ECO SENSORS, INC.

ENVIRONMENTAL ENCLOSURE
Model EE-1

INSTRUCTIONS FOR USE

GENERAL

The EE-1 environmental Enclosure is for dust and water protection in industrial and agricultural environments and in public places. A key principle of the EE-1's operation is separating the solids and liquids from the gas stream before the gas reaches the sensor. This is accomplished by forcing the particles and droplets to flow directly to the exhaust fan while the gas to be measured, such as ozone or a VOC, diffuses laterally to the sensor which is not in the inlet-outlet flow path.

The EE-1 housing is a polycarbonate plastic enclosure 125 mm wide, 175 mm high and 77 mm deep (5"X7"X3") with a clear polycarbonate gasketed front cover. There are screened air inlets on the sides and an exhaust fan on the bottom. An option is an interior enclosure heater. Everything in the enclosure is powered by 12-18 volts DC. Wiring to external equipment is via a semi-sealing side gland with knockouts for extra access if required. The same AC adapter that powers most Eco Sensors instruments powers the EE-1 and the instrument in it. The EE-1 can forward to an alarm panel, such as the Eco Sensors RAP-2, signals in the form of 0-2 V and set-point controlled relay contact closure.

CONNECTIONS

Before mounting the EE-1, identify where the external connections are made to its circuit board, and which ones you will use (refer to the drawing on the other side of this instruction sheet).

POWER INPUTS

12.5-18 VDC 500 mA to the power jack or to TB1. The EE-1 supplies power to the Eco Sensors gas instrument mounted in it, so only one power supply is necessary.

AC Adapter AC adapters with nominal 12 VDC output are suitable power sources for the EE-1 if their voltage under load to the EE-1 is 12.5 volts. Most so-called 12 VDC adapters have an output connected to the EE-1 of about 14 VDC. The adapter output plug should be a for a 2.5 mm jack, center +. The power jack is on the bottom of the enclosure. Eco Sensors Tech Note P101 has detailed information about suitable AC adapters.

Earth ground Use an unused GND terminal on TB3 on the lower right side of the board.

In general, it is preferable to power the RAP-2 or other alarm panel independently. If the RAP-2 uses the same power supply as the EE-1, at least 1 amp of DC should be available

OUTPUTS

Relay The relay has contacts rated at 5 A 250 V. TB2, the terminal block for the relay's contacts, is on the lower left side of the board. Terminal 2 is the arm (common). The relay will be normally open or normally closed depending on whether the instrument relay actuating the EE-2 relay is normally open or normally closed. When LED D1 just to the lower right of TB2 is illuminated terminals 1 and 2 of TB2 are connected, and when it is not illuminated terminals 2 and 3 of TB2 are connected.

0-2 VDC out Connect to TB3 terminals 0-2V and GND. 0-1 V corresponds to 0-.1 ppm for our ozone instruments (unless otherwise indicated) and to 0-1 V for our C-21 VOC instrument. 0-2 V is for simple signal transmission less than about 20 meters (60 feet).

INSTALLATION

The EE-1 is usually mounted on a wall or equipment panel by "feet" or "brackets" and screws found in the shipment. These can be mounted on the sides or top and bottom. All wiring can be passed through the knockouts on the sides or top of the EE-1. Caution! The enclosure itself is made of polycarbonate and fiberglass and is difficult to machine.

