

INSTRUCTIONS

REF-LOCATOR

4686714

TRACE-LOCATOR

4686715

Instruction Manual

Electronic Leak Detector

Bedienungsanleitung

Elektronisches Lecksuchgerät

Mode d'emploi

Détecteur de fuites électronique

Istruzioni per l'uso

Rilevatore di perdite elettronico

Manual de instrucciones

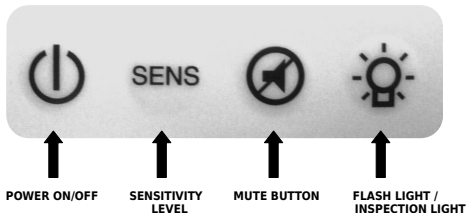
Detector de fugas electrónico

HVAC/R
Service Products



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How To Operate

1) TURN ON: Press the ON/OFF button once to turn on and again to turn off.

2) WARM UP: The leak detector automatically energizes the sensor, conditioning it for use. During the sensor conditioning cycle, the digital PIE GRAPH leak size indicator will gradually increase and the leak detector will sound a slow “beep”. The warm-up icon will turn on during this cycle (see image 1 below). The warm up mode is usually 30 seconds and is complete when the digital PIE GRAPH finishes displaying all 10 bars, then changes to show image 2.

NOTE: When the leak detector has not been used for long periods, conditioning may take slightly longer than the usual 30 seconds. When using in MAX sensitivity mode, allow for 60 seconds of run time after warm-up icon shuts off.

Image 1



Image 2



3) READY: The leak detector is ready to begin searching for leaks when the sensitivity setting (MAX, MED, MIN) and the battery indicator are displayed on the LCD (See image 2). The audio “beep” increases in frequency. **Note: allow an additional 60 seconds after the end of the conditioning cycle to achieve maximum sensitivity when searching for tiny leaks less than 4 g/yr.**

Low battery indicator

The battery indicator consists of the battery outline with 3 bars within the outline and located in the upper right portion of the LCD display. Battery level indication is displayed as follows:

Three Bars:	Full Voltage
Two Bars:	1/2 Life
One Bar:	1/4 Life
No Bars:	Low Voltage (Change Batteries)
No Bars/ Blinking:	Unit will be disabled and not function properly in this state Replace the 4 AA Alkaline batteries when the battery indicator shows no bars. Follow battery installation instructions under MAINTENANCE (page 6)

Leak Size Indicator

The digital leak size indicating LCD pie graph display remains off until a leak is detected. With increasing refrigerant concentration, a number of indicating pie chart segments will be displayed up to a maximum of 10 segments. The **REF-LOCATOR** indicates all HFC, HCFC and HFO refrigerants regardless of the sensitivity setting. The **TRACE-LOCATOR** indicates H2/Nitrogen (tracer gas) leaks.

Pie Graph Display

# of Segments	Size of Leak (oz/yr)	Color of Segment
1-3	Less than 4 g/yr (0.15 oz/yr)	green
4-6	from 4g /yr to 14/yr (0.2oz-0.5 oz/yr)	Yellow
7-10	more than 14 g/yr (0.5 oz and up)	red

The pie chart graph will continue to increase or decrease depending on the amount of refrigerant detected and the color of the segments will change from green to yellow to red as concentration increases. Once the leak source has been located the maximum segments displayed will indicate the approximate size of the leak. The table above can be used to approximate the size of the leak.

Audio Mute Function

To silence or mute the audio beep and alarm signal, press the MUTE button. The MUTE symbol will appear in the upper left corner of the display. To restore the audio sound, press the MUTE button again.

Adjusting Sensitivity Levels

The Leak Detector will default to the MED sensitivity level automatically once the unit comes out of the warm up mode and the battery indicator and sensitivity level are displayed. To change sensitivity levels to MIN or MAX, press the SENS button repeatedly.

Inspection Light

To turn on the LED inspection light, press the light button once. The light symbol will display in the upper left corner of the display. Press again to turn off.

Note: LED's should last for years under normal use. If necessary, the LED's can be replaced in the field. To replace, unscrew front ring counterclockwise and slide upward onto flex probe or remove completely. Carefully slide parabolic reflector assembly (see photo) up the flex probe to expose the six LED mounted in sockets on the printed circuit board. Remove the LED(s) by pulling straight out of the socket. Replace LED by pushing leads into socket noting the correct polarity.



Leak Test Vial

The Leak Detector comes with a Leak Test Vial that allows the user to make sure the detector is performing properly. To test:

1) Remove the plastic (green REF-LOCATOR, yellow TRACE-LOCATOR) seal label on top of the Leak Test Vial by pulling it off.

2) Turn on the Leak Detector and allow the unit to complete the warm up mode. The sensitivity level is set at MED by default.

Note: If the Leak Detector has been out of use for weeks, it may be necessary to set the sensitivity level to MAX initially when testing the unit with the Leak Test Vial.

