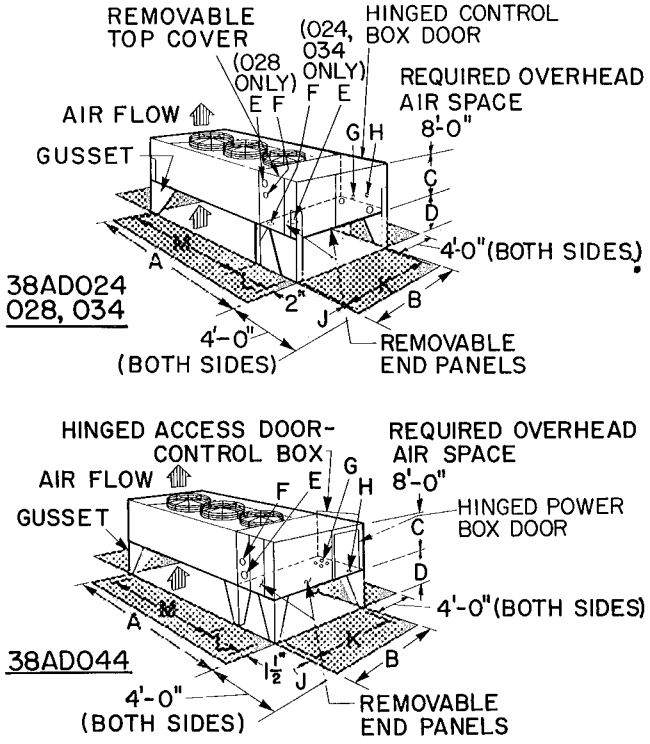
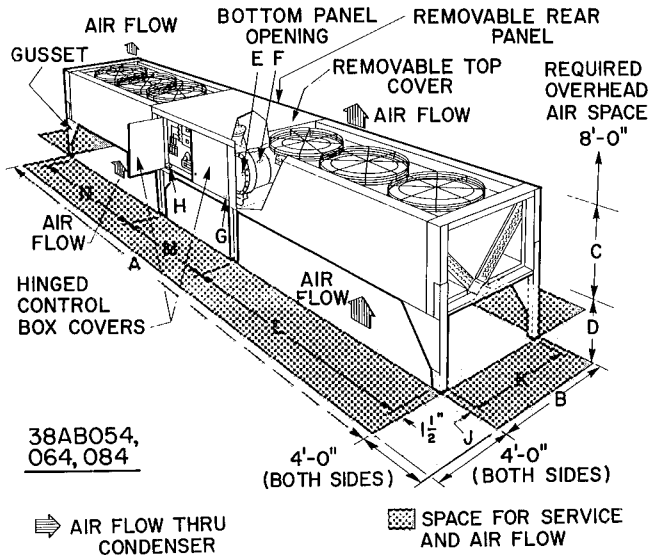
Air-Cooled Condensing Units

Table 1 — Dimensions

UNIT		38AD 024	38AD 028	38AD 034	38AD 044	38AB 054	38AB 064	38AB 084
DIMENSIONS (ft–in.)								
Length	A		13–0		12–10 11/16		24–4	24–4
Width	B	3–11 3/4		4–10 3/4	6– 0 1/4	3–11 3/4	4–10 1/4	6– 0 1/4
Height w/o Legs	C	2– 4 1/8		3– 1 7/8	3– 2	2– 4 1/8	3– 1 7/8	3– 1 7/8
Leg Height	D	1–0 or 2–0		1–6 or 2–2	1– 8	1–4 or 2–0	1–6 or 2–2	1–8 or 2–4
Mtg Holes								
Corner Legs	J	0– 1 1/2	0– 1 1/2	0– 1 1/2	2– 3/8	0– 1 7/16	0– 1 7/16	0– 1 1/2
	K	3– 8 3/4	3– 8 3/4	4– 7 1/4	5– 7 1/2	3– 8 7/8	4– 7 3/8	5– 9 1/4
Middle Legs	J	0– 0 7/8	0– 0 7/8	0– 0 7/8	2– 3/8	0– 0 7/8	0– 0 7/8	0– 0 7/8
	K	3–10	3–10	4– 8 1/2	5– 7 1/2	3–10	4– 8 1/2	5–10 1/2
	L		3–3 7/8		3– 7 9/16		9–4 1/8	
	M		9–4 1/8		8–10 3/8		5–3 1/4	
	N	–	–	–	–		9–5 5/8	
CONNECTIONS (in.)								
Suction (ODM)			1–5/8		2–1/8		2–1/8*	
Liquid (ODM)			7/8		7/8		1–1/8	
OPENINGS (in.)								
Suction	E		2–1/2		4		5	(2)5
Liquid	F	1– 3/4	1– 1/2	1– 3/4	2		2–1/4	3
Control (4 holes)	G		7/8		1–5/8		1	7/8
Power	H		3–5/8		5		3–3/4	(2)3 5/8

*Unit 38AB084 has two suction connections





Certified dimension drawings are available on request

Fig. 1 — Dimensions

RIGGING

Lift unit at points G,H, J, and K (Fig. 2). Use eyebolts and washers supplied in parts package. *Do not sling unskidded unit* Skidded unit may be slung, provided sling does not contact unit sides. Do not roll unskidded unit on pipes or wooden pilings.

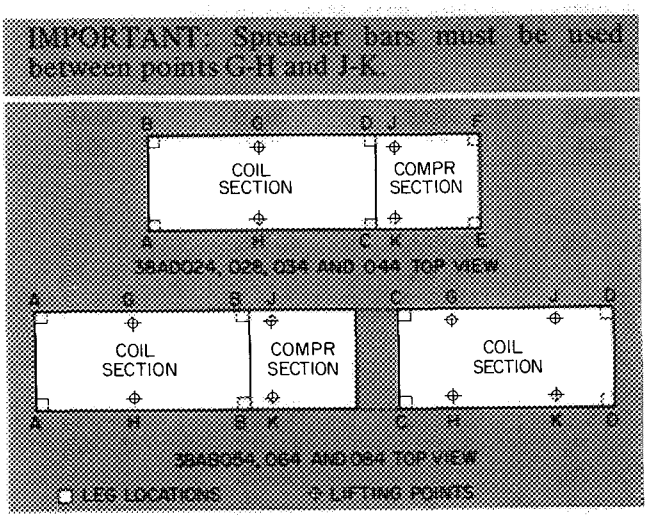


Fig. 2 — Weight Distribution and Lifting Points

Table 2 — Weight Distribution

UNIT	WEIGHT (lb)						
	Total	Leg Location					
		A	B	C	D	E	F
38AD024	1750	175	175	575	575	125	125
38AD028	1900	178	178	521	565	207	251
38AD034	2300	263	263	767	767	120	120
38AD044	3200	359	359	770	810	441	461
38AB054	3145	180	605	607	181	–	–
38AB064	3830	245	712	714	244	–	–
38AB084	4960	327	913	913	327	–	–

SKID REMOVAL

Remove the four bolts (each section) holding top frame in place and lift frame from unit (38AD024 thru 044 and 38AB054,064 units).

Compressor (with coil) Section — Raise and block up one side of unit 8 inches. Remove the three exposed hold-down bolts from base skid. Lower unit and repeat on opposite side.

Coil (only) Section (38AB054,064 and 084) — Raise and block up one end of unit 8 inches. Remove the two exposed hold-down bolts from base skid. Lower unit and repeat on opposite end.

ERECTING AND INTEGRATING ONE UNIT

Position Units 38AD028,044 and 38AB054, 064,084 so air flow is unrestricted on all sides and on top (Fig. 1).

