



Model 2008SDH 5% CO₂ 2008SDH-P 5%

(low profile terminal block and 90° hose barbs on gas cell option)

Specification: 2008SDH 5% CO₂

Method: N.D. I. R. (Non-dispersive Infra-red) Sample draw type gas sampling
(see VTI **Application Note A7** - Recommended Gas Conditioning)

Gas sample hose barbs: Designed for 1/8 inch I.D. tubing and **flow rates** between 0.05 and 0.3 liter/minute
see Application Note A24 about gas calibration.

Gas: Carbon Dioxide (CO₂)

Range: 0-5.0% CO₂

Accuracy: ± 5% of reading (±0.125% CO₂ from 0 to 2.5% CO₂) - see scale data

Repeatability: ± 1% of full scale (challenge with same gas sample and assure zero)

External Power Source: 12 Volts D.C. @ 0.6 amp. max.(11.0 to 16.0 VDC absolute min./max.)

Power Consumption: less than 3 watts @ 12.0 VDC (2.4 watts typical, 7.2 watts peak at 12.0 V)

Output Signals: Std. output connector is a Phoenix 5 pin male with mating terminal block, see option below

Voltage: 0 to 1 volt = 0 to 5% CO₂ (linear scale data attached)

Current Loop: 4 to 20 mA = 0 to 5% CO₂ (linear scale data attached) 300Ω max loop R

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 on V out during any 20 second period

Zero Drift due to Ambient Temp.: 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)

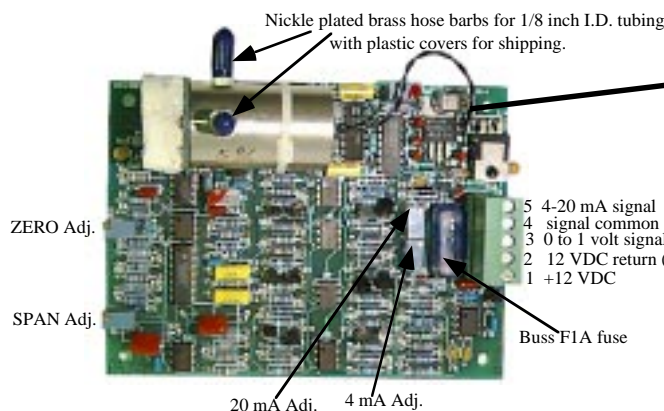
Operating Humidity Range: 5 to 95% RH non-condensing See **Application Note A30**

Weight: Less than 0.5 pounds (0.23 kilograms)

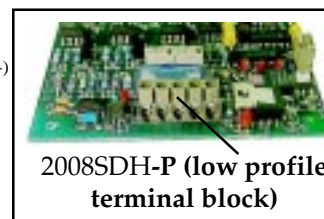
External Dimensions: PCB Card: 3.9" x 5" x 1.5" dimensions are in inches
..... see diagram on page 2 for mounting



Gas calibration should be done every 6 months. Flow nitrogen at about 0.3 to 1 liter/min through the cell and adjust ZERO for a 0-1 volt output of 0.00 volt Check the 4-20 mA output for 4.0±0.4 mA. Adjust 4mA if necessary. Flow 2.0±0.04% CO₂ through cell and adjust SPAN for 0.40 volt and check current loop for an output of 10.4±0.4 mA. Adjust 20 mA if necessary.



IR Source (emitter) leads. With power off an ohmmeter should read about 3 to 4 ohms cold.



Note: Flow rate through the gas cell should not exceed 1 liter per minute to assure that the gas cell is not pressurized. A pressure in the gas cell above atmospheric pressure will result in a SPAN error (gas law). Gas calibration should be done every 6 months, especially ZERO adjust using ZERO gas (nitrogen) flowing at about 500 mL/min. flow rate for a 0-1 volt output of 0.000 ± 0.005 volt. See **Application Note A7** for info about gas conditioning and parts for filtering the gas and preventing water droplets from entering the gas cell. See **Application Note A50** for PC board troubleshooting.

