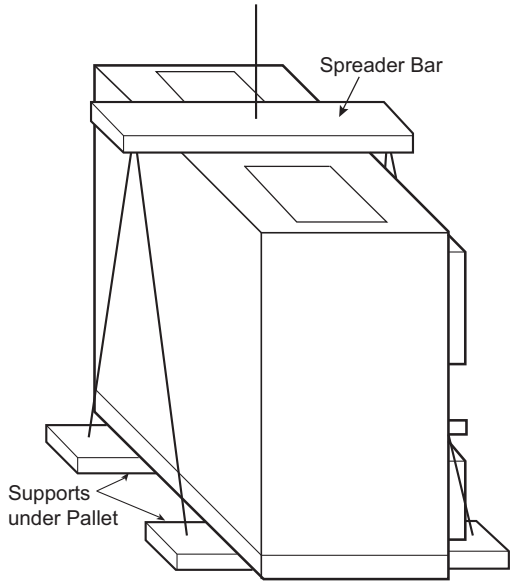
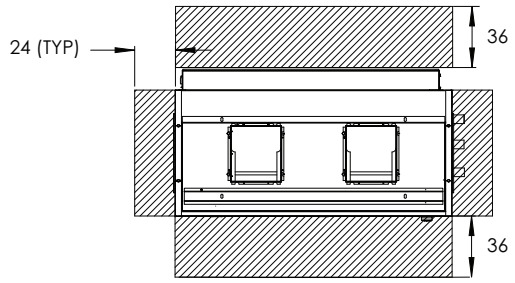


Fig. 10 — 50XCA Unit Rigging

PLACING THE UNIT

The selected unit location should not be adjacent to an acoustically sensitive space. The best locations for these units are mechanical rooms, near elevator shafts, near restrooms, near stairwells, or other similar locations. Position the unit where large supply of outdoor air is available for the unit inlet. Be sure to leave enough space for the return air inlet access to the evaporator and condenser coils for cleaning and maintenance. Units located on the same floor should have a minimum of 6 ft of clearance between condenser air openings. Units located floor-to-floor should have a minimum of 10 ft between units to prevent recirculation of conditioned air. DO NOT locate units where they will recirculate condenser air. This will cause increased head pressure which can cause units to trip on high pressure. See Fig. 11 for recommended unit clearances.



NOTE: Dimensions are in inches.

Fig. 11 — Unit Clearances

Either provide inlet filters to protect the coils, or locate the unit in an area free from airborne dirt or other foreign material which could clog the coils.

The units are designed to pass through most door openings. The filter rack may also be removed for additional clearance.

Step 3 — Install Additional Vibration Isolation (if required)

Unit compressors are internally isolated and the compressor compartment is lined with acoustical insulation. If additional vibration isolation is desired, rubber pads may be located under each unit corner or unit may be mounted on rubber shear isolators. Contact Carrier for application assistance. Spring isolators are not normally required. Ductwork attached to the unit should be isolated from the unit with a flexible collar on the inlet and outlet ducts.

Step 4 — Install Ductwork

The 50XCA unit is designed for use either with or without ductwork. If no ductwork is used, ensure that customer supplied wire fan guards are installed on condenser outlet to prevent injury. If either ductwork or no ductwork is used, care must be taken to eliminate air recirculation. Recirculation can be minimized by discharging through an extension elbow. When properly designed, single or double deflection discharge louvers can be applied to ductwork and to the unit air discharge. Fixed rain louvers over discharge outlets can cause excessive recirculation and nuisance high-pressure switch cutouts. Obstructions closer than 10 ft to the discharge air pattern can also cause significant recirculation. See Fig. 12 for recommended duct sizing.

CONDENSER AIR DUCT

The condenser supply and discharge air duct should be as short and straight as possible. The cross section area of the duct should be equal to the face area of the unit openings. Ductwork should be insulated to prevent moisture condensation on the unit panels during cold weather. (See Fig. 13.) Condenser discharge ducts for units with multiple blowers should consist of a "pair of pants" and be constructed in accordance with ASHRAE guidelines. (See Fig. 14.) Settling media may be required for uniform flow.

CONDENSER AIRFLOW LOUVERS

Separate inlet and discharge louvers are recommended (see Fig. 12) to avoid air recirculation. A baffle may also be used on the outside of the building to direct discharge away from the air inlet. See Fig. 12 for recommended dimensions.

EVAPORATOR DUCTWORK

The units should use a "pair of pants" configuration as shown in Fig. 14. Refer to ASHRAE standards for the recommended duct connection to unit with 2 or more fans. A flexible canvas duct connector is recommended on both supply and return air sides of the units to be connected to the system ductwork.

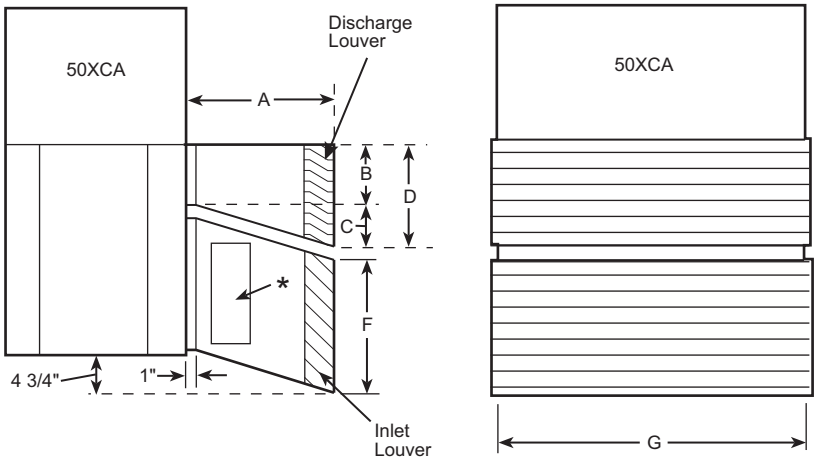
All metal ductwork should be adequately insulated to avoid heat loss or gain and to prevent condensation from forming on the duct walls. Uninsulated ductwork is not recommended, as the unit's performance will be adversely affected. Do not connect discharge ducts directly to the blower(s). The factory filter should be left in place on a free return system.

If the unit will be installed in a new installation, the duct system should be designed in accordance with ASHRAE procedures for duct sizing. If the unit will be connected to an existing duct system, check that the existing duct system has the capacity to handle the required airflow for the unit application at an acceptable system static pressure. If the existing duct system is too small, larger ductwork must be installed.

Units with two or more fans should have a properly designed "pair of pants" duct connection. (See Fig. 14.) Settling media may be required for uniform flow. Units with two or more fans should not be ducted separately. An adequate straight length of ducting from the unit should be allowed before elbows are installed. See table below for recommended straight length.

50XCA UNIT	LENGTH (in.)	50XCA UNIT	LENGTH (in.)
06	36.5	**14**	36.7
08	36.5	**16**	36.7
12	36.7	**24**	40.0

Elbows should turn in the direction of fan rotation, if possible. Abrupt turns will generate air turbulence, and excessive noise. Turning vanes should be used in all short radius bends. Ensure that ducting does not obstruct access to the unit for routine servicing.

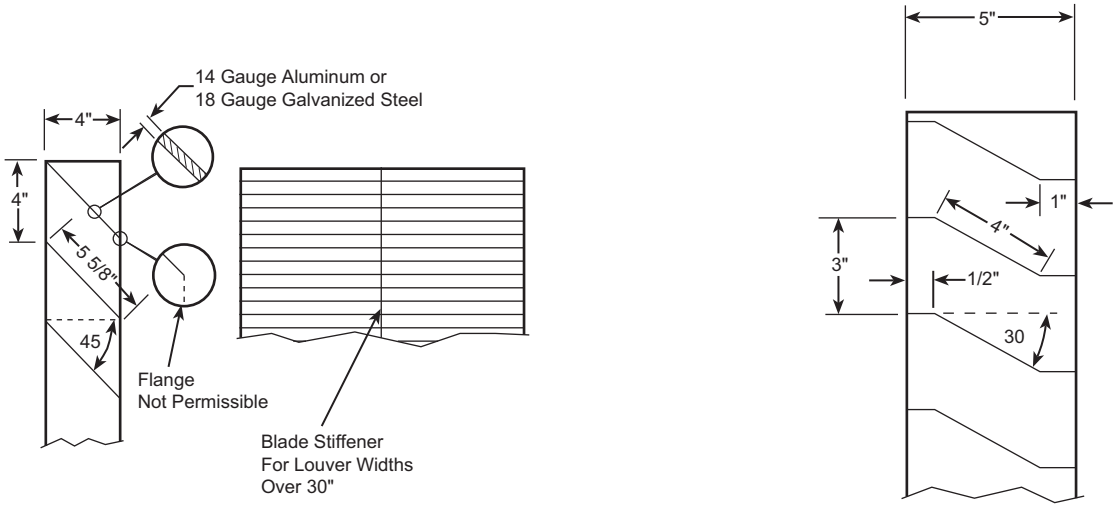


DIMENSIONS (in.)

UNIT 50XCA	A	B	C	D	F	G
06	41-1/2	12-3/4	4	16-3/4	29-3/8	46
08	41-1/2	12-3/4	4	16-3/4	29-3/8	46
12	50-1/2	16-1/4	4	20-1/4	32-3/4	60
14	53-3/4	16-1/4	4	20-1/4	32-3/4	80
16	53-3/4	16-1/4	4	20-1/4	32-3/4	80
24	58-1/2	16-1/4	4	20-1/4	38-1/2	80

*Access panel for condenser coil cleaning.

INLET LOUVER DETAIL DISCHARGE LOUVER DETAIL



DEFLECTOR DETAIL

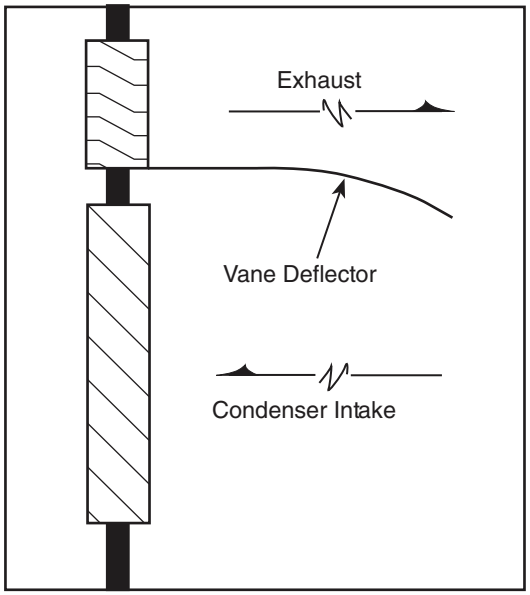
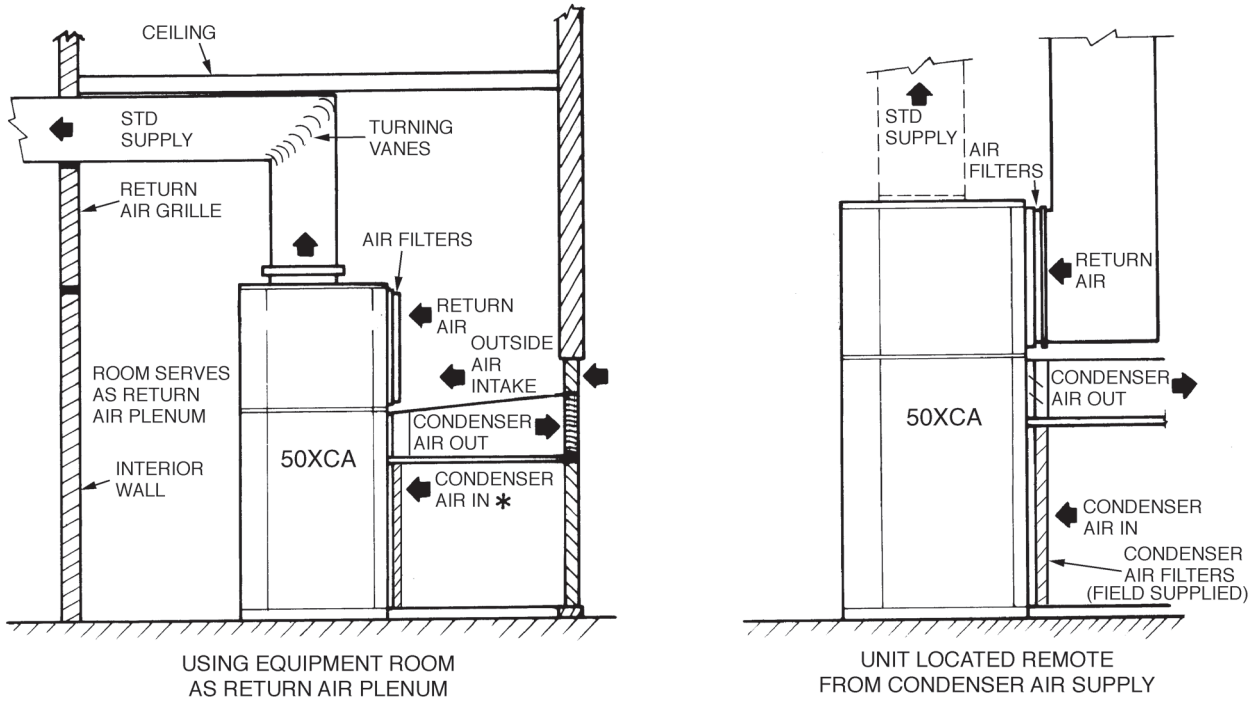
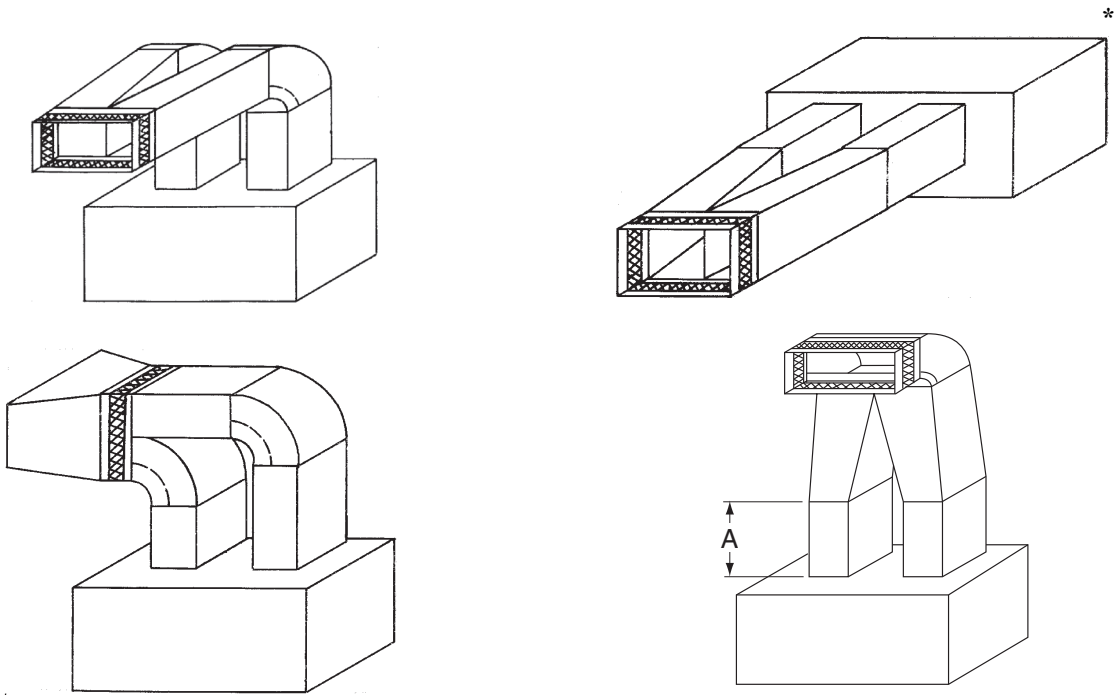


Fig. 12 — Typical Recommended Condenser Duct Dimensions



*Provide access for cleaning condenser coil.

Fig. 13 — 50XCA Installation Options



NOTE: A = min. straight duct length

* Preferred for condenser discharge ductwork.

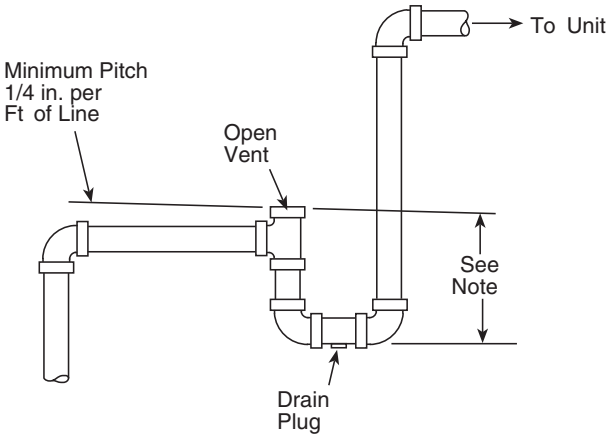
Fig. 14 — Typical Fan Discharge Connections for Multiple Fan Units

Step 5 — Install Condensate Drain Line

The 50XCA unit has a drain connection for evaporator condensate. When connecting condensate drains from the unit to floor drains, sinks, or hoppers, connect drains downstream of trap to ensure that condensate does not drain back into the unit.

IMPORTANT: NEVER use pipe smaller than 3/4 inches in the drain run.

Pitch drain pipe downward at a slope of at least 1/4 in. per ft for proper drainage. Provide tees plugged on one side for clean-outs. Leave clearance for servicing, and observe all local sanitary codes. The condensate trap should have a depth adequate to allow 3 in. of water in the trap with the unit running. See Fig. 15.



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

Fig. 15 — External Trap Condensate Drain

Step 6 — Complete Electrical Connections

GENERAL

Verify that nameplate electrical requirements match available power supply. See Tables 2 and 3. Voltage at condenser must be within the minimum and maximum shown in Table 2 and phases must be balanced within 2%. Contact local power company for line voltage corrections. 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:

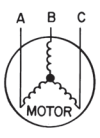
UNBALANCED 3-PHASE SUPPLY VOLTAGE

Use the following formula to determine the percent of voltage imbalance.

Percent 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 supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

Unit operation on improper line voltage or excessive phase imbalance may be considered abuse and any resulting damage may not be covered by Carrier warranty.

All wiring must be in accordance with local or NEC (National Electrical Code) regulations.

POWER WIRING

The units must have adequate overcurrent protection, fuses, or HACR (Heating, Air Conditioning and Refrigeration) breakers, according to the national and applicable local codes.

For field power connections, all main power wiring enters the unit through a factory-punched access hole on the side of the control box. Attach power wires to the power connections on the main power terminal block in the unit control box. Be sure to install a ground wire.

CONTROL WIRING

All units require an accessory thermostat package to complete the unit control system. For a room-mounted thermostat, the thermostat may be mounted in an appropriate location in the conditioned space. Never locate the thermostat in direct path of air discharge. Route the wires from the thermostat to the low voltage connection of the control box. Connect wires to the low voltage terminal block. See Fig. 16. The fan switch on the thermostat will control fan operations.

WINTER START MODIFICATIONS

When starting air-cooled units under low-ambient temperature conditions, the compressor may pull suction pressure down below the low-pressure cutout switch setting causing the compressor to shut off. At extremely low temperatures, the low-pressure switch may open during the off cycle, preventing the compressor from starting. The use of the winter start kit is recommended. This kit bypasses the low-pressure switch on start-up for 90 seconds.

Table 2 — Electrical Data[a,b,c,d]

UNIT 50XCA	V-PH-Hz	VOLTAGE RANGE		COMPRESSOR NO. 1		COMPRESSOR NO. 2	
		Min	Max	RLA	LRA	RLA	LRA
06	208/230-3-60	187	253	18.3	136	—	—
	460-3-60	414	506	8.8	66	—	—
	575-3-60	518	632	6.6	55	—	—
08	208/230-3-60	187	253	23.0	149	—	—
	460-3-60	414	506	11.0	75	—	—
	575-3-60	518	632	8.0	54	—	—
12	208/230-3-60	187	253	15.6	110	15.9	110
	460-3-60	414	506	7.8	52	7.1	52
	575-3-60	518	632	5.8	39	5.1	39
14	208/230-3-60	187	253	19.6	136	19.2	136
	460-3-60	414	506	8.2	66	8.7	66
	575-3-60	518	632	6.6	55	6.9	55
16	208/230-3-60	187	253	28.7	191	23.0	149
	460-3-60	414	506	13.3	100	11.0	75
	575-3-60	518	632	10.0	78	8.0	54
24	208/230-3-60	187	253	40.7	240	28.7	191
	460-3-60	414	506	19.3	140	13.3	100
	575-3-60	518	632	15.6	107	10.0	78

NOTE(S):

a. In compliance with NEC requirements for multimotor and combination load equipment (NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR circuit breaker. Canadian units may be fuse or circuit breaker.
b. Wire sizing amps are a sum of 125% of the compressor RLA plus 100% of indoor fan motor FLA.
c. Motors are protected against primary single phasing condition.
d. Indoor-fan motors are 3-phase motors of same voltage as unit.

LEGEND

LRA — Locked Rotor Amps
NEC — National Electrical Code
RLA — Rated Load Amps

Table 3 — Fan Electrical Data[a]

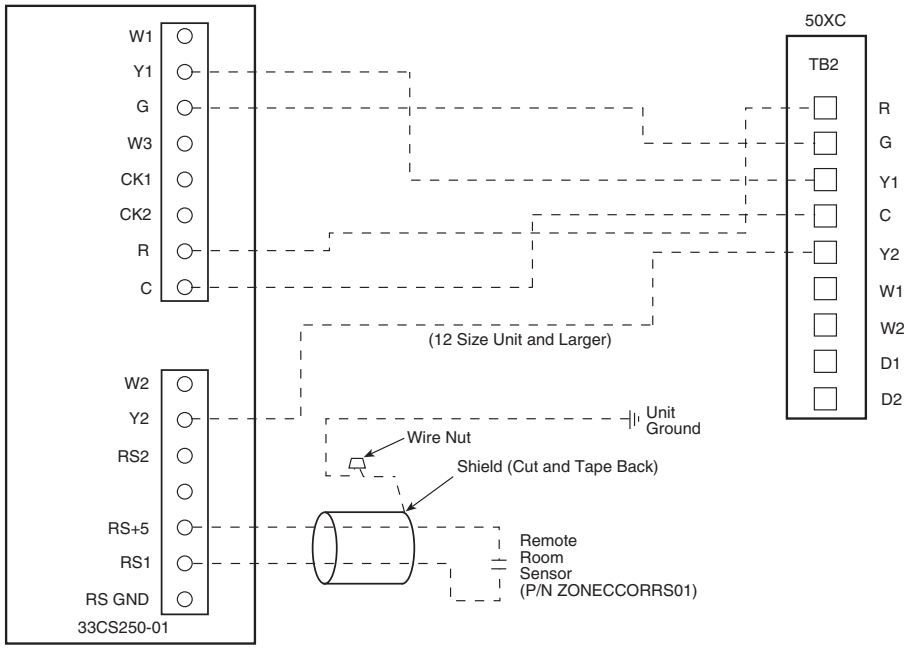
MOTOR CODE	HP	V-PH-Hz	VOLTAGE RANGE		FLA
			Min	Max	
D	1.00	208/230-3-60	187	253	3.2/3.2
		460-3-60	414	506	1.6
		575-3-60	518	632	1.1
E	1.50	208/230-3-60	187	253	4.6/4.8
		460-3-60	414	506	2.4
		575-3-60	518	632	1.6
F	2.00	208/230-3-60	187	253	6.0/5.8
		460-3-60	414	506	2.9
		575-3-60	518	632	2.1
G	3.00	208/230-3-60	187	253	9.2/8.6
		460-3-60	414	506	4.3
		575-3-60	518	632	3.4
H	5.00	208/230-3-60	187	253	14.5/13.6
		460-3-60	414	506	6.8
		575-3-60	518	632	5.4
J	7.50	208/230-3-60	187	253	21.5/19.4
		460-3-60	414	506	9.7
		575-3-60	518	632	7.5

NOTE(S):

a. The FLA data listed in this table is for one fan only. When calculating system FLA, evaporator fan and condenser fan must be included.

