

Chloro-Fluro-Carbon CFC Monitor

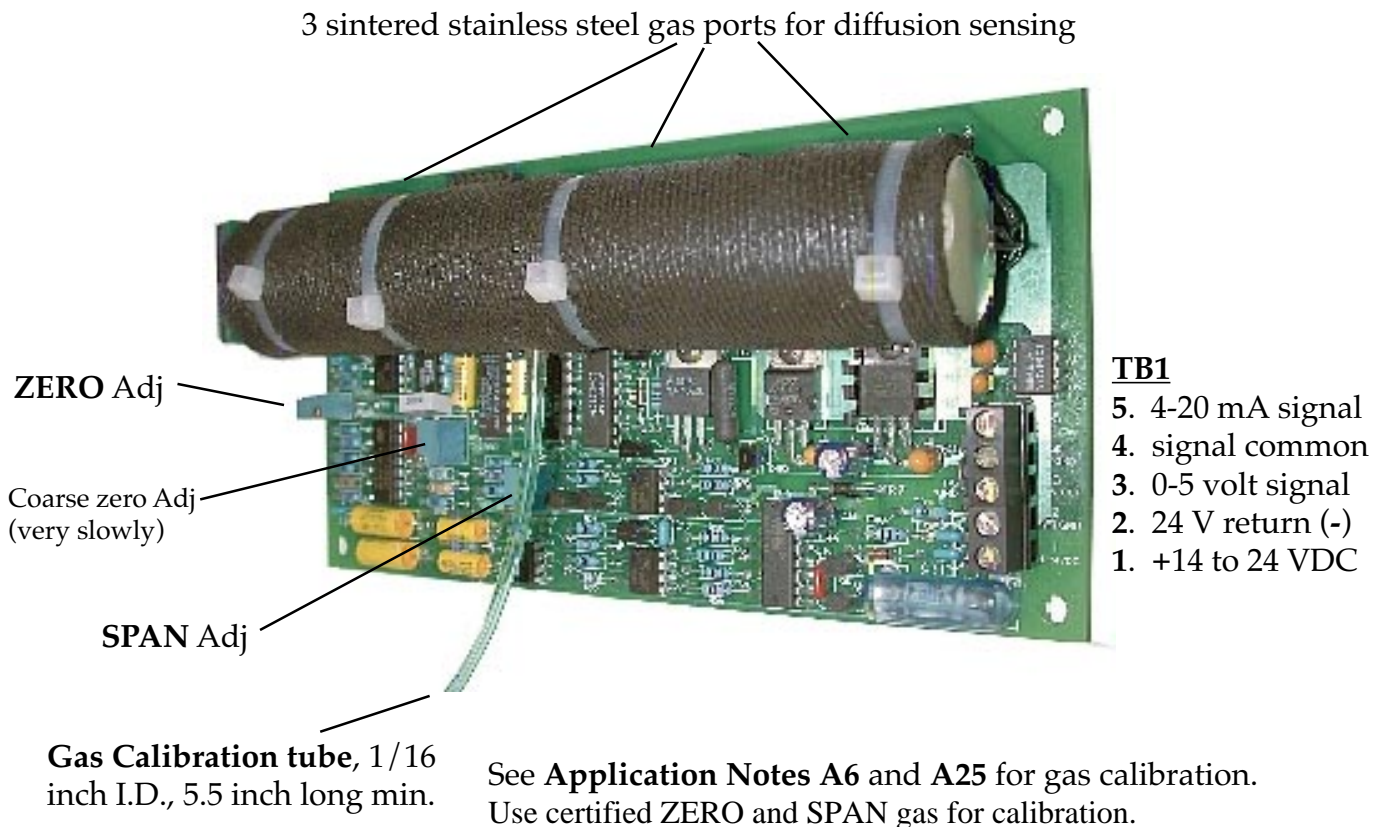
Model 2024DH 3000 ppm Refrigerant

Features:

- OEM optical bench
- Non dispersive infrared (**NDIR**) technology
- Precision gas calibration kit available
- Fast warm-up
- Industrially robust
- 14 to 24 VDC input power
- Cost effective - High quality
- Diffusion Gas Cell - no moving parts
- Solid state throughout
- Not affected by water vapor
- Linear 0-5V & 4-20 mA current loop outputs

Model 2024DH 0-3000 ppm Refrigerant

The board is 6.75" long X 3.5" wide X 1.6" high clearance. It has four (4) 0.194 diameter mounting holes that are on 6.35" x 3.1" centers in the four corners of the board.



Application:

- Industrial Safety:

The **VALTRONICS** Model 2024 is a non-dispersive infrared CFC monitor for use as an OEM module. It produces a control signal proportional to CFC concentration. See Application Note A6 for details.

