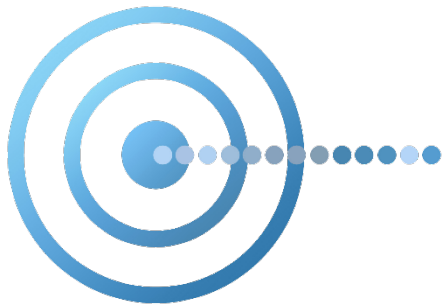




AIMS POWER™

www.aimscorp.net



USER'S MANUAL

SOLAR CHARGER CONTROLLER

30 AMP MPPT

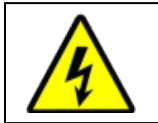
PART #: SCC30MPPT

INTRODUCTION & SAFETY INFORMATION

Thank you for choosing this 30A MPPT Solar Charge Controller from AIMS Power. This controller is designed to maximize energy harvest from photovoltaic (PV) modules while providing safe and efficient battery charging for lead acid and lithium battery systems.

Please read this manual carefully before installation, operation, or servicing. Failure to follow the instructions and safety precautions contained in this manual may result in equipment damage, personal injury, or system failure.

Retain this manual for future reference.



SAFETY INFORMATION

WARNING: ELECTRIC SHOCK HAZARD

Solar modules can produce hazardous voltages whenever exposed to light. Disconnect all power sources before installing or servicing the controller.

WARNING: FIRE AND EXPLOSION HAZARD

Do not install the controller in sealed compartments containing batteries or in areas where flammable gases may accumulate or there is lack of air flow.

WARNING: REVERSE POLARITY DAMAGE

Always verify correct polarity before making electrical connections. Reversed battery or PV connections may damage the controller and connected equipment. This is especially true with lithium batteries.

CAUTION: EQUIPMENT DAMAGE

Do not exceed the controller's maximum PV open circuit voltage or rated charging current. Exceeding these limits may permanently damage the controller.

CAUTION: PROPER VENTILATION REQUIRED

Install the controller in a well ventilated location. Allow a minimum of 4 inches (100 mm) of clearance above and below the controller for adequate airflow.

NOTICE

Installation must comply with all applicable national and local electrical codes.

PRODUCT OVERVIEW

This 30A MPPT Solar Charge Controller utilizes advanced Maximum Power Point Tracking technology to optimize energy harvest from solar modules under varying environmental conditions.

By continuously tracking the optimal operating point of the solar array, the controller can improve charging efficiency and increase solar energy utilization.

Key Features

- Advanced MPPT tracking efficiency greater than 99.5%
- Peak conversion efficiency up to 98%
- Dual peak and multi-peak tracking capability for partially shaded solar arrays
- Automatic power and current limiting protection
- Automatic temperature compensation
- LCD display for real time system monitoring
- Multiple programmable load operating modes
- Integrated electronic protections for system safety
- Automatic thermal power derating
- Transient voltage surge protection (TVS)
- Compatible with Sealed, Gel, AGM, Flooded Lead-Acid, LiFePO₄, and Lithium-ion battery chemistries

Applications

This controller is suitable for:

- RV and camper solar systems
- Marine applications – Not waterproof but conformal coated
- Off-grid cabins
- Remote equipment setups

- Backup power systems
- Industrial and commercial solar charging applications

BATTERY CHARGING OPERATION

The controller uses a three-stage charging algorithm to maximize battery performance, extend battery life, and ensure safe operation.

Bulk Charging

During Bulk Charging, the controller operates in MPPT mode and delivers maximum available charging current to the battery.

The controller continuously tracks the solar array's maximum power point to harvest the highest possible energy output.

Boost Charging

When battery voltage reaches the programmed Boost Voltage setpoint, the controller enters Boost Charging mode.

During this stage, the controller maintains a constant voltage while charging current gradually decreases as the battery approaches full charge.

The default Boost Charging duration is 2 hours.

Float Charging

After the Boost stage is completed, the controller transitions to Float Charging.

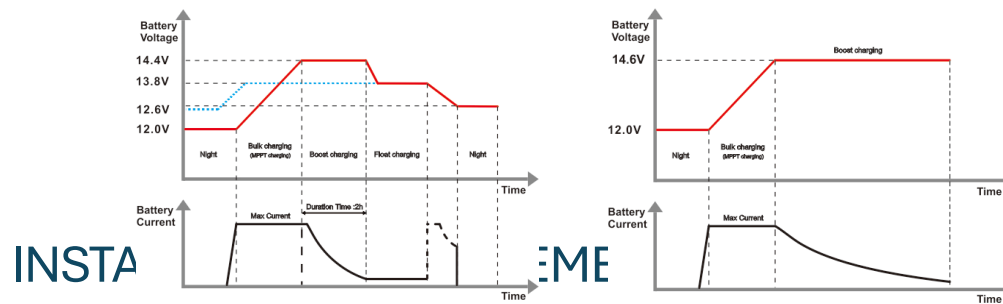
Float Charging maintains the battery at a lower maintenance voltage to compensate for self-discharge while minimizing water loss and battery heating.

