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CPS[®]

Leak-Seeker[®] I

Refrigerant Leak Detector



US Patent 8,555,701

OPERATION MANUAL

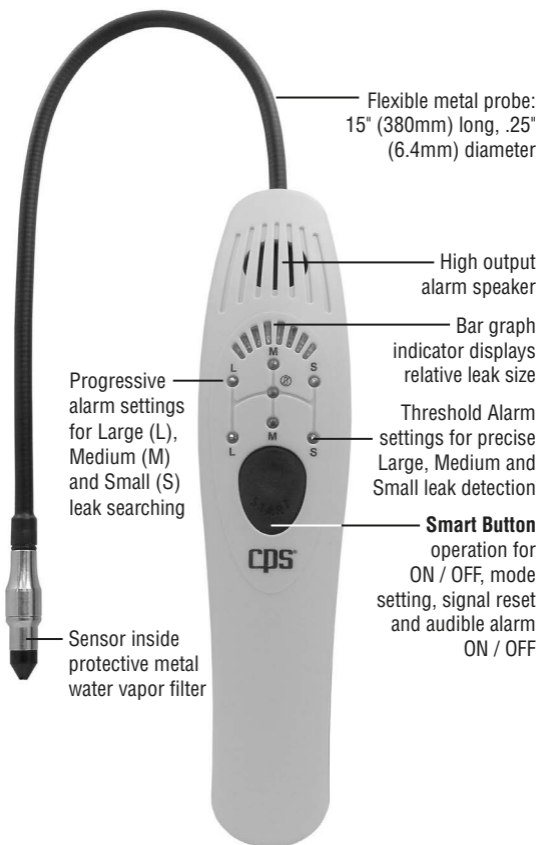
GENERAL INFORMATION

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Introduction



Leak-Seeker® I Specifications

Sensor:	State of the art E_MOS® technology
Gases:	Detects refrigerants including those with hydrocarbon components (CFC, CH2F2, HCFC, HFC, HFO, NH3, HC. Hydrogen trace gas in 95% N2, 5% H2 mixture A2L refrigerants). CAUTION: This leak detector is not intrinsically safe. Use in well ventilated areas.
Sensitivity:	Better than a 0.1 oz / year (3 g / annually) for all common refrigerants, including R-410a, R-404a and R-407a
Leak Indicators:	Extended tone range audible alarm indicates the relative size of the leak in the Progressive Alarm mode. Single high pitch tone audible alarm in the Threshold Alarm mode signals the presence of a leak. Audible alarm can be turned ON or OFF by double-clicking the START button. Eight LED bar graph indication signaling the relative size of the leak in the Progressive Alarm mode. Solid 8 LED bar turns on in the Threshold Alarm mode when a leak is present
Operating Temperature:	-18 to 60°C (0 to 140°F)
Power:	Three size "C" alkaline batteries (NEDA/ANSI 14A)
Battery Life:	50 hours minimum at 77°F (25°C). Battery life depends on cell chemistry and ambient conditions. Alkaline batteries provide longest life. Cold ambient conditions decrease battery life. The Leak-Seeker® I turns itself off after 10 minutes of inactivity— START button not pressed—to further prolong battery life
Dimensions:	Instrument (L x W x H): 10" x 2.3" x 2" 254mm x 59mm x 51mm
Probe:	15" (380mm) long, .25" (6.4mm) diameter
Weight:	1 lb 2 oz (500 g)
Certifications:	Complies with European Standard EN14624:2012

GENERAL INFORMATION

Leak-Seeker® I Overview

Combining outstanding ease of use and the sophisticated leak sensing **E_MOS®** technology exclusive to CPS Products, the Leak-Seeker® I opens a new era in electronic leak detection. Advanced software algorithms control the operation of this instrument to achieve efficient control of the power to the sensor offering long battery life while operating the sensor within its optimum parameters at all times.

The Progressive Alarm operating mode guides the user to the source of the leak by indicating the relative refrigerant concentration. In this mode, the user can deal with leaks from less than 0.1 oz. / yr. (2 g / yr.) to greater than 1 oz. / yr. (>30 g / yr.) of all common refrigerants. The Threshold Alarm mode lets the user find leaks greater than or equal to 0.5, 0.25 or 0.125 oz. / yr. (14, 7 or 4 g / yr.) allowing the user to find the bigger leaks quickly so the job can be done in less time.

Housed in an ergonomically shaped, high impact plastic chassis with a flexible 15" (38 cm) metal wand, the Leak-Seeker® I is built for rugged field use. The sensor is housed in a metal cage with the exclusive patented water vapor stabilizing filter which completely eliminates false alarms due to the presence of condensate. Operation of this advanced instrument is fully controlled by a single **SMART-BUTTON** switch.

