Number One Air Conditioning Maker
Carrier
Division of Carrier Corporation
Carrier Parkway • Syracuse, N Y 13221

Installation, Start-Up and Service Instructions

50EQ

Single-Package Heat Pumps

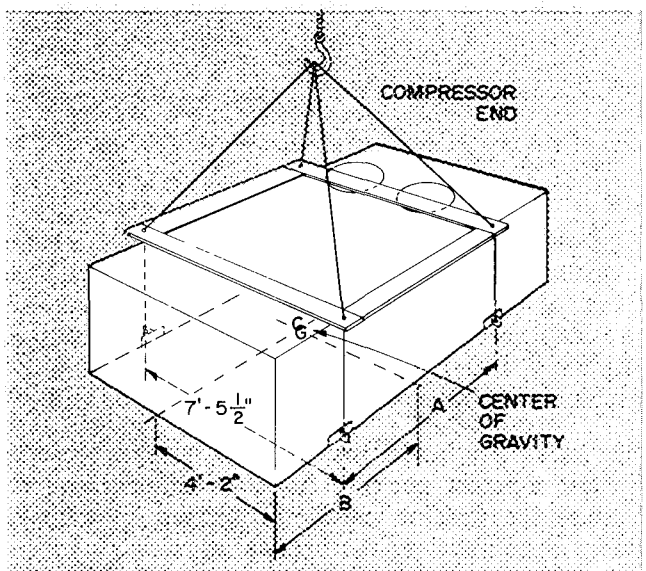
INSTALLATION

Rigging and Unit Placement — Inspect unit for transportation damage. File claim with transportation agency. Do not drop unit. Keep unit upright. Units are designed to be hoisted only. However, units with optional shipping skids may be moved with a fork truck. Use spreader bars over unit to prevent sling or cable damage to unit. Level unit by using unit frame as reference. Leveling tolerance is ±1/16 in. per linear ft in any direction. See Fig. 1 for additional information. Unit weight is shown in Table 1.

Roof Curb — Assemble and install accessory roof curb in accordance with instructions shipped with accessory. (In areas of prolonged sub-freezing temperatures or heavy snowfall, the use of an 18-in. high roof curb is recommended. This permits proper drainage during defrost.) Refer to Fig. 2.

Install insulation, cant strips, roofing and flashing as required. Ductwork can be installed to roof curb before unit is set in place. Curb should be level. Unit leveling tolerance is ±1/16 in. per linear ft in any direction. This is necessary to permit unit drain to function properly.

Cut hole(s) in roof to accommodate return and supply ducts only. Refer to accessory installation instructions.



DIMENSIONS (ft-in.)

UNIT	A	B
50EQ024	6-1-1/2	6-1
50EQ028	9-0	8-0
50EQ034	11-5	10-3

NOTES:
1. All unit panels must be in place when rigging.
2. Do not handle unit with fork trucks.
3. Use 4 cables and 4 "2-by-4's" or "4-by-4's" of dimensions shown.

Fig. 1 — Rigging Details

Roof Mount — Check building codes for weight distribution requirements.

Alternate Unit Support Methods — Where the preferred curb or slab mount cannot be used, support unit with sleepers along unit perimeter using unit curb-support areas. However, if sleepers cannot be used, support long sides of unit (dimension "A," Fig. 3) by three 4-in. by 4-in. pads, equally spaced. Units may sag if supported by corners only.

Positioning — Position unit so that drifting snow does not build up on outdoor coil. Provide clearances around and above the unit for airflow, safety, and service access (Fig. 3).

Do not install unit in an indoor location. Do not locate unit air inlets near exhaust vents or other sources of contaminated air.

Although unit is weatherproof, guard against water from higher runoff and overhangs.

Field-Fabricated Ductwork — Secure all ducts to building structure. Use flexible duct connectors between unit and ducts as required. Insulate and weatherproof all external ductwork, joints and all roof openings with flashing and mastic in accordance with applicable codes.

Ducts passing thru unconditioned spaces must be insulated and covered with a vapor barrier.

Unit Duct Connections — Ductwork openings are shown in Fig. 3.

Economizer Hood Installation, Fig. 4 — The economizer mechanism and all electrical connections are factory installed and adjusted. The hood assembly, outdoor air inlet screens and required hardware are shipped separately and must be field installed.

NOTE: There is a linkage rod and 3 fasteners (speed nuts) shipped with the economizer hood assembly. This rod is not required on 50EQ units.

Install economizer hood(s) as follows:

1. Loosen unit top panel sheet metal screws above outdoor air inlet opening.
2. Assemble hood top panel, side panels and support channel.

Table 1 — Physical Data

UNIT MODEL		50EQ024	50EQ028	50EQ034
OPERATING WEIGHT (lb)				
Base Unit		3300	3900	4550
Base Unit with Economizer		3450	4075	4750
COMPRESSOR		Serviceable, Reciprocating Hermetic		
No. .Model		2 06D824	2. 06D328	2 06D537
Oil (3GS or B1) pts (per Compr)		10	10	10
REFRIGERANT CHARGE		R-22	R-22	—
Sys 1*...Sys 2 (lb)		20.0...21.3	23.5...24.0	29.1...29.1
OUTDOOR AIR FANS		Direct Drive, Propeller		
No. ...Hp		2 . 1	2 . 1	3 1
Frame (NEMA)		56T	56T	56T
Rpm (1-Phase)		1050	1050	1050
INDOOR AIR FANS		Fixed Speed Centrifugal		
Motor	Std	5	7-1/2	10
	Opt	7-1/2	10	15
Shaft Diam (in.) — RPM 1750	Std	1-1/8	1-3/8	1-3/8
	Opt	1-3/8	1-3/8	1-5/8
Motor Frame Size	Std	184T	213T	215T
	Opt	213T	215T	254T
Motor Pulley Pitch Diam (in.)†	Std, A,B	6 5 6 0	6 5 6 0	6 5 5 6
	Opt, A,B	5 3 5 6	5 6 6 0	5 3 5 6
Fan Pulley Pitch Diam (in.)	Std	10 6	10 6	10 6
	Opt	8	8	8
Fan Speed (rpm)	Std, A,B	1073 991	1073 991	1073 925
	Opt, A,B	1159 1225	1225 1312	1159 1225
Fan Shaft Diam (in)		1-3/16	1-3/16	1-11/16
Belt No. ...Size	Std	2 3V750	2 3V750	2 3V750
	Opt	2 3V670	2 3V670	4 3V710
Max Allowable Fan Speed (rpm)		1300	1300	1300
ELECTRIC HEATERS				
Heat Anticipator Setting Stage 1...2		9 25	9 25	9 25
HIGH-PRESSURE SWITCH				
Cutout (psig)		428^{+5}_{-10}	428^{+5}_{-10}	428^{+5}_{-10}
Cut-in (psig)		320^{+5}_{-10}	320 ± 20	320^{+5}_{-10}
LOW-PRESSURE SWITCH				
Cutout (psig)		5 ± 3	5 ± 3	5 ± 3
Cut-in (psig)		20 ± 5	20 ± 5	20 ± 5
INDOOR AIR FILTERS (2-in.)				
Standard; No. ...Size (in.)		6 20x25		9 20x25
Throwaway; No. ...Size (in.)		6. .16x25	18 16x25	12 16x25
AIR INLET SCREENS				
Manual Damper; No. ...Size (in.)		—	—	—
Economizer; No. .. Size (in.)		3 20x25	4 20x25	5 20x25

*System No 1 is bottom portion of indoor coil
†Standard fan motor supplied with standard fan drive pulleys and belts, optional fan motor supplied with optional fan drive pulleys and belts Pulley A is installed in unit; pulley B is shipped with unit

3. Insert hood flange between unit top panel flange and unit. Slots are provided in hood flange to clear sheet metal screws. Tighten sheet metal screws.
4. Secure hood side panels to outdoor air opening flanges using screws provided.
5. Install hood support bracket(s) between U-channel and support channel.
6. Install screen retainer on support channel using screws in the slots. Do not tighten.
7. Install outdoor air screens.
8. Push retainers snugly against screens and tighten screws.

Enthalpy Control — Remove enthalpy control assembly (Fig. 5) from shipping location on horizontal deck in return air filter compartment.

Using 4 no. 10-1/2 screws from envelope in control assembly junction box, mount the enthalpy control assembly to the *inside* of economizer hood side panel nearest condenser section (Fig. 6).

Route the 3 wires, coiled near top cover on the condenser partition, thru knockout in side plate (Fig. 6). Using wire connectors from envelope in junction box, wire enthalpy control assembly as shown in Fig. 7. Use strain reliefs from envelope in junction box on side plate and junction box (Fig. 6).

Exhaust Air Hood Installation — The optional power exhaust package hood assemblies and required sheet metal screws are shipped in compartment at right of indoor air fan motor.

Using screws provided, install a hood assembly over each exhaust air opening as shown in Fig. 3. Power exhaust applies only to units with economizer. The exhaust fan and motor assembly is factory wired and adjusted. Refer to Service, Exhaust Air Fan Adjustment if required.

Return Air Filters — Check to be sure return air filters of the correct type and size are installed in unit filter racks. Filter data is shown in Table 1. Do not operate unit without return air filters.

Outdoor Air Inlet Screens — Be sure all outdoor air inlet screens are in place before operating unit.

Condensate Drains — See Fig. 3 for drain locations. Condensate drain is open to atmosphere and must be trapped. Install a trapped drain line at connection to be used. Trap must be at least 4 in. deep and made of flexible material or be installed so as to prevent freeze-up.

Condensate drain pan is fitted with a 1-in. FPT coupling. Condensate drain line may be routed thru unit base pan or unit side as shown. A grommet is shipped taped to this drain. Install this gasket in unit base pan opening or alternate opening on end of unit as required.

Field Power Wiring — All units have circuit breakers for compressors, heaters, fan motors and control circuits. Each unit is factory wired for voltage shown on nameplate. The main power terminal block is suitable for use with aluminum or copper wire. See Table 2 for use of aluminum wire on electric heater terminal blocks.

Install conduit connections in unit base pan or side panel opening provided as shown in Fig. 3.

On all units route power lines to terminal block in control box as shown in Fig. 8. On units with electric heat, route second power supply line thru connector to terminal block in heater compartment.