If battery voltage drops below the Boost Reconnect Voltage, the controller automatically returns to Bulk Charging mode.

Lithium Battery Charging

For supported lithium battery types, the controller uses charging parameters specific to the selected battery chemistry. Charging behavior differs from lead-acid charging profiles.

Always select the correct battery type before operating the system.



Solar Array Requirements

The MPPT Solar Charge Controller is designed to operate with a wide range of photovoltaic (PV) modules and system configurations.

Before connecting a solar array, verify that the total PV open circuit voltage (Voc) does not exceed the maximum PV input voltage rating of the controller at the lowest expected ambient temperature.

NOTE:

Cold temperatures increase solar panel voltage. Always calculate array voltage using the module manufacturer's temperature-corrected Voc specifications.

Failure to observe maximum voltage limits may permanently damage the controller.

Maximum PV Array Power

The controller incorporates automatic current and power limiting protection.

If the connected solar array is capable of producing more power than the controller's rated charging capacity, the controller will automatically limit charging current to its rated output.

While moderate oversizing of the solar array is acceptable, the PV open-circuit voltage must never exceed the controller's maximum voltage rating.

Wire Sizing

Proper conductor sizing is critical for safe and efficient operation.

Use conductors rated for the maximum expected current and environmental conditions. Excessive voltage drop can reduce system performance.

Recommended conductor sizes are listed in the technical specifications section of this manual.

Installation Environment

Install the controller indoors or in a protected enclosure.

The installation location should meet the following requirements:

- Dry and free from moisture
- Protected from direct sunlight
- Free from corrosive gases and chemicals
- Well ventilated
- Free from excessive dust and debris
- Within the specified operating temperature range

Maintain a minimum clearance of 4 inches (100 mm) above and below the controller to allow proper airflow and cooling.

Do not install the controller in the same sealed compartment as batteries.

INSTALLATION AND WIRING

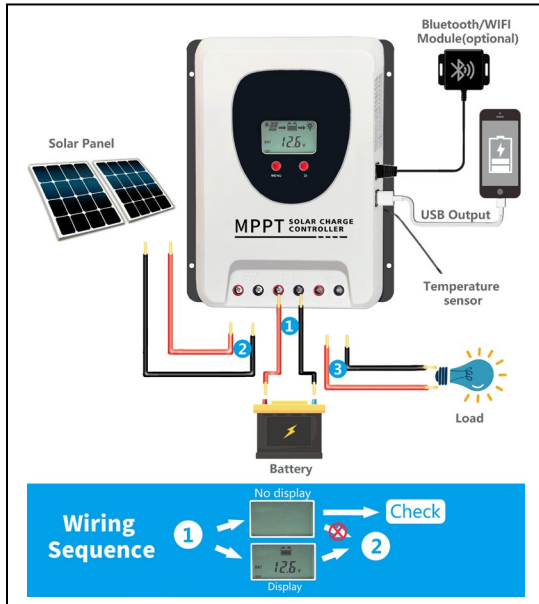
Mounting the Controller

Step 1: Select a suitable mounting location that meets the environmental requirements described in Installation Environment.

Step 2: Position the controller vertically on a flat surface.

Step 3: Secure the controller using appropriate mounting hardware.

Step 4: Verify adequate ventilation around the unit before proceeding.



To prevent equipment damage, always connect system components in the following order:

1. Battery
2. Solar Array (PV)
3. DC Load

When disconnecting the system, reverse the sequence:

1. DC Load
2. Solar Array (PV)
3. Battery



WARNING

Never connect the solar array to the controller before connecting the battery. The controller requires battery voltage for proper startup and operation.

Battery Connection

Connect the battery positive (+) and negative (-) conductors to the corresponding battery terminals on the controller.

Install an appropriately rated fuse or DC circuit breaker within 6 inches (150 mm) of the battery positive terminal.

Verify correct polarity before energizing the system.

Solar Array Connection

After connecting the battery, connect the PV array conductors to the controller.

Verify correct polarity before completing the connection.

If the PV array is exposed to sunlight, charging should begin automatically once the controller powers up.

Load Connection

Connect DC loads to the load terminals only if the total load current is within the controller's rated load output capacity.

Large DC loads should be connected through an appropriately rated external relay or contactor.

Inverter Installation

IMPORTANT

When using a power inverter, always connect power inverters directly to the battery bank.

Do not connect an inverter to the controller's load terminals.

