SmartGen

MAKING CONTROL SMARTER

BAC05NJ

BATTERY CHARGER

USER MANUAL

郑州众智科技股份有限公司

SMARTGEN(ZHENGZHOU)TECHNOLOGY CO.,LTD.

SmartGen
MAKING CONTROL SMARTER

SmartGen 众智 **Chinese trademark**

SmartGen **English trademark**

SmartGen — make your generator ***smart***

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Table 1 Software Version

Date	Version	Note
2022-08-24	1.0	Original release.

CONTENTS

1 OVERVIEW

BAC05NJ battery charger adopts switching power supply device, and is specially designed for lead-acid battery used in engine start according to its property. The charger is suitable for long-term complement charging (floating) of lead-acid battery. It is suitable for 24V/12V battery and the maximum output current is 5A.

2 PERFORMANCE AND CHARACTERISTICS

Characteristics are as below:

- Applying switching power supply structure, wide range of AC voltage input, small volume, light weight and high efficiency;
- Two-stage or three-stage charging method based on needs, both of them are designed according to charging properties of the lead-acid battery, which can avoid overcharging and this extends the battery life to the fullest;
- It has short circuit protection, reverse connection protection, absorption timing, and BOOST functions;
- LED status display: power indicator, and charging indicator;
- Applying horizontal installation, which is easy and simple to install.

3 CHARGING PRINCIPLES

3.1 TWO-STAGE CHARGING PRINCIPLE

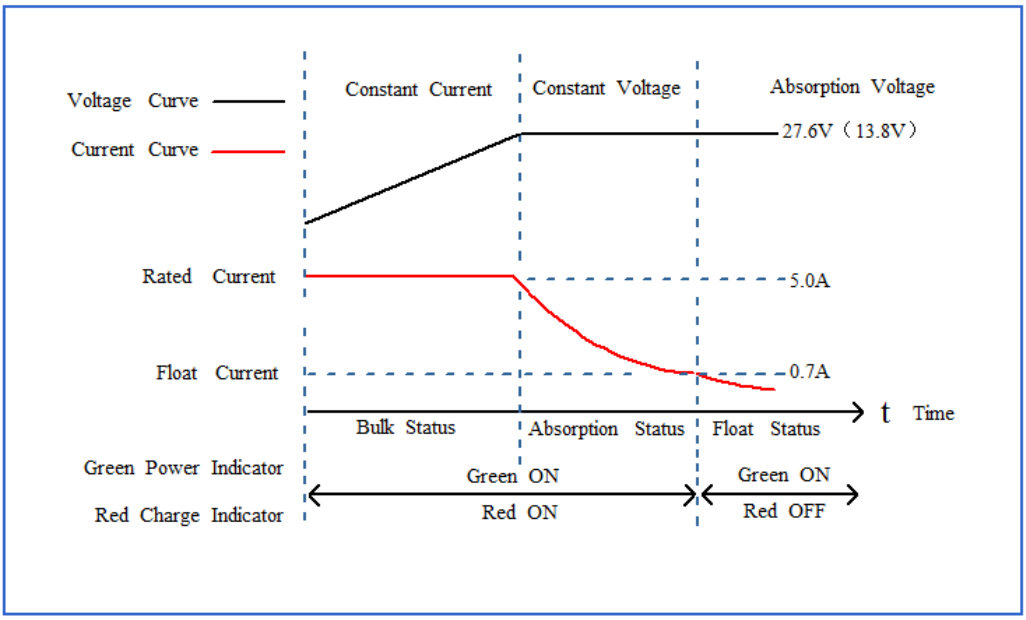

Fig. 1 Two Stage Charging Principle

According to battery charging properties to conduct charging, if two-stage charging method is used, charging mode is "constant voltage/constant current mode". That is, before battery terminal voltage is lower than pre-set value, it is constant current charging, and current is 5A. When battery terminal

voltage is higher than the pre-set value, charging current decreases gradually as battery terminal voltage increases until it reaches pre-set current value. At this time, it turns to float mode and charging current reduces gradually. Battery terminal voltage also gradually increases to pre-set constant voltage value. Charging current is less than 0.7A and battery is basically full-charged (charge indicator is OFF). Afterwards charging current only offsets the self-discharging of battery and even long-term charging does no harm for the battery, that is, charger can not only maintain battery full-status, but also ensure the usage life of battery.

