



ANALYTIC SYSTEMS

Power Conversion Solutions

INSTALLATION & OPERATION MANUAL

BCH10W & BCH10Y 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 fire, 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 fire. 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 flood eye with running cold water for at least 10
 - v. minutes and get medical attention immediately.



- vi. NEVER smoke or allow a spark or flame in the vicinity of a battery.
- vii. 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.
- viii. 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.
- ix. NEVER charge a frozen battery.
- x. 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.
- xi. Be sure area around battery is well ventilated.
- xii. Clean the battery terminals. Be careful to keep corrosion from coming in contact with eyes.
- xiii. Study all the battery manufacturer's specific precautions such as removing or not removing 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

The BCH10W Step Down series of Battery Chargers supply up to 10 amps of charging current at 12, 24, 36 or 48 volts from any higher voltage between 20 and 80 volts DC in an IP66 rated watertight and EMC shielded enclosure for use in automotive, heavy equipment, marine, industrial, rail or alternative energy environments. The output voltage is configured to allow permanent connection to the battery.

The standard BCH10W model offers a Deutsch connector on a pigtail input/output cable and is designed to be water resistant to IP66.

The BCH10Y is an upgraded version with the same connections that is individually tested to meet IP67.

The all surface mount high frequency design offers higher reliability, higher efficiency (more than 91%), more power (up to 544 watts at 48 VDC Out) and minimum size. Two LED indicators show the presence of input power, and when the unit is charging (output current is greater than 2 amps).

The unit has reverse input protection, reverse battery connection protection, output overvoltage protection and features spark free connection to the battery. Smart Ideal Diode output circuitry prevents any reverse current flowing from the battery back into the converter.



Main Parts



Front Panel

1. Deutsch DT04-4P Input/Output connector on pigtail
2. Input Power Good LED
3. Charging LED



Operation

To turn the unit on, simply turn on your source of power. The Input Power LED will illuminate to indicate the presence of input power.

The BCH10 will immediately begin charging the battery. When the unit is first turned on, it will charge the batteries at a constant current and the charging light will be on. After a period of time, which may be minutes to hours, the batteries will reach the float voltage and the charging current will begin to drop. When the current falls to 10% of the rated charging current, the charging light will go off, and the charger will maintain the batteries at the float voltage. You may check this voltage at the battery with a good digital voltmeter. As shipped from the factory, the unit is preset to the float voltage listed in the specifications, which is generally recommended for lead-acid batteries.



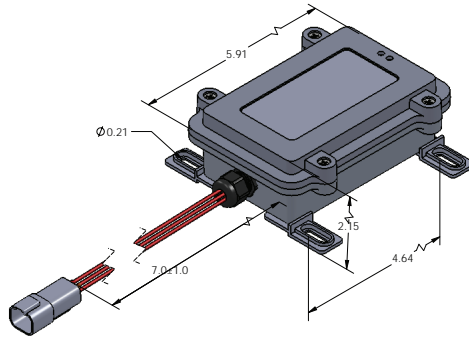
Installation

Mounting

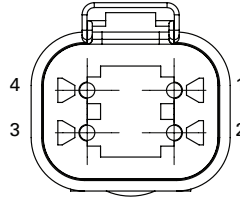
Mount the unit and allow at least 1 inch of clearance for adequate cooling.

Input and Output Connections

This unit is equipped with a watertight gland and short 4 conductor pigtail terminated with a Deutsch DT04-4P connector. The mating connector is also supplied, but without cable. The plug pin out is shown in the table below.



PIN NAME	DESCRIPTION
1	POSITIVE INPUT (red)
2	NEGATIVE INPUT (black)
3	NEGATIVE OUTPUT (black)
4	POSITIVE OUTPUT (orange)



Connect the input pins to the power source, and the output pins to the load, making sure to observe the correct polarity of the connections. If the input is connected in reverse, the protection fuse will blow, and must be replaced by the dealer or an electronics technician.



ROHS (European) Option (E Option)

Consistent with military standards, this unit is normally manufactured using lead based solder. However, this unit can be built to ROHS lead free standards, identified internally by a red colored printed circuit board by adding the E option. This is a no charge option, but can add 2-4 weeks to the delivery of an order.

IP67 (Waterproof Tested) Option (Y Option)

This is the same unit as the VHC10W, except each unit is individually tested to comply with the IP67 rating of withstanding 1 meter immersion for 30 minutes with no ingress of moisture.

Troubleshooting

This unit provides LED indicators to help diagnose any problems.

CHARGING	Indicates that the battery charger is charging the batteries: If the LED is not on, the batteries may be fully charged and the charger is supplying a float voltage to the batteries to keep them fully charged.
INPUT POWER	Indicates that power is being received by the unit If the LED is not on, check with a voltmeter that there is power at the connections. Check that the polarity is correct, Positive to Pin 1 and Negative to Pin 2. If the power is reversed, the unit is not damaged, but the input fuse must be replaced by a service technician experienced in Surface Mount Technology.

Specifications

Input Voltages					
MODEL	BCH10W(Y)-12	BCH10W(Y)-24	BCH10W(Y)-32	BCH10W(Y)-36	BBCH10W(Y)-48
Input Volts	20 - 80 VDC	30 - 80 VDC	40 - 80 VDC	45 - 80 VDC	60 - 80 VDC

Output Voltages					
Output Volts Nominal	12 VDC	24 VDC	32 VDC	36 VDC	48 VDC
Actual Volts	13.6 VDC	27.2 VDC	36.3 VDC	40.8 VDC	54.4 VDC
Output Amps	10 Amps Continuous				
Dissipation	12 Watts				
Efficiency	91.9%	95.8%	96.8%	97.1%	97.8%

Electrical	
Input Ripple and Noise	<100 mV Peak to Peak
Output Ripple and Noise	< 50 mV Peak to Peak
Transient Response	<300 mV for 50% Load Step Change
Regulation (Line & Load)	< +/- 0.5%
Emissions	Meets MIL-STD-461F

Mechanical	
Dimensions	6.20 in / 15.8 cm Long x 4.91 in / 12.5 cm Wide x 2.15 in / 5.5 cm High
Clearance	1.0 in / 2.5 cm all around
Weight	0.62.0 lb / 0.28 kg
Material and Finish	Diecast Aluminum with O-Ring and EMC Gaskets, Black Powder Coat Finish
Mounting	Wall or shelf mount
Connections	BCHW - Deutsch DT04-4P on 15cm Pigtail; Mating Connector Included
Shock and Vibration	Designed to meet MIL-STD-810G

Environmental and Safety	
Operating Temperature Range	-40°C to +55°C @ maximum output
Humidity	0 - 95% Relative Humidity (non-condensing) with standard conformal coating
Ingress Protection	W versions - Built to meet IP66, Y versions - tested to meet IP67
Audible Noise	NONE 0db @ 3ft
Typical Service Life	> 10 years (87,600 hrs)
Isolation	Any input or output to case (1500 VDC) Input to output - common negative
Warranty	Two years parts and labor
Safety	Built to meet CSA 22.2.107.1 & UL458