

RLD-H10G Refrigerant Leak Detectors

The RLD-H10G is a professional grade leak detector for use by refrigeration and air conditioning technicians. This detector senses all CFC, HCFC, and HFC refrigerants and blends, such as R12, R502, R22, R404a, R507, and R134a, among others. The RLD-H10G plugs into a 120 VAC outlet. A full line of accessories and maintenance kits is also available, including replacement sensors, tune-up kits, probe extensions, and leak vials.



Figure 1: RLD-H10G Leak Detector

| Features and Benefits | |
|--|---|
| <input type="checkbox"/> Positive Ion Emission Heated Diode Sensor | Provides the most sensitivity available today, while still detecting all halogenated refrigerant gases |
| <input type="checkbox"/> Halogen Selective Sensing | Eliminates many sources of possible false alarms due to background contamination |
| <input type="checkbox"/> High Quality Air Pump | Supplies constant air flow to sensor so it responds quickly to leaks; also helps sensor recover quickly after exposure to refrigerant so leak can be verified |
| <input type="checkbox"/> Visual and Audible Signal | Facilitates sensing in noisy equipment rooms with 360° visibility and piercing tone; Frequency of noise/light indicates magnitude of leak |
| <input type="checkbox"/> Exceeds SAE J1627 Moving Probe Specification | Minimizes service time because the leak is found the first time, is verifiable, and the fix can be confirmed |
| <input type="checkbox"/> External Calibration Source | Indicates when the sensor is working properly and serves as a reference point to judge leak size |

Application Overview

Growing concern over the effects of certain refrigerants on the atmosphere has generated a strong motive to eliminate system leaks and to develop safer refrigerants. With the RLD-H10G, you can be confident that your instrument will provide the sensitivity and capabilities to meet your service needs today and for the years to come.

The RLD-H10G is intended principally as a service technician's tool. This detector has the capability to detect small amounts of halogenated gases, including chlorine and fluorine based refrigerants and blends.

Theory of Operation

The leak detector consists of a control unit with a manual balancing circuit, a probe with a 4.5 ft cable, and a 6 ft power cord. The sensor uses positive ion emission technology, which is based on the ionization characteristics of alkali metals. The alkali metals act as the cathode of a diode, and the anode is heated by a DC voltage. Air from the area being leak checked is pumped from the probe and into the space between the cathode and anode. If halogen gas is present, it creates an ionized current between the cathode and the anode, which is amplified to sound a speaker and light a neon lamp in the probe. Sensitivity can be controlled by adjusting the current (temperature) through the sensor.

Dimensions

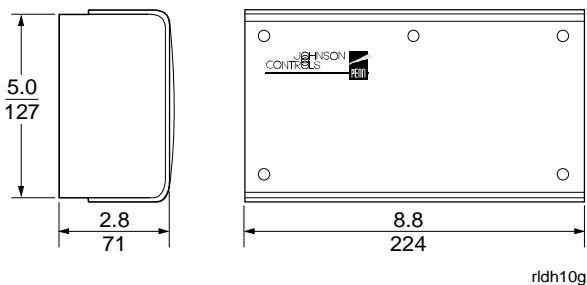


Figure 2: RLD-H10G Dimensions (in/mm)

Accessories



Figure 3: RLD-H10-100--14 in. Flexible Probe Extension



Figure 4: RLD-H10-600R--Tune-up Kit; includes sensor, 100 filters, 4 airflow indicator balls, 3 rubber probe tips, and leak vial

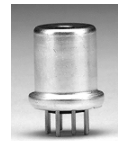


Figure 5: RLD-H10-601R--Replacement Sensor



Figure 6: RLD-H10-602R--Maintenance Kit; includes 100 filters, 4 airflow indicator balls, 3 rubber probe tips



Figure 7: RLD-H10-603R--Replacement Leak Vial

Operation

! WARNING: Personal Injury Hazard. Do not use the RLD-H10G in an explosive or combustible atmosphere. The ambient atmosphere is drawn through the probe and over the sensor, which operates at approximately 1000°F (540°C). The resulting hot mixture of air and combustible gas could explode.

! CAUTION: Equipment Damage Hazard. To avoid equipment damage, operate the RLD-H10G on the proper supply voltage, as given on the rating plate.

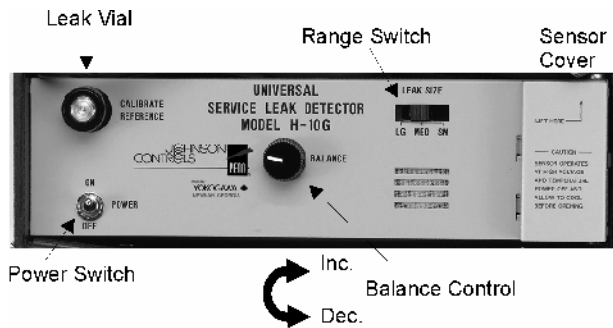


Figure 8: RLD-H10G Faceplate (Sensor heat control adjustment is on the bottom of the unit.)

1. Plug the cord into a 120 VAC, 60 Hz outlet.
2. Flip power switch to On position. (See Figure 8.)
3. Slide range switch to small (SM) leak position. (See Figure 8.)
4. Check for sufficient airflow by pointing the probe tip toward the floor and observing the airflow ball in the probe. (See Figure 9.) If the airflow is sufficient, the ball will rise and float a small distance above the tip of the probe. If the ball does not rise, tap the probe lightly to make sure it is not sticking. If the ball still does not rise, check the filter in the probe tip as described in the *Maintenance* section.



Figure 9: Verifying Airflow

5. Allow two minutes for the sensor to warm up. When the sensor is warm, the light and sound indication should idle at around three or four beats per second. The balance control (see Figure 8) may be used to adjust the idle rate.
6. Proceed to the *Calibration and Verification* section.

Calibration and Verification

The leak vial may be used as often as necessary to assure proper operation of the RLD-H10G, and to assist in determining the size of the leak. When using the small leak range position, a leak of HFC causing an audible signal equal to that produced by the leak vial has a leak rate of approximately one-half ounce/year. When using the medium leak range position on a CFC or HCFC system, this leak rate would also be approximately one-half ounce/year.

Proper unit response during the calibration test verifies sensitivity and operation for all three test positions.

1. Ensure that the range switch is in the small (SM) position and idling at three or four beats per second. (See Figure 8.)
2. Remove the black, sticky-label disc from the cap of the leak vial and discard. Allow a few minutes for the leak rate to stabilize. Do not attempt to unscrew the cap, as you may damage the bottle. The vial contains enough refrigerant to last for approximately six months.
3. Test operation by briefly moving the probe tip over the opening of the leak vial as if you are trying to locate this leak. It is not necessary to hold the probe over the leak, as this does not simulate field conditions.
4. The RLD-H10G should respond with an increase in flash rate and sound, verifying operation and indicating the location of the leak.
5. If the RLD-H10G does not respond to the leak vial, make sure there is liquid in the bottle. If the unit still does not respond to the leak, increase the sensor heat slightly by turning the sensor heat control knob (on the bottom of the unit) 1/16th of a turn clockwise.
6. Allow a minute for the sensor to heat, then repeat the calibration procedure.

Tips for Finding Leaks

- Use the black rubber probe tip whenever possible and hold the probe approximately 1/4 in. above the area being tested. Move the probe tip at about two inches per second along seams or joints suspected of leaking.
- Start leak checking anywhere, and continue in a logical progression through the entire system to locate all leaks.
- Set the range switch to the appropriate range to ensure maximum sensor life. If the leak size is unknown, start at the large (LG) leak setting. Adjust the balance control to maintain slow ticking (three or four ticks per second) in the idle state. (See Figure 8.)

IMPORTANT: Exposing the sensor to large amounts of refrigerant or holding the probe over a leak for a long period of time will significantly shorten sensor life.

- On CFC and HCFC systems, the medium (MED) range is sufficient to verify that the system is free of leaks that require fixing.
- On HFC systems, use the small (SM) range to verify that the system is free of leaks that require fixing.
- Replace the filter often (as described in the *Maintenance* section) to retain airflow and sensitivity.
- Wipe all surfaces to be tested with a clean, dry cloth.
- Check ports for moisture before inserting the probe.



CAUTION: Equipment Damage Hazard.
Submerging the probe in liquid will damage the vacuum pump.

Maintenance

Replacing the Filter and Airflow Indicator

To protect the air pump from damage due to foreign particles and moisture, replace the filter as it becomes dirty. With moderate use (15-30 minutes per day), replacing the filter once a month is recommended. In dirty environments or with heavy use, replace the filter more frequently. Replace the filter whenever it is visibly dirty or wet.

Replacing the Filter

1. Remove the black rubber probe tip.
2. Pick out the filter with a pin or tweezers. A fine screen will remain in the tip of the probe.
3. Insert the new filter in the probe end. (See Figure 10.) Make sure that the filter is firmly seated against the fine screen.
4. Replace the rubber probe tip.

Replacing Airflow Indicator

1. Remove the clear plastic section of the probe by gently pulling on the white rubber grip. (See Figure 10.)
2. Turn the probe upside-down and tap on it to remove the old airflow indicator ball.
3. Insert the new airflow indicator ball into the probe.
4. Reattach the probe end to the hose.

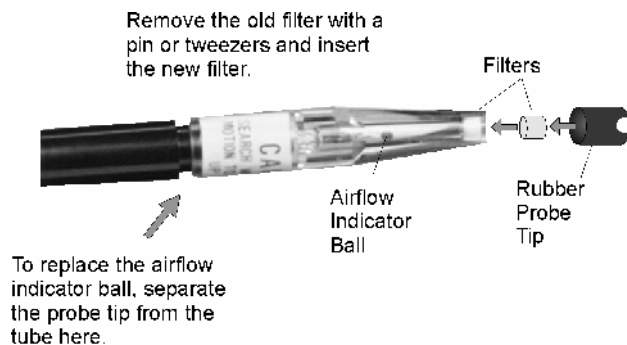


Figure 10: Replacing the Filter and Airflow Indicator

Replacing the Sensor

The sensor is a plug-in unit that is thrown away when expended. It needs replacement when the RLD-H10G no longer responds to the leak vial, even with the sensor heat control turned fully clockwise. (Make sure the leak vial contains some refrigerant.)



CAUTION: Personal Injury Hazard. Sensor surface temperature may reach 200°C (390°F) during operation, and may cause a burn if not allowed to cool.

1. Turn the leak detector off.
2. Unplug the power cord and open the sensor cover. The sensor is now visible. (See Figure 8 and Figure 11.)
3. Allow the sensor to cool before handling it (approximately 15 minutes).
4. Unplug and discard the sensor.
5. Insert a new sensor and close the sensor cover.
6. Turn the sensor heat control knob (on the bottom of the unit) to its full counterclockwise position.
7. Turn the unit on, and calibrate the new sensor. (See instructions in the *Calibration and Verification* section.)

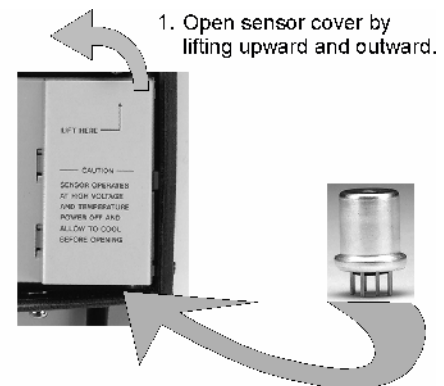


Figure 11: Replacing the Sensor

Troubleshooting

Table 1: Troubleshooting

| Problem | Cause | Solution |
|--|---|--|
| Responds to leak vial on large (LG) leak setting | Heat control set too high | Decrease the sensor heat slightly by turning the sensor heat knob (on the bottom of the unit) 1/16th of a turn counterclockwise. Allow a minute for the sensor to cool, then repeat calibration. |
| No response to leak vial | Leak vial empty | Reorder leak vial (RLD-H10-603R). |
| | No air flow (Airflow indicator ball in probe does not float.) | Replace filter in probe tip (RLD-H10-602R). Check pump operation. |
| | Sensor exposed to excessive amounts of halogen gas | Move probe to clean atmosphere for several minutes while sensor purges itself. Recalibrate in clean area. |
| | Water in probe | While unit is operating, blow clean air (5 psig) into the probe tip for approximately one minute or blow (by mouth) as hard as possible into probe tip for one or two minutes. Replace the filter (RLD-H10-602R). |
| | Heat control set too low | Increase the sensor heat slightly by turning the sensor heat knob (on the bottom of the unit) 1/16th of a turn clockwise. Allow a minute for the sensor to heat, then repeat calibration. |
| Audio normal; probe lamp does not flash | Burned-out or damaged probe lamp | Return unit to your Johnson Controls representative. |
| Responds continuously in all leak positions | Dirt in sensor | Remove sensor (see Figure 11) and blow it out with clean air (not over 10 psig). If unsuccessful, replace sensor (RLD-H10-601R). Replace the filter (RLD-H10-602R). |
| | Short circuit in sensor | Replace sensor (RLD-H10-601R). |
| Responds continuously on small leak position | Excessive sensitivity | Decrease the sensor heat slightly by turning the sensor heat knob (on the bottom of the unit) 1/16th of a turn counterclockwise. Allow a minute for the sensor to cool, then repeat calibration. |
| Balance control will not stop response away from leak | Atmosphere contaminated with excessive halogen gas | Ventilate area. Switch to large (LG) leak setting. (See Figure 8.) Reduce sensor heat if unit still responds excessively at large leak rate setting. |

Ordering Information

Table 2: Ordering Information

| Item | Description |
|--------------|---|
| RLD-H10G-1 | Refrigerant leak detector with 120 VAC power cord |
| RLD-H10-100 | 14 in. flexible probe extension |
| RLD-H10-600R | Tune-up kit; includes sensor, 100 filters, 4 airflow indicator balls, 3 probe tips, and leak vial |
| RLD-H10-601R | Replacement sensor |
| RLD-H10-602R | Maintenance kit; includes 100 replacement filters, 4 airflow indicator balls, and 3 probe tips |
| RLD-H10-603R | Replacement leak vial (contains enough refrigerant to last approximately six months) |

Repair

Should it become necessary to repair your RLD-H10G, please contact your Johnson Controls representative.

Warranty Repairs

Units under warranty will be shipped to Johnson Controls for repairs. The repairs will be completed within 24 hours after receipt by the repair center, and the unit will be returned to your Johnson Controls representative at the same priority of shipment with which it was received.

Non-Warranty Repairs

Units that are no longer under warranty will be repaired to factory specifications for a nominal fee. The repairs will be completed within seven days after receipt by the repair center, and the unit will be returned to your Johnson Controls representative at the same priority of shipment with which it was received.

Technical Specifications

| | | | |
|-------------------------------------|---|---|----------------------|
| Product | RLD-H10G Refrigerant Leak Detector | | |
| Power Requirements | 120 VAC at 60 Hz | | |
| Sensing Element Type | Positive Ion Emission Heated Diode | | |
| Approximate Sensitivity | Switch Position | Alarm Sensitivity (moving probe) | |
| | Small | >0.05 oz per year CFC or HCFC | >0.5 oz per year HFC |
| | Medium | >0.5 oz per year CFC or HCFC | >1.0 oz per year HFC |
| | Large | >3.0 oz per year CFC or HCFC | >5.0 oz per year HFC |
| Leak Alarm | Audible alarm, visible neon lamp | | |
| Response Time | Approximately 1 second | | |
| Warmup Time | Approximately 2 minutes | | |
| Accuracy | Meets SAE J1627 test requirements | | |
| Probe Length | Approximately 4.5 ft (1.4 m) | | |
| Ambient Operating Conditions | 32 to 113°F (0 to 45°C); 5-90% RH, non-condensing | | |
| Ambient Storage Conditions | 14 to 140°F (-10 to 60°C); 5-90% RH, non-condensing | | |
| Case | Vinyl | | |
| Dimensions (H x W x D) | 2.8 x 8.8 x 5.0 in. (71 x 224 x 127 mm) | | |
| Shipping Weight | 3.2 lb (1.4 kg) | | |

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.



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