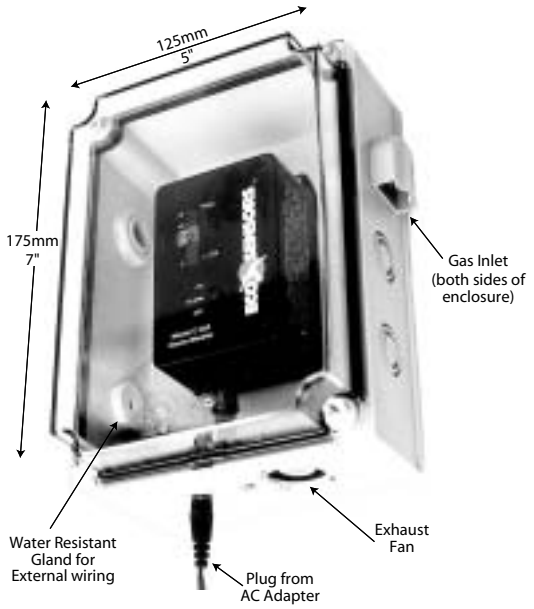
OPERATION

There is no on-off switch to power up the instrument. Simply plug in the AC adapter or connect to other DC or AC power. The pilot LED on the gas detection instrument will illuminate and the fan will run. If either system "on" indication does not happen, recheck wiring, etc.

It is recommended that the instrument be tested for gas response. For ozone systems, the Eco Sensors, Inc. OG-1A hand held ozone generator works well to test for ozone instrument response. Place the generator close to the air inlet on the right side of the EE-2 enclosure. Allow several minutes for the ozonated air to flow in and reach equilibrium inside the enclosure.

OPTION

Enclosure Heater For this option a 2+ watt heat dissipating resistor is factory installed as R2. This heater will increase the current drain on the external power supply by about 200 mA and will raise the enclosure interior temperature by about 10 degrees C.



AC ADAPTER

An AC adapter that delivers 12.5-18 volts at 500 mA should be used. Most of the low cost "12 volts DC" unregulated AC adapters deliver 13 or more volts DC to a modest load like the EE-1 so its voltage requirement is satisfied. The AC adapter output plug to fit our jack should have the 5.5 mm/2.5 mm female specification, jack center pin +. These are widely available worldwide. For more complete specifications see our Tech Note P-101.

SPECIFICATIONS

Outputs: Relay contacts (normally closed and normally open) and 0-2 V.
Response time and warm-up: None.
Temperature and humidity range: 5-35 degrees C and 10-95% relative humidity.
Supply voltage required: 12.5-30 VDC or 18-30 VAC 500 mA.
Relay ratings: SPDT non-latching. Contacts: 5 amps at 250 volts AC.
Protection Classifications: IP 52. Enclosure is polycarbonate with 10% glass fill. Front cover is clear polycarbonate, hinged and gasketed.
Size and weight: 125 mm wide, 175 mm high, and 77 mm deep (5" X 7" X 3"). The weight not including shipping materials is 570 grams (1 1/4 lbs.).

PRECAUTIONS

- Read all instructions in this manual.
- Review safety procedures in testing and operating this system.
- Call a qualified electrician if you have any doubts about voltages, wiring, electrical codes and practices, etc.
- Keep the boards and sensor dry. Never let water or other liquids into the system.
- Do not drop the boards. Damage may not be immediately obvious.
- Operate this system in areas of normal room temperature. Operation at extreme temperatures, such as warehouses or refrigerated areas, should only be attempted after testing in the proposed environment for correct and reliable operation.
- Do not attempt to service the instrument yourself.

When in doubt, operate the system at least 24 hours in your worst case environment as a test.

LIMITED WARRANTY

This product is warranted against defects in materials and workmanship for own year following the date of purchase by the first user. This warranty does not include damage to the product as a result of misuse, damage, modifications or alterations, and it does not apply if the instructions in this manual are not followed.

If a defect develops during the warranty period, Eco Sensors at its election will repair the product or replace it with new or reconditioned product of equivalent quality. In the event of replacement with a new or reconditioned product, the replacement will continue the warranty of the original model.

To return this system or any module of it, call your distributor or OEM. OEMs and distributors call Eco Sensors at (800) 472-6626 or e-mail at: sales@ecosensors.com to receive return instructions and a Return Goods Authorization (RGA) number.

Except as provided herein, Eco Sensors makes no warranties, express or implied, including warranties of merchantibility and fitness for a particular purpose. Eco Sensors shall not be liable for loss of use of this instrument or other incidental or consequential damages, expenses or economic loss, or claims for such damage or economic loss.

KEEP THIS MANUAL AND WARRANTY FOR YOUR RECORDS.

