

# ANALYTIC SYSTEMS

Power Conversion Solutions

## INSTALLATION & OPERATION MANUAL

### IBI SERIES IDEAL BATTERY ISOLATOR



An ISO9001 Registered Company • Battery Chargers • Inverters • Power Supplies • Voltage Converters

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[www.analyticsystems.com](http://www.analyticsystems.com)



# **IDEAL BATTERY ISOLATOR**

## **IMPORTANT SAFETY INSTRUCTIONS**

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**SAVE THESE INSTRUCTIONS** — this manual contains important safety instructions for the Ideal Battery Isolator

### **IDEAL BATTERY ISOLATOR PRECAUTIONS**

1. Never place the Ideal Battery Isolator directly above a battery; gases produced from the battery will corrode or damage it.
2. Never allow battery acid to drip onto the Ideal Battery Isolator.

### **BATTERY SAFETY**

1. Always wear eye protection while working around batteries.
2. Batteries contain corrosive acid and produce gas as a by-product of their operation.
  - If acid contacts your skin, neutralize it using a paste made from baking soda and water.
  - If acid contacts your eyes, flush them with clean water and seek medical attention immediately.
3. Never work near sparks or open flames, they could ignite the hydrogen gas produced by the battery leading to fire or explosion. Connecting the battery leads is one of the most common causes of sparks.
4. Always work in a well ventilated area to prevent accumulation of battery gases.
5. Remove all metal personal items such as rings, watches, necklaces and bracelets before working with the battery. A lead acid battery can produce a short circuit current high enough to melt metal and cause a severe burn.
6. When working near the battery, another person should be within range to come to your aid if needed.
7. To prevent sparks and arcs and arcs from forming when connecting or disconnecting the battery:
  - When connecting the battery, attach the positive lead before the negative.
  - When disconnecting the battery, detach the negative lead before the positive.



8. Before working, always make sure the unit is turned OFF. Make sure any devices connected to or being powered by the battery are turned OFF.
9. Do not charge or load test a maintenance-free (VRLA) battery if its charge indicator dot is yellow, clear or otherwise indicating insufficient electrolyte.
10. NEVER charge a frozen battery.
11. Use proper adapters to connect the charger leads to side terminal batteries.
12. Be extra careful not to drop a metal tool on to the battery. This can cause a spark or short-circuit leading to fire or explosion.
13. Clean the battery terminals regularly to prevent build up of corrosion. Be careful to keep corrosion from coming in contact with your eyes.
14. Study all the battery manufacturer's specific precautions such as whether to remove cell caps while charging and recommended rates of charge

### **Medical Equipment Notice**

Analytic Systems does not recommend the use of their products in life support applications where failure or malfunction of this product can be reasonably expected to cause failure of the life support device or to significantly affect its safety or effectiveness. Analytic Systems does not recommend the use of any of its products in direct patient care. Examples of devices considered to be life support devices are neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief, or other purposes), auto-transfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators for both adults and infants, anesthesia ventilators, and infusion pumps as well as any other devices designated as "critical" by the U.S. FDA



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## Introduction

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Analytic Systems introduces the updated IBI2/3 series of battery isolators, allowing you to charge 2 bank or 3 bank battery systems from a single alternator. Ideal for automotive, marine or trucking purposes, the IBI also isolates the battery banks using Analytic Systems' Ideal Diode technology preventing a discharged bank from draining a charged one.

Ideal Diode technology uses MOSFET transistors and control circuitry in place of the diode used in traditional battery isolators. By doing so, the IBI is able to operate with a fraction of voltage drop found in diode-based battery isolators. At its maximum rated current the voltage drop is a miniscule 0.16V and essentially zero at low currents. This way, all the power of the alternator is applied to the batteries ensuring a full recharge every time.

A green LED indicator clearly shows that the IBI has been correctly connected.

The IBI is available in two models, the IBI2 for 2 battery banks and the IBI3 for 3 battery banks. The IBI1, a custom high-current single battery bank isolator is also available by special order.

