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POWER THE FUTURE

BAC-D SERIES DIN-RAIL MOUNTED CHARGERS

User Manual 26V1.0



1 Product Overview

The BAC-D series represents advanced battery chargers, featuring a compact, DIN-rail-mountable plastic enclosure that combines high energy efficiency with cost-effectiveness. It incorporates protection against overload, short circuit, high temperature, and reverse battery connection. The overload protection is current-limiting rather than intermittent—intermittent protection would shut down the charger during overload, preventing the charging of a discharged battery at the rated current.

In the event of a short circuit or overload, the BAC-D charger does not shut down but merely limits the output current to the rated value, enabling rapid charging of discharged batteries.

When overheating occurs, the charger automatically reduces the output current while continuing normal operation.

It supports automatic detection of battery voltage, allowing it to adapt to 12V or 24V systems without manual selection. If the voltage at the output terminals is lower than 18VDC, the charger operates in 12V mode; if the voltage is higher than 18VDC, it switches to 24V mode. The input voltage range is 100-280VAC, covering 220VAC to 277VAC regions worldwide.

The green mode reduces losses by lowering the operating frequency under light loads, and enters pulse mode under extremely light loads to further cut power consumption. The no-load mode features ultra-low power consumption, contributing to environmental protection.

The charger fault output can drive a relay or transmit status signals to a control module.

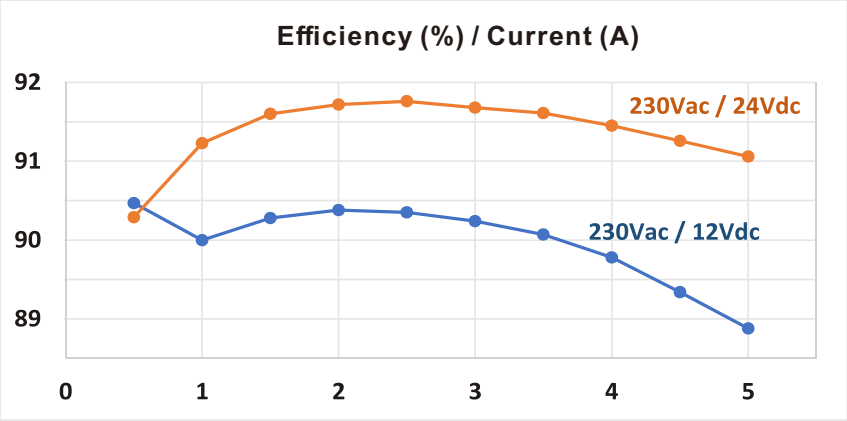
2 Product Functions

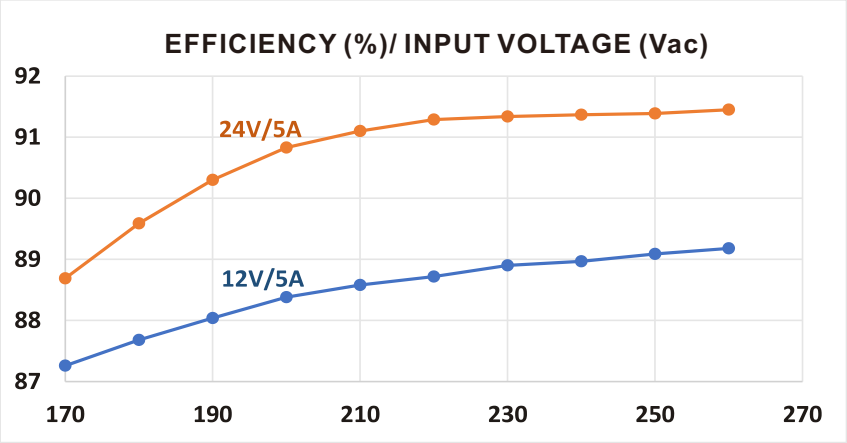
- Extremely high efficiency, up to 91.6%
- Wide operating voltage range (100-280VAC)
- Reverse Battery Connection Protection
- LED Status Indicator
- Low power consumption in no-load mode
- Green Mode Operation
- Output Short-circuit and Overload Protection
- High-temperature Protection
- Lightweight
- DIN-rail mounted, compact in size
- Charger Fault Output
- Wide Operating Temperature Range
- Low Output Ripple and Noise
- Low Line and Load Regulation
- Two-stage charging, supporting continuous connection

