



RefTec

INTERNATIONAL SYSTEMS LLC

LOVAC™

commercial



Low
Pressure
Electromechanical
Commercial
Refrigerant
Recovery
System

OPERATION MANUAL

Electromechanical Version 2.0
MODEL NUMBERS: CRL-V-115-E, & CRL-V-240-E

RefTec International
Clearwater, FL

Technical Support
800-214-4883

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SPECIFICATIONS

Electrical Power Requirements

Recovery Main Components & Controls:

CRL-V-115 MODEL: 115VAC, 50/60 Hz, 1-Phase, 20-Amperes

MIN CKT 20.0 AMP, MAX FUSE 20 AMPS.

CRL-V-240 MODEL: 115VAC, 50/60 Hz, 1-Phase, 20-Amperes

MIN CKT 20.0 AMP, MAX FUSE 20 AMPS.

Dimensions (approximate) 30" L x 18" W x 35" H

Weight 225-lbs. (300-lbs. shipping)

FURNISHED WITH LOVAC

One 48 cu inch replaceable core.

50' power cable & 12' float cable

1ea. 20 FT 3/4" Refrigerant Hose w/BV

2ea. 10 FT 3/4" Refrigerant Hose W/BV

REV.DATE (6/12/09)

LOVAC

CRL-V-115-E 115/60/1, 110/50/1, 1.0 Hp,
20A

CRL-V-240-E 240/50/1, 208/50/1, 1.0 Hp,
20A

Notice

RefTec International, Inc. urges that all HVAC servicers working on RefTec 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:

RefTec's LOVAC recovery system provides efficient and safe recovery of most low pressure refrigerants.

The unit consists of a 1-hp vacuum pump, high capacity 10.6 cfm water 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 3/4" male flare with isolation valves. After hoses are connected and evacuated, user simply configures hoses for liquid push/pull mode, opens all lines at chiller and recovery tank, and turns LOVAC on. After an internal 2 minute timer delay, LOVAC starts recovery by letting refrigerant migrate from the chiller 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 chiller condenser, thus creating a pressure differential for a push/pull liquid transfer.

Two onboard gauges display chiller pressure and recovery tank pressure. When liquid has finished transferring and sight glass on liquid line indicates liquid refrigerant has been transferred, user simply reconfigures hoses to vapor recovery mode, allowing LOVAC to pull vapor from chiller evaporator being recovered. LOVAC vacuum pump begins recovering vapor which is first cleansed by an 48 cu inch filter drier. Discharged hot compressed refrigerant passes through an oil separator where the oil is extracted and returned to the Pump. Refrigerant is then condensed by the water-cooled condenser and sent to the recovery tank.

Transfer stops when an internal pressure switch indicates that the chiller reaches a 29" Hg vacuum. If pressure should again rise above 27" Hg, the LOVAC will restart to pull refrigerant from chiller until a 29" Hg vacuum is restored.

SAFE OPERATIONS AND TIPS:

To ensure your safety as well as others, before attempting to recover a centrifugal chiller, proper and thorough preparation must take place:

Make sure you have a recovery tank with a minimum 3/4" male flare vapor port and a minimum 3/4" 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.

Reminder: 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 LOVAC needs to be shut down. If a scale is not available, the tanks can be equipped at time of purchase with a float switch that will deactivate LOVAC'S control circuit. All LOVAC units come with safety float connection and bypass switch.

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

PEAK PERFORMANCE:

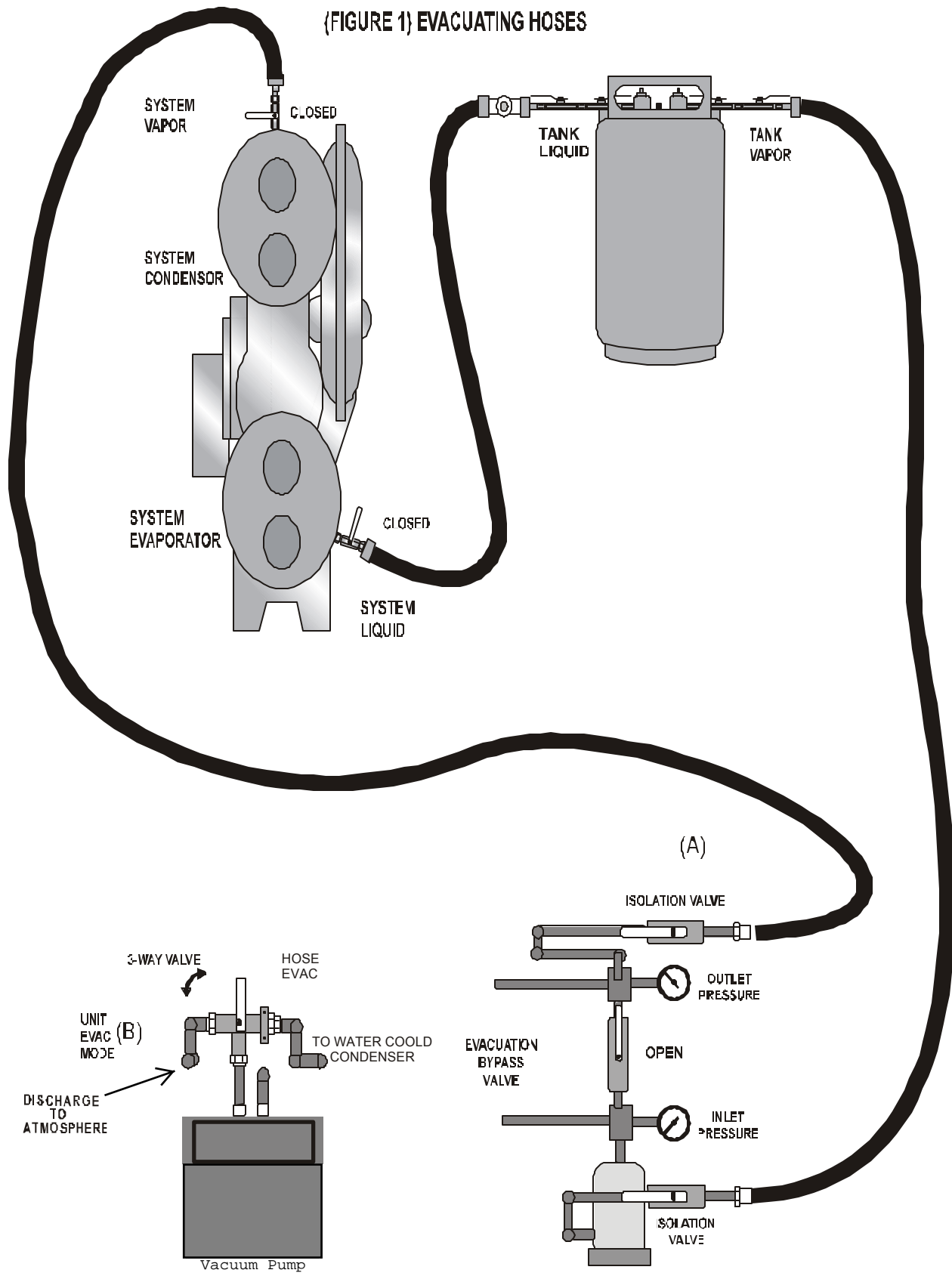
To get the highest performance from your LOVAC unit, we recommend that you:

Connect to 3/4" evaporator and 3/4" condenser ports on the centrifugal chiller and to recovery tanks with 3/4" ports whenever possible.

PROCEDURES FOR EVACUATING HOSES AND RECOVERY TANK:

- 1 Turn the centrifugal chiller off; make sure that the chiller cannot restart.
- 2 Connect the 50-ft 1-phase power cord to a minimum 20-amp / maximum 20-amp outlet with breaker or fused disconnect and plug it into LOVAC's control box.
- 3 Connect the three low pressure refrigerant hoses, as shown in **(Figure 1)** on page 6. At this time, connect safety float cable from LOVAC to recovery tank or use a suitable scale. If a scale is to be used instead of float safety cutout, the 80% full bypass switch will need to be set to the "On" position for LOVAC to run.
- 4 Open isolation valves on LOVAC recovery unit (Figure 1) (A). Keep isolation valves on chiller closed.
- 5 Turn 3-way valve located on LOVAC to **UNIT EVAC MODE**, as shown in (Figure 1) (B) on page 6 and open 2-way valve between unit Inlet and Outlet (Figure 1A) on page 6
- 6 Turn LOVAC power switch on and after an internal 2 minute timer delay, LOVAC will start evacuating recovery tank, and hoses. LOVAC will pull hose into a 29" vacuum, then automatically shut down. After LOVAC shuts down, proceed to next step.
- 7 Return 3-way valve on unit to **NORMAL OPERATION** (Figure 1) (B) And close 2-way valve between Lovac Inlet and Outlet. Turn Power Off. Now proceed to **Liquid Push/Pull** method on page 7.

(FIGURE 1) EVACUATING HOSES



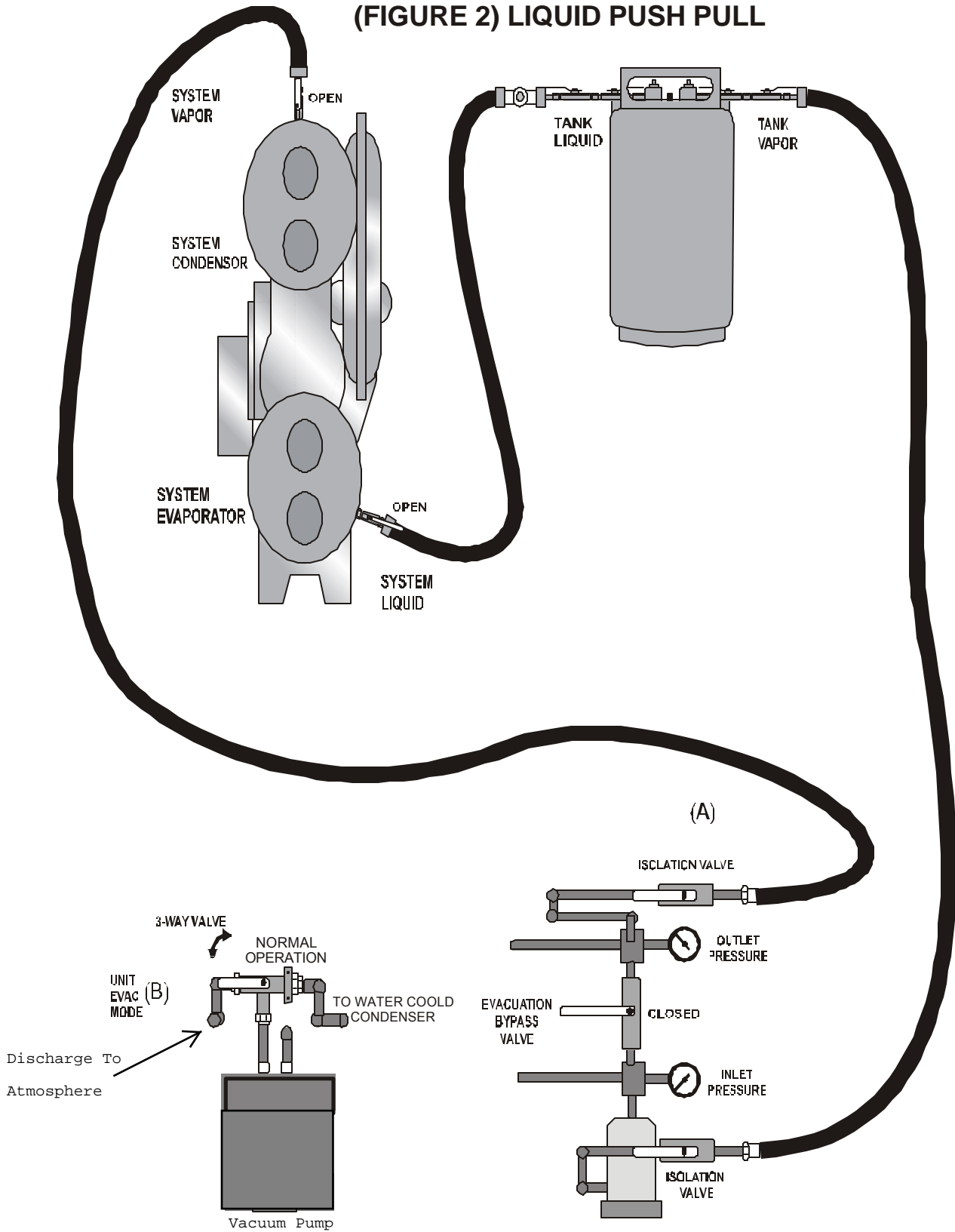
PROCEDURES FOR LIQUID PUSH/PULL MODE:

WARNING!