Doing so may damage the controller and void the warranty.

INITIAL START-UP

Step 1:

1. Connect battery to charge controller. Make sure to use the battery input terminals.
Confirm the polarity is correct.
2. Confirm the charge controller powers on.

Setting the battery type via LCD

The controller is factory-configured for Lead-Acid batteries by default. If you are using a different battery chemistry, such as LiFePO4 or Lithium-Ion, you must select the appropriate battery type during initial setup.

IMPORTANT: Selecting the incorrect battery type may result in improper charging performance, reduced battery life, or permanent battery damage.

WARNING: Do not disconnect the battery while the controller is actively charging.

The battery serves as the controller's primary voltage reference. Disconnecting the battery during operation may cause unstable voltage conditions that can interrupt power to connected DC loads. In severe cases, sensitive equipment connected to the load terminals may be damaged.

WARNING: Always verify battery polarity before connecting the battery to the controller.

If the battery is connected with reversed polarity shortly after the controller has been charging or operating, internal components may be damaged.

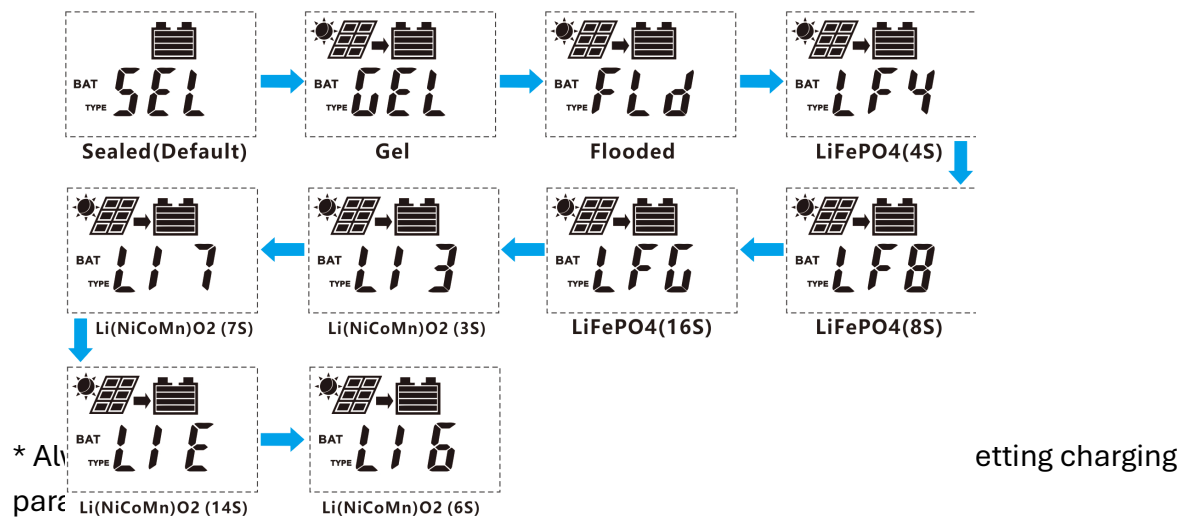
Damage caused by reverse polarity connections is not covered under warranty.

At main interface(cycle display), Press the **“MENU”** button to enter battery type mode interface.

Long press the **“MENU”** button($\geq 5S$) until the **“SEL”** flashes, and allows to enter a battery type setting.

Press the **“MENU”** and **“>”** button to confirm the battery type below:

Long press the **“MENU”** button($\geq 5S$) to save the new setting. If there is no operation within 20S, the controller will enter the main interface and cycle to back to previous screen.



Step 2: Connect the solar array to the solar input terminals of the controller. Confirm the solar array size meets the charge controller’s specifications. The specifications can be found in the Specifications section of the manual. If there is adequate sunlight, confirm the controller is charging.

Step 3 (if using DC load): Connect DC loads to load terminal of charge controller.

LCD DISPLAY, SETTINGS & PROTECTIONS

LCD DISPLAY OVERVIEW

The LCD display provides real time information regarding system operation, including:

- Battery Voltage
- Battery Current
- Battery Capacity
- Solar Array Voltage
- Solar Array Current
- Solar Charging Power
- Load Current
- Controller Temperature

- Charging Status
- Battery Type
- System Fault Conditions

BUTTON FUNCTIONS

MENU Button

- Navigate through display screens
- Enter programming mode
- Confirm settings

OPERATION Button “>>”

- Toggle load output ON/OFF (Manual Mode)
- Clear fault conditions
- Adjust programmable values

INTERFACE

PROGRAMMING SETTINGS

The controller allows adjustment of the following parameters:

- Battery Type
- Float Voltage
- Boost Voltage
- Low Voltage Disconnect (LVD)
- Low Voltage Reconnect (LVR)
- Load Operating Mode
- System Voltage Lock
- Lithium Charge Termination Current