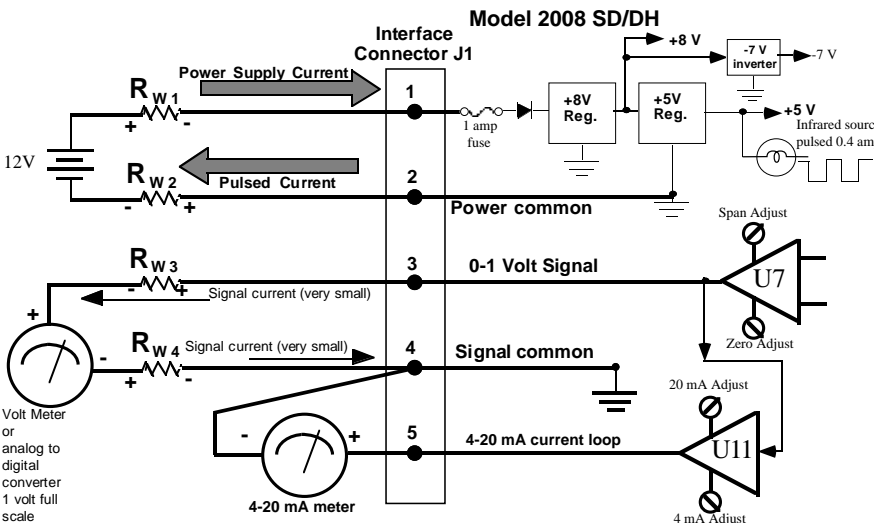


Adjustable 90° hose barb option on gas cell for lower profile

VALTRONICS 5% Gas & 1 volt full scale

| Gas in % | Output in volts | ±5% of Reading | | 4-20 mA output | ±5% of Reading | | 4-20 mA across 250Ω in volts |
|----------|-----------------|----------------|--------|----------------|----------------|-------|------------------------------|
| | | Max. | Min. | | Max. | Min. | |
| 0.00 | 0.000 | 0.025 | -0.025 | 4.00 | 4.40 | 3.60 | 1.00 |
| 0.10 | 0.020 | 0.045 | -0.005 | 4.32 | 4.72 | 3.92 | 1.08 |
| 0.20 | 0.040 | 0.065 | 0.015 | 4.64 | 5.04 | 4.24 | 1.16 |
| 0.30 | 0.060 | 0.085 | 0.035 | 4.96 | 5.36 | 4.56 | 1.24 |
| 0.40 | 0.080 | 0.105 | 0.055 | 5.28 | 5.68 | 4.88 | 1.32 |
| 0.50 | 0.100 | 0.125 | 0.075 | 5.60 | 6.00 | 5.20 | 1.40 |
| 0.60 | 0.120 | 0.145 | 0.095 | 5.92 | 6.32 | 5.52 | 1.48 |
| 0.70 | 0.140 | 0.165 | 0.115 | 6.24 | 6.64 | 5.84 | 1.56 |
| 0.80 | 0.160 | 0.185 | 0.135 | 6.56 | 6.96 | 6.16 | 1.64 |
| 0.90 | 0.180 | 0.205 | 0.155 | 6.88 | 7.28 | 6.48 | 1.72 |
| 1.00 | 0.200 | 0.225 | 0.175 | 7.20 | 7.60 | 6.80 | 1.80 |
| 1.10 | 0.220 | 0.245 | 0.195 | 7.52 | 7.92 | 7.12 | 1.88 |
| 1.20 | 0.240 | 0.265 | 0.215 | 7.84 | 8.24 | 7.44 | 1.96 |
| 1.30 | 0.260 | 0.285 | 0.235 | 8.16 | 8.56 | 7.76 | 2.04 |
| 1.40 | 0.280 | 0.305 | 0.255 | 8.48 | 8.88 | 8.08 | 2.12 |
| 1.50 | 0.300 | 0.325 | 0.275 | 8.80 | 9.20 | 8.40 | 2.20 |
| 1.60 | 0.320 | 0.345 | 0.295 | 9.12 | 9.52 | 8.72 | 2.28 |
| 1.70 | 0.340 | 0.365 | 0.315 | 9.44 | 9.84 | 9.04 | 2.36 |
| 1.80 | 0.360 | 0.385 | 0.335 | 9.76 | 10.16 | 9.36 | 2.44 |
| 1.90 | 0.380 | 0.405 | 0.355 | 10.08 | 10.48 | 9.68 | 2.52 |
| 2.00 | 0.400 | 0.425 | 0.375 | 10.40 | 10.80 | 10.00 | 2.60 |
| 2.10 | 0.420 | 0.445 | 0.395 | 10.72 | 11.12 | 10.32 | 2.68 |
| 2.20 | 0.440 | 0.465 | 0.415 | 11.04 | 11.44 | 10.64 | 2.76 |
| 2.30 | 0.460 | 0.485 | 0.435 | 11.36 | 11.76 | 10.96 | 2.84 |
| 2.40 | 0.480 | 0.505 | 0.455 | 11.68 | 12.08 | 11.28 | 2.92 |
| 2.50 | 0.500 | 0.525 | 0.475 | 12.00 | 12.40 | 11.60 | 3.00 |
| 2.60 | 0.520 | 0.546 | 0.494 | 12.32 | 12.74 | 11.90 | 3.08 |
