Carrier®
HEATING & COOLING

50AH024-060
Single-Package Cooling Units

Installation, Start-Up and Service Instructions

SAFETY CONSIDERATIONS

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

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

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

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock can cause personal injury.

GENERAL

The 50AH024,036,048, and 060 units are single-package, indoor, horizontally-mounted air conditioners of 2, 3, 4 and 5 tons capacity, respectively.

These units can be mounted as factory-shipped single-package units or can be separated and mounted as a split system. If unit is split, the condenser section can be mounted horizontally.

All units are designed to be ducted on both the condenser and evaporator sides. Centrifugal blowers are used to ensure quiet air delivery to the conditioned space. Sound level requirements should be determined before final unit installation site is chosen.

Unit servicing is relatively simple since access to the condenser and evaporator motors, blowers, belt, and pulley is gained through removable swing doors located on bottom of unit. These doors may also be used for cleaning of condenser coils. Unit side panels provide access to control box and pressure switches.

Refrigeration cycle components (e.g., compressor, filter drier, etc.) can be serviced upon removal of the base unit from the space.

INSTALLATION

⚠ WARNING

Determine building alterations required to run piping, wiring, and ductwork. Follow dimensional drawings carefully for ductwork, piping locations, electrical wiring, and overall unit dimensions. Read all installation instructions before starting installation.

The 50AH units are intended for indoor installation only.

Step 1 — Receive and Inspect Unit — Unpack and check unit against shipping order. Inspect carefully for concealed shipping damage. *If unit is damaged or incomplete, file claim with transportation company and advise Carrier immediately.*

Step 2 — Protect Unit from Damage — To maintain warranty, unit must be protected against theft and vandalism and stored indoors at all times.

Step 3 — Provide Unit Support — Refer to Fig. 1–2B for unit dimensions and component locations Refer to Table 1 for unit sizes and weights.

Each unit requires the following field-supplied items:

- 4 threaded suspension rods (⅜-in. - 16 SAE Grade 1 minimum)
- 4 washers
- 4 locknuts

Install the 4 field-supplied rods by suspending them from a suitable ceiling support. Locate rods to mate with 4 outside corner rigging holes shown in Fig. 1 and 3.

The ceiling and ceiling supports of existing buildings may require reinforcements; follow all applicable codes.

Step 4 — Rig and Place Unit — Move and store unit in horizontal position. Provide space around unit for service, filter access, ductwork, and overhead clearance as indicated in Fig. 1.

Using suitable hydraulic lift source, raise unit up to meet bottom of the 4 threaded rods suspended from ceiling. Center unit so that the 4 threaded rods can be easily inserted into the factory-drilled holes at each end. Refer to Fig. 3 for rigging details.

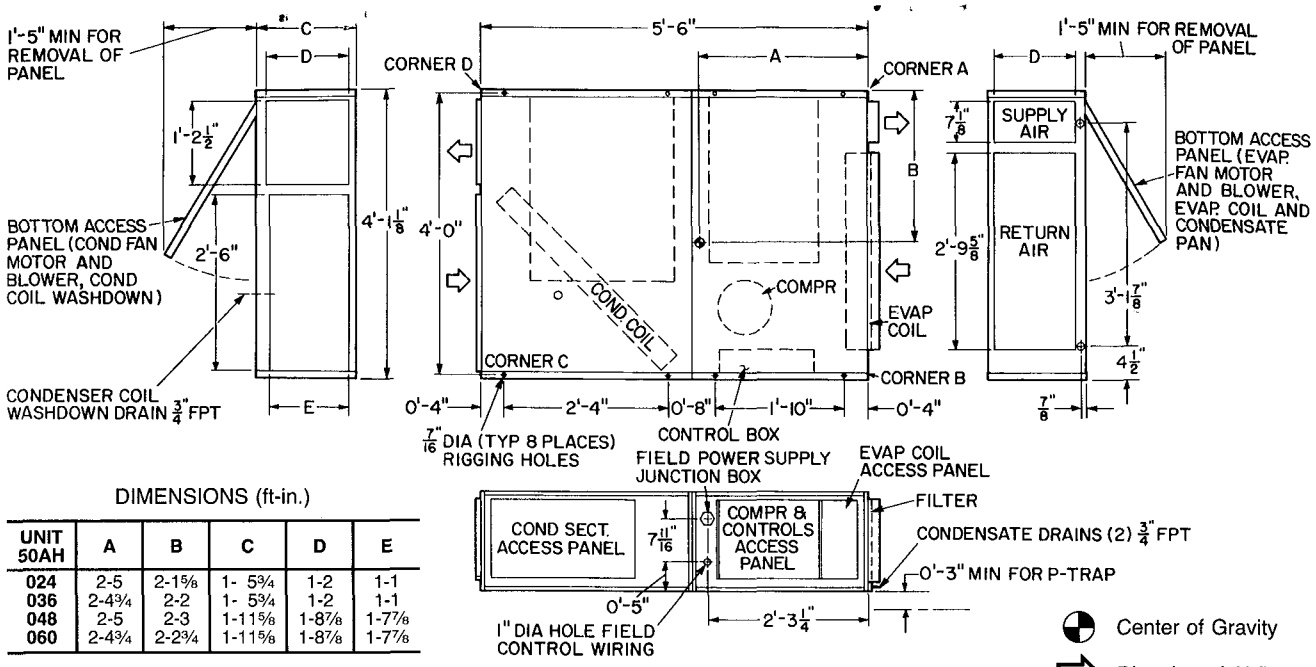
Apply washers and locknuts on ends of each of the 4 rods.

Tighten locknuts sufficiently so that unit weight is supported entirely by the 4 rods. Level unit within the space by adjusting locknuts.

IMPORTANT: Unit must be level to operate properly.

NOTE: The 2 factory-drilled holes in the middle of unit can be used for support if a split system application is desired. If required, an accessory vibration isolator package is available for use to minimize vibration that may be transmitted to building structure.

Step 5 — Make Piping Connections — Two ¾-in. pipe thread condensate drain connections are provided below the evaporator coil. One ¾-in. pipe thread connection is provided for condenser coil washdown. One of the evaporator drains is plugged at the factory; plug must be removed when making field connections. The condenser washdown pan is plugged at the factory. This drain is to be used only when condenser coil is being cleaned; plug must be replaced when cleaning is completed.



DIMENSIONS (ft-in.)

UNIT 50AH	A	B	C	D	E
024	2-5	2-1⅝	1- 5¾	1-2	1-1
036	2-4¾	2-2	1- 5¾	1-2	1-1
048	2-5	2-3	1-11⅝	1-8⅞	1-7⅞
060	2-4¾	2-2¾	1-11⅝	1-8⅞	1-7⅞

Fig. 1 — Dimensions

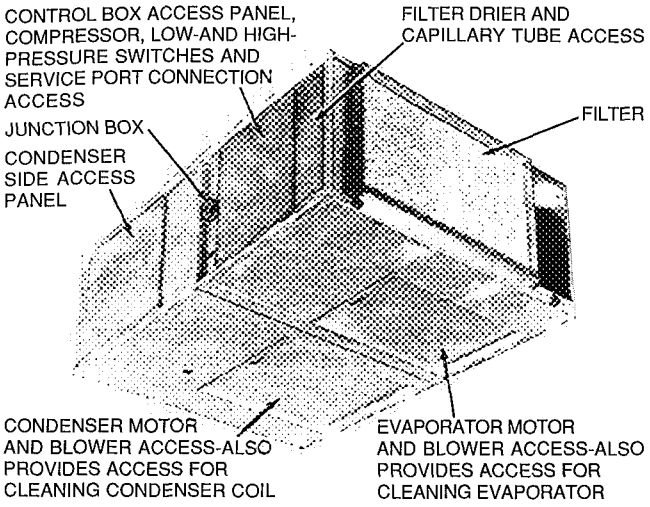
Table 1 — Physical Data

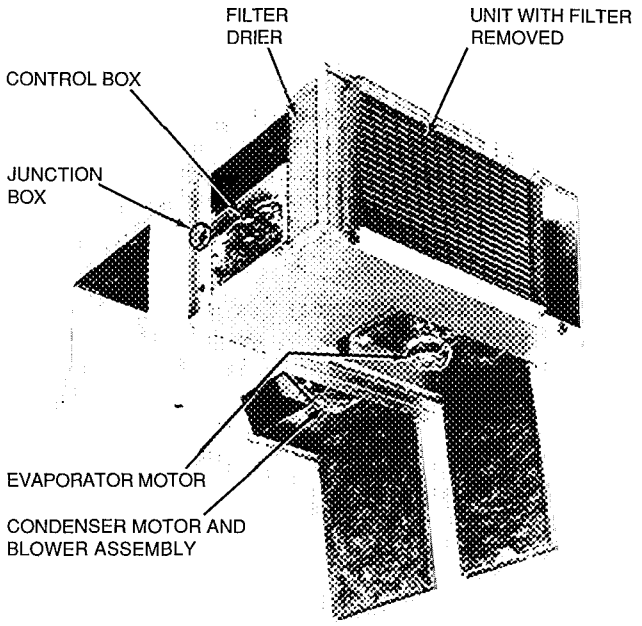
UNIT 50AH	024	036	048	060
SHIPPING WEIGHT (lb)*	560	590	690	700
OPERATING WEIGHT (lb)				
Base Unit	450	480	580	590
REFRIGERANT TYPE		R-22		
Operating Charge (lb)†	5 4	5 5	8.0	7.6
COMPRESSOR — TYPE	Scroll	Reciprocating	Scroll	
Quantity...Model	(1).. ZR23K1	(1)...CR35K6	(1) ZR49K2	(1) .ZR57K2
Oil (oz)	24	45	48	54
HPS Setting (psig)				
Cutout		426 ± 7		
Reset		320 ± 20		
LPS Setting (psig)				
Cutout		27 ± 4		
Reset		67 ± 7		
CONDENSATE DRAIN CONNECTION				
Size (in.)...Type		¾...FPT		
CONDENSER FAN	Centrifugal — Direct-Drive	Centrifugal — Belt Drive		
Nominal Cfm	1350	1750	2250	2450
Maximum Rpm	1100		1500	
Blower Size (in.)	12 x 6		12 x 9	
Pulley Pitch Diameter (in.)				
Blower	None	5.0	6 0	6.0
Motor (Variable)	None	2.4-3 4	1.9-2.9	2.4-3 4
Motor Hp	½	¾	1.0	1.5
Motor Rpm	825	1725	1725	1725
EVAPORATOR FAN		Centrifugal — Direct-Drive		
Nominal Cfm	800	1200	1600	2000
Maximum Rpm	1100	1150	1050	1050
Blower Size (in.)	10 x 5	10 x 6	10 x 8	10 x 8
Motor Hp	⅓	½	¾	¾
Motor Rpm	1100/850	1150/950	1050/900	1050/900
CONDENSER COIL		Copper Tubes — Aluminum Fins		
Size (L x H) (in.)	40 x 15	40 x 16	40 x 22	
Number of Rows...Fins/in.	4...13.6	4 17	4...13.6	
EVAPORATOR COIL		Copper Tubes — Aluminum Fins		
Size (L x H) (in.)	34 x 15	34 x 16	34 x 22	
Number of Rows...Fins/in.	4...14.4	4 ..15	4. 14.4	
INDOOR-AIR FILTERS		Factory-Supplied Cleanable Type		
Number...Size (in.)	1...14 x 34 x 1		1.. 21 x 34 x 1	

LEGEND

HPS — High-Pressure Switch
LPS — Low-Pressure Switch

*Shipping weights include base unit plus packaging.
†If components are to be split, additional refrigerant will be needed Refer to Fig. 4-7 for charging charts
NOTE: If components are to be split, the maximum length of refrigerant tubing to be used is 50 equivalent ft, assuming components will be installed in same horizontal plane. If components are not to be installed in same horizontal plane, contact your Carrier representative for more information. For additional piping information, refer to Carrier System Design Manual, Part 3.





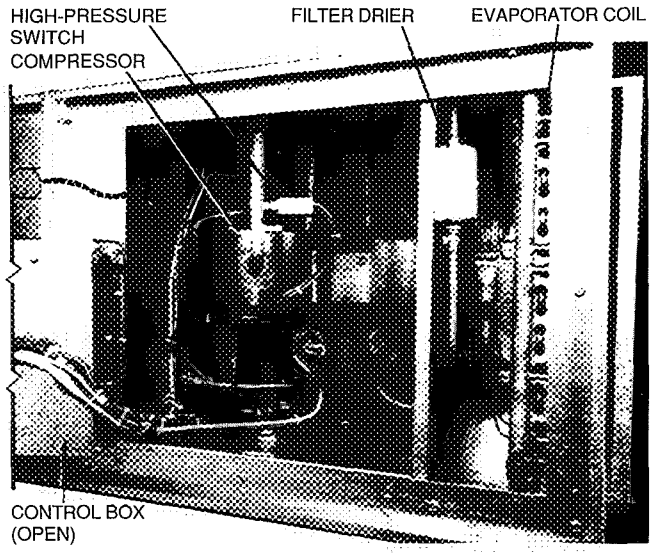


Fig. 2A — Component Locations (024,036,060)

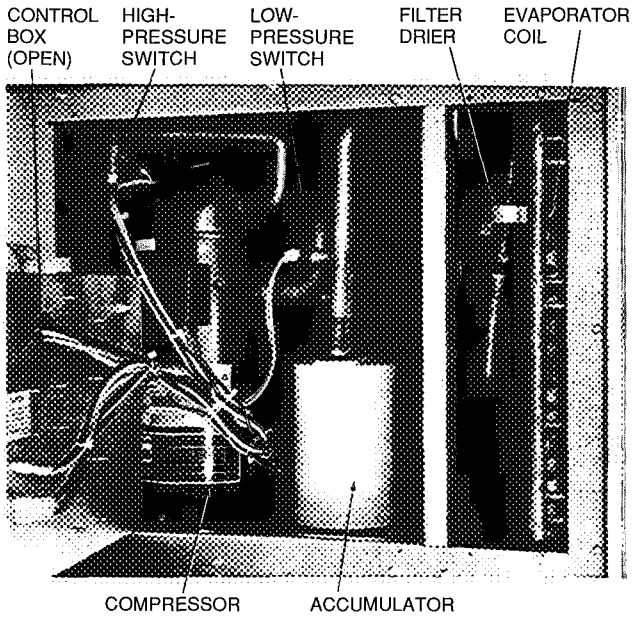
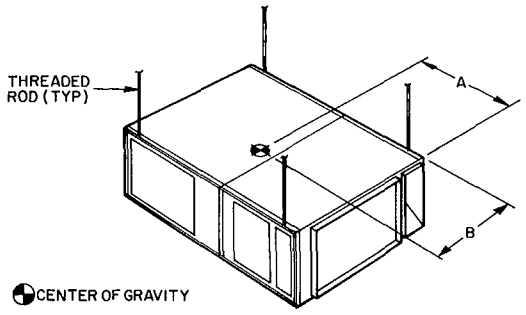


Fig. 2B — Component Locations (048)



CENTER OF GRAVITY

UNIT 50AH	DIMENSIONS (in.)	
	A	B
024	29.0	25.6
036	28.8	26.0
048	29.0	27.0
060	28.8	26.8

NOTE: Fasten threaded rods through holes in end frames as shown Use 2 rods on each side of unit for a total of 4.

⚠ CAUTION

All panels must be in place when rigging.

Fig. 3 — Rigging Details

Step 6 — Install Ductwork — Use flexible ductwork to attach duct to unit and to help control transmission of vibrations to building structures. Attach ductwork to the return and supply ends of both coils.

If unit is located with condenser close to outside of building, install a field-supplied rainhood. Hood intake dimensions should be same as condenser return-air dimensions. In addition, install a triple-layer bird screen over rainhood intake to eliminate possibility of insects, birds, water, or debris from entering unit.

Step 7 — Make Electrical Connections — Connect power wiring to junction box located on unit side near control box access panel. All wiring must comply with National Electrical Code (NEC) and all local code requirements.

Operating voltage to compressor must be within voltage range as indicated on unit nameplate. On 3-phase units, voltages between phases must be balanced within 2% and current must be balanced within 10%. Contact local power company for correction of improper voltage or phase imbalance. Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation would invalidate any applicable Carrier warranty.

Install a fused disconnect per NEC on the 5-ton (060) 230-1-60 unit. Refer to unit nameplate and Table 2 for fuse sizes and wire amperages for all units.

NOTE: For split systems, 8 suspension rods are required. Refer to Splitting Systems section below.

Splitting Systems — The 50AH roomtop units may be split into 2 sections, if desired, with condensing section mounted remotely either horizontally or vertically. If sections are installed in same horizontal plane they may be separated by up to 50 equivalent ft of tubing.

Condensing section must be located in same plane as, or above, evaporator section to maintain the liquid refrigerant seal at the expansion device. This permits expansion device to feed liquid refrigerant to evaporator coil properly. To split sections (some of the following steps may be eliminated depending on particular application):

1. Disconnect all electrical power to unit.
2. Remove 4 bolts connecting the 2 sections.
3. Remove top panels from each section.
4. Reclaim the refrigerant from the system using both the high- and low-pressure ports.
5. Cut refrigerant piping in the evaporator section just inside the partition between the 2 sections.
6. Unsweat the cut portions of the refrigerant piping in evaporator section at the closest bell joint. The bell joints are used to connect field-supplied refrigerant piping to evaporator section. Cut and braze a length of tubing to extend refrigerant piping outside the evaporator section.
7. Cut condenser-fan motor wiring at the partitions separating condenser and evaporator sections.
8. In the condenser section, install a junction box adjacent to the D-shaped grommet.
9. Install evaporator and condensing sections in desired locations. Refer to Steps 10-12 below.
10. Use appropriate length of no. 16 American Wire Gage (AWG) (minimum), 5/64-in. insulated copper wire to reconnect cut condenser-fan motor wires. Make connections in junction boxes installed in earlier steps. Follow all applicable electrical codes.
11. Use sufficient length of refrigeration piping to reconnect piping cut in previous step. Refer to Carrier System Design Manual, Part 3, for additional piping data.
12. Replace top panels on each section.

