

Installation Operation Maintenance

AllVac Commercial

High and Low Pressure Commercial Refrigerant
Recovery System



Model Numbers: RRG123E0A0, RRG123B0A0, RRG123C0A0,
RRG123F0A0, RRG123G0A0, RRG323E0A0, RRG323B0A0,
RRG323C0A0, RRG323F0A0, RRG323G0A0

Table of Contents

General Information	3
Warnings and Cautions	3
Model Number Description	3
Literature History	3
Specifications	4
Product Description	5
Figure 1 — AllVac Connections	6
Figure 2 — AllVac Schematic	8
Operating Procedures	9
Removing Residual Refrigerant	14
Calibration	19
Calibration Procedure	19
Changing Compressor Fluid	20
Figure 3 — 230/460, 1 Phase Model	21
Figure 4 — 230, 1 Phase Model	22
Figure 5 — 230/460, 3 Phase Model	23
Display Sequence	24
Electrical	26
Electrical Parts List	26
Figure 6 — Electrical Parts Breakdown	27
Replacement Parts List	28
Figure 7 — Replacement Parts Diagram	29
Figure 8 — 230/460, 1 Phase Model, Electrical Controls	30
Figure 9 — 230/460, 3 Phase Model, Electrical Controls	31
Figure 10 — 230, 1 Phase Model, Electrical Controls	32
Troubleshooting	33

General Information

Warnings and Cautions

Warnings and Cautions appear at appropriate locations throughout this manual. Read these carefully.

⚠ WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may be used to alert against unsafe practices and where property-damage-only accidents could occur.

Model number description

R	R	G	A	1	1	1	A	0	A	0
1	2	3	4	5	6	7	8	9	10	11

Refrigerant Recovery

Digits 1, 2 - Product Description

RR = Refrigerant Recovery

Digit 3 - Model Identifier

A = MicroVac
 B = HandiVac
 C = MityVac
 D = EVAC Commercial
 E = EVAC Industrial
 F = LoVac
 G = AllVac

Digit 4 - Development Sequence

A = First Development

Digit 5 - Condenser Type

1 = Air Cooled
 2 = Water Cooled
 3 = Air/Water Cooled

Digit 6 - Control Type

1 = Electromechanical
 2 = Microprocessor

Digit 7 - Connection Type

1 = 1/4" flare
 2 = 1/2" flare
 3 = 3/4" flare
 4 = 1.25" pipe thread fitting w/ball valve
 5 = Quick Connects on unit and hoses

Digit 8 - Unit Voltage (voltage/hz/phase)

A = 115/60/1, 110/50/1
 B = 230/60/1, 220/50/1
 C = 460/60/3, 415/50/3
 D = 575/60/3, 220/50/3
 E = 230/60/3, 220/50/3
 F = 575/60/3
 G = 230-460/60/1, 220-415/50/1
 H = 460-575/60/3, 415-550/50/3

Digit 9 - Safety Features

0 = Open
 1 = Float Cable Connection
 2 = Low Pressure Shut-Off
 3 = Float cable connection, LP shut-off

Digits 10, 11 - Design Sequence

A0 = First Design Sequence

Literature History

RRGA-SVX-01A (April 2001)

Original issue of manual. Describes the Installation, Operation and Maintenance procedures for this unit.

General Information

Electrical Power Requirements

Recovery Main Components & Controls:

- 115VAC, 50/60 Hz, 1-Phase, 20-Amperes Min. CKT 15.0 Amp, Max Fuse 20 Amps

Models RRG123G0A0 & RRG323G0A0:

- Compressor 230/460 VAC, 50/60Hz, 1 Phase Min. CKT 20.0 Amp, Max Fuse 30 Amps.

Models RRG123B0A0 & RRG323B0A0:

- Compressor 220/240VAC, 50/60Hz, 1 Phase MIN CKT 20.0 AMP, Max Fuse 30 Amps.

Models RRG123E0A0 & RRG323E0A0:

- Compressor 230 VAC, 50/60Hz, 3 Phase Min. CKT 10.0 Amp, Max-Fuse 20 Amps.

Models RRG123C0A0 & RRG323C0A0:

- Compressor 460 VAC, 50/60Hz, 1 Phase Min. CKT 10.0 Amp, Max Fuse 15 Amps.

Models RRG123F0A0 & RRG323F0A0:

- Compressor 575 VAC, 50/60Hz, 1 Phase Min. CKT 10.0 Amp, Max Fuse 15 Amps.

Dimensions (approximate)

- 41" high x 24" wide x 27" deep

Weight

- 240-lbs. (340-lbs. shipping)

Notice

The Trane Company urges that all HVAC servicers working on Trane equipment, or any manufacturer's products, make every effort to eliminate, if possible, or vigorously reduce the emission of CFC, HCFC and HFC refrigerants to the atmosphere resulting from installation, operation, routine maintenance, or major service on this equipment. Always act in a responsible manner to conserve refrigerants for continued use even when acceptable alternatives are available. Conservation and emission-reduction can be accomplished by following recommended Trane service and safety procedures published in Trane General Service Bulletin CTV-SB-81. The information and procedures provided in CTV-SB-81 supersedes those published in this manual. Copies of this bulletin may be obtained by contacting your local Trane commercial representative.

WARNING!

To avoid injury or death due to inhalation of, or skin exposure to refrigerant, closely follow all safety procedures described in the Material Safety Data Sheet for the refrigerant and to all labels on refrigerant containers. Certain procedures common to refrigeration system service may expose personnel to liquid or vaporous refrigerant.

General Information

Product Description

RefTec's AllVac recovery system provides automated recovery of most low & high pressure refrigerants and blends.

The unit consists of a 3 or 5-hp compressor with oil separator, disposable liquid & vapor prefilter driers, high capacity air cooled condenser, microprocessor control system, and actuated valving system. Unit connections are 3/4" male flare with isolation valves.

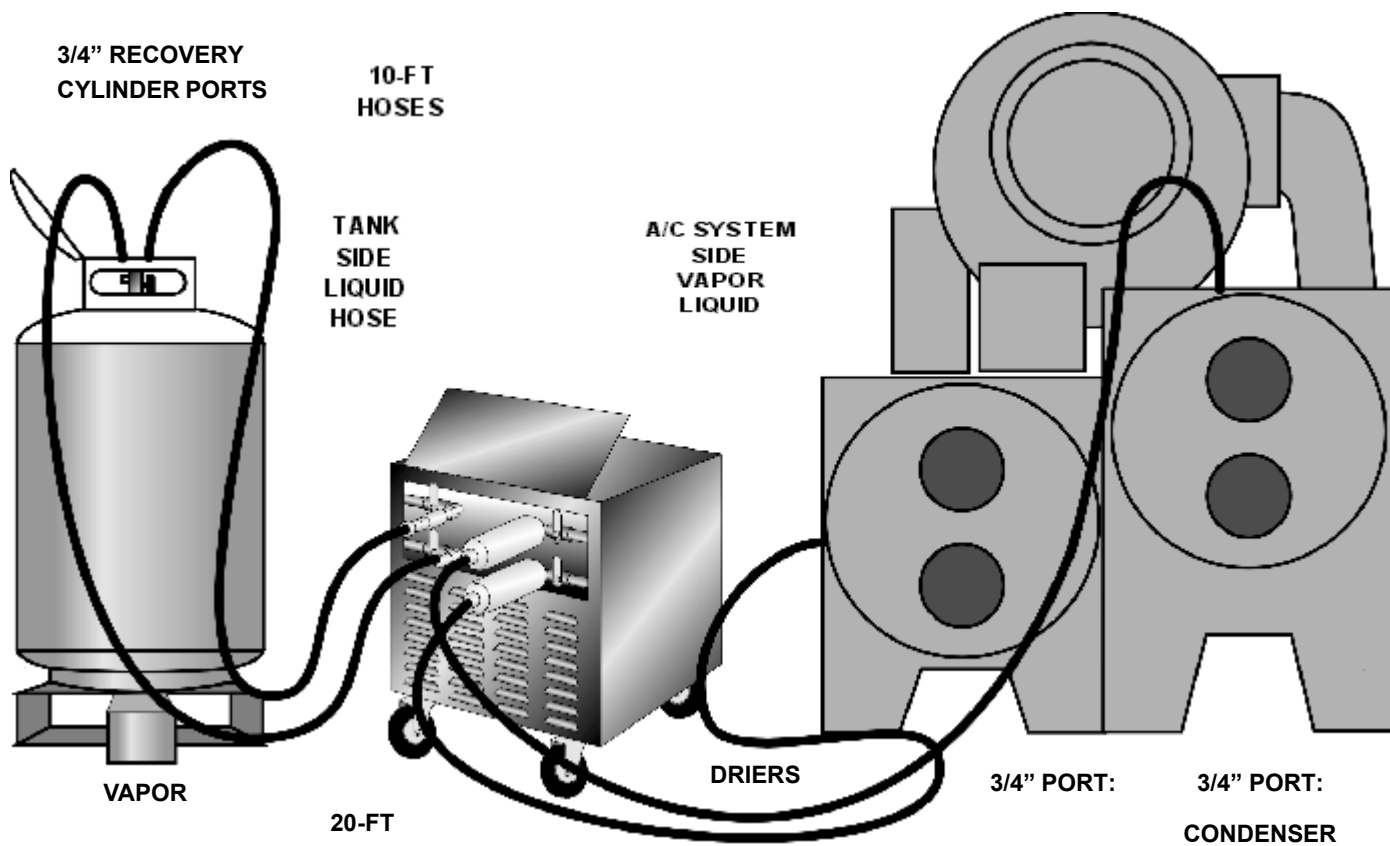
After hoses are connected and purged or evacuated, AllVac starts automated recovery by letting refrigerant migrate from the A/C system to the recovery tank. It then draws vapor off the recovery tank, heats it via compression, and injects it back into the A/C system high side, thus creating a pressure differential before commencing liquid transfer.

A sensor determines when liquid transfer is complete, and AllVac's compressor begins moving vapor, which is first cleansed by a filter drier. Discharged hot compressed gas passes through an oil separator and the oil is returned to the compressor. Refrigerant is then condensed by the air-cooled condenser and sent to the recovery tank.

The AllVac can be programmed to stop transfer at either 0 PSI or at 15" Hg vacuum for high pressure refrigerant and either 0 PSI or at 29" Hg vacuum for low pressure refrigerants. Transfer stops when a pressure transducer indicates the A/C system reaches the programmed pressure. The unit then confirms the vacuum level by monitoring pressure for two minutes. Should pressure in the A/C system rise, AllVac energizes again to achieve A/C system selected level of vacuum.

General Information

Figure 1. AllVac Connections



General Information

Furnished with the AllVac are:

- Two -10-ft. and 20-ft. 3/4" hoses equipped with four 3/4" female flare fittings with isolation valves
- Two - 3/4"-5/8" flare reducing fittings
- Two - 5/8" -1/2" flare reducing fittings
- Two - 3/4" female flare unions
- 50-ft., 230/460-VAC power cord
- 100-ft., 120-VAC power cord
- Two - 3/4" female flare 0.73-liter disposable in-line filter driers

Please follow the recommended procedures outlined in this manual for regular changing of compressor fluid. Before every recovery job install new liquid and vapor drier cores.

