

NH3 RESPONDER

PORTABLE AMMONIA
LEAK DETECTOR



Quick Reference Guide

Specially configured Ultra from



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General Info

The NH3 Responder detector is a specially configured Ultra for ammonia response operations. It utilizes two sensor technologies to cover the ranges of interest in an ammonia response operation. The first sensor is a PID sensor, which is configured to display ammonia concentration readings in the range of 0-1000 ppm. Over 1000 ppm this sensor displays OL and the LEL sensor is configured to display %LEL readings for the explosive levels decision making range. (10% LEL = 15,000 ppm NH3). Note that there is a 4,500 ppm gap from where the PID sensor leaves off at 1000 ppm and where the LEL sensor starts displaying at 3% LEL.

Additionally, the PID sensor has an extremely fast response time and is useful for finding small ammonia leaks. Think of it as an "electronic sulfur stick" for locating difficult to find leaks by "sniffing" around valve packing, sight glasses, shaft seals, etc.

OSHA recommends to bump test the sensor before each day's use to confirm its ability to respond to gas by exposing the detector to a gas concentration that exceeds the alarm setpoints. Manually verify that the audible and visual alarms are activated. Calibrate the sensor if the reading is not within 20% accuracy.

Important

Upon startup of the unit (every time it is powered up) it performs a pump test to check for proper flow. A message will appear "Block Inlet," requiring you to block the inlet with your finger.

Also, at any time during operation if the air flow sensor detects a significant change, it will initiate a pump test and require you to block the inlet again. This is normal and shouldn't be interpreted as a blocked inlet.

See next section for more details.

Operation

Activate the detector

Turn-on the detector in a safe area with clean air and free of hazardous gas.

1. For first time use, charge the battery for up to 8 hours or until LED light turns green using the charging adapter provided. Refer to Charge the battery for more information.
2. Press and hold the button for three seconds.
3. For first time use, a **Warming sensors** message is displayed and a 30 minute countdown is displayed. In most cases, this countdown only lasts a couple of minutes.
4. When the detector displays **Pump test Block inlet**, block the pump inlet with a finger, and then after a couple of seconds unblock the pump inlet. The detector performs a quick pump test. A **Pump Test passed** message is displayed. If you do not block the pump inlet, the detector will turn off after two minutes. The detector will then perform a self-test, including testing the sensors. This process could take several minutes. If necessary, you will be instructed by screen prompts to calibrate newly-installed sensors.
5. When the self-test is complete, press and hold the button to zero sensors. After the autozero is complete, the detector then checks the sensors for calibration and bump test. If the detector identifies

sensors requiring calibration or bump testing, press the button and follow the on-screen instructions.

Activate the backlight

To activate the backlight on the screen, press the button during normal operation.

Deactivate the detector

1. Press and hold the button during the powering-off countdown.
2. Release the button when **OFF** is displayed.

Navigate the menu

There are four main menu items.

- See Information
- Start Bump Test
- Zero Sensors
- Start Calibration

1. Double pressing the button displays all four options on the screen. See Information is selected and highlighted by default.
2. Press the button to transition the selection to the next choice.
3. Press and hold for three seconds to enter the selected option.
4. Follow on-screen instructions for your selected operation. Most of the detector's procedures are described in this guide.
5. Main menu goes back to the gas readings after 30 seconds of no user input.

View detector's general information

1. Double-press the button to enter the main menu.
2. Select See information and press the button to scroll through the following information:

- Peak readings
- STEL readings
- TWA readings
- Bump test intervals
- Calibration
- BLE information (BLE should be enabled)
- LEL Correction Factor
- Low Alam setpoint
- Hi Alam setpoints
- STEL setpoints
- TWA setpoints

Reset TWA or STEL readings

Before you begin.

You need to enable **TWA/STEL Reset** in Fleet Manager II to reset readings in the detector.

1. Go to the main menu and select > **See Information** > **TWA readings** or **STEL readings**.
2. Press and hold for 3 seconds to reset readings. A reset message is displayed.

