※ **Thank you for selecting VS AU series solar charge controller. Please read this manual carefully before using the product.**

※ **Do not install this product in humid, salt spray, corrosion, greasy, flammable, explosive, dust accumulative, or other severe environments.**

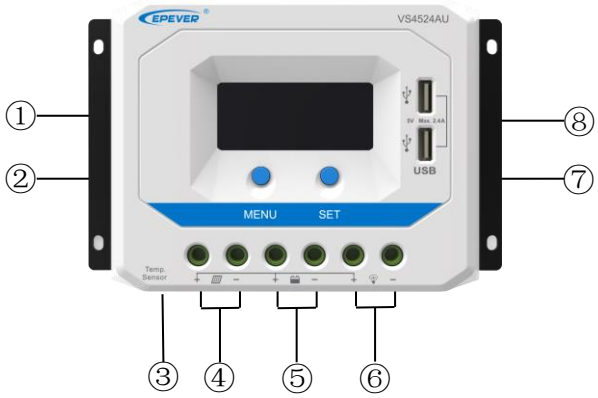
VS AU series solar charge controller

1. Overview

The VS AU controller is a PWM charge controller with a built-in LCD that adopts the most advanced digital technique. The multiple load control modes help it be widely used in the solar home system, traffic signals, street lights, solar garden lamps, etc. The features are listed below:

- Adopt high-quality components of ST, IR, and Infineon, ensure product lifespan
- Pass the UL and VDE certification, enabling the product is safer and more reliable
- Work continuously at full load in -25℃ ~ 55℃
- 3-Stage intelligent PWM charging: Bulk, Boost/Equalize, Float
- Support 3 battery types: Sealed, Gel, and Flooded
- LCD dynamically displays the device's operating data and working condition
- Double USB design, the power supply charge for electronic equipment
- With humanized button settings, the operation will be more comfortable and convenient
- Multiple load control modes
- Energy statistics function
- Battery temperature compensation function
- Extensive Electronic protection

2. Product Features



①	LCD	⑤	Battery Terminals
②	MENU Button	⑥	Load Terminals
③	RTS Port	⑦	SET Button
④	PV Terminals	⑧	USB Output Ports※

※ USB output ports provide the power supply of 5VDC/2.4A and have short circuit protection.

Optional Accessory:

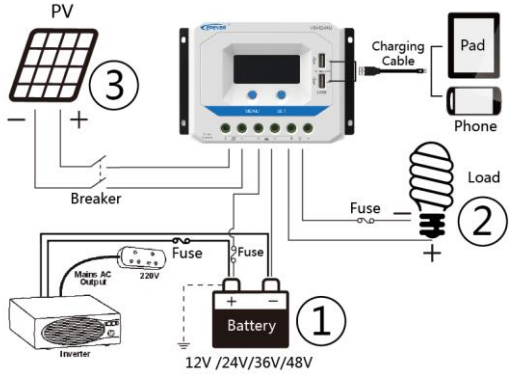
Name: Remote Temperature Sensor

Model: RTS300R47K3.81A

Acquisition of battery temperature for undertaking temperature compensation of control parameters, the standard length of the cable is 3m (length can be customized). The RTS300R47K3.81A connects to the port ③ on the controller.

NOTE: Unplug the RTS, and the battery's temperature will be set to a fixed value of 25ºC.

3. Wiring



(1) Connect components to the charge controller in the sequence as shown above and pay much attention to the "+" and "-." Please don't insert the fast-acting fuse or connect the breaker during the installation. When disconnecting the system, the order will be reserved.

(2) The system voltage level will be identified after powering the controller. Check whether the battery indicator is green ON. Otherwise, please refer to chapter 6.

(3)The battery's fast-acting fuse should be installed as close to the battery as possible. The suggested distance is within 150mm.

(4) The VS AU series is a positive ground controller. The positive poles of the solar, load, or battery can be earth grounded as required.

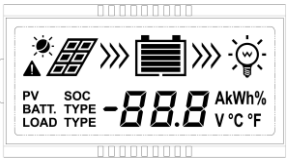
NOTE: Please connect the inverter or other loads with a large start current to the battery rather than to the controller's load terminal if the inverter or the load is necessary.

4. Operation

4.1 Button Function

Button	Function
MENU button	• Browse interface • Setting parameter
SET button	• Load ON/OFF • Clear error • Enter into Set Mode • Save data

4.2 LCD Display

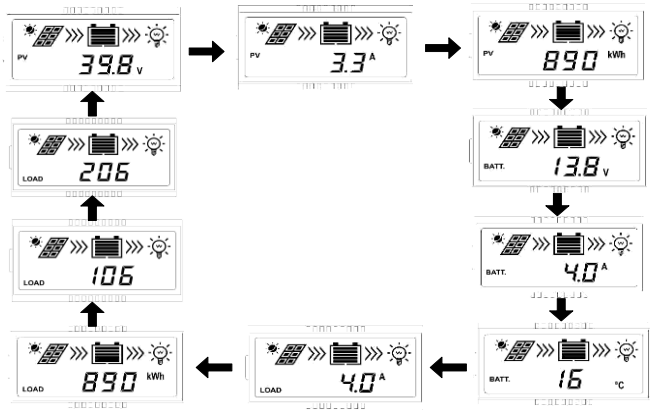


Note: The display screen can be viewed clearly when the angle between the end-users horizontal sight and the display screen is within 90°. If the angle exceeds 90°, the information on the display screen cannot be viewed clearly.

