

SmartGen

MAKING CONTROL SMARTER

BAC2410BST BATTERY CHARGER USER MANUAL



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SMARTGEN(ZHENGZHOU)TECHNOLOGY CO.,LTD.

SmartGen 众智 Chinese trademark

SmartGen English trademark

SmartGen – make your generator *smart*

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Table 1 Software Version

Date	Version	Note
2019-05-25	1.0	Original Release
2019-09-05	1.1	Fixed LED terminal description.
2022-09-03	1.2	Updated company logo and manual format.

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1 OVERVIEW

BAC2410BST Battery Charger applies up-to-date switching power supply device, and is designed especially for meeting the charging characteristics of lead-acid engine starter battery. It is applicable for long-term supplement (floating) charging and 24V battery pack.

2 PERFORMANCE AND CHARACTERISTICS

It has the following characteristics.

- It employs switching power supply structure, with wide voltage range of input current, small case dimension, light weight, and high efficiency features;
- Two-stage charging method or three-stage charging method can be used automatically according to needs (Three-stage: BOOST and B- are short circuited; Two-stage: BOOST is hung up;), both of which are designed based on battery charging characteristics, which prevents lead-acid battery over charging, and prolong the battery life to the most degree;
- Build-in PFC circuit, which can calibrate the power factor above 0.99;
- Build-in current protective circuit, which can give effective protection when overcurrent output, short circuit, or reverse connection occurs, and can recover output when above circumstances are eliminated;
- Applicable for 24V battery pack charging, rated charging current 10A;
- External LED status display: Green means full power indication; Red means charging indication;

3 CHARGING PRINCIPLE

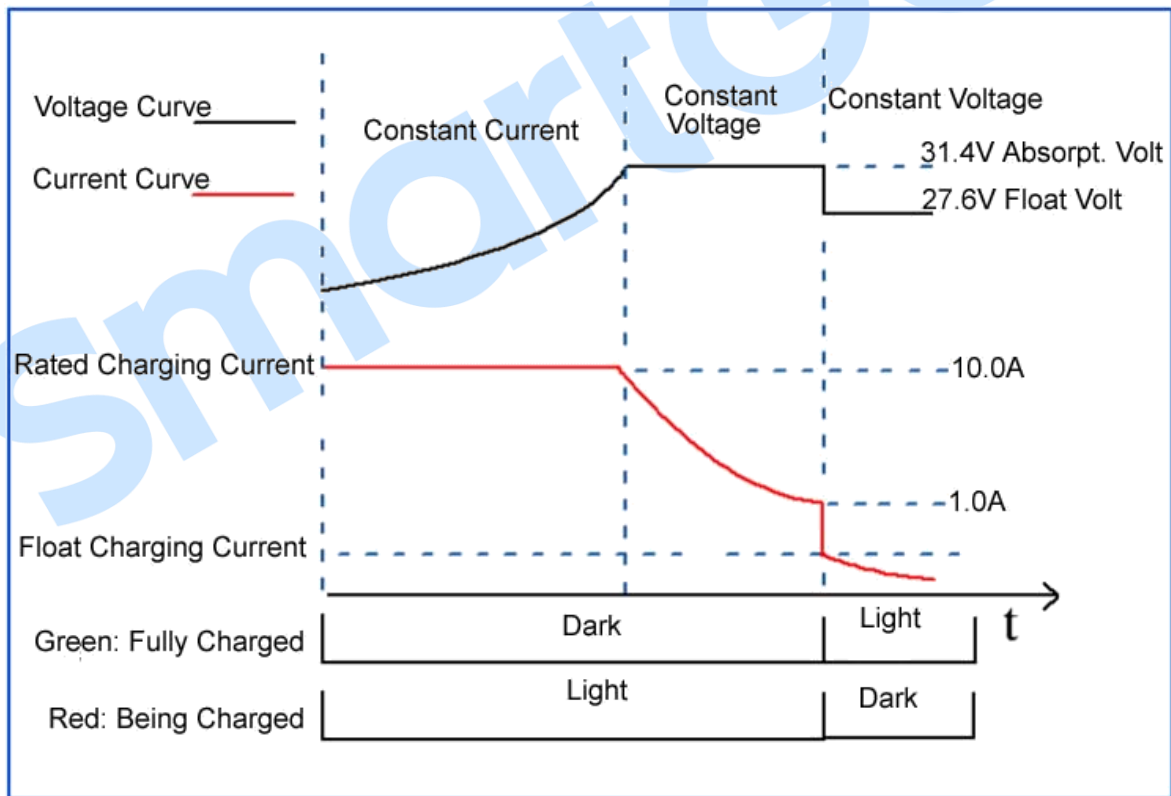


Fig.1 Three-stage Charging Curve

Three-stage method is employed when charging is performed according to the battery charging characteristics.

