

# YELLOW JACKET®

## R100 Oil-Less Refrigerant Recovery Unit



## Operation Manual

**Ritchie®**  
ENGINEERING COMPANY INC.  
[www.yellowjacket.com](http://www.yellowjacket.com)

# INTRODUCTION

Welcome to simple, efficient refrigerant recovery with your new YELLOW JACKET® Refrigerant Recovery Unit, R100. This unit combines the latest oil-less compressor technology with YELLOW JACKET®'s tradition as a manufacturer of quality refrigerant recovery products.

The R100 can recover refrigerant in three different modes:

- **Liquid Recovery** - Direct recovery of liquid refrigerant through the recovery

unit. (Suction Valve in the “Liquid Recovery” position.)

- **Vapor Recovery** - Direct recovery of vapor refrigerant through the recovery unit. (Suction Valve in the “Vapor Recovery” position.)

- **Push-Pull Liquid Recovery** - Indirect recovery of liquid by “pushing” the liquid with high pressure refrigerant vapor. Used when large amounts of liquid refrigerant need to be recovered.

# SPECIFICATIONS

Refrigerants: R-12, R-22, R-134a, R-404A, R-409, R-500, R-502 Hp/MP Blends

Compressor: 1 HP Reciprocating Oil-less 2-cylinder

Power Source: 110 VAC 60Hz (230 VAC 50Hz)

Amperage: Run Load Amps: 14.7 ( 3.7 )  
Full Load Amps: 18.4 ( 5.6 )  
Locked Rotor Amps: 72.0 (18.0 )

Size: Height: 13 in  
Width: 14.75 in  
Depth: 13.25 in  
Weight: 48 lb.

# TABLE OF CONTENTS

SECTION	PAGE
Introduction	2
Specifications	2
General Safety Instructions	3
Overview of System Operation	4
Cautions & Warnings	4
Push-Pull Liquid Recovery	5
Direct (Vapor) Recovery	7
Component Location	8
Troubleshooting Information	9
Repair Parts List	11

# GENERAL SAFETY INSTRUCTIONS

**Know Your Equipment.** Read and understand the operation manual and labels affixed to the unit. Learn its applications and limitations, as well as the specific potential hazards of your equipment.

## **ALWAYS WEAR SAFETY GOGGLES AND GLOVES.**

**Use the Correct Hoses.** All hoses used for refrigerant handling should be designated for use with the refrigerant to be handled. Also use hoses of minimal length with a shut-off device within 12 inches of the end of the hose to reduce the likelihood of refrigerant leaks to the atmosphere.

**Ground All Equipment.** This unit is equipped with an approved 3-prong grounding-type plug. Never remove the round ground prong from the plug. Only plug into a properly grounded receptacle.

**Do not pressure test with compressed air.** Some mixtures of air and refrigerant have been shown to be combustible at elevated pressures.

**Use the Proper Extension Cords.** TO REDUCE THE RISK OF FIRE, avoid use of an extension cord with this unit. The cord may overheat. If you must use an extension cord, use the following guide for choosing the proper extension cord:

<u>Wire</u>	<u>Maximum Length</u>
18 Ga.	10 feet
16 Ga.	25 feet
14 Ga.	50 feet
12 Ga.	100 feet

## **Avoid Dangerous Environments.**

- Do not use this unit in damp locations or expose it to rain.
- This equipment should be used in a location with mechanical ventilation that provides at least 4 air changes per hour. If this is not possible, it should be located at least 18 inches above the floor.
- This equipment should not be used near open containers or spills of

gasoline.

**Disconnect Unit from Power Supply Before Servicing.** An electrical shock hazard is present when the unit is disassembled.

**Repair Damaged Parts.** Do not operate the unit with a defective part. Repair unit to proper operating conditions.

**Use Recommended Accessories.** Follow the instructions that accompany all accessories. Improper use of accessories may damage equipment or create a hazard.