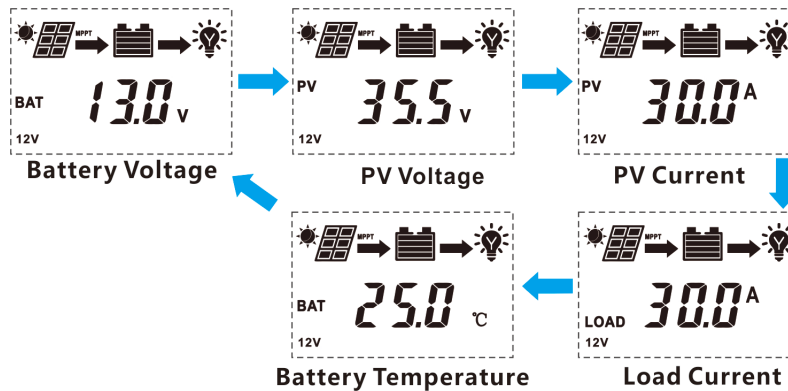
Status Description

Item	Icon	Status
PV Array		In daytime and PV connected correctly
		At night or no PV connect or reverse connect
		No Charging
		Charging In MPPT
		In Float Charging Mode

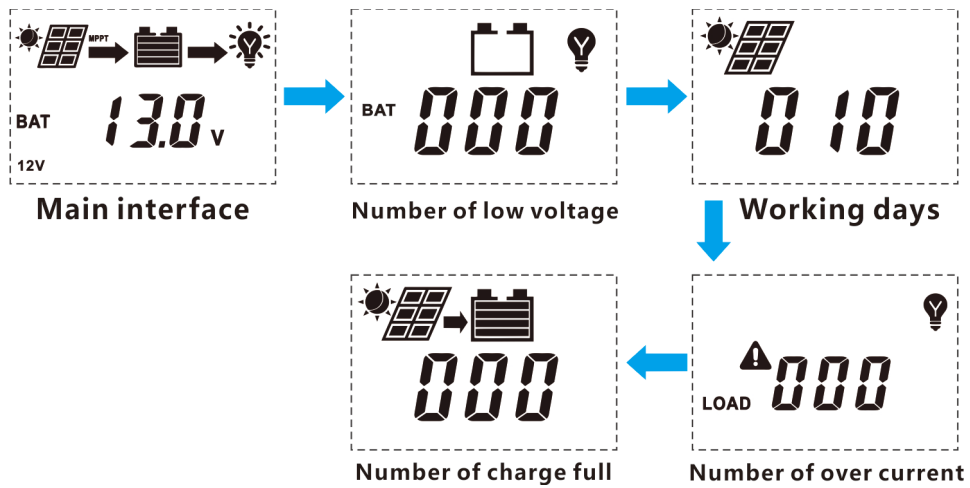
		In Boost Charging Mode
	PV	PV Voltage, Current and Power
Battery		Battery Capacity Indicating
	12V24V	Current System Voltage
	BAT	Battery Voltage and Current
	BAT TYPE	Battery Type
Load		Load ON
		Load OFF
		Light and Time Control Mode
		Light Control Mode
	LOAD TYPE	Load Working Mode
	LOAD	Discharging Current and Work Status