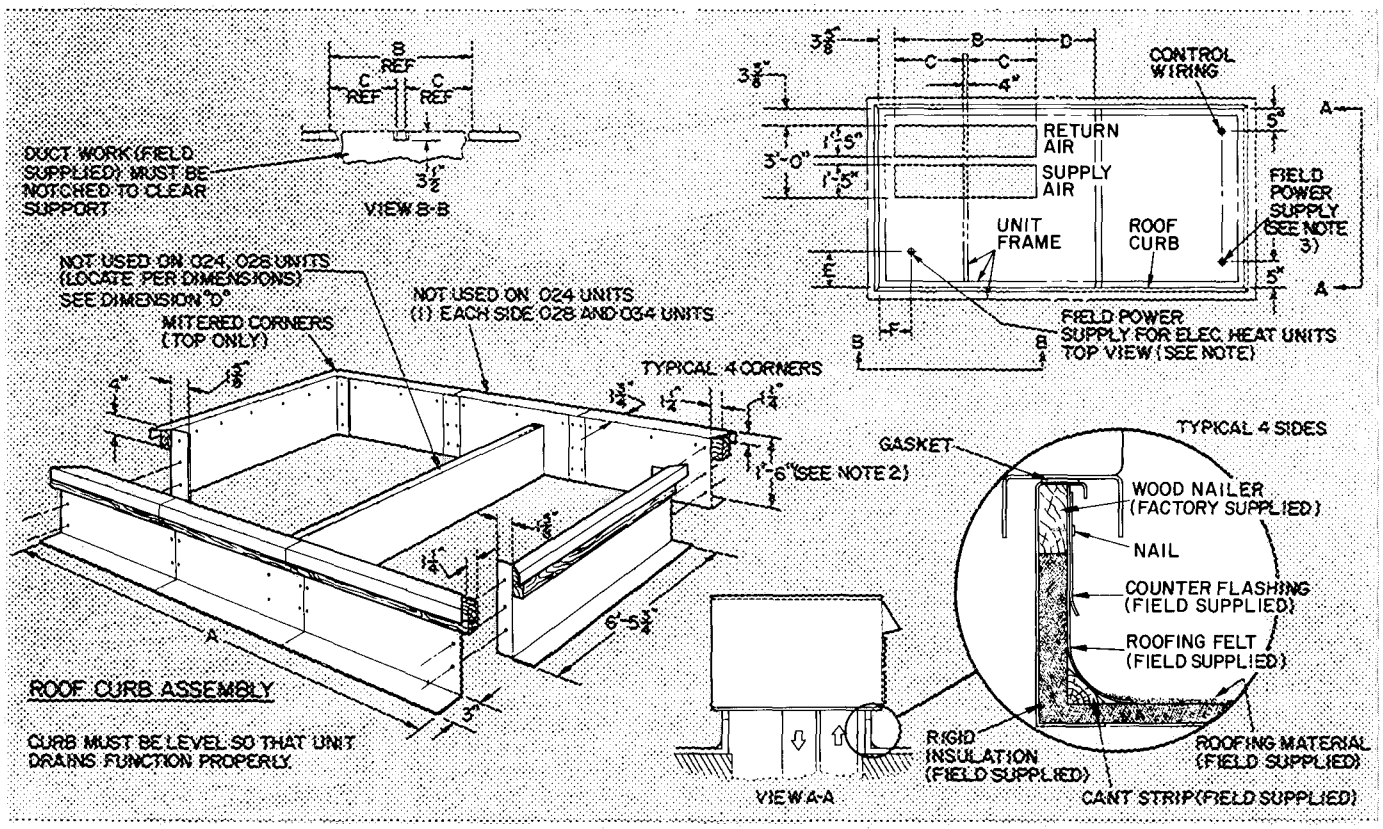
Locate field-supplied disconnect(s) within sight of and directly accessible from the unit. All field wiring must comply with NEC and local requirements.

Affix crankcase heater sticker to unit disconnect switch.

Voltage to compressor terminals during compressor operation must be within voltage range indicated on unit nameplate. Phases must be balanced within 2%. Contact local power company for correction of improper voltage or phase imbalance. See Table 2 as required.

Failure due to operation of unit on improper line voltage or with excessive phase imbalance constitutes abuse and may cause damage to unit electrical components.

Field Control Wiring — Install a Carrier approved accessory thermostat assembly according to installation instructions included with the accessory. Locate thermostat assembly in the conditioned space where it will sense average temperature.

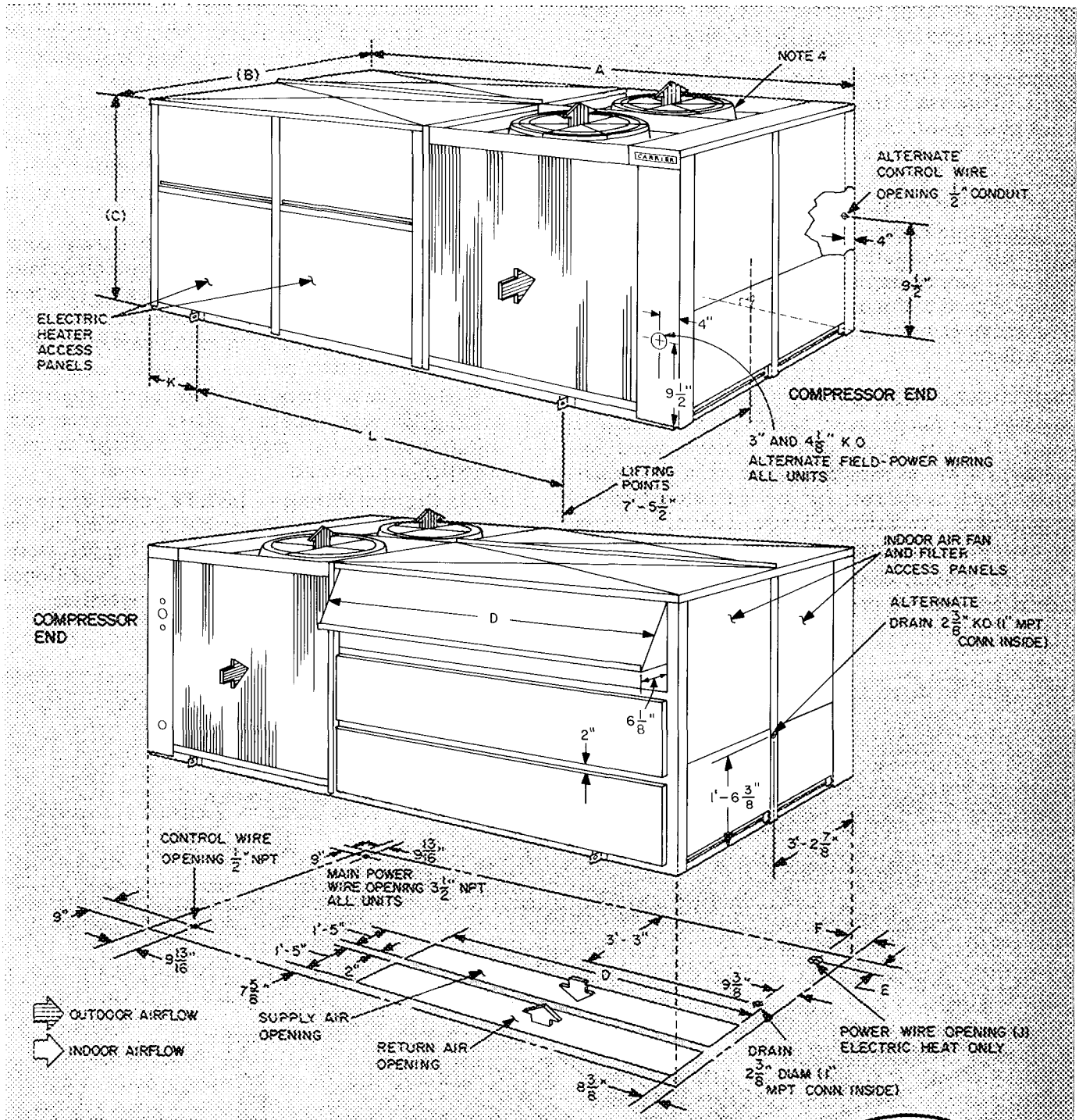


DIMENSIONS (ft-in.)

UNIT	ROOF CURB MODEL NO.	A	B	C	D	E	F
50EQ024	50EQ900001	10- 0-1/4	4-11	—	—	0-6-1/4	0-5-1/8
50EQ028	50EQ900011	12-10-3/4	6-11	—	—	0-6-1/4	0-5-1/8
50EQ034	50EQ900021	16- 3-1/8	9- 0	4-4	0-6	0-6-1/4	0-5-7/8

NOTES
1. Certified dimension drawings are available on request
2. For details of 12-in high roof curb, refer to 48DD *roof curb installation instructions*
3. Two field power supplies are required for 50EQ units with electric heat

Fig. 2 — Roof Curb Dimensions



Certified dimension drawings available on request.

DIMENSIONS (ft-in.)

UNIT 50EQ	024	028	034
A	10- 9-13/16	13- 8-1/2	17- 1
B	7- 2-11/16	7- 3-1/8	7- 3-1/8
C	4-10-1/2	4-10-1/2	4-10-1/2
D	4-11	6-11	11- 0
E	0-10-1/4	0-10-1/4	0-10-1/4
F	0- 9-7/8	0- 9-7/8	0- 9-7/8
G	—	—	—
H	—	—	—
J	3-1/2" NPT	4" NPT	4" NPT
K	2- 4	2- 4	2-10
L	6- 1-1/2	9- 0	11- 5

NOTES:
1. Allow 12 ft above unit, 8 ft on filter access panel end and 4 ft on remaining sides of unit for airflow and service clearance.
2. For smaller clearances, contact Carrier.
3. Refer to Roof Curb Dimensions for details of roof openings.
4. The 50EQ034 unit contains three fans.
5. The 50EQ034 unit contains three exhaust hoods.

Fig. 3 — Base Unit Dimensions

Route thermostat cable or equivalent single leads of no. 18 AWG colored wire from subbase terminals thru connectors in unit base pan or side panel (Fig. 3) to low-voltage connections in control box as shown in Fig. 9. Use no. 16 AWG wire for lengths exceeding 50 feet. Set heat anticipator settings as indicated in Table 1.

Refer to accessory remote control panel instructions as required.

Outdoor Air Thermostat — Unit is equipped with a field adjustable outdoor air thermostat. Thermostat is shipped taped to right-hand side of unit control box. Upon start-up, set the thermostat "close setpoint" to the building load balance point and unit capacity. Above the setpoint, the space thermostat controls 2 stages of compression heat and electric heat is locked out. Below the setpoint, one stage of compression heat is available and electric heat is controlled by the second stage of the space thermostat.

