

O P E R A T I N G M A N U A L



D-TEK

Refrigerant Leak Detector

Declaration of Conformity

This is to certify that this equipment, designed and manufactured by:

INFICON Inc.
2 Technology Place
East Syracuse, NY 13057
USA

meets the essential safety requirements of the European Union and is placed on the market accordingly. It has been constructed in accordance with good engineering practice in safety matters in force in the Community and does not endanger the safety of persons, domestic animals or property when properly installed and maintained and used in applications for which it was made.

Equipment Description: D-TEK Refrigerant Leak Detector

Applicable Directives: 73/23/EEC as amended by 93/68/EEC
89/336/EEC as amended by 93/68/EEC

Applicable Standards: EN 61010-1 : 1993
EN50081-1 : 1992
EN50082-1 : 1992

CE Implementation Date: January 3, 1995

Authorized Representative: Gary W. Lewis
Vice President-Quality Assurance
INFICON Inc.

ANY QUESTIONS RELATIVE TO THIS DECLARATION OR TO THE SAFETY OF INFICON'S PRODUCTS SHOULD BE DIRECTED, IN WRITING, TO THE QUALITY ASSURANCE DEPARTMENT AT THE ABOVE ADDRESS.

THIS SYMBOL IS INTENDED TO ALERT THE USER TO THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE (SERVICING) INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE INSTRUMENT.



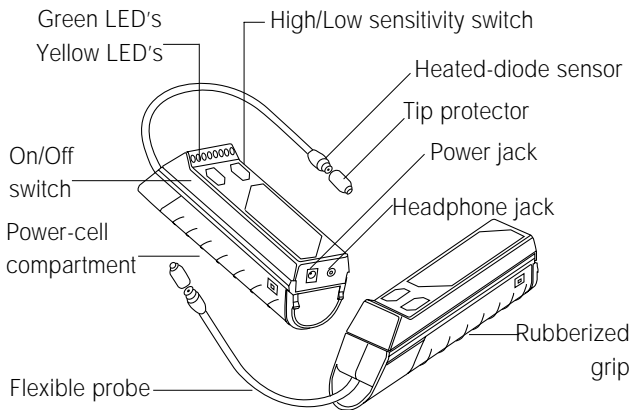
Thank you for buying the INFICON D-TEK Refrigerant Leak Detector!

D-TEK combines sophisticated technology with durability for an instrument with outstanding sensitivity that's still Laboratory Accurate, Toolbox Tough™. With normal use and little special care, your D-TEK Refrigerant Leak Detector from INFICON will give you years of trouble-free service.

The D-TEK's High-Performance Features

- Electrochemical heated-diode sensor
- "No-reset" detection of CFCs, HCFCs, and HFCs
- Automatic adjustment (zeroing) to refrigerants in leak test area
- Rugged flexible probe
- Foam filter for sensor protection
- High/Low leak-sensitivity switch
- Convenient ON/OFF switch with LED indicator
- Variable-pitch audible leak-source signal
- Progressive yellow LED leak-magnitude indicators
- Rechargeable, replaceable NiCd power cells
- AC mains power adapter (100, 120, 220, 240 VAC models available)

To get the best performance from your D-TEK Leak Detector, please read this manual carefully before you start using the instrument. If you have any questions or need additional assistance, please call 800-344-3304. We'll be happy to help you.



Getting Started



WARNING: DO NOT OPERATE THIS INSTRUMENT IN THE PRESENCE OF GASOLINE, NATURAL GAS, PROPANE, OR IN OTHER COMBUSTIVE ATMOSPHERES.

Installing the Sensor

The D-TEK Refrigerant Leak Detector is shipped with the heated-diode sensor packed separately. The sensor is located in the foil protective package along with a desiccant capsule to keep it dry. Installation of the sensor in the tip of the leak detector is required before use. The steps for installation are:

- Locate the end of the leak detector probe and unscrew (counter-clockwise) the tip protector. The three sockets are for the leads of the D-TEK sensor to fit into.
- Remove the sensor from the foil protective package. The sensor is the small metal "can" with a hole in the top.

Installing the Sensor (Continued)

- Carefully align the 3 leads (small wires coming out of the bottom of the cap) on the sensor with the 3 sockets in the top of the probe. Insert the leads into the sockets and press them together.
Note: You must be careful not to bend the sensor leads because this can cause erratic operation (see **Troubleshooting**.)
- Place the tip protector (with filter installed) over the sensor and tighten snugly by turning cap in clockwise direction.

Charging the Power Cells

Because the D-TEK's power cells are nickel/cadmium, they are not yet charged. To charge them, connect the cord of the AC power adapter to the power jack at the rear of the instrument, and plug the adapter into the appropriate mains outlet. Allow 10 hours for the full charge. **Even while the power cells are being charged, your D-TEK Leak Detector's power cords allow it to operate (see Using Your INFICON D-TEK).**

Note: Power cells must be installed in the detector for proper operation.

Using Your INFICON D-TEK



WARNING: DO NOT OPERATE THIS INSTRUMENT IN THE PRESENCE OF GASOLINE, NATURAL GAS, PROPANE, OR IN OTHER COMBUSTIVE ATMOSPHERES.

Using the D-TEK Refrigerant Leak Detector is simple: Make sure the sensitivity switch is set on HIGH, then slide the power switch to the ON position. The green ON indicator lamp will light, and some or all of the yellow warm-up indicator lamps will come on. When the yellow lamps all go off, the unit is ready to use.

The INFICON D-TEK Refrigerant Leak Detector provides similar responses to all CFC's, HCFC's, HFC's and refrigerant blends (i.e.,

Using Your INFICON D-TEK (Continued)

R-404A, R407C, R-410A) as well as SF₆. There is no need to select the refrigerant you're working with.

Headphone sets may be used with the D-TEK Refrigerant Leak Detector. When the headphones are plugged into the detector, the audio signal will only be heard through the headset.



WARNING: ONLY USE HEADPHONE SETS SUPPLIED BY INFICON, PART #032-404. SERIOUS HEARING DAMAGE MAY OCCUR IF OTHER HEADPHONE SETS ARE USED.

Finding Leaks

- Place the tip of the leak-detector probe as close as possible to the site of the suspected leak. Try to position the probe within 1/4 inch of the possible leak source.
- Slowly (approximately 1-2 inches per second) **move** the probe past each possible leakage point.

Note: It is important to move the tip of the probe past the leak to get a correct reading. The INFICON D-TEK only responds to changes in concentration of the refrigerant from the leak. Moving the probe permits the instrument to respond properly to these changes.

- Watch for the yellow lamps to light, and listen for a tone. When the instrument detects a leak source, its yellow lamps will light, and it will emit a different audible tone.
- When the D-TEK signals a leak, pull the probe away from the leak for a moment, then bring it back to pinpoint the location.
- If the concentration of the refrigerant gas is high, slide the sensitivity switch to LOW before repositioning the probe at the

suspected leak source. The LOW sensitivity setting helps find the exact site when a leak is large.

- Once you have isolated the leak source, return the sensitivity setting to HIGH to continue using the D-TEK.

Note: When you reset the instrument to HIGH, as when you turn it on initially, the yellow lamps will relight and the tone will sound again momentarily.

- When you've finished leak-testing, turn OFF the instrument.
- Store your INFICON D-TEK in a clean place, protected from shock, impact, or other possible damage.

Choosing Power Options

The INFICON D-TEK Refrigerant Leak Detector will operate either on charged power cells or by connection to the AC power adapter. When the unit is plugged in using the AC power adapter, the power cells will continue to be charged while the D-TEK is operating, although somewhat more slowly than if the instrument is OFF.

Two DC power cords are also available, designed to charge and power the D-TEK from your vehicle's battery. One DC power cord plugs into your cigarette lighter; the other has battery clips. As with the AC adapter, the D-TEK can be operated while connected to the 12-volt supply.

Note: Power cells must be installed in the detector for proper operation.

Maintaining Your INFICON D-TEK

Recharging the Power Cells

Fully charged power cells should provide power for greater than 6 hours of continuous operation. When the charge is getting low, the green light starts to flash. The flashing light indicates that you have

Maintaining Your INFICON D-TEK

Recharging the Power Cells (Continued)

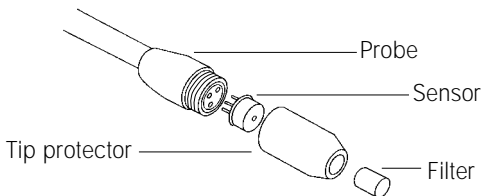
about 1 hour of useful charge in the power cells. To recharge the power cells, use one of the instrument's power cords.



WARNING: DO NOT ATTACH ANY OTHER POWER CORDS TO THE D-TEK'S POWER JACK EXCEPT THE AC POWER ADAPTER AND DC CORDS DESIGNED FOR THIS INSTRUMENT.