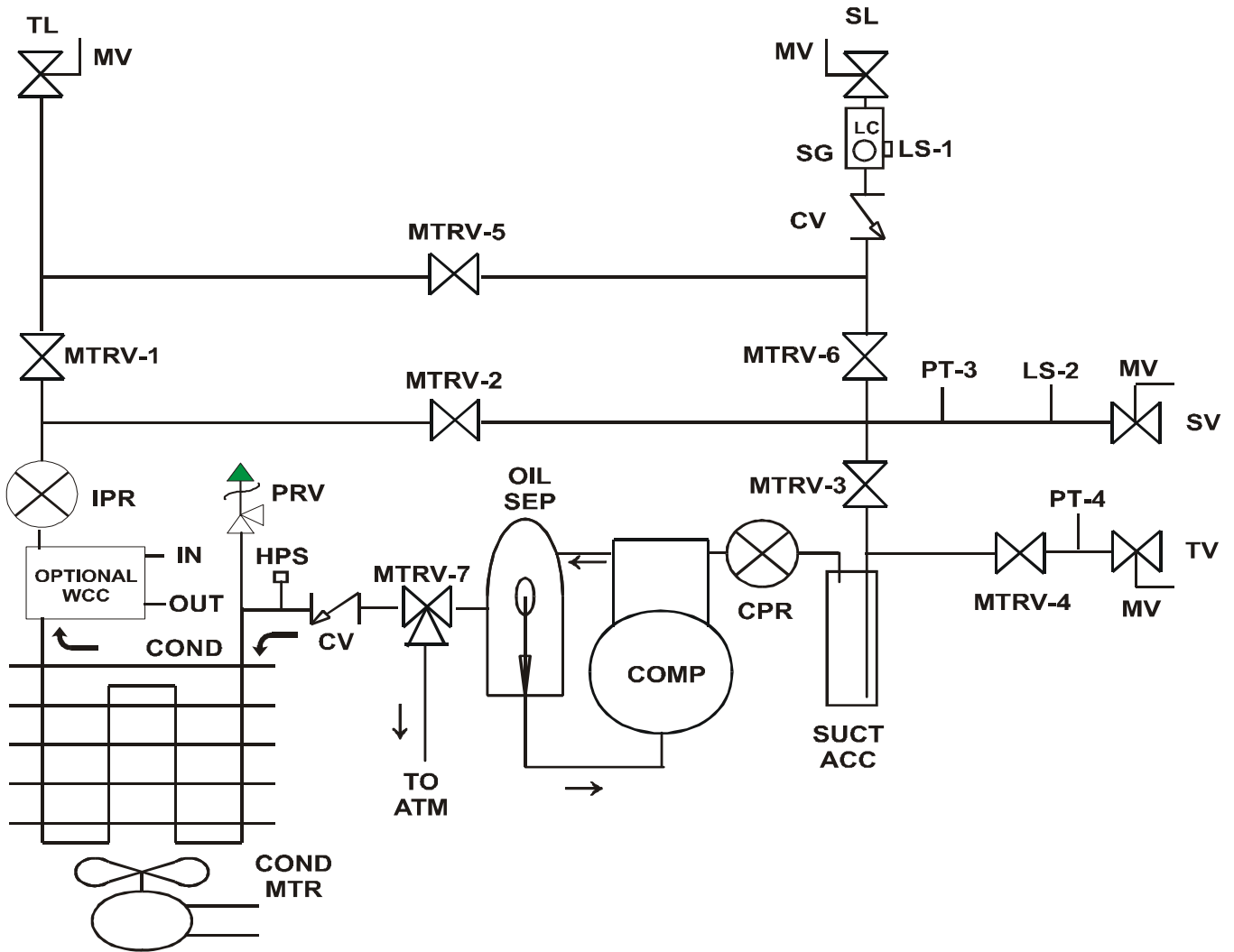
Peak Performance:

To get the highest performance from your AllVac unit, we recommend that you:

1. Connect to 3/4" evaporator and condenser ports on the chiller or A/C system and to recovery cylinders with 3/4" full ports whenever possible and with a minimum 3/4" liquid dip tube.
2. Whenever there is an additional liquid access port on the A/C system, connect an additional refrigerant line (3/4" if possible) directly from the A/C system, through a drier, to the recovery cylinder. AllVac's pressure differential will motivate the refrigerant to the recovery cylinder, increasing recovery speed. See Notes 1, 2, & 3 or 4 & 5 in Operating Procedures.

General Information

Figure 2. AllVac Schematic



Operation

Operating Procedures

To ensure your safety as well as others, before attempting to recover an A/C, refrigeration or chiller system, proper and thorough preparation must take place:

- Make sure you have a recovery cylinder with a minimum 3/4" male flare vapor port and a minimum 3/4" male flare liquid port and 3/4" dip tube. This tank or series of tanks must be able to hold the entire refrigerant charge at 80% full. Both the tank and the refrigerant hoses also must be pressure rated for the specific refrigerant being recovered.

Reminder: Refrigerant full weight is 80% of water capacity weight determined as follows: Maximum allowable gross weight = 80% of water capacity weight + cylinder tare weight.

- In addition, a suitable scale should be used to weigh the tanks in case AllVac needs to be shut down to prevent overfilling tanks. If a scale is not available, the tanks can be equipped at time of purchase with a float switch that will deactivate AllVac's microprocessor control circuit when the tank reaches 80% capacity.
- Finally, the recovery cylinder or cylinders must be pulled into a 29" vacuum before recovery commences. Failure to follow these above stated procedures will decrease the likelihood of AllVac performing at its highest possible effectiveness.

1. Turn the A/C system off; make sure that the chiller cannot restart.
2. When using dual voltage model ARLH-A-D24-1-M connect has follows:
For 230-VAC, 1-phase power, connect the 50-ft., 230/460-VAC, 1-phase power cord to a minimum 20 amp, maximum 30 amp circuit breaker or fused disconnect and plug the quick connect Hubbell into AllVac's control box. When using 460-VAC, 1-phase power, connect the 50-ft., 230/460-VAC, 1-phase power cord to a minimum 10 amp, maximum 20 amp circuit breaker or fused disconnect and plug the quick connect Hubbell into AllVac's control box. Connect the 100-ft., 120-VAC, 1-phase power cord for controls. At this time, follow procedures 5 & 6 in selecting 1-phase voltage, 230 or 460, failure to select proper voltage will result in major damage to compressor motor. All other models connect to proper voltage and required amperage as rated on equipment label.
3. At this point, the display lights up indicating the unit has power and prompting you to press "**Start**".

Operation

An additional feature can be accessed at this time, by pressing the “M” key. This display will show you total compressor run time as well as give you a historical maintenance schedule. In addition, at every 10 hours of cumulative operating run time for the compressor, an automatic message will appear each time you start the AllVac until maintenance is performed. After changing oil, press the “Enter” key which records that maintenance has been performed. Message will then not appear until the next 10 hours of compressor run time is accumulated. The system will retain a log of each maintenance event recorded.

4. AllVac then asks you to **“Use M V To Select Scale or Float Switch”**. Scroll to either “Scale” or “Float Switch”, then press **“Enter”**.

Procedures 5 & 6 for ARLH-A-D24-1-M Model only

5. AllVac then asks you to **“Use M V To Select Operating Voltage”**. Scroll to the desired voltage 230/460 using the “M V” keys, then press **“Enter”**.
6. AllVac then tells you that **“You Selected Single Phase ___V Operation Is This Correct? Enter = Yes, Can = No”**.
7. AllVac then asks you to **“Select Refrigerant”** being recovered. Scroll to the desired refrigerant using the “M V” keys then press **“Enter”**.
8. AllVac then prompts you to check selection by displaying **“Selected Refrigerant R___ Is This Correct? Enter = Yes, Can = No”**.
9. AllVac then prompts you to select the vapor transfer shutdown pressure by **“Use M V to select 0 PSI or 15 Hg Shutdown”** for high pressure refrigerants, or **“Use M V to select 0 PSI or 29 Hg Shutdown”** for low pressure refrigerants. Scroll to the desired shutdown pressure, then press **“ENTER”**.
10. AllVac then asks you to **“Connect all Refrigerant Hoses”** then press **“Enter”**. Connect the two supplied 10-ft. hoses to AllVac’s recovery side liquid and vapor ports and to liquid and vapor ports on the recovery cylinder. Connect the two supplied 20-ft. hoses to ports on the chiller evaporator and condenser or A/C system and to the System Liquid and System Vapor on AllVac unit as shown on Page 6.
 - At this point, procedures for HIGH or LOW pressure refrigerant recovery differ
For HIGH Pressure - follow steps 11 - 26
For LOW Pressure, go to page 7 follow steps 27 - 42
11. **“Open System Vapor & Liquid Hand Valves on AllVac Recovery Unit”** then press **“Enter”**.
12. **“Open Recovery Vapor & Liquid Hand Valves on AllVac Recovery Unit”** then press **“Enter”**.

Caution

Failure to select proper voltage will result in major damage to unit.

Operation

Note 1: If recovery tank side hoses have isolation valves, open them now.

13. **“To Evacuate Hoses Press Enter, To Skip Hose Evacuation Press Cancel”** if “Enter” is pressed, unit displays **“Hose Evacuation in Process”** followed by **“Hose Evacuation Complete, Press Enter”**.
14. Next **“Open Vapor & Liquid Access Valves on A/C System Being Recovered”** then press **“Enter”**. If you pressed **“Cancel”** in step 13, AllVac will display **“Purge Both Refrigerant Lines at the Recovery Tank”** then press **“Enter”**.
15. **“Open Vapor and Liquid Hand Valves on Recovery Tank”** then press **“Enter”**.
16. AllVac then displays **“Liquid Transfer!”** and displays the A/C system and recovery tank pressures.
 - AllVac now begins automated recovery while continuously displaying A/C system & recovery tank pressures.

Note 2: If additional liquid line is connected for faster liquid recovery, open A/C system and recovery tank valves now. When AllVac goes into vapor recovery, close recovery tank side of the hose.

17. Once pressure between the cooling system and recovery tank are within 15-psi of each other and a liquid sensor indicates that all liquid from liquid transfer has been removed, the unit switches to vapor recovery, displaying **“Vapor Recovery in Process”** and continues to display the A/C system & recovery tank pressures.

If AllVac does not switch to vapor recovery and you are absolutely sure that all of the liquid has been removed, it may be because lines to the recovery tank or to the cooling system are restricted. In this case, a bypass feature can be accessed that forces the unit to begin vapor recovery. To perform this task, press the enter key two times in a row during liquid recovery mode and vapor recovery will commence. It is absolutely imperative that all liquid has been transferred before using this override feature. Failure to do so may result in liquid slugging to the compressor and causing major damage.

