



SmartGen
ideas for power

BAC2405

BATTERY CHARGER

USER MANUAL



SMARTGEN (ZHENGZHOU) TECHNOLOGY CO., LTD.



Chinese trademark

SmartGen English trademark

SmartGen – make your generator *smart*

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Table 1 Software Version

| Version | Date | Note |
|---------|------------|--|
| 1.0 | 2014-03-14 | Original release. |
| 1.1 | 2017-11-09 | Add "BAC2405 TROUBLESHOOTING"; Update" CASE DIMENSIONS"; Change "Efficiency Parameter" to "Max. Efficiency". |
| 1.2 | 2021-04-13 | 1.Modify the voltage range of "BAC2405 Mask Description"; 2.Upgrade the company information, font, format of header and footer. |



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1 SUMMARY

Fit with up-to-date power supply device, float charger BAC2405 is specially designed for meet the charging characteristics of the lead-acid engine starter batteries and can be used for long-term float charging of 24V lead-acid batteries.

2 PERFORMANCE AND CHARACTERISTICS

- Switch power supply structure, wide input alternating voltage range, small size, light weight, high efficiency rate;
- Automatic two-stage charging process (first constant current, then constant voltage) carried out according to storage battery charging characteristics to prevent overcharging and significantly prolong battery lifetime;
- Built-in current protective circuit for short-circuit protection and reverse connection protection;
- Charging voltage and current can be adjusted via potentiometer on the spot;
- Suitable for 24V storage battery and the rated current is 5A;
- LED display: Power indication and charging indication.

3 CHARGING PRINCIPLE

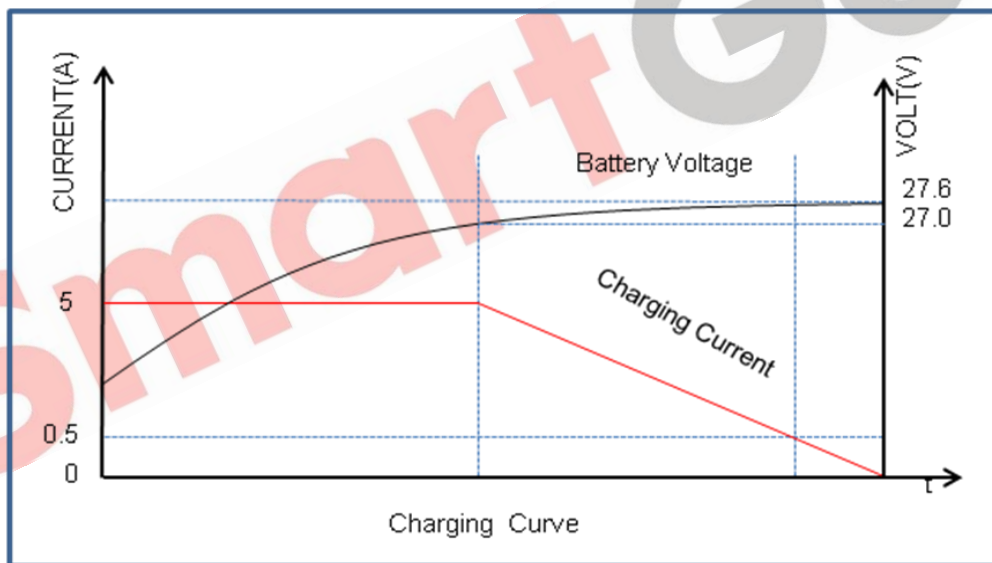


Fig.1- Charging Principle

Charging is performed according to the battery charging characteristics using two-stage method. Charging type is 'constant current type' which means that when the battery terminal voltage falls below the pre-set value, charging current will be constant; when the battery terminal voltage exceeds the pre-set value, charging current will decrease with the rising of terminal voltage until the pre-set current value is reached; then Chargers automatically return to float mode. As soon as charging current value falls below 0.5A and the constant voltage value is reached, the battery is basically charged (charging indicator will extinguish). After that charging current will only neutralize the battery self discharge. Even long-term charging cannot harm the battery, as charger can keep the battery fully charged and so guarantee long lifetime of the battery.

