

# MARK MODEL 9822™ HELIUM DETECTOR

## INSTRUCTION MANUAL

### USER SAFETY WARNINGS

**IMPORTANT** – Observe all safety guidelines to prevent personal injury or damage to the helium detector.

- Do not operate the device if it has been damaged. Refer to qualified factory service personnel.
- Do not disassemble the device; only qualified factory service personnel should perform repairs.
- Do not draw water into the helium detector; this could adversely affect the operation of the unit.
- Use precautions when operating the detector in rain, snow or adverse conditions. Do not allow water to accumulate on the faceplate.
- Do not use the probe tip to dig in the soil.
- Do not operate the detector when the “LOBAT” indicator is lit. False readings may occur when used under this condition.

### DESCRIPTION AND APPLICATION

The Mark Model 9822 Helium Detector is a portable leak pinpointing device that uses helium as a tracer gas to find leaks in underground storage tanks, oxygen systems, fuel lines, pressurized cables or any other pressurized system that has a leakage problem.

The use of helium as a tracer gas is ideal in that it is non-toxic, and the lightest of the inert gases. Being lighter than air, helium will penetrate small leaks rapidly and permeate through most dense soils and pavements quickly. The leak can therefore be pinpointed easily with the helium detector.

The Model 9822 features a continuous “SURVEY” or a one-shot “BATCH” mode of operation. The percentage of helium detected is displayed on the LCD readout, while the mode of operation is indicate via the status LEDs.

### UPON DELIVERY

After receipt, the unit should be inspected for any damage caused during shipping. Notify the carrier immediately for any damage claims. Mark Products is not responsible for damage caused in transit.

Complete the warranty information card supplied with the instrument, and return it to Mark Products for warranty registration.



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## SYSTEM CONTROLS AND INDICATORS

The Mark Model 9822 Helium Detector features “membrane” switches, a large LCD display, and LED status indicators.

ON/OFF	Supplies power to the instrument under software control. The instrument will turn off automatically if left unattended for periods longer than 15 minutes.
BATCH/SURVEY	Determines the mode of operation. Upon start-up, the unit operates in the survey mode.
RUN	Starts sampling process while in the batch mode. Re-calibrates unit when in the survey mode.
SAMPLE	LED indicates sample period while in the batch mode.
READ	LED indicates read period while in the batch mode.
PURGE	LED indicates purge period while in the batch mode.
SURVEY	LED indicates survey mode of operation.
DISPLAY	LCD displays the percentage of helium detected.
RESET	Resets instruments in the event of processor lockup.

## PREPARATION

The Mark Model 9822 Helium detector is powered by a twelve volt rechargeable battery. The battery should be fully charged before attempting to use the detector. Charging the battery is accomplished by connecting the charging unit to the detector (instrument off) and plugging the charging unit into a standard 110 VAC outlet.

Standard charging time is approximately ten hours, depending on the state of charge on the battery. The charging unit has two LED indicators that display “power on” and “quick charge” conditions. The quick charge indicator will extinguish when the battery is charged. The charging unit may be left on the detector when not using the instrument. This will insure that the battery is fully charged and available when needed. Battery life is increased when kept in the fully charged state.

## APPLICATION

Survey Mode: The survey mode is ideal for testing many fittings and/or long lengths of piping and pressurized cable. There is a 3-6 second delay between the time that the probe tip is over the leak and the instrument reacts to the helium. The instrument responds to helium by increasing the numbers on the display from .01 to 100 percent. The instrument will give an audible “beep” three times to alert the user when helium is detected.

When surveying, move slowly along the areas to be sampled. In noisy environments, it may be advisable to use the headphones to hear the “beeps”.

The instrument contains an auto shut-off feature that alerts the user after fifteen minutes by “beeping” three times and flashing “CAL” on the LCD display indicating that shut-off will occur. To continue surveying, press the “run” button.

Batch Mode: The batch mode is ideal for testing underground piping systems or to specifically identify the leak area. Once the general leak area has been identified, take several readings a few inches apart. The area with the highest concentration of helium is the area where the leak is likely to be found.

When the unit is in the sample cycle, do not move the probe assembly as this may cause inaccurate readings. When the unit is in the read cycle, do not move the instrument as this may cause inaccurate readings.

**Notes:** Insure there is a continuous supply of helium to the area to be sampled. Helium will escape very quickly if there is not a consistent supply.

In detecting the location of a large leak, it is best to trickle the amount of helium into the system using a flow rating device.