3.2 THREE-STAGE CHARGING PRINCIPLE

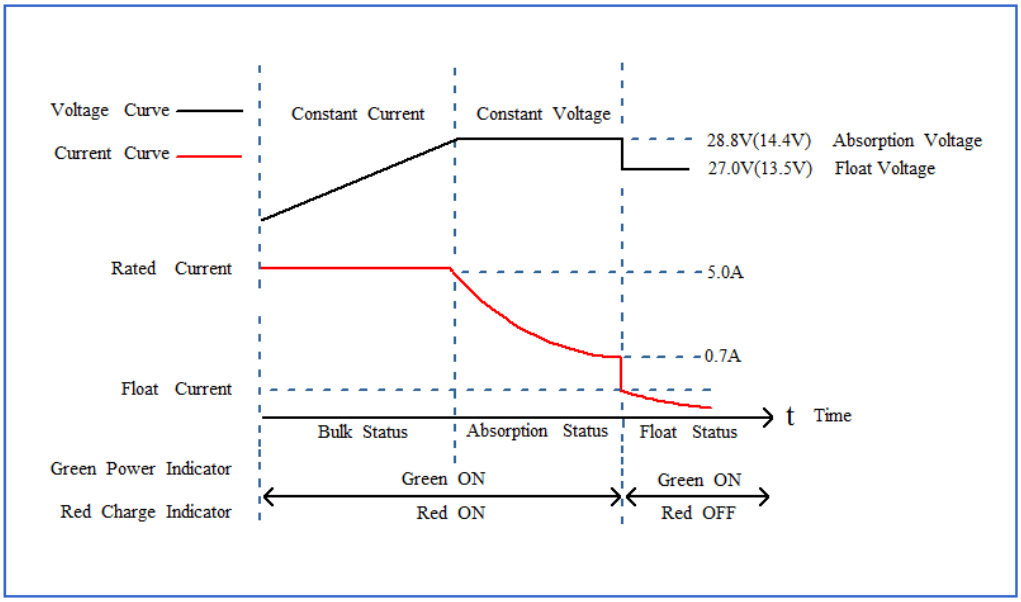

Fig. 2 Three Stage Charging Principle

According to battery charging properties to conduct charging three-stage charging method is used.

— Charging mode of first phase is "constant current mode". When battery terminal voltage is low, charging current is rated 5A. Large current makes battery power rise rapidly. Above process is called bulk charging. Its characteristics is red charging indicator ON always.

— Charging mode of second phase is "absorption mode". After constant current charging, battery voltage rises to absorption voltage value. At this time battery keeps constant voltage output and charging current decreases slowly. Battery terminal voltage then keeps slowly at absorption voltage value. In this process red charging indicator is ON always. When absorption mode is reached, internal timer starts counting. When charging current drops to below 0.7A, or about 3.5 hours, it turns to float charging mode.

— Charging mode of third phase is "float mode". After above two modes, power is basically full, and charger output voltage automatically transfers to float voltage 27.0V (13.5V), while current drops to below 0.7A. Red charging indicator is OFF.

4 SPECIFICATION

Table 2 Product Parameters

Category	Items	BAC05NJ			
		Two-stage	Three-stage	Two-stage	Three-stage
		12V	12V	24V	24V
Input Characteristics	Nominal AC Voltage	AC (150~277)V			
	Max. AC Voltage	AC (150~305)V			
	AC Frequency	50Hz/60Hz			
	Max. Input Current	1.2A		2.0A	
	Max. Efficiency	83%		87%	
Output Characteristics	Rated Current	5A			
	Float Voltage	13.8V	13.5V	27.6V	27.0V
	Absorption Voltage	/	14.4V	/	28.8V
	Max. Output Power	69W	72W	138W	144W
	No-load power consumption	<3W			
Insulation	Insulation Resistance	Between input and output, input and shell, input and BOOST all are: DC500V 1min R≥500MΩ			
	Insulation Voltage	Between input and output, input and shell, input and BOOST all are: DC4200V 1min, between output and shell it is DC800V 1min, Leakage current: I≤3.5mA.			
Working Conditions	Working Temperature	(-40~+55)°C			
	Storage Temperature	(-40~+85)°C			
	Working Humidity	20%RH~93%RH (No condensation)			
EMC	EMC Emission	EN55032			
	EMC Immunity	IEC/EN61000-4-2,3,4 ,5,6,11 GB17626.2,3,4,5,6,11			
Profile	Weight	0.47kg			
	Dimension	136mm×86mm×49mm			
Mounting Size	Screw Mounting	Hole centers 77mm, suitable for M4 (2 pieces of M4);			

5 OPERATION

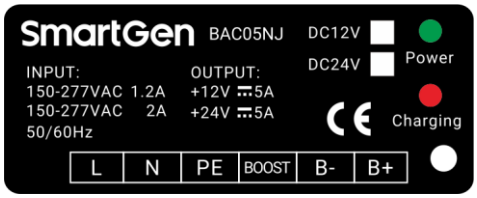

Fig. 3 Panel Drawing

Table 3 Operation Illustration

Mark	Function	Description
L	AC input terminal	Terminal L and N connects AC (150-277)V; BVR1mm^2 multi-strand copper line is recommended.
N		
PE	GND connected terminal	Internally connected with shell;
BOOST	Charging phase mode selection	Two-stage: BOOST hung up; Three-stage: BOOST verse B- short circuit connection;
B-	Charger output negative	Connected with battery negative; BVR1.5mm^2 multi-strand copper line is recommended.
B+	Charger output positive	Connected with battery positive; BVR1.5mm^2 multi-strand copper line is recommended.
Power	Green LED indicator	Power status indicator;
Charging	Red LED indicator	Charging status indicator.