**Use Caution When Connecting or Disconnecting.** Improper usage may result in refrigerant burns (frostbite). If a major refrigerant leak occurs, proceed immediately to a well ventilated area.

**Only Use the R100 with the Correct Refrigerants.** See the specifications for a list of compatible refrigerants.

**Operate the Unit within the Design Environment.** The R100 was designed to operate in a temperature range from 40°F to 120°F. The unit should also not be operated in a wet location.

**WARNING!** Refrigerant, in liquid and vapor form, is a potentially hazardous material. Please consult the refrigerant manufacturer's Material Safety Data Sheet for additional information and adhere to the following safety guidelines:

- Avoid breathing high concentrations of vapors.
- Use with sufficient ventilation to keep operator exposure below recommended limits, especially in enclosed and low lying areas.
- Avoid contact of liquid refrigerant with the eyes and prolonged skin exposure.
- Wear goggles and protective gloves.
- Do not attempt to operate this unit above 120°F ambient temperature.
- Do not allow refrigerants to contact open flame. Refrigerant decomposition in a flame results in phosgene gas. Breathing phosgene gas can be

## GENERAL SAFETY INSTRUCTIONS, cont.

**FIRST AID:** If high concentrations of refrigerant are inhaled, immediately remove the victim to fresh air. Call a physician or emergency medical technician. Keep calm. If the victim is not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do not give epinephrine or similar drugs.

- **EYE:** In case of liquid contact, immediately flush eyes with plenty of water.

Call a physician.

- **SKIN:** Flush with water. Treat for frostbite, if necessary, by gently warming the effected area.

**CAUTION!** All refrigerant hoses, recovery tanks, refrigerant lines, the R100, and other vessels containing refrigerants should be handled as if under high pressure.

## OVERVIEW OF SYSTEM OPERATION

The 1 HP R100 offers significant flexibility to meet your refrigerant handling needs in a compact rugged, powder-coated case. Careful handling of refrigerant is an important part of servicing air-conditioning and refrigeration equipment. Specific regulations apply to refrigerant handling. Familiarize yourself with these regulations.

Because the refrigerant is combined in a large tank, every technician must be sure which refrigerant is in each tank. Your company procedures should help you determine this. Mixing refrigerants can contaminate a large volume of refrigerant.

Use care when recovering refrigerant into

a portable tank. As stated in the warnings, overfilling a tank can be extremely dangerous. This unit is equipped with a tank overfill sensor cord. When connected properly to a recovery tank with a 80% float, this device will shut off the unit when the tank float activates (open contacts).

The R100 is designed for direct recovery of liquid or vapor refrigerant. It can also be used for the traditional push-pull, high volume recovery of liquid refrigerant.

Recovery of liquid refrigerant in Vapor Mode can damage the recovery unit compressor. If you are not sure if liquid refrigerant is present, use the Liquid Mode.

### CAUTION!

- This unit should be operated by certified personnel per 40 CFR part 82 subpart F or current equivalent. Before operating this unit, please read this manual thoroughly. You must understand the procedures outlined in this manual. Failure to follow these procedures could void all warranties.
- Before handling refrigerants, read the material safety data sheet (MSDS) from the refrigerant manufacturer.

### WARNING!

- Inhalation of high concentration of refrigerant vapors is harmful and may cause heart irregularities, unconsciousness, or death. Deliberate inhalation of refrigerants is extremely dangerous. Death can occur without warning. Vapors reduce oxygen available for breathing and are heavier than air. Decomposition products are hazardous. Liquid contact can cause frostbite. All refrigerant containers, equipment, and hoses contain high pressure.
- Contact with refrigerant can cause frostbite.

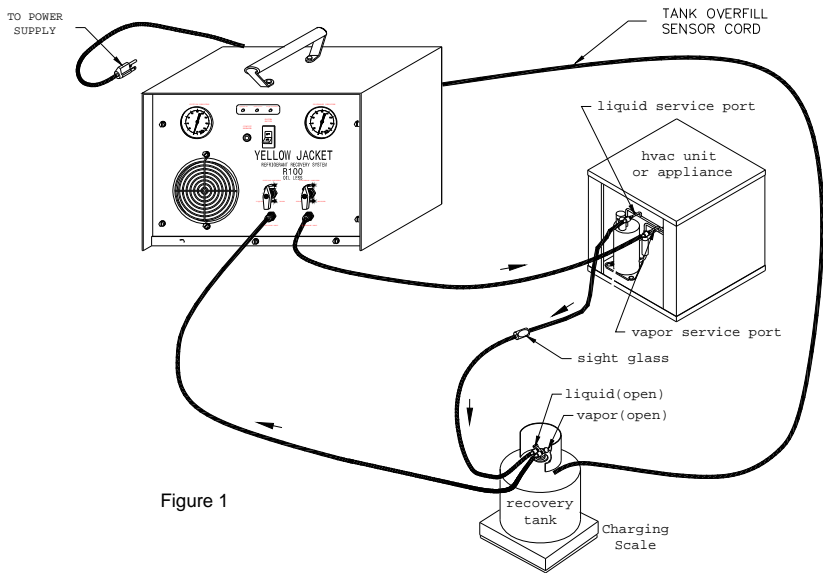


Figure 1

## PUSH-PULL LIQUID RECOVERY

The Push-Pull Liquid Recovery mode is used for transferring large volumes of liquid refrigerant. The R100 “Pulls” vapor from the recovery cylinder and produces high pressure discharge gas that “Pushes” liquid out of a HVAC system into a recovery cylinder. ( see figure 1)

Some systems may not allow push-pull liquid recovery. **If any of the following conditions apply to your recovery job, proceed directly to Vapor Recovery.**

- Equipment contains less than 8 pounds of refrigerant.
- Equipment is a heat pump or other unit with a reversing valve.
- Equipment has an accumulator between the service ports used in liquid recovery.
- Liquid refrigerant has migrated and the location of the refrigerant is not known.

- The refrigerant system does not allow for a solid column of liquid refrigerant to be formed.

**When using push-pull recovery, the R100 will not recover to the required vacuum level in the recovered system.**

Use a sight glass to determine when the liquid is being “pushed” into the recover tank. When liquid refrigerant is no longer visible, switch to Vapor Recovery (see figure 2).

The hose connections for liquid “push” recovery are shown in the figure 1. Perform the following steps for push-pull recovery:

1. Ensure the recovery unit *System Switch* is “OFF” and the power to the system to be serviced is also turned off.

## PUSH-PULL LIQUID RECOVERY, cont.

2. Connect the recovery unit, the system to be serviced, and the recovery tank as shown in the figure 1.
  3. Open the valves on the recovery cylinder.
  4. Turn the *Suction Valve* to "VAPOR RECOVERY" and the *Discharge Valve* to "PURGE" position.
  5. Turn the *System Switch* "ON." The Green LED should energize.
  6. Monitor the sight glass. When there is no longer significant liquid refrigerant passing through the sight glass, push-pull liquid recovery is complete.
- Note:** If the Yellow LED energizes, the recovery tank is full. Turn off power. Turn off both valves.
7. Turn the *Tank Vapor Valve* to "OFF." Wait until suction pressure gauge indicates a vacuum.
  8. Perform *PURGE* process.
  9. Disconnect Refrigerant hoses.
  10. Proceed to the Vapor Recovery procedure in this manual to remove the remainder of the refrigerant and to evacuate the system to the required vacuum level.

