

# **GUEST<sup>®</sup>**

**Model 2433P**

**GALVANIC ISOLATOR**  
With Status Monitoring



**Installation and Instruction Manual**

## **1. INTRODUCING THE GALVANIC ISOLATOR**

The Guest Model 2433P Galvanic Isolator is installed in your boat, and electrically connected between the boat's AC panel ground and the dockside AC ground wire.

The Galvanic Isolator is designed to permit AC ground currents to pass safely between the boat and the dockside, but to block the small DC currents that can flow in seawater between boats in a marina because different metals on the boats are in the water.

Experience has shown that the different metals (steel vs. aluminum, for example) actually become the electrodes of a battery. The battery fluid is the seawater. A direct electrical connection of your boat's hull ground to the dock ground passes or to the hull of a nearby boat, and becomes a short circuit to the seawater battery. So currents flow between the different metals, and actually cause movement of metal just like a plating bath. You may lose metal off your prop shaft or prop blade because of these currents, or you may suffer accelerated corrosion of some boat parts. If your boat is protected by zincs, they may erode very quickly.

The Galvanic Isolator is a passive device in that it has no control functions, but only serves to block the Galvanic currents between boats. It stops the accelerated corrosion caused by these currents and preserves the usefulness of important boat accessories and zincs.

The Guest Model 2433P includes active Status Monitoring of the internal circuitry and the external ground connections to assure full effectiveness and safety. See section 3 for the circuit description.

A green LED is illuminated when the Status Monitoring determines that both internal and external conditions are safe. A red LED is illuminated when either an internal fault or external shore ground unsafe condition exists.

## **2. INSTALLING THE GALVANIC ISOLATOR**

### **Location**

The Guest Model 2433P Galvanic Isolator should be mounted in the boat hull adjacent to the shore power connector so that no part of the grounding system bypasses the isolator. This location must be ventilated, dry and in an accessible location.

**Mounting**

Hold the case against the bulkhead wall, and mark the slots with a pencil. Drill mounting holes for a #10 screw in the slot areas you have marked. Then mount and fasten the Model 2433P to the bulkhead. Depending upon your boat's construction, you may wish to mount the Galvanic Isolator using either self-tapping screws, or common machine screws, washers and nuts. We recommend using stainless steel #10 fasteners if possible. The case of the Guest Model 2433P is flame-retardant ABS plastic.

**Warning:**

Avoid serious injury or death from electrical shock.  
Before opening panel and installation, turn off AC power supply.

**AC Connections**

The Model 2433P Galvanic Isolator shall be connected in series with the AC grounding system adjacent to the shore power connection. The external tinned copper bars used for the SHORE GND and BOAT GND terminals each accommodate a 1/4" machine screw to clasp ring terminals. Crimp your ground wires (SHORE and BOAT) into suitable ring terminals, and clasp between the brass bolts, nuts and washers provided.

**Tightening Torque:**

200 inch pounds on Boat GND and Shore GND terminals.

**Status Monitoring Connections**

The Model 2433P Galvanic Isolator uses both the boat +12VDC and the shore power AC neutral (white wire) connection for monitoring. Connect these power sources to the 1/4" faston terminals on the case as marked using minimum 16 AWG wire.

### External LED indicators

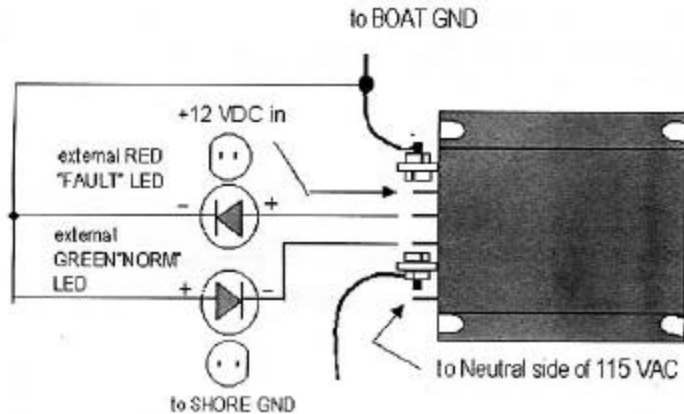
To add external LED indicators to the functioning of the Galvanic Isolator:

1. Determine a location for the LEDs that is readily visible.
2. Determine the length of wire necessary to connect the LEDs from the visible location to the galvanic isolator and cut 2 pieces of 16 AWG black and red wire to that length.
3. Connect the 16 AWG red wire to the anodes of the LEDs and connect 16 AWG black wire to the cathodes of the LEDs.



LED Bottom View

4. Terminate the red wire of the RED LED and the black wire of the GREEN LED with 1/4" faston terminals.
  5. Terminate the black wire of the RED LED and the red wire of the GREEN LED with suitable ring terminals.
  6. Connect the red wire of the RED LED to the FAULT faston tab on the galvanic isolator.
  7. Connect the black wire of the GREEN LED to the NORM faston tab on the galvanic isolator.
  8. Connect both the black wire of the RED LED and the red wire of the GREEN LED to the BOAT GND terminal on the galvanic isolator.
- The LED connection is shown in the diagram on the next page.



The Model 2433P sources a limited current of 10mA on each output for driving remote LED's, or a piezoelectric audio alarm. If replacement LEDs need to be obtained Guest recommends a high-efficiency T-1 3/4 Solid State Green and Red LEDs with diffused lenses rated at 10mA.

