

**Recommended procedure for checking the response of Brasch carbon monoxide detectors.  
(USE ONLY FOR DETECTORS WITH SERIAL NUMBERS 2999 AND BELOW.)**

The following procedure describes the recommended Brasch technique for testing the response of Brasch CO Detectors to carbon monoxide. This procedure is meant only to provide an indication that the detector is in working condition. **DO NOT USE THIS PROCEDURE TO CALIBRATE THE DETECTOR. Calibration must be done under very controlled conditions in a laboratory environment.**

**Initial Preparations:**

Certain requirements, listed below, must be met prior to beginning the response check.

1. Obtain a known good tank of air containing approximately 100 PPM carbon monoxide. (Do not use carbon monoxide mixed in nitrogen because the CO sensor requires oxygen to function properly.)

**CAUTION**

**Carbon monoxide is a lethal gas. Be especially careful when working with or around any source of this gas. Do not use this test procedure in any confined area where the concentration of carbon monoxide could build to a dangerous level.**

2. Make sure that the unit to be tested has continuously operated for at least 72 hours. If the unit has operated in the "PURGE" mode anytime during the previously 72 hours, the test will give lower than expected results.
3. Remove the cover from the detector housing. If necessary, protect the detector from drafts while the cover is removed. Drafts can create erroneous test results.
4. Allow the sample gas to flow for a few minutes before beginning the test to purge all lines of air and allow the sample concentration to become constant.
5. Obtain a known good volt-ohm meter capable of measuring below one volt.

**Technical Background:**

The Brasch CO detector uses a CO sensor operating in what is known as a "pulsed mode of operation". The sensor is first held at an elevated temperature for one minute. After this time, the sensor is then operated at a reduced temperature for 1½ minutes. At the end of this reduced heat period, the detector is operated without heating power for approximately 250 milliseconds while the resistance of the sensor is measured. The resistance of the sensor is less when carbon monoxide is present and the lowered resistance is proportional to the concentration of CO in the sample. The detector checks for CO once each cycle and each cycle requires 2 ½ minutes to complete.

To properly test the CO sensor, the sample gas must be applied at the instance the sensor enters the higher heat mode at the beginning of a measuring cycle. The gas is allowed to flow to the sensor during the entire cycle. The reading is then observed and compared to the expected result.

**NOTE**

**This sensor is sensitive to changes in humidity when operating in environments where the humidity drops below approximately thirty percent. The sample gas from the tank is usually supplied with very low water content. Allowing the sample to flow to the sensor for more than two measuring cycles can dry the sensor's active element and decrease the response to carbon monoxide. For this reason, the sensor should not be subjected to more than two cycles of gas**

**flow at any time. If, for some reason, the gas is allowed to flow to the sensor for more than two cycles, allow at least one hour for the sensor to stabilize before applying the next sample.**

#### **Test Procedure:**

Once you have obtained the necessary sample gas and equipment listed above, you are ready to begin testing. With the cover removed from the detector, you will have access to the sensor amplifier board. This board contains the CO sensor and the resistor, R1100, used to control the current supplied to the sensor during the heating modes. Using Fig. 1, connect the voltmeter to the identified points on the sensor amplifier board.

The voltmeter will read approximately 0.75 volts during the high heat mode and approximately 0.25 volts during the low heat mode. The meter will not respond to the portion of the cycle when the sensor resistance is measured because this time is so short. However, this time occurs between the ending of the low heat mode and the beginning of the high heat mode. This is the time you are interested in since the sample will be applied at the beginning of the high heat mode.

To test the response of the detector to carbon monoxide, follow the steps below.

1. Turn on the tank of sample gas and allow it to flow for a few minutes.
2. Attach the "sample delivery cup" to the flexible line connected to the tank. (Fig. 2 illustrates the sample being applied to the sensor.)
3. Connect the voltmeter to the sensor amplifier as illustrated in Fig. 1.
4. Monitor the voltage across the resistor, R1100, and when the voltage changes **from 0.25 volts to 0.75 volts** apply the sample gas to the sensor as shown in Fig. 2 by placing the "sample delivery cup" completely over the sensor. **You may have to physically hold the "sample delivery cup" in place during the entire cycle.**
5. Allow the gas to flow to the sensor during the entire cycle.
6. Remove the "sample delivery cup" when the voltage across the resistor, R1100, changes **from 0.25 volts to 0.75 volts** at the end of the cycle.
7. Read the sensor response to the sample gas from the LED display and compare it to the expected response.
8. Repeat the procedure again, if necessary, allowing **at least 30 to 45 minutes** between tests.

#### **Conclusion:**

If the response and operation of the detector is as expected, the detector is functioning properly. Replace the cover while being careful not to short the cover to any of the live detector circuits. If the power is removed while replacing the cover, allow at least 72 hours after power is restored for the detector to reach its calibrated sensitivity level.

The calibration procedure for this sensor is very complicated and must be accomplished under very controlled conditions. **If the above described test indicates that calibration is required, contact your Brasch representative, or the factory directly, to obtain service. DO NOT TRY TO CALIBRATE THE SENSOR IN THE FIELD BASED UPON THE RESULTS OF THIS TEST.**