- Connect the AC power adapter cord to the instrument, and plug the adapter into a working outlet **or**
- Connect one of the DC cords to the D-TEK, and tap the power from your vehicle's battery.

Allow 10 hours for a full charge. You can operate the leak detector on any of its power cords while the power cells are charging. Using the instrument while the power cells are charging, however, will lengthen the time required for a complete charge. The leak detector will not overcharge the power cells, but for maximum power cell life, disconnect the power adapter when the power cells are fully charged.



Changing the Filter

The foam filter at the probe tip should be replaced if it becomes plugged with water or oil. To replace the filter, unscrew the tip

Changing the Filter (Continued)

protector (counter clockwise) and simply push out (with a paper clip or similar diameter object) the filter from the sensor side (larger end) of the tip protector. Slide the new filter into the small hole in the tip protector, then replace the tip protector.

If the sensor unplugs when you remove the tip protector, take it out and plug it back in, as described in the next section.

Changing the Sensor

The D-TEK's electrochemical heated-diode sensing element is located in the tip of the probe. This specialized sensor will operate for about 100 hours. At that point, you should replace the sensor:

- Turn OFF the leak detector.
- Locate the end of the leak detector probe and unscrew (counter clockwise) the tip protector. Pull the sensor (the sensor is the small "can" with the hole in the top) straight out, which unplugs it.
- Remove the replacement sensor from the foil protective package.
- Carefully align the 3 leads (small wires coming out the bottom of the can) on the sensor with the 3 sockets in the top of the probe. Insert the leads into the sockets and press them together.

Note: You must be careful not to bend the sensor leads because this can cause erratic operation (see **Troubleshooting**.)

- Take this opportunity to change the filter, too. (see **Changing the Filter**.)
- Place the tip protector over the sensor and tighten snugly by turning cap in clockwise direction.

Sensitivity Check

The D-TEK has a circuit that allows the operator to check the sensor's operation, insuring your instrument will be able to sense refrigerant at the specified rate. To do this check you should:

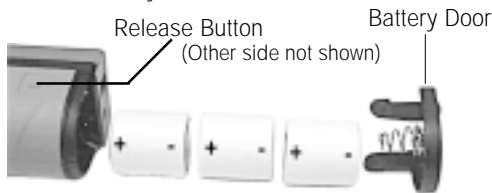
- Turn on the D-TEK with the sensitivity switch in the HIGH position. Be sure you either have charged power cells or you are operating the D-TEK off the AC adapter.
- After the D-TEK goes through its warm up and all the yellow LED's turn off, move the sensitivity switch from HIGH to LOW and then back to HIGH.
- If you do **not** see three (3) or more yellow LED's light then zero out, your sensor has either lost its ability to pick up the specified refrigerant leak or your D-TEK has a malfunction (see **Troubleshooting**.)

Removing/Replacing the Power Cells

If you have a **set of three** fully charged power cells, you may exchange the **complete set** with the three used cells in the leak detector, then recharge the originals later.

Note: Power cells must be installed in the detector for proper operation.

Remove the battery compartment door on the back of the D-TEK by pressing on both release buttons on the grip and pulling the door straight out. See the photo below for location of parts. The batteries are free to slide out into your hand.



Removing/Replacing the Power Cells (Continued)

To install fresh power cells, check the polarity label inside the power-cell compartment, and insert the positive (button) end of each power cell first, as shown. Once the power cells are in place, close the battery compartment by aligning the two tabs and sliding the door straight in until it latches.

Cleaning the D-TEK's Housing

The D-TEK's plastic housing can be cleaned with standard household detergent or isopropyl alcohol. Care should be taken to prevent the cleaner from entering the instrument. Since gasoline and other solvents may damage the plastic, protect your INFICON D-TEK from contact with these substances.

Troubleshooting

Note: The internal parts of the D-TEK Leak Detector are not serviceable. Opening the plastic housing for any reason will void the warranty.

Problem

Low sensitivity, the leak detector is slow to respond to a leak or the leak detector will not "pick up" refrigerant.

Diagnostics/Remedy

This problem can be caused by broken or shorted wire in the probe, by a failure in the pumping system or by a sensor that has burned out.

To identify which area may be the problem you should:

- Turn your D-TEK on and verify the pump is running by listening for a high pitched motor sound. If you do not hear this sound, the pump system has failed.

- If the pump system is operating, perform a sensitivity check (see **Sensitivity Check**) on the sensor.
- If your leak detector has failed to light 3 LED's during the sensitivity test, you should replace the sensor at the tip of probe (see **Installing the Sensor**). With tip protector **off**, turn the leak detector ON and look for a red glow in the small hole of the sensor. If you fail to see a red glow, the leak detector has a broken or shorted sensor power wire in the probe. If you see a red glow, screw on the tip protector and perform the **Sensitivity Check** again. If your leak detector still fails to light 3 LED's, you have a broken or shorted sensor signal wire in the probe. The above failures require you to take your leak detector to your wholesaler for handling.

Problem

Your D-TEK will not power up (even after charging the proper time) or all the lights illuminate with no audio sound.

Diagnostics/Remedy

This problem can be caused by power cells that need to be recharged, improperly installed power cells, power cells that have shorted or a faulty AC power adapter.

Note: A new D-TEK Refrigerant Leak Detector does not come with the batteries charged. To charge them see **Charging the Power Cells**.

Note: Power cells must be installed in the detector for proper operation.

To identify what area may be the problem you should:

- Insure the power cells have been charged the proper amount of time. **Note:** If the detector has been plugged into a power source the proper amount of time, you may want to guarantee the power source does not get turned off at night.

- Check that the power cells are installed properly. The positive (button) end of each power cell should be inserted first (toward the front of the instrument).
- Visually check that the power cells are free of oxidation or other residue. If needed, clean the ends of the power cells with pencil eraser.
- Open the battery door. Using the AC power adapter try operating the detector. If the leak detector does not turn on, the power adapter has failed. **Note:** In very few cases the power circuit on the electronic board in the leak detector may fail giving the same symptoms. If possible, before ordering a new power adapter, you may want to run this test with a different power adapter to insure the electronic board is operating. This test is performed to verify proper operation of the AC adapter. With the battery door open, the detector will not operate to published specifications.
- If your leak detector operates on the AC power adapter, test each individual power cell for voltage output. Do this by using a voltmeter (DC voltage), putting a probe on each end of the cell. You should read from 1.0 to 1.4 volts DC on each cell. If any of the cells fail to indicate the correct voltage, replace the complete battery set (all 3 cells).

Problem

Your leak detector is erratic, it sounds off when moving the probe, when the tip is bumped, or when it is sitting on the desk.

Diagnostics/Remedy

This problem can be caused by the sensor leads being bent, not allowing for proper contact with sockets, by humidity being absorbed over a long period of not operating the leak detector, or

Diagnostics/Remedy (Continued)

by shorting lead wires in the probe tip. It should be noted that sudden whipping of the leak detector probe or “blowing” into the sensor tip will affect the air flow over the sensor and cause the instrument to alarm.

To identify what area may be the problem you should:

- Remove the protective cap and sensor. Inspect the sensor leads (these are the small wires coming out the bottom of the silver can) for straightness. If they are bent, use needle nose pliers to gently straighten out the wires. Install the sensor and test the detector.
- If the D-TEK has not been used for 5 weeks or greater, humidity may have been absorbed by the “core” of the sensor. Turn the D-TEK on with the sensitivity switch in the HIGH position. Allow the D-TEK to run for a minimum of 20 minutes or until spiking alarms stop. **Note:** The absorption of moisture in no way affects the life or sensitivity of the sensor.
- With the protective cap installed try pushing down on tip of the probe. Also try bending the probe at the base of the tip from one side to another. Be cautious not to block the air flow through the sensor. If you receive a long, continuous alarm, there may be a short in the probe tip. This failure requires you to take your leak detector to your wholesaler for handling.

Disposing of Power Cells

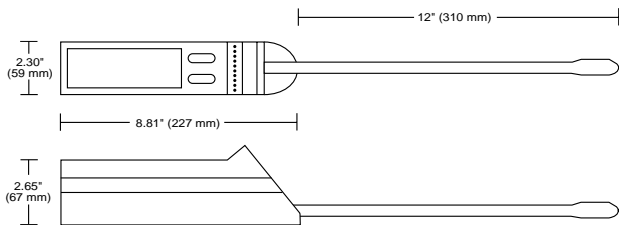
At the end of the life of a set of power cells, please dispose of them according to applicable state and local regulations. In the absence of such regulations, INFICON encourages its customers to recycle and/or dispose of the cells through voluntary waste recycling programs.

Replacement Parts and Accessories

Replacement parts and accessories for your INFICON D-TEK Refrigerant Leak Detector are available through the same dealer from whom you bought the instrument.

Molded plastic case	703-059-P1
Headphones	032-404
12-volt cord with battery clips, 12 ft.	703-056-P1
12-volt cord with cigarette-lighter plug, 12 ft	703-055-P1
120-volt adapter and cord, 6 ft	054-513
220-volt mains adapter and cord, 6ft.....	054-515
Power cells, set of three	703-057-G1
Replacement sensor	703-020-G1
Tip filters, package of 20 with replacement tip protector	703-015-G1

Instrument Features and Specifications



Base unit includes sensor, 3 NiCd power cells, AC voltage wall adapter with cord, hard plastic molded case, 10 replacement filters, and 12-volt power cord with cigarette plug.

Instrument Features and Specifications (Continued)

Features:

- Power on/off switch
- High/low sensitivity switch
- Automatic background zeroing
- Several power options:
 - AC power wall adapter with 6' cord (100, 120, 220, or 240 VAC)
 - 3 NiCd rechargeable 1/2 D size power cells, good for greater than 6 hrs. of continuous operation.
- Built-in recharger
- Case materials are all self extinguishing, per UL 94HB

Specifications:

- Usage Indoor or Outdoor
- Minimum sensitivity to R12 and R134a 0.25 oz/yr (7 g/yr)
- Input voltage range 12 to 16 volts DC
- Input current 500 mA Max.
- Operating and charging temperature range* . +32°F to 122°F
(0°C to +50°C)
- Storage temperature range +14°F to +140°F
(-10°C to +60°C)
- Humidity 95% RH NC Max.
- Altitude 6500' (2000m)
- Pollution degree 2
- Overvoltage category 2
- Weight (with power cells) 1.28 lb (0.58kg)

*May be operated for a limited time in lower temperature environments

Warranty and Liability-Limitation

INFICON warrants your D-TEK Refrigerant Leak Detector to be free from defects of materials or workmanship for two years from the date of purchase. INFICON does not warrant items that deteriorate under normal use, including power cells, sensors and filters. In addition, INFICON does not warrant any instrument that has been subjected to misuse, negligence, or accident, or has been repaired or altered by anyone other than INFICON.

INFICON's liability is limited to instruments returned to INFICON, transportation prepaid, not later than thirty (30) days after the warranty period expires, and which INFICON judges to have malfunctioned because of defective materials or workmanship. INFICON's liability is limited to, at its option, repairing or replacing the defective instrument or part.

This warranty is in lieu of all other warranties, express or implied, whether of MERCHANTABILITY or of FITNESS FOR A PARTICULAR PURPOSE or otherwise. All such other warranties are expressly disclaimed.

INFICON shall have no liability in excess of the price paid to INFICON for the instrument plus return transportation charges prepaid. INFICON shall have no liability for any incidental or consequential damages. All such liabilities are **EXCLUDED**.

Return Materials Authorization Procedure

All instruments and parts returned to INFICON for repair or credit must be properly packaged, insured, shipped transportation charges prepaid, and must have a Return Material Authorization (RMA) number issued before the material is returned. The RMA number is to be marked on all shipping labels and packing slips. Please contact INFICON at 800-344-3304 for RMA number.

Special Information for Automotive Technicians

INFICON's D-TEK Refrigerant Leak Detector Model #703-005-GX is designed certified by MET Laboratories, Inc. to meet SAE J1627, "Rating Criteria for Electronic Refrigerant Leak Detectors" for R12, R22, and R134a. The following SAE Recommended Practice applies to this instrument and to the use of generally available electronic leak detection methods to service motor-vehicle passenger-compartment air-conditioning systems.

1. The electronic leak detector shall be operated in accordance with the equipment manufacturer's operating instructions.
2. Leak test with the engine *not* in operation.
3. The A/C system shall be charged with sufficient refrigerant to have a gage pressure of at least 340 kPa (50 PSI) when not in operation. At temperatures below 15°C (59°F) 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 being tested is contaminated. 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

Special Information for Automotive Technicians (Continued)

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 to 50 mm/second (1 to 2 inches/second) and no more than 5 mm (1/4 inch) from the surface completely around the position. Slower and closer movement of the probe greatly improves the likelihood of finding a 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 seconds minimum, shutting it off, then waiting for the refrigerant to accumulate in the case for time specified by section 9.1 (below), then inserting the leak detector probe into the blower resistor-block or condensate drain-hole if no water is present, or into the closest opening in the HVAC case to the evaporator, such as the heater duct or a vent duct. If the detector alarms, a leak apparently has been found.
 - 9.1 The accumulation time for evaporator testing is 13 minutes.
 - 9.2 Following any service to the refrigerant system of the vehicle, and any other service which disturbs the refrigerant system, a leak test of the repair and of the service ports of the refrigerant system shall be done.



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