

CO/CO₂/NO₂/OR VOC MONITOR

MODEL GVVU-3

GENERAL DESCRIPTION:

The GVVU-3 ventilation control system combines toxic gas-based and time-based fan control modes in an all solid-state low maintenance, cost effective product.

The GVVU-3 series controller can monitor up to three (3) GVVU-CO sensors; (3) GVVU-CO₂ sensors, (3) GVVU-NO₂ sensors, (3) GVVU-VOC sensors; or any combination of sensors. The GVVU-3 Controller consists of the power supply, solid-state clocks, time delays, output relays, terminal strips, 3 sensor alarm LED's and a green LED to indicate power to remote sensor.

The GVVU-CO Sensor is microprocessor based and is temperature and humidity compensated for stability. The GVVU-CO sensor range is 0 to 250 ppm. The transducer utilizes a tin oxide sensing element that is cleaned and sampled by the microprocessor. The GVVU-CO indicates its status via a two color LED. When the LED is flashing green, operation is normal and not in alarm. When the LED is flashing red, the unit is in alarm (high CO); a continuous red or green indicates sensor failure; and LED extinguished indicates power failure.

See separate specification data sheet for information regarding GVVU-CO₂ carbon dioxide sensors, GVVU-NO₂ nitrogen dioxide sensor and GVVU-VOC smoke/air quality sensor.

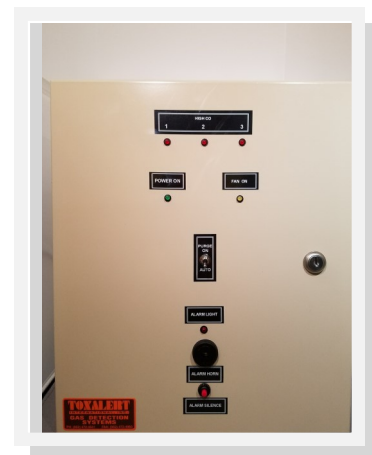
TIME CONTROL:

The systems hourly timeclock outputs to the fan-on relay once per hour causing it to energize. The on time of the fan-on relay is user adjustable, in one minute increments from 1 to 8 minutes. The hourly timeclock operates in this manner irrespective of sensor reading, and may be disabled, if desired. To disable the

DETECTION CONTROL:

Should a high gas concentration occur (above user adjustable alarm level), a alarm signal from any sensor unit starts a 30 second delay. Should the concentration persist through the delay period, the "alarm" clock is activated. The "on" time of this clock is user adjustable in discrete setting from 1 to 8 minutes and its settings is independent of the hourly clock settings. Upon activation of the "alarm" clock, the "fan-on" relay energizes and remains energized until the "alarm clock" times out. Should the concentration still be above the alarm level, the "fan-on" relay shall remain ON and the alarm shall energize. This condition is maintained until the concentration drops.

In the event of a power failure, the control unit sets itself to an alarm condition up power restoration. Thus, fan activation is assured, clearing out any accumulated toxic gases.



GVVU-3
CONTROL PANEL



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LISTED

STANDARD FEATURES:

- User Adjustable Alarm Setting
- User Adjustable minimum fan run time
- User Adjustable 2nd stage activation
- One person field calibration
- Fully electronic for long life

- Red LED to indicate high gas concentration
- UL listed upon request
- Visual indication of high gas concentration level and fan on
- Automatic fan start-up upon power restoration following power outage
- Operating range meets OSHA std. 1910.1000

OPTIONS:

- Audible alarm with silence switch
- Power ON, Fan ON LED's
- Sensor alarm LED's
- Controller key lock
- UL Listed

SPECIFICATION:

- Input Power:** 120 VAC, 60 Hz, 1A (fused)
- Relay Contacts:** 24 VAC, 2A resistive, 1.5 inductive
- Discrete Clock Settings:** 1 minute intervals
- Automatic Ventilation Cycle Upon Power Restoration:** User adjustable 1 to 8 minutes
- Finish:** Grey Enamel
- Enclosure:** Nema 1 standard, others available
- Dimensions:** 14" H x 12" W x 4" D
(305mm x 102 mm)
- Weight:** 8lbs (3.6 kg)

INSTALLATION INSTRUCTIONS

1. INTRODUCTION

Your TOXALERT Ventilation Control System incorporates the latest in solid state technology to give you maximum reliability and performance. The system alarm set point can be adjusted to activate fans upon detection of an unsafe concentration of CO, CO₂, NO₂, VOC air quality. In addition, a user-definable hourly repeat cycle is provided, allowing time-based, as well as gas-based fan activation. In both modes of fan control, the "on" time is user-adjustable 1 to 8 minutes in one-minute increments. For optimum performance, install, burn-in, calibrate and check out your TOXALERT exactly as instructed. If your TOXALERT can't be calibrated or fails checkout, please contact your local representative or TOXALERT International for servicing.

2. INSTALLATION

Refer to figure 1, 2 and 3, and install and connect the TOXALERT sensors and control units as follows.

GVU-CO SENSING UNITS

- 1) Open the door using the key provided, Next life off the front door by sliding it up the pins of the hinges. Put it aside.
- 2) Locate a mounting location away from drafts, away from direct fresh air intakes, and mount vertically on wall or support column approximately 5 to 6 feet above floor.
- 3) Mount base with hinge pins along left side by using mounting holes (4 are available)
- 4) A wiring access hole must be added to the base anywhere around the bottom or right side. Do not place an access hole on the hinge side of the base, since, if conduit is used, this may restrict the opening of the door. If conduit is to be used, use a chassis punch to match the required fitting size.
- 5) Remove any metal chips and burrs from enclosure.
- 6) Place the cover onto the hinges of the base.

See separate data sheet for installation instructions of GVV-CO₂, GVV_NO₂, and GVV-VOC

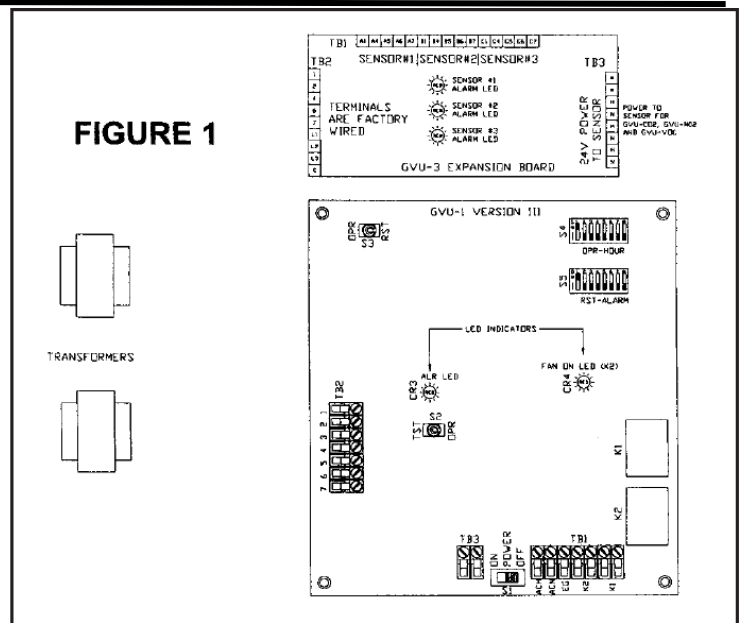


FIGURE 1

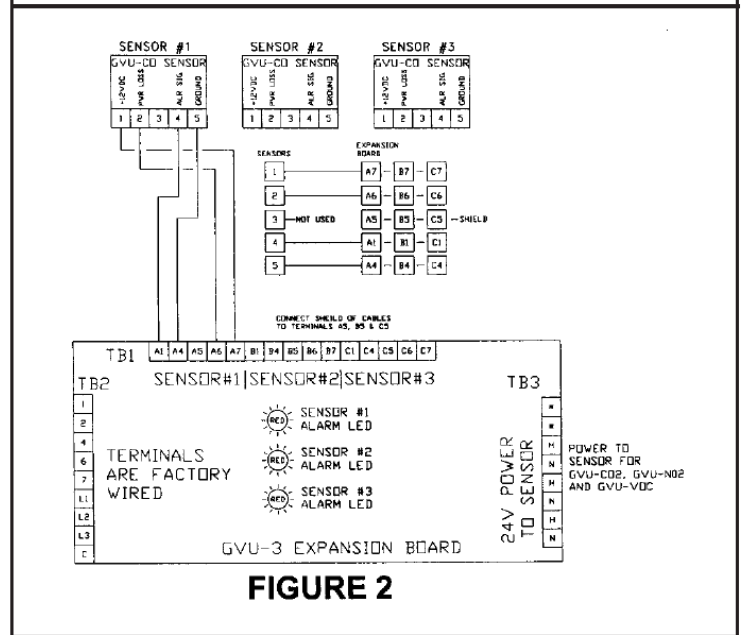


FIGURE 2

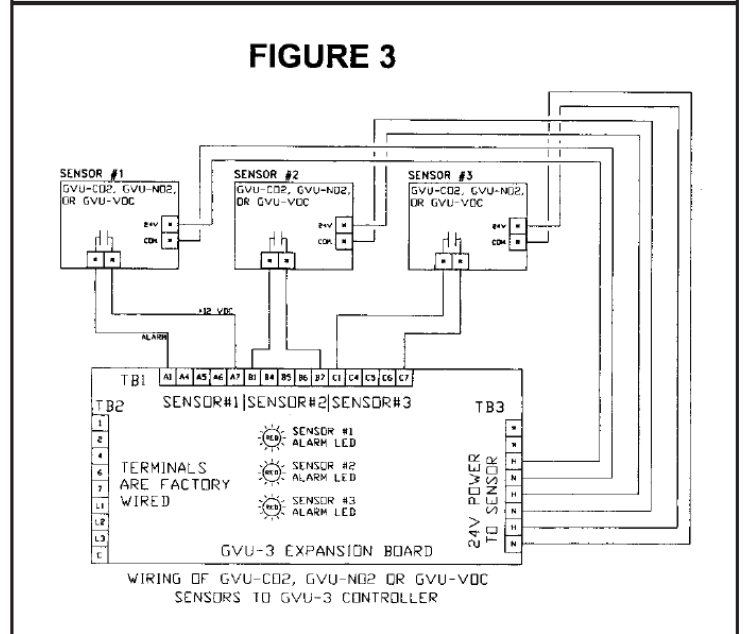


FIGURE 3

CONTROL UNIT

- 1) Unlock and open enclosure cover
- 2) If necessary, cut access holes for wiring in enclosure sides directly opposite terminal blocks to be wired. First disconnect fuse leads, remove the four screws that secure chassis plate to enclosure and then carefully remove plate and attached transformer and circuit boards; cut holes and remove metal chips and burrs from enclosure.
- 3) Mount enclosure with four screws
- 4) Reinstall and secure chassis plate to enclosure with the four screws and reconnect fuse leads removed in step (2).
- 5) Connect to 120 VAC, 60 Hz power source

SENSOR WIRING

NOTE: Refer to Figures 2 and 3 and Tables 1 and 2. Use shielded cable to interconnect sensors and control units if metal conduit is not used, or if conduit also contains AC wiring.

- 1) Measure distance between sensing unit and controller unit and select proper size wire or larger wire from Table 1.
- 2) Run wiring between controller and sensing units and into enclosure through access holes. Connect wires from terminal blocks in sensing unit to appropriate sensor # terminal (TB-1 of GVU-3 expansion board) in control unit per figure 2 and/or 3.

TABLE 1

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

POWER AND RELAY WIRING

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

- 1) Connect power to TB1 of GVU-1, version II board as follows:

AC hot to TB-1 (ACM)
AC neutral to TB1-2 (CAN)
AC ground to TB1-3 (KG)

CAUTION: Relay K1 and K2 are rated for a 5.0 amps resistive load. If a higher rated alarm or pilot control is required, add a remote relay between the control relay and load.

- 2) Connect dry contacts of alarm K1(TB1-6 and TB1-7) to alarm device (optional).
- 3) Connect dry contacts of fan relay K2 (TB1-4 and TB1-5) to fan pilot control.
- 4) Set control unit power switch S1 to the off position, TST/OPR switch S2 to OPR and OPR/RST switch S3 to RST.
- 5) Turn on control unit AC power source, but do not apply power to fans at this time.

3. BURN-IN

Burn-in period allows sensor to stabilize before proceeding with alarm setting procedure.

- 1) Be sure fan power is off, power is applied to control unit and power switch S1 is set to PWR ON
- 2) Allow system with CO/VOC sensors to burn-in at least 72 hours with power turned on to sensor. Allow CO₂ / NO₂ sensors 1 hour to burn-in.
- 3) When 72 hour burn-in is complete, proceed with alarm settings and checkout.

4. SETTING OF TIME FUNCTIONS:

These are two (2) eight position dip switches in the upper right hand corner of the GVU-1 controller board, labeled S4 and S5. These control the system's timing functions.

A) Hourly Operations (S4)

S4 and Toggle switch S3, in the upper left corner of the P.C. board control the hourly operation of K-2 relay. With number "1" switch of S4 in the up position, the fan will run one min each hour, with the number "2" switch in the up position, system will run 2 mins every hour; and so on, up to eight (8) mins. The switches are not additive and if more than one switch of S4 is in the up position, the system operates the lowest number of mins of the S4 switches in the up position. With S3 in RST (reset) position the hourly function is deactivated. If S3 is in the OPR position and all S4 switches are down (off), K2 will operate 8 mins each hour.

B) Minimum Fan Run Time (S5)

Dip switch S5 controls the minimum time K2 relay is activated once an alarm condition has been acknowledged by the controller. With number "1" switch of S5 in the up position, the minimum run time (K2 relay closed) is one minute. With number "2" switch of S5 in the up position, the minimum run time is 2 mins, and so on, up to 8 mins. The switches are not additive, and if more than one switch is in the up position, K2 operates the number of mins of the "lowest" numbered switch of S5 in the up position. If all are in the down position, the minimum run time defaults to 8 mins.

TABLE 2 (Refers to Figures 2 and 3)

CO SENSOR TERMINALS	GVU-3 SENSOR EXPANSION BOARD TERMINALS				C02 / N02 SENSOR TERMINALS
	Sensor #1	Sensor #2	Sensor #3	Function	
1	A7	B7	C7	(+ 12 VDC Power)	Normally open relay terminal
2	A6	B6	C6	(Sensor Power Loss)	NA
4	A1	B1	C1	(Alarm Input)	Normally open relay terminal
5	A4	B4	C4	(Ground)	NA
No Connection*	A5	B5	C5	(Cable Shield)	No Connection*
NA	TB3-Hot			(24 VAC Power)	VAC (+)
NA	TB3-Neutral			(24 VAC Power)	VAC (-)

5. ALARM SETTING PROCEDURE

All sensors are factory calibrated for their specific set-point. Periodic calibration is required and performed at the sensor. Please refer to the individual sensor instruction manual (supplied with each sensor) and calibration instruction sheet (supplied with calibration kits, available separately).

6. CHECKOUT

- 1) Turn off power.
- 2) Disconnect alarm input wires from sensors at terminals A1, B1 & C1 of GVU-3 board.
- 3) Set alarm timer (S5) to 2 minutes and hour time (S4) to 1 minute.
- 4) Set power switch S1 to PWR ON. Set OPR/RST switch S3 to RST and back to OPR, note time.
- 5) Check that the LED indicators CR3 and CR4 on GVU1 board are extinguished and that fans are off.
- 6) Set TST/OPR switch S2 to TST, check that the CR3 LED indicator is ON. After 30 seconds check that CR4 and the fans are on. Set S2 to OPR (CR3 off) and check that the fans stop after running 2 minutes (CR4 off).
- 7) Set TST/OPR switch to TST, check that when 2 1/2 minutes have elapsed (this includes the delay), alarm device activates and fans continue to run. If optional alarm is not installed, connect an ohm-meter across TB1-6 and TB 1-7 and check that contacts of relay K1 are closed (continuity).
- 8) Set S2 to OPR. Check that fans stop and K1 de-energizers (CR3 and CR4 off).
- 9) Check that 1 hour after step 2 was performed, fans start (CR4 lights) run for 1 minute.
- 10) Check power switch S1 to off position, set alarm and hour timers to desired setting.
- 11) To disable hour clock operation, position switch S3 to RST position.
- 12) Reconnect sensor alarm input wires, to A1, B1, & C1.
- 13) Set power switch to PWR ON, close and lock enclosure cover. This completes the checkout and installation.

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
GVU-6	Control unit for use with one to six remote sensors
GVU-12	Control unit for use with one to twelve remote sensors
GVU-18	Control unit for use with one to eighteen remote sensors

REMOTE SENSORS:

GVU-CO	Remote carbon monoxide sensor
GVU-CO ₂	Remote carbon dioxide sensor
GVU-NO ₂	Remote nitrogen dioxide sensor
GVU-VOC	Remote smoke/air quality sensor

ANNUAL CALIBRATION CHECK IS RECOMMENDED