LEGEND

FLA — Full Load Amps



NOTE: Remote sensor is field-installed option.

Fig. 16 — Typical Thermostat Wiring Connections

Step 7 — Check Fan Sheave and Belt Alignment

Factory-supplied drives are pre-aligned and tensioned, however, Carrier recommends checking the belt tension and alignment before starting the unit. Always check the drive alignment after adjusting belt tension.

To install sheaves on the fan or motor shaft, remove any rust-preventive coating on the shaft. Make sure the shaft is clean and free of burrs. Add grease or lubricant to bore of sheave before installing. Mount sheave on the shaft; to prevent bearing damage, do not use excessive force (i.e., a hammer). Place sheaves for minimum overhang (see Fig. 17).

Each factory-assembled fan, shaft, and drive sheave assembly is precision aligned and balanced. If excessive unit vibration occurs after field replacement of sheaves, the unit should be rebalanced. To change the drive ratio, reselect and replace the motor sheave, not the fan sheave.

After 24 hours of unit operation, the drive belts may stretch. Check the belt tension after 24 hours of operation and adjust if necessary. Periodically check belt tension throughout the run-in period, which is normally the initial 72 hours of operation.

ALIGNMENT

Make sure that fan shafts and motor shafts are parallel and level. The most common causes of misalignment are nonparallel shafts and improperly located sheaves. Where shafts are not parallel, belts on one side are drawn tighter and pull more than their share of the load. As a result, these belts wear out faster, requiring the entire set to be replaced before it has given maximum service. If misalignment is in the sheave, belts enter and leave the grooves at an angle, causing excessive belt and sheave wear.

1. Shaft alignment can be checked by measuring the distance between the shafts at 3 or more locations. If the distances are equal, then the shafts are parallel.
2. Sheave Alignment:

   Fixed sheaves — To check the location of the fixed sheaves on the shafts, a straightedge or a piece of string can be used. If the sheaves are properly aligned, the string will touch them at the points indicated by the arrows in Fig. 18.

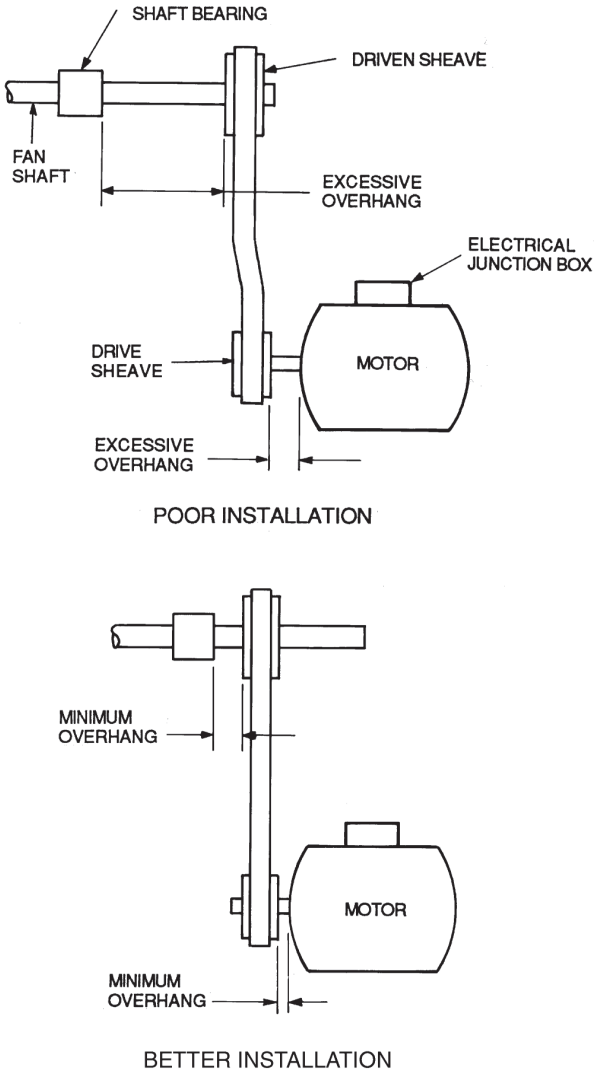


Fig. 17 — Determining Sheave-Shaft Overhang

Adjustable sheaves — To check the location of adjustable sheave on shaft, make sure that the centerlines of both sheaves are in line and parallel with the bearing support channel. See Fig. 18. Adjustable pitch drives are installed on the motor shaft. Carrier recommends that adjustable sheaves should only be used for initial balancing and be replaced with fixed pitch sheaves by the air balancer prior to the final system air balance.

⚠CAUTION

Do not exceed maximum fan speed rpm with adjustable sheave or unit damage could occur.

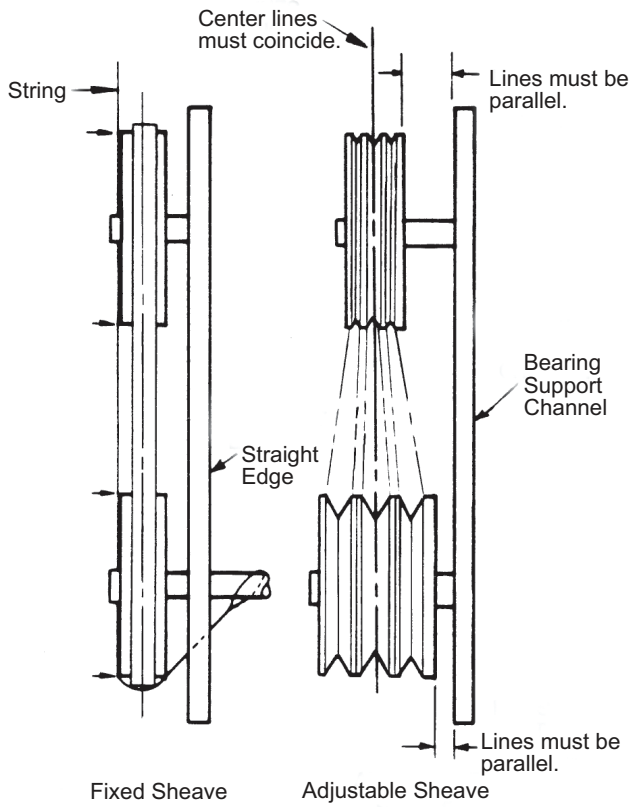


Fig. 18 — Determining Sheave-Shaft Alignment

3. Rotate each sheave one-half revolution to determine whether the sheave is wobbly or the drive shaft is bent. Correct any misalignment.
4. With sheaves aligned, tighten cap screws evenly and progressively.

NOTE: There should be a 1/8 in. to 1/4 in. gap between the mating part hub and the bushing flange. If gap is closed, the bushing is probably the wrong size.

5. With taper-lock bushed hubs, be sure the bushing bolts are tightened evenly to prevent side-to-side pulley wobble. Check by rotating sheaves and rechecking sheave alignment. When substituting field-supplied sheaves for factory-supplied sheaves, consider that fan shaft sheave has been factory balanced with fan and shaft as an assembly. For this reason, substitution of motor sheave is preferable for final speed adjustment.

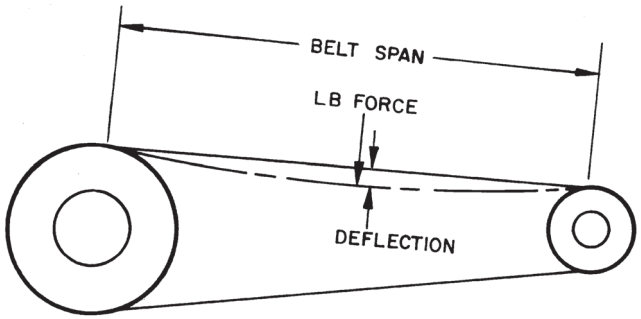
V-BELTS

When installing or replacing belts, always use a complete set of new belts. Mixing old and new belts will result in the premature wear or breakage of the newer belts.

Refer to label on inside of fan access door for information on factory-supplied drive.

1. Always adjust the motor position so that V-belts can be installed without stretching over grooves. Forcing belts can result in uneven stretching and a mismatched set of belts.
2. **Do not allow belt to bottom out in sheave.**
3. Tighten belts by turning motor-adjusting jackscrews. Turn each jackscrew an equal number of turns.
4. Equalize belt slack so that it is on the same side of belt for all belts. Failure to do so may result in uneven belt stretching.
5. Tension new drives at the maximum deflection force recommended (Fig. 19).

On current production, the correct tension information is listed on the fan drive label. For older equipment or for units with field-modified drives, use the deflection formula given in the following example and the tension data from Fig. 19.



BELT CROSS SECTION	SMALL SHEAVE PD RANGE (in.)	DEFLECTION FORCE (lb)					
		Super Belts		Notch Belts		Steel Cable Belts	
		Min	Max	Min	Max	Min	Max
A	3.0-3.6	3	4-1/4	3-7/8	5-1/2	3-1/4	4
	3.8-4.8	3-1/2	5	4-1/2	6-1/4	3-3/4	4-3/4
	5.0-7.0	4	5-1/2	5	6-7/8	4-1/4	5-1/4
B	3.4-4.2	4	5-1/2	5-3/4	8	4-1/2	5-1/2
	4.4-5.6	5-1/8	7-1/8	6-1/2	9-1/8	5-3/4	7-1/4
	5.8-8.6	6-3/8	8-3/4	7-3/8	10-1/8	7	8-3/4
C	7.0-9.4	11-1/4	14-3/8	13-3/4	17-7/8	11-1/4	14
	9.6-16.0	14-1/8	18-1/2	15-1/4	20-1/4	14-1/4	17-3/4
5V	4.4-6.7	—	—	10	15	—	—
	7.1-10.9	10-1/2	15-3/4	12-7/8	18-3/4	—	—
	11.8-16.0	13	19-1/2	15	22	—	—
8V	12.5-17.0	27	40-1/2	—	—	—	—
	18.0-22.4	30	45	—	—	—	—

Fig. 19 — Fan Belt Tension Data

EXAMPLE:

Given:

Belt Span 16 in.

Belt Cross-Section A, Super Belt

Small Sheave PD 5 in.

Deflection = Belt Span/64

Solution:

a. From Fig. 19 find that deflection force for type A, super belt with 5 in. small sheave PD is 4 to 5-1/2 lb.

b. Deflection = 16/64
= 1/4 in.

c. Increase or decrease belt tension until force required for 1/4 in. deflection is 5 lb.

Check belt tension at least twice during first operating day. Readjust as required to maintain belt tension within the recommended range.

With correct belt tension, belts may slip and squeal momentarily on start-up. This slippage is normal and disappears after unit reaches operating speed. Excessive belt tension shortens belt life and may cause bearing and shaft damage.

After run-in, set belt tension at lowest tension at which belts will not slip during operation.

START-UP

⚠ CAUTION

To prevent injury, ensure that ducting or wire fan guards are installed on the condenser fan before starting the unit.

General

Complete the start-up checklist on pages CL-1 and CL-2 before attempting system start-up.

1. Set indoor thermostat system switch to OFF position and fan switch to AUTO position.
2. Check all electrical connections, fuses, starter, and pressure control resets.
3. Check operation of evaporator fan motor and ensure fan rotation is correct. If rotation needs to be reversed, disconnect main power and switch any 2 leads on the load side of the disconnect switch.
4. Adjust fan speed. Units are belt-driven and allow for a wide range of static and airflow requirements. It may be necessary to adjust the condenser airflow to account for these inlet conditions. Inadequate airflow will result in poor unit performance and possible nuisance tripping of high-pressure switches. If an airflow is not specified, use the nominal airflow from Tables 4-15 and adjust fan speed to compensate for actual job conditions. Use Table 1 to determine proper fan speed. If the unit trips on high pressure due to high condensing temperature it may be necessary to increase the fan speed and condenser airflow.
5. The outdoor-air fans cycle with the compressor. Be sure fans are running during compressor operation.

Compressor Rotation

To determine whether or not compressor is rotating in the proper direction:

1. Connect service gauges to suction and discharge pressure fittings.
2. Energize the compressor.
3. The suction pressure should drop and the discharge pressure should rise, as is normal on any start-up.
4. If the suction pressure does not drop and the discharge pressure does not rise to normal levels, the compressor may be rotating in the wrong direction.
5. Since the compressor and fan motors are connected in phase during production, it is likely that the evaporator and condenser fans are probably also rotating in the wrong direction.
6. Turn off power to the unit and lock and tag disconnect per standard safety procedures.
7. Reverse any two of the unit power leads.
8. Remove lock and tag per standard safety procedures and reapply power to the unit.
9. The suction and discharge pressure levels should now move to their normal start-up levels.

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

Table 4 — Condenser Fan Performance — 50XCA06 Units[a,b,c,d,e]

cfm	ESP (in. wg)																			
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2100	***466***	***0.21***	***548***	***0.30***	***623***	***0.40***	692	0.51	757	0.63	818	0.76	876	0.90	931	1.05	984	1.20	1035	1.37
2200	***488***	***0.24***	***567***	***0.34***	***639***	***0.44***	706	0.55	769	0.68	829	0.81	885	0.95	940	1.10	992	1.26	1042	1.42
2300	***511***	***0.28***	***586***	***0.37***	656	0.48	721	0.60	782	0.72	840	0.86	896	1.00	949	1.15	1000	1.31	—	—
2400	***533***	***0.31***	***605***	***0.41***	673	0.53	736	0.64	796	0.77	852	0.91	907	1.06	959	1.21	1009	1.37	—	—
2500	***555***	***0.36***	***625***	***0.46***	690	0.57	751	0.70	810	0.83	865	0.97	918	1.12	969	1.27	—	—	—	—
2600	***577***	***0.40***	***644***	***0.51***	708	0.62	767	0.75	824	0.89	878	1.03	930	1.18	980	1.34	—	—	—	—
2700	***599***	***0.45***	664	0.56	725	0.68	783	0.81	839	0.95	892	1.09	943	1.25	992	1.41	—	—	—	—
2800	***621***	***0.50***	684	0.61	744	0.74	800	0.87	854	1.01	906	1.16	956	1.32	—	—	—	—	—	—
2900	***644***	***0.56***	704	0.67	762	0.80	817	0.94	870	1.08	920	1.23	969	1.39	—	—	—	—	—	—
3000	666	0.61	725	0.74	781	0.87	834	1.01	886	1.15	935	1.31	—	—	—	—	—	—	—	—
3100	688	0.68	745	0.80	799	0.94	852	1.08	902	1.23	950	1.39	—	—	—	—	—	—	—	—
3200	710	0.75	766	0.88	818	1.01	869	1.16	918	1.31	—	—	—	—	—	—	—	—	—	—
3300	732	0.82	786	0.95	838	1.09	887	1.24	935	1.40	—	—	—	—	—	—	—	—	—	—
3400	755	0.89	807	1.03	857	1.18	905	1.33	—	—	—	—	—	—	—	—	—	—	—	—
3500	777	0.98	828	1.12	876	1.27	924	1.42	—	—	—	—	—	—	—	—	—	—	—	—

cfm	ESP (in. wg)																			
	1.00		1.10		1.20		1.30		1.40		1.50		1.60		1.70		1.80		1.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2100	***555***	***0.36***	***625***	***0.46***	690	0.57	751	0.70	810	0.83	865	0.97	918	1.12	969	1.27	—	—	—	—
2200	***588***	***0.42***	***654***	***0.53***	716	0.65	775	0.78	831	0.92	885	1.06	936	1.21	986	1.37	—	—	—	—
2300	***621***	***0.50***	***684***	***0.61***	744	0.74	800	0.87	854	1.01	906	1.16	956	1.32	1004	1.48	—	—	—	—
2400	***655***	***0.58***	714	0.71	771	0.83	826	0.97	878	1.12	928	1.27	976	1.43	1023	1.60	—	—	—	—
2500	***688***	***0.68***	745	0.80	799	0.94	852	1.08	902	1.23	950	1.39	997	1.55	1042	1.72	—	—	—	—
2600	721	0.78	776	0.91	828	1.05	878	1.20	927	1.36	973	1.52	1019	1.69	1063	1.86	—	—	—	—
2700	755	0.89	807	1.03	857	1.18	905	1.33	952	1.49	997	1.66	1041	1.83	—	—	—	—	—	—
2800	788	1.02	838	1.16	886	1.31	933	1.47	978	1.64	1022	1.81	—	—	—	—	—	—	—	—
2900	821	1.15	869	1.30	916	1.46	961	1.62	1005	1.79	—	—	—	—	—	—	—	—	—	—
3000	855	1.30	901	1.45	946	1.62	989	1.78	—	—	—	—	—	—	—	—	—	—	—	—
3100	888	1.46	932	1.62	976	1.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3200	921	1.63	964	1.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3300	954	1.81	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicates field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower

ESP — External Static Pressure

Table 5 — Condenser Fan Performance — 50XCA08 Units[a,b,c,d,e]

cfm	ESP (in. wg)															
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2500	***555***	***0.36***	***625***	***0.46***	690	0.57	751	0.70	810	0.83	865	0.97	918	1.12	969	1.27
2650	***588***	***0.42***	***654***	***0.53***	716	0.65	775	0.78	831	0.92	885	1.06	936	1.21	986	1.37
2800	***621***	***0.50***	***684***	***0.61***	744	0.74	800	0.87	854	1.01	906	1.16	956	1.32	1004	1.48
2950	***655***	***0.58***	714	0.71	771	0.83	826	0.97	878	1.12	928	1.27	976	1.43	1023	1.60
3100	***688***	***0.68***	745	0.80	799	0.94	852	1.08	902	1.23	950	1.39	997	1.55	1042	1.72
3250	721	0.78	776	0.91	828	1.05	878	1.20	927	1.36	973	1.52	1019	1.69	1063	1.86
3400	755	0.89	807	1.03	857	1.18	905	1.33	952	1.49	997	1.66	1041	1.83	—	—
3550	788	1.02	838	1.16	886	1.31	933	1.47	978	1.64	1022	1.81	—	—	—	—
3700	821	1.15	869	1.30	916	1.46	961	1.62	1005	1.79	—	—	—	—	—	—
3850	855	1.30	901	1.45	946	1.62	989	1.78	—	—	—	—	—	—	—	—
4000	888	1.46	932	1.62	976	1.79	—	—	—	—	—	—	—	—	—	—
4150	921	1.63	964	1.79	—	—	—	—	—	—	—	—	—	—	—	—
4300	954	1.81	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4450	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

cfm	ESP (in. wg)													
	0.80		0.90		1.00		1.10		1.20		1.30		1.40	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2500	1018	1.43	1066	1.60	1112	1.78	—	—	—	—	—	—	—	—
2650	1034	1.54	1080	1.71	1125	1.89	—	—	—	—	—	—	—	—
2800	1050	1.65	1095	1.83	—	—	—	—	—	—	—	—	—	—
2950	1068	1.77	—	—	—	—	—	—	—	—	—	—	—	—
3100	1086	1.90	—	—	—	—	—	—	—	—	—	—	—	—
3250	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3550	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3850	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4150	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4300	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4450	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicates field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower

ESP — External Static Pressure

Table 6 — Condenser Fan Performance — 50XCA12 Units[a,b,c,d,e]

cfm	ESP (in. wg)															
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
4100	***389***	***0.41***	***451***	***0.53***	506	0.66	557	0.80	605	0.94	651	1.10	695	1.26	—	—
4300	***408***	***0.47***	***467***	***0.60***	520	0.73	569	0.87	616	1.02	661	1.18	704	1.35	745	1.53
4500	***427***	***0.54***	***484***	***0.67***	535	0.81	583	0.96	628	1.11	672	1.28	714	1.45	754	1.63
4700	***446***	***0.62***	501	0.76	550	0.90	596	1.05	641	1.21	683	1.37	724	1.55	763	1.73
4900	***465***	***0.70***	518	0.84	566	0.99	611	1.15	653	1.31	694	1.48	734	1.66	773	1.85
5100	***484***	***0.79***	535	0.94	581	1.09	625	1.25	666	1.42	706	1.59	745	1.78	783	1.97
5300	503	0.88	552	1.04	597	1.20	640	1.37	680	1.54	719	1.72	757	1.90	793	2.10
5500	522	0.99	569	1.15	613	1.32	654	1.49	694	1.66	732	1.85	769	2.04	804	2.23
5700	541	1.10	587	1.27	629	1.44	670	1.62	708	1.80	745	1.98	781	2.18	816	2.38
5900	560	1.22	604	1.39	646	1.57	685	1.75	722	1.94	758	2.13	794	2.33	828	2.53
6100	578	1.35	622	1.53	662	1.71	700	1.90	737	2.09	772	2.29	807	2.49	840	2.70
6300	597	1.48	639	1.67	679	1.86	716	2.05	752	2.25	786	2.45	820	2.66	—	—
6500	616	1.63	657	1.82	696	2.02	732	2.21	767	2.42	801	2.62	833	2.83	—	—
6700	635	1.78	675	1.98	712	2.18	748	2.39	782	2.59	815	2.81	—	—	—	—
6900	654	1.95	693	2.15	729	2.36	764	2.57	798	2.78	830	3.00	—	—	—	—

cfm	ESP (in. wg)													
	0.80		0.90		1.00		1.10		1.20		1.30		1.40	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2500	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2650	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	793	1.81	—	—	—	—	—	—	—	—	—	—	—	—
2950	801	1.92	838	2.12	—	—	—	—	—	—	—	—	—	—
3100	810	2.04	846	2.24	—	—	—	—	—	—	—	—	—	—
3250	819	2.16	855	2.37	889	2.58	—	—	—	—	—	—	—	—
3400	829	2.30	864	2.51	898	2.72	—	—	—	—	—	—	—	—
3550	839	2.44	874	2.65	—	—	—	—	—	—	—	—	—	—
3700	850	2.59	884	2.80	—	—	—	—	—	—	—	—	—	—
3850	861	2.74	894	2.96	—	—	—	—	—	—	—	—	—	—
4000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4150	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4300	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4450	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4600	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicates field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower
ESP — External Static Pressure

Table 7 — Condenser Fan Performance — 50XCA14 Units[a,b,c,d,e]

cfm	ESP (in. wg)															
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
6000	496	1.03	533	1.17	570	1.36	608	1.58	646	1.82	683	2.06	719	2.31	755	2.56
6250	517	1.17	552	1.31	588	1.50	624	1.72	660	1.97	696	2.22	732	2.48	766	2.74
6500	537	1.31	571	1.46	605	1.65	640	1.88	675	2.13	710	2.39	744	2.66	—	—
6750	558	1.47	590	1.62	623	1.81	657	2.05	691	2.30	724	2.57	757	2.85	—	—
7000	579	1.64	610	1.79	642	1.99	674	2.23	707	2.49	739	2.76	—	—	—	—
7250	599	1.82	629	1.98	660	2.18	691	2.42	723	2.68	—	—	—	—	—	—
7500	620	2.02	649	2.18	679	2.38	709	2.62	—	—	—	—	—	—	—	—
7750	641	2.23	669	2.39	697	2.59	726	2.84	—	—	—	—	—	—	—	—
8000	661	2.45	688	2.61	716	2.82	—	—	—	—	—	—	—	—	—	—
8250	682	2.69	708	2.85	—	—	—	—	—	—	—	—	—	—	—	—
8500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

cfm	ESP (in. wg)									
	0.80		0.90		1.00		1.10		1.20	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
6000	789	2.81	—	—	—	—	—	—	—	—
6250	—	—	—	—	—	—	—	—	—	—
6500	—	—	—	—	—	—	—	—	—	—
6750	—	—	—	—	—	—	—	—	—	—
7000	—	—	—	—	—	—	—	—	—	—
7250	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—
7750	—	—	—	—	—	—	—	—	—	—
8000	—	—	—	—	—	—	—	—	—	—
8250	—	—	—	—	—	—	—	—	—	—
8500	—	—	—	—	—	—	—	—	—	—
8750	—	—	—	—	—	—	—	—	—	—
9000	—	—	—	—	—	—	—	—	—	—
9250	—	—	—	—	—	—	—	—	—	—
9500	—	—	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicates field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower

ESP — External Static Pressure

Table 8 — Condenser Fan Performance — 50XCA16 Units[a,b,c,d,e]

cfm	ESP (in. wg)																			
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
6250	474	1.16	524	1.37	570	1.58	612	1.79	653	2.01	691	2.23	727	2.45	762	2.67	795	2.90	827	3.13
6500	493	1.28	541	1.49	585	1.70	627	1.92	666	2.14	704	2.37	739	2.59	773	2.82	806	3.05	838	3.28
6750	512	1.41	558	1.62	601	1.84	642	2.06	680	2.28	717	2.51	752	2.74	785	2.97	817	3.20	849	3.44
7000	531	1.54	576	1.76	618	1.98	657	2.20	695	2.43	730	2.66	764	2.89	797	3.13	829	3.36	860	3.60
7250	550	1.68	593	1.90	634	2.13	672	2.36	709	2.59	744	2.82	778	3.06	810	3.29	841	3.53	871	3.77
7500	569	1.83	611	2.06	650	2.28	688	2.52	724	2.75	758	2.99	791	3.22	823	3.46	853	3.71	883	3.95
7750	588	1.99	629	2.22	667	2.45	704	2.68	739	2.92	772	3.16	804	3.40	836	3.64	866	3.89	895	4.14
8000	607	2.15	646	2.38	684	2.62	720	2.86	754	3.10	787	3.34	818	3.59	849	3.83	878	4.08	907	4.33
8250	626	2.32	664	2.56	701	2.80	736	3.04	769	3.28	801	3.53	832	3.78	862	4.03	891	4.28	920	4.53
8500	645	2.50	682	2.74	718	2.98	752	3.23	784	3.48	816	3.73	846	3.98	876	4.23	905	4.48	933	4.74
8750	664	2.69	700	2.93	735	3.18	768	3.43	800	3.68	831	3.93	861	4.18	890	4.44	918	4.70	—	—
9000	683	2.88	718	3.13	752	3.38	784	3.63	816	3.89	846	4.14	875	4.40	904	4.66	—	—	—	—
9250	702	3.09	736	3.34	769	3.59	801	3.85	832	4.10	861	4.36	890	4.62	—	—	—	—	—	—
9500	721	3.30	754	3.56	787	3.81	818	4.07	848	4.33	877	4.59	—	—	—	—	—	—	—	—
9750	740	3.52	772	3.78	804	4.04	834	4.30	864	4.56	—	—	—	—	—	—	—	—	—	—

cfm	ESP (in. wg)																			
	1.00		1.10		1.20		1.30		1.40		1.50		1.60		1.70		1.80		1.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
6250	858	3.37	888	3.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6500	868	3.52	898	3.76	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6750	879	3.68	908	3.92	936	4.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7000	889	3.84	918	4.09	946	4.33	973	4.58	—	—	—	—	—	—	—	—	—	—	—	—
7250	900	4.02	929	4.26	956	4.51	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7500	912	4.20	940	4.45	967	4.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7750	923	4.39	951	4.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8000	935	4.58	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicates field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower

ESP — External Static Pressure

Table 9 — Condenser Fan Performance — 50XCA24 Units[a,b,c,d,e]

cfm	ESP (in. wg)															
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
8,500	613	2.20	657	2.54	698	2.87	737	3.22	773	3.56	808	3.91	841	4.27	873	4.63
8,800	634	2.45	677	2.79	717	3.14	755	3.49	790	3.85	824	4.21	857	4.58	889	4.95
9,100	656	2.70	697	3.06	736	3.42	773	3.78	808	4.15	841	4.53	873	4.91	904	5.29
9,400	678	2.98	718	3.35	756	3.72	791	4.09	826	4.47	858	4.86	890	5.25	920	5.64
9,700	699	3.28	738	3.65	775	4.04	810	4.42	844	4.81	876	5.21	907	5.61	936	6.02
10,000	721	3.59	759	3.98	795	4.37	829	4.77	862	5.17	893	5.58	923	5.99	953	6.41
10,300	742	3.92	779	4.32	814	4.73	848	5.14	880	5.55	911	5.97	940	6.39	969	6.82
10,600	764	4.27	800	4.69	834	5.10	867	5.53	898	5.95	928	6.38	958	6.81	—	—
10,900	786	4.65	821	5.07	854	5.50	886	5.93	917	6.37	946	6.81	—	—	—	—
11,200	807	5.04	841	5.48	874	5.92	905	6.36	935	6.81	—	—	—	—	—	—
11,500	829	5.46	862	5.91	894	6.36	925	6.81	954	7.27	—	—	—	—	—	—
11,800	850	5.90	883	6.36	914	6.82	944	7.29	—	—	—	—	—	—	—	—
12,100	872	6.36	904	6.83	934	7.30	—	—	—	—	—	—	—	—	—	—
12,400	894	6.84	925	7.32	—	—	—	—	—	—	—	—	—	—	—	—
12,700	915	7.35	—	—	—	—	—	—	—	—	—	—	—	—	—	—

cfm	ESP (in. wg)													
	0.80		0.90		1.00		1.10		1.20		1.30		1.40	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
8,500	904	5.00	933	5.37	962	5.75	990	6.13	1017	6.52	1043	6.91	—	—
8,800	919	5.33	948	5.71	976	6.10	1004	6.49	1030	6.89	—	—	—	—
9,100	934	5.68	963	6.07	991	6.47	1018	6.87	—	—	—	—	—	—
9,400	949	6.04	978	6.44	1005	6.85	—	—	—	—	—	—	—	—
9,700	965	6.42	993	6.84	—	—	—	—	—	—	—	—	—	—
10,000	981	6.83	—	—	—	—	—	—	—	—	—	—	—	—
10,300	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10,600	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10,900	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11,200	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11,800	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12,100	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12,400	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12,700	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicates field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower

ESP — External Static Pressure

Table 10 — Evaporator Fan Performance — 50XCW06, 50XCA06, 50XCR06 Units[a,b,c,d,e]

cfm	ESP (in. wg)																			
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1500	***477***	***0.19***	***542***	***0.24***	***603***	***0.30***	660	0.36	714	0.43	766	0.50	816	0.58	864	0.66	910	0.74	954	0.83
1600	***509***	***0.23***	***570***	***0.28***	627	0.34	682	0.41	734	0.48	784	0.55	832	0.63	878	0.71	923	0.80	966	0.89
1700	***540***	***0.27***	***598***	***0.33***	653	0.40	705	0.46	755	0.54	803	0.61	849	0.69	894	0.78	937	0.87	979	0.96
1800	***572***	***0.32***	627	0.39	679	0.45	729	0.52	777	0.60	823	0.68	868	0.76	911	0.85	953	0.94	994	1.03
1900	***604***	***0.38***	656	0.45	706	0.52	754	0.59	800	0.67	844	0.75	887	0.83	929	0.92	970	1.01	1009	1.11
2000	636	0.44	685	0.51	733	0.58	779	0.66	823	0.74	866	0.83	908	0.91	948	1.01	988	1.10	1026	1.20
2100	668	0.51	715	0.58	760	0.66	804	0.74	847	0.82	888	0.91	929	1.00	968	1.09	1006	1.19	1044	1.29
2200	699	0.59	744	0.66	788	0.74	831	0.83	872	0.91	912	1.00	951	1.09	989	1.19	1026	1.29	1062	1.39
2300	731	0.67	774	0.75	816	0.83	857	0.92	897	1.01	935	1.10	973	1.20	1010	1.30	1046	1.40	1081	1.50
2400	763	0.76	804	0.85	845	0.93	884	1.02	922	1.11	960	1.21	996	1.31	1032	1.41	1067	1.51	1101	1.62
2500	795	0.86	835	0.95	873	1.04	911	1.13	948	1.22	985	1.32	1020	1.42	1055	1.53	1089	1.63	1122	1.74
2600	826	0.97	865	1.06	902	1.15	939	1.25	975	1.35	1010	1.45	1044	1.55	1078	1.66	1111	1.77	1144	1.88
2700	858	1.09	895	1.18	931	1.28	967	1.37	1002	1.47	1036	1.58	1069	1.68	1102	1.79	—	—	—	—
2800	890	1.21	926	1.31	961	1.41	995	1.51	1029	1.61	1062	1.72	1094	1.83	—	—	—	—	—	—
2900	922	1.35	956	1.45	990	1.55	1023	1.65	1056	1.76	1088	1.87	—	—	—	—	—	—	—	—

cfm	ESP (in. wg)																			
	1.00		1.10		1.20		1.30		1.40		1.50		1.60		1.70		1.80		1.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1500	997	0.92	1039	1.02	1080	1.12	1119	1.22	1158	1.33	***1195***	***1.44***	***1232***	***1.55***	***1268***	***1.67***	***1303***	***1.79***	—	—
1600	1008	0.99	1049	1.08	1088	1.18	1127	1.29	1165	1.40	***1201***	***1.51***	***1237***	***1.62***	***1273***	***1.74***	***1307***	***1.86***	—	—
1700	1020	1.05	1060	1.15	1098	1.26	1136	1.36	1173	1.47	***1209***	***1.58***	***1244***	***1.70***	***1279***	***1.82***	—	—	—	—
1800	1033	1.13	1072	1.23	1110	1.33	1147	1.44	***1183***	***1.55***	***1218***	***1.66***	***1252***	***1.78***	***1286***	***1.90***	—	—	—	—
1900	1048	1.21	1086	1.31	1122	1.42	1158	1.53	***1193***	***1.64***	***1228***	***1.75***	***1262***	***1.87***	—	—	—	—	—	—
2000	1063	1.30	1100	1.40	1136	1.51	1171	1.62	***1205***	***1.73***	***1239***	***1.85***	—	—	—	—	—	—	—	—
2100	1080	1.39	1116	1.50	1151	1.61	***1185***	***1.72***	***1219***	***1.84***	—	—	—	—	—	—	—	—	—	—
2200	1098	1.50	1132	1.61	1166	1.72	***1200***	***1.83***	—	—	—	—	—	—	—	—	—	—	—	—
2300	1116	1.61	1150	1.72	***1183***	***1.83***	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2400	1135	1.73	1168	1.84	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2500	1155	1.86	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicate field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower
ESP — External Static Pressure

Table 11 — Evaporator Fan Performance — 50XCW08, 50XCA08, 50XCR08 Units[a,b,c,d,e]

cfm	ESP (in. wg)																			
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2200	***497***	***0.27***	581	0.39	655	0.52	722	0.66	782	0.80	839	0.95	892	1.11	941	1.28	989	1.45	1034	1.62
2400	542	0.35	621	0.48	690	0.62	753	0.77	812	0.92	866	1.08	917	1.25	966	1.42	1012	1.60	1056	1.78
2600	587	0.45	660	0.59	726	0.74	787	0.89	843	1.06	895	1.22	945	1.40	992	1.58	1037	1.76	—	—
2800	632	0.56	701	0.71	763	0.87	821	1.04	875	1.21	925	1.38	974	1.57	1019	1.75	—	—	—	—
3000	677	0.69	742	0.85	801	1.02	856	1.19	908	1.37	957	1.56	1003	1.75	—	—	—	—	—	—
3200	723	0.84	783	1.01	839	1.19	892	1.37	942	1.56	989	1.76	—	—	—	—	—	—	—	—
3400	768	1.01	825	1.19	879	1.37	929	1.57	977	1.77	—	—	—	—	—	—	—	—	—	—
3600	813	1.19	867	1.39	918	1.58	967	1.79	—	—	—	—	—	—	—	—	—	—	—	—

cfm	ESP (in. wg)									
	1.00		1.10		1.20		1.30		1.40	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2200	1077	1.80	—	—	—	—	—	—	—	—
2400	—	—	—	—	—	—	—	—	—	—
2600	—	—	—	—	—	—	—	—	—	—
2800	—	—	—	—	—	—	—	—	—	—
3000	—	—	—	—	—	—	—	—	—	—
3200	—	—	—	—	—	—	—	—	—	—
3400	—	—	—	—	—	—	—	—	—	—
3600	—	—	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicate field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower
ESP — External Static Pressure

Table 12 — Evaporator Fan Performance — 50XCW12, 50XCA12, 50XCR12 Units[a,b,c,d,e]

cfm	ESP (in. wg)																			
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3000	***381***	***0.26***	***434***	***0.33***	***492***	***0.41***	553	0.51	614	0.63	674	0.77	730	0.93	783	1.10	831	1.29	877	1.47
3200	***406***	***0.32***	***456***	***0.39***	510	0.48	566	0.58	624	0.69	681	0.83	735	0.99	788	1.16	837	1.35	882	1.54
3400	***432***	***0.39***	***478***	***0.46***	528	0.55	581	0.65	635	0.76	689	0.90	742	1.05	793	1.22	841	1.41	887	1.61
3600	***457***	***0.46***	501	0.54	548	0.63	597	0.73	647	0.84	699	0.98	749	1.13	799	1.30	847	1.48	892	1.68
3800	***483***	***0.54***	524	0.62	568	0.72	614	0.82	661	0.93	710	1.06	758	1.21	806	1.38	852	1.56	897	1.76
4000	508	0.63	547	0.71	588	0.81	632	0.92	677	1.04	722	1.17	768	1.31	814	1.47	859	1.65	903	1.85
4200	533	0.73	570	0.82	609	0.92	650	1.03	693	1.15	736	1.28	780	1.42	823	1.58	867	1.76	910	1.95
4400	559	0.83	594	0.93	631	1.03	670	1.15	710	1.27	751	1.40	792	1.54	834	1.70	876	1.87	917	2.06
4600	584	0.95	618	1.05	653	1.16	690	1.28	728	1.40	767	1.53	806	1.68	846	1.83	886	2.01	926	2.19
4800	610	1.08	641	1.19	675	1.30	710	1.42	746	1.54	783	1.68	821	1.82	859	1.98	897	2.15	936	2.33
5000	635	1.22	666	1.33	698	1.45	731	1.57	766	1.70	801	1.84	837	1.98	873	2.14	910	2.31	946	2.49

cfm	ESP (in. wg)																			
	1.00		1.10		1.20		1.30		1.40		1.50		1.60		1.70		1.80		1.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3200	925	1.74	965	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3400	931	1.82	972	2.03	1010	2.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3600	936	1.89	977	2.11	1016	2.33	1053	2.56	1089	2.78	—	—	—	—	—	—	—	—	—	—
3800	941	1.97	982	2.19	1022	2.42	1059	2.65	—	—	—	—	—	—	—	—	—	—	—	—
4000	946	2.06	987	2.28	1027	2.51	1064	2.75	—	—	—	—	—	—	—	—	—	—	—	—
4200	951	2.16	992	2.38	1031	2.61	1069	2.85	—	—	—	—	—	—	—	—	—	—	—	—
4400	958	2.27	998	2.49	1037	2.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4600	965	2.39	1004	2.61	1042	2.83	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4800	974	2.53	1011	2.74	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	983	2.68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicate field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower
ESP — External Static Pressure

Table 13 — Evaporator Fan Performance — 50XCW14, 50XCA14, 50XCR14 Units[a,b,c,d,e]

cfm	ESP (in. wg)																			
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3500	***450***	***0.30***	***495***	***0.46***	537	0.56	583	0.65	633	0.76	687	0.89	742	1.05	793	1.23	841	1.41	885	1.60
3700	***476***	***0.35***	519	0.53	558	0.64	600	0.73	646	0.84	696	0.96	748	1.12	799	1.29	847	1.48	892	1.68
3900	502	0.41	543	0.60	580	0.72	619	0.83	661	0.93	707	1.05	756	1.19	805	1.37	852	1.56	898	1.76
4100	527	0.48	566	0.68	602	0.82	639	0.93	678	1.03	720	1.15	765	1.29	811	1.45	858	1.64	903	1.84
4300	553	0.55	591	0.77	625	0.92	659	1.04	696	1.15	735	1.26	776	1.40	820	1.55	865	1.73	909	1.93
4500	579	0.63	615	0.87	648	1.03	681	1.15	715	1.27	751	1.39	789	1.52	830	1.67	872	1.84	915	2.03
4700	604	0.72	639	0.97	671	1.14	702	1.28	734	1.40	768	1.52	804	1.65	842	1.80	882	1.96	922	2.15
4900	630	0.81	664	1.08	694	1.27	724	1.41	755	1.55	786	1.67	820	1.80	855	1.94	892	2.10	931	2.28
5100	656	0.92	688	1.20	718	1.40	746	1.56	776	1.70	806	1.83	837	1.96	870	2.10	905	2.26	941	2.43
5300	682	1.03	713	1.33	741	1.54	769	1.71	797	1.86	826	2.00	855	2.14	886	2.28	919	2.43	953	2.59
5500	707	1.15	738	1.47	765	1.69	792	1.88	819	2.03	846	2.18	874	2.32	903	2.46	934	2.62	966	2.78
5700	733	1.28	763	1.61	789	1.85	815	2.05	841	2.22	867	2.37	894	2.52	921	2.67	950	2.82	980	2.98
5900	759	1.42	787	1.77	813	2.02	838	2.23	863	2.41	888	2.57	914	2.73	940	2.88	968	3.03	996	3.19
6100	784	1.57	812	1.93	838	2.20	862	2.42	886	2.62	910	2.79	934	2.95	960	3.11	986	3.27	1013	3.43

cfm	ESP (in. wg)																			
	1.00		1.10		1.20		1.30		1.40		1.50		1.60		1.70		1.80		1.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3500	925	1.78	962	1.97	997	2.15	1030	2.32	1061	2.50	—	—	—	—	—	—	—	—	—	—
3700	933	1.88	971	2.07	1007	2.27	1041	2.46	1072	2.65	1103	2.83	—	—	—	—	—	—	—	—
3900	940	1.97	979	2.17	1016	2.38	1051	2.59	1083	2.79	1114	2.99	1143	3.19	1172	3.38	1199	3.57	1225	3.76
4100	946	2.05	986	2.27	1024	2.49	1059	2.71	1093	2.93	1124	3.14	1154	3.35	1183	3.56	1211	3.77	1237	3.97
4300	951	2.15	992	2.37	1030	2.60	1067	2.83	1101	3.06	1133	3.29	1164	3.51	1194	3.73	1222	3.95	1249	4.17
4500	957	2.24	998	2.47	1036	2.71	1073	2.94	1108	3.18	1141	3.43	1173	3.66	1203	3.90	1232	4.14	1260	4.37
4700	963	2.35	1003	2.58	1042	2.81	1079	3.06	1115	3.31	1149	3.56	1181	3.81	1212	4.06	1241	4.31	1269	4.56
4900	970	2.48	1009	2.70	1047	2.93	1085	3.18	1121	3.43	1155	3.69	1188	3.95	1219	4.22	1249	4.48	1278	4.74
5100	978	2.62	1016	2.83	1053	3.06	1090	3.31	1126	3.56	1161	3.83	1194	4.10	1226	4.37	1257	4.64	—	—
5300	988	2.78	1024	2.98	1060	3.20	1096	3.44	1132	3.70	1166	3.97	1200	4.24	1232	4.52	—	—	—	—
5500	999	2.95	1033	3.15	1068	3.37	1103	3.60	1137	3.85	1172	4.11	1205	4.39	1238	4.67	—	—	—	—
5700	1012	3.15	1044	3.34	1077	3.55	1110	3.77	1144	4.02	1178	4.28	1211	4.55	—	—	—	—	—	—
5900	1025	3.36	1056	3.55	1087	3.75	1119	3.97	1152	4.20	1184	4.45	1217	4.72	—	—	—	—	—	—
6100	1040	3.60	1069	3.78	1099	3.97	1129	4.18	1160	4.41	1192	4.65	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicate field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower
ESP — External Static Pressure

Table 14 — Evaporator Fan Performance — 50XCW16, 50XCA16, 50XCR16 Units[a,b,c,d,e]

cfm	ESP (in. wg)																			
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
4500	***414***	***0.53***	482	0.69	544	0.86	600	1.03	652	1.21	701	1.40	747	1.59	790	1.79	832	1.99	872	2.20
4750	***437***	***0.63***	502	0.79	561	0.97	615	1.15	666	1.34	714	1.53	758	1.73	801	1.94	842	2.15	881	2.37
5000	***460***	***0.73***	522	0.91	579	1.09	632	1.28	681	1.48	727	1.68	771	1.89	813	2.10	853	2.32	892	2.54
5250	***483***	***0.85***	542	1.04	597	1.23	648	1.43	696	1.63	741	1.84	784	2.06	825	2.28	865	2.50	902	2.73
5500	506	0.98	563	1.17	616	1.38	665	1.58	712	1.79	756	2.01	798	2.24	838	2.46	877	2.70	914	2.94
5750	529	1.12	584	1.33	635	1.54	682	1.75	728	1.97	771	2.20	812	2.43	851	2.67	889	2.91	926	3.15
6000	552	1.28	604	1.49	654	1.71	700	1.93	744	2.16	786	2.40	826	2.64	865	2.88	902	3.13	938	3.38
6250	575	1.45	625	1.67	673	1.90	718	2.13	761	2.37	802	2.61	841	2.86	879	3.11	916	3.37	951	3.63
6500	598	1.63	647	1.86	693	2.10	737	2.34	778	2.59	818	2.84	857	3.09	894	3.35	929	3.62	964	3.89
6750	621	1.83	668	2.07	713	2.32	755	2.57	796	2.82	835	3.08	872	3.34	909	3.61	944	3.89	978	4.16
7000	644	2.04	689	2.29	733	2.55	774	2.81	814	3.07	852	3.34	888	3.61	924	3.89	958	4.17	992	4.46
7250	667	2.27	711	2.53	753	2.80	793	3.07	832	3.34	869	3.62	905	3.90	940	4.18	973	4.47	—	—
7500	690	2.52	732	2.79	773	3.06	812	3.34	850	3.62	886	3.91	922	4.20	956	4.49	—	—	—	—
7750	713	2.79	754	3.07	794	3.35	832	3.63	869	3.92	904	4.22	939	4.52	—	—	—	—	—	—
8000	736	3.07	776	3.36	814	3.65	852	3.94	887	4.24	922	4.55	—	—	—	—	—	—	—	—

cfm	ESP (in. wg)																			
	1.00		1.10		1.20		1.30		1.40		1.50		1.60		1.70		1.80		1.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
4500	910	2.42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4750	919	2.59	955	2.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5000	929	2.77	965	3.01	999	3.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5250	939	2.97	974	3.21	1008	3.46	1042	3.71	—	—	—	—	—	—	—	—	—	—	—	—
5500	950	3.18	984	3.43	1018	3.68	1051	3.94	1083	4.21	1114	4.47	—	—	—	—	—	—	—	—
5750	961	3.40	995	3.66	1028	3.92	1061	4.19	1092	4.46	1123	4.73	—	—	—	—	—	—	—	—
6000	973	3.64	1006	3.91	1039	4.17	1071	4.45	1102	4.72	—	—	—	—	—	—	—	—	—	—
6250	985	3.90	1018	4.17	1050	4.44	1082	4.72	—	—	—	—	—	—	—	—	—	—	—	—
6500	998	4.16	1030	4.44	1062	4.73	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6750	1011	4.45	1043	4.73	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7000	1024	4.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7750	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicate field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower
ESP — External Static Pressure

