

HI-EFFICIENCY BATTERY CHARGER



FEATURES

- **Very high efficiency, up to 92.4% (see charts)**
- **Wide operating voltage range (170-305VAC)**
- **LED status indicator**
- **Low power consumption at no-load mode**
- **Green mode operation**
- **Output short circuit and overload protection**
- **High temperature protection**
- **2 stage charging for continuous connection**
- **Rectifier fail output**
- **Wide operating temperature range**
- **Low output ripple & noise**
- **Low line and load regulations**
- **DIN rail mounted, small dimensions**
- **Low weight**

BC-4A-P

12/24V AUTOSELECT

4.0 AMPERES

170-305 VAC

DESCRIPTION

BC-4A-P series are state of the art low cost battery chargers featuring very high efficiency and low cost in a compact DIN rail mounted plastic package.

Chargers are designed to withstand high levels of disturbances found in the harsh automotive environment.

Chargers are practically impossible to destroy, having overload, short circuit and high temperature protections. The overload protection is current limiting type, not hiccup.

Hiccup protected chargers will turn-off in case of overload and will be incapable of charging an empty battery with their rated current. In case of a short circuit or overload condition, the BC-4A-P charger does not shut-off, and delivers simply the rated current, allowing a full-speed charge of an empty battery.

In case of overheating, the charger will automatically reduce its output current and continue normal operation.

Chargers offer automatic battery voltage detection. Thus, the same module operates at 12V or 24V without the need of a manual selection, removing human errors.

BC-4A-P chargers have 170-305V input voltage range, enabling the use in most countries with nominal voltages ranging from 220VAC to 277VAC. The nominal output is fully available at all 170-305VAC range without derating.

Chargers offer green mode of operation. The green mode consists on reducing the operating frequency when the load decreases. Thus, chargers reduce their losses helping protection of the environment. At very small loads, they enter into a burst mode to reduce the consumption further.

Chargers feature very low power consumption at no-load mode, helping again the protection of the environment.

The peak efficiency of chargers exceeds 92%, resulting in lower long-term operational costs. As an example, compared to a 24V/4A charger of 85% efficiency, with 30% average load and 20 years of operational life, BC-4A-P will consume 500 kW-hour less electrical energy. This leads approximately to 50 USD less energy expense per charger.

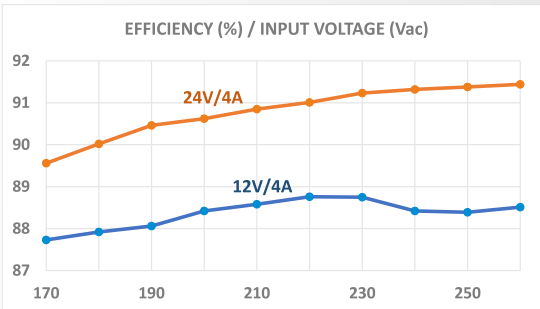
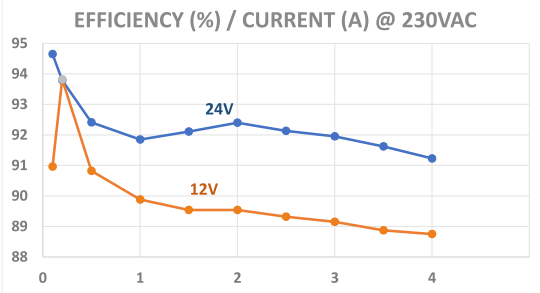
The rectifier fail output is capable of transmitting the operational status to a control module which will give an alarm in case of failure.



