38AE
38AF

Carrier
United Technologies

Installation Manual

(Condensing Units)

38AE
38AF

38AE020-040
38AF020-040

38AE050-060
38AF050-060

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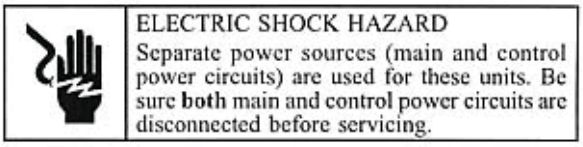

SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location (roofs, elevated structures, etc.)

Only trained, qualified installers and service mechanics should install, start-up, and service this equipment (Fig.1)

Untrained personnel can perform basic maintenance functions such as cleaning coils. Trained service personnel should perform all other operations.

When working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment.

Follow all safety codes. Wear safety glasses and work gloves. Keep quenching cloth and fire extinguisher nearby when brazing. Use care in handling, rigging and setting bulky equipment.

INSTALLATION

Step 1 – Complete Pre-Installation Checks

UNCRATE UNIT –Remove unit packaging except for the top skid assembly, which should be left in place until after the unit is rigged into its final location.

INSPECT SHIPMENT – File claim with shipping company if shipment is damaged or incomplete.

CONSIDER SYSTEM REQUIREMENTS

- Consult local building codes and National Electrical Code (NEC, U.S.A.) for special installation requirements.
- Allow sufficient space for airflow clearance, wiring, Refrigerant piping, and servicing unit. See Fig. 1. See Fig. 2 for unit component locations.
- Locate unit so that outdoor coil (condenser) airflow is unrestricted on all sides and above.

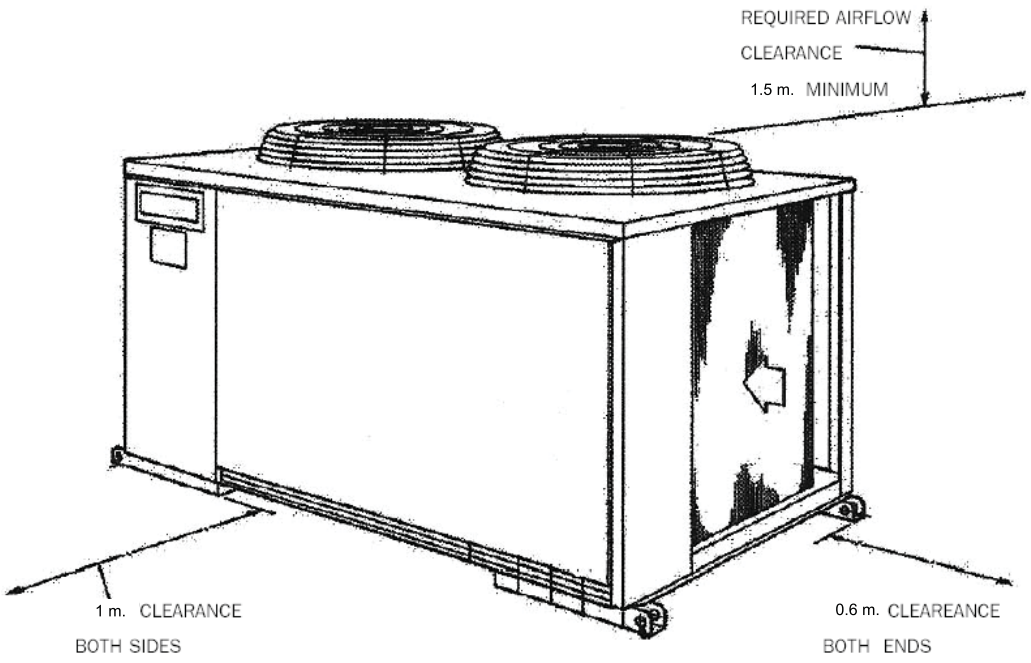

Fig. 1 -Air flow clearance

SPECIFICATION

Description			Air Cooled Condensing Unit					
Product Model			38AE020	38AE025	38AE030	38AE040	38AE050	38AE060
Nominal Cooling Capacity		W	58,900	82,300	94,000	118,100	160,600	177,200
		Btu/hr.	201,000	281,000	321,000	403,000	548,000	604,900
Power Consumption		W	19,370	26,360	28,360	39,860	52,450	58,050
Power Supply		V/Ph./Hz	380/3/50					
Operating Current		Amp.	44.05	54.84	59.38	85.12	108.68	120.42
Compressor	Model		06E2250611	06E2265611	06E627506	06E6299681	06E2265611	06E627506
	Type		Semi-Hermetic Reciprocating					
	Quantity		1	1	1	1	2	2
	RLA		36	48.8	53.4	79.1	2 x 48.8	2 x 53.4
	LRA		173	223	253	345	2 x 223	2 x 253
Coil	Type		Copper Tube / Aluminium Fin					
	Row		1.5	3	3	3	3	3
	Fin / Inch		15	15	15	15	15	15
	Face Area	sq.ft.	42.94	42.94	54.00	54.00	73.23	73.23
Fan Motor	Power Supply	V/Ph./Hz	220/1/50	380/3/50				
	Power Output	Hp	1	2	2	2	2	2
	RLA	Amp.	2 x 4.31	2 x 3.30	2 x 3.30	2 x 3.30	3 x 4.95	3 x 4.95
	Power Input	W	2,200	2,700			4,030	
	Fan Type		Propeller					
	Drive Type		Direct					
	Fan Diameter	inch	28	27	30	30	27	30
	Quantity		2	2	2	2	3	3
	Nominal Air Flow	CFM	20,000	21,200	23,200	23,200	33,000	33,000
Safety Device	Hi-Pressure Switch	psig	395 / 275 (Cut out / Cut in) - Auto Restart type					
	Low-Pressure Switch	psig	30 / 60 (Cut out / Cut in) - Auto Restart type					
	Oil-Pressure Switch	psig	6 / 14 (Cut out / Cut in) - Auto Restart type					
Capacity Step Control (By Unload)		%	0/50/100	0/66/100	0/66/100	0/66/100	0/33/50/83/100	0/33/50/83/100
Starter			Part Winding					
Electrical Controls			Time Guard Control Module					
Refrigerant	Type		R-22					
	Pre-Charging from Factor	kg.	0.30					
	Operation Charging	kg.	12.70	13.60	19.50	29.50	2 x 13.6	2 x 19.5
Piping Connections	Liquid	inch	7/8	7/8	7/8	7/8	2…..7/8	2…..7/8
	Suction	inch	1...5/8	1...5/8	2...1/8	2...1/8	2…..1 5/8	2…..2 1/8
Weight		lb(kg.)	1,155 (524)	1,286 (583)	1,367 (620)	1,435 (651)	1,950 (885)	2,125 (966)

