
Intelligent Solar Charge Controller

User's Manual



Please read this manual carefully before you use this product.

Catalogue

| | |
|--|-----------|
| 1. Product Introduction..... | 4 |
| 2. Installation..... | 5 |
| 3. Operation..... | 6 |
| 4. Common Fault and Handling..... | 11 |
| 5. Technical Data..... | 13 |

1. Product Introduction

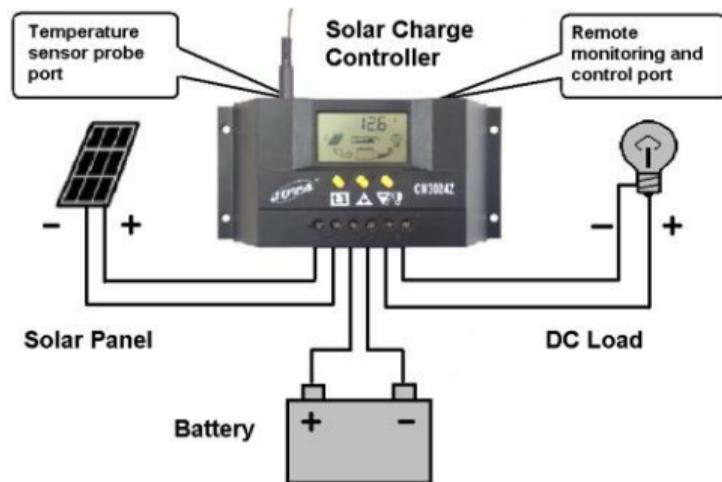
CM series controller is a kind of intelligent, multi-purpose solar charge and discharge controller. The family use the fixed LCD display, with a very friendly interface; various control parameters can be flexibly set, fully meet your various application requirements. CM series controller has following features:

- Image of LCD graphic symbol
- Automatic Identification System Voltage level
- Automatic Temperature Compensation
- Settable Operating mode of Load
- Remote monitoring and control function (custom)
- Battery Low Voltage Disconnection (LVD)
- Accumulated function of charge and discharge Ampere hours
- Simple button operation
- Intelligent PWM charge mode
- Adjustable charge-discharge control parameters
- Overload, Short Circuit Protection
- Battery reverse-discharge protection
- Battery reverse connection protection

2. Installation

Install:

- ① Get ready for tools and cables. Advise you to match the right cables. Ensure that the current density $<4A/mm^2$ that is conducive to reducing the line voltage drop. Recommendation: 30A with 10mm² cables. Check whether the installation site complies with the relevant safety requirements. Please avoid damp, dusty, flammable, explosive and corrosive gases use the controller to install.
- ② Install the controller into a fixed vertical plane. See section 5 of the pore size and pore spacing. In order to ensure a good thermal control conditions, please set aside each 10cm below the controller space.
- ③ As shown on the right, connect the (1) Load, (2) Battery and (3) Solar Panel to the controller according to the order of (1) (2) (3). Pay attention to the load, battery, solar panel and controller of same polarity.
- ④ Put the external temperature sensor into the left of the controller (probe port). The temperature sensor should be placed at the similar space of the battery. (Otherwise, the controller will control the parameters of all wrong temperature compensation.)
- ⑤ If you have remote monitoring and control function, please insert one end of the included communication wire on the right of the controller (communication port), the other end to connect to the host computer.



Demolition: To prevent accidents, please order the demolition of solar panels, battery and load disconnect with controller.

Note: Battery polarity will not damage the controller, but you will have a load equipment security risks.

3. Operation

1 Description of LCD graphic symbol

-  : Stop-powered Status for Loads
-  : Power to the load status, the load circuit without current
-  : The load circuit with current
-  : Load
-  : Solar Panel
-  : Load sensor control
-  : Load timer control

-  : Stop the battery charging
-  : Bulk charging the battery
-  : Float charging the battery
-  : The system is working correctly
-  : The system is not working properly
-  : Battery charge capacity instruction
-  : Battery

2 Description of Button Function:

-  : Interface loop switch button, use the button to cycle between pages in each switch cycle sequence shown in (figure 1)
-  : Adjustment of parameters plus buttons. In addition, at the state in the parameter view, long press the button more than 5 seconds, all parameter to restore factory setting.
-  : Adjustment of parameters minus button. In addition, in the main interface, click this button to switch the load.