MAIN INTERFACE

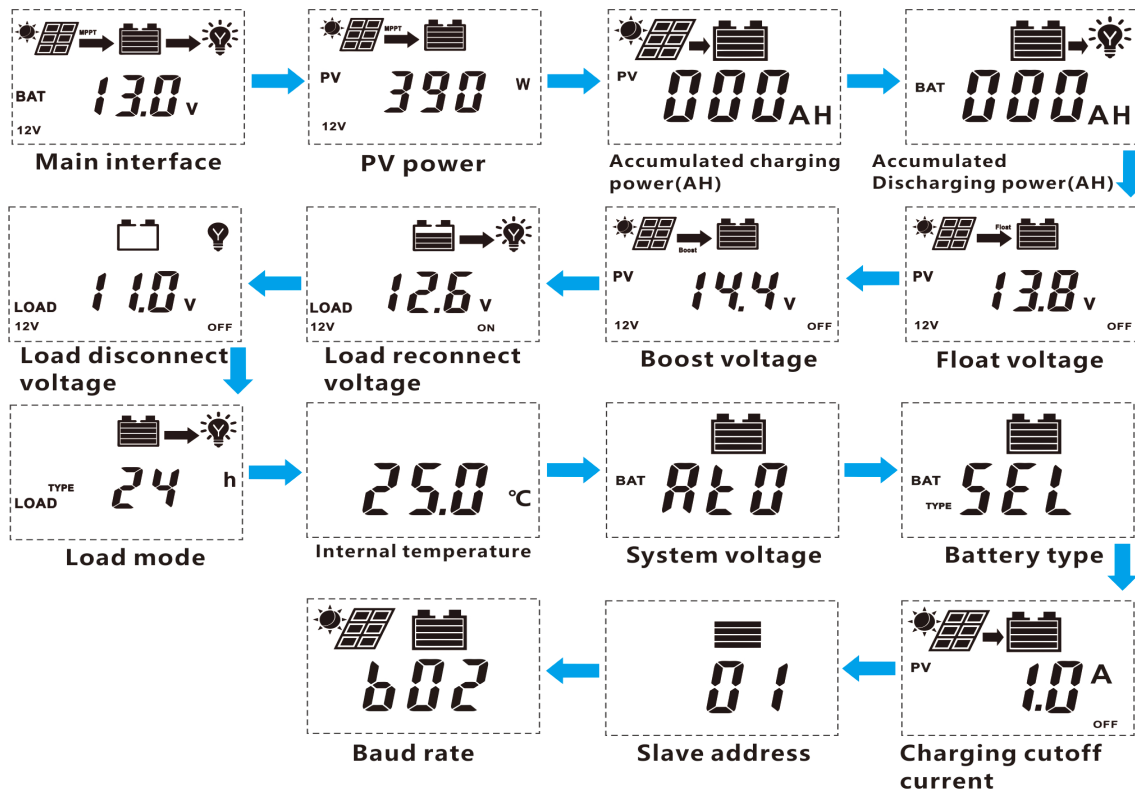
If there is no operation within 20s in any mode or powered on within 10s, the main interface will cycle to display the battery voltage, PV voltage, charging current, discharging current and battery temperature every 3s. Long press the “»” button can speed up the cycle display time.



At the main interface (during cycle display), press and hold the **MENU** and “»” buttons at the same time to enter the **Working Record** screen. This section displays the number of low-voltage events, total working days, over-current events, and full-charge cycles.



At main interface (during cycle display), press the **MENU** button to enter the menu interface to access more menu options.

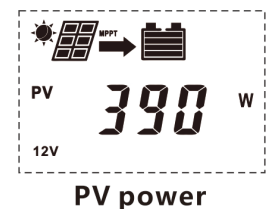


SETTINGS

Controller Reset

On the PV power interface, you can reset the PV power generated. From the Main Interface, Press the ">>" button to go through the menu to PV power and press and hold the ">>" key for 5 seconds, and the controller will automatically reset and restart the value.

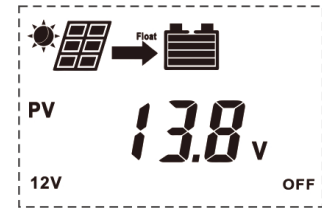
Note: This reset is a software reset. Before resetting, ensure that the controller is not charging and the PV is disconnected to prevent sudden reset from causing damage to the controller. Repeat the same process for Accumulated charging power and Discharging power.



Float Voltage

Step 1: At main interface, continue to press the ">>" button until you get to the float voltage interface

Step 2: Long press the "MENU" button($\geq 5S$) until the value flashes, now its setting state

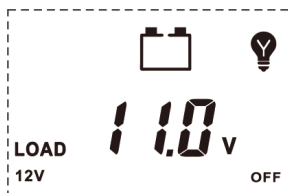


Float voltage

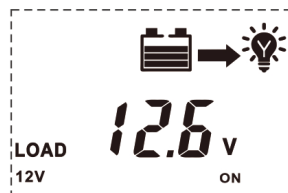
Step 3: Press the "MENU" and ">>" button to change the value

Step 4: After setting, Long press the "MENU" button($\geq 5S$) to save the new setting. If there is no operation within 20S, the controller will go back to the main interface and cycle to display automatically.

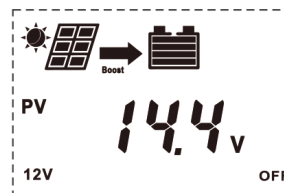
Follow the same steps to set Boost Voltage, Low Voltage Reconnect and Low Voltage Disconnect



Load disconnect voltage



Load reconnect voltage



Boost voltage

At main interface (cycle display), Press the "MENU" button to enter the relevant interface.

**The following rules must be observed when modifying the parameter values:
(CHARGING SPECIFICATIONS SHOULD BE FOLLOWED PER BATTERY MANUFACTURER SPECIFICATIONS)**

1. Charging Limit Voltage > Boost Charging Voltage > Float Charging Voltage > Boost Reconnect Charging Voltage.
2. Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage(BMS+0.2V)
3. Boost Reconnect Charging voltage > Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage(BMS+0.2V)

Battery Voltage Charging Parameters

Below parameters are for a 12V system at 25 °C, double the values for a 24V system.

