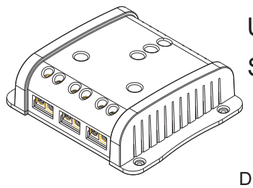
Solar charge controller



User Manual
SMC Series

Dear customer

Thank you very much for buying our product . Please read thoroughly before using the product

Description of Functions

The SMC controller is a state-of-the art device which was developed in accordance with the latest available technical standards. It comes with a number of outstanding features, such as:

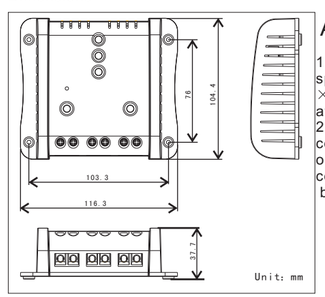
- Clear,readable display of the state of charge
- Acoustic signal when the state of charge changes
- Low voltage disconnect regulated by state of charge or voltage
- Complete electronic protection

The charge controller protects the battery from being overcharged by the solar array and from being deep discharged by the loads. The charging characteristics indlude several stages which include automatic adaptation to the ambient temperature
The charge controller adjusts itself automatically to 12v or 24V system voltage.
The charge controller has a number of safety and display functions

Installation

Please install in the room, Keep cool, dry, and away from direct light. Please controller and the batteries installed in the same place, the controller can be seized Measuring the battery temperature, charge voltage regulation.

Dimensions



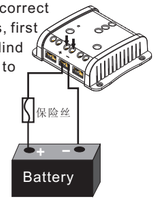
Attention

1. Screws specifications M3 × 10 (since the attack)
2. Make sure the cooling aperture on both side of the controller shouldn't be blocked

Connecting

Step 1:

Connect wires leading to the battery with correct polarity. To avoid any voltage on the wires, first connect the controller, then the battery. Mind the recommended wire length (min 30 cm to max approx.100cm) and the wire size:
SMC05 : min 2.5mm²
SMC08/10: min4.0mm²
SMC15/20 : min6.0mm²



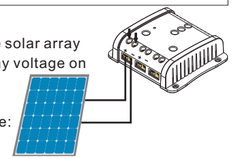
Wrong polarity will cause a permanent warning sound.

WARNING: If the battery is connected with reverse polarity, the load terminals will also have the wrong polarity, Never connect loads during this condition!

REMARK: Mind the recommendations of your battery manufacturer, we strongly recommend connecting a fuse directly to the battery to protect any short circuit at the battery wiring. The fuse must take the charge controller nominal current:
SMC05/08: 20A
SMC10/15: 30A

Step 2:

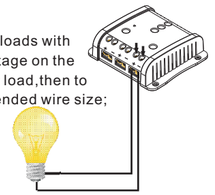
Connect the wires leading to the solar array with correct polarity. To avoid any voltage on the wires, first connect the controller, then the solar array.
Mind the recommended wire size:
SMC05: 2.5mm²
SMC08/10: 4mm²
SMC15/20: 6mm²



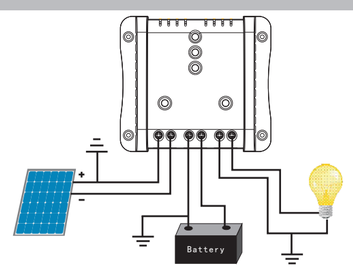
REMARK: Solar panels provide voltage as soon as exposed to Sun light .Mind the solar panel manufacture`s recommendations in any case

Step 3:

Connect the wires leading to the loads with correct polarity. To avoid any voltage on the wires, fist connect the wier to the load,then to the controller. Mind the recommended wire size;
SMC05: 2.5mm²
SMC08/10: 4mm²
SMC15/20: 6mm²



Grounding the solar system



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

REMARK: If the device is used in a vehicle which has the battery negative on the chassis, loads connected to the controller must not have an electric connection to the car body

Starting up the controller

Self Test
As soon as the controller is supplied with power either from the battery or the solar array, it starts a self test routine, then the display changes to normal operation.
System voltage

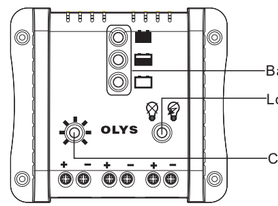
The controller adjusts itself automatically to 12v or 24v system voltage. As soon as the voltage at the time of start-up exceeds 20.0v, the controller implies a 24v system, if the battery voltage is not within the normal operation range at start-up, a status display according to the section ERROR DESCRIPTION occurs.
Battery Type

The controller is preset to operate with lead acid batteries with liquid electrolyte. If you intend to use a lead-acid battery with solid electrolyte you can adjust the charging characteristics (see "setting"). The equalization charge is deactivated then.
In case of any doubts consult your dealer

Recommendations for Use

The controller warms up during normal operation.
The controller does not need any maintenance or service.
Remove dust with a dry tissue.
It is important that the battery gets fully charged frequently(at least monthly).Otherwise the battery will be permanently damaged. A battery can only be fully charged when charging power is more than drawn power. Keep that in mind, especially if you install additional loads.