4 SPECIFICATION

Table 2 Specification

| Items | Contents | Parameters | | |
|---------------------------|------------------------|--|---------|---------|
| Input Characteristics | Nominal AC Voltage | AC (100~240)V | | |
| | Max. AC Voltage | AC (90~280)V | | |
| | AC Frequency | 50Hz/60Hz | | |
| | Max. Active Power | 164W | | |
| | Max. Current | 2.5A | | |
| | Max. Efficiency | | AC 110V | AC 220V |
| | | | 84% | 87% |
| No-load Power Consumption | <3W | | | |
| Output Characteristics | No-load Output Voltage | 27.6V (Error±1%) | | |
| | Rated Charging Current | 5A (Error±2%) | | |
| | Max. Output Power | 135W | | |
| Insulating Property | Insulation Resistance | Between input and output, input and shell both are: DC500V 1min $R_L \geq 500M\Omega$ | | |
| | Insulation Voltage | Between input and output, input and shell both are: AC1500V 50Hz 1min; leakage current: $I_L \leq 3.5mA$ | | |
| Working Condition | Working Temperature | (-30~+55)°C | | |
| | Storage Temperature | (-40~+85)°C | | |
| | Working Humidity | 20%RH~93%RH (No condensation) | | |
| Shape Structure | Weight | 0.66kg | | |
| | Dimension | 143mm×96mm×55mm (length*width*height) | | |

5 EFFICIENCY CURVE

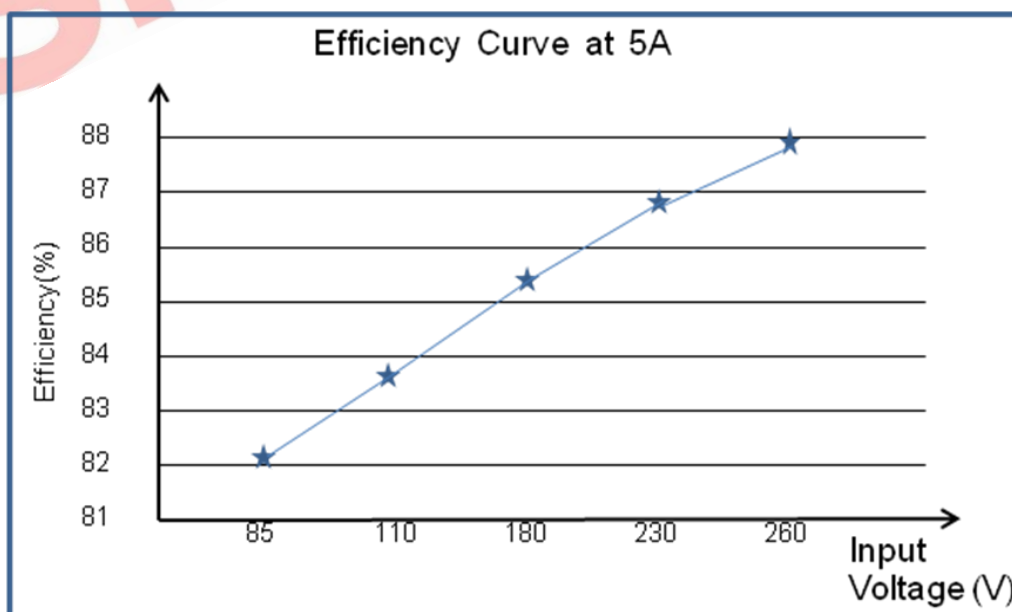


Fig.2 Efficiency Curve

6 VOLTAGE/CURRENT REGULATION

6.1 VOLTAGE REGULATION

If adjust voltage on-site, battery need to be disconnected with battery charger, and then adjust the voltage potentiometer (VOLT) to the appropriate value while measuring the charger output voltage.

6.2 CURRENT REGULATION

After connecting output port to the storage battery, measuring charging current under 25.0V charging voltage, and then adjust the current potentiometer (AMP) to the appropriate value. Current also can be estimated according to the scale of the current potentiometer.

7 OPERATION

7.1 MASK DESCRIPTION



Fig.3- BAC2405 Mask

- Connect terminals L and N to alternating voltage 220V, using BVR 1mm² multi-strand copper line.
- Connect B+ and B- to battery positive and negative using multi-strand BVR1.5mm² copper wires.
- POWER: power supply indicator, illuminated when the charger is operating normally.
- CHARGING: charging indicator, illuminated when charging current exceeds 0.5A while extinguished when charging current has fallen below 0.5A.
- VOLT: charging voltage regulator-potentiometer
- AMP: charging current regulator-potentiometer
- FUSE: output fuse; rated current: 10A. If connected in the wrong way, the fuse will be burnt out and then voltage free. In this case connect cables correctly, replace the fuse and the system will continue to operate normally.

NOTE:

- 1) Because there is diode and current-limiting circuit inner the charger, it can be used together with charging generator, and there is no need to disconnect the charger when cranking
- 2) During genset is running, high current will cause voltage drop in charging line, so recommend separately connecting to battery terminal to avoid disturbance on sampling precision.

7.2 BAC2405 TROUBLESHOOTING

7.2.1 FAULT DIAGNOSIS

Output terminal of battery charger short circuit or battery reverse connection may blow the charger output fuse. In that case, after connecting AC power supply, charger green LED lights up but output terminal without voltage outputting, and then remove the output fuse tube to visually observe whether fuse is blown or not, if condition permit, multimeter can be used to measure the fuse status.

- If output terminal 10A fuse is blown, users only need to change the same capacity fuse.
- If output fuse isn't blown or battery without outputting after changing the fuse, battery needs to depot repair.
- Fuse burn emergency method: using conductive metal wire short connected burnt fuse, and then change the fuse later.

7.2.2 PROCEDURES OF CHANGING FUSE

- Press hard on the slotted screwdriver, screw counter-clockwise and then take out the fuse.(improper operation or over tightening may damage the block)
- Put a new fuse into the block, press the slotted screwdriver and screw clockwise.

8 CASE DIMENSIONS

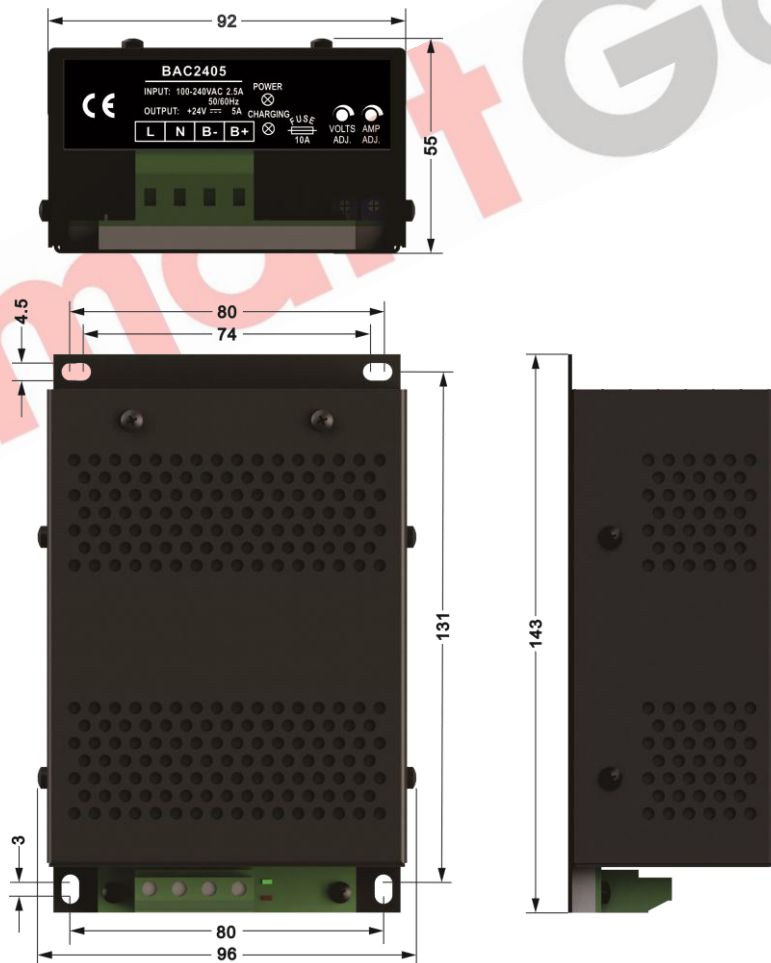


Fig.4- BAC2405 Case Dimensions