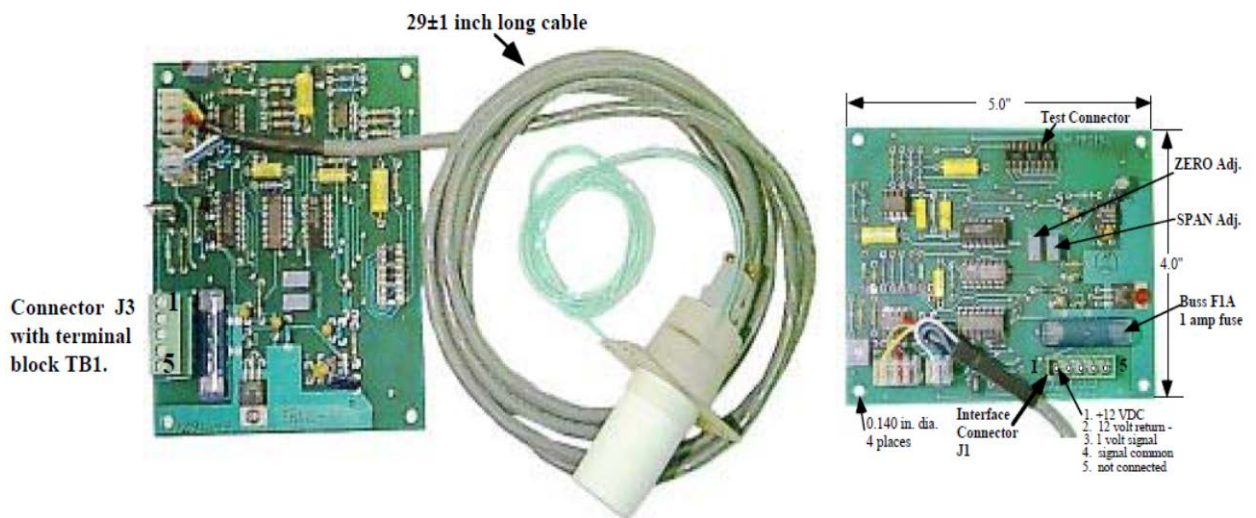


Model 2015DH

Operating/Maintenance



Instruction Manual

07-03-2014

**VALTRONICS MODEL 2015DH
CARBON DIOXIDE MONITOR
CALIBRATION INSTRUCTIONS**



Depending on the full-scale concentration of the monitor, outdoor fresh air will have a reading of close to 0.00 volts. The only sure way of knowing if the percent gas readings are accurate is to use calibration gas. Calibration kits are available from Valtronics. Order a span gas concentration that is near the level that is usually measured (mid-scale is a safe choice).

A. ZERO ADJUSTMENT

1. Remove the small white plug from the 1/16-inch ID gas calibration tube. Connect the plastic tubing from the flow meter outlet (top connection) to the gas calibration tube. Make sure the flow meter is in the upright position. Refer to FIG. 1 on page 2.
2. Remove the protective cap from top of nitrogen cylinder. Push and thread the pressure regulator valve onto cylinder outlet.
3. Connect the plastic tubing from the pressure regulator outlet to the flow meter inlet.
4. Make sure the unit to be calibrated is turned on and has had at least a 5-minute warm-up.
5. Connect a voltmeter to the output of the unit: the red or positive lead to the 0-1V signal output (pin 3 of TB1), and the black or negative lead to signal common (pin 4).
6. Slowly open the flow valve of the nitrogen cylinder while observing the flow meter.
7. Adjust the flow to be between 100 and 300 mL/min liters per minute.
8. After three minutes of continuous nitrogen flow, observe the voltage output and adjust the ZERO potentiometer for a reading of 0.00 Volts.
9. Turn off the flow valve and remove the pressure regulator from the nitrogen cylinder.

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B. SPAN ADJUSTMENT

Before doing this step, ensure that the unit is reading 0.00V with Nitrogen. If it is not reading 0.00V, go to step A on page 1.

1. Replace the nitrogen cylinder with the appropriate span gas cylinder (10% or 5% CO₂).
2. Open the flow valve of the gas cylinder and set the flow the same value as in the step A. Observe the voltage output.
3. Allow the span gas to flow until the final indication is obtained. Adjust the SPAN potentiometer for the proper reading: for 10% CO₂, the reading should be .736 volts; for 5% CO₂, the reading should be .511 volts.
4. Turn off the flow valve and remove the pressure regulator from the gas cylinder.
5. Disconnect the calibration tube and replace the plug.

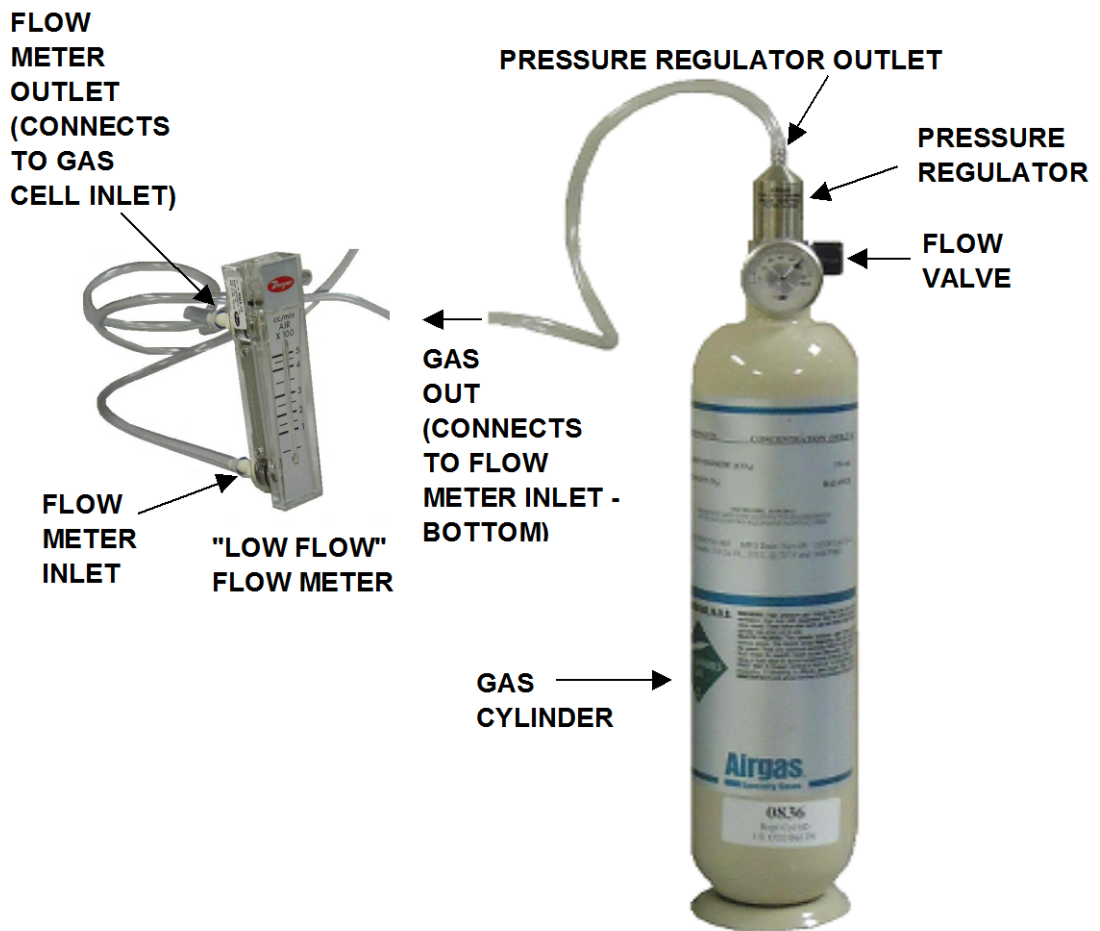


FIG. 1 - CALIBRATION SET-UP

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TECHNICAL NOTES

1. How to avoid Ground Loops: As seen in FIG. 2, you should keep the power supply circuit and the signal circuits separated. Even though the Power common and the Signal common are tied together on our printed circuit board, you must run separate wires for each one and make sure that the Power common wire is a large wire gauge and as short as possible. The object is to prevent the pulsed power supply current from getting into the signal path. The power supply current pulses, created by the infrared source turning on and off every 1.4 seconds, will follow the path of least resistance (represented by R_{W1} and R_{W2} , the resistance of the wires). The current flowing through the wire resistance creates a voltage drop (current times resistance) that would appear to be noise if the two loops were connected together. This is classically called a ground loop problem.
2. EMI (Electro-Magnetic Interference): The infrared detector and its amplifiers are sensitive to strong magnetic fields that are building and collapsing at 50 Hz and 60 Hz rates. Examples of this would be devices like fan motors, florescent light fixtures, or AC solenoids that are within a few centimeters of the 2015. The magnetic field induces a signal that beats up and down at a period of about 8 to 15 seconds. This can be easily avoided by keeping the unit away from the sources of the strong fields. If you cannot avoid being close to an EMI source, then place an earth grounded steel shield between the EMI source and the 2015.

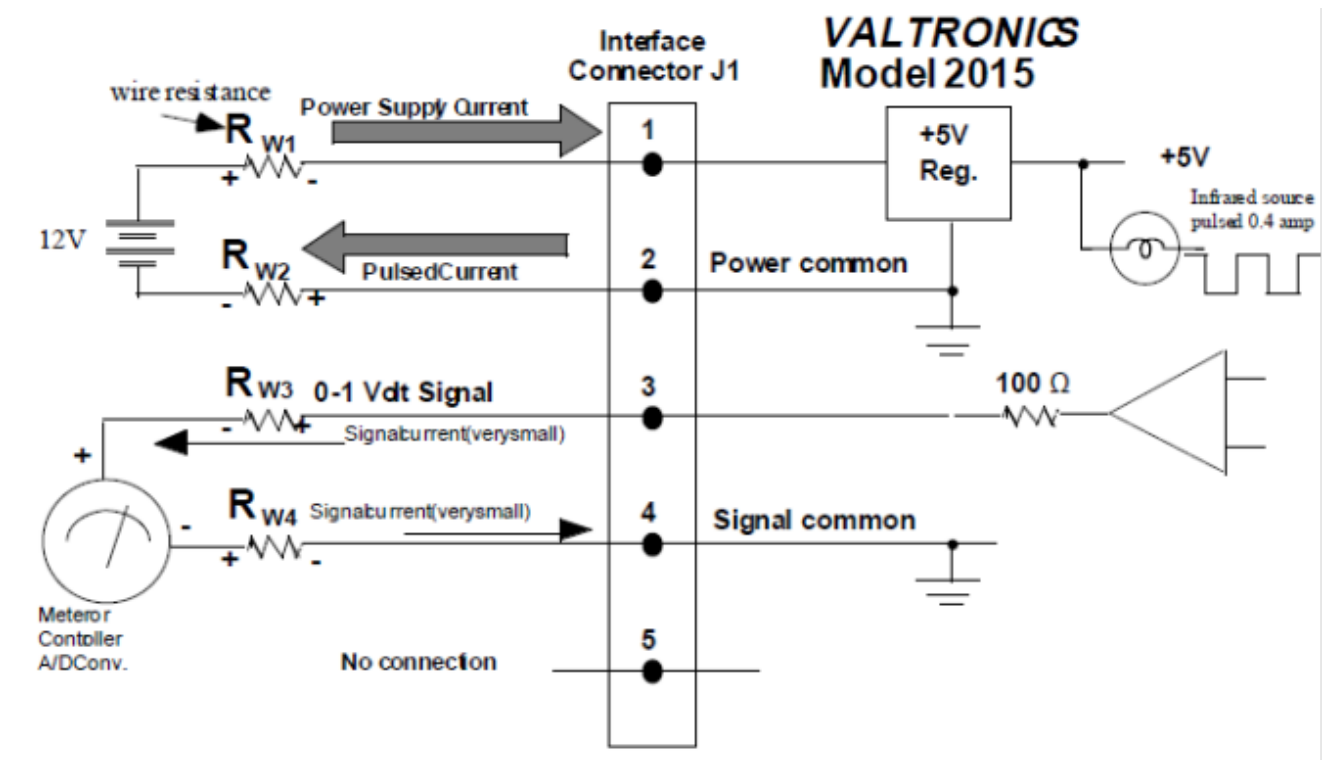


FIG. 2

**VALTRONICS MODEL 2015DH
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SPECIFICATIONS

- Method: N.D.I.R. (Non-Dispersive Infra-Red) Diffusion Type Gas Cell.
- Gas: Carbon Dioxide (CO₂)
- Available Ranges: 0-5%, 0-10% and 0-20%
- Accuracy: $\pm 5\%$ of reading from $\frac{1}{2}$ scale to full scale and $\pm .025V$ from 0.0 % to $\frac{1}{2}$ scale
- Repeatability: $\pm 1\%$ of full scale (using the same gas sample and assure zero)
- External Power Source: 12 VDC @ .5A max. (7.7 to 16.0 VDC absolute min/max)
See page 3 – How to avoid GROUND LOOPS & EMI
- Power Consumption: Less than 3 watts @ 12.0 VDC
- Output Signals: Standard output connector is a Phoenix 5-pin male connector with a mating terminal block. Voltage Output: 0 to 1 volt = 0 to full-scale CO₂
- Zero Drift at Constant Temperature: Less than 2% of full scale per 24 hours (random, not cumulative)
- Zero Noise at Constant Temperature: Less than 10 mV peak to peak (measured at V out during any 20-second period).
- Zero Drift due to Ambient Temperature: Less than 0.5% of full scale per degree Centigrade
- Operating Temperature Range: 0 to 40°C (41° to 104°F)
- Storage Temperature Range: -40° to +70°C (-40° to +158°F)
- Operating Humidity Range: 5 to 95% Relative Humidity (non-condensing)
- Weight: Less than 0.5 pounds (0.23 kilograms)
- PCB Clearance Dimensions: 4" x 5" x 2" (10.16cm x 12.7cm x 5.08cm)

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ASSISTANCE OR TECHNICAL SUPPORT

Before calling for assistance or technical support, please refer to the technical note above. If you still need help, follow the instructions below.

When calling, please know the purchase date, the complete model and serial number of the unit. This information will help us to better respond to your request.

If you need to send the unit to us for repair, please contact the sales department. You will be issued an RMA (Returned Materials Authorization) number and instructions on how to return the unit. Please allow 2 – 4 weeks turnaround time, depending on the problem.

Phone: (209) 754-0707 • **FAX** (209) 754-0104 • **e-mail:** vti@val-tronics.com

WARRANTY

Valtronics warrants that the original items furnished under this warranty will be free from defects in material and workmanship. This warranty is exclusive and in lieu of all other warranties whether written, oral, or implied (including any warranty of merchantability of fitness for purpose). If it appears within 12 months from the date of invoice that this material does not meet the warranty specified above, and you notify us of this promptly, we shall correct any defect or any non-conformity to the specifications, either (at our option) by repairing any defective part of parts which are returned to us freight prepaid or by making available at your plan (via lowest freight rate) a repaired or replacement material or at Valtronics option to credit the customer the original purchase of the item. Our liability to you arising out of the supplying of this material, or its use, whether on warranty, contract, or negligence, shall not in any case exceed the cost of correcting defects in the material, as herein provided. Upon the expiration of the warranty period all such liability shall terminate. The foregoing shall constitute your sole remedy and our sole liability. In no event shall we be liable for special or consequential damages. This warranty does not include abuse of malicious damage.

If equipment returned during the warranty period is found to have nothing wrong with it, there will be a \$198.00 handling charge. There is a minimum of a \$198.00 charge for equipment returned for out of warranty repair.

Please call for an RMA (Return Material Authorization) number before sending any equipment back. Items returned for repair must be accompanied by a purchase order. Equipment repair not covered by warranty will be billed on material and labor basis. There will be an additional 60% “end-user” charge for customers who did not purchase the equipment directly from Valtronics. Equipment must be sent to Valtronics prepaid and return transportation will be billed as part of the repair. Valtronics will not be responsible for damage due to improper packaging of the item returned for repair.

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NOTES: