ANALYTIC SYSTEMS

Power Conversion Solutions

INSTALLATION & OPERATION MANUAL

BCA150
AC SOURCE
BATTERY CHARGER

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

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AC SOURCE BATTERY CHARGER IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS — This manual contains important safety and operating instructions for the battery charger.

BATTERY CHARGER PRECAUTIONS

1. Do not expose the battery charger to rain or snow unless it is a sealed model.
2. Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of □re, electric shock, or injury to persons.
3. Do not disassemble the battery charger; return it to the manufacturer or an authorized service center when service or repair is required. Incorrect reassembly may result in a risk of electric shock or □re. Voltages in excess of 350 volts are present inside the charger anytime it is plugged into an AC outlet, even if it is switched off.
4. To reduce risk of electric shock, unplug the battery charger from the AC outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
5. Never place battery charger directly above battery; gases from battery will corrode and damage battery charger.
6. Never allow battery acid to drip on the battery charger.

BATTERY SAFETY

1. WARNING — RISK OF EXPLOSIVE GASES
   i. WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPORTANCE THAT EACH TIME BEFORE SERVICING EQUIPMENT IN THE VICINITY OF THE BATTERY, YOU READ THIS USER GUIDE AND FOLLOW THE INSTRUCTIONS EXACTLY.
   ii. To reduce risk of battery explosion, follow these instructions and those published by the battery manufacturer and manufacturer of any equipment you intend to use in vicinity of battery. Review the cautionary marking on these products.
2. PERSONAL PRECAUTIONS
   i. Someone should be within range of your voice or close enough to come to your aid when you work near a battery.
   ii. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
   iii. Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
   iv. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately □ood eye with running cold water for at least 10 minutes and get medical attention immediately

i. NEVER smoke or allow a spark or flame in the vicinity of a battery.

ii. Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit the battery or other electrical part that may cause a fire or explosion.

iii. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can produce a short- circuit current high enough to melt metal, causing a severe burn.

iv. NEVER charge a frozen battery.

v. If it is necessary to remove a battery from service, always remove grounded terminal from battery first. Make sure all accessories connected to the battery are off, to prevent an arc when reconnecting the new battery.

vi. Be sure area around battery is well ventilated.

vii. Clean the battery terminals. Be careful to keep corrosion from coming in contact with eyes.

viii. Study all the battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge

GROUNDING AND AC POWER CORD CONNECTION INSTRUCTIONS

The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER Never alter the AC power cord or plug provided. If it will not fit the output, use an approved adapter or have the proper AC power cord installed by a qualified electrician. Improper connection can result in the risk of electric shock.

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

The BCA150 AC-source battery charger provides up to 150 watts of precision charging power to charge your one or two bank battery system. The batteries must share a common ground.

This unit features advanced Power Factor Correction circuitry on the AC input to use the electricity in the most effective and ef□cient way possible and will work from any standard AC voltage worldwide (85-265 VAC). The recently updated single board design incorporates modern switch-mode technology for unmatched ef□ciency and ultra-quiet operation. In the absence of a battery, the BCA150 can also function as a power supply up to its continuous current rating.

Designed for maximum safety, unit's reliability features include spark-free battery connections reverse battery connection protection, over temperature shutdown with automatic recover and both input and output fuses Additional features include a drip shield for wall mounting and visual indicators for the presence of AC power as well as charging progress.

Box Contents

The box you've received should contain the following:

- One BCA150 battery charger
- One IEC320 AC cable
- 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

Front Panel

1. Output Voltage Adjust
2. **AC Input Connection:** Bulgin IEC320 Flange Mount Inlet 6.3mm
3. **DC Output Connections:** 2 sets Phoenix VDFK4 Terminal Blocks (Red and Black)
4. Chassis Grounding Screw

Top Panel

1. Lighted Power Switch
2. Power Indicator LED
3. Drip Shield
4. Integrated Digital Voltmeter
5. Load Indicator LEDs (Output 1&2)

Operation

The BCA150 is designed for simple and intuitive operation. Before operating the charger, it must be properly connected to a source of AC Power and to the batteries as shown in *Installation.*

Charging a battery

1. Move the Power Switch to the ON position.
2. The Power LED will glow green indicating that the unit is powered ON. The Output LED(s) will also glow corresponding to the charge of the battery. See *LED Indicators*.
3. Once the batteries are fully charged, the Output LED will glow green. The unit will maintain the batteries at the oat voltage as long as they connected.
4. You can check the battery's charge using a voltmeter or multimeter at the battery.

Adjusting the charging voltage

The charging voltage can be adjusted over a range of ±0.6V (±1.2V for the 24V model) to suit your speci c charging needs. To adjust the charging voltage:

1. Using a small at-blade screwdriver rotate the Output Voltage Adjust potentiometer. Rotate clockwise to increase the output voltage.
2. Rotate it counterclockwise to decrease the output voltage.
3. You can check the charging voltage using the integrated digital voltmeter.

LED Indicators

The BCA150 features several indicator LEDs on its top panel to display the unit's operating condition. Their meanings are detailed below.

POWER:

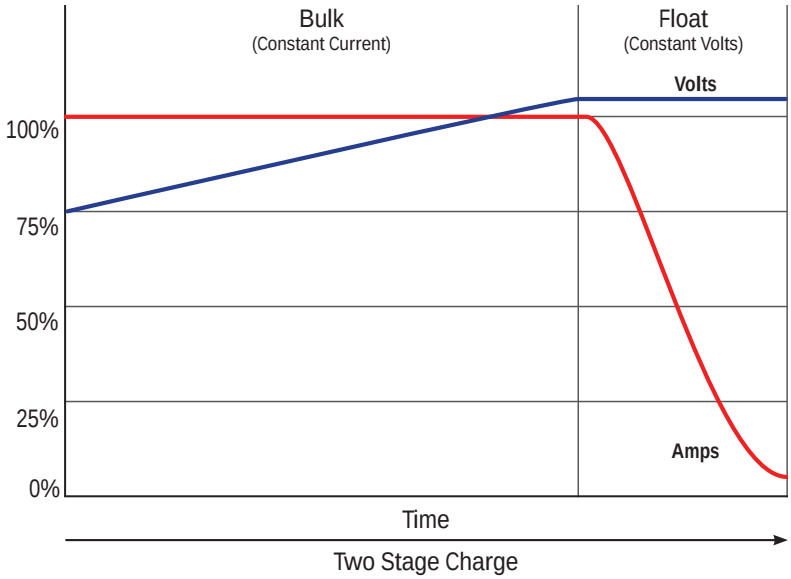
This LED glows green when the unit is connected to an AC power source and energized.

OUTPUT 1 & OUTPUT 2:

These LEDs indicate what stage of charging that the connected battery is undergoing.

- If the LED is glowing red, the battery is in the Bulk stage of the charging cycle.
- If the LED is glowing yellow, the battery is in the Float stage of the charging cycle.
- If the LED is glowing green, the battery is completely charged. The unit will maintain the battery in this state as long as it is connected, so it always ready for service.

Two-Stage Charging



The BCA150 charges batteries using either a two-stage charging pro□le. A two-stage charging pro□le occurs in two stages.

During the bulk stage, the battery draws a constant current (Output Current) from the charger. This causes the battery's voltage to rise until □nally reaching a voltage slightly higher than the battery's rated capacity, the □oat voltage. The □oat voltage is higher than the rated voltage to compensate for the characteristic discharge of idle batteries.

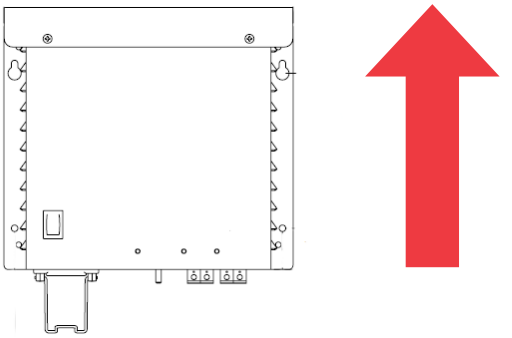
Then during the □oat stage, the battery is held at the □oat voltage the current reduces as necessary to maintain it at this voltage. The battery can be left connected to the charger inde□-nitely, which will maintain it.

A two-stage charger is recommended in most instances (over a three-stage charger) since it is the most versatile. The battery is also subjected to lower voltages than in three-stage charging and therefore is less stressed. In addition, a reasonable load can be put on the battery without altering its ability to keep the battery at full charge.

Installation

Mounting

Mount the unit in a WELL VENTILATED and DRY area with at least one inch (2.54 cm) of clearance around the extruded vents. The unit should be mounted on a vertical surface with the drip shield facing upward as shown below.



AC Input Connection

This unit is equipped with a 3-pin Bulgin AC Inlet (6.3mm) Tab Flange Mount to serve as an AC input connection. Your unit is supplied with an IEC320 cable for connection to an AC power source, if the supplied cable does not □t your AC receptacle, any other IEC320 cable can be used.

DC Output Connection

This unit is equipped with two sets of Phoenix VDFK block connectors to serve separate DC output connections. Connect the batteries to this connection using an appropriate gauge of wire for the current (see *Specifications* for more information). These connections are wired as follows:

RED: **Positive Battery Terminal**
BLACK: **Negative Battery Terminal**

These connections can be used to charge up to two battery banks simultaneously. If charging a single battery, connect the positive terminal of that battery to **both** positive DC outputs, this will reduce strain on the connection.

Fuse Replacement

This unit features reverse battery connection protection. In the event that a battery is connected in reverse polarity, the output fuses will blow to prevent damage to unit from erroneous current.

1. Loosen and remove the 8 screws located on the vented side panels. (There are 4 screws on each side.)
2. Loose and remove the 2 screws securing the drip shield to the top panel.
3. Slide the top panel free from the bottom panel.
4. Locate the blown fuses, found on the back front panel circuit board. They are directly behind the DC Output connections.
5. Replace the fuses with suitable replacements. For more information on the make and model of the output fuses, see Speci□cations.
6. Return the top panel to its original position and insert and tighten and 8 side panel screws.
7. Return the drip shield to its original position and insert and tighten the 2 screws.

Troubleshooting

In the event that your unit is not operating normally, the table below can be used to troubleshoot the cause of the problem and recommend the next course of action.

Issue:	**The output fuse(s) immediately blow when the unit is turned ON.**
Check:	The battery is likely connected in reverse polarity and the output fuses have blown to protect the unit from erroneous current. To replace the output fuses, see *Fuse Replacement.*
Issue:	**The input fuse has blown during operation**
Check:	The design of the unit makes it impossible to supply an input over current by conventional means. Usually the input fuses blowing means there is an internal component failure and the unit must be returned for repair.
Issue:	**The unit keeps turning OFF.**
Check:	Check the temperature of the unit. If the unit is running above its operating temperature range, its thermal derating may cause it to turn OFF. If the unit feels signi□cantly hot, improve the air circulation around the unit.
Issue:	**The unit will not turn ON.**
Check:	Check the input AC power source, make sure it is supplying a suitable voltage and current to the unit. Check the input connections, make sure they are connected and undamaged. If there are no issues with the input, the cause is likely an internal component failure and,the unit must be returned for repair.

Specifications

Input	
Unit Model	BCA150
Voltage	85-265 VAC
Current	3A (Max @ 90 VAC in)
Power Factor	>0.98 at full load (>0.86 @ 400Hz)
Input Frequency	45 - 405 Hz
Noise on Input	< 50 mV

Output		
Nominal Voltage	12 VDC	24 VDC
Float Voltage	13.4 ± 0.6 VDC	27.6± 1.2 VDC
Charging Current	12A	6A
Output Fuse	ATL-15	ATL-8
Duty Cycle	Continuous	
Efficiency	> 90% @ Maximum Output	
Charging Stages	2	
Number of Battery Banks	1 or 2	

Mechanical	
Dimensions	8.0 in/20.3 cm Long x 8.8 in/22.4 cm Wide x 2.2 in/5.6 cm High
Clearance	1.0 in/2.5 cm all around
Weight	3.6 lb / 1.6 kg
Mounting	Wall Mount (with Drip Shield)
Material & Finish	Marine Grade Black Powdered Aluminum with 18-8 Stainless Fasteners
Connections	AC Input - 3-pin IEC320 AC Inlet (6.3mm) Tab Flange Mount DC Output - 2x Phoenix VDFK4 Terminal Blocks (Red and Black)

Environmental and Safety	
Operating Temperature Range	-25°C to +40°C @ maximum output.
Humidity	0 - 95% Relative Humidity (non-condensing) with standard conformal coating
Isolation	Input-Case & Input-Output, Output-Case: 1500VDC
Emissions	Meets FCC Part 15, Class B
Safety	Built to meet CE, UL458 and CSA 22.2.107.1
Typical Service Life	> 10 years (87,600 hrs)
Warranty	Three years parts and labor

* Specifications subjects to change without notice.

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Limited Warranty

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, identi□cation 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 speci□cally 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, □tness for the ordinary purposes for which such goods are used, or □tness 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 pro□t, 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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