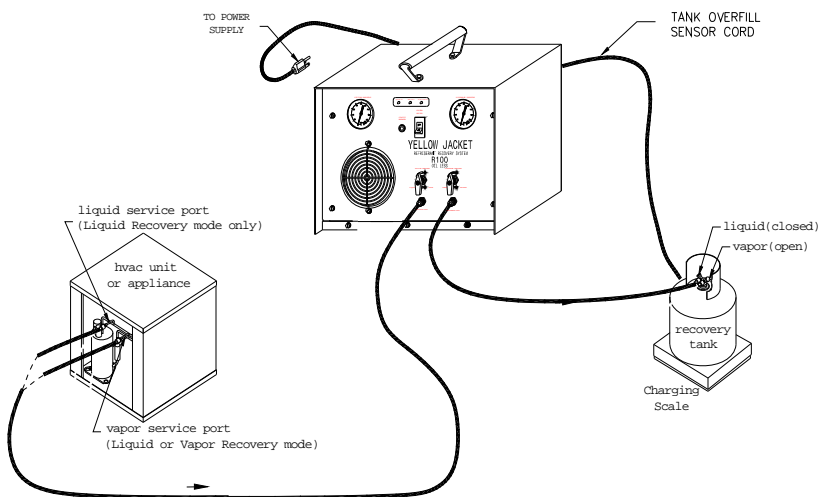


Figure 2

# VAPOR & LIQUID (DIRECT) RECOVERY

Vapor or Liquid Recovery is used to pull refrigerant directly out of the system to be serviced. The refrigerant is then transferred to a recovery tank.

Liquid Recovery is used when connecting to the high pressure side of the system to be serviced or any other service port that liquid refrigerant is present.

Either Vapor or Liquid Recovery can be used when connecting to the low pressure side or any other service port that vapor refrigerant is present.

**IMPORTANT: If you are not sure whether liquid refrigerant is present, choose Direct Liquid Mode. This mode limits the amount of liquid refrigerant entering the compressor. Recovery of liquid refrigerant in the Vapor Recovery mode can damage the compressor.**

If large quantities of liquid refrigerant are expected, use the liquid push-pull method. Push-pull will transfer liquid refrigerant faster than direct liquid recovery.

The hose connections for vapor & liquid recovery are shown in the figure 2. To perform vapor or liquid recovery, please follow the steps below:

1. Turn off power to the system to be serviced.
2. Turn the Suction Valve to "OFF" and the Discharge Valve to "RECOVER."
3. Connect the recovery unit, the system to be serviced, and the recovery tank as shown in the figure 2. The suction hose can be connected to the liquid and/or vapor service ports. **If you connect to the liquid service port, ensure you use Liquid Recovery.** Also ensure the hose to the tank is connected to the DISCHARGE port of

the recovery unit.

4. Open the vapor valve on the recovery cylinder.
5. Turn the discharge valve (right) to "RECOVER" position.
6. Turn the *System Switch* "ON". The Green LED should energize.
7. Turn the suction valve (left) to:  
"VAPOR RECOVERY" for vapor recovery from the vapor service port.

"LIQUID RECOVERY" for liquid recovery from the liquid service port.

**CAUTION: If unsure of the refrigerant's phase, always choose the "LIQUID RECOVERY" position.**

Note: If the Yellow LED energizes, the recovery tank is full. Turn off power. Turn off both valves. Exchange recovery tank with an empty one. Repeat Steps 3-6.

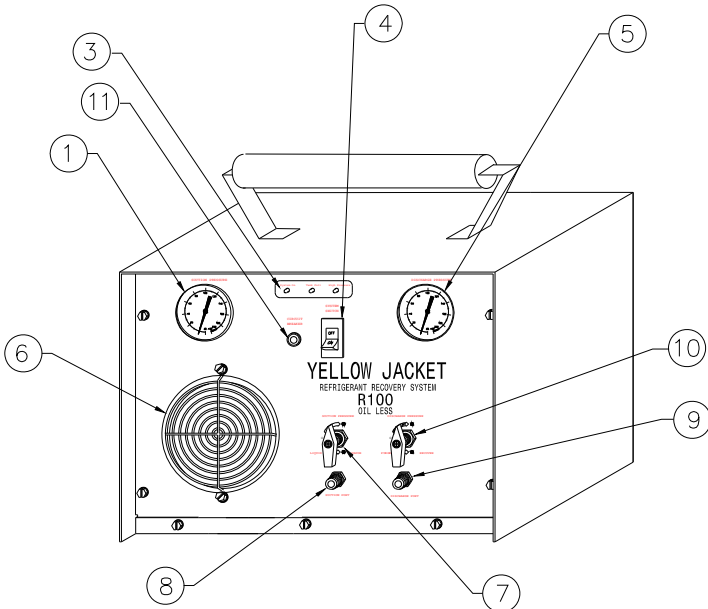
If the Red LED energizes, the recovery unit is sensing a high-pressure limit. Turn off power and check for restrictions. If tank pressure is above 400 psig, exchange tank. Repeat Steps 3-6.

