

MPPT SOLAR CHARGE CONTROLLER

10A,20A, 30A, 40A, 50A, 60A, 70A, 80A

Dear customer

Thank you very much for the trust you have placed in us. You have acquired a reliable high-quality product which will deliver good services for a long time if used appropriately. Please read these instructions for use thoroughly and completely to familiarize yourself with the product prior to putting it into operation. You receive important for safe operation and maintenance of the device.

The pack contains: MPPT solar charge controller, operating instructions, remote controller(optional)remote display (optional)

Intended use

The solar charge controller of the MPPT series was developed to charge lead batteries in a solar stand-alone system. The product is designed for private use only and not suitable for commercial use. The user must ensure that the device is protected against humidity and damp. Any other use than described before may damage this product; in addition, improper use may result in serious hazards, such as short-circuiting, fire, electrical shock etc. The entire product must not be modified or converted and the housing must not be opened in any manner whatsoever!

Safety instructions

Dear customer,

The following safety notes and hazard warnings serve not only for the protection of the device but also for the protection of your health. Please read the following points thoroughly. In case of property damage or personal injuries caused by improper handling or non-observance of these operating instructions or the safety notes stated herein, the warranty/guarantee expires. We assume no liability for any consequential damages.

General

- For safety and technical approval reasons(CE),the unauthorized conversion and/or modification of the product is not permitted.
- This device is not a toy and must not be used by children! Please ensure childproof operation and storage of the device at any time.
- Maintenance, installation or repair works may only be performed by an expert/qualified workshop. Use only original spare parts for repair work.The use of any other spare parts may lead to serious damage to property and personal injury!
- The interior of the device does not contain any product components which must be set or maintained by you.
- Don't leave packaging material heedlessly. It could become a hazardous toy for children!
- Handle the product with care; impacts, shocks or even a fall from a low height may cause damage. In this case the solar charge controller has been qualified expert before restart.
- If you detect damages, stop operating the device. Bring it to a qualified workshop or dispose of it in an environmentally compatible manner.

Operation

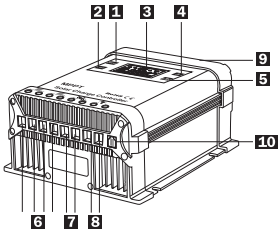
- The product may only be operated in a dry environment. It may not get humid or wet; otherwise there is a risk of life-threatening electrical shocks.
- The use of the product under unfavorable environment conditions must be avoided under all circumstances. Unfavorable environmental conditions include: ambient temperatures above 50°C, flammable gases, solvents, vapors, dust, relative humidity in excess of 80%, and moisture.
- The device may not be operated near of flammable materials, open fire or gases. Explosion hazard!
- Ensure proper ventilation during the operational phase, never cover the solar charge controller and connected devices.

- Protect the solar charge controller against electro-magnetic fields as well as impacts and vibrations.
- Protect the solar charge controller against heat! Should the solar charge controller become too hot due to high ambient temperatures, the overheat protection switches the device off to avoid consequential damage. In this case wait until the device has cooled down.
- Avoid sudden different in temperature! This may cause the formation of condensation water in the solar charge controller! In this case, the solar charge controller must be adjusted to the new ambient temperature before start at a well ventilated place for at least one hour.

Notes on the battery

- If used improperly, lead batteries are a high risk for humans, animals and the environment. Always observe the safety instructions of the battery manufacturer!
- Lead batteries contain aggressive corrosive acids. Avoid eye and skin contact with liquids from the battery! Never disassemble lead batteries! If eyes or skin get in contact with acid, immediately flood them with running, clear and cool water! Then seek medical help immediately! If acid gets on your clothes, remove the contaminated clothes immediately and flood the affected parts of the skin with running, cool water thoroughly, if required.

Connection and display elements



- Menu button
- Load ON/OFF button(10-60A)
OK button(70-80A)
- LCD screen display
- Setting button(UP)
- Setting button(DOWN)
- Solar panel input
- Battery port
- DC load(10-60A)
Second battery port(70-80A)
- RS232 communication interface(optional)
- Remote display(optional)

LCD Screen Display Functions

The MPPT controller is equipped with a big LCD display panel and 4 buttons.

There is one main window and seven different screens display different states by pressing the menu button to change the states.

▲Note: If LCD screen in main menu, press "MENU", then change to submenu. If in submenu, by press "UP" or "DOWN", you can change to different states.

10-60A LCD screen display explanation:

Main Menu		Main window	Battery voltage
Submenu		LCD screen displays state No.1	PV charging current
		LCD screen displays state No.2	Load's discharge current

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Submenu		LCD screen displays state No.3	Total PV charge Ah
		LCD screen displays state No.4	Total battery discharge Ah
		LCD screen displays state No.5	The setting of equalization charge voltage: If you long press 5s the menu button, going into the setting station (the data flashing). By pressing the "UP" button, you can increase the value. By pressing the "DOWN" button, reduce the value. ▲ Note: the factory default setting value is 14.6V in 12V system, 29.2V in 24V system. 12V system: the setting range is from 14V to 15V 24V system: the setting range is from 28V to 30V
		LCD screen displays state No.6	The setting of low voltage disconnecting: If you long press 5s the menu button, going into the setting station (the data flashing). By pressing the "UP" button, you can increase the value. By pressing the "DOWN" button, reduce the value. ▲ Note: the factory default setting value is 11V in 12V system, 22V in 24V system. 12V system: the setting range is from 10.4V to 11.4V 24V system: the setting range is from 20.8V to 22.8V
		LCD screen displays state No.7	The setting of low voltage reconnecting: If you long press 5s the menu button, going into the setting station (the data flashing). By pressing the "UP" button, you can increase the value. By pressing the "DOWN" button, reduce the value. ▲ Note: the factory default setting value is 12.8V in 12V system, 25.6V in 24V system. 12V system: the setting range is from 12.2V to 13.2V 24V system: the setting range is from 24.4V to 26.4V

70-80A LCD screen display explanation

Main Menu		Main window	Battery voltage
Submenu		LCD screen displays state No.1	PV charging current
		LCD screen displays state No.2	Total PV charge Ah
		LCD screen displays state No.3	The setting of equalization charge voltage: If you long press 5s the menu button, going into the setting station (the data flashing). By pressing the "UP" button, you can increase the value. By pressing the "DOWN" button, reduce the value. ▲ Note: the factory default setting value is 14.6V in 12V system, 29.2V in 24V system. 12V system: the setting range is from 14V to 15V 24V system: the setting range is from 28V to 30V

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Buttons function explanation:

	When LCD screen in submenu, press it to go back to main window. When LCD screen in main menu, press it to go into the submenu.
	When the LCD screen stay in state No.5, 6 and 7, Long press 5s the button to make the data settle[data flashing]
	(10-60A) ON/OFF the DC load
	(70-80A)When in state No.3, press OK button, LCD flashing, press UP or DOWN button to set the data, press OK button to confirm.
	Press it to increase the setting value (in state No.5, 6 and 7). Once LCD screen go into the submenu, by pressing "UP" to change to last state. eg. If LCD screen in state No.3, you press "UP" then change to state No.2 Press it to reduce the setting value(in state No.5,6 and 7). Once LCD screen go into the submenu, by pressing "DOWN" to change to next state. eg. If LCD screen in state No.2 you press "DOWN" then change to state No.3

- Notes: 1. If without any operation, no matter the LCD screen in which state, it shall go back to main window which displays the battery voltage.
2. The LCD screen shall be off after 30s, you can effect it by press any button.
3. Only when the LCD screen in main window, the load button can ON/OFF the DC load.
4. Press the up and down button at same time 5s, when the LCD flash then to reset the MPPT controller.

Features:

- With maximum power point tracker (MPPT)
- Automatic recognition of system voltage (12/24V or 24V or 48V)
- Input voltage range from 22-60V/30-90V/70-150V
- Temperature-dependent correction of charging parameters.
- Step-up function
- Deep discharge protection
- Overcharge protection
- Desulfation function (pulse charging)
- Temperature-activated protective circuit
- Reverse polarity protection
- Connection possibility of an optional remote display with SD card mounts.
- RS232 communication interface (optional)
- Power conversion efficiency: ≥95%

Description of functions

The MPPT solar charge controllers are modern, microprocessor-controlled devices which were developed for charging lead-acid batteries in solar stand-alone systems. The MPPT (maximum power point tracker) enables you to make optimum usage of the solar power of your solar modules. The most efficient operating point of the solar modules changes due to factors such as exposure rate, temperature and the type of solar cells. This optimum operating point (MPP-maximum power point) is monitored constantly by the internal microprocessor of the solar controller and is controlled by the MPPT in such a way that your battery is always charged with maximum power.

When the maximum charge voltage of your battery has been reached, the MPPT solar controller switches the charging current off.

The microprocessor is also responsible for controlling all important protective functions.

A load output to be switched by push-button enables you to switch on and off all consumers connected to the MPPT solar charge controller by the push of a button.

Adapting the module power to the solar controller

Strictly ensure that the module power match the used solar controller!

If you have a module voltage which is significantly higher than the battery voltage, the charging current of the battery will be higher than the given maximum current of the module. For example: A module with 36V and 5A charges a 12V battery with max. 15A, this module requires a MPPT 20A.

Attention: If you use a solar controller whose charging power is too low, the solar controller may be damaged in the long run!

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Maximum module power

	MPPT-10A	MPPT-20A	MPPT-30A	MPPT-40A	MPPT-50A	MPPT-60A	MPPT-70A	MPPT-80A
12V battery system voltage	120 watts	240 watts	360 watts	480 watts	600 watts	720 watts	840 watts	960 watts
24V battery system voltage	240 watts	480 watts	720 watts	960 watts	1200 watts	1440 watts	1680 watts	1920 watts
48V battery system voltage	480 watts	960 watts	1440 watts	1920 watts	2400 watts	2880 watts	3360 watts	3840 watts

Assemble

In order to guarantee appropriate operation, please read these operating instructions including safety information completely and carefully before use.
During assemble ensure that the solar controller and any other system components are mounted in such a way that is not accessible for children. Danger of life!
Do not mount the MPPT solar controller directly above a heat source! Ensure that the battery is located in a well ventilated room! Strictly ensure correct polarity!
Always ensure proper ventilation of your solar controller. Never cover the ventilation slots of the solar controller. Never use the device in the vicinity of highly flammable materials.
Remember that large amounts of energy are stored in batteries. In case of short-circuit; these energy quantities can be released in a short time. This means that extreme heat may build up or a fire may break out at the site of short-circuit.

Connecting the solar charge controller

All components (solar module, battery, consumers and MPPT solar controller) must be adjusted to each other concerning voltage and intensity of current. Check this information on the respective type plate. In case of doubt, please contact your dealer.
To ensure safe operation, please strictly follow the correct order, when connecting the individual system components.

1. Connecting the battery:

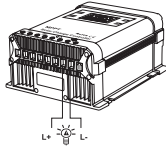
Connect the battery with the MPPT solar controller by using the screw type terminals intended for this purpose. Make sure you use a proper cable cross section to keep the voltage drop and heating of the cables as low as possible. The screw type terminals are designed for cable cross sections of up to 16mm².
Required minimum cross sections:

1.5mm ² to	10A	10mm ² to	50A
2.5mm ² to	20A	10mm ² to	60A
4mm ² to	30A	16mm ² to	70A
6mm ² to	40A	16mm ² to	80A

Make sure that the line between battery and MPPT solar charge controller is fused according to instructions. For example, you can use a slow acting 40A fuse with a 30A MPPT controller.

2. Connecting the solar module

Connect the solar module with the solar controller to the corresponding screw type terminals. Make sure the correct polarity! To avoid any voltage from the wires, first connect the controller, then the solar array.
Note: place the positive and the negative wires close to each other to minimize electromagnetic effects.
Note: solar panels provide voltage as soon as exposed to sunlight. Mind the solar panel manufacture's recommendations.



3. Connecting to the load (10A-60A)

Connect the wires leading to the loads with proper polarity. To avoid any voltage on the wires, please first connect the wire to load, then to the controller.
Note: if the DC loads were protected by short circuit, over current or lower voltage, there is a in shall flash (LCD screen displays).
Note: there is fuse inside of the controller for protection. If fault happens, fuse blow.

Description of functions and safety features

Step-up function

The MPPT solar controller is equipped with a step-up function, i.e. the solar controller charges even if the solar voltage is lower than the battery voltage. Here, the maximum charging current is 1A.
Note: please note that this function is not given if the solar voltage is lower than the solar controller's own consumption. In this case, the solar controller switches to standby. (See explanation of standby function)

Standby function

When the solar charging power is lower than the solar controller's own consumption, the standby function is automatically activated after 30seconds. This may also occur when the module is connected to the solar controller for the first time.

Deep discharge protection

The solar controllers of the MPPT series are equipped with deep discharge protection, i.e. with battery voltage decreasing to 11V, the solar controller switches the load off automatically. As soon as the battery is recharged over the solar module, the load switches on automatically.

Overcharge protection

The MPPT solar controller stops the charging process reliably, when the final charging voltage is reached. This prevents the battery from being damaged by overcharging or heavy steaming.

Desulfation function (pulse charging)

Following the regular main charging phase, the solar controller applies pulses to the battery. This causes sulfate layers in the battery to be dissolved which prolongs the battery lifetime significantly.

Temperature protective circuit

The MPPT solar controllers switch off the load current, when the temperature inside the device is too high. The load output continues to function. When the solar controller has cooled down to normal operating temperature, charging current is reconnected automatically.

Reverse polarity protection

The MPPT solar controllers are protected against incorrect connection to the battery. Ensure correct polarity when connecting. The solar controller is reset automatically and ready for use again.

Changing the internal fuse

The solar controllers of the MPPT series are equipped with an internal safety fuse. For changing the fuse, the housing of the solar controller needs to be opened. For this purpose, disconnect the connected cables and the four screws on the side of the housing. Now it is easy to remove the lid of the housing and you have free access to the fuse.
Attention: replace the fuse only by a fuse of the same type and rated current! Now close the housing of the solar controller.

Operation with optional remote controller

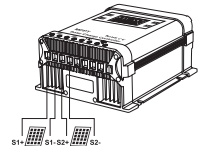
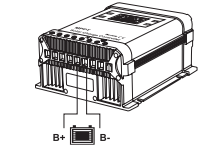
Optionally, our MPPT solar controller up to 30A shall with a remote controller function, the remote controller is optional

Operation with optional remote display

Optionally, all models of the MPPT solar controller series maybe operated with a remote display.

Technical specifications

For features and intensity of current, please observe the respective type plate of your device!



Working voltage of the battery	12/24V or 24Vor 48V DC
Module voltage	22-60V / 30-90V / 70-150V DC
Max. module /charge current:	10/20/30/40/50/60/70/80A(type-dependent)
Battery types	all 12V or 24V or 48V rechargeable lead-acid batteries (open, AGM, gel)
Own consumption, active	15mA
Own consumption, standby	<1mA
Own consumption with load connected	130mA
Constant voltage charge	14.6V(14-15V settable)/29.2V(28-30V settable)/58.4V(56-60V settable)
Low disconnect voltage	11V(10.4-11.4V settable)/22V(20.8-22.8V settable)/44V(41.6-45.6V settable)
Low reconnect voltage	12.8V(12.2-13.2V settable)/ 25.6V(24.4-26.4V settable)/ 51.2V(48.8V-52.8V settable)
Protection type	IP20
Cross section of terminal	Up to 16mm ²

Environment protection note

At the end of its useful life, this product must not be disposed of together with normal household waste, but has to be dropped off at a collection center for the recycling of electrical and electronic devices. This is indicated by the symbol on the product, one the instruction manual or on the packaging.
The materials of which this product is made are recyclable pur suant to their labeling. With the reuse, the recycling of the materials or other forms of scrap usage you are making an important contribution to the protection of the environment. Please ask your local administration office for the appropriate disposal center.

Warranty and service agreements

This warranty covers only manufacturing defects. The appliance must not be modified or altered in any way with regards to both form and function. This warranty does not apply in case of improper usage that falls beyond normal use as indicated in the user's manual or if there is damage caused by force majeure (e.g. natural disaster). Only clean and intact appliances will be accepted for warranty and non-warranty repair. The standard warranty period is 36 months starting from the purchase date. In order to make a warranty claim, this warranty card must be submitted along with proof of purchase, including the model number, purchase date and a dealer's stamp.

Mode numbe:

Dealer's stamp and signature:

Date of warranty claim:

Defect(s) noted:



MPPT SOLAR CHARGE CONTROLLER

10A/20A/30A/40A/50A/60A/70A/80A

USER'S MANUAL

