

PV CHARGE CONTROLLER

USER MANUAL

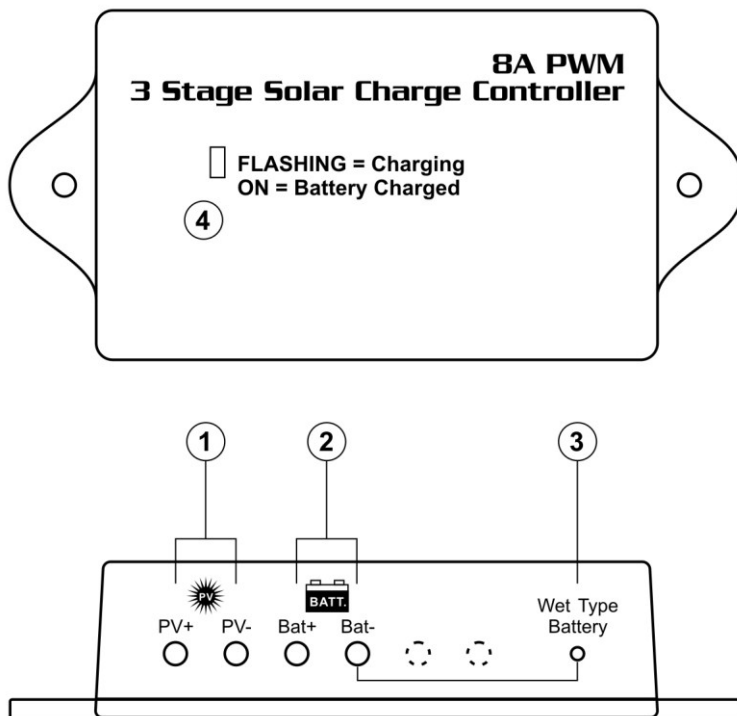
SBC-2108



1. INTRODUCTION

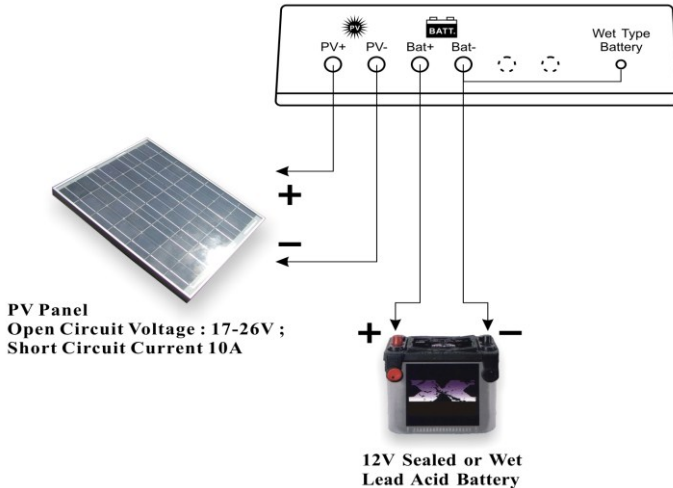
This water resistant PV charge controller has a LED to indicate the battery is being charged (flashing) or full (solid) or no charging (off). If the LED is not on under sunlight, it indicates there is a loose connection or a over-discharged battery in the solar system. It is ideal for portable solar panel because it can be permanently connected to the solar panel even without connection to battery during transit. So only two wires to be connected to the battery on site and the LED shows if system is working. Three Stage Charging is controlled by a micro-processor programmed for 3 stage charging with PWM in absorption & float stage and bundled with self recoverable protections.

2. Control and LED Indicator



- (1) PV Terminal cables
- (2) Battery Terminal cables
- (3) Sealed/Wet Type Battery Selection Blue Colour Wire
- (4) LED charge indicator

3. INSTALLATION



1. Connect the **Bat- BLACK** wire to the battery's negative terminal.
2. **Wet-Type battery:** Connect blue colour wire (3) to the battery's negative black wire.
Seal Type battery: Insulated blue colour wire (3)
3. Connect the **Bat+ RED** to the battery's positive terminal.
4. Connect the Solar panel using the PV BLACK wire to negative and the YELLOW PV positive wire to positive terminals.
5. Place the solar panel under strong sun, the LED SHOULD BE LIT UP either flashing or solid if system connections are correct. Otherwise, look for loosen connections, wrong polarity in battery or solar terminals.

