

MANUAL

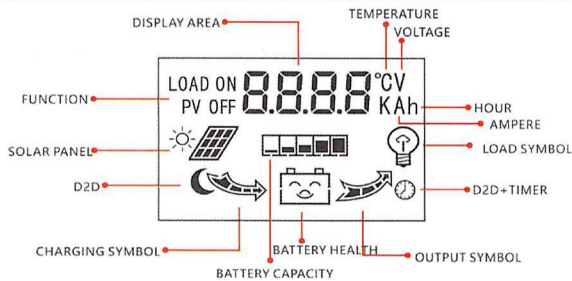
SAFETY INSTRUCTIONS

- Read all of the instructions and cautions in the manual before beginning installation.
- There are no user serviceable parts inside. Do not disassemble or attempt to repair the controller
- Disconnect all sources of power to the controller before installing or adjusting.
- Install external fuses/breakers as required.
- a battery can present a risk of electrical shock, burn from high short-circuit current, fire or explosion from vented gases.observe proper precautions;
- Disconnecting battery during charging may cause a brief spike in load voltage which may damage sensitive equipment.
- Danger of explosion due to improper handling of batteries! Corrosive hazard by leaking battery acid! Keep children away from batteries and acid! Smoking, fire and naked lights are prohibited when handling batteries. Prevent sparking and wear eye protection gear during installation.
- Solar modules generate power from light incidence. Even by low light incidence solar modules carry the full voltage. Therefore, work cautiously and avoid sparking during all work.
- Use only well-isolated tools!

PRODUCT FEATURES

- Thank you for choosing the solar power controller produced by our company. The controller is designed with the most advanced digital control technology, and the LCD display is fully automatic. Its pulse width modulation (PWM) battery charging mode and unique control technology will greatly improve the battery life. This product has a lot of unique functions, and it is very convenient to use.
- Use a high speed and high performance processor.
 - Automatic voltage identification of 12V/24V or single 48V system.
 - The high efficiency series PWM charging mode extends the battery life and improves the performance of the system.
 - The power MOSFET is used as an electronic switch without any mechanical switches.
 - It has a wide range of applicability and automatically identifies daytime / night.
 - A large size backlight liquid crystal display and 3 key man-machine interface are used.
 - The overall working state shows that the charging stage, the battery voltage, the photo voltaic panel voltage, the charging current, the load current and the accumulative electricity generation, etc.
 - Humanized design of the browsing interface, convenient for various operations.
 - Complete setting and modification of field control parameters.
 - Various load control modes and intelligent memory functions enhance the flexibility of load output, and can be directly applied to street lighting control, home power station, outdoor monitoring and other application scenarios.
 - Build-in Two sets of USB charger.

LCD DISPLAY/KEY

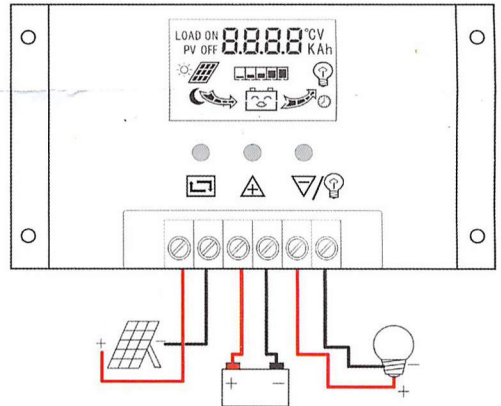


Icon	Meaning
0.0000	The main digital display area, used to display or set the number of voltages, currents, and so on
LOAD ON PV OFF	The group word area, which is displayed with the number to complete the display or setting of the interface
°CV KAh	Symbolic region
	solar panel
	Battery power display
	load
	When the work mode is D2D,this icon will light

	when the work mode is 1h-23h(D2D+timer)this iron will light.		
	The battery is in good condition		Under voltage battery
	Stop charging the battery		The battery is in bulk charging state
			The battery is in float charging state
	Stop discharging		Power supply state, no current in the load loop
			The power supply state, the load loop has the current
	Menu key:short press to switch to the parameter display interface, or to be able to enter or exit parameters by long press.		
	UP: press to increase value.		
	DOWN: press to decrease value.		

