

4.3 Load mode setting

Operating Steps:

Under load mode setting interface, press SET button and hold on 5s till the number begin flashing, then press MENU button to set the parameter, press SET button to confirm.

{**}	Timer 1	2**	Timer 2
00	Light ON/OFF	2 n	Disabled
01	Load will be on for 1 hour since sunset	2 01	Load will be on for 1 hour before sunrise
02	Load will be on for 2 hours since sunset	2 02	Load will be on for 2 hours before sunrise
03~13	Load will be on for 3~13 hours since sunset	2 03~213	Load will be on for 3~13 hours before sunrise
14	Load will be on for 14 hours since sunset	2 14	Load will be on for 14 hours before sunrise
15	Load will be on for 15 hours since sunset	2 15	Load will be on for 15 hours before sunrise
16	Test mode	2 n	Disabled
17	Manual mode(Default load ON)	2 n	Disabled

NOTE: Please set Light ON/OFF, Test mode and Manual mode via Timer1. Timer2 will be disabled and display "2 n".

4.4 Battery Type

> Operating Steps

Under Battery Voltage interface, press SET button and hold on 5s then enter into the interface of Battery type setting. After choosing the battery type by pressing MENU button, waiting for 5s or pressing SET button again to modify successfully.

> Battery Type



①Sealed (Default)

②Gel

③Flooded

NOTE: Please refer to the battery voltage parameters table for the different battery type.

5. Protections

- PV Short Circuit
When PV short circuit occurs, the controller will stop charging. Clear it to resume normal operation.
- PV Reverse Polarity
Fully protection against PV reverse polarity, correct the wire connection to resume normal operation.
- Battery Reverse Polarity
Fully protection against battery reverse polarity, correct the wire connection to resume normal operation.



Warning: Shock Hazard!

When the battery is reverse, the load will appear the equal and reverse polarity voltage to battery.

- Battery Over Voltage
When the battery voltage reaches to the set point of Over Voltage Disconnect Voltage, the controller will stop charging the battery to protect the battery from being over charged to break down.
- Battery Over Discharge
When the battery voltage reaches to the set point of Low Voltage Disconnect Voltage, the controller will stop discharging the battery to protect the battery from being over discharged.
- Battery Overheating
The controller detect the battery temperature through the external temperature sensor. If the battery temperature exceeds 65°C, the controller will automatically start the overheating protection to stop working and recover below 50 °C.
- Load Overload
Load will be switched off when 1.05 times rated current overload happens. Controller will automatically attempt to reconnect load for 5 times. If overload protection still exist after controller's 5 times attempts, user have to reduce load appliance, then press the SET button or repower the controller or wait for one night-day cycle (night time>3 hours).
- Load Short Circuit
Load will be switched off when load short circuit (≥4 times rated current) happens. Controller will automatically attempt to reconnect load for 5 times. If short circuit protection still exist after controller's 5 times attempts, user have to clear short circuit ,then press the SET button or disconnect and restart the controller or wait for one night-day cycle (night time>3 hours).
- Damaged Remote Temperature Sensor
If the temperature sensor is short-circuited or damaged, the controller will be charging or discharging at the default temperature 25 °C to prevent the battery damaged from overcharging or over discharged.

- Controller Overheating
If the temperature of the controller heat sinks exceeds 85°C, the controller will automatically start the overheating protection and recover below 75°C.

- High Voltage Transients
PV is protected against small high voltage surge. In lightning prone areas, additional external suppression is recommended.

6. Troubleshooting

Faults	Possible reasons	Troubleshooting
The LCD is off during daytime when sunshine falls on PV modules properly	PV array disconnection	Confirm that PV wire connections are correct and tight
Wire connection is correct, LCD not display	1. Battery voltage is lower than 9V 2. PV voltage is less than battery voltage	1. Please check the voltage of battery. At least 9V voltage to activate the controller 2. Check the PV input voltage which should be higher than battery's
Interface blink	Battery over voltage	Check if the battery voltage is higher than OVD point (over voltage disconnect voltage), and disconnect the PV.
Interface blink	Battery over discharged	When the battery voltage is restored to or above LVR point (low voltage reconnect voltage), the load will recover
Interface blink	Battery Overheating	The controller will automatically turn the system off. But while the temperature decline to be below 50 °C, the controller will resume.
Interface blink	Over load or Short circuit	Please reduce the number of electric equipments or check carefully loads connection.

7. Technical Specifications

Item	VS1024A	VS2024A	VS3024A
Nominal system voltage	12/24VDC Auto		
Battery input voltage range	9~32V		
Rated charge current	10A	20A	30A
Max. PV open circuit voltage	50V		
Temperature compensation coefficient	-3mV/°C/2V (25°C)		
Self-consumption	≤8.1mA(12V);≤6.5mA(24V)		
Charge circuit voltage drop	≤0.29V		
Discharge circuit voltage drop	≤0.16V		
LCD temperature range	-20°C~+55°C		
Working environment temperature	-25°C~+45°C		
Humidity range	≤95% (N.C.)		
Enclosure	IP30		
Grounding	Common Positive		
Overall dimension	132x84.6 x39.7mm	149x94.1 x46.1mm	177.5x106.6 x46.2mm
Mounting dimension	120x56mm	137x60mm	165.5x70mm
Mounting hole size	Φ4.5mm		
Terminals	4mm ²	16mm ²	16mm ²
Net weight	0.18kg	0.26kg	0.33kg

Battery Voltage Parameters (parameters is in 12V system at 25°C, please use double value in 24V.)

Battery charging setting	Sealed	Gel	Flooded
Over Voltage Disconnect Voltage	16.0V	16.0V	16.0V
Charging Limit Voltage	15.0V	15.0V	15.0V
Over Voltage Reconnect Voltage	15.0V	15.0V	15.0V
Equalize Charging Voltage	14.6V	—	14.8V
Boost Charging Voltage	14.4V	14.2V	14.6V
Float Charging Voltage	13.8V	13.8V	13.8V
Boost Reconnect Charging Voltage	13.2V	13.2V	13.2V
Low Voltage Reconnect Voltage	12.6V	12.6V	12.6V
Under Voltage Warning Reconnect Voltage	12.2V	12.2V	12.2V
Under Volt. Warning Volt.	12.0V	12.0V	12.0V
Low Volt. Disconnect Volt.	11.1V	11.1V	11.1V
Discharging Limit Voltage	10.6V	10.6V	10.6V
Equalize Duration	120min	—	120min
Boost Duration	120min	120min	120min

8. Disclaimer

This warranty does not apply under the following conditions:

- 1) Damage from improper use or use in an unsuitable environment.
- 2) PV or load current, voltage or power exceeding the rated value of controller.
- 3) User disassembly or attempted repair the controller without permission.
- 4) The controller is damaged due to natural elements such as lightning.
- 5) The controller is damaged during transportation and shipment.

Any changes without prior notice! Version number: V1.1