Table 15 — Evaporator Fan Performance — 50XCW24, 50XCA24, 50XCR24 Units[a,b,c,d,e]

cfm	ESP (in. wg)																			
	0.00		0.10		0.20		0.30		0.40		0.50		0.60		0.70		0.80		0.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
6,000	558	1.10	619	1.37	675	1.65	728	1.93	777	2.23	824	2.53	869	2.84	912	3.15	952	3.47	992	3.79
6,300	585	1.27	644	1.55	698	1.84	749	2.14	797	2.45	843	2.76	887	3.08	928	3.41	968	3.74	1007	4.08
6,600	613	1.46	669	1.76	722	2.06	771	2.37	818	2.69	862	3.02	905	3.35	945	3.69	985	4.03	1023	4.38
6,900	641	1.67	695	1.98	746	2.29	793	2.62	839	2.95	882	3.29	923	3.63	963	3.98	1002	4.34	1039	4.70
7,200	669	1.90	721	2.22	770	2.55	816	2.88	860	3.23	902	3.58	943	3.93	982	4.30	1019	4.66	1056	5.03
7,500	697	2.14	747	2.48	794	2.82	839	3.17	882	3.53	923	3.89	962	4.26	1000	4.63	1037	5.01	1073	5.39
7,800	725	2.41	773	2.76	818	3.11	862	3.48	904	3.85	944	4.22	982	4.60	1020	4.99	1056	5.38	1091	5.77
8,000	743	2.60	790	2.96	835	3.32	878	3.69	918	4.07	958	4.45	996	4.84	1033	5.23	1068	5.63	1103	6.04
8,300	771	2.90	817	3.27	860	3.65	901	4.03	941	4.42	979	4.82	1017	5.22	1053	5.63	1087	6.04	1121	6.45
8,600	799	3.23	843	3.61	885	4.00	925	4.40	964	4.80	1001	5.21	1038	5.62	1073	6.04	1107	6.47	1140	6.89
8,900	827	3.58	869	3.98	910	4.38	949	4.79	987	5.20	1024	5.62	1059	6.05	1093	6.48	1127	6.92	—	—
9,200	855	3.96	896	4.36	935	4.78	973	5.20	1010	5.63	1046	6.06	1081	6.50	1114	6.94	—	—	—	—
9,500	883	4.35	923	4.78	961	5.21	998	5.64	1034	6.08	1069	6.53	1103	6.98	—	—	—	—	—	—
9,800	911	4.78	949	5.22	987	5.66	1023	6.11	1058	6.56	1092	7.02	—	—	—	—	—	—	—	—
10,000	929	5.08	967	5.52	1004	5.97	1039	6.43	1074	6.89	—	—	—	—	—	—	—	—	—	—

cfm	ESP (in. wg)																			
	1.00		1.10		1.20		1.30		1.40		1.50		1.60		1.70		1.80		1.90	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
6,000	1030	4.12	1067	4.46	1102	4.80	1137	5.14	1171	5.49	1203	5.84	—	—	—	—	—	—	—	—
6,300	1044	4.42	1080	4.76	1116	5.12	1150	5.47	1183	5.83	1215	6.20	1247	6.56	1278	6.94	—	—	—	—
6,600	1059	4.73	1095	5.09	1129	5.45	1163	5.82	1196	6.19	1228	6.57	1259	6.95	—	—	—	—	—	—
6,900	1075	5.06	1110	5.43	1144	5.81	1177	6.18	1209	6.57	1241	6.96	—	—	—	—	—	—	—	—
7,200	1091	5.41	1125	5.79	1159	6.18	1191	6.57	1223	6.97	—	—	—	—	—	—	—	—	—	—
7,500	1108	5.78	1141	6.18	1174	6.57	1206	6.98	—	—	—	—	—	—	—	—	—	—	—	—
7,800	1125	6.17	1158	6.58	1190	6.99	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8,000	1137	6.45	1169	6.86	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8,300	1154	6.88	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8,600	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8,900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9,200	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9,500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9,800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

NOTE(S):

a. Units are available with several motor hp and drive package combinations.
b. Bold italics indicate field-supplied drive required.
c. Static pressure losses for any options or accessories must be applied to external static pressure before entering the fan performance table.
d. Interpolation is permitted; extrapolation is not.
e. Fan performance is based on 1 in. standard throwaway filter, unit casing, and wet DX (direct expansion) coil losses at sea level.

LEGEND

bhp — Brake Horsepower
ESP — External Static Pressure

Operating Sequence

All units require the addition of a thermostat accessory package to complete the control circuit. The sequence of operation may vary depending on which package is selected.

ROOM-MOUNTED THERMOSTAT

These units use an electronic thermostat mounted in the conditioned space.

FAN CIRCULATION

The indoor-fan motor is energized through G on the thermostat and the indoor-fan contactor is energized. This starts the indoor-fan motor (IFM). The fan will operate to provide continuous air circulation.

COOLING

The indoor fan will operate continuously or when the compressor runs, depending on the setting of the thermostat fan selector switch. When the thermostat closes on a call for cooling (Y1), the outdoor fan relay (OFR) or outdoor-fan contactor (OFC) are energized to start the condenser fan and compressor contactor closes to start the first stage compressor.

If additional cooling demand is required, the second stage (Y2) will close and will then start the second stage of compression. When the thermostat is satisfied, the second stage compressor will stop first, and then the first stage compressors will stop when cooling demand is satisfied. The outdoor fan will also stop as soon as the first stage cooling is satisfied.

HEATING

The indoor fan will operate continuously or when the heater runs, depending on the setting of the thermostat fan selector switch. When the thermostat closes (on a call for heating), the thermostat activates the water or steam control valve (provided by customer) or electric heater to meet heating requirements.

ALL UNITS

The control circuit incorporates a current sensing lockout relay (Cycle-LOC™ device) that locks off the compressor(s) for 5 minutes when any safety device is activated (low or high-pressure switches, or compressor internal overload). If any compressor safety device opens, the compressor will stop. High and low-pressure switches and compressor motor overload protectors will reset automatically when the condition which caused the device to trip has dropped below the reset condition. To reset the Cycle-LOC control device, manually turn the control power OFF, then back ON at the thermostat.

Low Ambient Operation (Factory Installed)

Refrigerant pressure controlled VFD (variable frequency drive) adjusts fan speed to control head pressure. This fan speed control permits unit to operate in cooling even in winter, when outdoor air temperature is down to 0°F. Dual circuit units have transducers that monitor refrigerant pressure on each circuit and provide continuous operation in the event one circuit is down. The VFD is pre-programmed and run tested at factory set point for discharge pressure of 400 psig.

2-Speed Fan Operation Sequence

On the VFD the following parameters must be set on each unit. To change the parameters:

1. Press MENU.
2. Select Parameters.
3. Press ENTER.
4. Select sub-group (first two digits of the parameters).
5. Press SEL.
6. Select parameter.
7. Press EDIT.
8. Select the new value (see Table 16).
9. Press SAVE.
10. Select any other parameters of the group to change and go to Step 7.
11. When complete, press EXIT.
12. Select any other parameter groups to change and go to Step 5.
13. When complete, press EXIT.
14. Press EXIT until the status menu is visible (HZ, PSI).

Table 16 — VFD Parameters

PARAMETER INDEX (320|550 / 580)	PARAMETER FUNCTION	CHANGES FROM STANDARD MACRO
9906 / 99.06	Motor Nominal Current	Motor FLA (use value on motor nameplate)
9907 / 99.08	Motor Nominal Frequency	Frequency 60/50 Hz (use value on motor nameplate)
9908 / 99.09	Motor Nominal Speed	Motor Nameplate
9909 / 99.10	Motor Nominal Power	Motor HP

On the VFD, the following parameters must be loaded from the IFM-VFD configuration keypad. The parameter list is provided should the keypad be damaged and the points loaded manually (see Table 17). To download parameters from the configuration keypad:

1. Press MENU.
2. Select PAR backup.
3. Press SEL.
4. Select download to drive ALL.
5. Press SEL.
6. When download is complete press SEL.

Table 17 — IFM — VFD Parameters

PARAMETER INDEX (320|550 / 580)	PARAMETER FUNCTION	CHANGES FROM STANDARD MACRO
9902 / 96.04	Application Macro	1 (HVAC Default)
1101 / N/A	Keypad Ref Sel	2 - REF2 (%)
1102 / 19.11	EXT 1 - EXT 2 SEL	7- EXT 2
1106 / 28.15	REF2 Select	2 - AL2
1107 / 12.29	REF2 Minimum	67%
1201 / 28.22	Constant Speed Select	-2 - DI2(INV)
1202 / 28.26	Const Speed 1	60 Hz
1601 / 20.40	Run Enable	1-DI1
1608 / 20.41	Start Enable	0 - Not Sel / Not used
1611 / N/A	View	Long View

Should it be necessary to upload data to the configuration keypad:

1. Press MENU.
2. Select PAR backup.
3. Press SEL.
4. Select upload to panel.
5. Press SEL.

When download is complete, press SEL.

Configuration of Low Ambient Kit (Field Installation)

The original unit should have the wiring diagrams as shown in the typical wiring schematic in Troubleshooting section. The motor start and wiring should be replaced with a 24-v relay and the VFD, with the wiring shown in the typical wiring schematic for low ambient option (50XCA06-24 units). Wiring diagrams are provided in Troubleshooting section.

Be sure the VFD jumper wires are set as shown in the wiring diagram and the two DIP switches are set to the "0" position for voltage control.

The parameters shown in Table 18 or Table 19 must be set for low ambient operation. Motor FLA (full load amps) values are shown in Table 20 (208/230-v and 460-v) and Table 21 (575-v) for reference. Use actual nameplate motor FLA value since this value is subject to change.

When the drive is installed and wired, it will be necessary to configure the drive for this application, as follows:

1. When the drive first starts, system will prompt to run the Carrier Configuration Assistant. Exit this option.
2. Configure the drive parameters by pressing the menu button and using the arrow keys to select "Parameters," then press the enter key.
3. Move to the appropriate sub-group using the arrow keys (first two digits of the parameter to be changed), then press <SEL>.
4. Select the parameter to view or change using the arrow keys. Change a parameter by scrolling to that parameter and pressing <EDIT>.
5. Select the New Value, then press <SAVE>.

Table 18 — VFD Head Pressure Control Parameters (ACS320/ACH550)

PARAMETER INDEX	PARAMETER FUNCTION	SELECTION
9902	Application Macro	1 (HVAC Default)
9906	Motor Nominal Current	Motor FLA (use value on motor nameplate)
9907	Motor Nominal Frequency	Frequency 60/50 Hz (use value on motor nameplate)
9908	Motor Nominal Speed	1750
9909	Motor Nominal Power	Motor HP (use value on nameplate)
1102	EXT 1 - EXT 2 SEL	EXT 2
1301	AI-1 Minimum	5%
1302	AI-1 Maximum	45%
1304	AI-2 Minimum	5%
1305	AI-2 Maximum	45%
1501	AO1 Content	122 (RO1-3 Status)
2007	FREQUENCY MIN	30.0 Hz
2202	Acceleration Time	10 s
2203	Decel Time	11 s
3404	OUTPUT 1 DISPLAY FORM	Direct
3408	OUTPUT 2 PARAMETER	PID 1 SETPOINT
3409	SIGNAL 2 MIN	0.0 PSI
3410	SIGNAL 2 MAX	667.0
3412	OUTPUT 2 UNITS	PSI
3413	OUTPUT 2 MIN	0.0 PSI
3414	OUTPUT 2 MAX	667.0
3415	OUTPUT 3 PARAMETER	PID 1 FEEDBACK
3416	SIGNAL 3 MIN	0.0 PSI
3417	SIGNAL 3 MAX	667 PSI
3419	OUTPUT 3 UNITS	PSI
3420	OUTPUT 3 MIN	0.0 PSI
3421	OUTPUT 3 MAX	667 PSI
4001	PID GAIN	0.7
4002	PID INTEGRATE	5 s
4003	DERIVATION TIME	DISABLE
4005	ERROR VALUE INVERTED	YES
4006	UNITS	PSI
4008	0% VALUE	0.0 PSI
4009	100 % VALUE	667 PSI
4010	SET POINT SELECT	INTERNAL
4011	INTERNALSET POINT	300.0
4014	Feedback Select	7 [Max(A1, A2)]
4017	ACT-2 Input	1 (AI1)

ACH580 Low Ambient Operation Parameters

The parameters shown in Table 19 must be set in ACH580 VFD for low ambient operation. Use the actual nameplate motor FLA value since this value is subject to change.

Table 19 is intended for Head Pressure parameters, two transducers. PID will operate and control the speed of the motor to maintain pressure when DI-1 is on; the fans will turn off when DI-1 turns off. To change the display, go to the PID parameters in 40 and then add the PID output and PID feedback to the view screen by selecting first View, then Add to View. Now the front panel can be changed and customized with the PID control information. The setpoint will be shown in the reference position in the upper right-hand corner.

When the drive is installed and wired, it will be necessary to configure the drive for this application as follows:

1. At startup, the drive displays a system prompt to run the First Start Configuration Assistant. Exit this option.
2. Configure the drive parameters by pressing the menu button and using the arrow keys to select “Parameters”, then press the enter key (press).
3. Using the arrow keys, move to the appropriate sub-group (first two digits of the parameter to be changed), then press <SEL> (press).
4. Select the parameter to view or change using the arrow keys. Change a parameter by scrolling to that parameter and pressing <EDIT>.
5. Select the new value, then press <SAVE> (press).

Table 19 — VFD Head Pressure Control Parameters (ACH580)

ACH580 PARAMETERS	PARAMETER FUNCTION	VALUES
96.04	Application Macro	1 (HVAC Default)
99.06	Motor Nominal Current	Motor FLA (use value on motor nameplate)
99.08	Motor Nominal Frequency	Frequency 60/50 Hz (use value on motor nameplate)
99.09	Motor Nominal Speed	Motor Nominal RPM
99.10	Motor Nominal Power	Motor HP (use value on nameplate)
30.17	MAX I	Max Current
21.19	Scalar Start Mode	Scaler Flystart
12.15	AI-1 Unit selection	V
12.17	AI-1 Minimum	0.5
12.18	AI-1 Maximum	4.5
12.19	AI-1 Scaled at AI-1 min	0
12.20	AI-1 Scaled at AI-1 max	667
12.25	AI-2 Unit selection	V
12.27	AI-2 Minimum	0.5
12.28	AI-2 Maximum	4.5
12.29	AI-2 Scaled at AI-2 min	0
12.30	AI-2 Scaled at AI-2 max	667
19.11	EXT1/EXT2 selection	EXT2
20.01	Ext1 commands	Not Selected
20.03	Ext1 in 1 source	Always Off
20.06	EXT2 commands	in1 start
20.08	Ext 2 in1 source	DI-1
22.18	EXT2 Speed reference	PID (16)
23.12	Acceleration time1	10 s
23.13	Deceleration time1	10 s
28.11	Ext1 frequency ref 1	zero
28.15	Ext2 frequency ref1	PID (16)
30.13	FREQUENCY MIN	20.0 Hz
40.07	Process PID operation mode	on when drive running
40.08	SET 1 feedback 1 source	AI-1 scaled
40.09	Set 1 feedback 2 source	AI-2 scaled
40.10	Feedback Select	7 [Max(A1, A2)]
40.14	Set1 setpoint scaling	667
40.16	Set 1 setpoint 1 source	INTERNAL Setpoint
40.17	Set 1 setpoint 2 source	Not Selected
40.18	Set 1 function	In1
40.21	INTERNAL SET POINT 1	325
40.27	Set1 setpoint max	500
40.31	ERROR VALUE INVERTED	YES
40.32	PID GAIN	1.2
40.33	PID INTEGRATE	3s
40.34	DERIVATION TIME	0
40.60	Set PID 1 Activation source	DI-1
40.79	UNITS	PSI

Table 20 — Motor FLA Values (208/230-v, 460-v)

HP	208/230-v	460-v
0.50	2.2	1.1
0.75	2.6	1.3
1.00	3.4	1.5
1.50	4.6	2.1
2.00	6.0	2.8
3.00	9.2	4.3

Table 21 — Motor FLA Values (575-v)

HP	575-v
0.50	0.9
0.75	1.0
1.00	1.1
1.50	1.6
2.00	2.1
3.00	3.4

SERVICE

Cleaning Evaporator and Condenser Coils

Do not use high-pressure water or air. Damage to fins may result. Clean coils with a vacuum cleaner, fresh water, compressed air, or a bristle brush (not wire). Backflush coil to remove debris. Commercial coil cleaners may also be used to help remove grease and dirt. Steam cleaning is NOT recommended.

Units installed in corrosive environments should be cleaned as part of a planned maintenance schedule. In this type of application, all accumulations of dirt should be cleaned off the coil.

Lubrication

The 50XCA06-24 evaporator fans and 50XCA06-14 condenser fans have permanently lubricated bearings.

Condenser Fan Adjustment

To prevent personal injury, be sure wire fan guards (provided by customer) are secured in place over each fan discharge (or that fans are ducted) before starting the unit.

TO CHANGE FAN SPEED

1. Shut off unit power supply. Lock out power supply and tag disconnect locations.
2. Loosen fan belt by loosening fan motor belt adjusting bolts. Do not loosen fan motor mounting bracket from unit.
3. Loosen movable pulley flange setscrew (Fig. 20).
4. Screw movable flange toward fixed flange to increase fan speed and away from fixed flange to decrease speed. Increasing fan speed increases load on motor. Do not exceed maximum allowable fan speed or motor full load amps indicated on unit nameplate. See Tables 2 and 3 for electrical data.
5. Set movable flange setscrew at nearest flat of pulley hub and tighten setscrew.
6. Check pulley alignment and belt tension adjustment as described below.
7. Check fan operation. Repeat above procedure as required.

Pulley Alignment

Shut off unit power supply. Lock out power supply and tag disconnect locations. Loosen fan motor pulley setscrews and slide fan pulley along fan shaft. Make angular alignment by loosening motor from mounting bracket. Check alignment with a straightedge (see Fig. 20).

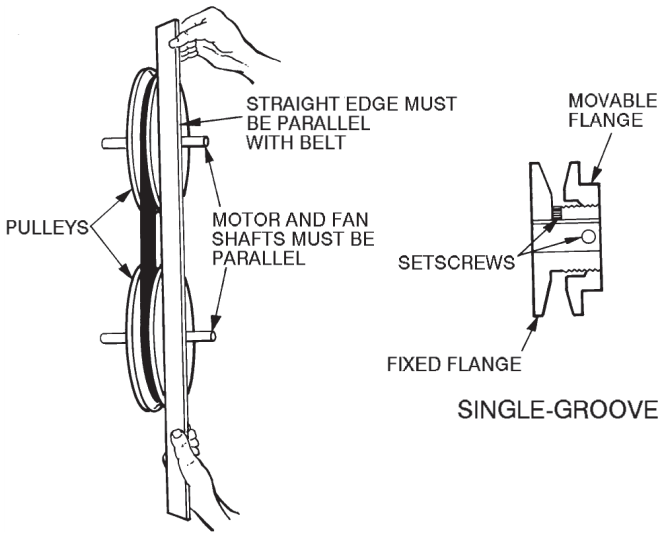


Fig. 20 — Fan Pulley Adjustments

Belt Tension Adjustment

Shut off unit power supply. Lock out power supply and tag disconnect locations. Loosen fan motor mounting plate bolts. Do not loosen motor mounting bracket from unit. Adjust belt tensioning bolts until proper belt tension is obtained.

Changing Fan Wheel

If a fan wheel should fail, it may be replaced as follows:

1. Remove belts from fan pulley.
2. Loosen locking collars on the fan bearings and set screws on the fan wheels.
3. Remove the shaft through the access panel on either side of the unit.
4. Remove the fan cut-off plate in the fan discharge.
5. Remove the fan wheel through the fan discharge opening.
6. Replace the wheel, and reverse Steps 1-4 above.

Fan Bearing Replacement

If a fan bearing fails, replace it as follows:

1. Remove belts from the fan pulley.
2. Support fan shaft.
3. Loosen locking collar on fan bearing.
4. Remove bearing from the shaft.
5. Install new bearing onto the shaft, and reverse Steps 1-3 above.

Concentric Alignment

Shaft and wheels must be concentrically centered with the venturi or air inlet of the fan housing (see Fig. 21).

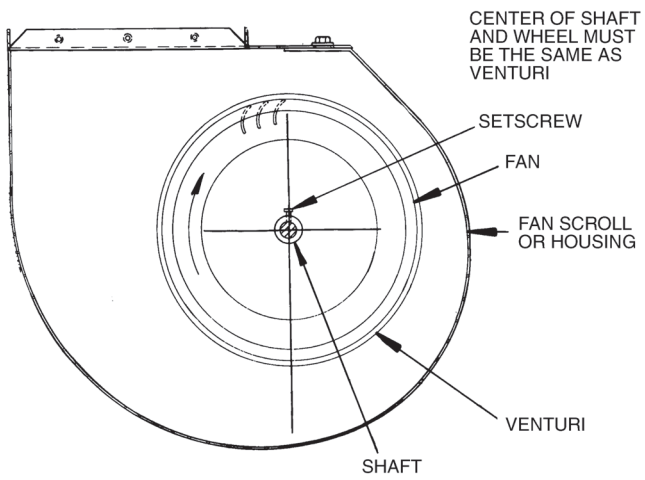


Fig. 21 — Concentric Alignment

Shaft bearings are supports by bearing supports (Fig. 22). If shaft and wheels are concentrically misaligned from shipping shock, it is possible to re-bend the bearing support arms to the original positions. Replace the bearing support if it has extensive damage.

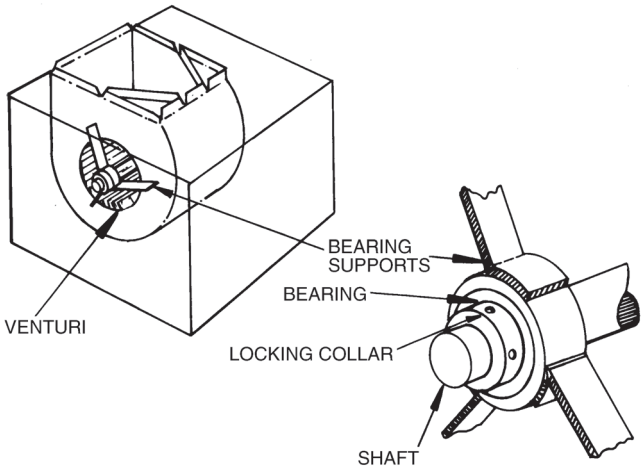


Fig. 22 — Fan Shaft Bearings

Evaporator and Condenser Motor Starter Setting (after Lockout/Tagout)

Motor starter is factory set. If starter is replaced in the field, use the following procedure to set:

1. On the starter, adjust the Motor Overload to match the **FLA Rating** of the installed motor by turning the Overload Setpoint wheel to the appropriate value. See Fig. 23. Evaporator and condenser motor FLA Ratings are listed in Table 22.
2. On the starter, turn the Motor Overload Reset wheel to **M-O** (referred to as Manual Reset).
3. On the starter, depress the Motor Overload Reset wheel (wheel also acts as reset button).
4. Turn the Power Switch/Disconnect Switch of the Start/Stop Station to the **ON** Position.

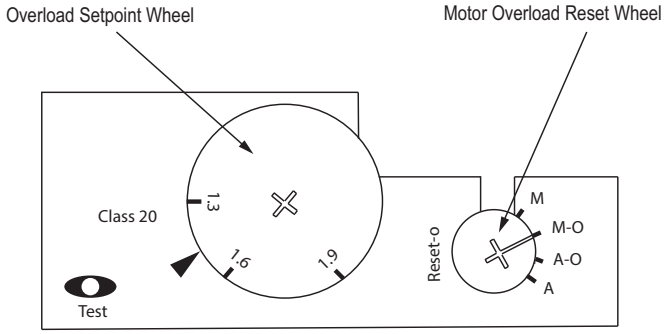


Fig. 23 — Motor Starter Setting

Table 22 — Evaporator and Condenser Motor Starter Settings

HP	208-230-v		460-v	575-v
	FLA		FLA	FLA
	208-v	230-v		
0.50	1.8	2.2	1.1	0.9
0.75	2.5	2.6	1.3	1.0
1.00	3.4	3.0	1.5	1.1
1.50	4.6	4.2	2.1	1.6
2.00	6.0	5.6	2.8	2.1
3.00	9.2	8.6	4.3	3.4
5.00	14.5	13.6	6.8	5.4
7.50	21.5	19.4	9.7	7.5

MAINTENANCE

Cleaning

The unit should be thoroughly cleaned inside and out. Frequency of cleaning will depend on unit location and area conditions. Drains must be kept free of dirt and trash. Coils can be cleaned with a stiff brush or vacuum cleaner. Coil can be reached through access panels.

