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FEATURES

- **Low and High Side Pressure**
- **Vapor and Liquid Saturation**
- **High and Low Side Temperatures**
- **Superheat**
- **Subcool**
- **Pressure Differential**
- **Temperature Differential**
- **Digital Manifold w/ 4 valves**
- **Max/Min**
- **12 Parameter Backlit display**
- **Reads in Psi, kPa, Bar, Mpa**
- **Bargraph (Relative)**
- **Zero to recalibrate**
- **64 Refrigerant options**
- **Selectable °F or °C**
- **Over molded grip**
- **Thermistor temperature ports**

GENERAL SPECIFICATIONS

- **Operating Temperature:** -4° to 122°F (-20° to 50°C)
- **Storage Temperature** -4° to 122°F (-20° to 50°C)
- **Dimensions:** 7 3/4" X 7 1/2" X 3 1/2"
- **Item Weight:** 2.97 lbs
- **Calibration:** Recommended annually
- **Battery Type:** 9V X 1

QUICK START INSTRUCTIONS

- Install 1 (9V) battery into back of analyzer.
- Press Power (Green) button to turn on analyzer.
- Display: 12 Parameter screen:
 1. Low Side Pressure value.
 2. High Side Pressure value.
 3. Vapor Saturation temperature.
 4. Liquid Saturation temperature.
 5. T-Low.
 6. T-High.

Display will not show temperatures if sensors are NOT connected to the Temperature Clamp Sensor ports.
 7. Superheat.
 8. Subcool.
 9. Refrigerant selected.
 10. Time: (HH:MM) Test Duration.
 11. ΔP (Delta pressure).
 12. ΔT (Delta temperature).
 - Unit of Measurement.
 - Low Side Relative Pressure Bargraph: Each segment is 0.25 Psi.
 - High Side Relative Pressure Bargraph: Each segment is 1.0 Psi.
 - The Relative Bargraph shows real time changes in pressure. The center bar is stable. If the pressure is increasing, the bars will go to right. If the pressure is decreasing, the bars will go to the left.
- Review and follow all **Important Safety Warnings** (see page 6).
- Connect the AK940 to the system to be tested.
- You are now ready to test.

NOTE: See diagram (page 19) – Connecting AK940 in Operating Instructions.

IMPORTANT SAFETY WARNINGS

WARNING

Read entire Safety Notes section regarding potential hazard and proper instructions before using this meter. In this manual the word “**WARNING**” is used to indicate conditions or actions that may pose physical hazards to the user. The word “**CAUTION**” is used to indicate conditions or actions that may damage this instrument.

WARNING

- **WARNING:** Do not exceed Maximum Over Pressure of **600 Psi**.
- Do not use the analyzer if it operates abnormally. Protection may be impaired.
- Do not operate this analyzer or service batteries around explosive gas, vapor or dust.
- Various refrigerants have been intentionally excluded for very significant reasons. Never use refrigerants in this analyzer that are not listed in the Refrigerant Selection menu or Operating Instructions.
- The refrigerant database in this analyzer may include refrigerants classified as flammable. If such refrigerants are selected, the operator may need additional certifications and/or training. Consult with your local and state governments and fully comply with all requirements.
- Always inspect the sample hoses before each use. Replace the hoses if they appear cracked, frayed, obstructed or fouled with oil.
- Always wear eye and skin protection when working with refrigerants. Escaping refrigerants will present a freezing danger. Do not direct refrigerants vapors venting towards the skin.
- Do not breathe refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. If accidental system discharge occurs, immediately ventilate work area.
- Because this analyzer allows for various inputs including electrical and mechanical, care must be taken to observe any ways that a shock hazard could develop. Wet or humid conditions, along with damaged temperature sensor clamp could allow an electrical path across the analyzer and over wet hoses. Keep all interconnected equipment clean, organized and in proper condition. Do not use the analyzer if you are not qualified to recognize potential electrical faults.

CAUTION: To avoid damage to the analyzer, follow these guidelines:

- Do not allow pressures beyond what specifications are listed in this manual.
- Be aware that internal pressures can change unintentionally when equipment is stored with pressure in the system during temperature changes. If subcooled liquid refrigerant is trapped in a hose or manifold with no room for expansion, it may

result in dramatic pressure variations with seemingly small temperature changes. Pressures can reach high enough levels to cause damage to the instrument's pressure sensors. Release liquid refrigerant from the hoses and manifold when disconnecting from a system.

- Do not attempt to introduce liquid or samples heavily laden with oil into the analyzer.
- Do not use this analyzer on systems containing leak sealing chemicals. These leak sealants can collect and harden in the analyzer, causing permanent damage.
- Do not utilize any hose other than those supplied with the analyzer (or supplied by UEi). The use of other hose types will introduce errors into the refrigerant analysis and instrument calibration.
- Never obstruct the air intake, sample exhaust or case vent ports of the analyzer during use.

 **WARNING**

- The analyzer contains no internal user-serviceable parts other than batteries that may be accessed through the battery cover. Do not open the analyzer other than opening the battery cover.

 **WARNING**

- To ensure safe operation and service of the analyzer, follow these instructions. Failure to observe these warnings can result in severe injury or death.
- **NOTE:** *It is unlawful to discharge or exhaust refrigerants into the atmosphere. It is recommended to recycle or recover refrigerants. Check with your local government agencies for refrigerant handling regulations.*

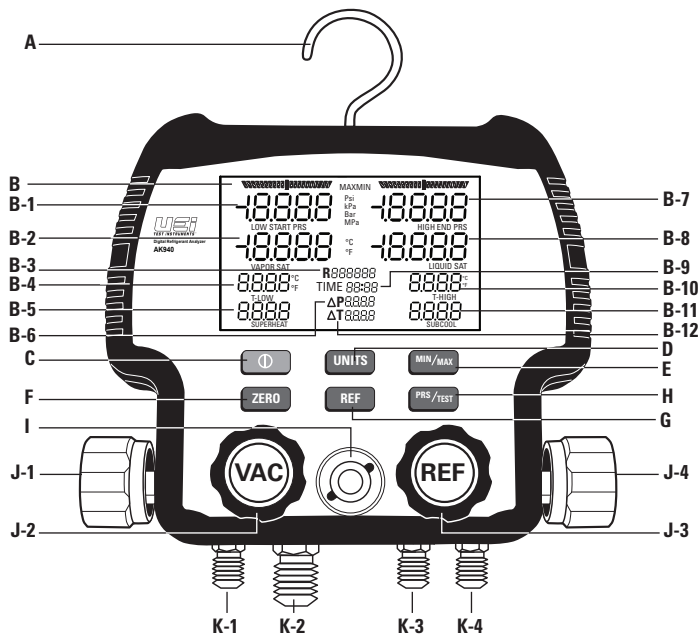
 **WARNING**

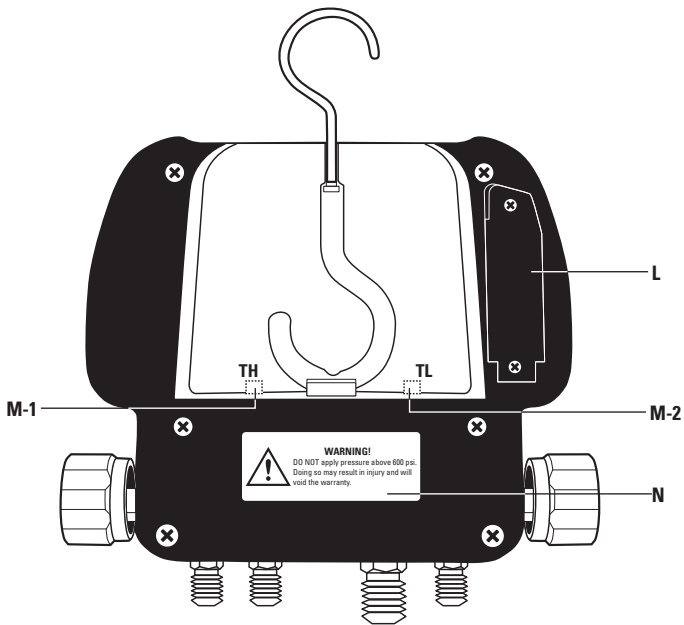
- This analyzer is designed for trained trade professionals who are familiar with the hazards of their trade. Observe all recommended safety procedures and use of personal protective equipment. For vapor compression refrigeration, air conditioning and heat pump systems; servicing of refrigeration systems requires special training to ensure the safety of the service person, building, occupants, local and global environments.

SYMBOLS

MAX	Maximum measured value displayed	MIN	Minimum measured value displayed
°F	Degrees Fahrenheit	°C	Degrees Celsius
—	Polarity	⚠	Warning or Caution
🕶	Eye Protection Recommended	⚡	High Voltage Risk

OVERVIEW





A. Hanger Hook: with 360° swivel.

B. Display: 12 Parameter screen:

1. Low Side Pressure value.
2. Vapor Saturation temperature.
3. Refrigerant.
4. T-Low.
5. Superheat.
6. ΔP (Delta pressure). Displayed numerically to right of ΔP .
7. High Side Pressure value.

8. Liquid Saturation temperature.
9. Time: (HH:MM) Test Duration. Time starts counting as soon as Analyzer is powered on. Time (Test Duration) resets to zero when Pressure Test button is pressed. Time resets to zero when Pressure Test mode is exited.
10. T-High.
11. Subcool.
12. ΔT (Delta temperature): Displayed numerically to right of ΔT .
 - Unit of measurement.
 - Temperature Scale.
 - Low Side Relative Pressure Bargraph: Each segment is 0.25 psi.
 - High Side Relative Pressure Bargraph: Each segment is 1.0 psi.
 - The Relative Bargraph shows real time changes in pressure. The center bar is stable. If the pressure is increasing, the bars will go to right. If the pressure is decreasing, the bars will go to the left.
 - Backlight: Backlight will stay on until turned off.

C. Power Button (Green):

- Press and hold to turn on analyzer. Press briefly when analyzer is on to turn on Backlight. Press briefly to turn off Backlight. Press and Hold to turn analyzer off.
- Auto power off after 30 minutes.

D. Units Button: Changes unit of measurement for pressure and temperature scale.

E. Min/Max Button:

- Used to Capture Maximum and Minimum values.

F. Zero Button: Used to zero analyzer and compensate for ambient pressure changes or sensor drift.

G. Refrigerant Button: Used to select desired refrigerant.

H. Pressure Test Button: Used to start and stop pressure test.

I. Site Glass: Monitor refrigerant flow.

J. Flow Valves:

1. Low Side Flow Valve (Blue): Controls flow through low side port.
2. Vacuum Flow Valve (Yellow): Controls the flow through the vacuum port.
3. Refrigerant Flow Valve (Green): Controls flow through the refrigerant port.
4. High Side Flow Valve (Red): Controls flow through high side port.

K. Hose Connection Ports:

1. Low Side Pressure Port: left side, 1/4" Port.
2. Vacuum Port: left middle, 3/8" Port; used as a common connection to vacuum pump or recovery unit.
3. Refrigerant Port: right middle, 1/4" Port; used as a common connection to refrigerant supply tank.
4. High Side Pressure Port: right side, 1/4" Port.

L. **Battery Cover:** Easy access for replacing batteries.

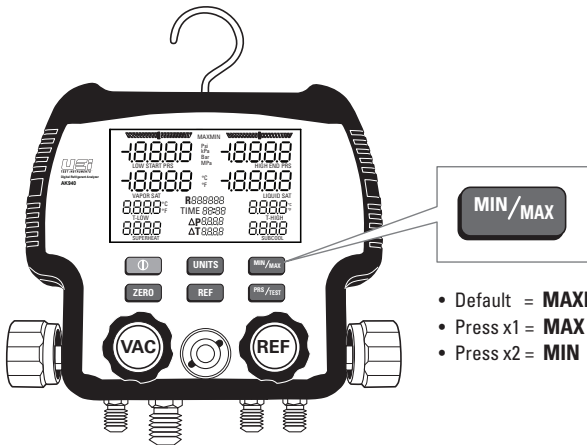
M. **Temperature Sensor Clamp Ports:** Connect the temperature sensor clamps for measurements.

1. T-High port.
2. T-Low port.

N. Maximum pressure Warning label

OPERATING INSTRUCTIONS

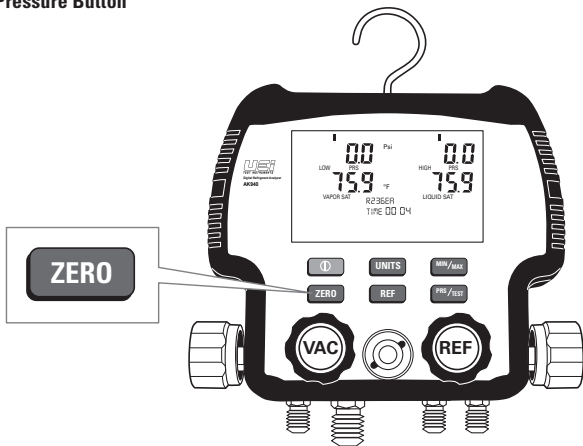
Min/Max Button:



- Default = **MAXMIN**
- Press x1 = **MAX**
- Press x2 = **MIN**

- Press **MIN/MAX** button to activate MAX/MIN on display.
- Press to toggle between MAX value and MIN value displayed.
- Press and hold to return to live readings.

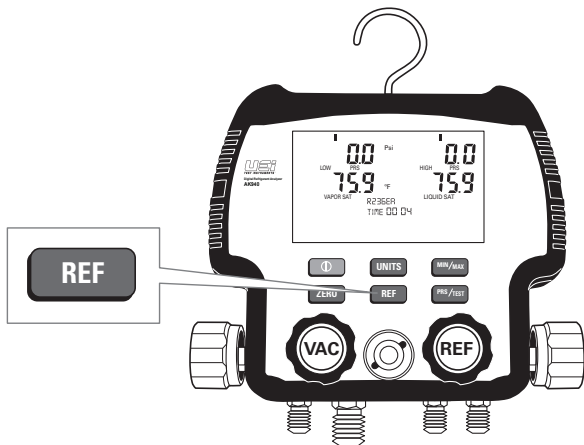
Zero Pressure Button



- **NOTE:** *It is recommended to Zero Pressure by each time before using the analyzer.*
- This operation should be performed especially if the analyzer has been dropped or maximum pressure has been exceed.
- Press and hold the Zero button.
- The display will read zeros on both Low Side and High Side Pressures.

Refrigerant Selection Button

- Change the refrigerant selected.
- To select another refrigerant other than the one displayed.
- Press the **REF** button to scroll slowly through available refrigerants.
Press and hold to scroll quickly through available refrigerants.

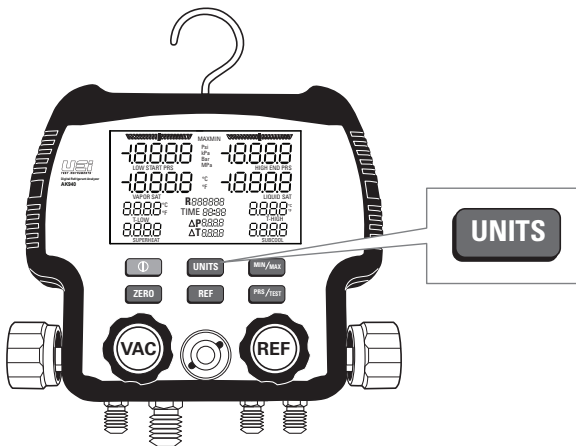


- Refrigerants included in this analyzer:

R11	R12	R13	R14	R21	R22	R23	R32
R41	R114	R115	R123	R124	R134A	R143A	R176
R218	R236EA	R236FA	R245CA	R290	R401A	R401b	R401C
R402A	R402b	R403A	R403b	R404A	R406A	R407A	R407b
R407C	R408A	R409A	R410A	R410b	R411b	R412A	R413A
R414A	R416A	R417A	R420A	R421A	R422A	R422b	R422d
R423A	R424A	R427A	R434A	R437A	R438A	R501	R502
R503	R504	R507	R600A	R601	R601A	R718	R1234yF

Unit Selection Button

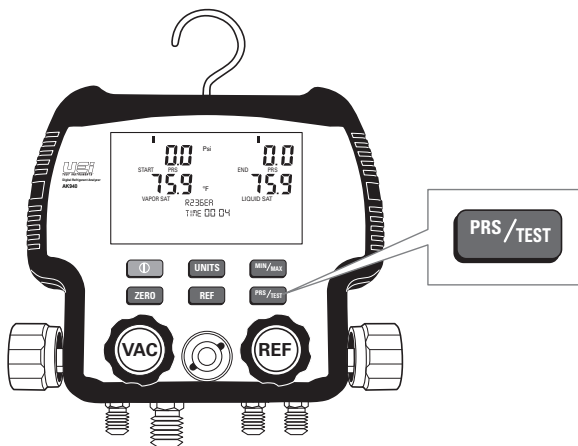
- Change the measured unit for pressure and temperature.
- Press the **UNITS** button repeatedly to scroll the Unit options.
- Scrolling will display Scale in Fahrenheit with unit, then Scale in Celsius with unit.



- Scale and Units included in this analyzer (in order displayed):
 - Degree F/Psi
 - Degree F/kPa
 - Degree F/Bar
 - Degree F/MPa
 - Degree C/Psi
 - Degree C/kPa
 - Degree C/Bar
 - Degree C/MPa
- Selecting the Scale (Fahrenheit or Celsius), will display for: Vapor and Liquid Saturation temperature, T- Low and T-High and ΔT .

Pressure Test/ Δ P (Delta Pressure) Button

- **NOTE:** see diagram (page 19) – Connecting AK940 in Operating Instructions.
- Connect the analyzer to the system.
- Select appropriate refrigerant.



- Press Pressure Test button to start pressure test. Press again to stop pressure test.
- When **Pressure Test** button is pressed, Start Pressure will appear on left side of display (where Low Pressure appears); When Pressure Test button is pressed again, End Pressure appears on the right side of the screen (where High Pressure appears).
- Press and hold to return to live readings.

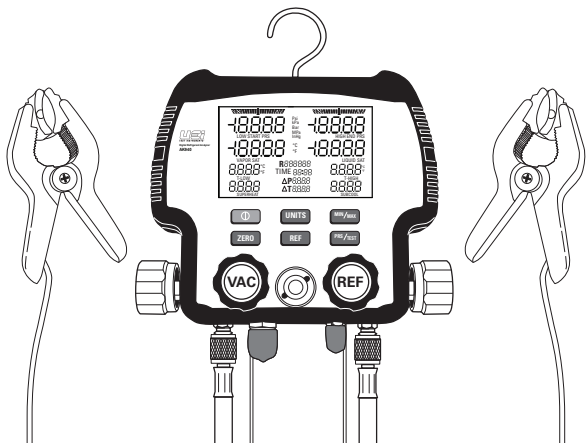
WARNING

WARNING: Maximum Over Pressure for this analyzer is: **600 Psi**.

While in Pressure Test mode the following options are not available:

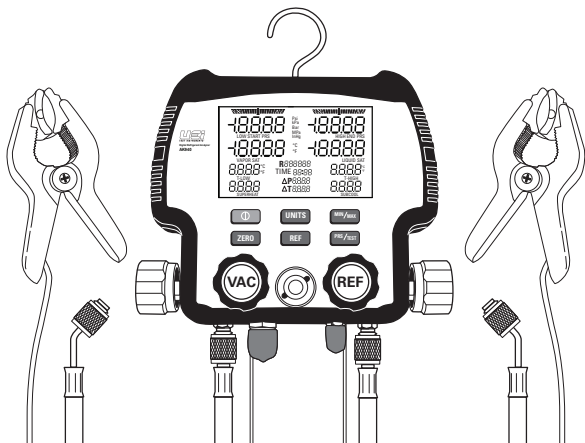
- Unit Selection
- Refrigerant Selection
- Min/Max mode
- Superheat and Subcool

Superheat and Subcool



- **NOTE:** see diagram (page 19) – Connecting AK940 in Operating Instructions.
- Connect the analyzer to the system.
- Select appropriate refrigerant.
- The AK940 can calculate and display both superheat and subcool simultaneously.
- **Superheat:** Attach the temperature sensor clamp on the suction line between the evaporator and the compressor, no closer than 6 inches to the compressor.
- **Subcool:** Attach the temperature sensor clamp on the liquid line between the condenser and the expansion valve (TXV), as close to the service port as possible.
- After the turning on the system or making any adjustments to the system, wait 15 minutes before charging by superheat or subcool to ensure the system is running correctly.
- To add or remove refrigerant, follow charging or recovery practices from manufacturer over those in this manual. Let system stabilize for 15 minutes.

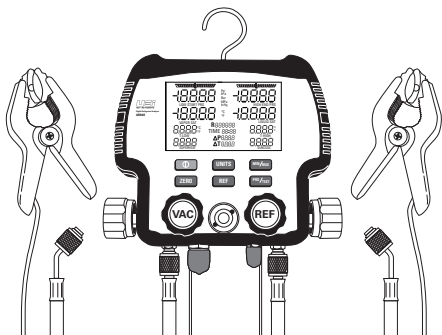
Vapor/Liquid Saturation Temperatures



- **NOTE:** see diagram (page 19) – Connecting AK940 in Operating Instructions.
- Connect the analyzer to the system.
- Select appropriate refrigerant.
- Displays Vapor Saturation (VSAT) and Liquid Saturation (LSAT) temperatures calculated from the pressures measured and the refrigerant selected.

T-Low and T-High/ ΔT (Delta Temperature)

- **NOTE:** see diagram (page 19) – Connecting AK940 in Operating Instructions.
- Connect analyzer to the system.
- Select appropriate refrigerant.
- Attach the Low Side temperature sensor clamp on the suction line between the evaporator and the compressor.
- Attach the High Side temperature sensor clamp on the liquid line between the condenser and the expansion valve (TXV).
- Displays T-Low and T-High and ΔT .



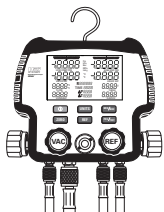
⚠ WARNING

- Display will not show temperatures if sensors are NOT connected to the temperature sensor clamp ports.

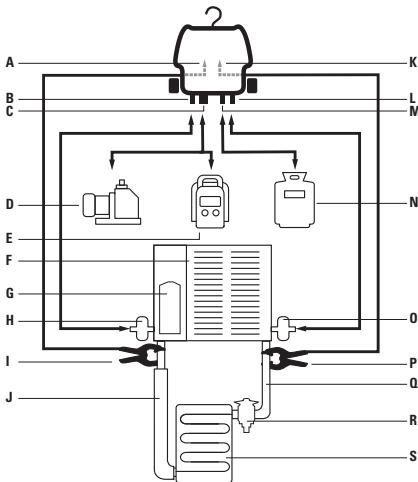
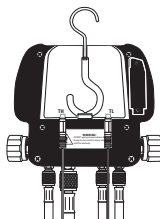
Recovering Refrigerant; Evacuating a System; Adding Refrigerant to a System

- **NOTE:** see diagram (page 19) – Connecting AK940 in Operating Instructions.
- Connect the analyzer to the system.
- Select appropriate refrigerant.
- To add or remove refrigerant, follow charging or recovery practices from manufacturer over those in this manual. Let system stabilize for 15 minutes.

Connecting AK940



Blue 1/4 Yellow 3/4 Yellow 1/4 Red 1/4



- A. Low Side Temperature Sensor Clamp Input Port
- B. Low Side Pressure Hose Connection Port
- C. Vacuum Hose Port
- D. Vacuum Pump
- E. Recovery Unit
- F. Condenser Unit
- G. Compressor
- H. Suction Service Port
- I. Low Side Temperature Sensor Clamp
- J. Low Side Refrigerant Line
- K. High Side Temperature Sensor Clamp Input Port
- L. High Side Pressure Hose Connection Port
- M. Refrigerant Hose Port
- N. Refrigerant Tank
- O. Discharge Service Port
- P. High Side Temperature Sensor Clamp
- Q. High Side Refrigerant Line
- R. TXV/Expansion Valve
- S. Evaporator Coil

Battery Replacement

- Remove the screws (Phillips-head) from the battery cover.
- Replace the old battery with new; 1 (9V) battery.
- Replace battery cover and screws.

DISPOSAL



CAUTION: This symbol indicates that equipment and its accessories shall be subject to separate collection and correct disposal.

CLEANING

Periodically clean your meter's case using a damp cloth. DO NOT use abrasive, flammable liquids, cleaning solvents, or strong detergents as they may damage the finish, impair safety, or affect the reliability of the structural components.

STORAGE

Remove the batteries when instrument is not in use for a prolonged period of time. Do not expose to high temperatures or humidity. After a period of storage in extreme conditions exceeding the limits mentioned in the General Specifications section, allow the instrument to return to normal operating conditions before using it.

WARRANTY

The AK940 Analyzer (only, not accessories) is warranted to be free from defects in materials and workmanship for a period of two years from the date of purchase. If within the warranty period your instrument should become inoperative from such defects, the unit will be repaired or replaced at UEi's option. This warranty covers normal use and does not cover damage which occurs in shipment or failure which results from alteration, tampering, accident, misuse, abuse, neglect or improper maintenance. Batteries and consequential damage resulting from failed batteries are not covered by warranty.

Any implied warranties, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the express warranty. UEi shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss.

A purchase receipt or other proof of original purchase date will be required before warranty repairs will be rendered. Instruments out of warranty will be repaired (when repairable) for a service charge

For more information on warranty and service, contact:

www.ueitest.com • Email: info@ueitest.com
1-800-547-5740

This warranty gives you specific legal rights. You may also have other rights, which vary from state to state.