The Mark Model 526 Flow Rater will allow an indication of the amount of helium injected to the system. By limiting the amount of helium injected to a very small amount, the leak will be pinpointed easier due to the fact that the helium is not escaping in large amounts causing a flood of helium. In addition, the helium supply will be saved from rapid depletion.

**Once helium is detected, always take a second reading to confirm the fact that helium has been found.**

## **OPERATION**

1. Connect the probe cable to the right side of the instrument. Connect the metal probe extensions, if desired, to the cable assembly using a twisting motion. Do not use more than the three sections provided with the instrument, as this may cause inaccurate readings. Connect the collection boot or the probe tip to the end of the probe assembly.

Keep the Auto-Zero ports on each side of the instrument (small brass fittings) free from obstructions during operation.

2. Press the on/off button to turn the unit on. The instrument will initially run a diagnostic system check, a 5 minute warm up (counting down from 5:00 to 0:00) and then automatically switch to the calibration cycle (display will read “CAL”). During the calibrations cycle, the instrument will also evaluate the remaining charge in the battery. If the battery voltage is low, the unit will display the “LOWBAT” and the “E10” message. If this occurs, turn the unit off and plug in the recharging unit. False readings may occur if the unit is used when the battery is low.

3. The unit will now operate in the survey mode. The instrument may be recalibrated at any time while in the survey mode by pressing the “run” button

There is a delay of approximately 3-6 seconds after the probe takes in the sample and the instrument displays the helium percentage reading. If the batch mode is required, press the “BATCH/SURVEY” button. The “SURVEY” LED will then extinguish.

4. For batch mode operation; press the “run” button to start the sample cycle. After 6-8 seconds, the instrument will then automatically switch to the read cycle, and display the percentage of helium found, if any.

If helium is detected, the instrument will then automatically switch to the purge cycle after the read cycle is completed. The instrument will be ready for the next sample cycle when the purge light extinguishes.

If no helium is detected, the instrument will bypass the purge cycle and wait for the next sample cycle. The next sample cycle is started by pushing the “run” button again.

## THEORY OF OPERATION

The Mark Model 9822 Helium Detector is a microprocessor controlled instrument that operates on the principle of changes in thermal conductivity to detect the presence of helium.

The instrument operates by taking a sample of air and passing it through a separation column to separate the individual components. The separated components are then passed through the sensor block, which contains the sensing element.

The sensor transmits data to the microprocessor only during a specific “window” of time, during which the helium is flowing over the sensor. Since each component takes a different amount of time to go from the column to the sensor, this “window” makes the 9822 very sensitive to helium. The amount of helium detected is displayed on the LCD readout in percentage of helium. The instrument can detect the percentage of helium from .01 to 100 percent.

## MAINTENANCE

Instrument	Clean away any debris or moisture accumulation with a soft cloth. Check Auto-Zero ports on each side of unit (small brass fittings) for any obstructions.
Collection Boot	Clean with compressed air or with soap and water to remove mud and debris. Dry thoroughly.
Probe Tip	Clean with compressed air if clogged with debris.
Extensions	Clean with soft cloth to remove debris.
Filter	Check filter in handle every 6 or sooner if used in dusty environments. Replace filter annually or as needed.

## TROUBLESHOOTING GUIDE

CONDITION	PROBABLE CLAUSE	REPAIR PROCEDURE
"LOWBAT" or "E10"	Battery discharged	Recharge battery
"E15"	Clogged system	Inspect and clean probe
	Processor malfunction	Restart unit 3 times, if condition does not clear; call for factory service
"E20"	Calibration error	Cycle unit in fresh air to clean out column
Pump failure	Clogged system	Inspect and clean probe
	Battery discharged	Recharge battery
No power	Battery discharged	Recharge battery
	Processor malfunction	Call for factory service
No LCD display	Processor malfunction	Call for factory service
Instrument does not respond to membrane switches	Processor malfunction	Reset instrument by using a small object to push reset switch in hole on left side of unit under strap

## SERVICE

When returning a unit for factory service, call <sup>LACO</sup> Mark's Customer Service Department at ~~(408) 732-4600~~ or toll free at ~~(800) 621-4215~~ for RMA (Return Material Authorization) number and information. Units should be boxed appropriately and contain a written letter stating problem, contact person and telephone number, billing information and return shipping information.

## WARRANTY

Mark Products, Inc. warrants that the product will conform to Mark's specifications and will be free from defects in materials and workmanship for a period of one year from the date of delivery to the end use customer. Mark's entire liability and the customer's exclusive remedy under this warranty, which is subject to the customer returning the product to Mark with a written statement of the defects, will be, at Mark's option, to repair or to refund the purchase price and cancel the sale.

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