Table 2 — Electrical Data

UNIT 50AH	V-PH (60 Hz)	VOLTAGE RANGE		COMPRESSOR		FAN MOTORS				POWER SUPPLY	
						Evaporator		Condenser		Min Ckt Amps	MOCP Amps
		Min	Max	RLA	LRA	Hp	FLA	Hp	FLA		
024	230-1	207	254	11.5	62.5	.33	1.32	.50	3.40	19.1	25
036	230-1	207	254	16.2	96 0	50	3.20	75	6.06	29.5	40
	208/230-3	187	254	10 2	75 0	50	3 20	1 0	3 93	19.9	25
	460-3	414	508	4.3	37 0	50	1.50	1 0	1.97	8.8	15
048	230-1	207	254	23 7	129 0	75	4 0	1 0	8.35	42 0	60
	208/230-3	187	254	13 5	99 0	75	4 0	1 0	3 93	24 8	35
	460-3	414	508	7 4	49 5	75	2 15	1 0	1 97	13 4	15
	575-3	518	632	5 8	40 0	75	1 40	1 0	1 45	10 1	15
048*	208/230-3	187	254	13 5	99 0	1 5	5 6	1 0	3 93	26 4	35
	460-3	414	508	7 4	49 5	1.5	2 8	1 0	1 97	14 0	20
060	230-1	207	254	28 8	169 0	75	4 0	1 5	9 50	49 5	70
	208/230-3	187	254	17 3	123 0	75	4 0	1 5	4 82	30 4	45
	460-3	414	508	9.0	62.0	.75	2 15	1.5	2 41	15 8	25
	575-3	518	632	7.1	50.0	75	1.40	1 5	1 90	12 2	20
060*	208/230-3	187	254	17 3	123 0	1 5	5 6	1 5	4 82	32.0	40
	460-3	414	508	9.0	62.0	1 5	2 8	1 5	2 41	16.5	25

LEGEND

HACR — Heating, Air Conditioning, and Refrigeration
Hp — Horsepower
FLA — Full Load Amps
LRA — Locked Rotor Amps
MOCP — Maximum Overcurrent Protection (HACR breaker)
RLA — Rated Load Amps

*Special order evaporator-fan motor nameplate data.

13 Recharge unit with R-22 following Charging Charts (Fig. 4-7) in these instructions.

After splitting sections, additional refrigerant must be added to system to ensure proper refrigerant charge. The amount of refrigerant to be added depends on length of tubing added to system and operating temperatures of system. Refer to Carrier System Design Manual, Chapter 3.

Since standard roomtop unit has negligible line losses, splitting the system can increase line loss and decrease system capacity. Capacity reduction can be determined by referring to Carrier System Design Manual.

Field Control Wiring — Install a Carrier-approved accessory thermostat assembly according to installation instructions provided by thermostat manufacturer. Locate thermostat assembly on a solid wall in the conditioned space away from drafts to sense average room temperature.

Using thermostat cable or equivalent single leads of no. 18 AWG colored wire, route cable or wire from the subbase terminals, up and through connector on unit side (below power lead junction box) and connect to low-voltage terminal block inside the control box.

Thermostat Wire — Use 18 gage for 0-ft to 50-ft long wires and 16 gage for 51- to 75-ft wire lengths.

Step 8 — Fan Speed — Adjust fan speed to meet jobsite conditions. Refer to Tables 3-5 to determine fan speed settings.

DIRECT DRIVE MOTORS — The evaporator-fan motor factory speed setting is shown on label diagram affixed to base unit. If other than factory setting is desired, refer to label diagram for motor reconnection.

BELT DRIVE MOTORS — The condenser-fan motors on 50AH036-060 units are belt drive The 50AH024 has a direct-drive motor.

Table 3 — Evaporator-Fan Performance

AIRFLOW (cfm)	UNIT SIZE — 50AH							
	024		036		048*		060*	
	ESP	Fan kW	ESP	Fan kW	ESP	Fan kW	ESP	Fan kW
600	60	20	—	—	—	—	—	—
700	54	.22	—	—	—	—	—	—
800	43	.24	—	—	—	—	—	—
900	.29	26	.69	.44	—	—	—	—
1000	.11	29	.57	.46	—	—	—	—
1100	—	—	.42	.49	1.10	45	1 11	.52
1200	—	—	.23	.52	1.01	.49	1.045	.55
1300	—	—	—	—	.90	51	.97	.57
1400	—	—	—	—	.79	.55	.88	.59
1500	—	—	—	—	67	.58	.78	.62
1600	—	—	—	—	.54	.61	.67	.64
1700	—	—	—	—	39	.64	.53	.67
1800	—	—	—	—	22	.67	39	.70
1900	—	—	—	—	03	70	24	.74
2000	—	—	—	—	—	—	07	.78

CFM — Cubic Feet Per Minute
ESP — External Static Pressure (in. wg)
kW — Total Fan Motor Power Input (kilowatts)

*Standard direct drive indoor-fan motor (IFM). For optional belt drive IFM performance, see following table.

NOTES:
1. Above fan performance is based on wet coil and deducted casing losses, and clean factory-installed permanent cleanable filter.
2. Evaporator fans are direct drive (except 048, 060 special order indoor fan motor option).
3. Interpolation is permissible, do not extrapolate.

Table 4 — Belt Drive Evaporator-Fan Performance*

AIRFLOW (cfm)	UNIT SIZE — 50AH			
	048		060	
	ESP	Fan kW	ESP	Fan kW
1800	—	—	—	—
1850	—	—	—	—
1900	—	—	—	—
1950	81	1.03	—	—
2000	72	1.05	—	—
2050	63	1.07	—	—
2100	55	1.08	1.02	1 17
2150	47	1 11	93	1.21
2200	42	1 14	84	1 24
2250	34	1.17	75	1 27

*Special order only.

NOTE: Pulley setting must be adjusted to limit cfm to 450 cfm/ton *maximum.* Unit operation beyond that limit may result in blow-off and condensate problems

Table 5 — Condenser Fan Performance

UNIT 50AH	AIRFLOW (cfm)	EXTERNAL STATIC PRESSURE (in. wg)													
		0.0		0.1		0.2		0.3		0.4		0.5		0.6	
		Turns	kW	Turns	kW	Turns	kW	Turns	kW	Turns	kW	Turns	kW	Turns	kW
024	1525	Note 4	.66	—	—	—	—	—	—	—	—	—	—	—	—
	1475	—	—	Note 4	.64	—	—	—	—	—	—	—	—	—	—
	1400	—	—	—	—	Note 4	63	—	—	—	—	—	—	—	—
	1350	—	—	—	—	—	—	Note 4	.62	—	—	—	—	—	—
	1300	—	—	—	—	—	—	—	—	Note 4	.62	—	—	—	—
036	1650	2	.84	—	—	—	—	—	—	—	—	—	—	—	—
	1600	—	—	2	.82	—	—	—	—	—	—	—	—	—	—
	1550	—	—	—	—	2	80	—	—	—	—	—	—	—	—
	1500	3	72	—	—	—	—	2	78	1	.84	—	—	—	—
	1450	4	.63	3	.70	—	—	—	—	2	.76	1	.83	—	—
	1400	—	—	4	61	3	.68	—	—	—	—	—	—	1	81
	1350	5	51	—	—	—	—	3	.67	—	—	2	.73	—	—
	1300	—	—	5	50	4	.57	—	—	3	.65	—	—	2	71
048	2700	2	.90	—	—	—	—	—	—	—	—	—	—	—	—
	2600	—	—	2	87	—	—	—	—	—	—	—	—	—	—
	2550	3	.81	—	—	—	—	—	—	—	—	—	—	—	—
	2450	—	—	3	77	2	.83	1	.89	—	—	—	—	—	—
	2350	—	—	—	—	—	—	2	80	1	86	—	—	—	—
	2300	4	.68	—	—	3	.74	—	—	—	—	0	.90	—	—
	2200	—	—	4	66	—	—	—	—	2	.77	1	.82	0	.86
060	3100	3	1.34	—	—	—	—	—	—	—	—	—	—	—	—
	3000	—	—	3	1.32	—	—	—	—	—	—	—	—	—	—
	2900	—	—	—	—	—	—	2	1 39	—	—	—	—	—	—
	2850	4	1.11	—	—	3	1.24	—	—	—	—	—	—	—	—
	2750	—	—	4	1 07	—	—	—	—	2	1.32	—	—	—	—
	2700	—	—	—	—	—	—	3	1 17	—	—	—	—	—	—
	2650	—	—	—	—	—	—	—	—	—	—	—	—	1	1.37
	2600	5	.95	—	—	4	1.01	—	—	—	—	2	1.26	—	—
	2550	—	—	—	—	—	—	—	—	3	1.12	—	—	—	—
	2500	—	—	5	92	—	—	—	—	—	—	—	—	—	—
	2450	—	—	—	—	—	—	4	.97	—	—	—	—	2	1 21
	2400	—	—	—	—	5	.90	—	—	—	—	3	1 08	—	—

CFM — Cubic Feet Per Minute
kW — Total Fan Motor Power Input (kilowatts)

NOTES:
1 Above fan performance is based upon coil and deducted casing losses only.
2. External static pressure (ESP) is measured in inches water gage (in. wg).
3. Interpolation is permissible. Do not extrapolate.
4. Condenser fan on unit size 024 only, is direct drive.
5 Minimum one turn open of motor pulley is required on unit sizes 036 and 060
6. Number of turns open applies to field setting of motor pulley
7 Factory setting as follows: 036, 5 turns open; 048, 2 turns open; 060, 5 turns open

START-UP

Unit Preparation — Make sure unit has been installed in accordance with installation instructions and applicable codes.

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

Internal Wiring — Check all electrical connections in unit control boxes and tighten as required.

Refrigerant Service Valves — Each unit system has 3 Schrader-type service ports, one on the suction line, one on the compressor discharge line, and one for low-ambient damper kit. Be sure that caps on the ports are tight. One Schrader-type valve is located under both the high-pressure switch and low-pressure switch.

Compressor Rotation — On 50AH048,060, 3-phase units, it is important to be certain compressor is rotating in the proper direction. To determine whether or not compressor is rotating in the proper direction:

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

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

1. Note that the condenser fan may also be rotating in the wrong direction.
2. Turn off power to the unit.
3. Reverse any two of the unit power leads.
4. Reapply power to the compressor.

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

NOTE: When the compressor is rotating in the wrong direction, the unit will sound louder than normal and will not provide cooling.

Crankcase Heater — A crankcase heater is standard on 50AH036 only, heater is energized as long as there is power to the unit. Energize heater 24 hours prior to unit start-up.

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

TO SHUT OFF UNIT — Set system selector switch at OFF position or reset thermostat at a position above room temperature. Units are equipped with either Time Guard® II control (50AH024,048,060 — single phase only) or Cycle-LOC™ protective device (all other units).

Time Guard II control automatically prevents compressor from restarting for at least 5 minutes after a shutdown, preventing short cycling of compressor if thermostat is rapidly changed.

Cycle-LOC protective device shuts unit down on any safety trip. The protective device causes an indicator light on the thermostat to light upon safety trip. Be sure to check reason for safety trip before restarting unit. Compressor restart is accomplished by manual reset at the thermostat by turning the selector switch to OFF and then to ON position.

SERVICE

ELECTRIC SHOCK HAZARD

Open all remote disconnects before servicing this equipment.

IMPORTANT: If repairs to refrigerant cycle components (e.g., compressor, filter drier, etc.) are required, reclaim all refrigerant from the system by using both high- and low-pressure ports. Then remove base unit from the space.

Filters — Filters are cleanable and should be inspected and cleaned at regular intervals. They are located in front of the evaporator coil and may be removed by sliding them horizontally out to edge of unit. See Fig. 1–2B. No tools are required for installation or removal of filters.

Condenser Coil — The condenser coil is accessible through the bottom access door marked condenser section, or through side access panel on condenser section. Use a stiff brush when cleaning coil.

Connect the condenser washdown pan drain connection (¾-in. FPT) to the building drain using a ¾-in. MPT hose. Entering through unit bottom condenser access door, use a water hose or other suitable equipment to flush out dirt and wash down coil. *Be careful not to force water spillage out of condenser washdown pan.*

Evaporator Coil — The evaporator coil is accessible for cleaning through the bottom access door marked "Evaporator Section." When necessary, wash coil with a commercial cleaner (Oakite 164) or dishwasher detergent using a pressurized spray canister. Flush coil from return-air duct side and *take care not to get water in ductwork or unit insulation.*

Condensate Drain — Clean and empty drain pan at least once a year to prevent sludge buildup.

Lubrication — Lubrication of the condenser and evaporator motors is not necessary since both are equipped with permanently lubricated bearings. *Do not oil.*

Motor Speed Adjustment — The evaporator motors are all direct drive, single speed and require no adjustment.

Unit 50AH024 Condenser Motor — Condenser motor is direct drive, single speed and requires no adjustment.

Unit 50AH036-060 Condenser Motor — All 50AH036-060 units contain belt-driven adjustable-pulley condenser fan systems. All 50AH036-060 unit fan motors are shipped with adjustable pulley 5 turns open and can be adjusted to increase fan speed.

Blower Wheel Servicing — In-space servicing is recommended for the evaporator and condenser blowers. Both are removed by loosening and removing the 4 screws that hold them in place. In both cases, the entire assembly is then moved outside of the base unit. Once outside, the blower wheel and condenser shaft bearings and/or evaporator motor can be serviced.

Control Box Side Access Panel — The control box side access panel is held in place with ¼-in. self-retaining fasteners. When these fasteners are pulled, the access panel can be turned around 180 degrees so that its metal lip will line up with the metal lip on bottom of unit. This enables the access panel cover to hang down, exposing the base unit wiring diagram and enabling the service person to work more freely.

Refrigerant Charge — Amount of refrigerant charge is listed on unit nameplate (also refer to Table 1). Refer to Carrier GTAC II; Module 5; Charging, Recovery, Recycling, and Reclamation manual and the following procedure.

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

NO CHARGE — Use standard evacuating techniques. After evacuating system, weigh in the specified amount of refrigerant. (Refer to Table 1.)

LOW CHARGE COOLING — Using Cooling Charging Charts, Fig. 4-7, vary refrigerant until the conditions of the appropriate chart are met. Note the charging charts are different from type normally used. Charts are based on charging the units to the correct superheat for the various operating conditions. Accurate pressure gage and temperature sensing device are required. Connect the pressure gage to the service port on the suction line. Mount the temperature sensing device on the suction line and insulate it so that surrounding ambient temperature does not affect the reading. Indoor-air cfm must be within the normal operating range of the unit.

TO USE COOLING CHARGING CHART — Take the ambient temperature and read the suction pressure gage. Refer to appropriate chart to determine what suction temperature should be. If suction temperature is high, add refrigerant. If suction temperature is low, carefully reclaim some of the charge. Recheck the suction pressure as charge is adjusted.

Example: (Fig. 5)

Ambient Temperature ..... 85 F
Suction Pressure ..... 70 psig
Suction Temperature should be .... 47 F
(Suction Temperature may vary ± 5 F.)

If Chargemaster® charging device is used, temperature and pressure readings must be accomplished using the charging chart.