CFC Monitor

Model 2024DH 3000 ppm Refrigerant

Description:

The **VALTRONICS** Model 2024 is a non-dispersive infrared CFC monitor for use as an OEM module. It produces a control signal proportional to CFC concentration. See Application Note A6 for detailed explanation of the relative response (chart shown on page 3) to other refrigerant compounds.

The linear signal outputs of 0-5 VDC and 4-20 mA current loop may be used with any central control alarm of air monitoring system.

Specifications: 2024DH 0-3000 ppm Refrigerant

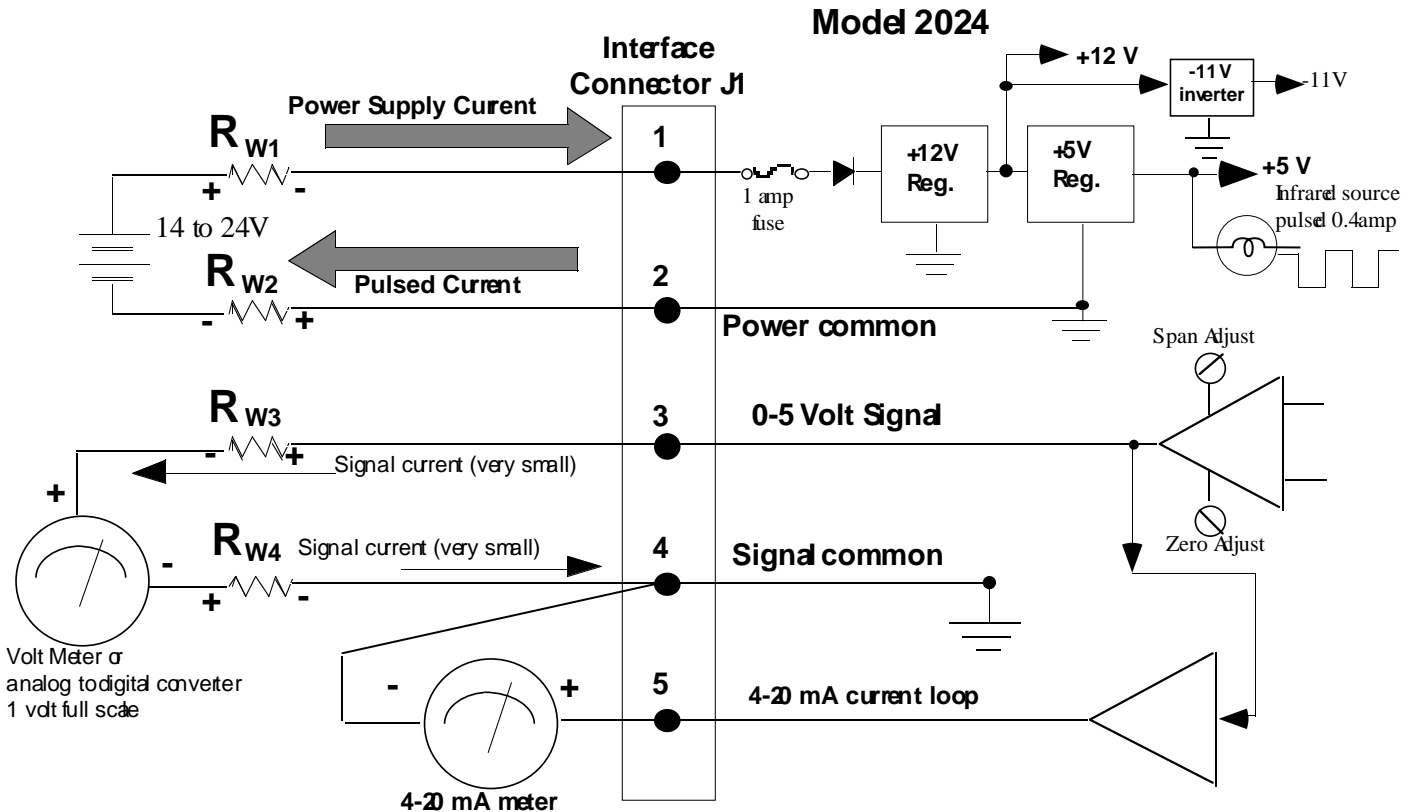
Method: N.D. I. R. (Non-dispersive Infra-red) Gas Diffusion type gas sampling
Gas: **Refrigerant**
Range: 0-3000 ppm Refrigerant (see relative response chart and Application Note A6)
Accuracy: $\pm 5\%$ of reading from 1500 to 3000 ppm Refrigerant
..... ± 75 ppm Refrigerant from 0 to 1500 ppm Refrigerant
Repeatability: $\pm 1\%$ of full scale (challenge with same gas sample and assure zero)
External Power Source: 14.0 to 24.0 VDC absolute min./max.
Power Consumption: Less than 3 watts @ 15 VDC
Output Signals:
Voltage: 0 to 5 volt = 0 to 3000ppm Refrigerant (linear scale data attached)
Current Loop: 4 to 20 mA = 0 to 3000ppm Refrig (linear scale data attached)
Zero Drift at constant Temperature: . 2% of full scale per 24 hours maximum (random not cumulative)
Zero Noise at constant Temperature: Less than 50 mV peak to peak measured during any 20 second period
..... measured on the 0-5 V signal output terminal with respect to signal common
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)
Operating Humidity Range: 0 to 95% RH non-condensing
Storage Temperature range: -40 to +70°C (-40 to +158°F)
Weight: Less than 0.5 pound
External Dimensions: 6.75 inches x 3.5 inches x 1.6 inches (5.5 inch long gas calibration tube)

VALTRONICS 3000 ppm & 5 volt full scale

Gas in ppm	Output in volts	±5% of Reading		4-20 mA output	±5% of Reading		Gas in ppm	Output in volts	±5% of Reading		4-20 mA output	±5% of Reading	
		Max.	Min.		Max.	Min.			Max.	Min.		Max.	Min.
0	0.000	0.125	-0.125	4.00	4.40	3.60	1550	2.583	2.708	2.458	12.27	12.67	11.87
50	0.083	0.208	-0.042	4.27	4.67	3.87	1600	2.667	2.792	2.542	12.53	12.93	12.13
100	0.167	0.292	0.042	4.53	4.93	4.13	1650	2.750	2.875	2.625	12.80	13.20	12.40
150	0.250	0.375	0.125	4.80	5.20	4.40	1700	2.833	2.958	2.708	13.07	13.47	12.67
200	0.333	0.458	0.208	5.07	5.47	4.67	1750	2.917	3.042	2.792	13.33	13.73	12.93
250	0.417	0.542	0.292	5.33	5.73	4.93	1800	3.000	3.125	2.875	13.60	14.00	13.20
300	0.500	0.625	0.375	5.60	6.00	5.20	1850	3.083	3.208	2.958	13.87	14.27	13.47
350	0.583	0.708	0.458	5.87	6.27	5.47	1900	3.167	3.292	3.042	14.13	14.53	13.73
400	0.667	0.792	0.542	6.13	6.53	5.73	1950	3.250	3.375	3.125	14.40	14.80	14.00
450	0.750	0.875	0.625	6.40	6.80	6.00	2000	3.333	3.458	3.208	14.67	15.07	14.27
500	0.833	0.958	0.708	6.67	7.07	6.27	2050	3.417	3.542	3.292	14.93	15.33	14.53
550	0.917	1.042	0.792	6.93	7.33	6.53	2100	3.500	3.625	3.375	15.20	15.60	14.80
600	1.000	1.125	0.875	7.20	7.60	6.80	2150	3.583	3.708	3.458	15.47	15.87	15.07
650	1.083	1.208	0.958	7.47	7.87	7.07	2200	3.667	3.792	3.542	15.73	16.13	15.33
700	1.167	1.292	1.042	7.73	8.13	7.33	2250	3.750	3.875	3.625	16.00	16.40	15.60
750	1.250	1.375	1.125	8.00	8.40	7.60	2300	3.833	4.025	3.642	16.27	16.88	15.65
800	1.333	1.400	1.267	8.27	8.67	7.87	2350	3.917	4.113	3.721	16.53	17.16	15.91
850	1.417	1.488	1.346	8.53	8.93	8.31	2400	4.000	4.200	3.800	16.80	17.44	16.16
900	1.500	1.575	1.425	8.80	9.20	8.56	2450	4.083	4.288	3.879	17.07	17.72	16.41
950	1.583	1.663	1.504	9.07	9.47	8.81	2500	4.167	4.375	3.958	17.33	18.00	16.67
1000	1.667	1.750	1.583	9.33	9.73	9.07	2550	4.250	4.463	4.038	17.60	18.28	16.92
1050	1.750	1.838	1.663	9.60	10.00	9.32	2600	4.333	4.550	4.117	17.87	18.56	17.17
1100	1.833	1.925	1.742	9.87	10.27	9.57	2650	4.417	4.638	4.196	18.13	18.84	17.43
1150	1.917	2.013	1.821	10.13	10.54	9.83	2700	4.500	4.725	4.275	18.40	19.12	17.68
1200	2.000	2.100	1.900	10.40	10.81	10.08	2750	4.583	4.813	4.354	18.67	19.40	17.93
1250	2.083	2.188	1.979	10.67	11.08	10.33	2800	4.667	4.900	4.433	18.93	19.68	18.19
1300	2.167	2.275	2.058	10.93	11.35	10.59	2850	4.750	4.988	4.513	19.20	19.96	18.44
1350	2.250	2.363	2.138	11.20	11.62	10.84	2900	4.833	5.075	4.592	19.47	20.24	18.69
1400	2.333	2.450	2.217	11.47	11.89	11.09	2950	4.917	5.163	4.671	19.73	20.52	18.95
1450	2.417	2.538	2.296	11.73	12.16	11.35	3000	5.000	5.250	4.750	20.00	20.80	19.20
1500	2.500	2.625	2.375	12.00	12.40	11.60							

Accuracy = ±5% of reading from 1500 to 3000 ppm gas and ±75 ppm gas from 0 to 1500 ppm Chart revised on 3-30-95

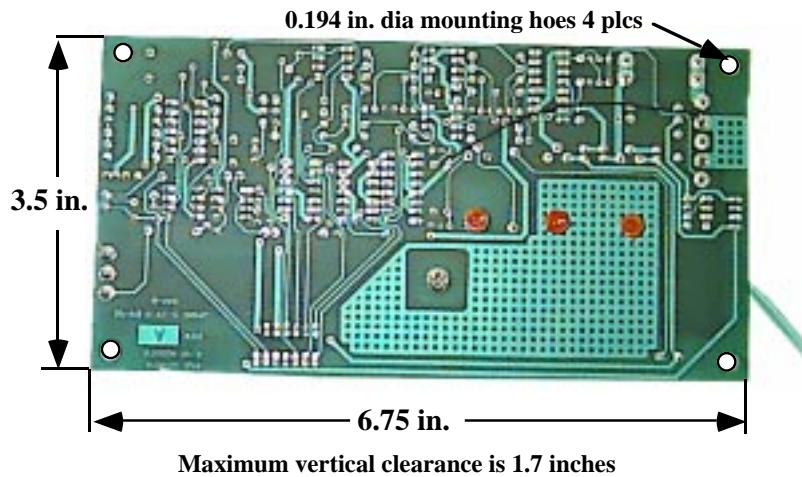
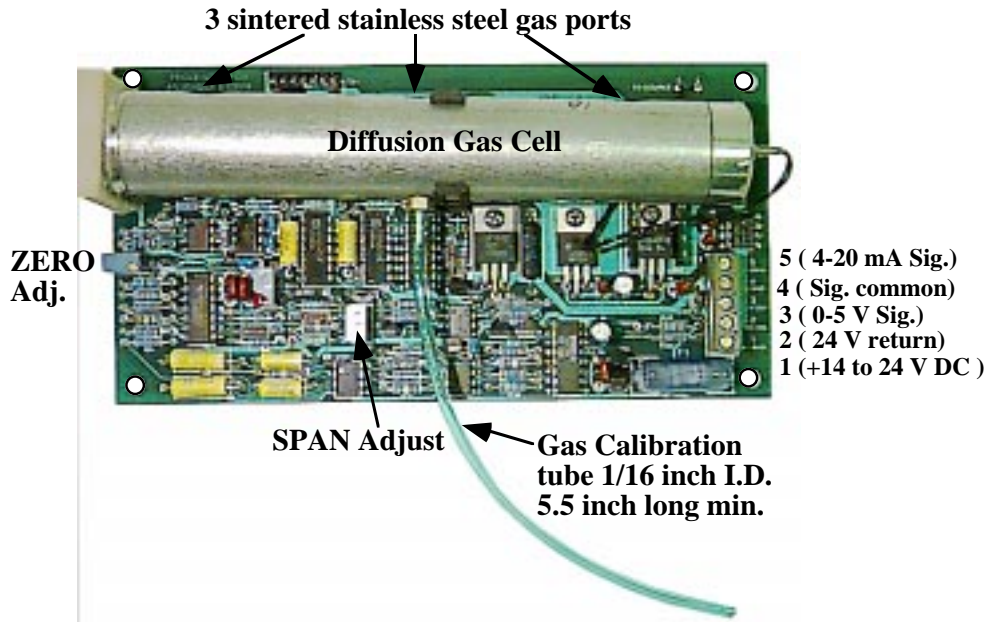
Note: 4-20 mA output was modified in April 2002 to go to 0.0 mA when the 0-5 volt output goes to about -1.25 volt instead of stopping at about 3.5 mA. A 0-5 volt output of about -0.5 volt will give a 4-20 mA output of about 2.4 mA.



The pulsed DC power supply return current of about 0.4 amps peak will take the path of least resistance to get back to the 14 to 24 VDC power supply. If the wire that you connect to pin # 2 is a large diameter and is short in length, this return current pulse will travel through it and not through the signal common (pin#4) path and appear as noise. There **MUST** be a **minimum of four (4) wires** connected, 2 for DC power and 2 for signal.

Even the 4-20 mA current loop will not respond quick enough to use a 3 wire connection. R_{W1} = wire resistance

VTI-VALTRONICS, INC



Circuit Side of printed circuit board