PowMr SL03-30A

PowMr SL03-30A Solar Charge Controller User Manual

Model: SL03-30A

1. Introduction

The PowMr SL03-30A Solar Charge Controller is designed to manage the power flow from your solar panels to your battery bank, ensuring efficient charging and protecting your batteries from overcharge and over-discharge. This controller is suitable for 12V/24V systems and supports various battery types including Lithium and Lead-Acid batteries. It features an LCD display for monitoring system parameters and offers multiple protection functions to enhance system safety and longevity.

2. Key Features

Image: Overview of the PowMr SL03-30A Solar Charge Controller's main features, including 12V/24V auto-detection, energy recording, temperature compensation, aluminum heat sink, eight electronic protections, compatibility with Lithium/Lead-acid batteries, and light & timer control.

- **12V/24V Auto-detection:** Automatically identifies system voltage.
- **Energy Recording/Current Display:** Provides real-time monitoring of energy and current.
- **Temperature Compensation:** Adjusts charging parameters based on ambient temperature.
- **Aluminum Heat Sink:** Ensures efficient heat dissipation for stable operation.
- **Eight Electronic Protections:** Comprehensive safety features including overcharge, over-discharge, short-circuit, and reverse current protection.
- **Battery Compatibility:** Supports Lithium and Lead-Acid battery types (Flooded, GEL, AGM, LiFePO4).
- **Light & Timer Control:** Programmable load control functions.
- **LCD Display:** Clear interface for parameter viewing and adjustment.