Compressor(s) — Loosen compressor hold-down bolts until sidewise movement of the washer under each hold-down bolt head can be easily obtained. Do not loosen completely as bolts are self-locking and will maintain their adjustment.

Open the compressor discharge and suction service valves. Replace and tighten valve caps to prevent leaks.

Liquid Line Service Valves — Open the liquid line service valves. Replace caps and tighten to prevent leaks.

START-UP

Cooling

1. Open compressor service valves. Replace valve caps to prevent leaks. Make sure crankcase heater has been on for at least 24 hours to drive out any liquid refrigerant in compressor crankcase. Check compressor oil level. Oil sight glass should be about half full.
2. Be sure that liquid line service valve is open.
3. Check that setscrews are tight in fan bearing locking collar, pulley and fan blades.
4. Check pulley alignment and belt adjustment. Remove tape on indoor fan pulley.
5. Check that internal power wire terminal screw connections are tight.
6. On 3-phase units, check for correct fan rotation.
7. Set system selector switch at COOL and fan switch at AUTO. Adjust thermostat at a setting below room temperature. Compressor no. 1 will start on closure of no. 1 contactor. An additional rise in room temperature closes cooling contactor no. 2 in thermostat, energizing no. 2 contactor, no. 2 compressor will start.
8. Check cooling effect at duct supply outlets.
9. Check unit charge. Refer to Refrigeration Charge in Service section.

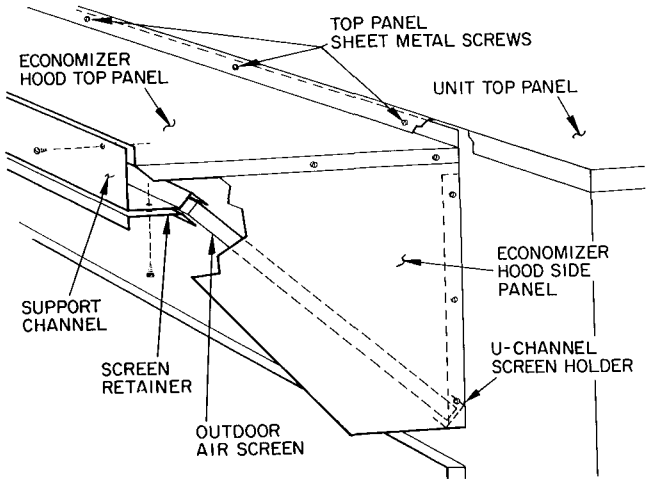


Fig. 4 — Economizer Outdoor Air Inlet Hood Assembly

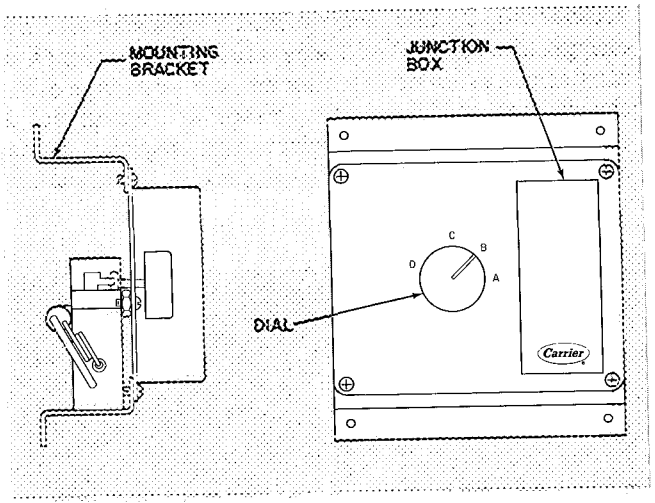


Fig. 5 — Enthalpy Control Assembly

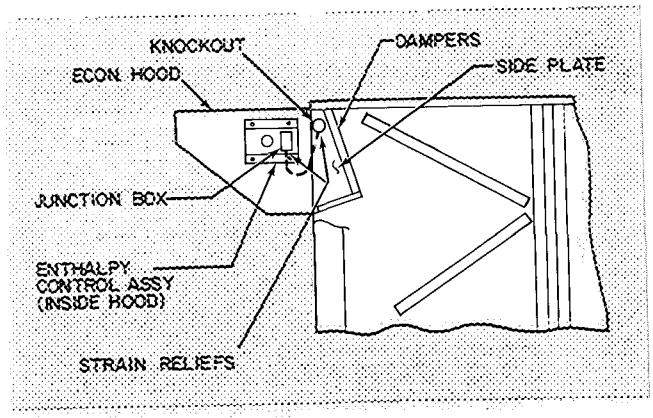


Fig. 6 — Enthalpy Control Assembly Installation Details

10. Reset thermostat at a setting above room temperature. Compressor(s) will shut off.

TO SHUT OFF UNIT — Set system selector switch at OFF position or reset thermostat at a setting above room temperature.

Do not shut off unit circuit breakers except when unit is to be serviced. Crankcase heaters are energized only when unit power is on.

Units are equipped with Signal-LOC™ compressor protective device. Unit shuts down on trip of any safety device and indicator light on thermostat comes on. Check reason for safety device trip. Compressor restart is accomplished by manual reset at room thermostat by moving selector switch to OFF and then ON.

Heating — To start unit, turn on main power supply. Refer to Crankcase Heaters.

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

First stage of the heating thermostat energizes compressor no. 1; the second stage energizes compressor no. 2. The electric heater elements are not energized until the field adjustable outdoor air thermostat closes. When this occurs, the first stage of the thermostat energizes compressor no. 1 and no. 2; the second stage energizes the electric heater elements.

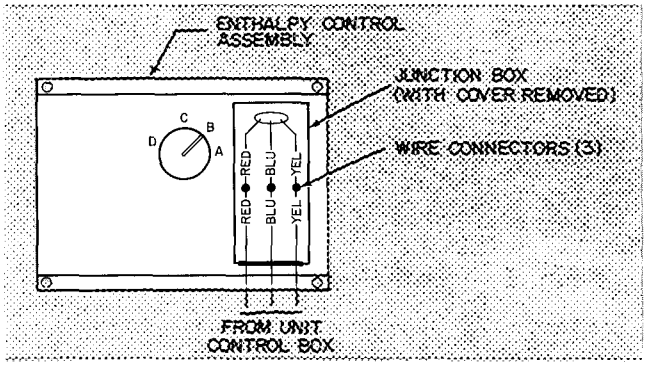


Fig. 7 — Enthalpy Control Assembly Wiring Connections

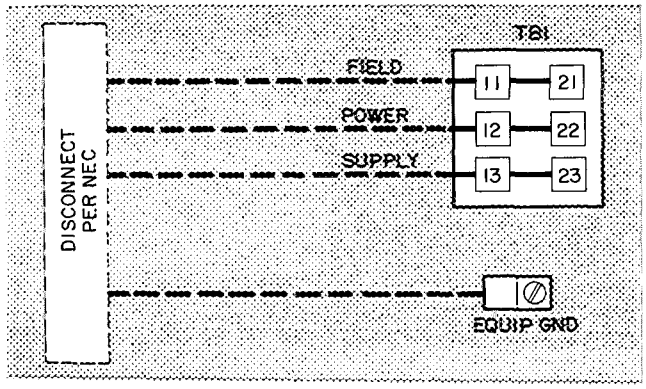


Fig. 8 — Field Power Wiring Connections

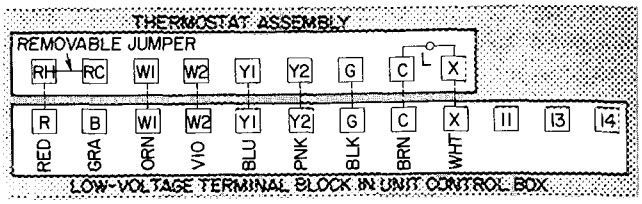


Fig. 9 — Field Control Thermostat Wiring

Check heating effect at duct supply outlets.

Check unit operation. Refer to heating operation chart in service section.

TO SHUT OFF UNIT — Set system selector switch at OFF or set heating selector lever below room temperature.

Safety Relief — A fusible plug in the accumulator provides pressure relief under abnormal temperature and pressure conditions.

Defrost Cycle — As frost builds up on the outdoor coil, the defrost thermostat closes and the unit operates in a defrost cycle (controlled by the defrost timer and thermostat). During this cycle the outdoor air fan shuts off and the unit operates on cooling cycle for a maximum of 10 minutes. During defrost, bottom of outdoor coil defrosts first to ensure proper drainage.

If only compresor no. 1 is operating at beginning of a defrost cycle, compressor no. 2 is started to maintain warm air supply to conditioned space.

If both compressors are operating, one is prevented from defrosting as the other compressor continues thru the defrost cycle. The electric heaters are not automatically energized during a defrost cycle.

Automatic Changeover (with Automatic Changeover Thermostat only) — The unit will automatically switch from heating mode to cooling mode when the system selector switch is set at AUTO. and the temperature of the conditioned space rises to cooling selector lever setting. When the temperature of the conditioned space falls to the heating selector lever setting, the unit will automatically change from cooling mode to heating mode.

The thermostat and unit are so connected that the cooling and heating systems will not operate simultaneously.

Economizer Operation — If unit is equipped with a modulating outdoor air control (economizer), it should operate as follows:

THERMOSTAT SETTINGS — Set enthalpy control to the desired temperature and relative humidity which provides cooling with outside air only (no compressor operation). To determine appropriate setting of enthalpy control:

1. Determine the maximum combination of relative humidity and temperature of the supply air considered acceptable for the installation.

2. In Fig. 10, locate the percent humidity on the left-hand scale and the dry-bulb temperature on the right-hand scale. Example in Fig. 10 uses 60% RH and 66 F.
3. Draw a straight line connecting the 2 points.
4. Adjust the enthalpy control dial to the setting indicated on the control setting scale in Fig. 10.

   The control setting for the example conditions is the B range.

Then set mixed air thermostat in unit filter compartment to desired temperature of air delivered to the conditioned space (not less than 50 F or condensation in unit will result).

HEATING OR COMPRESSOR COOLING

Night Switch Closed — The dampers will assume and hold the ventilation position whenever indoor air fan is operating. When indoor air fan shuts off, the outdoor air damper will close.