Reset peak readings

Before you begin.

You need to enable **Peak Reset** in Fleet Manager II to reset readings in the detector.

1. Go to the main menu and select > **See Information** > **Peak readings**.
2. Select **Hold** to reset peak readings. Press and hold for 3 seconds to reset readings.

Zero sensors

1. Go to the main menu and select **Zero Sensors**.
2. Press and hold for 3 seconds.
A Zeroing process starts automatically.
The screen displays all current gas measurements, highlighting entries above zero.
Ambient air is applied to zero all sensors.
The screen displays all current gas measurements, highlighting entries being reset to zero.
3. Zero results are displayed.
Press the button or wait for six seconds to end the Zeroing process.
A two-minutes gas measure process starts automatically.
All current gas measurements and entries reset to zero are displayed.
4. Turn off the gas following on-screen instructions.
Zero results are displayed.
5. Press the button or wait for six seconds to end the Zeroing process.

Zero results are displayed as follows:

- A check mark for sensors that passed Zero
- A cross mark for sensors that failed Zero
- An exclamation mark for sensors that skipped Zero

Acknowledge alarms and messages

Press and release the button to perform any of the following:

- To acknowledge a latching alarm
- To acknowledge a low alarm
- To acknowledge due today message (for example, calibration and bump test reminders). Note that the force calibration and force bump test features cannot be bypassed.

Latching alarms

If enabled, during an alarm condition the Latching Alarms option causes the low and high gas alarms (audible, visual, and vibrator) to persist until the alarm is acknowledged and the gas concentration is below the low alarm setpoint. The LCD displays the peak concentration until the alarm no longer exists. Local regulations in your region may require the Latching Alarms option be enabled.

The detector is shipped with the Latching Alarms option disabled.

Start a bump Test

Perform a bump test regularly to test sensors and alarms.

To bump test, expose the sensors to a gas concentration that exceeds alarm setpoints and confirm that the sensors and alarms work correctly.

The detector can be bump tested in two ways:

- Apply gas from a cylinder to the sensors manually through the pump inlet.
- Use an IntelliDoX module.

Perform a manual bump test

Before you begin.

Connect the calibration hose to a demand flow regulator on the gas cylinder.

1. Double-press the button and select > **Start Bump test**.
2. Press and Hold the button for three seconds. The detector displays **Starting Bump test. Bump test started** is displayed, and then the detector makes noise, flash, and vibrate.
3. The detector will prompt you **Did you see and hear the alarms?**, select **Pass**, and press and hold for three seconds to confirm that the visual, audible, and vibrator alarms work correctly. An **Audio-Visual test passed** message is displayed. Skip to Step 5.
4. If the visual, audible, and vibrator alarms failed,

select **Fail**, and press and hold the button. An **Audio-Visual test failed** message is displayed.

Then you can:

- a. Apply gas, Skip to Step 5
 - b. Press the button to skip gas application and follow on-screen instructions to end the Bump Test. Bump test results are displayed, and the test ends.
5. If you want to apply gas, follow on-screen instructions. Wait for about 30 seconds; gas measurements are displayed for each pertinent gas sensor. A **Bump Test pass** confirmation is displayed.
 6. After the **Turn gas off** message is displayed, remove the hose from the pump inlet. The detector will remain in alarm until the gas clears from the sensors. Bump test results are displayed showing check marks next to the tested sensors. These sensors reset to the number of days until the next Bump Test is due.
 7. Press the button to finish the procedure.

CTI recommends to bump test the sensors before each day's use to confirm their ability to respond to gas by exposing the sensors to a gas concentration that exceeds the alarm setpoints.

Set up IntelliFlash

The IntelliFlash® feature causes the detector, if it is in compliance (for example, bump tested and calibrated), to flash a green light every second (the factory setting default) from the top visual alarm indicator. In Fleet Manager II, use the IntelliFlash Interval option to change how often the detector flashes.

Set up reverse IntelliFlash

IntelliFlash flashes a green light when the detector is in compliance, but Reverse IntelliFlash® flashes an amber light when the detector is not in compliance (a bump test or calibration is overdue, or a sensor is not working and has been overridden).

Use Fleet Manager II to change how often the detector flashes for Reverse IntelliFlash.

IntelliFlash and Reverse IntelliFlash can be configured in one of four scenarios:

Scenario 1

When both IntelliFlash and Reverse IntelliFlash are enabled, the detector's green LED will flash until it goes out of compliance, then its amber LED will flash instead.

Scenario 2

If IntelliFlash is enabled and Reverse IntelliFlash is disabled, the detector's green LED flashes until it goes out of compliance, then it stops flashing.

Scenario 3

If IntelliFlash is disabled and Reverse IntelliFlash is enabled, neither LED will flash while the detector is in compliance. The amber LED will flash if it goes out of compliance.

Scenario 4

When both IntelliFlash and Reverse IntelliFlash are disabled, neither LED will flash under any circumstances.

Set up the confidence and compliance beep interval

The Confidence Compliance Beep is a sound that tells the user the detector is in compliance (for example, bump tested and calibrated). In Fleet Manager II use the **Confidence/Compliance Beep** option to change how often the detector beeps for Confidence Compliance Beep.

Connect with IntelliDoX

If a detector's calibration is overdue and the forced calibration feature is enabled, the calibration can be performed with an IntelliDoX docking station or through the calibration option from the detector's main menu.

Connect with an IR Link

The detector can be paired with an IR link, aka dongle. There is an IR connection at the bottom of the

detector that allows FleetManager II configurations to be efficiently transferred to multiple detectors. The IR link will also allow new firmware to be transferred to detectors or data/event logs to be transferred to FleetManager II.

Note: You should have the IR Connectivity Kit (sold separately) to transfer the data from a computer to the detector.

Bluetooth pairing

The user can pair the NH3 Responder to a mobile device via built in Bluetooth Low Energy (BLE). The Honeywell Safety Communicator app, installed on the mobile phone, can then show gas readings and alarms from the NH3 Responder that is connected.

Readings and alarms can then be sent to Honeywell's remote monitoring software.

1. On the mobile device, turn on the Bluetooth connection and look for available detectors. On the NH3 Responder, the Bluetooth connection is on by default.
2. On the mobile device, select the detector and then enter the last six digits from the detector's serial number.

Note: Pairing is not allowed at start up, during calibration, or bump test.

Warning: Wireless communication and infrastructure should be used as informational monitoring only.

Replace a sensor

Use only sensors designed for the NH3 Responder. Replace the sensors in a non-hazardous location.

The NH3 Responder can be configured for a maximum of 5 gases.

Contact CTI for replacement part information.

Calibration

CTI provides rapid turnaround calibration service, which includes a certificate of calibration that satisfies OSHA PSM documentation requirements for the detector. At minimum, six month intervals are recommended. Call 866-394-5861 or visit www.ctiengineering.com/PortableCalibrations to arrange shipment.

Calibration guidelines

When calibrating the detector, adhere to the following guidelines:

- The detector is shipped with a factory calibration. Calibrate the detector on a regular schedule, depending on use and sensor exposure to poisons and contaminants. CTI recommends calibration once every 180 days (6 months) under normal use.
- Required cal gas order #: RB17L-NH3/250 and RB17L-CH4/2.5%. For larger gas cylinders, use order # RB34L-NH3/250 and RB34L-CH4/2.5%
- If more sensor elements are installed in the NH3 Responder, order the appropriate gas(es). Contact CTI for help with gas selection.

Calibration procedure

The detector can be calibrated in two ways:

- Apply gas from a cylinder to the sensors manually through the pump inlet.
 - Use an IntelliDoX module.
1. Check that you have a demand flow regulator, 250ppm NH₃ and 50% LEL CH₄ calibration gas.
 2. Double press the button to go to the main menu then highlight > **Start Calibration**.
 3. Press and hold the button for three seconds to display the **Starting Calibration** countdown. The detector will enter the zero function. The Zeroing process starts automatically and current gas measurements are displayed, and entries above zero are highlighted.
 4. Press button to confirm **Zero Passed**.
 5. When **Apply Gas** is displayed, apply the 250ppm NH₃ gas. When it detects enough of that gas for sensor calibration, a check mark will appear in the box displayed next to that gas. Calibration then begins. Gas values will adjust on the screen during the calibration.
 6. When **Turn gas off** is displayed, disconnect the device from gas. Repeat step 5 with the 50% LEL CH₄ gas

7. If the calibration was successful, **Calibration Passed** will be displayed. Press the button to exit calibration. These sensors reset to the number of days until the next calibration is due (for example, 180 days). The calibration cycle will take about two minutes after which the user will be prompted to **Press button to continue**.
8. If the calibration failed for some or all of the gases, either a **Cal Error All gases applied mixed results** message (if the detector was not successfully calibrated for all gases) or a **Fail all gases** message will be displayed. After the button is pressed, a **Cal overdue** message will be displayed.

Maintenance

Perform the following tasks to maintain the detector in good operating condition:

- Calibrate, bump test, and inspect the detector on a regular schedule.
- Maintain an operations log of all maintenance, bump tests, calibrations, and alarm events.
- Keep the exterior of the detector clean.

Gas cylinder guidelines

- Use an NIST traceable calibration gas.
- Verify the expiration date on the cylinder before use.
- Do not use an expired gas cylinder.
- Contact CTI if a certified calibration of the detector is required.
- The use of a demand-flow gas regulator allows the NH3 Responder's pump to draw from the gas cylinder.

Charge the battery

You can charge the battery using the provided charging adapter, that is certified for SELV/LVLC (isolated) with an output of 6.3 V.

It can take up to 8 hours to get the battery fully charged in a temperature range from 5 °C to 35 °C.

Note: If you charge with the power on, charging may not be completed within 8 hours.

Maintain the battery

Lithium-ion batteries do not respond well to cycles of full discharge followed by a full charging cycle. Recharge the battery before it is exhausted.

Do not charge the battery at low or elevated temperatures.

30°C (86°F) is considered an elevated temperature and should be avoided whenever possible.

A rechargeable battery's runtime decreases approximately 20% over a two-year period of typical use.

Real time clock Display

The real time clock is displayed in the upper left corner of the detector's screen. It is configurable through FleetManager II in 12 or 24-hour formats.

The date display can also be configured in several formats through FleetManager II.

The time/date information is retained even when the detector's battery is being changed.

Languages

The NH3 Responder supports eight languages: English, French, German, Portuguese, Spanish, Simplified Chinese, Russian, Italian, Dutch, Slovak, Czech, Polish, Norwegian, Danish, Swedish, Finnish, Turkish, and Arabic.

These are configurable through FleetManager II.

Clean the detector

Clean the exterior of the detector with a soft, damp cloth. Use only water-based (non-alcohol) cleaners. Do not use soaps, solvents, or polishes.

Upgrade the firmware

Upgrade the Firmware via IR Link using the Fleet Manager II Software.

Before you begin.

- You should have the IR Connectivity Kit (sold separately) to transfer the data from a computer to the detector.
- Download and save the firmware update file to a PC or network drive. Do not rename the file.
- Download the BWFleetManager2.exe file and install Fleet Manager II.
- For more information refer to the Fleet Manager II User Manual.

1. Turn on the detector.
2. Start Fleet Manager II application.
 - a) Expand **Administration** from the left pane.
 - b) Click **Login/Logout**.
 - c) Type in the default password: **Admin**.
 - d) Click **OK** to continue.
3. In the left pane select **Devices > Configure device via IR link**.

In the Device Selection window:

 - a) Select **Honeywell BW™ Ultra**.
 - b) Click **OK**.

4. In the Honeywell BW™ Ultra configuration window, click **Bootloader** to select the binary file.

In the Honeywell BW™ Ultra Bootloader window, click **Choose File**.
5. In the Choose Firmware File to Upload window, select the downloaded file, and then click **Open**.
6. Connect the NH3 Responder to the computer using the IR Link connector.
7. Click **Send** to initiate the file transfer to the gas detector. After the file transfer is complete, the Bootload process will start. During Bootload, the display will go blank and the detector will beep several times.
8. The **Programming Succeeded** message is displayed.

Press the button to finish the procedure, and then disconnect the detector from the computer.

Service

Replace the 1-Series Sensors

1. Turn the instrument off.
2. Remove the battery:
 - a. Turn the instrument face down and unscrew on the battery pack.
 - b. Remove the battery pack and the four screws in the battery compartment.
3. Remove the sensor:
 - a. Remove the two screws at the top of the instrument and pull the back shell apart from the front shell.
 - b. Remove the screw from the manifold's corner. c) Pull back the two retaining clips on the manifold.
 - c. Lift the manifold sideways, farthest from the pump.
 - d. Pull the sensor manifold out from the pump manifold.
 - e. Remove the desired sensor.
4. Install the new sensor:
 - a. Mind the orientation key, and then push the sensor down into manifold.
 - b. Insert manifold inlet into pump manifold.
 - c. Push the manifold down and as the two latches engage, listen for two snapping sounds.
5. Replace the back shell and install the four screws back into the battery compartment (torque 4-5 in-lbs).
6. Reinstall the 2 screws at the top of the instrument (torque 4-5 in-lbs).
7. Attach the battery:

- a. To place the battery pack correctly, first engage hooks on the bottom of the battery pack.
 - b. Push the battery pack into place and tighten the battery retention screw (torque 4-5 in-lbs).
8. Turn on the instrument and allow for the sensors to stabilize.

Replace the 4R+ sensors

1. Turn the instrument off.
2. Remove the battery:
 - a. Turn the instrument face down and unscrew on the battery pack.
 - b. Remove the battery pack and the 4 screws in the battery compartment.
3. Remove the sensor:
 - a. Remove the two screws at the top of the instrument and pull the back shell apart from the front shell.
 - b. Disconnect the 4R+ cable from the sensor.
 - c. Push at the PRESS marking in the manifold toward the top of the instrument.
 - d. Use the tabs on the sensor to pull it out of the manifold.
4. Install the new sensor:
 - a. Retrieve the new sensor and insert it into the manifold aligning the sensor guides to the instrument's slots.
 - b. Push sensor forward until it stops moving.
 - c. Re-connect the 4R+ sensor cable.
5. Replace the back shell and install the four screws back into the battery compartment (torque 4-5 in-lbs). Reinstall the two screws at the top of the

instrument (torque 4-5 in-lbs).

6. To place the battery pack correctly, first engage hooks on the bottom of the battery pack.
7. Push the battery pack into place and tighten the battery retention screw (torque 4-5 in-lbs).
8. Turn on the instrument and allow for the sensors to stabilize.
9. Calibrate new sensor.

Replace the battery

1. Turn the instrument off.
2. Turn the instrument face down and unscrew on the battery pack.
3. Remove the battery pack.
4. To place the new battery pack correctly, first engage hooks on the bottom of the battery pack.
5. Push the battery pack into place and tighten the battery retention screw (torque 4-5 in-lbs).
Note: Use only the HU-BAT battery pack.

Replace the pump inlet filter

1. Turn the instrument off.
2. Unthread the screw on the pump inlet cover.
3. Rotate the cover counter-clockwise.
4. Remove the cover.
5. Remove both the particulate and hydrophobic filter.
6. First, Install both the hydrophobic and then the particulate filters.
7. Place the filter cover and rotate the filter cover clockwise until stop.
8. Tighten the screw (torque to 3-4 in-lbs).

Replace the pump filter

1. Turn the instrument off.
2. Remove the battery:
 - a. Turn the instrument face down and unscrew on the battery pack.
 - b. Remove the battery pack and the four screws in the battery compartment.
3. Remove the sensors manifold:
 - a. Remove the two screws at the top of the instrument and pull the back shell apart from the front casing.
 - b. Remove the screw from the manifold's corner.
 - c. Pull back the two retaining clips on the manifold.
 - d. Lift the manifold sideways, farthest from the pump, and then pull the sensor manifold out from the pump manifold.
 - e. Pull the sensor manifold out from the pump manifold.
4. Gently detach the pump filter from the red restrictor.
5. Pull up the new pump filter and remove it.
6. Install the new pump filter:
 - a. Place the new pump filter in the instrument.
 - b. Gently attach the pump filter to the red restrictor.
7. Insert manifold inlet into pump manifold.
8. Push the manifold down and as the two latches engage, listen for two snapping sounds, and then reinstall the screw to the manifold's corner.
9. Replace the back shell and install the four screws back into the battery compartment (torque 4-5

- in-lbs).
10. Reinstall the two screws at the top of the instrument (torque 4-5 in-lbs).
 11. Attach the battery:
 - a. To place the battery pack correctly, first engage hooks on the bottom of the battery pack.
 - b. Push the battery pack into place and tighten the battery retention screw (torque 4-5 in-lbs).
 12. Turn on the instrument and allow for the sensors to stabilize.

Appendices

Gas alarm setpoints

Gas alarms are activated when detected gas concentrations are above or below the user-defined setpoints. The gas alarms are described as follows.

Alarm Conditions:

Low

Toxics and combustibles: Ambient gas level above low alarm setpoint.

Oxygen: Ambient gas level may be set above or below 20.9% (or 20.8%).

High

Toxics and combustibles: Ambient gas level above high alarm setpoint.

Oxygen: Ambient gas level may be set above or below 20.9% (or 20.8%).

TWA

Toxics only: Accumulated value above the TWA alarm setpoint.

STEL

Toxics only: Accumulated value above the STEL alarm setpoint.

Multi-gas

Two or more gas alarm conditions simultaneously.

Over Limit (OL)

OL displays when readings are above or below the sensor detection range, respectively.

Cross-sensitivity

The PID sensor will respond to most volatile organic compounds (VOC) such as paint fumes, gasoline fumes, cleaners, alcohol, etc. Fluctuating low ppm readings (less than 20 ppm) in your facility are common due to these VOCs.

The LEL sensor will respond to most combustible gases, and at different sensitivities to each. Interference gases are not likely to be > than 4% LEL in most facilities so readings from cross-sensitivity are uncommon.

Contamination/poisoning

It is recommended that the combustible sensor be checked with a known concentration of calibration gas after any known exposure to contaminants/poisons (sulfur compounds, silicon vapors, halogenated compounds, etc.).

- Protect the combustible sensor from exposure to lead compounds, silicones, and chlorinated hydrocarbons. Although certain organic vapors (such as leaded gasoline and halogenated hydrocarbons) may temporarily inhibit sensor performance, in most cases, the sensor will recover after calibration.
 - Any rapid up-scaling reading followed by a declining or erratic reading may indicate a gas concentration beyond upper scale limit, which may be hazardous.
 - Protect the PID sensor from exposure to silicone vapors.
- Extended exposure of the detector to certain concentrations of combustible gases and air may stress a sensor element that can seriously affect its performance. If an alarm occurs due to high concentration of combustible gases, recalibrate the sensor, or if required, replace the sensor.

Troubleshooting

Problem	Possible Cause	Solution
Detector does not display normal gas reading after startup sequence	Sensor not stabilized. Sensor requires calibration Target gas is present.	Used sensor: wait 60 seconds. New sensor: wait 5 minutes. Calibrate the detector. Detector is operating properly. Use caution in suspect areas.
Pump trouble or failure	Flow change detected	Make sure inlet is not blocked Check filter and replace if dirty
The detector does not activate or automatically deactivates	Depleted battery	Charge battery for 8 hours
Detector intermittently enters alarm without reason	Ambient gas levels are near alarm setpoint or the sensor is exposed to a puff of hazardous gas. Alarm setpoints are set incorrectly.	Detector is operating normally. Use caution in suspect areas. Check MAX gas exposure reading. Reset the alarm setpoints.
Battery has been charging for 6 hours. Charging indicator on LCD shows the battery is still charging	Battery is trickle charging	Verify the charger is properly connected to the AC outlet
Battery indicator does not display when charging	Battery is depleted below normal levels	Replace the battery
Sensor fails to zero during startup self-test	Sensor at or near the end of its useful life	Change the sensor
The detector does not activate	Depleted battery. Damaged detector.	Replace the battery. Contact CTI

Specifications

Detector dimensions: 3.2" x 5.75" x 2"

Weight: 1 lb

Operating temperatures: -4°F to +122°F

Battery operating time: 10 hours.

Rechargeable battery: 8 hours in a temperature range from 40 °F to 95 °F.

Storage temperature: -40°F to +122°F

Operating humidity: 0% to 95% relative humidity (non-condensing)

Detection range:

PID sensor: 0-1000 ppm (1 ppm increments)

LEL sensor: 0% to 100% LEL (1% LEL increments)

O2 sensor (if equipped) : 0 – 30.0% vol. (0.1% increments)

Sensor type:

PID: Photoionization detector

LEL: Plug-in catalytic-bead

Alarm conditions: Low alarm, high alarm, multi-gas alarm, TWA alarm, STEL alarm, low battery alarm, confidence beep, automatic deactivation alarm

Audible alarm: 95 dB at 1 ft. (100 dB typical) variable pulsed beeper

Visual alarm: Red light-emitting diodes (LED)

Display: Alphanumeric liquid crystal display (LCD)

Screen resolution: 160 X 240 pixels.

Backlight: Activates during an alarm and when the pushbutton is pressed. Deactivates after 5 seconds.

Self-test: Initiated upon activation.

Calibration: Automatic zero and automatic span.

Warranty: 1 year including sensors

Warranty

Limited Warranty & Limitation of Liability

Calibration Technologies, Inc. (CTI) warrants this product to be free from defects in material and workmanship under normal use and service for a period of one year, beginning on the date of shipment to the buyer. This warranty extends only to the sale of new and unused products to the original buyer. CTI's warranty obligation is limited, at CTI's option, to refund of the purchase price, repair, or replacement of a defective product that is returned to a CTI authorized service center within the warranty period. In no event shall CTI's liability hereunder exceed the purchase price actually paid by the buyer for the Product.

This warranty does not include:

- a) replacement sensor elements, disposable batteries or the routine replacement of parts due to the normal wear and tear of the product arising from use;
- b) any product which in CTI's opinion, has been misused, altered, neglected or damaged by accident or abnormal conditions of operation, handling or use;
- c) any damage or defects attributable to repair of the product by any person other than an authorized dealer, or the installation of unapproved parts on the product; or

The obligations set forth in this warranty are conditional on:

- a) proper storage, installation, calibration, use, maintenance and compliance with the product manual instructions and any other applicable recommendations of CTI;
- b) the buyer promptly notifying CTI of any defect and, if required, promptly making the product available for correction. No goods shall be returned to CTI until receipt by the buyer of shipping instructions from CTI; and
- c) the right of CTI to require that the buyer provide proof of purchase such as the original invoice, bill of sale or packing slip to establish that the product is within the warranty period.

THE BUYER AGREES THAT THIS WARRANTY IS THE BUYER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CTI SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING LOSS OF DATA, WHETHER ARISING FROM BREACH OF WARRANTY OR BASED ON CONTRACT, TORT OR RELIANCE OR ANY OTHER THEORY.



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