Inspection

Check coil baffles for tight fit to prevent air from bypassing the coil. Check panels for air leakage, particularly those sealing the fan and coil compartments. Check for loose electrical connections, proper refrigerant charge, and refrigerant piping leaks.

Air Filters

Air filters may be installed on the condenser air inlet. Air filters should be replaced or cleaned on a regular basis depending on how dirty the operating environment is. Failure to clean air filters regularly will result in loss of unit performance and possible nuisance tripping of the high-pressure switch.

Condensate Drain

The drain pan and trap should be cleaned at least twice per year. After cleaning, test the condensate drain for proper operation by pouring a bucket of water into the condensate drain pan. The water should flow out immediately and evenly.

Checking System Charge

NOTE: Condenser and evaporator airflow must be properly set before checking system charge.

The 50XCA units are shipped with full operating charge. If recharging is necessary:

1. Insert thermometer bulb in insulating rubber sleeve on liquid line near filter drier. Use a digital thermometer for all temperature measurements. DO NOT use a mercury or dial-type thermometer.
2. Connect refrigerant pressure gauge to discharge line near compressor.
3. After unit condition have stabilized, read head pressure on discharge line gauge.
   NOTE: Operate unit a minimum of 15 minutes before checking charge.
4. From standard Pressure-Temperature chart for R-410A, find equivalent saturated condensing temperature.
5. Read liquid line temperature on thermometer; then subtract from saturated condensing temperature. The difference equals subcooling temperature.
6. Compare the subcooling temperature with the normal temperature listed in Table 23. If the measured liquid line temperature does not agree with the required liquid line temperature, ADD refrigerant to raise the temperature or REMOVE refrigerant (using standard practices) to lower the temperature (allow a tolerance of ± 3°F).

Example:

Head pressure (from gauge)	416.4 psig
Saturated condensing temp (from chart)	120°F
Liquid line temp (from thermometer)	100°F
Subcooling (by subtraction)	20°F

Table 23 — Subcooling Temperature

UNIT 50XCA	SUBCOOLING[a]
06	20°F
08	17°F
12-14	21°F
16	18°F
24	25°F

NOTE(S):

a. Saturated condensing temperature at compressor minus liquid line temperature.

⚠ WARNING

To prevent personal injury, wear safety glasses and gloves when handling refrigerant. Do not overcharge system — this can cause compressor flooding.

NOTE: Do not vent or depressurize unit refrigerant to atmosphere. Remove and recover refrigerant following accepted practices.

Access Panel Removal

TOP PANEL

Remove 3 to 6 screws, pull out panel, and remove.

CONTROL PANEL

Remove 4 screws and remove the panel.

BOTTOM PANEL

Remove 3 to 6 screws in bottom panel and lift up to remove the panel.

Evaporator-Fan Motor Removal

⚠ CAUTION

Before attempting to remove fan motors or motor mounts, place a piece of plywood over evaporator coils to prevent coil damage.

NOTE: Motor power wires need to be disconnected from control box terminals before motor is removed from unit.

1. Shut off unit main power supply. Lock out power supply and tag disconnect locations.
2. Loosen bolts on mounting bracket so that fan belt can be removed.
3. Disconnect motor power wires from motor terminals.
4. Remove the 4 motor mounting bolts from bottom of motor.
5. Remove motor. Rest motor securely on a high platform such as a step ladder. Do not allow motor to hang by its power wires.

NOTE: Use the same procedure to remove the condenser fan motor.

Pressure Relief Device

All units are equipped with a fusible-plug type safety relief device on the refrigerant tubing. The relief setting is 210°F.

Current Protection Device

All units are equipped with a current-sensing lockout relay on each circuit. This device will lock out the compressor after any safety trip (high-pressure switch, low-pressure switch, or internal overload of the compressor for 5 minutes). Check reason for lockout before resetting the device. To reset, turn the thermostat system switch to OFF, then back to COOL position.

High and Low-Pressure Switch

The high-pressure switch is located on the compressor discharge line. The low-pressure switch is located on the suction line.

Oil Charge

All units are factory charged with oil (refer to Table 1 for compressor model number). It is not necessary to add oil unless the compressor is removed from the unit. If additional oil is needed, do not use mineral oils. Only synthetic oils are satisfactory.

TROUBLESHOOTING

See Table 24 to determine the possible cause of the problem and the associated procedure necessary to correct it. See Fig. 24-33 for typical wiring schematics.

Table 24 — Troubleshooting Procedure

PROBLEM	POSSIBLE CAUSE	CORRECTION PROCEDURE
Unit Will Not Start	Loss of unit power	Check power source. Check fuses, circuit breakers, disconnect switch. Check electrical contacts.
	Unit voltage not correct	Check and correct.
	Open fuse	Check for short circuit in unit.
	Open protection device	Check relays, contacts, pressure switches.
	Unit or motor contactor out of order	Test and replace if necessary.
Fan Does Not Operate	Contactor or relay overload or out of order	Test and replace if necessary.
	Motor defective	Test and replace if necessary.
	Broken belt	Replace belt.
	Loose electrical contact	Tighten contact.
Compressor Is Noisy, but Will Start	Under voltage	Check and correct.
	Defect in compressor motor	Replace compressor.
	Missing phase	Check and correct.
	Compressor seized	Check and replace if necessary.
Compressor Starts, but Does Not Continue to Run	Compressor or contact defect	Test and replace if necessary.
	Unit is not properly charged	Check and correct any leaks. Adjust refrigerant charge.
	Unit is oversized	Check heat load calculation.
	Compressor is overloaded	Check protection device and replace. Check for missing phase. Check TXV. Check temperature in suction discharge line.
Unit is Noisy	Compressor noise	Check TXV and replace if necessary. Check internal noise.
	Tube vibration or condenser water problem	Check and correct.
	Unit panel or part vibrating	Check and tighten appropriate part.
Unit Runs Continuously, but has Low Capacity	Unit is undersized	Check heat load calculation.
	Low refrigerant or non-condensing gas present	Check for leaks and add refrigerant or gas as necessary. Replace refrigerant if non-condensing gas present.
	Dirty condenser coil	Check and correct. Clean coil.
	Compressor defect	Check pressure and amps. Replace if necessary.
	Insufficient flow of refrigerant in evaporator	Check filter drier and replace if necessary. Check TXV and adjust or replace if necessary. Check position of TXV bulb and equalizer.
	Low airflow	Check filters, and clean or replace as necessary. Check coils, and clean as necessary. Check for restrictions in ductwork. Check fan rotation and adjust. Check fan motor. Check belts for wear.
	Oil in evaporator	Drain evaporator.
High Discharge Pressure	Low airflow in condenser	Check fan rotation. Check motor, and replace if necessary. Check belts, and replace if necessary. Check coils, and clean if necessary.
	Dirty condenser coil	Clean condenser.
	High temperature in condenser air or air recirculation	Check for short circuit of air. Check water supply installation.
	Overcharged	Check and reclaim excess charge. Adjust subcooling.
	Non-condensing gas present	Verify and correct. Replace refrigerant.
Discharge Pressure too Low	Outdoor temperature too low	Install low-ambient control.
	Condenser airflow too high	Check and adjust.
	Low charge	Check for and repair leaks and add refrigerant as necessary.
	Compressor fault	Check suction and discharge pressure.
Suction Pressure too Low	Discharge pressure is low	See Discharge Pressure Too Low section of this table.
	Low thermal load	Check building load.
	Low refrigerant	Check for and repair leaks and add refrigerant as necessary.
	Low airflow in evaporator	Clean filter. Remove scale. Check for blockage in ducts. Check fan rotation. Check motor operation. Check belts.
	Low refrigerant flow in evaporator	Check for obstruction in filter drier. Check for obstruction in TXV. Check super heating. Check position of TXV bulb and equalizer.
Suction Pressure too High	High thermal load	Check design conditions.
	Compressor defect	Check pressures, and replace if necessary.
Condensate Water Leaks	Defective connection	Check and correct.
	Blocked drain	Clean drain pan.
	Drain lines incorrect	Check and correct.

LEGEND

TXV — Thermostatic Expansion Valve

LEGEND AND NOTES FOR FIG. 24-33

LEGEND

C	—	Compressor Contactor
CH	—	Crankcase Heater
CLO	—	Compressor Lockout
COMP	—	Compressor
CR	—	Control Relay
DISC	—	Disconnect
FRZ	—	Freeze Protection
GND	—	Ground
HPS	—	High Pressure Switch
HR	—	Heat Relay
IFC	—	Indoor-Fan Contactor
IFM	—	Indoor-Fan Motor
IFR	—	Indoor-Fan Relay
LPS	—	Low Pressure Switch
LLT	—	Liquid Line Temperature
OFC	—	Outdoor-Fan Contactor
OFM	—	Outdoor-Fan Motor
OFR	—	Outdoor-Fan Relay
PRES	—	Pressure Transducer
SAT	—	Supply Air Thermistor
TB	—	Terminal Block
TRAN	—	Transformer
VFD	—	Variable Frequency Drive

Terminal Block Connection

Marked Terminal

Unmarked Terminal

Splice

Factory Wiring

Field Power Wiring

*Disconnect can be factory or field-installed.

NOTES:
1. Fan motors are inherently thermally protected.
2. Three-phase motors are protected under primary single phase conditions.
3. Use conductors suitable for at least 194°F (90°C) when replacing factory wiring.
4. Use copper conductors only.
5. Wiring for field power supply must be rated at 165°F (75°C) minimum.
6. Phase rotation sequence is L2-L1-L3.
7. TRAN1 and TRAN2 power separate 24-v circuits. These circuits should not be interconnected and separation must be maintained.
8. Transformers are factory wired for 240-v operation. Move the black wire to the 208-v tap for 208-v operation.

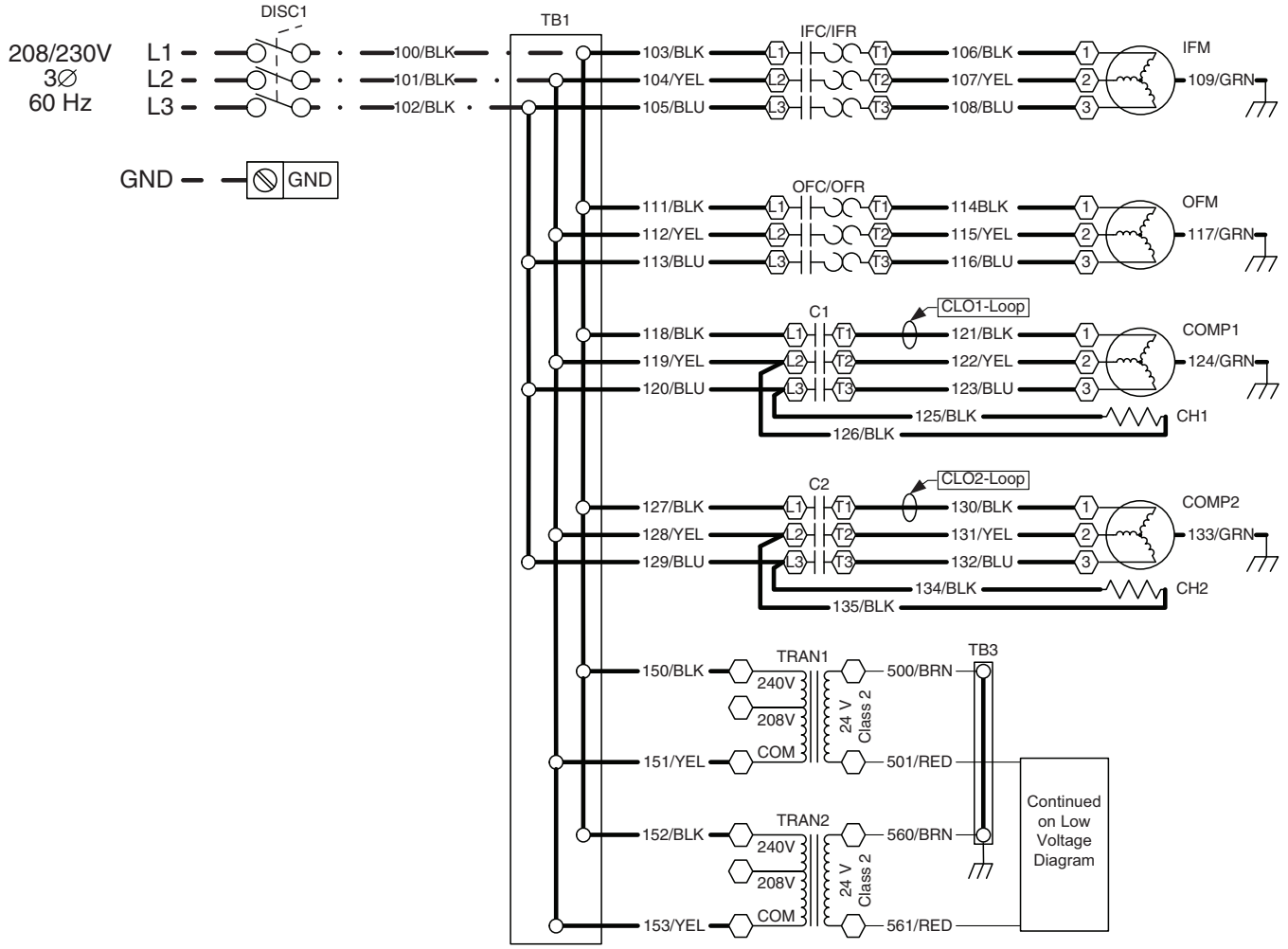
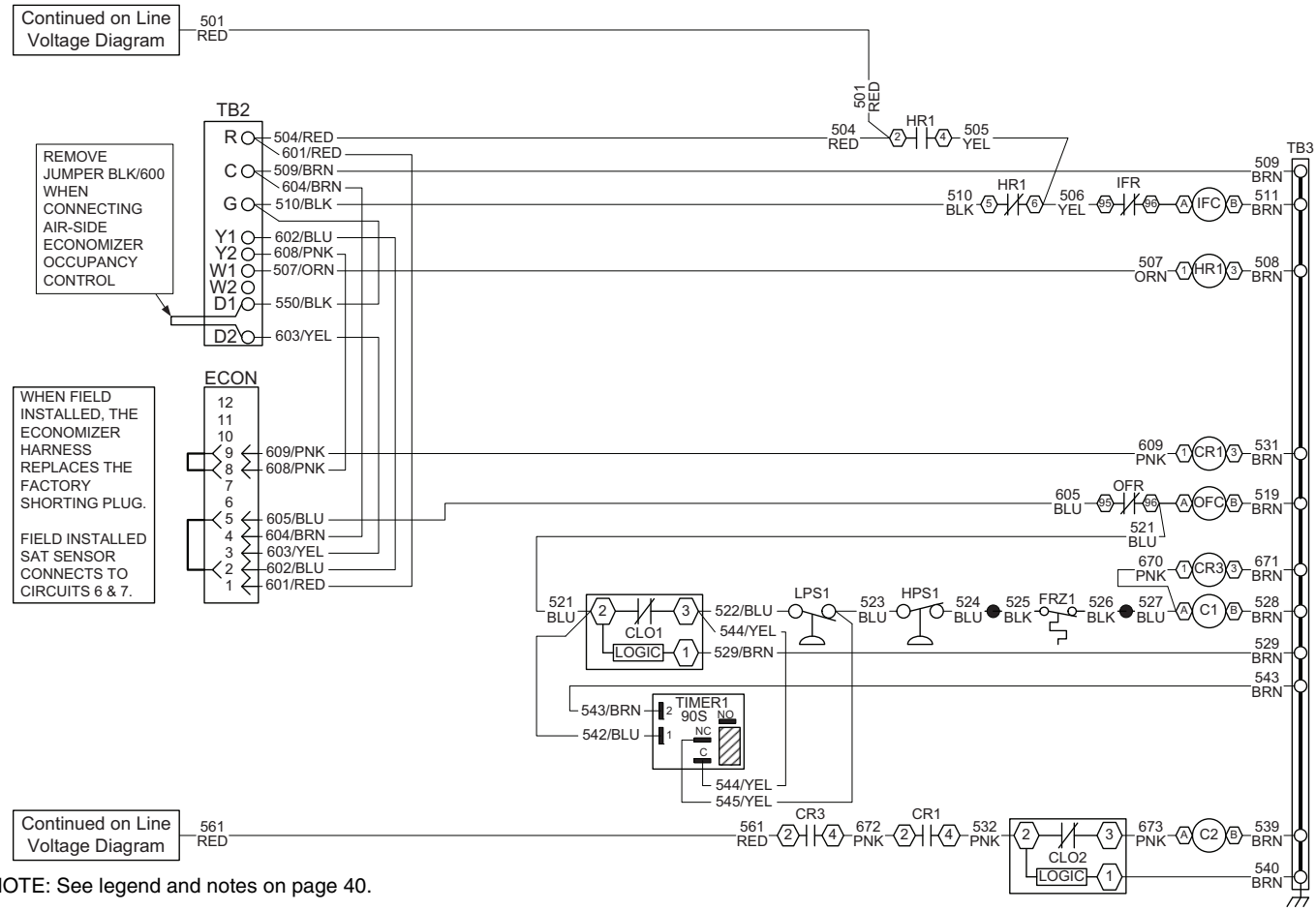
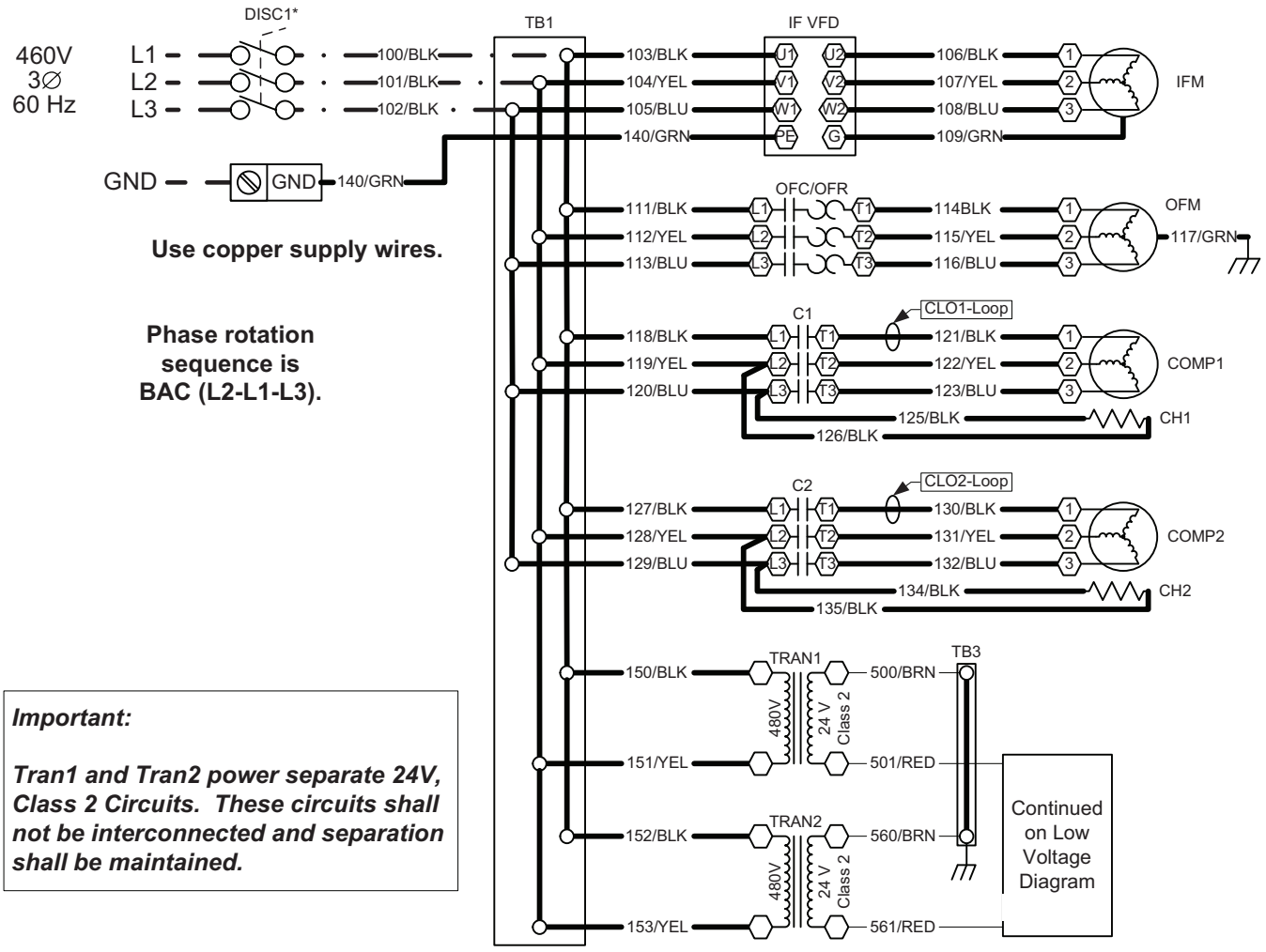


Fig. 24 — Line Voltage Diagram — 50XCA012-24, 208/230-3-60 Units Shown



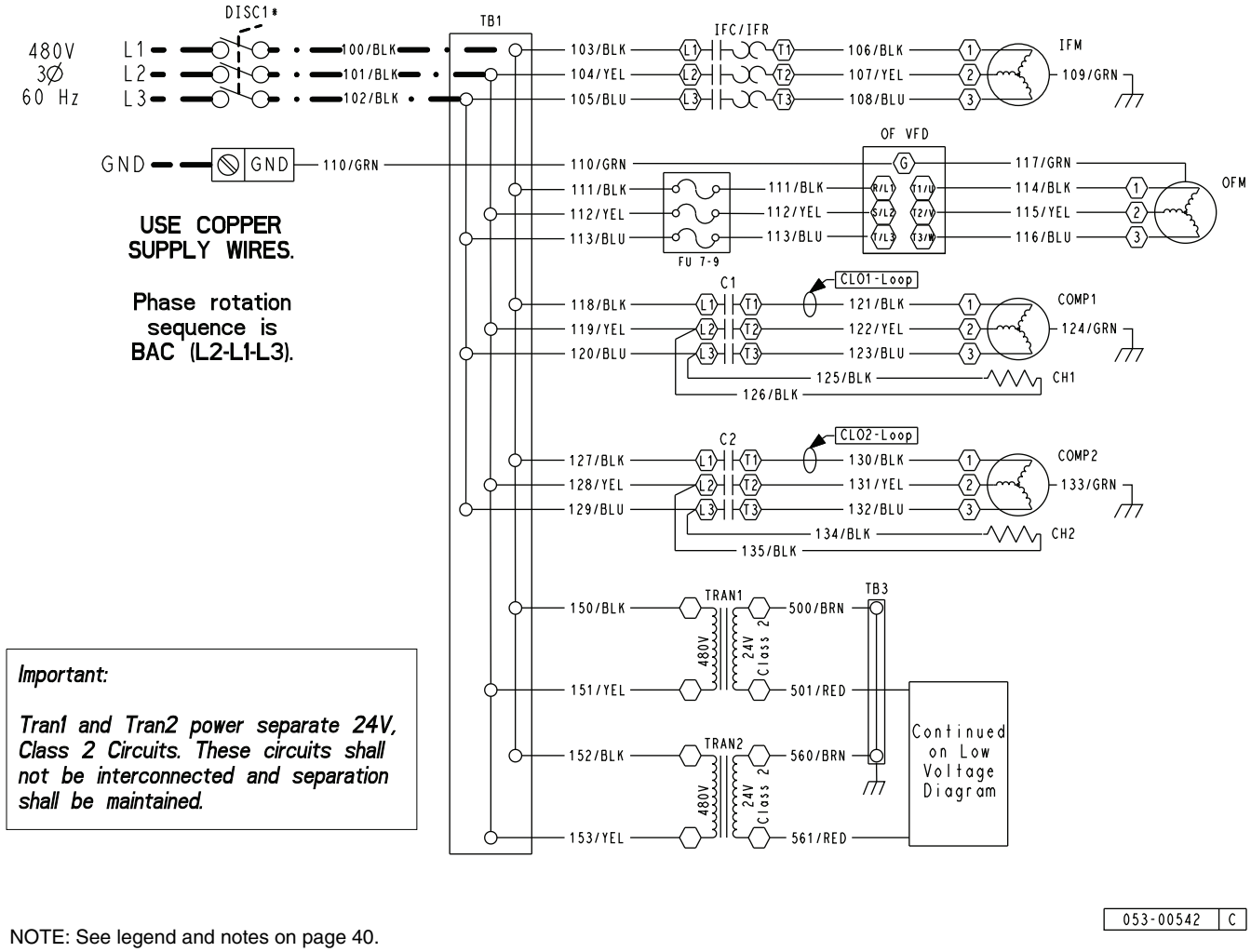
NOTE: See legend and notes on page 40.

Fig. 24 — Line Voltage Diagram — 50XCA012-24, 208/230-3-60 Units Shown (cont)



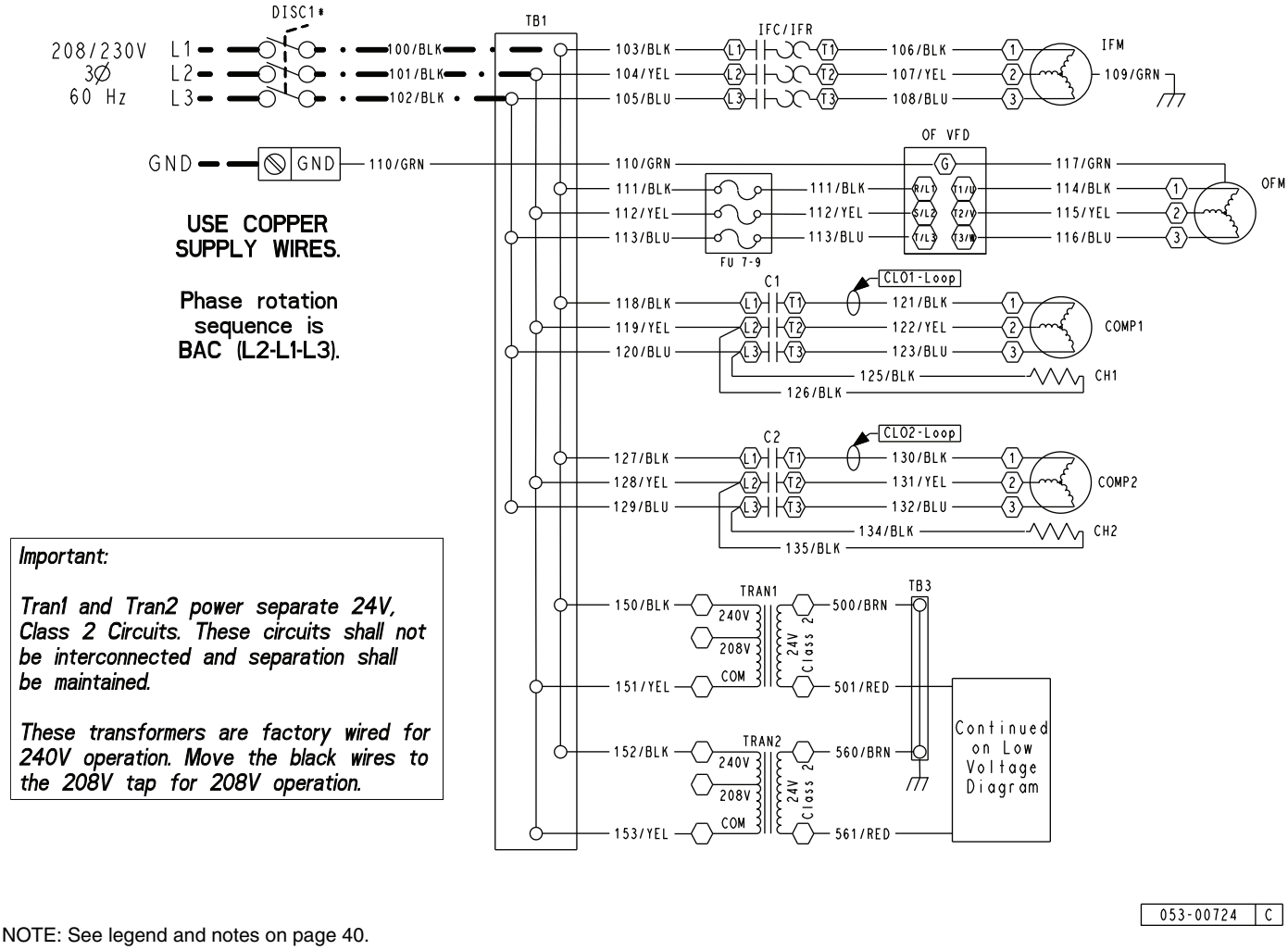
NOTE: See legend and notes on page 40.

Fig. 25 — Line Voltage Diagram — 460-v Units (50XCA12-24 Units)



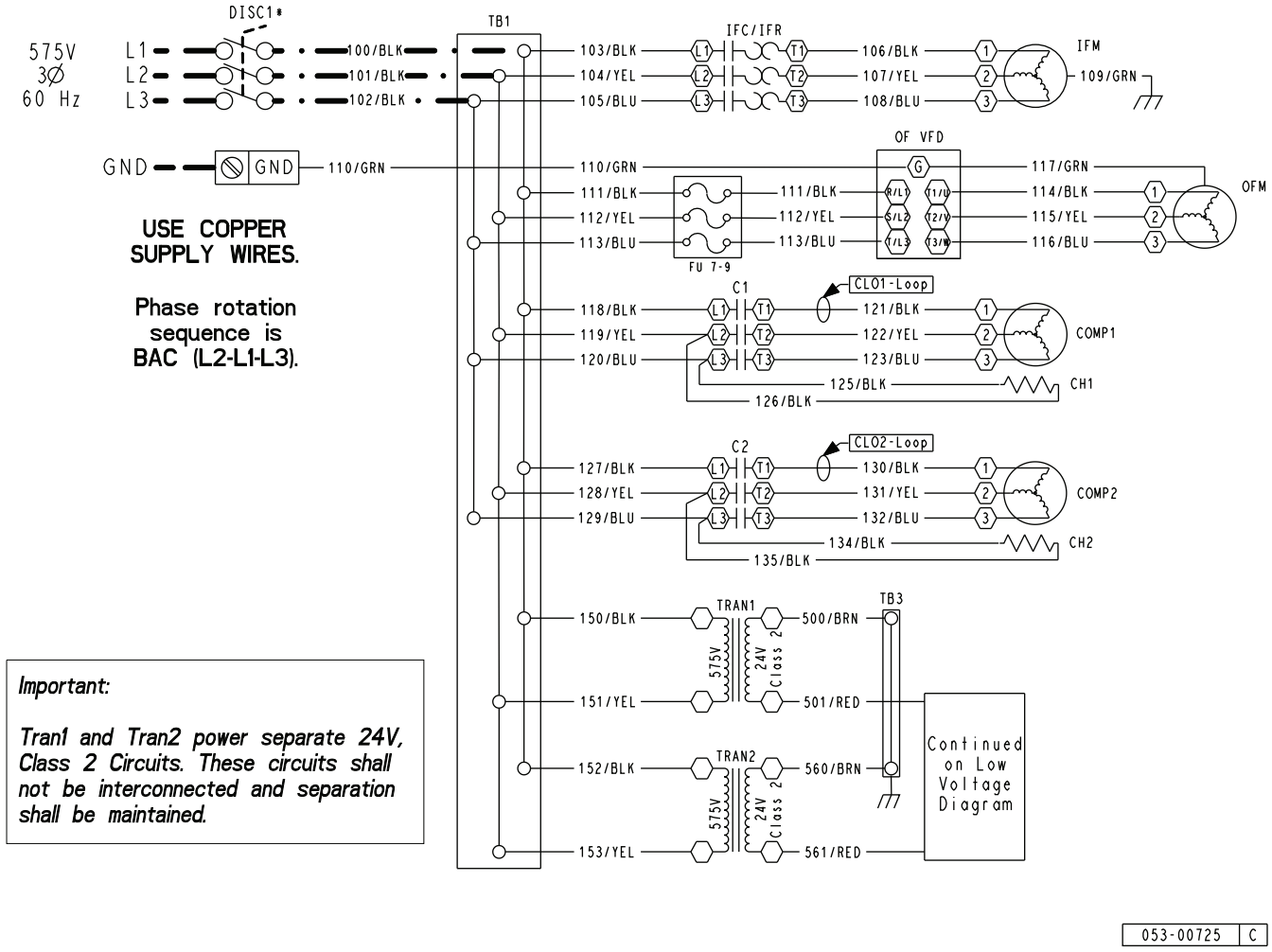
NOTE: See legend and notes on page 40.

Fig. 26 — Control and Line Voltage Diagram — 480-v Units without VFD and with Winter Start Kit (50XCA06,08)



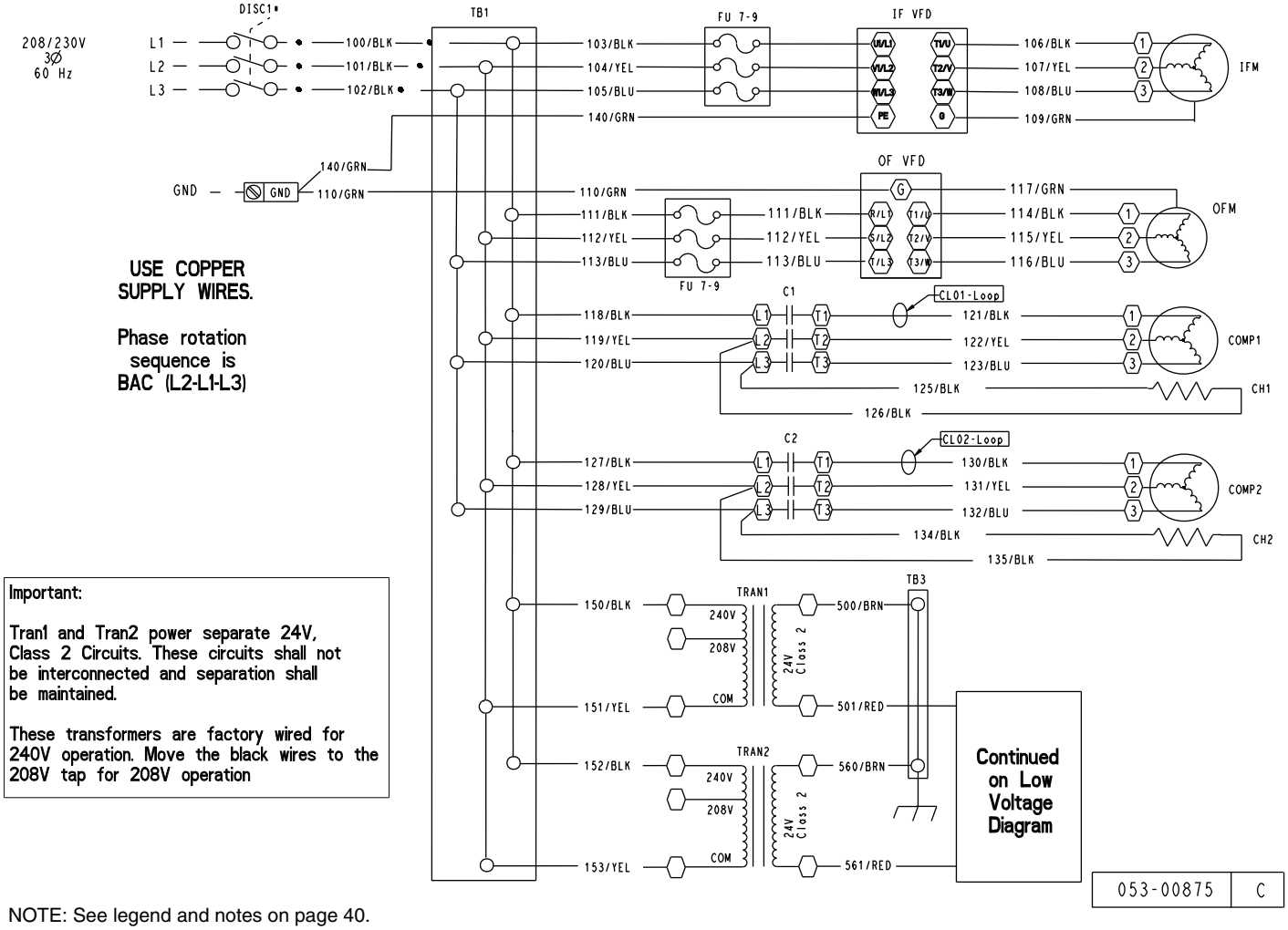
NOTE: See legend and notes on page 40.

Fig. 27 — Typical Wiring Diagram — 208/230-v Units without VFD and with Winter Start Kit (50XCA12-24)



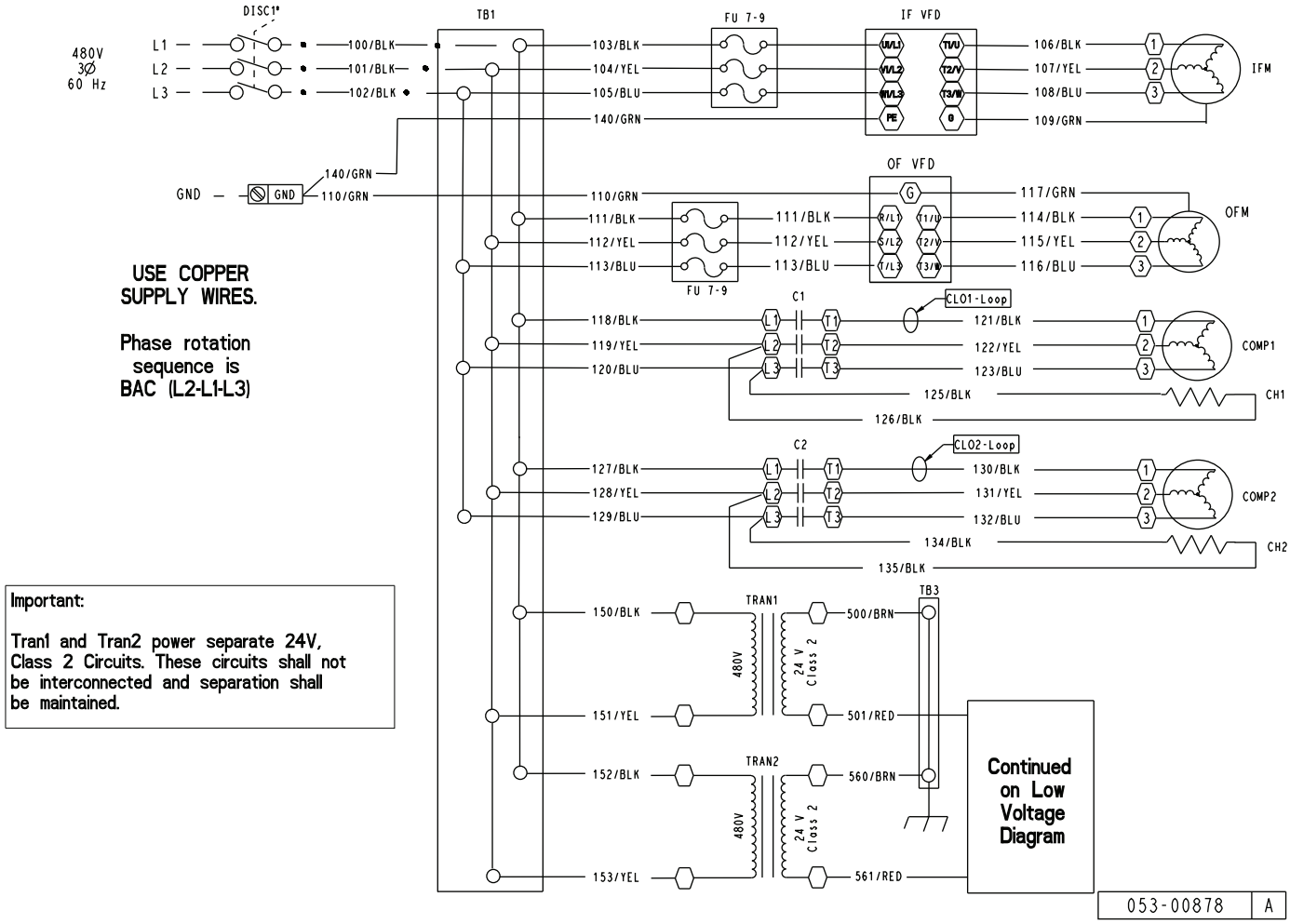
NOTE: See legend and notes on page 40.

Fig. 28 — Typical Wiring Diagram — 575-v Units without VFD



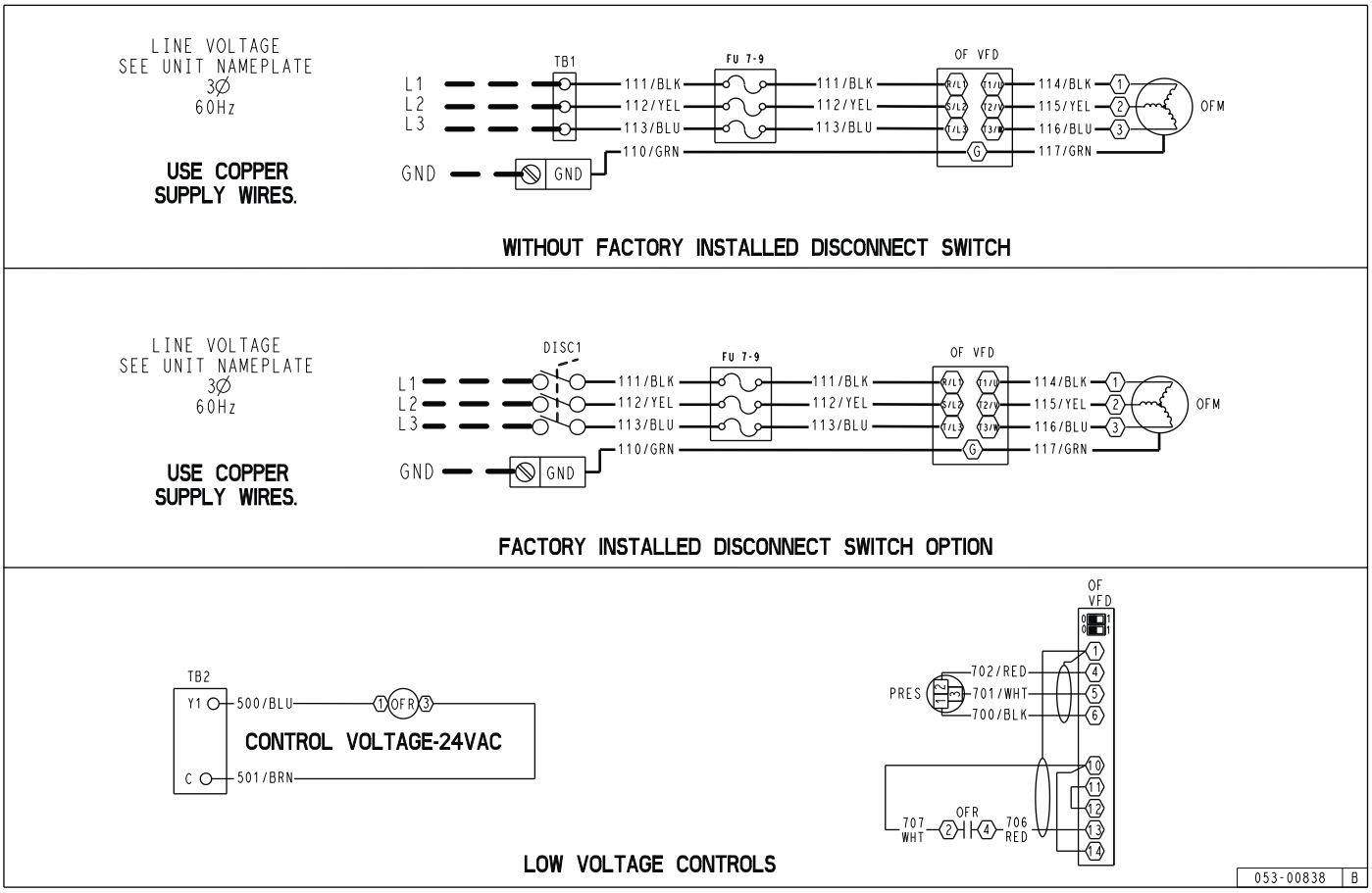
NOTE: See legend and notes on page 40.

Fig. 29 — Typical Wiring Diagram — 208/230-v Units with VFD



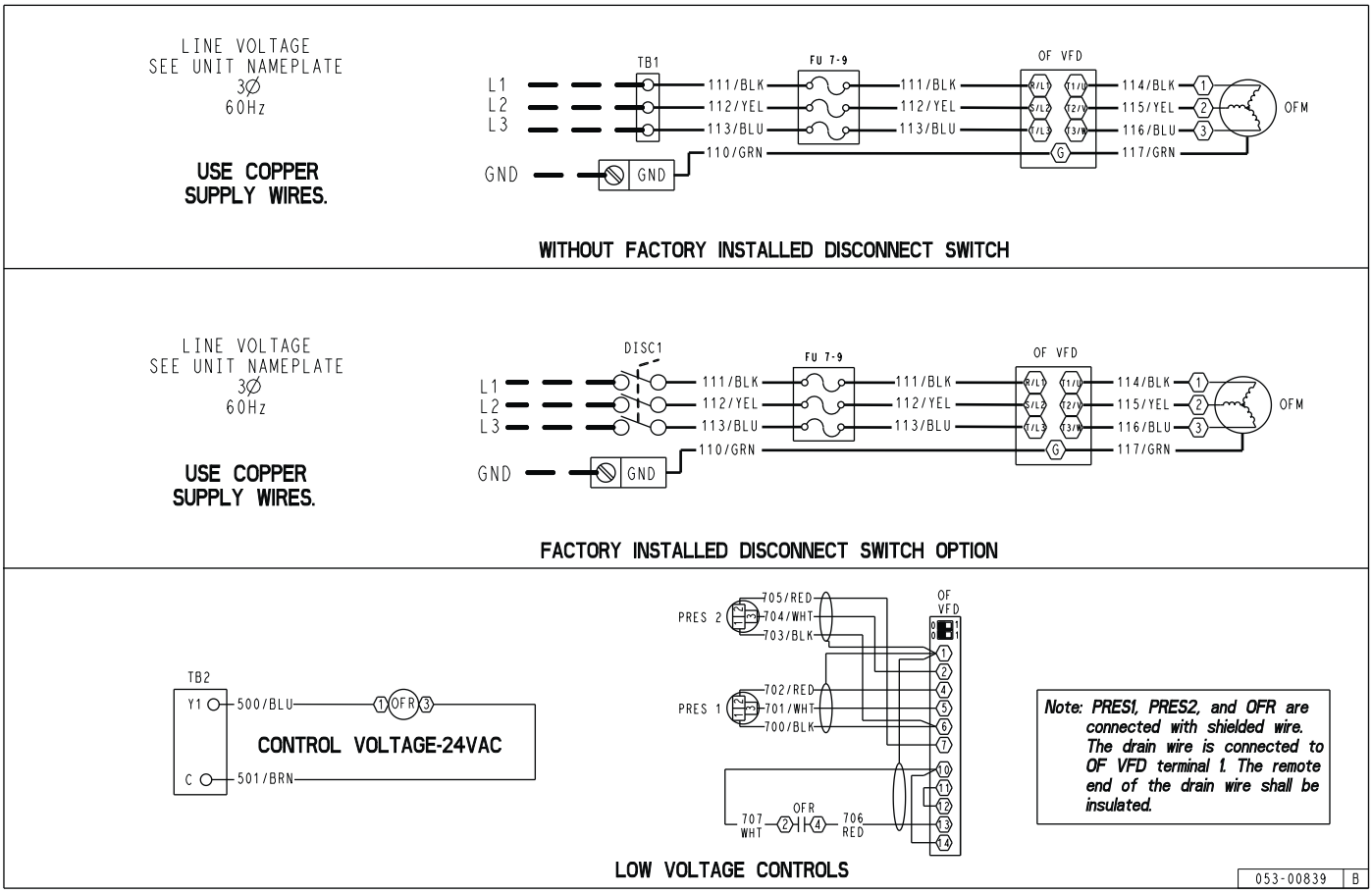
NOTE: See legend and notes on page 40.

