

Max-EU series Solar Charge Controller

12/24V , 20A/30A/40A

User Manual

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Dear Clients,

Thanks for selecting the Max-EU series solar charge controller.

Please take the time to read this user manual, this will help you to make full use of many advantages the controller can provide your solar system.

This manual gives important recommendations for installing and using and so on. Read it carefully in your own interest and pay attention to the safety recommendations in it please.

1, Safety instructions and waiver of liability

1.1 Safety Instructions

The following symbols are used throughout this manual to indicate potentially dangerous conditions or mark important safety instructions. Please take care when meeting these symbols.



WARNING: Indicates a potentially dangerous condition. Use extreme caution when performing this task.



CAUTION: Indicates a critical procedure for safe and proper operation of the controller.



CAUTION:

- 1) There are no user serviceable parts inside the controller. Do not disassemble or attempt to repair the controller.
- 2) Keep children away from batteries and the charge controller.

1.2 Liability Exclusion

The manufacturer shall not be liable for damages, especially on the battery, caused by use other than as intended or as mentioned in this manual or if the recommendations of the battery manufacturer are neglected. The manufacturer shall not be liable if there has been service or repair carried out by any unauthorized person, unusual use, wrong installation, or bad system design.

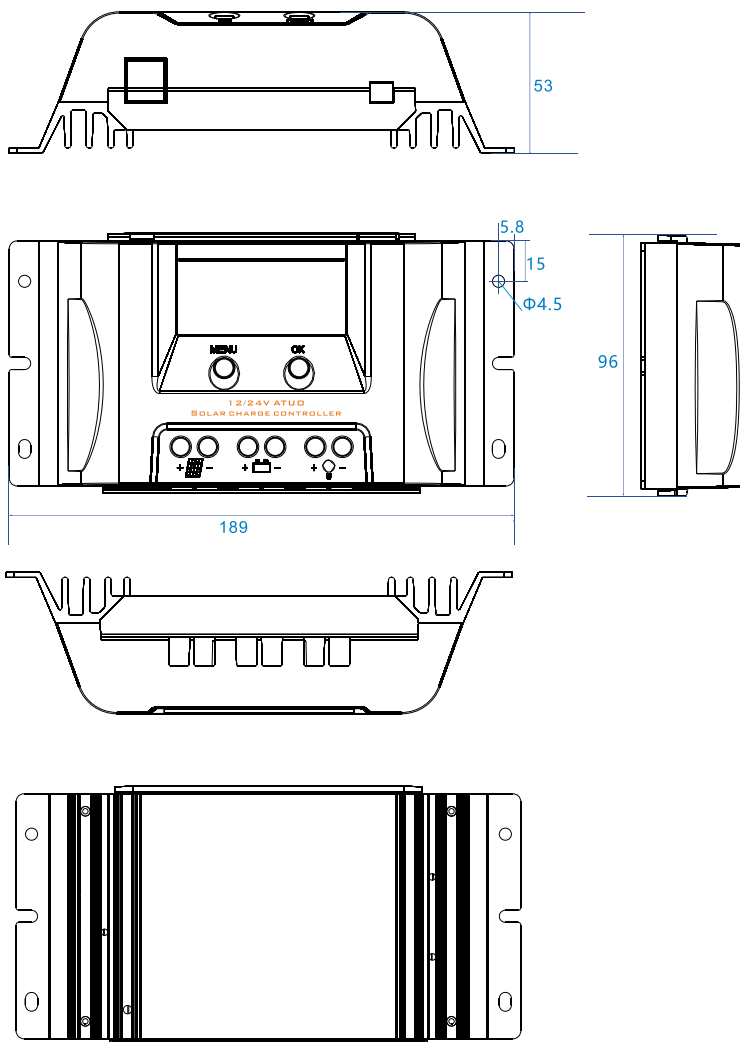
2, Overview

With your new Max-EU series solar charge controller you own a state-of-the art device which was developed according to the latest available technical standards.