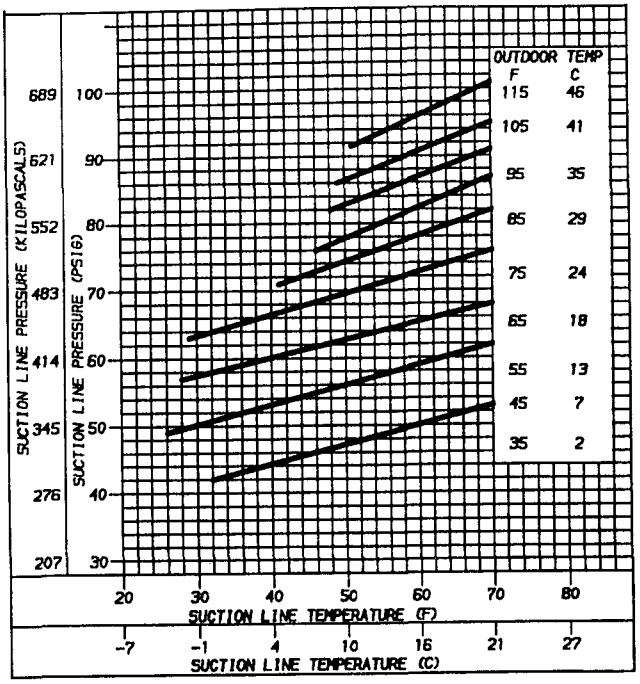


Fig. 4 — Charging Chart — 50AH024

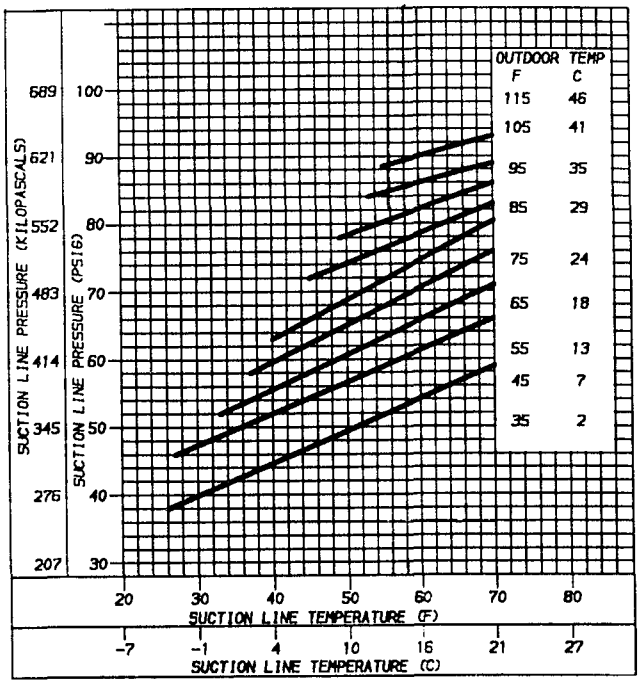


Fig. 6 — Charging Chart — 50AH048

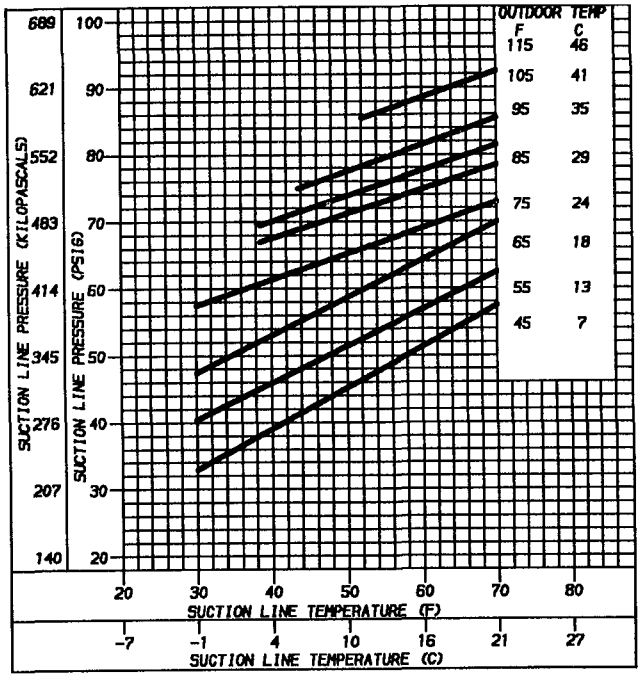


Fig. 5 — Charging Chart — 50AH036

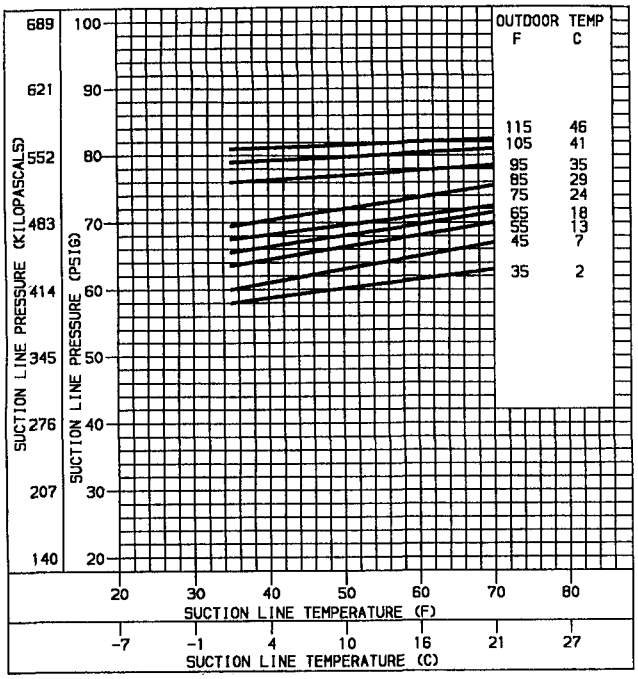
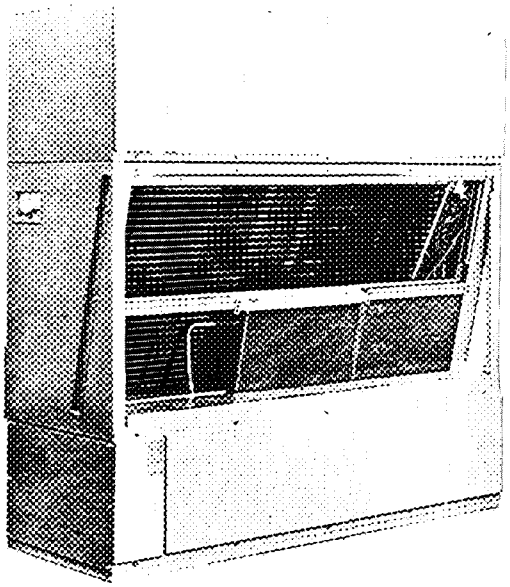


Fig. 7 — Charging Chart — 50AH060

Carrier

50B

Installation Instructions



Filing Instructions Page 28

50BA,BB,BC024 SELF-CONTAINED AND CONDENSERLESS WEATHERMAKERS

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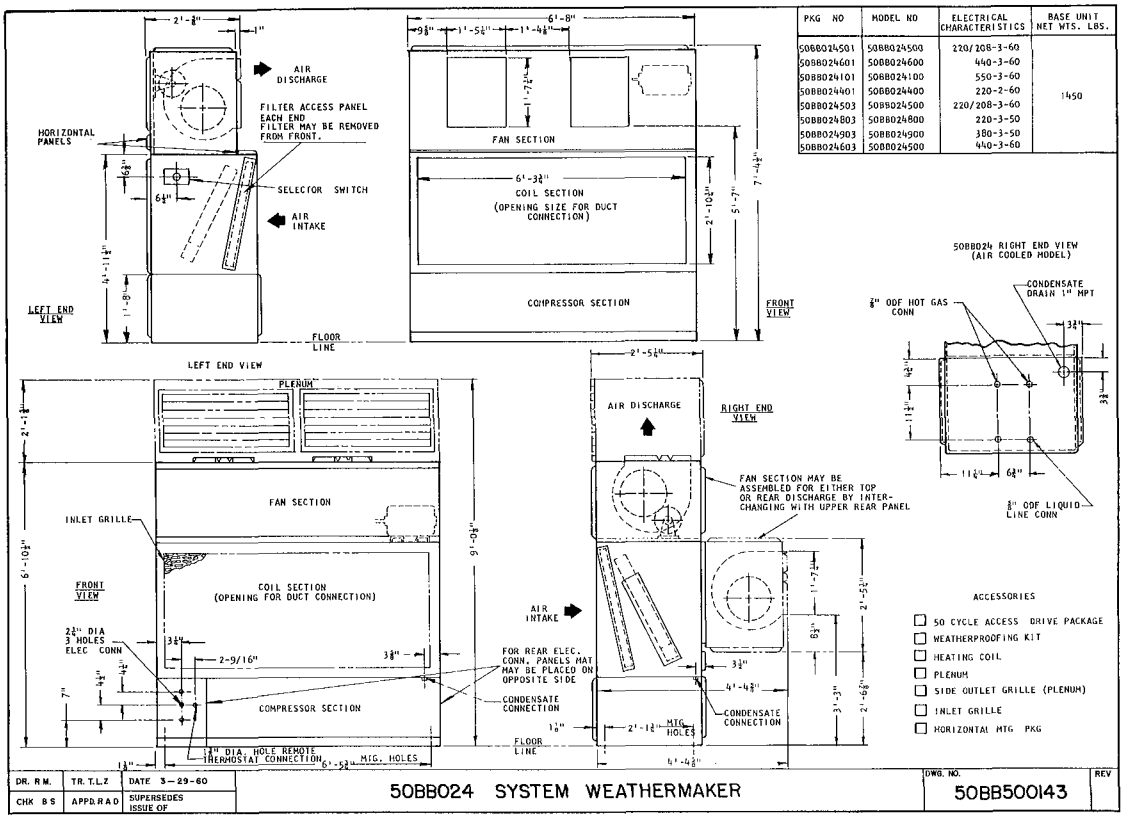


FIG. 1 - DIMENSION DRAWING - SELF-CONTAINED UNITS

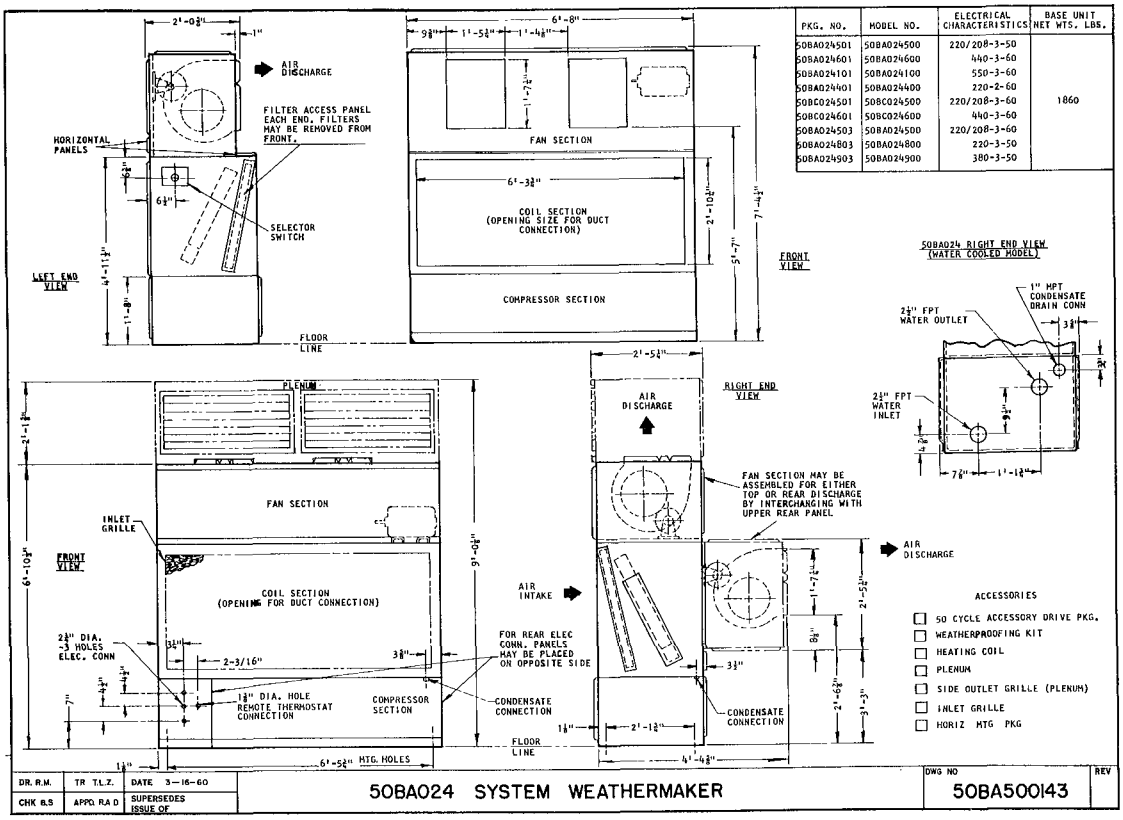


FIG. 2 - DIMENSION DRAWING - CONDENSERLESS UNITS

CONTENTS

INTRODUCTION

The 50B models are available in two models, a self-contained water-cooled unit and a condenserless (air cooled) unit. The base unit components are accessible from the front or back with access being provided on one side for electrical connections, and the other side for the piping connections.

The thermostatic expansion valve is accessible through an access panel on the piping end; the fan motor and drive from the front and back. The liquid valves are remote from the condenser for accessibility. The front and rear panels are removable. The control center is attached with four screws and is removable for servicing.

Five possible fan installation arrangements are shown in Fig. 11.

The 50BA and BC are self-contained water-cooled units. The 50BB024 is a condenserless version adaptable for air-cooled or heat pump application.

Location of unit components and service access panels are shown in Fig. 3, 4, 5, and 6.

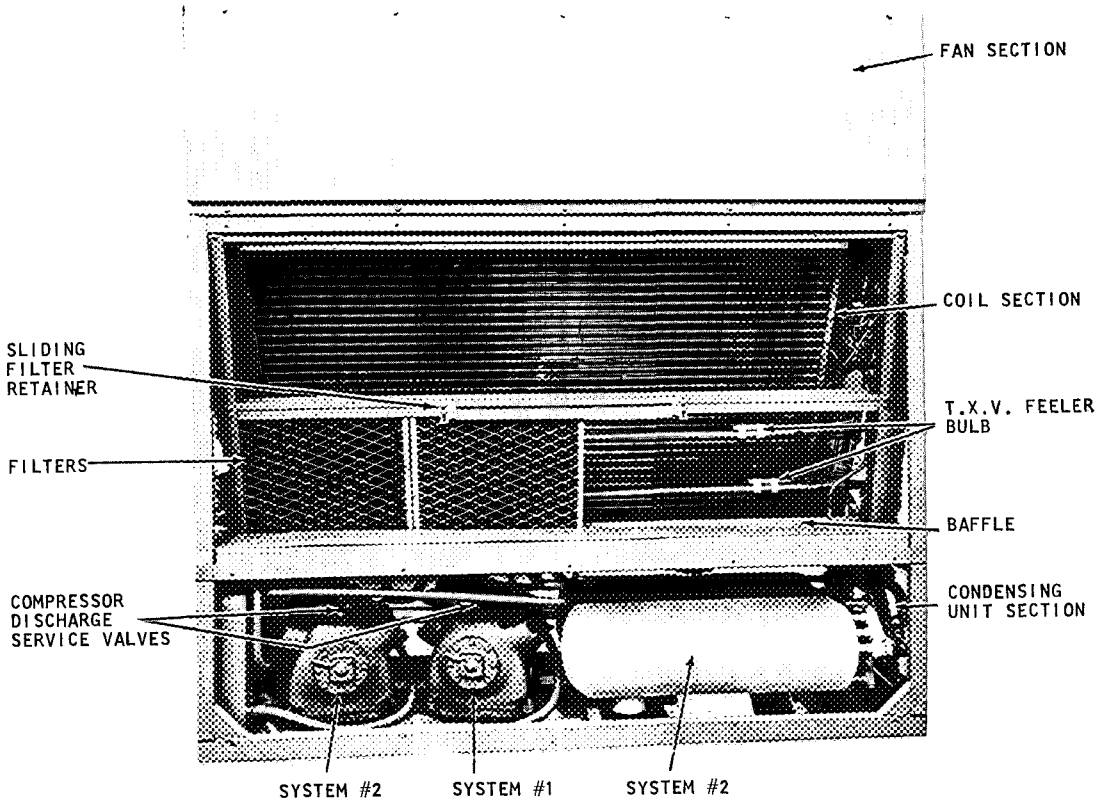


FIG. 3 - 50BA024 UNIT (COMPRESSOR SIDE PANEL REMOVED) FRONT OF UNIT

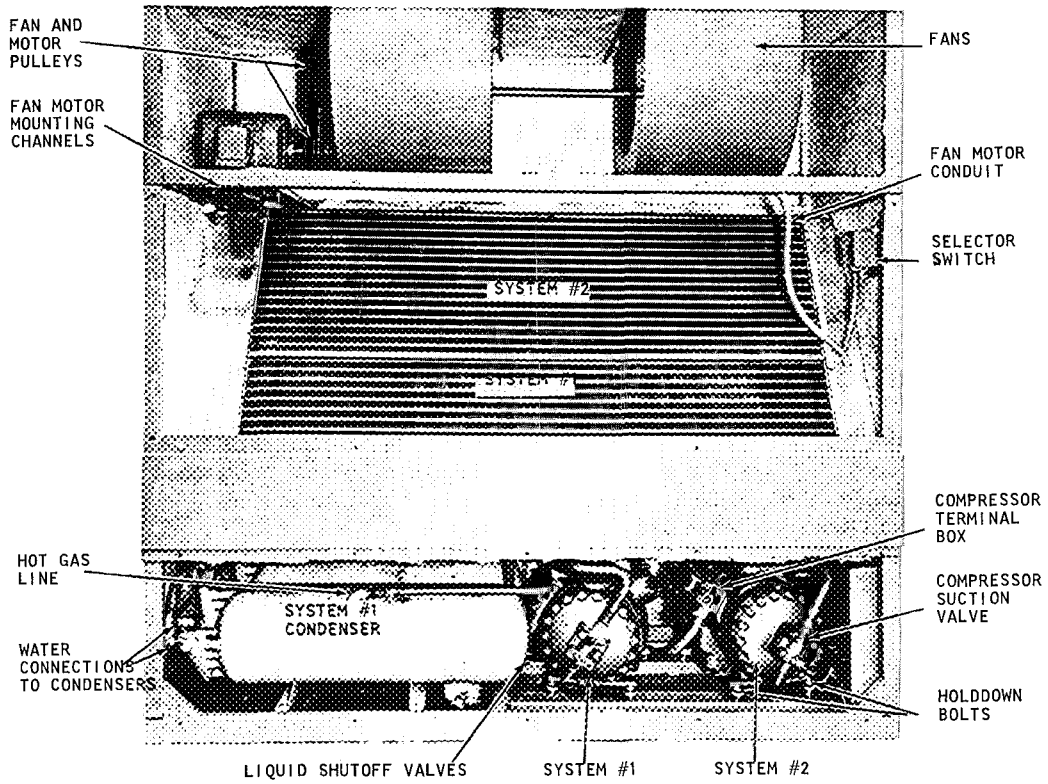


FIG. 4 - 50BA024 UNIT (REAR PANELS REMOVED)

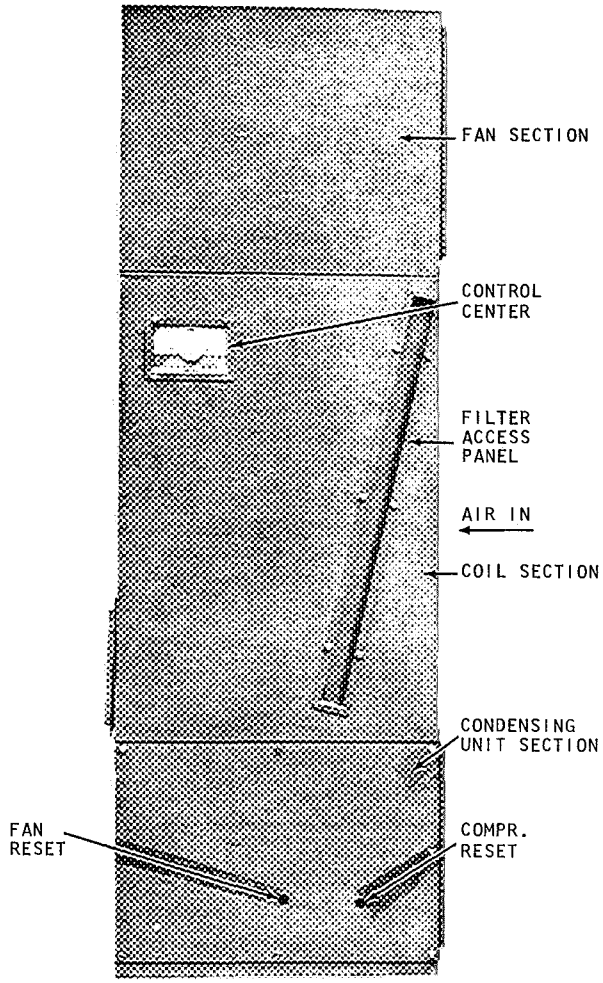


FIG. 5 - 50BA024 UNIT - LEFT SIDE OF UNIT

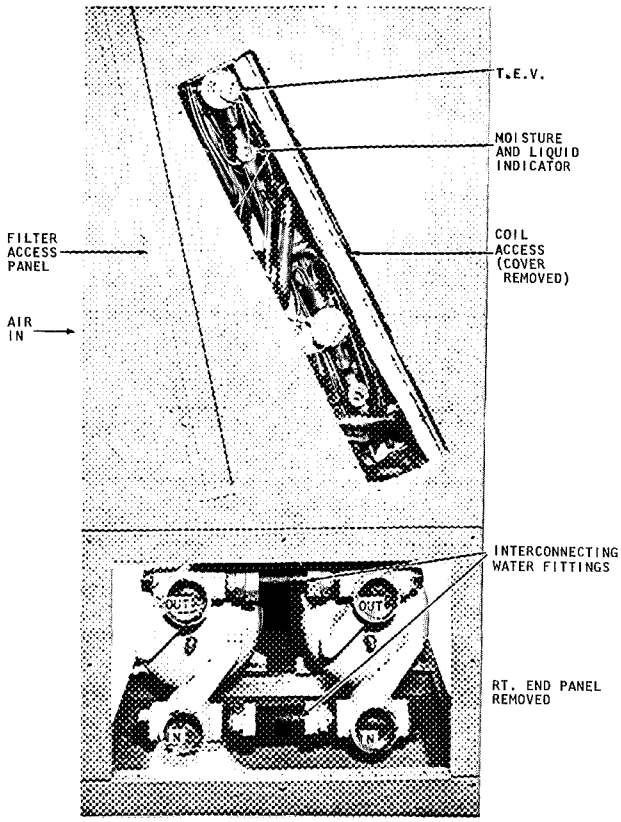


FIG. 6 - 50BA024 UNIT - RIGHT SIDE OF UNIT

1. MAKE A PRELIMINARY SURVEY

Location and size of various service connections and requirements listed below are shown in Fig. 1 and 2. Check Fig. 1 and 2 before starting installation of unit.