Fig. 30 — Typical Wiring Diagram — 480-v Units with VFD



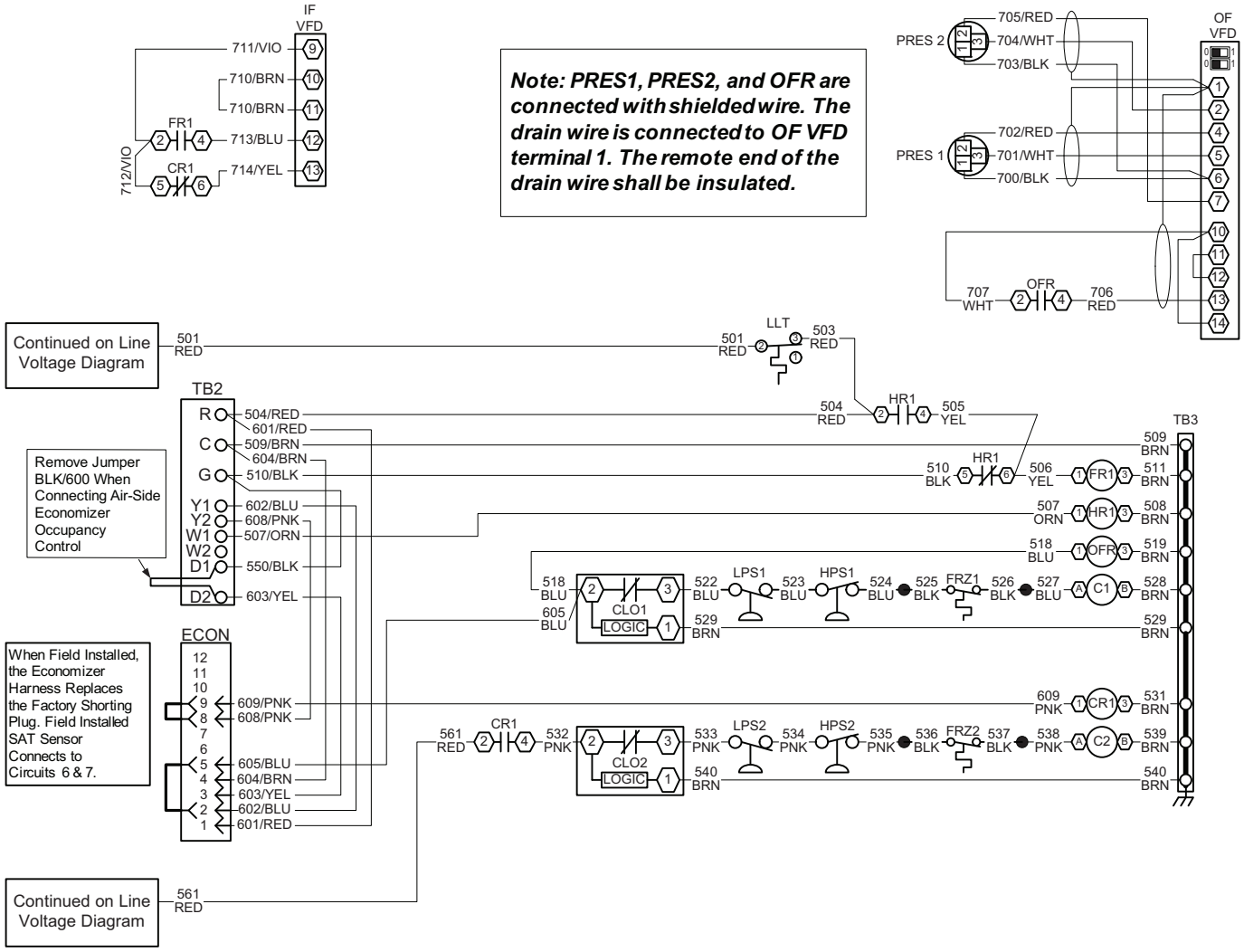
NOTE: See legend and notes on page 40.

Fig. 31 — Typical Wiring Diagram with Low Ambient Option (50XCA06,08 Units)



NOTE: See legend and notes on page 40.

Fig. 32 — Typical Wiring Diagram with Low Ambient Option (50XCA12-24 Units)



NOTE: See legend and notes on page 40.

Fig. 33 — Typical Wiring Schematic with Airside Economizer

APPENDIX A — VFD INFORMATION

VFD OPERATION

The VFD keypad is shown in Fig. A-C. The functions of SOFT KEYS 1 and 2 change depending on what is displayed on the screen. The functions of ACH550/ACS320 SOFT KEYS (1 and 2) or ACH580 (and) change depending on what is displayed on the screen. The function of SOFT KEY 1 matches the word in the lower left-hand box on the display screen. The function of SOFT KEY 2 matches the word in the lower right-hand box on the display screen. If the box is empty, then the SOFT KEY does not have a function on that specific screen. The UP and DOWN keys (ACH550/320) or Arrow Keys (ACH580) are used to navigate through the menus. The OFF key is used to turn off the VFD. The AUTO key is used to change control of the drive to automatic control. The HAND key is used to change control of the drive to local (hand held) control. The HELP button is used to access the help screens.

For the VFD to operate on the units covered by this document, the drive must be set in AUTO mode. The word "AUTO" will appear in the upper left-hand corner of the VFD display. Press the AUTO button to set the drive in AUTO mode.

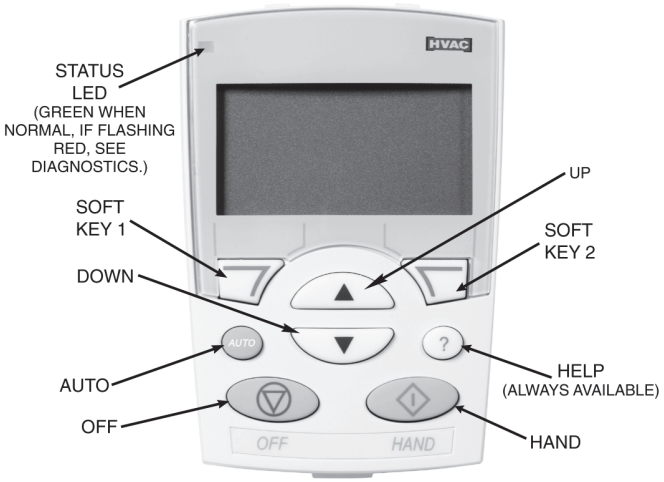


Fig. A — ACH550/ACS320 VFD Keypad

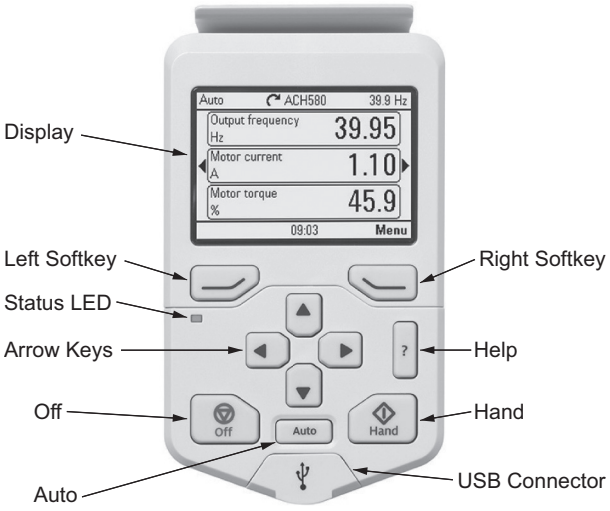


Fig. B — ACH580 VFD Keypad — Front

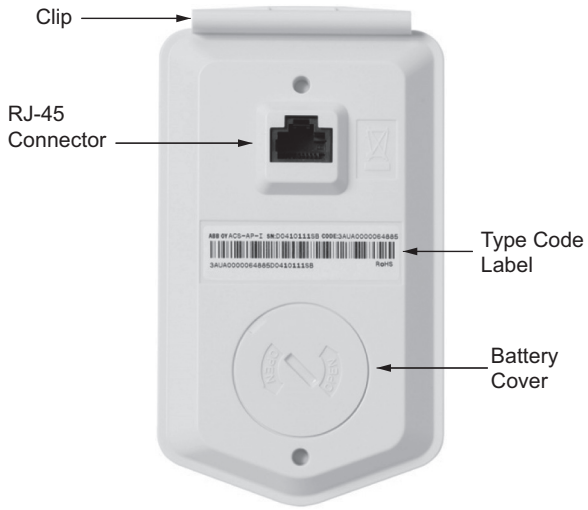


Fig. C — ACH580 VFD Keypad — Back

START UP BY CHANGING PARAMETERS INDIVIDUALLY

Initial start-up is performed at the factory. To start up the VFD by changing individual parameters, perform the following procedure:

1. For 320/550, select MENU (SOFT KEY 2).
   For 580, press .
   The Main menu will display.
2. Use the UP or DOWN keys to highlight PARAMETERS on the display screen, then:
   For 320/550, press SEL (SOFT KEY 2).
   For 580, press .
3. Use the UP or DOWN keys to highlight the desired parameter group, then:
   For 320/550, press SEL (SOFT KEY 2).
   For 580, press .
4. Use the UP or DOWN keys to highlight the desired parameter, then:
   For 320/550, press EDIT (SOFT KEY 2).
   For 580, press .
5. Use the UP or DOWN keys to change the value of the parameter, then save or cancel the change. Any modifications that are not saved will not be changed.
   a. To save the change:
      For 320/550, press SAVE (SOFT KEY 2).
      For 580, press to store the modified value.
   b. To cancel the change:
      For 320/550, press CANCEL (SOFT KEY 1).
      For 580, press to keep the previous value.
6. Choose another parameter or return to parameter groups list :
   For 320/550, press EXIT/BACK (SOFT KEY 1).
   For 580, press to go back.
7. Continue until all the parameters have been configured, then:
   For 320/550, press EXIT/BACK (SOFT KEY 1).
   For 580, press to return to the main menu.

NOTE: The current parameter value appears above the highlighted parameter. To view the default parameter value, press the UP and DOWN keys simultaneously. To restore the default factory settings, select the application macro "HVAC Default" (ACH550/320 only).

VFD MODES

The VFD has several different modes for configuring, operating, and diagnosing the VFD.

The modes are:

- Standard Display mode — shows drive status information and operates the drive
- Parameters mode — edits parameter values individually
- Start-up Assistant mode — guides start-up and configuration
- Changed Parameters mode — shows all changed parameters
- Drive Parameter Backup mode — stores or uploads the parameters
- Clock Set mode — sets the time and date for the drive
- I/O Settings mode — checks and edits the I/O settings

ACH580 Standard Display Mode

Use the standard display mode to read information on the drive status and operate the drive. To reach the standard display mode, press BACK until the LCD display shows status information as described below. See Fig. D.

The top line of the LCD display shows basic status information of the drive. The HAND icon indicates that the drive control is local from the control panel. The AUTO icon indicates that the drive is in remote control mode, such as the basic I/O or field bus.

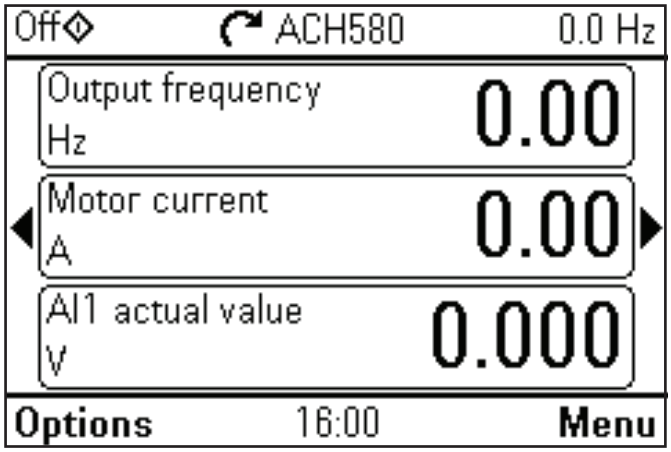


Fig. D — ACH580 Standard Display Example

The arrow icon indicates the drive and motor rotation status. A rotating arrow (clockwise or counterclockwise) indicates that the drive is running and at set point and the shaft direction is forward or reverse. A rotating blinking arrow indicates that the drive is running but not at set point. A stationary arrow indicates that the drive is stopped. For the units covered in this manual, the correct display rotation is clockwise.

The upper right corner shows the frequency set point that the drive will maintain. From Home view, press "Options" then "Edit Home View" to change the Home layout. The middle of the LCD display can be configured to display 3 parameter values, Graphs or digital indicators. The default display shows (OUTPUT FREQ) in percent speed, (CURRENT) in amperes, and (AI1) in voltage DC.

The bottom corners of the LCD display show the functions currently assigned to the two soft keys. The lower middle displays the current time (if configured to show the time).

The first time the drive is powered up, it is in the OFF mode. To switch to local hand-held control and control the drive using the control panel, press and hold the HAND button. Pressing the HAND button switches the drive to hand control while keeping the drive running. Press the AUTO button to switch to remote input control. To start the drive, press the HAND or AUTO buttons; to stop the drive, press the OFF button.

To adjust the speed in HAND mode, press the UP or DOWN buttons (the reference changes immediately). The reference can be modified in the local control (HAND) mode, and can be parameterized (using Group 11 reference select) to also allow modification in the remote control mode.

Parameters Mode

The Parameters mode is used to change the parameters on the drive. To change parameters, perform the following procedure:

1. Select MENU (press). The Main menu will display.
2. Use the UP or DOWN keys to highlight PARAMETERS on the display screen and press Select (press).
3. Use the UP or DOWN keys to highlight the desired parameter group and press Select (press).
4. Use the UP or DOWN keys to highlight the desired parameter and press EDIT (press).
5. Use the UP or DOWN keys to change value of the parameter.
6. Press SAVE (press) to store the modified value. Press CANCEL (press) to keep the previous value. Any modifications that are not saved will not be changed.
7. Choose another parameter or press BACK (press) to return to the listing of parameter groups. Continue until all the parameters have been configured and then press EXIT (press) to return to the main menu.

Changed Parameters Mode

The Changed Parameters mode is used to view and edit recently changed parameters on the drive. To view the changed parameters, perform the following procedure:

1. Select MENU (press). The Main menu will display.
2. Use the UP or DOWN keys to highlight PARAMETERS on the display screen and press Select (press).
3. Use the UP or DOWN keys to highlight MODIFIED on the display screen and press Select (press). A list of the recently changed parameters will be displayed.
4. Use the UP or DOWN keys to highlight the desired parameter group and press EDIT (press) to change the parameter if desired.
5. Press BACK (press) to exit the Changed Parameters mode.

Drive Parameter Backup Mode

The drive parameter backup mode is used to export the parameters from one drive to another. The parameters can be uploaded from a VFD to the removable control panel. The control panel can then be transferred to another drive and the parameters downloaded into memory.

Depending on the motor and application, there are two options available. The first option is to download all parameters. This copies both application and motor parameters to the drive from the control panel. This is recommended when using the same application for drives of the same size. This can also be used to create a backup of the parameters group for the drive.

The second option downloads only the application parameters to the drive. This is recommended when using the same application for drives of different sizes. Parameters 99.07, 99.06, 99.08, 99.09, 99.10, and group 51 parameters and internal motor parameters are not copied.

UPLOAD ALL PARAMETERS

To upload and store parameters in the control panel from the VFD, insert the keypad in the VFD slot (Fig. E); animation will appear to show loading the VFD configuration.

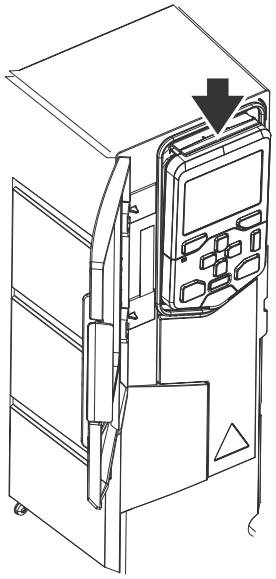


Fig. E — Insert Keypad in Slot

DOWNLOAD ALL PARAMETERS FROM BACKUP

To download all parameters from the control panel to the VFD, perform the following procedure:

1. Install the control panel with the correct parameters onto the VFD.
2. Select MENU (press ⊂). The Main menu will display.
3. Use the UP or DOWN keys to highlight BACKUPS on the display screen and press SEL (press ⊂).
4. Use the UP or DOWN keys to highlight the backup file and press SEL (press ⊂).
5. The text "Restoring Parameters" will be displayed with a progress indicator. To stop the process, select CANCEL (press ⊂).
6. When the download is complete, the text "Parameter download successful" will be displayed.
7. The display will then return to the PAR BACKUP menu. Select BACK (press ⊂) to return to the main menu.
8. The control panel can now be disconnected from the drive.

Clock Set Mode

Use the clock set mode to set the date and time for the internal clock of the VFD. In order to use the timer functions of the VFD control, the internal clock must be set. The date is used to determine weekdays and is visible in the fault logs.

To set the clock, perform the following procedure:

1. Select MENU (press ⊂). The Main menu will display.
2. Use the UP or DOWN keys to highlight PRIMARY SETT. on the display screen and press ENTER (press ⊂). The Sub list will be displayed.
3. Use the UP or DOWN keys to highlight clock, region, and display, then press SEL (press ⊂). This parameter is used to display or hide the clock on the screen. Use the UP or DOWN keys to change the parameter setting. Press OK (press ⊂) to save the configuration and return to the Sub list menu.
4. Use the UP or DOWN keys to highlight SET TIME and press SEL (press ⊂). Use the UP or DOWN keys to change the hours and minutes. Press OK (press ⊂) to save the configuration and return to the Clock Set menu.
5. Use the UP or DOWN keys to highlight TIME FORMAT and press SEL (press ⊂). Use the UP or DOWN keys to change the parameter setting. Press OK (press ⊂) to save the configuration and return to the Clock Set menu.
6. Use the UP or DOWN keys to highlight SET DATE and press SEL (press ⊂). Use the UP or DOWN keys to change the day, month, and year. Press OK (press ⊂) to save the configuration and return to the Clock Set menu.
7. Use the UP or DOWN keys to highlight DATE FORMAT and press SEL (press ⊂). Use the UP or DOWN keys to change the parameter setting. Press OK (press ⊂) to save the configuration and return to the Clock Set menu.
8. Press BACK (press ⊂) twice to return to the main menu.

I/O Settings Mode

Use the I/O Settings mode to view and edit the I/O settings. To configure the I/O settings, perform the following procedure:

1. Select MENU (press ⊂). The Main menu will display.
2. Use the UP or DOWN keys to highlight PRIMARY SETT. on the display screen and press SEL (press ⊂). The Sub list will be displayed.
3. Use the UP or DOWN keys to highlight ADVANCED OPTIONS/FUNCTIONS on the display screen and press SEL (press ⊂). The Sub list will be displayed.
4. Use the UP or DOWN keys to highlight I/O SETTINGS on the display screen and press SEL (press ⊂). The I/O settings parameter list will be displayed.
5. Use the UP or DOWN keys to highlight the desired I/O setting and press SEL (press ⊂).
6. Use the UP or DOWN keys to select the parameter to view. Press OK (press ⊂).
7. Use the UP or DOWN keys to change the parameter setting. Press SAVE (press ⊂) to save the configuration. Press CANCEL (SOFT KEY 1) to keep the previous value. Any modifications that are not saved will not be changed.
8. Press BACK (press ⊂) twice to return to the main menu.

VFD DIAGNOSTICS

The drive detects error situations and reports them using:

1. Status LED on the control panel
2. Control panel display
3. The Fault Word and Alarm Word parameter bits

The form of the display depends on the severity of the error. The user can specify the severity for many errors by directing the drive to ignore the error situation, report the situation as an alarm, or report the situation as a fault.

Faults (Red LED Lit)

The VFD signals that it has detected a severe error, or fault, by:

1. Enabling the red LED on the drive (LED is either steady or flashing).
2. Setting an appropriate bit in a Fault Word parameter.
3. Overriding the control panel display with the display of a fault code.
4. Stopping the motor (if it was on).

The fault code on the control panel display is temporary. Pressing the MENU button (press ⊂) removes the fault message. The message reappears after a few seconds if the control panel is not touched and the fault is still active. See Table A for a list of fault codes.

APPENDIX A — VFD INFORMATION (CONT)

Table A — FAULT AND ALARM CODES for ACH580 VFD

CODE (HEX)	WARNING / AUX. CODE	CAUSE	WHAT TO DO
A2B1	Overcurrent	Output current has exceeded internal fault limit. In addition to an actual overcurrent situation, this warning may also be caused by an earth fault or supply phase loss.	Check motor load. Check acceleration times in parameter group 23 Speed reference ramp (speed control) or 28 Frequency reference chain (frequency control). Also check parameters 46.01 Speed scaling, 46.02 Frequency scaling and 46.03 Torque scaling. Check motor and motor cable (including phasing and delta/star connection). Check for an earth fault in motor or motor cables by measuring the insulation resistances of motor and motor cable. See chapter Electrical installation, section Checking the insulation of the assembly in the Hardware manual of the drive. Check there are no contactors opening and closing in motor cable. Check that the start-up data in parameter group 99 Motor data corresponds to the motor rating plate. Check that there are no power factor correction capacitors or surge absorbers in motor cable.
A2B3	Earth leakage	Drive has detected load unbalance typically due to earth fault in motor or motor cable.	Check there are no power factor correction capacitors or surge absorbers in motor cable. Check for an earth fault in motor or motor cables by measuring the insulation resistances of motor and motor cable. See chapter Electrical installation, section Checking the insulation of the assembly in the Hardware manual of the drive. If an earth fault is found, fix or change the motor cable and/or motor. If no earth fault can be detected, contact your local Carrier representative.
A2B4	Short circuit	Short-circuit in motor cable(s) or motor.	Check motor and motor cable for cabling errors. Check motor and motor cable (including phasing and delta/star connection). Check for an earth fault in motor or motor cables by measuring the insulation resistances of motor and motor cable. See chapter Electrical installation, section Checking the insulation of the assembly in the Hardware manual of the drive. Check there are no power factor correction capacitors or surge absorbers in motor cable.
A6A4	Motor nominal value	The motor parameters are set incorrectly.	Check the auxiliary code.
	Motor nominal value 0001	The drive is not dimensioned correctly.	Check the auxiliary code. Check the settings of the motor configuration parameters in groups 98 and 99. Check that the drive is sized correctly for the motor.
A780	Motor stall Programmable warning: 31.24 Stall function	Motor is operating in stall region because of, for example, excessive load or insufficient motor power.	Check motor load and drive ratings. Check fault function parameters.
A783	Motor overload	Motor current is too high.	Check for overloaded motor. Adjust the parameters used for the motor overload function (35.51...35.53) and 35.55...35.56.
A784	Motor disconnect	All three output phases are disconnected from motor.	Check that switches between drive and motor are closed. Check that all cables between drive and motor are connected and secured. If no issue was detected and drive output was actually connected to motor, contact Carrier.
A7AB	Extension I/O configuration failure	Installed extension module is not the same as configured.	Check that the installed extension module (shown by parameter 15.02 Detected extension module) is the same as selected by parameter 15.01 Extension module type.
A7C1	FBA A communication Programmable warning: 50.02 FBA A comm loss func	Cyclical communication between drive and fieldbus adapter module A or between PLC and fieldbus adapter module A is lost.	Check status of fieldbus communication. See user documentation of fieldbus interface. Check settings of parameter groups 50 Fieldbus adapter (FBA), 51 FBA A settings, 52 FBA A data in and 53 FBA A data out. Check cable connections. Check if communication master is able to communicate.
A7CE	EFB comm loss Programmable warning: 58.14 Communication loss action	Communication break in embedded fieldbus (EFB) communication.	Check the status of the fieldbus master (online/offline/error etc.). Check cable connections to the EIA-485/X5 terminals 29, 30, and 31 on the control unit.
A7EE	Panel loss Programmable warning: 49.05 Communication loss action	Control panel or PC tool selected as active control location for drive has ceased communicating.	Check PC tool or control panel connection. Check control panel connector. Check mounting platform if being used. Disconnect and reconnect the control panel.
A88F	Cooling fan	Maintenance timer limit exceeded.	Consider changing the cooling fan. Parameter 05.04 Fan on-time counter shows the running time of the cooling fan.
AFAA	Auto reset	A fault is about to be auto reset.	Informative warning. See the settings in parameter group 31 Fault functions.
AFE1	Emergency stop (off2)	Drive has received an emergency stop (mode selection off2) command.	Check that it is safe to continue operation. Then return emergency stop push button to normal position. Restart drive. If the emergency stop was unintentional, check the source selected by parameter 21.05 Emergency stop source.
AFE2	Emergency stop (off 1 or off3)	Drive has received an emergency stop (mode selection off1 or off3) command.	Check that it is safe to continue operation. Then return emergency stop push button to normal position. Restart drive. If the emergency stop was unintentional, check the source selected by parameter 21.05 Emergency stop source. Informative warning. See parameter 21.22 Start delay.
AFE9	Start delay	The start delay is active and the drive will start the motor after a predefined delay.	Check that it is safe to continue operation. Then return emergency stop push button to normal position. Restart drive. If the emergency stop was unintentional, check the source selected by parameter 21.05 Emergency stop source. Informative warning. See parameter 21.22 Start delay. Check the setting of (and source selected by) parameter 20.40 Run permissive.
AFED	Run permissive	Run permissive is keeping the drive from running the motor.	
AFEE	Start interlock 1	Start interlock 1 is keeping the drive from starting.	Check the signal source selected for parameter 20.41 Start interlock 1.
AFEF	Start interlock 2	Start interlock 2 is keeping the drive from starting.	Check the signal source selected for parameter 20.42 Start interlock 2.