38AD024,034: any side except compressor end may be installed against a wall if high leg setting is used and other three sides are unrestricted.

Place 38AB and 38AD units on high leg setting if accessory damper is used.

Erect Unit using legs and gussets attached to unit base skid(s) or frame. Adjust all corner legs to desired height before attaching to unit.

38AD024,028,034 AND 044 UNITS — Block up or suspend unit. With field-supplied bolts, bolt corner leg and angle gusset to each corner of unit. Bolt two center legs to bottom of unit where compressor and coil sections meet. Lower unit.

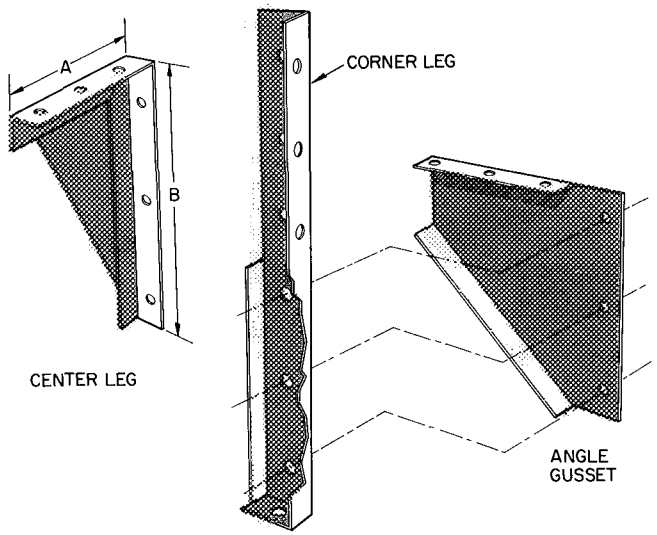
38AB054,064 AND 084 UNIT — Block up or suspend compressor (with coil) section. Bolt corner leg and angle gusset to each corner at coil end. Bolt two center legs to compressor end. Allow one set of holes to project out past compressor section. Bolt two center legs to bottom of unit where compressor and coil sections meet. Lower unit.

Block up or suspend coil (only) section. Bolt two corner legs and angle gussets to coil return bend end. Butt coil (only) section against compressor compartment, allowing coil to rest on leg projections. Remove top cover on compressor compartment and bolt sections together at legs and sides.

Table 3 — Legs and Gussets Provided

38AB	38AD	QUANTITY			
		Corner Leg	Center Leg	Angle Gusset	Parts Pkg*
–	024,028 034	4	2	4	1
–	044	4	2	–	1
054,064	–	–	4	–	1
084	–	4	–	4	1

*Parts packages in units contain all mounting fasteners required for attaching legs and gussets



UNIT	38AD 024	38AD 028	38AD 034	38AD 044	38AB 054	38AB 064	38AB 084
A(in.)	16	16	18	–*	16	18	20
B(in.)	24	24	26	20	24	26	28

*Only 044 units use one-piece legs

Fig. 3 — Legs and Gussets

Compressor Mounting

38AD024,028,034 UNITS – As shipped, compressor is held down by special self-locking bolts and plain lockwashers. After unit is installed, remove the self-locking bolts one at a time and reassemble with flanged washers and neoprene snubbers as shown in Fig. 4. Special flanged washers and neoprene snubbers are shipped in a cloth bag tied to one of the compressor feet. Tighten all four bolts. Then, loosen each until the flanged washer can be moved sidewise.

38AD044, 38AB054,064 AND 084 UNITS (compressors are mounted on a common support channel) – Remove the four shipping bolts from mounting channels prior to start-up.

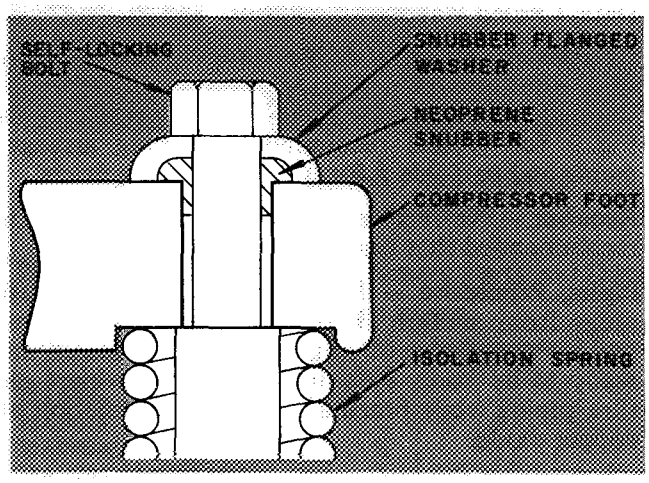


Fig. 4 – Compressor Mounting (38AD024,028 and 034)

Fan Thermostat – Route the thermostat control bulb and capillary (located in compressor section) thru grommeted hole in compressor section base pan. Do not kink capillary. Position bulb in inlet air stream and secure to inlet air flange adjacent to compressor section. Use clamp and screw provided in parts package.

If accessory head pressure control damper section is used, secure bulb to air inlet side of damper. Use hole in damper frame.

Integrate Unit (38AB054,064 and 084 only) – Connect refrigerant piping between the two sections, using materials furnished with unit. Arrange discharge and liquid lines as shown in Fig. 5 and braze as indicated.

Electrically connect unit control box and junction box on coil (only) section by using flexible fan conduit furnished in the unit. Use the mating, quick-connect, polarized plugs furnished in the two sections to make the wire connections.

Motormaster® (32 Series) Head Pressure Controller – Refer to MOTORMASTER Instructions shipped with this accessory, plus the following information.

Control box and sensor location is shown in Fig. 6.

Electrical connections are shown in Fig. 7. Refer to unit label diagram as required. On 200-, 208- and 230-volt units, outdoor fan motor no. 1 (OFM1), located nearest the compressor, may be used with MOTORMASTER without modification. For 460- and 575-volt units, refer to Table 4 for field-supplied components needed with MOTORMASTER.

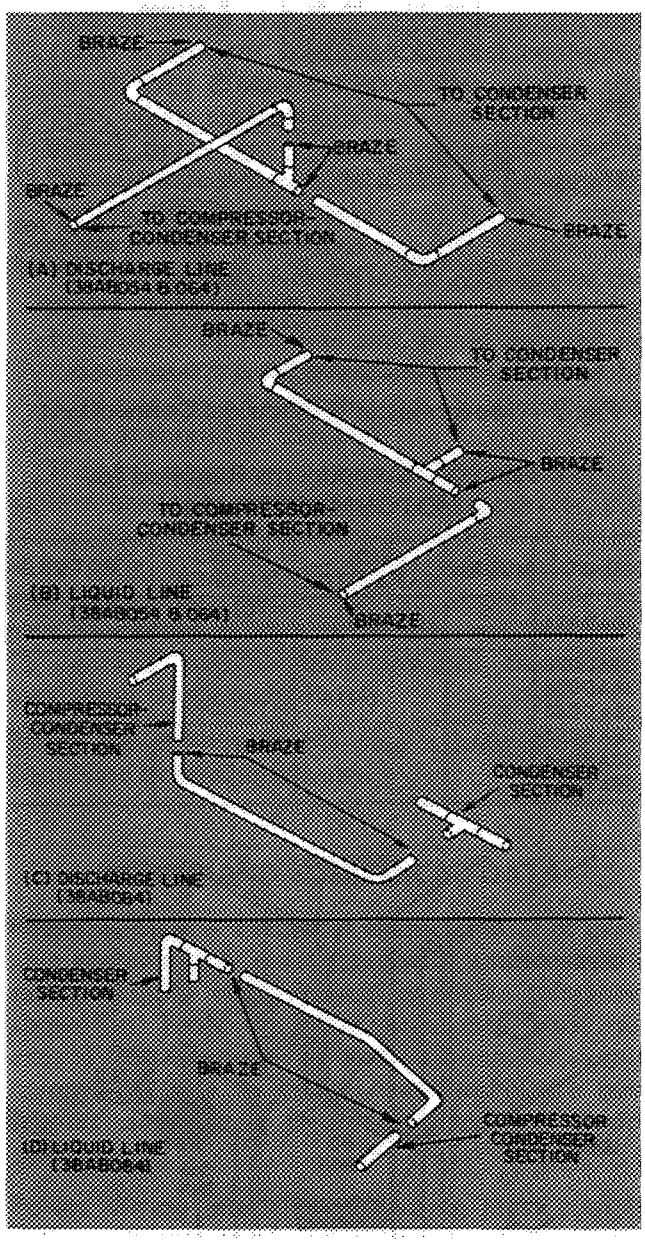


Fig. 5 – Refrigerant Connections

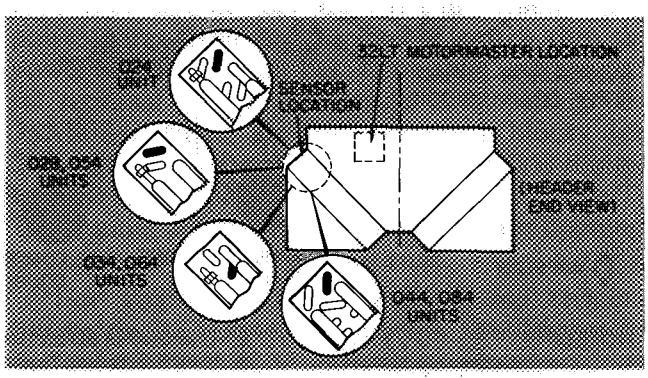
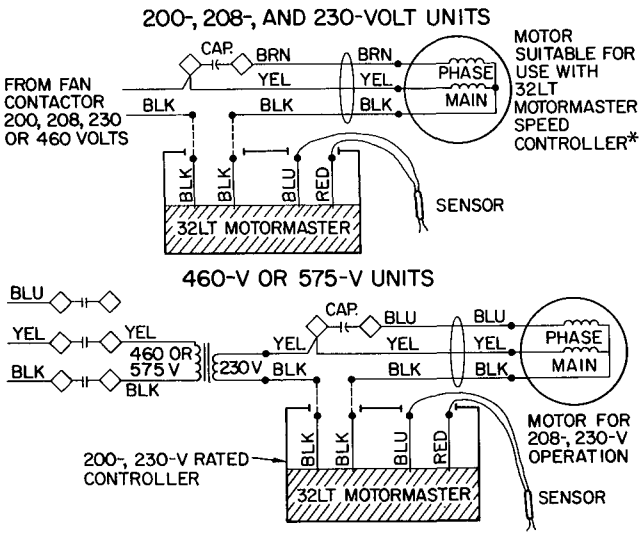


Fig. 6 – MOTORMASTER Control Box and Sensor Location



*Use 230-volt controller with 200-, 208- or 230-volt motors

Fig. 7 — Motormaster® Electrical Connections

Table 4 — Components Required for MOTORMASTER Use

UNIT	MODEL	RUN CAPACITOR	TRANS-FORMER	MOTOR
→ 38AD024	600 100	HC96LH020	HT01AH951 HT01AH959	HC46VL220 or HC46VL221
38AD028 38AD034 38AD044 38AB054 38AB064 38AB084	600 100	HC96LH030	HT01AH952 HT01AH954	HC52TE230

REFRIGERANT PIPING

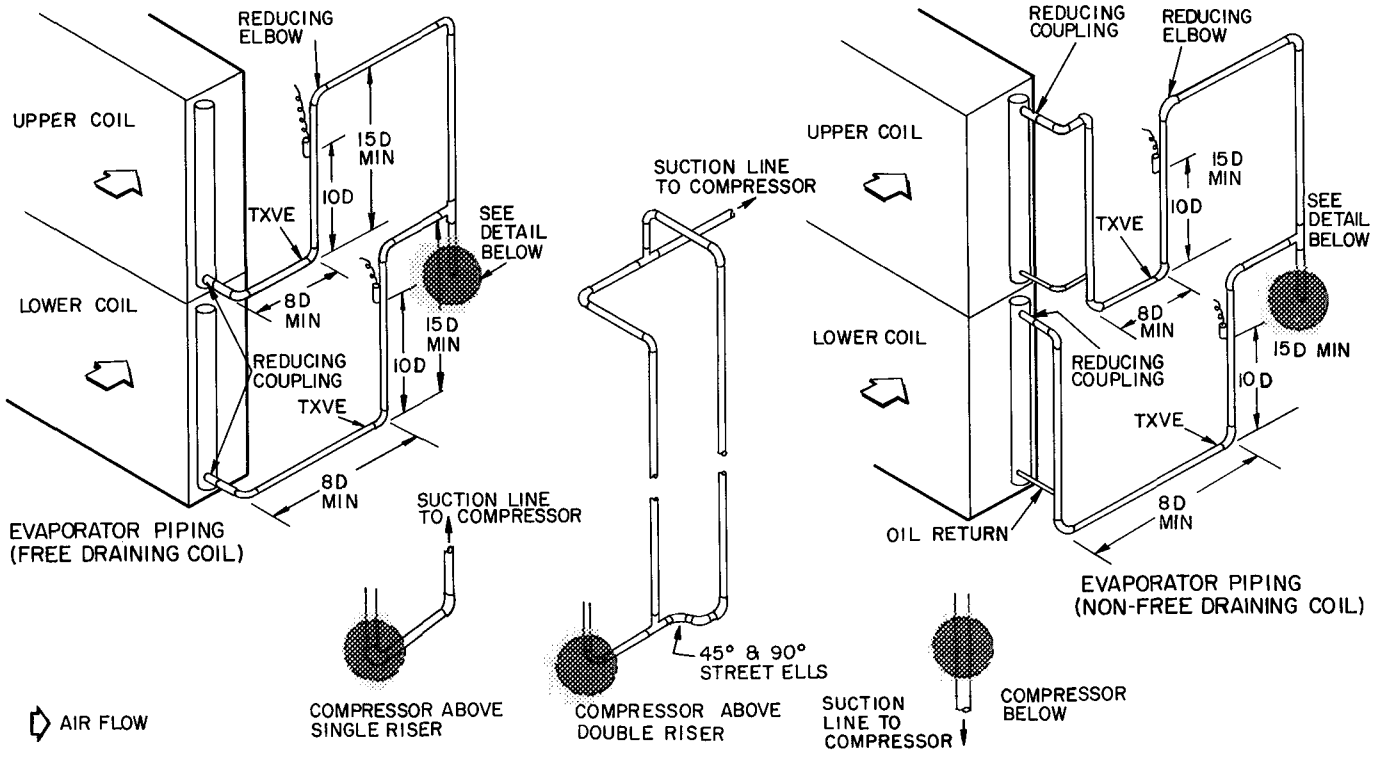
Refrigerant Line Sizes will depend on length of piping required between condensing unit and evaporator. Consideration must be given to liquid lift and to compressor oil return. Refer to Part 3 of Carrier System Design Manual for line sizing information and Fig. 8 for recommended piping details.

