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Find the *VTI Valtronics 2166* at our website: ***Click HERE***

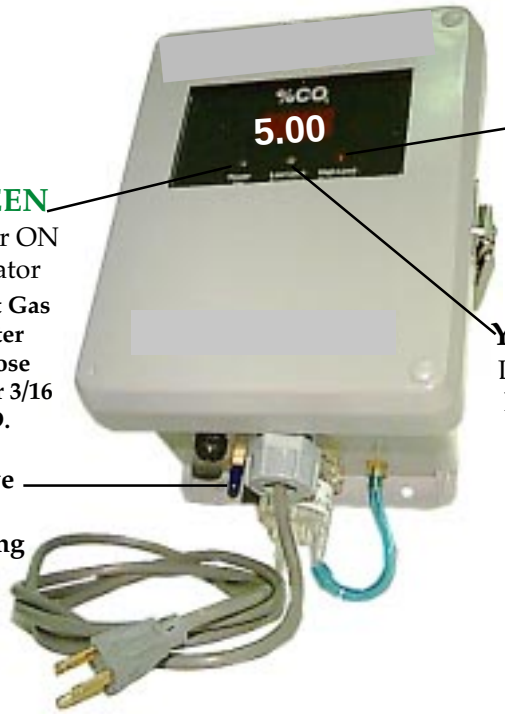
VALTRONICS

Carbon Dioxide Monitor
Model 2166 5% CO_2

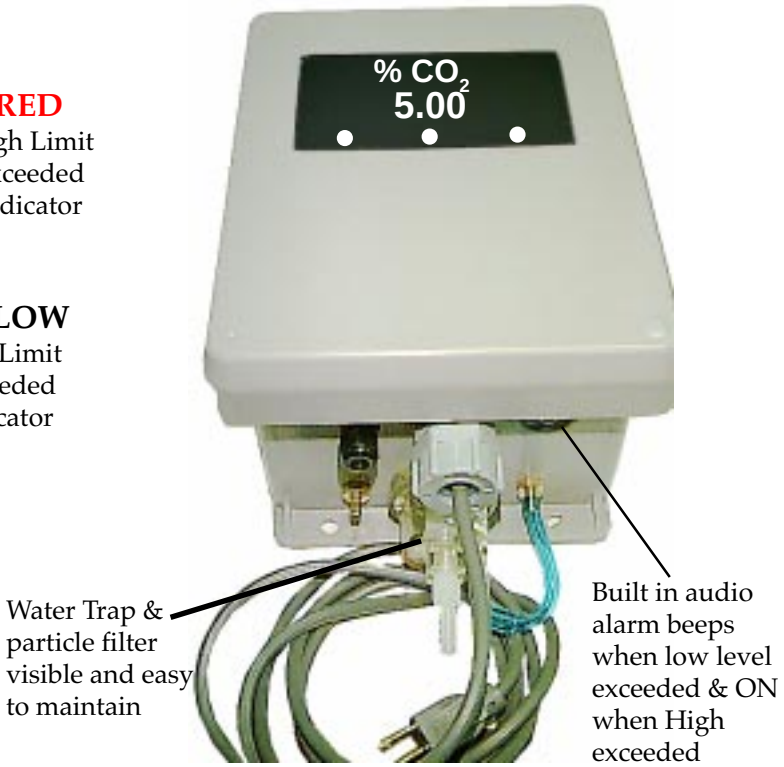
Features:

- Complete self contained units
- Non dispersive infrared (NDIR) technology
- Precision gas calibration kit available
- Fast warm-up
- **Linear 0-5 V** and **4-20 mA** outputs
- Dual level detect set points and relays
- **Green Power** Indicator
- 115/230 volt, 50/60 Hz Operation
- Cost effective - High quality
- Sample draw system with pump switch for calib.
- Solid state throughout - linear outputs
- Humidity and moisture resistant - Water Trap
- Dust-tight water resistant fiberglass enclosure
- Digital readout with 0.56 inch red LED display
- **Yellow** and **Red** Limit Exceeded **Indicators**
- Audible Alarm with switch to diasble