- First stage of charging mode is Constant Current. When battery terminal voltage is low and charging current is rated 10.0A, large current charging makes battery power increase rapidly, which is called Bulk Charging. The typical characteristic is red indicator is light on always.
- Second stage is Absorption mode. After constant current charging, battery voltage grows to absorption voltage soon. At this time battery shall keep constant voltage output, the charging

current decreases slowly, and battery terminal voltage keeps steadily at absorption voltage value. During this process red indicator is light on always.

- Third stage is Float charging mode. After the above two stages, battery is basically fully charged. Charger output voltage switches automatically to float voltage 27.6V and charging current reduces to below float current 1.0A, and red indicator is extinguished, green indicator is illuminated. Afterwards charging current only offsets battery's self-discharge. Long time charging doesn't do harm to battery. Charger can keep the status of fully charged for the battery and also ensure the usage life of battery.

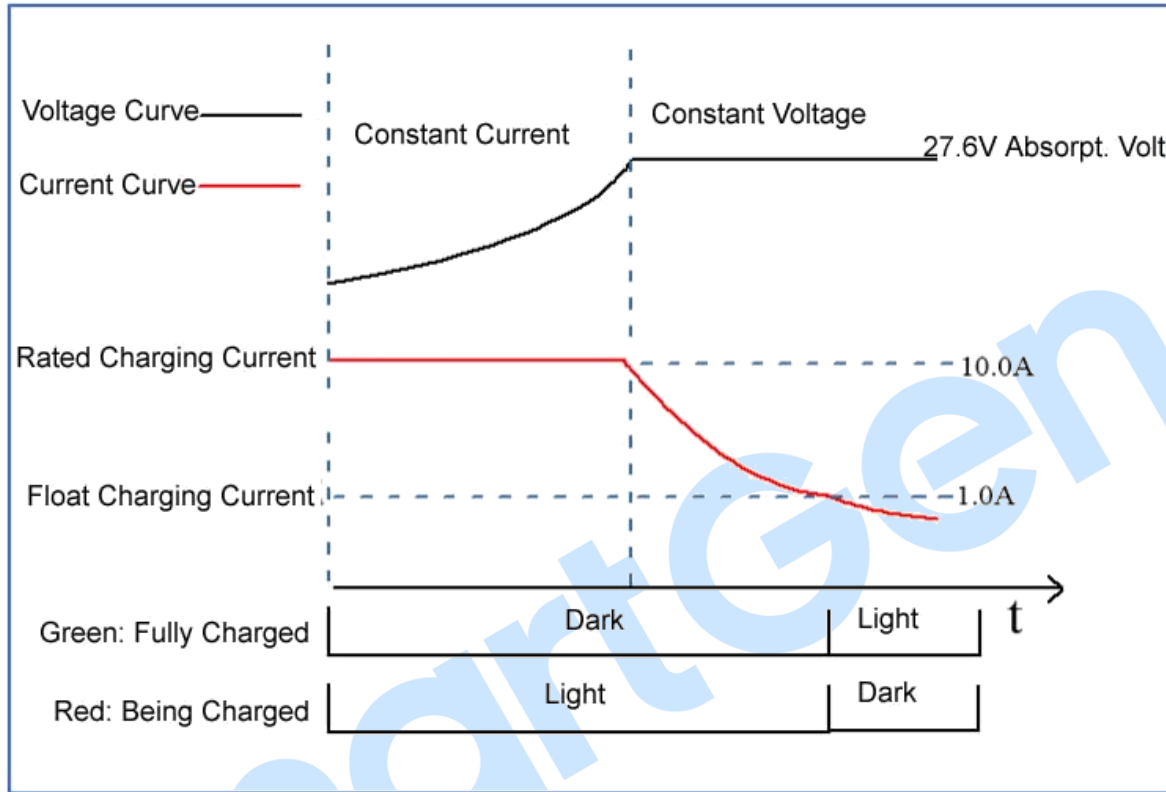


Fig.2 Two-stage Charging Curve

Two-stage method is employed when charging is performed according to the battery charging characteristics.

- First stage of charging mode is Constant Current, which means when battery terminal voltage is below the pre-set value, it is always constant current charging.
- Second stage is Absorption mode. When battery terminal voltage is above the preset value, charging current becomes smaller gradually as the terminal voltage increases. At this time, it becomes absorption charging mode. When charging current is below 1.0A, then battery terminal voltage also gradually increases to the preset constant voltage value. Now the battery is basically fully charged (red indicator is extinguished, and green indicator is illuminated). Afterwards charging current only neutralize the battery self-discharge. Long time charging doesn't do harm to battery. Charger can keep the status of fully charged for the battery and also ensure the usage life of battery.

