



AUTOMOTIVE REFRIGERANT ANALYZER

OPERATION MANUAL

Analyzer Part Number: 68941



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For Your Safety:

PLEASE READ THIS MANUAL IN ITS ENTIRETY BEFORE ATTEMPTING INSTALLATION OR OPERATION! Attempting to operate the YELLOW JACKET 68941 without fully understanding its features and functions may result in unsafe conditions

- Always use protective eye wear and observe proper safety procedures when working with pressurized gases.

Identifier Warnings

- **Counterfeit Refrigerant Warning:** Counterfeit refrigerant blends containing highly dangerous substances have been found in the marketplace. These substances include, but are not limited to, R40 (Methyl Chloride or Chloromethane). This and other substances require extreme care and special handling. It is the responsibility of the user to understand the life threatening dangers of these substances and take appropriate cautionary measures when connecting this device to the service port of the system. Failure to take appropriate precautions may result in fire, explosion, injury or death.
- **Sample Filter Warning:** Replace the sample filter of the instrument AS SOON AS RED SPOTS OR DISCOLORATION BEGIN TO APPEAR ON THE OUTSIDE DIAMETER OF THE WHITE ELEMENT. Failure to properly maintain and replace the sample filter will result in severe damage.
- **Sample Input Warning:** The instrument requires connection of the supplied sample hose to the LOW SIDE OR VAPOR port of refrigerant storage cylinders or air conditioning systems. DO NOT attempt to introduce liquid or samples heavily laden with oil into the instrument. DO NOT connect the sample hose to the HIGH SIDE or LIQUID port! Liquid or oil laden samples will cause severe damage to the instrument that will not be covered under warranty repairs.
- Connection to power sources greater than 13V DC could cause “out of warranty” damage. Only the supplied power supply or factory supplied replacement may be used.
- No operator access is permitted inside the enclosure.
- If the equipment is used in a manner not specified by the manufacturer, the protection by the equipment may be impaired.

General Cautions



Operate this unit with vehicles or cylinders marked to contain R-1234yf refrigerant. Cross-contamination with other refrigerant types causes severe damage to the A/C system, to service tools, and equipment. Do NOT attempt to adapt the unit for another refrigerant. Do NOT mix refrigerant types through a system or in the same container.



Some vehicles may contain illegal substitute refrigerants that may contain hydrocarbons. R-1234yf is considered a flammable substance. Failure to follow the manual can result in serious injury or death. Less than 2 grams of R-1234yf and unknown sample types are required to be vented with each sample. This identifier is designed with sealed heat sources and without sparking components. Ensure adequate ventilation in the recycling machine design to prevent the accumulation of refrigerants.



DO NOT breathe refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose, and throat. If accidental system discharge occurs, immediately ventilate the work area. There must be adequate ventilation in the vehicle servicing area.



The air detection sensor is a chemical fuel cell sensor that will eventually expire. The user must return the unit to replace the air detection sensor whenever the instrument indicates as such. Failure to replace the air detection sensor will result in non- functionality of the instrument.



Wear eye and skin protection when working with refrigerants. Escaping refrigerant vapors can freeze upon contact. Do NOT direct refrigerant escaping from the sample hose toward exposed skin or toward the face.

WELCOME

Thank you for purchasing the YELLOW JACKET 68941 Refrigerant Identifier.

The YELLOW JACKET 68941 is the most advanced refrigerant identifier ever designed for determining the purity of specific gaseous refrigerants. It has many features to offer the user, which will be described in this manual. **We recommend that all personnel who use this instrument read this manual to become more familiar with its proper operation.**

For further information regarding the application, operation or spare parts, please contact the Ritchie Engineering Co., Inc. Customer Service Department. If you have questions or comments, we would like to hear from you.

