



**CONSPEC®**

**P2621-CO/VC  
CARBON MONOXIDE MONITOR / VENTILATION  
FAN CONTROLLER**

**OPERATING MANUAL**



# Carbon Monoxide Monitor/Ventilation Fan Controller

*Over 32 Years of Proven Experience and Performance*

## P2621-CO/VC



Conspec's **P2621-CO/VC** Carbon Monoxide Monitor / Ventilation Fan Controller is designed to be a stand alone or multi-unit CO detector and fan controller. A single controller will provide up to 10,000 square feet of protection. Multiple controllers can be installed and easily connected without the need for a central panel by a simple series connection of the controllers. LED indicator lights clearly show the status of the monitor and a large LCD display continually shows the CO levels being monitored. After a power loss or in the event of a malfunction, the controller activates the ventilation system.

Reliability and stability of sensors are key concerns for users of fixed monitoring systems - costs will increase rapidly if a sensor proves unreliable in the field. Conspec has addressed these issues and in doing so become the monitors of choice for fixed-point gas detection.

## FEATURES

- Up to 10,000 Square Feet of Protection (10 foot average ceiling height)
- Easy Installation of Single or Multiple Controllers
- Bright LED Display of Power, Fan Activation, Alarm Status and Sensor Fail
- Fused Power Supply to Electronic Circuitry
- Fail Safe Operation, Microcomputer Self Tests Electronics
- Easy to read LCD display
- 2 Years Warranty
- Standard SPDT Fan Relay and SPDT Alarm relay
- Automatic Reset when Alarm Condition Clears
- Rugged NEMA 4-4X Weatherproof Non-Metallic Enclosure
- Automatic Restart After a Power Interruption
- Long Sensor Life, Quick and Easy Replacement
- LA City Approved

## APPLICATIONS

Enclosed Parking Garages	Generator Rooms	Bus Terminals	Indoor Air Quality
Factories	Tunnels	Hospitals	Service Bays
Boiler Rooms	Warehouses	Rail Stations	Power Plants

## SPECIFICATIONS

<b>Enclosure Type:</b>	UL Listed NEMA 4-4X NONMETALLIC	<b>Operating Temperature:</b>	0 to 40 Deg C (32 to 104 Deg F)
<b>Response time:</b>	- < 40 sec. to 90% of the reading	<b>Dimensions:</b>	11"H x 8"W x 5"D or 13.5"H x 10"W x 7"D
<b>Optional Power Input:</b>	115 VAC	<b>Display:</b>	Easy to Read LCD Display
<b>Power Input:</b>	15 -24 VAC	<b>Fuse:</b>	AGC-1/2 A 250VAC
<b>Sensors:</b>	CO / NO2 - Electro-Chemical		

## SALES and ASSISTANCE

*Call for a free CD-ROM Catalog or talk to one of our sales professionals on how Conspec can assist in your Monitoring and Control needs.*

## **Introduction:**

Conspec's P2621-CO/VC Carbon Monoxide Monitor / Ventilation Fan Controller is designed for use where ventilation fans are needed to prevent the accumulation of dangerous levels of carbon monoxide (CO). Many devices such as engines, small generators and other combustion generating appliances produce carbon monoxide as a byproduct of their use. The P2621-CO/VC can significantly lower your operating costs by activating the ventilation fans only when required instead of constant cycling. Each Conspec P2621 will monitor up to 10,000 square feet (10 foot ceiling average). The monitor utilizes a micro-controller to provide overall supervisory control, measure the CO level and display the CO level from 0 to 500 ppm on the built in LCD display. The monitor continually self-tests the internal electronic circuitry, supplied power and sensor to determine if a fault is present. The sensor is factory calibrated and when required, a field calibration with the optional field calibration kit can be performed. Please check local and state regulations.

## **Important Information:**

When installing the Conspec P2621-CO/VC:

- A) Read and follow these instructions carefully. Failure to follow the instructions could result in damage to the Conspec P2621-CO/VC or cause a hazardous condition.
- B) The installer must be trained and experienced in control systems.
- C) Check that the ratings given in these instructions, under Specifications, and located on the monitor are suitable for your application.
- D) When the installation is complete check the operation of your Conspec P2621-CO/VC as shown in the Power-Up and Test section of this manual.

## **System Operation:**

The Conspec P2621-CO/VC provides one (1) relay for ventilation fan control and one (1) relay for alarm control. Figure 1, located in the back of this manual, shows a typical P2621-CO/VC installation. In CO free atmosphere, fan relay contacts K1-K2 are closed and alarm relay contacts K3-K4 are open. When the monitor detects a CO level of 50 ppm or greater, or if a fault is detected, relay contacts K1-K2 are opened. This provides a fail safe circuit if connected to a normally closed (NC) fan controller. The fans will remain in operation until the carbon monoxide (CO) level falls below 35 ppm. The minimum fan on time is 2 ½ to 3 minutes to eliminate any short cycle of the fans. The P2621-CO/VC has four (4) LED indicator lights and one (1) LCD display located on the front panel. A steady green LED indicates normal power ON operation. The same green LED if flashing or OFF indicates a problem with the power input to the unit. If a carbon monoxide (CO) level in excess of 50 ppm is detected, the Yellow Fan LED is activated indicating that the P2621-CO/VC has initiated fan operation. Until the CO level drops below 35 ppm, both the fan and the Yellow Fan LED will continue to operate. If the CO level rises above 200 ppm or remains above 150 ppm for more than 15 minutes, contacts K3-K4 on the second relay will close along with the activation of the Red Alarm LED. The alarm state will reset automatically when the CO levels fall below 150 ppm. In the event of a failure of the self-test or of a sensor failure, the Red Fail LED will light and the K1-K2 relay contacts will open causing continuous fan operation to prevent the buildup of CO in the area. If there is a power interruption, the P2621-CO/VC will automatically reset when power is restored. "FAN" will be displayed on the LCD and the contacts K1-K2 will remain open for 2 ½ to 3 minutes to clear the area of any CO buildup. Normal operation resumes after the start-up period.

## **Power Requirement and Relays:**

The P2621-CO/VC was engineered to be used with a 24VAC power supply and a 24VAC relay control circuit. The relay contacts are rated 5A@ 24VAC for use with an inductive load. If the installation requires a higher voltage or greater load capacity, replace the relay in the unit with a suitability rated relay or use a second relay between the control relay and the load. A power requirement for each P2621-CO/VC is 24VAC at 0.5 amps. Comply with the latest codes, standards, tests and wiring practices when installing the units. Install to national NEC and BOCA standards if applicable.

***WARNING: The use of the P2621-CO/VC unit with higher or lower voltages can cause damage to the unit, result in improper operation of the unit or cause hazardous conditions.***

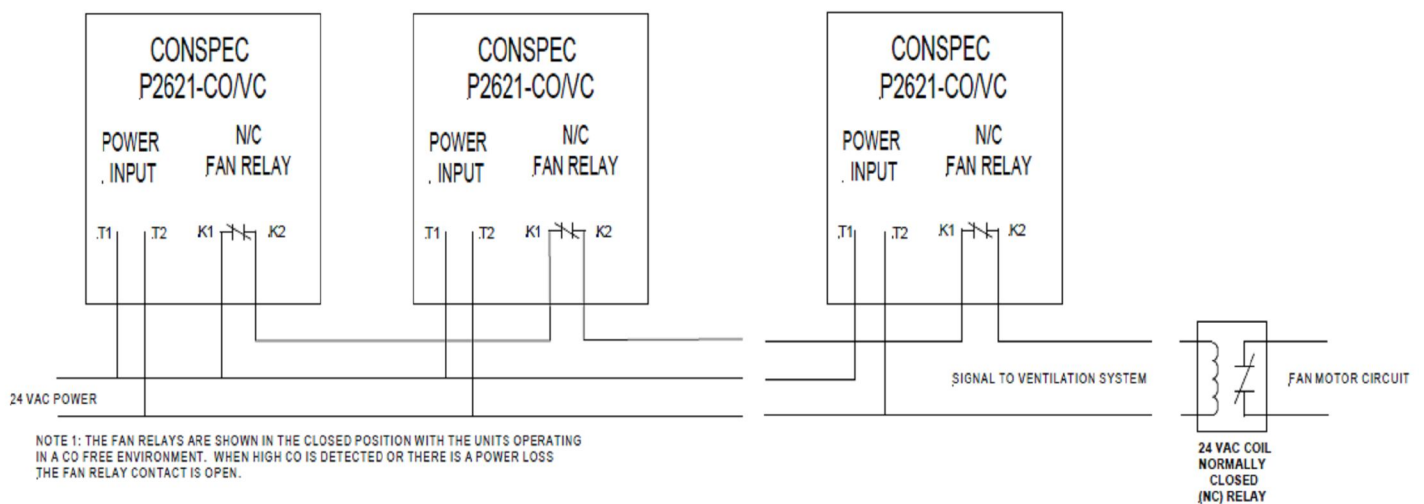
## Location and Mounting:

The P2621-CO/VC can be used to monitor up to 10,000 square feet of undivided area (10 foot ceiling average). It can be used as a self-contained, stand-alone control or as part of a multi sensor control system. No central panel is required. If the airflow is not uniform or if the shape of the area to be monitored is unusual, then the area monitored by each unit should be appropriately reduced. Select an appropriate mounting location in an area of heavy traffic flow, away from drafts and where the vent holes on the bottom of the unit will not be blocked. Mount the unit with four (4) screws using the external mounting feet provided. The unit should be mounted at a convenient height, usually about five (5) feet above the floor.

## Installation and Wiring:

After mounting the unit(s) as described above connect the power and relay wires as shown in Fig. 1. The power circuit and the control circuit of the unit(s) must be wired with 18 AWG or heavier copper wire. Multiple sensor installation requires only a simple series connection of the fan control relays. This feature allows you maximum flexibility in system design and installation. Zoned systems are easily created when several sets of fans need to be controlled independently. Automatic timers and manual switches are easily added to a P2621-CO/VC installation. The desired devices are simply wired into the series fan control loop such that the loop is opened whenever fan activation is desired. The diagram below shows a typical P2621-CO/VC installation.

### TYPICAL INSTALLATION



1) Open the enclosure using the provided locking screw tool. The control card is mounted on the inside of the enclosure door. A terminal block for electrical connections is located on the back panel of the monitor. The terminals are marked for power input and relay connections.

2) Warning: Be sure to turn OFF power to the fan control system and turn OFF power to the 24 VAC supply for the P2621-CO/VC before wiring and connecting the P2621-CO/VC.

3) The wiring must enter the P2621-CO/VC enclosure through the two electrical openings provided on the unit with conduit fittings.

4) Connect the 24 VAC supply to terminals T1 and T2 of the terminal block. Each P2621-CO/VC unit requires 12 watts of power for proper operation.

5) Connect the relay (control) contact K1 and K2 in series with the coil of the ventilation fan control intermediate relay, or for multiple unit installations the K1 and K2 contacts of the next unit. WARNING: The P2621-CO/VC must be wired so that the fans are ON when the relay contacts K1 and K2 are open.

5a) OPTIONAL ALARM RELAY .Connect the optional relay (alarm) contacts K3 and K4, if so equipped, as shown in the above wiring diagram.

6) Verify that the wiring to each P2621-CO/VC is correct.

## **Power Up and Testing:**

1) Close the enclosure door and secure the screws on the front panel.

2) Make sure that the power to the fan control system is OFF. Turn ON the 24 VAC power to the P2621-CO/VC.

3) The green POWER light should turn ON. The word -FAN- should appear in the LCD display. After several minutes the LCD display will display the current Carbon Monoxide (CO) reading in ppm. If no lights turn ON or if any other lights are ON refer to the Troubleshooting Section. NOTE: After the P2621-CO/VC has been OFF, when power is restored to the unit. -FAN- will appear in the LCD display and the unit will run the ventilation fan for several minutes to clear the air of accumulated CO then resume normal operation.

4) Turn OFF the power to the P2621-CO/VC. Turn ON the power to the ventilation fan control system, then turn on the power to the P2621-CO/VC. The green POWER light should turn ON. The word -FAN- should appear in the LCD display. After several minutes, the LCD display will display the current Carbon Monoxide (CO) reading in ppm. If no lights turn ON or if any other lights are ON refer to the Troubleshooting Section.

5) If the power up tests is passed, the P2621-CO/VC is ready for normal operation. Otherwise refer to the Troubleshooting Section.

### **Troubleshooting:**

#### 1) No Lights On The Front Panel

- a) Turn OFF the power to the P2621-CO/VC and to the fan control system.
- b) Open the enclosure and check that the 24 VAC power supply wiring is securely attached to the terminals T1 and T2, and that the wiring from the connector terminals to the circuit board is securely attached.
- c) Turn ON the 24 VAC power to the P2621-CO/VC. If the power light is OFF, using a voltmeter, measure the voltage between T1 and T2. The Voltage should read close to 24 VAC, if it does not, the problem is in the power supply and not in the P2621-CO/VC.
- d) If there is 24 VAC across the T1 and T2 terminals and the power light is off, return the P2621-CO/VC to your supplier or CONSPEC for repair or replacement.

#### 2) The Fan Does Not Operate When Fan Light (yellow light) is ON **or** The Fan Does Not turn OFF When The Fan Light (yellow light) is OFF

- a) Turn OFF the power to the P2621-CO/VC and to the fan control system.
- b) Check that the field-installed relay in the fan motor circuit is a (NC) Normally Closed type.
- c) Open the enclosure and check that the ventilation fan wiring is securely attached to the terminals K1 and K2, and that the wiring from the connector terminals to the circuit board is securely attached.
- d) Disconnect the ventilation fan wiring from terminals K1 and K2. Using an ohmmeter, measure the resistance between terminals K1 and K2. The circuit should be open (high resistance). If the circuit is not open, return

the P262I-CO/VC to your supplier or to CONSPEC for repair or replacement.

e) Turn on the 24 VAC power to the P262I-CO/VC and wait for -FAN- to appear in the display. Using an ohmmeter, measure the resistance between terminals K1 and K2. The circuit should be open (high resistance) if the circuit is not open, return the P2621-CO/VC to your supplier or to COTNSPEC for repair or replacement.

f) With the 24VAC power to the P2621-CO/VC turned ON, wait for "FAN" to disappear from the display. Using an ohmmeter, measure the resistance between terminals K1 and K2. The circuit should be closed (low or zero resistance). If the circuit is not closed, return the P2621-CO/VC to your supplier or to CONSPEC for repair or replacement

g) If the above resistance checks between terminals K1 and K2 are fine, turn OFF the 24 VAC power to the P2621-CO/VC and reconnect the fan control wiring. Turn on the 24 VAC power to the unit and to the fan control system. Check the fan operation. If the fan does not operate properly the problem is in the ventilation fan control system or the connecting wiring.

### 3) Fault Light Is ON

a) Turn OFF the 24 VAC power to the P2621-CO/VC then turn it ON. If power cycling does not remove the fault condition continue to step b.

b) Turn OFF the 24 VAC power and power to the ventilation fan control system. Open the enclosure and check that the connector from the sensor is attached to the main board.

d) If the above steps do not remove the fault condition, turn OFF the 24 VAC power to the P262I-CO/VC and return the unit to your supplier or to Conspec for repair or replacement e) The sensor is factory calibrated and the P2621-CO/VC is ready to install and use. An optional field calibration kit is available when local regulations require periodic calibration checks of the sensor. When the sensor is about to fail, the red fail LED will light intermittently and will light steadily when the sensor fails. If the sensor is not replaced the P2621-CO/VC will turn on the fans and go into the fail mode. The plug in sensor module must be replaced before the unit can be reset.

### 4) Any Other Problem Not Mentioned Above

a) Call Conspec Factory Service At: 724-489-8450 FAX: 724-489-9772