3) Place the sensor to the small hole in the top of the Leak Test Vial. The beep rate should increase and the Digital Leak Size Pie Graph should display a minimum of 3 bars indicating that the sensor and electronics are working properly.

NOTE: Always remember to replace the plastic seal label on the top of the vial and place the vial back into the plastic bag after the test is complete. Seal the bag to prevent the leak test media from drying out. Replace the Leak Test Vial when the green color is no longer visible.



Maintenance

Install Batteries: Remove rear battery cap by unscrewing as shown below.



Always insert all four batteries into the battery compartment in the proper polarity.

Note: Polarity mark is on the inside of the battery compartment for proper battery orientation.

Replace Filter: Unscrew sensor tip as shown below. Replace filter whenever it becomes visibly dirty or every 2 to 3 months depending on use.



Replace Sensor: Unscrew the front ring (Figure 1) and carefully slide out the reflector (Figure 2). Remove sensor by pulling the wand body which is connected to the sensor (Figure 3). Install the new sensor by unscrewing the old sensor from the detector wand and screwing on the new one (figure 4). Make sure to align the notch in sensor with the raised spline on the sensor socket (figure 5).

Note: Do not force sensor into socket. Misalignment can damage the sensor pins.

IMPORTANT: Make sure sensor is fully inserted for proper operation. The detector will stay in warm-up mode if the sensor becomes loose or is not fully inserted or becomes defective,

Figure 1



Figure 2



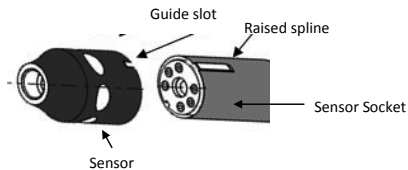
Figure 3



Figure 4



Figure 5



Guide slot must be aligned with raised spline

REF-LOCATOR Specifications

Sensitivity:	0.05 oz/yr All HFC, refrigerants and blends including HFC's R410A, R404A, R407C, & R134a 0.025 oz/yr HCFC R22. 0.0125 oz/yr HFO R-1234yf Also indicates HC refrigerants
Inspection Light:	6 white LED's. Auto shutoff after 5 minutes
Sensor Life:	approx. 10 year lifetime (4000 hours) with proper filter changes
Sensor Technology:	Solid electrolyte semi-conductor
Response Time:	Instantaneous (static test) 0.100 sec moving at 3"/sec 0.15 oz/yr leak R134a)
Sensitivity Levels:	MIN-4 g/yr (0.15oz/yr) MED- 7 g/yr (0.25 oz/yr) MAX- 14 g/yr (0.5 oz/yr)
Display (5.2 cm):	BTN LCD (black) with 10 segment color "pie graph" showing leak size. Backlight included
Mute Function:	Silent mode- display shows leak indication
Power supply:	4 AA Alkaline or 4 AA NiMH Batteries
Battery Life:	2.5 hrs continuous (AA Alkaline) 4 hrs continuous (Rechargeable NiMH AA batteries)
Water protection:	IP54. Housing incorporates "O ring" seal, openings inside protected with foam
Certifications:	Complies to standard SAE-J2791, SAE-J2913 EN14624:2012, CE, ROHS, ASHRAE Standard 173 (pending)
Warm up Time:	approx. 30 seconds
Weight:	1lb. 3.4 oz
Probe length	17"
Length (body):	10"
Warranty:	2 years
Made in USA	

TRACE-LOCATOR Specifications

Sensitivity:	< 5 ppm H ₂ (tracer Gas)
Inspection Light:	6 white LED's. Auto shutoff after 5 minutes
Sensor Life:	1000 hours with proper filter changes
Sensor Technology:	Solid electrolyte semi-conductor
Response Time:	Instantaneous
Sensitivity Levels:	3 levels; MIN (>0.5 oz/yr), MED (0.1 oz/yr to 0.5 oz/yr) & MAX (<0.1 oz/yr)
Display (5.2 cm):	BTN LCD (black) with 10 segment color "pie graph" showing leak size. Backlight included
Mute Function:	Silent mode- display shows leak indication visually
Power supply:	4 AA Alkaline or 4 AA NiMH Batteries
Battery Life:	4.5 hrs continuous (AA Alkaline) 4 hrs continuous (Rechargeable NiMH AA batteries)
Water protection:	IP54. Housing incorporates "O ring" seal, openings inside protected with foam
Certifications:	Fulfills the limits of standard EN35422 The tracer gas conforms to article 6, paragraph 3 of the EU directive 2006/40/EG Pending SAE-J2970 certification
Warm up Time:	approx. 30 seconds
Weight:	1lb. 3.4 oz
Probe length	17"
Length (body):	10"
Warranty:	2 years
Made in USA	

Replacement Parts REF-LOCATOR

Description:	Part No
Sensor Filter (5 pcs.)	4686821
Sensor REF-LOCATOR	4686822
Leak test vial REF-LOCATOR	4686705
Case for REF-LOCATOR	4686707
Replacement LED (6 Stk.)	4686828

REPLACEMENT PARTS TRACE-LOCATOR:

Description:	Part No
Sensor Filter (5 pcs.)	4686821
Sensor TRACE-LOCATOR	4686823
Leak test vial TRACE-LOCATOR	4686703
Case for TRACE-LOCATOR	4686708
Rerplacement LED (6 Stk.)	4686828

HVAC/R
Service Products



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Congratulations on the purchase of the REFCO STARTEK Refrigeration Leak Detector, the most technologically advanced of its kind. The STARTEK's low power requirements, small size and high sensitivity combine to create a tool which is easy to handle and ultra effective at locating even the most difficult-to-find leaks.

Fully SAE J1627 compliant, STARTEK will detect leaks as small as 0.1 oz/yr (3g/year) in R12, R22, R134a and other halogen refrigerant systems.

STARTEK should not be used on systems that contain flammable refrigerants such as Propane, Isobutane, etc.

TECHNICAL DATA

• Dimensions	150 x 34 x 55 mm
• Weight	190 g
• Batteries	2 x AA batteries
• Battery Life	40 hours
• Sensitivity	< 3g/year (0.1 oz/yr)
• Sensor lifetime	approx. 30 hours
• Operating temperature	0 – 50°C
• Warm up time	< 2 sec.
• Response time	instantaneous
• Reset time	instantaneous
• Probe length	30 cm
• Warranty	2 years

ES-02 (pack of 2)
Replacement sensor

Part-No. **4507577**



INSTRUCTIONS

1. Press the button to turn the unit on.
2. The LED will flash orange for a short moment to indicate auto-reset, afterwards the unit will begin beeping and flashing green.
3. To reset the unit to the existing level of ambient refrigerant, press and release the button. The LED will flash orange briefly to indicate the reset. All levels of refrigerant less than the reset level will be ignored.
4. Unit turns on in the low sensitivity level, which is adequate for most leaks. Press the button twice (double-click like a computer mouse). The LED will fade from red to green and a sweeping sound effect of low to high pitch will be heard. The sensitivity is now set for 3g/year (0.1oz/yr). This mode should only be used for looking for leaks of less than 14g/year (0.5 oz/yr).
5. Double click again to change back to low sensitivity.
6. Move the probe towards a suspected refrigerant leak at a rate of less than 2 inches (50 mm) per second, no more than ¼ inch (5 mm) away from the suspected source.
7. If a leak exists, the sound will increase in rate and pitch and the LED will start flashing rapidly.
8. To turn the STARTEK off, press and hold the button for 3 seconds.

FEATURES

- If the sensor is damaged, a sweeping alarm and a red-green flash will indicate the problem.
 - A flashing LED during normal operation also reflects the battery level:
 - Green: batteries are fresh
 - Orange: batteries should be changed
- If the batteries are nearly empty, the LED will turn solid red and a two-tone alarm will be noted for 5 seconds, before STARTEK will power itself off.
- If the unit is left on unattended, it will automatically turn off after about 5 minutes to conserve batteries.

SAE J1628 RECOMMENDED PROCEDURES

For the purpose of Automotive A/C Testing with respect to the SAE J1627 standard, the following leak testing procedure applies:

1. Operate the Startek in high sensitivity mode.
2. Leak test with the engine not in operation.
3. The air conditioning system shall be charged with sufficient refrigerant to have a gauge pressure of at least 340 kPa when not in operation. At temperatures below 15°C, leaks may not be measurable, since this pressure may not be reached.
4. Take care not to contaminate the detector probe tip. If the part is particularly dirty, it should be wiped off with a dry shop towel or blown off with shop air. No cleaners or solvents shall be used, since many electronic detectors are sensitive to their ingredients.
5. 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 shall be carefully checked with the detector probe, as well as all fittings, hose to line couplings, refrigerant controls, service ports with caps in place, brazed or welded areas, and areas around attachment points and hold-downs on lines and components.
6. 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.
7. At each area checked, the probe shall be moved around the location, at a rate no more than 25-50 mm/s and no more than 5 mm from the surface completely around the position. Slower and closer movement of the probe often helps locate the exact position of the leak.
8. An apparent leak shall be verified at least once by blowing shop air into the area of the suspected leak, if necessary, 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.
9. Leak testing of the evaporator core while in the air conditioning module shall be accomplished by turning the air conditioning blower on high for a period of 15 sec. minimum, shutting it off, then waiting for the refrigerant to accumulate in the case for time specified by

Operation Manual
Bedienungsanleitung
Manuel d'utilisation
Manuale d'istruzione
Manual de Instrucciones

STARTEK

Refrigeration
Service Products
and Components



10084 Rev. C

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