Single Pumpout Control — All units are factory wired to operate on single pumpout control and require a field-supplied liquid line solenoid valve, sized for minimum pressure drop, to be installed immediately ahead of each expansion valve. If unit is to be used with a chiller, wiring modifications may be necessary. Refer to 38AB Application Data, Chilled Water Applications.

Refrigerant Drier and Moisture Indicator — A filter-drier(s) and a liquid-moisture indicator are shipped with unit for field installation. Refer to Fig. 9 for typical recommended piping arrangements and to Table 5 for physical data on driers.

Receiver — No receiver is provided with unit. It is recommended that one *not* be used.

Piping Procedure — Do not remove plastic dust plugs from suction and liquid line stubs in compressor compartment until piping connections are ready to be made. Pass nitrogen or other inert gas thru piping while brazing, to prevent formation of copper oxide.



NOTES
1 Lower split first on, last off
2 D as used in 8D etc, indicates the pipe diameter size as a measure of length
3 TXVE indicates Thermostatic Expansion Valve Equalizer Connection

→ **Fig. 8 — Typical Piping Connections for Face Split Coils**

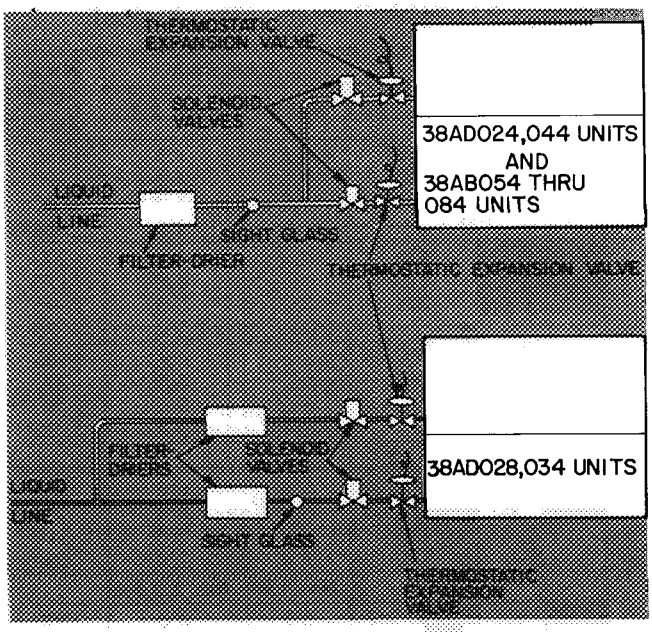


Fig. 9 – Recommended Filter-Drier(s) and Sight Glass Locations

Table 5 – Filter-Drier Replacement Parts and Data

UNIT	FILTER-DRIER				
	Part No.	Qty	Conn. Size	Replacement Part No.	Core Qty
38AD024	KH43LE123	1	5/8	Same	0
38AD028	KH43LE121	2	5/8	Same	0
38AD034	KH43LE121	2	5/8	Same	0
38AD044	KH49EA030	1	7/8	KH29EZ050*	2
38AB054	KH49EA120	1	1 1/8	KH29EZ050*	2
38AB064	KH49EA120	1	1 1/8	KH29EZ050*	2
38AB084	KH49EA040	1	1 1/8	KH29EZ050*	3

*Replaceable cores only

Install field-supplied thermostatic expansion valve in liquid line ahead of each evaporator section. For two-step cooling, *the solenoids used must be wired to be opened by control from a two-step thermostat*

For example: two solenoids may be used with three TXV's – one of the solenoids serving a liquid line feeding two of the TXV's. When three solenoids are used with three TXV's, two of the solenoids must be tied in parallel with the thermostat to serve the one liquid line feeding the two TXV's. The third solenoid operates independently for the other step of cooling.

Suction Piping at Evaporator and TXV Bulb Location

The purpose of these recommendations is to achieve good mixing of the refrigerant leaving the evaporator suction header for proper sensing by the TXV bulb.

1. A minimum of two 90° elbows must be installed upstream of the expansion valve bulb location.
2. The thermal bulb must be strapped to a vertical riser following the second elbow of item 1. This riser must be at least 15 pipe diameters high and the bulb should be fastened 10 pipe diameters above the preceding elbow.
3. Size the suction line from near evaporator thru the 15 diameter long riser for high velocity. Enter the suction pipe sizing charts in Carrier System Design Manual at corrected design tons (each evaporator split) and 80 feet equivalent length (for 2° loss). Choose the smaller size pipe, when reading falls between two sizes on chart. Since the selection of suction piping recommended for high velocity is approximately 20 ft equivalent length, this sizing method will result in about 0.5° friction loss for that section. If a 2° loss is allowed for the entire suction line, this leaves 1.5° for the balance of suction line and should be sized on that basis. This high-velocity sizing should be adequate for oil return up the 15 diameter long riser. It should be checked.

If an oil return connection at the bottom of the suction header is supplied with an evaporator, this connection must be teed in ahead of first mixing elbow (Fig. 8). When the compressor is below the evaporator, the riser at the evaporator does not have to extend as high as the top level. After the 15 diameter riser has been provided, the suction may elbow down immediately.

Safety Relief – A fusible plug is located on unit liquid line before liquid valve.

→ WIRING AND ELECTRICAL DATA

Power Supply – Electrical characteristics of available power supply must agree with unit nameplate rating. Supply voltage must be within tolerances shown in Table 6. Phase unbalance must not exceed 2%. *Operation of unit on improper supply voltage or with excessive phase unbalance constitutes abuse and is not covered by Carrier Warranty.*

Power Wiring – All power wiring must comply with applicable local and national codes. Install a field-supplied branch circuit disconnect switch of a type that can be locked "Off" or "Open." Run power wires from the disconnect switch thru the power opening (H on Fig. 1) on unit and connect to terminal block just inside the opening. On 38AB084, there are two terminal blocks (on 208-volt and 230-volt units only). Each is limited to 350 MCM maximum wire size (see Table 7). These units are provided with two power openings to accommodate two conduit runs.

For access to power opening and terminal blocks on 38AD044, unlatch the two latches on the outer hinged door and swing open outer door. Remove screws on barrier panel and remove barrier to expose wiring.

Table 6 — Electrical Data (3-Phase, 60-Hz)

UNIT						COMPRESSOR				FAN FLA		MAX FUSE AMPS
Model		Nameplate Voltage	Supplied* Voltage	MWA	ICF	FLA		LRA		No. 1	No. 2,3	
38AD 024	400	200	180-229	122	333	85 8		[redacted]	320	4 5	4 5	150
	500	230	207-264	103	314	71.5		[redacted]	300	4 5	4.5	125
	600	460	414-528	50	156	37.5		150		1 9	1 9	60
	100	575	518-660	41	125	28.6		120		1.6	1.6	50
38AD 028	410	200	180-229	175	455	123 0		[redacted]	436	6 2	6 6	200
	510	230	207-264	154	428	108 6		[redacted]	410	6.2	6 0	175
	610	460	414-528	77	214	54 4		[redacted]	205	3.0	3 0	90
	110	575	518-660	62	172	43.6		164		2.4	2.4	70
38AD 034	400	200	180-229	175	477	123 0		[redacted]	458	6 2	6 6	200
	500	230	207-264	158	458	111 4		[redacted]	440	6 2	6 0	200
	600	460	414-528	81	229	57 2		[redacted]	220	3.0	3.0	90
	100	575	518-660	63	183	45.0		176		2.4	2.4	80
						No. 1	No. 2	No. 1	No. 2			
38AD 044	400	200	180-229	213	424	85 8	85 8	[redacted]	320 [redacted]	6 2	6 6	250
	500	230	207-264	181	390	71 5	71 5	[redacted]	300 [redacted]	6 2	6.0	250
	600	460	414-528	90	195	37 5	37 5	150	150	3 0	3 0	110
	100	575	518-660	73	158	28.6	28.6	120	120	2.4	2.4	100
										No. 1,4	No. 2,3,5,6	
38AB 054	410	208	187-229	271	547	119 6	83.0	[redacted]	464 [redacted]	387	6.2	6 6	300
	510	230	198-254	263	508	119 6	77 5	[redacted]	420 [redacted]	350	6 2	6 0	300
	610	460	414-506	131	253	59 8	38.6	[redacted]	210 [redacted]	175	3 0	3 0	150
	110	575	518-632	108	204	49.3	31.5	168	140		2.4	2.4	125
38AB 064	410	208	187-229	306	624	118 8	118 8	[redacted]	464 [redacted]	464	6 2	6 6	350
	510	230	198-254	303	577	118 8	118 8	[redacted]	420 [redacted]	420	6 2	6 0	350
	610	460	414-506	152	288	59 4	59 4	[redacted]	210 [redacted]	210	3 0	3 0	175
	110	575	518-632	125	232	49.3	49.3	168	168		2.4	2.4	150
38AB 084	410	208	187-229	246/206†	842	165 0	165 0	[redacted]	636 [redacted]	636	6 2	6 6	450
	510	230	198-254	226/190†	780	152 0	152 0	[redacted]	590 [redacted]	590	6 2	6 0	450
	610	460	414-506	189	390	76 0	76 0	[redacted]	295 [redacted]	295	3 0	3 0	225
	110	575	518-632	152	312	61 0	61 0	[redacted]	236 [redacted]	236	2 4	2 4	175

[redacted] Shaded values are LRA drawn by first winding of part-winding start units (not standard on 38AB054,064, but may be field modified) See Note 1 Larger value is total LRA.

FLA — Full Load Amps

ICF — *Maximum Instantaneous Current Flow* (sum of LRA of last compressor to start and FLA of all other motors in unit, and control circuit current)

LRA — Locked Rotor Amps

MWA — Minimum Wire Amps per NEC, Section 430-24 Values based on maximum of 1% voltage drop in line.

*Units are suitable for use on electrical systems where voltage supplied to the unit terminals is never below or above the listed limits

†Units 38AB084 (208-, 230-volt only) have two power connections Maximum wire size is 350 MCM each

NOTES

1 Dual compressor units have a 4- to 12-second delay between first- and second-compressor start-up Units are supplied with either across-the-line or part-winding start, depending on unit size and voltage Refer to Electrical Data table Where two LRA values are shown, units are part-winding start, (all others are across-the-line)
2 Units have factory-installed circuit breakers and/or pullout fuses that meet NEC requirements for branch circuit over-current protection and in-sight disconnect Consult local codes
3 Maximum Incremental Current Inrush during start-up is LRA drawn by first winding of part-winding start unit (shaded area) or across-the-line LRA of largest compressor when part-winding start is not available
4 Fans no 1 and 4 have single-phase speed control motors on 208- and 230-volt units
5 Units 38AB054 and 064 which have two contactors, can be converted to part-winding start by addition of two time-delay relays (Carrier part no HN67SK001 for 208- and 230-volt units, or no HN67SK002 for 460- and 575-volt units) Two additional contactors are also required with 460- and 575-volt units to be wired same as other part-wind compressors

On 38AD024 thru 034 units, power terminal block is in the control box. Remove the outer panel and remove the no. 10 screw on the door. Swing open door, remove screws on barrier panel and remove barrier panel. On 38AB054,064 and 084 units, remove two screws holding hinged sheet metal barrier and swing open barrier.

Condenser fans must rotate clockwise when viewed from above. If necessary, correct direction of fan rotation by interchanging any two power input wires at disconnect switch.

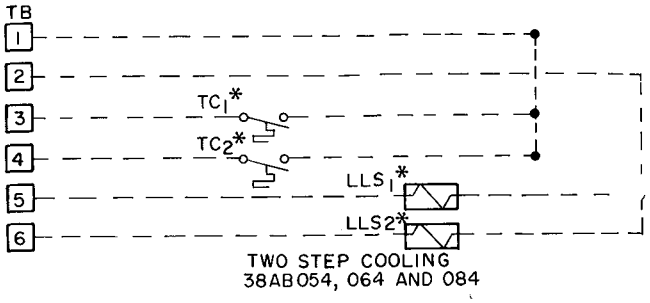
Affix crankcase heater decal to unit disconnect switch.

Control Circuit Wiring — *Internal control voltage on 38AD units is 115 volts.* Internal control voltage on 208- and 230-volt 38AB units is the same as unit voltage. On 460- and 575-volt 38AB units, it is 115 volts. *All control circuit wiring must comply with applicable local and national codes.* Remote control wiring must enter unit control box thru control opening (G on Fig. 1) and connect to terminal block inside the control box.

Table 7 – Maximum Field Wire Sizes

UNIT	SIZE	VOLTS (60-Hz)	WIRE SIZE	CONN.
38AD	024,028,034	208 230	6 AWG to 350 MCM	TB
		460 575	14 AWG to 2/0	
	044	460 575 208 230	6 AWG to 350 MCM	TB CT
38AB	054,064	208 230	6 AWG to 350 MCM	CT
		460 575	6 AWG to 3/0	
	084	All	6 AWG to 350 MCM	CT

CT – Compression Terminal (attached to terminal block)
TB – Terminal Block (with integral compression terminal)



LEGEND

CR – Control Relay	**TC** – Thermostat, Cooling
LLS – Liquid Line Solenoid	– – – Field Wiring
TB – Terminal Board (at unit)	*Field Supplied

Fig. 10 – Control Circuit Wiring with Line Voltage (115, 208- or 230-volt) Thermostat

LINE VOLTAGE REMOTE CONTROL – Install field-supplied line voltage thermostat(s) as shown in Fig. 10 for two-step cooling. Wire liquid line solenoid as shown.

LOW-VOLTAGE REMOTE CONTROL – Install field-supplied accessories as shown in Fig. 11 or Fig. 12 for either two-step cooling or two-step cooling, one-step heating. Wire liquid line solenoids as shown.