* RATING CONDITION: OUTDOOR AMBIENT TEMPERATURE 95˚F, SATURATED SUCTION TEMPERATURE 45˚F

** UNIT SUPPLIED FROM FACTORY ONLY PRE-CHARGE

POWER WIRING

Unit Model	Power Supply	Voltage Range		Compressor		Fan Motor		Recommended		
		Min	Max	RLA	LRA	QTY	RLA	Power Wire(mm.2)	Ground Wire (mm.2)	Field CB (AT)
38AE020	380V/3Ph/50Hz	342	415	36.2	173	2	4.31	25	6	70
38AE025	380V/3Ph/50Hz	342	415	48.8	223	2	3.30	35	10	90
38AE030	380V/3Ph/50Hz	342	415	53.4	253	2	3.30	35	10	90
38AE040	380V/3Ph/50Hz	342	415	79.1	345	2	3.3	95	16	150
38AE050	380V/3Ph/50Hz	342	415	2…..48.8	2…..223	3	4.95	95	16	175
38AE060	380V/3Ph/50Hz	342	415	2…..53.4	2…..253	3	4.95	120	16	200

Remark : RLA : Rated Load Amps. Cable type : THW LRA : Locked Rotor Amps.

Type of conductor is installed : Insulated single core cables up to 3 lines. Or

Insulated sheathed cables up to 3 axes in a pipe in the air in a pipe buried in the wall plaster. or in a pipe in the ceiling

SPECIFICATION

Description			Air Cooled Condensing Unit					
Product Model			38AF020	38AF025	38AF030	38AF040	38AF050	38AF060
Nominal Cooling Capacity		w	58,000	82,000	93,000	117,000	161,000	180,000
		Btu/hr.	200,000	280,000	320,000	400,000	550,000	615,000
Power Consumption		w	19,370	26,360	28,360	39,860	52,450	58,050
Power Supply		V/Ph./Hz	380/3/50					
Operating Current		Amp.	44.05	54.84	59.38	85.12	108.68	120.42
Compressor	Model		06E2250611	06E2265611	06E627506	06E6299681	06E2265611	06E627506
	Type		Semi-Hermetic Reciprocating					
	Quantity		1	1	1	1	2	2
	RLA		36	48.8	53.4	79.1	2 x 48.8	2 x 53.4
	LRA		173	223	253	345	2 x 223	2 x 253
	Lubricating Oil	gal.	1.7	2.4	2.4	3.2	2…..2.4	2…..2.4
Coil	Type		Copper Tube / Aluminium Fin					
	Row		1.5	2	2	3	3	3
	Fin / Inch		15	15	15	15	15	15
	Face Area	sq.ft.	42.94	42.94	54.00	54.00	73.23	73.23
Fan Motor	Power Supply	V/Ph./Hz	220/1/50	380/3/50				
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	Power Input	W	2,200	2,700			4,030	
	Fan Type		Propeller					
	Drive Type		Direct					
	Fan Diameter	inch	28	27	30	30	27	30
	Quantity		2	2	2	2	3	3
	Nominal Air Flow	CFM	20,000	21,200	23,200	23,200	33,000	33,000
Safety Device	Hi-Pressure Switch	psig	395 / 275 (Cut out / Cut in) - Auto Restart type					
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Capacity Step Control (By Unload)		%	0/50/100	0/66/100	0/66/100	0/66/100	0/33/50/83/100	0/33/50/83/100
Starter			Part Winding					
Electrical Controls			Time Guard Control Module					
Refrigerant	Type		R407C					
	Pre-Charging from Factory	kg.	Nitrogen					
	Operation Charging	kg.	12.70	13.60	19.50	29.50	2 x 13.6	2 x 19.5
Piping Connections	Liquid	inch	7/8	7/8	7/8	7/8	2…..7/8	2…..7/8
	Suction	inch	1…5/8	1…5/8	2…1/8	2…1/8	2…..1 5/8	2…..2 1/8
Weight		lb(kg.)	1,155 (524)	1,286 (583)	1,367 (620)	1,435 (651)	1,950 (885)	2,125 (966)

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** UNIT SUPPLIED FROM FACTORY ONLY ONRY NITROGEN

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38AF040	380V/3Ph/50Hz	342	415	79.1	345	2	3.3	95	16	150
38AF050	380V/3Ph/50Hz	342	415	2…..48.8	2…..223	3	4.95	95	16	175
38AF060	380V/3Ph/50Hz	342	415	2…..53.4	2…..253	3	4.95	120	16	200

Remark : RLA : Rated Load Amps. Cable type : THW LRA : Locked Rotor Amps.
Type of conductor is installed : Insulated single core cables up to 3 lines. Or
Insulated sheathed cables up to 3 axes in a pipe in the air in a pipe buried in the wall plaster. or in a pipe in the ceiling

Dimension .

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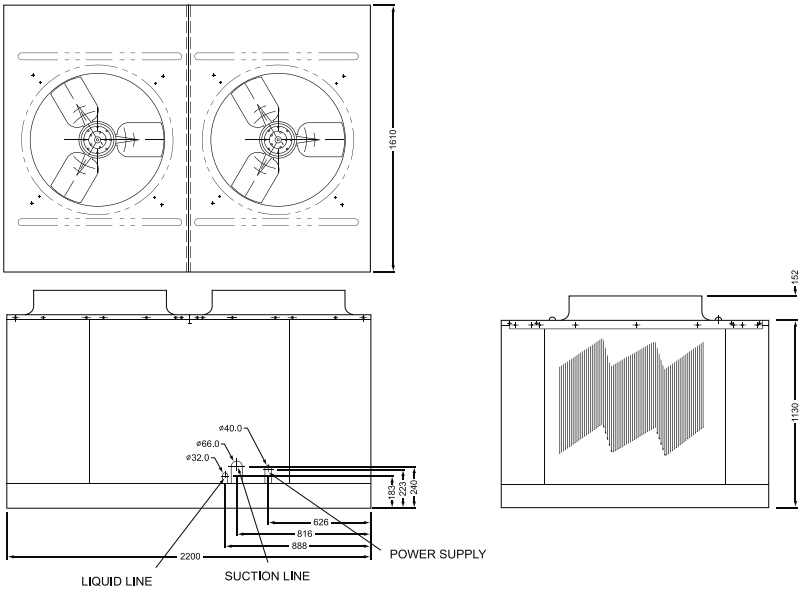