Battery Type	SEL/AGM 24V*2	GEL 24V*2	FLD 24V*2	LF4(LiFePO44S/12V) LF8 (LiFePO4 8S/24V*2)	LI3 (Li(NiCoMn)O 2 3S/12V) LI6 6S/24V	LI7 (Li(NiCoMn)O2 7S/24V)
Over Voltage Disconnect	16.0V	16.0 V	16.0 V	16.0V	17.0 V	32.0V
Charging Limited Voltage	15.0 V	15.0 V	15.0 V	14.8V	17.0 V	30.0V
Over Voltage Reconnect	15.0 V	15.0 V	15.0 V	14.8V	17.0 V	30.0V
Boost Charge	14.4 V	14.2 V	14.6 V	14.4V	12.5V	29.2V
Float Charge	13.8 V	13.8 V	13.8 V	14.0V	12.2V	27.6V
Boost Restart Voltage	13.2V	13.2V	13.2V	13.5V	12.1V	26.4V
Low Voltage Reconnect	12.6V	12.6V	12.6V	12.6V	10.5V	25.2V
Low Voltage Disconnect	11.0V	11.0V	11.0V	11.0V	9.3V	21.0V

Load Working Mode

The controller operates in a continuous 24-hour mode by default. As long as the battery maintains sufficient charge, the controller will provide uninterrupted power to the connected load.

Operation:

Step 1: At main interface(cycle display), press the “**MENU**” button to enter load mode interface.

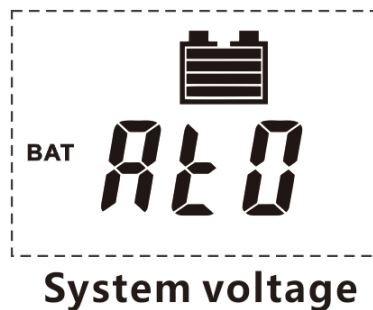
Step 2: Long press the “**MENU**” button($\geq 5S$) until the 24H flashes, it is now ready to change the setting

Step 3: Press the “**MENU**” and “**»**” button to change the value

Hours	Light and Timer Control
24H	Load will always be on
23H	The load remains on, and the load switch is not controlled by the key.
1H	Load will be on for 1 hour after sunset
2H	Load will be on for 2 hours after sunset
3H~14H	Load will be on for 3 ~ 14hours after sunset
14H~22H	Load will be on after sunset and be off before sunrise.

System Voltage Setting

The system voltage is set to automatically detect the voltage by default and the voltage can only be set when a non-lithium battery type is selected. Users can lock the voltage level according to the actual battery voltage via this interface. The setting method is the same as previous steps in the manual.



Supported Battery Types

Lead-acid battery	Sealed / / AGM(default) / Gel / Flooded / User Defined
Lithium battery	LiFePO4 LF4/12V LF8/24V
	Li(NiCoMn)O2 LI3/12V LI6/LI7/24V

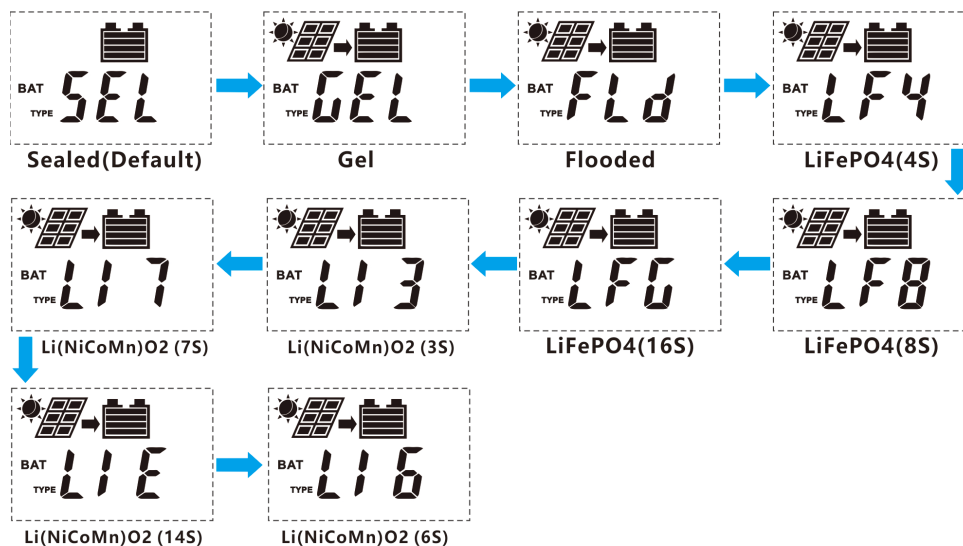
SETTING THE BATTERY TYPE

Step 1: At main interface(cycle display), press the “**MENU**” button to enter battery type mode interface.