7. After the Suction Pressure Gauge indicates the required vacuum, turn the discharge valve to "PURGE" to remove the remaining refrigerant from the recovery unit.
8. When the Suction Pressure Gauge indicates a vacuum, Turn the SUCTIION VALVE to "OFF", Turn off the power to the recovery unit, and Disconnect the two refrigerant hoses.

Recovery and Purge Operations are now complete. The R100 is ready for the next job.

# COMPONENT LOCATION AND DESCRIPTION

1. **Suction Gauge** - Indicates the suction pressure of the recovery unit.
2. **Power Cord** - 6 foot long with grounded plug to be connected to a grounded 110 volt AC power source. (not shown)
3. **LED Status Lights**- Green “on”, Yellow “Tank Full”, Red “High Pressure Limit”
4. **System Switch**- Switch for turning on the recovery system compressor and fan. A 15 amp circuit breaker is integrated into the switch.
5. **Discharge Gauge** – Indicates the discharge pressure of the recovery unit’s condenser.
6. **Cooling Fan** - This fan provides airflow through the condenser and across the compressor.
7. **Suction Valve** - Valve for selecting either liquid or vapor recovery mode. The SUCTION port is closed when in the “OFF” position.
8. **Suction Port & Filter**- Fitting for connecting a refrigerant hose to the system to be recovered. Filter located under fitting. Clean or replace element.
9. **Discharge Port** - Fitting for connecting a refrigerant hose to the recovery tank. DISCHARGE port is closed when in the “OFF” position.
10. **Discharge Valve** – Valve used to select Recovery or Purge operation.
11. **Circuit Breaker**– 30 AMP breaker is non-integrated.
12. **Tank Overfill Sensor Cord**- used to connect to a tank float with a 3-prong Brad Harrison. (not shown) Shorting Cap also included.





# TROUBLESHOOTING INFORMATION

Problem	Possible Causes	Solution
R100 compressor and fan will not start	Power cord not plugged in	<ul style="list-style-type: none"> <li>• Plug in to energized socket</li> </ul>
	Socket not energized	<ul style="list-style-type: none"> <li>• Check socket for power</li> </ul>
	High Pressure Switch activated	<ul style="list-style-type: none"> <li>• Check for restrictions</li> <li>• Check recovery tank</li> </ul>
	Tank Overfill Sensor activated	<ul style="list-style-type: none"> <li>• Turn off power to reset</li> </ul>
	Circuit Breaker is tripped	<ul style="list-style-type: none"> <li>• Reset circuit breaker</li> </ul>
	Defective system switch	<ul style="list-style-type: none"> <li>• Replace switch</li> </ul>
	Broken or loose wire	<ul style="list-style-type: none"> <li>• Repair electrical connection</li> </ul>
R100 compressor will not start but fan runs	Compressor Start relay or capacitor defective	<ul style="list-style-type: none"> <li>• Replace the relay or capacitor</li> </ul>
	Compressor thermal overload is tripped	<ul style="list-style-type: none"> <li>• Thermal overload will automatically reset</li> </ul>
	Compressor leads are broken or loose	<ul style="list-style-type: none"> <li>• Repair compressor leads</li> </ul>
R100 starts but stops after a short period	Restriction in the discharge line tripping the high pressure switch	<ul style="list-style-type: none"> <li>• Open valve on recovery tank</li> <li>• Check for other restrictions</li> <li>• Turn off power to reset</li> </ul>
R100 trips circuit breaker upon start up	High differential pressure across compressor suction and discharge valves	<ul style="list-style-type: none"> <li>• Turn Discharge Valve to the PURGE position for 5 seconds. Return valve back to RECOVERY position.</li> </ul>
R100 will not perform liquid push-pull recovery	System to be serviced does not allow liquid recovery	<ul style="list-style-type: none"> <li>• Use Direct Recovery method</li> </ul>