Night Switch Open — Outdoor air damper remains in the closed position. No outdoor air is introduced into the airstream; unit operation is unaffected.

INTERMEDIATE SEASON (FREE COOLING)

Night Switch Closed (Normal daytime operation) — If outdoor enthalpy is below enthalpy control setting, the compressor will remain off when the room thermostat operates the indoor air fan in the usual manner. The damper will modulate to maintain the mixed air thermostat (MAT.) setting. If the outdoor enthalpy rises above the enthalpy control setting, the unit operates as described in Heating or Compressor Cooling paragraph above.

Night Switch Open — Unit operates as described in Heating or Compressor Cooling paragraph above.

Power Exhaust Operation (if fitted) — When unit is on economizer mode, the outdoor air damper is open providing low-cost cooling. The exhaust fan (runs only during economizer operation) exhausts return air to the outdoors.

Crankcase Heater — Keeps oil free of refrigerant. Main power must remain on for heater operation. In case of extended unit shutdown (more than 24 hours), energize heaters at least 24 hours before starting compressor.

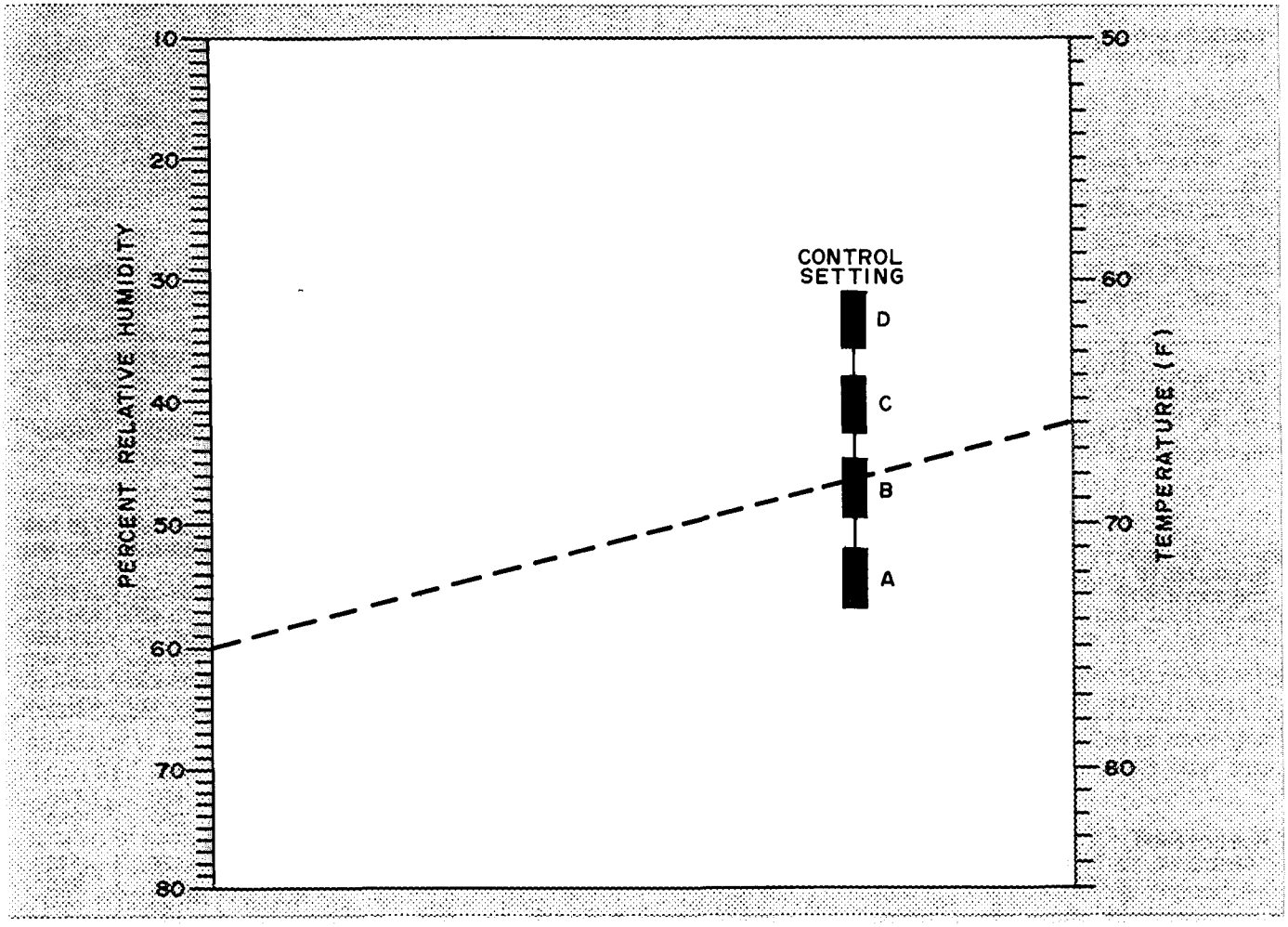


Fig. 10 — Nomograph for Determining Enthalpy Control Setting

Table 2 — Electrical Data, Units 50EQ024

UNIT MODEL NOMINAL VOLTS/PH/HZ	VOLTAGE RANGE		COMPR NO. 1, 2		OUTDOOR FAN MOTORS		INDOOR FAN MOTOR		EXHAUST FAN MOTOR		HEATERS	POWER SUPPLY*			
												Circuit No. 1		Circuit No. 2	
	Min	Max	RLA	LRA	Qty	FLA	Hp	FLA	Hp	FLA	FLA	MCA	MOCP	MCA	MOCP
							5	16 2	—	—	—	150	175	—	—
							5	16 2	3	11 0	—	175	175	—	—
							7 5	25 3	—	—	—	175	175	—	—
							5	16 2	—	—	162	150	175	205	250
							5	16 2	—	—	199	150	175	250	250
50EQ024400 200/3/60	180	229	49 3	170	2	7 6 (ea)	7 5	25 3	3	11 0	—	175	175	—	—
							5	16 2	3	11 0	162	175	175	205	250
							5	16 2	3	11 0	199	175	175	250	250
							7 5	25 3	—	—	162	175	175	205	250
							7 5	25 3	—	—	199	175	175	250	250
							7 5	25 3	3	11 0	162	175	175	205	250
							7.5	25.3	3	11.0	199	175	175	250	250
							5	13 2	—	—	—	130	150	—	—
							5	13 2	3	9 6	—	150	150	—	—
							7 5	22 0	—	—	—	150	150	—	—
							5	13 2	—	—	144	130	150	200	200
							5	13 2	—	—	240	130	150	310	350
50EQ024500 230/3/60	207	264	44 4	153	2	6 6 (ea)	7 5	22 0	3	9 6	—	150	150	—	—
							5	13 2	3	9 6	144	150	150	200	200
							5	13 2	3	9 6	240	150	150	310	350
							7 5	22 0	—	—	144	150	150	200	200
							7 5	22 0	—	—	240	150	150	310	350
							7 5	22 0	3	9 6	144	150	150	200	200
							7.5	22 0	3	9.6	240	150	150	310	350
							5	6 6	—	—	—	65	70	—	—
							5	6 6	3	4 8	—	85	80	—	—
							7 5	11 0	—	—	—	85	80	—	—
							5	6 6	—	—	69 1	65	70	95	100
							5	6 6	—	—	115 1	65	70	150	150
50EQ024600 460/3/60	414	528	22 2	77	2	3 3 (ea)	7 5	11 0	3	4 8	—	85	80	—	—
							5	6 6	3	4 8	69 1	85	80	95	100
							5	6 6	3	4 8	115 1	85	80	150	150
							7 5	11 0	—	—	69 1	85	80	95	100
							7 5	11 0	—	—	115 1	85	80	150	150
							7 5	11 0	3	4 8	69 1	85	80	95	100
							7 5	11 0	3	4 8	115 1	85	80	150	150

SEE LEGEND AND NOTES, PAGE 9

Table 3 — Electrical Data, Units 50EQ028

UNIT MODEL NOMINAL VOLTS/PH/HZ	VOLTAGE RANGE		COMPR NO. 1, 2		OUTDOOR FAN MOTORS		INDOOR FAN MOTOR		EXHAUST FAN MOTOR		HEATERS	POWER SUPPLY*			
												Circuit No. 1		Circuit No. 2	
	Min	Max	RLA	LRA	Qty	FLA	Hp	FLA	Hp	FLA	FLA	MCA	MOCP	MCA	MOCP
							7 5	24 2	—	—	—	175	200	—	—
							7 5	24 2	3	11	—	175	200	—	—
							10 0	30 8	—	—	—	175	225	—	—
							7 5	24 2	—	—	164-192	175	200	225-250	225-250
							7 5	24 2	—	—	289-322	175	200	370-420	400-450
50EQ028510 208-230/3/60	187	253	55 2	172	2	7 6	10 0	30 8	3	11	—	175	225	—	—
							7 5	24 2	3	11	164-192	175	200	205-250	225-250
							7 5	24 2	3	11	289-322	175	200	370-420	400-450
							10 0	30 8	—	—	164-192	175	225	205-250	225-250
							10 0	30 8	—	—	289-322	175	225	370-420	400-450
							10 0	30 8	3	11	164-192	175	225	205-250	225-250
							10.0	30.8	3	11	289-322	175	225	370-420	400-450
							7 5	11	—	—	—	75	90	—	—
							7 5	11	3	4 8	—	75	90	—	—
							10 0	14	—	—	—	80	100	—	—
							7 5	11	—	—	96	75	90	120	125
							7 5	11	—	—	161 1	75	90	250	250
50EQ028600 460/3/60	414	528	24 8	86	2	3 3 (ea)	10 0	14	3	4 8	—	80	100	—	—
							7 5	11	3	4 8	96	75	90	120	125
							7 5	11	3	4 8	161 1	75	90	250	250
							10 0	14	—	—	96	80	100	120	125
							10 0	14	—	—	161 1	80	100	250	250
							10 0	14	3	4 8	96	80	100	120	125
							10 0	14	3	4 8	161 1	80	100	250	250