Ritchie Engineering Co., Inc.
10950 Hampshire Avenue South
Bloomington, MN 55438
Tel: (952) 767-7208

EMAIL: custserv@yellowjacket.com
Visit us at www.yellowjacket.com

1

INTRODUCTION AND OVERVIEW

1.1 General

Contamination of refrigerants either in storage cylinders or air conditioning systems can lead to component corrosion, elevated head pressures and system failures when utilized by unsuspecting technicians. The ability of the technician to determine refrigerant type and purity is severely hampered by the presence of air when attempting to utilize temperature-pressure relations. The development and introduction of various counterfeit and substitute refrigerants further complicate the ability of a technician to identify refrigerant purity based upon temperature-pressure relationships. The counterfeit and substitute refrigerant blends can also introduce a flammability hazard to the technician and the ultimate end user of the air conditioning system.

The YELLOW JACKET 68941 Refrigerant Identifier will provide a fast, easy and accurate means to determine refrigerant purity in refrigerant storage cylinders or directly in air conditioning systems. The instrument utilizes non-dispersive infrared (NDIR) technology to determine the weight concentrations of refrigerant types R134a, R12, R22, Hydrocarbons, "Unknown" and Air. Refrigerant purity is automatically determined for R134a refrigerant by the instrument to eliminate human error.

The instrument is supplied complete with a ¼" flare and R134a sample hose, a R134a adapter fitting to permit sampling of ACME ported cylinders, a 12 VDC power supply and all required plumbing housed within a rugged, portable, storage case.

Sample gas is admitted into the instrument through the supplied sample hose and presented to the sensing device. The instrument provides the user with direct, % by weight, concentrations of R134a, R12, R22, Hydrocarbons, "Unknown" and Air. Note that the instrument does not consider air to be a contaminant since it can be removed by most refrigerant recycling equipment. Since air is not considered to be a contaminant, it is possible to read 100% R134a plus 5% air.

The instrument interfaces with the user with an LCD graphic display, status indicator lamps, and push button communication switches. Alarm indications are provided to alert the operator of instrument fault conditions or contaminated refrigerant presence. Direct, % by weight, concentrations of the sample refrigerant are provided on the display as well as user directions and prompts. An on-board printer is included to print on-the-spot test documentation.

1.2 Features

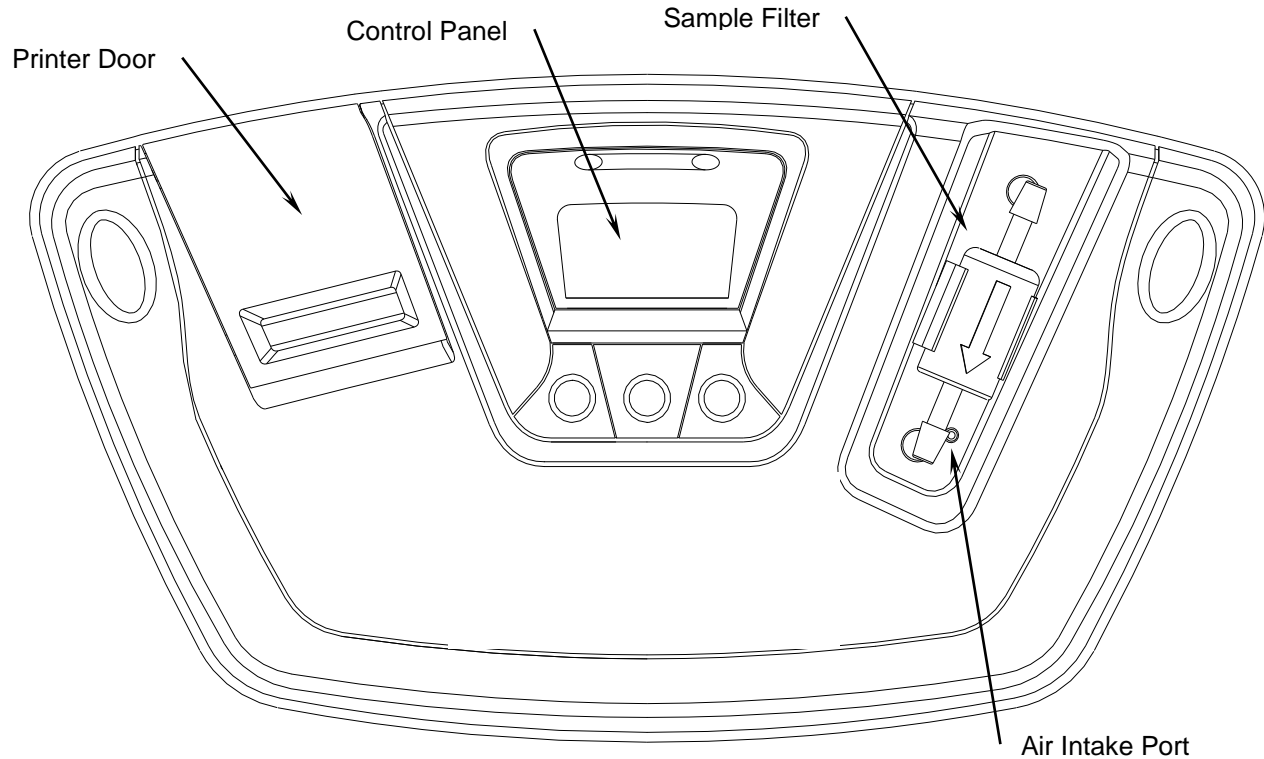
The YELLOW JACKET 68941 Refrigerant Identifier is the most advanced instrument ever manufactured for determining the purity of gaseous refrigerants for the automotive market.