* **Notes**

No need to have blocking diode to prevent current back to solar panel at night time as controller has such function.

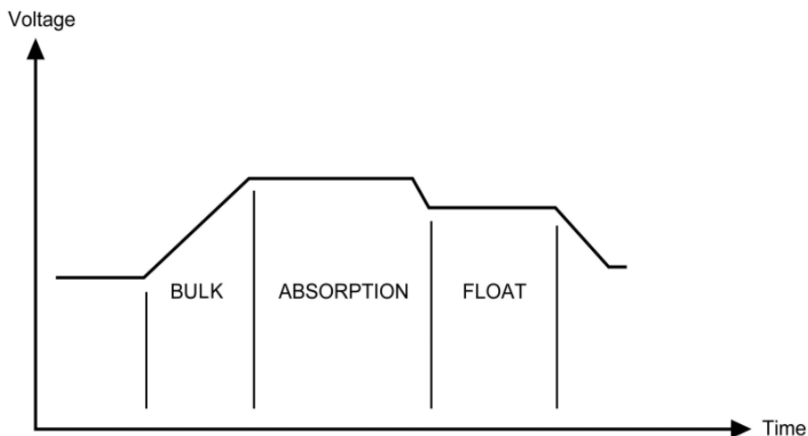
A negative earth ground at the battery is recommended for most effective lightning protection.

The controller is splash proof, so it can be mounted outdoors in a vertical position. Do not expose to ambient temperature above 60°C.

Double check all the positive and negative connections of the system starting with the battery with a multi meter. The controller has self recoverable electronic protection for reverse polarity connection of battery.

4. OPERATIONS AND FUNCTIONS

3 Stage charging with PWM in Absorption Stage.



Bulk:

Full constant current charging from the solar, limited to 8A max. until battery voltage rises to a preset value then charger change to Absorption stage.

Absorption:

Charging voltage is kept constant with pulsing charging current (PWM) as drops with time for about one hour then to Float stage.

Float:

The battery is kept a lower voltage with just enough current to fill up the self discharge loss. In the case the battery voltage drops below 12.5VDC a new cycle of charge of bulk absorption will start.

LED indication of charging mode:

Flashing	Bulk and Absorption state
Solid	Battery full and Float charge
Off	No charging (If the LED is off under sunlight, it indicates there is a loose connection or a over-discharged battery in the solar system)

5. Protections

Electronic protections (self-recoverable) for:

Controller Over Temperature
Battery terminal Short Circuit
Over Voltage Protection to battery at 16VDC
Over Charging Current Protection
Reverse Polarity for battery connection
Back current to Solar panel

6. SPECIFICATIONS

Model Number	SBC-2108
Battery System Voltage	12V
Max. PV Open Circuit Voltage	26V
Max. PV Short Circuit Current	10A
Rated PV Input Current	8A
Max PV Input Current (5 minutes)	10A
Min. Operating Charging Voltage (From Battery)	7V
Standby Current	<3mA
Voltage Drop across PV to Battery terminals	0.5V at 8A
Absorption Voltage	Sealed Type Battery Setting: 14.5V \pm 0.2V Wet Type Battery Setting: 14.8V \pm 0.2V
Float Voltage	13.8V \pm 0.2V
LED indication	Flashing - Bulk or Absorption charging Solid - Battery full (Float charging) Off - No charging
Over Voltage Protection for Battery	16V \pm 0.5V self recoverable
Over Charging Current protection	>12A \pm 1A self recoverable
Over Temperature Protection to shut down unit	Yes and self recoverable
Battery terminal reverse polarity protection	Yes and self recoverable
Battery terminal short circuit protection	Yes and self recoverable
Back current to PV panel protection	Yes (Electronic blocking)
Ambient Temperature Range	-40°C ~ +60°C
Relative Humidity	100%
Approvals	CE EN 61000 ; IP65 ; FCC PART 15
Dimensions (L x W x H)	97 x 46 x 26 mm
Weight	about 120g

All values are based on the Standard ambient Temperature 25°C and Pressure 0.1Mpa.