CALIBRATION KIT

CTi GAS DETECTION SPECIALISTS

Instruction Manual

Table of Contents

General Description

The gas sensor Calibration Kit and replacement cylinders allow for field calibration of most fixed and portable gas detectors. This manual has been prepared to aid in the calibration of Calibration Technologies gas sensors. Please refer to the manual shipped with each piece of equipment for further information.

Note: This manual includes the latest version of our sensors. Some or all features may be included in older versions of the sensor and the calibration procedure may or may not be identical. Refer to original sensor instruction manual calibration procedure if needed.

The calibration kit may contain either one or two disposable bottles filled with the dry gas appropriate for the sensor. Also included in the kit are the following:

- Regulator with pressure gauge
- (2) Calibration adapters
- Hose

The disposable certified gas cylinders are N.I.S.T. traceable. After initial purchase, replacement cylinders can be ordered at any time. Standard cylinder sizes include either 17 or 34 liter cylinders. The 17L cal kit will include a regulator (female fitting) for use with the CGA600 outlet fitting (male fitting) of the 17L cylinder. The 34L cal kit will include a regulator (male fitting) for use with the C-10 outlet fitting (female fitting) of the 34L cylinder. Because calibration gas has a shelf life, each bottle has an expiration date printed on it. Do not use the calibration gas after the expiration date.

Each regulator is preset for 0.8 liters per minute with an easy on/off valve and includes a cylinder pressure gauge. The Calibration Kit also includes 3 feet of Norprene tubing and flexible calibration adaptors designed to fit most standard size gas cells and sensors. All kit accessories are enclosed in a durable hard carrying case with foam inserts.

For calibrating portable gas detectors with sampling pumps, particularly the Ultra, demand flow regulators are now available. See website for details.

Getting Started

Startup:
Refer to sensor manual for power-up/warm-up procedures if power has recently been applied to the sensor, as some sensors may require a stabilization period before calibration is possible.

It may be suitable to bypass external alarms and other equipment until the calibration of the sensor is completed, so as not to disrupt plant operations. Verification of alarm functions is recommended on a yearly basis.

Alarm and readout verification:
Because sensors are normally located at a distance from the main unit, the test time required and accuracy of the response checks will be improved if two people perform the start-up procedures and use radio contact.

Ensure that the calibration gas concentration is equal to or greater than the alarm setpoints if alarm verification is required.

Sensor element replacement:
Below are a few response characteristics which may be an indication that the sensor element is at or near the end of its useful life. If any of these are observed, the sensor should be replaced:

- Slow response to / recovery from calibration gas.
- Failure of the output to reach 50% of the calibration gas value prior to span adjustment.
- Unable to achieve correct span output during calibration.

Refer to sensor manual for more details.

Calibration Guidelines:
In highly critical areas, a response test should be performed between calibrations to verify proper sensor response and alarm functions. This can be done with bump gas, calibration gas or a gas sample. The response test is not required if multiple like sensors are installed in the same room.

All tests and calibrations must be logged.

GG-NH3

The GG-NH3 ammonia sensor comes factory calibrated and should require only minimal adjustments after installation. Calibration should be performed at 6-month intervals after installation. Note that some features may not be available on previous versions of the GG-NH3 sensor.

There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

Zero Calibration:
After the sensor is installed and has been powered up for a minimum of 8 hours, the unit can be zero calibrated by the following:

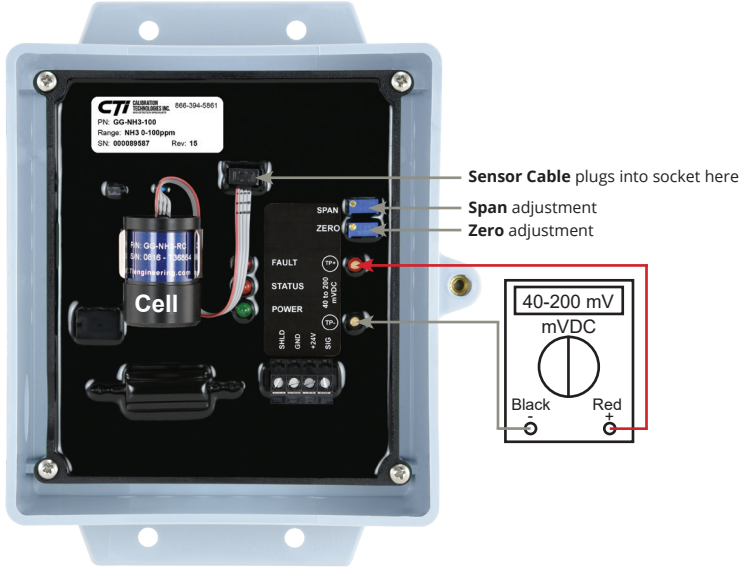
- Be sure the unit is in clean air (target gas is not present) or apply Zero Air calibration gas at 0.5 to 0.8 L/min.
- Adjust the Zero pot until the sensor outputs 40 mV from Test [-] to Test [+].

Note:
To zero the sensor immediately after power up or cell replacement, unplug the cell from the transmitter and adjust signal to 40 mV.

Note:
To enter calibration mode (disables all filtering and averaging), turn the Zero pot clockwise ¼ turn and then back again. Successful entry into calibration mode will be indicated by the Power (green) LED blinking twice per second. Calibration mode will time out automatically after 10 minutes.

Span Calibration:

- Apply span gas at 0.5 to 0.8 L/min (span gas must be balanced in air, not nitrogen).
- Sensor should react to gas within 15 seconds.
- Once the output signal has peaked (or two minutes maximum) adjust the span pot until the correct output is achieved. The calculated span value with full-scale span gas is 200 mVDC. ((span gas / sensor range * 16 + 4) *10).
  Example: ((250 ppm / 250 ppm x 16 + 4) x 10) = 200 mVDC.
  Example: ((100 ppm / 250 ppm x 16 + 4) x 10) = 104 mVDC.
- Calibration is now complete.



Sensor Life:
These electrochemical cells are extremely reliable with a typical cell life of 2-4 years in most applications. Several factors can cause the cell chemicals to become depleted including a long period of time, exposure to high temperatures and continuous, long term exposure to ammonia gas.

When the cell becomes depleted, the unit will give no indication of failure other than that the sensor will not respond. Therefore, it is absolutely essential that these sensors be calibrated on a regular basis.

Note: Rev A01 thru A10 sensors do not include the status LED or calibration mode

GG-NH3-2%

Calibration should be performed six months after installation. There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

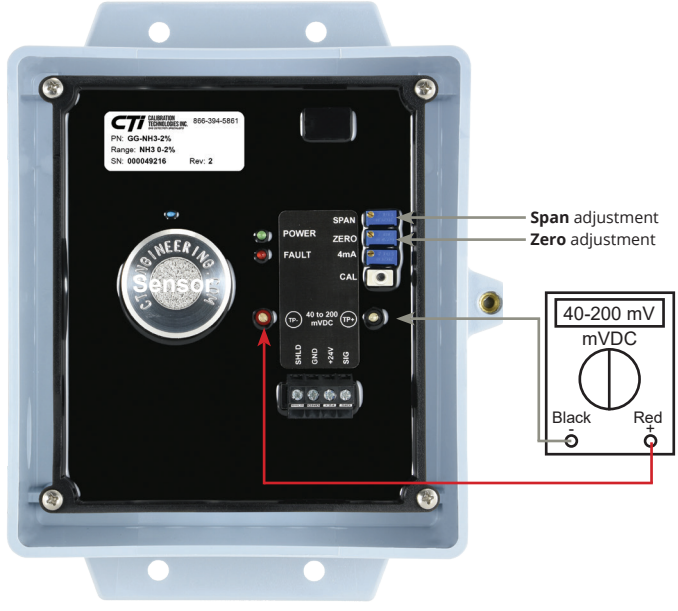
Calibration Mode:
Calibration mode is required for calibrating the sensor. Calibration mode clears the deadband (factory set at 4.8 mA) and averaging. Pressing the CAL switch enables cal mode and the green LED will flash. To exit out of cal mode, press the CAL switch or after 4 minutes it will automatically time-out.

Zero Calibration:
After the unit is installed and has been powered up for a minimum of 1 hour, the unit can be zero calibrated by the following:

- Be sure the unit is in clean air with no noticeable ammonia vapors.
- Press the CAL switch once to enter cal mode. Do not adjust the zero pot if the green LED is not flashing.
- Adjust the zero pot until the sensor outputs 40 mV from TP [-] to TP [+].

Span Calibration:
Do not remove sensor housing cap during calibration.

- If green LED is not flashing, press the CAL switch once to enter cal mode.
- Apply 2% NH3 span gas at 0.5 to 0.8 L/min (span gas must be balanced in air, not nitrogen).
- Sensor should react to gas within 15 seconds.
- Once the output signal has peaked (or two minutes maximum) adjust the span pot until the correct output is achieved (200 mV).
- Calibration is now complete.



4mA adjustment:
Sometimes a fine adjustment of the 4mA signal may be desired to compensate for a slight positive or negative zero-signal reading on the control panel.

- Make sure the sensor is NOT in calibration mode.
- Adjust the 4mA pot until the control panel reads zero.

Sensor life:
These catalytic-bead long-life sensors have an expected life of 5-7 years in mechanical room applications.