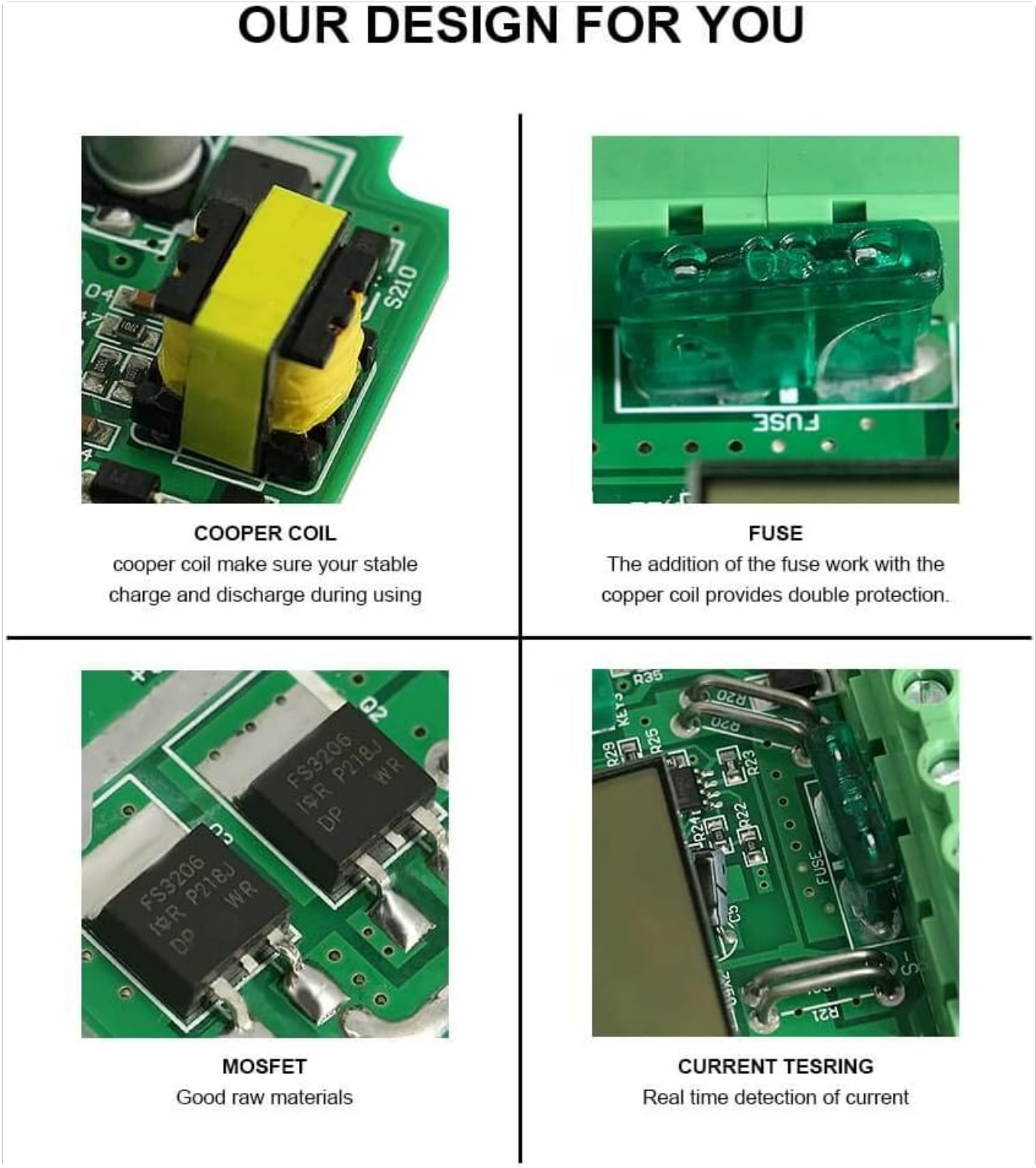

Image: Internal view of the controller highlighting key components such as the copper coil for stable charge/discharge, a fuse for double protection, and MOSFETs made from good raw materials for current sensing.

3. Safety Instructions

Please read all instructions carefully before installation and operation. Failure to follow these instructions may result in damage to the controller, battery, or solar panels, and may void the warranty.

- Ensure the battery is connected first to allow the controller to recognize the system voltage.
- Always connect the solar panels and load after the battery.
- Disconnect the solar panels and load before disconnecting the battery.
- Install the controller in a well-ventilated, dry, and cool environment, away from flammable materials.

- Avoid touching or short-circuiting wires or terminals.
- Use appropriate wire gauges for all connections to prevent overheating.
- This device is for indoor use only. Avoid exposure to water or excessive humidity.
- Keep out of reach of children.

4. Installation

4.1 Wiring Sequence

1. Connect the battery to the charge controller. Ensure correct polarity (+ to + and - to -). The controller will display the battery voltage.
2. Connect the solar panel to the charge controller. Ensure correct polarity. The controller will begin charging the battery.
3. Connect the load to the charge controller. Ensure correct polarity.

Important: *Always connect the battery first and disconnect it last. This sequence prevents damage to the controller from voltage surges.*

4.2 Mounting

Mount the controller vertically on a wall or flat surface in a well-ventilated area, away from direct sunlight, high temperatures, and water. Ensure there is sufficient air circulation around the heat sink.

Image: The PowMr SL03-30A Solar Charge Controller showing its mounting holes on the sides, indicating how it can be affixed to a surface.

