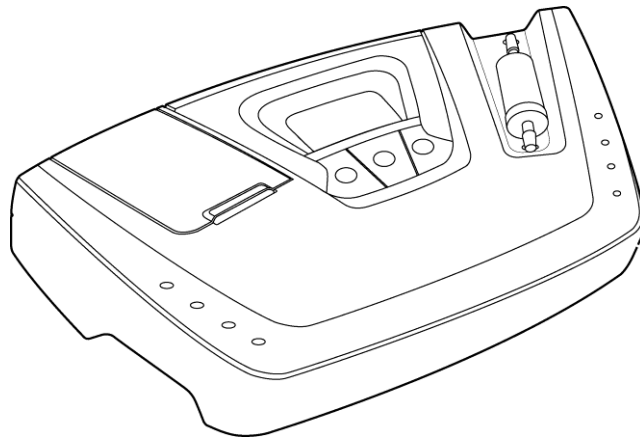




# **Refrigerant Identifier for R-134a and R-1234yf**

**(P/N 37865)**



## **OPERATION MANUAL**

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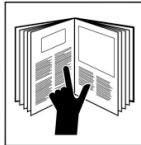
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# Safety Precautions

WARNING: To prevent personal injury:



Study, understand, and follow all warnings in this manual before operating this unit. If the operator cannot read these instructions, operating instructions and safety precautions must be read and discussed in the operator's native language.



Operate this unit with vehicles or cylinders marked to contain R-1234yf or R134a 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 refrigerant 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. Use recycling equipment certified to meet the requirements of SAE J2788, J2843, or J2851 to remove refrigerant from the A/C system. If accidental system discharge occurs, immediately ventilate the work area. There must be adequate ventilation in the vehicle servicing area.



The optional 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.

Connection to power sources greater than 13V DC could cause "out of warranty" damage.

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**

Always inspect the sample hose before each use. Replace the hose if it appears cracked, frayed, obstructed or fouled with oil.

ALWAYS turn the compressor or automobile engine off before connecting the instrument to an air conditioning system.

Always wear eye and skin protection when working with refrigerants. Escaping refrigerant vapors will present a freezing danger.

To reduce the risk of electrical shock, do not disassemble the instrument; do not use the instrument in wet or damp areas.

DO NOT direct refrigerant vapors venting from hoses towards the skin.

DO NOT disassemble the instrument. There are no serviceable components internal to the instrument and disassembly will void the warranty.

ALWAYS place the Identifier on a flat and sturdy surface.

DO NOT utilize any other hose other than those supplied with the instrument. The use of other hose types will introduce errors into the refrigerant analysis and instrument calibration.

ALWAYS verify that the refrigerant to be tested does not contain or will not emit heavy loads of oil or liquid.

NEVER admit any sample into the instrument at pressures in excess of 300 psig.

DO NOT utilize the coupler supplied on the service end of the R134a or R1234yf Sample Hoses for any application other than with the instrument. The coupler supplied is a modified version that does not contain a check valve and is not suitable for any other refrigerant application.

NEVER obstruct the air intake, sample exhaust or case vent ports of the instrument during use.

This refrigerant identifier is designed for use independently or in conjunction with an SAE J2843 approved A/C Service Machine to determine the purity of gaseous R134a or R1234yf refrigerant. 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 Customer Service Department. If you have questions or comments, we would like to hear from you.

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# **1** INTRODUCTION AND OVERVIEW

## **1.1 General**

Contamination of refrigerants either in storage cylinders or vehicle 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 of various substitute refrigerants further complicates the ability of a technician to identify refrigerant purity based upon temperature-pressure relationships. The substitute refrigerant blends can also introduce a flammability hazard to the technician and the ultimate end user of the vehicle air conditioning system.

This R134a and R1234yf Refrigerant Identifier will provide a fast, easy and accurate means to determine refrigerant purity in refrigerant storage cylinders or directly in vehicle air conditioning systems. The instrument utilizes non-dispersive infrared (NDIR) technology to determine the weight concentration of R1234yf or R134a refrigerant. Acceptable refrigerant purity as it relates to this instrument, has been defined by the SAE as a refrigerant mixture that contains 98.0%, or greater of R1234yf or R134a, by weight.