GG-CO

There are two pots on the preamp that are used for calibration. Span calibration can be performed within 5 minutes after power-up, although best to wait 1 hour before adjusting the zero pot.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

Zero Calibration:
After the sensor is installed and has been powered up for at least 1 hour, the unit can be zero calibrated by the following:

- Be sure the unit is in clean air. If unsure, apply Zero Air gas at 0.5 to 0.8 L/min.
- Adjust the zero pot until the sensor outputs 40 mV from Test [-] to Test [+].

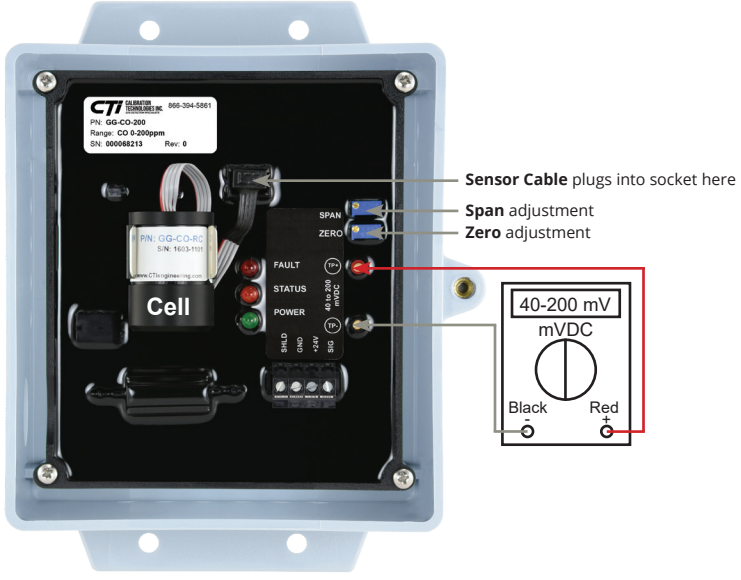
Note: To zero the sensor immediately after power up or cell replacement, unplug the cell from the transmitter and adjust signal to 40 mV.

Span Calibration:
- Apply span gas at 0.8 L/min (span gas must be in air, not nitrogen).
- Sensor should react to gas within 15 seconds.
- Once the output signal has peaked (or two minutes maximum) adjust the span pot until the correct output is achieved. The calculated span value with full-scale span gas is 200 mVDC. ((span gas / sensor range * 16 + 4) *10)

  Example 1: ((200 ppm / 200 ppm x 16 + 4) x 10) = 200 mVDC.
  Example 2: ((100 ppm / 200 ppm x 16 + 4) x 10) = 120 mVDC.
- Calibration is now complete.

Sensor Life:
These electrochemical cells have a typical cell life of 5 years. Several factors can cause the cell chemicals to become depleted including a long period of time, exposure to high temperatures and continuous, long term exposure to carbon monoxide.

When the cell becomes depleted, the unit will give no indication of failure other than that the sensor will not respond. Therefore, it is absolutely essential to calibrate the sensor every six months.



Fault (red) LED:
- On steady if supply voltage is less than 10VDC.

Status (amber) LED:
- Blinks once per second if RFI is detected.

Power (green) LED:
- On steady to Indicate Power.
- Blinks once per second for 60 seconds during power-up.
- Blinks twice per second in calibration mode (4 minute timeout delay).

GG-CO2

Calibration should be performed at 6-month intervals after installation.

There are two pots on the preamp that are used for calibration.

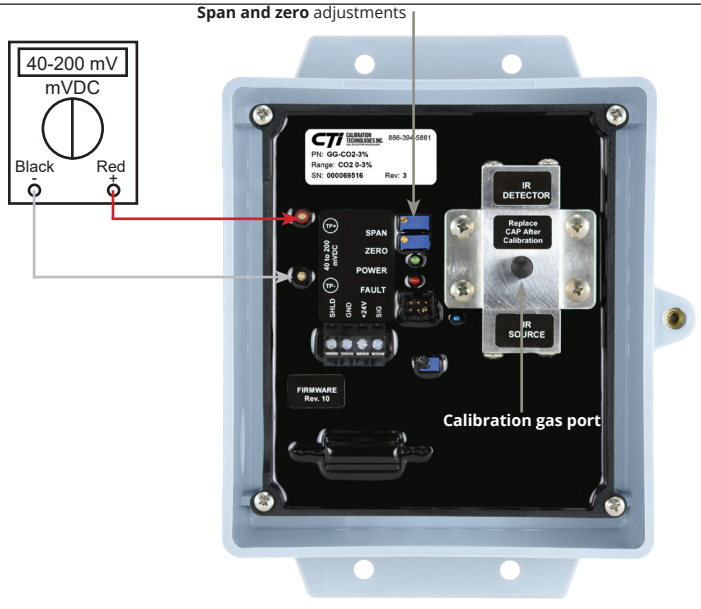
Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

Zero Calibration:
After the unit is installed and has been powered up for a minimum of 2 hours, the unit can be zero calibrated by the following:

- Apply 500 ppm CO_2 gas at 0.5 to 0.8 L/min.
- Adjust the zero pot until the voltmeter reads the following mVdc on the test points [-] to [+].
    - 0-1% CO_2 range sensor = 48.0 mVdc
    - 0-3% CO_2 range sensor = 42.7 mVdc
    - 0-5% CO_2 range sensor = 41.6 mVdc

Span Calibration:
- Connect tubing to the calibration port of the infrared tube.
- Apply span gas at 0.5 to 0.8 L/min.
- Sensor should react to gas within 10 seconds.
- Once the output signal has peaked (or two minutes maximum) adjust the span pot until the correct output is achieved. The calculated span value with full-scale span gas is 200 mVDC. (span gas / sensor range * 16 + 4) *10)

  Example 1: (3% / 3% x 16 + 4) x 10) = 200 mVDC.
  Example 2: (1% / 3% x 16 + 4) x 10) = 93.3 mVDC.
- Calibration is now complete.



Sensor Life:
Typical sensor life of the GG-CO2 is five to seven years. Failure of the infrared sensor is typically caused when the infrared source opens or breaks, similar to an incandescent light bulb filament. If this occurs, the sensor will produce a continuous fault indication signal of 0.5 mA and the fault LED will be lit. Contact Calibration Technologies for a sensor replacement.

GG-CL2

Calibration should be performed at 6-month intervals after installation. There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

Zero Calibration:
After the sensor is installed and has been powered up for a minimum of 8 hours, the unit can be zero calibrated by the following:

- Be sure the unit is in clean air.
- Adjust the Zero pot until sensor outputs 40 mV from Test [-] to Test [+].

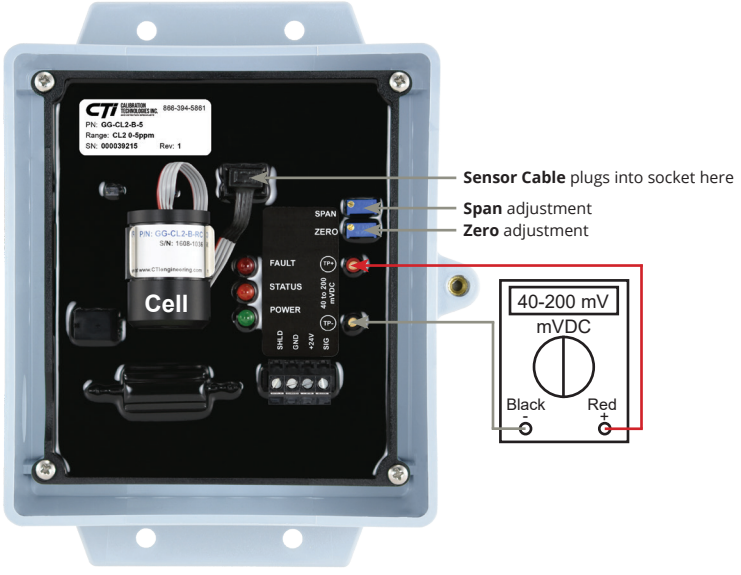
Note: To zero the sensor immediately after power up or cell replacement, unplug the cell from the transmitter and adjust signal to 40 mV.

Span Calibration:
- Apply span gas at 0.8 L/min (span gas balance can be air or nitrogen).
- Sensor should react to gas within 15 seconds.
- Once the output signal has peaked (or two minutes maximum) adjust the span pot until the correct output is achieved. The calculated span value with full-scale span gas is 200 mVDC. (span gas / sensor range * 16 + 4) *10)

  Example 1: ((5 ppm / 5 ppm x 16 + 4) x 10) = 200 mVDC.
  Example 2: ((3 ppm / 5 ppm x 16 + 4) x 10) = 136 mVDC.
- Calibration is now complete.

Sensor Life:
Typical cell life will be two to three years. Several factors can cause the cell chemicals to become depleted including a long period of time, exposure to high temperatures and continuous, long term exposure to chlorine gas.

When the cell becomes depleted, the unit will give no indication of failure other than that the sensor will not respond. Therefore, it is absolutely essential to calibrate the sensor every six months.



Fault (red) LED:
- On steady if supply voltage is less than 10VDC.

Status (amber) LED:
- Blinks once per second if RFI is detected.

Power (green) LED:
- On steady to Indicate Power.
- Blinks once per second for 60 seconds during power-up.
- Blinks twice per second in calibration mode (4 minute timeout delay).

GG-H2-EC

The GG-H2 sensor should be calibrated at 6-month intervals after installation.

There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

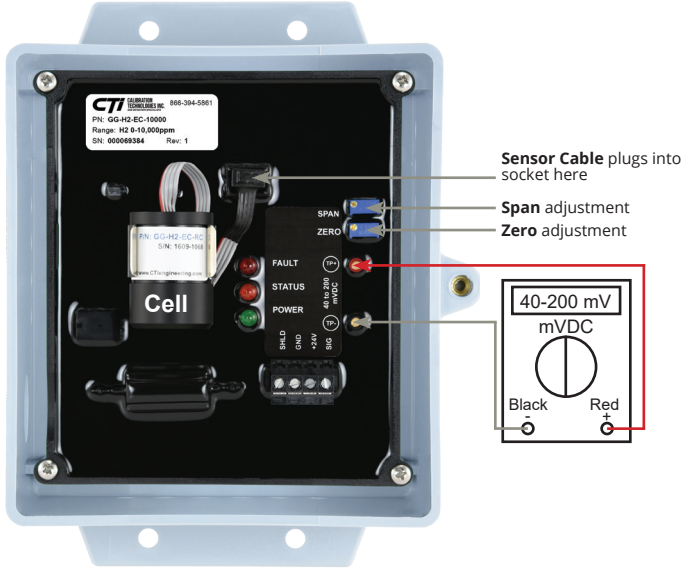
Zero Calibration:
After the unit is installed and has been powered up for a minimum of 12 hours, the unit can be zero calibrated by the following:

- Be sure the unit is in clean air, otherwise apply zero air.
- Adjust the zero pot until the sensor outputs 40 mV from Test [-] to Test [+].

Span Calibration:
- Perform zero adjustment before spanning.
- Apply span gas at 0.5 to 0.8 L/min (span gas must be in air, not nitrogen or other carrier).
- Sensor should react to gas within 10 seconds
- Once the output signal has peaked (or two minutes maximum) adjust the span pot until the correct output is achieved.

Sensor Life:
Typical cell life will be two to three years. Several factors can cause the cell chemicals to become depleted including a long period of time, exposure to high temperatures and continuous, long term exposure to hydrogen gas.

When the cell becomes depleted, the unit will give no indication of failure other than that the sensor will not respond. Therefore, it is absolutely essential to calibrate the sensor every six months.



Fault (red) LED:
- On steady if supply voltage is less than 10VDC.

Status (amber) LED:
- Blinks once per second if RFI is detected.

Power (green) LED:
- On steady to Indicate Power.
- Blinks once per second for 60 seconds during power-up.
- Blinks twice per second in calibration mode (4 minute timeout delay).

GG-H2S

The GG-H2S sensor should be calibrated at 6-month intervals after installation.

There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

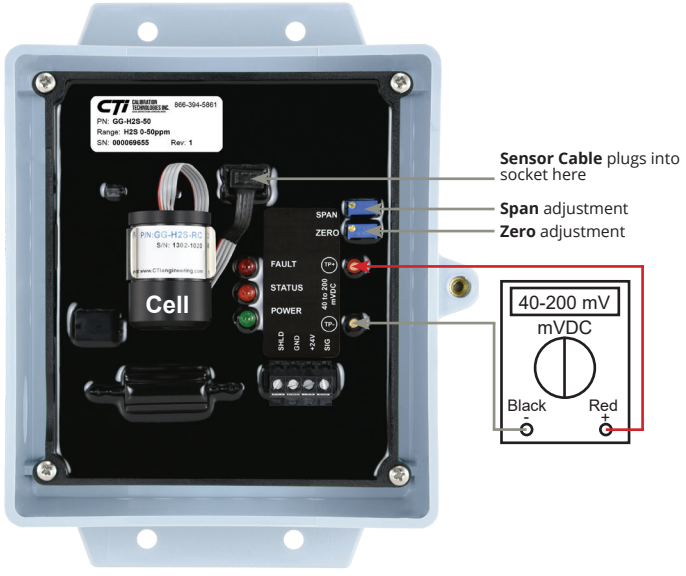
Zero Calibration:
After the sensor is installed and has been powered up for a minimum of 12 hours, the unit can be zero calibrated by the following:

- Be sure the unit is in clean air (target gas is not present) or else apply Zero Air calibration gas at 0.5 to 0.8 L/min.
- Adjust the zero pot until the sensor outputs 40 mV from Test [-] to Test [+].

Span Calibration:
- Apply span gas at 0.5 to 0.8 L/min (span gas must be in air, not nitrogen).
- Sensor should react to gas within 15 seconds.
- Once the output signal has peaked (or two minutes maximum) adjust the span pot until the correct output is achieved. The calculated span value with full-scale span gas is 200 mVDC. ((span gas / sensor range * 16 + 4) *10)
- Calibration is now complete.

Sensor Life:
These electrochemical cells are extremely reliable with a typical cell life of 3-4 years in most applications. Several factors can cause the cell chemicals to become depleted including a long period of time, exposure to high temperatures and continuous, long term exposure to hydrogen sulfide gas.

When the cell becomes depleted, the unit will give no indication of failure other than that the sensor will not respond. Therefore, it is absolutely essential that these sensors be calibrated on a regular basis.



Fault (red) LED:
- On steady if supply voltage is less than 10VDC.

Status (amber) LED:
- Blinks once per second if RFI is detected.

Power (green) LED:
- On steady to Indicate Power.
- Blinks once per second for 60 seconds during power-up.
- Blinks twice per second in calibration mode (4 minute timeout delay).

GG-NO2

The GG-NO2 should be calibrated at 6-month intervals after installation.

There are two pots on the preamp that are used for calibration

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

Zero Calibration:
After the sensor is installed and has been powered up for a minimum of 8 hours, the unit can be zero calibrated by the following:

- Be sure the unit is in clean air.
- Adjust the zero pot until the sensor outputs 40 mV from Test [-] to Test [+].

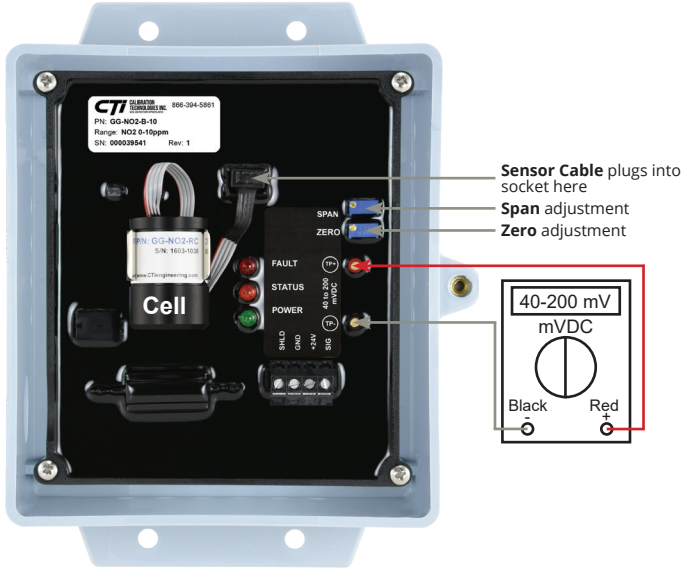
Span Calibration:

- To enter calibration mode (disables all filtering and averaging), turn the Zero pot clockwise 1/4 turn and then back again. Successful entry into calibration mode will be indicated by the Power (green) LED blinking twice per second. Calibration mode will time out automatically after 4 minutes.
- Apply span gas at 0.5 to 0.8 L/min (span gas must be in air, not nitrogen or other carrier).
- Sensor should react to gas within 15 seconds.
- Once the output signal has peaked (or 5 minutes maximum) adjust the Span pot until the correct output is achieved. With full-scale span gas, the calculated span value is 200 mV. ((span gas / sensor range * 16 + 4) (mA output))

Sensor Life:

Typical cell life will be two to three years. Several factors can cause the cell chemicals to become depleted including a long period of time, exposure to high temperatures and continuous, long term exposure to nitrogen dioxide.

When the cell becomes depleted, the unit will give no indication of failure other than that the sensor will not respond. Therefore, it is absolutely essential to calibrate the sensor every six months.



Fault (red) LED:

- On steady if supply voltage is less than 10VDC.

Status (amber) LED:

- Blinks once per second if RFI is detected.

Power (green) LED:

- On steady to Indicate Power.
- Blinks once per second for 60 seconds during power-up.
- Blinks twice per second in calibration mode (4 minute timeout delay).

GG-O2

The GG-O2 should be calibrated at 6-month intervals after installation. After the sensor is installed and has been powered up for a minimum of 1 hour, the sensor can be calibrated.

There are two pots on the preamp that are used for calibration

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings on sensor test points.

Note: Adjusting the span to achieve a 20.9% reading can be done with calibration gas or in clean air.

Span Calibration:

- Apply 20.9% O2 span gas at 0.5 to 0.8 L/min.
- Once the output signal has peaked (or 2 minutes maximum), adjust the span pot until the correct output is achieved.

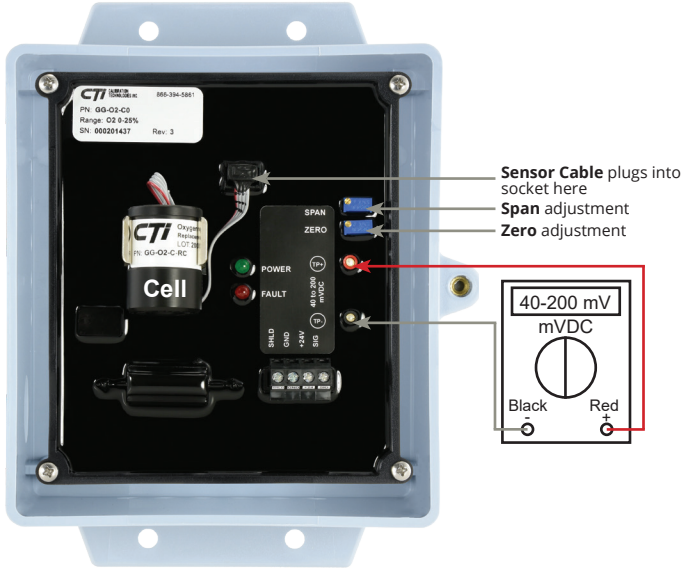
  Note: Calculated span values
  0-25% range = 173.7 mV from Test [-] to Test [+]
  15-25% range = 134.4 mV from Test [-] to Test [+]

Zero Calibration:

- Apply zero calibration gas (nitrogen or 15% O2 depending on range of sensor) at 0.5 to 0.8 L/min.
- Once the output has settled (or 2 minutes maximum), adjust the zero pot until the sensor outputs 40 mV from Test [-] to Test [+].

Sensor Life:

Typical sensor life in 20.9% oxygen is three years. When the cell becomes depleted, a replacement cell can be obtained from Calibration Technologies. Simply unplug the cell's ribbon cable from the transmitter, pull the old cell from the spring clip, discard the old cell and replace it with a new one.



GG-O3

The GG-O3 ozone sensor should be calibrated at 6-month intervals after installation.

There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

Zero Calibration:
After the unit is installed and has been powered up for a minimum of 12 hours, the unit can be zero calibrated by the following:

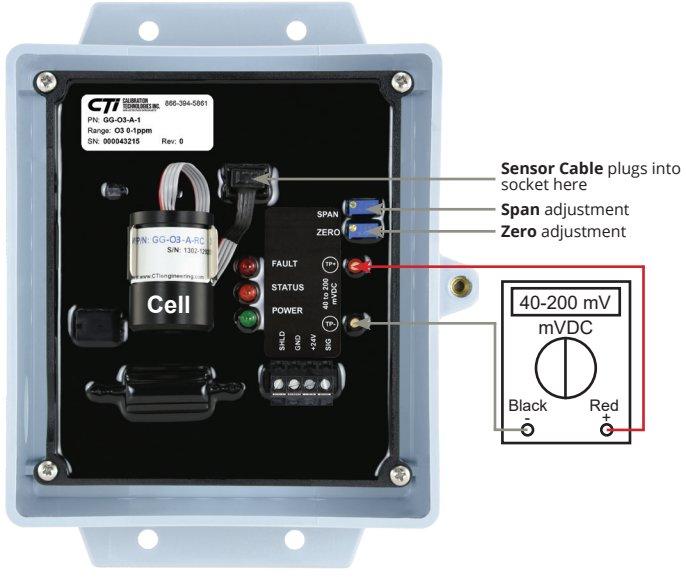
- Be sure the unit is in clean air (target gas is not present) or else apply Zero Air calibration gas at 0.5 to 1.0 L/min.
- Adjust the zero pot until the sensor outputs 40 mV from Test [-] to Test [+].

Span Calibration:
- Never adjust the span pot without an ozone generator.
- Perform zero adjustment before spanning.
- Apply span gas at 0.5 to 1.0 L/min.
- Sensor should react to gas within 20 seconds.
- Once the output signal has peaked (or 5 minutes maximum) adjust the span pot until the correct output is achieved.
- Calibration is now complete.

Note: If an ozone generator is not available, the unit can be calibrated with chlorine. The relative response of the ozone sensor to chlorine is 1:1. To calibrate with chlorine, apply 1.0 ppm and adjust output to 20.00 mA.

Sensor Life:
Typical cell life will be two years. Several factors can cause the cell chemicals to become depleted including a long period of time, exposure to high temperatures and continuous, long term exposure to ozone or chlorine.

When the cell becomes depleted, the unit will give no indication of failure other than that the sensor will not respond. Therefore, it is absolutely essential that these sensors be calibrated on a regular basis.



Fault (red) LED:
- On steady if supply voltage is less than 10VDC.

Status (amber) LED:
- Blinks once per second if RFI is detected.

Power (green) LED:
- On steady to Indicate Power.
- Blinks once per second for 60 seconds during power-up.
- Blinks twice per second in calibration mode (4 minute timeout delay).

GG-R

The GG-R refrigerant sensor should be calibrated at 6-month intervals after installation.

There are two pots on the preamp that are used for calibration.

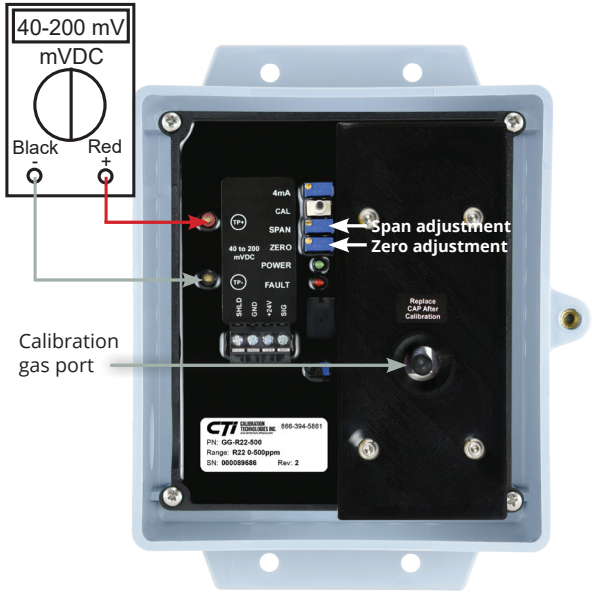
Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

Zero Calibration:
After the unit is installed and has been powered up for a minimum of 2 hours, the unit can be zero calibrated by the following:

- Activate calibration mode by pressing the CAL MODE button (green LED will flash).
- Be sure the unit is in clean air (target gas is not present) or else apply Zero Air calibration gas (or nitrogen) at 0.3 to 0.8 L/min.
- Adjust the zero pot until the sensor outputs 40 mVDC from test points TP [-] to TP [+].

Span Calibration:
- Perform zero calibration prior to spanning.
- Connect tubing to the calibration port of the infrared tube.
- Apply span gas at 0.3 to 0.8 L/min.
- Sensor should react to gas within 20 seconds.
- The adjustment response is dampened. Make slight adjustments (no more than ½ turn of the potentiometer) and wait for output response. Once the output signal has peaked (or three minutes maximum) adjust the span pot until the correct output is achieved. The calculated span value with full-scale span gas is 200 mVDC. ((span gas / sensor range * 16 + 4) *10)

  Example 1: ((500 ppm / 500 ppm x 16 + 4) x 10) = 200 mVDC.
  Example 2: ((500 ppm / 1000 ppm x 16 + 4) x 10) = 120 mVDC.
- Calibration is now complete.



Sensor Life:
Expected sensor life of the GG-R is seven to ten years. Failure of the infrared sensor is typically caused when the infrared optics reach the end of their useful life. If this occurs, the sensor will produce a continuous fault indication signal of 0.5 mA and the fault LED will be lit. Field replacement of the sensor optics is not available at this time. Contact Calibration Technologies for sensor repair or replacement.

GG-CO-NO2

The GG-CO-NO2 sensor should be calibrated at 6-month intervals after installation.

There are four pots on the preamp that are used for calibration. Repeat zero and span calibration steps for CO and NO2.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings. Use the TP+ and TP- testpoints for the corresponding cell being calibrated.

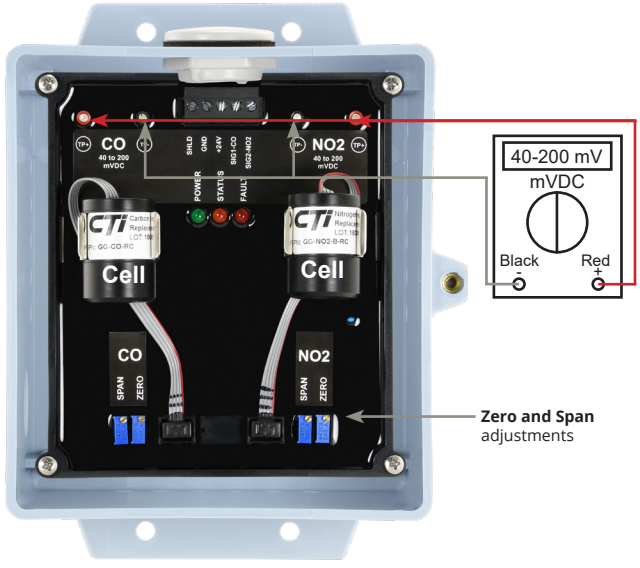
Zero Calibration:
After the unit is installed and has been powered up for a minimum of 1 hour, the unit can be zero calibrated by the following:

- Be sure the unit is in clean air (target gas is not present) or else apply Zero Air calibration gas at 0.5 to 1.0 L/min.
- Adjust the zero pot until the sensor outputs 40 mV from Test [-] to Test [+].

Span Calibration:
- Apply span gas at 0.5 to 0.8 L/min.
- Sensor should react to gas within 10 seconds.
- Once the output signal has peaked (or 2 minutes maximum for CO, 5 minutes maximum for NO2) adjust the span pot until the correct output is achieved.
- Calibration is now complete.

Sensor Life:
Typical cell life is seven years for CO and two years for NO2. Several factors can cause the cell chemicals to become depleted including a long period of time, exposure to high temperatures and continuous, long term exposure to the target gases.

When the cells becomes depleted, the unit will give no indication of failure other than that the sensor will not respond. Therefore, it is absolutely essential that these sensors be calibrated on a regular basis.



Fault (red) LED:
- On steady if supply voltage is less than 10VDC.

Status (amber) LED:
- Blinks once per second if RFI is detected.

Power (green) LED:
- On steady to Indicate Power.
- Blinks once per second for 60 seconds during power-up.
- Blinks twice per second in calibration mode (4 minute timeout delay).

DouSense-M

The DuoSense-M vehicle emmisions gas detector should be calibrated at 6-month intervals after installation.

Note: See Operating Manual for detailed version of calibration procedure.

Zero Calibration:

- Use the ▲ arrow key to scroll to the CO sensor **Zero** adjust screen. The current PPM concentration and offset is displayed.
- If a zero calibration is necessary, follow the next steps. Otherwise, press the ▲ arrow key to go to CO sensor **Span** adjust.
- Press the ENTER key for edit mode and then apply Zero Air gas at 0.5 to 0.8 L/minute or zero the sensor in clean air. Then press the ▲ or ▼ arrow keys until the value equals 0 ppm. A ppm offset value is dislayed at the bottom of the display for troubleshooting purposes.
- Zeroing is complete. Remove the zero calibration gas at this time. Press ESCAPE to exit edit mode and save the value.

Span Calibration:

- Use the ▲ arrow key to scroll to the CO sensor **Span** adjust screen. The current PPM value and % of gain applied is displayed.
- Press the ENTER key for edit mode and apply Span gas at 0.5 to 0.8 L/ minute. The concentration of the span gas should be between 25 and 100% of the full-scale range of the sensor.
- Once the output signal has peaked (or 2 minutes maximum for CO and 5 minutes max for NO2), use the ▲ ▼ arrows to change the value on the display to match the value of the span gas. A % gain value is displayed at the bottom of the screen for troubleshooting purposes.
- Spanning is complete. Remove the span calibration gas at this time. Press ESCAPE to exit edit mode and save the value.
- Repeat same steps for both sensor calibrations.

Sensor Life:

Typical cell life is seven years for CO and two years for NO2. Several factors can cause the cell chemicals to become depleted including a long period of time, exposure to high temperatures and continuous, long term exposure to the target gases.

When the cells becomes depleted, the unit will give no indication of failure other than that the sensor will not respond. Therefore, it is absolutely essential that these sensors be calibrated on a regular basis.

GG-VL2-NH3

The GG-VL2-NH3 vent line sensor should be calibrated at 6-month intervals after installation.

There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

Note: Do not response test with propane or MAPP gas, as these can shorten sensor life!

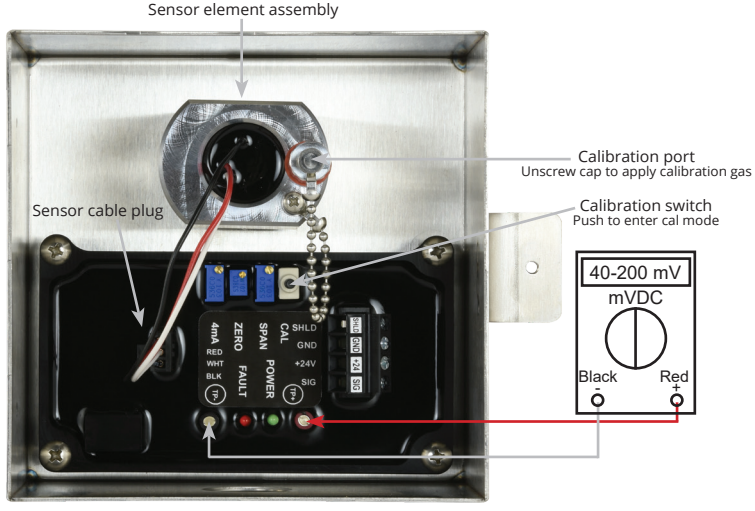
Calibration Mode: Cal mode is required for calibrating the sensor. It clears the averaging, latching and deadband (factory set to 8 mA). Pressing the CAL switch enables cal mode and the green LED will flash. To exit out of cal mode, press the CAL switch or after 6 minutes it will automatically time-out back to normal mode.

Zero Calibration: After the unit is installed and has been powered up for a minimum of 1 hour, the unit can be zero calibrated by the following:

- Be sure the unit is in clean air. When in doubt, apply zero air gas.
- Press the CAL switch to enter cal mode. Do not adjust the zero pot if the green LED is not flashing.
- Adjust the zero pot until sensor outputs 40 mVdc from Test [-] to Test [+].

Span Calibration: Do not adjust the span pot without certified calibration gas! If span adjustment is required, use the following procedure.

- Unscrew calibration port cover and connect cal gas hose to hose barb fitting
- Press the CAL switch once to enter cal mode.
- Apply 1% NH3 span gas at 0.8 L/min (span gas must be in air, not nitrogen or other carrier).
- Sensor should react to gas within 15 seconds.
- Once the output signal has peaked (or 2 minutes maximum) adjust the span pot until the correct output is achieved (200 mVdc).
- Shut-off gas, remove hose and replace cover.
- Press the CAL switch to exit cal mode.
- Calibration is now complete.



Note: Allow up to an hour for the signal to return back to 4 mA after exposure to high concentrations.

Note: If correct output during span adjustment is unachievable, replace sensor element.

Note: Gas exposures well above the 0-1% NH3 range of the sensor can shorten the life of the sensor element, and typically results in a "zero signal shift", where the signal is stuck at full-scale levels. Make sure no ammonia gas is present and simply re-zero the sensor following the **Zero Calibration** procedure.

4mA adjustment:
Sometimes a fine adjustment of the 4mA signal may be desired to compensate for a slight positive or negative zero-signal reading on the control panel.

- Make sure the sensor is NOT in calibration mode.
- Adjust the 4mA pot until the control panel reads zero.

GG-VL2-CO2

The GG-VL2-CO2 vent line sensor should be calibrated at 6-month intervals after installation.

There are three pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

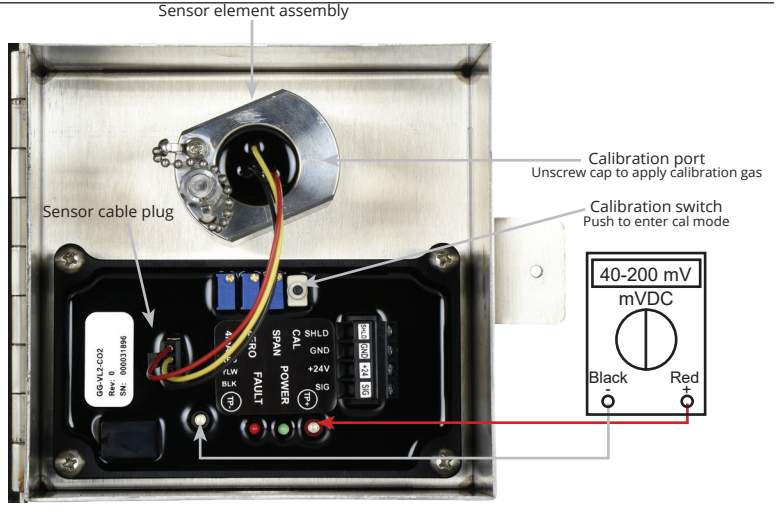
Calibration Mode: Cal mode is required for calibrating the sensor. Pressing the CAL switch enables cal mode and the green LED will flash. To exit out of cal mode, press the CAL switch or after 6 minutes it will automatically time-out back to normal mode.

Zero Calibration: After the unit is installed and has been powered up for a minimum of 5 minutes, the unit can be zero calibrated by the following:

- Press the CAL switch to enter cal mode. Do not adjust the zero pot if the green LED is not flashing.
- Apply Zero Air calibration gas at 0.5 - 0.8 L/min.
- Adjust the zero pot until the sensor outputs 40 mVdc from Test [-] to Test [+]

Span Calibration: If span adjustment is required, use the following procedure:

- Unscrew calibration port cover and connect cal gas hose to hose barb fitting
- Press the CAL switch once to enter cal mode.
- Apply 5% CO2 span gas at 0.5 - 0.8 L/min.
- Sensor should react to gas within 15 seconds.
- Once the output signal has peaked (or 2 minutes maximum) adjust the span pot until the correct output is achieved (200 mVdc).
- Shut-off gas, remove hose and replace cover.
- Press the CAL switch to exit cal mode.
- Calibration is now complete.



Note: Depending on sensor's proximity to fresh air, allow up to an hour for the signal to return back to 4 mA after exposure to high concentrations. Applying Zero Air calibration gas to the sensor will help purge the CO2 gas from the sensor element, and return the signal back to normal.

Note: If correct output during span adjustment is unachievable, replace sensor element.

4mA adjustment: Sometimes a fine adjustment of the 4mA signal may be desired to compensate for a slight positive or negative zero-signal reading on the control panel.

- Make sure the sensor is NOT in calibration mode.
- Adjust the 4mA pot until the control panel reads zero.

GG-VL-R

The GG-VL-R vent line sensor should be calibrated at 6-month intervals after installation.

There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

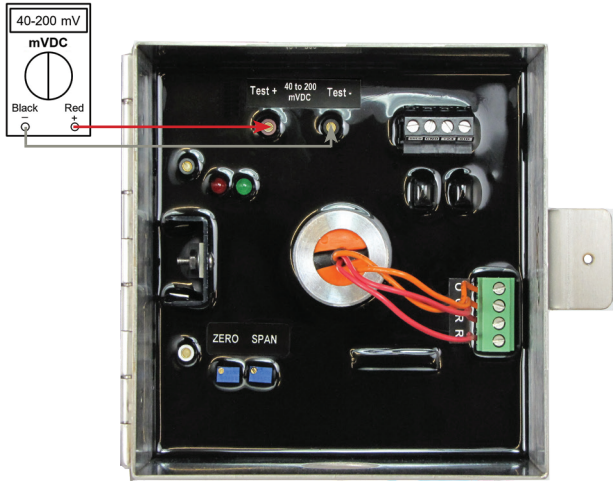
Zero Calibration: After the unit is installed and has been powered up for a minimum of 24 hours, the unit can be zero calibrated by the following:

- Be sure the unit is in clean air. This can be accomplished by removing the sensor from the mounting kit into fresh air.
- Adjust the zero pot until the sensor outputs 40 mV from Test [-] to Test [+].

Span Calibration: It is recommended that the GG-VL-R sensor be response tested only, every six months. Refer to the Response Test procedure below.

Response Test:

1. One person removes the ½" plug in the tee and injects a small amount of propane/butane from an unlit plumber's torch.
2. The second person stays at the control panel to determine that each sensor, when exposed to the gas, is connected to the proper input and responds, causing appropriate alarm functions.



GG-VL2-R

The GG-VL-R vent line sensor should be calibrated at 6-month intervals after installation.

There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

Response Test:

1. One person exposes sensor to 1% R507A calibration gas.
2. The second person stays at the control panel to determine that each sensor, when exposed to the gas, is connected to the proper input and responds, causing appropriate alarm functions.

Zero Calibration:
After the unit is installed and powered up, the unit can be zero calibrated by the following:

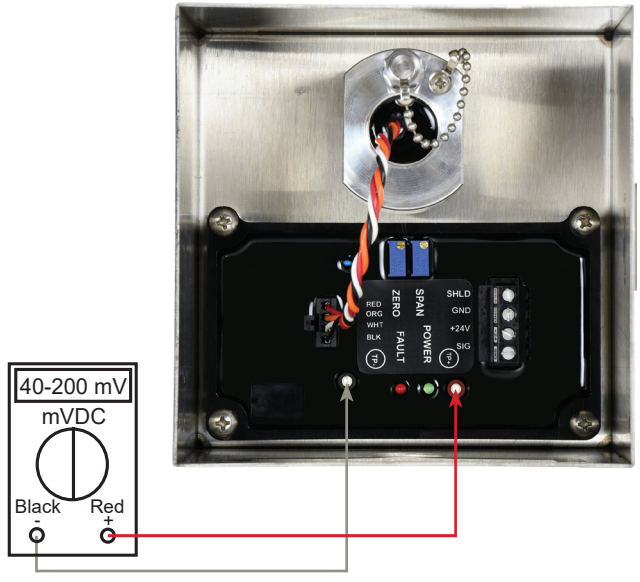
- Be sure the unit is in clean air. This can be accomplished by applying zero air calibration gas or removing the detector from the mounting kit into fresh air.
- Adjust the zero pot until the detector outputs 40 mV from Test [-] to Test [+] (see **Figure 3**).

Span Calibration:

It is recommended that the GG-VL2-R sensor be response tested only, every six months. Refer to the Response Test procedure on this page.

If span calibration is required, the following procedure will span the unit:

- Unscrew calibration port cover and connect cal gas hose to hose barb fitting (see **Figure 3**).
- Apply 1% R507a span gas at 0.5 - 0.8 L/min.
- Once the output signal has peaked (or two minutes maximum) adjust the span pot until the sensor outputs 200 mV from Test [-] to Test [+]



Note: The GG-VL2-R detector has a similar response to most common halocarbon gases. For ease of bump testing and calibration, we recommend using 1% R507a for bump gas and calibration gas. If target gas is preferred or required, please inquire with CTI sales staff for help obtaining specific calibration gases.

Note: If correct output during span adjustment is unachievable, replace sensor element.

GG-EXP

Since the zero and span calibration procedures are the same for the EXP series gas sensors, refer to the specific gas sensor in the previous pages. The generic procedures below can also be used.

The GG-EXP should be calibrated every six months after installation. There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

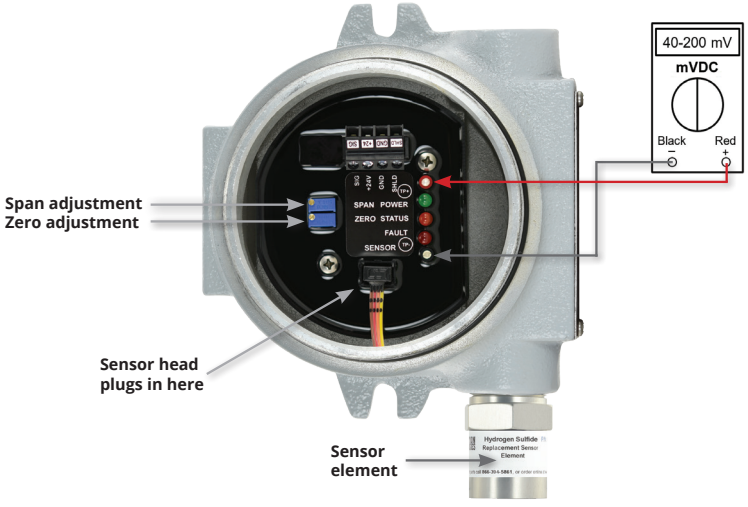
Zero Calibration: After the sensor is installed and has been powered up for a minimum of 8 hours, the unit can be zero calibrated by the following:

- Be sure the unit is in clean air.
- Adjust the Zero pot until the sensor outputs 40 mV from TP [-] to TP [+].

Note: To zero the sensor immediately after power up or cell replacement, unplug cell from the transmitter and adjust signal to 40 mV.

Span Calibration: If span adjustment is required, use the following procedure:

- To enter calibration mode (disables all filtering and averaging), turn the Zero pot clockwise 1/4 turn and then back again. Successful entry into calibration mode will be indicated by the Power (green) LED blinking twice per second. Calibration mode will time out automatically after 4 minutes.
- Apply span gas at 0.5 to 0.8 L/min.
- Sensor should react to gas within 15 seconds.
- Once the output signal has peaked (or 2 minutes maximum) adjust the Span pot until the correct output is achieved. With full-scale span gas, the calculated span value is 200 mV.



Fault (red) LED:

- On steady if supply voltage is less than 10VDC.

Status (amber) LED:

- Blinks once per second if RFI is detected.

Power (green) LED:

- On steady to Indicate Power.
- Blinks once per second for 60 seconds during power-up.
- Blinks twice per second in calibration mode (4 minute timeout delay).

GG-LEL2-NH3

The combustible gas sensor has a slightly different response to each combustible gas or vapor. Therefore, a combustible transmitter can be calibrated with different gases, as long as the relative response is known. It's always best to use the target gas for calibration, but sometimes the target gas is difficult to obtain in certain concentrations. The voltage that you set at the transmitter test point will be different for each gas. The following table provides voltage settings for both recommended calibration gases.

Relative Response Table

Gas	Voltage (mVDC)
2% Ammonia	61
2.5% Methane	120

Note: Ensure area is free from explosive gases before removing cover while sensor is energized.

The GG-LEL2-NH3 sensor should be calibrated every six months after installation. There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

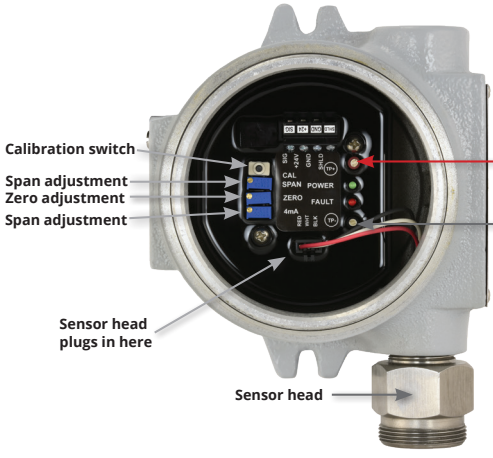
Calibration Mode: Cal mode is required for calibrating the sensor. It clears the deadband (factory set at 4.8 mA) and averaging. Pressing the CAL switch enables cal mode and the green LED will flash. To exit out of cal mode, press the CAL switch or after 6 minutes it will automatically time-out.