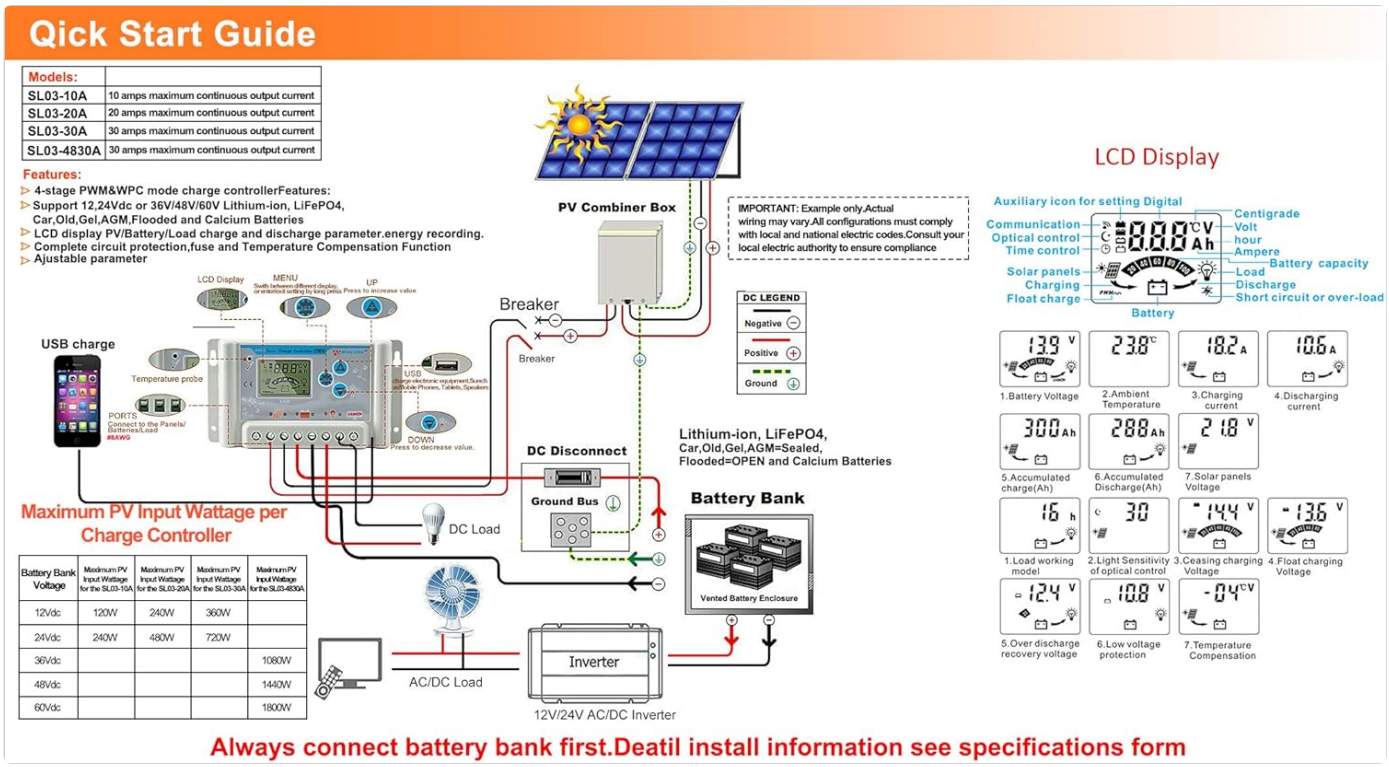

Image: A detailed wiring diagram for the solar charge controller, showing connections for PV combiner box, battery bank, DC load, and inverter. It also illustrates the LCD display and various parameters.

4.3 Video Guide: How to Connect the Controller

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Video: This video demonstrates the correct wiring procedure for the PowMr SL03-30A Solar Charge Controller, showing how to connect the battery and solar panels. It also shows how to browse the interface and adjust settings.

5. Operation

5.1 LCD Display and Buttons

The controller features an LCD display and three buttons for operation: UP, DOWN, and SET.

- **UP Button:** Navigates through display interfaces, increases parameter values.
- **DOWN Button:** Navigates through display interfaces, decreases parameter values.
- **SET Button:** Enters/exits setting mode, confirms parameter changes.

5.2 Browsing Display Interfaces

Press the UP or DOWN button to cycle through various display interfaces, including battery voltage, charging current, accumulated discharge, and load status.

5.3 Parameter Settings

To enter the setting interface, long-press the SET button for 5 seconds. Use the UP and DOWN buttons to adjust values and the SET button to confirm and move to the next parameter. Long-press SET again to save changes and exit. Adjustable parameters include:

- **Battery Type:** Select the correct battery type (e.g., Lead-Acid, Lithium).
- **Load Control Mode:** Set timer for load operation (e.g., 24H for continuous, 16H for dusk-to-dawn).
- **Charge Voltage:** Adjust maximum charge voltage.

- **Discharge Cut-off Voltage:** Set the minimum voltage before load disconnection.
- **Discharge Reconnect Voltage:** Set the voltage at which the load reconnects.

Refer to the "Specifications" section for default and adjustable ranges for each parameter.

6. Protection Functions

Image: A circular diagram illustrating the eight electronic protection features of the PowMr SL03-30A Solar Charge Controller, including power off memory, short-circuit, over-charging, open-circuit, over-load, under-voltage discharge, over-heat, and dual MOSFET reverse current protection.

The PowMr SL03-30A controller incorporates multiple protection mechanisms to ensure the safety and longevity of your solar system:

- **Over-charge Protection:** Prevents battery damage from excessive charging.
- **Over-discharge Protection:** Disconnects the load when battery voltage drops below a safe level.
- **Short-circuit Protection:** Automatically shuts down in case of a short circuit.
- **Open-circuit Protection:** Protects the system if the solar panel circuit is open.
- **Reverse Polarity Protection:** Prevents damage from incorrect battery or solar panel connections.
- **Over-load Protection:** Disconnects the load if current exceeds the rated limit.
- **Over-heat Protection:** Reduces power or shuts down if the controller's internal temperature is too high.
- **Power Off Memory:** Retains settings even after power loss.