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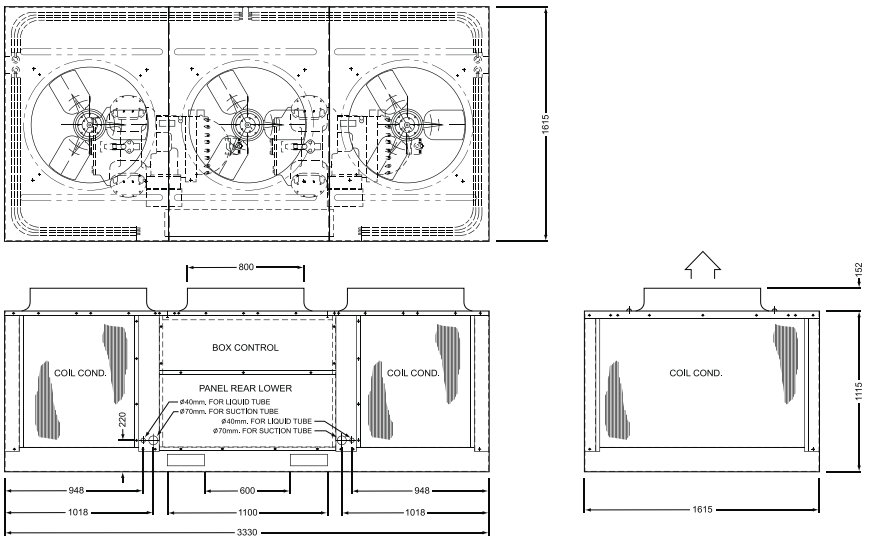


Step 2 – Rig and mount the Unit

⚠ CAUTION

Be sure unit panels are securely in place prior to rigging.

RIGGING – These units are designed for overhead rigging only. For this purpose, the transverse base channels extend beyond the sides of the unit, with holes provided in the end plates to attach cables or hooks. Rig with top skid packaging assembly in place to prevent unit damage by the rigging cable. As further protection for the coil faces, plywood sheets can be placed against the sides of the unit, behind the cables. Run the horizontal is not less than 45 degrees. Raise and set the unit down carefully.

If it is necessary to roll the unit into position, mount the unit on longitudinal rails, using a minimum of 3 rollers. Apply force to the rails, not the unit. If the unit is to be skidded into position, place it on a large pad and drag it by the pad. Don not applies any force to the unit.

Rise from above to lift unit from the rails or pad when unit is in final position.

COMPRESSOR MOUNTING –As shipped, the compressor is held tightly in place by self-locking bolts.

Before starting unit, loosen self-locking bolts until the snubbed washer can be moved sideways with finger pressure. Do not remove shipping bolts. See Fig.3.

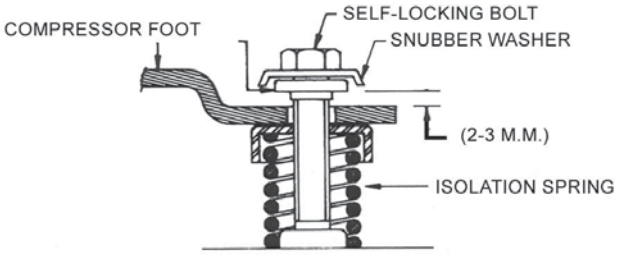
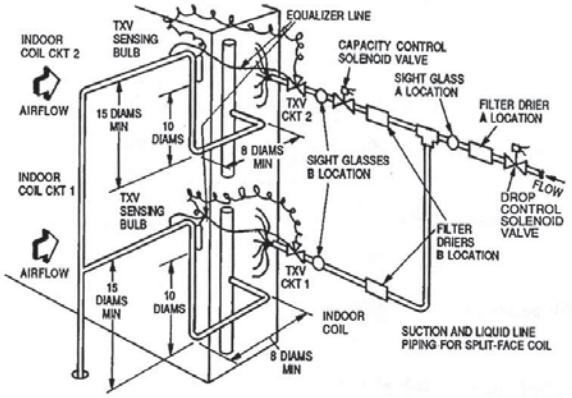


Fig. 3 — Compressor Mounting

INSTALL FILTER DRIER (S) AND MOISTURE INDICATOR (S) — Every unit should have a filter drier and liquid-moisture indicator (sight glass). In some applications, depending on space and convenience requirements, it may be desirable to install 2 filter dryers and sight glasses. One filter drier and sight glass may be installed at **A** locations in Fig. 4. Or, 2 filter dryers and sight glasses may be installed at **B** locations.



TXV — Thermal Expansion Valve

Fig.4 – Location of Slight Glass

Select the filter drier for maximum unit capacity and minimum pressure drop. Complete the refrigerant piping from indoor unit to outdoor unit before opening the liquid and suction lines at the outdoor unit.

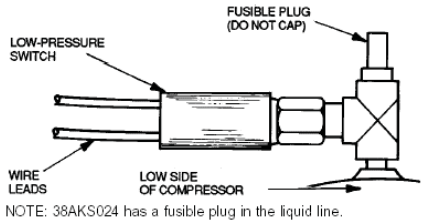
INSTALL LIQUID LINE SOLENOID VALVE — SOLENOID DROP—It is recommended that a solenoid valve be placed in the main liquid line (see Fig. 4) between condensing unit (38AE) and fan coil (40RR). (A liquid line solenoid valve is required when the liquids line length exceeds 100-ft [30.5 m] or when the condensing unit is connected to the chiller barrel in a built-up chiller system.) This valve prevents refrigerant migration (which causes oil dilution) to the compressor during the off cycle at low outdoors-ambient temperatures. The solenoid should be wired in parallel with the compressor contractor coil. This means of electrical control is referred to as solenoid *drop* control.

INSTALLLIQUID LINE SOLENOIDVALVE (OPTIONAL) CAPACITY CONTROLS — If 2-step cooling is desired, place a solenoid valve in the location shown in Fig. 4.

MAKE PIPING CONNECTIONS —Do not remove run around loop from suction and liquid line stubs in the compressor compartment until piping connections are ready tube made. Pass nitrogen or other inert gas through piping while brazing to prevent formation of copper oxide.

Install field supplied thermostatic expansion valve(s) in indoor section. If 2 thermostatic expansion valves are installed for 2-step cooling, install field-supplied liquid line solenoid valve ahead of the second expansion valve.

PROVIDE SAFETY RELIEF — A fusible plug is located on the compressor crankcase or in the liquid line (Fig. 5). Do not cap this plug. If local code requires additional safety devices, install them as directed.



NOTE: 38AKS024 has a fusible plug in the liquid line.