4 PARAMETERS CONFIGURATION

Table 2 Technical Parameters

Items	Contents	Parameters		
Input Characteristics	Nominal AC Voltage	AC (100~277)V		
	Max. AC Voltage	AC (90~305)V		
	AC Frequency	50Hz/60Hz		
	Max. Active Power	370W		
	Max. Current	4A		
	Efficiency	AC 110V	>82%	AC 220V >90%
		Power Factor Calibration	AC 110V >0.99	AC 220V >0.95
Output Characteristics	No-load Output Voltage	27.6V, (Error±1%)		
	Rated Charging Current	10A, (Error±2%)		
	Max. Output Power	310W		
Insulating Property	Insulating Resistance	Between input and output, input and BOOST and B- short circuited, input and shell, output and shell are: $R_L \geq 500M\Omega$		
	Insulating Voltage	Between input and output, input and BOOST and B- short circuited, input and shell both are: DC2400V 50Hz 1min Output and shell: DC800V 50Hz 1min Leakage current: $I_L \leq 3.5mA$		
Working Condition	Working Temperature	$(-30 \sim +55)^\circ C$		
	Storage Temperature	$(-40 \sim +85)^\circ C$		
	Working Humidity	20%RH~93%RH (No condensation)		
Shape Structure	Weight	1.15kg		
	Dimension	205.5mm*131mm*55mm (length*width*height)		