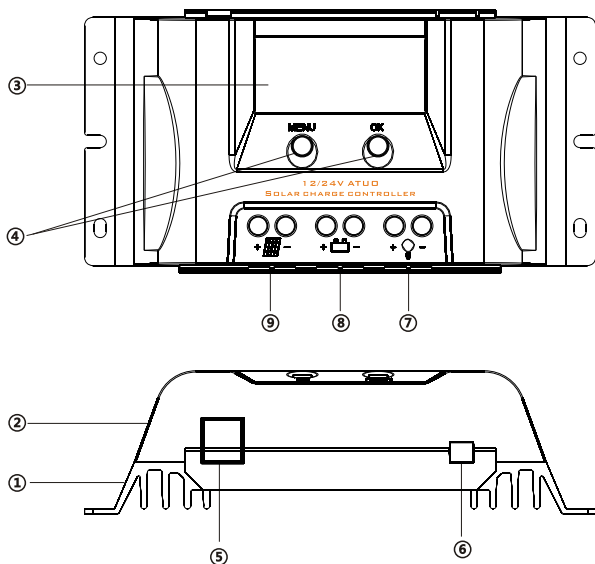
It comes with a number of outstanding features, such as:

- LCD display design, read operating data and working condition easily.
- Real-time energy statistics function.
- 12V/24V automatic recognition
- AGM、Liquid and GEL battery for selection
- External temperature sensor, automatic temperature compensation
- Built-in temperature sensor, when the temperature exceeds the set value, the charging current will lower down followed by the decrease of temperature, so as to control the controller' s temperature rise
- Four stages charge way: fast, boost, equal, float
- Multiple load control modes: Standard, Dusk to Dawn, Timer and User-defined mode.
- Two USB interfaces
- Perfect EMC & thermal design
- Full automatic electronic protect function

3, Dimensions



4, Structure & Accessory



- ①Heat Sink
—dissipate controller heat
- ②Plastic Case
—Internal protection
- ③LCD
—Display settings and operating status, system parameters
- ④Key: MENU、OK
Set and view the operating parameters
- ⑤Two USB interfaces
—Output 5V, 2A
- ⑥Temperature Sensor Port
—Collect temperature information, Temperature compensation.
- ⑦ Load Terminals
—Connected load.
- ⑧Battery Terminals
—Connect the battery.
- ⑨Solar module terminals
—Connected solar modules.

Temperature Sensor

To collect battery temperature data for temperature compensation so the controller can charge the battery. The temperature sensor connected via interface 6.

5, Installation



CAUTION: Please read all instructions and precautions in the manual before installing!

5.1 Installation Notes

(1)The solar charge controller may only be used in PV systems in accordance with this user manual and the specifications of other modules manufacturers. No energy source other than a solar generator may be connected to the solar charge controller.

(2)Before wiring installation and adjustment of controller, Always disconnect the solar modules and insurance or circuit breaker of battery terminal.

(3)Only to comply with the range of the battery charge controller.

(4)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.

(5)Batteries can produce flammable gases. Avoid making sparks, using fire or any naked flame. Make sure that the battery room is ventilated.

(6)Uses insulated tools and avoid placing metal objects near the batteries.

(7)Be very careful when working with batteries. Wear eye protection. Have fresh water available to wash and clean any contact with battery acid.

(8)Avoid touching or short circuiting wires or terminals. Be aware that the voltages on special terminals or wires can be as much as twice the battery voltage. Use isolated tools, stand on dry ground, and keep your hands dry.

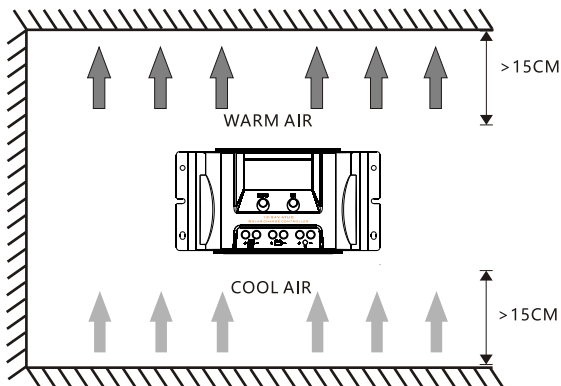
(9)Prevent water from entering the internal controller, outdoor installation should avoid direct sunlight and rain penetration.