- Advanced ergonomic design
- Large graphic display with on-screen instructions
- Ultra fast 90 second test time
- "Unknown" channel to represent many refrigerants that are not R134a, R12, R22 or Hydrocarbons
- Electrochemical Fuel Cell Air Sensor
- Built in printer for instant test documentation
- Internal, rechargeable battery for cordless operation in any location
- USB Port for Field Software Updates
- Hard shell carry/storage case

1.3 YELLOW JACKET 68941 Components

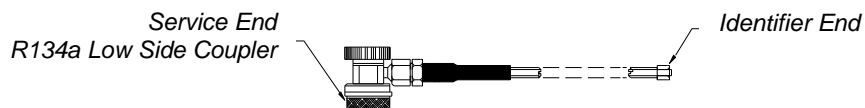
1.3.1 YELLOW JACKET 68941 Base Unit

The YELLOW JACKET 68941 base unit houses the Graphic Display, Infrared Bench, Electrical Connections, and Printer Module. These components require no maintenance, therefore **there are no serviceable components internal to the instrument, and disassembly will void the warranty.**



1.3.2 R134a Sample Hose

The 2 meter R134a Sample Hose is constructed of polyurethane ether with a plastic fitting on the analyzer end and a brass flow restrictor on the service end. The brass flow restrictor is mated to the R134a Low Side Coupler. The sample hose is considered a consumable maintenance part. (Replacement P/N 6-02-6001-32-0)



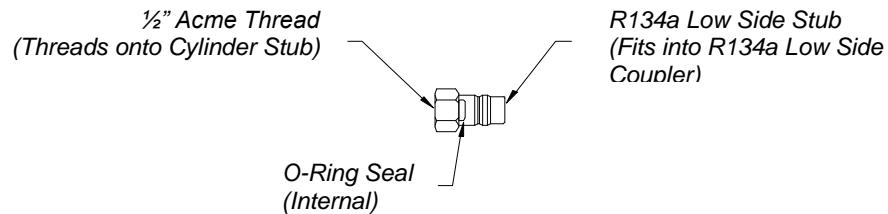
1/4" Flare Sample Hose

The 2 meter 1/4" Flare Sample Hose is constructed of polyurethane ether with a plastic fitting on the analyzer end and a brass flow restrictor on the service end. The brass flow restrictor is mated to a 1/4" Flare Low Side Connector. The flow restrictor, clear hose and plastic fitting are considered a consumable maintenance part.



1.3.3 R134a Tank Adapter Fitting

The R134a Tank Adapter Fitting will provide the user with an adapter to allow connection of the R134a sample hose to a R134a cylinder ACME port.