Zero Calibration: After the unit is installed and has been powered up for a minimum of 1 hour, the unit can be zero calibrated by the following:

- Press the CAL switch once to enter cal mode. Do not adjust the zero pot if the green LED is not flashing.
- Be sure the unit is in clean air. If unsure, apply zero air gas to the sensor to properly zero calibrate.
- Adjust the zero pot until the sensor outputs 40 mV from Test [-] to Test [+].

Span Calibration: If span adjustment is required, the following procedure will span the unit:

- Apply span gas at 0.5 to 0.8 L/min (span gas must be in air, not nitrogen or other carrier).



Fault (red) LED:

- On steady if supply voltage is less than 10VDC.

Status (amber) LED:

- Blinks once per second if RFI is detected.

Power (green) LED:

- On steady to Indicate Power.
- Blinks once per second for 60 seconds during power-up.
- Blinks twice per second in calibration mode.

- Sensor should react to gas within 15 seconds.
- Once the output signal has peaked (or 2 minutes maximum) adjust the span pot until the correct output is achieved.
- Calibration is now complete.

4mA adjustment: Sometimes a fine adjustment of the 4mA signal may be desired to compensate for a slight positive or negative zero-signal reading on the control panel.

- Make sure the sensor is NOT in calibration mode.
- Adjust the 4mA pot until the control panel reads zero.

GG-LEL2

The combustible gas sensor has a slightly different response to each combustible gas or vapor. Because of these factors, a combustible transmitter must be adjusted differently if the system is meant to detect a gas or vapor other than methane. 1.0% methane gas can be used for calibration of the combustible transmitter when used for other gases. The voltage that you set at the transmitter test point will be different for each gas. The table below provides the voltage setting for various gases.

Relative Response Table

Gas	Voltage (mVDC)	Gas	Voltage (mVDC)
Methane	72	n-Hexabe	104
Propane	89	Hydrogen	68
n-Butane	89	Ethane	80
n-Pentane	97	Ethylene	91

(see sensor manual for more gases)

Note: Ensure area is free from explosive gases before removing cover while sensor is energized.

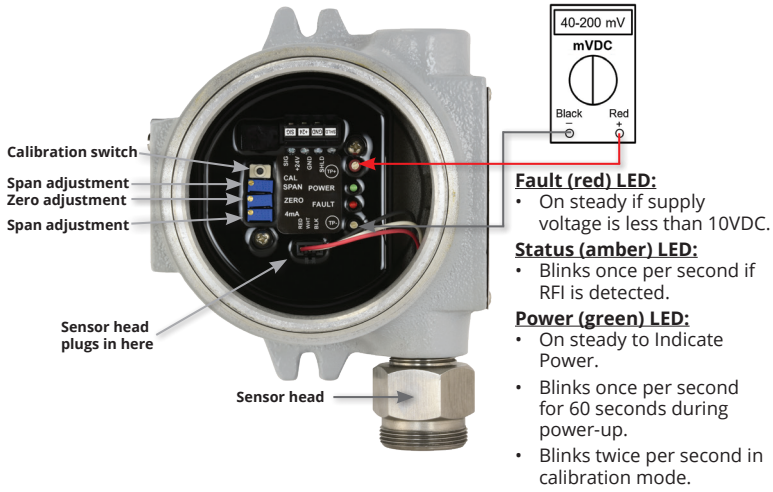
The GG-LEL2 sensor should be calibrated every six months after installation. There are two pots on the preamp that are used for calibration.

Note: Never measure sensor output in mA. Always use mVDC or VDC voltmeter settings.

Calibration Mode: Cal mode is required for calibrating the sensor. It clears the deadband (factory set at 4.8 mA) and averaging. Pressing the CAL switch enables cal mode and the green LED will flash. To exit out of cal mode, press the CAL switch or after 6 minutes it will automatically time-out.

Zero Calibration: After the unit is installed and has been powered up for a minimum of 1 hour, the unit can be zero calibrated by the following:

- Press the CAL switch once to enter cal mode. Do not adjust the zero pot if the green LED is not flashing.
- Be sure the unit is in clean air. If unsure, apply zero air gas to the sensor to properly zero calibrate.
- Adjust the zero pot until the sensor outputs 40 mV from Test [-] to Test [+]



Fault (red) LED:
- On steady if supply voltage is less than 10VDC.

Status (amber) LED:
- Blinks once per second if RFI is detected.

Power (green) LED:
- On steady to Indicate Power.
- Blinks once per second for 60 seconds during power-up.
- Blinks twice per second in calibration mode.

Span Calibration: If span adjustment is required, the following procedure will span the unit:

- Apply 2.5% CH4 span gas at 0.5 to 0.8 L/min (span gas must be in air, not nitrogen or other carrier).
- Sensor should react to gas within 15 seconds.
- Once the output signal has peaked (or 2 minutes maximum) adjust the span pot until the correct output is achieved (see Relative Response Table).
- Calibration is now complete.

4mA adjustment: Sometimes a fine adjustment of the 4mA signal may be desired to compensate for a slight positive or negative zero-signal reading on the control panel.

- Make sure the sensor is NOT in calibration mode.
- Adjust the 4mA pot until the control panel reads zero.

NH3 Responder

The NH3 Responder portable ammonia detector comes factory calibrated and should require only minimal adjustments after purchase. Calibration should be performed at 6-month intervals.

Note: Verify that the calibration gas being used matches the span concentration values that are set for the detector in the Use Option Menu. Refer to Span Gas Value section on page 8 of the operating manual. Correction factors are not applied during calibration. Correction factors that were set prior to calibration are restored when the detector returns to normal operation.

Selecting sensor(s) to be calibrated (during Auto Span) is not necessary for calibration of the PID and LEL sensors as the cal gas being used will only be detected by its corresponding sensor.

Required calibration gas:
PID: 250 ppm Ammonia, balance air
LEL: 50% LEL Methane (2.5%), balance air

Start Calibration

1. To enter calibration, press and hold ◯ and ▼ simultaneously as the detector beeps, flashes, and vibrates to the corresponding countdown. The detector then reads Starting calibration.

Auto Zero

2. Auto Zero flashes while the detector automatically zeroes the sensors. Do not apply calibration gas during this process, otherwise the auto zero step will fail.

Auto Span

3. Next, three screens are displayed:
   - Apply span gas now to calibrate (recommended) (skip to step #4)
   - or press ◯ to select sensor(s)
   - or press ⓜ to skip calibration (skip to step #5)

Apply Span Gas Now

4. Attach the calibration hose and apply gas to the unit at a flow rate of 0.5 to 0.8 l/min. The cal gas cylinder icon flashes as the detector initially detects the calibration gas. After 30 seconds the detector beeps and the cal gas cylinder stops flashing. Auto Span flashes while spanning the respective sensor until the detector has attained a sufficient level of the expected gas.

5. When the span is complete, the following screens are displayed:
   - Calibration successful
   - Press ▲ to apply new cal gas (repeat step #4)
   - Press ▼ to end span

Remove hose and turn off cal gas. The display then advises to press ◯ to set or ⓜ to bypass the calibration due dates.

NH3 Responder Ultra

The Ultra portable gas detector comes factory calibrated and shouldn't require adjustments after purchase. Calibration should be performed at 6-month intervals.

Start Calibration

1. Check that you have a demand flow regulator, 250ppm NH3, 18% O2, 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 18% O2 and 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.

Required cal gas order #: RB17L-NH3/250, RB17L-O2/18%, and RB17L-CH4/2.5%.

For larger gas cylinders, use order # RB34L-NH3/250, RB34L-O2/18%, and RB34L-CH4/2.5%

If more sensor elements are installed in the NH3 Responder Ultra, order the appropriate gas(es). Contact CTI for help with gas selection.

4-Gas Responder

Calibration Procedure (AutoCal)

Verify that the calibration gas being used matches the span concentration values that are set for the detector. Refer to Span Gas Value section on page 9.

Start Calibration

1. To enter calibration, press and hold ◯ and ▼ simultaneously as the detector beeps, flashes, and vibrates to the corresponding countdown. The detector then reads Starting calibration.

Auto Zero

2. Auto Zero flashes while the detector automatically zeroes the sensors. Do not apply calibration gas during this process, otherwise the auto zero step will fail.

Auto Span

3. Next, three screens are displayed:

- Apply span gas now to calibrate (recommended) (skip to step #4)

- or press ◯ to select sensor(s)

- or press ⏻ to skip calibration (skip to step #5)

Apply Span Gas Now

4. *Note: turn on gas flow prior to connecting to the portable to prevent a pump failure alarm.*

Attach the calibration hose to the regulator outlet and apply gas to the unit at a flow rate of 0.5 to 0.8 l/min. The cal gas cylinder icon flashes as the detector initially detects the calibration gas. After 30 seconds the detector beeps and the cal gas cylinder stops flashing. Auto Span flashes while spanning the respective sensor until the detector has attained a sufficient level of the expected gas. Wait until the spanning countdown is complete.

5. When the span is complete, the following screens are displayed:

- Calibration successful

- Press ▲ to apply new cal gas (repeat step #4)

- Press ▼ to end span

Remove hose and turn off cal gas. The display then advises to press ◯ to set or ⏻ to bypass the calibration due dates.

CO2 Responder

The CO2 Responder portable carbon dioxide detector comes factory calibrated and should require only minimal adjustments after purchase. Calibration should be performed at 6-month intervals.

Note: Verify that the calibration gas being used matches the span concentration value(s) that are set for the detector in the User Options Menu. Refer to Span Gas Value section in the operating manual. Required calibration gas:

CO2: 1% CO2 balance air

Start Calibration

1. To enter calibration, press and hold ◯ and ▼ simultaneously as the detector beeps, flashes, and vibrates to the corresponding countdown. The detector then reads Starting calibration.

Auto Zero

2. Auto Zero flashes while the detector automatically zeroes the sensors. Do not apply calibration gas during this process, otherwise the auto zero step will fail.

Auto Span

3. Next, three screens are displayed:
   - Apply span gas now to calibrate (recommended) (skip to step #4)
   - or press ◯ to select sensor(s)
   - or press ⏻ to skip calibration (skip to step #5)

Apply Span Gas Now

4. Attach the calibration hose and apply gas to the sensor(s) at a flow rate of 500 ml/min. The cal gas cylinder icon flashes as the detector initially detects the calibration gas. After 30 seconds the detector beeps and the cal gas cylinder stops flashing. Auto Span flashes while spanning the sensors until the detector has attained a sufficient level of the expected gas.

5. When the span is complete, the following screens are displayed:
   - Calibration successful
   - Press ▲ to apply new cal gas (repeat step #4)
   - Press ▼ to end span

Remove hose and turn off cal gas. The display then advises to press ◯ to set or ⏻ to bypass the calibration due dates.

GasAlert Extreme - NH3

The GasAlert Extreme portable detector (GAXT-A2-DL) comes factory calibrated and should require only minimal adjustments after purchase. Calibration should be performed at 6-month intervals. The following procedure is written for NH3 but is the same for all gases.

Required calibration gas: NH3 100ppm

Start Calibration

1. To enter calibration, press and hold ○ and ▼ simultaneously the detector beeps, vibrates and flashes LEDs four times.
   The **CAL.** screen displays, then the detector beeps one time and the Auto Zero screen displays.

Auto Zero

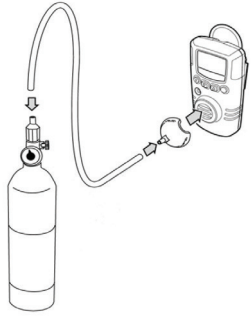
2. The LCD flashes while the detector automatically zeroes the sensor. Do not apply calibration gas until the LCD displays the flashing gas cylinder icon; otherwise, the auto zero step will fail.
   When the auto zero is complete, the detector beeps twice.

Set Span

3. Set SPAN flashes
   - Press ▲ or ▼ to adjust gas concentration to match the concentration value on the gas cylinder.
   - Press ○ to save the new value and proceed to the span screen.
4. The Set Span screen displays a flashing .

Apply Span Gas Now

5. Apply calibration gas at 0.5 to 0.8 L/min. The detector then begins spanning the sensor for the next 5 minutes. The detector beeps 3 times when the span is complete. The detector beeps three times when the span is complete.
6. If the Span is unsuccessful, the LCD will display SPAN FAIL, and a replacement sensor will likely be needed.



7. If the Span is successful, the LCD will display the following screens in succession:
   Press ▲ or ▼ to change the value. Press ○ to save the value.
   - Cal Due date (in amount of days until next calibration)
   - TWA Alarm Setpoint
   - STEL Alarm Setpoint
   - Low Alarm Setpoint
   - High Alarm Setpoint
8. Calibration is complete.

Solo

The Solo portable gas detector comes factory calibrated and shouldn't require adjustments after purchase. Calibration should be performed at 6-month intervals.

Required calibration gas: NH3 100 ppm (balance air or nitrogen)

Start Calibration

1. First, place the calibration cap over the Solo and hook the caps left clip to the corresponding groove on the detector and press down on the tab to snap it in place.
2. To enter Calibration Mode, from the main reading screen, click the button twice in rapid succession to enter the menus.
3. Click the button until you see **Calibrate**.

Set Span / Zero Calibration

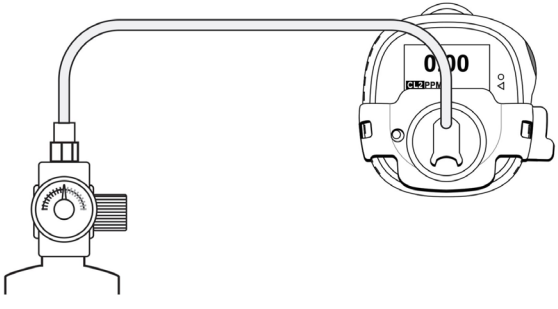
4. Press and hold the button for 3 seconds. When it enters the **Span Value** screen, choose **Yes** to change the span gas value or choose **No** to skip and enter the zeroing process. It will perform a zero calibration.

Apply Span Gas Now

5. When **Apply Gas** appears on the display, connect calibration hose to the cap and the calibration gas cylinder, and open the regulator valve.
6. Start the calibration by pressing and holding the button for 1 second. The calibration is indicated by a progress bar, followed by **Passed** or **Failed**. You can abort the calibration by clicking the button once.
7. When **Turn Gas Off** appears, close the regulator valve and remove the calibration cap by pulling on the tab.
8. Calibration is complete.

Important

If calibration fails, try calibrating it again. If the Solo can not be calibrated after repeated tries the sensor may need replacement or there may be a problem with the detector itself. Do not use the detector until the problem is resolved.



Ultra

The Ultra portable gas detector comes factory calibrated and shouldn't require adjustments after purchase. Calibration should be performed at 6-month intervals.

Start Calibration

1. To enter Calibration Mode, from the main reading screen, click the button twice in rapid succession to enter the menus.
2. Click the button to scroll down to **Start Calibration**.

Zero Calibration

3. Hold down the button through the 3-second countdown to start calibration.
4. Allow sensors to zero. When the zero calibration passes, click the button to confirm. Skip step 5 if there is no CO2 sensor.
5. When **Apply Nitrogen to zero CO2** appears, connect either nitrogen or zero air gas to the pump inlet and allow the CO2 to zero. Click button to confirm when it passes.

Apply Span Gas

6. When **Apply calibration gas now** is displayed, apply the indicated gas. A check mark will appear in the box and the calibration will start.
7. When **Turn Gas Off** appears, close the regulator valve and remove the calibration hose.
8. Click the button to confirm calibration passed. Steps 6 and 7 will repeat for the next sensors to be calibrated.
9. When all sensors are calibrated, the device will display which sensors passed and which failed, show the days until next calibration and return to main reading screen.
10. Calibration is complete.

Calibration Failure

If the calibration failed for some or all gases, either a **Cal Error All gases applied mixed results** message (if the detector was not successfully calibrated for all gases), or **Fail all gases** message will be displayed. After the button is pressed, a **Cal overdue** message will be displayed.

Wingman

The Wingman portable gas detector comes factory calibrated and shouldn't require adjustments after purchase. Calibration should be performed at 6-month intervals.

Required calibration gas: NH3, 50-500 ppm (balance air)

Start Calibration

1. First, place the calibration cap over the Solo and hook the caps left clip to the corresponding groove on the detector and press down on the tab to snap it in place.
2. To enter Calibration Mode, from the main reading screen, press the △ + ✓ keys for 1 second.
3. Press the ✓ key to start calibration .

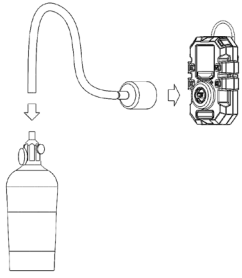
Zero Calibration

4. Apply Zero Air gas at 0.3 to 1.0 L/minute or zero the sensor in clean air for 2 minutes. Press the △ / ▽ keys until the value equals 0 ppm. Press the ✓ key to go to the Span calibration.

Span Calibration

The concentration of the Certified Calibration Gas should be between 10% and 100% of the full-scale range of the sensor (50-500 PPM).

5. Apply certified calibration gas at 0.3 to 1.0 L/minute.
6. Once the output signal has peaked (or 2 minutes maximum), press the △ / ▽ keys to change the value on display to match the value of the calibration gas.
7. Spanning is complete. Remove the span calibration gas at this time. Press the ✓ key to end Span calibration.Calibration is complete.



Important

If an extreme gain adjustment was applied, the sensor may be at or near the end of its useful life. This may be due to the age of the sensor, high exposure to the target gas or other environmental factors.

If the span calibration failed, check the calibration gas cylinder pressure and flow, as well as the hose and adaptor to make sure the gas is getting to the sensor. Replace the sensor element at this time.

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 2 years, 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) 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 contractor, or the installation of unapproved parts on the product

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.

GAS DETECTION SPECIALISTS

CAL-KIT-DOC1-6
20231031