7. Specifications

Specifications

Product Model	SL03-10A	SL03-20A	SL03-30A	SL03-4830A
Norinal Battery voltages		12V/24V auto		36V/48V/60V auto
Charge Current	10A	20A	30A	30A
Discharge current	10A	20A	30A	30A
Battery type	Lead-Acid Battery:I(Flooded,AGM,GEL,Car,Old and Calcium) LFP,Li(NiCoMn)O2,			
System Recognize Range	Lead-Acid Battery: 9V-15V(12V System) 18V-30V(24V System) LiFePO4 (4S/12V;8S/24V) Li(NiCoMn)O2(3S/12V;6S/24V)			
Charging Reguation	bulk,absorpton,float and equalization			
Max.PV open circuit voltage(VOC)	<=50V			<=100V
NEC Recommended Solar Maximum Array STC Nameplate(don't exceed)	120W/12Vdc 240W/12Vdc	240W/12Vdc 480W/12Vdc	360W/12Vdc 720W/12Vdc	1080W/36Vdc 1440W/48Vdc 1800W/60Vdc
Stop-Charge-Voltage	default 14.4V/28.8V(can setting9V-35V)			default43.2/57.6/72.0V (can setting28V-78V)
Float-charge-voltage	default 13.6V/27.2V(can setting9V-35V)			default40.8/54.4/68.0V (can setting28V-78V)
Low Voltage Reconnected	default 12.4V/24.8V(can setting9V-35V)			default37.2/49.6/62.0V (can setting28V-78V)
Low Voltage Disconnection	default 10.8V/21.6V(can setting9V-35V)			default32.4/43.2/54.0V (can setting28V-78V)
No load losses current	<=15mA			<=10mA
Battery Temperrature Compensation	Automatic with optional RTS installed/4.0mV(adjustable) per 2V battery cell per ℃			
Better safe Design	Aluminum platen base,Bigger circuit board, better circuit configuration and the lithium battery fuse			
Electronic protection	Dual MOSFET Reverse Current protection /over heat protection Under-voltage discharge protection /short-circuit protection open-circuit protection /over-load protection /over-charging protection Power off memory protection			
Electronic protection	<=0.26V			
Load circuit voltage drop	<=0.17V			
Installation Cable area	#8AWG			
Working temperature	-25 ~ +60℃			
outline size(L*W*H)	143*77*40mm			
Mounting Hole Spacing	134*55mm			
Weight	260g			
	SL03-10A/SL03-20A/SL03-30A			
Battery type	12V/24V Lead-Acid battery	12V Lead-Acid battery	24V Lead-Acid battery	3.2V*4S LiFe PO4-(LFP) battery
Ceasing Charging Voltage	14.4V/28.8V	14.4V	28.8V	14.4V
Floate-Charging-Voltage	13.6V/27.2V	13.6V	27.2V	13.8V
Over discharge recovery voltage	12.4V/24.8V	12.4V	24.8V	11.7V
Low Voltage Protection	10.8V/21.6V	10.8V	21.6V	9.4V
Battery type	3.2V*8S LiFePO4 (LFP) battery	3.7V*3S Li(NiCoMn) O2(Li-ion,Li-POL....)	3.7V*6S Li(NiCoMn) O2(Li-ion,Li-POL....)	User-Defined
Ceasing Charging Voltage	28.8V	12.6V	25.2V	8.5V-35V
Float Charging Voltage	27.6V	12.0V	24.0V	8.5V-35V
Over discharge recovery voltage	23.4V	11.0V	22.0V	8.5V-35V
Low Voltage Protection	18.8V	8.5V	17.0V	8.5V-35V

NOTE before INSTALL:

1	Connection order: 1)battery 2)panels 3)Load(ensure panels can't get any sunlight when install). The disassembly sequence is contrary to the wiring order . Before wiring installation and adjustment of controller,Always disconnect the solar modules and insurance or circuit breaker of battery terminal.
2	Connect the inverter (DC / AC) to the battery. Do not connect to the solar controller.
3	the load system voltage should be the same as solar system. it means if your solar system is 12V,your load's system voltage must be the 12V.
4	When installing for the first time, please make sure the battery voltage more than 8V so that the Charger controller can recognize system.See recognize range.
5	we suggest the input power more than the half of maximum value.Don't let controller work for long periods with limit maximum Input power or limit max Solar Input voltage or limit max charge current.The max value could find in label of panels.
6	The controller will stop output when the battery under 10.7V(adjustable).
7	The solar charge controller may only be used in PV systems in accordance with this user manual and the specifications of other modules manufacturers.Mo energy source other than a solar generator may be connected to the solar charge controller.
8	Tighten the wire to ports, otherwise it will produce sparks easily resulting in high temperatures.then burn easily ports.The controller is kept in a cool and breathable place.
9	Batteries store a large amount of energy , never short circuit a battery under all circumstances.We strongly recommend connecting a fuse directly to the battery to protect any short circuit at the battery wiring.
10	Install the Charger controller to the battery as close as possible to avoid voltage and power dropping caused by overlong wire and affect normal voltage judgment.
11	Batteries can produce flammable gases.Avoid making sparks,using fire or any naked flame. Make sure that the battery room is ventilated.
12	Uses insulated tools and avoid placing metal objects near the batteries.
13	Avoid touching or short circuiting wires or terminals.Be aware that the voltages on spedcial terminals or wires can be as much as twice the battery voltage.Use isolated tools, stand on dry ground, and keep your hands dry.
14	Dust and weather will affect MPP(MAX Power Point) tracking.make it clean.Sometimes. The data beat because of it tracking the MAX Power Point.
15	Be very careful when working with batteries.Wear eye protection. Have fresh water available to wash and clean any contact with battery acid.
16	Prevent water from entering the internal controller,outdoor installation should avoid direct sunlight and rain penetration.
17	The LCD display has an error of 0.2 V- 0.3 V, but this is normal
18	Do not open the heat sink of the solar controller without permission.

Image: A comprehensive table detailing the specifications for PowMr SL03-10A, SL03-20A, SL03-30A, and SL03-40A models, including normal battery voltage, charge/discharge current, battery type, system recognize range, charging regulation, maximum PV open circuit voltage, and various protection parameters.

PowMr SL03-30A Solar Charge Controller Specifications

Parameter	Value (SL03-30A)
Normal Battery Voltage	12V/24V Auto
Charge Current	30A

Parameter	Value (SL03-30A)
Discharge Current	30A
Battery Type	Lead-Acid Battery (Flooded, AGM, Gel, Calcium), LiFePO4 (Lithium)
System Recognize Range	Lead-Acid Battery: 8V-15V(12V System), 18V-30V(24V System) LiFePO4: 8V-15V(12V), 18V-30V(24V)
Charging Regulation	Bulk, Absorption, Float, Equalization
Max. PV Open Circuit Voltage (Voc)	<=50V
Max. PV Input Wattage (12V/24V)	360W/720W
Stop-charge Voltage	Default 14.4V (12V), 28.8V (24V) (adjustable)
Float-charge Voltage	Default 13.6V (12V), 27.2V (24V) (adjustable)
Low Voltage Reconnected	Default 12.4V (12V), 24.8V (24V) (adjustable)
Low Voltage Disconnection	Default 10.8V (12V), 21.6V (24V) (adjustable)
No Load Losses	<10mA
Battery Temperature Compensation	Automatic with optional NTC thermal probe (adjustable)
Operating Temperature	-20°C to +60°C
Outline Size (L*W*H)	143*77*40mm
Mounting Hole Spacing	134*55mm
Weight	260g

8. Troubleshooting

This section provides solutions to common issues you might encounter with your PowMr SL03-30A Solar Charge Controller.

Problem	Possible Cause	Solution
Controller display is off.	No battery connected or battery voltage too low.	Connect the battery correctly. Ensure battery voltage is above 8V.
"LLL" or "HHH" displayed on screen.	No PV input or PV voltage too low/high.	Ensure solar panels are connected and receiving sunlight. Check PV voltage.
Battery not charging.	Solar panel not connected, insufficient sunlight, or incorrect wiring.	Check solar panel connections and ensure adequate sunlight. Verify wiring polarity.
Load not working.	Load disconnected, battery voltage too low (over-discharge protection), or load control settings.	Check load connections. Charge battery. Adjust load control timer (e.g., set to 24H for continuous).

Problem	Possible Cause	Solution
Controller overheating.	Poor ventilation or excessive load/charging current.	Ensure proper ventilation around the controller. Reduce load or charging current if consistently overheating.

9. Maintenance

Regular maintenance ensures optimal performance and extends the lifespan of your solar charge controller.

- **Cleanliness:** Keep the controller clean and free from dust and debris. Use a dry cloth for cleaning.
- **Connections:** Periodically check all wiring connections for tightness and corrosion. Loose connections can cause overheating and poor performance.
- **Ventilation:** Ensure the ventilation openings are not blocked to allow for proper heat dissipation.
- **Battery Health:** Monitor battery voltage and health regularly. Replace batteries as needed.
- **Environmental Conditions:** Ensure the controller is operating within its specified temperature and humidity ranges.

10. Warranty and Support

For warranty information, technical support, or service inquiries, please contact PowMr customer service through the retailer where the product was purchased or visit the official PowMr website. Please have your model number (SL03-30A) and purchase date available when contacting support.
For more information, visit the PowMr Store.