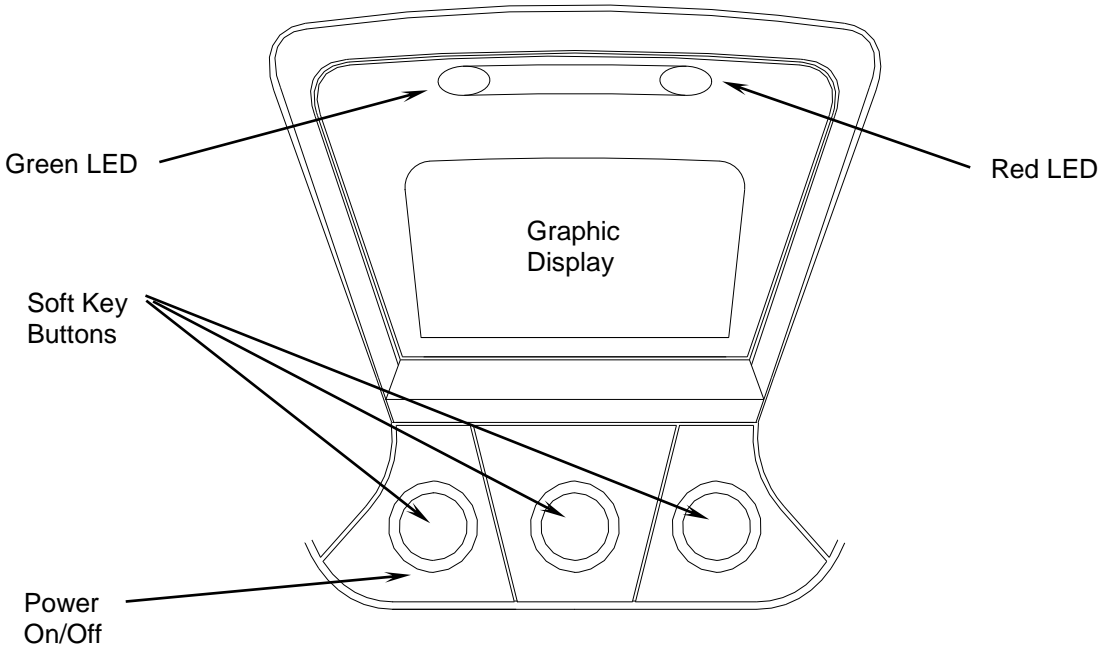


1.3.4 AC Power Adapter

The YELLOW JACKET 68941 is powered from an internal LiFe battery pack. A 12 VDC Power Adapter is supplied to charge the battery and power the unit simultaneously for uninterrupted use.

1.3.5 Control Panel

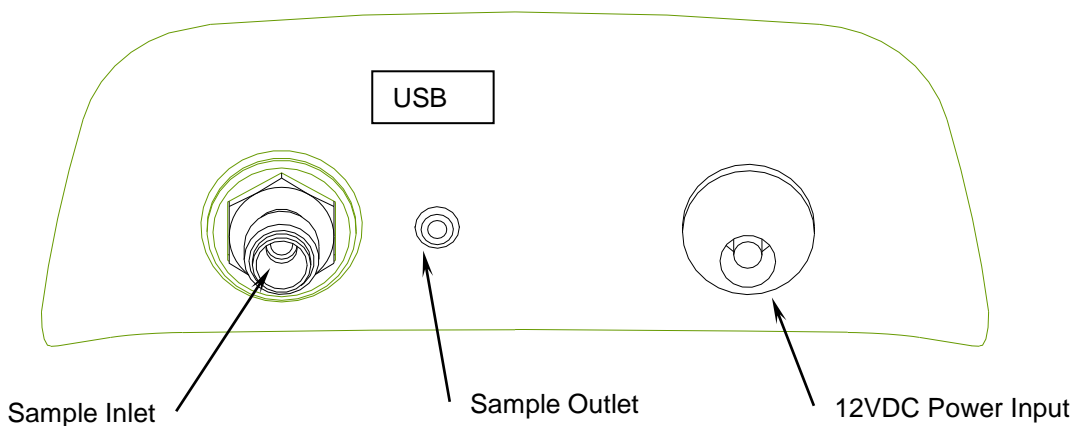
The Control Panel serves as the main user interface. The Control Panel features three soft key buttons that change their function as the instrument changes modes. The current function for each button is displayed by the soft key label at the bottom of the graphic display. Red and Green LED's at the top of the Control Panel are used for visual Pass/Fail indications.



