GSM Series MPPT PV Controller

Version 1.0

Manual

1 Introduction

GSM series PV controller is a high-performance Buck solar power equipment, using MPPT (Maximum Power Point Tracking) algorithm makes full use of solar photovoltaic energy. PV input voltage range, for a variety of battery charging, and three-stage charging effectively improve the battery life. The modular design of the controller, you can use more than one parallel, allowing customers the freedom and flexibility to configure.

➢ Using industrial-grade materials to ensure stable and reliable equipment.

➢ Memory function, save the settings, date and time, power generation, and other functions.

➢ Three-stage charging (constant current, constant voltage, float), effectively extending the battery life.

➢ LCD and LED display various parameters, such as PV input voltage, battery type, charging voltage, charging current, charging power, working status, etc.

➢ Using MPPT technology to automatically make full use of PV power.

➢ Multiple devices can be run in parallel, the expansion of the scope of use to meet the requirements of high-power charging.

2 Safety

➢ To avoid a risk of fire and electric shock, make sure that existing wiring is in good condition and that wire is not undersized. Do not operate the solar charge controller with damaged or substandard wiring.

➢ Do not disassemble the solar charge controller. It contains no user-serviceable parts.

➢ See Warranty for instructions on obtaining service. Attempting to repair the solar charge controller by yourself may result in a risk of electric shock or fire and will make your warranty invalid.

➢ To reduce the risk of electric shock, authorized service personnel must use insulating tool to operate the device.

➢ Keep away from flammable, explosive materials to avoid fire disaster. The

installation place should be away from humid or corrosive substance.

➢ To reduce the chance of short-circuits, authorized service personnel must use insulated tools when installing or working with this equipment.

➢ Due to high input working voltage, please be cautious, otherwise it is danger to life.

➢ The appliance is not to be used by children or persons with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.

➢ Energy stored in capacitors will remain alive for 5 minutes; don't touch within the period after disconnection. Both the sides have circuit lines, disconnect both and don't operate within 5 minutes after disconnection.

➢ Ensure input DC voltage no more than Max. DC voltage. Over voltage may cause permanent damage to solar charge controller or other losses, which will not be included in warranty!

3 Installation

3.1 Environment Condition

➢ The mounting location must be accessible at all times.

➢ The charge controller must be easy to remove from the mounting location at any time.

➢ The ambient temperature should be between −10 ℃ and +50 ℃ to guarantee optimal operation.

➢ Do not expose the charge controller to direct sunlight to avoid power losses due to overheating.

➢ The controller can work under the 1000 meters elevation height. If more than 1000 meters, it must reduce rated power.

3.2 Wiring
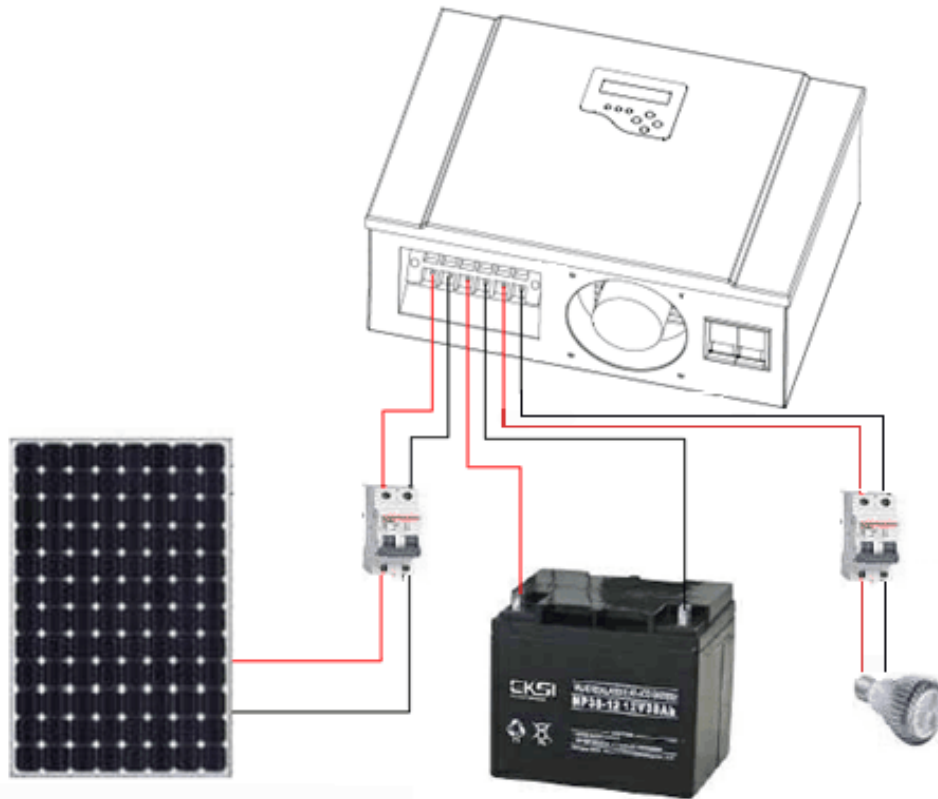
Note：

➢ All the connection must be reliable, or it may cause a fire or damage the machine etc.

➢ Between the battery and the controller wire length no more than 3 meters, ot herwise, must be bold wire (more than 3 meters line diameter is usually 1-2 times).

➢ Because the machine has so many types, this figure only as illustration. The correct wiring please refer to machine factory marking silk description as standard.