NOTE 1: Charger can be used with charger in the engine in parallel and there is no need to disconnect charger at cranking.

NOTE 2: For application on genset, as charging current is very big and voltage drop will produce from charging wires, so it is recommended to connect charging wire to battery terminal separately. The purpose of this is to avoid affecting sensor sampling precision.

6 WIRING DIAGRAM

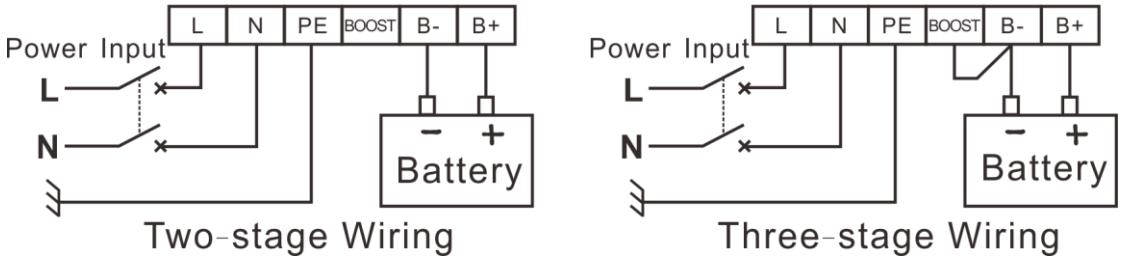

Fig. 4 BAC05NJ Wiring Diagram

7 OVERALL DIMENSIONS AND INSTALLATION SIZE

Unit: mm

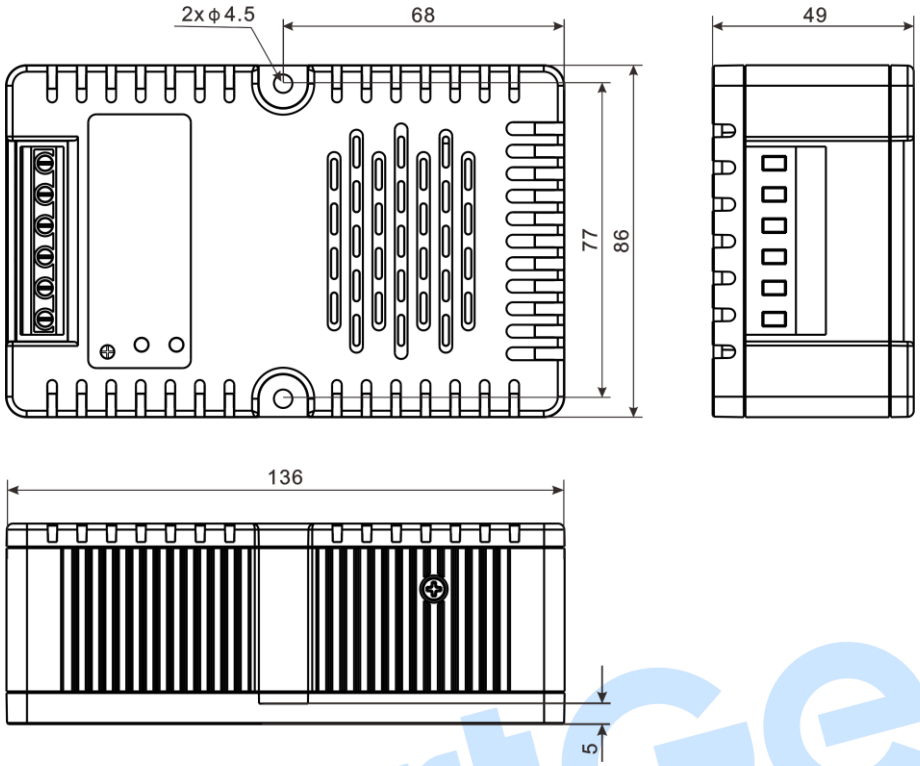

Fig. 5 Installation Size Drawing

NOTE 1: This charger is screw mounting designed, please use 2 pieces of M4 slots to fix.

8 MODELS

For ordering, please select based on the table below.

Table 4 Charger Model

Model	Battery Type	Rated Output Current	BOOST Function
BAC05NJ-12V	12V	5A	√
BAC05NJ-24V	24V	5A	√