1.3.6 Back Panel Connections

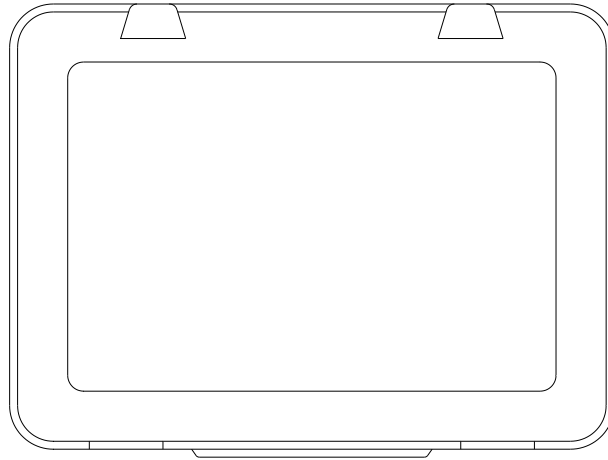
The connections located on the back panel are illustrated below.

CAUTION: The sample outlet port should never be obstructed. Keep the sample outlet port free and clear at all times. Do Not Connect anything to the USB Port except factory software updates.



1.3.7 Hard Shell Storage/Carrying Case

The hard shell storage/carrying case is custom fit to the YELLOW JACKET 68941. It provides rugged protection for the instrument as well as convenient storage for all components. The enclosure is general purpose and is not watertight.



2

YELLOW JACKET 68941 OPERATION

2.1 First Use

2.1.1 Battery Charging

The YELLOW JACKET 68941 has an internal, LiFe, rechargeable battery. **Charge the battery for a minimum of two hours with the supplied power supply prior to first use.**

2.2 Turning On the Unit

Press the left power button and the splash screen shown in **Figure 1** will appear. After selecting “OK”, the warm up screen shown in **Figure 2** will appear for 30 seconds followed by the calibration screen shown in **Figure 3**. **Connect the appropriate sample hose to the identifier now.**

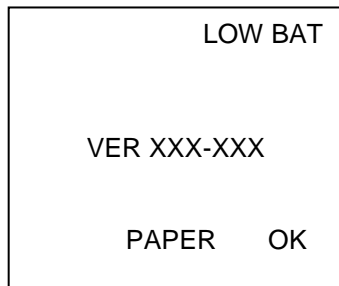


Figure 1

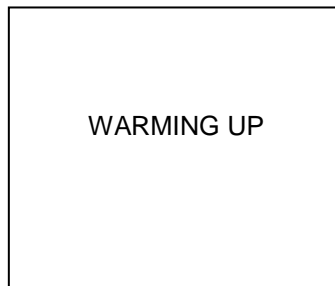


Figure 2

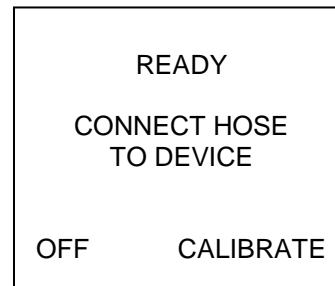


Figure 3

2.3 Calibration

Each time the YELLOW JACKET 68941 begins a new test cycle it must first self-calibrate. The calibration takes 30 seconds and brings fresh air into the unit via an internal pump. This fresh air purges any excess refrigerant from the unit and ensures accurate test results. Calibration requires that the hose be connected to the device and disconnected from the AC system or refrigerant cylinder. Pressing the “Calibrate” button shown in **Figure 3** will begin the calibration process and display the screen shown in **Figure 4**.