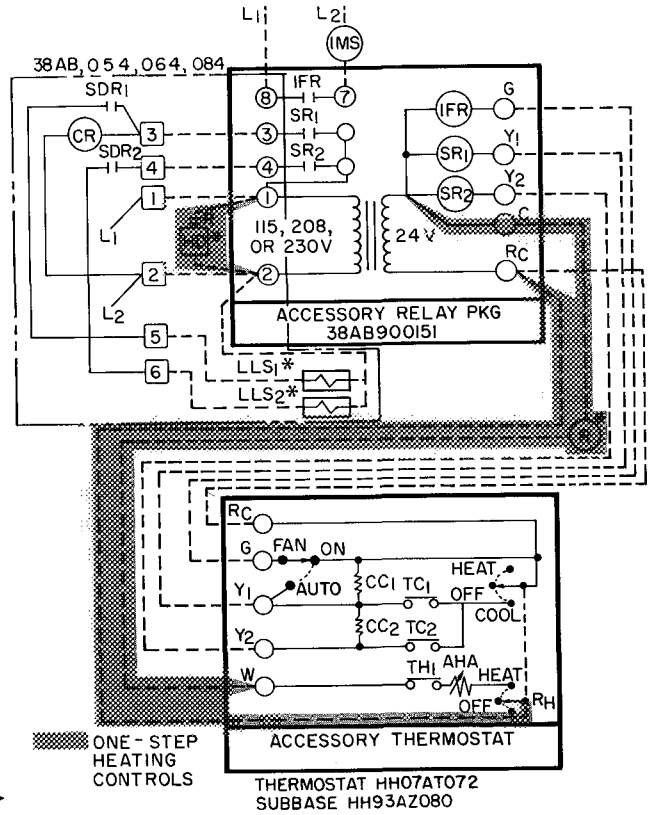
START-UP

Preliminary Checks

→ 1. Compressor oil level must be visible at sight glass in each compressor crankcase. Add oil if necessary.
2. Each compressor must float freely on its mounting springs.
3. All internal wiring connections must be tight, and all barriers and covers must be in place.
→ Toggle switches for units 38AB054,064 and 084 must be in "On" position.
4. Electrical power source must agree with unit nameplate rating.
5. All service valves must be open.
6. Fan cycling thermostat sensing bulb must be in air stream under fan no. 1.
7. Crankcase heater must be firmly locked into the compressor crankcase.

Leak Test the entire refrigerant system by the Pressure Method described in the Carrier Standard Service Techniques Manual, Chapter 1, Section 1-6. Use R-22 at approximately 25 psig backed up with an inert gas to a total pressure not to exceed 245 psig.

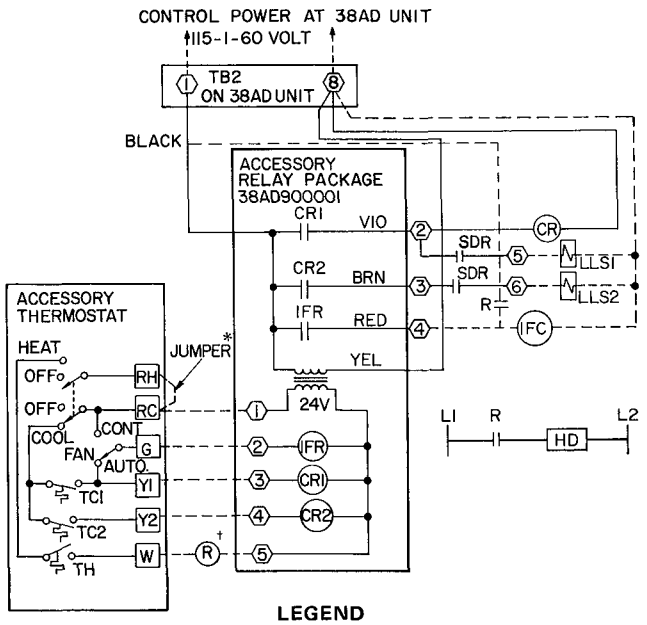
Evacuate and Dehydrate the entire refrigerant system by either of the methods described in the Carrier Standard Service Techniques Manual, Chapter 1, Section 1-7.



LEGEND

AHA – Adjustable Heat Anticipator	**SR** – Solenoid Relay
CC – Cooling Compensator	**TB** – Terminal Board
CR – Control Relay	**TC** – Thermostat, Cooling
HD – Heating Device	**TH** – Thermostat, Heating
IFR – Indoor Fan Relay	——— Factory Wired
IMS – Indoor Motor Starter	– – – Field Wired
LLS – Liquid Line Solenoid	▭ Terminal Board Conn. at Unit
R – Relay (Accessory)	
SDR – Solenoid Dropping Relay	*Field Supplied

Fig. 11 – Control Circuit Wiring with 24-Volt Accessories (38AB Units Only)



LEGEND

CR – Control Relay
HD – Heating Device
IFC – Indoor Fan Contactor
IFR – Indoor Fan Relay
LLS – Liquid Line Solenoid
R – Heating Relay (field-supplied 24-volt sealed coil, 10VA maximum rating)
SDR – Solenoid Dropping Relay
TB – Terminal Board
TC – Thermostat, Cooling
TH – Thermostat, Heating

——— Factory Wiring
— — — Field Wiring

*Jumper removed only when separate 24-volt power sources are available for heating and cooling
†To control heating device and provide automatic indoor fan operation on heating

→ **Fig. 12 – Control Circuit Wiring with 24-Volt Accessories (38AD units only)**

Preliminary Charge – Refer to Carrier Standard Service Techniques Manual, Chapter 1, Section 1-8, for charging methods and procedures mentioned below.

Charge system with approximately 25 lb of R-22 (75 lb for 38AD044, 38AB054,064 and 084 units) by the Liquid Charging Method and Charging by Weight Procedure.

Energize the Branch Circuit, *set space thermostat above ambient.* Close field disconnect switch and turn on unit circuit breakers. Be sure compressor crankcase heater(s) is operating. Allow crankcase heater(s) to operate a minimum of 24 hours before starting unit.

To Start Unit, set space thermostat below ambient, to ensure circuit operation. On 38AD044 and 38AB084, push control circuit reset button(s). After starting unit, there will be a delay of about 15 seconds (12 seconds on 38AD044 and 38AB084) before first compressor starts.

Charging System

1. Block condenser coils to maintain 125 F condensing temp at 280 psig, then add additional charge to clear sight glass. *(If long liquid lines or vertical lifts greater than 25 ft are used, a liquid line sight glass should be installed at condensing unit and used for charging purposes.)*
2. After sight glass has cleared, additional charge must be added per Table 8, to flood subcooler circuits in condensers.

After Charging the System, allow unit to run for about 20 minutes. Stop unit and check compressor oil level. Add oil only if necessary to bring oil into view in sight glass. If oil is added, run unit for additional 10 minutes. Stop unit and check oil level. If level is again low, add oil *only after* determining that piping system is designed for proper oil return and that the system is not leaking oil. Check the operation of all safety controls. Replace all service panels. *Be sure that control panel door is closed tightly.*

Table 8 – Charging Data (R-22)

UNIT	REFRIG CHG (lb) Sub-cooler Coil*	REFRIG STORAGE CAP. (lb)†
38AD024	8	70
38AD028	8	77
38AD034	7	99
38AD044	15	161
38AB054	12	154
38AB064	10	198
38AB084	21	322

*For maximum system capacity without receiver
†At 120 F condensing temp with condenser 80% full of liquid

NOTE
Values shown do not include charging requirements for cooling coils and piping

SERVICE

Capacity Control is by either one or two suction pressure actuated unloaders. Each controls two cylinders. Unloaders are factory set (see Table 9) but may be field adjusted. No. 1 unloader is on cylinder bank on same side of compressor as terminal box.

CONTROL SET POINT (cylinder load point) is adjustable from 0 to 85 psig. To adjust, turn control set point adjustment nut (Fig. 13) clockwise to its bottom stop. In this position, set point is 85 psig. Then, turn adjustment counterclockwise to desired control set point. Every full turn counterclockwise decreases set point by 7.5 psig.

PRESSURE DIFFERENTIAL (difference between cylinder load and unload points) is adjustable from 6 to 22 psig. To adjust, turn pressure differential adjustment screw (Fig. 13) counterclockwise to its back stop position. In this position, differential is 6 psig. Then, turn adjustment clockwise to desired pressure differential. Every full turn clockwise increases differential by 1.5 psig.