(10)After installation check that all connections are tight line, avoid heat accumulation caused by virtual access danger.

5.2 Mounting Location Requirements

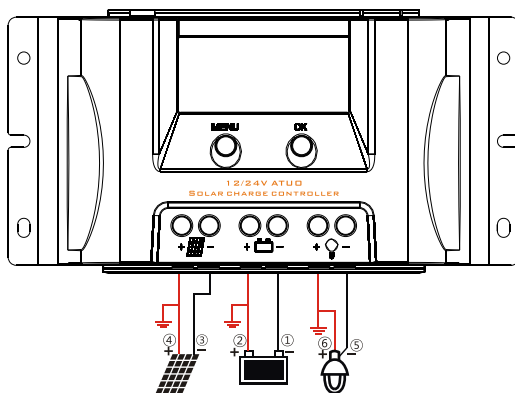
Do not mount the solar charge controller outdoors or in wet rooms. Do not subject the solar charge controller to direct sunshine or other sources of heat. Protect the solar charge controller from dirt and moisture. Mount upright on the wall on a non-flammable substrate. Maintain a minimum clearance of 15cm below and around the device to ensure unhindered air circulation. Mount the solar charge controller as close as possible to the batteries.

Mark the position of the solar charge controller fastening holes on the wall, drill 4 holes and insert dowels, fasten the solar charge controller to the wall with the cable openings facing downwards.



5.3 Connection

We strongly recommend connecting a fuse directly to the battery to protect any short circuit at the battery wiring. Solar PV modules create current whenever light strikes them. The current created varies with the light intensity, but even in the case of low levels of light, full voltage is given by the modules. So, protect the solar modules from incident light during installation. Never touch uninsulated cable ends, use only insulated tools, and make sure that the wire diameter is in accordance with the solar charge controller's expected currents.



1st step: Connect the battery

Connect the battery connection cable with the correct polarity to the middle pair of terminals on the solar charge controller (with the battery symbol). If the system is 12V, please make sure that the battery voltage is within 10V~15V, else if the system is 24V, the battery voltage should be between 20V~30V. If the polarity is correct, the LCD on the controller will begin to show.

2nd step: Connect the solar module

Ensure that the solar module is protected from incident light. Ensure that the solar module does not exceed the maximum permissible input current. Connect the solar module connection cable to the correct polarity of the left pair of terminals on the solar charge controller (with the solar module symbol).

3rd step: Connect loads

Connect the load cable to the correct polarity of the right pair of terminals on the solar charge controller (with the lamp symbol). To avoid any voltage on the wires, first connect the wire to the load, then to the controller.

4th step: Final work

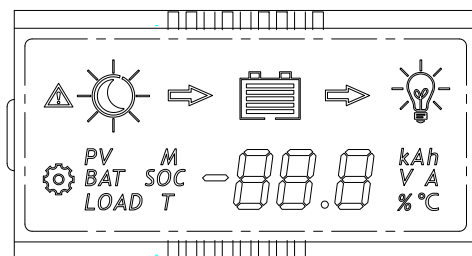
Tighten all cables connected to the controller and remove any debris around the controller (leaving a space of approx. 15 cm).

5.4 Grounding
















Be aware that the positive terminals of controller are connected together and therefore have the same electrical potential. If any grounding is required, always do this on the positive wires.

