

Refrigerant Recovery Unit, Model RRU570



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Specifications

Electrical Power Requirements

Recovery Main Components and Controls

115Vac, 50/60 Hz, 1-Phase, 20-Amperes

Min Ckt 15.0 Amp, Max Fuse 20 Amps

Model RRU570-3 Compressor 220/240Vac

50/60Hz, 1 Phase Min Ckt 20.0 Amp, Max Fuse 30 Amps

Model RRU570-V Compressor 230 Vac

50/60Hz, 3 Phase Min Ckt 10.0 Amp, Max Fuse 20 Amps

Model RRU570-R Compressor 460 Vac

50/60Hz, 1 Phase Min Ckt 10.0 Amp, Max Fuse 15 Amps

Model RRU570-D Compressor 575 Vac

50/60Hz, 1 Phase Min Ckt 10.0 Amp, Max Fuse 15 Amps

Dimensions (approximate): 42 in. high x 24 in. wide x 22 in. deep

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

Furnished with RRU570

One- 48 cu. in. drier core

80% tank float cable

Two-10 ft. $\frac{3}{4}$ in. hoses with isolation valves

One-20 ft. $\frac{3}{4}$ in. hoses with isolation valves

NOTICE

McQuay International urges that all HVAC servicers working on McQuay 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 of 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 service and safety procedures.

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.

Product Description

McQuay's RRU570 recovery system provides efficient and safe recovery of most positive-pressure refrigerants.

The unit consists of a 3 or 5-hp open drive compressor, high capacity 1200 cfm air-cooled condenser, system pressure gauge, tank pressure gauge, a valving system consisting of one manually operated 3-way valve, oil return valve and one 2-way evacuation valve. Unit connections are 3/4in. male flare with isolation valves. After hoses are connected and evacuated, user simply configures hoses for liquid push/pull mode, opens all lines at A/C System and recovery tank, and turns RRU570 on. RRU570 then starts recovery by letting refrigerant migrate from the A/C system to the recovery tank. It then draws vapor off the recovery tank, lowering tank vapor pressure, heats vapor and increases pressure via compression, and injects it back into the A/C system condenser, thus creating a pressure differential for a push/pull liquid transfer.

Two onboard gauges display A/C system pressure and recovery tank pressure. When the liquid has finished transferring and sight glass on liquid line indicates liquid refrigerant has been transferred, the user simply reconfigures the hoses to vapor recovery mode, allowing the RRU570 to pull vapor from A/C system evaporator being recovered. The RRU570 compressor begins recovering vapor which is first cleaned by a 48 cu inch filter drier. The discharged hot compressed refrigerant passes through an oil separator where the oil is extracted and returned to the compressor. Refrigerant is then condensed by the air-cooled condenser and sent to the recovery tank.

The transfer stops when an internal pressure switch indicates the A/C system is under a 15 in. Hg vacuum. If pressure should again rise above 0 psig, the RRU570 will restart to pull the refrigerant from the A/C system until a 15 in. Hg vacuum is restored.

Safe Operations and Tips

To ensure your safety as well as others, before attempting to recover a A/C system, proper and thorough preparation must take place.

Make sure you have a recovery tank with a minimum 3/4in. male flare vapor port and a minimum 3/4in. male flare liquid port, or larger ports if possible. This tank or series of tanks must be able to hold the entire refrigerant charge at 80% full and also must be pressure rated for the specific refrigerant being recovered.

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

In addition, a suitable scale should be used to weigh the refrigerant charge to prevent overfilling tanks in case the RRU570 needs to be shut down. If a scale is not available, the tanks can be equipped at the time of purchase with a float switch that will deactivate the RRU570's 120-Vac control circuit. All RRU570 units come with a safety float connection and bypass switch.

Finally, the recovery tank or tanks must be pulled into a 29 in. Hg vacuum before recovery commences. Failure to follow these above stated procedures will decrease the likelihood of the RRU570 performing at its highest possible effectiveness.

Peak Performance

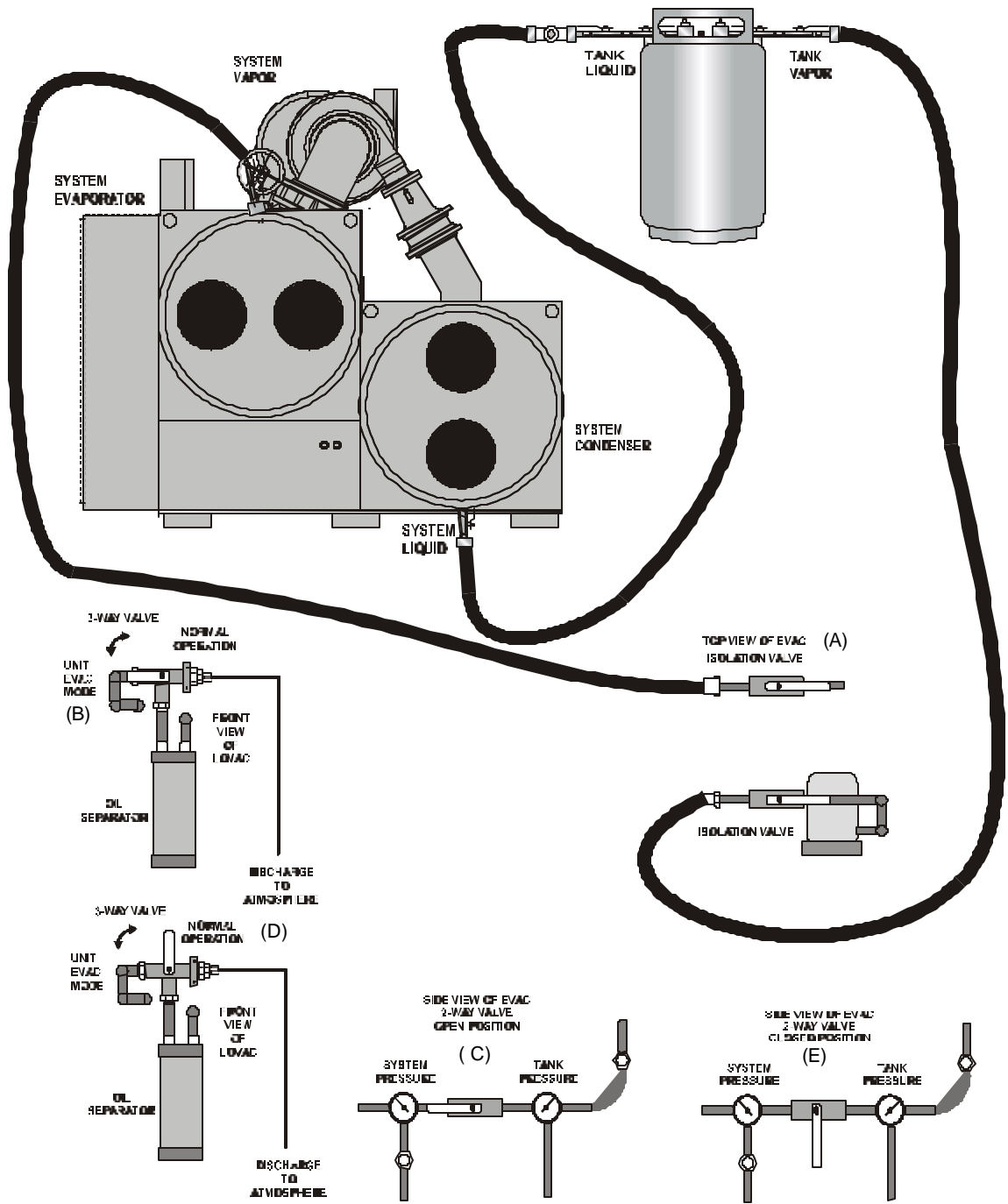
To get the highest performance from your RRU570 unit, we recommend that you connect to 3/4in. evaporator and 3/4in. condenser ports on the A/C system and to recovery tanks with 3/4in. ports whenever possible.

Procedures for Evacuating

NOTE: Close the oil return valve between oil separator and compressor before evacuating refrigerant lines and the RRU570.

1. Turn the A/C system off and make sure that the chiller cannot restart.
2. When using 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 the RRU570's control box. When using a 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 the RRU570's control box. Connect the 100-ft 120-Vac 1-phase power cord for controls. At this time, switch the voltage selector switch to desired 1-phase voltage 230 or 460. Failure to select proper voltage will result in major damage to the compressor motor. All other models connect to proper voltage and required amperage as rated on the equipment label.
3. Connect the three high-pressure refrigerant hoses, as shown in Figure 1. At this time, connect the safety float cable from the RRU570 to recovery tank or use a suitable scale. If a scale is to be used instead of a float safety cutout, the 80% full bypass switch will need to be set to the "On" position for the RRU570 to run.
4. Open isolation valves on top of the RRU570 recovery unit Figure 1 (A).
5. Turn the 3-way valve located on the front of unit RRU570 MODE, as shown in Figure 1 (B).
6. Turn the RRU570 power switch on, the RRU570 will start evacuating recovery tank vapor side hose. The RRU570 will pull hose into a 15 in. vacuum, then automatically shut down. After the RRU570 shuts down, proceed to next step.
7. Turn the 2-way EVACUATION BYPASS VALVE located on the side of the RRU570 to OPEN POSITION, as shown in Figure 1 (C). Once the RRU570 restarts, the discharge hose from the RRU570 to the A/C system condenser will be pulled into a 15 in. vacuum, then the RRU570 will automatically shut down. After the RRU570 shuts down, proceed to next step.
8. Return the 3-way valve on front of unit to NORMAL OPERATION as shown in Figure 1 (D) and turn the 2-way EVACUATION BYPASS VALVE located on side of the RRU570 to the CLOSED POSITION, as shown in Figure 1 (E). Open the oil return valve between oil separator and compressor. Now proceed to the Liquid Push/Pull method on page 7.

Figure 1, Evacuating Hoses and Liquid Push/Pull



Procedures for Liquid Push/Pull Method

WARNING

Before attempting to operate this unit, make absolutely sure that the 3-way valve on front of unit and the 2-way valve on the side of the unit are set to their NORMAL OPERATION AND CLOSED POSITIONS respectively. Also open the oil return valve between the oil separator and compressor.

1. Turn the A/C system off and make sure that the A/C system cannot restart.
2. When using 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 the RRU570'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 the RRU570's control box. Connect the 100-ft 120-Vac 1-phase power cord for controls. At this time, switch the voltage selector switch to desired 1-phase voltage 230 or 460, failure to select proper voltage will result in major damage to the compressor motor. All other models connect to proper voltage and required amperage as rated on the equipment label.
3. Verify that all hoses are connected as shown on Figure 1 and that they have been evacuated as previously described in Procedures for Evacuating Hoses and RRU570 on page 5.
4. Open the vapor and liquid access valves on the A/C system being recovered.
5. Open isolation valves on top of the RRU570 recovery unit (Figure 1).
6. Open the vapor and liquid isolation valves on the recovery tank.
7. Turn the RRU570 power switch on, the RRU570 will automatically start drawing vapor off the recovery tank and forcing compressed refrigerant back into the condenser of the A/C system. The liquid push/pull is now in process.
8. Continue to monitor the liquid sight glass on the liquid line between the A/C system evaporator and recovery tank. Once all of the liquid has been completely removed, close isolation valves on the recovery tank.
9. Close the vapor and liquid access valves on the A/C system being recovered and proceed to the next section.

Procedures for Vapor Recovery Mode

WARNING

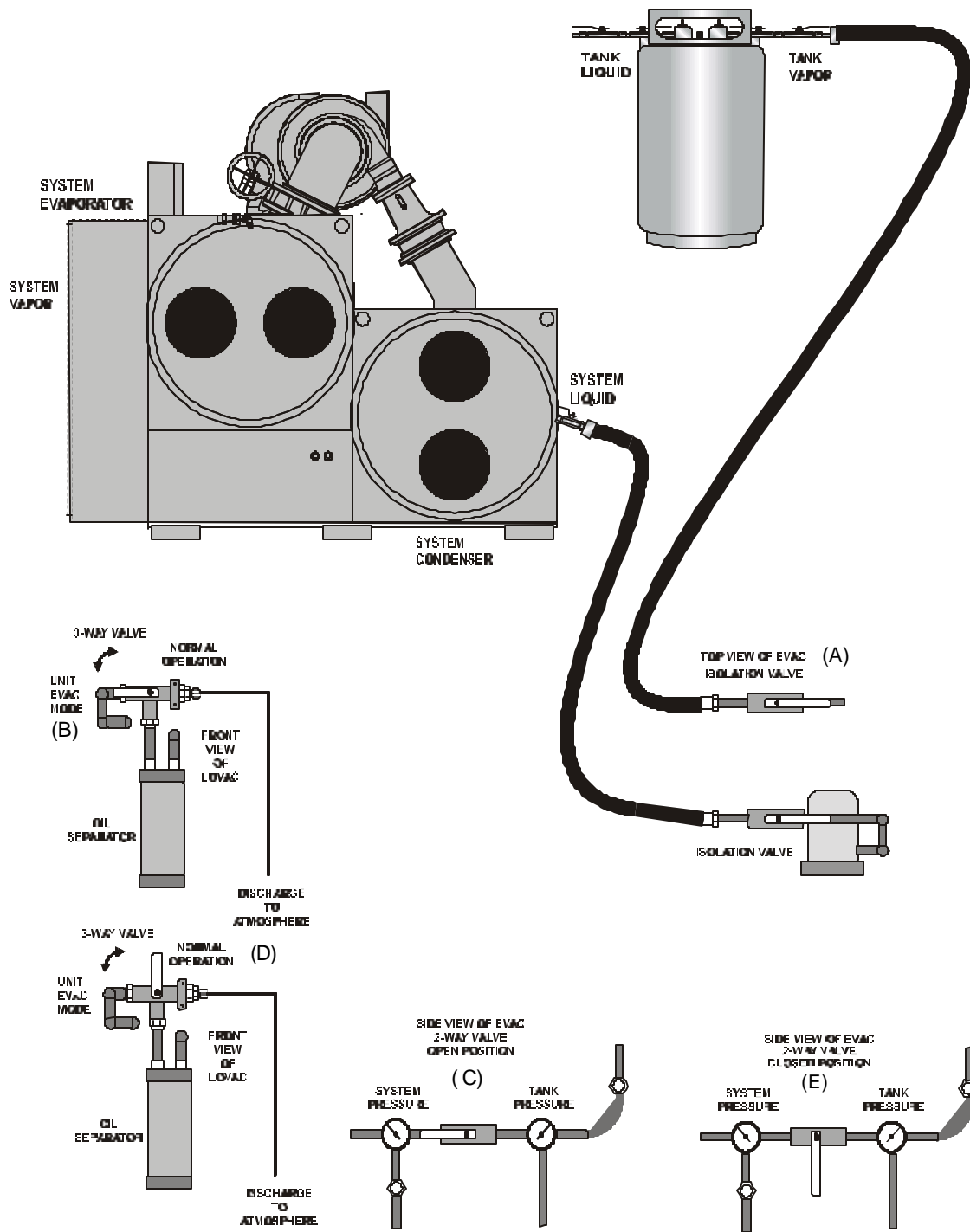
Before attempting to operate this unit, make absolutely sure that the 3-way valve on front of the unit and the 2-way bypass valve on the side of the unit are set to their NORMAL OPERATION AND CLOSED POSITIONS, respectively. Also open the oil return valve between the oil separator and compressor.

WARNING

It is absolutely imperative that all of the liquid has been removed before switching into the vapor recovery mode. Failure to do so may result in liquid slugging to the compressor and causing major damage to the compressor.

1. Turn the A/C system off and make sure that the A/C system cannot restart.
2. When using 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 the RRU570'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 the RRU570's control box. Connect the 100-ft 120-Vac 1-phase power cord for controls. At this time, switch the voltage selector switch to desired 1-phase voltage 230 or 460. Failure to select the proper voltage will result in major damage to the compressor motor. All other models connect to proper voltage and required amperage as rated on equipment label.
3. Verify that all the hoses are connected as shown in Figure 2 and that they have been evacuated as previously described in Procedures for Evacuating Hoses and the RRU570 on page 5.
4. Open the evaporator access valve on the A/C system being recovered.
5. Open isolation valves on top of the RRU570 recovery unit (Figure 2) (A).
6. Open the liquid side isolation valve on the recovery tank.
7. Turn the RRU570 power switch on. The RRU570 will automatically start recovering all of the remaining vapor refrigerant in the A/C system and pull the entire system into a 15 in. Hg vacuum. To help ensure that the RRU570 pulls the A/C system into a 15 in. Hg vacuum as quickly and efficiently as possible, monitor the RRU570's system pressure gauge and oil in the compressor. When the gauge reads below a 5 in. Hg vacuum and if vapor recovery seems to be abnormally slow and you are sure that there is sufficient oil in the compressor, the user may close the compressor oil return valve to speed up the process. If the compressor begins to lose oil, open the oil return valve occasionally to help lubricate the compressor.
8. Once the A/C system has been completely recovered to a 15 in. Hg vacuum, the RRU570 will shut down and "Recovery Complete" light will illuminate. Should pressure in the A/C system again rise above 0 in. Hg vacuum, the RRU570 will restart and pull the A/C system back into a 15 in. Hg vacuum.
9. When recovery is finished, close the isolation valve on the A/C system and recovery tank as well as the isolation valves on the RRU570 recovery unit. Close the isolation valves on hoses and disconnect.

Figure 2, Vapor Recovery Mode



Note: There may still be a small, residual amount of refrigerant in the RRU570. This amount must be removed if you want to change to a different type of refrigerant. An explanation of how to remove this residual amount of refrigerant is explained in the next section.

Refrigerant Clearing Procedures

NOTE: After recovery is complete and all the refrigerant has been removed from the refrigerant lines, the RRU570 may still have a very small amount of residual refrigerant in the unit. To remove this refrigerant, connect an evacuated recovery tank to both the compressor suction and discharge service ¼ in. access valves on top of the compressor. Allow the remaining refrigerant to be pulled into the tank. This procedure needs to be performed whenever a different type of refrigerant is going to be recovered. In addition, the filter core and oil will need to be changed whenever changing types of refrigerant.

Changing Replaceable Cores

Make sure you replace the disposable filter cores after each recovery job. Failure to use new cores on each and every recovery may result in damage to the open drive compressor.

Remove the inlet filter-drier unit cover by removing the cover bolts, remove old element, inspect and clean where necessary. Install a new filter-drier element and the cover gasket. Replace the filter-drier tank cover and torque the cover bolts to 14-to-16 ft.-lbs.

Changing Recovery Compressor Oil

The compressor's charge of oil should be regularly replaced with an identical fluid and, at a minimum, after any of the following events:

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

WARNING

When changing oil, it is highly recommended that the same type of oil being used with the refrigerant being recovered be used in the RRU570 compressor. This will help ensure that cross-contamination does not occur.

Procedures to remove and change the oil in the compressor and the oil separator:

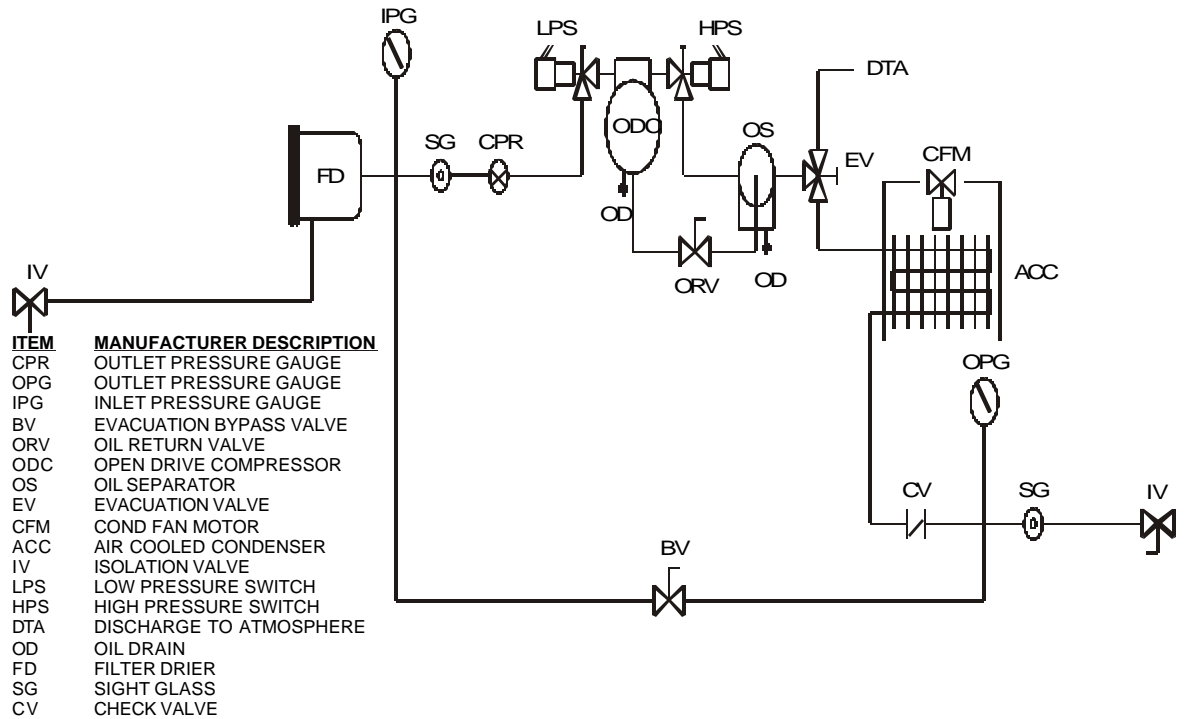
- a. Make sure RRU570 unit has no refrigerant in its internal parts.
- b. Connect a manifold set to dry nitrogen and to the suction and discharge service ¼ in. access valves located on the top of the RRU570 compressor.
- c. Connect another ¼ in. hose to the access fitting on the bottom of the RRU570 oil separator and the other end to a suitable disposable oil container.
- d. Gradually allow dry nitrogen to go into the discharge port on the RRU570 compressor until all oil has been forced out of the oil separator. **Note:** 10 to 15 psi will be more than adequate.
- e. Connect another ¼ in. hose to the access fitting on the bottom of the RRU570 compressor and the other end to a suitable disposable oil container.
- f. Gradually allow dry nitrogen to go into the suction port on the RRU570 unit until all oil has been forced out of the compressor.