SYSTEM CONNECTION

- Make sure your battery has enough voltage for the controller to recognize the battery type before first installation.
- The battery cable should be as short as possible to minimize loss.
- The regulator is only suitable for lead-acid,lithium ions and LiFePO4 batteries.
- The charge regulator is only suitable for regulating solar modules. Never connect another charging source to the charge regulator.

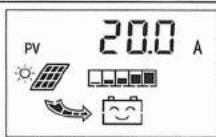


- Connect the battery to the charge regulator - plus and minus.
- Connect the solar module to the regulator - plus and minus.
- Connect the consumer to the charge regulator - plus and minus.

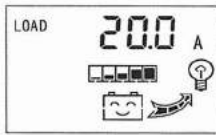
The reverse order applies when deinstalling!
An improper sequence order can damage the controller!
The battery polarity reverse will not damage the controller, but it will have a safe risk to your load device.

DISPLAY/SETTING

	Main display,it shows battery voltage,battery capacity,charging and discharging status.press [MENU] to enter next display tab.
	As shown on the left, the displayed value for the ambient temperature controller for battery charging voltage temperature compensation. The temperature sensor must be installed at work (some model is built in)



Charging ampere display.



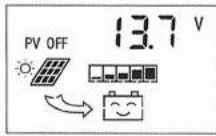
Discharging ampere display.



Accumulative charging power generation view and zero-clean
As shown on the left, it display value for the solar panel cumulative power ah. long press the menu button (> 5 seconds) to make a zero-clean.



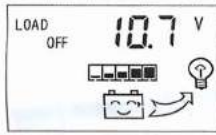
Accumulative discharging power generation view and zero-clean
As shown on the left, it display value for the load cumulative power ah. long press the menu button (> 5 seconds) to make a zero-clean.



Float charging voltage setting.when battery is charged to this voltage,it will maintain and keep float charging,long press the [MENU] key until the numbers flashes,use [UP]/[DOWN] to select the voltage desired,then long press the [MENU]again to exit setting,long press [UP] to restore factory setting.



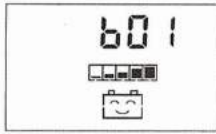
Low voltage re-connect setting.
When a low voltage disconnect happens,the controller will wait until the voltage raise more than this voltage,then it will re-connect the load again. the setting is the same as above.



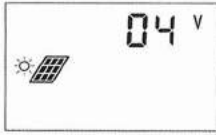
Low voltage disconnect setting.
When battery voltage is lower than this voltage,the controller will cut off the output automatically .the setting is the same as above.



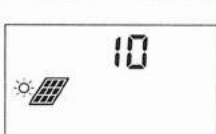
Load working mode.For 24H means the controller will continuously supply power to your load.For 0H means Dusk to Dawn .For 1-23H means enable output after sun goes down and run a 1-23H then close output.the setting is the same as above.



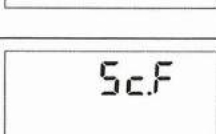
Battery type setting.
B01=LEAD-ACID 12V
B02=LITHIUM ION 3s 3x3.7V=11.1V
B03=LIFePO4 4s 4x3.2V=12.8V
The setting is the same as above. (some model does not have this setting page)



D2D trigger value(solar panel voltage)
When the work mode is D2D or Timer,the controller will detect the solar panel voltage to decide whether its day or night,so to decide to enable load output or not.the higher this value is,the earlier it enables the load output.the setting is the same as above. (some model does not have this setting page)