SEE LEGEND AND NOTES, PAGE 9

Table 4 — Electrical Data, Units 50EQ034

UNIT MODEL NOMINAL VOLTS/PH/HZ	VOLTAGE RANGE		COMPR NO. 1, 2		OUTDOOR FAN MOTOR		INDOOR FAN MOTOR		EXHAUST FAN MOTOR		HEATERS	POWER SUPPLY*			
												Circuit No. 1		Circuit No. 2	
	Min	Max	RLA	LRA	Qty	FLA	Hp	FLA	Hp	FLA	FLA	MCA	MOCP	MCA	MOCP
50EQ034500 208-230/3/60	187	254	71 2	240	3	7 6	10	30 8	—	—	—	230	250	—	—
							10	30 8	3	9 6	—	230	250	—	—
							15	41 4	—	—	—	230	250	—	—
							10	30 8	—	—	199-229	230	250	255-310	300-350
							10	30 8	—	—	—	230	250	—	—
							10	30 8	—	—	318-376	230	250	420-475	450-500
							15	41 4	3	9 6	—	230	250	—	—
							10	30 8	3	9 6	199-229	230	250	255-310	300-350
							10	30.8	3	9.6	—	230	250	—	—
							10	30 8	3	9 6	318-376	230	250	420-475	450-500
							15	41 4	—	—	119-229	230	250	255-310	300-350
							15	41 4	—	—	—	230	250	—	—
							15	41 4	—	—	318-376	230	250	420-475	450-500
							15	41 4	3	9 6	199-229	230	250	255-310	300-350
							15	41 4	3	9 6	—	230	250	—	—
							15	41.4	3	9.6	318-376	230	250	420-475	450-500
50EQ034600 460/3/60	414	528	32	120	3	3 3	10	14	—	—	—	100	110	—	—
							10	14	3	4.8	—	100	110	—	—
							15	20	—	—	—	100	110	—	—
							10	14	—	—	115.1	100	110	150	150
							10	14	—	—	—	100	110	—	—
							10	14	—	—	184	100	110	230	250
							15	20	3	4 8	—	115	125	—	—
							10	14	3	4 8	115 1	100	110	150	150
							10	14	3	4 8	—	100	110	—	—
							10	14	3	4 8	184	100	110	230	250
							15	20	—	—	115 1	100	110	150	150
							15	20	—	—	—	100	110	—	—
							15	20	—	—	184	100	110	230	250
							15	20	3	4 8	115 1	115	125	150	150
							15	20	3	4 8	—	115	125	—	—
							15	20	3	4 8	184	115	125	230	250

*Fuse only

Compr — Compressor
FLA — Full Load Amps
Hp — Nominal Horsepower
Kw — Kilowatts
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection
RLA — Rated Load Amps

NOTES: (Tables 2, 3, and 4)
1. All outdoor fan motors are single-phase motors
2 All heaters are 3-phase assemblies
3 Main power supply (circuit no 1) on all units is suitable for copper or aluminum or wire
4 Electric heat power supply (circuit no 2) on 240 amp, 230 v, 114 amp, 460 v units is suitable for copper wire only

SERVICE

Cleaning — Inspect unit interior at the beginning of each heating and cooling season and during each season as operating conditions require. Remove unit side panels as required to expose unit interior.

INDOOR COILS — Clean with a stiff brush, vacuum cleaner or compressed air.

OUTDOOR COIL — Clean with a stiff brush or vacuum cleaner. When cleaning with compressed air or low-pressure water or steam, guard against damaging compressor wiring and nearby controls. Condenser fan motors are drip-proof but not waterproof.

CONDENSER SECTION DRAINS — Check that these drains are clean and drain freely.

CONDENSATE DRAIN — Check and clean annually at start of cooling season. In winter, keep drain and trap dry to protect against freeze-up.

RETURN AIR FILTERS — Clean or replace filters at start of each heating and cooling season and once during each season or as often as necessary during each season depending on operating conditions. Refer to Table 1 for type and size of filter used. Filter access panels are shown in Fig. 3. Return air filter tracks will accept 2 layers of one-in. thick filters if 2-in. filters are not available. Do not install bag filters in standard filter tracks. Do not install standard filters or 2-in. high-efficiency filters in bag filter tracks.

OUTDOOR AIR INLET SCREENS — Clean screens with steam or hot water and mild detergent. Do not use throwaway-type filters in place of screens. To remove screens, loosen fastening bracket screws and slide out screens.

Lubrication

COMPRESSORS — Each compressor is charged with correct amount of oil at the factory. Oil level should be between bottom and mid level of sight glass when compressor is warm. Refer to 06D Compressor Service Manual if additional information regarding compressor lubrication system is required.

FAN SHAFT BEARINGS — Charge each grease fitting with a suitable bearing grease at least once a year. Do not overlubricate.

FAN MOTOR BEARINGS — No relubrication of outdoor air fan motors or indoor air fan motors is necessary for first 2 to 5 years of use depending on operating conditions. Annually thereafter, open, clean and repack each bearing with a suitable bearing grease.

Indoor Air Fan Adjustment — Fixed fan speeds are shown in Table 1; note that second pulley is shipped with unit. For other fan speeds, select field-supplied motor or pulleys from Table 5.

Table 5 — Indoor Air Fan Pulley Data

UNIT 50EQ	FAN RPM	MOTOR PULLEY	FAN PULLEY	BELT NO - SIZE
		No. Grooves - Type - In.		
024	925	2 - 3V - 5.6	2 - 3V - 10.6	2 - 3V - 710
	991	2 - 3V - 6.0	2 - 3V - 10.6	2 - 3V - 750
	1073	2 - 3V - 6.5	2 - 3V - 10.6	2 - 3V - 750
	1093	2 - 3V - 5.0	2 - 3V - 8.0	2 - 3V - 670
	1159	2 - 3V - 5.3	2 - 3V - 8.0	2 - 3V - 670
	1225	2 - 3V - 5.6	2 - 3V - 8.0	2 - 3V - 670
	1300	2 - 3v - 6.0	2 - 3V - 8.0	2 - 3V - 710
028	919	2 - 3V - 5.6	2 - 3V - 10.6	2 - 3V - 710
	985	2 - 3V - 6.0	2 - 3V - 10.6	2 - 3V - 750
	1067	2 - 3V - 6.5	2 - 3V - 10.6	2 - 3V - 750
	1088	2 - 3V - 5.0	2 - 3V - 8.0	2 - 3V - 670
	1153	2 - 3V - 5.3	2 - 3V - 8.0	2 - 3V - 670
	1218	2 - 3V - 5.6	2 - 3V - 8.0	2 - 3V - 670
	1305	2 - 3V - 6.0	2 - 3V - 8.0	2 - 3V - 670
034	925	2 - 3V - 5.6	2 - 3V - 10.6	2 - 3V - 750
	1073	2 - 3V - 6.5	2 - 3V - 10.6	2 - 3V - 750
	1093	2 - 3V - 5.0	2 - 3V - 8.0	2 - 3V - 670
	1159	2 - 3V - 5.3	2 - 3V - 8.0	4 - 3V - 710
	1225	2 - 3V - 5.6	2 - 3V - 8.0	4 - 3V - 710
	1300	2 - 3V - 6.0	2 - 3V - 8.0	2 - 3V - 710

Shaded values indicate standard or optional pulley combinations available as shown in Physical Data table All other combinations are field supplied

PULLEY REMOVAL — Pulleys are of the fixed type. To remove, shut off unit power. Loosen fan motor mounting plate and remove belt. Remove pulley from shaft.

After reinstalling pulley and belt, check pulley alignment and belt tension as described below.

PULLEY ALIGNMENT — Loosen fan shaft pulley bushing and slide pulley along shaft. Make angular adjustment by loosening motor mounting plate and repositioning it as required.

BELT TENSION — Adjust belt tension by moving motor back until only a SLIGHT BOW appears in the belts on the slack side of the drive while running under full load. Secure motor. Recheck belt tension after 24 hours of operation, adjust as necessary.

Exhaust Air Fan Adjustment — Adjust belt tension so that 1/8-in. deflection at 5- to 8-lb pressure between pulley centers can be obtained. To change tension, loosen motor mounting bolts, reposition motor and tighten mounting bolts. Tighten locknut and bolt under motor mounting plate to secure in fixed position.

Outdoor Air Fan Adjustment (Fig. 11) — Shut off fan power supply. Remove fan guard and loosen fan hub setscrews. Adjust fan height using a straight edge laid across fan venturi. Tighten setscrews. Fill hub recess with permagum to prevent hub from rusting to motor shaft.

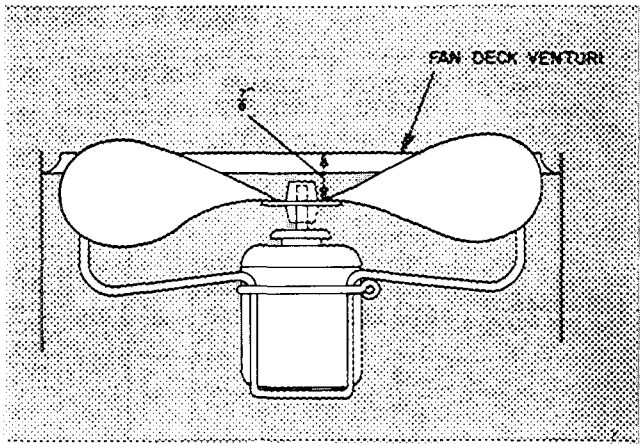


Fig. 11 — Outdoor Air Fan Adjustment

Economizer Adjustment

1. Set enthalpy control at its highest setting. If outdoor temperature is above 70 F, perform the following: Install jumper between enthalpy control terminals 1 and 2 (red and yellow wires). Remove control relay (CR) from unit economizer control panel.
2. Set system selector switch at COOL and set cooling temperature selector lever at lowest setting.

   Cooling mode may also be simulated by removing the thermostat wires from terminals Y1 and Y2 and installing a jumper between terminals R and Y1.
3. Set mixed air thermostat at its lowest setting. Outdoor air damper will go to fully open position (indoor air damper closes).
4. Set mixed air thermostat at its highest setting. Outdoor air damper will go to fully closed position (indoor air damper opens).
5. Adjust mechanical linkage if necessary, for correct positioning (Fig. 12). If enthalpy control terminals were jumped and plug-in control relay was removed from unit control box in step 1, remove jumper and replace plug-in control relay after positioning dampers. If cooling mode was simulated as described in step 2, be sure to remove jumper and reconnect thermostat wires to Y1 and Y2.

DAMPER VENT POSITION SETTING

1. Set fan switch on thermostat assembly at FAN (continuous fan operation) and close night switch (if used).
2. Set thermostat system selector switch at OFF.
3. Remove cap from vent adjustment screw on top of damper motor terminal box cover.