18. When the selected shutdown vacuum (either 0 PSI or 15” Hg) has been achieved in the A/C system, the unit power shuts off and the display reads **“Vapor Recovery 2 Minute Wait State”** and displays the time remaining.

At this point, the microprocessor continues to monitor A/C system pressure. Should pressure rise, AllVac restarts to again achieve the user selected vacuum.

19. Then the display will read **“Vapor Recovery Finished! press Enter”**.

Operation

Upon pressing “Enter”, AllVac prompts you to perform the following valve manipulations 20-26:

Note 3: Close additional liquid access valve at this time, if being used.

20. “Close Access Valves on A/C System Being Recovered” then press “Enter”.
21. “Close Both Hand Valves on AllVac Unit A/C System Side” press “Enter”.
22. AllVac compressor then restarts and begins to force remaining liquid in AllVac as well as liquid in hose into the recovery tank. Displaying “**Liquid Refrigerant Clearing in Process**”.
23. “Close Both Liquid & Vapor Hand Valves on Recovery Tank” press *Enter*.
24. AllVac then begins evacuating the recovery tank vapor hose, displaying “**Hose Evacuation in Process**”.
25. “Close Both Liquid & Vapor Tank Hand Valves on AllVac unit” then press “Enter”.
26. Finally, the unit displays “**System Recovery Completed! Disconnect all Hoses and Power**”.

At this time, close all four refrigerant hose isolation valves located on the ends of the refrigerant hoses connected from AllVac to the recovery tank.

There will still be a small, residual amount of refrigerant in AllVac. This amount must be removed if you want to change to a different type of refrigerant. An explanation on how to remove this residual amount of refrigerant is on page 14.

Low Pressure Section

27. “Open Chiller Condenser & Evaporator Hand Valves on AllVac Unit” then press “Enter”.
28. “Open Tank Vapor & Liquid Hand Valves on AllVac Recovery Unit” then press “Enter”.
29. “To Evacuate Hoses Press Enter, To Skip Hose Evacuation Press Cancel” if “Enter” is pressed, unit displays “Hose Evacuation in Process” followed by “Hose Evacuation Complete, Press Enter”.
30. “Open Chiller Condenser & Evaporator Service Access Valves” then press “Enter”.
31. Next “Open Vapor and Liquid Hand Valves on Recovery Tank” then press “Enter”.
32. AllVac then displays “**Liquid Transfer!**” and displays the chiller pressure and recovery tank pressures.

Operation

Note 4: If additional liquid line is connected for faster liquid recovery, open chiller and recovery tank valves now. When AllVac goes into vapor recovery, close recovery tank side of the hose.

33. AllVac will remain in liquid transfer state until manually switched to vapor transfer as follows:

Once all liquid from chiller has been transferred and absolutely no liquid refrigerant is remaining in clear recovery hoses and you are absolutely sure that all of the liquid has been removed from the chiller, PRESS THE ENTER KEY TWO TIMES IN A ROW. VAPOR RECOVERY WILL COMMENCE. ALLVAC WILL DISPLAY “**VAPOR RECOVERY IN PROCESS**” AND DISPLAY THE CHILLER AND RECOVERY TANK PRESSURE. **IT IS ABSOLUTELY IMPERATIVE THAT ALL LIQUID HAS BEEN TRANSFERRED BEFORE SWITCHING TO VAPOR RECOVERY MODE. FAILURE TO DO SO MAY RESULT IN LIQUID SLUGGING THE COMPRESSOR AND CAUSING MAJOR DAMAGE.**

34. When the user selected shutdown vacuum (either 0 PSI or 29” Hg) has been achieved in the chiller system, the unit power shuts off and the display reads “**Vapor Recovery 2 Minute Wait State**”.

Operation

At this point, the microprocessor continues to monitor chiller pressure. Should pressure rise, AllVac restarts to again achieve the user-selected vacuum.

35. Then the display will read **“Chiller Vapor Recovery Finished! press Enter”**.

Upon pressing “Enter”, AllVac prompts you to perform the following valve manipulations 36 - 42:

Note 5: Close additional liquid access valve at this time, if being used. **“Close Both Service Access Valves on Chiller”** then press **“Enter”**.

36. **“Close Both Hand Valves on AllVac Unit Chiller Side”** press **“Enter”**.

37. AllVac compressor then restarts and begins to force remaining liquid in AllVac as well as liquid in hose into the recovery tank. Displaying **“Liquid Refrigerant Clearing in Process”**.

38. **“Close Both Liquid & Vapor Hand Valves on Recovery Tank”** press **“Enter”**.

39. AllVac then begins evacuating the recovery tank vapor hose, displaying **“Hose Evacuation in Process”**.

40. **“Close Both Liquid & Vapor Tank Hand Valves on AllVac unit”** then press **“Enter”**.

41. Finally, the unit displays **“Chiller Recovery Completed! Disconnect all Hoses and Power”**.

At this time, close all four refrigerant hose isolation valves located on the ends of the refrigerant hoses connected from AllVac to the recovery tank.

There will still be a small, residual amount of refrigerant in AllVac. This amount must be removed if you want to change to a different type of refrigerant. An explanation on how to remove this residual amount of refrigerant is described in next paragraph.

Removing Remaining Residual Refrigerant

- a) Connect the center tap of a manifold set to a suitable vacuum pump inlet and discharge side of pump to an 50 lb. evacuated recovery cylinder. Connect the low & high side of the manifold set to the 1/4” compressor suction and discharge access ports located on the side of AllVac unit.
- b) Open valve on 50 lb. recovery tank and turn on the vacuum pump. Open the low & high side manifold valves and wait until a 29” vacuum has been achieved on your manifold gauge.
- c) Close both manifold valves, shut down vacuum pump and close recovery tank valve. If you intend to use AllVac on a different type of refrigerant, make sure to change compressor fluid and disposable driers.

Operation

Changing Replaceable Cores

Make sure you replace filter cores after each recovery job. Simply unscrew used filter assembly and replace.

Procedures for Recharging System Using AllVac

These procedures provide for the transfer of refrigerant liquid and vapor from a recovery tank to a centrifugal chiller system using the AllVac recovery unit. These procedures are to be used when clean refrigerant is being returned to a chiller without recycling.

When moving refrigerant between vessels, be certain that the pressure never is greater than the vessel manufacturer's recommendations.

CAUTION

Failure to adhere to the procedures outlined herein can cause severe damage to the chiller. If liquid refrigerant is introduced into the chiller while the chiller is at deep vacuum, this could result in tube freeze-up.

Note: AllVac's microprocessor displays instructions on the LCD screen as recovery operations are implemented. During system recharging, the references to the A/C System and the Recovery Tank are reversed. Therefore, during recharging operations, the operator **MUST** assume that the A/C System is now the Recovery Tank and the Recovery Tank is the A/C System.

Select the desired vapor transfer stopping pressure, either zero (0) or 29" Hg, for low pressure refrigerant.

1. Connect all liquid and vapor lines between chiller, AllVac recovery unit and recovery tanks.

a) Refrigerant hoses should be connected in the following manner with all valves in the closed position at this point:

Hose	From	To
Tank Vapor	Tank	AllVac System Vapor
Tank Liquid	Tank	AllVac System Liquid
Chiller Vapor	Chiller	AllVac Tank Vapor
Chiller Liquid	Chiller	AllVac Tank Liquid

Operation

2. Evacuate Air from Chiller, AllVac and Hoses.

- a) Once all lines are connected, open the AllVac valves in the following sequence: system liquid, system vapor, tank liquid, and tank vapor on AllVac only.
- b) Connect manifold gauge set and vacuum pump to ports on side of AllVac unit at compressor suction and discharge ports.
- c) Vacuum complete lines and AllVac to 29" Hg vacuum.
- d) Close AllVac valves in the following sequence: system liquid, system vapor, tank liquid, and tank vapor.
- e) Disconnect manifold gauge and vacuum pump.

Caution:

During this procedure connect the 120 VAC power for control circuit to AllVac, but DO NOT TURN THE ALLVAC UNIT ON until this procedure 3 has been completed and the pressure has been equalized between the chiller and the recovery tank AND pressure is above the freezing point.

3. Increase Chiller Pressure Using Vapor From Recovery Tank.

(Refrigerant Vapor from the recovery tank is utilized to increase chiller pressure at a controlled rate to prevent tube freeze-up when performing procedure 4 below.)

- a) Energize chiller condenser and evaporator water pumps. Water should be flowing through both evaporator and condenser during this procedure to reduce the potential for freezing chiller tubes.
- b) Connect a vacuum gauge to the chiller.
- c) Slowly open the specified valves in the following sequence:
 - (1) recovery tank vapor valve
 - (2) AllVac system vapor valve
 - (3) AllVac tank vapor valve
 - (4) chiller vapor valve
- c) Continued. This step must be closely monitored manually at (4) chiller vapor valve until the chiller pressure is sufficient to insure that it is above freezing point for the refrigerant being transferred and until pressure has equalized between the chiller and the recovery tank.
- d) When pressure has equalized, close the specified valves in the following sequence:
 - (1) chiller vapor valve
 - (2) recovery tank vapor valve
 - (3) AllVac system vapor valve
 - (4) AllVac tank vapor valve

Caution:

If liquid refrigerant is introduced to the chiller when the pressures are below the minimum levels as noted in "b" below, severe damage can occur due to freezing of the chiller tubes.

4. Pump Liquid Refrigerant from Recovery Tank to Chiller

(Using AllVac to pump liquid refrigerant from recovery tank to chiller.)

- a) Energize chiller condenser and evaporator water pumps. Water should be flowing through both evaporator and condenser during this procedure to reduce the potential for freezing chiller tubes.

Operation

b) Before proceeding with this procedure, chiller pressure must be at a minimum of 15" Hg. of vacuum or greater for R-11 or R-123. The minimum pressure for R113 is 25" Hg. vacuum. If the chiller is not above the minimum level, do not proceed with liquid transfer, but repeat procedure 3 above.

Do not continue this procedure until it is confirmed that chiller pressure is above minimum required level.

c) Refrigerant hoses should be connected as follows:

Hose	From	To
Tank Vapor	Tank	AllVac System Vapor
Tank Liquid	Tank	AllVac System Liquid
Chiller Vapor	Chiller	AllVac Tank Vapor
Chiller Liquid	Chiller	AllVac Tank Liquid

d) Follow the procedures per the AllVac display, except you may ignore instructions to evacuate hoses at this time if hoses have already been evacuated per procedure 2 above.