Model 2166 5% CO_2



Overall Clearance: 5 x 7.5 x 13 inches



Fresh air is about **0.04**% or **400** ppm CO_2

Application:

- Industrial Safety
- Process Control
- Wineries
- Breweries
- Food Processing
- with CO_2 Blasters

The VALTRONICS Model 2166 is a non-dispersive infrared (NDIR) carbon dioxide monitor for use as an outdoor air sensor. It produces a control signal proportional to carbon dioxide concentration. This control signal is then used to provide remote control of the outdoor air dampers; thereby controlling the fresh air intake or varying the ventilation rates while maintaining safe indoor air quality. Dual adjustable level detect circuits may be used for alarms.

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VALTRONICS

Carbon Dioxide Monitor
Model 2166 5% CO_2

Description:

The Model 2166 is a non dispersive infrared gas monitor designed as a fully functioning stand-alone unit for the continuous monitoring of carbon dioxide. The optical system is not effected by humidity. The pumped gas sampling circuit has a self-draining water trap. This eliminates difficulties with water condensation in the sample lines. It has a 0.56 inch high digital readout and two adjustable level detect circuits with associated front panel indicators (yellow and red) and SPDT relay contacts.

This low power, water resistant system makes this an ideal remote sensor to interface with any central control unit. It has linear 0 to 5 volt and 4 to 20 mA current loop outputs. In either configuration, interfaced or stand-alone, this device is an excellent choice for any environment in which the level of carbon dioxide must be monitored or controlled.

Specifications: 2166 5% CO_2

Method: ..... N.D. I. R. (Non-dispersive Infra-red) Gas sample pump (see **app note A67**)
Gas: ..... Carbon dioxide (CO_2)
Range: ..... 0-50,000 ppm (**5.0%**) CO_2
Accuracy: ..... ±0.13% CO_2 from 0 -2.5% CO_2 and ± 5% of reading from 2.5% to 5% CO_2
Repeatability: ..... ± 1% of full scale (challenge with same gas sample and assure zero)
External Power Source: ..... 115/220 VAC , 50/60 Hz
Power Consumption: ..... less than 8 watts @ 115 VAC
Adjustable Set Points: ..... Dual set points adjustable from 0.5% CO_2 to full scale (audio alarms below)
..... Low SET Point adjusted to 1.0% and High SET Point to 3.0% unless specified on PO
SET POINT Relay Contact Rating: ... SPDT contacts: non-latching N.C., N.O. 3 amp max. at 250 VAC or 30 VDC
Display: ..... 0.56 inch high digital Light Emitting Diode (LED) readout
Output Signals:
- Voltage: ..... 0 to 5 volt = 0 to 5% CO_2 (**linear** scale data attached)
- Current Loop: ..... 4 to 20 mA = 0 to 5% CO_2 (**linear** scale data attached) 0 to 550Ω load
- Audio Alarms: ..... Beeps once a second when Low SET Point is exceeded, continuous when High exceeded
- Set Point Indicators: ..... Yellow flashes when Low SET Point is exceeded, RED on continuous when High exceeded

Zero Drift at Constant Temperature: ..... Less than 2% of full scale per month (random not cumulative)
Zero Noise atConstant Temperature: ..... Less than 50 mV peak to peak measured during any 20 second period
..... measured on voltage output (equals less than 1% of full scale)
Zero Drift due toAmbient Temperature: Less than 0.5% of full scale per degree Centigrade
Operating Temperature Range: .. 0 to 50°C (32° to 122°F) see **Application Note A12**
Storage Temperature Range: ..... -40 to +70°C (-40 to +158°F)
Operating Humidity Range: ..... 5 to 95% RH (non-condensing) in gas cell
Weight: ..... Less than 6 pounds (< 2.72 kilograms)
External Clearance Dimensions: . 5 inches high, 7.5 inches wide, 13 inches long (including 3.5" water trap)
Mounting, four 0.312 inch dia holes ... Mounting centers 4.0 inch x 8.75 inch: see diagram

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VALTRONICS

Terminal block TB1 has a linear 0 to 5 volt output signal on pin number 9 with respect to pin number 8 which is signal common. Pin number 7 has a linear 4 to 20 mA current loop signal referenced again to pin number 8. See the wiring diagram on page 4.

