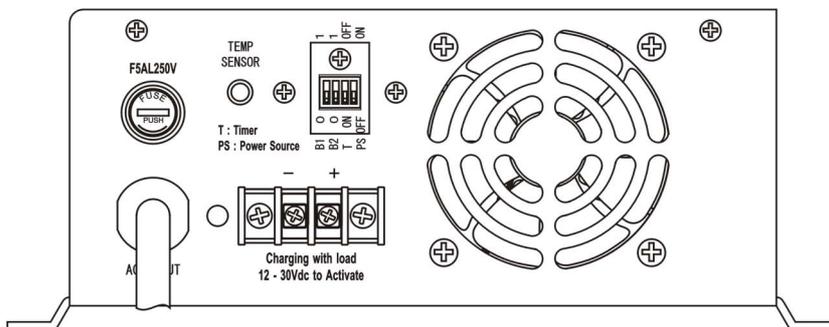
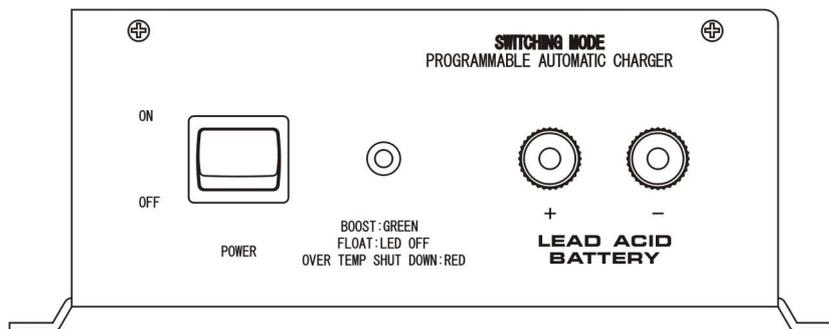


# SWITCHING MODE PROGRAMMABLE AUTOMATIC CHARGER

for

## Lead-Acid Battery

### SBC-Series User's Manual



## 1. INTRODUCTION

This series of battery chargers are field proven for charging all types of lead acid batteries including Gel and AGM. They are ideal for caravan, motor homes. Wheelchair, electric scooter and etc.

Main Features are:

- (a) Charging battery with external load connected at the same time.
- (b) Lead acid wet/gel cell selector switch for optimum Boost and Float Charge Voltages based on battery type.
- (c) Fully Automatic, battery can be left on charge unattended all the time.
- (d) Temperature compensation adjusts charging voltage based on battery temperature via remote (optional accessory).

## 2. SAFETY PRECAUTIONS

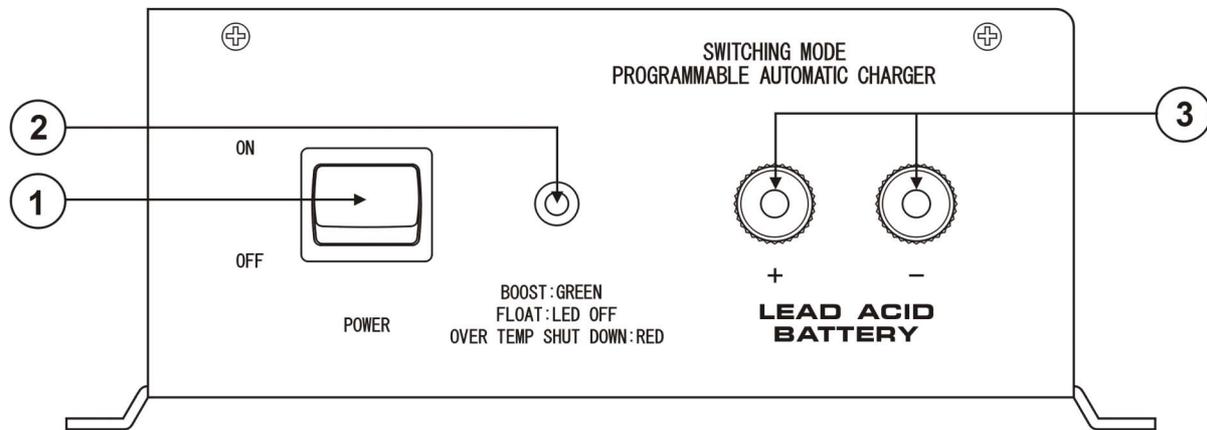
- 1. Do not smoke, strike a match, place metal tools on battery or cause a spark in the vicinity of the battery. When removing battery cables, remove ground cable first.
- 2. Do not charge the battery on boats. Remove the battery and charge on shore.
- 3. Lead Acid Battery contains highly corrosive sulphuric acid. Avoid contact with eyes, skin and clothing while working with battery.
- 4. Working in Vicinity of a Lead Acid Battery is dangerous. Batteries generate EXPLOSIVE gases during normal operation. Provide ventilation to outdoors from the highest point of the battery compartment.
- 5. Be extra cautious to reduce the possibility of dropping a metal tool onto batteries. It might spark or short circuit batteries or other electrical parts that may cause explosion. Cover wrench handles with plastic tape or vinyl dip coating material.
- 6. Do not expose charger to rain, snow and wet conditions.
- 7. Use charger only for Lead-Acid Batteries.
- 8. Check that the model number of the charger matches the voltage and capacity of the battery.

