
DIESEL EXHAUST SMOKE/VOC SENSOR

MODEL GVU-VOC

TYPICAL INSTALLATIONS:

- Bus Garages
 - Fire Stations
 - Tunnels
 - Truck Warehouses
 - Welding Shops
 - Vehicle Maintenance & Storage
 - Highway Departments
 - Utilities
 - Public Works
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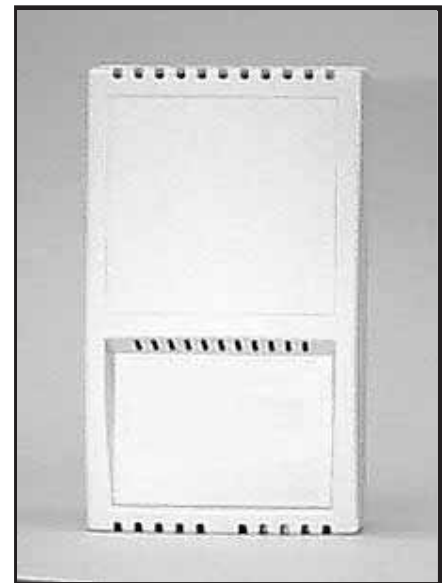
GENERAL DESCRIPTION:

The model GVU-VOC diesel smoke full spectrum sensor is designed to interface with Toxalert International's GVU series control units. The GVU-VOC is a microprocessor-based air quality sensor utilizing metal-oxide semi conductor technology. This is a full spectrum sensor sensitive to a wide variety of air pollutants such as smoke, hydrocarbons, gasoline fumes, acetone, toluene, etc. (see Table 3). The GVU-VOC indicates its status with indicators for auto-power on and processor normal, ok, low, mid or high for level of contaminant detected.

BACKGROUND:

The diesel engine exhausts a great percentage of smoke (soot) as well as, many hydrocarbons (e.g., ethylene, formaldehyde, methane, benzene, and polynuclear aromatic hydrocarbons) and toxic gases (e.g., nitric oxide, nitrogen dioxide and oxides of sulfur). The smoke is particularly evident at the beginning of a work shift, when all the buses or trucks are started in a maintenance/storage facility.

Even though, the exhaust smoke is not classified as a toxic, it is considered a carcinogen (reference: carcinogenic effects of exposure to diesel exhaust - NIOSH Publication No. 88-116). Therefore many facility owners are monitoring the smoke/hydrocarbons (VOC) as well as, the toxic oxides of nitrogen.



Model GVU-VOC

FEATURES:

- Micro processor based
 - Power Indication
 - Low, mid, high reading indicators
 - Humidity and Temperature compensated
 - Completely solid state for long life
 - Low voltage class two (2) wiring
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SPECIFICATIONS

- **Type:** Metal semi conductor
- **Input voltage:** 20- 30VAC from GUV controller
- **Operating Temperature:** 32° to 104°F (0-40°C)
- **Display:** 5 indicators ok, low, mid, high
- **Sample Method:** Diffusion
- **Supply Current:** 220 MA(max)
- **Operating Humidity:** 0-85% non-condensing
- **Enclosure:** AE wall mount
2.75"W x 4.65"H x 1.25"D
(70 x 118 x 32mm)

INSTALLATION INSTRUCTIONS

1. INSTALLATION

For best operation, locate a mounting location away from direct fresh air intakes, doors and supply diffusers and mount vertically on wall or support column approximately 5 to 6 feet above floor. An alternate location is in the ceiling space of facilities with top discharge diesel vehicles. Refer to figures 1 and 2; Table 1 and 2 and installation instructions in GUV series control unit data sheet and install the GUV-VOC sensor as follows.

2. COVER REMOVAL

Screw set-screw in bottom of cover in (clockwise) and remove cover.

3. MOUNTING

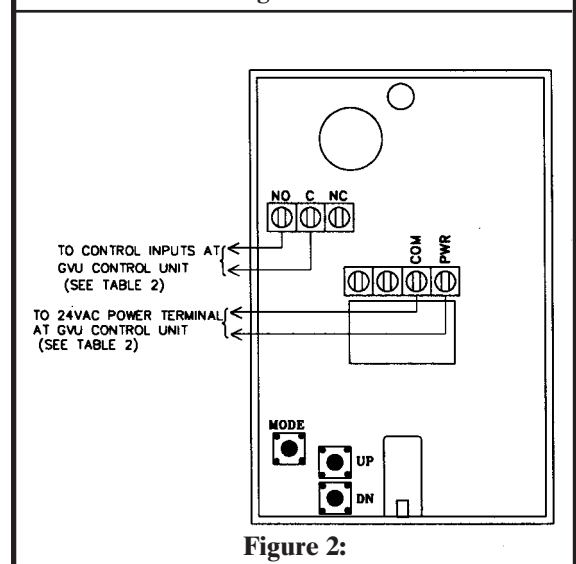
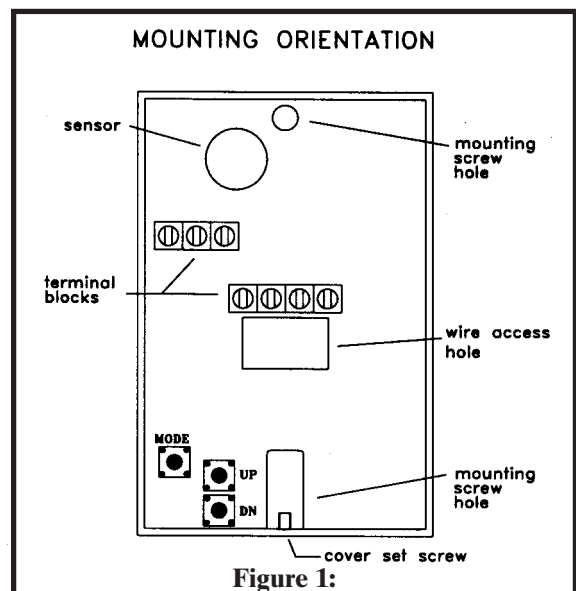
The sensor has mounting provisions to install directly on a standard electrical box.

4. SENSOR WIRING

WARNING: To prevent fire or shock hazard, turn off power source to control unit before making connections. Comply with all local building codes and ordinances.

NOTE: Refer to Figure 2 and Tables 1 and 2. Use shield cable to interconnect sensor and control unit if metal conduit is not used, or if conduit also contains AC wiring.

- 1.) Measure distance between sensing unit and control unit and select proper wire or larger wire from Table 1.



- 2.) Run wiring between control and sensing unit and into enclosure through access holes. Connect wires from terminal blocks in sensing unit to control unit per Table 2 and GVU series control unit data sheet.

5. START-UP

- 1.) Verify all wiring connections are correct and are tight.
- 2.) Apply power and note the status LEDs. Initially the LEDs will flash in sequence (OK, LOW, MID, HIGH and AUTO) to indicate a successful start-up. The device will then enter a three minute warm-up cycle and this is indicated by a flashing AUTO LED and lit OK LED. This mode will continue for three minutes until the sensor has reached operating temperature.
- 3.) After the initial warm-up period, the device will enter normal operation. This will be indicated by the AUTO LED being lit and also one pollution level LED being lit (OK, LOW, MID or HIGH).

Note that the sensor is calibrated at manufacture to be suitable for use in average room conditions. The sensor filter will accumulate dust over a period of inactive time and the sensor must be allowed to burn-in before proper operation. This time will vary depending on the storage time, but the unit will be suitable for pre-commissioning after about 30 minutes.

- 4.) Replace cover.

TABLE 1

AWG	DO NOT EXCEED
#22 Wire	500 Ft. Sensor to Controller
#20 Wire	800 Ft. Sensor to Controller
#18 Wire	1300 Ft. Sensor to Controller
#16 Wire	2000 Ft. Sensor to Controller

TABLE 2

GVU-VOC SENSOR	WIRING CONNECTIONS CONTROL UNITS	
	GVU-1	GVU-3
PWR	TB11-H(24VAC)	TB3-H (24VAC)
COM	TB11-N (COM)	TB3-N (COM)
NO	TB2-1	TB1-A1, B1, C1
COM	TB2-7	TB1-A7, B7, C7
**	TB2-5	TB1-A5, B5, C5

** Shield of cable (if used) should be connected at control unit only. Make sure sensor end is taped and isolated from terminals or metal.

TABLE 3

PARTIAL LIST OF CONTAMINATES DETECTED BY TOXALERT INTERNATIONAL GVU-VOC SENSOR.

CHEMICAL

Ethylene
Benzene, Toluene, Xylene
Methane
Formaldehyde
Methyl Ethyl Ketone
Acetone
Ethyl Alcohol
Hydrogen

COMMON SOURCE

Diesel exhaust
Diesel exhaust, solvents and motor fuels
Diesel exhaust, decomposition and synthesis
Diesel exhaust, disinfectants and preservatives
Solvents and cleaning products
Solvents and organic synthesis
Solvents and liquor fermentation
Used in synthetics

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CHEMICAL

COMMON SOURCE

Hydrogen Sulfide
Methyl Alcohol
Methyl Chloride
Vinyl Chloride
Trichloroethylene
Propane
Carbon Monoxide
Freon-22
Ammonia

Water and putrefying matter
Solvents, antifreeze and synthetics
Solvents, paints and refrigerants
Textiles and polymers
Solvents and cleaning agents
Fuels and chemical synthesis
Combustion of carbon
Refrigerants and aerosols
Solvents and refrigerants

GVU SERIES PRODUCTS:

CONTROLLERS -

GVU-1 Control unit for use with one sensor
GVU-3 Control unit for use with one to three remote sensors

REMOTE SENSORS -

GVU-CO Remote carbon monoxide sensor
GVU-CO₂ Remote carbon dioxide sensor
GVU-NO₂ Remote nitrogen dioxide sensor
GVU-VOC Remote smoke/air quality sensor