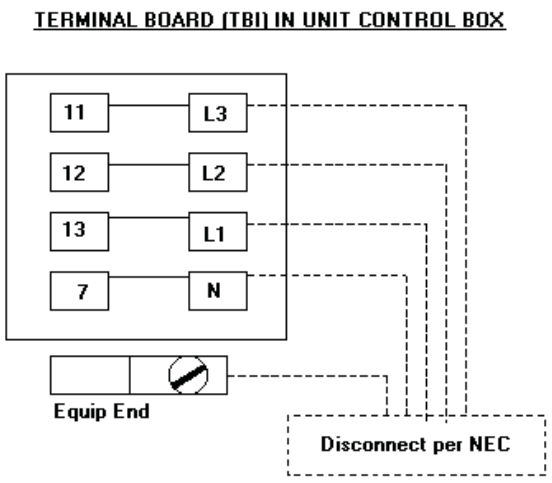
Fig.5 – Location of Fusible Plug (38AE)

Step 3 – Complete Electrical Connections

POWER WIRING –Unit is factory wired for voltage shown on nameplate. Provide adequate fused disconnect switch within sight from unit and readily accessible from unit , but out of the reach of children. Locks witch open (off) to prevent power from being turned on while unit is being serviced. Disconnect switch. Fuses, and code requirements .

Route power wires through opening in unit end panel to connection in unit control box as shown on unit label diagram and in Fig 6. Unit must be grounded.

Affix crankcase heater warning sticker to unit disconnects switch.



LEGEND

EQUIP GND – Equipment G round
NEC - National Electrical Code
____ Factory Wiring
----- Field Wiring

Fig. 6 ___ Main Power Supply Wiring

Main Power Supply Wiring

PRE-START-UP

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

Leak Test the entire refrigerant system by the pressure method described in Carrier Standard Service Techniques Manual, Chapter l. Use R-22 at approximately 25 psig (172.4 kPa) backed up with an inert gas to a total pressure not to exceed 245 psig (1689 kPa).

Turn on Crankcase Heaters for 24 hours before starting the unit to be sure all the refrigerant is out of the oil. To energize the crankcase heaters, proceed as follows.

1. Set the space thermostat set point above the space temperature so there is no demand for cooling.
2. Close the field disconnect
3. Turn the fan circuit breaker on. Leave the compressor circuit breakers off. The crankcase heaters are now energized.

Add Preliminary Charge to the refrigerant system accordingly to Carrier Standard Service Techniques Manual, Chapter l. By the liquid charging method and charging by weight procedure, charge the units with approximately the amounts of R-22 refrigerant shown in table l. Physical Data.
Before Starting Unit ensure the following:

1. Compressor oil level must be at least within sight in the compressor sight glass. Add oil if necessary (see Tables l).
2. Compressor hold down bolts must be snug, but not tight.
   Refer to Compressor Mounting section and tag on compressor foot.
3. All internal wiring connections must be tight; all barriers and covers must be in place.
4. Electrical power source must agree with unit nameplate rating .
5. All service valves must be open.
6. Crankcase heater must be firmly locked into the compressor crankcase.

START- UP

To Start Unit – Set thermostat set point below the space temperature. After starting unit, there is a delay of at least 3 seconds before compressor starts.

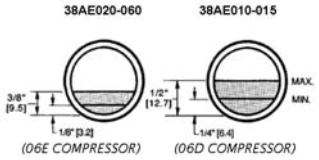


Fig.7

Oil Charge (see Tables l.) – Allow unit to run for about 20 minutes. Stop unit and check compressor oil level at sight glass. Add oil if necessary to bring oil to the correct level show in Fig 8. Use only Carrier-approved compressor oil. Approved oils are:
Witco Chemical Corp ……Suniso 3GS
Texaco, Inc ……..WF32
Petroleum specialties Co ..……Cryol 150

Do not reuse drained oil or use any oil that has been exposed to atmosphere. Procedures for adding or removing oil are given in Carrier Standard Service Techniques Manual, Chapter l., Refrigerants.
If oil is added, run unit for additional 10 minutes. Stop unit and check oil level. If level is still low , add oil only after determining that piping system is designed for proper oil return and that the system is not leaking oil.

SERVICE

Capacity Control –A suction pressure-actuated unloader controls 2 cylinders and provides capacity control. Unloaders are factory set (see Tables l.), but can be field adjusted as described in the 2 following sections.

Time Guard ll Circuit – Prevents short – cycling by providing a delay of approximately 5 minutes before restarting compressor after shutdown from safety device action.

On start-up, the Time Guard II time causes a delay of approximately 3 seconds after thermostat closes.

On compressor shutdown, the time recycles for approximately 5 minutes. During this time, the compressor cannot restart.

Refer to Fig. 8 and to label diagram on unit.

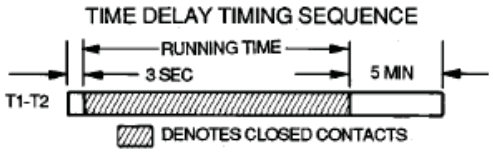
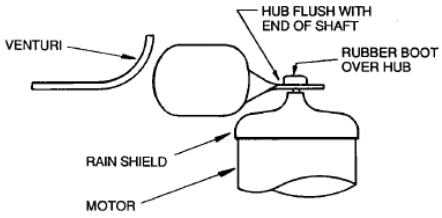


Fig.8 – Timer Sequence chart

Crankcase Heater – The heater prevents refrigerant migration and compressor oil dilution during shutdown whenever compressor is not operating. It is wired into the control circuit. and cycles with the compressor; the heater is off when compressor is running ,and on when compressor is off.

Both compressor service valves must be closed whenever the crankcase heater is for more than 6 hours. The crankcase heater is operable as long as the control circuit is energized.

Outdoor Fans – Each fan is supported by a formed wire mount bolted to the fan deck and covered with a wire guard. The exposed end of the motor shaft is covered with a rubber boot. In case a fan motor must be repaired or replaced, be sure the rubber boot is put back on when the fan is reinstalled and be sure the fan guard is in place before starting the unit. Fan motors have permanently lubricated bearings.



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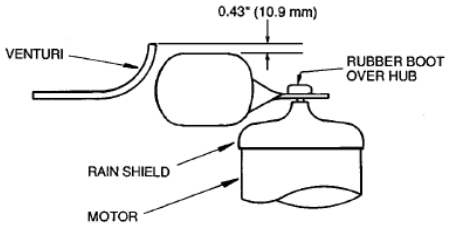

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Lubrication

FAN MOTORS have sealed bearings. No provisions are made for lubrication.

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. See oil Charge section.

Cleaning Coils –The coils can be cleaned with a vacuum cleaner, washed out with water, blown out with low-pressure compressed air, or brushed (do not use wire brush).Fan motors are drip-proof.

Clean outdoor coil annually or as required by location outdoor air conditions. Inspect coil monthly, and clean as required. Fins are not continuous through coil sections; dirt and debris may pass through first section, become trapped between the 2 rows of fins (38AE020) or 3 rows of fins (38AE010, 015,025-060) and restrict outdoor airflow. Use a flashlight to determine if dirt or debris has collected between coil sections. Clean coil as follows.

1. Turn off unit power.
2. Remove screws holding rear corner posts and top cover in place. Pivot top cover up 12 to 18 in.(305 to 457 mm) and support with a rigid support. See Fig 9.
3. Remove clips securing tube sheets together at the return bend end of the coil. Carefully spread the ends of the coil rows apart by moving the outer sections. See Fig 10.
4. Using a water hose, or other suitable equipment, flush down between the sections of coil to remove dirt and debris.
5. Clean the remaining surfaces in the normal manner.
6. Reposition outer coil sections.
7. Reinstall clips, which secure tube sheets.
8. Replace to cover and rear corner posts.

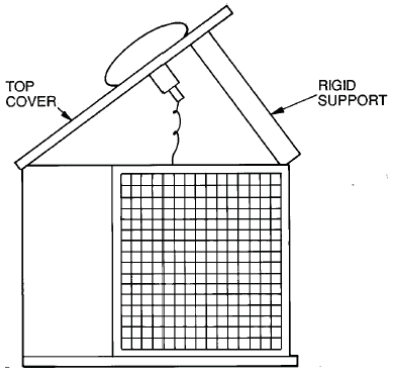


Fig.15—Pivot and Support Top Cover

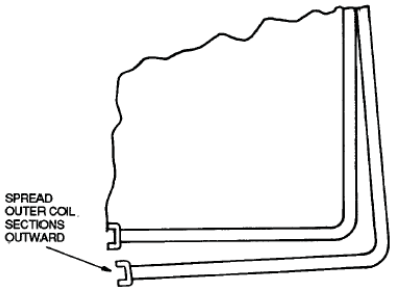


Fig.16—Coil Cleaning (Typical)

TROUBLESHOOTING PROBLEM

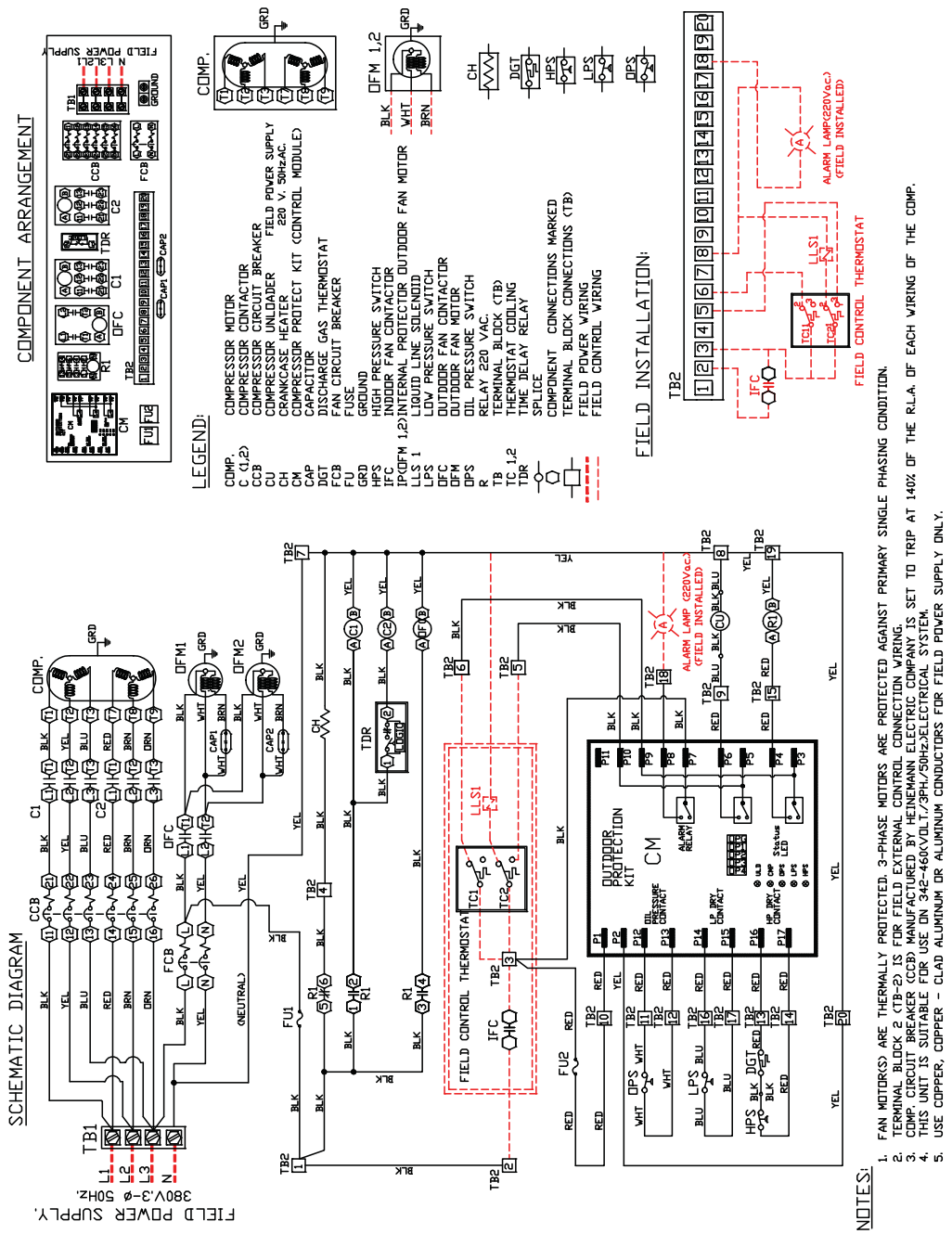
Problem	Solution
COMPRESSOR DOES NOT RUN	
Contractor Open	
1. Power off.	1. Restore power.
2. Fuses blown in field power circuit.	2. After finding cause and correcting. Replace with correct size fuse.
3. No control power.	3. Check secondary fuse(s); replace with correct type and size.
4. Thermostat circuit opens.	4. Check thermostat setting.
5. Time Guard ll device not operating.	5. Check Time Guard ll devices.
6. Compressor circuit breaker tripped.	6. Check for excessive compressor current draw. Reset breaker; replace if defective.
7. Safety device lock-out circuit active.	7. Reset lockout circuit at thermostat or circuit breaker.
8. Low-pressure switch opens.	8. Check for refrigerant undercharge, obstruction of indoor airflow, or whether compressor suction shutoff valve is fully open. Be sure outdoor fans are operating correctly.
9. High-pressure switch open.	9. Check for refrigerant overcharge, obstruction of outdoor airflow, air in system. or whether compressor discharge valve is fully open. Be sure outdoor fans are operating correctly.
10. Compressor over temperature switch open.	10. Check for open condition. Allow for reset. Replace if defective.
11. Loose electrical connections.	11. Tighten all connections.
12. Compressor stuck.	12. See compressor service literature.
Contractor Closed	
1. Compressor leads loose.	1. Check connections
2. Motor windings open.	2. See compressor service literature.
3. Single phasing.	3. Check for blown fuse. Check for loose connection at compressor terminal.
COMPRESSOR STOPS ON HIGH-PRESSURW SWITCH	
Outdoor Fan On	
1. High-pressure switch faulty.	1. Replace switch.
2. Reversed fan rotation	2. Confirm rotation, correct if necessary.
3. Airflow restricted.	3. Remove obstruction.
4. Air recalculating.	4. Clear airflow area.
5. Non condensable in system.	5. Purge and recharge as required.
6. Refrigerant overcharge.	6. Purge as required.
7. Line voltage incorrect.	7. Consult Power Company.
8. Refrigerant system restrictions.	8. Check or replace filter drier, expansion valve, etc. Check that compressor discharge service valve is fully open.
Outdoor Fan Off	
1. Fan slips on shaft.	1. Tighten fan hub set screws.
2. Motor not running.	2. Check power and capacitor.
3. Motor bearings stuck.	3. Replace bearings.
4. Motor overload open.	4. Check overload rating. Check for fan blade obstruction.
5. Motor burned out.	5. Replace motor.
COMPRESSOR CYCLES ON LOW-PRESSURE SWITCH	
Indoor-Air Fan Running	
1. Compressor suction service valve partially closed.	1. Open valve fully.
2. Liquid line solenoid valve(s) fails to open.	2. Check liquid line solenoids valve (s) for proper operation Replace if necessary.
3. Filter drier plugged.	3. Replace filter drier.
4. Expansion valve power head defective.	4. Replace power head.
5. Low refrigerant charge.	5. Add charge. Check low-pressure switch setting.

TROUBLESHOOTING (cont.)

Problem	Solution
COMPRESSOR CYCLES ON LOW-PRESSURE SWITCH (cont.)	
Airflow Restricted	
1. Coil iced up.	1. Check refrigerant charge.
2. Coil dirty.	2. Clean coil fins.
3. Air filters dirty.	3. Clean or replace filters.
4. Dampers closed.	4. Check damper operation and position.
Indoor-Air Fan Stopped	
1. Electrical connections loose.	1. Tighten all connections.
2. Fan relay defective.	2. Replace relay.
3. Motor overload open.	3. Power supply.
4. Motor defective.	4. Replace motor.
5. Fan belt broken or slipping.	5. Replace or tighten belt.
COMPRESSOR RUNNING BUT COOLING INSUFFICIENT	
Suction pressure low	
1. Refrigerant charge low.	1. Add refrigerant.
2. Head pressure low.	2. Check refrigerant charge and check or replace filters.
3. Air filters dirty.	3. Clean or replace filters.
4. Expansion valve power head defective.	4. Replace power head.
5. Indoor coil partially iced.	5. Check low-pressure setting.
6. Indoor airflow restricted.	6. Remove obstruction.
Suction Pressure High	
1. Unloaders not functioning.	1. Check unloader adjustments and Check unloader setting.
2. Compressor valve defective.	2. See compressor service literature.
3. Heat load excessive.	3. Check for open doors or windows in vicinity of fan coil.
UNIT OPERATES TOOLONG OR CONTINUOUSLY	
1. Low refrigerant charge.	1. Add refrigerant.
2. Control contacts fused.	2. Replace control.
3. Air in system.	3. Purge and evacuate system.
4. Partially plugged expansion valve or filter drier.	4. Clean or replace.
SYSTEM IS NOISY	
1. Piping vibration.	1. Support piping as required.
2. Compressor noisy.	2. Check valve plates for valve noise. Replace compressor if bearings are worn.
COMPRESSOR LOSES OIL	
1. Leak in system.	1. Repair leak.
2. Crankcase heaters not energized during shutdown.	2. Check wiring and relays. Check heater and replace if defective.
3. Improper interconnecting piping design.	3. Check piping for oil return. Replace if necessary
FROSTED SUCTION LINE	
Expansion valve admitting excess refrigerant.	Adjust expansion valve
HOT LIQUID LINE	
1. Shortage of refrigerant due to leak.	1. Repair leak and recharge.
2. Expansion valve opens too wide.	2. Adjust expansion valve.
FROSTED LIQUID LINE	
1. Restricted filter drier.	1. Remove restriction or replace.
2. Liquid line solenoid valve partially closed.	2. Replace valve.
COMPRESSOR WILL NOT UNLOAD	
1. Defective unloader.	1. Replace unloader.
2. Defective capacity control solenoid valve (if used).	2. Replace valve.
3. Miswired capacity control liquid line solenoid(if used).	3. Rewire correctly.
4. Weak,broken ,or wrong valve body spring.	4. Replace spring.
COMPERSSOR WILL NOT LOAD	
1. Miswired capacity control liquid line solenoid (if used).	1. Rewire correctly.
2. Defective capacity control solenoid valve (if used).	2. Replace valve.
3. Plugged strainer (high side).	3. Clean or replace strainer.
4. Stuck or damaged unloader piston or piston ring (s)	4. Clean or replace the necessary parts.

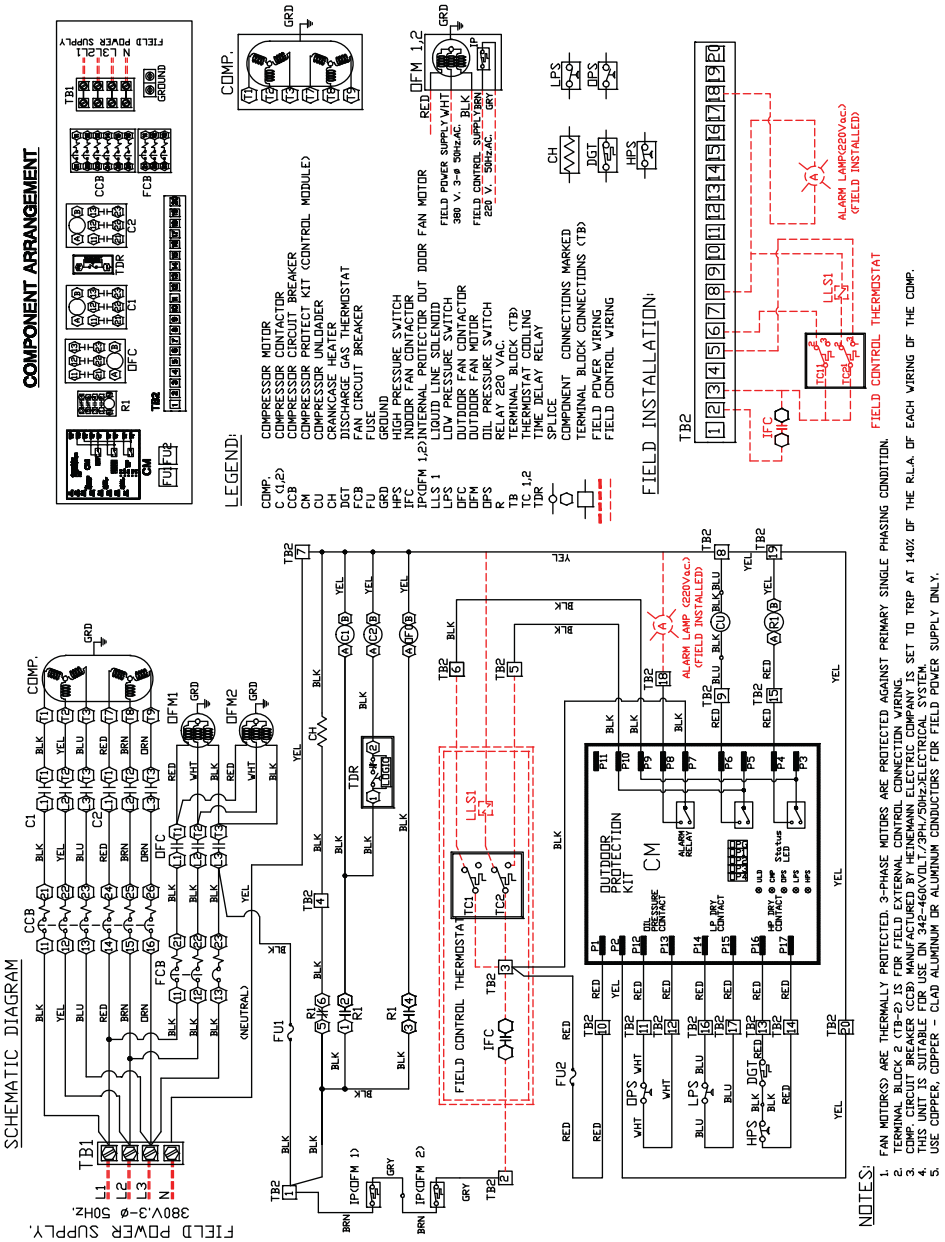
Wiring Diagram

38AE020 / 38AF020



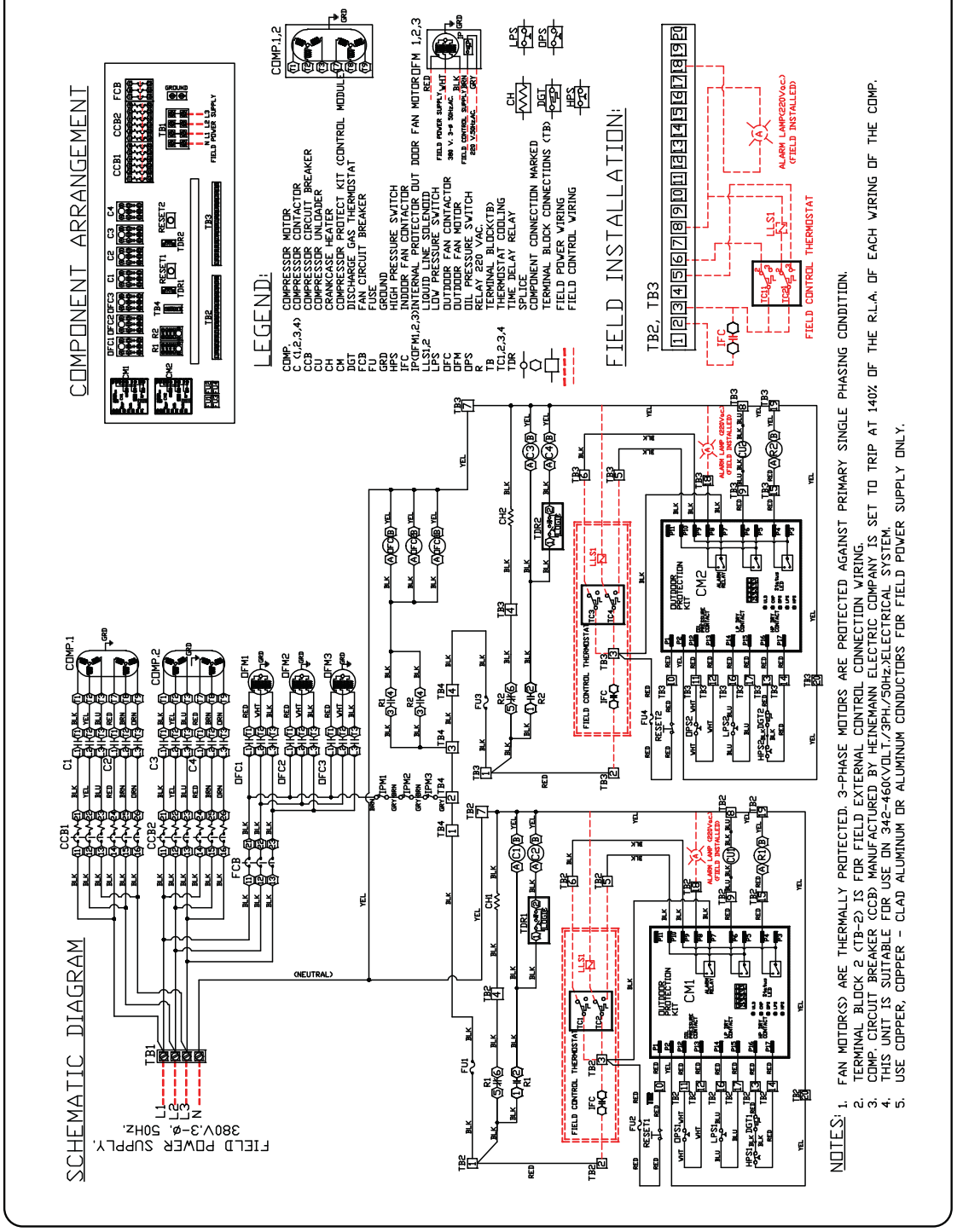
Wiring Diagram

38AE025, 030, 040 / 38AF025, 030, 040



Wiring Diagram

38AE050, 060 / 38AF050,060



Control Module (CM) Operation

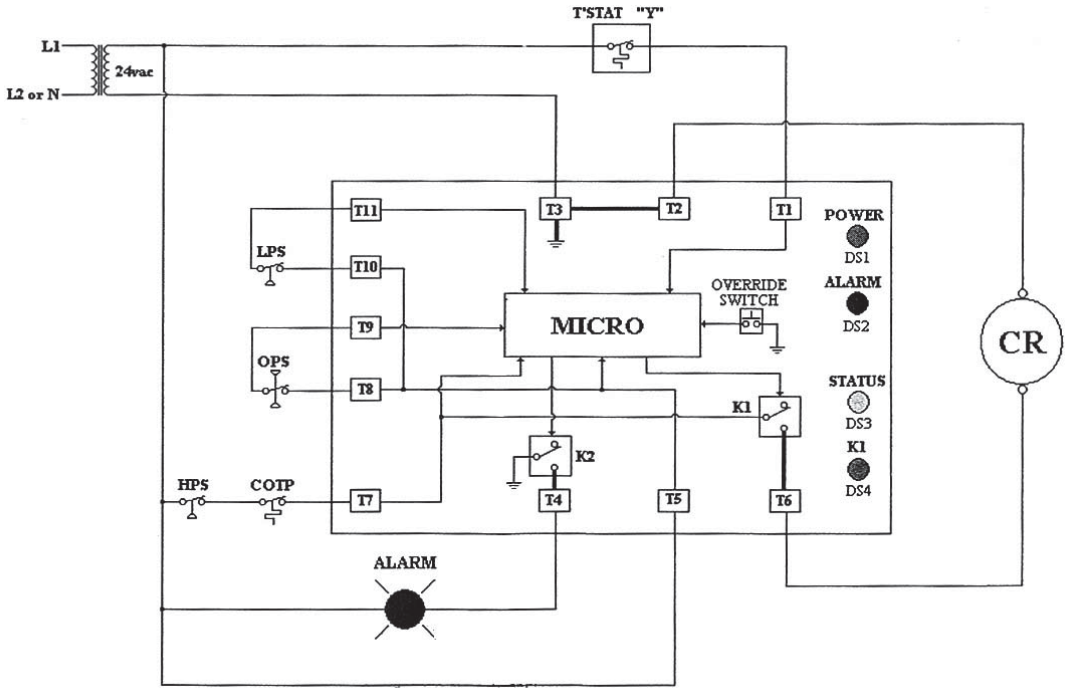
When voltage is applied the power LED (DSI) will continuously flash 1/4 second off. The module starts a 3-minute compressor delay timer. This delay can be bypassed by pressing the override switch for at least 1/2 second. The Status LED (DS3) must be flashing or the override switch will not function.
On a call for cooling, the control module checks for 24vac to be present at T1 for a period of 7 seconds. It also checks that the 3-minute compressor delay has clasped or overridden and also checks the state of the HPS/COTP. If on alarms are detected nor delays are active the module will energize the compressor contactor relay. A timer is started to provide minimum 3½ minute compressor run period.

During compressor operation the module continuously checks the HPS/COTP state (Status LED (DS3)and K1 LED (DS4) are ”NO” steady). If the circuit poens (24 vac not present at T7) the module will immediately shut down the compressor and display the alarm Alarm LED (DS2) “ON” steady). Power must be cycled to restore normal control operation.

The OPS state is ignored during the first 60 seconds of operation .After this time if the OPS is open (24 vac not present at T9) the compressor will be shut down. Alarm LED (DS2) displays the state of the OPS. A double blink (2-1/4) second blinks, I second 0ff) indicates the OPS is open . If the OPS opens during operation and remains open for longer that 60 seconds the module will lockout unit operation and display the alarm. Power must be cycled to restore normal control operation.

The LPS is monitored during a call for cooling . The LPS is ignored during the first 2 ½ minutes of operation . The Alarm LED (DS2) displays the state of the LPS. A single blink (1/4 second on, 1 second off) indicates that the LPS is open. If the LPS remains open after 2 ½ minutes or opens later during the call for cooling (24 vac not present at T11) the module shuts down the compressor. The 3-minute compressor delay is started and the cycle repeats. If the call for cooling remains and this LPS cycle is repeated 3 times the module will lock out and display the alarm. Power must be cycled to restore normal control operation.

When the call for cooling is satisfied and the compressor has run for at least 3 ½ minutes the module shuts off the compressor. The CM stats the 3-minute compressor delay timer.



