OPERATING INSTRUCTIONS

MODEL RLV-700

REFRIGERANT RECOVERY / RECYCLING UNIT
(PATENTED)

NATIONAL REFRIGERATION PRODUCTS

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MODEL RLV700

The RLV700 unit can recover/recycle liquid and vapor refrigerant. It has only one inlet for refrigerant and automatically adjust itself for proper mode when liquid or vapor enters the unit. For safety reasons this unit is equipped with an automatic recovery cylinder shut off. This shut off maintains a maximum 80% fill of the recovery cylinder by volume.
The unit has a hourmeter to indicate when to change filter drier cores. Filter cores must be changed every 4 hours or 135 lbs processed!

ALWAYS USE CYLINDERS APPROVED FOR RECOVERY (NRP model NC50U or equivalent).

DO NOT MIX DIFFERENT REFRIGERANTS IN A CYLINDER. Mixtures cannot be separated.

ALWAYS WEAR RUBBER GLOVES AND GOGGLES WHEN TRANSFERRING REFRIGERANT.

BEFORE FILLING AN EMPTY CYLINDER ALWAYS EVACUATE THE CYLINDER FOR 15 MINUTES OR TO AT LEAST 1000 MICRONS TO REMOVE AIR AND NONCONDENSABLES. NONCONDENSABLES WILL INCREASE DISCHARGE PRESSURE DRAMATICALLY.

ALWAYS USE A PREFILTER (ALCO #ALF-053, PARKER #PF053-MF, OR FILTER DRIER SPORLAN #C-053) AT THE INLET OF THE UNIT. FAILURE TO DO THAT MAY RESULT IN MALFUNCTIONING OF PRESSURE REGULATOR, LIQUID/VAPOR SWITCH, AND SOLENOID VALVES.

NOTE:

1. All valves on the RLV700 must be in the closed position except when the unit is in use. The RLV700 is like a refrigeration unit and must not be open to the air.

2. Connect the RLV700 to a properly grounded 115 Volt 1 phase 60 Hz outlet. Do not use an extension cord longer than 25 ft. Voltage drop will damage the compressor.

3. Refrigeration hoses should not exceed eight feet in length.

4. **USE A PREFILTER (ALCO #ALF-053, PARKER #PF053-MF, OR FILTER DRIER SPORLAN #C-053) TO PREVENT PARTICLES TO INTERFERE WITH PROPER OPERATION OF PRESSURE REGULATOR, LIQUID/VAPOR SWITCH, AND SOLENOID VALVES. PREFILTER MUST BE CHANGED AFTER RECOVERY FROM A BURNOUT SYSTEM, BEFORE PROCESSING ANOTHER REFRIGERANT, AFTER PROCESSING 135 POUNDS OF REFRIGERANT.**

5. RLV700 unit is suitable for R12, R22, R134a, R502, and Blends.

6. Always remove Schrader cores from access fitting when process refrigerant from disabled unit. This type of restriction reduces flow rate drastically.

7. Evacuate the RLV700 by hooking a vacuum pump up to the outlet port. Evacuate for 15 minutes or 1000 microns. Turn the RLV700 on without the float cord connected. This energizes the solenoids allowing access to all the piping.

COMPRESSOR OIL SIGHT GLASS

During normal operation a very small amount of compressor oil will be carried out of the RLV700 unit. The compressor oil level should be at 1/2 sight glass (located on the front side of the unit).When oil level decreases, more POE refrigeration oil needs to be added to the compressor. Before adding oil ensure that any pressure in the unit has been properly relieved and the inlet valve is closed. To add oil, attach a hose to "Oil charging port". Transfer oil from a container by turning RLV700 on until the sight glass is 1/2 full. **DO NOT OVERFILL.** Turn unit off, close oil port cap. Normal oil charge is approximately 14-16 ounces.

COMPRESSOR OIL DRAIN

The compressor oil drain is located on the bottom of the unit. Before draining oil ensure that pressure has been properly relieved in the unit. Remove fitting cap and Schrader valve, tilt the unit. Oil will drain into container by gravity. Drain oil into a container for proper disposal. **WARNING: Oil in the compressor can be under pressure and hot if unit has been running. Serious burns could occur. Use caution!**

WARNING

1. Avoid the use of an extension cord because the cord may overheat. However, if you must use one, the cord must be a minimum number 14/3, oil resistant, meet N.E.C., and be 25 ft long maximum.

2. THE FOLLOWING DAMAGES TO RLV700 ARE NOT COVERED BY THE WARRANTY:

   A. Damage to the compressor due to the compressor being run without oil.
   B. Damage to the pressure regulator, liquid/vapor switch, level switch, or solenoid valves due to particles introduced into unit because prefilter was not used or changed.

WARRANTY

NRP Recovery/Recycling Equipment is warranted to be free of manufacturing defects. NRP will repair or give credit for repair at NRP's choice if any NRP Recovery/Recycling unit or accessories have manufacturing defects. Any warranty claim must be submitted in writing within one year of purchase with a copy of the original invoice. Under no circumstances shall NRP be liable for the cost of labor charges, lost profits, injury to good will or any other special or consequential damages for defective goods, late delivery or non-delivery. There are no warranties which extend beyond the description of the face hereof, and NRP makes no warranty of merchantability or fitness for a specific purpose. This warranty does not cover damage by improper operation or abuse.

RECOVERY/RECYCLING PROCEDURE

The RLV700 can recover/recycle liquid and vapor refrigerant. It has only one inlet for refrigerant. When liquid or vapor enters the unit it automatically switches itself to the proper mode of operation.

IMPORTANT: Pump-out switch must be in "OFF" position during recovery/recycling.

VERY IMPORTANT: Always use a prefilter (Alco #ALF-053, PARKER #PF053-MF, or filter drier SPORLAN #C-053) at the inlet of the unit. Failure to do that may result in malfunctioning of pressure regulator, liquid/vapor switch, and solenoid valves.
Prefilter must be changed after processing refrigerant from a burnout system, when transferring another refrigerant, after processing 150 lb of refrigerant.

1. Connect the inlet of the RLV700 unit to the liquid port of the source of contaminated refrigerant (recovery cylinder, disabled unit, etc).

2. Connect the outlet of the RLV700 unit to the liquid port of the cylinder designated for recycled refrigerant.

3. Open outlet valve on the RLV700 unit, liquid valve on recycled refrigerant cylinder, and liquid valve on contaminated refrigerant source (if it has one).

4. Turn on the RLV700 unit.

5. Slowly open inlet valve on the RLV700 unit.

The unit will recover/recycle refrigerant. Switching from liquid to vapor mode and from vapor to liquid mode is automatic.

VERY IMPORTANT: During recovery/recycling pay attention to contaminant accumulator sight glass. Since all contaminants (oil, acid, particulates) are separated in the accumulator it is imperative to drain them out (see Contaminants draining procedure) when:

A. Contaminants are level with the sight glass.

B. Recovery/recycling is complete.

C. Replacing a full cylinder with recycled refrigerant with an empty one.

D. Changing filter drier cores.

5. When recovery/recycling is complete, close all the valves and drain the accumulator (see **Contaminants draining procedure).**

CONTAMINANTS DRAINING PROCEDURE

Contaminants accumulator must be drained when:

A. Contaminants are level with the sight glass.

B. Recovery/recycling is complete.

C. Replacing a full cylinder with recycled refrigerant with an empty one.

D. Changing filter drier cores.

To drain accumulator:

1. Connect a hose to "CONTAMINANTS DRAIN" valve. Another end of the hose put into a container.

2. Close the inlet valve.

3. Turn on the RLV700 unit.

4. Evacuate low pressure side of the RLV700 unit to 10"~15" of vacuum. (R22 ~ 10") all others 15"

5. Turn off the unit.
   If pressure on inlet gauge is rising above 0 psi repeat steps 2 and 3.

6. Connect a hose to a vapor valve of the cylinder you currently discharge refrigerant into, purge the hose, and connect the hose (hose fitting to be with a depressor) to the "Compressor oil charge" port.

7. Slowly open the vapor valve of the cylinder to increase pressure on the low side of the RLV700 to 3~5 psig **(never increase pressure above 5 psig).**

8. **Slightly** open the "CONTAMINANTS DRAIN" valve and drain all contaminants into a container for proper disposal.
   Drain contaminants until gas starts coming out of the drain hose. If necessary repeat step 7.

CLEARING TRAPPED REFRIGERANT

Since the RLV700 is designed to be used with different refrigerants clearing procedure which removes residual refrigerant out of the unit to be followed before transferring a different refrigerant.

To clear refrigerant out of the unit:

1. Connect outlet of the unit to the vapor side of empty (or almost empty) cylinder.
2. Open outlet valve of the unit and vapor valve of the cylinder.
3. Keep closed the inlet valve of the unit.
4. Turn the unit "ON".
5. When the inlet gauge indicates vacuum, turn the pump out switch "ON" (the pressure on the inlet gauge will go up).
6. When the inlet gauge is down to 10" of vacuum, pump out is complete.
7. After completing pump out, turn "OFF" the power switch and then pump out switch.
8. A total evacuation of the unit can be obtained by using a vacuum pump.

IMPORTANT: The composition of oil in recycled refrigerant is slightly higher during pump out procedure.
It will be still lower than requirements of the INDUSTRY RECYCLING GUIDELINE (IRG-2) but if user is attempting to clean refrigerant to requirements of ARI Standard 700, the pump out should be discharged into separate cylinder (this refrigerant can be recycled later).

Purging Non-Condensables ~ Method (1)

Allow the cylinder, into which you have recycled the refrigerant, to sit for as long as possible. This helps separate the refrigerant gas from the non-condensable. ARI allows 15 minutes to complete the purge cycle. Slowly open the vapor valve on your recovery tank. Evacuate air from the tank for no more than 8-10 seconds.

Purging Non-Condensables ~ Method (2)

As in method (1) it is good to let the cylinder sit for as long as possible. Minimum ambient should be 65 degrees F.

* Install a pressure gauge calibrated with 1 PSIG divisions to the vapor port of your recovery/recycling tank.

* Measure the cylinder pressure.

* Measure the temperature of the cylinder midway on the top domed radius.

* From a **"Pressure ~ Temperature Relationship Chart"** find the tank pressure from the measured temperature.

* Compare the measured tank pressure and converted pressure from dome temperature to the **"Pressure ~ Temperature Relationship Chart"** (not provided).

* If the measured values are within 8 PSI of each other, the recycled refrigerant is within specification.

* If it is not, follow the purging procedure used in method (1) to remove the non-condensables unitl an 8 PSI differential is obtained.

FILTER DRIER CORES CHANGE

Filter drier cores must be changed when transferring another refrigerant or every 4 hours of recovery/recycling. The RLV700 has an hourmeter which is energized when the compressor is on. Filter drier core change has to be made as fast as possible to avoid adsorption of moisture from the air.

IMPORTANT: RLV700 must be evacuated after filter drier replaced.

To change filter cores:

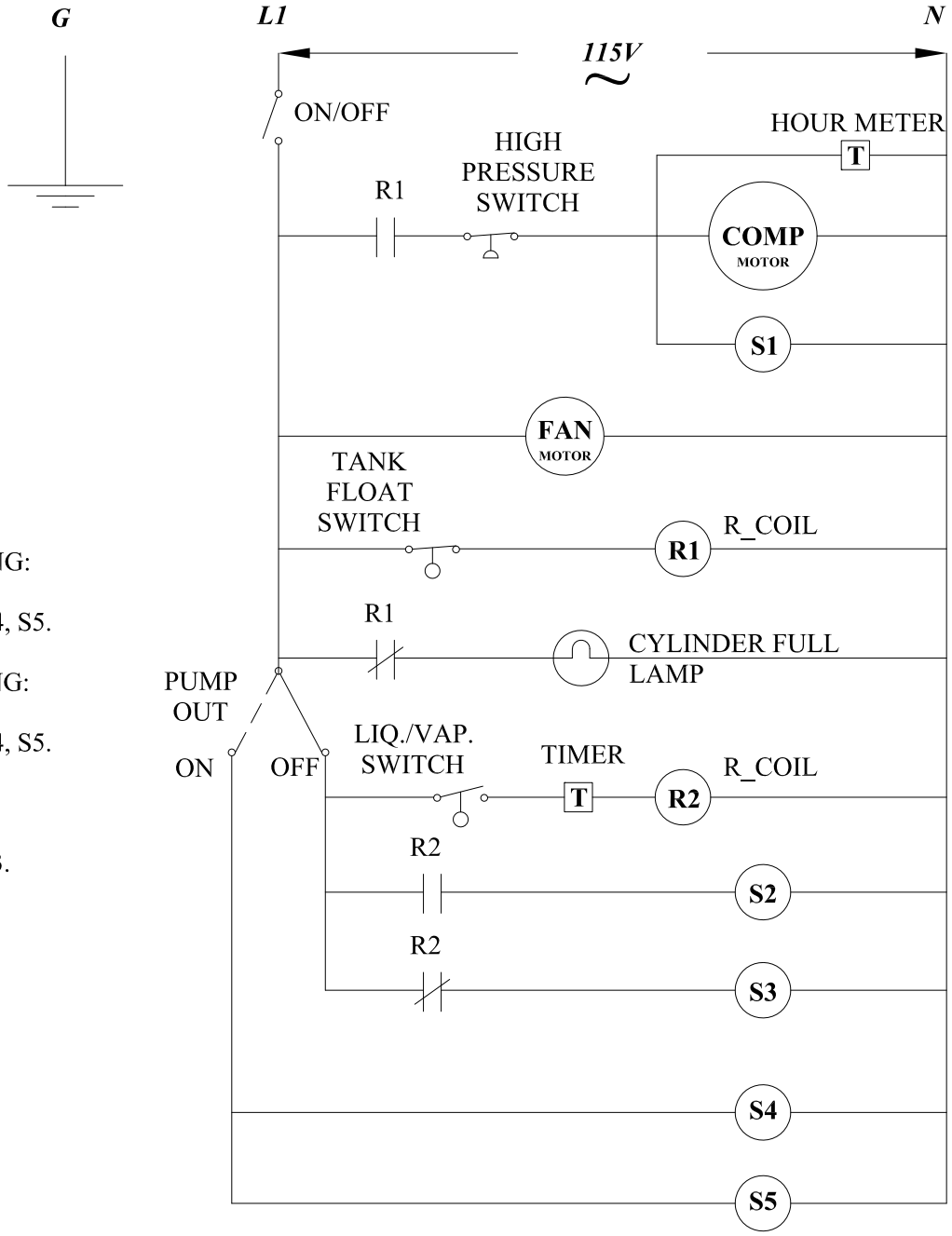
1. Properly relieve pressure from the RLV700 unit.
2. Unscrew bolts on filter drier shells and take cartridges with filter cores out of the shells.
3. Examine gaskets on the filter caps and on the end of the cartridges. If necessary replace them.
4. Properly wipe internal surface of the shells with clean rag.
5. Replace the cores and install cartridges with the new cores into the shells. **REPLACE AND INSTALL ONE CORE AT THE TIME. DO NOT FORGET TO INSTALL FINAL FILTER PADS (Final filter pads are supplied with filter cores).**
6. Evacuate the unit.

IMPORTANT RECOMMENDATION

The RLV700 unit was tested to ARI Standard 740 and if properly maintained and operated will clean refrigerants to requirements of ARI Standard 700-95 concerning **WATER, CHLORIDE ION, ACIDITY, NON BOILING RESIDUES AND PARTICULATES/SOLIDS.**

The RLV700 **unit (as any other recycling unit)** cannot separate mixtures of refrigerants and thus satisfy requirements ARI Standard 700 concerning **"OTHER REFRIGERANTS"** if refrigerant designated for recycling contains other refrigerant(s). In this case refrigerant must be sent for reclaimation.

WIRING DIAGRAM



RLV 700

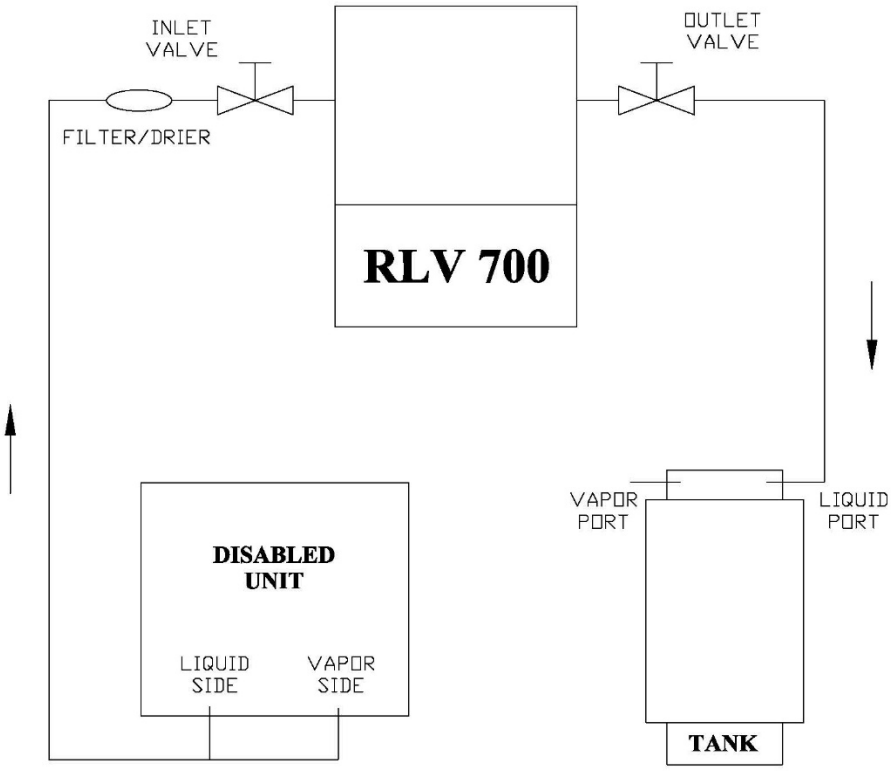
- RECYCLING
- PUMP OUT

1,. LIQUID RECYCLING:
- OPEN - S1, S3;
  - CLOSED - S2, S4, S5.

1. VAPOR RECYCLING:
- OPEN - S1, S2;
  - CLOSED - S3, S4, S5.

3. PUMP OUT:
- OPEN - S1, S4, S5;
  - CLOSED - S2, S3.

DIAGRAM: RLV700 LIQUID RECOVERY AND VAPOR RECYCLING



RLV700 RECOVERY/RECYCLING:

* THE CONTAMINATED REFRIGERANT IS RECOVERED OR PUMPED AUTOMATICALLY, FROM A DISABLED UNIT OR A REFRIGERANT CYLINDER, BY THE RLV700

* THE RLV700 RECYCLES AUTOMATICALLY THIS REFRIGERANT IN ONE PASS AND TRANSFERS THE RECYCLED REFRIGERANT INTO A RECOVERY TANK

* THE RLV700 CAN PROCESS REFRIGERANT IN VAPOR FORM OR/AND IN LIQUID FORM