6, Operation

6.1 LCD Display

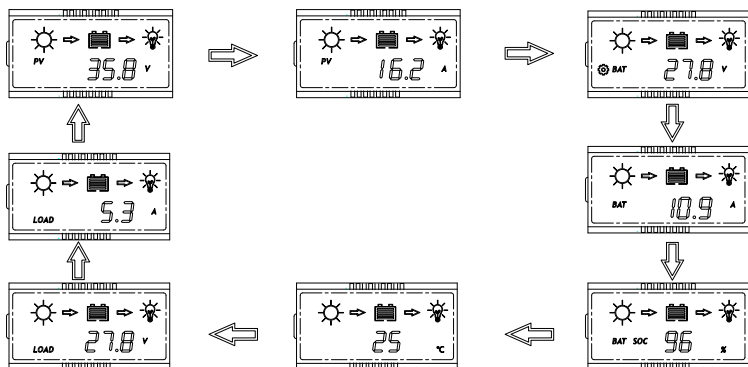


6.1.1 Status Description

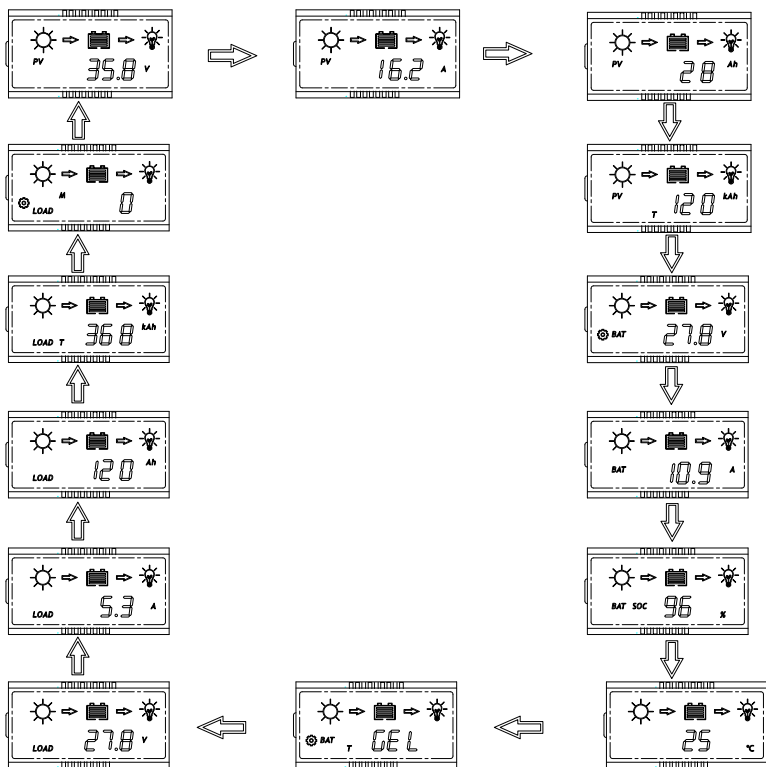
Item	Icon	Status
PV array	 	Daytime, not charging
	  	Daytime, charging
		Night
	<i>PV</i>	PV voltage、 current and ampere hours
	<i>PV</i> <i>T</i>	The total charge ampere hours from the solar panel
Battery		Battery capacity
	 <i>BAT</i>	Battery voltage(Programmable)
	<i>BAT</i>	Battery current
	<i>BAT</i> <i>SOC</i>	Battery capacity
	<i>25</i> °C	Temperature
	 <i>BAT</i> <i>T</i> <i>GEL</i>	Battery type(Programmable)
Load	<i>LOAD</i>	Load voltage、 current and ampere hours(24H cycle)
	<i>LOAD</i> <i>T</i>	The total discharge ampere hours of the load
	 <i>LOAD</i> <i>M</i>	Load mode(Programmable)
	  	The load is on
	 	The load is off

 **PV array charge ampere hours and load ampere hours are off after power failure.**











6.1.2 The interface automatically cycles



6.1.3 Press OK to browse the interface




6.1.4 Fault indication

Status	Icon	Description
Short circuit	  E1	Load off, fault icon display, load icon flashes, the LCD screen displays E1
Over current	  E2	Load off, fault icon display, load icon flashes, the LCD screen displays E2
Low voltage	  E3	Battery lever shows empty, fault icon display, battery frame flashes, the LCD screen displays E3
Over voltage	  E4	Battery lever shows full, fault icon display, battery frame flashes, the LCD screen displays E4
Over temperature	  E5	Turn off the charge and discharge, fault icon display, icon °C flashing, the LCD screen displays E5

