

# Контроллер заряда солнечной батареи ViewStar серии A

## 1. Краткое описание

Спасибо за то, что выбрали контроллер заряда солнечной батареи ViewStar серии A с положительным заземлением. Серия VS-A представляет собой ШИМ контроллер, в котором используются самые продвинутые технологии, а также присутствует встроенный ЖК дисплей. Множество режимов контроля позволяют использовать его как в домашних солнечных системах, так и в контрольно-измерительных системах подземного газогенератора, в сигналах светофоров, в системах уличного освещения, в солнечных садовых фонарях и тд. Особенности:

- 3-х ступенчатая зарядка : объемная зарядка, выравнивабщая зарядка и непрерывная зарядка
- Выбор типа АКБ: гелевый, герметичный и обслуживаемый
- ЖК дисплей отображает рабочие данные и условия работы устройства
- Несколько режимов управления нагрузкой
- Функция статистики энергии
- Функция компенсации температуры батареи
- Обширная электронная защита

## 2. Особенности

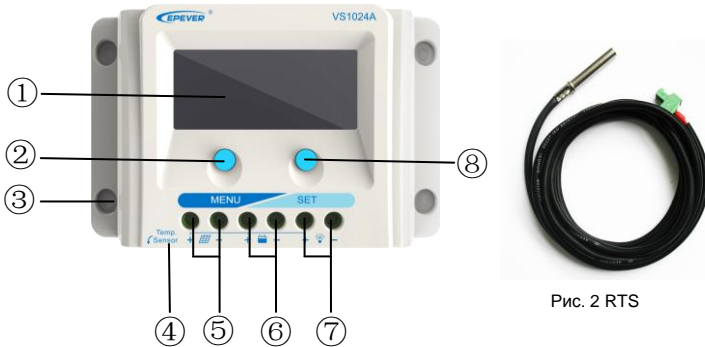


Рис.1 Особенности

|   |                          |   |                          |
|---|--------------------------|---|--------------------------|
| ① | ЖК дисплей               | ⑤ | PV клеммы                |
| ② | Кнопка МЕНЮ (MENU)       | ⑥ | Клеммы батареи           |
| ③ | Монтажное отверстие Ф4.5 | ⑦ | Клеммы нагрузки          |
| ④ | Порт RTS*                | ⑧ | Кнопка регулировки (SET) |

\* Комплектующие: Дистанционный датчик температуры (Модель: RTS300R47K3.81A)

Обеспечение температуры батареи для проведения температурной компенсации, стандартная длина кабеля составляет 3 м (длина может быть изготовлена на заказ). RTS300R47K3.81A подключается к порту (4-й) на контроллере.

Примечания: При отключении RTS температура батареи будет установлена на фиксированное значение 25°C.

## 3. Подключение

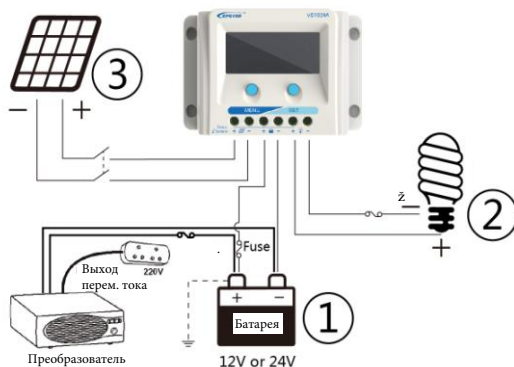


Рис. 3 Соединение

(1) Подключите компоненты к контроллеру заряда в последовательности, указанной выше, и обратите особое внимание на «+» и «-». Пожалуйста, не вставляйте предохранитель или не включайте размыкатель во время установки. При отключении порядок

(2) После включения контроллера, проверьте, включен ли монитор. В противном случае см. раздел 6. Всегда подключайте батарею первой, чтобы позволить контроллеру распознавать напряжение системы.

(3) Предохранитель батареи должен быть установлен как можно ближе к батарее. Предлагаемое расстояние не превышает 150 мм.

(4) Контроллер серии VS-A имеет положительное заземление. Любое положительное соединение солнечной батареи, нагрузки или аккумулятора может быть заземлено по мере необходимости.

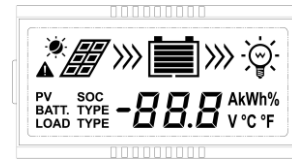
**ПРИМЕЧАНИЯ:** Если требуется инвертор или другая нагрузка, пожалуйста, подключите так, чтобы имелся большой пусковой ток к батарее, а не к контроллеру.

## 4.

### 4.1 Button Function

| Button      | Function   |
|-------------|--|
| MENU button | <ul style="list-style-type: none"> <li>• Browse interface</li> <li>• Setting parameter</li> </ul>  |
| SET button  | <ul style="list-style-type: none"> <li>• Load ON/OFF</li> <li>• Clear error</li> <li>• Enter into Set Mode</li> <li>• Save data</li> </ul> |

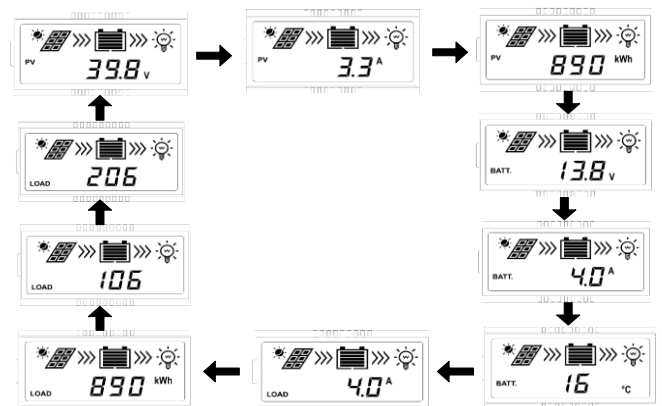
### 4.2 LCD Display



### > Status Description

| Item     | Icon              | Status                                |
|----------|-------------------|---------------------------------------|
| PV array |                   | Day                                   |
|          |                   | Night                                 |
|          |                   | No charging                           |
|          |                   | Charging                              |
| Battery  | <b>PV</b>         | PV Voltage, Current, Power            |
|          |                   | Battery capacity, In Charging         |
|          | <b>BATT.</b>      | Battery voltage, current, temperature |
| Load     | <b>BATT. TYPE</b> | Battery type                          |
|          |                   | Load ON                               |
|          |                   | Load OFF                              |
|          | <b>LOAD</b>       | Load Voltage, Current, Load mode      |

### > Browse interface



### NOTE:

1) When no operation, the interface will be automatic cycle, but the follow two interfaces not be display.



2) Accumulative power zero clearing: Under PV power interface, press SET button and hold on 5s then the value blink, press SET button again to clear the value.

3) Setting temperature unit: Under battery temperature interface, press SET button and hold on 5s to switch.

### > Fault Indication

| Status                  | Icon | Description  |
|-------------------------|------|--|
| Battery over discharged |      | Battery level shows empty, battery frame blink, fault icon blink         |
| Battery over voltage    |      | Battery level shows full, battery frame blink, fault icon blink          |
| Battery Overheating     |      | Battery level shows current value, battery frame blink, fault icon blink |
| Load failure            |      | Load overload <sup>①</sup> , Load short circuit                          |

① When load current reaches 1.02-1.05 times, 1.05-1.25 times, 1.25-1.35 times and 1.35-1.5 times more than nominal value, controller will automatically turn off loads in 50s, 30s, 10s and 2s respectively.

### 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<br>2. PV voltage is less than battery voltage | 1. Please check the voltage of battery. At least 9V voltage to activate the controller<br>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<br>x39.7mm     | 149x94.1<br>x46.1mm | 177.5x106.6<br>x46.2mm |
| Mounting dimension                   | 120x56mm                | 137x60mm            | 165.5x70mm             |
| Mounting hole size                   | Φ4.5mm                  |                     |                        |
| Terminals                            | 4mm <sup>2</sup>        | 16mm <sup>2</sup>   | 16mm <sup>2</sup>      |
| 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