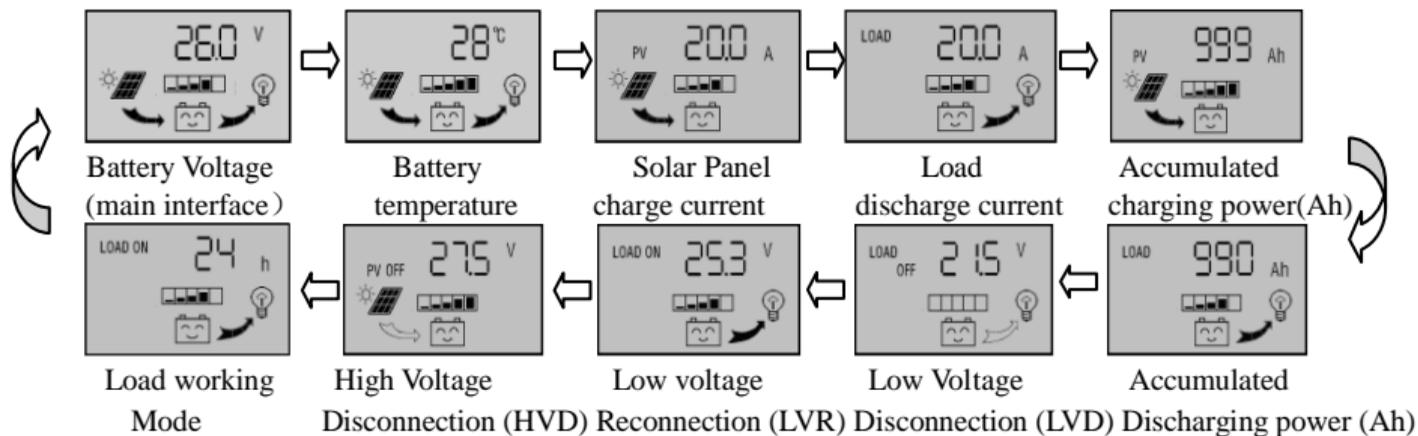


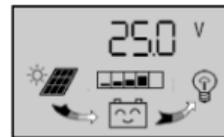
Figure 1

3 View and set the parameters:

The controller will default entry “battery voltage” interface after correct power-on. This is the main interface. Use the button  could in turn visit the following parameters interface. If that interface could be set, long press the button  (>5seconds, numbers start flashing) To enter the parameter setting interface; set out the parameter interface after long press the button  again. (The numbers stops flashing)

3.1 Battery Voltage View

As shown on the right, displays the value for current battery voltage. This interface (based interface) displays charge status, discharge status, battery capacity and battery voltage.



3.2 The load on/off control

View the interface in the battery voltage could be used key

▼/💡 On, off the load

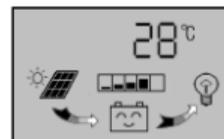
In other interface, the key there is no such feature.



3.3 Environment Temperature of View

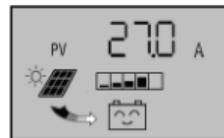
As shown on the right, displays the ambient temperature of the controller, the value used for temperature compensation on LVD function.

The sensor must be plug in before using the controller.



3.4 Solar Panel charging current of View

As shown on the right, display the value of charging current from solar panel.



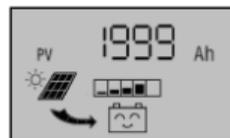
3.5 Load discharging current of View

As shown on the right, display the value of discharging current for Loads.



3.6 View the Accumulated charging power (Ah) by solar panel and back to zero

As shown on the right, display the accumulated charging power from solar panel (Total ampere hour), long press the button  more than 5seconds, the value will back to zero.



3.7 View the Accumulated discharging power (Ah) by Load and back to zero

As shown on the right, display the accumulated discharging power for loads (Total ampere hour), long press the button  more than 5seconds, the value will back to zero.



3.8 View and set the Low Voltage Disconnection Protection

As shown on the right, shows the values for the LVD protection voltage.

When the battery voltage is lower than protection voltage, the controller will disconnect the load circuit to prevent battery over-discharge.