CHECK THE FOLLOWING:

- Space Requirements and Clearance
  - When Moving
  - When Installed
- Floor Strength
- Water Connections
- Drain Connections
- Power Supply and Wiring
- Air Duct Connections

2. CHECK SPACE REQUIREMENTS FOR CLEARANCE FOR SERVICING (FIG. 1 AND 2)

The evaporator coil, heating coils, and fan shaft may be removed through either side or top of the unit. See Fig. 1 and 2 for approximate length and height of coils.

Clearance must be provided on the left side of the unit for servicing the electrical control panel. Provide clearance on the right side of the unit for condenser piping and servicing the fan drive for horizontal fan discharge. Provide clearance at the front and back of the unit for the following:

- Compressor Removal
- Condenser Removal
- Connecting Water Regulating Valve Capillary
- Testing Refrigerant Charge

The above service operations cannot be made on both of the unit circuits if clearance is not provided at the front and back of the unit.

TABLE 1 - OVERALL UNIT DIMENSIONS (INCHES)

50BA, BB, BC024		
Crated Unit	Height Width Depth	87 88 34
Uncrated Unit Without Plenum	Height Width Depth	83-1/2 80 29-1/4
Uncrated Unit With Plenum	Height Width Depth	101-1/2 80 29-1/4

TABLE 2 - UNIT WEIGHT, (LBS.)

	50BA024 50BC024	50BB024
Crated Unit	1960	1550
Uncrated Unit Without Plenum	1860	1450
Uncrated Unit With Plenum	2000	1590
Plenum	140	140

3. CHECK FLOOR STRENGTH

Unit net weights and dimensions are shown in Table 1 and 2. Be certain that the floor is strong enough to support the total weight.

4. UNCRATE AND INSPECT UNIT (WHERE USED)

After the unit has been uncrated, examine the unit for shipping damage. If shipping damage is noted, file a claim with the transportation agency. Raise the base skid onto blocks and remove the bolts which secure the base skid to the unit. Remove the blocks and slide the unit off the base skid.

5. CHECK FAN SECTION

Check the following:

FAN WHEELS AND FAN SHAFT

If the fan wheels and fan shaft assembly are not properly centered, the blades may scrape against the scroll or may create an objectionable whistling noise. It may be necessary to adjust individual fan wheels or move the entire fan shaft.

ADJUST INDIVIDUAL FAN WHEEL

Loosen the two hex head bolts holding the fan wheel locking clamp. Each wheel has two clamps on each side of the wheel hub. Position the fan wheel in the center of the fan housing and tighten the locking clamp bolts. Finger clearance between the wheel and housing may be used to position the fan wheel.

ADJUST FAN SHAFT POSITION

Loosen the Allen setscrew on the locking collar of each fan shaft bearing. To replace the locking collar, push the collar up against the inner race of the bearing. Turn the collar in the direction of fan rotation until tight, and tighten the setscrew (Fig. 7). Tighting the locking collar in the direction of fan rotation will tend to further tighten the collar should the setscrew work itself loose.

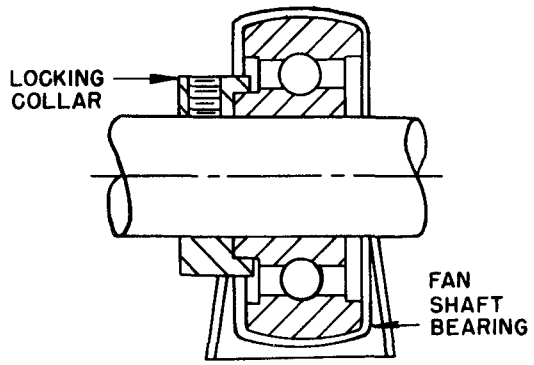


FIG. 7 - FAN SHAFT BEARING.

VERTICAL SHAFT ALIGNMENT

Fan wheels must also be centered with respect to the air inlet opening in the fan housing. If the wheels are not centered, it may be necessary to place shims between the bearing support bracket of one or both of the bearings (see Fig. 8).

FAN MOTOR MOUNTING

The fan motor is mounted on the fan section motor mounting channels. The channels are slotted to allow a lateral movement of up to 2-1/2" of the fan motor.

FAN BELT ADJUSTMENT

To adjust belt tension, loosen the four bolts holding motor to the motor mounting channels and slide the motor into the required position. Tighten the bolts.

Adjust the belts so that they can be depressed approximately one inch with one finger midway between the two pulleys.

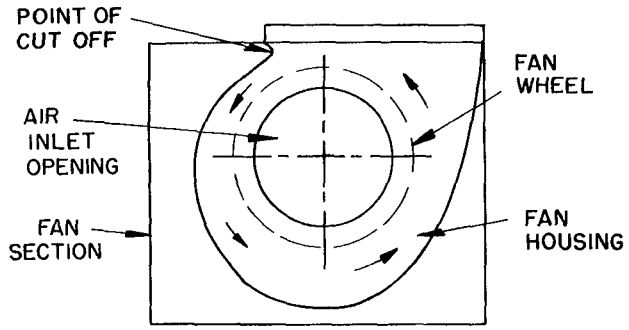


FIG. 8 - CENTER FAN WHEEL

DRIVE CENTER DISTANCES

Range of fan drive center distances for 50BA, BB, and BC024 units is given in Table 3.

TABLE 3 - FAN DRIVE CENTER DISTANCES

Motor Frame Size	Center Distance (In.)	
	Maximum	Minimum
184	11 13/16	9 3/8
213	11 13/16	8 3/8
215	11 13/16	8 3/8

CHECK THE FAN DRIVE ADJUSTMENT

Pulleys

To adjust, loosen the setscrews in either the fan or the motor pulleys. Align them with a straight edge or a taut cord stretched from one pulley face to the other.

The fan motor is equipped with a variable pitch pulley. By adjustment of this pulley, the fan speed varies the unit air quantities. To obtain the desired fan speed (See Table 4), adjust the fan motor pulley as follows:

1. Slack off on the fan belt tension by loosening the four hold down bolts on the motor. Remove the fan belts.
2. Loosen the setscrews in both of the movable flanges of the pulley (Fig. 9). Screw the movable flanges an equal amount toward the center fixed flange to increase fan speed, and away from the fixed flange to reduce fan speed. Before tightening the setscrews, make certain they are over the nearest flat surface of the pulley hub.
3. Replace the belts and adjust the belt tension as outlined under "Fan Belts".

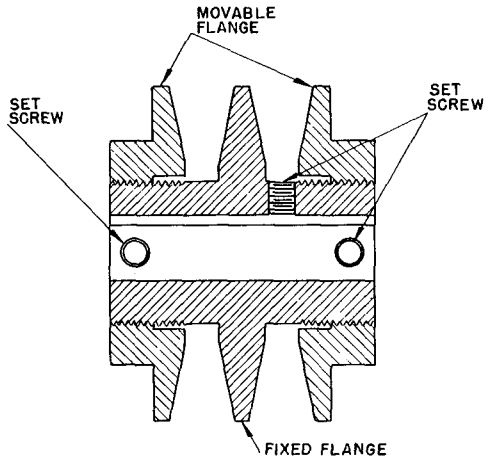


FIG. 9 - VARIABLE PITCH PULLEY

ALIGN PULLEYS

Proper pulley alignment is essential. Follow the procedure outlined below:

1. Line up pulleys by eye, and tighten screws on fan pulley to lock it in place.
2. Slip belts on the pulleys.
3. Use the methods outlined in Fig. 10 to check proper pulley alignment.
4. If pulleys are not in correct alignment, slide the motor axially until the pulleys are aligned.
5. Tighten motor hold-down bolts.

FAN MOTOR LUBRICATION

Fan motors supplied with the unit have permanently lubricated bearings and require no further lubrication.

FAN SHAFT BEARINGS

The fan shaft bearings are permanently lubricated ball bearing, rubber vibration mounted. They do not require any further lubrication.

FAN SECTION ACCESS PANELS

Servicing of the fan section may be gained by removing the front or rear panels on the fan section.

TABLE 4 - 50BA, BB, BC024 FAN DRIVES FOR 50 AND 60 CYCLE MOTORS

		Fan Pulley "V" Belt					Adjustable Motor Pulley					
									Turns Open From Closed Position		Fan Speed Per 1/2 Turn (RPM)	Fan Speed Range (RPM)
Cycle	Motor RPM	Pitch Diam. (In.)	Bore (In.)	No. Req'd	Belt Sect.	Outside Length (In.)	Bore (In.)	Pitch Diam. (In.)	Min. Pitch Diam.	Max. Pitch Diam.		
60	1750	10	1	2	A	45	1 1/8	4.0/ 5.0	5	0	17.5	700 - 875
50	1450	10	1	2	A	45	1 1/8	4.5/ 5.5	5	0	14.5	665 - 810

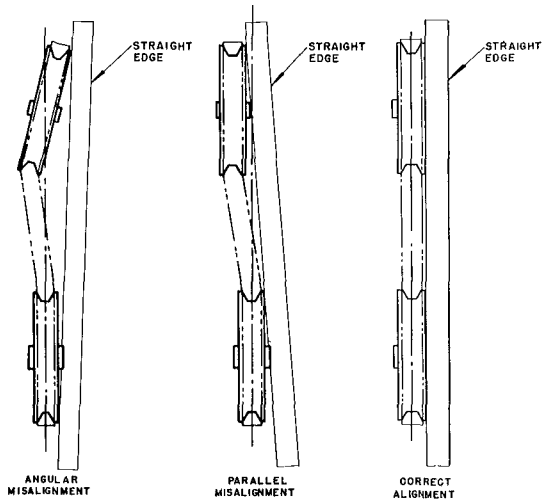


FIG. 10 - DIAGRAM OF CORRECT PULLEY ALIGNMENT

6. POSSIBLE FAN ARRANGEMENTS

The unit, as shipped from the factory, has the fan section mounted for vertical air discharge. Other possible arrangements can be made in the field.

Forward or backward horizontal air discharge is possible with an accessory package which contains six panels for completing this changeover. See Installation Instructions 38RR531505.

HORIZONTAL AIR DISCHARGE (BACK MOUNTED)

Rear mounted fan sections for horizontal air discharge can be obtained by following step-by-step procedures outlined below:

1. Remove front panel from fan section.
2. Remove upper rear coil section panel.
3. Remove conduit and wires from fan motor.
4. Remove the four 3/8-16 fasteners, found at each corner of fan section, which secure the fan section to the coil section.
5. Remove and rotate fan section 180° and secure it to the coil section with the fasteners removed in Step 4.
6. Replace the fan motor conduit and wires removed in Step 3.
7. Place panel, removed from rear of coil section, on top of the coil section. The flange of this panel will overlap onto the fan section.
8. Place fan section panel, removed in Step 1 on top of fan section.
9. Fasten both panels with screws removed in Step 1 and 2.

7. PLACE UNIT

The base unit should be level and adequately supported. Where extremely quiet operation is essential, place vibration dampening material between the floor and base of the unit. In leveling, use the channels at the front and ends of the condensing unit section for reference points.

Structural insulation materials such as Celotex, Temlock, Insulate, and Lockaire are good isolators, but will deteriorate and give off odors when wet, as would occur outdoors or on floors that are mopped regularly.

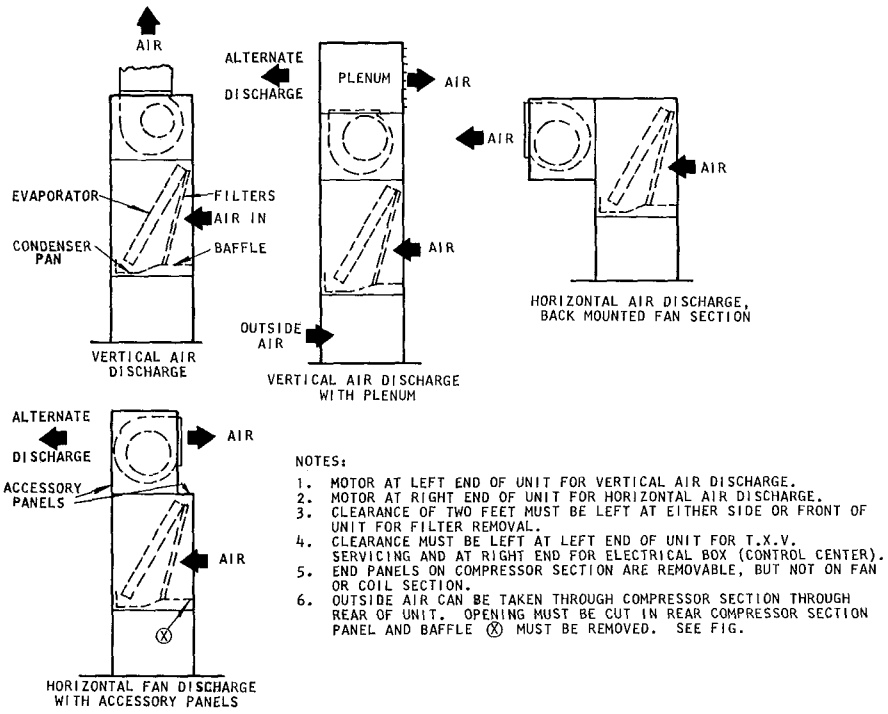


FIG. 11 - POSSIBLE FAN ARRANGEMENTS

RECOMMENDED ISOLATORS

A. Sponge Rubber

B. Corrugated Rubber Matting

C. Fiberglas Roof Insulation

8. INSTALL FILTERS

High velocity, cleanable type filters must be used. One inch high velocity filters are shipped with the unit; however, two inch filters may be used by removing the filter spacer channels from the filter frame tracks.

TABLE 5 - FILTER SIZES

Model	Size (In.)	No. Required
50BA, BB,	1 x 20 x 25	3
BC024	1 x 16 x 25	3

To remove the filters, remove either of the side filter access panels. Filters may also be removed through the front of the unit by loosening the two wing nuts holding the sliding filter retainer in place, sliding retainer up or down and removing the filters. See Fig. 3, 4, 5, and 6.

9. MAKE AIR DUCT CONNECTIONS DISCHARGE CONNECTIONS

Connect the flanged discharge openings to the supply duct utilizing a canvas connection to prevent vibration. It is important that this connection be properly fabricated to prevent high friction losses and air noise.

RETURN CONNECTIONS

The return and outside air connections should be brought to the filter rack through a canvas connectio to prevent transmission of unit vibration.

When a duct blocks off the access panel provide a slip joint in the duct work so that it may be removed for service purposes.

OUTSIDE AIR INLET CONNECTIONS

Outside air inlet connections should be tapped into th return air duct work. A damper must be provided i the outside air duct to permit the control of the outside air volume.