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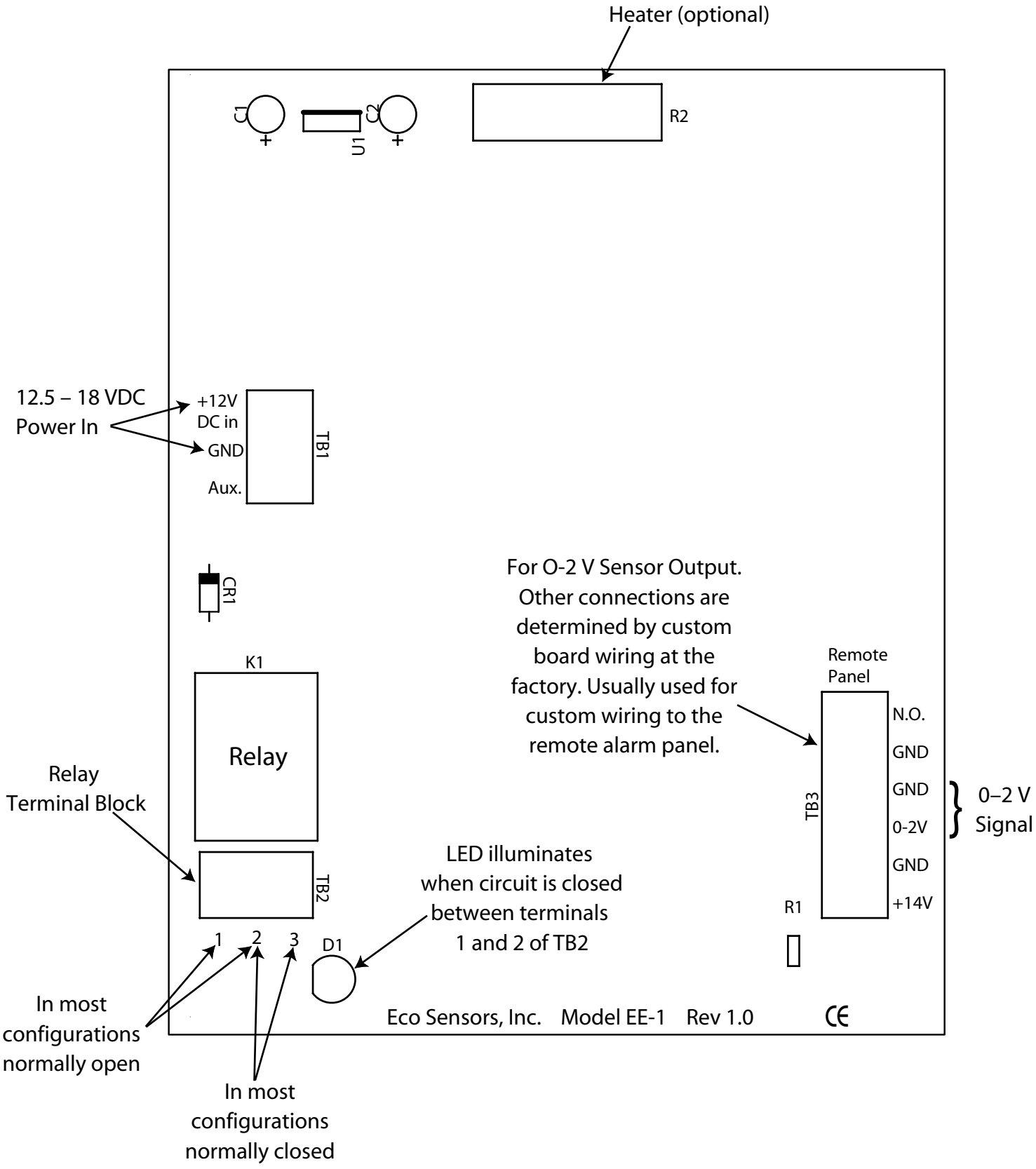
(OVER)

Rev. 11/02

ECO SENSORS, INC. EE-1



CONNECTIONS TO THE CIRCUIT BOARD
ACCESSED BY OPENING THE FRONT PANEL