| 2.70 | 0.540 | 0.567 | 0.513 | 12.64 | 13.07 | 12.21 | 3.16 |
| 2.80 | 0.560 | 0.588 | 0.532 | 12.96 | 13.41 | 12.51 | 3.24 |
| 2.90 | 0.580 | 0.609 | 0.551 | 13.28 | 13.74 | 12.82 | 3.32 |
| 3.00 | 0.600 | 0.630 | 0.570 | 13.60 | 14.08 | 13.12 | 3.40 |
| 3.10 | 0.620 | 0.651 | 0.589 | 13.92 | 14.42 | 13.42 | 3.48 |
| 3.20 | 0.640 | 0.672 | 0.608 | 14.24 | 14.75 | 13.73 | 3.56 |
| 3.30 | 0.660 | 0.693 | 0.627 | 14.56 | 15.09 | 14.03 | 3.64 |
| 3.40 | 0.680 | 0.714 | 0.646 | 14.88 | 15.42 | 14.34 | 3.72 |
| 3.50 | 0.700 | 0.735 | 0.665 | 15.20 | 15.76 | 14.64 | 3.80 |
| 3.60 | 0.720 | 0.756 | 0.684 | 15.52 | 16.10 | 14.94 | 3.88 |
| 3.70 | 0.740 | 0.777 | 0.703 | 15.84 | 16.43 | 15.25 | 3.96 |
| 3.80 | 0.760 | 0.798 | 0.722 | 16.16 | 16.77 | 15.55 | 4.04 |
| 3.90 | 0.780 | 0.819 | 0.741 | 16.48 | 17.10 | 15.86 | 4.12 |
| 4.00 | 0.800 | 0.840 | 0.760 | 16.80 | 17.44 | 16.16 | 4.20 |
| 4.10 | 0.820 | 0.861 | 0.779 | 17.12 | 17.78 | 16.46 | 4.28 |
| 4.20 | 0.840 | 0.882 | 0.798 | 17.44 | 18.11 | 16.77 | 4.36 |
| 4.30 | 0.860 | 0.903 | 0.817 | 17.76 | 18.45 | 17.07 | 4.44 |
| 4.40 | 0.880 | 0.924 | 0.836 | 18.08 | 18.78 | 17.38 | 4.52 |
| 4.50 | 0.900 | 0.945 | 0.855 | 18.40 | 19.12 | 17.68 | 4.60 |
| 4.60 | 0.920 | 0.966 | 0.874 | 18.72 | 19.46 | 17.98 | 4.68 |
| 4.70 | 0.940 | 0.987 | 0.893 | 19.04 | 19.79 | 18.29 | 4.76 |
| 4.80 | 0.960 | 1.008 | 0.912 | 19.36 | 20.13 | 18.59 | 4.84 |
| 4.90 | 0.980 | 1.029 | 0.931 | 19.68 | 20.46 | 18.90 | 4.92 |
| 5.00 | 1.000 | 1.050 | 0.950 | 20.00 | 20.80 | 19.20 | 5.00 |

Accuracy = ± 0.125 % CO2 from 0.0% CO2 to 2.5% CO2
 Accuracy = ±5% of reading from 2.5% CO2 to 5.0% CO2
 Chart revised on 1-5-95



• The pulsating power supply return current will take the path of least resistance. If the wire from pin# 2 is large and short it will travel through it and not in the signal path which would introduce an offset and noise. The SIGNAL COMMON must have a separate wire for signal current to flow through. There must be a minimum of four (4) wires. A three (3) wire connection where one wire is used for both power supply and signal common will **not work** even with the current loop.

