

## USER'S MANUAL FOR SOLAR CONTROLLER

### 1. Features and Functions:

- Adopts industrial degree MCU SCM and particular software, reach intelligent control.
- PWM charging control mode, charge in high efficient.
- Battery reverse connection, over-voltage and low-voltage protections.
- Load output resume, output over-current, and output short-circuit protections.
- Solar panel short-circuit protection
- Battery open circuit protection
- High precision voltage recognition function
- LED indication for battery capacity

### 2. General Introduction

SOLAR series solar charge controller is especially designed by industrial degree MCU SCM with high-performance and excellent quality, and designed for home solar power system and solar power station.

#### Functions:

#### 1) Battery management function:

Over-charge protection and over-discharge protection ensure the normal using and prolong the longevity of battery.

#### 2) Temperature compensation function:

Auto adjust the setting data of battery management program control parameters to avoid the battery “under-voltage” in winter and “over-charge” in summer.

#### 3) Multi-protections:

Battery reverse connection, over-voltage and low-voltage protections, solar panel short-circuit protection, auto. Resume output, and output short-circuit protections.

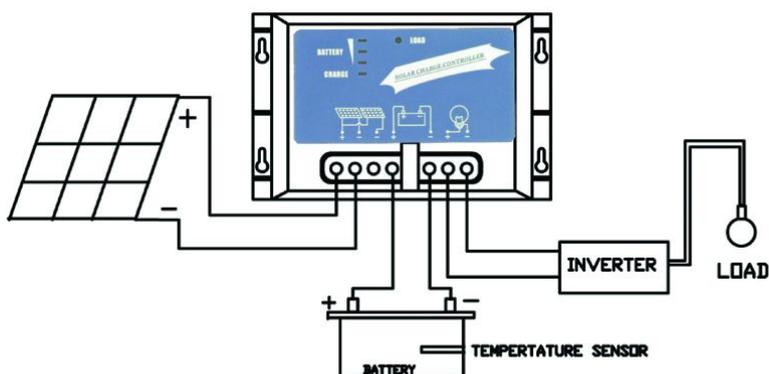
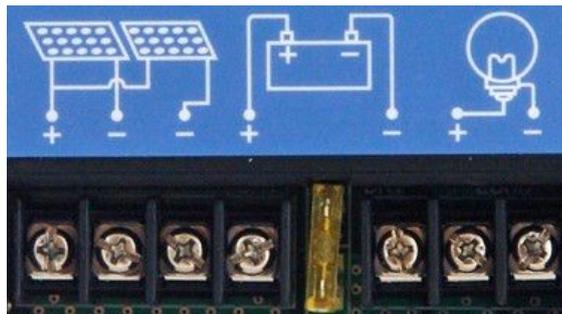
### 3. Technical Parameters

Parameters		Model No.	CM20S-10A	CM20S-20A
Rated Voltage			12V / 24V	
Rated Current			10A	20A
Over-Charge Protection			14.4V / 28.8V ± 0.2 Vdc	
Over-Discharge	Cut-off		10.7V / 21.4V ± 0.2 Vdc	
	Resume		12.6V / 25.2V ± 0.2 Vdc	
Over-Voltage	Cut-off		16.5V / 33Vdc	
	Resume		15.0V / 30.0 Vdc	
Voltage Drop	Between input and batteries		<0.2 Vdc	
	Between batteries and load		<0.2 Vdc	
No Load Current Draw			<15 mA	
Ambient Temperature			-10 ~ +55 °C	
Altitude			≤5500m	
Size (L*W*H: mm)			164*100*48	
Weight (Kg)			0.39	
Temp. Compensated factor			-4 mV / cell•°C	

### 4. Connections

- 1) Connecting all parts correctly according to the following drawing, make sure polarity is right. The order is as follows.
  - a) Connect the controller with the battery first, then connect the solar panel, finally connect the load.
  - b) Disconnect from the controller: disconnect the load first, then solar panel, finally disconnect the batteries.

- c) When connect the lines, make sure the “+” and “-” are not reversely connected.
- d) Do not connect the line of battery to the solar panel terminal.
- e) Do not connect any regulated power supply or charger to the solar panel terminal.



## 5. Status Indication



5.1 If the connection is correct, the indicators will show the capacity of the battery, and the load indicator will be on.

5.2 The charging indicator will be on when it is at charging state, and the charge indicator will flicker when the battery is charged full.

5.3 When the battery is in low capacity, the battery indicator will flicker. It means you need to charge the battery now.

5.4 The load indicator on or off represents there is load output or there is no load output.

## 6. Protection Function

Protection item	Details
Batteries reverse polarity	the battery indicator will not be on if the battery is connected reversed
Solar module reverse polarity	If the solar module reverses polarity, the unit will function after correction.
Load over-current and short circuit protection	If the load draws current exceeding max. Discharge current or load short circuit, fuses will be blow. Repair if necessary and replace the fuse with an equivalent.
Batteries open-circuit working Protection	When solar module is charging, and battery is open-circuit, the solar controller will limit voltage, so that the load will not be destroyed.

## 7. Trouble Shooting Guide

SOLAR series controllers are of good quality, if you have any trouble or problem, please check the units as follows or contact the suppliers.

Problem	Remedy
Indicator is power off, without output	Check the fuse, maybe it breaks
“LOAD” indicator is flashing	overload protection, remove extra load

## 8. Models of the Controller

Model No.	Rated Voltage	Rated Current	Connections of solar panel			Fuse model
			+	-	-	
<b>CM20S-10A</b> <b>CM20S-20A</b>	12V/24V	10A	√	*	*	15A/32V
		15A	√	*	*	20A/32V
		20A	√	*	*	30A/30V

Note: there are two "-" terminals on the controller, "√" means okay for connection of "+", "\*" means ok for connection of "-".