## Box Contents

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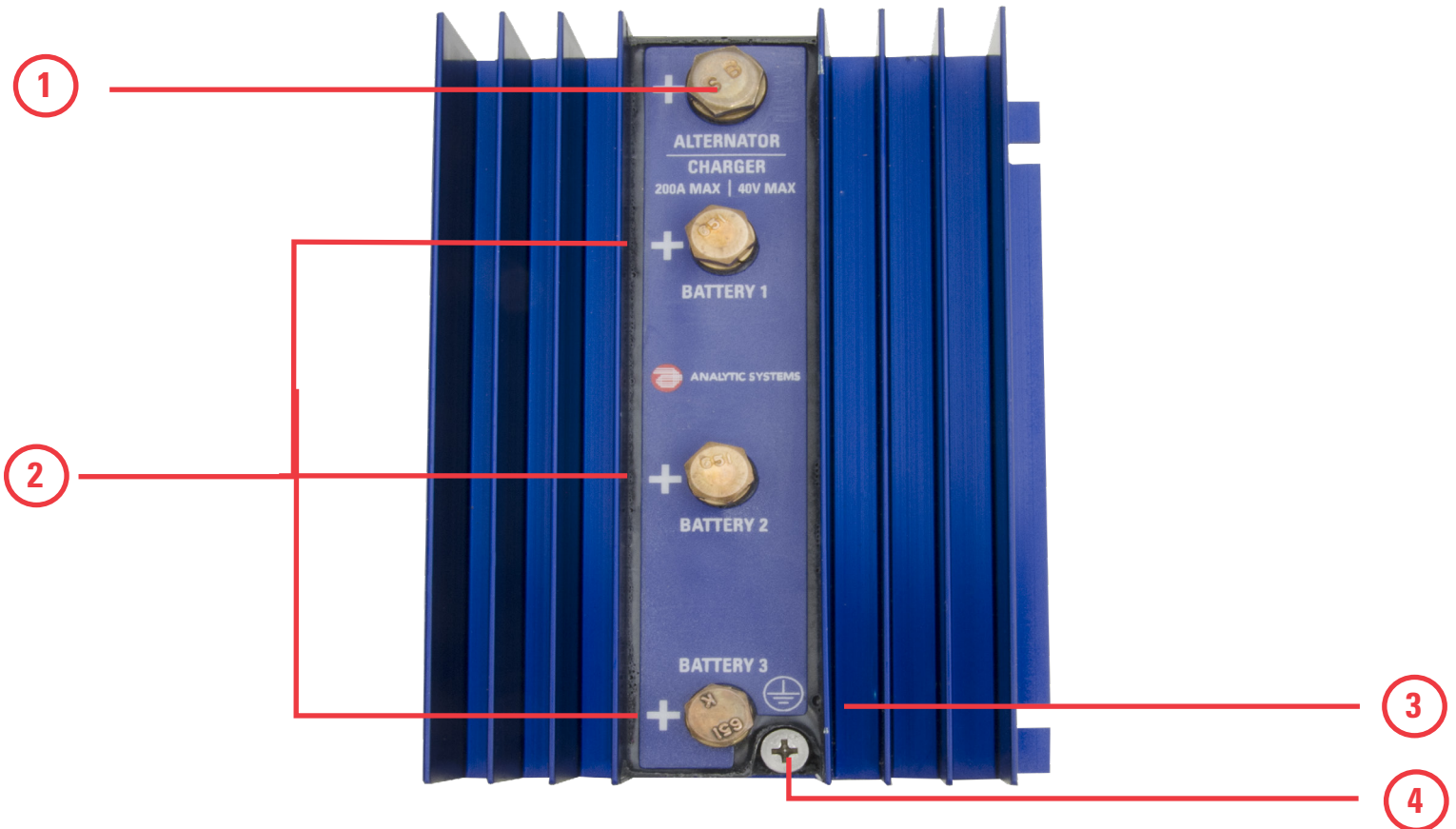
The box you have received should contain the following:

- One IBI Ideal Battery Isolator
- This Manual
- One Warranty Card

*If anything is damaged or missing from your box, please contact your dealer or Analytic Systems for a replacement.*



# Main Parts



Pictured: Top Panel of an IBI3

## Top Panel

- 1. Alternator Positive Connection:** 5/16"-18 Silicon-Bronze Hex Bolt
- 2. Battery Positive Connections:** 5/16"-18 Silicon-Bronze Hex Bolt  
*(On the IBI2 model, there are two connection bolts instead of the three pictured.)*
- 3. Grounding LED:** 3mm LED Green Clear
- 4. Ground Point:** #10-32 Stainless Steel Phillips Screw



# Operation

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## Mounting

Mount the unit in a convenient location between your alternator and battery banks, this location should be clear and unobstructed for running cables between the three.

If mounting on a metal surface, the ground potential of the surface should be the same as the battery negative. On a steel or aluminum boat this may not be the case for electrolysis prevention. In this case, mount the IBI on a plywood board or other non-conductive material. Then mount that non-conductive material to the vessel.

Make sure the screws mounting the IBI to the non-conductive material do not protrude through the bottom of the material.

**CAUTION: All connections must be securely made before starting the engine.**

## Input Connection

The input connection connects the alternator to the battery isolator. To set up this connection:

1. Remove the existing wire from the alternator. Cover the lug with electrical tape or shrink tubing and carefully move it aside. Secure it with a tie wrap.
2. Prepare a cable with a 5/16" ID lug on one end of the cable (End A). On the other end, attach a lug suitable for connection with your alternator (End B)
3. Connect the End A of the cable to the Alternator Positive Connection. Connect End B of the cable to your alternator.

## Output Connection

The output connection connects the battery isolator to the battery banks. To set up this connection:

For each battery bank:

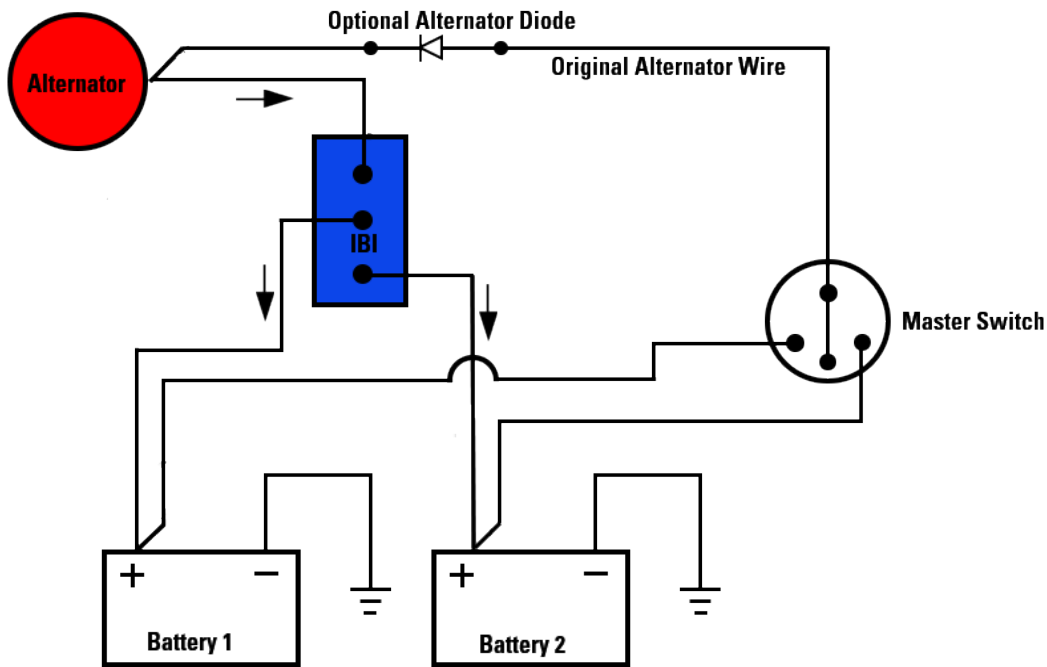
1. Prepare a cable with a 5/16" lug on one end (End A) . On the other end, attach a connector suitable for the positive terminal of the battery bank (End B)
2. Connect End A to one of the **Battery Positive Connections**.
3. Connect End B to the positive terminal of the battery bank. Battery 1 connects to the HOUSE BANK and Battery 2 or 3 (IBI3 model) connects to the ENGINE STARTING BATTERY
4. Connect the negative terminal of the battery bank to the ground.



## Ground Connection

The IBI uses a ground reference to operate its control circuitry which it reads through the Ground Connection. To set up this connection:

1. Prepare an AWG18 wire with a #10 lug on one end.
2. Connect this end of the wire to **Ground Point**.
3. Connect the other end of the wire to the battery negative terminal or directly the engine block. If the ground is properly connected, the **Grounding LED** will be illuminated. This is a very high efficiency LED that requires only 1 milli-amp from 12 volts so it will never discharge the battery.



## Ignition (IGN) Connection

The Ignition (IGN) Connection is an optional connection done by the installer. If you read a normal charging current from your alternator to the battery banks after installing the IBI then you do not need to make this connection.

If there is no charging current after installing the IBI, you may need to make an Ignition Connection. Simply attach the original charging wire back to the alternator using a commonly available industrial axial leaded diode such as a 1N4001 with the cathode (bar end) facing the alternator. The diode will apply voltage from the battery to the alternator so it will start.





# Specifications

<b>Input</b>	<b>IBI2-40-200</b>	<b>IBI2H-40-280</b>	<b>IBI3-40-200</b>
Input Voltage	10-40 VDC for 12, 24, 28 or 32V Battery Systems		
Input Current	0-200A (Cont.)	0-280A (Cont.)	0-200A (Cont.)
Battery Banks	2	2	3
Voltage Drop	0.16V @ Max Current		

## Mechanical

Length	6.0 in / 15.2cm
Width	4.8 in / 12.2cm
Height	2.6 in / 6.6cm
Clearance	1.0 in / 2.5cm all around
Weight	2.0 lb / 0.9kg
Material	Marine Grade Aluminum
Finish	Black, Blue or Red Anodize/Epoxy Potting
Connections	Alternator: 5/16" -18 Silicon Bronze Hex Bolt Battery Positive: 5/16" -18 Silicon Bronze Hex Bolt Ground Connection: #10-32 Stainless Steel Phillips Screw
Fasteners	Silicon-Bronze

## Environmental and Safety

Temperature Rise	<40 °C@ 200A or 280A Continuous
Water and Dust Protection	Sealed unit
Isolation	None - Heat sink is bonded to Battery Negative
Warranty	Three years parts and labor





## Limited Warranty

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1. The equipment manufactured by Analytic Systems Ware (1993) Ltd. (the "Warrantor") is warranted to be free from defects in workmanship and materials under normal use and service.
2. This warranty is in effect for:
  - a. 3 Years from date of purchase by the end user for standard products offered in our catalog.
  - b. 2 Years from date of manufacture for non-standard or OEM products
  - c. 1 Year from date of manufacture for encapsulated products.
3. Analytic Systems will determine eligibility for warranty from the date of purchase shown on the warranty card when returned within 30 days, or
  - a. The date of shipment by Analytic Systems, or
  - b. The date of manufacture coded in the serial number, or
  - c. From a copy of the original purchase receipt showing the date of purchase by the user.
4. In case any part of the equipment proves to be defective, the Purchaser should do the following:
  - a. Prepare a written statement of the nature of the defect to the best of the Purchasers knowledge, and include the date of purchase, the place of purchase, and the Purchasers name, address and telephone number.
  - b. Call Analytic Systems at 800-668-3884 or 604-946-9981 and request a return material authorization number (RMA).
  - c. Return the defective part or unit along with the statement at the Purchasers expense to the Warrantor; Analytic Systems Ware (1993) Ltd., 8128 River Way, Delta, B.C., V4G 1K5, Canada.
5. If upon the Warrantor's examination the defect proves to be the result of defective material or workmanship, the equipment will be repaired or replaced at the Warrantor's option without charge, and returned to the Purchaser at the Warrantor's expense by the most economical means. Requests for a different method of return or special handling will incur additional charges and are the responsibility of the Purchaser.
6. Analytic Systems reserves the right to void the warranty if:
  - a. Labels, identification marks or serial numbers are removed or altered in any way.
  - b. Our invoice is unpaid.
  - c. The defect is the result of misuse, neglect, improper installation, environmental conditions, non-authorized repair, alteration or accident.
7. No refund of the purchase price will be granted to the Purchaser, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so.
8. Only the Warrantor shall perform warranty service. Any attempt to remedy the defect by anyone else shall render this warranty void.
9. There shall be no warranty for defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment specifically stated to be waterproof.
10. No other express warranty is hereby given and there are no warranties that extend beyond those described herein. This warranty is expressly in lieu of any other expressed or implied warranties, including any implied warranty of merchantability, fitness for the ordinary purposes for which such goods are used, or fitness for a particular purpose, or any other obligations on the part of the Warrantor or its employees and representatives.
11. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives for injury to any person or persons, or damage to property, or loss of income or profit, or any other consequential or resulting damage which may be claimed to have been incurred through the use or sale of the equipment, including any possible failure of malfunction of the equipment, or part thereof.
12. The Warrantor assumes no liability for incidental or consequential damages of any kind




DESIGNED AND MANUFACTURED BY



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