

## CO<sub>2</sub> Calibration Instructions - Analog Flow Thru Gas Cells



NOTE: Gas calibration should be done a minimum of once every (6 ) six months (at least **ZERO** calibration). If you keep a calibration log book and record how much zero & span drift occur, you can verify if the calibration interval is correct. You may find that **ZERO** calibration every 6 months and **SPAN** once a year is sufficient to maintain accuracy.

NOTE: Refer to product spec sheet for **ZERO & SPAN** adjustment locations.

1. Remove protective cap from top of nitrogen cylinder. Push and thread pressure regulator valve onto cylinder outlet. Nitrogen is **ZERO** gas. Fresh air is about **0.04% (400ppm) CO<sub>2</sub>**.
2. Connect plastic tubing from pressure regulator outlet to flow meter inlet. (bottom connection of flow meter)
3. Connect plastic tubing from flow meter outlet (top connection) to inlet side of gas cell.
4. Make sure unit to be tested is powered on and has had a 5 minute warm-up.
5. Connect voltmeter to either 0-1V or 0-5V output. (See product spec sheet for details)
6. Make sure flow meter is in a vertical / upright position. Open flow valve slowly while observing flow meter.
7. Adjust the flow to between 250 - 350 ml / min (Cal kit regulator should limit flow to about 300mLPM).
8. After 3 minutes of continuous nitrogen flow, observe voltage signal output and adjust **ZERO** potentiometer (**0.00 +/-0.05 volts**) as required.
9. Turn off flow valve and remove pressure regulator valve from nitrogen cylinder.
10. Replace nitrogen cylinder with CO<sub>2</sub> cylinder containing **SPAN** gas (0.1% CO<sub>2</sub> for 0.2% FS, 0.5% CO<sub>2</sub> for 1% FS, 1% CO<sub>2</sub> for 2% or 3% FS, 2% CO<sub>2</sub> for 5% FS, 5% CO<sub>2</sub> for 10% FS (FS = full scale))
11. Open flow valve and observe voltage signal output. (See product spec sheet scale data for voltage reading)
12. Allow **SPAN** gas to flow until a stable reading is obtained. Adjust **SPAN** potentiometer as required. (See product spec sheet scale data for voltage reading)
13. Turn off flow valve and remove pressure regulator from cylinder.



- **Field Calibration Kits** are available and consist of the following: (See **page 3** for part numbers)
  - one tank with approx 8 hour supply of 99.8% N<sub>2</sub>
  - one tank with approx 8 hour supply of CO<sub>2</sub>
  - flow meter - 0 to 500 ml/minute range (Includes 2 plastic hose barbs)
  - pressure regulator w/flow control valve - 0.3 L/min
  - two plastic interconnect calibration gas tubes
  - carrying case - 23 x 9 x 4.5 inches
 Concentrations of 0.1% (1000 +/-20 ppm certified) 0.2%, 0.5%, 1%, 5%, & 10% CO<sub>2</sub> are in stock and certified to be +/-2% of reading.
- Replacement gas tanks for CO<sub>2</sub> and N<sub>2</sub> are available. These 14" high 6D size tanks contain 3.6 ft<sup>3</sup> or 103 liters @70 degrees F and 1000 PSIG.
- Special gases and concentrations may be ordered with 3-6 week lead times depending on the specific gas ordered.

**NOTE:** You should use a **tank value** near mid-scale and **not at full scale**.

Examples: 0.1% CO<sub>2</sub> (1000 ppm) for a 0.2% (2000 ppm) full scale sensor.  
 1.0% CO<sub>2</sub> for a 3% full scale sensor.  
 5.0% CO<sub>2</sub> for a 10% full scale sensor.

<u>Part Number</u>	<u>Calibration Kits</u>
<b>030181</b>	<b>0.1%</b> (1000 ppm) CO <sub>2</sub> +/-2% of reading. <b>Certified</b> = 0.100+/-0.002% CO <sub>2</sub>
<b>030337</b>	<b>0.5%</b> (5000 ppm) CO <sub>2</sub> +/-2% of reading. <b>Certified</b> = 0.500+/-0.010% CO <sub>2</sub>
<b>030338</b>	<b>1.0%</b> (10,000 ppm) CO <sub>2</sub> +/-2% of reading. <b>Certified</b> =1.000+/-0.020% CO <sub>2</sub>
<b>030715</b>	<b>2.0%</b> (20,000 ppm) CO <sub>2</sub> +/-2% of reading. <b>Certified</b> =2.000+/-0.040% CO <sub>2</sub>
<b>030339</b>	<b>5.0%</b> (50,000 ppm) CO <sub>2</sub> +/-2% of reading. <b>Certified</b> =5.000+/-0.100% CO <sub>2</sub>

<u>Part Number</u>	<u>Replacement Certified Calibration Gas Cylinders</u>
<b>0616</b>	<b>99.8%</b> (nitrogen) N <sub>2</sub> <b>tank</b> for <b>ZERO</b> calibration
<b>0615</b>	<b>0.1%</b> (1000 ppm) CO <sub>2</sub> <b>tank</b> for <b>SPAN</b> calibration on 2000 ppm sensor.
<b>0610</b>	<b>0.2%</b> (2000 ppm) CO <sub>2</sub> <b>tank</b> for <b>SPAN</b> calibration on 5000 ppm sensor.
<b>0611</b>	<b>0.5%</b> (5000 ppm) CO <sub>2</sub> <b>tank</b> for <b>SPAN</b> calibration on 1% sensor.
<b>0836</b>	<b>1.0%</b> (10,000 ppm) CO <sub>2</sub> <b>tank</b> for <b>SPAN</b> calibration on 2% or 3% sensor.
<b>0856</b>	<b>2.0%</b> (20,000 ppm) CO <sub>2</sub> <b>tank</b> for <b>SPAN</b> calibration on 3% or 5% sensor.
<b>0612</b>	<b>5.0%</b> (50,000 ppm) CO <sub>2</sub> <b>tank</b> for <b>SPAN</b> calibration on 10% sensor.
<b>0837</b>	<b>10%</b> (100,000 ppm) CO <sub>2</sub> <b>tank</b> for <b>SPAN</b> calibration on 20% sensor.

Pressure regulator  
 flow control valve to  
 limit flow to **300 ml**  
 per minute.

**Tank of  
 Certified  
 CO<sub>2</sub>** with  
 balance of  
 nitrogen.



Two (2) #**0651** 3/16 ID x  
 3 ft long plastic tubes.  
 One to bottom of flow  
 meter & one from top of  
 flow meter to the inlet  
 hose barb on the gas cell.

0 to 500 ml (0.500 L/min )  
 per min #**0290** flow meter  
 with two #**0304** 3/8 NPT to  
 3/16 ID hose barbs.