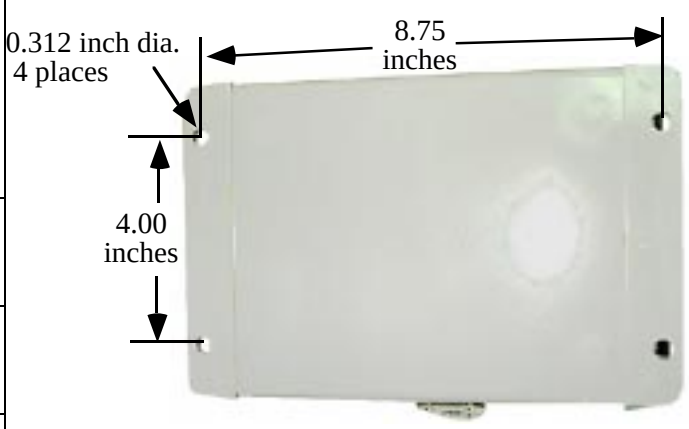
The table below shows both the linear 0 to 5 volt and the 4 to 20 mA current loop responses to 0 to 5% carbon dioxide being drawn through the gas cell by the sample pump. The wires from TB1 go through the strain relief cable grommet shown on page 4. The resulting wire bundle must be between 0.090 and 0.25 inch diameter to be properly stain reliefed.

VALTRONICS 5% Gas & 5 volt full scale

Gas in %	Output in volts	±5% of Reading Max.	±5% of Reading Min.	4-20 mA output	±5% of Reading Max.	±5% of Reading Min.	4-20 mA across 500Ω in volts
0.00	0.0	0.13	-0.13	4.00	4.40	3.60	2.00
0.10	0.1	0.23	-0.03	4.32	4.72	3.92	2.16
0.20	0.2	0.33	0.08	4.64	5.04	4.24	2.32
0.30	0.3	0.43	0.18	4.96	5.36	4.56	2.48
0.40	0.4	0.53	0.28	5.28	5.68	4.88	2.64
0.50	0.5	0.63	0.38	5.60	6.00	5.20	2.80
0.60	0.6	0.73	0.48	5.92	6.32	5.52	2.96
0.70	0.7	0.83	0.58	6.24	6.64	5.84	3.12
0.80	0.8	0.93	0.68	6.56	6.96	6.16	3.28
0.90	0.9	1.03	0.78	6.88	7.28	6.48	3.44
1.00	1.0	1.13	0.88	7.20	7.60	6.80	3.60
1.10	1.1	1.23	0.98	7.52	7.92	7.12	3.76
1.20	1.2	1.33	1.08	7.84	8.24	7.44	3.92
1.30	1.3	1.43	1.18	8.16	8.56	7.76	4.08
1.40	1.4	1.53	1.28	8.48	8.88	8.08	4.24
1.50	1.5	1.63	1.38	8.80	9.20	8.40	4.40
1.60	1.6	1.73	1.48	9.12	9.52	8.72	4.56
1.70	1.7	1.83	1.58	9.44	9.84	9.04	4.72
1.80	1.8	1.93	1.68	9.76	10.16	9.36	4.88
1.90	1.9	2.03	1.78	10.08	10.48	9.68	5.04
2.00	2.0	2.13	1.88	10.40	10.80	10.00	5.20
2.10	2.1	2.23	1.98	10.72	11.12	10.32	5.36
2.20	2.2	2.33	2.08	11.04	11.44	10.64	5.52
2.30	2.3	2.43	2.18	11.36	11.76	10.96	5.68
2.40	2.4	2.53	2.28	11.68	12.08	11.28	5.84
2.50	2.5	2.63	2.38	12.00	12.40	11.60	6.00
2.60	2.6	2.73	2.47	12.32	12.74	11.90	6.16
2.70	2.7	2.84	2.57	12.64	13.07	12.21	6.32
2.80	2.8	2.94	2.66	12.96	13.41	12.51	6.48
2.90	2.9	3.05	2.76	13.28	13.74	12.82	6.64
3.00	3.0	3.15	2.85	13.60	14.08	13.12	6.80
3.10	3.1	3.26	2.95	13.92	14.42	13.42	6.96
3.20	3.2	3.36	3.04	14.24	14.75	13.73	7.12
3.30	3.3	3.47	3.14	14.56	15.09	14.03	7.28
3.40	3.4	3.57	3.23	14.88	15.42	14.34	7.44
3.50	3.5	3.68	3.33	15.20	15.76	14.64	7.60
3.60	3.6	3.78	3.42	15.52	16.10	14.94	7.76
3.70	3.7	3.89	3.52	15.84	16.43	15.25	7.92
3.80	3.8	3.99	3.61	16.16	16.77	15.55	8.08
3.90	3.9	4.10	3.71	16.48	17.10	15.86	8.24
4.00	4.0	4.20	3.80	16.80	17.44	16.16	8.40
4.10	4.1	4.31	3.90	17.12	17.78	16.46	8.56
4.20	4.2	4.41	3.99	17.44	18.11	16.77	8.72
4.30	4.3	4.52	4.09	17.76	18.45	17.07	8.88
4.40	4.4	4.62	4.18	18.08	18.78	17.38	9.04
4.50	4.5	4.73	4.28	18.40	19.12	17.68	9.20
4.60	4.6	4.83	4.37	18.72	19.46	17.98	9.36
4.70	4.7	4.94	4.47	19.04	19.79	18.29	9.52
4.80	4.8	5.04	4.56	19.36	20.13	18.59	9.68
4.90	4.9	5.15	4.66	19.68	20.46	18.90	9.84
5.00	5.0	5.25	4.75	20.00	20.80	19.20	10.00

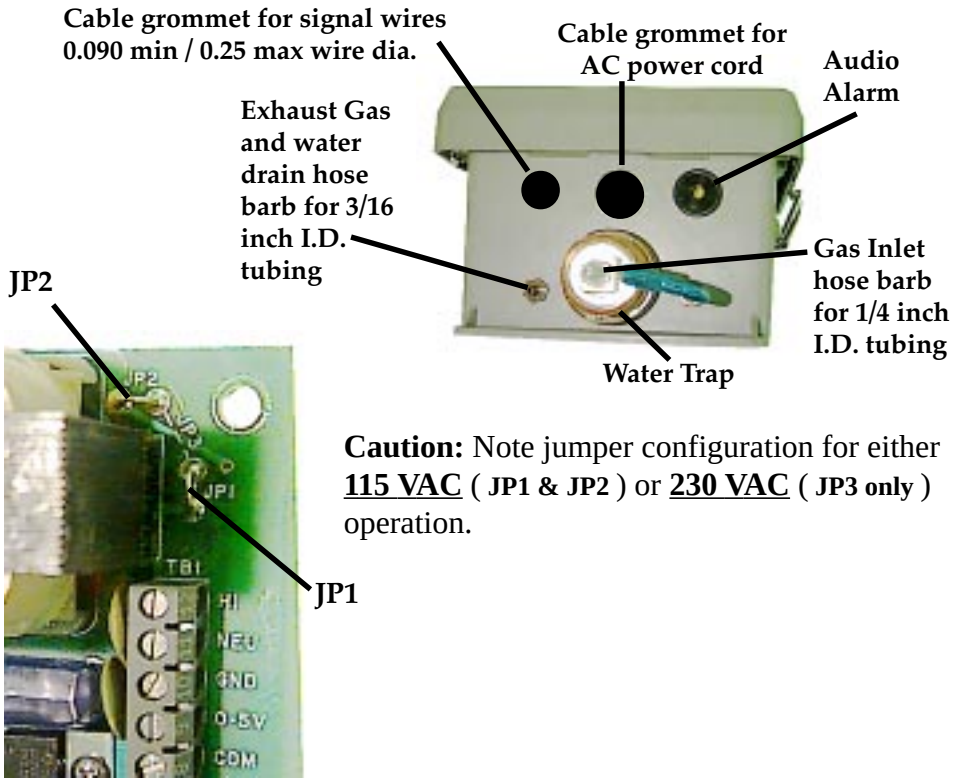
Accuracy = ± 0.13 % CO2 from 0.0% CO2 to 2.5% CO2
Accuracy = ±5% of reading from 2.5% CO2 to 5.0% CO2
Chart revised on 10-8-97

Rear view:
Mounting



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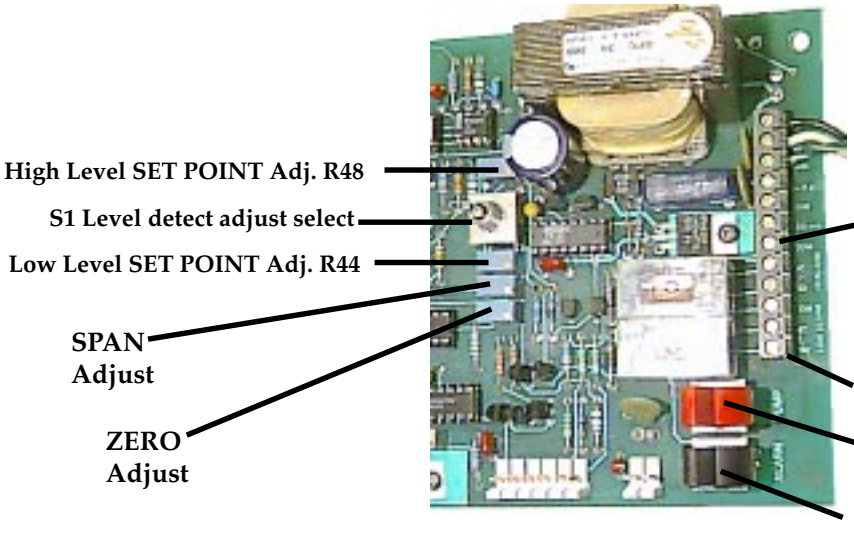
Caution: Note jumper configuration for either **115 VAC** (**JP1 & JP2**) or **230 VAC** (**JP3 only**) operation.

Preventive Maintenance:

Gas calibration should be done every six months. At least calibration with zero gas (nitrogen or fresh air) every six months and both zero and span (certified **1**% or **2**% CO_2) at least once a year. A calibration log book where you record how much ZERO and SPAN had drifted before it was recalibrated will help you decide what the optimum duration between calibrations should be.

See **Application Note A24** & **A73** for detailed calibration instructions. The **pump switch** should be **turned off** during gas calibration and the flow rate set to about 1 to 2 LPM if into the water trap but only about 0.5 LPM if directly into the hydrophobic filter (see **App Note A73**). The filter in the water trap and the hydrophobic / particle filter inside should inspected and changed when necessary.

The flow rate of the pump should be checked to see if it is still operating properly. It should be about 3 to 5 liters per minute if measured at the water trap input, Gas Inlet (both sides of the pump drawing). See **Application Note A67** for spare parts information. See **Application Note A46** for detailed info on PC board.



Terminal Block TB1

12. AC power High
11. AC power neutral
10. Earth Ground
9. **0 to 5** volt **signal out**
8. Signal **common**
7. 4-20 mA current loop out
6. High Alarm Common (relay contact)
5. High Alarm N.C. (relay contact)
4. High Alarm N.O. (relay contact)
3. Low Alarm Common (relay contact)
2. Low Alarm N.C. (relay contact)
1. Low Alarm N.O. (relay contact)

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