Table 9 – Physical Data

UNIT	38AD024	38AD028	38AD034	38AD044		38AB054		38AB064		38AB084	
OPER WT (lb)	1750	1900	2300	3200		3145		3830		4960	
REFRIGERANT	R-22										
→ Oper Chg (lb)*	28 0	30 5	35 5	66 0		57 0		71 0		132 0	
COMPRESSOR	Reciprocating Hermetic – 1750 rpm										
Number	1	1	1	2		2		2		2	
→ Model	06ED250	06EE266	06EE275	06EA 250	06ED 250	06EA 250	06EE 275	06EA 275	06EE 275	06EA 299	06EE 299
Cylinders	4	4	6	4	4	4	6	6	6	6	6
→ Oil (pt)	14	14	19	14	14	14	19	19	19	19	19
Crankcase Htr	125 Watts										
Protection	Solid State & Ckt Bkr					Thermotector & Ckt Bkr				Solid State & Ckt Bkr	
Cap. Control	Suction Pressure Cylinder Unloader(s)										
No. 1	Unloader Settings (psig)										
Load	76	78	78	88		–	79	–	79	–	79
Unload	58	60	60	66		–	66	–	66	–	66
No. 2	Unloader Settings (psig)										
Load	–	76	76	–		–	76	–	76	–	76
Unload	–	58	58	–		–	58	–	58	–	58
COND FANS	Axial Flow; Direct Drive										
Number	3	3	3	3		6		6		6	
Rpm	1140	1140	1140	1140		1140		1140		1140	
Diam (in.)	26	30	30	30		30		30		30	
Motor Hp (ea)	¾	1	1	1		1		1		1	
Cfm	18,200	25,200	28,200	31,000		50,400		56,400		62,000	
COND COIL	Plate Fins; 3-rowt										
Sections	1	1	1	1		2		2		2	
Face (sq ft)	35 4	39 0	49 6	60 4		78 0		99 2		120 8	
Capacity (lb)‡	70	77	99	161		154		198		322	
ELEC CONTROLS	Time Guard Circuit**										
Pressurestat	Dual										
High Cutout	375 Psig										
High Cut-in	275 Psig										
Low Cutout	29 Psig			29 Psig		29 Psig					
Low Cut-in	44 Psig			45 Psig		63 Psig					
Pressurestat	Capacity Control										
Cutout	–	–	–	57 Psig		57 Psig					
Cut-in	–	–	–	87 Psig		87 Psig					
Pressurestat	Oil Pressure Control										
Cutout	5 Psi Above Suction Pressure										
Thermostat	Fan Cycling										
No. 1	Opens, 70 F; Closes, 75 F										
No. 2	Opens, 57 F; Closes, 62 F										
Thermostat	Discharge Line										
	Opens, 290 F; Closes, 210 F										
PRESS. RELIEF	Fusible Plug										
DISCHARGE LINE CHECK VALVE	1	1	1	2		2		2		2	

*Approximate charge for maximum system capacity. Holding charge factory supplied with all units

†Unit 38AD044 and 38AB084 have 4-row coil

‡Storage capacity at 120 F condensing temp with condenser 80% full of liquid

**Short-cycle protection

Time Guard Circuits

BASIC FUNCTIONS OF TIME GUARD CIRCUIT on all units provide for normal (12 to 15 sec) momentary delays after the thermostat closes and before compressor(s) start. The circuit also provides for a longer delay (4 min 45 sec to 5 min 30 sec) in the event of thermostat short cycling or momentary power failure.

38AD024 THRU 044 UNITS

In addition to the basic functions, timers in these units provide additional delays for oil pressure switch bypass (40 sec), winter start provision (150 sec) bypass of low-pressure switch and part-winding start (1 sec), if used.

38AB084 UNIT

Timers in this unit provide basic function, plus 40 sec bypass for oil failure switch and 1 sec delay to accomplish part-winding start.

For specific sequence for each unit, refer to Timing Charts in Fig. 14.

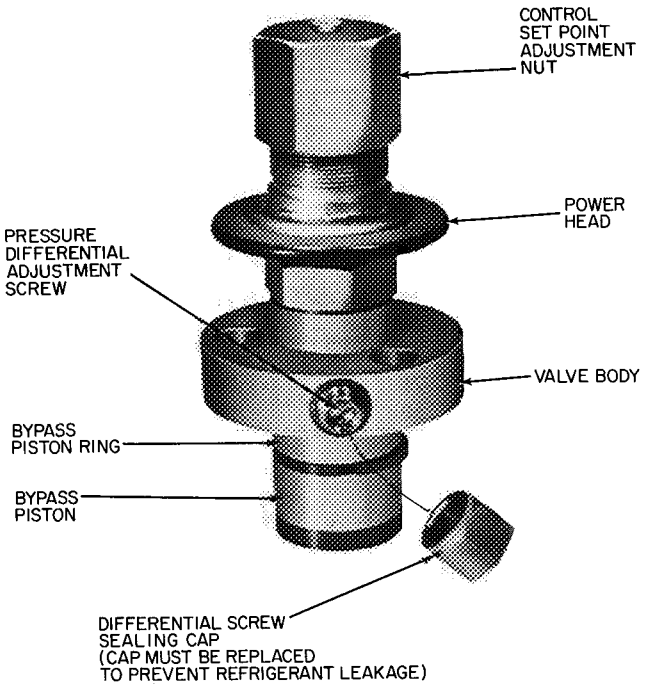


Fig. 13 – Capacity Control Valve

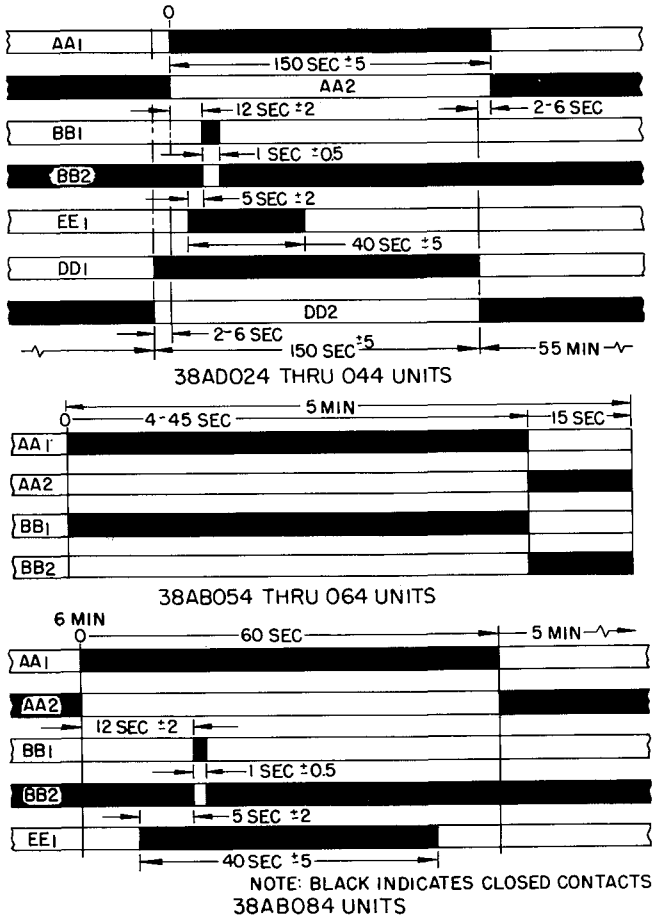


Fig. 14 – Timing Charts

Control Circuit Reset

38AD024 THRU 044 AND 38AB084 – *Control circuit locks out on these units in the event of oil pressure loss, excessive motor temperatures, or excessive discharge temperatures* Reset is accomplished by pushing reset button(s) in unit control box.