4 Operation

☞ Caution: 1 Please follow the steps, or the machine will be easy to broken.

2 First time power on, true battery volume must be set.

Please make sure the machine has already been connected in right way.

Step 1:Turn on the breaker that connect with battery, then the LED and LCD will show some information)

Step 2: If first time power on, please set the true battery volume, through setting menu. This parameter will influence the charge efficiency and battery life, so please be sure to right set battery volume.

Step 3: Turn on the breaker that connect with PV module, if the PV module voltage is in the charging range, then the charger will start to work automatically.

The step for turn off machine:

Step 1: Turn off the PV input breaker, make sure PV and controller disconnect.

Step 2: Turn off the battery breaker, the machine will be completely off.

> ⚠️ Warning：When the controller is charging for battery, please do not turn off the battery breaker before PV input has not been turned off. Otherwise the machine will have unrecoverable fault and this will not in the warranty.

5 Meaning of LED and function key

ALARM (Red): Alarm Light (when controller in fault state this light will on.)

CHARGE(Green): Charging Light (when controller start to charge, this light will on.)

LOAD(Red): Load Light (when the DC load turn on, this load will on.)

UP: UP Function Key (For check or page up and numerical increase.)

DOWN: DOWN Function Key (For check or page up and numerical reduction)

ENTER: ENTER key (For enter in and save data）

ESC: ESC Key (For exit)

➢ **Charge Mode**

This controller have 3 modes: Constant current charging stage (CC Mode), Constant voltage charging stage (CV Mode), Floating charge Stage (CF Mode) :

In CC Mode, the blue light will flash for every second.

In CV Mode, the blue light will flash for every 2 seconds.

In CF Mode, the light will keep on.

(Note: Charging Mode also could check in LCD.)

Menu No.	Menu Type	Menu Description
1	Work Status	For check the charging state and realtime data
2	Setting	Parameter set
3	Information	For check the machine information

The information of LCD display in different menu.

LCD INFORMATION			Note
Work status	Chg Mode		Charging Mode
	Chg Cur		Charge current
	BatChgCur		Battery charge current, if discharge show 0.
	BatSts		Battery status
	PVChgSts		Charging status
	PVinVolt		PV input voltage
	BuckTemp		Radiator temperature
	BatVolt		Battery Voltage
Setting	UserBatTypeSet	Default	Setup battery type
		User Def	
	UserBatSet	Bulk Volt Set	Special battery, just need to set. Bulk charging voltage and float charging voltage .Please based on 12V battery .
		Float Volt Set	
	DataSet		Setup data
	TimeSet		Setup Time
	BatVolumeSet		Setup system real battery volume, must be correct.
	MachineIDSet		Setup Machine ID
Info	ETotal		Total energy generated by this machine

	Firmware Ver	Firmware Version
	Machine ID	Machine ID
	BatVoltDegree	Display rated Battery voltage
	Bat Type	Battery Type display
	Time	Time

6 Troubleshooting and Warranty

6.1 Troubleshooting

When the controller is abnormal, please check the following questions and contact the customer service representative. Please check the fault tips in the failure mode, and then proceed to the appropriate troubleshooting.

When the controller does not run properly:

1. Check the controller external solar panels with the correct polarity.

2. Check Battery Connection;

3. Check Battery voltage;

4. Check circuit breaker;

5. Check internal fuse;

If the problem still exists, please contact the customer service. Offer the following information: equipment information and detailed description of the problem.

6.2 Warranty

Within the warranty period, it is free to repair for the non-human fault. Otherwise, should charge the cost of repairs.

Appendix：Technical Parameters

Voltage level		GSM48	GSM96	GSM192	GSM220	GSM240	GSM360
Rated voltage (VDC)		48	96	192	220	240	360
Over voltage value(VDC)		62.0	124.0	248.0	279.0	310.0	465
Over voltage recovery value(VDC)		60.0	120.0	240.0	270.0	300.0	450
Float charge Voltage(VDC)	Settable	54.0	108.0	216.0	243.0	270.0	405
Bulk charge Voltage(VDC)		56.8	113.6	227.2	255.6	284.0	426
Maximum charging current (A)		60/120	50/100/150/200				40/80/120/160
Charging Mode		Three-stage: constant current(MPPT), bulk charge, float charge					
Rated input power (kWp)		3.4/6.8	5.7/11.4/ 17.1/22.8	11.4/22.8/ 34.2/45.6	12.8/25.6/ 38.4/51.2	14.2/28.4/ 42.6/56.8	17/34/51/68
Start work voltage(VDC)		80	140	270	290	330	450
MPPT voltage range (VDC)		70-150	130-280	260-450	280-450	320-450	430-620
Maximum input voltage (VDC)		160	300	480			760
Maximum efficiency		>98%					
MPPT efficiency		>99%					
Noise (dB)		<55					

Degree of protection	IP20	
Display	LCD+LED	
Communication	RS485(optional)	
Working temperature	-10~+50℃	
Relative humidity	0 to 95% (non-condensing)	
Altitude (m)	≤5000m, (1000 meters above derating)	
Degree of protection	IP20	
Dimensions (W × H × D mm)	400*280*160	400*280*160/440*685*440
Protection	PV array reverse polarity protection; reverse battery protection; nighttime anti-charge protection; battery overcharge protection, output overload protection, over temperature protection ect.	

Above information is just for reference, no inform if there is any change. Special voltage can be customized.