Model no.	Battery Voltage	Maximum Charging Current	Recommended Battery Capacity
SBC-8112	12V	10A	50-120 AH
SBC-8125	12V	20A	120-200 AH
SBC-8215	24V	10A	50-120 AH

( Table 1 )

- 9. Please refer to battery manufacturer's specific recommended values for setting Boost(Bulk) charging voltage.
- 10. Before using the battery charger, read all the instructions and cautionary markings on the battery charger and the batteries
- 11. Do not attempt to repair the battery charger. Incorrect re-assembly may result in a risk of electric shock or fire.
- 12. To reduce risk of electric shock, disconnect all wiring before attempting any maintenance or cleaning Turning off controls will not reduce this risk.

**3. CONTROL AND INDICATORS**



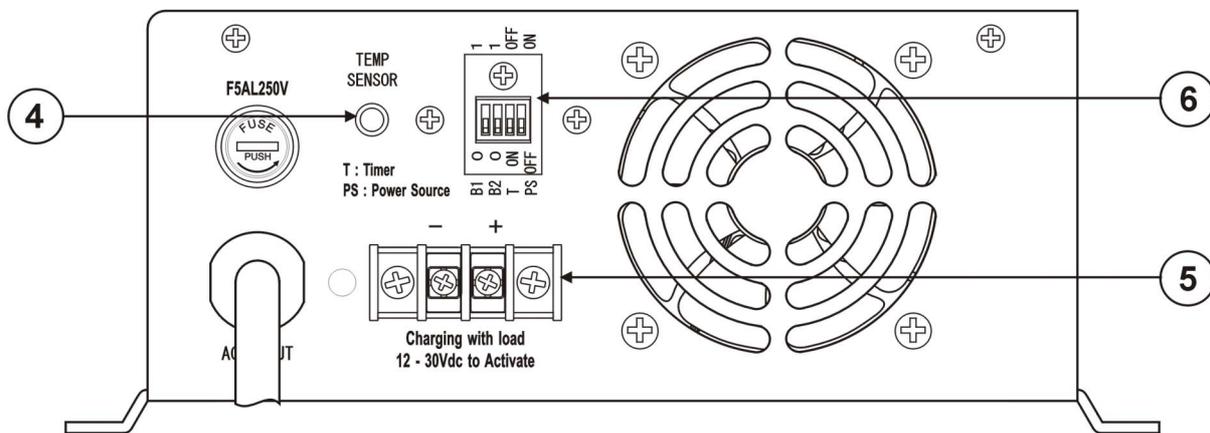
**FIG.1 FRONT VIEW**

1. Power ON/OFF Button, power on with light
2. LED INDICATOR

Color	Green	Red	LED Off
Status	Boost Charge Mode	Over-temperature Shutdown	Float Charge mode

( TABLE 2 )

3. OUTPUT TERMINAL (CONNECTED TO LEAD ACID BATTERY)



**FIG.2 BACK VIEW**

4. Temperature Sensor Terminal
5. Remote Control Terminal (12-30VDC Input) (Section 4.1 C)
6. Dip Switch Control

**4. OPERATIONS**

**4.1 Charging Methods**

There are 3 charging methods.

**A. Normal Charging**

1. Check and set the Dip Switch Control Settings for your battery type: Wet, Seal or AGM Type. Then set the timer T to Off and PS to Off ( *Table 3* ).

	<b>SBC - 8112 / 8125 ( 12V system )</b>	<b>SBC - 8215 ( 24V system )</b>
	13.9V	27.8V
	14.4V	28.8V

*Table 3*

2. Put the ring/spade connector of your cable to the terminal pole first, then the spring washer and screw as tight as possible.
3. Recheck the tightness by jiggling the cable and ensuring the spring washers are flat.
4. Switch on the charger and the LED should light up in green. The charger will Boost Charge the battery until fully charged up then the charger will switch to Float voltage automatically and the LED will be Off.