10. INSTALL WATER CONNECTIONS

RECIRCULATING WATER SYSTEM

The 50BA and BC024 unit condensers are installed

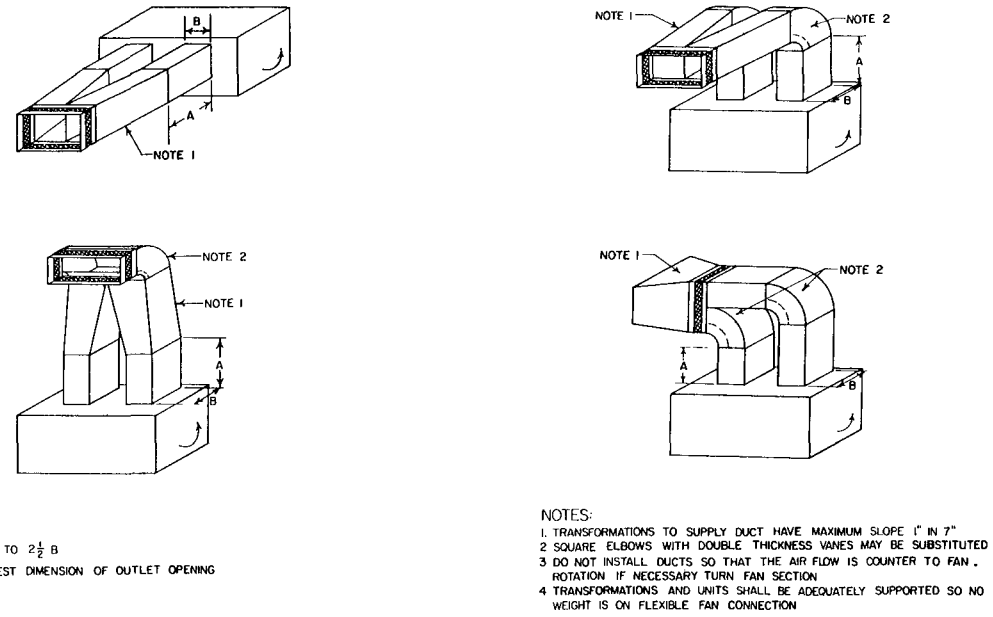


FIG. 12 - FAN DISCHARGE CONNECTIONS FOR MULTIPLE FAN UNITS

parallel to each other and located in the compressor section. The condensers are shipped interconnected to provide single inlet and outlet water connections for cooling tower application.

Water connections may be made through the right side panel. See dimension drawing for location. It is not necessary to remove the panel. Each condenser is provided with pipe connections for water inlet and outlet as shown in Fig. 13.

TABLE 6 - CONDENSER DATA

Unit	Cond. Size (Ton)	Number Required	Inlet and Outlet Sizes
50BA024 50BC024	10	2	2-1/2 FPT

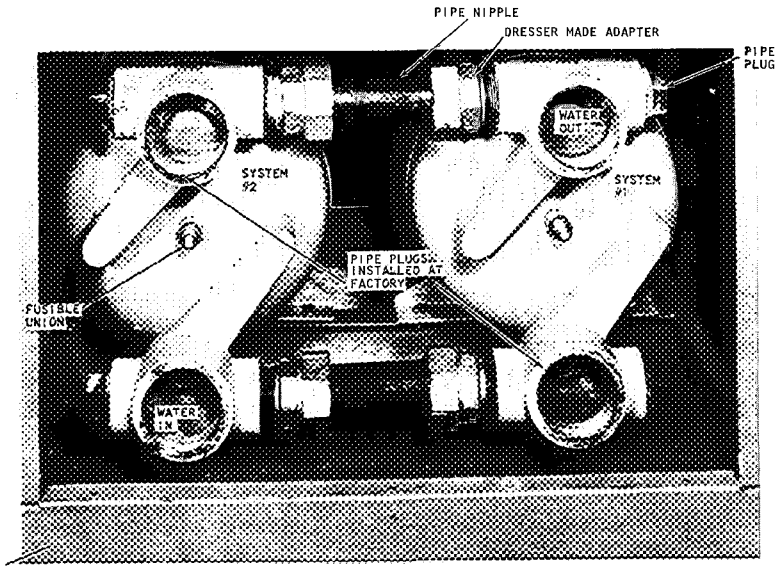


FIG. 13 - CONDENSERS SHIPPED FOR RECIRCULATING WATER

WASTE AND CITY PIPING

When the unit condensers are used on waste or city water application, they must be re-piped in the field. This is done by removing the interconnecting piping on the inlet side of the condenser, plugging the open ends, and running water piping to each condenser as shown in Fig. 15 and 16.

A water regulating valve must be connected to the water inlet of each condenser. Install the water valves with the arrow on the valve body pointing the direction of the water flow.

A single water outlet may be used. For other piping arrangements see Section 25 x of Application Data.

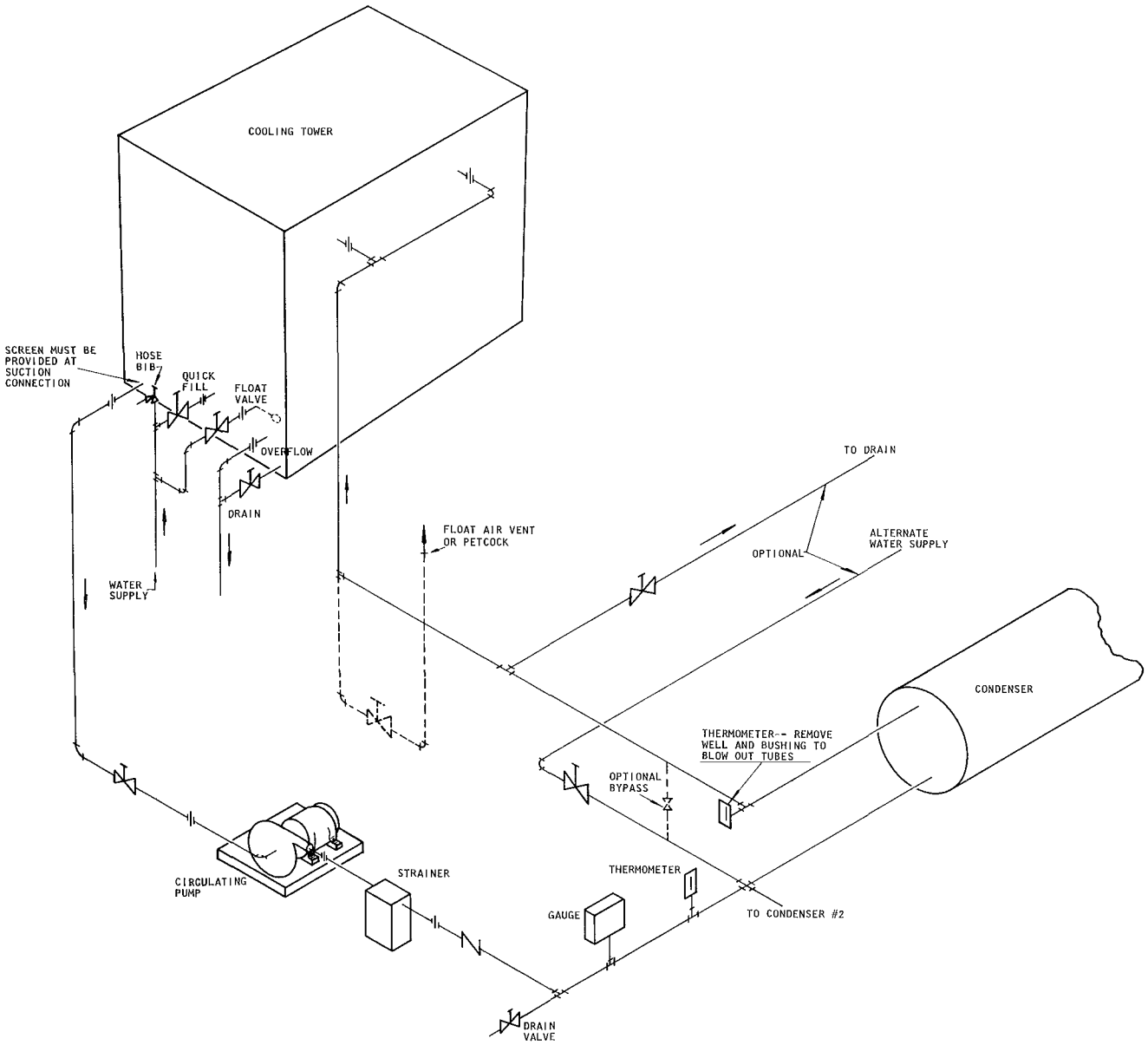


FIG. 14 - TYPICAL WATER TOWER PIPING

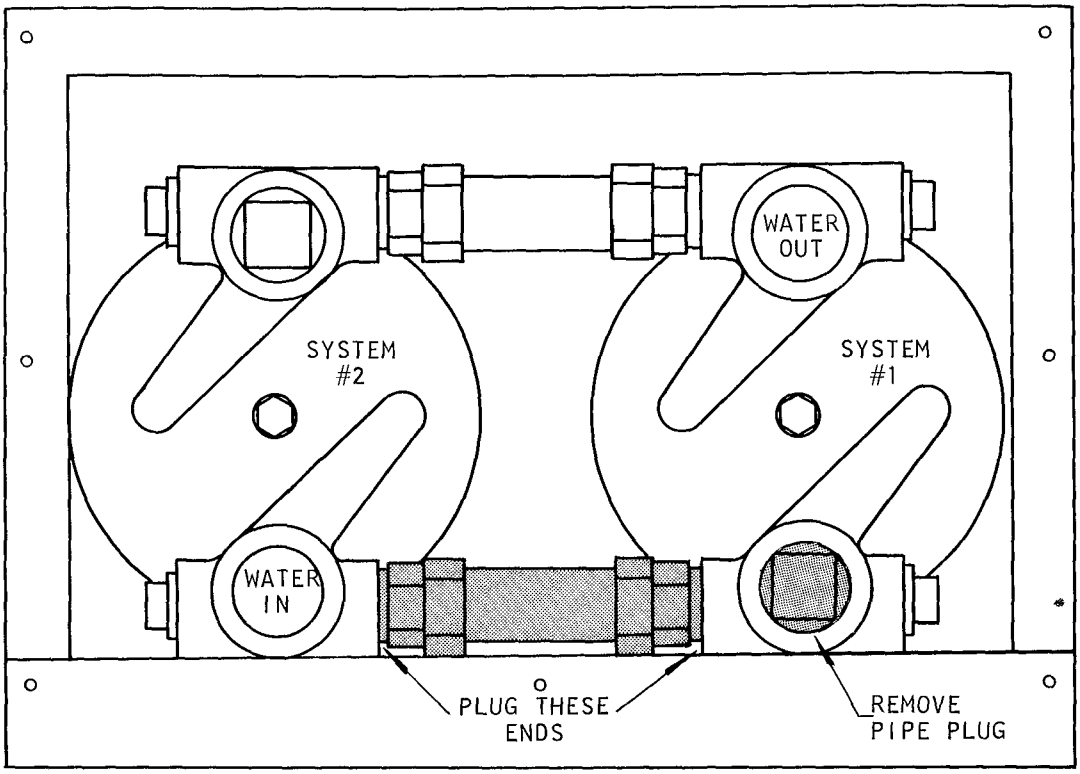


FIG. 15 - CITY WATER CONDENSER PIPING CONVERSION (REMOVE FITTINGS SHADED IN SKETCH)

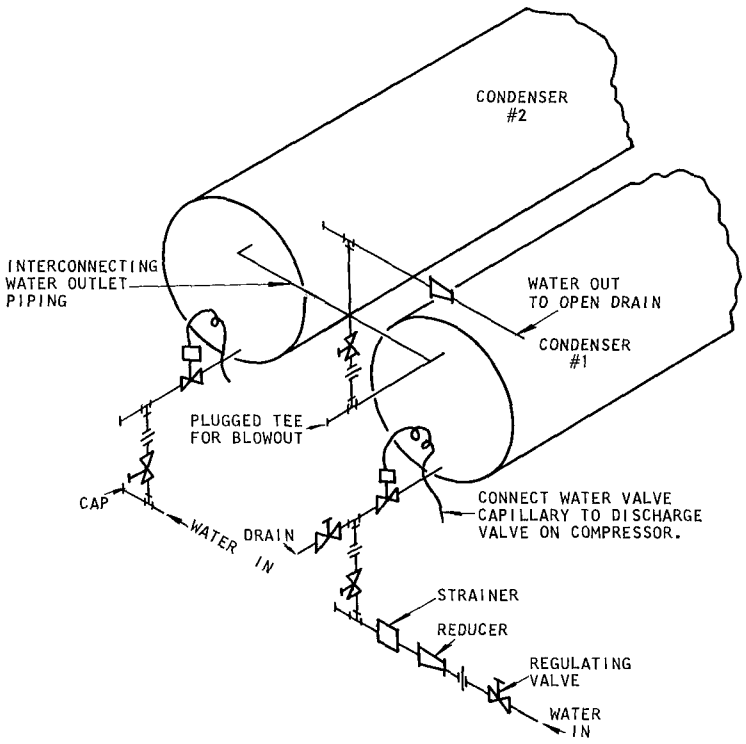


FIG. 16 - TYPICAL WASTE OR CITY WATER PIPING

11. INSTALL DRAIN CONNECTIONS

The condenser outlet should be run full size or larger to an open drain. If the condenser water is piped to roof sprays, the line should be oversized to keep the pressure loss to a minimum.

The condensate drain should be connected to the 1" FPT half coupling which is attached to the drip pan. The nipple is located in the back right hand corner of the compressor section. See dimension drawing for details. The drain line may be brought out of the unit through the right side panel of the compressor section. A hole is located in the upper right hand corner of the right end panel. Provide ample clearance around the drain line to permit removal of the panel for service operations. The drain should be at least 1" pipe size and must pitch downward to an open drain or sump. Make provisions for cleaning by using plugged tees in place of elbows at all turns. See Fig. 17.

All local sanitary codes should be observed when installing either the condenser or condensate drains.

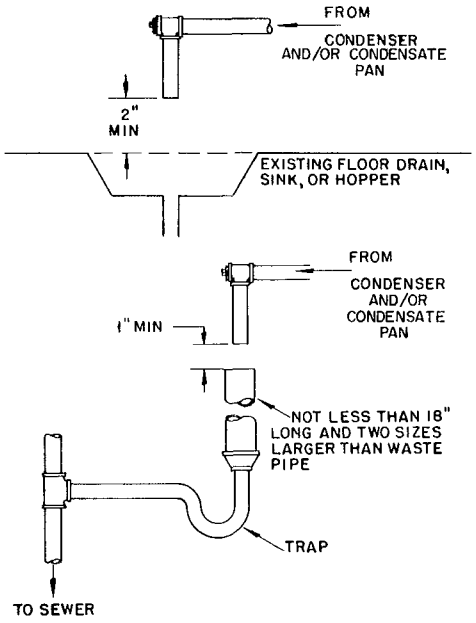


FIG. 17 - DRAINS

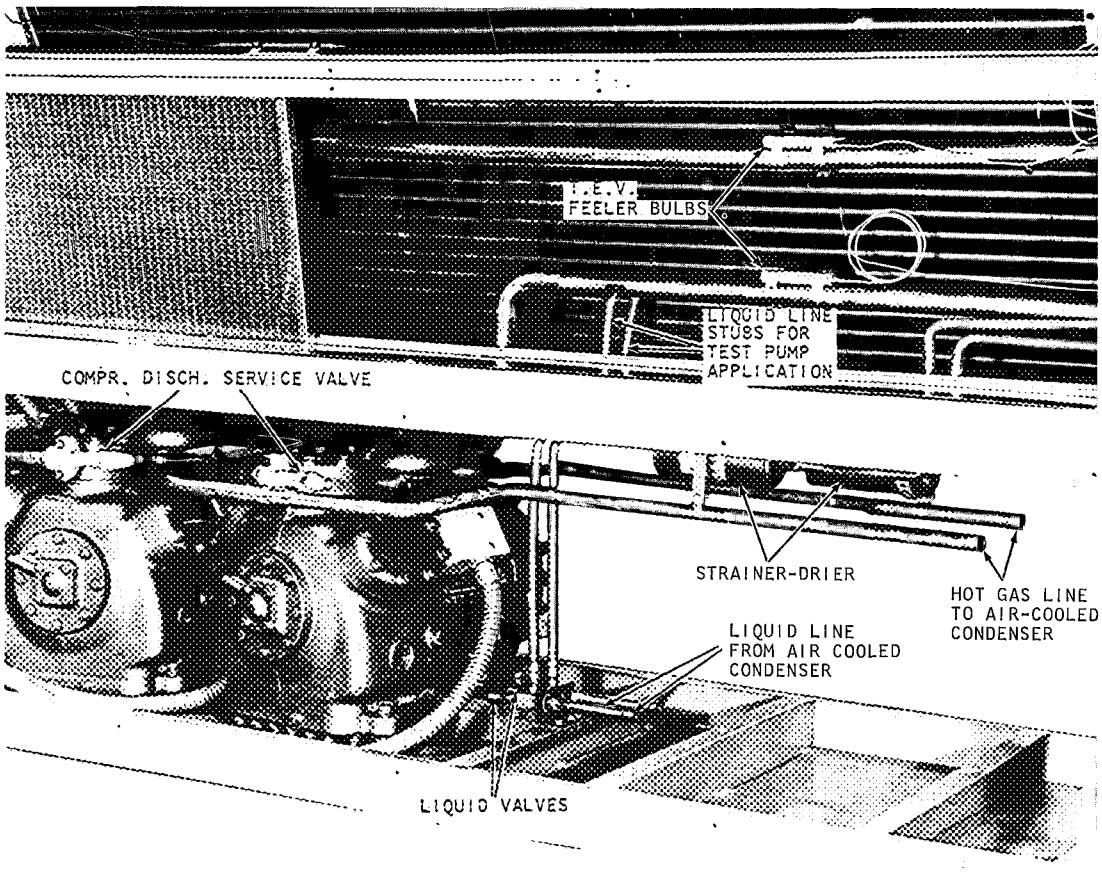


FIG. 18 - 50BB024 UNIT. HOT GAS AND LIQUID LINE FIELD CONNECTIONS

12. REFRIGERANT PIPING (AIR COOLED)

Install the hot gas line between the base unit and the air cooled condenser for each system; carefully connect the correct components in each system. Fig. 15 and 16 show the location of the connections at the base unit. Fig. 20 shows the schematic piping layout when connected to two 9AB air cooled condensers. See 09DC Instruction Book for piping details on the 09DC condensers.

Table 7 shows the connection sizes at the base unit and recommended line sizes. Consult the installation instructions of the condenser used, and section 25B of the Product Information Book for piping details and line sizes when greater lengths are used.

The air cooled condenser should not be located more than 60 feet above, or 15 feet below the base unit.