❸ Technical Parameters

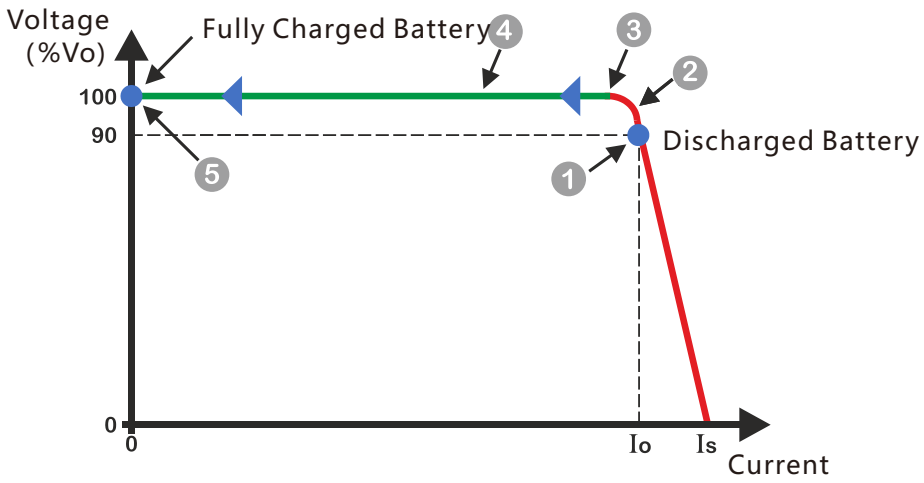
Output Voltage (Vo)	Auto-switching, 13.50 or 27.00 VDC
Output Current (Io)	5.0 5.0 ADC (Continuous)
Input Voltage Range	170-300 VAC (Nominal Values: 220-277V)
Input Current	Maximum 2.1 ARMS (at 170 VAC)
Input Frequency Range	45-68 Hz
Maximum Input Power	< 160W
Peak Efficiency	> 91.5%（230VAC，24VDC）
Output Power	Maximum Continuous Output: 135 W
No-load Power	〈 0.3W@230VAC/24VDC < 0.15W @ 230VAC/12VDC
Overload Protection	Limits the output current to 5A
Short-circuit Protection	Limits the output current to 5A
Short-circuit Duration	Unlimited
High-temperature Protection	Limits the internal temperature to 85°C
Operating Temperature Range	-30°C to +80°C
Storage Temperature Range	-40°C to +80°C
Maximum Relative Humidity	95% (non-condensing)
Dimensions	77.5(W) x 92(H) x 61(D) mm
Protection Rating	(EN60529 Standard): IP20
High-temperature protection enables the equipment to operate with reduced power continuously in the following scenarios	• Environments with a maximum ambient temperature of 80°C • Severe blockage of the control cabinet air duct
High-temperature Protection	The built-in temperature sensor locks the upper temperature limit of the circuit board interior at 85°C. When the internal temperature reaches 85°C, the equipment automatically reduces its output power to minimize heat generation and maintain a stable temperature. The equipment's ultimate damage temperature is 115°C, and the 85°C protection threshold leaves a sufficient safety margin, ensuring that high-temperature conditions have a minimal impact on the equipment's lifespan.