Turn adjustment screw slowly until dampers assume desired vent position. *Do not manually operate damper motor. Damage to motor will result.*

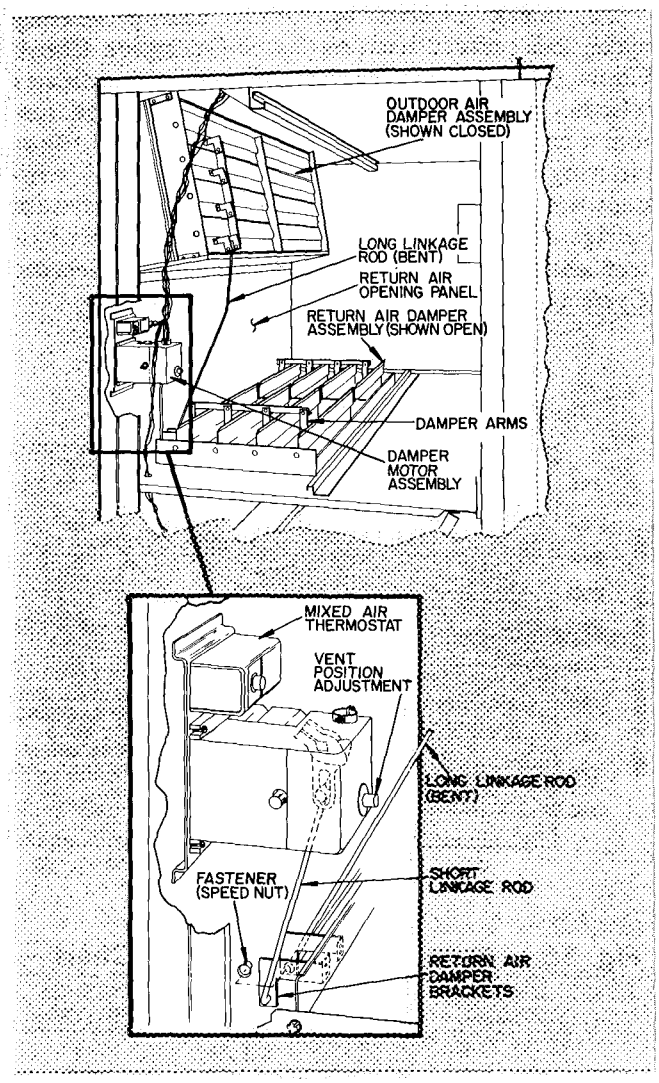


Fig. 12 — Economizer Damper Details

POWER FAILURE — Dampers do not have a spring return. In the event of a loss of power, dampers remain in position until power is restored. *Do not manually operate damper motor. Damage to motor will result.*

Refrigerant Charge — Amount of unit refrigerant charge is listed on unit nameplate (or refer to Table 1). Refer to Carrier Standard Service Techniques Manual, Chapter 1, Refrigerants.

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.

LOW CHARGE — Using charging chart (Fig. 13, 14, or 15) add refrigerant until the conditions of the chart are met. Note that the charging chart is different from the one normally used. Chart is based on charging the units to the correct superheat for the various operating conditions. An 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 outdoor 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 outdoor ambient temperature and read the suction pressure gage. Refer to chart to determine what the suction temperature should be. If the suction temperature is high, add refrigerant. If the suction temperature is low, carefully blow some of the charge. Recheck the suction pressure as charge is adjusted. Example: 50EQ024, Fig. 13:

Outdoor Temperature ..... 85 F
Suction Pressure ..... 68 psig
Suction Temperature should be ..... 50 F
Suction Temperature may vary ..... ±2 F

If Chargemaster® charging device is used, temperature and pressure readings must be accomplished using charging chart, Fig. 13.

LOW CHARGE HEATING — If the outdoor ambient temperature is above 45 F, operate unit on cooling and refer to LOW CHARGE, COOLING. If outdoor ambient is below 45 F, evacuate system and weigh in specified amount of refrigerant. (Refer to Table 1.)

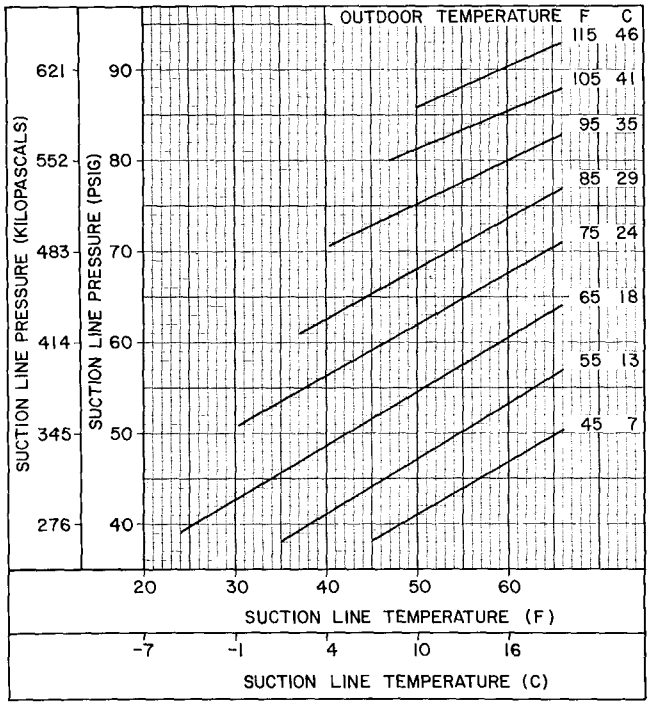


Fig. 13 — Charging Chart — Cooling, 50EQ024

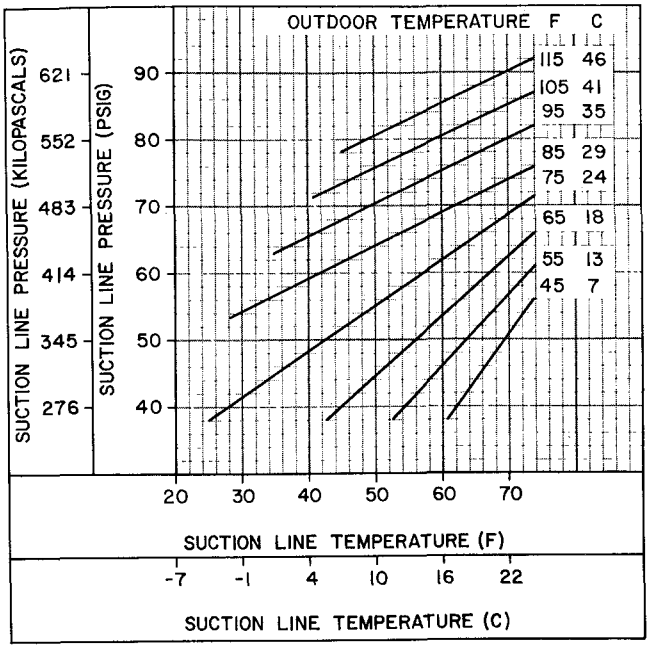


Fig. 14 — Charging Chart — Cooling, 50EQ028

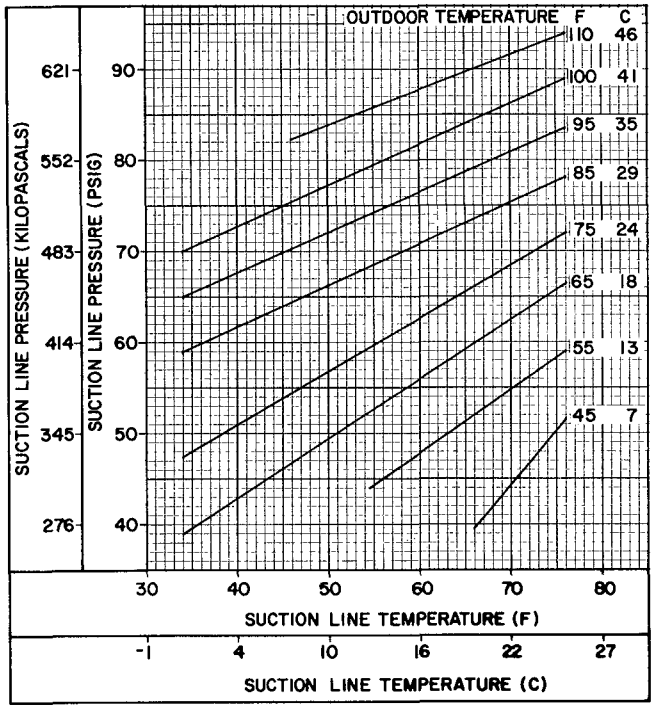


Fig. 15 — Charging Chart — Cooling, 50EQ034

Table 6 — Air Quantity Limits

UNIT 50EQ	MINIMUM CFM STANDARD AIR	MAXIMUM CFM STANDARD AIR
024	6,800	9,000
028	8,300	12,000
034	10,080	14,000

NOTES
1 Operation below minimum limits may cause a high pressure condition when unit is on heating cycle
2 The operation of electric resistance heaters above 47 F when compressor heat is operational is not recommended below minimum cfm's Field-adjustable thermostat in unit locks out electric heat

To check *system operation* during heating cycle, use correct Heating Cycle Operation Check Chart (Fig. 16, 17, or 18). This chart indicates whether a correct relationship exists between system operating pressures and indoor and outdoor entering air temperatures. If pressure and temperature lines do not intersect on chart, the system refrigerant charge may not be correct or other system abnormalities may exist. *Do not use Heating Cycle Chart to adjust refrigerant charge.*

