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LD-100

Heated Diode

Refrigerant Leak Detector

User Manual



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General Description

LD-100 offers the greatest sensitivity and fastest response of any portable refrigerant detector available. This is achieved through the employment of a high sensitive heated diode sensor combined with a sophisticated microprocessor-controlled circuit.

In addition to the supreme performance and functional advantages, it offers an unique designed shape to provide greater ease of use and comfort.

Main Features

- Sensor type: heated diode sensor
- Minimum Sensitivity: 3g/yr
- Response time:<3s
- Warm up time:<60s
- Ambient Environment:
Temperature: 0 °C ~ 50 °C ; Humidity: < 80%RH(non condensing)

- Application of refrigerant:

It will respond to all halogenated (including Chlorine of Fluorine) refrigerants. This includes, but is 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 method: Highlight LED display
- One-touch reset and six-level adjustable sensitivity
- True mechanical pump provides instant response and clearing
- Battery level indication
- Sensor failure indication
- Three 1.5V AA high-energy battery
- Unique shape design
- Flexible stainless probe

Parts Diagram (Figure 1)

- 1.ON/OFF key
2. Sensitivity high/low key
3. Reset key
4. Alarm key
5. Status display zone
6. Sensor
7. Flexible probe
8. Battery compartment

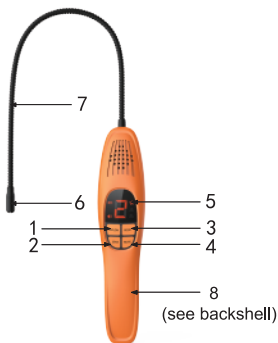


Figure-1

Battery installation

Hold the device tightly with two hands. Press the battery cover, drag outward and remove it. Install the batteries to the compartment and close the cover. Please pay attention to the direction during installation.
(see Fig 2)



Figure-2

Functions and Features

The product is easy to operate and simplifies user interface. Please refer to Fig 1 to familiarize yourself with the indicators and keypad controls as you proceed through this section

4.1 Battery Voltage Indicator

The Battery Voltage Indicator allows the user to see the battery level at all times.

If the indicator is off, the batteries are in full power;

If the indicator is on, the batteries have enough voltage for operation;

If the indicator is fast flashing, low batteries, need to change batteries at the soonest to prevent unstable performance or failure of detection.

4.2 Automatic Circuit/Reset feature

The unit features Automatic Circuit and Reset functions that set the unit to ignore ambient concentrations of refrigerant. Automatic circuit: Upon initial power-on and completion of the warm-up, the unit automatically sets itself to ignore the level of refrigerant present at the tip. Only a level, or concentration, greater than this level will cause an alarm.

Note: Since this feature causes the unit to ignore any refrigerant present at the sensor tip after warm-up is completed, the unit should be powered on and allowed to warm up in fresh air.

Reset feature: Resetting the unit during operation performs a similar function; it programs the circuit to ignore the level of refrigerant present at the tip. Each time the Reset key is pressed (and released), the unit 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, the unit can be moved to fresh air and reset for maximum sensitivity. Resetting the unit with no refrigerant present (fresh air) causes any level above zero to be detected. If need to reset the unit, press the Reset key. 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 unit provides six levels of sensitivity adjustment. When the unit is switched on, it is set to the lowest sensitivity position.

To change the sensitivity of the unit, press the Sensitivity key, LED screen will display the corresponding sensitivity level. Six level sensitivity could be real-time adjusted in circulation.

4.4 Sensor Status Indicator

The product has the ability to automatically diagnose and indicate the sensor's Status. Whenever the product is turned on, the circuit automatically senses the condition of the sensor and can detect a failed or missing sensor.

Failed Sensor Indication: “”

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

4.5 Audible / Visual alarms – Mute feature

The unit features two alarm indications – an internal speaker audible alarm and LED screen data visual alarm. When detect the leakage, LED screen will display the leakage level. The leakage level is from 1-7. User could select to activate both the audible and visual alarms, or use only the visual alarm. Upon power-on, the product will automatically deactivate audible alarm. If you want to enable the audible alarm, press Alarm key, then the internal speaker is enabled, and the leakage could be indicated by both LED screen and speaker. Press Alarm Key again, the speaker alarm will be muted.

Operation

5.1 Press and release ON/OFF Key to switch on the detector.

5.2 The detector will start the warm-up. The middle LED will flash, air pump indicator warm-up indicator is on, and battery indicator is on , and warm-up time is about 60 seconds.

5.3 After warm-up, it displays "0" and blinks, representing the device is ready for use. Press Alarm key to enable audible indication, and the device will emit a stable beeping.

5.4 Set the sensitivity level according to user's demand, as described in the Sensitivity Adjustment Section.

5.5 Begin searching for leakage. Move the probe tip toward the suspected leak. The flexible probe may be shaped to provide access to hard-to-reach areas.

NOTE: If the device has previously been used, make sure that the probe tip is not obstructed with dirt, grease, etc.

5.6 If a refrigerant is detected, the device will begin to alarm – the audible tone will quicken and it displays number of leakage level. The larger of the detected concentration, the greater it alarms.

5.7 If an alarm occurs before the leak source is pinpointed, the Reset Key may be used to pinpoint the leak, as described in the Reset Features section. The unit may be reset as many times as necessary to pinpoint the leak 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

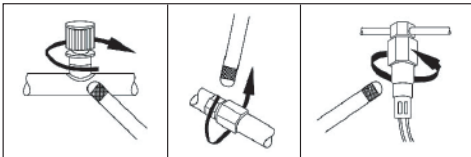


Figure -3

- 6.1. Visually exam the refrigeration system. The oily and dirty spots, node valves, coils, connectors, or pipelines are the areas most likely to leak gases.
- 6.2. Start leak detecting at the joint at a speed of 1cm /s and the distance between sensor tip and the joint should be 1-3mm.
- 6.3. When an alarm is triggered, it may indicate that the leakage is close by. Detect around that area again and see if the alarm is repeatable. If the leak is confirmed, pinpoint the leak source by moving slowly from no-leaking (no-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 unit, adjusting the sensitivity lower and repeating the above process. Once confirmed, mark around the leakage and continue detecting the whole line of the system.
- 6.4. 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.
- 6.5. Leak on evaporator coil is more difficult to detect than other areas because it is difficult for sensor tip to 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.

The system with the fan should be turned on for 10 seconds and then turn off the fan, wait 10-15 minutes at the evaporator, then use detector to detect the outlet of the condensate (make sure the sensor tip doesn't touch with the condensate), or detect the air inside the evaporator chamber. Most halogens are lighter than the air and likely to accumulate at the highest spot in the closed space. An alarm may indicate a leak at the evaporator coil, but it is hard to repair evaporator by pinpointing the precise leak location. In most cases, the whole coil has to be replaced.

Notes before leakage detection

- 7.1 In order to detect leakage in a refrigeration system, the system must have normal operating pressure, or at least partially reaches to minimum 50 PSI. Low environmental temperature (lower than 59 °F or 15 °C) may lower the system required pressure and may make the leakage less likely to be detected. No leak detected does not mean the system does not have gas leakage. Check the pressure before making the conclusion.
- 7.2 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.
- 7.3 The function of the detector is to detect refrigerant's relative change at the sensor tip. Pinpointing the leakage source needs professionals to adjust sensitivity to proper level and reset the detector.
- 7.4 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.

- 7.5 In windy area, the leaking halogen refrigerant may be quickly diluted or removed from the leakage source. The technician may use a wind shield to isolate the leak area or temporarily turn off the fan.
- 7.6 To avoid false alarm, prevent the sensor tip against any moisture or other solvent. Besides, the screw of the sensor should be tightened up.

Maintenance

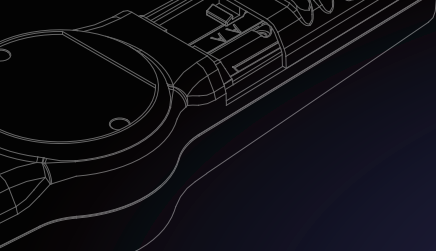
Proper maintenance is important and may extend the service life and improve the performance of your detector.

Warning: Turn the power off 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, turpentine, these solvents may coat the sensor with a thin film and 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; remove the batteries if the detector is not used for a long time.



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