- Microprocessor controlled sensor electronics utilizing a multi channel signal detection method, improves sensitivity while reducing false alarms.
- New E_MOS® sensor technology incorporates a proprietary pulse modulation design to increase both battery and sensor life.
- Software managed sensor rejuvenation mode, automatically initiated at each startup ensures the highest level of sensitivity every use, for up to 500 hours of detecting leaks of less than .1 oz per year.
- Sensitivity remains constant over the life of the sensor.
- Two operating modes guide the user to the source of the leak. The audible alarm can be muted to operate in quiet surroundings.
- Exclusive SMART_BUTTON feature allows complete operation of the instrument with a single button.
- Senses all refrigerants including those with hydrocarbon components.
- Meets or exceeds all US and International standards for both automotive and commercial use.
- Superior sensitivity to R-410A and new HFO refrigerants.
- Sensor not contaminated by R-404a.
- Sensitivity to 35 parts per million (less than .1 oz per year).
- 50+ hour battery life (3) "C" batteries.
- 500+ hours sensor life.
- 1 year warranty.
- Patented.

Modes of Operation

Progressive Alarm Mode:

The audible alarm increases in pitch as the concentration of refrigerant gas seen by the sensor increases. The number of lit LED's in the bar graph indicator increases with the refrigerant concentration. **Three blue LED's indicate the current setting.**

Large Leak Setting (L):

Alarm begins to indicate at about 0.5 oz / year (14 g / yr.) depending on the refrigerant. Alarm saturates at very large leaks.

Medium Leak Setting (M):

Alarm begins to indicate at about 0.1 oz / year (2 g / yr.) and saturates at approximately 0.5 oz / year (14 g / yr.).

Small Leak Setting (S):

Alarm saturates at approximately 0.125 oz / year (4 g / yr.) leak rate.

Threshold Alarm Mode

The audible alarm sounds a low pitch tone interrupted twice per second until a given leak rate is found. When the leak is found, the audible alarm sounds a high pitch tone and all the LED in the bar graph turn on at once. **Three white LED's indicate the current setting in this mode.**

Large Leak Setting (L):

Signals with leaks of 0.5 oz / year (14 g / yr.) or greater.

Medium Leak Setting (M):

Signals with leaks of 0.25 oz / year or greater.

Small Leak Setting (S):

Signals with leaks of 0.125 oz / year or greater.

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Using the *Leak-Seeker*[®] I

SMART-BUTTON Operation:

- Press the START button to turn the instrument ON.
- While in any mode, press and hold the START button for three seconds to turn the instrument OFF.
- Press and hold the START button to change sensitivity settings. The corresponding LED will turn on to indicate the sensitivity setting.
- Click the START button to reset the Leak-Seeker[®] I to the ambient contamination level.
- Double-click the START button to silence the audible alarm. Double-click again to restore the audible alarm.

Mode and Sensitivity Selection:

The Leak-Seeker[®] I offers two modes of operation. The **Progressive Alarm Mode** should be used to guide the user to the source leak; the pitch of the alarm and the number of LED's increases progressively as the leak source is approached. The Progressive Alarm allows searching for a broad range of leak sizes, and the searching should be started in the large leak setting (L) since those leaks need to be fixed first. If you start in the highest sensitivity setting, the alarm may saturate far away from the actual leak and then you would have to back to a lower sensitivity setting.

The **Threshold Alarm Mode** provides a quick go or no go mode to verify that a leak has been found and its approximate size. Always scan the suspected leak site several times to make sure you are detecting a leak and not accumulated refrigerant.

Low battery indicator :

When the batteries reach approximately 10% of capacity, the **GREEN** LED turns OFF.

Windy conditions:

Locating leaks under windy conditions may severely impede the leak searching process. Even very large leaks may be difficult to locate as the escaping gas is quickly dissipated into the atmosphere. If necessary, fabricate a gas trap using aluminum foil around joints or fittings or otherwise shield the search area from the wind.

Leak verification:

If a suspected leak is indicated, verify several times by moving the sensor away from the leak area, resetting the unit and then back to the suspected leak. If the instrument indicates a leak three consecutive times, then you have found a leak.


Leak Searching Tips

1. Take care not to plug the sensor housing tip by dragging it over dirty or wet surfaces. If the area is particularly dirty, or condensate (moisture) is present, it should be wiped off with a dry shop towel. No cleaners or solvents should be used, since the detector may be sensitive to their ingredients. Visually trace the entire refrigerant system and look for signs of air conditioning lubricant leakage, damage, and corrosion on all lines, hoses, and components. Each questionable area should be carefully checked with the detector: controls, service ports with caps in place, brazed or welded areas, and areas around attachment points and hold-down on lines and components.
2. Always follow the refrigerant system around in a continuous path so that no areas of potential leaks are missed. If a leak is found, always continue to test the remainder of the system.
3. At each area checked, the probe should be moved around the location at a rate no more than 1-2 in / sec. (25 to 50mm / sec.), and no more than .2" (5mm) from the surface, completely around the position. Slower and closer movement of the probe greatly improves the likelihood of finding a leak.
4. An apparent leak shall be verified at least once by blowing shop air into the area of the suspected leak and repeating the check of the area. In cases of very large leaks, blowing out the area with shop air often helps locate the exact position of the leak.
5. Following any service to the refrigerant system, and any other service that disturbs the refrigerant system, a leak test of the repair and of the service ports of the refrigerant system should be done.

Maintenance

With a sensor life of more than 500 hours and a battery life of over 50 hours, very little maintenance is required to keep the Leak-Seeker®I in top operating conditions. Below are the proper procedures to follow when changing batteries and sensors.

Low battery indication:

When the batteries reach approximately 10% of capacity, the rightmost LED of the tachometer indicator (above the LO BAT symbol () will energize. The other seven LED's will continue to function as indicators of the leak's relative size. To replace the batteries, slide the bottom cover of the instrument backwards to reveal the battery compartment. Replace the batteries with a new set of (3) "C" alkaline batteries.

Changing the sensor:

See page 9 for the sensor replacement diagram.

- Remove the sensor housing tip by turning it counterclockwise.
- With a pair of tweezers or a needle nose pair of pliers gently pull the sensor away from its socket.
- Inspect the inside of the sensor housing and verify that there is an O-ring over the socket and that no dirt or debris is present. If there is dirt or debris, gently pull the O-ring out, use a dry cotton swab to loosen the dirt and blow with compressed air. Clean the O-ring and replace.



Do not cover the O-ring with Vaseline or any other lubricant.

- Install the replacement sensor. Orient the tab on the edge of the sensor so it coincides with the slot on the side of the housing and gently push the sensor in.



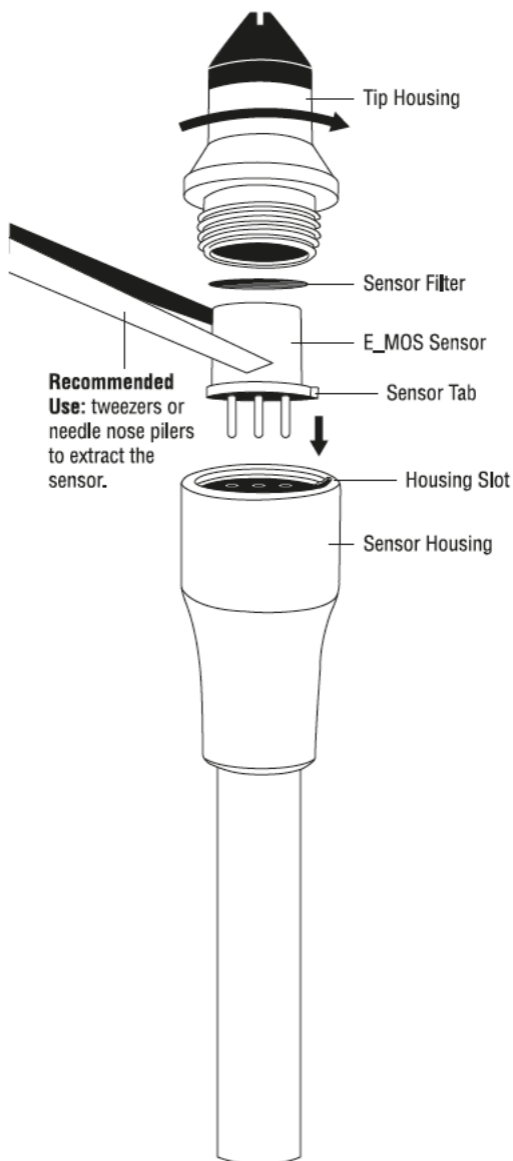
Do not use silicone based hand cleaners or lotions prior to installing a new sensor as this will irreversibly affect the operation of the sensor.

- Remove and discard the filter inside the sensor housing's tip. Replace with a new filter disk, making sure no dirt, water, oil or any other substance comes in contact with filter. It is recommended to first clean the sensor housing's tip with alcohol or some other solvent which does not contain oil or silicone. Use a cotton swab to first loosen any debris from the tip's opening. Finish by blowing with dry, oil-free, compressed air. Re-attach the tip to the sensor housing, screwing it finger tight.



Do not use acetone or silicone based solvents, lotions or un-cured adhesives while handling the sensor.

Sensor Replacement Diagram



Replacement Parts

EMOS2	Replacement EMOS sensor
LS2XF	Replacement filters
LS2XVF	Replacement water vapor filter

WARRANTY

CPS® Products, Inc., guarantees that all products are free of manufacturing and material defects for one year. If the equipment should fail during the guarantee period it will be repaired or replaced (at our option) at no charge. This guarantee does not apply to equipment that has been altered, misused, or returned solely in need of field service maintenance. This repair policy does not include equipment that is determined to be beyond economical repair. All products being returned for warranty repair must be accompanied by an original bill of sale and customer contact information.

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