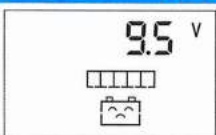


D2D trigger delay value(Second)
When the controller detect the solar panel voltage is lower than trigger value,it will delay for 10S and detect again to make sure night falls, then enable the load output.some car light or thunder lighting will confuse the controller and make it think its daytime,using this delay can prevent interference.default values are recommended.the setting is the same as above. (some model does not have this setting page)

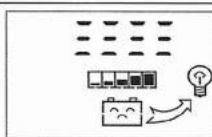


Short-circuit protection setting.
Some inductive or capacitive consumer will trigger the short-circuit protection during start up.therefore,you can disable the SC-protection manually.
SC.F=OFF, SC.N=ON.the default is OFF.
the setting is the same as above. (some model does not have this setting page)

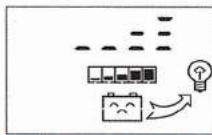
UNUSUAL DISPLAY



Low voltage protection interface.
Empty battery symbol flashing means the battery is discharged lower than the LVD voltage.the controller has disable the output.user should charge the battery until it raise up to LVR voltage and then controller will recover the output status.press any key to ignore for one time and force to work again.

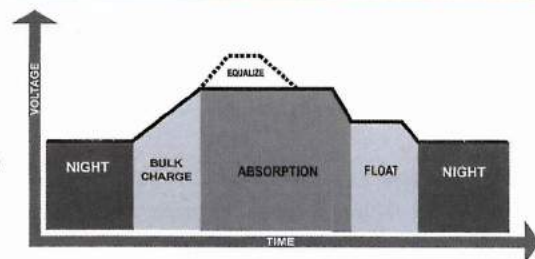


short-circuit protection.
this symbol means a output short-circuit protection occurs. The controller now will disable the output and wait for 30s delay then try to recover again.User should check and remove the trouble in time.



Over-current protection.
this symbol means means a output over-current protection occurs. The controller now will disable the output and wait for 30s delay then try to recover again.User should check and remove the trouble in time.

CHARGING PROCESS



Introduction of 4 stage charging of lead-acid battery

BULK CHARGE

In Bulk charging stage, the battery is not at 100% state of charge and battery voltage has not yet charged to the Absorption voltage set-point. The controller will deliver 100% of available solar power to recharge the battery.

ABSORPTION CHARGE

When the battery has recharged to the Absorption voltage set-point, constant-voltage regulation is used to maintain battery voltage at the Absorption set-point. This prevents heating and excessive battery gasing. The battery is allowed to come to full state of charge at the Absorption voltage set-point.

FLOAT CHARGE

After the battery is fully charged in the Absorption stage, the controller reduces the battery voltage to the Float voltage set-point. When the battery is fully recharged, there can be no more chemical reactions and all the charging current is turned into heat and gasing. The float stage provides a very low rate of maintenance charging while reducing the heating and gasing of a fully charged battery. The purpose of float is to protect the battery from long-term overcharge.

EQUALIZE CHARGE

Certain battery types benefit from a periodic boost charge to stir the electrolyte, level the cell voltages, and complete the chemical reactions. Equalize charging raises the battery voltage above the standard absorption voltage so that the electrolyte gases. Routine equalization cycles are often vital to the performance and life of a battery - particularly in a solar system. During battery discharge, sulfuric acid is consumed and soft lead sulfate crystals form on the plates. If the battery remains in a partially discharged condition, the soft crystals will turn into hard crystals over time. This process, called "lead sulfation," causes the crystals to become harder over time and more difficult to convert back to soft active materials. Sulfation from chronic undercharging of the battery is the leading cause of battery failures in solar charging systems. In addition to reducing the battery capacity, sulfate build-up is the most common cause of buckling plates and cracked grids. Deep cycle batteries are particularly susceptible to lead sulfation.

Normal charging of the battery can convert the sulfate back to the soft active material if the battery is fully recharged. However, a solar charged battery is seldom completely recharged, so the soft lead sulfate crystals harden over a period of time. Only a long controlled overcharge, or equalization, at a higher voltage can reverse the hardening of sulfate crystals.