- g. To add new oil to the RRU570 compressor, connect a vacuum pump to the ¼ in. access port on the suction side of the compressor. Pull down into a minimum 29 in. vacuum.
- h. Connect the other hose to the ¼ in. access port on the bottom of the compressor and into the new oil container. **Note:** fill compressor with exactly 16 oz. of oil.
- i. After compressor has been filled, connect the other hose to the ¼ in. 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 RRU570 into a 29 in. vacuum. Dispose of old oil properly.

WARNING

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, Process and Identification Schematic



Electrical Parts Breakdown

- 1 Model RRU570-V, RRU570-R, Compressor Motor 3 Hp, 230/460 VAC, 50/60 Hz, 3Ph 1725 RPM
- 1 Model RRU570-D, Compressor Motor 3 Hp, 230/460 VAC, 50/60 Hz, 1Ph 1725 RPM
- 2 Condenser Fan Motor 115/230 VAC 50/60Hz ¼Hp
- 3 High Pressure Switch 350 Psig
- 4 Low Pressure Switch 15 Hg
- 5 Male Inlet - 15A, 125V, 2 P, 3W GRD
- 6 Terminal Block
- 7 Amber Indicating Lamp 120 VAC
- 8 Red Indicating Lamp 120 VAC
- 9 (2) Switches 120 VAC
- 10 Circuit Breakers- 20 Amp, 250 VAC, 28 VDC
- 11 Contactor-115 VAC coil 50/60Hz 40A, FL 600 VAC
- 12 Tank Safety Float Connector
- 13 Male Inlet - 50A, 480V, 1Ph or 3Ph, 4 Wire
- 13 Model RRU570-D, Male Inlet - 50A, 600V, 3Ph, 4 Wire