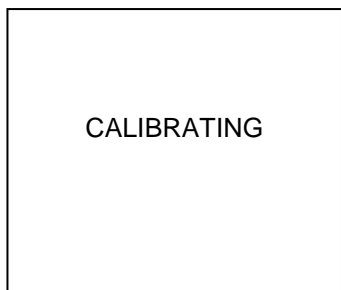


Figure 4

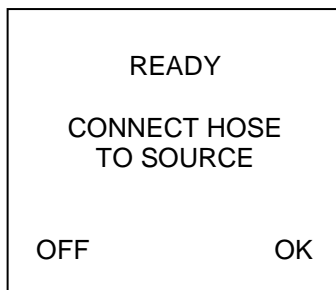


Figure 5

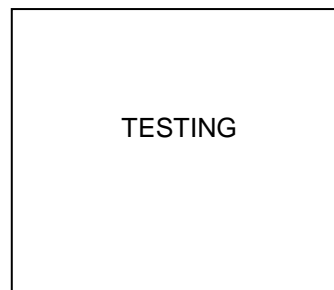


Figure 6

2.4 Testing the Refrigerant

After the self-calibration is complete, the instrument is ready for testing the refrigerant and will display the screen shown in **Figure 5**. Connect the hose to the Low Side Vapor Port of the AC system or cylinder and open the valve. Press the “OK” button to begin the test and the screen shown in **Figure 6** will be displayed.

2.5 Viewing the Test Results

Upon completion of the test, **close the source valve or disconnect the coupler**. The YELLOW JACKET 68941 will display a screen similar to that shown in **Figure 7** or **Figure 8**.

R134A:	92.2	
R12:	0.0	
R22:	4.1	
HC:	0.0	
UNK:	3.7	
AIR:	0.0	
OFF	PRINT	OK

Figure 7

R134A:	100.0	
R12:	0.0	
R22:	0.0	
HC:	0.0	
UNK:	0.0	
AIR:	1.5	
OFF	PRINT	OK

Figure 8

If the refrigerant tested is 99.9% - 100.0% pure R134A the Green LED will illuminate. Should the refrigerant be less than 99.9% pure, the Red LED will illuminate. In either case, pressing the left button will turn the unit “OFF”, the center button will “PRINT” the test results and the right “OK” button will return to the calibration screen shown in **Figure 3**.

Any indication on the “UNK” (Unknown) may indicate the presence of R40 or other highly dangerous substances. Extreme care should be used before taking any further action related to the AC System.

2.6 Printing the Test Results

The test results can be printed by selecting the “PRINT” button. After the print is complete, carefully tear off the printout and the unit will return to the previous screen. Additional printouts may be made following the same procedure. **Figure 9** and **Figure 10** show sample printouts for various test results.

```
68940
Refrigerant
Analyzer

- TESTED R134A -

R134A = 92.2%
R12 = 0.0%
R22 = 4.1%
HC = 0.0%
UNK = 3.7%
AIR = 0.0%

____
(Date)

____
(Technician)

XXXX-XXXX-XXXX
XXXX-XXXX-XXXX
```

Figure 9

```
68940
Refrigerant
Analyzer

- TESTED R134A -

R134A = 100.0%
R12 = 0.0%
R22 = 0.0%
HC = 0.0%
UNK = 0.0%
AIR = 1.5%

____
(Date)

____
(Technician)

XXXX-XXXX-XXXX
XXXX-XXXX-XXXX
```

Figure 10

3

MAINTENANCE & TROUBLESHOOTING

3.1 Installing Printer Paper

The YELLOW JACKET 68941 is equipped with an on-board printer and uses an inexpensive thermal paper for printing. The paper roll should be changed when a red stripe appears on the left side of the printout.

Open the printer door and remove the old roll by tearing the paper as it enters the printer then pressing the “PAPER” button shown in **Figure 11** until the old roll exits the printer completely. Insert the new paper roll from the underside as shown below:

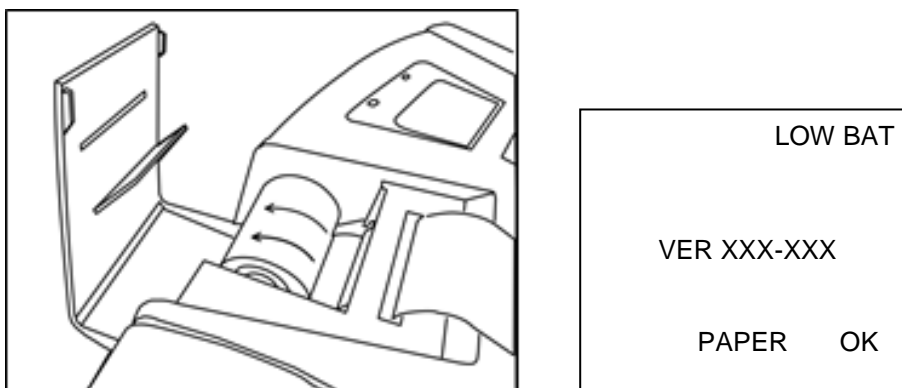


Figure 11

To feed the new paper roll, press the “PAPER” button on the Welcome screen as shown in **Figure 11**. This will feed the paper into the printer mechanism. Slide the paper through the slot in the printer door and close the door.

3.2 Changing the Sample Filter

When inspecting the sample filter, look completely around the entire outside diameter of the white filter element located inside of the clear plastic housing. Look for red spots or the beginnings of discoloration on the white outside diameter of the element. Do not look into the round ends of the white element for red spots or discoloration. The round ends of the filter may always appear red. If red spots or discolorations are discovered, the sample filter requires replacement to prevent the influx of particulate and oil mists into the instrument.

Obtain a replacement filter. Remove the existing filter from the retaining clip of the instrument by pulling straight up and out. CAREFULLY remove the flexible, black rubber tubing connections from both ends of the existing filter. DO NOT allow the tubes to slip back into the internal portion of the case. Discard the existing filter in an environmentally friendly manner.

Install the tube ends onto the barbs of the replacement filter, taking note to align the flow arrow of the filter with the flow arrow of the instrument top panel. CAREFULLY slide the tubing back into the internal portion of the instrument and seat the new filter into the retaining clip. Inspect the sample hoses for signs of oil entrapment. Replacement of the sample filter usually requires cleaning or replacement of the sample hoses.

3.3 Replacing the Sample Hoses

If the sample hose assemblies become discoloured damaged, or the instrument displays a repeated “High Air Content” error, the sample hose should be replaced.

3.4 Low Battery Warning

A “Low Bat” indication will appear on the upper right of the screen if the internal battery voltage falls below an acceptable level. The instrument should then be connected to AC power using the included power supply to recharge the battery.

3.5 Error Messages

In the unlikely event that an “Error” message is displayed on the screen, power off the unit, take it to a location outside of the shop environment where fresh air is available and turn the unit back on. If the “Error” message reappears, contact our service department for assistance.

Ritchie Engineering Co., Inc.
 10950 Hampshire Avenue South
 Bloomington, MN 55438
 Ph: 952-767-7208
custserv@yellowjacket.com

4 APPENDICES

4.1 Spare Parts List

PART NUMBER	DESCRIPTION
68948	Optional internal rechargeable battery kit with battery and 110V charger
68949	Optional 110/220V power adapter
68950	Thermal printer paper – 1 roll
68977	In line identifier replacement filter
68978	R-12 replacement hose
68979	R-134a replacement hose
68994	Replacement flow restrictor hose (3 pak)

4.2 Appendix B - Specifications

SAMPLE PARAMETERS:	Vapor only, oil-free, 300 psig (2 MPa) Maximum
DETECTED COMPOUNDS:	R134a, R12, R22, Hydrocarbons, Unknown & Air
SENSOR TECHNOLOGY:	Non-Dispersive Infrared (NDIR)
REFRIGERANT SAMPLE:	0.15 ounces (4 grams) per sample
ACCURACY:	Better than +/- 2% for detected compounds when the R134A value exceeds 90%. R40 Detection begins between 2 – 3%.
POWER:	12 VDC, 2 Amps Maximum
OPERATIONAL TEMPERATURE:	50 - 122°F (10 - 50 °C)
UNKNOWN REFRIGERANTS	The YELLOW JACKET 68941 is capable of detecting the presence of refrigerants such as R40, R32, R125, etc. and will display them in the “Unknown” Channel. Detection of these refrigerants begins at concentrations between 2 - 3%.