The instrument is supplied complete with an R1234yf sample hose, and R134a sample hose, 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 a digital display of refrigerant purity. The instrument only considers the weights of the refrigerant and contaminants in the total mixture. Air is measured, and displayed, separately. Other contents such as refrigerant oil and dye are not considered contaminants.

The instrument interfaces with the user with an LCD graphic display, status indicator lamps, push button communication switches and an alarm horn. Alarm indications are provided to alert of instrument fault conditions or contaminated refrigerant presence.

## **1.2 Features**

The YELLOW JACKET 37865 Refrigerant Identifier is the most precise handheld instrument ever manufactured for determining the purity of R1234yf and R134a for the automotive market.

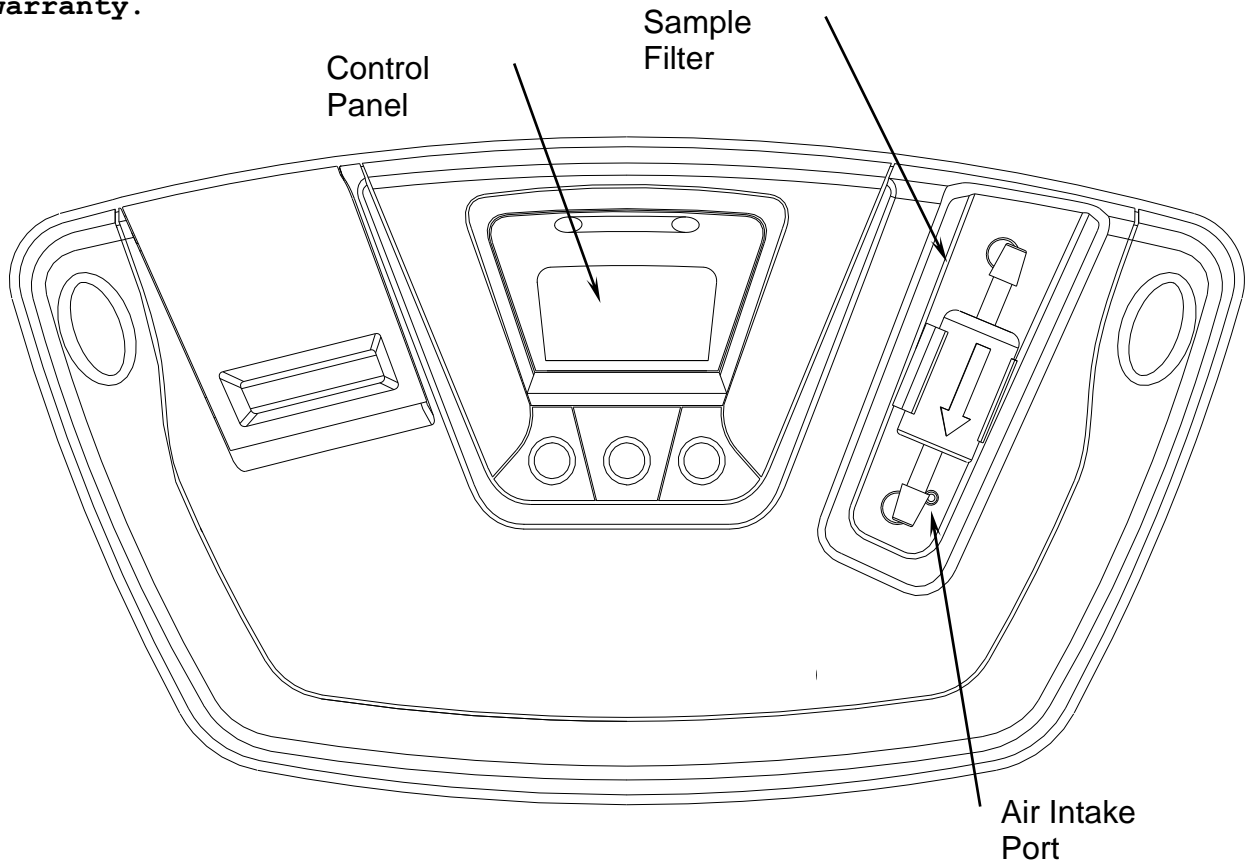
### **Features Include:**

- Advanced ergonomic design
- Fender friendly resting surface
- Large graphic display with on-screen instructions
- Ultra-fast 70 second test time
- Internal, rechargeable battery for cordless operation in any location
- USB Port for connection to the AC Service Machine
- Hard shell carry/storage case

