



## Carbon Dioxide Monitor Model RI-221L 2000 ppm CO<sub>2</sub>



#10-32 screw may be replaced by a #10-32 hose barb for gas calibration



## Model RI-221L 2000 ppm CO<sub>2</sub>

### Description:

The Valtronics Model RI-221L is a Non-Dispersive Infrared gas monitor, designed as a remote transducer-transmitter for continuous monitoring of Carbon Dioxide in the range of zero to 2000 ppm CO<sub>2</sub> full scale.

The Optical Diffusion Head is completely unaffected by humidity, and requires no gas sampling pump. The transducer output may be interfaced to any controller unit via the non-linear 0 to 10 Volt or 4 to 20 mA output signals.

### Model RI-221L 2000 ppm CO<sub>2</sub> Specifications:

|   |   |
|---|---|
| Method: .....                           | N.D. I. R. (Non-dispersive Infra-red) gas diffusion sample cell<br>Remote diffusion gas cell on a 8 inch long cable                           |
| Gas: .....                              | Carbon dioxide (CO <sub>2</sub> )   |
| Range: .....                            | 0-2,000 ppm (0.2%) CO <sub>2</sub> by volume  |
| Accuracy: .....                         | ±50 ppm CO <sub>2</sub> from 0 to mid scale (0-0.1% CO <sub>2</sub> )<br>± 5% of reading from mid to full scale (0.1to 0.2% CO <sub>2</sub> ) |
| Repeatability: .....                    | ± 1% of full scale (challenge with same gas sample and assure zero )  |
| External Power Source: .....            | 110/220 VAC (jumper selectable), 50/60 Hz   |
| Power Consumption: .....                | Less than 5 watts at 110 VAC  |
| SET POINT Control Relays: .....         | Dual set points adjustable from 500 ppm CO <sub>2</sub> to 2000 ppm CO <sub>2</sub>   |
| Relay Contact Rating: .....             | SPDT contacts: non-latching N.C., N.O., 250 VAC or 30 VDC @ 3 amp   |
| Output Signals Voltage: .....           | 0 to 10 volt = 0 to 2000 ppm CO <sub>2</sub> ( non-linear scale data attached)  |
| Current Loop: .....                     | 4 to 20 mA = 0 to 2000 ppm CO <sub>2</sub> ( non-linear scale data attached)  |
| Electronic Response Time: .....         | 8 seconds typical to a step change in gas concentration<br>gas response depends on gas diffusion physics                                      |
| Zero Noise at Constant Temperature: ..  | Less than 0.1 volt peak to peak measured on voltage output<br>(measured during any 20 second period)  |
| Zero Drift at Constant Temperature: ... | Less than 2% of full scale per 24 hours (random not cumulative)   |
| Zero Drift due to Ambient Temperature:  | Less than 0.5% of full scale per degree Centigrade  |
| Operating Temperature Range: .....      | 5 to 40°C (41° to 104°F) see <b>Application Note A12</b>  |
| Ambient Relative Humidity: .....        | 5 to 95% RH non-condensing see Application Note A30   |
| Storage Temperature range:- .....       | 40 to +70°C (-40 to +158°F)   |
| Weight: .....                           | Less than 0.5 pound   |
| External Clearance Dimensions: ....     | 6.7 x 3.95" x 1.5" PCB; four 3/16" dia mounting holes (see poicture)  |
| remote Diffusion Gas Cell: .....        | 2.05" x 2.0" x 4.5" on a 8±1 inch long cable with four 3/16" dia mounting holes   |
| .....                                   | Gas cell is 1.0" in diameter (with POREX outer cover)   |



## Model RI-221L 2000 ppm CO<sub>2</sub>

### VALTRONICS 2000 ppm & 10 volt full scale

| CO2<br>in ppm | Output ±5 % of reading |        |        | 4-20 mA ±5 % of reading |       |       |
|---------------|------------------------|--------|--------|-------------------------|-------|-------|
|               | in volts               | Max.   | Min.   | output                  | Max.  | Min.  |
| 0             | 0.000                  | 0.292  | -0.292 | 4.00                    | 4.40  | 3.60  |
| 50            | 0.310                  | 0.602  | 0.018  | 4.50                    | 4.90  | 4.10  |
| 100           | 0.630                  | 0.922  | 0.338  | 5.01                    | 5.41  | 4.61  |
| 150           | 0.940                  | 1.232  | 0.648  | 5.50                    | 5.90  | 5.10  |
| 200           | 1.260                  | 1.552  | 0.968  | 6.02                    | 6.42  | 5.62  |
| 250           | 1.570                  | 1.862  | 1.278  | 6.51                    | 6.91  | 6.11  |
| 300           | 1.880                  | 2.172  | 1.588  | 7.01                    | 7.41  | 6.61  |
| 350           | 2.190                  | 2.482  | 1.898  | 7.50                    | 7.90  | 7.10  |
| 400           | 2.500                  | 2.792  | 2.208  | 8.00                    | 8.40  | 7.60  |
| 450           | 2.810                  | 3.102  | 2.518  | 8.50                    | 8.90  | 8.10  |
| 500           | 3.120                  | 3.412  | 2.828  | 8.99                    | 9.39  | 8.59  |
| 550           | 3.430                  | 3.722  | 3.138  | 9.49                    | 9.89  | 9.09  |
| 600           | 3.730                  | 4.022  | 3.438  | 9.97                    | 10.37 | 9.57  |
| 650           | 4.020                  | 4.312  | 3.728  | 10.43                   | 10.83 | 10.03 |
| 700           | 4.300                  | 4.592  | 4.008  | 10.88                   | 11.28 | 10.48 |
| 750           | 4.570                  | 4.862  | 4.278  | 11.31                   | 11.71 | 10.91 |
| 800           | 4.840                  | 5.132  | 4.548  | 11.74                   | 12.14 | 11.34 |
| 850           | 5.100                  | 5.392  | 4.808  | 12.16                   | 12.56 | 11.76 |
| 900           | 5.350                  | 5.642  | 5.058  | 12.56                   | 12.96 | 12.16 |
| 950           | 5.590                  | 5.882  | 5.298  | 12.94                   | 13.34 | 12.54 |
| 1000          | 5.840                  | 6.132  | 5.548  | 13.34                   | 13.74 | 12.94 |
| 1050          | 6.080                  | 6.384  | 5.776  | 13.73                   | 14.21 | 13.24 |
| 1100          | 6.320                  | 6.636  | 6.004  | 14.11                   | 14.62 | 13.61 |
| 1150          | 6.570                  | 6.899  | 6.242  | 14.51                   | 15.04 | 13.99 |
| 1200          | 6.820                  | 7.161  | 6.479  | 14.91                   | 15.46 | 14.37 |
| 1250          | 7.060                  | 7.413  | 6.707  | 15.30                   | 15.86 | 14.73 |
| 1300          | 7.310                  | 7.676  | 6.945  | 15.70                   | 16.28 | 15.11 |
| 1350          | 7.550                  | 7.928  | 7.173  | 16.08                   | 16.68 | 15.48 |
| 1400          | 7.790                  | 8.180  | 7.401  | 16.46                   | 17.09 | 15.84 |
| 1450          | 8.010                  | 8.411  | 7.610  | 16.82                   | 17.46 | 16.18 |
| 1500          | 8.230                  | 8.642  | 7.819  | 17.17                   | 17.83 | 16.51 |
| 1550          | 8.430                  | 8.852  | 8.009  | 17.49                   | 18.16 | 16.81 |
| 1600          | 8.620                  | 9.051  | 8.189  | 17.79                   | 18.48 | 17.10 |
| 1650          | 8.800                  | 9.240  | 8.360  | 18.08                   | 18.78 | 17.38 |
| 1700          | 8.970                  | 9.419  | 8.522  | 18.35                   | 19.07 | 17.63 |
| 1750          | 9.150                  | 9.608  | 8.693  | 18.64                   | 19.37 | 17.91 |
| 1800          | 9.320                  | 9.786  | 8.854  | 18.91                   | 19.66 | 18.17 |
| 1850          | 9.500                  | 9.975  | 9.025  | 19.20                   | 19.96 | 18.44 |
| 1900          | 9.690                  | 10.175 | 9.206  | 19.50                   | 20.28 | 18.73 |
| 1950          | 9.860                  | 10.353 | 9.367  | 19.78                   | 20.56 | 18.99 |
| 2000          | 10.000                 | 10.500 | 9.500  | 20.00                   | 20.80 | 19.20 |

Data taken on 4-24-95

Accuracy = ±50 ppm form 0 to 1000 ppm and ±5% of reading above 1000 ppm



## Carbon Dioxide Monitor Model RI-221L 2000 ppm CO<sub>2</sub>