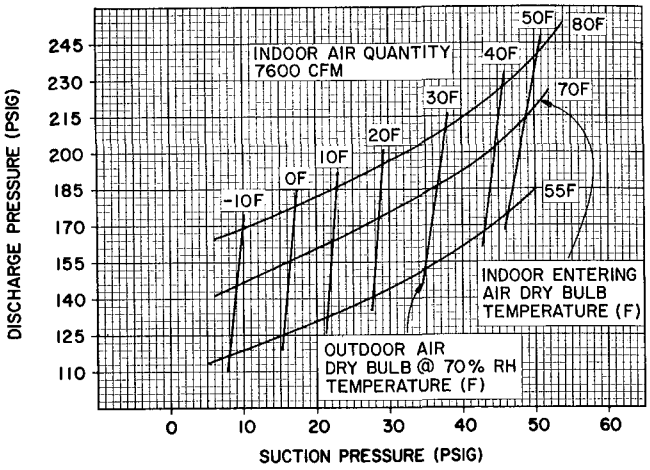


Fig. 16 — Heating Cycle Operation Chart — 50EQ024

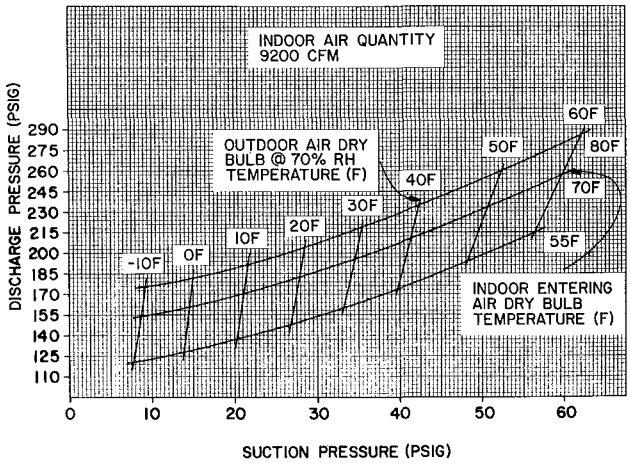


Fig. 17 — Heating Cycle Operation Chart — 50EQ028

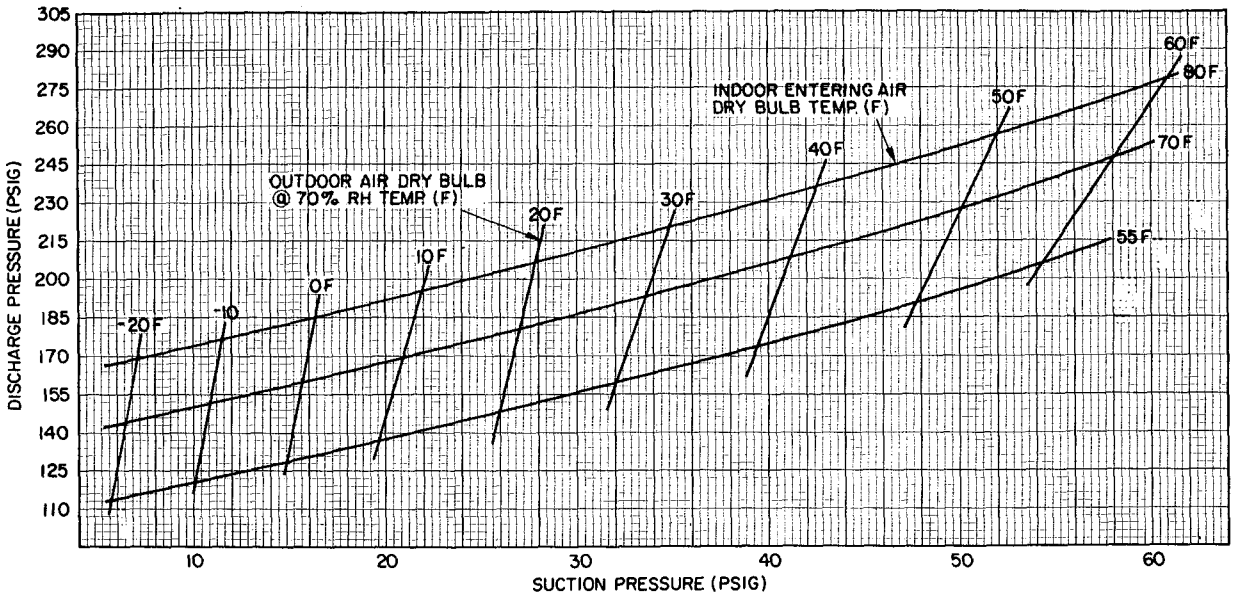
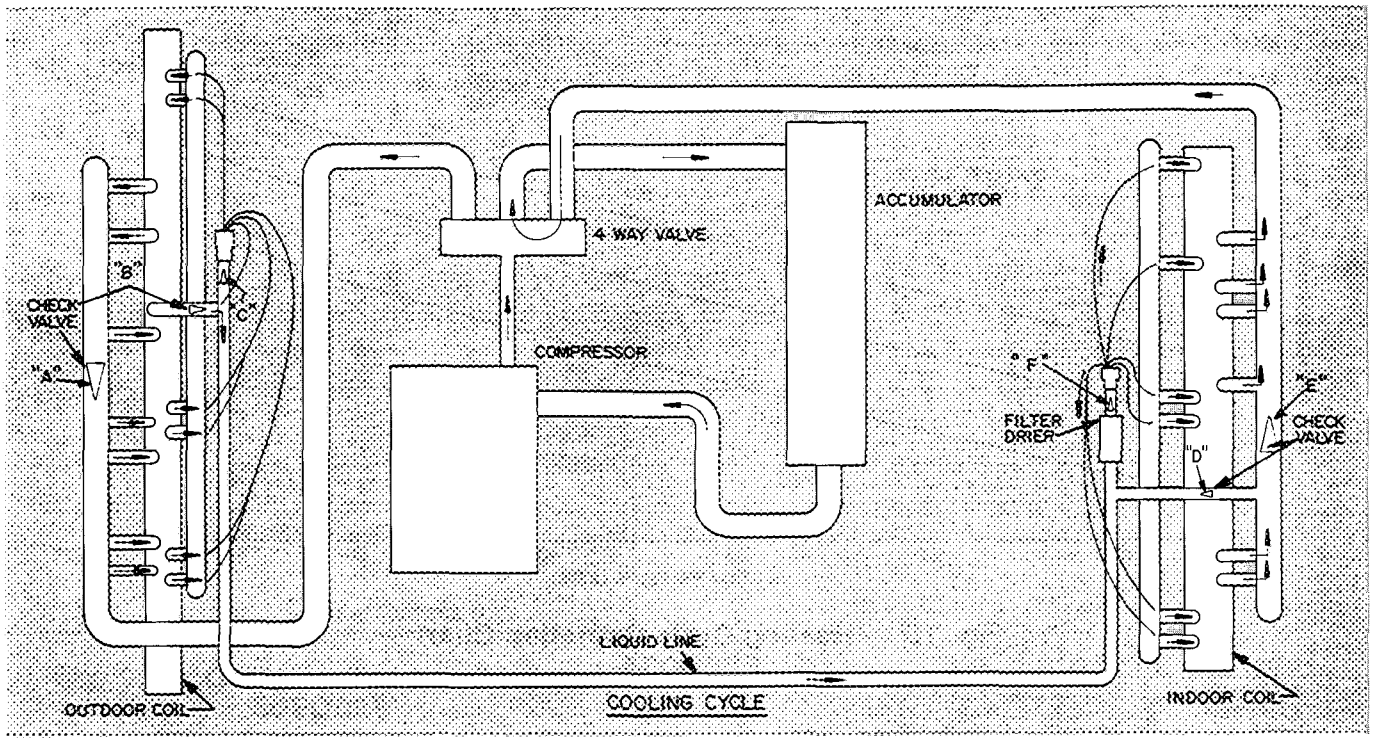


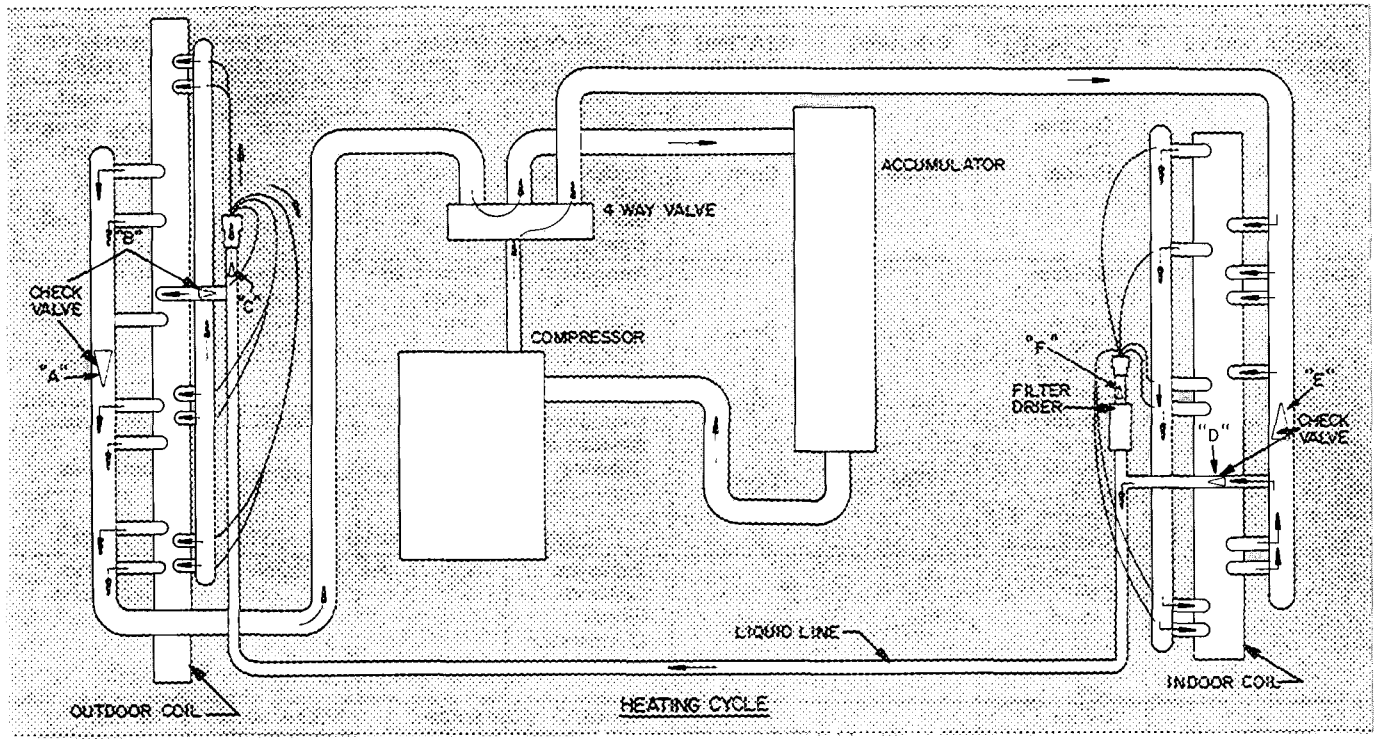
Fig. 18 — Heating Cycle Operation Chart — 50EQ034

Table 7 — Check Valve Functions — 50EQ

CHECK VALVE IDENTIFICATION	LOCATION	COOLING CYCLE	HEATING CYCLE	COOLING CYCLE CHECK VALVE STUCK		HEATING CYCLE CHECK VALVE STUCK	
				Open	Closed	Open	Closed
A	Outdoor Coil Header	Closed	Open	Lose Circuiting in Outdoor Coil Acts like Low Charge	Normal	Normal	Top 3 Circuits Restricted
B	Outdoor Coil Liquid Line Leaving Coil	Open	Closed	Normal	Restricted Liquid Line	Flooding Outdoor Coil and Compressor	Normal
C	Outdoor Coil Liquid Line Feeding Capillaries	Closed	Open	Lose Slight Amount of Capacity	Normal	Normal	Restricted Outdoor Capillaries
D	Indoor Coil Liquid Line Leaving Coil	Closed	Open	Bypasses Coil and Floods Compressor	Normal	Normal	Restricted Liquid Line
E	Indoor Coil Header	Open	Closed	Normal	Bottom Circuits of Indoor Coil Inactive	Lose Indoor Coil Circuiting Symptom of Low Charge	Normal
F	Indoor Coil Liquid Line Feeding Capillaries	Open	Closed	Normal	Restricted Indoor Capillaries	Lose Small Amount of Capacity	Normal



1 Hot gas from compressor flows thru the 4-way valve and is directed to the outdoor coil header At the header it is condensed and subcooled thru converging circuits (4-2-1) Refrigerant leaves the outdoor coil by way of the check valve to the liquid line
2 The refrigerant then flows thru the filter-drier and feeds the indoor coil by way of capillary tubes on each circuit
3 Each circuit evaporates the refrigerant and the circuits are combined in the indoor coil header with some of the circuits flowing thru the check valve
4 The refrigerant then flows thru the 4-way valve accumulator and back to the compressor

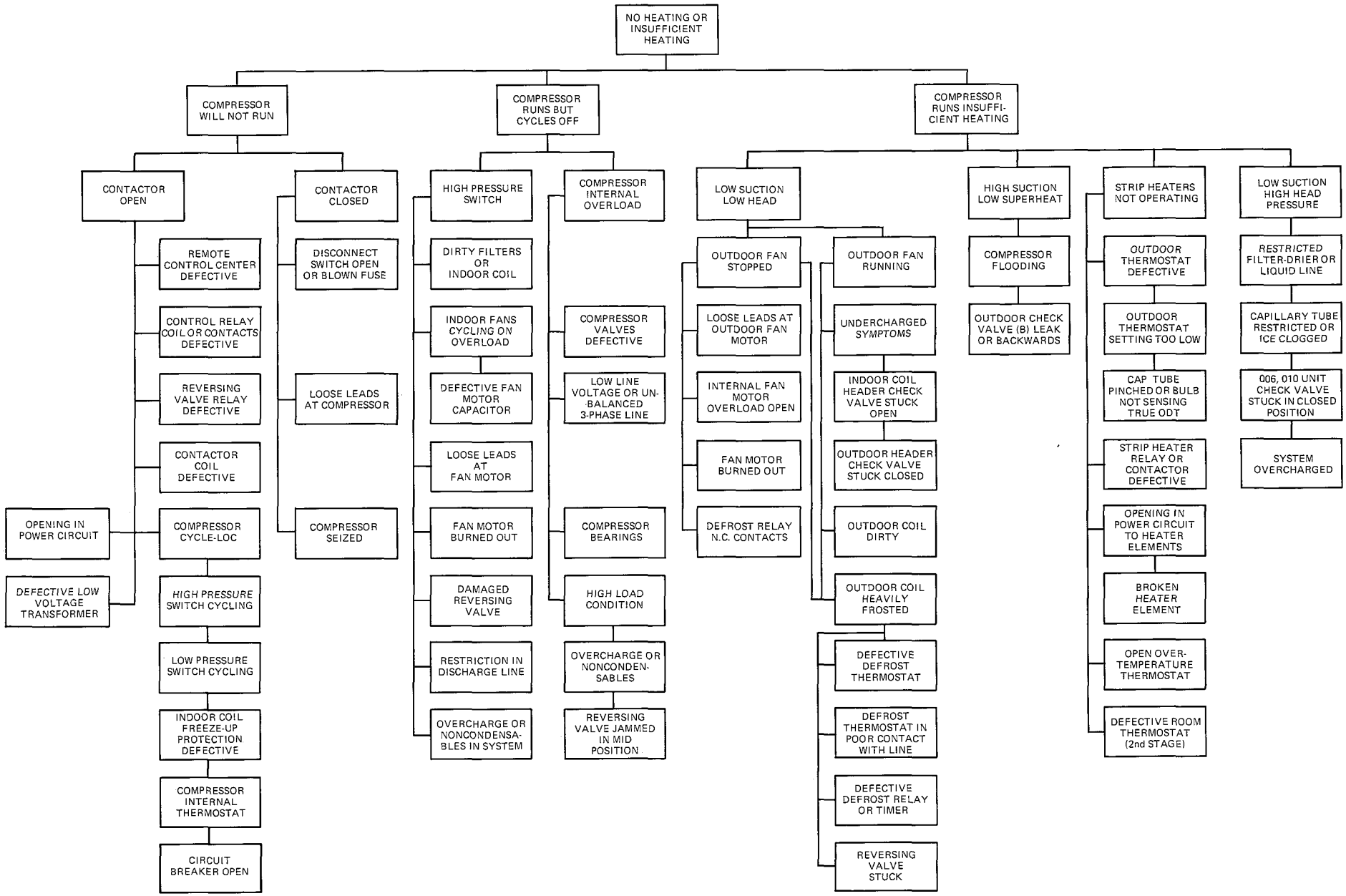


1 Hot gas from compressor flows thru the 4-way valve and is directed to the indoor coil header At the header it is condensed and directed thru subcooling circuits and out the indoor coil check valve to the liquid line
2 The refrigerant then feeds the outdoor coil by way of a strainer and then thru capillary tubes on each circuit
3. Each circuit evaporates the refrigerant and the circuits are combined in the outdoor header with some of the circuits flowing thru the check valve
4 The refrigerant then flows thru the 4-way valve, accumulator and back to the compressor

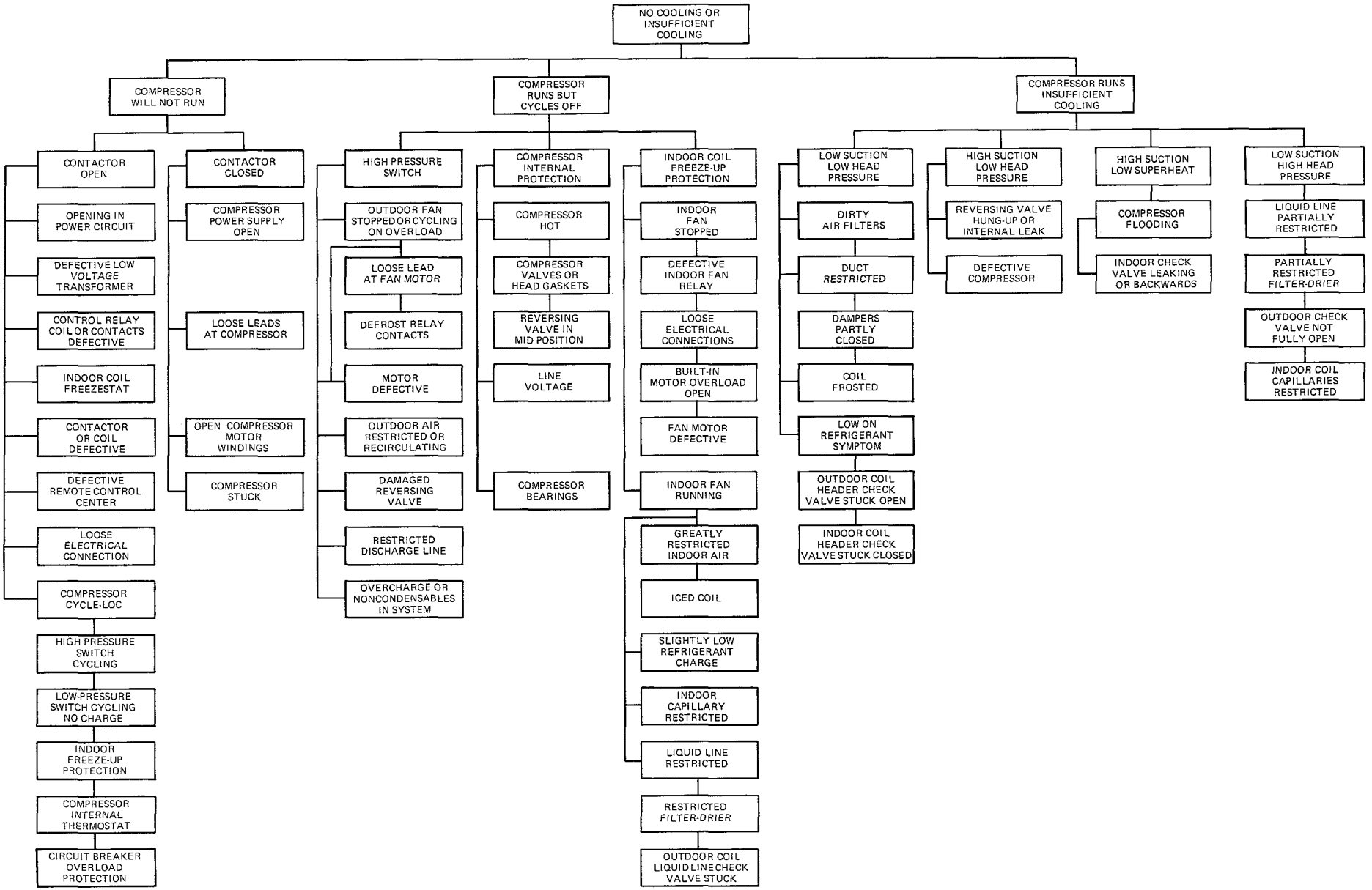
NOTE: Refrigeration circuitry for cooling and heating cycle is shown for single system; 50EQ, with 2 individual and independent refrigeration systems operates in identical fashion

Fig. 19 — Typical Heat Pump Operation

TROUBLESHOOTING CHART, HEATING CYCLE



TROUBLESHOOTING CHART, COOLING CYCLE



Form 50EQ-4SI Supersedes 50EQ-1SI, 50EQ-3SI Printed in U S A 4-79 PC 111 Catalog No 535-006