Table A — FAULT AND ALARM CODES for ACH580 VFD (cont)

CODE (HEX)	WARNING / AUX. CODE	CAUSE	WHAT TO DO
AFF0	Start interlock 3	Start interlock 3 is keeping the drive from starting.	Check the signal source selected for parameter 20.43 Start interlock 3.
AFF1	Start interlock 4	Start interlock 4 is keeping the drive from starting.	Check the signal source selected for parameter 20.44 Start interlock 4.
AFF2	Run permissive forced warning	A forced DI is used as a source for parameter 20.40 Run permissive.	If 20.40 Run permissive uses DIx as the source, check if the bit corresponding to DIx in parameter 10.03 DI force selection is 1.
AFF3	Start interlock forced warning	One or more forced DIs is used as a source for one or more of parameters 20.41 Start interlock 1 ... 20.44 Start interlock 4.	Check all parameters 20.41 Start interlock 1 ... 20.44 Start interlock 4. If any of these parameters uses DIx as the source, check if the bit corresponding to DIx in parameter 10.03 DI force selection is 1.
AFF5	Override new start required	The Safe torque off function was active and has been reset while in Override.	A new start signal is required to start the drive again.
AFF6	Identification run	Motor ID run will occur at next start.	Informative warning.
AFF8	Motor heating active	Preheating is being performed.	Informative warning. Motor preheating is active. Current specified by parameter 21.16. Preheating current is being passed through the motor.
AFFE	Override active	Drive is in Override mode.	Informative warning.
B5A2	Power applied	The drive was powered up or the control board was rebooted successfully.	Informative event.
B681	Hand mode selected	The drive was placed in Hand mode.	Informative event. Check the control panel to ensure that the current control location is correct.
B682	Off mode selected	The drive was placed in Off mode.	Informative event. Check the control panel to ensure that the current control location is correct.
B683	Auto mode selected	The drive was placed in Auto mode.	Informative event. Check the control panel to ensure that the current control location is correct.
2310	Overcurrent	Output current has exceeded internal fault limit. In addition to an actual overcurrent situation, this fault may also be caused by an earth fault or supply phase loss.	Check motor load. Check acceleration times in parameter group 23 Speed reference ramp (speed control) or 28 Frequency reference chain (frequency control). Also check parameters 46.01 Speed scaling, 46.02 Frequency scaling and 46.03 Torque scaling. Check motor and motor cable (including phasing and delta/star connection). Check there are no contactors opening and closing in motor cable. Check that the start-up data in parameter group 99 corresponds to the motor rating plate. Check that there are no power factor correction capacitors or surge absorbers in motor cable. Check for an earth fault in motor or motor cables by measuring the insulation resistances of motor and motor cable. See chapter Electrical installation, section Checking the insulation of the assembly in the Hardware manual of the drive.
FF61	ID run	Motor ID run was not completed successfully.	Check safety circuit connections. For more information, see chapter The Safe torque off function in the Hardware manual of the drive and description of parameter 31.22 STO indication run/stop(page 520). Check the value of parameter 95.04 Control board supply. Check the nominal motor values in parameter group 99 Motor data. Check that no external control system is connected to the drive. Cycle the power to the drive (and its control unit, if powered separately). Check that no operation limits prevent the completion of the ID run. Restore parameters to default settings and try again. Check that the motor shaft is not locked. Check the auxiliary code.

Alarms (Green LED Flashing)

For less severe errors, called alarms, the diagnostic display is advisory. For these situations, the drive is simply reporting that it had detected something unusual. In these situations, the drive:

1. Flashes the green LED on the drive (does not apply to alarms that arise from control panel operation errors).
2. Sets an appropriate bit in an Alarm Word parameter.
3. Overrides the control panel display with the display of an alarm code and/or name

Alarm messages disappear from the control panel display after a few seconds. The message returns periodically as long as the alarm condition exists. Refer to Table A for a list of alarm codes.

Correcting Faults

The recommended corrective action for faults is shown in Table A. The VFD can also be reset to remove the fault. If an external source for a start command is selected and is active, the VFD may start immediately after fault reset.

To reset a fault indicated by a flashing red LED, turn off the power for 5 minutes. To reset a fault indicated by a red LED (not flashing), press RESET from the control panel or turn off the power for 5 minutes. Depending on the value of parameter, digital input or serial communication could also be used to reset the drive. When the fault has been corrected, the motor can be started.

Correcting Alarms

To correct alarms, first determine if the alarm requires any corrective action (action is not always required). Use Table A to find and address the root cause of the problem.

If diagnostics troubleshooting has determined that the drive is defective during the warranty period, contact Carrier.

Control Panel Cleaning

Use a soft damp cloth to clean the control panel. Avoid harsh cleaners which could scratch the display window.

Battery Replacement

A battery is only used in assistant control panels that have the clock function available and enabled. The battery keeps the clock operating in memory during power interruptions. The expected life for the battery is greater than ten years. To remove the battery, use a coin to rotate the battery holder on the back of the control panel. Replace the battery with type CR2032.

ACH580 MAINTENANCE SCHEDULE

These ACH580 Maintenance Schedules are valid for drives manufactured or maintained in 2017 onward. Recommended maintenance intervals and component replacements are based on specified operational and environmental conditions. Annual drive inspections are recommended to ensure the highest reliability and optimum performance.

IMPORTANT: Long term operation near the maximum specified ratings or environmental conditions may require shorter maintenance intervals for certain components.

LEGEND FOR TABLES B-D
I — Inspection (inspection and maintenance action if needed)
P — Performance of on/off-site work (commissioning, tests, measurements, or other work)
R — Replacement

Table B — Maintenance – Annual Actions

RECOMMENDED ANNUAL ACTIONS BY THE USER	
Connections and Environment	
Cabinet door filters IP54	R
Quality of supply voltage	P
Spare Parts	
Spare parts	I
DC circuit capacitors reforming for spare modules and spare capacitors	P
Inspections by User	
IP22 and IP42 air inlet and outlet meshes	I
Tightness of terminals	I
Dustiness, corrosion and temperature	I
Heat sink cleaning	I

Table C — Maintenance Cooling

COOLING	YEARS FROM START-UP						
	3	6	9	12	15	18	21
Fans, IP21 UL (NEMA) Type 1 Frames R1 to R9							
Main cooling fans R0-R5		R		R		R	
Main cooling fans R6-R8 LONGLIFE			R			R	
Auxiliary cooling fan for circuit boards R4v2 89A/IP21 and R4v2 77A/IP21		R		R		R	
Auxiliary cooling fan for circuit boards Only R5 – R8 LONGLIFE			R			R	
Fans, IP55 UL (NEMA) Type 12 Frames R1 to R8 (Not standard offering)							
Main cooling fans R1-R5		R		R		R	
Main cooling fans R6-R8 LONGLIFE			R			R	
Auxiliary cooling fan for circuit boards R1-R2	R	R	R	R	R	R	R
Auxiliary cooling fan for circuit boards R3, R4 LONGLIFE			R			R	
Auxiliary cooling fan for circuit boards R4v2		R		R		R	
Auxiliary cooling fan for circuit boards R5-R8 LONGLIFE			R			R	
Second Auxiliary cooling fan Only R8 LONGLIFE			R			R	

Table D — Maintenance Aging

COOLING	YEARS FROM START-UP						
	3	6	9	12	15	18	21
Common, Control Panel Battery							
Control panel battery			R			R	
Cabinet auxiliary 24 vdc power supplies and buffers >-<				R			
Frequency Converter Frames R1 to R8							
CCU control unit				R			
Frequency Converter Frames R6 to R8							
Flat ribbon cables				R			
DC circuit electrolytic capacitors and discharging resistors			R			R	
ZINT, ZPOW, ZINP, QINT module internal circuit boards				R			

MAIN FAN REPLACEMENT IP21 and IP55 (UL Type 1 and UL Type 12)

The main cooling fan of the VFD has a life span of about 60,000 operating hours at maximum rated operating temperature and drive load. The expected life span doubles for each 18°F drop in the fan temperature (fan temperature is a function of ambient temperatures and drive loads).

Fan failure can be predicted by increasing noise from fan bearings and the gradual rise in the heat sink temperature in spite of heat sink cleaning. If the drive is operated in a critical part of a process, fan replacement is recommended once these symptoms start appearing. Replacement fans are available from Carrier.

To replace the main fan for frame sizes R1 and R2, perform the following (see Fig. F and G):

1. Remove power from drive. Wait 5 minutes and then make sure by measuring that there is no voltage.
2. Remove drive cover.
3. For frame sizes R1, R2, R3 and R4, press together the retaining clips on the fan cover and lift.
4. Disconnect the fan cable.
5. Install the new fan by reversing Steps 2 to 4.
6. Restore power.

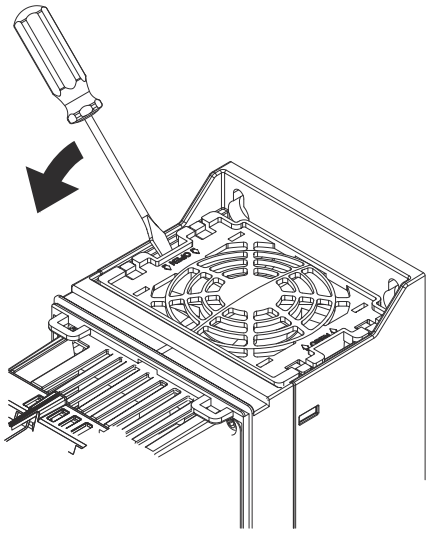


Fig. F — Remove Main Fan (Frame Sizes R1 up to R4)

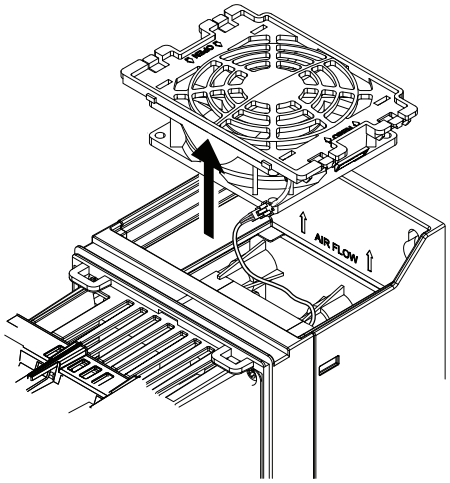


Fig. G — Remove Main Fan (Frame Sizes R1 up to R3)

AUXILIARY COOLING FAN REPLACEMENT IP21 and IP55 (UL Type 1 and UL Type 12)

The VFD IP21 and IP55 / UL Type 1 and 12 enclosures have an additional internal fan to circulate air inside the enclosure.

To replace internal enclosure fan for frame sizes IP55 (UL Type 12) R1, R2, and R3, perform the following (see Fig. H-K):

1. Remove power from drive (R1, R2, and R3).
2. Remove the front cover (R1, R2, and R3).
3. Unplug fan power supply wires from drive (R1, R2, and R3).
4. Remove the finger-guard by inserting a screwdriver into the finger-guard hole (R1, R2 only).
5. Unplug fan power supply wires from drive (R1, R2, and R3).
6. Pull off the plastic housing (R3 only).
7. Pull off the fan (R1, R2, and R3).
8. Install the new fan by following these steps in reverse order (R1, R2, and R3).

NOTE: Make sure that the arrow on the fan points the same direction as the arrow on the drive frame.

CONTROL PANEL CLEANING

Use a soft damp cloth to clean the control panel. Avoid harsh cleaners which could scratch the display window.

BATTERY REPLACEMENT

A battery is only used in assistant control panels that have the clock function available and enabled. The battery keeps the clock operating in memory during power interruptions. The expected life for the battery is greater than ten years. To remove the battery, use a coin to rotate the battery holder on the back of the control panel. Replace the battery with CR2032.

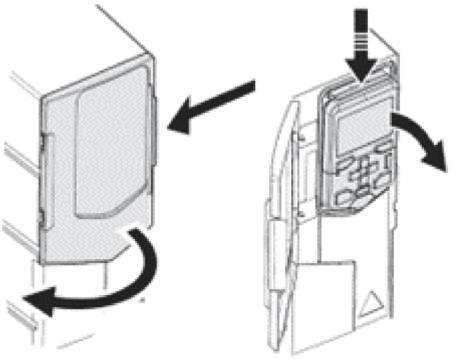


Fig. H — Remove Auxiliary Fan (Frame Sizes R1, R2, R3, R4, and R5)

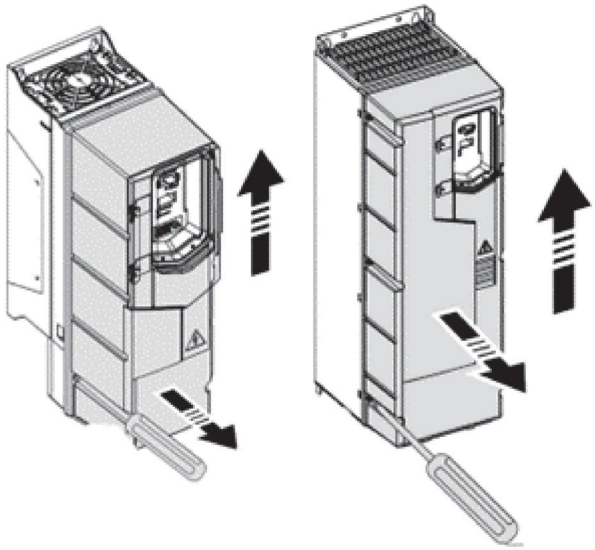


Fig. I — Remove Drive Cover (Frame Sizes R1, R2, R3, R4, and R5)

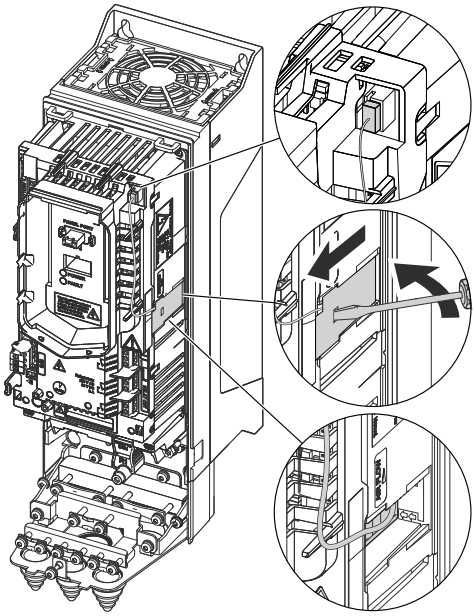


Fig. J — Remove Auxiliary Fan (Frame Sizes R1 and R2)

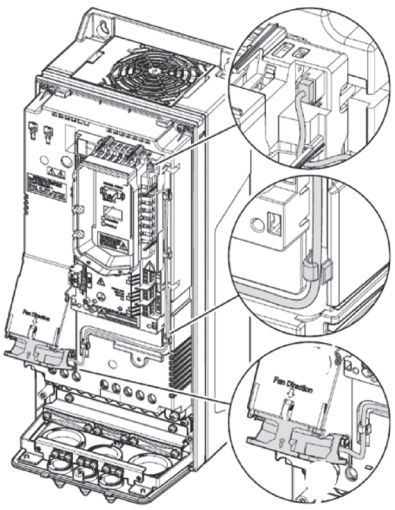


Fig. K — Remove Auxiliary Fan (Frame Sizes R3)

APPENDIX B — ACH580 BRANCH CIRCUIT PROTECTION

This appendix outlines the applicable fuses that can be used for branch circuit protection for ACH580 drives. The drive ACH580 has been tested by ABB in accordance with UL Standard 61800-5-1 on a circuit having available system fault current of 100 kA maximum using fusing protection.

To meet the SCCR Safety Requirements described in UL Standard 61800-5-1, it is recommended to utilize the fusing protection listed in Table E. The use of alternative electrical protection brands is permissible only if the fuses are rated under UL Standards 248-8 (CLASS J) or 248-15 (CLASS T) and have been tested by ABB. For information on approved electrical components, please reach out to your local representative.

VFD FUSE BOX

For the VFD outdoor fan factory-installed option, fuses are in the back side of the VFD enclosure (Fig. L). For fuse selection, refer to Table E.

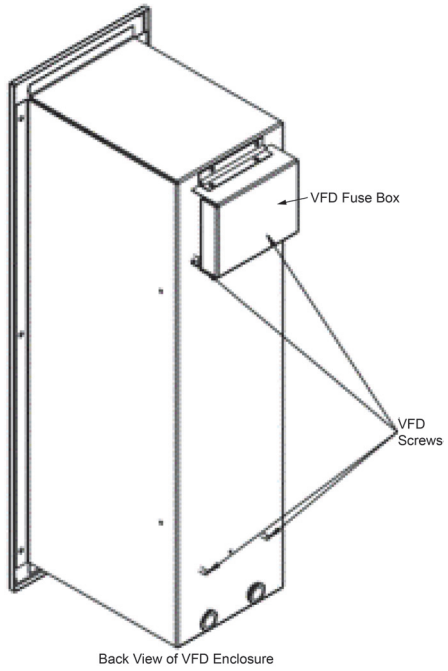


Fig. L — 50XCA Outdoor Fan VFD Factory-Installed Option

Table E — VFD Fuse for SCCR Protection

ACH550 CROSS	ACH580 P/N	FUSE HOLDER CARRIER P/N	FUSE CARRIER P/N	VOLTAGE(V)	POWER(HP)	CURRENT(AMPS)
HK30WA001	HK30WB305	HY11UT030	HY10KB093	208-230	5	16.7
HK30WA002	HK30WB305	HY11UT030	HY10KB093	208-230	5	16.7
HK30WA003	HK30WB306	HY11UT030	HY10KB095	208-230	7.5	24.2
HK30WA008	HK30WB321	HY11UT030	HY10KB090	460	5	7.6
HK30WA009	HK30WB322	HY11UT030	HY10KB092	460	7.5	12
HK30WA010	HK30WB322	HY11UT030	HY10KB092	460	7.5	12
HK30WA021	HK30WB341	HY11UT030	HY10KB090	575	5	6.1
HK30WA022	HK30WB343	HY11UT030	HY10KB093	575	10	11

START-UP CHECKLIST

(Fill out this form on Start-Up and file in job folder)

NOTE: To avoid injury to personnel and damage to equipment or property when completing the procedures listed in this start-up checklist, use good judgment, follow safe practices, and adhere to the safety considerations/information as outlined in preceding sections of this Installation, Start-Up and Service document.

I. PRELIMINARY INFORMATION

50XCA UNIT: MODEL NO. _____ SERIAL NO. _____

FIELD-INSTALLED ACCESSORIES: _____

START-UP DATE: _____

II. PRE-START-UP:

Verify all shipping materials have been removed from the unit.

Is there any shipping damage? _____ If so, where? _____

_____

Will this damage prevent unit start-up? (Y/N) _____

Check power supply. does it agree with unit? (Y/N) _____

Has the ground wire been connected? (Y/N) _____

Has the circuit protection been sized and installed properly? (Y/N) _____

Are the power wires to the unit sized and installed properly? (Y/N) _____

Have condenser and evaporator fan and motor pulleys been checked for proper alignment and do the fan belts have proper tension? (Y/N) _____

Has correct fan rotation or evaporator and condenser been confirmed? (Y/N) _____

Verify condensate drain has been installed per instructions.

Has water been placed in drain pan to confirm proper drainage? (Y/N) _____

Are proper air filters in place and are filters clean? (Y/N) _____

Verify unit is installed within leveling tolerances.

CONTROLS

Have thermostat connections been made and checked? (Y/N) _____

Are all wiring terminals (including main power supply) tight? (Y/N) _____

PIPING

Have leak checks been made at compressor, condenser, evaporator, TXVs (Thermostatic Expansion Valves), solenoid valves, filter driers, and fusible plugs with a leak detector? (Y/N) _____

Locate, repair, and report any leaks.

CHECK VOLTAGE IMBALANCE

Line-to-line volts: AB _____ V AC _____ V BC _____ V

(AB + AC + BC)/3 = Average Voltage = _____ V

Maximum deviation from Average Voltage = _____ V

Voltage imbalance = 100 X (Max Deviation)/(Average Voltage) = _____ %

If over 2% voltage imbalance, do not attempt to start system!

Call local power company for assistance.

II. START-UP

Check indoor (evaporator) fan speed and record. _____

Check indoor (condenser) fan speed and record. _____

After AT least 15 minutes running time, record the following measurements:

	CIRCUIT 1	CIRCUIT 2 (If Applicable)
SUCTION PRESSURE		
SUCTION LINE TEMP		
DISCHARGE PRESSURE		
DISCHARGE LINE TEMP		
SATURATED SUCTION TEMP		
SATURATED CONDENSING		
SUPERHEAT DEGREES		
SUBCOOLING DEGREES		
ENTERING CONDENSER-AIR TEMP		
LEAVING CONDENSER-AIR TEMP		
EVAP ENTERING-AIR DB (dry bulb) TEMP		
EVAP ENTERING-AIR WB (wet bulb) TEMP		
EVAP LEAVING-AIR DB TEMP		
EVAP LEAVING-AIR WB TEMP		

COMPRESSOR AMPS:

L1		
L2		
CONDENSER FAN AMPS:		
SUPPLY FAN AMPS:		

NOTES: _____

_____

_____

_____

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE