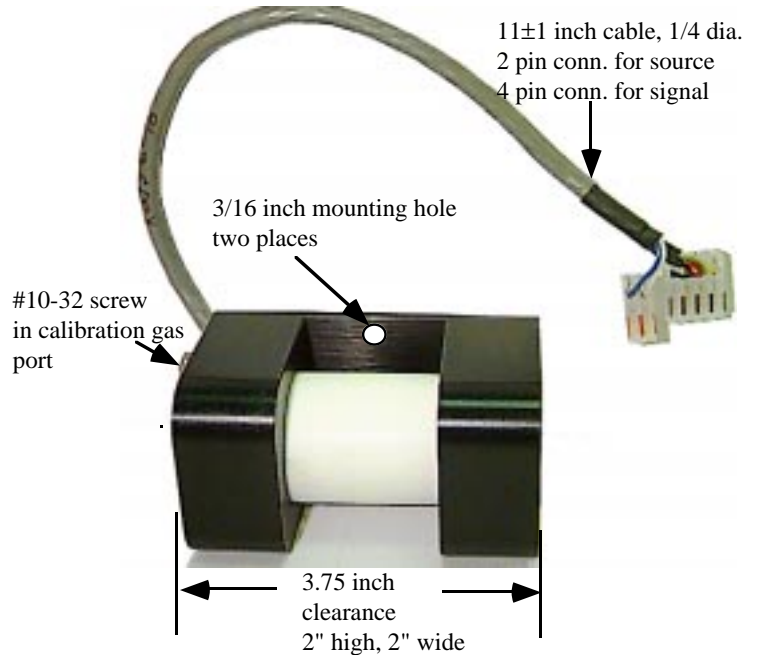
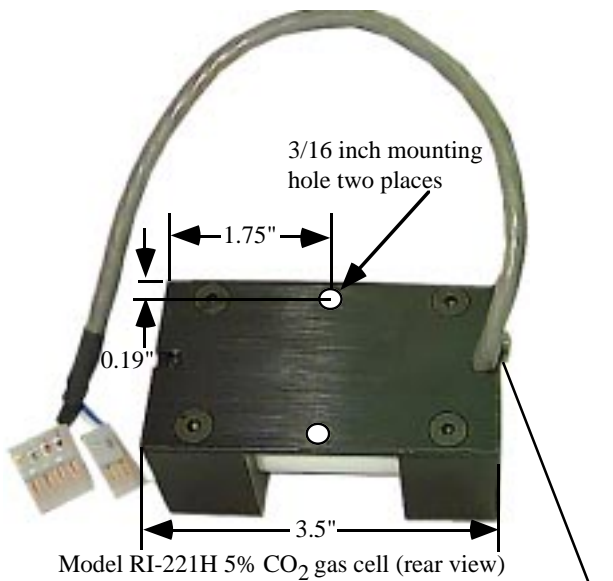
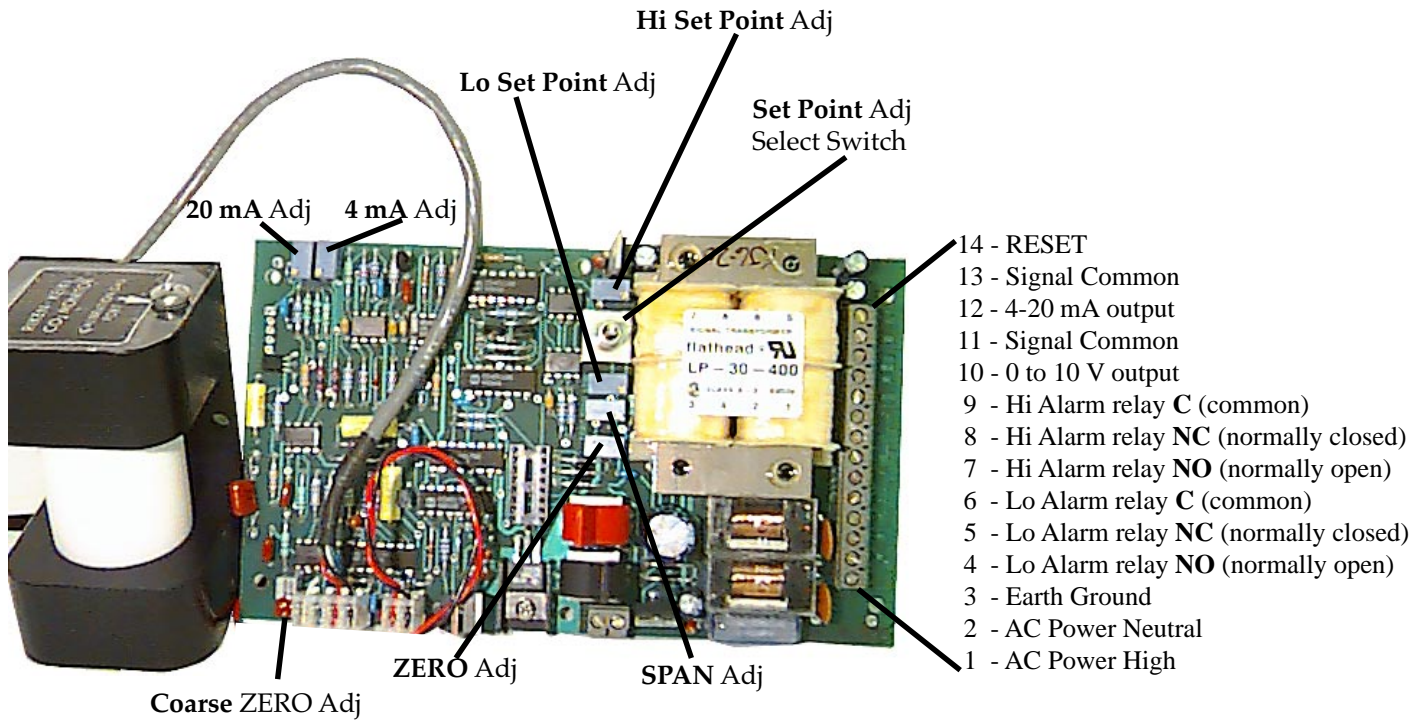