### 3. CIRCUIT DESCRIPTION

The Model 2433P Galvanic Isolator has been designed to the full requirements of the American Boat and Yacht Council (A.B.Y.C.) A-28 standard, including the Status monitoring features. The basic ratings include:

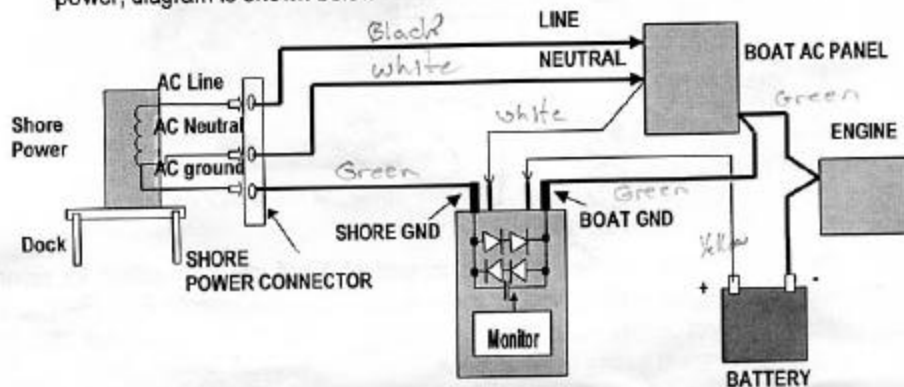
- Rated current of 30 Amps AC continuous @ 50 / 60 Hz;
- AC surge (fault) current of 3,000 Amps;
- DC (Galvanic) blocking of  $\pm 1.1$  VDC at 30 mA, including the effects of a 3 Amp AC test current superimposed;
- Ignition Protected

The internal Status Monitoring features include:

- Checking for open or shorted diode;
- Failure to block galvanic current;
- Circuit continuity of the shore grounding;
- Failure of the status monitoring system.

#### 4. OPERATION OF THE GALVANIC ISOLATOR

The operation of the Galvanic Isolator in blocking the stray currents that are attracted to your boat in the water, while passing the necessary AC currents back to shore power, diagram is shown below



2433P Galvanic Isolator

The diodes block the galvanic currents up to  $\pm 1.1$  VDC, the highest expected voltage for galvanic effects in water. The capacitor permits AC currents to pass safely back to shore.

##### Status Monitoring

The internal Status Monitor continuously checks the proper functioning of the following:

- Diodes
- Capacitor
- Integrity of the external shore ground connection

It reports malfunctions via the red FAULT LED on the case and FAULT output.

The **LED Function Chart** below describes the status monitoring function

Display	Operating condition
Red ● Green ●	When the <b>green LED is on</b> , the 2433P is in fact blocking low voltage DC galvanic current flow while permitting the passage of AC current normally associated with the grounding. If the green LED stays on when AC power is disconnected, refer to Problem 1 in the troubleshooting section in this manual.
Red ● Green ●	When the <b>red LED is on continuously</b> , the 2433P is detecting a fault condition internally to the Galvanic Isolator. If this is the case, refer to Problem 2 in the troubleshooting section in this manual.
Red ● Green ●	When the <b>red LED is blinking on and off</b> , either: <ul style="list-style-type: none"> <li>• The AC power is disconnected, this will also be the case when you are underway because the connection between AC neutral and AC safety ground is open, or;</li> <li>• There is large amount of current in the grounding system.</li> </ul> Note: This may takes a minute to occur the Galvanic Isolator is set to verify functionality every minute. If this is the case, refer to Problem 3 in the troubleshooting section in this manual.

## 5. TROUBLESHOOTING

Problem	Cause	Solution
1. Green LED stays ON even when AC power is disconnected	2. Sensing of the AC neutral and AC safety ground connection.	<ol style="list-style-type: none"> <li>1. Verify that no part of the grounding system bypasses the isolator.</li> <li>2. Verify the AC Neutral connection is in place.</li> </ol>
2. Red LED is ON continuously	1. A fault internal to the galvanic isolator has occurred.	1. Return Galvanic Isolator to the Guest Service Department.
3. Red LED flashes ON and OFF.	<ol style="list-style-type: none"> <li>1. The AC power is disconnected.</li> <li>2. Large amount of current is flowing through the safety ground system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect AC power and verify the green LED turns ON, if so then when AC is disconnected the fault may be ignored.</li> <li>2. Verify that no part of the grounding system bypasses the isolator</li> <li>3. Verify the AC Neutral connection is in place</li> <li>4. Disconnect all appliances connected to AC power on vessel, verify green LED turns ON.</li> <li>5. Contact Guest Service Dept.</li> </ol>
4. Neither of the LED's turn on.	<ol style="list-style-type: none"> <li>1. No BOAT GND or 12VDC connection</li> <li>2. Component failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Connect BOAT GND and 12VDC</li> <li>2. Return Galvanic Isolator to the Guest Service Dept.</li> </ol>



#### **LIMITED WARRANTY**

For one (1) year from the date of purchase, The Guest Co. will at its discretion repair or replace for the original consumer, free of charge, any parts found defective in material or workmanship.

Proof of Purchase is required. A computerized register receipt is required. Hand written receipts are not accepted for warranty proof of purchase.

There is no other expressed warranty. Implied warranties, including those of merchantability and fitness for a particular purpose, are limited to one year from date of purchase. This is the exclusive remedy, and consequential damages are excluded where permitted by law.

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I-25505 Rev. I