Slowly open the specified valves in the following sequence:

- (1) Recovery tank liquid valve
- (2) AllVac system liquid valve
- (3) AllVac tank liquid valve
- (4) Chiller liquid valve

e) Monitor pressure in chiller condenser and evaporator. If pressure in chiller becomes greater than 8 psig, shut down power to AllVac and remove non-condensibles from chiller before resuming transfer.

f) Operate unit until all liquid refrigerant is removed from recovery tank. AllVac liquid sight glass, tank sight glass and liquid level gauge should all indicate that all liquid refrigerant has been removed from the tank.

g) When all liquid refrigerant is removed from recovery tank, press "ENTER" key two times on AllVac and vapor transfer from recovery tank will commence. Continue to let AllVac run until vapor recovery is complete.

Operation

5. Evacuating Refrigerant Vapor From Recovery Tank and Hoses
(This step removes any liquid or refrigerant vapor in the recovery tank and connecting hoses.)

- a) Energize chiller condenser and evaporator water pumps. Water should be flowing through both evaporator and condenser during this procedure to reduce the potential for freezing chiller tubes.
- b) AllVac provides for automated evacuation procedures of the recovery system and hoses.

The operator reads the instructions provided by the microprocessor controls, then performs the task described. This sequences each step for closing valves and evacuating the AllVac and hoses

Important: AllVac's microprocessor displays instructions on the LCD screen as recovery operations are implemented. During system recharging, the references to the A/C System and the Recovery Tank are reversed. Therefore, during recharging operations, the operator **MUST** assume that the A/C System is now the Recovery Tank and the Recovery Tank is the A/C System.

- c) Operate AllVac until tank vapor pressure gauge indicates a vacuum greater than 29" Hg for low pressure refrigerants.

Note: If, at any time, chiller pressure gauge indicates a value greater than 10 psig:

1. Compare chiller gauge reading with the saturated pressure shown in a standard pressure/temperature chart for the type of refrigerant being transferred. If the chiller pressure exceeds the saturated pressure indicated for the type of refrigerant being transferred for the present chiller temperature, it is actually an indication of the presence of air in the chiller.
2. If there is air in the chiller, the operator should use the chiller's purge system to remove the air before continuing and/or use RefTec's portable Minipurge. The Minipurge is an oil-less compressor driven purge which is designed to purge non-condensibles from any refrigerant.

Note: If chiller pressure repeatedly rises above 10 psig, this indicates an air leak in either the recovery tank or connecting hoses. If leakage cannot be stopped at this time, terminate the operation.

- d) Upon completion of the evacuation procedures, follow the instructions according to the AllVac display to shut down unit.
- e) Disconnect all power cables and hoses.

Calibration

Pressure Transducer Calibration Procedure

AllVac unit is equipped with a sensitive pressure transducer which needs to be calibrated prior to running the AllVac. This will take into account variations in atmospheric pressure at various altitudes and locations.

RefTec recommends that this calibration procedure be performed if any of the following events occur:

- a) Any time a new pressure transducer is installed on the unit.
- b) Any time that the unit is moved to a substantially different altitude or is exposed to significantly different atmospheric pressure.
- c) Any time that pressure readings appear to be questionable or there is any reason to doubt the accuracy of the transducer readings.

Calibration Procedure Steps:

1. At power up, the AllVac Recovery Unit will display:
"AllVac COMMERCIAL RECOVERY UNIT"
"HAS POWER (PRESS START)"
2. At this screen you must press "**CANCEL**" twice within 5 seconds to enter the CALIBRATION mode. The display will then show the following:
"OPEN PRESSURE TRANSDUCERS TO ATMOSPHERE "
"(THEN PRESS ENTER KEY)"
3. Now, with no hoses connected, open the liquid and vapor, system and recovery tank, valves on the AllVac to the atmosphere and press "ENTER".
4. The screen will then display the following message:
"SYSTEM PRESSURE xx PSI"
"PRESS ENTER TO CALIBRATE THIS TRANSDUCER"

The system is displaying the raw, uncalibrated reading from the transducer. If you press "ENTER", it will calculate a calibration value and store it in the computer's nonvolatile memory. If you press "CANCEL", a new calibration factor will not be calculated.

5. It will then display the following message:
"RECOVERY TANK PRESSURE xx HG"
"PRESS ENTER TO CALIBRATE THIS TRANSDUCER"

Calibration

The system is once again displaying the raw, uncalibrated reading from the transducer. Once you press ENTER, it will calculate a calibration value for this transducer and store it in memory. If you press "CANCEL", a new calibration factor will not be calculated. It will then display the following message and be ready for operation:

"ALLVAC COMMERCIAL RECOVERY UNIT"

"HAS POWER (PRESS START) "

Changing Compressor Fluid

The compressor's charge of Poly Ester fluid should be regularly replaced with an identical fluid or, at a minimum, after any of these events:

1. After a maximum of 10 hours of run time
2. When changing recovery jobs that involve different refrigerants
3. After a recovering a system with a burnt out compressor.

Caution:

When changing oil, it is highly recommended that the same type of oil being used with the refrigerant being recovered, be used in the AllVac compressor. This will help ensure that cross contamination does not occur.

To remove and change the oil in the compressor and the oil separator:

- a) Make sure AllVac unit has no refrigerant in its internal parts.
- b) Connect a manifold set to dry nitrogen and to the suction and discharge service 1/4" access ports located on the side of the AllVac.
- c) Connect another 1/4" hose to the access fitting on the bottom of the AllVac oil separator fitting and the other end to a suitable disposable oil container.
- d) Gradually allow dry nitrogen to go into the discharge port on the AllVac unit until all oil has been forced out of the oil separator. **Note: 10 to 15 PSI will be more than adequate.**
- e) Connect another 1/4" hose to the access fitting on the bottom of the AllVac compressor fitting and the other end to a suitable disposable oil container.
- f) Gradually allow dry nitrogen to go into the suction port on the AllVac unit until all oil has been forced out of the compressor.
- g) To add new oil to the AllVac compressor, connect a vacuum pump to the 1/4" access port on the suction side of the compressor. Pull down into a minimum 29" vacuum.
- h) Connect other hose to the 1/4" access port on the bottom of the compressor and into the new oil container. Note: fill compressor with exactly 18 oz. of oil.
- i) After compressor has been filled, connect other hose to the 1/4" access port on the bottom of the oil separator and into the new oil container. Note: fill oil separator with exactly 16 oz. of oil.
- j) Once this procedure is finished, remove all hoses and pull entire AllVac into a 29" vacuum. Dispose of old oil properly.

Note: Failure to follow above procedures for recharging oil in compressor with the exact amount of oil may result in major damage to the compressor.

Figure 3. 230/460, 1 Phase Model

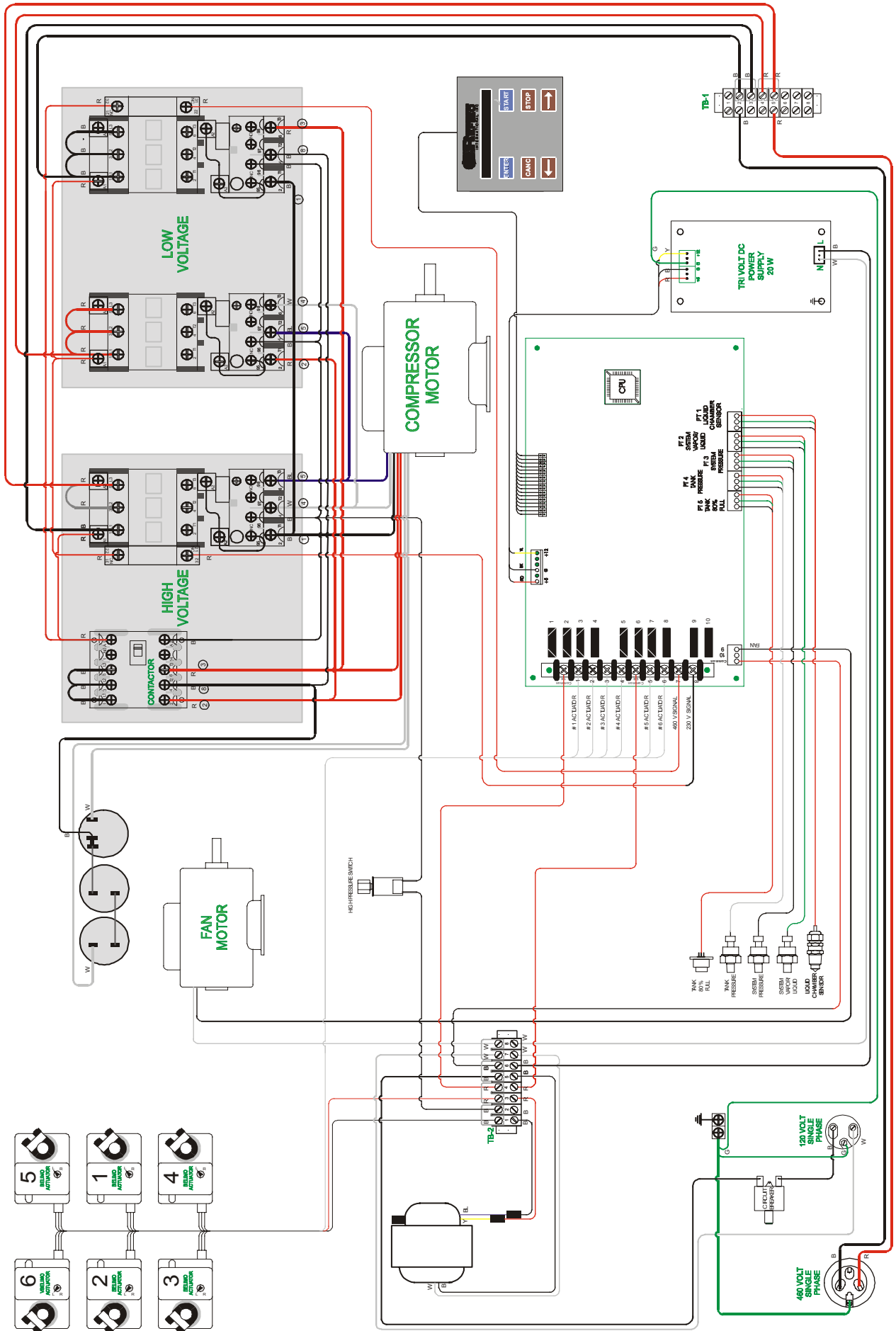


Figure 4. 230, 1 Phase Model

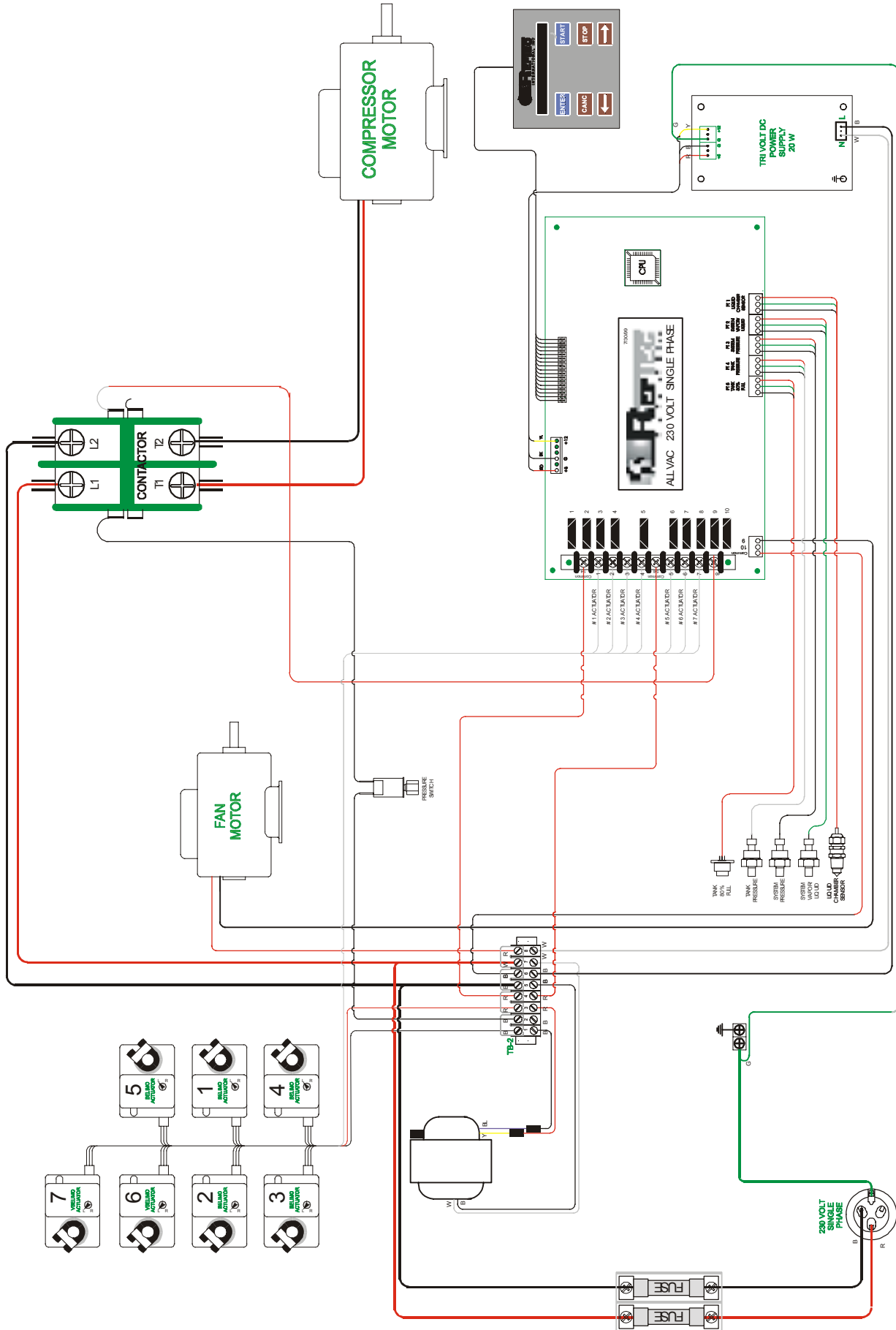
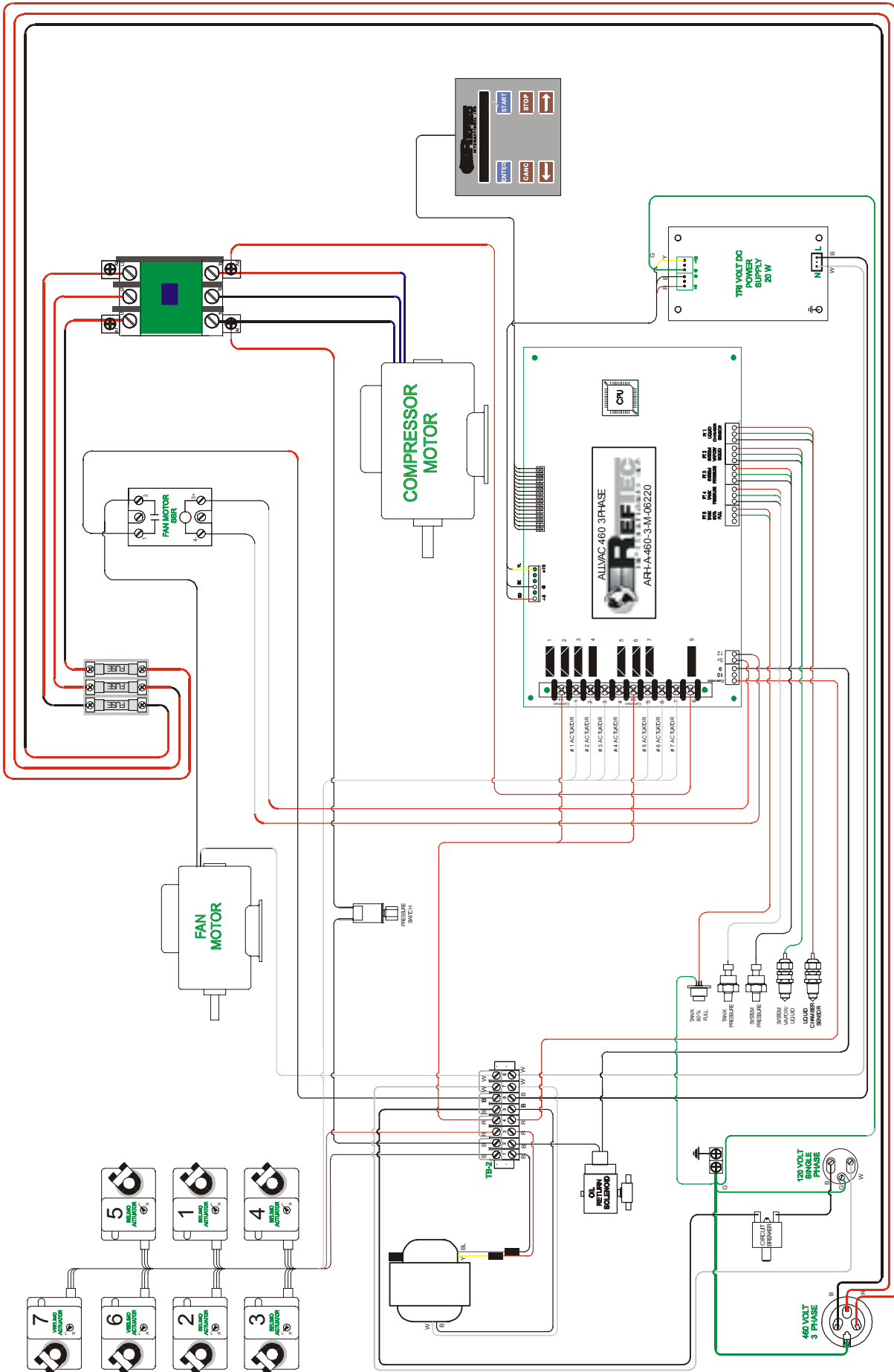
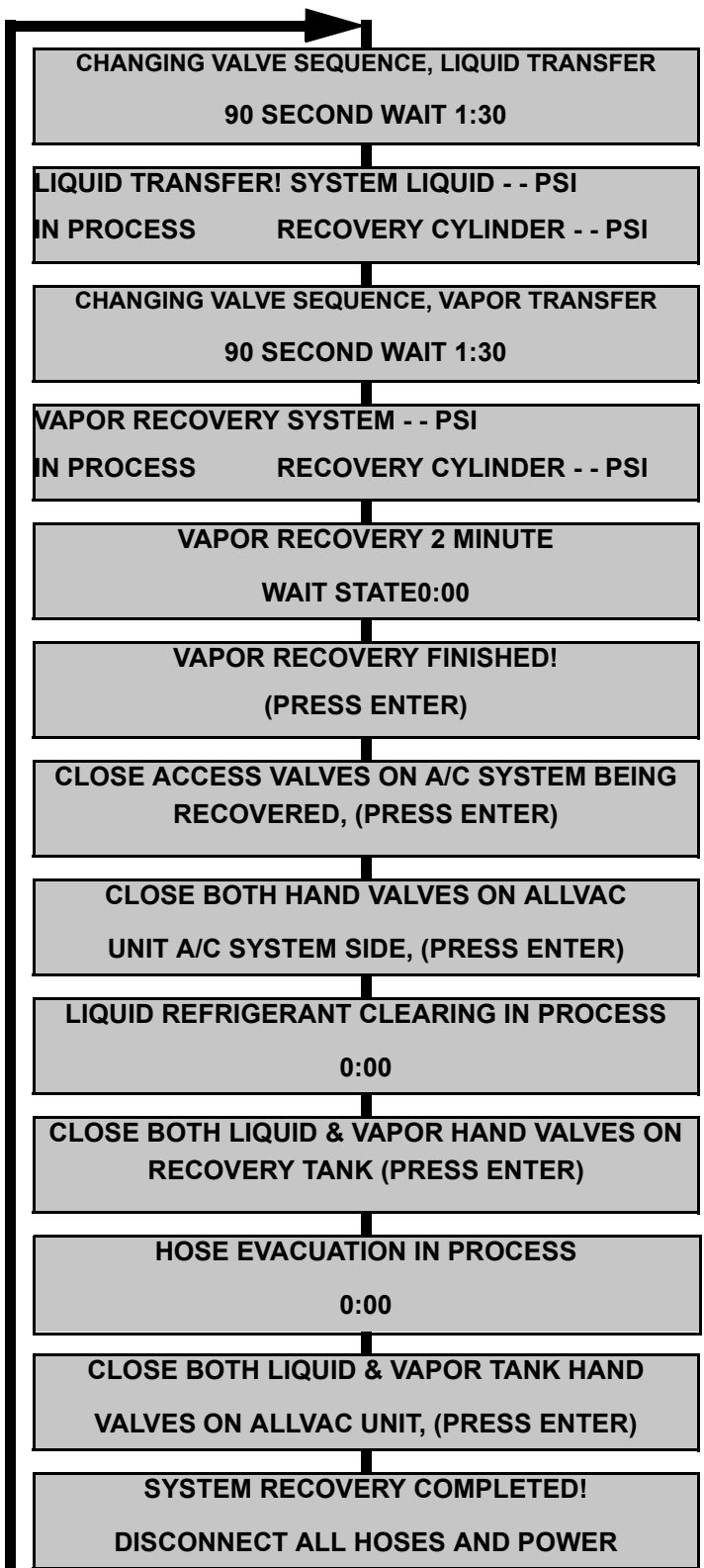
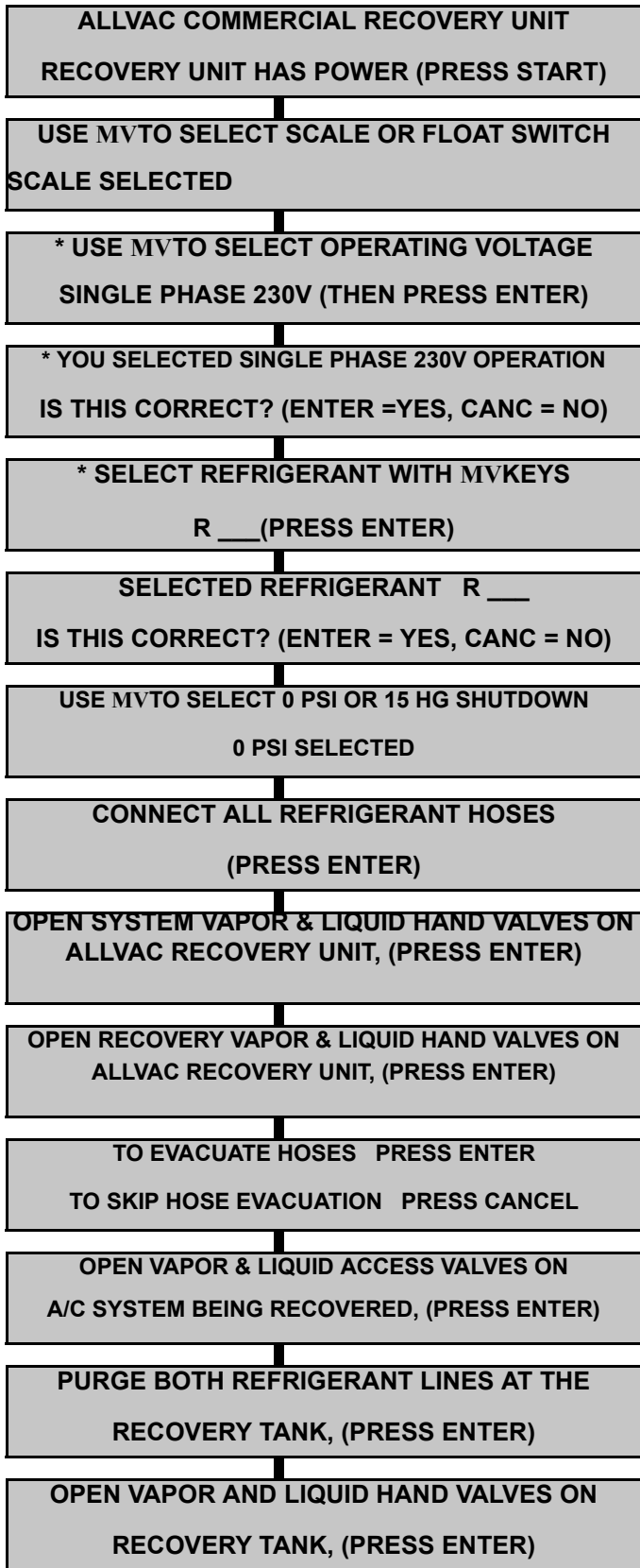


Figure 5. 230/460, 3 Phase Model



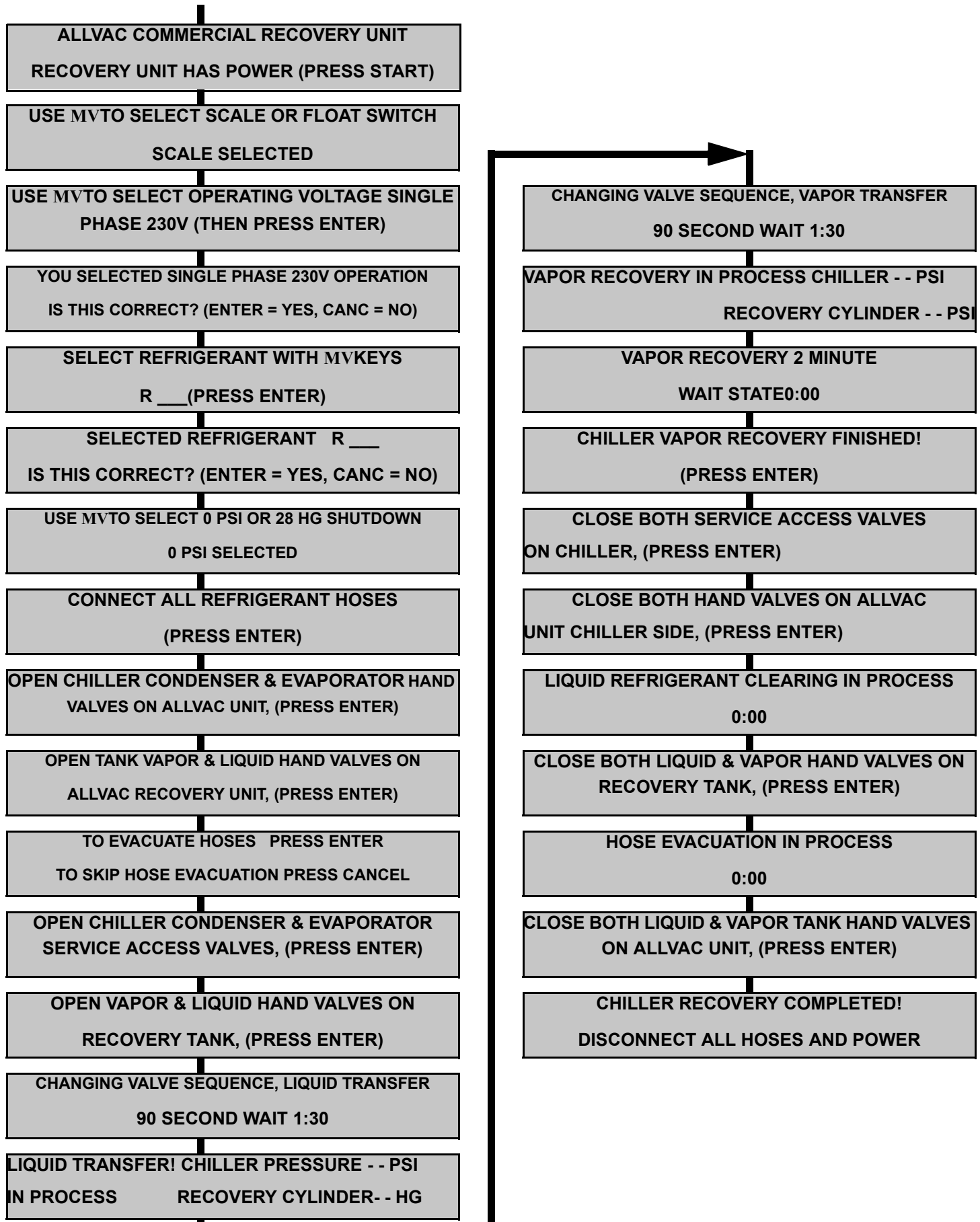
DISPLAY SEQUENCE

HIGH Pressure Refrigerant



* Denotes ARLH-A-D24-1-M

DISPLAY SEQUENCE



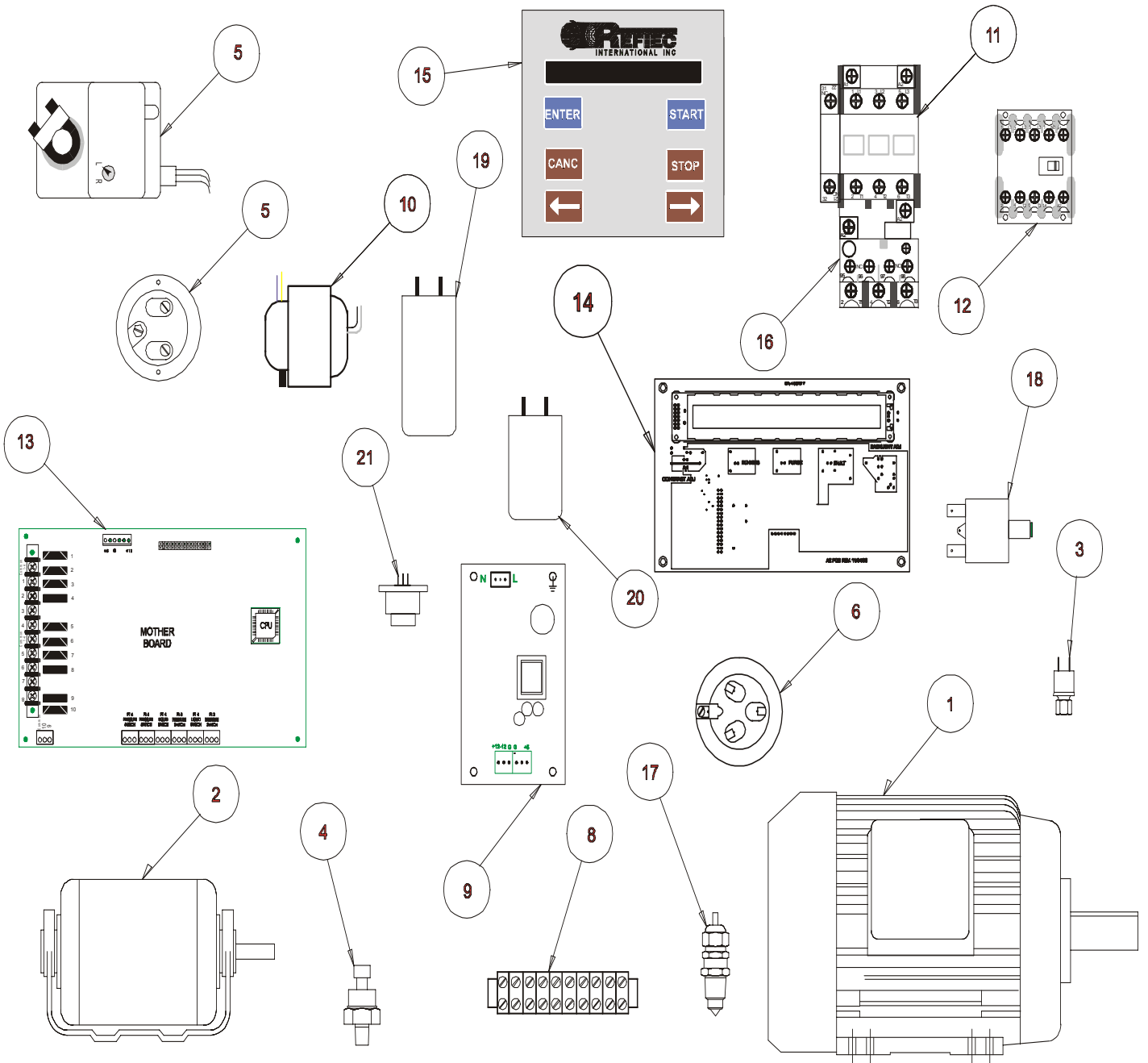
Electrical

Table 1. Electrical Parts Breakdown

1	Compressor Motors; Dual voltage model: 5HP, 230/460VAC, 50/60Hz, 1Ph. 230/460 3ph model: 3HP 230/460VAC, 50/60Hz, 1Ph. 230/460 3ph model: 3HP 230/460VAC, 50/60Hz, 1Ph.
2	Condenser Fan Motor; 115/230 VAC 50/60Hz
3	High Pressure Switch
4	Pressure transducer
5	Actuator 22-26 VAC/ 2/-32 VDC
6	Male Inlet - 50A, 600V, 1PH, 4W
7	Male Inlet -15A,125V, 1PH, 3W GRD
8	Terminal Block
9	Power Supply - 20W, 115V, 1A / 230V, 0.6A
10	Control Transformer; PRI 120 208 240V; SEC 24V 40VA
11	Contactator; 24V 50/60Hz 5Hp 600 VAC, MAX 26A open
12	Contactator-24V 50/60Hz 5Hp 600 VAC
13	CPU Mother Board Assembly
14	Display Board Assembly
15	Keypad
16	Overload Relay; 240 VAC, 1.5A, 600 VAC 0.6A
17	Liquid Switch; 30 in.lb. Torque
18	Circuit Breakers; 20 Amp, 250 VAC, 28 VDC
19	Start Ampacitor
20	Run Capacitor
21	Float Switch connector