Step 2: Long press the “**MENU**” button($\geq 5S$) until the “SEL” flashes, now it is in setting state.

Step 3: Press the “**MENU**” and “**»**” button to confirm the battery type below.

Step 4: Long press the “**MENU**” button($\geq 5S$) to save the new setting. If there is no operation within 20S, the controller will enter the main interface and cycle to display automatically.



Lithium Notes: Cut-off Current Setting

When the battery type is set to lithium, the controller will stop charging once the battery reaches the boost charging voltage and the charging current drops below the stop charging cut-off current. Charging will resume when the battery voltage falls below the recharge recovery voltage or after the next nightfall. A higher current setting will result in an earlier charging stop. The default value is 1A, and the adjustable range is 0.2A to 10A.

PROTECTION FEATURES

The controller incorporates multiple automatic protection systems including:

- PV Overvoltage Protection
- PV Reverse Polarity Protection
- PV Overcurrent Limiting
- Battery Reverse Polarity Protection (excludes lithium)*
- Battery Overvoltage Protection
- Battery Over Discharge Protection
- Load Overload Protection
- Load Short Circuit Protection
- Controller Overtemperature Protection
- Night Reverse Current Protection
- Transient Voltage Surge (TVS) Protection

*Refer to lithium battery wiring notes for polarity restrictions.

MAINTENANCE

Inspect the system at least twice annually.

Recommended maintenance includes:

- Inspecting all wiring connections
- Tightening terminal connections
- Checking for corrosion
- Cleaning dust and debris from ventilation openings
- Inspecting fuses and circuit breakers
- Verifying proper grounding
- Confirming normal charging operation

Always disconnect all power sources before performing maintenance

TROUBLESHOOTING

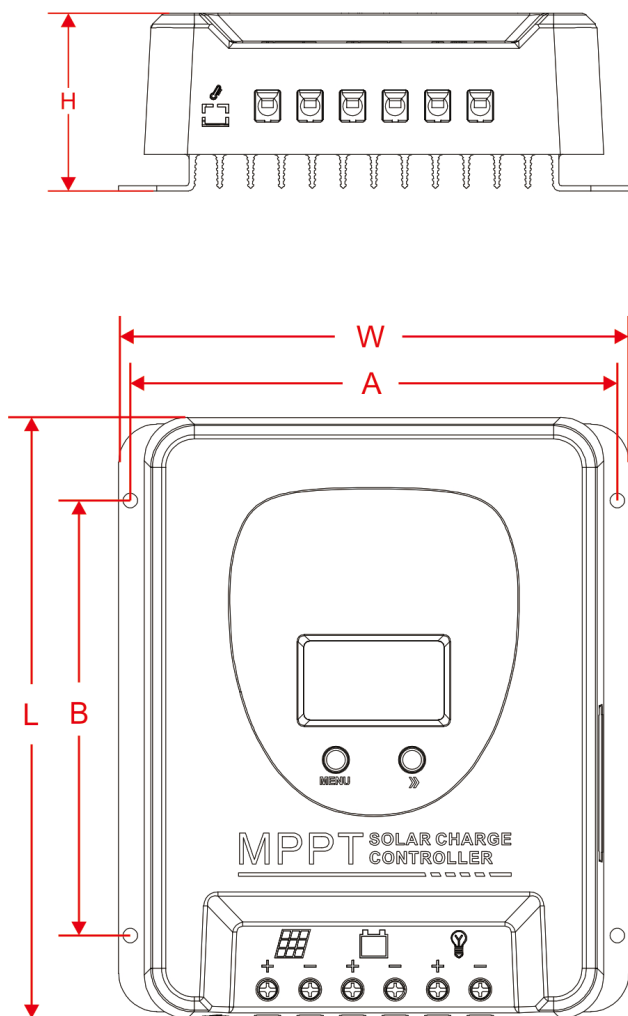
Problem	Possible Causes	Corrective Action
No Display	Battery disconnected Battery voltage below startup threshold Loose wiring	Verify terminal connections Verify battery voltage Inspect battery fuse or breaker
No Solar Charging	PV disconnect switch open Reverse PV polarity Insufficient sunlight	Inspect wiring and breakers Confirm correct polarity Verify PV voltage at controller terminals
Battery Overvoltage Fault	Incorrect battery type setting Charging source malfunction	Verify battery type selection Disconnect charging sources Inspect battery voltage
Load Not Operating	Low Voltage Disconnect active Load overload condition Short circuit condition	Recharge battery Reduce connected load Inspect load wiring
Controller Overtemperature	Poor ventilation Excessive ambient temperature High charging current	Improve airflow Reduce operating temperature Remove obstructions from heat sink