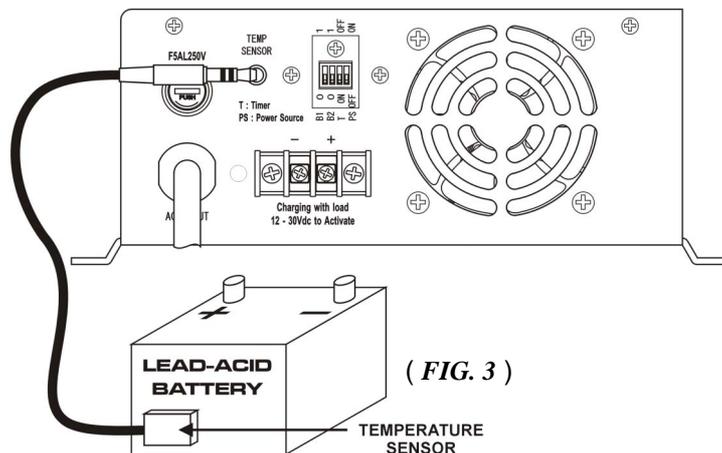
The Charger can be left unattended without worrying about overcharging the battery. In case, the battery becomes low again, the charger will automatically start the Boost to Float charging cycle again.

5. To use the Temperature Compensation Function, plug a PT100 Temperature Sensor (optional accessory) into the Temperature Sensor Terminal and attach it firmly on the side of the battery ( *FIG. 3* ).

For 12V system( SBC-8112, 8125 ), it will regulate at -20mV/degree C increase.

For 24V system( SBC-8215 ), it will regulate at -40mV/degree C increase.

When the battery's temperature is about 60 degree C, the LED will be red and the charger will stop charging the battery. Turn off the charger to reset the charger.



**B. Timer Charging**

1. After checking for the correct battery type on B1 and B2 Dip Switch, set the timer T to On and PS to Off ( *Table 4* ).

	<b>SBC - 8112 / 8125 ( 12V system )</b>	<b>SBC - 8215 ( 24V system )</b>
	13.9V	27.8V
	14.4V	28.8V

*Table 4*

2. Switch on the charger, it will Boost Charge the battery for 4 hours only, then to Float Voltage automatically
3. It will not go back to Boost Voltage again.
4. Switch the charger Off and On to start another 4 hours timer charging.
5. To use the Temperature Compensation Function, please refer to section A step 5.
6. The temperature cut off over-ride the timer preset when temperature sensor is used.

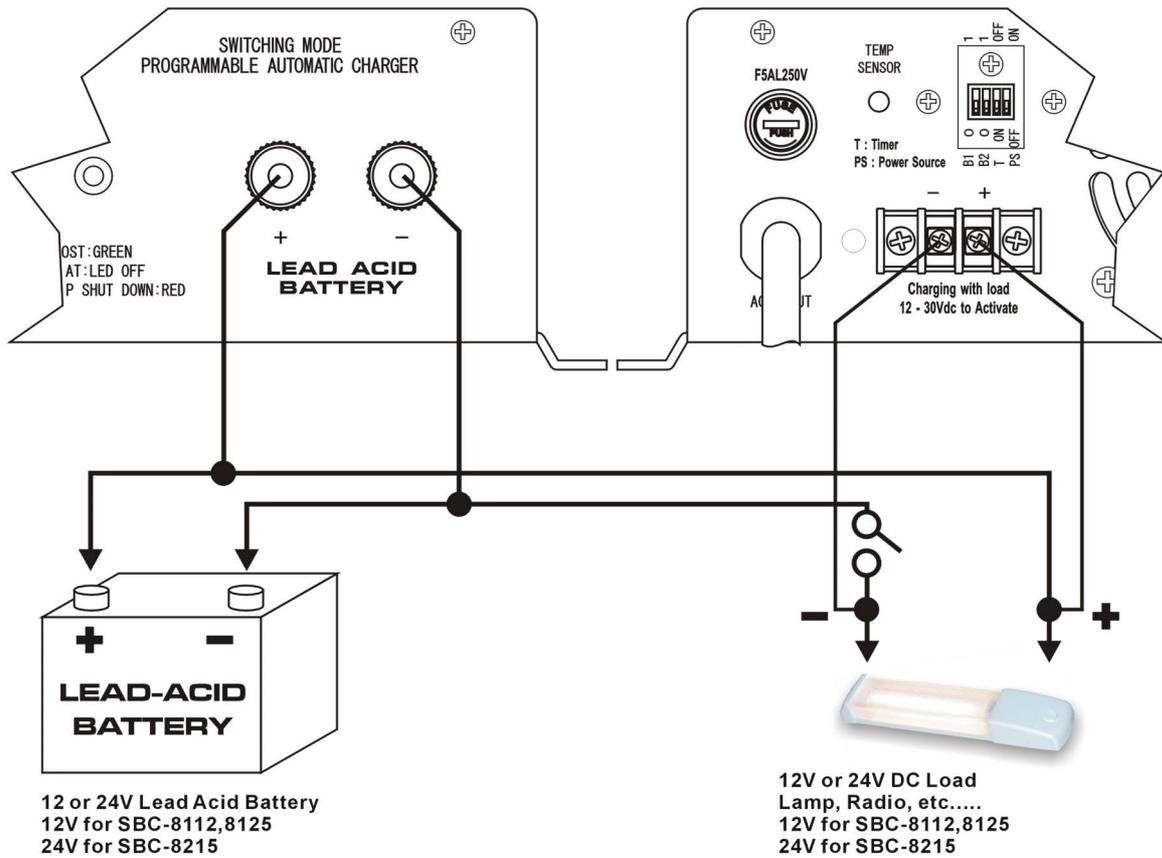
**C. Charging battery with external load connected ( Ideal for Caravan and motor homes application )**

