

COOL AIR

INCORPORATED



LBW-50-RLV-% Ammonia Leak Detector

For vent line leak detection

CAUTION & SYMBOL DEFINITIONS:

CAUTION: Gives detailed description of different situations to avoid or not avoid for the proper operation of the equipment.



WARNING: RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER TO QUALIFIED SERVICE PERSONNEL.

AVIS: RISQUE DE CHOC ELECTRIQUE. NE PAS ENLEVER LE COUVERCLE. AUCUN ENTRETIEN DE PIECES INTERIEURES PAR L'USAGER. CONFIER L'ENTRETIEN AU PERSONNEL QUALIFIE.

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IMPORTANT READ THIS FIRST

PLEASE READ AND UNDERSTAND THIS SECTION BEFORE INSTALLING AND OPERATING THE LBW-50 DETECTOR

CAUTION:

Operating the detector in lower temperatures will slow the detector response rate, and high humidity or excessive heat can cause the “Minimal Concentration” LED to light.

After applying power, test the detector to ensure it is operating correctly. Be sure the detector has been powered on for at least 20 minutes before testing.

INTRODUCTION

The Cool Air Incorporated LBW-50-RLV-% is an AC/DC powered state-of-the-art ammonia leak detector that detects and indicates ammonia concentrations of .1% to 10%. It comes equipped with a catalytic bead, long-life ammonia sensor that has a quick and accurate response to ammonia concentrations.

Outputs are three dry contact relays.

STANDARD FEATURES

The LBW-50-RLV-% comes with these additional standard features:

- Adjustable Alarm set point.
- Normally open, normally closed contacts for communicating with common industry alarm systems.
- A NEMA 4X, UL-listed enclosure.
- Spare contacts for operating auxiliary equipment such as exhaust fans, king valves, compressors, and additional alarm systems.
- Service mode which allows for testing and calibrating without setting off the alarms.

PARTS DESCRIPTION

Front Panel Display

The front panel display is comprised of a series of labeled indicating LED's. The LEDs provide an indication of ammonia concentration, alarm status, power supply, and service mode at a glance.



For information on how the display indicates ammonia concentrations, see the sections on ammonia leak indication

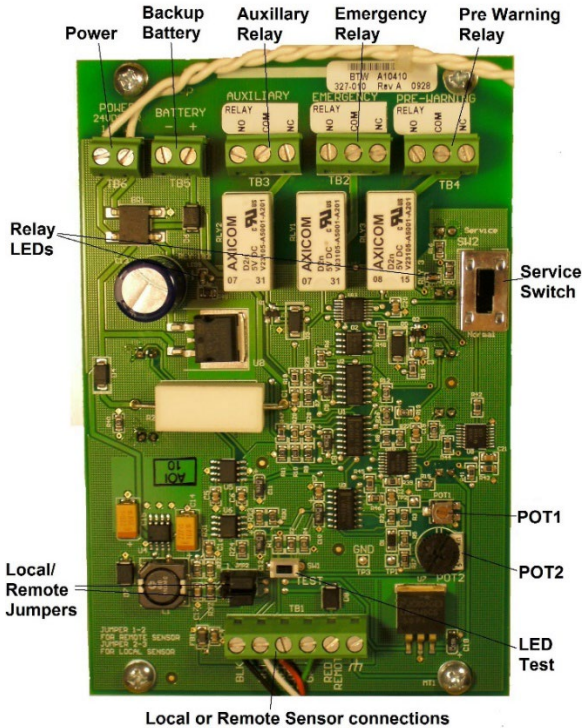
Ammonia Sensor

The detector comes with a catalytic bead, long-life sensor that has a high sensitivity to amine compounds and a quick response to concentrations of ammonia.

If a new ammonia sensor is installed, the detector must be re-calibrated. See the “TESTING AND CALIBRATION” section.

Front Panel-Mounted Circuit Board

The front panel-mounted circuit board contains the controls necessary for adjusting and operating the detector. Each control is described in detail in the following pages. When the detector enclosure is open, this circuit board is on the left, attached to the front panel.



FRONT PANEL MOUNTED CIRCUIT BOARD

Service Switch (Service Mode)

The detector can be set to one of two modes: normal operating mode or service mode. The detector is in normal operating mode when the service Switch is in the “Normal” position. When the service switch is in the “Service” position, the detector continues to function as usual, however the alarm, pre-alarm, and auxiliary relays are disabled. This allows the detector to be serviced, tested, and calibrated without tripping the alarm relays and setting off the alarms.

NOTE: When the detector is in the service mode, the “Service” LED on the front panel flashes yellow. After 30 minutes in service mode, the “Minimal Contamination” and “Early Warning” LEDs will also be lit. This is done as a reminder to set the service switch back to the “Normal” mode.

Adjustable Alarm Potentiometer

There is one adjustment potentiometer that is provided to set the Alarm set point. The Pre-Alarm (Early Warning) is adjusted at the factory. The Alarm set point is also pre-set at the factory but is field adjustable. The adjustment procedure is in the “INSTALLATION AND SET-UP” section.

LED Test Button

Pressing the momentary LED Test button will cause all LEDs to light to up and all three relays to de-energize to confirm that they are functional. This also allows testing of connected devices with out the need to expose the sensor to ammonia gas.

Local/Remote Jumpers

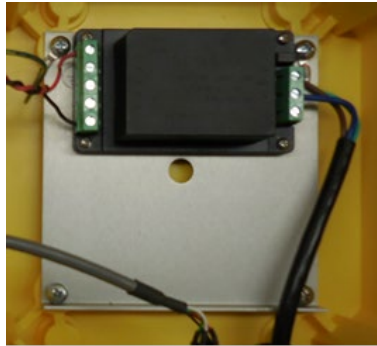
JMPR1 and JMPR2 are not used in this device and must connect pins 2 to 3, the far-right position.

Relay LED's

Two green LEDs indicate that the relays are energized. LED 9, to the left of the relays, indicates that Alarm and Auxiliary relays are energized. LED 10, to the right of the relays indicates that the Pre-Warning relay is energized.

Enclosure-Mounted Components

The enclosure-mounted components include an AC to DC converter for 100 to 240 VAC, 50/60 Hz operation. An optional back-up battery can be installed in the location shown and wired to the front-panel circuit board “Battery” terminal.



Power Supply



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Power for the LBW-50 must be a nominal 100 to 240 Volts AC, 50/60 Hz, 16 VAC, or 24 VDC. The 100 to 240 Volts AC power is connected to the AC to DC converter mounted on the back panel of the enclosure. The 16 VAC or 24 VDC power is connected directly to the “Power” terminals on the upper left-hand corner of the front panel mounted circuit board. A safety ground terminal is also provided on the back panel.

Relays

The detector has three miniature printed circuit board relays: The Alarm, Pre-Alarm (Early Warning), and the Auxiliary relays. The Auxiliary relay operates at the same time as the Alarm relay. In the normal operating mode, the relays are energized in a normally open state. If a loss of power to the detector occurs, the relays will de-energize and the alarms, if connected, will activate.

Relay Status LED's

Each relay has a surface-mounted LED associated with it that indicates the status of the relay. A relay is energized (a non-alarm condition) when its LED is lit (green), and de-energized (an alarm condition) when the LED is not lit.

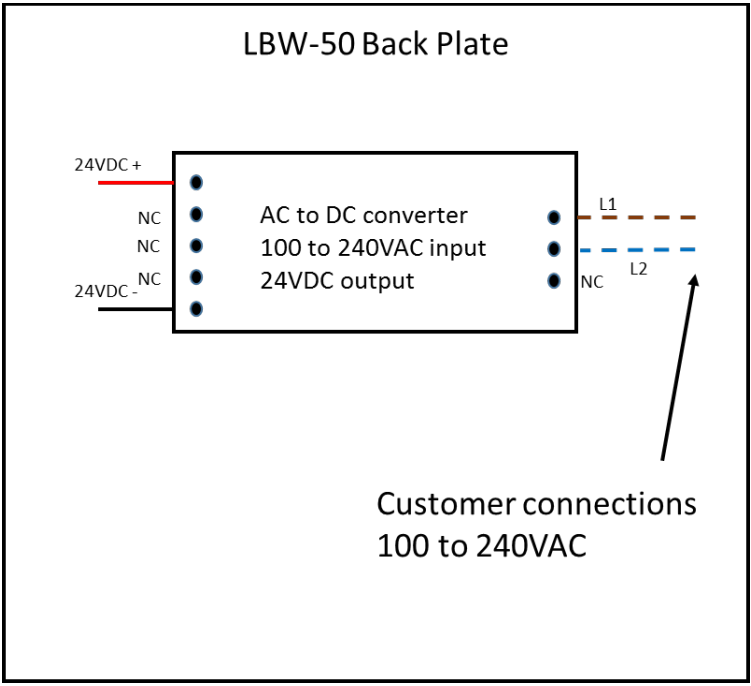
External Connections

Contacts for external connections:

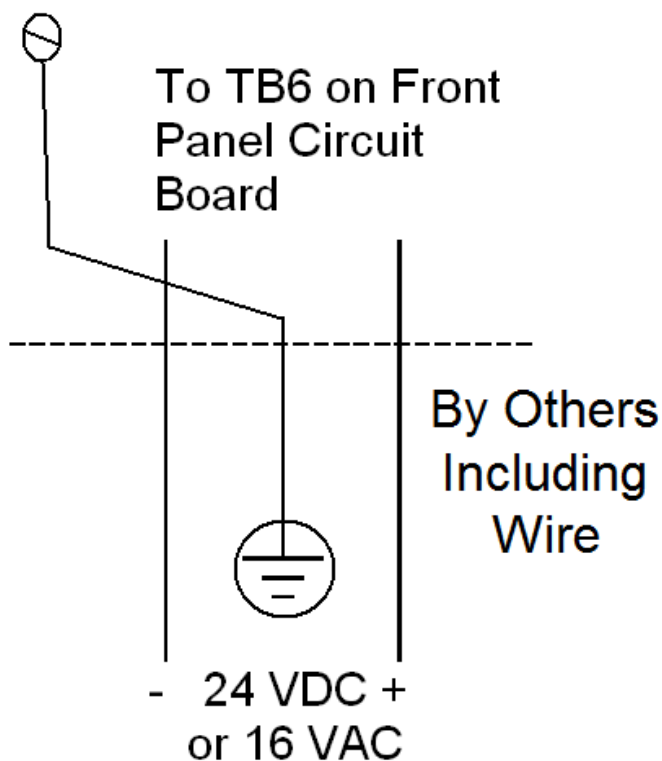
- Auxiliary Relay contacts
- Alarm Relay contacts
- Pre-Alarm (Early Warning) Relay contacts

Wiring Diagram: LBW-50

Installation wiring diagrams for the LBW-50. The 100 to 240 VAC diagram is shown below, and the 24 VAC or 24 VDC diagram is on page 12.



LBW-50



Typical 24 VDC or 16 VAC Application

INSTALLATION AND SETUP

Caution: Do not apply power to the detector until instructed to do so.

When power is applied to the detector, may immediately go into Alarm status and the LED's will indicate a large ammonia concentration. This is normal. When the sensor warms to normal operating temperature (usually about a minute) the detector will return to a non-alarm status. **For this reason, the detector must be placed in service mode before applying power to the detector to avoid nuisance alarms.**

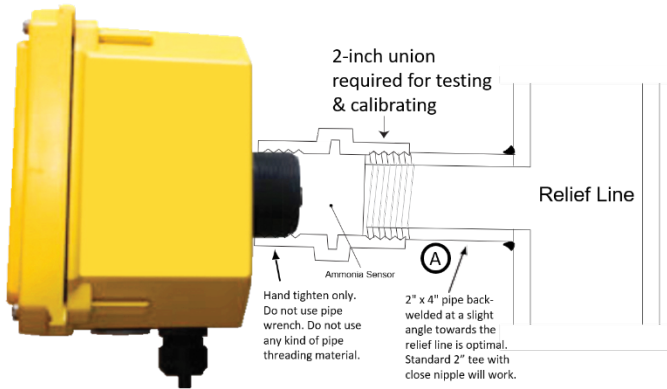
Once the LED's are no longer lit up, set the service switch back into the normal mode.

The detector is tested, adjusted, and calibrated at the factory. To field adjust the Alarm set point of the detector for a specific installation, follow the steps below.

1. Open the detector enclosure and place the detector in service mode by sliding the service switch to the "Service" position.
2. Apply power to the detector and allow the sensor to warm up to normal operating temperature (at normal operating temperature, all LEDs will be unlit).
3. Apply test gas of desired % Ammonia, balance air to the sensor at .3L/min
4. Adjust the Alarm set point by adjusting the potentiometer labeled 'POT2' clockwise to increase the sensitivity and counterclockwise to decrease the sensitivity. Until the Alarm LED (top red LED) just comes on.
5. Remove the test gas.
6. As soon as the gas sensed is below the low alarm set point (yellow LED is off), slide the service switch back to the 'Normal' setting.
7. For testing and calibrating the leak detector, see the "TESTING & CALIBRATION" section.

Typical Installation

2-inch union required for testing & calibrating (supplied with the detector order)



NOTES:

- (A) = If LBW-XXX-RLV is mounted on the relief line above the roof drill 3/16" hole for condensation drain at this location.
DO NOT DRILL THIS HOLE IF MOUNTED INSIDE A BUILDING.

LBW-XXX-RLV should be mounted above the roof, above the last relief valve connection, and accessible for testing or calibration.

Remote Sensing

Please request special documentation for remote sensing.

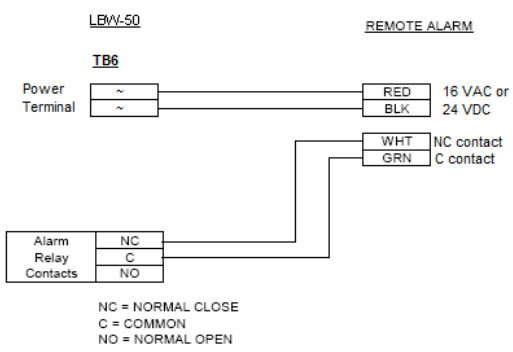
Remote Alarm Installation

Remote Alarm allows for an audible and visible alarm of the LBW-50 at a local or remote location.

The wiring diagram below shows the connections from the LBW-50 to the Remote Alarm. Power for the Remote Alarm is derived from the 16 VAC or 24 VDC ‘Power’ terminal strip on the LBW-50 Front Panel Circuit Board. An Alarm signal is derived from the LBW-50 enclosure-mounted circuit board.

The Remote Alarm device is pictured next to the wiring diagram.

LBW-50 to Remote Alarm Wiring



Ammonia Leak Indication

In the event of a higher-than-normal ammonia concentration, the front-panel LEDs will indicate as follows:

	If the Ammonia Concentration...	Then the...	And...
▼ INCREASING ▼ CONCENTRATION	Equals or exceeds .1%	Red “Minimal Concentration” LED lights	No other actions occur
	Equals or exceeds the pre-alarm set point	Yellow “Early Warning” LED lights	The pre-alarm relay trips
	Continues to increase above the pre-alarm set point	First red “Progressive” LED lights	No other actions occur
	Equals or exceeds the alarm set point	Red “Alarm” LED flashes	The alarm and auxiliary relays trip

After an alarm, the alarm and auxiliary relays will automatically reset when the ammonia concentration falls below the alarm set point, and the pre-alarm relay will automatically reset when the ammonia concentration falls below the pre-alarm set point.

TESTING AND CALIBRATION

It is recommended the detector(s) be tested at least once a month in critical areas and once a quarter in non-critical areas to ensure they are operating correctly. Also, the detector must be calibrated at least once a year to ensure it is detecting and displaying ammonia concentration accurately. At the time of calibration, you must use new ammonia test gas that can be purchased from Cool Air Inc. or their distributors. If a new ammonia sensor is installed, the detector must be recalibrated. All tests and calibrations must be documented.

TESTING:

To test the detector, follow these steps:

1. Open the detector enclosure and slide the service switch to the “SERVICE” position, if needed. This step deactivates the Early Warning, Alarm, and Auxiliary relays so that any attached strobe lights, horns, and/or monitoring systems are not activated. In some applications, if alarming is required, leave the service switch in the “NORMAL” position.
2. Apply test gas of desired % Ammonia, balance air to the sensor at .3L/min
3. Check the following:
 - LEDs on the front display panel light up from the bottom to the top.
 - If not in service mode the relay should activate.
4. Remove the ammonia sample.

Wait until the ammonia concentration reading is below the pre- Alarm set point (yellow LED goes off), then slide the service switch to the “NORMAL”

Position and close the detector enclosure. Remember, this step is only required if the service switch was turned to the “SERVICE” position in step # 1 above. Testing is now complete.

CALIBRATION:

1. Visually inspect the leak detector for any corrosion, damage, etc. that could possibly affect the calibration procedure.
2. **Make sure that the leak detector is powered up for a minimum of 20-minutes before the calibration procedure is performed.**
3. Slide the service switch to the “SERVICE” position. This step deactivates the Early Warning, Alarm, and Auxiliary relays so that any attached strobe lights, horns, and/or monitoring systems are not activated. In some applications, if alarming is required, leave the service switch in the “NORMAL” position.
4. Apply test gas of desired % Ammonia, balance air to the sensor at .3L/min for 30-45 seconds, the top LED lamp (large lamp) shall light up. Also, if not in service mode, the Alarm and Auxiliary relays will de-energize. Remember,

during the calibration procedure, the Early Warning LED lamp (amber lamp) will light up, and the Early Warning relay, if not in service mode will de-energize. This is a **factory set, non-adjustable setting.**

5. To fine tune the Alarm set point, adjust the POT2 potentiometer (large potentiometer) until the Alarm LED lamp just lights up. Adjusting clockwise shall cause the LED lamps to light up from the bottom to the top. Adjusting counterclockwise shall cause the LED lamps to turn off from the top to the bottom.
6. Calibration complete Remove the test gas from the sensor.
7. After the detector indicate ammonia level below the low alarm set point (Yellow LED off) slide the service switch to the “NORMAL” position. this step is only required if the service switch was turned to the “SERVICE” position in step # 4 above.
8. We recommend this calibration to be performed once a year or whenever the sensor has been replaced. Use a new ammonia test gas with balance air. These can be purchased from your local Cool Air Incorporated distributor or directly from the manufacturer.

TECHNICAL SUPPORT

For technical support, contact Cool Air Incorporated using any of these methods:

Contact: Sales@coolinc.com
Phone: (763) 205-0844 (USA)
Fax: (763) 432-9295 (USA)
E-mail: sales@coolairinc.com
Web site: www.coolairinc.com
Address: Cool Air Incorporated
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134th Avenue NE
Ham Lake Ham Lake, MN 55304 55304
USA

WARRANTY

The LBW-50-RLV-% comes with a 36-month warranty from the time of purchase.

Cool Air Incorporated guarantees that the LBW-50 ammonia leak detector, when connected to and operated in accordance with the instructions contained in this manual, will perform in accordance with the warranty expressed on the cover of the detector. Not installing, maintaining, repairing, or operating the detector in accordance with the instructions in this manual will automatically void the warranty.

Cool Air Incorporated will not be held liable for any losses, liabilities, judgments, attorney fees, claims, or damages, including incidental and consequential damages.

THE DETECTOR MUST BE TESTED AT LEAST ONCE A MONTH IN CRITICAL AREAS, QUARTERLY IN NON CRITICAL AREAS AND CALIBRATED AT LEAST ONCE A YEAR TO ENSURE IT IS OPERATING ACCURATELY AND CORRECTLY. TEST AND CALIBRATION RECORDS MUST BE RECORDED ON APPROPRIATE LOG SHEETS.

LBW-50-RLV-% SPECIFICATIONS

Ammonia Detection Sensitivity	
Ammonia Sensor – Catalytic Bead	<ul style="list-style-type: none"> • Selectivity to NH₃ • Linear output • Long life • Stable baseline
Relays	<p>Alarm, Pre-Alarm, and Auxiliary (auxiliary relay operates at same time as alarm relay)</p> <p>Form C (SPDT), normally open, normally closed, energized in normally open state.</p> <p>Rated 5A, 115 VAC or 24 VDC</p>
Outputs	Contacts for: alarm, pre-alarm, and auxiliary relays, and external temperature sensor
Operating Temperature	-50°F to 130°F
Operating Humidity	5% to 95% RH, non-condensing
Power Requirements	100 to 240VAC 60 Hz, 0.12 Amps max. or 24 VDC, 0.58 Amps max. or 16VAC, 0.65 Amps max.
Dimensions:	7-1/2"H x 7-1/2"W x 4-1/2"D
Weight:	4 lbs.
Enclosure:	NEMA 4X rated, UL listed, CSA, IEC, IP66

LBW-50-RLV-% SPECIFICATIONS (cont'd)

Pollution Degree	1
Options	<div>1. Remote ammonia sensor with box and cable (500 ft. max.)</div> <div>2. Remote alarm light and horn unit with box, cable, & TEST/NORMAL/SILENCE toggle switch.</div>



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