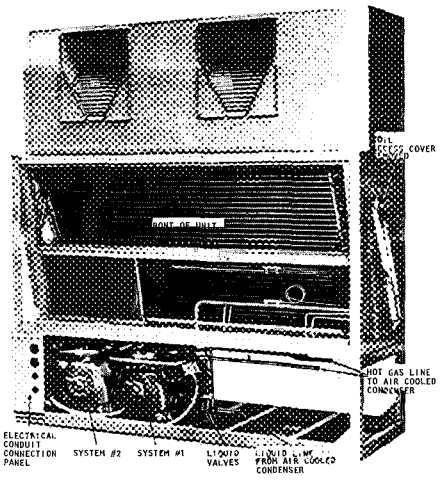


FIG. 19 - 50BB024 UNIT WITH HORIZONTAL FAN DISCHARGE (PANELS REMOVED)

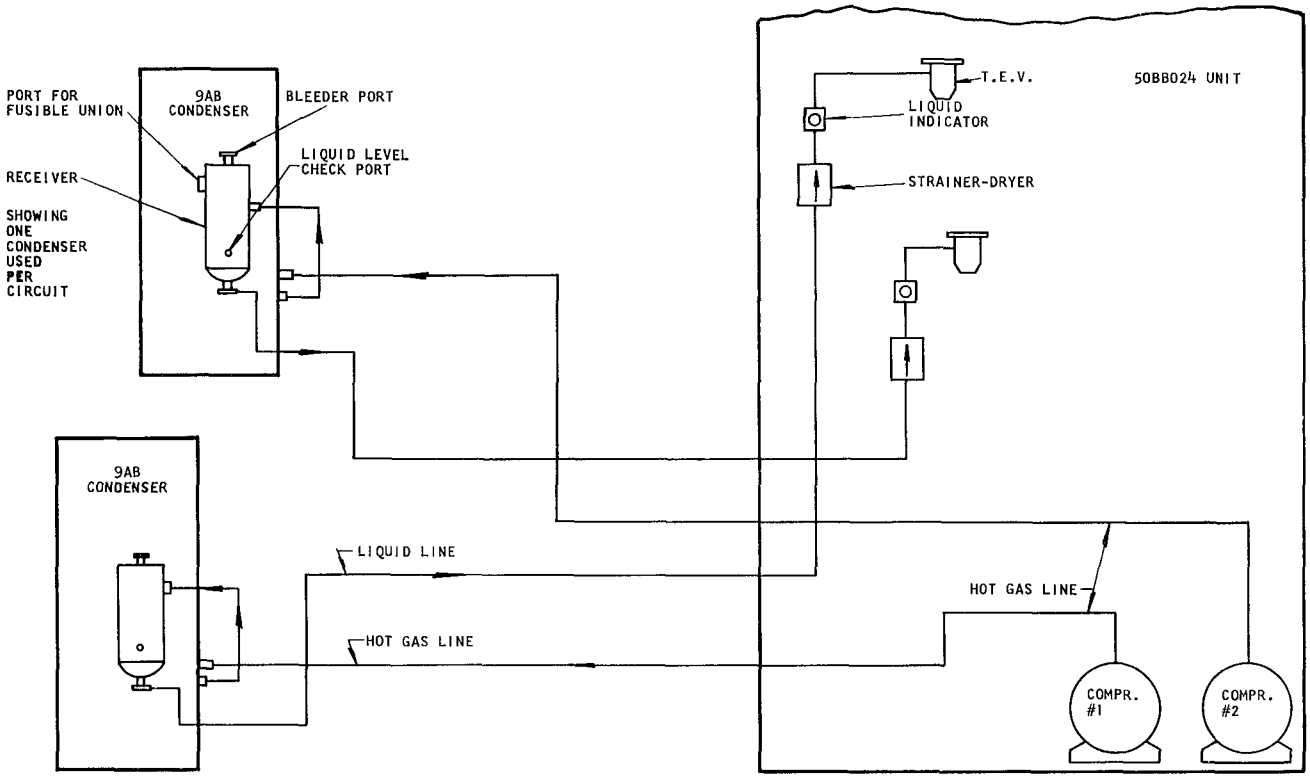


FIG. 20 - SCHEMATIC PIPING FOR 50BB024 WITH TWO 9AB CONDENSERS

TABLE 7 - LINE SIZES

System	Refrigerant	Disch. Line Connection	Liquid Line Connection	Recommended Line Sizes Linear Feet Piping					
				20		40		60	
				Hot Gas	Liquid	Hot Gas	Liquid	Hot Gas	Liquid
Each System	22	7/8"	5/8"	7/8	5/8	1 1/8	5/8	1 1/8	3/4

13. REFRIGERANT CHARGE

In the water cooled units each system contains 17 pounds of refrigerant, giving a total of 34 pounds for each unit.

The condenserless units are shipped from the factory with a 2-1/2 pound holding charge in each system. The operating charge of the base unit only is 7 pounds for each circuit or a total of 14 pounds in each unit. To this, add the charge requirements of the refrigerant lines, condensers and receivers (when used).

If used with other refrigerant, consult your Application Engineering Data for information.

14. OPEN REFRIGERANT VALVES

Before putting the unit into operation, open the following valves:

Compressor Discharge valves on each compressor
Compressor Suction valves on each compressor
Liquid Line shut off valves
On air cooled units, also check the valves on the receiver

After opening the valves, replace the valve caps and tighten to prevent leakage around the valve packing.

15. REMOVE COMPRESSOR HOLD DOWN BOLTS

The spring mounted compressors are held rigid in shipment by four hold bolts. After removing the bolts the compressors should float freely upon the springs. Save the bolts for future use by placing in a cotton bag and tying inside the unit where they will not rattle. They should be used whenever the unit is moved from one location to another.

16. COMPRESSOR LUBRICATION

No external oiling of the hermetic compressors is required, since the compressor oil is sealed inside the cooling system. However, the oil level at the compressor sight glass should be checked. To check the level, operate the unit for 20 minutes and then shut the compressor off. The correct oil level is between 1/2 and 3/4 of the oil sight glass.

17. CHARGING PROCEDURE 50BB024 AND 9AB

The complete refrigerant system should be evacuated with a good vacuum pump before charging with refrigerant. When charging, connect a cylinder of refrigerant through a tee to a gauge to the gauge port on the compressor service valve. Have the cylinder in the upright position to admit vapor only. Admit refrigerant to break the vacuum in the system. Start the compressor and modulate the valve on the cylinder to keep the suction pressure slightly under 50 psig. Charge the system until liquid refrigerant will bleed from the liquid level check port on the receiver and also until the sight glass is clear.*

*NOTE: If the liquid refrigerant will bleed from the liquid level check port on the receiver but there is still flashing at the sight glass, there is an indication that the liquid line or filter-drier is restricted.

Let system operate for 20 min. to balance out and recheck the refrigerant and oil levels.

The receiver has a bleeder port at the top to bleed non-condensables from the system. There has to be sufficient refrigerant in the system to make a liquid seal at the outlet of the receiver to trap the non-condensable in the top of the receiver before the bleeder port can be effective. For charging instructions when using 09DC condensers see installation book 09DC501005.

18. MOISTURE AND LIQUID INDICATOR

The moisture and liquid indicator must be full of liquid refrigerant to properly indicate the moisture content of the refrigerant. Operate the system at least 30 minutes before attempting to determine the moisture reading.

19. ADJUST REGULATING VALVES (IF USED) (WATER-COOLED UNITS)

1. Consult the engineering survey to determine the design condensing temperature and the water shutoff condensing temperature used in selecting the valve size. The shutoff point should be 90 F (170.1 psig) or below.

2. Install a pressure gauge in the discharge service valve and operate the unit to obtain a gauge reading.

3. Temporarily adjust the valve until the condensing temperature indicated by the gauge reading is 5 to 10 degrees (15 to 25 psig) below the design condensing temperature.

4. Shut off the unit and observe the gauge pressure at the instant the water flow into the open sump stops.

5. Readjust the valve until it shuts off at the correct shut off condensing temperature. At this setting, the valve will hold the desired condensing temperature when maximum design conditions are reached.

20. DUAL PRESSURESTAT SETTINGS

The 50BA and BC024 unit pressurestats are factory set to open at 280 ± 5 psig with a differential of 100 ± 15 psig on the high side. The low side is set to cut-out at 46 ± 5 psig and cut in at 76 ± 5 psig.

The 50BB024 unit pressurestats are factory set to open at 364 ± 5 psig with a differential of 100 ± 15 psig on the high side. The low side is set to cut-out at 46 ± 5 psig and cut in at 76 ± 5 psig.

21. WIRING

All wiring should comply with local and National Electric Code Requirements. Units are wired at the factory for electrical characteristics shown on nameplate. Check nameplate electrical characteristics of the unit with the available power supply. Power at the unit must be within 10% of rated voltage, and the phase voltages must be balanced within 3%. Contact the power company for correction of line voltage that is (1) not within 10% of standard, or (2) unbalanced.

OPERATION OF THE UNIT ON IMPROPER LINE VOLTAGE OR WITH PHASES UNBALANCED MAY BE CONSIDERED ABUSE AND IS NOT COVERED BY THE CARRIER WARRANTY.

Provide separate fused disconnect switches of adequate size to handle the starting currents in the power supply. Locate these switches within sight of the unit. Proper wire and fuse sizes are given in Table 9. Use of undersized wire may cause nuisance tripping, accentuated voltage unbalance and generally unsatisfactory operation and unit life.

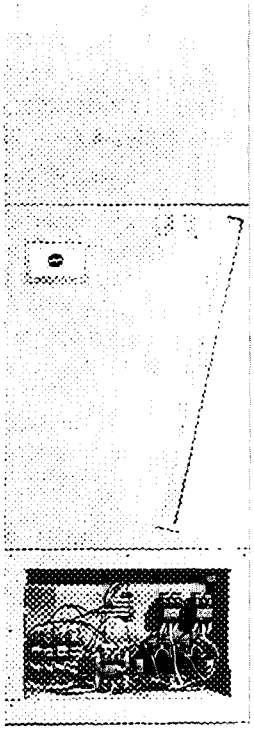


FIG. 21 - LEFT END OF UNIT SHOWING ELECTRICAL PANEL (COVER REMOVED)

The following recommended conduit sizes are for field wiring power supply from the disconnect switch to the motor contactor.

TABLE 8 - RECOMMENDED CONDUIT SIZES

Unit Electrical Characteristics	Each Compressor		Fan Motor
	WC	C'less	WC & C'less
208/220-3-60	3/4"	1"	1/2"
220-2-60	1-1/4"	1-1/4"	1/2"
440-3-60	1/2"	3/4"	1/2"
550-3-60	1/2"	1/2"	1/2"
220-3-50	3/4"	1"	1/2"
380-3-50	1/2"	3/4"	1/2"

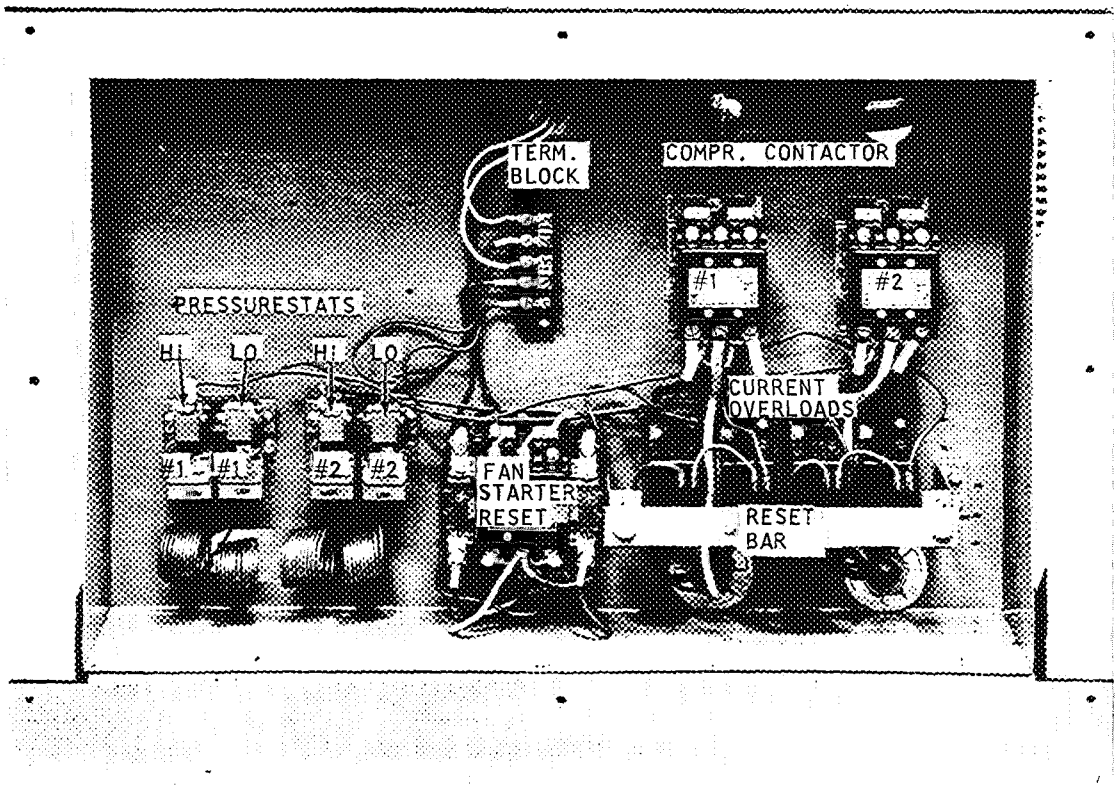


FIG. 22 - 50BA, BB, BC ELECTRICAL PANEL (208/220-3-60)

WATER-COOLED UNITS

The water-cooled condensing unit section is completely wired at the factory. Field power connections are made to starter terminals in control box through a panel which can be mounted either in front or back of the unit. A terminal block provides connections for cooling tower controls. Compressors are protected by magnetic overload relays which can be manually reset by means of reset buttons on control box cover. High and low pressurestats and an "off-fan-auto" selector switch are included. For continuous fan operation turn selector switch to "fan". For cycling of fan with compressors turn switch to "auto".

Field wiring must be run to the terminals on the fan starter, and compressor contactors.

The thermostats are not supplied by Carrier. See wiring diagrams for field wiring.

CONDENSERLESS UNITS

The wiring on the condenserless units is the same as for the water-cooled units. Included in the condenserless units are compressor crankcase heaters which are wired at the factory. The crankcase heaters reduce liquid slugging in the compressor and excessive absorption of oil by the refrigerant, thus replacing the need for liquid line solenoid valves. Crankcase heaters are energized when the compressors are "off", by a normally closed contact on the contactor. The heaters are rated for 100 watts, 230 volt, single phase, 60 cycle. Two condenser fan relays S.P.S.T. (Normally Open) are included with the base unit. These are field wired and installed. See wiring diagrams.

The 440/550 volt units are supplied with a transformer to supply 220 volt control voltage for the base unit, and air cooled condenser control circuit.

A terminal block is supplied in the control box for ease of wiring of thermostat and air cooled condenser relays.

The thermostats are not supplied by Carrier.

TABLE 9 - ELECTRICAL DATA

	Current Characteristics	Locked Rotor Current Amps.		Full Load Current Amps.		Wire Size AWG No.	Max. Wire Length, Ft.	Wire Size AWG No.	Max. Wire Length, Ft.	Maximum Fuse Size - Amps.		Dual Element Fuse Size - Amps.	
		50BA 50BC	50BB	50BA 50BC	50BB	50BA 50BC		50BB		50BA 50BC	50BB	50BA 50BC	50BB
Compressor Motor	220-3-60	140	180	29.8	39.8	8 6 4	70 105 170	6 4 2	82 125 190	100	125	40	60
	220-2-60	121	156	27.6	34.5	8 6 4	55 90 145	6 4 2	70 115 190	90	110	35	45
	440-3-60	70	90	14.9	19.9	12 10 8	115 180 280	10 8 6	135 210 325	50	60	20	30
	550-3-60	56	72	12.8	14.4	12 10 8	170 265 400	12 10 8	150 235 360	40	45	17-1/2	20
	220-3-50	120	180	26.7	33.6	8 6 4	75 120 190	6 4 2	95 150 225	90	110	35	45
	380-3-50	70	90	14.9	19.9	12 10 8	100 160 240	10 8 6	115 180 280	50	60	20	30
Evaporator Fan Motor	208/220-3-60			9.2/9.0	9 2/9.0	14 12 10	60 100 160	14 12 10	60 100 160	30	30	12	12
	220-2-60			7 8	7.8	14 12 10	55 90 145	14 12 10	55 90 145	25	25	10	10
	440-3-60			4.3	4.3	14	245	14	245	15	15	6-1/4	6-1/4
	550-3-60			3.5	3.5	14	415	14	415	15	15	4-1/2	4-1/2
	220-3-50			9.2	9.2	14 12 10	65 100 160	14 12 10	65 100 160	30	30	12	12
	380-3-50			5.3	5.3	14 12	195 315	14 12	195 315	20	20	7	7

NOTES:

1. Wire sizes, lengths, fuse sizes and dual element fuse sizes shown are for the branch circuit between the disconnect switch and the unit.
2. The branch circuit wire sizes and the corresponding maximum wire lengths tabulated will result in a 1% voltage drop at the nameplate full load amperage. The wire size listed and the maximum fuse sizes are in accordance with the National Electric Code.
3. Dual element fuses can be sized much closer to the actual running current than one-time link type fuses because of the built-in lag. Thus, dual element fuses give additional motor protection against both single phasing and locked rotor failure, should starter contacts fuse. Use dual element fuses for compressor protection on all installations. With properly selected fused disconnect switches, fuse reducers may be required.
4. Units having 3 phase fan motors require a separate disconnect switch and fuses or dual element fuses for the fan motor circuit as well as a separate disconnect switch and dual element fuse for each compressor circuit.