6.2 Key function



Mode	Operating
Browse interface	Short press OK
Static display	Press the MENU and OK key at the same time for 1s, the LCD screen will lock the interface. Press the MENU and OK key again for 1s, the LCD interface will unlock and start scrolling.
Setting parameter	Press the MENU key for 1s to enter the setting mode when the icon  appears on the display interface, and exit automatically after 30s
Load On/Off	When the controller is working in street lamp mode, press the MENU key for 3s to open the load, press the MENU key again or 1min later the load will be off.

6.3 USB interface

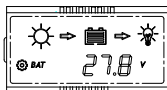
Max-EU series have two USB interfaces, single USB maximum output is 5V 1.5A, two USB maximum output is 5V 2A, for charging mobile phones and other smart devices.


The USB stops output only when the controller is in low voltage protection.

6.4 Parameters setting

When the icon  appears in the display interface, it means that the parameters can be set. Long press the **MENU** key for 1s, then icon  flashes, press **OK** to change the parameter.

6.4.1 Low voltage protection and reconnect



When the LCD shows as the left, press the **MENU** key for 1s, the icon  flashes, you can set the controller's low voltage protection, low voltage protection is divided into battery voltage control and SOC.

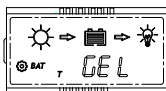
① Battery voltage control


Low voltage protection setting range : 10.8~11.8V/21.6~23.6V.
Low voltage reconnect range : 11.6~12.6V/23.2~25.2V.

② SOC

Display	Low voltage protection range	Low voltage reconnect
S-1	11.0~11.6V/22.0~23.2V	12.4/24.8V
S-2	11.1~11.7V/22.2~23.4V	12.5/25.0V
S-3	11.2~11.8V/22.4~23.6V	12.6/25.2V
S-4	11.4~11.9V/22.8~23.8V	12.7/25.4V
S-5	11.6~12.0V/23.2~24.0V	12.8/25.6V

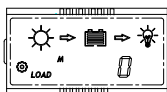
6.4.2 Battery type




When the LCD shows as the left, press the **MENU** key for 1s, the icon  flashes, you can set battery type.

Display	Battery type
GEL	GEL
L19	Liquid
AG-	AGM

6.4.3 Load mode



When the LCD shows as the left, press the **MENU** key for 1s, the icon  flashes, you can set the load mode.

Display	Load mode
0	Standard, 24H
1	Dusk to Dawn
23456789	Load will be on for 2~9hours since sunset
USE	User-defined mode



Test Function(Street lamp mode)

When the controller is working in the street lamp mode, press the **MENU** key for 3 seconds to turn on the load. Press the **MENU** key again or the load turns off automatically after 1 minute. If the controller is operating in 24H output mode, the test function does not work.



User-defined mode

When the controller is set to user-defined mode, the default mode of load is on. Short press the **MENU** key, the load will be turned off, press the **MENU** key again, the load will be turned on.

Note:

1.If the controller turns off the load due to low voltage protection, overcurrent protection, short-circuit protection or over temperature protection, the load will turn on automatically when the controller recovers from protection state,.

2.Please note: Pushing the MENU button can still activate the function of the key, even during of the above four kinds protection states.

7, Protections, Troubleshooting and maintenance

7.1 Protection

■ PV Short Circuit

When PV short circuit occurs, the controller will stop charging. Remove it to start normal operation.

■ PV Reverse Polarity

Fully protection against PV reverse polarity, no damage to the controller. Correct the connection to start normal operation.

■ Battery Reverse Polarity

Fully protection against battery reverse polarity, no damage to the controller. Correct the connection to start normal operation

■ Battery Over voltage

If there are other energy sources to charge the battery, when the battery voltage exceeds 15.5 / 31.0V, the controller will stop charging to protect the battery from overcharging damage.

■ Battery Over discharge

When battery voltage drop to the voltage set point of Low Voltage Disconnect , the controller will stop discharging to protect the battery from over discharging damage.

■ Load Over Current Protection

If the load current exceeds the maximum load current rating 1.25 times, the controller will disconnect the load.

■ Load Short Circuit Protection

Once the load short circuit happens , the load short circuit protection will start automatically.











■ Over Temperature Protection

The controller detects the internal temperature through internal sensor, when the temperature exceeds the setting value, the charging current will lower down followed by the decrease of temperature, so as to control the controller' s temperature rise; when the internal temperature exceeds the setting value, the controller stops working and restores after the temperature is lowered.

■ Damaged Remote Temperature Sensor

If the temperature sensor is short-circuited or damaged, the controller will be charging or discharging at the default temperature 25°C to prevent the battery damaged from overcharging or over discharged.

7.2 Troubleshooting

Faults	Reason	Troubleshooting
  E1	Short Circuit	Switch off all loads, remove short circuit, load will be reconnected after 1 minute automatically
  E2	Over Current	Reduce the load, the controller will resume to work after 1 minute.
  E3	Battery voltage is too low	Load will be reconnected when battery is recharged
  E4	Battery voltage is too high	Check if other sources overcharge the battery. If not, controller is damaged.
  E5	Over temperature	After the temperature decreases, the controller will work normally
Wire connection is correct, LCD not display	Battery voltage is abnormal at start-up	Charge or discharge the battery so that the battery voltage is within the normal operating range (10~15V or 20~30V)
Battery can't be charged during daytime	PV panel fault or reverse connection	Check panels and connection wires

7.3 Maintenance

The following inspections and maintenance tasks are recommended at least two times per year for best performance.

- Make sure no block on air-flow around the controller. Clear up any dirt and fragments on radiator.
- Check all the naked wires to make sure insulation is not damaged. Repair or replace some wires if necessary.
- Tighten all the terminals. Inspect for loose, broken, or burnt wire connections.
- Check and confirm that LCD is consistent with required. Pay attention to any troubleshooting or error indication. Take corrective action if necessary.
- Confirm that all the system components are ground connected tightly and correctly.
- Confirm that all the terminals have no corrosion, insulation damaged, high temperature or burnt/discolored sign, tighten terminal screws to the suggested torque.
- Check for dirt, nesting insects and corrosion. If so, clear up in time.



WARNING : Risk of electric shock!

Make sure that all the power is turned off before above operations, and then follow the corresponding inspections and operations.

8, Technical Data

Item	Max20-EU	Max30-EU	Max40-EU
System Voltage	12V/24V automatical recognition		
Max Charging Current	20A	30A	40A
Fast Voltage	<14.5/29.0V@25°C		
Boost Voltage	14.5/29.0V @25°C		
Equalization Voltage	14.8/29.6V @25°C (Liquid)		
Float Voltage	13.7/27.45V @25°C		
Low Volt. Disconnect	10.8~11.8V/21.6~23.6V, SOC1~5		
Reconnect Voltage	11.6~12.8V/23.2~25.6V		
Overcharge Protect	15.5/31.0V		
Max volt on Bat. terminal	35V		
Temp. Compensation	-4.17mV/K per cell (Boost, Equalization) , -3.33mV/K per cell (Float)		
Battery Type	Liquid, Gel , AGM		
Max volt on PV terminal	55V		
Dusk/Dawn detect volt.	5.0/10.0V		
Output Current	20A	30A	40A
USB interface	5V, 2A		
Work mode	Standard, D2D, Street lamp, User-defined mode		
Dimensions(mm)	189 * 96 * 53		
Weight	420g		
Self consumption	5mA		
Ambient temperature	-20 ~ +50°C		
Storage temperature	-25 ~ +80°C		
Ambient humidity	0 ~ 100%RH		
Protection degree	IP32		
Max Altitude	4000m		

* Around oblique line value separately on behalf of 12V and 24V system's value.



Lumiax
Magic your solar life!

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