5 EFFICIENCY CURVE

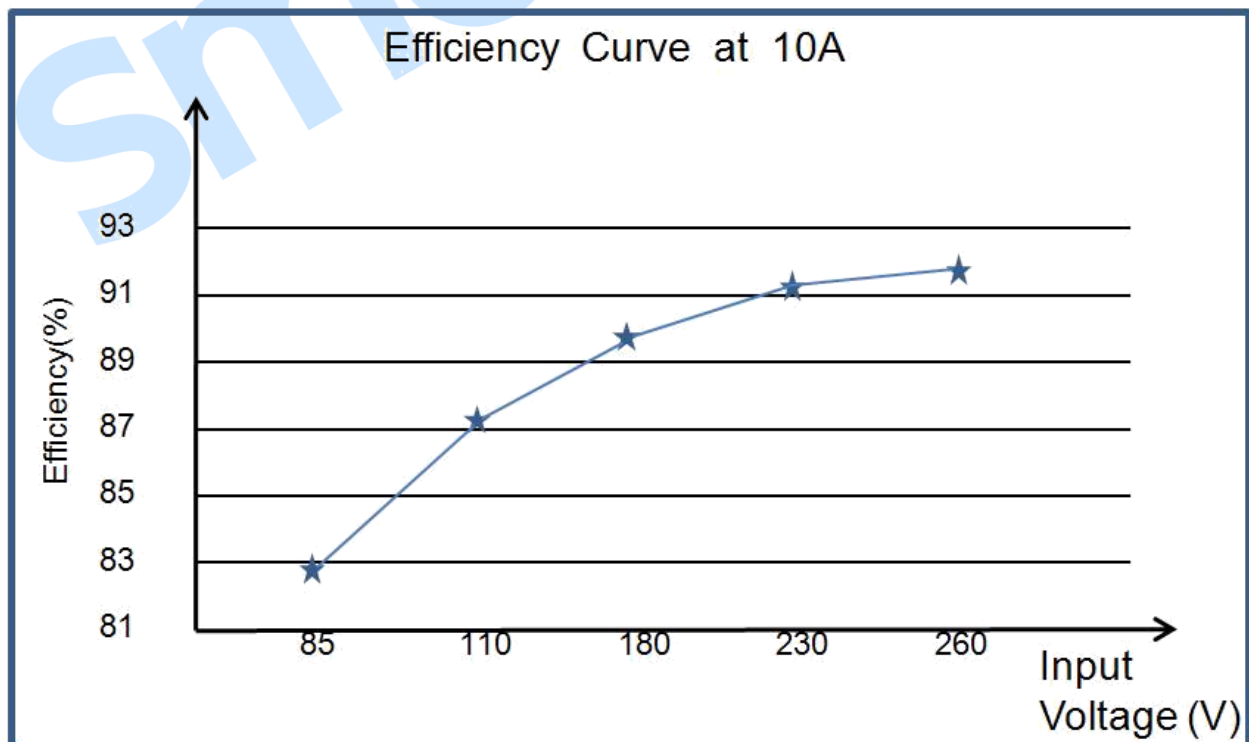


Fig.3 Efficiency Curve

6 OPERATION

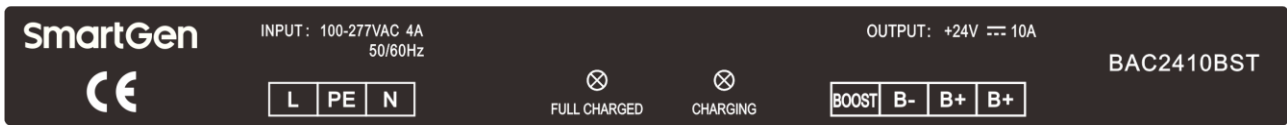


Fig.4 BAC2410BST MASK

Table 3 Connection Description

Terminal	Function	Description
L	AC Terminals	Connect terminals L and N to AC voltage (100~240)V by using greater than BVR 1.5mm ² multi-strand copper line.
N		
PE	GND Terminals	Connect to shell internally already.
BOOST	Mode Selection	3-stage: BOOST and B- are short circuited; 2-stage: BOOST is hung up.
B-	Battery Negative	Connect to battery negative by using greater than BVR 2.5mm ² multi-strand copper lines.
B+	Battery Positive	Connect to battery positive by using greater than BVR 2.5mm ² multi-strand copper lines.
FULL CHARGED	Green LED Indicator	Fully charged indicator
CHARGING	Red LED Indicator	Charging indicator

NOTES:

- 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) When this is applied on genset, as charging current is very big, there shall be voltage decreasing on the charging wire. Recommend to connect charging wire with battery terminals separately for avoiding disturbance on sample precision.

7 CASE DIMENSIONS

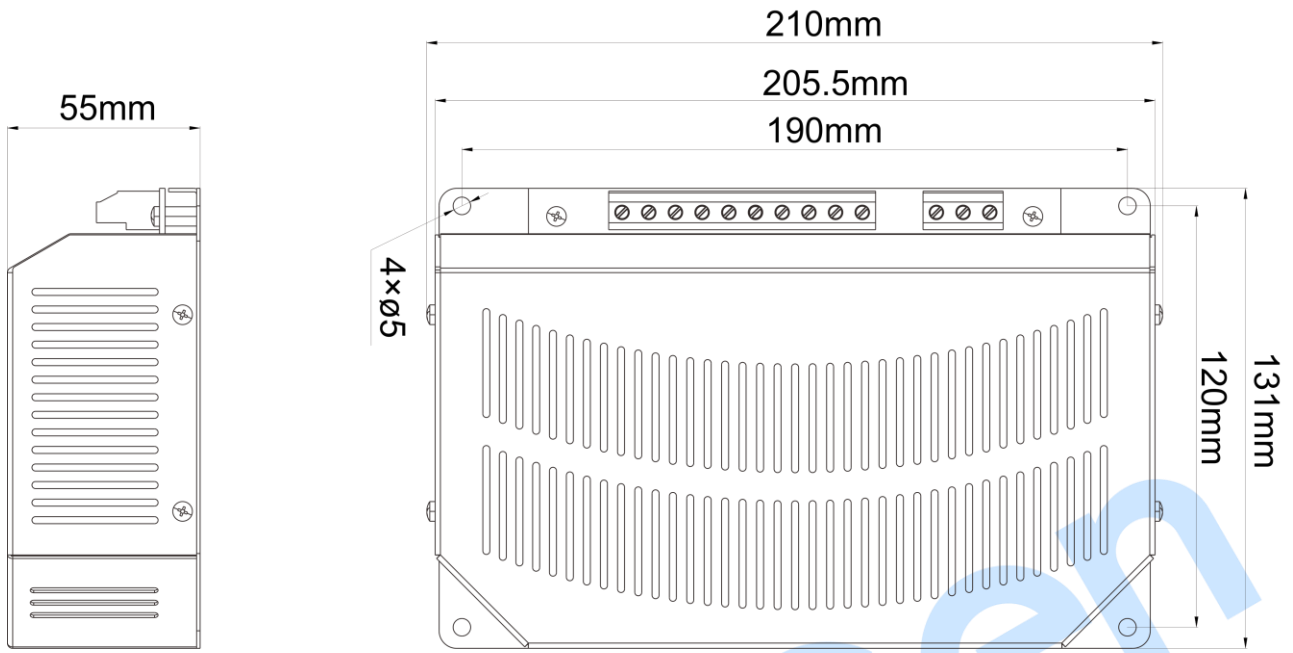


Fig.5 BAC2410BST Case Dimension