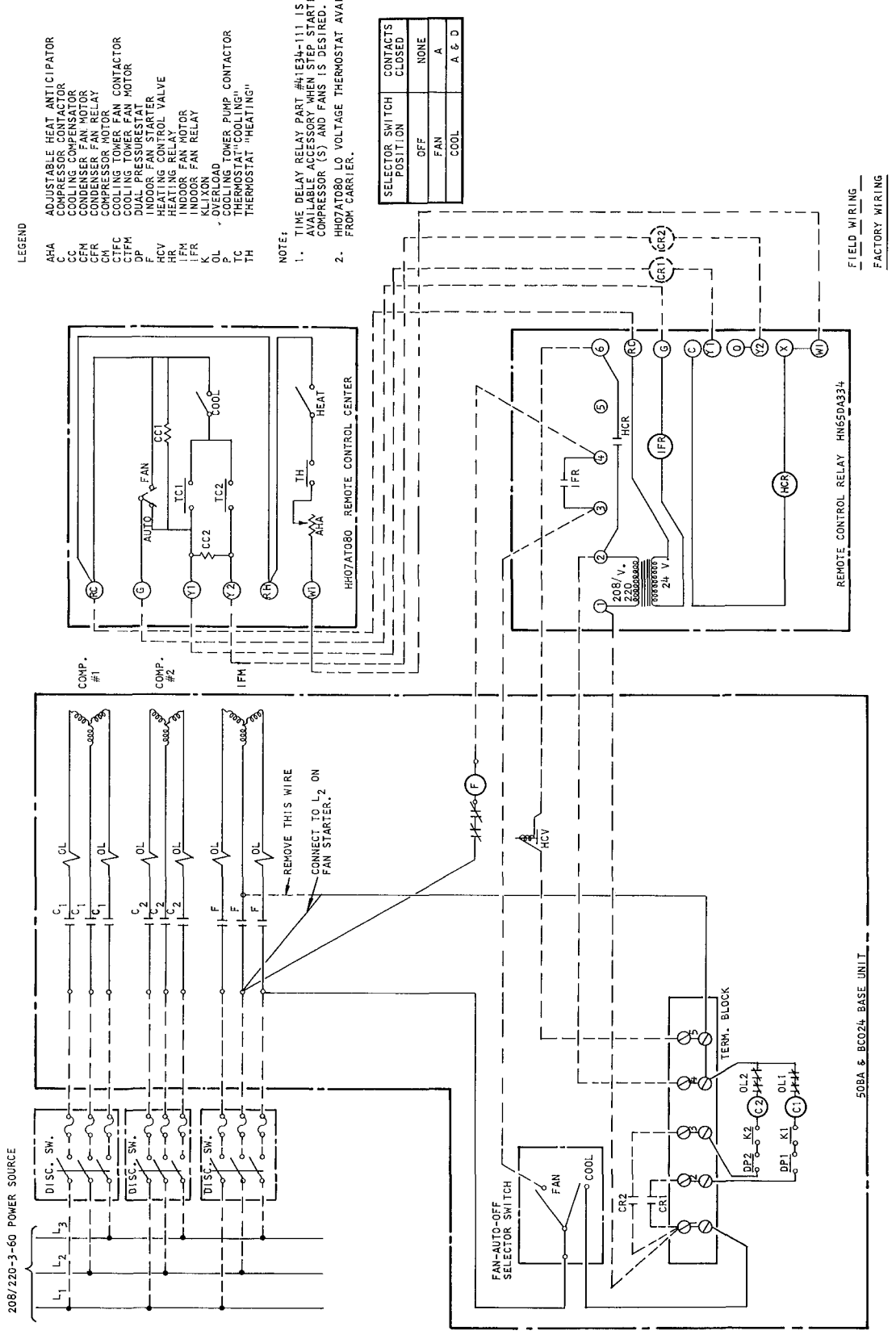


FIG. 23 - 50BA024 AND 50BC024 SCHEMATIC WIRING WITH REMOTE CONTROL RELAY AND 24 VOLT THERMOSTAT (208/220-3-60)

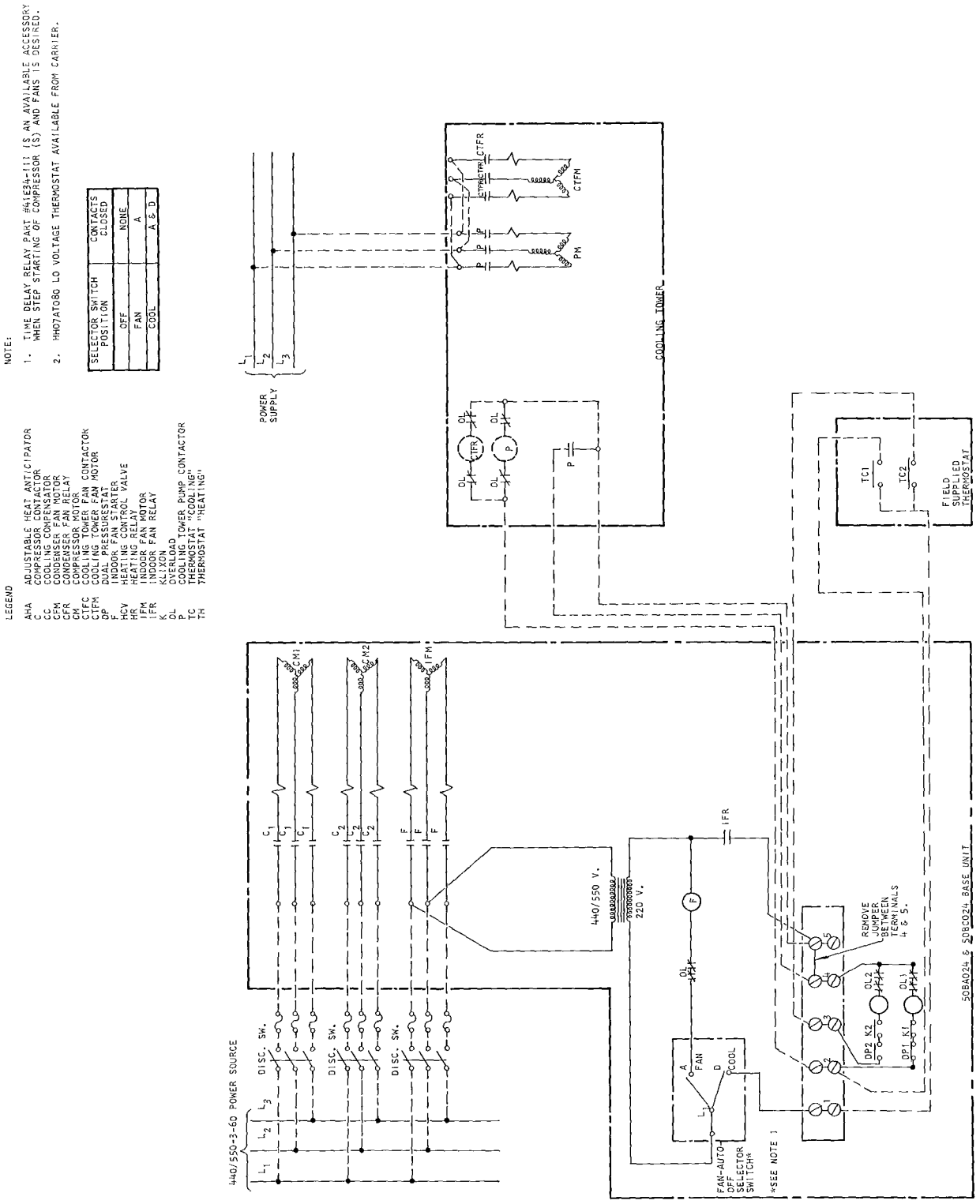


FIG. 24 - 50BA024 AND 50BC024 SCHEMATIC WIRING - LINE VOLTAGE THERMOSTAT AND COOLING TOWER (440/550-3-60)

NOTE:

1. TIME DELAY RELAY PART #HH1E34-111 IS AN AVAILABLE ACCESSORY WHEN STEP STARTING OF COMPRESSOR (S) AND FANS IS DESIRED.
2. HH07AT080 LO VOLTAGE THERMOSTAT AVAILABLE FROM CARRIER.

SELECTOR SWITCH POSITION	CONTACTS CLOSED
OFF	NONE
FAN	A
COOL	A & D

LEGEND

AHA	ADJUSTABLE HEAT ANTICIPATOR
C	COMPRESSOR CONTACTOR
CC	COOLING COMPENSATOR
CFM	CONDENSER FAN MOTOR
CFR	CONDENSER FAN RELAY
CM	COMPRESSOR MOTOR
CTFC	COOLING TOWER FAN CONTACTOR
CTFM	COOLING TOWER FAN MOTOR
DP	DUAL PRESSURESTAT
F	INDOOR FAN STARTER
HCV	HEATING CONTROL VALVE
HR	HEATING RELAY
IFM	INDOOR FAN MOTOR
IFR	INDOOR FAN RELAY
K	KLIXON
OL	OVERLOAD
P	COOLING TOWER PUMP CONTACTOR
TC	THERMOSTAT "COOLING"
TH	THERMOSTAT "HEATING"

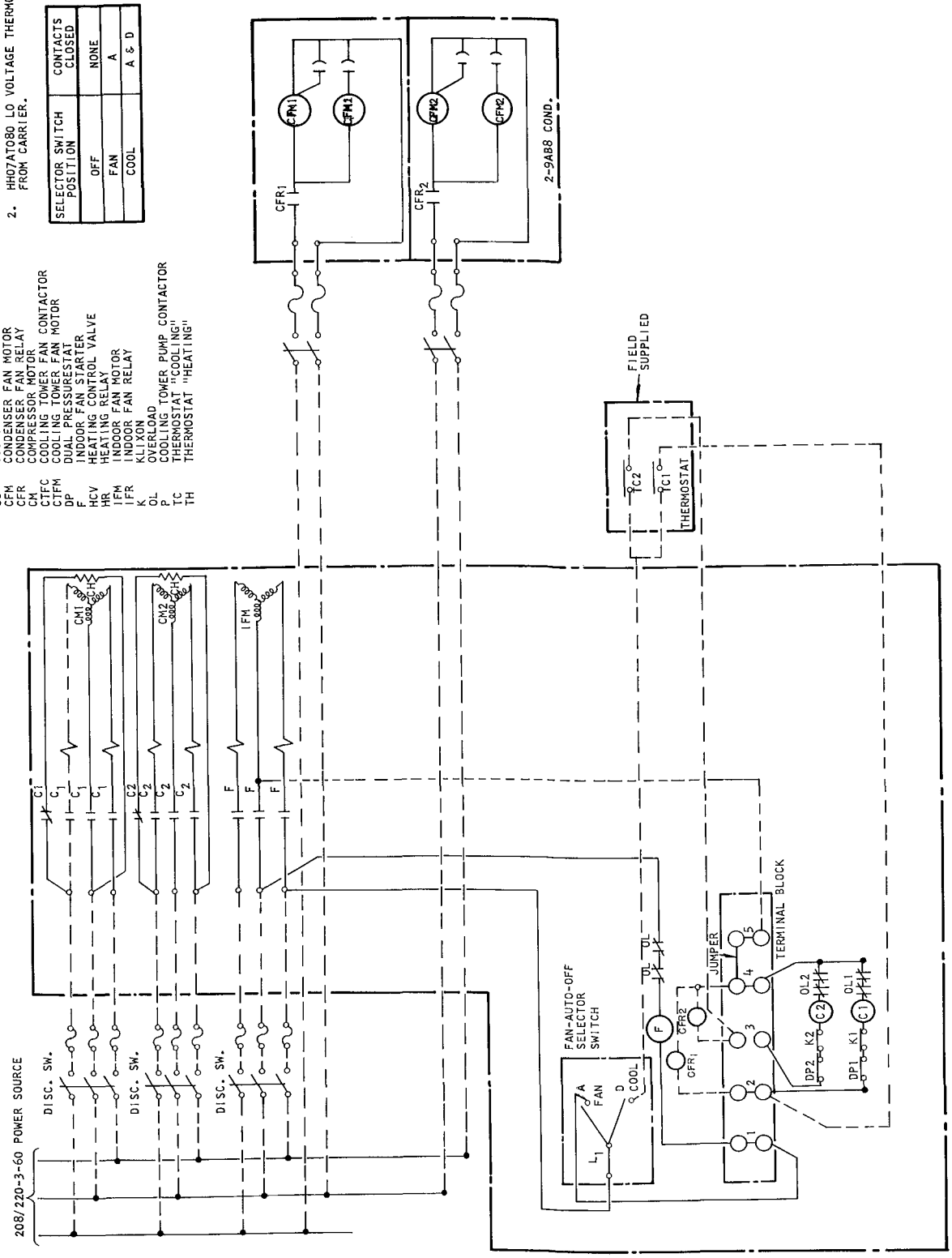


FIG. 25 - 50BB024 UNIT SCHEMATIC WIRING WITH TWO 9AB8 CONDENSERS

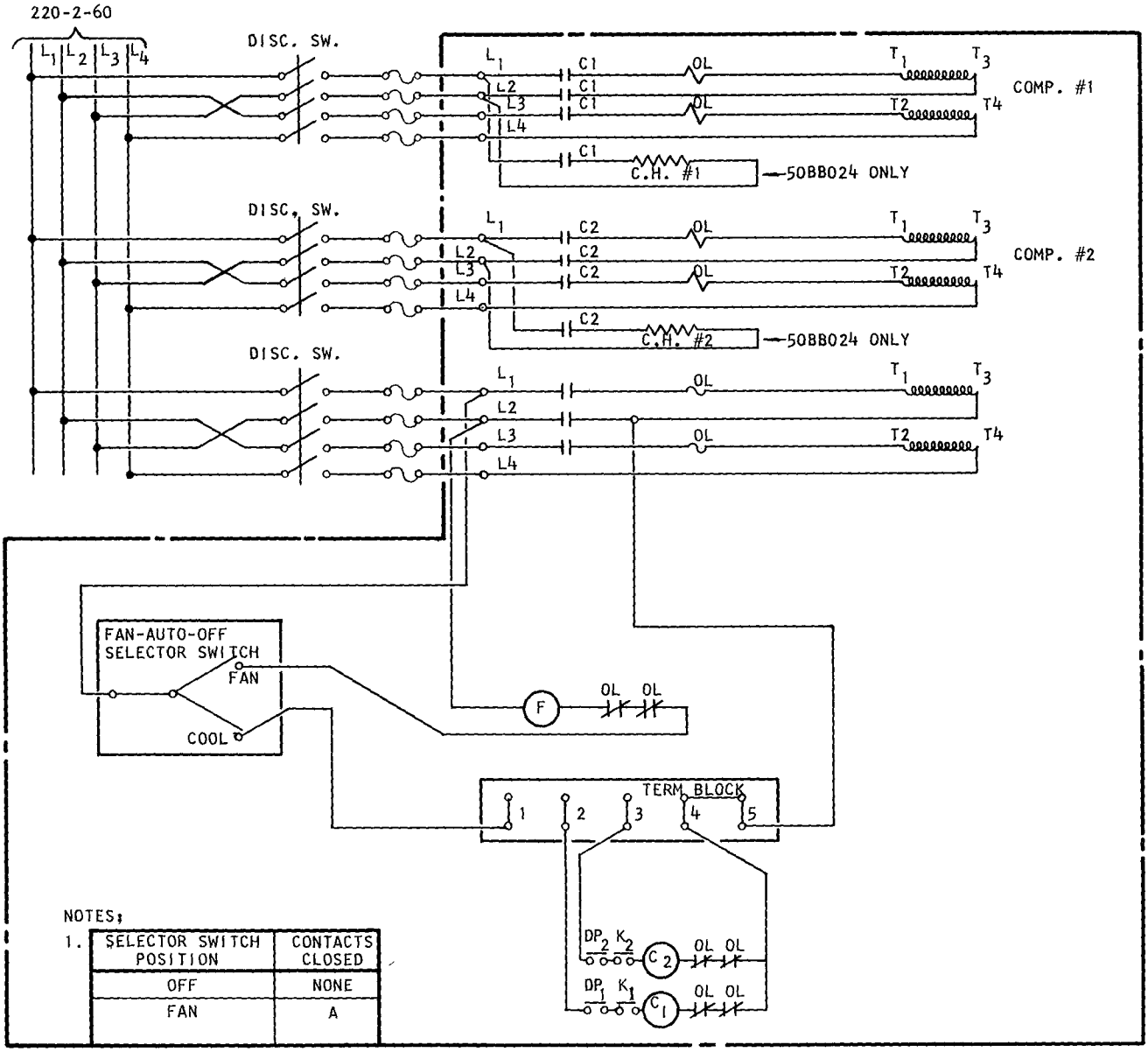
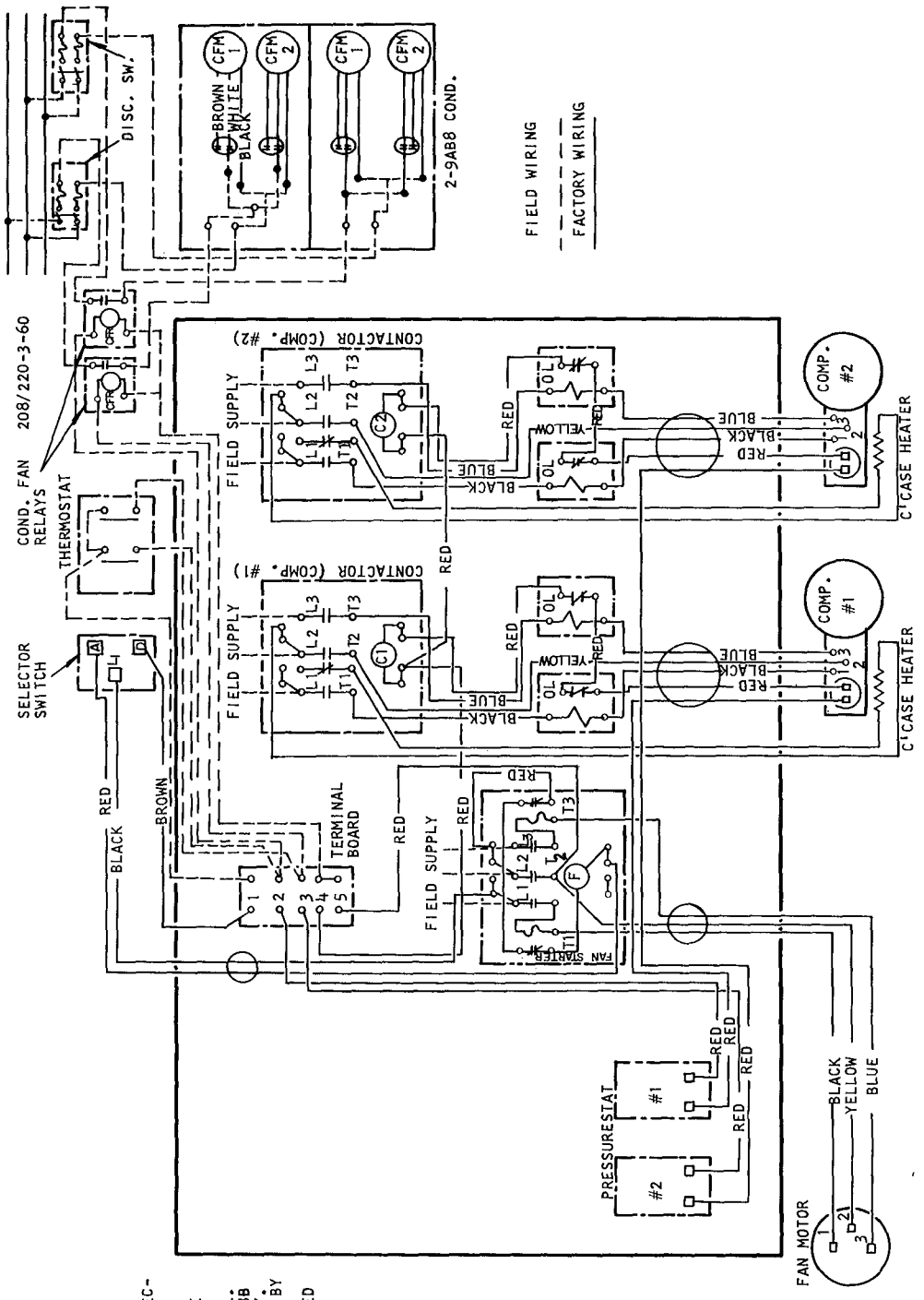


FIG. 26 - 50BA, BB, BC024 SCHEMATIC WIRING (220-2-60)



NOTES:

1. TERMINAL BLOCK FOR CONNECTION OF CLASS 1 CONTROL CIRCUIT.
2. MAX. EXT. LOAD AVAILABLE BETWEEN TERMINALS 1 & 5 AND/OR 2 & 5-60 VA TOTAL.
3. CRANKCASE HEATERS IN 50BB (AIR COOLED) MODELS ONLY.
4. THERMOSTAT NOT SUPPLIED BY CARRIER.
5. COND. FAN RELAYS INCLUDED WITH UNIT.

