

DENRYO

Solar Charge Controller for Lithium-ion Secondary Battery

SolarAmp B

User's Manual Ver.1.00

CE RoHS DENRYO CO., LTD.

1. Introduction

Thank you for purchasing "SolarAmp B" solar charge controller. This manual contains important safety, installation and operating instructions for "SolarAmp B" solar charge controller in order to prevent the users from any damage. Make sure to read all of the instructions and cautions in the manual before beginning installation.

< Battery type >

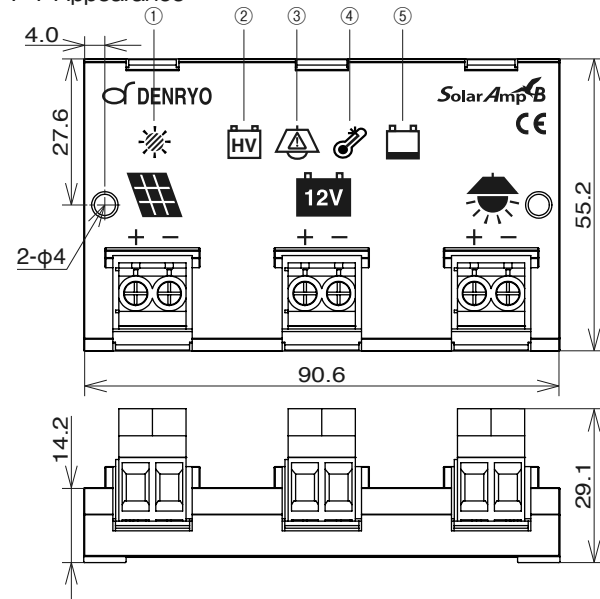
Please use 11.1V lithium-ion secondary battery. The battery may be equipped with protection circuit. Depending on the protection circuit, "SolarAmp B" and your battery may work incorrectly. Please check the specification of the lithium-ion secondary battery or confirm with the battery manufacturer before using "SolarAmp B".

2. Product Overview

"SolarAmp B" is very compact design and very simple to use, which has full electronic protections.

7. Operation

7-1 Appearance



7-2 State of Charging LED

LED/Color	Indication	Status
① Charging GRN	Flashing	Charging
Solid	Solid	Full Battery

① Charging LED

Charging LED is flashing while charging the battery. Flashing LED becomes solid when the battery is full charge.

3. Features

- 2-stage Charging (Bulk, Absorption)
- Pre-charge function
- Full Electronic Protections
High Voltage Protection, Over Discharge Protection, Over Load Protection, High / Low Temperature Protection, Reverse Polarity Protection, Load Short Circuit Protection, Surge Protection
- Current Regulation Caused High / Low Temperature
- Positive Earth Ground
- Status LED Indications
State of Charging, High Voltage, Over Load, High / Low Temperature, Low Voltage

4. Precaution

- Cover the PV panel (Photovoltaic panel: Solar panel) with cloth not to generate electricity during installation.
- It is recommended to install an external fuses (less than rated current) between controller and battery, controller and load.
- Connect battery to earth ground if necessary (positive earth ground). If you need negative earth ground, connect only one terminal (battery or PV panel or load terminal) to the earth ground.
- Do not connect device which has big input capacity such as DC-AC inverter to the load terminal.
- Do not use PV panel or Load which specification is out of the ratings. The PV panel Voc should never exceed "Max. Input Voltage" of the product. The PV panel Isc should never exceed "Max. Input Current" of the product. The peak current of Load should never exceed "Max. Load Current" of the product.
- Charging will start when PV panel voltage exceeds battery voltage.
- Reverse Polarity Protection and Over Load Protection is not effective in every possible condition, thus please take care in wiring and confirm the specifications of PV panel and Battery and Load.

7-3 Warning and Error LED

LED / Color	Indication	Charging Status	Load Status
② High Voltage RED		OFF	ON
③ Over Load RED		OFF	OFF※ ¹
④ High/Low Temp YEL		ON※ ²	ON
		OFF	ON
⑤ Low Voltage YEL		ON	ON
		ON	OFF

*1 "SolarAmp B" tries to reconnect to load 3 seconds 1 time and shut down the load after 10 minutes.
*2 "SolarAmp B" reduce charge current to 50% only when bulk charging.

② High Voltage LED

Solid: The battery voltage has exceeded the maximum regulation limit of the controller. Make sure the battery is applicable.

③ Over Load LED

Flashing: The load current exceeds the maximum load current rating. The Load is reconnected automatically by every 3 seconds in 10 minutes. If the overload remains, LED becomes solid and disconnects.※¹

Solid: There is a possibility of load wiring short circuit. The fault must be cleared by removing and reapplying power.

④ High / Low Temperature LED

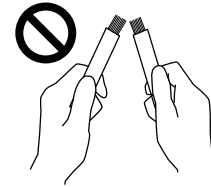
Flashing: The controller temperature close to the limit value. *2
Solid: The controller temperature is out of range. The controller stops charging until the temperature recovers to normal range.

⑤ Low Voltage LED

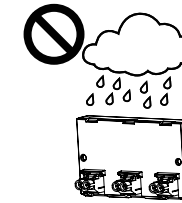
Flashing: The battery voltage is low.
Solid: The load is disconnecting for Low Voltage Disconnect on. The load will automatically switch on when the battery recharges to the Low Voltage Reconnect threshold voltage.

5. Safety Information

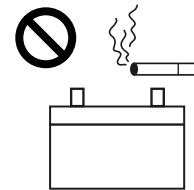
5-1: DO NOT short circuit (For all terminals)



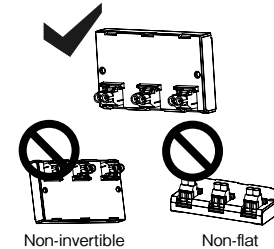
5-2: Protect from direct rain



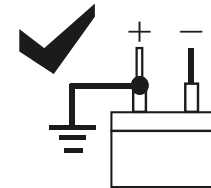
5-3: Explosion hazard



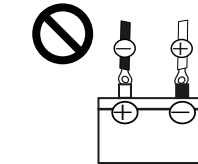
5-4: Mounting direction



5-5: Positive earth ground



5-6: DO NOT reverse polarity connection (For all terminals)



8. Specifications

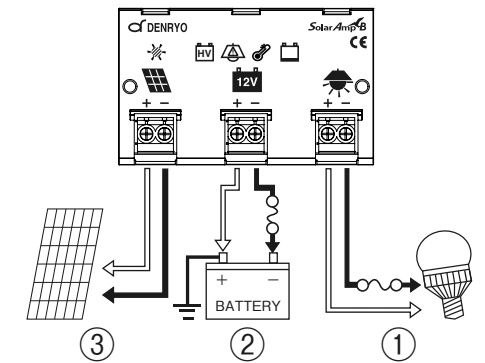
Model No.	SA-BA10Li	
System Voltage	12V	
Max. Input Voltage	25V	
Min. Input Battery Voltage	6V	
Max. Input Current	10A	
Max. Load Current	10A	
Self-consumption Current	2mA (Typical)	
Charging Algorithm	2-stage (Bulk, Absorption)	
Charging Voltage	12.4V	
High Voltage Protection	Error	13.5V
	Recovery	12.8V
Over Discharge Protection	Warning	10.0V
	Error	9.0V
Protection	Recovery	10.5V
	High Temp. Protection	40°C(Warning)/50°C(Error)/40°C(Recovery)
Low Temp. Protection	0°C(Warning)/-10°C(Error)/0°C(Recovery)	
Battery Type	11.1V lithium-ion secondary batteries	
Wire Size	#12AWG~#18AWG	
Grounding	Positive Ground	
Temperature Coefficient	NA	
Operation Temperature	-10°C~50°C	
Storage Temperature	-30°C~70°C	
Humidity	5 to 95%RH (non-condensing)	
Dimensions (D x W x H)	29x91x55mm	
Weight	65g	
Certifications	CE RoHS	

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6. Connection

Connect each wire in order (1. LOAD 2. BATTERY 3. PV panel) as the below figure and screw tightly not to loosen.



< Battery charging operation >

- "SolarAmp B" charges the battery with PWM constant voltage charging.
- Pre-charge function charges the battery with PWM at a 10% duty cycle from LVD till the battery voltage raise to 10.0V.
- In bulk charge status, the battery is charged by the maximum output current from the PV panel
- In absorption charge status, "SolarAmp B" charge the batteries with PWM constant voltage charging, not linear constant current charging.

WARRANTY

Thank you very much for your purchase. To make a claim under the warranty, confirm the User's manual to be certain that there is a problem with the product.

- Please keep your warranty document safe. Without a valid warranty you cannot accept a warranty service. Upon modifying contents of this warranty document, the document is deemed to be invalid.
- DENRYO CO., LTD. warrants original purchase against defects in material and workmanship for a period of THREE (3) years from Shipment Date to buyer. The extension shall in no case exceed THREE POINT FIVE (3.5) years in aggregate.
- DENRYO CO., LTD. shall not warrant product under the following conditions:
 - *Damage by accident, negligence at operation, incorrect directions for use (e.g. Damage by not using with the exact way User's manual and original label say)
 - *Damage by other devices are connected to our product
 - *Unauthorized remodel by other than our serviceperson
 - *Breakdowns due to the effects of natural disasters, pollution, salt damage
 - *Lack an original label includes serial number
 - *Made a claim after passing warranty period
 - *Damage by any transactional problems not attributable to DENRYO CO., LTD. (e.g. Damage by accident during transportation without other than our packing)
- Buyer shall bear the shipping charge when return the defective products.

DENRYO CO., LTD. IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, INCLUDING BUT NOT LIMITED TO LOST PROFITS, DOWNTIME, GOODWILL OR DAMAGE TO EQUIPMENT OR PROPERTY.

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Model Name : SA-BA10Li

Serial No. :

Dealer :

Sale Date : (yyyy/mm/dd)

DM-4811