BRASCH
ENVIRONMENTAL TECHNOLOGIES

Field Calibration Instructions

Revision H

Overview

The sensor's useful lifetime depends greatly upon its operating conditions. Continuous operation around large or numerous gas sources may necessitate more frequent calibration. A recommended recalibration date is recorded on the front panel label of each transmitter. If at any point in time the sensor fails to respond in a timely manner or fails to read within acceptable tolerances, calibrate the sensor as soon as possible. Brasch recommends a response time to 90% of under 50 seconds and an accuracy of ±10%.

This document outlines the procedure for performing field calibration of Brasch Generation 2 sensor modules on Revision H sensor boards. For the calibration procedure of Revision A through G sensor boards, see page 4.

Required:

- Voltmeter
- Test Gas Cylinder(s)

  - Carbon Monoxide (CO) – 100 PPM CO
  - Nitrogen Dioxide (NO_2) – 5.0 PPM NO_2
  - Methane (CH_4) – 50% LEL (2.5% V/V) CH_4
  - *Propane (C_3H_8) – 50% LEL (2.5% V/V) CH_4
  - Hydrogen (H_2) – 50% LEL (2% V/V) H_2
  - Oxygen (O_2) – 100% N_2
  - Zero Air – 20.9% O_2
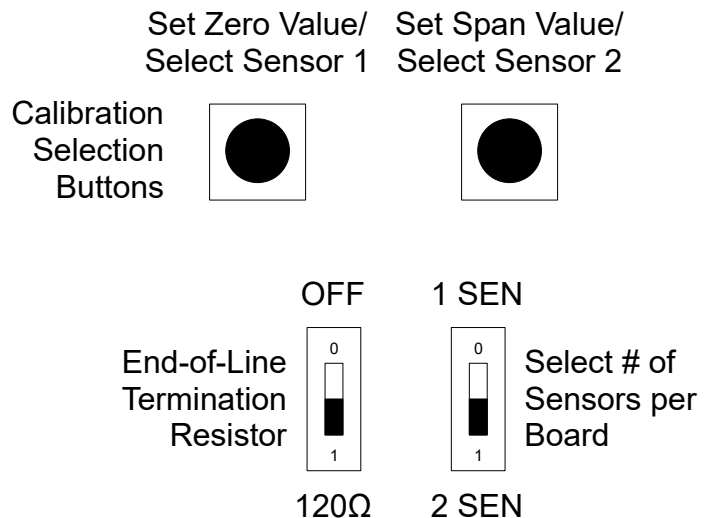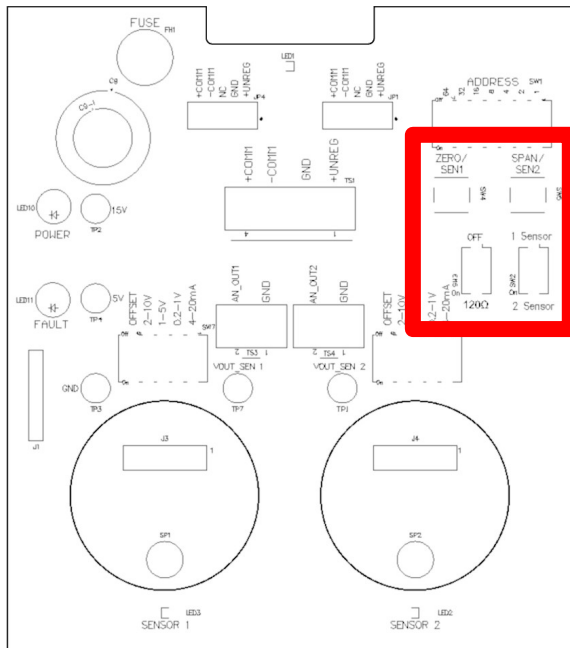- Gas Flow Regulator
- Tubing
- Sensor Cup

Note: All of the above required parts (except a voltmeter) are included with Brasch Test Gas Kits. *Propane sensors must be calibrated using methane gas.

Procedure:

1. To enter calibration mode, simultaneously press and hold both SW4 and SW5 for three seconds.

2. Once LED2 and LED3 blink in an alternating pattern, select the sensor to be calibrated by pressing the corresponding button – SW4 or SW5.

   a) Once selected, the corresponding LED will remain solid.

3. Verify there is no target gas present.

   a) Use a cylinder of zero air if necessary.

4. Press SW4 to set the zero value.

   a) The corresponding LED will blink continuously when the zero value is saved correctly.

   b) Repeat this step if the LED remains solid.

5. Apply calibration gas to the sensor. Refer to the test gas cylinder list above to determine the appropriate calibration gas to use.

   a) If calibrating a propane sensor, only use propane gas to verify accuracy after using methane gas to perform the calibration.

6. Place the voltmeter leads between COM (TP3) and VOUT_SEN 1 or 2 (TP7 or TP1).

7. Once the sensor output voltage has stabilized, press SW5 to set the span value.

   a) Stabilization time varies by gas type, but should take no more than five minutes.

8. If the calibration completed successfully, the blue LEDs will turn off and the transmitter will exit calibration mode.

Troubleshooting:

- In the event calibration needs to be cancelled, use one of the following two methods:

  ○ After ten minutes of inactivity, the calibration mode will automatically timeout and return to normal operation.

  ○ Press and hold SW4 and SW5 for three seconds to manually exit calibration mode.

- If any of the following errors are present, calibration data was corrupted and this procedure needs to be repeated.

  ○ Standalone Detectors: 9997

  ○ BMS Transmitters: 0x0008

  ○ Control Panel Remotes: Sensor # Calibration Invalid

- If achieving stable values is not possible, it may be necessary to replace the sensor module and/or the sensor board.

  ○ Once the useful lifespan of the sensor is exceeded, the sensor can no longer be recalibrated. Replacing the sensor module should yield more stable values.

  ○ Over time, control electronics can degrade or suffer damage. If this is the case, replacing the sensor board should yield more stable values.

Set Zero Value/ Select Sensor 1

Set Span Value/ Select Sensor 2

Calibration Selection Buttons

OFF   1 SEN

End-of-Line Termination Resistor

Select # of Sensors per Board

120Ω   2 SEN

Field Calibration Instructions

Revision A – G

Overview

Brasch Generation 2 sensor boards are calibrated at the factory and have an expected calibration duration of approximately two years. Environmental conditions may shorten or prolong this period of time, but once the sensor parameters drift outside of acceptable tolerances, the sensor board must be either be recalibrated or replaced.

This document outlines the procedure for performing field calibration of all Brasch Generation 2 sensor boards Revision A through G. For the calibration procedure of sensor modules on Revision H sensor boards, see page 1.

Required:

- Voltmeter

- Potentiometer Adjustment Tool

- 100 PPM Carbon Monoxide Test Gas (for CO sensors)

- 5.0 PPM Nitrogen Dioxide Test Gas (for NO_2 sensors)

- Gas Flow Regulator

- Tubing

- Sensor Cup

Note: All of the above required parts (except a voltmeter) are included with Brasch CO and NO_2 Test Gas Kits.
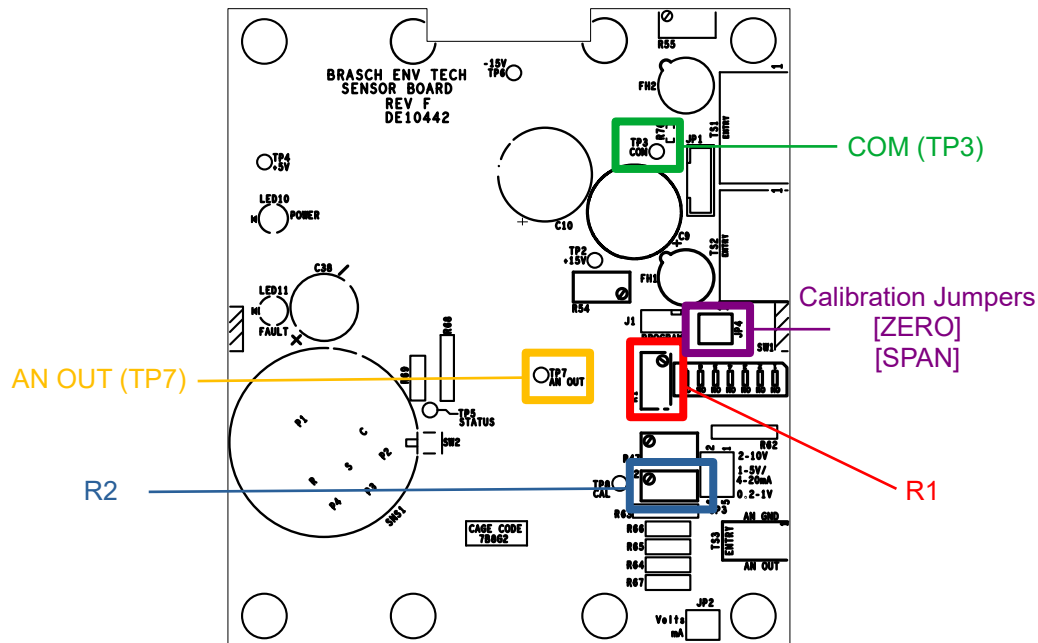
Procedure:

1. Turn power OFF to the sensor board

2. Move the calibration jumpers (JP4) so that both pins are covered by the jumpers

3. Turn power ON to the sensor board

4. Connect the negative voltmeter lead to COM (TP3)

5. Connect the positive voltmeter lead to AN OUT (TP7)

6. Set the voltmeter to measure DC voltage (VDC)

    a) If possible, set the meter to display the average voltage to smooth out readings

7. Use the potentiometer adjustment tool on R2 until the meter reads approximately 5.0 V

    a) This number will fluctuate but should remain stable at or near 5.0 V

8. Remove the top calibration jumper on JP4

9. Apply test gas directly to the sensor

    a) The voltage at TP7 will begin to drop

10. Once the voltage stabilizes, remove the bottom calibration jumper on JP4

    a) Stabilization requires approximately 5 minutes from the application of gas

11. Remove test gas from the sensor

12. Verify that the voltage at TP7 returns to approximately the same value as was set in step 7

    a) Stabilization may take approximately 5 minutes from the removal of gas

13. Cycle power to the sensor board to verify that calibration data has been saved

14. Repeat this procedure for any remaining sensor boards

Troubleshooting:

- If any of the following errors are present, calibration data was corrupted and this procedure needs to be repeated.

  - Standalone Detectors: 9997

  - BMS Transmitters: 0x0008

  - Control Panel Remotes: Sensor # Calibration Invalid

- If achieving stable voltages is not possible, it may be necessary to replace the sensor and/or the sensor board.

  - Once the useful lifespan of the sensor is exceeded, the sensor can no longer be recalibrated. Both carbon monoxide and nitrogen dioxide sensors have an expected lifespan of up to 10 years; however, this period can be reduced with increased exposure to the target gas or sensor poisons. Replacing the sensor should yield more stable voltages.

  - Over time, control electronics can degrade or suffer damage. If this is the case, replacing the sensor board should yield more stable voltages.

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