## YELLOW JACKET 37865 Components

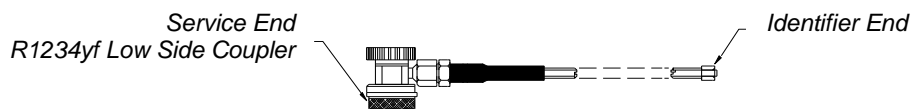
### 1.2.1 Base Unit

The 37865 base unit houses the Graphic Display, Infrared Bench, Electrical Connections, and Rechargeable Battery. These components require no maintenance, therefore **there are no serviceable components internal to the instrument, and disassembly will void the warranty.**



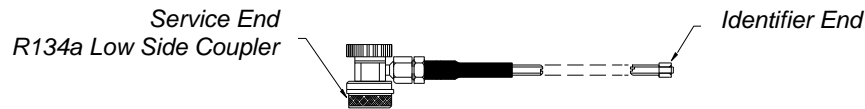
### 1.2.2 R1234yf Sample Hose

The 2-meter Sample Hose is constructed of polyurethane ether. The hose is provided with an instrument inlet port mating connector on one end and a brass flow/pressure reducer on the other end that screws into the R1234yf Low Side Coupler. The sample hose is considered a consumable maintenance part. A spare hose with Flow Restrictor only is also provided.

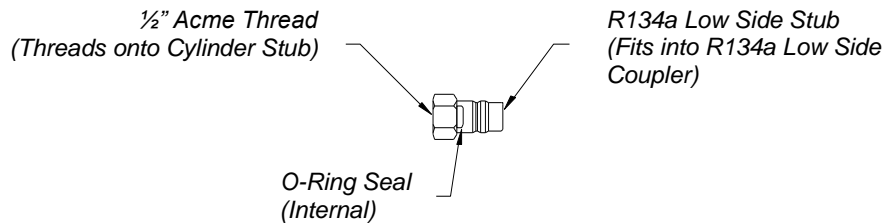


### 1.2.3 R134a Sample Hose

The 2-meter Sample Hose is constructed of polyurethane ether. The hose is provided with an instrument inlet port mating connector on one end and a brass flow/pressure reducer on the other end that screws into the R134a Low Side Coupler. The sample hose is considered a consumable maintenance part. A spare hose with Flow Restrictor only is also provided.