# Carbon Dioxide Monitor Model RI-221H 5% CO<sub>2</sub>



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



## Model RI-221H 5% CO<sub>2</sub>

---

### Description:

---

The Valtronics Model RI-221H 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 5% 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-221H 5% CO<sub>2</sub> Specifications:

---

Method: .....	N.D. I. R. (Non-dispersive Infra-red) gas diffusion sample cell Remote diffusion gas cell on a 11 inch long cable
Gas: .....	Carbon dioxide (CO <sub>2</sub> )
Range: .....	0-5% CO <sub>2</sub> by volume
Accuracy: .....	±0.125% CO <sub>2</sub> from 0 to mid scale (0-2.5% CO <sub>2</sub> ) ± 5% of reading from mid to full scale (2.5 to 5% 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 0.5% CO <sub>2</sub> to 5% 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 5% CO <sub>2</sub> ( non-linear scale data attached)
Current Loop: .....	4 to 20 mA = 0 to 5% CO <sub>2</sub> ( non-linear scale data attached)
Electronic Response Time: .....	8 seconds typical to a step change in gas concentration gas response depends on gas diffusion physics
Zero Noise at Constant Temperature: ..	Less than 0.1 volt peak to peak measured on voltage output (measured during any 20 second period) see page 4 on how to avoid GROUND LOOPS & EMI
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 <b>Application Note A30</b>
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 11±1inch long 1/4" dia cable with four 3/16" dia mounting holes
.....	Gas cell is 1.0" in diameter (with POREX outer cover)



# Model RI-221H 5% CO<sub>2</sub>

5% & 10 volt full scale - nonlinear

Gas in %	Output in volts	±5% of Reading		4-20 mA out in milliamps	±5% of Reading		4-20 mA across 250Ω in volts
		Min.	Max		Min.	Max	
0.00	0.000	-0.326	0.326	4.00	3.60	4.40	1.00
0.10	0.510	0.184	0.836	4.82	4.42	5.22	1.20
0.20	0.970	0.644	1.296	5.55	5.15	5.95	1.39
0.30	1.380	1.054	1.706	6.21	5.81	6.61	1.55
0.40	1.760	1.434	2.086	6.82	6.42	7.22	1.70
0.50	2.110	1.784	2.436	7.38	6.98	7.78	1.84
0.60	2.430	2.104	2.756	7.89	7.49	8.29	1.97
0.70	2.730	2.404	3.056	8.37	7.97	8.77	2.09
0.80	3.010	2.684	3.336	8.82	8.42	9.22	2.20
0.90	3.270	2.944	3.596	9.23	8.83	9.63	2.31
1.00	3.520	3.194	3.846	9.63	9.23	10.03	2.41
1.10	3.760	3.434	4.086	10.02	9.62	10.42	2.50
1.20	3.990	3.664	4.316	10.38	9.98	10.78	2.60
1.30	4.210	3.884	4.536	10.74	10.34	11.14	2.68
1.40	4.420	4.094	4.746	11.07	10.67	11.47	2.77
1.50	4.630	4.304	4.956	11.41	11.01	11.81	2.85
1.60	4.830	4.504	5.156	11.73	11.33	12.13	2.93
1.70	5.030	4.704	5.356	12.05	11.65	12.45	3.01
1.80	5.230	4.904	5.556	12.37	11.97	12.77	3.09
1.90	5.420	5.094	5.746	12.67	12.27	13.07	3.17
2.00	5.610	5.284	5.936	12.98	12.58	13.38	3.24
2.10	5.800	5.474	6.126	13.28	12.88	13.68	3.32
2.20	5.980	5.654	6.306	13.57	13.17	13.97	3.39
2.30	6.160	5.834	6.486	13.86	13.46	14.26	3.46
2.40	6.340	6.014	6.666	14.14	13.74	14.54	3.54
2.50	6.510	6.184	6.836	14.42	14.02	14.82	3.60
2.60	6.680	6.346	7.014	14.69	14.15	15.22	3.67
2.70	6.850	6.508	7.193	14.96	14.41	15.51	3.74
2.80	7.020	6.669	7.371	15.23	14.67	15.79	3.81
2.90	7.180	6.821	7.539	15.49	14.91	16.06	3.87
3.00	7.340	6.973	7.707	15.74	15.16	16.33	3.94
3.10	7.500	7.125	7.875	16.00	15.40	16.60	4.00
3.20	7.650	7.268	8.033	16.24	15.63	16.85	4.06
3.30	7.800	7.410	8.190	16.48	15.86	17.10	4.12
3.40	7.950	7.553	8.348	16.72	16.08	17.36	4.18
3.50	8.100	7.695	8.505	16.96	16.31	17.61	4.24
3.60	8.240	7.828	8.652	17.18	16.52	17.84	4.30
3.70	8.380	7.961	8.799	17.41	16.74	18.08	4.35
3.80	8.520	8.094	8.946	17.63	16.95	18.31	4.41
3.90	8.660	8.227	9.093	17.86	17.16	18.55	4.46
4.00	8.790	8.351	9.230	18.06	17.36	18.77	4.52
4.10	8.920	8.474	9.366	18.27	17.56	18.99	4.57
4.20	9.050	8.598	9.503	18.48	17.76	19.20	4.62
4.30	9.170	8.712	9.629	18.67	17.94	19.41	4.67
4.40	9.290	8.826	9.755	18.86	18.12	19.61	4.72
4.50	9.410	8.940	9.881	19.06	18.30	19.81	4.76
4.60	9.530	9.054	10.007	19.25	18.49	20.01	4.81
4.70	9.640	9.158	10.122	19.42	18.65	20.20	4.86
4.80	9.760	9.272	10.248	19.62	18.84	20.40	4.90
4.90	9.880	9.386	10.374	19.81	19.02	20.60	4.95
5.00	10.000	9.500	10.500	20.00	19.20	20.80	5.00

Accuracy = ± 5% of reading from 2.5% CO<sub>2</sub> to 5% CO<sub>2</sub> and ±0.125% CO<sub>2</sub> from 0 to 2.5%  
 Chart revised on 11-7-95