Electrical

Figure 6. Electrical Parts Layout



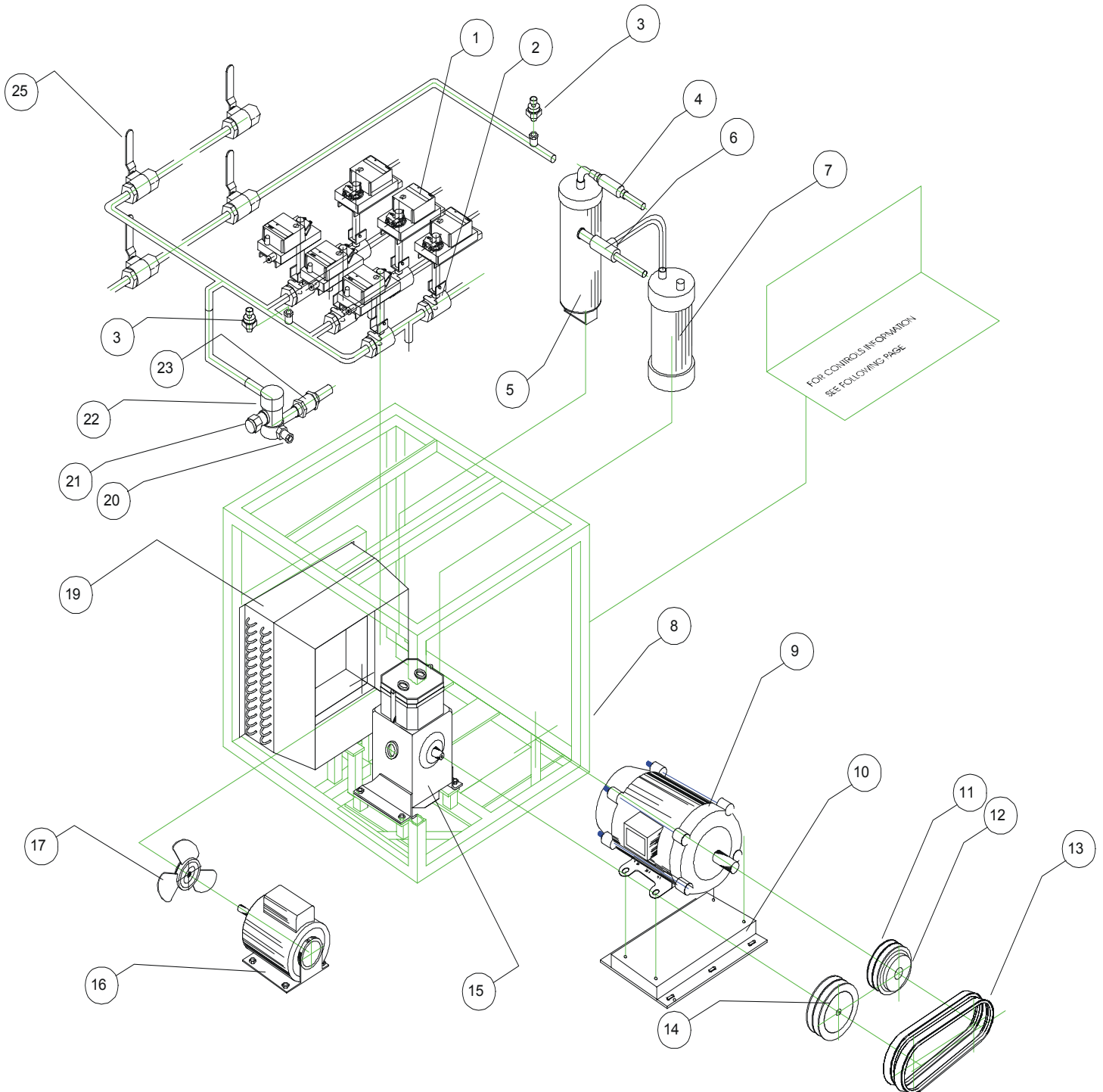
Replacement Parts

Table 2. AllVac Replacement Parts List

Reference Number	Manufacturer Description
1	Motor Actuator
2	Actuated Ball Valve Assembly
3	Pressure Transducer
4	Check Valve
5	Vapor Comp Oil Separator
6	Crankcase Pressure Regulator
7	Suction Accumulator
8	Unit Frame
9	Compressor Drive Motor 230/460 V. 3ph 5hp 1800 Rpm
9	Compressor Drive Motor 230/460 V. 1ph 5hp 1800 Rpm
9	Compressor Drive Motor 115/230 V. 1 Ph 3hp 1725 Rpm
10	Motor Slide Base
11	Motor Drive Pulley Bushing
12	Motor Drive Pulley
13	Motor Drive Belts
14	Compressor Pulley
15	Vapor Recovery Compressor
16	Cond Fan Motor 115/230 V. 1/4 Hp 1750 Rpm
17	Cond Fan Blade
19	Condenser Coil
20	Liquid Level Sensor
21	Liquid Chamber Sight Glass
22	Liquid Chamber
23	Liquid Check Valve
24	Pressure Transducer
25	Hand Ball Valves Tank & System
26	6 Button Keypad
27	Display Board
28	Ribbon Cable Connectors
29	Mother Board
30	Interface Ribbon Cable
31	Output Board
32	Male Inlet 230 20 Amp 250 V.
32	Male Inlet 50 Amp 480 V.
33	Male Inlet 115v
34	Power Supply (Electronics)
35	10 Position Terminal Strip
36	Control Transformer
37	Capacitor Kit
38	Solid State Relay
39	Contactors 30 Amp 2 Pole 24 V. Coil
39	Contactors 40 Amp 3 Pole 24v. Coil

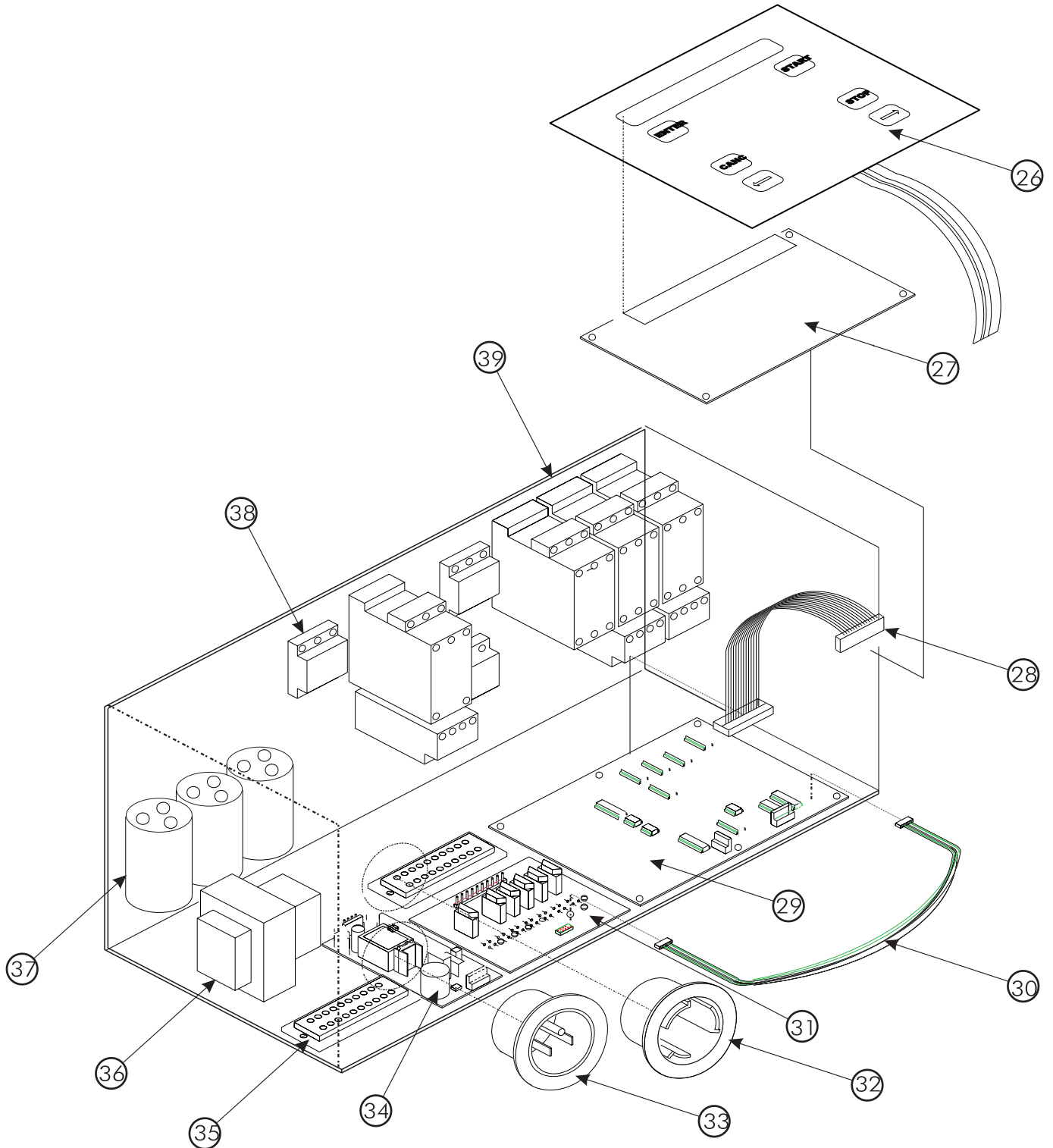
Replacement Parts

Figure 7. AllVac Replacement Parts Diagram



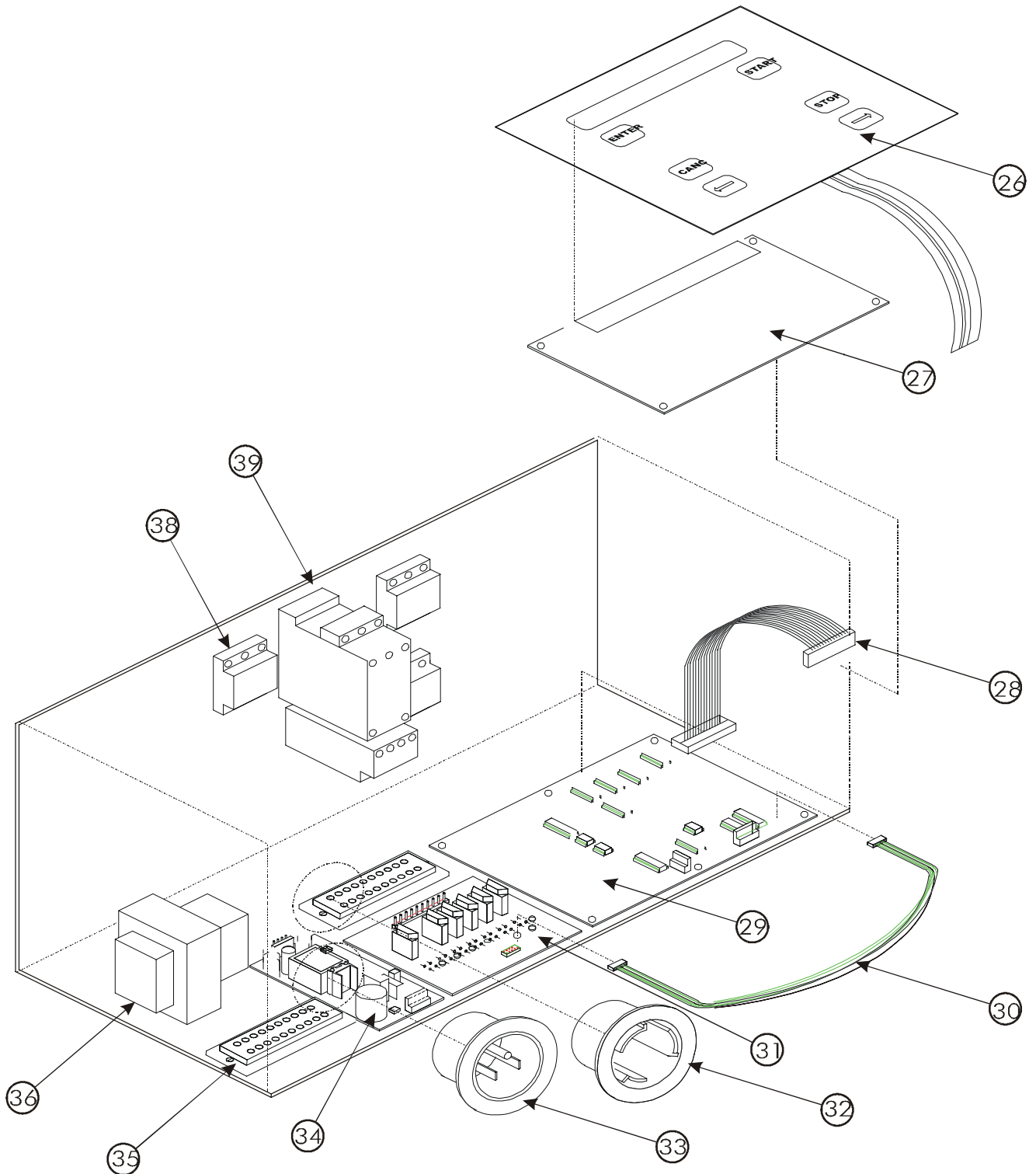
Electrical

Figure 8. 230/460, 1 Ph, 5 Hp Model, Electrical Controls Component Diagram



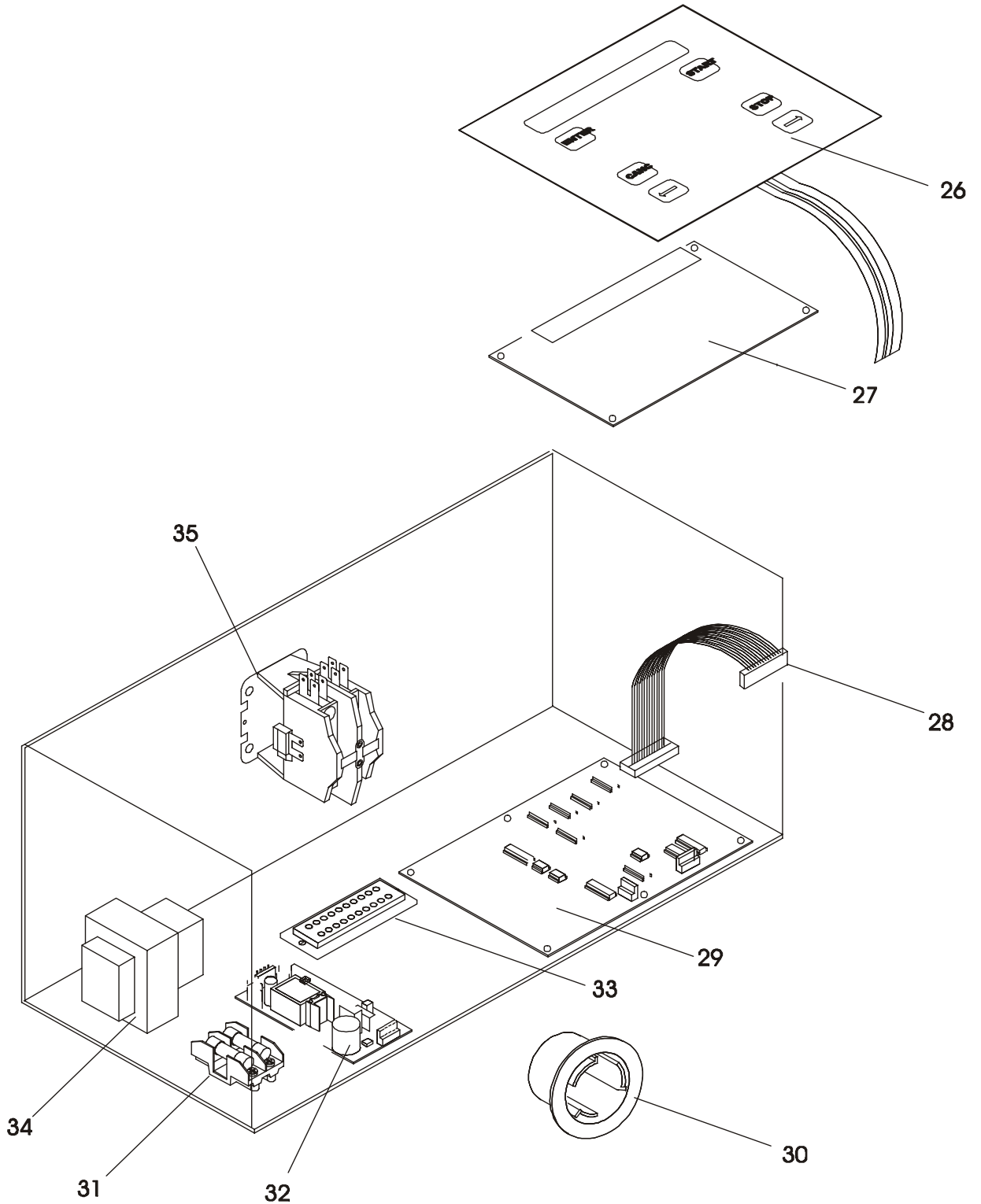
Electrical

Figure 9. 230/460, 3 Ph Model, Electrical Controls Component Diagram



Electrical

Figure 10. 230, 1 Ph Model S, Electrical Controls Component Diagram



Troubleshooting

Troubleshooting Procedures

If functional difficulties are experienced and the preceding maintenance checks do not resolve the problem, refer to the following troubleshooting chart for assistance.

Troubleshooting Guide

The following guide is provided to assist in analyzing problems that could occur.

- Symptom: Describes what is happening;
- Cause: Suggests possible sources;
- Solution: Describes what must be done.

Symptom	Cause	Solution
AllVac will not switch from liquid mode to vapor mode when transferring high pressure refrigerant.	Still have liquid in system Possible malfunction	When the pressure differential between system and receiving tank is less than 15 psig, and all liquid has been removed, unit will automatically switch from liquid to vapor mode. If unit does not automatically switch to vapor mode, make sure that all liquid has been transferred and that no liquid is in the sight glass. Press ENTER key 2 times in a row. This will manually force AllVac into vapor mode. See Manual for further details.
AllVac will not switch from liquid mode to vapor mode when transferring low pressure refrigerant.	Still have liquid in system	Make sure that all liquid has been transferred and that no liquid is in the sight glass. Press ENTER key 2 times in a row. This will manually force AllVac into vapor mode.
Oil separator float is stuck open and feeding refrigerant back to suction side of compressor.		Drain compressor oil separator

Troubleshooting

Pressure differential between system and recovery tank becomes too high - greater than 50 psig.	Restrictions in recovery lines or tank	Tank needs to have a 3/4" ID valve. Many tanks do not have 3/4" valves. RefTec provides tanks fitted with properly sized valves for this purpose.
Slow liquid transfer.	Restriction in flow.	Replace restrictive fittings and hoses with appropriate size to expedite transfer.
Unit will not pump down to a 29" vacuum on low pressure refrigerant recovery.	Pressure transducer not properly calibrated.	Verify that displayed pressure is equal to gauge pressure. If they are different, please follow the calibration procedures on Page 11 of this Manual to calibrate the pressure transducers.
AllVAC running high head pressure back to recovery tank.	Restriction in hoses going to tank.	Replace with appropriately sized hoses and fittings. Run water over tank or add secondary water cooled condensor on liquid return line going to recovery tank. RefTec has available secondary water cooled and air cooled condensers.
	Capacity of recovery tank is too small or tank is overfilled. Fan not working High concentration of noncondensibles	Replace with appropriately sized tanks. Replace fan motor, check for loose wiring. Remove noncondensibles.
Automatic actuator valves do not function.	Loss of power to valves	Make sure LED's on mother board (XPC110) are working. If LED signal is present at mother board, check to verify that 24 VAC is being supplied to actuators. If 24 VAC is not present, replace transformer.
Display does not show anything and is blank.		Adjust contrast potentiometer on back of display board.

Troubleshooting

Pressure readings appear to be inaccurate	Pressure transducer reading improperly Pressure transducer failed	Recalibrate pressure transducers - see instructions on Page 11 of this Manual. Replace transducer
---	--	--



The Trane Company
Aftermarket Business Unit
3600 Pammel Creek Road
La Crosse, WI 54601
www.trane.com
An American Standard Company

Literature Order Number	RRGA-SVX01A-EN
File Number	SV-CAP-RR-RRGA-SVX-01A-401
Supersedes	New
Stocking Location	La Crosse

Since The Trane Company has a policy of continuous product and product data improvement, it reserves the right to change design and specifications without notice. Only qualified technicians should perform the installation and servicing of equipment referred to in this publication.