

## CO<sub>2</sub> Diffusion Head Calibration Instructions



**CO<sub>2</sub> Diffusion Head**  
**Calibration Kit:**  
**DH CAL KIT**  
2 cylinders of calibration gas:  
one of 99.8% Nitrogen (N<sub>2</sub>) zero gas  
one of 0.1% (1000 ppm) CO<sub>2</sub> span gas  
Regulator:  
    reuseable 0.3 LPM ( 300 ml/min )  
    with on/off valve  
Flow meter - 1-500 ml/min  
Tubing and tubing connector  
Twin-pack carrying case  
  
To order please call (209) 754-0707  
or FAX (209) 754-0104

Only a voltmeter connected to terminal block pins 5 (- lead) and 6 (+ lead) are required to read the 0 to 5 volt output signal. See Application Note A51. Fresh air at about 400 ppm CO<sub>2</sub> should read about 1.00 volts on the 0 to 5 volt output and about 7.2 mA on the 4-20 mA output. If you do not have any certified 1000 ppm CO<sub>2</sub> gas left you may adjust ZERO (not SPAN) on fresh air for a voltage output of 1.00 volts.



Gas calibration should be done a minimum of once every six months. Ref *BSR/ASHRAE 62-1989R*, 8.3.10 8/96 A calibration log where you record the unit's voltage and mA readings BEFORE any adjustments are made will help you to decide if the period between calibrations should be longer or shorter (App. Note A26 ).

**CALIBRATION INSTRUCTIONS:**

1. Remove protective cap from top of nitrogen cylinder. Push and thread pressure regulator valve onto cylinder outlet. Very high flow rates in the duct may dilute the calibration gas in the cell. Make sure that the duct flow rate is low or remove the sensor from the duct.
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 unit to be tested.
4. Make sure unit to be tested is turned on and has had a 5 minute warm-up.
5. Connect voltmeter to voltage signal output or observe signal output on field test unit.
6. Make sure flow meter is in an upright position. Open flow valve slowly while observing flow meter.
7. Adjust the flow to between 200 - 300 ml/min.
8. After 2 to 3 minutes of continuous nitrogen flow, observe signal output and perform ZERO adjustment (0.00 volts) if required.
9. Turn off flow valve and remove pressure regulator valve from nitrogen cylinder.
10. Replace nitrogen cylinder with cylinder containing 0.1% (1000 ppm) CO<sub>2</sub>.
11. Open flow valve and observe signal output. (see scale data for voltage reading)
12. Allow sample to flow until final indication is obtained. Adjust span potentiometer if required. (see scale data for voltage reading at 1000 ppm) 2.50 volts for a Model 6289
13. Turn off flow valve and remove pressure regulator from cylinder.





## Application Note A25

Table of **VALTRONICS** part numbers to order different concentrations of carbon dioxide.

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

Examples: 1000 ppm (0.1%) CO<sub>2</sub> for a 2000 ppm full scale unit like a 6289.

1.0% CO<sub>2</sub> for a 3% full scale unit like a Model 2156 or 2166.

5.0% CO<sub>2</sub> for a 10% full scale unit like a Model 2008 or 2208.

<b>VALTRONICS</b> part #	<b>Certified CO<sub>2</sub> concentration</b>
030181	0.1% (1000 ppm) CO <sub>2</sub> ±2% of reading <b>Certified</b> = 0.100±0.002% CO <sub>2</sub>
030337	0.5% (5000 ppm) CO <sub>2</sub> ±2% of reading <b>Certified</b> = 0.500±0.010% CO <sub>2</sub>
030338	1.0% (10000 ppm) CO <sub>2</sub> ±2% of reading <b>Certified</b> = 1.000±0.020% CO <sub>2</sub>
030339	5.0% (50000 ppm) CO <sub>2</sub> ±2% of reading <b>Certified</b> = 5.000±0.100% CO <sub>2</sub>

Pressure regulator to limit flow to 300 ml per minute.

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



0 to 500 ml per minute **flow meter**