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LD-200
Heated Diode
Refrigerant Leak Detector
User Manual

Contents

General Description	2
Main Features	2
Battery Charge	3
Functions and Features	3
Operation Instruction	5
Detection Method	6
Maintenance	9

General Description

LD-200 is among the existing portable refrigerant leak detectors that offer the greatest sensitivity and fastest response. This is achieved through the employment of a high sensitive heated diode sensor combined with a sophisticated microprocessor-controlled circuit. With supreme performance and functional advantages, it offers an unique designed shape to provide greater ease of use and comfort.

Main Features

Sensor: heated diode sensor

Minimum sensitivity: 3g/yr

Response time < 3s

Warm-up time < 30s

Operating temperature: 0°C ~50°C ;

Operating humidity < 80%RH (non-condensing)

The detector responds to all halogenated refrigerants (including Chlorine and Fluorine), which include but not limited to:

CFCs e.g. R12, R11, R500, R503 etc.

HCFCs e.g. R22, R123, R124, R502 etc.

HFCs e.g. R134a, R404a, R410a, R407C etc.

CH R600a

Display: Highlight LED display

One-key reset and seven-level adjustable sensitivity

Vacuum pump provides instant response and clearing

Battery level indication

Sensor failure indication

3.7V high capacity lithium battery

Unique shape

Flexible stainless probe

The detector and its parts (Figure 1)

1. ON/OFF key
2. Sensitivity key
3. Reset key
4. Mute key
5. Status display zone
6. Sensor
7. Probe
8. Battery charge port
9. Charge indicator



Figure-1

Battery Charge

Connect the matched power adapter to the detector in correct way. The discharge time is no less than 5.5 hours for battery in full power.

It takes less than 2.5 hours for charging.

Charge indicator:

Red: in charging

Green: charging completed.

Note: When the indicator is fast flashing, please charge the battery in time; otherwise, it may influence the service life of the battery.

Functions and Features

The detector is easy to operate with simplified user interface. Please refer to Figure 1 for indicators and keys before you proceed through this section.

4.1 Battery Level Indicator

The battery level indicator allows the user to see the battery level at all times.

If the indicator is off, the battery is in full power.

If the indicator is on, the battery has enough voltage for operation.

If the indicator is fast flashing, it indicates low battery. Charge the battery in time to prevent unstable performance or failure of detection.

4.2 Automatic Circuit/Reset feature

The detector features automatic circuit and reset functions that allows it to ignore ambient concentrations of refrigerants.

Automatic circuit: Upon initial power-on and completion of the warm-up, the detector automatically ignores the current level of refrigerant at the tip. Only when a level or concentration is greater than this level, it will cause an alarm.

Note: Power on and warm up the detector in fresh air, since the detector ignores any refrigerant at the sensor tip after warm-up.

Reset feature: It is similar to automatic circuit function. It programs the circuit to ignore the level of refrigerant at the tip. Each time the Reset key is pressed and released, the detector sets its threshold for detection to a level above the current concentration being detected. By moving closer to a large leak, and pressing Reset each time a full detection is indicated, the user can pinpoint the source of the leakage. Similarly, move the detector to fresh air and reset for maximum sensitivity. After reset in fresh air, the detector can detect any leakage with level above zero. Press the Reset key to reset the detector. Each time the Reset key is pressed, LED displays "8" about three seconds to provide a visual confirmation of the reset action.

4.3 Sensitivity Adjustment


The detector provides seven levels of sensitivity adjustable. The default sensitivity is the highest level.

Press the Sensitivity key to change the sensitivity level, LED screen will display the corresponding sensitivity level. Seven level could be adjusted in circulation in a real-time manner.

4.4 Sensor Status Indicator

The detector has the function to diagnose and indicate the sensor's status. Whenever the detector is turned on, the circuit will automatically sense the condition of the sensor and detect a failed or missing sensor.

Failed Sensor Indication: “”

If the circuit detects a failed or missing sensor, it displays “” and the detector will stop working.

4.5 Audible/Visual alarm – Mute function

The detector features two types of alarm indication—internal audible alarm via a buzzer and visual alarm via LED screen data. When leakage is detected, the LED screen will display the leakage level. The leakage level is from 1-7. You can select both the audible and visual alarms, or just the visual alarm. After power-on, the detector will automatically deactivate audible alarm. If you want to activate it, press Mute key, then the internal speaker inside the buzzer is enabled, and the leakage could be indicated by both LED screen and buzzer. Press Mute key again, the buzzer alarm will be muted.

Operation Instruction

1. Press and release ON/OFF key to switch on/off the detector.
2. The detector will start warming up. The LED in the middle will flash, vacuum pump, warm-up indicator and battery indicator are on. It takes about 30 seconds for warm-up.
3. After warm-up, the LED displays “0” and blinks, indicating the detector is ready for use. Press Mute key to enable audible indication, and the detector will beep stably.
4. Set the sensitivity level as you desire, as described in the Sensitivity Adjustment Section. Press the Reset key to set the current refrigerant level as the base point.

5. Begin to search for leakage. Move the sensor tip toward the suspected leak places. The flexible probe may be shaped to access to hard-to-reach areas.

NOTE: If the detector has been used, make sure the sensor tip is not covered with dirt, grease, etc.

6. If a leakage is detected, the detector will begin to alarm. The alarm will quicken and LED displays number of leakage level. The larger the detected concentration, the greater it alarms.
7. If an alarm occurs before the leakage source is located, use the Reset key to pinpoint the leak, as is described in the Reset Features section. The detector may be reset as many times as necessary to pinpoint the leakage source. It is suggested to wait for about ten seconds to detect the leakage after pressing rest key.

Detection Method

As for the detection method, please see Figure3

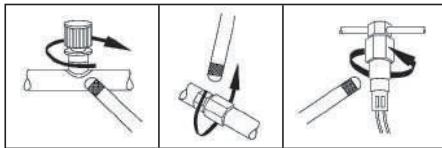


Figure-3

1. Visually exam the refrigeration system. The oily and dirty spots, node valves, coils, connectors, or pipelines are the areas most likely to leak gases.
2. Start leak detecting at the joint at a speed of 1cm /s. The distance between sensor tip and the joint should be 1-3mm.

3. When an alarm is triggered, it may indicate that the leakage is close by. Detect around that area again and see if the alarm repeats. If the leakage is confirmed, pinpoint the leak source by moving slowly from non-alarm area to the leaking area from different directions. Besides, you could also pinpoint the leakage by moving the detector away from the leaking area and reset the detector, adjusting the sensitivity lower and repeating the above process. Once the leakage is confirmed, mark it and continue detecting the whole system.
4. Additional work may be needed to eliminate possible ambiguity, such as, other contaminants at the spot may also make the detector work abnormally. Please clean the leaking area with dry cloth and blow clean dry air to the leaking area and repeat step 3 above to confirm the leak.
5. It is more difficult to detect the leakage on evaporator coil than other areas due to the limited access to the whole evaporator coil. Most evaporator coils are composed of modules and are installed in a closed space with fan for heat exchange. Turn on the system with a fan for 10 seconds, turn off the fan and wait for 10-15 minutes at the evaporator, then use the detector to detect the outlet of the condensate (make sure the sensor tip doesn't touch water directly), or detect the air inside the evaporator chamber. Most halogens are lighter than the air and likely to accumulate at the higher spot in the closed space. An alarm may indicate leakage at the evaporator coil, but it is hard to repair evaporator by pinpointing the precise leakage location. In most cases, the whole coil has to be replaced.

Notes before leakage detection

1. In order to detect leakage in a refrigeration system, the system itself must have normal operating pressure, or at least partially reach to minimum 50 PSI. Low ambient temperature ($<15^{\circ}\text{C}$) may lower the system required pressure and make the leakage less likely to be detected. No leak detected does not mean the system does not have gas leakage. Check the pressure first.
2. Leaking areas are usually covered with contaminants such as compressor oil or dirt. Be careful not to make the sensor tip contact with these contaminants.
3. The function of the detector is to detect refrigerant's relative change at the sensor tip. Pinpointing the leakage source needs professional to adjust sensitivity to proper level and reset the detector.
4. In areas where the atmosphere is contaminated with halogen refrigerant, press Reset key to ignore the leakage in the background. Make sure not move the sensor tip away from the contaminated background while resetting the detector.
5. In windy area, the leaking halogen refrigerant may be quickly diluted or blown away from the leakage source. The technician may use a wind shield to isolate the leak area or temporarily turn off the fan.
6. To avoid false alarm, prevent the sensor tip against any moisture or other solvent. Besides, the screw of the sensor should be tightened up.
7. Ban after the boot directly put the probe in environment with high concentration test, to prevent the poisoning caused by sensor, instrument cannot be used.

Maintenance

It is important to maintain the detector so as to extend its service life and improve its performance.

Warning: Turn off the power before clearing the shell of sensor.

Keep the sensor tip clean: Use cotton cloth or dry air to clean the shield on the sensor tip if it gets contaminated. If the sensor tip itself is contaminated, soak the tip in absolute alcohol for a few minutes, and then use compressed air to blow it dry, or dry it with cloth.

Note: Never use strong solvents such as Gasoline, mineral oil and turpentine. These solvents may coat the sensor with a thin film to reduce the sensitivity of the detector and make the detector slow to respond to a leak.

Put the detector and the sensor in a dry and clean place. Charge the battery every three months if the detector is not used for a long time in case self-discharge causes ultra-low battery and irreversible capacity loss.

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