38AB054 AND 064 – *Loss of oil pressure or excessive motor temperatures cause control circuit lock out on these units* Reset is accomplished by pushing reset button on oil failure safety switch(es). All other safety controls on each unit are automatic reset, with restart accomplished through unit timers.

Oil Pressure Safety Control (OPS) for each compressor will stop unit if oil pressure differential is not established or maintained at either compressor.

If OPS stops unit, determine and correct the cause (such as loss of compressor oil or flooded compressor) before restarting unit. Failure to do so will constitute abuse. *Equipment failure due to abuse is not covered by the Warranty* To restart unit, push manual reset button in unit control box (except 38AB054 and 064 units). Reset button is on OPS on 38AB054 and 064.

→ **Compressor Motor Protection** on 38AD024 thru 044 and 38AB084 consists of three temperature sensors (one for each phase) embedded in the motor windings, and solid state modules in unit control box.

Sensors are part of a temperature bridge. If a motor winding overheats, the bridge circuit will unbalance and a silicone-controlled rectifier in the module will de-energize a relay which opens a set of normally open contacts in the module and stops the compressor.

If *one* sensor fails, it can be jumped with a 75-ohm, 2-watt resistor. When checking or testing module, *do not apply more than 6 volts across sensor terminals.* Many test instruments exceed this voltage rating; check before using.

If a component in a module fails on 38AD024 thru 044, the entire module must be replaced. On 38AB084, the transformer is external to the module and may be replaced separately. Replace transformer with a Carrier specified balanced transformer.

To restart compressor after shutdown due to motor protection trip, push control circuit reset button in unit control box.

Safety Relief – All 38AB,AD units are protected against excessive pressure by a fusible plug inserted in the liquid line.

→ **Winter Start Control** – On 38AB units (not necessary on 38AD units because the timer supplies this function), install a liquid line pressurestat (Carrier part no. HK02AB026) and evaporator freeze-up protector (defrost thermostat, Carrier part no. HH22UA025).

38AD control circuits incorporate a 150 seconds timed bypass of the low-pressure switch to

allow unit to start under low-ambient conditions. *An evaporator freezestat must also be installed in series with the control thermostat(s) to prevent coil freeze-up (See lower part of Fig 15 – EDT Wiring section.)*

LIQUID LINE PRESSURESTAT – Connect to system liquid line service valve port. Connect switch into control circuit as shown on unit label → diagram or in Fig. 15. Pressurestat is set to cutout at 5 psig with a differential of 10 psig. *Do not change setting*

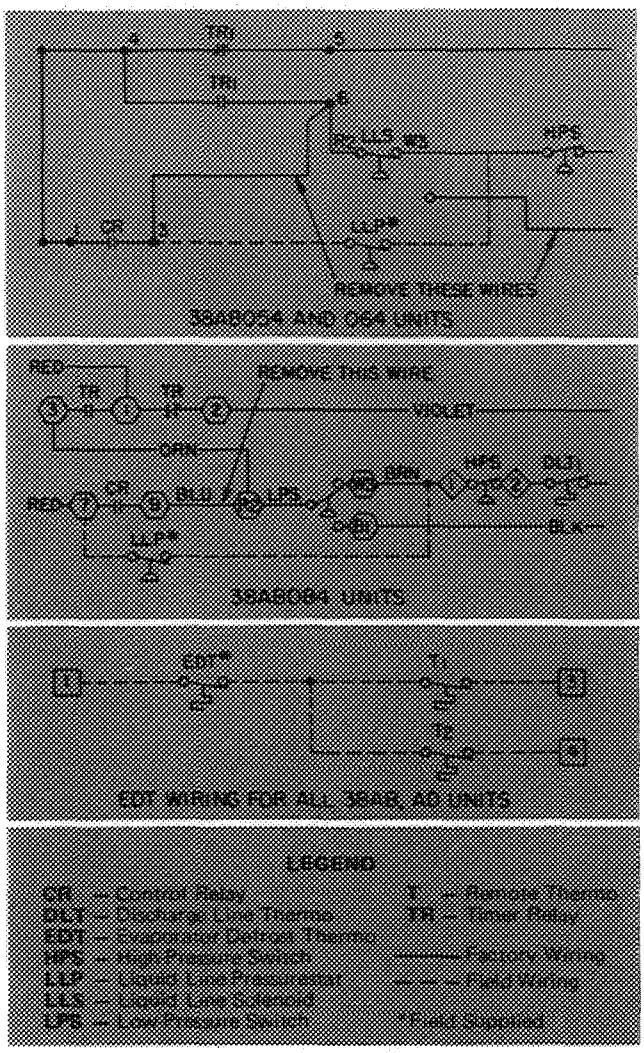


Fig. 15 – Unit Wiring Changes for Winter Start Control

DEFROST THERMOSTAT – Position switch so that moisture cannot enter switch insulator. Install control with approximately 2 in. of top of thermostat capillary passing thru lower part of evaporator coil and with remainder of capillary inserted between fins on entering air side of coil. Connect thermostat electrical contacts into indoor cooling thermostat circuit or in series with compressor holding coil.

Thermostat is set to cut out at 25 F and cut in at 55 F. Contact rating is 16 amps and 230 volts. As evaporator coil frosts, coil fin temperature drops to thermostat cutout setting, and stops compressor. Evaporator fans keep running to defrost coil with room air. As indoor coil defrosts, fin temperature will rise to thermostat cut-in setting. Compressor starts when cooling is required.

NOTE. Use a defrost thermostat on all systems operating with outdoor temperatures below 45 F.

Fan Adjustment – When replacing a fan, adjust fan until top surface of hub plate is below the top of the orifice ring as indicated in Fig. 16. Then, tighten both setscrews, located over the keyway of the fan hub of the motor shaft. Seal recessed area of fan hub bore with Permagum to prevent rusting.

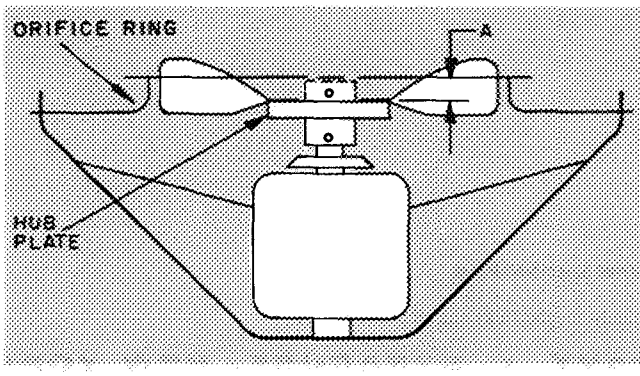
Lubrication

FAN MOTORS have permanently lubricated bearings. No provisions for lubrication are made.

COMPRESSOR has its own oil supply. Loss of oil due to a leak in the system should be the only reason for adding oil after the system has been in operation.

To Add or Remove Compressor Oil

1. Stop compressor and close suction service valve. Pump down compressor to 2 psig. Stop compressor and close discharge shutoff valve.
2. Relieve crankcase pressure by disconnecting line, at compressor, which goes to low-pressure connection of oil safety switch.
3. Add oil thru oil filter connection.
4. Remove oil thru drain plug in bottom cover. Remove small amounts of oil thru oil discharge connection with compressor running.



UNIT	DIMENSION A (in.)	
	Center Fan	End Fan
38AD024	5/8	5/8
38AD028		
38AD034		
38AD044	1 3/16	2 3/16
38AB054		
38AB064		
38AB084		

Fig. 16 – Fan Adjustment

For replacement items use Carrier Specified Parts.

Manufacturer reserves the right to change any product specifications without notice.

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