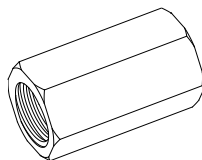
### 1.2.4 R134a Tank Adapter Fitting



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

### 1.2.5 R1234yf Tank Adapter Fitting

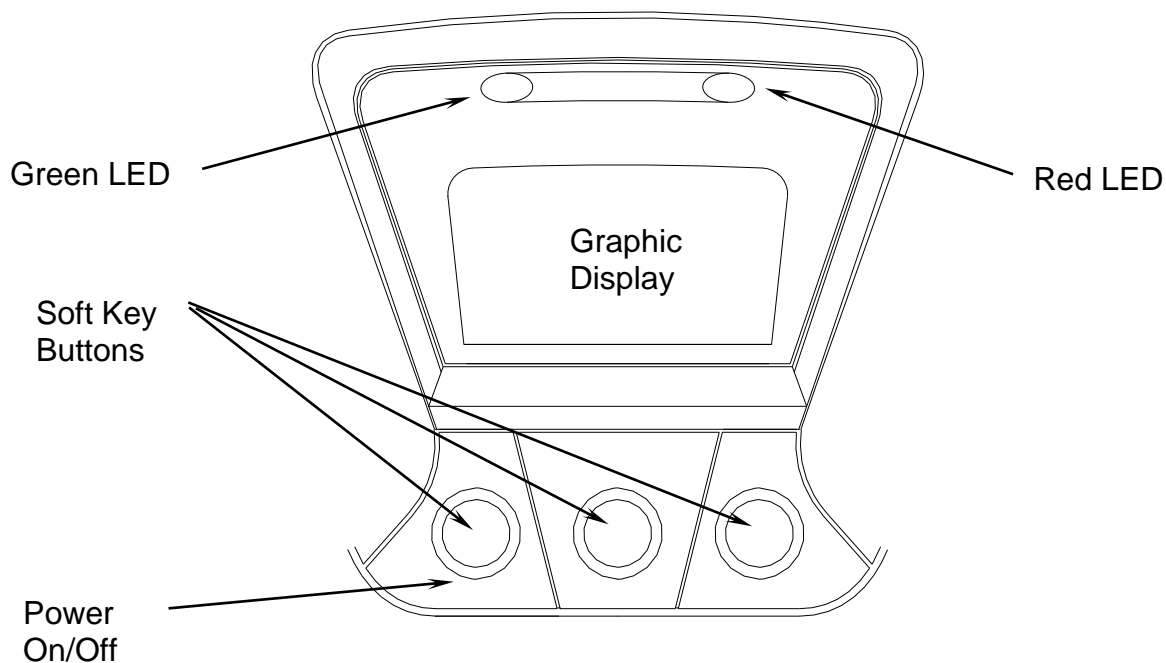
The R1234yf Tank Adapter Fitting will provide the user with an adapter to allow connection of the M12 Flow Restrictor to the 1/2" LH Acme threads on the R1234yf cylinder.





### 1.2.6 Control Panel

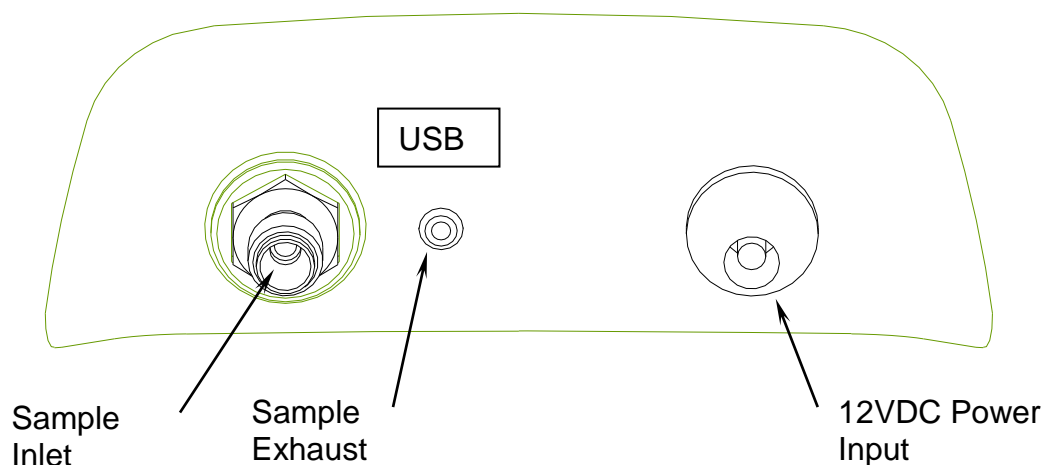
The Control Panel serves as the main user interface. The Control Panel features three soft key buttons that change their function as the instrument changes modes. The current function for each button is displayed by the soft key label at the bottom of the graphic display. Red and Green LED's at the top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



### 1.2.7 Back Panel Connections

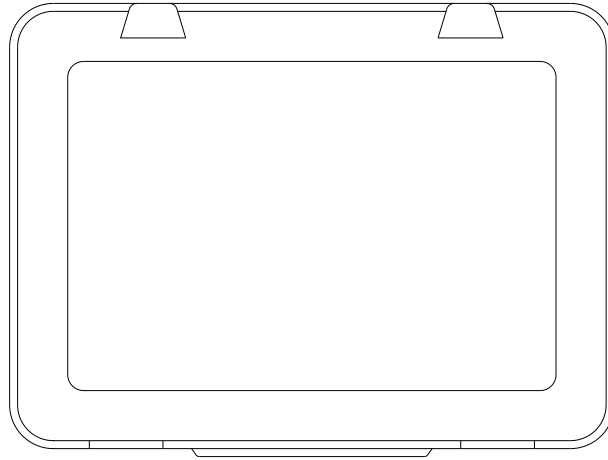
The connections located on the back panel are illustrated below.

**CAUTION:** The sample outlet port should never be obstructed. Keep the sample outlet port free and clear at all times.



### 1.2.8 Hard Shell Storage/Carrying Case

The hard-shell storage/carrying case is custom fit to the Handheld R1234yf. 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 37865 OPERATION

## 2.1 First Use

Charge the battery for a minimum of 2 hours with the included power supply prior to first use.

## 2.2 Turning on the Unit

For use with an SAE J2843 certified AC Service Machine, connect one end of the provided USB cable to the USB port on the back of the identifier and connect the other end of the USB cable to the R1234yf AC Service Machine. If the unit is being used as an independent device or for testing of R134a systems, the USB cable need not be connected.

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 "Select Refrigerant" screen shown in **Figure 3**. (The "HELP" button functions are described in section 3.)

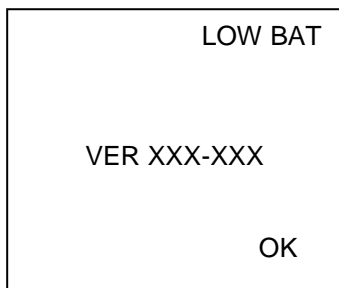


Figure 1

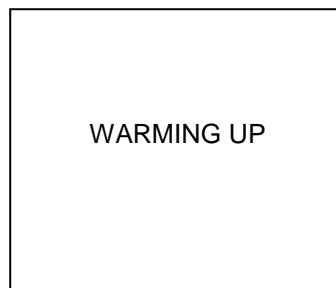


Figure 2

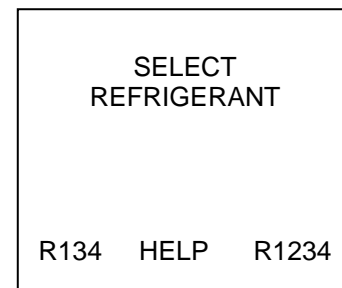


Figure 3

## 2.3 Calibration

Each time the YELLOW JACKET 37865 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 **MUST** be connected to the device and disconnected from the vehicle or refrigerant cylinder. Select the refrigerant to be tested as shown in **Figure 3**. Follow the on-screen instructions shown in **Figure 4** and then press the "CALIBRATE" button. This will begin the calibration process and display the screens shown in **Figure 5** followed by **Figure 6**.

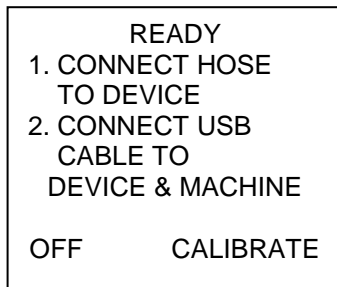


Figure 4

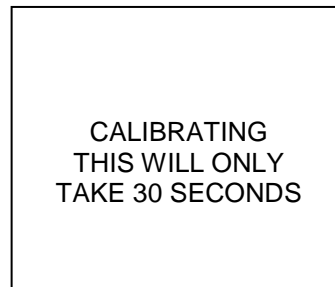


Figure 5

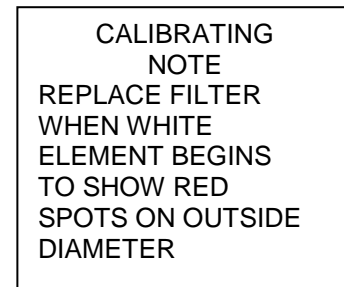


Figure 6

## 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 7**. Connect the hose to the vehicle and open the valve. Press the "OK" button to begin the test and the screen shown in **Figure 8** will be displayed. The screen shown in **Figure 9** will be displayed if any of the following conditions exist.