4 Efficiency Curve Chart





5 Constant Voltage, Current-limited Operation Mode

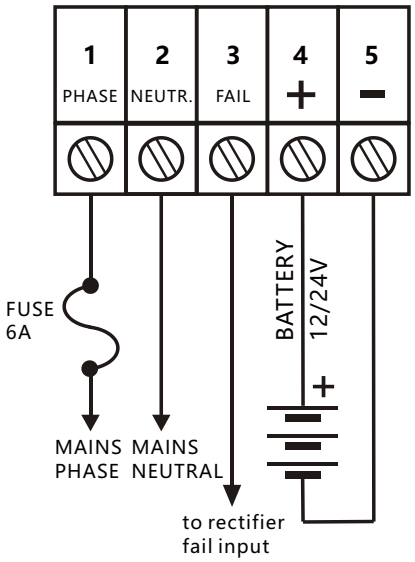


1. When we use this charger to charge a discharged battery,the voltage in the initial stage is approximately 90% of the nominal voltage, and the charger will output its rated current at this point.
2. As the battery continues to charge, its voltage steadily rises, and the operating point moves up and to the left along the red curve.
3. When the output voltage Vo is reached, the charger's output voltage stops rising.
4. The voltage stabilizes at Vo, and the current begins to decrease.
5. When the current drops to zero, it indicates that the charging cycle has been completed.

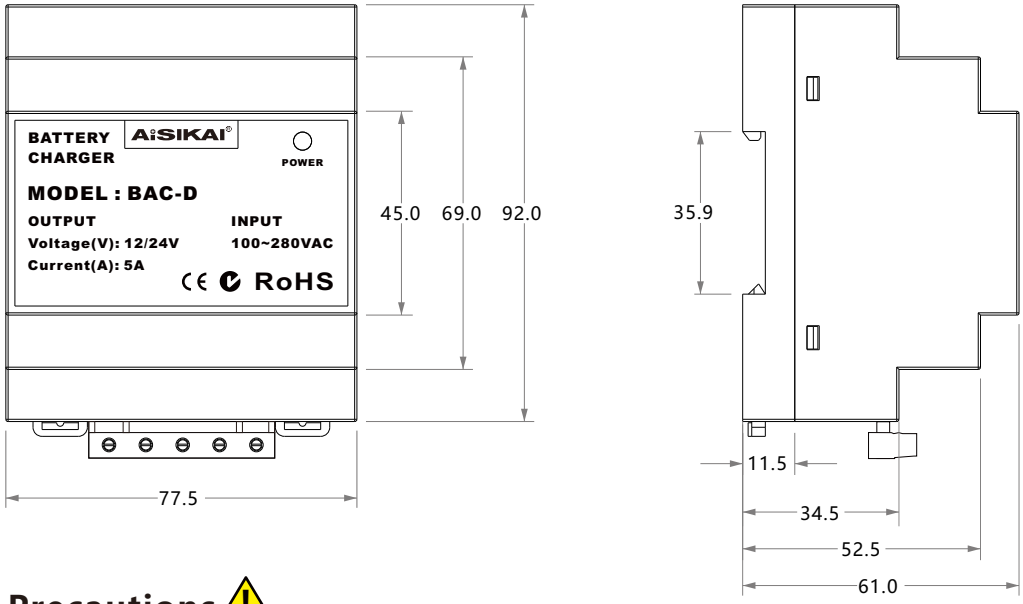
- Depending on the charging method adopted, Vo can correspond to the float charge voltage, absorption voltage, trickle
- charge voltage, or even the boost charge voltage.

The value of Vo will also depend on the battery type and the number of cells within the battery.

6 Wiring Diagram



7 Installation Dimension Drawing



8 Safety Precautions

- Failure to comply with the following operational specifications may result in death or severe injury. This battery charger is designed for installation within an electrical panel and must not be used as a standalone product.
- This electrical equipment is intended for installation by certified professional electricians only. The manufacturer and its affiliates shall bear no liability for any consequences resulting from improper operation.
- Read this manual in full before installation.
- Unpack and inspect the equipment for any transportation-induced dents, cracks, or damage. Equipment found damaged must not be installed.
- All electrical parameters applied to the equipment must fall within the ranges specified in the manual. Power supply exceeding these specifications will shorten the equipment's service life and may even directly burn out the charger.
- It is prohibited to disassemble the charger casing, as there are no internal components that can be repaired by the user.

  A maximum 6A fast-acting fuse must be connected in series at both the AC input terminal and the DC output terminal.
- Before servicing the equipment, ensure that all power supplies are completely disconnected.
- Verify that the terminal wiring is correct before energizing the equipment.
- When connecting the equipment to the power grid, do not touch the terminals.