Display Functions in normal operation

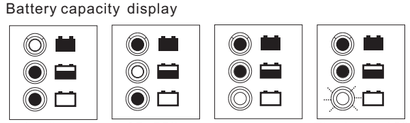


Charge display

Solar array supplies electricity (LED on)

Solar array does not supply electricity(LED off)

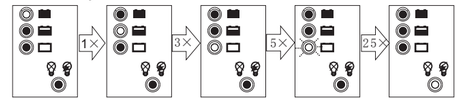
Battery capacity display



The percentage ratio shows the available energy of battery from low voltage to fully charged

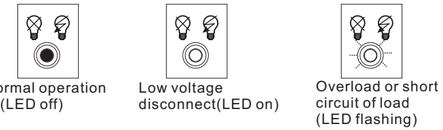
LED ON LED OFF LED flashes

Acoustic signals



The loads are disconnected approx. 1 minute after a series of 25 acoustic alarm.

Load status display
When deep discharge or overload/short-circuit of load occured , the load output would switched off. Relevant display as follows



Normal operation (LED off)

Low voltage disconnect(LED on)

Overload or short circuit of load (LED flashing)

Low Voltage Disconnect Function(LVD)

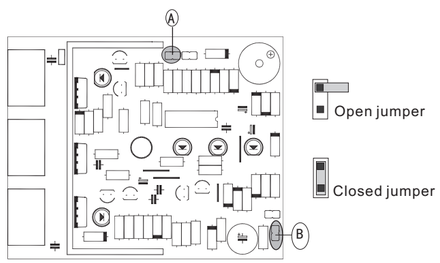
The controller has 2 different modes to protect the battery from being deeply discharged:
1. SOC controlled: Disconnect at 11.4V (at nominal load current)up to 11.9v (at no load current). Normal operation mode for good battery protection.
2. Voltage controlled: Disconnect at 11.0v (fixed setting.)

The controller is preset to mode 1 from the factory. changing the mode setting is described below.
In case of doubts which mode to choose, consult your dealer because this has to be evaluated depending on the battery used.

Settings

The controller can be configured for special operation. For this purpose, open the cover of the controller by removing the screws on the back side.

WARNING The controller should not be opened while connected and in operation!



With two jumpers, the following settings can be configured:

Jumper	GEL (A)	LVD (B)
Function	Battery type	Function of low voltage disconnect
Setting jumper open	Liquid electrolyte	SOC controlled
Setting jumper closed	GEL(VRLA battery)	Voltage controlled
Function setting	Jumper open (liquid electrolyte)	Jumper closed voltage controlled

After completing the setting,replace the cover and tighten it with the screws.

Safety Features

The controller is protected against improper installation or use:

	At the solar terminal	At the battery terminal	At the load terminal
Battery connected with wrong polarity	Unrestricted	Unrestricted Acoustic warning	Unrestricted
Reverse polarity	Yes, not at 24V system voltage	Yes, if only the battery is connected, Acoustic warning	Load output is protected, but loads might be damaged
Short circuit	Unrestricted	Unrestricted (Battery must be protected by fuse.	Unrestricted
Overcurrent	No protection	-----	Controller switches off load terminal
Thermal overload	No protection	-----	Controller switches off load terminal
Reverse current	Unrestricted	-----	-----
Overvoltage	Varistor 56v, 2.3j	Max.40v	Controller switches off load terminal.
Undervoltage	Normal operation	Controller switches off load terminal	Controller switches off load terminal

Error Description

Error	Display	Reason	Remedy
Load can't work		Battery is low (red LED on)	Load will reconnect as soon as battery is recharged.
		Overcurrent /short circuit of loads(red LED flashing)	Switch off all loads. Remove short circuit controller will switch on load automatically after max 1 minute
		Battery voltage too high(>15.5/ 31.0v)	Check if other sources overcharge the battery if not, controller is damaged
Battery is empty after a short time		Battery has low capacity (red LED on)	Change battery
Battery is not being charged during the day		Solar array faulty or wrong polarity (LED off)	Remove faulty connection/reverse polarity

Technical Data

Nominal voltage	12V/24V,automatic recognition
Boost voltage	14.5/29V(25℃) , 2h
Equalization voltage	14.8/29.6V(25℃) , 2h
Float voltage	13.7/27.4V(25℃)
Low voltage disconnect function	11.4-11.9/22.8-23.8V controllde by SOC. 11/22V controlled by voltage
Load reconnect voltage	12.8/25.6V(25℃)
Temperature compensation	-4mV/cell*K
Max. Charge current	5/8/10/15/20A(according to model)
Max. load current	5/8/10/15/20A(according to model)
Max. Wire size	4mm²
Weight	200g
Dimensions	116.3×104.4×37.7mm
Ambient temperature range	-40-50℃
Case protection	IP22