In this mode, the charger will carry external loads and still keep the battery in a full charge condition without overcharging the battery. When the load is On, the charger will only deliver a semi-boost voltage to the battery( 13.4V for 12V system, 26.8V for 24V system ). When the external load is off, the charger will resume its normal Boost to Float cycle automatically. Long term continuous loads should be limited to 50% of the charger rated output.

<b>Model No.</b>	<b>Continuous Rating of the Load</b>
SBC-8112	5 A
SBC-8125	10 A
SBC-8215	5 A

*Table 5*

1. Connect the wiring diagram for external load as shown in ( *Fig.4* ) with proper selection of cable size and ON/OFF switch taking into account of voltage drop due to the length of cable ( *Table 6* ). Make sure the cable from from the charger to battery as short as possible and the battery is installed in a well ventilated location.



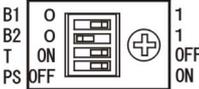
*( Fig.4 Setup for charging with external load )*

Wire Size (AWG)	Max. one-way distance ( feet ) for 2% voltage loss (10A)	Max. one-way distance ( feet ) for 2% voltage loss (20A)
14	4.5	2
12	7	3.5
10	11.5	5.5
8	18	9
6	28.5	14.5
4	45.5	22.5
2	72.5	36
1/0	115	57.5
2/0	145	72.5
4/0	230	116

*Table 6 Selection of cable size and length vs current*

## SBC-Series Switching Mode Programmable Automatic Charger User Manual

2. Adjust the Dip Switch B1 and B2 to select the correct Boost Charge Voltage.
3. After checking for the correct battery type on B1 and B2 Dip Switch, set the Dip Switch T to Off and the PS to ON state ( *Table 7* ).

	SBC - 8112 / 8125 ( 12V system )	SBC - 8215 ( 24V system )
	13.9V	27.8V
	14.4V	28.8V

*Table 7*

4. Turn On the charger and turn Off the external load On/Off switch, measure the battery terminal voltage to check for correct Boost Charge Voltage for battery type used.
5. To use the Temperature Compensation Function, please refer to section A step 5.

**WARNING:** Use an ON/OFF Switch with appropriate RATING for the load in setup of ( *Fig.4* ).

**REMARKS:**

There are situations that the voltage drop due to the workable cable size and the battery location cause the Boost Charge Voltage at the battery terminals below the recommended value. Then depending on the value of the de-rated Boost Voltage, change to a Gel Type of Battery or consult your dealer for a higher voltage type charger on request .

(Note: factory preset 14.8/15.5V for 12V System or 29.6/31.0V for 24V System).

The Temperature Sensor(optional accessory) protects the battery from overheating due to environment or faulty cell or low water level. When the temperature of the battery reaches around 60 degree C, the over-temperature shutdown will be triggered and the charger will be shut down completely to avoid damages to the battery and the charger.

### 5. SPECIFICATIONS

Model	SBC-8112	SBC-8125	SBC-8215
<b>Battery System</b>	12V	12V	24V
<b>Recommended Battery Capacity</b>	50-120 AH	120-200 AH	50-120 AH
<b>Output (@25°C)</b>			
<b>Max. Charging Current</b>	10A	20A	10A
<b>Float Mode Charging Voltage</b>	13.3V	13.3V	26.6V
<b>Semi-Boost Mode Charging Voltage</b>	13.4V	13.4V	26.8V
<b>Boost Mode Charging Voltage</b>	13.9/14.4V	13.9/14.4V	27.8/28.8V
<b>Line Regulation(+/- 10%)</b>	80mV	100mV	80mV
<b>Load Regulation (0-100% Load)</b>	< 150mV	< 200mV	< 200mV
<b>Ripple and Noise (V<sub>r.m.s.</sub>)</b>	< 25mVrms	< 25mVrms	< 35mVrms
<b>Efficiency</b>	80%		
<b>Input Voltage</b>	230VAC / 50Hz ( or 120VAC / 60Hz on request )		
<b>Cooling System</b>	Current Controlled Fan		
<b>Dimensions</b>	( L ) 255 x ( W ) 200 x ( H ) 80 mm		
<b>Weight</b>	2kg	3.5kg	3.5kg
<b>Approvals</b>	Designed and manufactured to comply with CE		