**TECHNICAL SUPPORT: 800-769-8370**

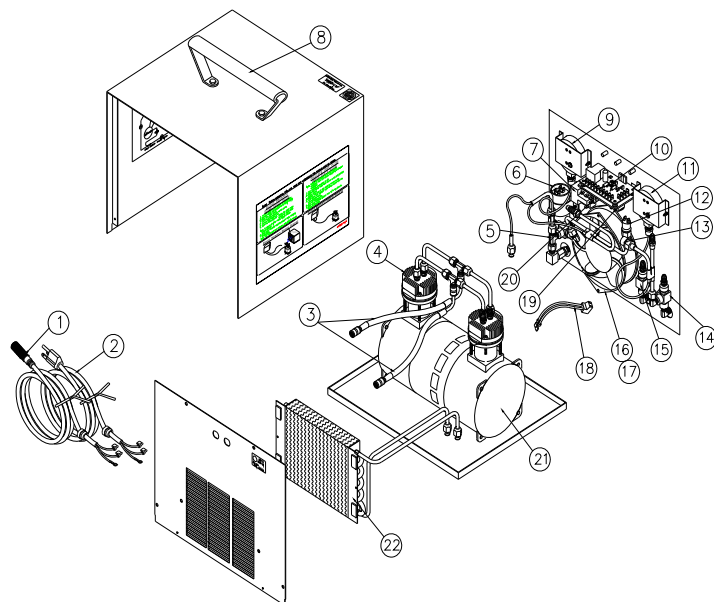
- Call this number if you require additional information on your YELLOW JACKET® Unit.

**FOR WARRANTY OR OTHER SERVICE:**

- Contact your YELLOW JACKET® Distributor

## Notes:

## REPAIR PARTS DIAGRAM



## REPAIR PARTS LIST

The following list contains the major components of the R100. To order these parts, please contact your YELLOW JACKET® Dealer.

Please have the following information available when you call.

Model:     R100     Serial Number:                      Date of Purchase:                     

	Part Number	Description
1	95248 95188	Tank Overfill Sensor Cord Shorting Cap
2	95215	Power Cord
3		Compressor hoses
4	95154	Compressor (includes head)
5	95251	Suction Valve w/ Strainer
6	95190	Capacitor
7	95233	Compressor Relay
8	95252	Foam for Handles
9	95213	Low Pressure Gauge
10	95212	High Pressure Gauge
11	95253	PC Board w/Remote LED's

	Part Number	Description
12	G-95254 Y-95255 R-95256	Remote LED's
13	95173	High Pressure Switch
14	95206	Discharge Valve
15	95257	Fan
16	95241	Guard
17	95232	Circuit Breaker
18	95216	Rocker Switch
19	95228	Condenser
20	95163	2 psig Check Valve
21	95247	10 psig Check Valve
22	95258	Operation Manual

***Ritchie***®  
**ENGINEERING COMPANY INC.**

***[www.yellowjacket.com](http://www.yellowjacket.com)***

Recovery Division  
6701 West 110th Street  
Bloomington, MN 55438 USA

Phone: 952-943-1333  
Phone: 800-769-8370  
Fax: 952-943-1605  
Fax: 800-322-8684

Email: [custserv@yellowjacket.com](mailto:custserv@yellowjacket.com)  
Web: [www.yellowjacket.com](http://www.yellowjacket.com)