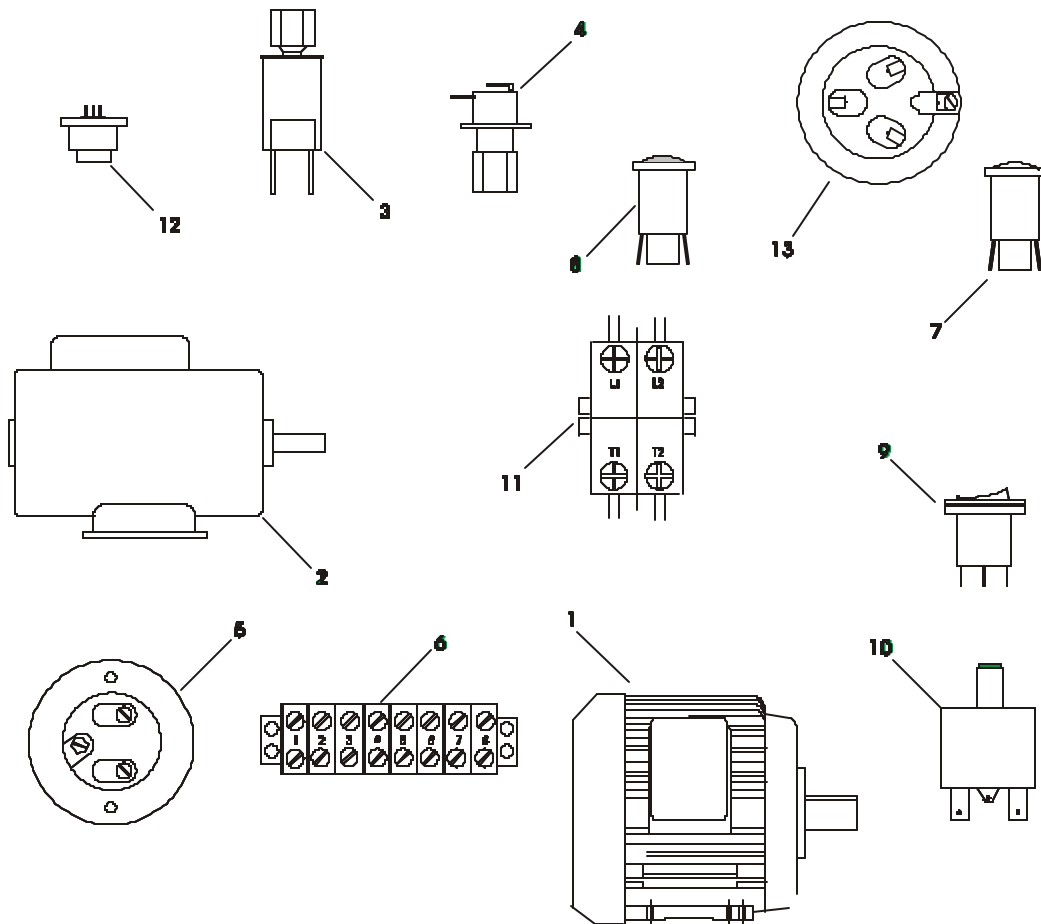


Figure 4, RRU570 Electrical Block Wiring Diagram (Models RRU570-V, RRU570-R, RRU570-D)

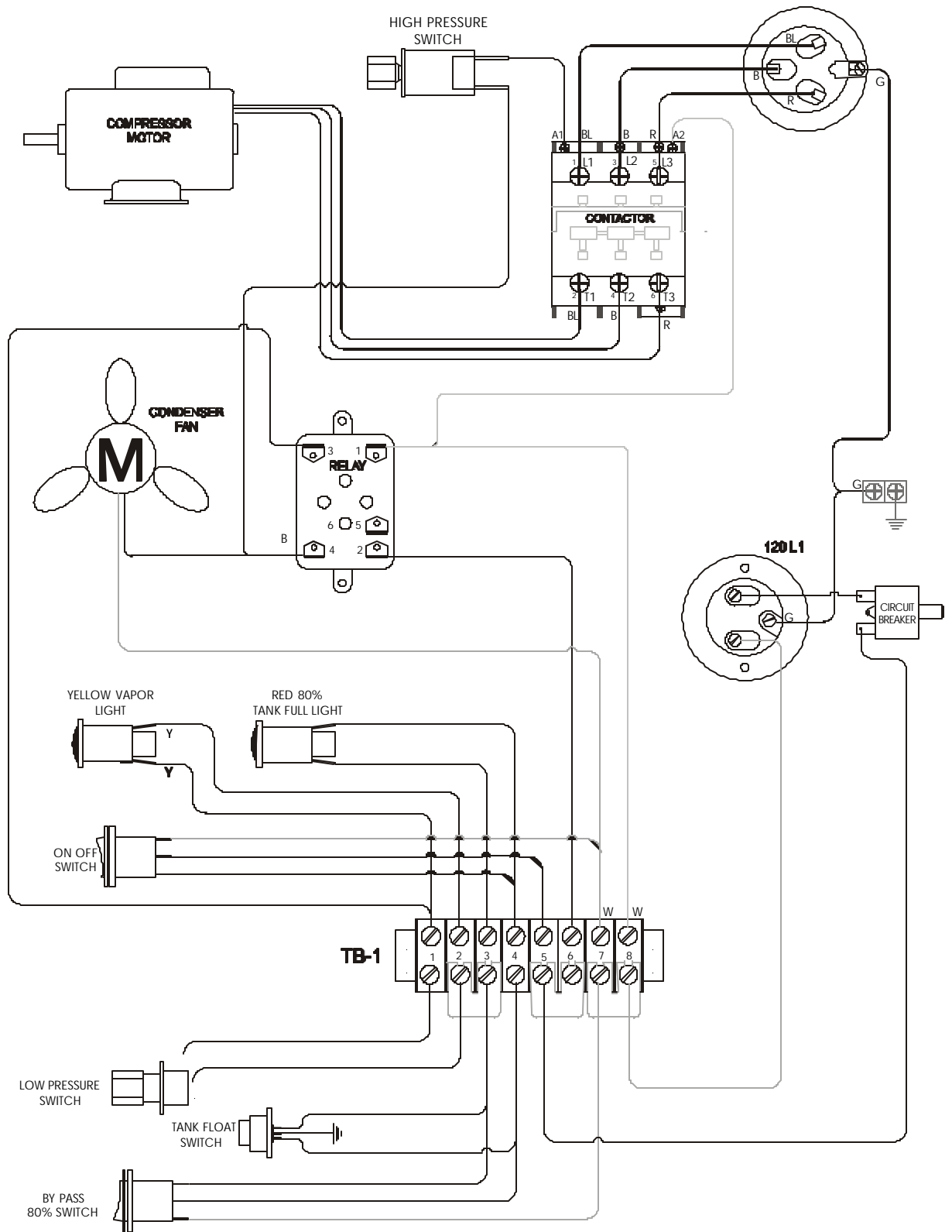
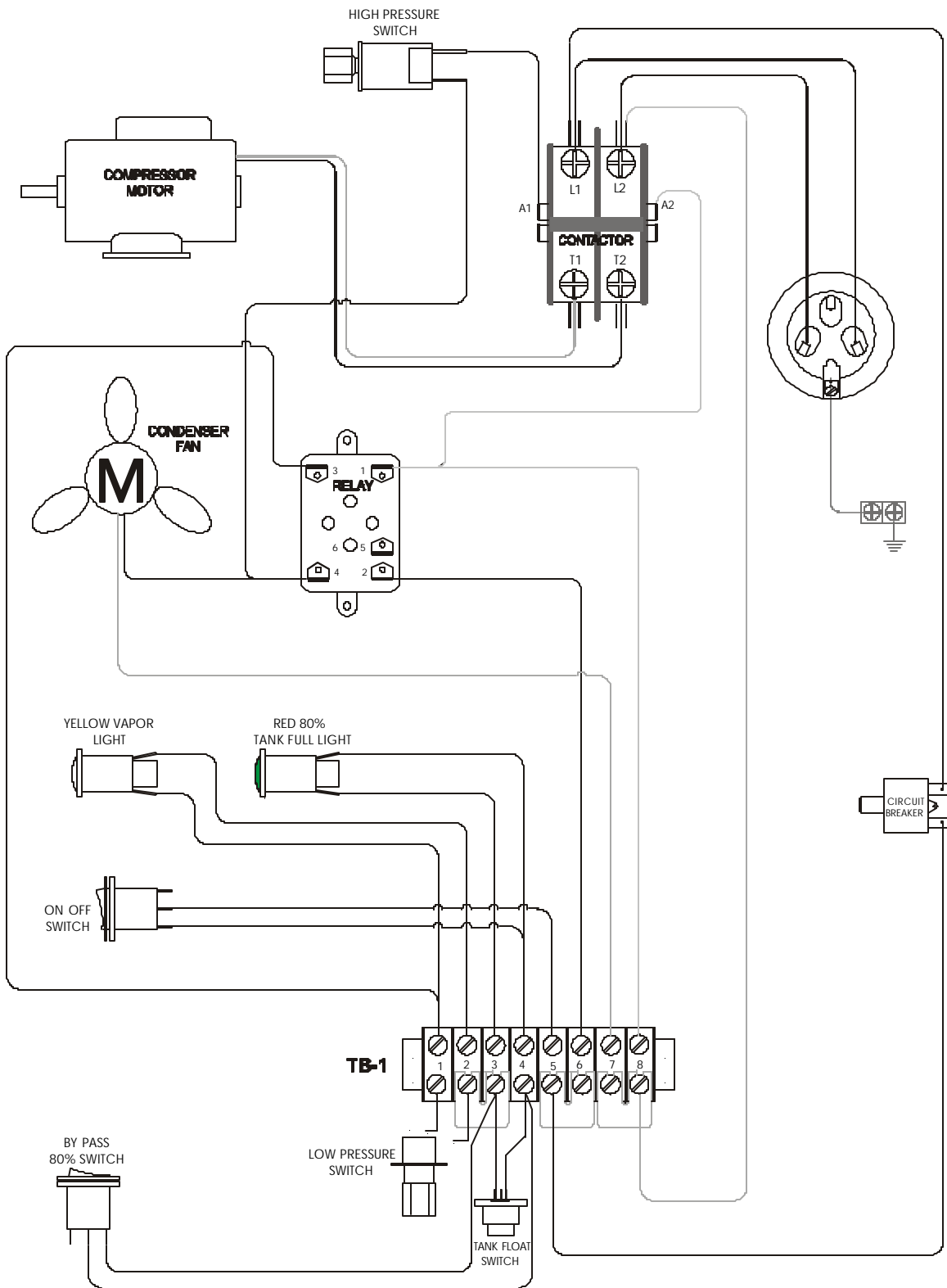


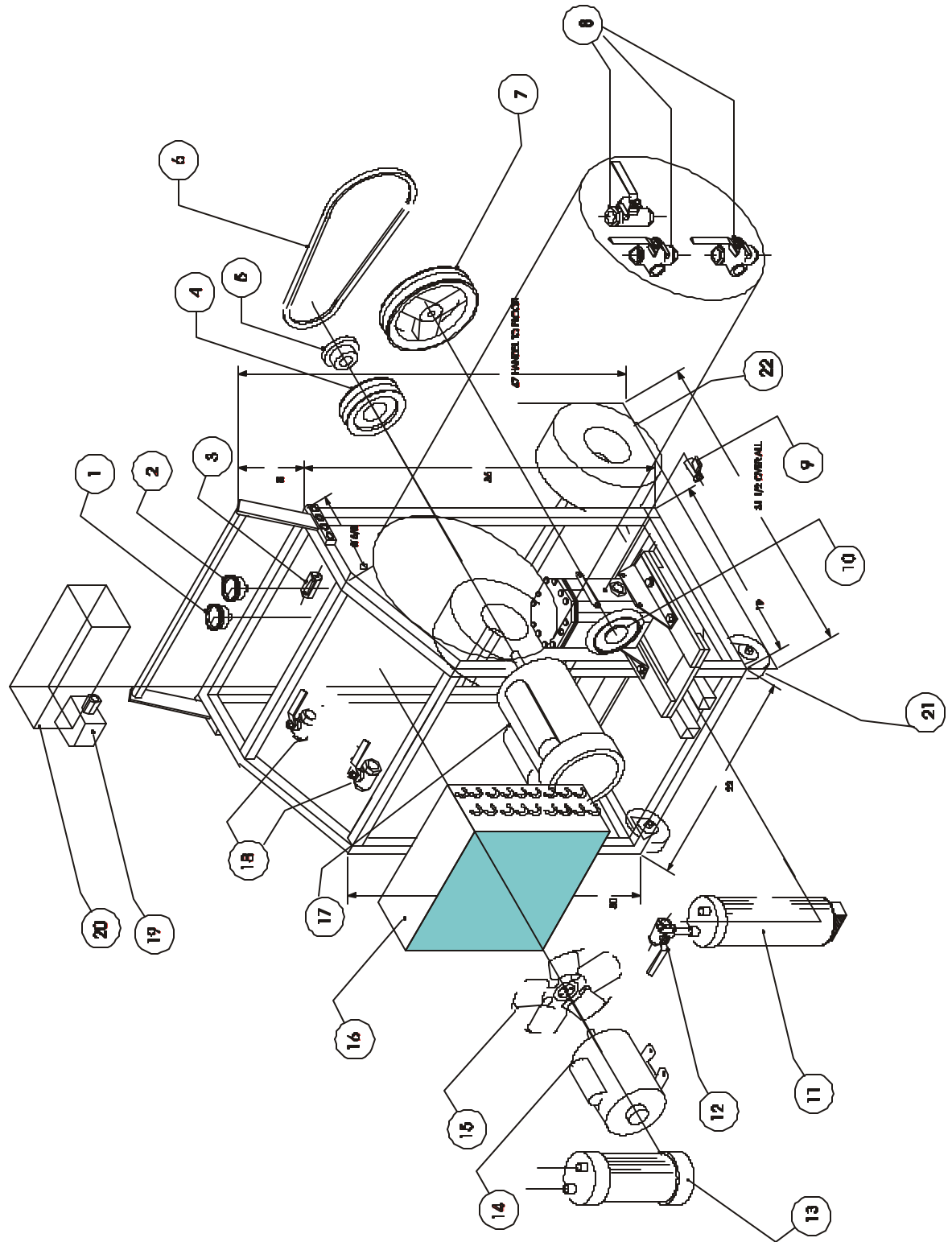
Figure 5, RRU570 Electrical Block Wiring Diagram (Model RRU570-3)



Replacement Parts List

Reference Number	Part Number	Description
1	RGA300	System Pressure Gauge
2	RGA600	Tank Pressure Gauge
3	RV-004	Evacuation Bypass Valve
4	HPY045	Motor Pulley
5	HBU002	Pulley Bushing
6	HBT141	V-Belt
7	HPY085	Compressor Pulley
8	RV-304	3-Way Hand Valve
9	RVM012	Oil Bypass Valve
10	RCP999	Compressor
11	ROS005	Vapor Compressor Oil Separator
12	RVA304	Discharge Evacuation Valve
13	ROS007	Suction Accumulator
14	EMO112	Fan Motor
15	GFB125	Fan Blade
16	RCC014	Condenser Coil
17	EMO215	Compressor Drive Motor 230/460 Vac 1PH
17	EMO233	Compressor Drive Motor 230/460 Vac 3PH
17	EMO575	3HP 1725RPM 575 Vac 3PH
18	RVX006	Hand Ball Valves for Tank and System
19	XSW015	Low Pressure Switch
20	EBX125	Electrical Control Box
21	HWH018	4 in. Swivel Caster
22	HWH463	Pneumatic Tires
Not Shown	EIM400	50 Amp 480V Receptacle
Not Shown	EMI452	50 Amp 230V Locking Connector
Not Shown	EMI459	50 Amp 600V Flanged Inlet
Not Shown	EMI200	50 Amp 230V Male Inlet
Not Shown	EMI401	50 Amp 480V Male Inlet
Not Shown	EMI406	50 Amp 600V Locking Connector
Not Shown	EMI115	Male Inlet 115V
Not Shown	RHX200	2 Ton Heat Exchanger Optional
Not Shown	RST005	Y Strainer

Figure 6, RRU570 Isometric Drawing (All Models)



Troubleshooting

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.

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
Pressure differential between system and recovery tank becomes too high - greater than 50 psig.	Restrictions in recovery line.	Remove restriction in liquid recovery lines or tank. Tank needs to have minimum ¾ in. ID valves.
Slow liquid transfer.	Restriction in flow.	Replace restrictive fittings or lines with appropriate size to expedite transfer.
RRU570 running high head pressure back to recovery tank.	Restriction in hoses going to tank. Capacity of recovery tank is too small or tank is overfilled. High concentration of noncondensibles. Condenser fan not running.	Replace with appropriately sized lines and fittings. Run water over tank or add secondary water cooled condenser on liquid return line going to recovery tank. (McQuay has available secondary water cooled and air cooled condensers.) Replace with appropriately sized tanks. Remove noncondensibles. Check fan motor and relay.
RRU570 compressor won't restart.	Compressor motor thermal overload open.	Let unit cool down.
RRU570 slugging with liquid during liquid push/pull.	Recovery hose incorrectly connected This may cause liquid to be injected into compressor. Improper valves on recovery tank allowing liquid to be injected into compressor.	Verify that the system vapor and liquid lines are properly connected and that the vapor and liquid lines on recovery tank are connected correctly. Verify that the liquid and vapor valves on the recovery tank are separate and that the recovery tank is no more than 80 % full.