Fault Indicators

Possible reasons	Faults	Troubleshooting
PV array disconnection	 LCD display during daytime	Confirm that PV wire connections are correct and tight. Confirm adequate sunlight
Battery voltage is lower than 8V	Wire connection is correct, the controller is not working.	Check the voltage of battery. The battery voltage needs to be at 8V or greater to activate controller.
Battery over voltage	  Battery level shows full, battery frame blink, fault icon blink	Check if battery voltage is higher than OVD(over voltage disconnect voltage), and disconnect the PV.
Battery over discharged	  Battery level shows empty ,battery frame n blink	When the battery voltage is restored to or above LVR(low voltage reconnect voltage), the load will recover
Overload	  	Reduce the number of panels and restart
Load Short Circuit	1. No output 2.Load and fault icon blink	Check the load connections, and all wires. Do not disconnect live wires. Clear the fault. Restart the controller.

TECHNICAL SPECIFICATIONS

Rated charge current	30A
Rated discharge current	30A
Max PV open circuit voltage	100V
PV Input Voltage	12V battery input 17-100V DC MPPT range 23VDC -100VDC 24V battery input 32-100V DC MPPT range 46VDC -100VDC
Max Input Wattage	390W / 12V & 780W / 24V
Rated charge current	30A
Rated discharge current	30A
Battery voltage range	8~32V
System nominal voltage	12/24VDC Auto Detecting
Battery Type	Sealed AGM(Default) / Gel/Flooded / LiFePO4/ Li(NiCoMn)O2/ User Defined
Rated charge power	390W-12V & 780W-24V
LVD	11.0V ADJ 9V....12 and ×2/24
LVR	12.6V ADJ 11V....13.5V and ×2/24
Float voltage	13.8V ADJ 13V....15 and ×2/24V
Boost voltage	14.4V : ADJ 14V....15 and ×2/24V Battery Voltage less than Boost Restart Voltage Start Boost changing for 2hours
Self-consumption	≤28mA(12V) ≤19mA(24V)
Discharge circuit voltage drop	≤0.12V
Temperature compensate Coefficient ④	-4mv/°C/2V
Cooling	Natural + Heat Sink
Wire Size	10 AWG
Working environment temperature	-20°C~+85°C (@ 100% output) Derating threshold - 75°C Warning threshold - 80°C Shutdown threshold - 85°C Recovery threshold - 65°C
Storage temperature range	-20°C~+70°C
Relative humidity	≤95%, N.C.
Enclosure	IP30
Dimension(L*W*H) inches	6 7/8 x 6 3/4 x 2 1/2
Dimension(A*B)	6 1/2" x 4 3/4"
Mounting hole size	Φ5mm
Weight	2.4 lbs



Item	30A
Dimension(L*W*H)	6 7/8" x 6 3/4" x 2 1/2"
Mounting Dimension(A*B)	6 1/2" x 4 3/4"
Mounting hole size	Φ5mm
Weight	2.4 lbs

TECHNICAL SUPPORT

For installation assistance, troubleshooting support, or warranty service, contact: AIMS Power Technical Support techsupport@aimscorp.net. Please have the model number, serial number, and system information available when contacting support.

WARRANTY

This product includes a 2 year warranty. The warranty coverage against manufacturer defects as follows, from the date of purchase.

Within the warranty coverage period, AIMS Power™ will repair or replace, at its sole discretion, any defective product. Some products may carry limited or prorated warranties.

NO REFUNDS AFTER 30 DAYS. REPAIR OR REPLACE ONLY.

Return shipping costs for warranty service or exchanges are the responsibility of the customer. If the product is approved for warranty coverage, AIMS Power™ will cover the cost of shipping the repaired or replacement item back to the customer within the 48 contiguous states.

Warranty Exclusions

This warranty does not cover:

- Products determined by AIMS Power™ to be free of material or workmanship defects
- Excessive wear, misuse, improper installation, lightning damage, or altered products
- Missing or defaced labels, stickers, serial numbers, or identifying information
- Improper care or storage (including water damage or exposure to extreme temperatures)
- Systems that mix battery types, brands, or old and new components
- Products that have been tampered with, altered or customized
- Secondhand purchases or products purchased from unauthorized sellers
- Products outside the warranty period
- To protect the health and safety of our staff, AIMS Power reserves the right to decline any warranty diagnostics or repairs on items deemed unsanitary.

Non-Transferable:

The AIMS Power Warranty covers the original purchaser of the product and is not transferable to any other person or entity. Proof of purchase is required.

CONTACT INFORMATION:

AIMS Power, Inc.

9550 Gateway Drive

Reno, NV 89521

www.aimscorp.net

775.359.6703