- The device is not connected to a refrigerant source.
- The coupler valve is not open.
- The Brass Flow Restrictor is clogged with oil or debris.
- The source contains little or no refrigerant.

READY

1. CONNECT HOSE TO SOURCE
2. OPEN VALVE
3. PRESS OK

OFF                      OK

Figure 7

TESTING  
RXXX SAMPLE

THIS WILL ONLY  
TAKE 60 SECONDS

Figure 8

HIGH AIR CONTENT

1. CHECK HOSE COUPLER VALVE
2. CHECK BRASS FLOW RESTRICTOR

OFF                      OK

Figure 9

## 2.5 Viewing the Test Results

Upon completion of the test, the YELLOW JACKET 37865 will display a screen like that shown in **Figure 10** or **Figure 11**. Selecting "OFF" to power down the device, "PRINT" to print the results or "OK" to return to the Select Refrigerant Screen shown in **Figure 3**.

R134:	98.0	
R12:	0.0	
R22:	0.0	
HC:	2.0	
UNK:	0.0	
AIR:	1.0	
OFF	PRINT	OK

Figure 10

R134:	1.7	
R1234:	98.3	
R22:	0.0	
HC:	0.0	
UNK:	0.0	
AIR:	1.5	
OFF	PRINT	OK

Figure 11

If the refrigerant tested is 98.0% pure or better, the refrigerant is deemed suitable for standard recovery and reuse. Should the refrigerant be less than 98.0% pure, the refrigerant is not suitable for standard recovery and should not be reused. In either case, disconnect the hose from the vehicle and press either "OK" to return to the calibration mode or "OFF" to turn the instrument off.

# 3

## MAINTENANCE & TROUBLESHOOTING

### 3.1 Changing the Sample Hoses

If the instrument displays an error or discoloration appears in the sample hose near the service coupler, the sample hose should be replaced.

### 3.2 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 device should then be connected to AC power using the included power supply to recharge the battery.

### 3.3 Help Button

Pressing the "HELP" button as shown in Figure 12 will provide access to various device settings as shown in Figure 13.

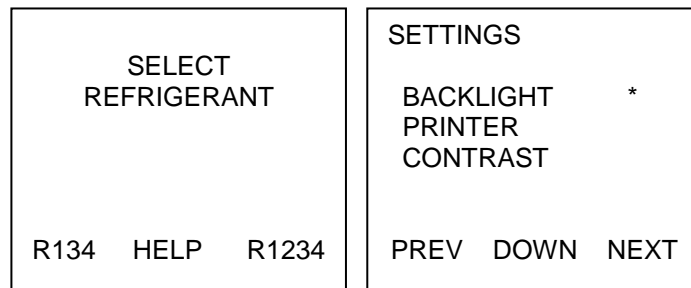


Figure 12

Figure 13

Using the center button, scroll to the desired setting you wish to change. Use the right button to select the setting and the left button to return to the previous screen.

- BACKLIGHT will allow the backlight to be turned on or off when the device is running on battery power.
- PRINTER will allow paper to be fed into the printer when replacing a printer paper roll.
- CONTRAST will allow the screen brightness to be adjusted.

When the user is finished making adjustments, press the "PREV" button to return to the Select Refrigerant Screen shown in **Figure 3**.

### 3.4 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 (see page 4).

# 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
68977	In line identifier replacement filter
68978	R-12 replacement hose
68979	R-134a replacement hose

## 4.2 Specifications

<b>SAMPLE PARAMETERS:</b>	Vapor only, oil-free, 300 psig (2 MPa) Maximum
<b>DETECTED COMPOUNDS:</b>	R134a, R1234yf, R12, R22, HC, Unknown, Air
<b>SENSOR TECHNOLOGY:</b>	Non-Dispersive Infrared (NDIR)
<b>REFRIGERANT SAMPLE SIZE:</b>	2 grams per sample
<b>POWER:</b>	12 VDC, 2 Amps Maximum