Before attempting to operate this unit, make absolutely sure that the 3-way & 2-way valves on unit (Figure 2) (B) page 8 are set to their **NORMAL OPERATION AND CLOSED POSITIONS**, respectively. Also open oil return valve between oil separator and vacuum pump.

- 1 Turn the centrifugal chiller off; make sure that the chiller cannot restart.
- 2 Connect the 50-ft 1-phase power cord to a minimum 20-amp / maximum 20-amp outlet with breaker or fused disconnect and plug it into LOVAC's control box.
- 3 Verify that all hoses are connected as shown on page 8 (**Figure 2**) and that they have been evacuated as previously described in **Procedures for Evacuating Hoses and LOVAC** on page 5.
- 4 Open vapor & liquid access valves on chiller being recovered.
- 5 Open isolation valves on LOVAC recovery unit (Figure 2) (A).
- 6 Open vapor & liquid isolation valves on recovery tank .
- 7 Turn LOVAC power switch on and after an internal 2 minute timer delay, LOVAC will automatically start drawing vapor off the recovery tank and forcing compressed refrigerant back into the condenser of the chiller. Liquid push/pull is now in process.
- 8 Continue to monitor liquid sight glass on liquid line between chiller evaporator and recovery tank. Once all of the liquid has been completely removed, turn Lovac off and close isolation valves on recovery tank, lovac unit & chiller .
- 9 When liquid push/pull recovery is finished, proceed to vapor recovery on page 9.

(FIGURE 2) LIQUID PUSH PULL



PROCEDURES FOR VAPOR RECOVERY MODE:

WARNING!

Before attempting to operate this unit, make absolutely sure that the 3-way & 2-way valves on unit (Figure 3) (B) page 10 are set to their **NORMAL OPERATION AND CLOSED POSITIONS**, respectively.

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 vacuum pump and causing major damage to the compressor.

- 1 Turn the centrifugal chiller off; make sure that the chiller cannot restart.
- 2 Connect the 50-ft 1-phase power cord to a minimum 20-amp / maximum 20-amp outlet with breaker or fused disconnect and plug it into LOVAC's control box.
- 3 Verify that all hoses are connected as shown on page 10 (**Figure 3**) and that they have been evacuated as previously described in **Procedures for Evacuating Hoses and LOVAC** on page 5.
- 4 Connect water hoses to the water cooled condenser and run 65 deg. city water through. For better condensing capacity run 45 deg. chiller water through the condenser.
- 4 Open evaporator access valve on chiller being recovered.
- 5 Open isolation valves on LOVAC recovery unit (Figure 3) (A).
- 6 Open liquid side isolation valve on recovery tank.

7 Turn LOVAC power switch on and after an internal 2 minute timer delay, LOVAC will automatically start recovering all of the remaining vapor refrigerant in the chiller and pull the entire system into a 29" Hg vacuum. **To help ensure that LOVAC pulls chiller into a 29" Hg vacuum as quickly and efficiently as possible, monitor LOVAC's system pressure gauge and oil in vacuum pump.** If oil is at a proper level, the oil bypass valve may be closed to allow a deeper vacuum .

8 Once chiller has been completely recovered to a 29" Hg vacuum, LOVAC will shut down and "Recovery Complete" red light will illuminate. Should pressure in chiller again rise above 27" Hg vacuum, LOVAC will restart and pull chiller back into a 29" Hg vacuum.

9 When recovery is finished, turn power off, close isolation valve on chiller and recovery tank as well as isolation valves on LOVAC recovery unit. Close isolation valves on hoses and disconnect.



Vacuum Pump



Vacuum Pump