Long press the button  (>5seconds) in this interface, numbers start flashing, that has entered the LVD setup interface, you can use the key  / 、 to adjust the parameter. After long press the key  (>5seconds) to exit parameter setting interface, the controller will save the settings.



3.9 View and set the Low Voltage Reconnection

As shown on the right, shows the values for the LVR voltage. Under the LVD protection in the controller, when the battery voltage is restored to the higher voltage than LVR voltage, the controller will re-connect the load circuit.



Long press the button  (>5seconds) in this interface, numbers start flashing, that has entered the LVR setup interface, you can use the key  / 、 to adjust the parameter. After long press the key  (>5seconds) to exit parameter setting interface, the controller will save the settings.

3.10 View and set the High Voltage Disconnection

As shown on the right, shows the values for the HVD voltage. When the battery voltage reaches HVD voltage, the controller will cut off the charging circuit to prevent over-charging battery. Battery voltage drops under the value the charging circuit will be re-connected.



Long press the button  (>5seconds) in this interface, numbers start flashing, that has entered the HVD setup interface, you can use the key  / 、 to adjust the parameter. After long press the key  (>5seconds) to exit parameter setting interface, the controller will save the settings.

3.11 View and set Load Working Mode

As shown on the right is Load working mode interface, different values represent different load working patterns.

24h—said Normal Mode, in case of no fault state of the load is always in power.

1h~23h—said Light Control with Time Control Mode, Load power after dark, and close the load according to the timer setting.

0h—said Light Control Mode, Load power after dark, turn off the load after drawn.



Long press the button  (>5seconds) in this interface, numbers start flashing, that has entered the Load Working Mode setup interface, you can use the key /、 to adjust the parameter. After long press the key  (>5seconds) to exit parameter setting interface, the controller will save the settings.

4. Common Fault and Handling

LVD Protection and Treatment:

Screen display as shown in the figure that the battery drops below the LVD protection voltage. The controller has entered the LCD protection state, load circuit has been disconnected. Use the solar panels recharge the battery or charger when the battery voltage reaches LVR voltage, the controller will resume on the load power supply, into the normal working state.



Overload Protection and Treatment:

Screen display (see the figure) and flashing expressed load loop circuit current sustained 60seconds than 1.5times rated current, the controller has entered into overload protection state. After reduce the load, press the button  to restore power to the load.



Short Circuit Protection and Treatment:

Screen display (see the figure on the right) and flashing expressed there is short circuit on the load loop circuit. The controller has enter into Short Circuit Protection state Check the load if there is damage or not, if there is cable short circuit or not, after trouble shooting short press the button  for restoration.



Solar Panel Fault and Treatment:

 Symbol flashing represent the controller was not detected solar panels within 24hours. Check if there is a connection from solar panel, check if there is an open circuit between solar panels with controller.

Load Shock Fault:

Open load if the  flashing, that indicate the load impulse current is more than twice rated current of the controller. The controller is restarting the load in action many timers do.

5. Technical Data

| Data Model | CM2024Z | CM3024Z | CM2048 | CM3048 | Data Model | CM3024Z | CM3048 |
|--|--------------|---------|-------------|--------|---------------------------------|--|--------|
| Rated Current | 20A | 30A | 20A | 30A | Installation cable area. | $\leq 7\#$ AWG (16mm ²) | |
| Rated Voltage | 12V/24V | | 48V | | Operating Temperature | -10°C~60°C | |
| Open Circuit Voltage of solar panel | $\leq 50V$ | | $\leq 100V$ | | Storage temperature | -30°C~70°C | |
| Low Voltage Disconnection(LVD) | 10.7V/21.4V | | 42.8V | | Humidity requirements | $\leq 90\%$,no condensation | |
| Float Voltage | 13.8V/27.6V | | 55.2V | | Size | 90 mm×188 mm×48 mm | |
| Low Voltage Reconnection(LVR) | 12.5V/25.0V | | 50.0V | | Mounting hole spacing | 60 mm×178 mm --Φ5 | |
| No load loss | $\leq 30mA$ | | \leq | | weight | 360g | |
| Loop Voltage Drop | $\leq 170mV$ | | \leq | | Notes | Model suffix “Z” represent automatic identify system voltage level, “T” represent controller with remote monitoring. | |
| Charging Mode | PWM mode | | | | | | |
| Temperature Compensation | -4mV/Cell/°C | | | | | | |

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