CE EAC RoHS

 **DATAKOM**

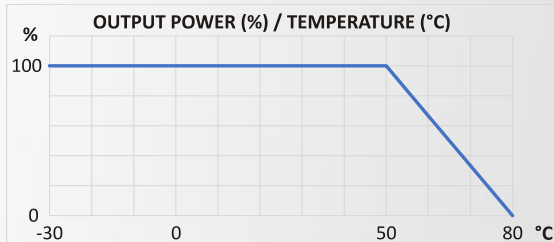
EFFICIENCY CHARTS



AUTOMATIC POWER DERATING

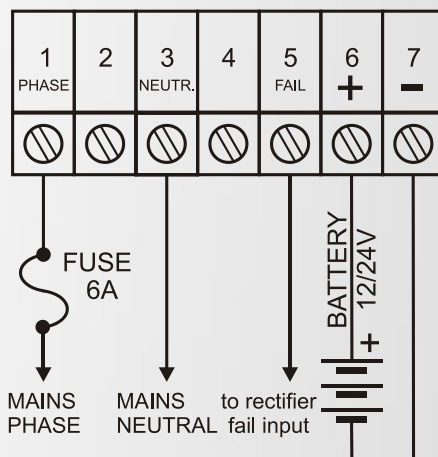
The charger is capable of delivering its full power continuously from -30°C (-22°F) to $+50^{\circ}\text{C}$ (122°F).

Above 50°C , below derating curve is automatically applied.



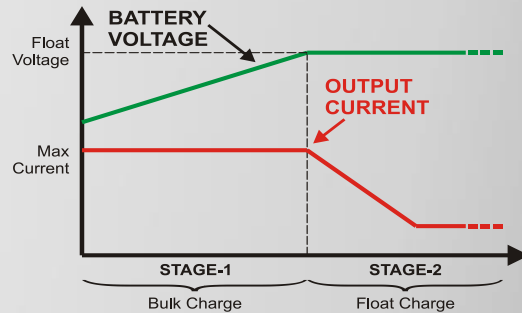
Thus if the charger is forced to operate in an environment above $+50^{\circ}\text{C}$, it will simply reduce its output power to the corresponding value in the above chart and continue normal operation.

CONNECTION DIAGRAM



2-STAGE CHARGING

If the battery voltage is below the nominal voltage (V_0) then the unit is in the bulk charge stage and it delivers continuously its nominal output current (I_0). Thus, the missing charge in the battery will be completed quickly. When the battery voltage reaches the float level, the unit switches to float charge mode where the output voltage is constant (V_0), providing maximum battery life without overcharging or gassing.



TECHNICAL SPECIFICATIONS

Technology: Switchmode, flyback 65 kHz

Output voltage (V_0): autoselect, 13.50 or 27.00 VDC

Output current (I_0): 4.0 ADC (continuous)

Input voltage range: 170-305 VAC (220-277V nominal)

Input current: 1.7 ARMS max. (@170 VAC)

Input frequency range: 45-68 Hz

Cooling: natural convection

Maximum input power: < 125 Watts

Peak Efficiency: > 92% (230VAC, 24VDC)

Output power: 108 Watts max continuous,

No load power: < 0.3W @ 230VAC/24VDC
< 0.15W @ 230VAC/12VDC

Output ripple: < 0.5% of V_0 (peak-to-peak)

Output noise: < 40mV RMS

Load regulation: < 0.5% of V_0

Line regulation: < 0.01% of V_0

Warm-up voltage: < 0.5% of V_0

Overshoot: < 3% of V_0 (@100% to 0% load change)

Current consumption from battery: < 10mA

Overload protection: limits output current to 4A

Short circuit protection: limits output current to 4A

Short circuit duration: unlimited

High temp. protection: limits internal temp. to 85°C

Rectifier fail output: negative pulling transistor, 270 ohms serial impedance

Isolation: Input-output: 3300 VAC

Input-ground: 1650 VAC

Output-ground: 1650 VAC

Operating temperature range: -30°C to $+80^{\circ}\text{C}$

Storage temp. range: -40°C to $+80^{\circ}\text{C}$

Max relative humidity: 95% (non condensing)

Dimensions: 70mm(W) x 99mm(H) x 60mm(D)

Weight (approx): 210 grams

Protection degree: (EN60529): IP30

Case material: Flame retardant ABS/PC, UL94-V0

Electrical connections: two part connector, 2.5 mm²