

# *OPERATING INSTRUCTIONS*



## **MODEL AR1UL OIL-LESS REFRIGERANT RECOVERY UNIT ONE STEP LIQUID/VAPOR SETUP NEW SUBCOOL FEATURE**

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## MODEL AR1UL

The AR1UL unit can recover liquid refrigerant when using a recovery cylinder with a 2 port valve or a cylinder with 2 valves ( one liquid and one vapor ).

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.

- ALWAYS USE CYLINDERS APPROVED FOR RECOVERY (NRP model NC50U or equivalent).
- DO NOT MIX DIFFERENT REFRIGERANTS IN THE SAME CYLINDER.
- ALWAYS USE AN O53 FILTER DRIER AT THE INLET OF THE AR1UL. THIS WILL PROTECT THE AR1UL COMPRESSOR, PRESSURE REGULATOR AND SOLENOID VALVES.

### NOTE:

1. All the valves on the AR1UL must be in the closed position except when the machine is in use. The AR1UL is just like a refrigeration unit and must not be open to air. Moisture from the air will damage the compressor.
2. Connect the AR1UL to a properly grounded 115 V, 1 phase, 60 Hz outlet. Do not use an extension cord longer than 25 ft. The voltage drop when using a longer extension cord will damage the compressor.
3. Refrigeration hoses should not exceed 8 ft. in length. For optimum recovery rates use 3/8" ID hoses no longer than 5 ft. (It may be necessary to adapt down to 1/4" fittings).
4. USE AN O53 DRIER ON THE BALL VALVE LABELED "FROM DISABLED UNIT LIQUID SIDE" TO PROTECT THE COMPRESSOR AND TO PREVENT PARTICLES FROM INTERFERING WITH THE PROPER OPERATION OF THE PRESSURE REGULATOR AND SOLENOID VALVES. The filter-drier must be changed after recovery from a burnout system. The filter-drier must be changed before recovering another refrigerant to avoid mixing refrigerants. The filter-drier must be changed after recovering 50 pounds of refrigerant.
5. The AR1UL unit is suitable for recovering R12, R22, R500, R502, R134a, R404A, blends and new refrigerants.
6. Always remove schrader cores from access fittings on the disabled unit. This type of restriction reduces the recovery rate drastically. (Use a schrader core removing tool. This allows hose connections without venting).

### Warning

1. If possible, avoid the use of an extension cord. The extension cord may overheat. However, if you must use an extension cord, the cord must be 14/3 AWG minimum, oil resistant, meet N.E.C. requirements and be 25' long maximum.
2. THE FOLLOWING DAMAGES TO THE AR1UL ARE NOT COVERED BY WARRANTY:
  - Damage to the compressor due to liquid being introduced at the ball valve labeled "FROM RECOVERY TANK VAPOR PORT". This would slug the AR1UL and damage the compressor valves.
  - Damage to the suction pressure regulator and/or the solenoid valves due to particles which were brought in with contaminated refrigerant because an O53 filter drier was not used. Particles such as metal shavings will interfere with the operation of the pressure regulator and the solenoid valves.

### **WARRANTY**

NRP Recovery 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 Unit or accessories have manufacturing defects. Any warranty claim must be submitted in writing within one year of purchase with the copy of invoice. In no event shall NRP be liable for the cost of labor charges, lost profits, injury to good will or any other special 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 specific purpose. Warranty does not cover damage by improper operation or abuse.

### **PLEASE NOTE**

The AR1UL is equipped with an automatic shut off set at 12" vacuum. The AR1UL may require 2 – 3 PSI of Positive pressure placed on the ball valve labeled "From disabled unit liquid side" to get it to restart. This is Due to the tolerance of the differential of the vacuum switch.

## ARIUL LIQUID AND VAPOR RECOVERY

**Note:** For Liquid Recovery Flow Diagram see Diagram (1) on page 5.  
For Vapor Recovery Flow Diagram see Diagram (2) on page 5.

Liquid refrigerant is transferred directly from the disabled unit through the ARIUL to the liquid port of the recovery tank at a rate of 10-12 lb./min. The recovery unit pumps vapor from the top of the cylinder to the disabled unit. This maintains a lower pressure in the cylinder than in the disabled unit which pulls liquid refrigerant to the cylinder.

1. Connect the disabled unit to the cylinder and the recovery unit as shown in Diagram (1). Use 3/8" hoses less than 5 feet long with 1/4" to 3/8" adapter fittings to the tank. Connect an O53 filter drier onto ball valve labeled "FROM DISABLED UNIT LIQUID SIDE" as shown. Connect the yellow float cord on the ARIUL to the float switch on the recovery cylinder. The cylinder must be standing upright.
2. Turn on the recovery unit. The yellow electrical cord on the ARIUL must be connected to the NC50U in order to run the unit. When the recovery tank becomes 80% full it will automatically shut off.
3. Open both valves on cylinder and all the ball valves on the ARIUL.
4. When you have recovered all the liquid from the disabled unit and there is no liquid present in the recovery unit, the ARIUL switches into vapor mode. This begins the vapor recovery process. No hoses or valve positions need to be changed.
5. When the pressure on the system gauge reaches 10" Hg vacuum, vapor recovery is complete. The ARIUL has a built in vacuum switch which will automatically shut the system down at 12" Hg. vacuum
6. When vapor transfer is complete, or the cylinder is 80% full, close all the valves and turn off the recovery unit.

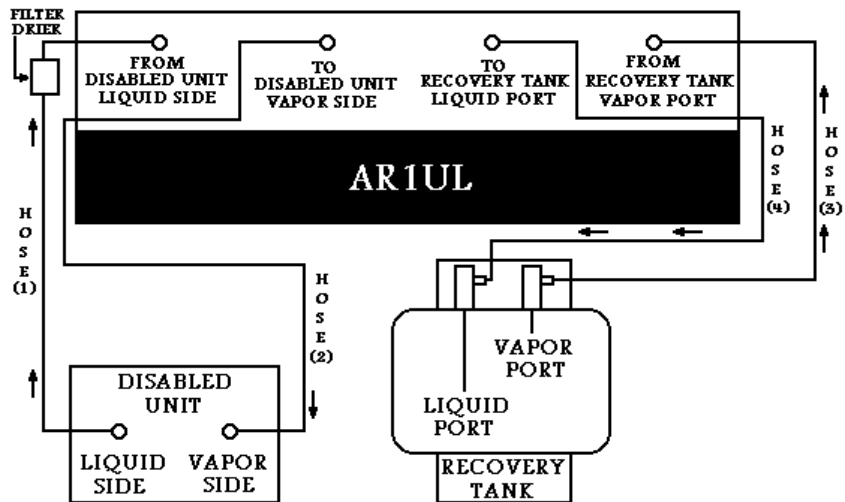
### NOTE:

- The recovery flow rate is slower at inlet pressures below 0 PSIG. Hoses # 2 and #3 have no function in the vapor mode.

### ARIUL VAPOR ONLY RECOVERY

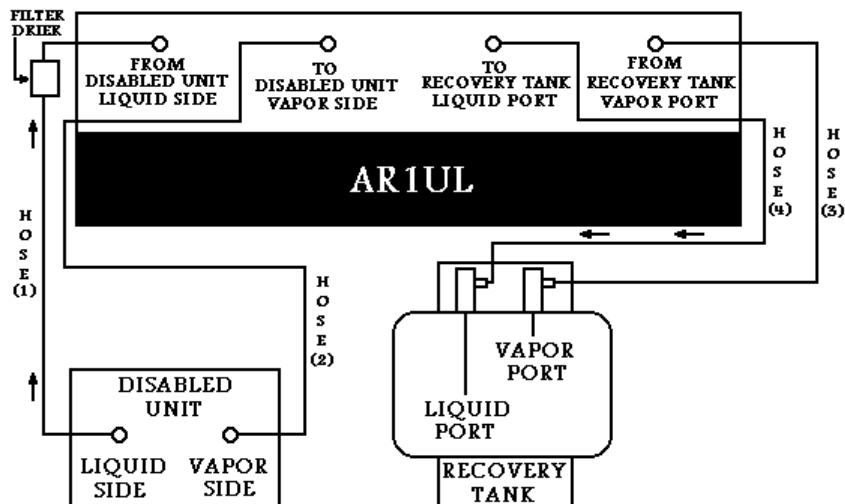
In some cases it may not be possible to recover the refrigerant in liquid form. There may not be liquid refrigerant or it has migrated to another part of the system. In such cases the refrigerant must be recovered in vapor form. Only **Hose (1)** and **Hose (4)** are used for vapor recovery. The flow of refrigerant is the same as the flow in **Diagram (2)**.

## DIAGRAM (1): AR1UL LIQUID RECOVERY FLOW DIAGRAM

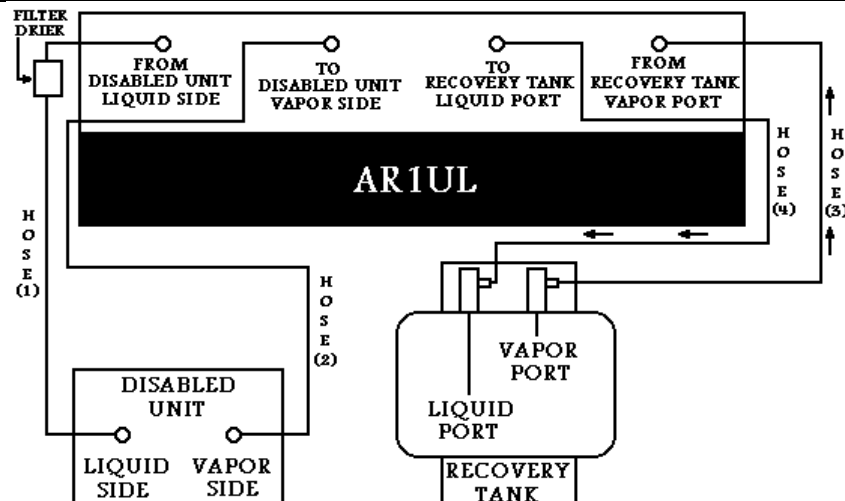


1. NO HOSE CHANGES ARE REQUIRED TO SWITCH FROM LIQUID TO VAPOR RECOVERY
2. HOSE (2) AND HOSE (3) HAVE NO FUNCTION DURING VAPOR RECOVERY

## Diagram (2): AR1UL VAPOR RECOVERY FLOW DIAGRAM



## DIAGRAM (3): AR1UL SUBCOOL AND SELF-CLEARING



1. NO HOSE CHANGES ARE REQUIRED TO ENTER SUBCOOL OR SELF CLEARING
2. HOSE (1) AND HOSE (2) HAVE NOFUNCTION DURING SUBCOOL OR SELF-CLEARING

## SUBCOOL FEATURE (SEE DIAGRAM (3) ON PAGE 5)

When the ambient temperature rises above 104°F you may encounter some resistance recovering into a hot tank. When this occurs, place the unit into the “SUBCOOL” mode. This is done by pressing the “SUBCOOL” switch into the “ON” position. Automatically your recovery unit turns into a refrigeration system with the recovery tank being the evaporator. (IT GETS COLD). The subcool system lowers the pressure in your tank. The hotter the tank the more the cooling capacity. The recovery process is stopped until the “SUBCOOL” switch is pressed into the “OFF” position. The AR1UL should now be in vapor mode. If more subcooling is desired simply press the “SUBCOOL” switch back into the “ON” position.

### RECOMMENDATION

When recovering refrigerant, it is always better not to stop and start the recovery unit compressor. The compressor should not be allowed to short cycle. This increases the compressor temperature. The compressor may kick out on thermal overload to protect the motor windings. Do not stop the AR1UL compressor until the recovery job is complete.

### SELF-CLEARING PROCEDURE BEFORE RECOVERING A DIFFERENT REFRIGERANT

<b>THIS PROCEDURE MUST BE PERFORMED WHEN RECOVERING A DIFFERENT REFRIGERANT</b>
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1. Connect hose (3) and hose (4) as per Diagram (3). The recovery tank should have between 5 and 10 lb. of refrigerant. Purge both hoses with the recovery tank.
2. Close both “DISABLED SYSTEM” valves on the AR1UL.
3. Turn the AR1UL unit on and IMMEDIATELY turn on the “SUBCOOL” switch.
4. Open both “RECOVERY TANK” valves on the AR1UL and both valves on the recovery tank.
5. Allow the recovery unit to run for 15 minutes to insure self- clearing.
6. Shut the valve on the AR1UL labeled “From Recovery Tank Vapor Port”
7. Shut off the Subcool switch.
8. Wait until the high side gauge drops down and stabilizes.
9. Close the valve labeled “To Recovery Tank Liquid Port”.
10. Shut off the power switch.
11. Close both “Recovery Tank” valves
12. The AR1UL is now self-cleared.
13. A total evacuation of the AR1UL can only be achieved by using a vacuum pump.
14. This can be done by connecting a hose from your vacuum pump to the ball valve on the AR1UL marked “TO RECOVERY TANK LIQUID PORT”. Turn the AR1UL’s power switch on with the float cord disconnected to the recovery cylinder. This opens the internal piping and allows full evacuation.