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Identification and Overview

Rough Service Refrigerant Leak Detectors

The Rough Service Refrigerant Leak Detector senses a wide range of refrigerants. The sensor is temperature compensated for improved detection of leaks and spills. The output voltage increases as the concentration of the refrigerant increases in the space.

These units are not intended for critical ppm measurements nor life safety applications.

Part #: N1-RLD-EL-C
NSB-RLD-C

Specifications

Power:

9 to 40 VDC at 120 mA max

19 to 32 VAC at 5 VA

Output Impedance: 680 Ohms

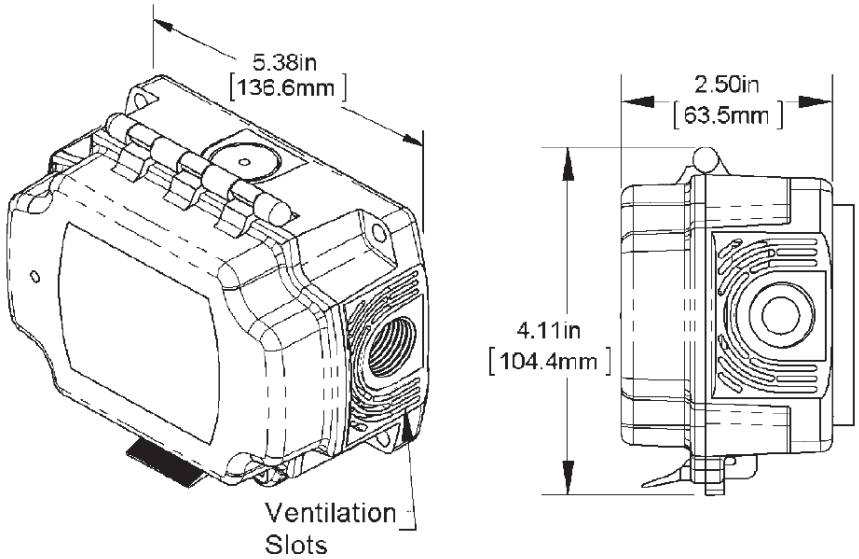
Output Voltage: 0 to 4.8 VDC

Ambient Temp: 32 to 140ºF (0 to 60ºC)

Sensor Element Life: 2 Years Typical

Warranty: 2 Years

Dimensional Drawing



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Refrigerants

Single Compound Refrigerants

Refrigerant	Safety Class	Detectable By Sensor
R-22	A1	Yes
R-32	A2L	Yes
R-125	A1	Yes
R-134a	A1	Yes
R-290	A3	**No**
R-744	A1	**No**
R-1234yf	A2L	Yes
R-1234ze	A2L	Yes

Blended Refrigerants

Refrigerant	Safety Class	Detectable By Sensor
R-400	A1	**No**
R-401a	A1	Yes
R-401b	A1	Yes
R-401c	A1	Yes
R-402a	A1	Yes
R-402b	A1	Yes
R-403a	A2	Yes
R-403b	A1	Yes
R-404a	A1	Yes
R-405a	na	Yes
R-406a	A2	Yes
R-407a	A1	Yes
R-407b	A1	Yes
R-407c	A1	Yes
R-407d	A1	Yes
R-407e	A1	Yes
R-407f	A1	Yes
R-407g	A1	Yes
R-407h	A1	Yes
R-407i	A1	Yes
R-408a	A1	Yes
R-409a	A1	Yes
R-409b	A1	Yes
R-410a	A1	Yes
R-410b	A1	Yes
R-411a	A2	Yes
R-411b	A2	Yes
R-412a	A2	Yes
R-413a	A2	Yes
R-414a	A1	Yes
R-414b	A1	Yes
R-415a	A2	Yes
R-415b	A2	Yes
R-416a	A1	Yes
R-417a	A1	Yes

Blended Refrigerants

Refrigerant	Safety Class	Detectable By Sensor
R-417b	A1	Yes
R-417c	A1	Yes
R-418a	A2	Yes
R-419a	A2	Yes
R-419b	A2	Yes
R-420a	A1	Yes
R-421a	A1	Yes
R-421b	A1	Yes
R-422a	A1	Yes
R-422b	A1	Yes
R-422c	A1	Yes
R-422d	A1	Yes
R-422e	A1	Yes
R-423a	A1	Yes
R-424a	A1	Yes
R-425a	A1	Yes
R-426a	A1	Yes
R-427a	A1	Yes
R-428a	A1	Yes
R-429a	A3	**No**
R-430a	A3	**No**
R-431a	A3	**No**
R-432a	A3	**No**
R-433a	A3	**No**
R-433b	A3	**No**
R-433c	A3	**No**
R-434a	A1	Yes
R-435a	A3	**No**
R-436a	A3	**No**
R-436b	A3	**No**
R-436c	A3	**No**
R-437a	A1	Yes
R-438a	A1	Yes
R-439a	A2	Yes
R-440a	A2	**No**
R-441a	A3	**No**
R-442a	A1	Yes
R-443a	A3	**No**
R-444a	A2L	Yes
R-444b	A2L	Yes
R-445a	A2L	Yes
R-446a	A2L	Yes
R-447a	A2L	Yes
R-447a	A2L	Yes
R-447b	A2L	Yes
R-448a	A1	Yes
R-449a	A1	Yes

Blended Refrigerants

Refrigerant	Safety Class	Detectable By Sensor
R-449b	A1	Yes
R-449c	A1	Yes
R-450a	A1	Yes
R-451a	A2L	Yes
R-451b	A2L	Yes
R-452a	A1	Yes
R-452b	A2L	Yes
R-452c	A1	Yes
R-453a	A1	Yes
R-454a	A2L	Yes
R-454b	A2L	Yes
R-454c	A2L	Yes
R-455a	A2L	Yes
R-456a	A1	Yes
R-457a	A2L	Yes
R-459a	A2L	Yes
R-459b	A2L	Yes
R-460a	A1	Yes
R-460b	A1	Yes
R-460c	A1	Yes
R-461a	A1	Yes
R-462a	A2	Yes
R-463a	A1	Yes
R-464a	A1	Yes
R-465a	A2	Yes
R-466a	A1	Yes
R-500	A1	**No**
R-501	A1	Yes
R-502	A1	Yes
R-503	na	**No**
R-504	na	Yes
R-505	na	**No**
R-506	na	**No**
R-507	A1	Yes
R-507a	A1	Yes
R-508a	A1	**No**
R-508b	A1	**No**
R-508b	A1	**No**
R-509a	A1	Yes
R-510a	A3	**No**
R-511a	A3	**No**
R-512a	A2	**No**
R-513a	A1	Yes
R-513b	A1	Yes
R-514a	B1	**No**
R-515a	A1	Yes
R-516a	A2L	Yes

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Mounting

Rough Service Mounting

The mounting location must allow air to flow freely through the enclosure. The refrigerants this unit will detect are heavier than air and will settle in the lowest level in the space. Generally, the unit should be mounted 18” (450mm) above the floor. Make sure that there is an unobstructed path for a minimum of 12” (300mm) above and below the unit.

As a general rule, a single detector will have a coverage area of approximately a 50’ (15m) radius.

1. Mount the unit horizontally as shown in Fig 2 on a solid, non-vibrating surface.
2. Hold the unit against the mounting surface to mark the mounting holes and drill for #10 screws (1/8” or 3mm drill).
3. Screw the unit to the mounting surface.

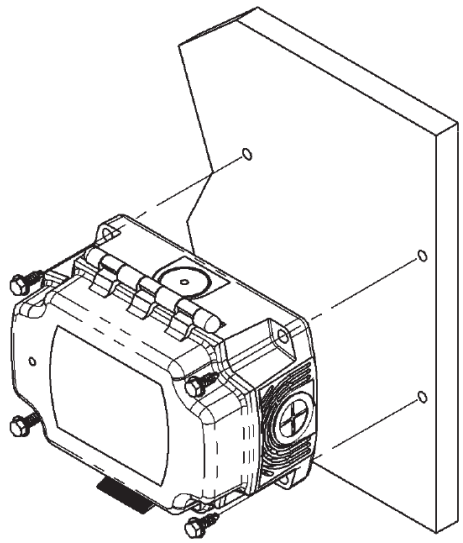

Figure 1: Rough Service Mounting

Termination

Caution	• Do NOT run this device’s wiring in the same conduit as AC power wiring of NEC class 1, NEC class 2, NEC class 3 or with wiring used to supply highly inductive loads such as motors, contactors and relays. Tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines. If you are experiencing any of these difficulties, please contact your representative. • We recommend wiring the product with power disconnected. Proper supply voltage, polarity and wiring connections are important to a successful installation. Not observing these recommendations may damage the product and void the warranty. • All wiring must comply with the National Electric Code (NEC) and local codes.

Tip	We recommend using twisted pair wire of at least 22AWG for all wire connections. Larger gauge wire may be required for long runs.

Any port may be used for wire entry. If the back port is used, remove the sensor board prior to drilling the hole to prevent damaging the board.

Terminal and Description

Vin Power, Referenced to GD, 9 to 40 VDC, 120 mA maxor 19 to 32 VAC, 5 VA

GD To Controller Ground [GND or Common]

Vo Voltage Output, Referenced to GD, 4.8 VDC max

Note: Lightly tug on each wire after tightening to verify proper termination.

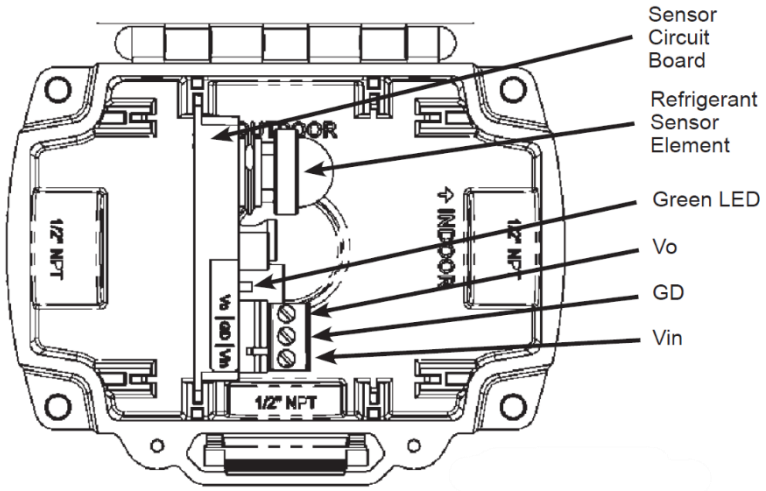

Figure 2: Component Identifier and Electrical Connections

Keeping the Enclosure Air Tight After Termination

For the detector to work correctly, the wiring entrance must remain air tight. If the detector is mounted to a hollow wall and wired through its back, or wired with conduit, it is possible that a draft of clean air may fill the enclosure through the wiring opening. This draft may prevent the unit from measuring the ambient refrigerant. We recommend either a liquid-tight fitting or plugging the conduit at the enclosure.

Liquid-Tight Fitting – Liquid-Tight Fitting (N1/LTF) allows wire cables of 0.1 to 0.3 inch (2.5 to 7.6mm) outside diameter to enter the box. Tightening the collar onto the wire cable keeps the wiring entrance air tight.

Conduit – Included with the detector is a foam plug to seal the ½ inch (13mm) EMT. Place the wires into the plug as shown in figure and then insert the plug into the conduit sealing the conduit.

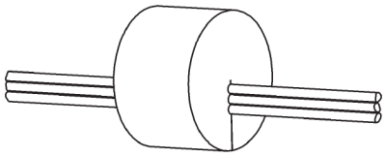

Figure 3: Wires Through Foam Plug

Operation

The Refrigerant Leak Detector has a sensing element that changes its electrical resistance with changes in refrigerant concentrations. As the concentration increases, so does the output voltage of the unit. The sensing element has a different sensitivity to each refrigerant and therefore the rate of increase of the output voltage is different for each refrigerant.

Allow up to 5 minutes after power-up for the output voltage to settle to the ambient conditions. Extended power outages may cause the output voltage to initially spike during those first 5 minutes after power is returned. The typical output in a clean air environment is between 0.1V to 0.3V. Therefore, we recommend using 0.5V as the minimum detection voltage to minimize false alarms.

- Any output voltage offsets must be applied at the controller.
- The solid green LED indicates that the unit is powered.
- The temperature sensor is for internal temperature compensation only.

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Sensor Element Replacement

We recommend replacing the sensor element every two years. Exposure to multiple events of high refrigerant concentrations or being exposed to refrigerants for long periods of time will shorten the life of the sensor element. If this occurs, we recommend that you consider replacing the sensor element at that time.

1. Disconnect power from the unit and remove the sensor board from the enclosure.
2. Remove the old sensor element with your fingers by pulling the element out of its socket. Gently wiggle the element while pulling.
3. Install the new element by plugging it into the socket. The element is not polarity sensitive. Fully insert the element. The base of the element should be flush with the socket.
4. Reinstall the sensor board
5. Reconnect the unit to power.
6. Allow 5 minutes after power-up for the output voltage to settle to the ambient conditions. If the element has been in extended storage, additional time may be required.

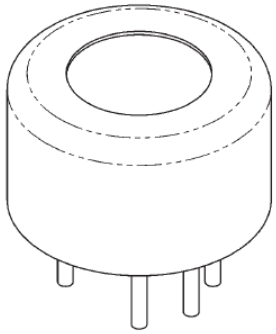

Figure 4: Refrigerant Sensor Element

Diagnostics

POSSIBLE PROBLEMS:	POSSIBLE SOLUTIONS:
Green LED is not on	Check for correct power and wiring connections.
No output voltage	Sensing element is either unplugged from its socket or it is not operational.

Appendix – Symbols Key

Warning	Potential for death, serious injury, or permanent damage to a system.
Caution	Potential for injury, damage to a system, or system failure.
Tip	Useful information not related to injury or system damage.