TART-UP CHECKLIST

A. Preliminary Information

Outdoor: model no._____ Serial no._____
Indoor: air handler manufacturer_____
Model no._____ Serial no._____
Additional accessories_____

B. Pre-Start-Up

Outdoor Unit
Is there any shipping damage? _____ (y/n)_____
If so, where: _____
Will this damage prevent unit start-up? (y/n)_____
Check power suppy. Does it agree with unit? (y/n)_____
Has the ground wire been connected? (y/n)_____
Has the circuit protectionbeen sized and installed properly? (y/n)_____
Are the power wires to the unit sized and installed properly? (y/n)_____
Have compressor holddown bolts been loosened (snubber washers are snug,but not tight)? (y/n)___

Controls

Are thermostat and indoor fan control wiring
Connections made and checked? (y/n)_____
Are all wiring terminals (including main power supply) tight? (y/n) _____
Has crankcase heater been energized for 24 hours? (y/n) _____

Piping

Are loquid line solenoid valves located at the evaporator coils as required? (y/n) _____
Have leak checks been made at compressor, condenser, evaporator(s), Txvs (thermostatic expansion valves), solenoid valves, filter driers, and fusible plugs with a leak detector ? (y/n) _____
Locate, repair, and report any leaks._____
Have all compressor service valves been fully opened (backseated)? (y/n) _____
Have liquid line service valves been opened? (y/n) _____
Is the oil level in each compressor crankcase visible in the compressor sight glasses? (y/n) _____

Check Voltage Imbalance

Line-to-line volts: ab____v ac____v bc_____v
(ab+ac+bc)/3 = average voltage = _____v
Maximum deviation from average voltage=_____v
Voltage imbalance=100 x (max deviation)/(average voltage)=_____%
If over 2% voltage imbalance,do not attempt to start system !
Call local Power Company for assistance.

C. Start-Up

Check evaporator fan speed and record._____
Check condenser fan speed and record._____
After at least 10 minutes running time ,record the following measurements:

Oil pressure _____
Suction pressure _____
Suction line temp _____-
Discharge pressure _____
Entering condenser air temp _____
Leaving condenser air temp _____
evap entering-air db (dry bulb) temp _____
evap entering air wb (wet bulb) temp _____
evap leaving air db temp _____
evap leaving air wb temp _____

Compressor amps (L1/L2/L3) _____/_____/_____
Check the compressor oil level sight glasses; are the sight glasses showing oil level in view? (y/n)_____

Notes:

_____
_____
_____
_____
_____

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