FIG. 27 - 50BA, BB, BC024 LINE DIAGRAM (208/220-3-50/60)

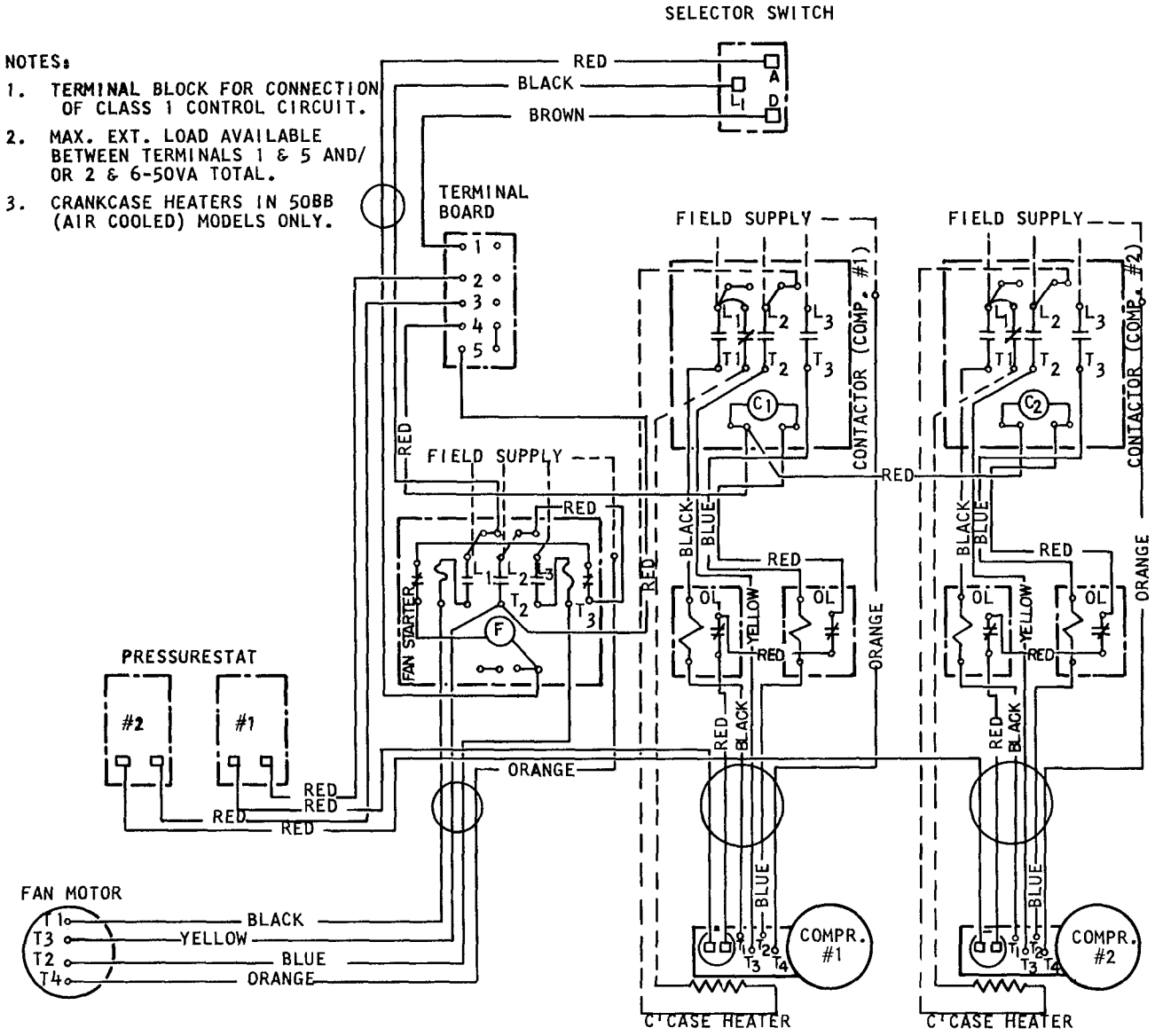


FIG. 28 - 50BA, BB, BC024 LINE DIAGRAM (220-2-60)

NOTES:
1. TERMINAL BLOCK FOR CONNECTION OF CLASS 1 CONTROL CIRCUIT.
2. MAX. EXT. LOAD AVAILABLE BETWEEN TERMINALS 1 & 5 AND/OR 2 & 6-50 VA TOTAL.
3. CRANKCASE HEATERS IN 50BB (AIR COOLED) MODELS ONLY.

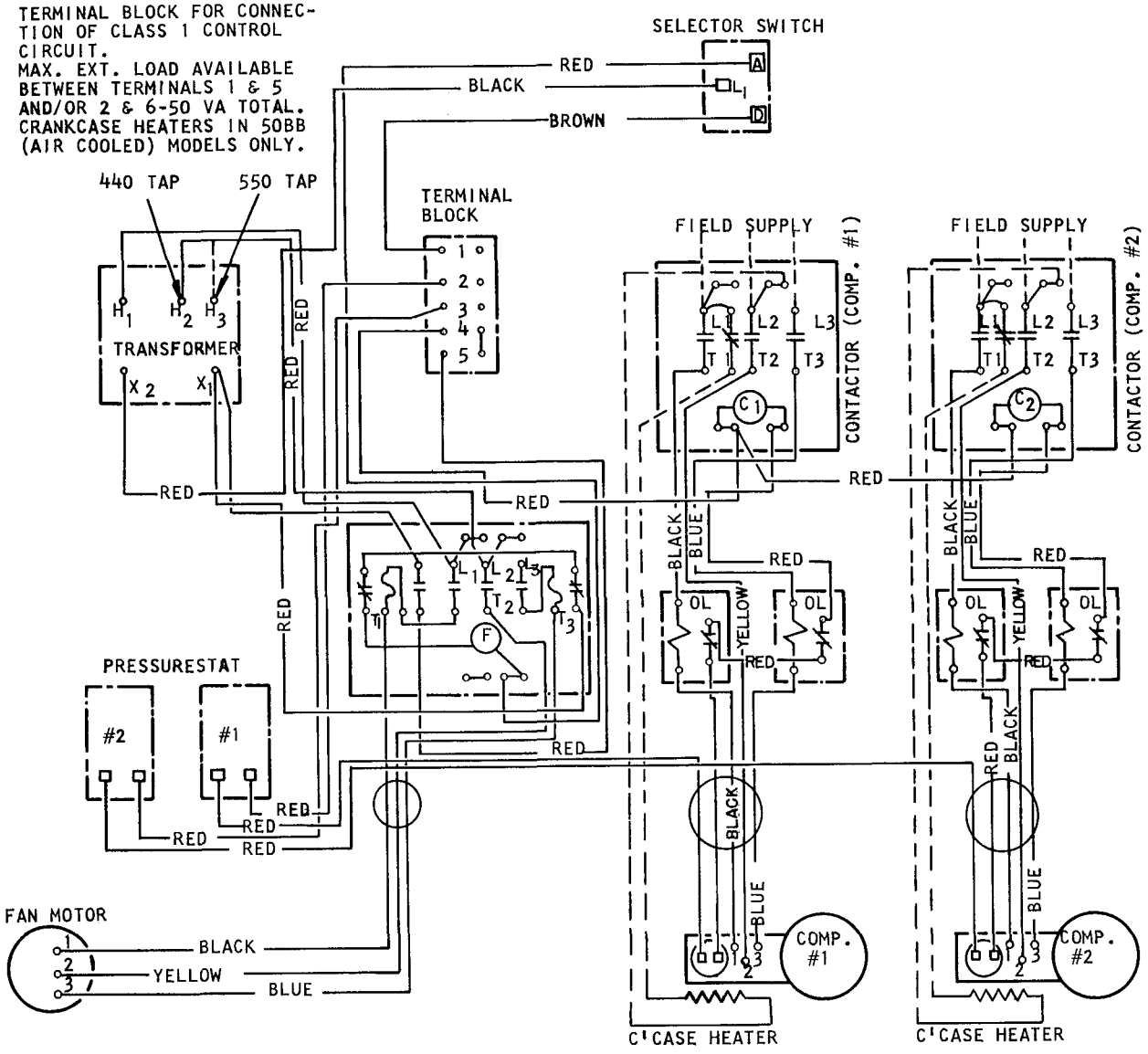


FIG. 29 - 50BA, BB, BC024 LINE DIAGRAM (440/550-3-60)

NOTE:

1. TERMINAL BLOCK FOR CONNECTION OF CLASS 1 CONTROL CIRCUIT.
2. MAX. EXT. LOAD AVAILABLE BETWEEN TERMINALS 1 AND 5 AND/OR 2 AND 6-50 VA TOTAL.
3. CRANKCASE HEATERS IN 50BB (AIR COOLED) MODELS ONLY.

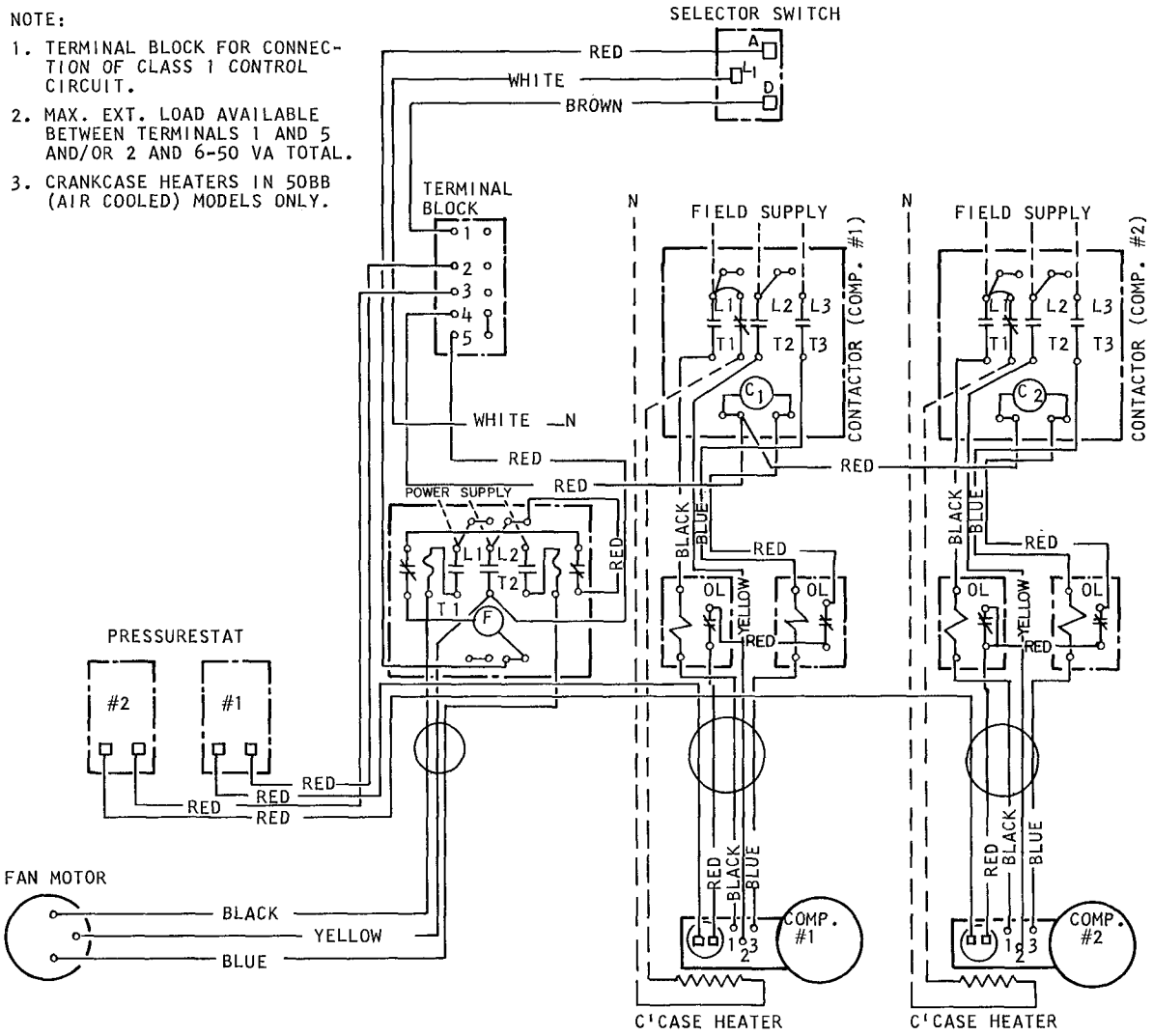


FIG. 30 - 50BA, BB, BC024 LINE DIAGRAM (380-3-50)

22. PREVENTATIVE MAINTENANCE

Proper maintenance of this equipment will help to insure trouble-free operation and will add to the life of the unit. Inspection and maintenance operations should be done at regular intervals and should include the following:

Complete cleaning of the entire unit including if necessary, the fan wheel, cooling coil, condensate pan and drain, heating coils, return air grille (if used).

A. Inspection of panels and sealing of unit against air leakage.

B. Adjustment of fan motor, belt, bearings, wheels.

C. Cleaning or replacement of filters.

D. Testing for leaks - adding refrigerant charge, and oil if necessary.

E. Checking all electrical connections.

PANELS

Panels are fastened to the unit frame with self-tapping screws. It is extremely important that the fan and coil compartment is sealed tightly to prevent air leakage which will by-pass the cooling coil.

FAN WHEELS

Keep fan wheels and fan housings clean. Remove any objects or dirt. Poorly balanced, bent or broken fan wheels should be replaced with new factory wheels. Center fan wheels as outlined in installation instructions.

FAN MOTOR LUBRICATION

Fan motors supplied with the 024 models have permanently lubricated ball bearings and require no further lubrication.

FAN SHAFT BEARINGS

Fan shaft bearings are permanently lubricated ball bearings rubber vibration mounted. They do not require any further lubrication.

CLEANING COOLING COIL

Keep the cooling coil clean. Under no circumstances should the unit be operated without air filters. When removing the filters, the underside of the cooling coil should be inspected and any accumulated dirt removed. The coil may be cleaned more easily when it is dry. A stiff brush, vacuum cleaner or compressed air will help in cleaning of the coil. Coil baffles should be kept clean and checked for a tight fit to keep air from by-passing the coil.

REPLACEMENT OF MOTOR

See Paragraph 5 for correct procedure in replacing motor, pulleys, belts, etc.

CONDENSATE DRAINS

Keep condensate drains free from dirt and foreign matter. Install drains with clean-out plugs. Check strainer located at rear right-hand side of condensate pan to keep water from being trapped in condensate pan, and over-flowing on to floor.

Install condensate drains with traps.

Without a trap, air will be drawn up the drain line until the water level in the condensate pan becomes equal to the static pressure created by the fans. Conditions will worsen if filters become blocked.

With a trap the static pressure of the fans is balanced in the trap. Water can drain completely from the pan into the trap.

SERVICE ACCESS PANELS

A. The coil may be removed from the unit either through the top or the back of the coil fan section.

B. Filters are removable through access panels on either side of the unit.

C. Fan motor and drive may be serviced through the front or back of the fan section.

D. Fan shafts and wheels may be removed through the front or the back of the fan sections.

E. Distributors are mounted so that the expansion valve or coil can be serviced from the front of the unit or through the access cover located on the right side of the unit coil section.

See Fig. 3, 4, 5 and 6 for component arrangement and service access panels.

FILING INSTRUCTIONS

BOOK	MAJOR TAB	MINOR TAB	THIS ISSUE	SUPERSEDES	TAB
Packaged Equipment (Installation & Service)	Packaged Units	Commercial & Industrial Units	50BA501005 1-28 11-60	New	18