FAQ

Q:why the controller is not showing charging when I connect the solar panel?

A:please carefully check the solar panel wires are connected correctly,and there is no reverse.the PV voltage should be higher than the voltage of the battery,any sewage or shadow on the PV will cause the voltage drop.please use a 18v PV to charge a 12V battery under normal circumstances.

Q:why is my charging current very small?

A:use more solar panel and stronger sun light will increase the charging current,otherwise,using the wrong PV voltage or sewage and shadow on the PV will reduce the charging current.in addition,when the battery voltage is high it will enter float charging mode,also the charging current will become smaller.

Q:why my consumer is off?

It could be wrong working mode,like setting the work mode to D2D,but you are asking why my consumer is off during the daytime.or battery is not enough and a low-voltage disconnect has happened.or your consumer is broken,to check that ,you can directly connect your consumer to the battery to see if it is working,please carefully check the wires and so.

Q:the solar power stored is not enough to supply the consumer

A:if the power generated by the solar panel is less than the consumer used,the consumer will have to get the power from the battery storage.and day by day,it will cause a LVD finally at some moment.please use more solar panel and add more battery capacity to prevent cloudy or rainy day,or you can reduce the watt of the consumer or working time to balance the system.

Q:why my battery runs out of power very quickly after it is fully charged?

A:your battery could have been used for a very long time,and after few hundred of cycling, its dying.a dying battery will not have the capacity to keep the electricity,run a simple test like this,when you charge your battery ,the voltage raise very quickly ,and when you discharge it again,it drops very quickly,this means you should change your battery.

TECHNICAL PARAMETER						
VOLTAGE	12V/24V AUTO or 48V					
RATED AMP	10A	20A	30A	40A	50A	60A
Max.INPUT	<50V@12/24V		<100V@48V			
STANDBY LOST	< 15mA					
WORKING TEMP	-20°C~50°C					
STORAGE TEMP	-30°C~70°C					
HUMIDITY	≤90%, Non condensation					
Charge mode	PWM					
USB OUTPUT	5V/2A(for 12V/24V only)					
WIRE	10AWG (16mm ²)	6AWG (16mm ²)	3AWG (25mm ²)			
SIZE/WEIGHT	151*86*36mm /220g	186*90*50mm /370g	187*128*51mm /500g			
Installation hole position	141*64mm	177*60mm	176*98mm			
Bat.option	B01	B02	B03			
Battery type	LEAD-ACID 12V	LITHIUM ION 3S*3.7V=11.1V	LiFePO4 4s 4x3.2V=12.8V			
bulk	14.2V	-	-			
Absorption	14.2V	-	-			
Float	13.7V	12.6V	14.6V			
Equalize	14.4V	-	-			
LOW-VOLTAGE DISCONNECT	10.7V	9V	10V			
LOW-VOLTAGE RECONNECT	12.6V	10.5V	12V			

*all red color voltage X2 ,X4 while using 24V /48V system.
*Product specifications are subject to change without prior notice.

WARRANTY

- Quality assurance should be carried out according to the following rules:
 - The product is guaranteed of replacement, returning and repairing within 7 days after Sale.
 - The product is guaranteed of replacement and repairing within 1 month after sale.
 - The product is guaranteed of repairing within 12 months after sale.
- If it is not possible to identify the using date of the controller, we would refer to the ex-work date, and prescribe 18 months as the warranty period. We need to charge beyond the warranty period. The controller can be repaired for life no matter when and where you use it.
- If the controller is damaged by the following causes, we need to charge even if it is in the guarantee period:
 - Do not operate according to the user's manual.
 - Use the controller under the condition which is beyond the using standard and technical requirements.
 - Repair by yourself or reform by yourself.
 - The inappropriate environmental condition which can cause the breakdown and aging of the apparatus.
 - Improper carrying or storage.
 - Regarding to the service of replacement, returning and repairing, you need to retreat the product to our company, and we decide whether to replace or repair after we make clear who should be responsible.