➢ **Status Description**

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

➢ **Browse interface**



NOTE:

1） When there is no operation, the interface will be an automatic cycle. However, the following two interfaces will not be displayed.

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

3） Switch the temperature unit: Under the battery temperature interface, press the 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 ①, Load short circuit

①When load current reaches1.02-1.05 times, 1.05-1.25 times, 1.25-1.35 times, and 1.35-1.5 times more than the rated value, the controller will automatically turn off loads in the 50s, 30s,10s, and 2s respectively

4.3 Load mode setting

Operating Steps:
Long press the SET button in the load mode interface until the value flashes. Then press the MENU button to set the load mode, and press the SET button to confirm.

1**	Timer 1	2**	Timer 2
100	Light ON/OFF	2 n	Disabled
101	The load will be on for 1 hour since sunset	201	The load will be on for 1 hour before sunrise
102	The load will be on for 2 hours since sunset	202	The load will be on for 2 hours before sunrise
103~113	The load will be on for 3~13 hours since sunset	203~213	The load will be on for 3~13 hours before sunrise
114	The load will be on for 14 hours since sunset	214	The load will be on for 14 hours before sunrise
115	The load will be on for 15 hours since sunset	215	The load will be on for 15 hours before sunrise
116	Test mode	2 n	Disabled
117	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**

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

➢ **Battery Type**

①Sealed (Default) ②Gel ③Flooded

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

5. Protections

Protection	Conditions	Status
PV Reverse Polarity	When the battery is correctly connected, the PV can be reversed.	The controller is not damaged
Battery Reverse Polarity	When the PV is not connecting, the battery can be reversed.	
Battery Over Voltage	The battery voltage reaches the OVD	Stop charging
Battery Over Discharge	The battery voltage reaches the LVD	Stop discharging
Battery Overheating	The temperature sensor is higher than 65℃	Output is OFF
	The temperature sensor is less than 55℃	Output is ON
Controller Overheating	The temperature sensor is higher than 85℃	Output is OFF
	The temperature sensor is less than 75℃	Output is ON
Load Short Circuit	The load will be switched off when the load short circuit (≥4 times rated current) happens. The controller will automatically attempt to reconnect the load for 5 times. Suppose short circuit protection still exists after the controller's 5 times attempts. In that case, the user has to clear the short circuit, restart the controller or wait for one night-day cycle (night time>3 hours).	Output is OFF **Clear the fault:** Restart the controller or wait for one night-day cycle (night time>3 hours).
Load Overload	If the load current exceeds1.05 times the rated current, the controller disconnects the load after a delay time. Overloading must be cleared up by reducing the load, and then restart the controller or wait for one night-day cycle (night time>3 hours).	Output is OFF **Clear the fault:** Restart the controller or wait for one night-day cycle (night time>3 hours).
Damaged RTS	The RTS is short-circuited or damaged	Charging or discharging at 25℃

6. Troubleshooting

Faults	Possible reasons	Troubleshooting
The LCD is off during the daytime when sunshine falls on PV modules properly	PV array disconnection	Confirm that PV wire connections are correct and tight
The wire connection is correct, LCD does not display	1) Battery voltage is lower than 9V 2) PV voltage is less than battery voltage	1) Please check the battery voltage. 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 the OVD point (over voltage disconnect voltage), and disconnect the PV.
⚠ Interface blink	Battery over-discharged	When the battery voltage is restored to or above the 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 declines below 50 ºC, the controller will resume.
⚠ Interface blink	Overload or Short circuit	Please reduce the number of electric equipment or carefully check the loads' connection.

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 controller's rated value.
3) The controller's working temperature exceeds the limited environment temperature.
4) User disassembly or attempted to repair the controller without permission.
5) The controller is damaged due to natural elements such as lighting.
6) The controller is damaged during transportation and shipment.

7. Technical Specifications

Item	VS1024AU	VS2024AU	VS3024AU	VS3048AU	VS4524AU	VS4548AU	VS6024AU	VS6048AU
Nominal system voltage	12/24VDC Auto			12/24/36/48VDC Auto	12/24VDC Auto	12/24/36/48VDC Auto	12/24VDC Auto	12/24/36/48VDC Auto
Battery input voltage range	9V~32V			9V~64V	9V~32V	9V~64V	9V~32V	9V~64V
Rated charge/discharge current	10A@55℃	20A@55℃	30A@55℃		45A@55℃		60A@55℃	
Max. PV open circuit voltage	50V			96V	50V	96V	50V	96V
Battery type	Sealed(Default) / Gel / Flooded							
Equalize Charging Voltage※	Sealed:14.6V/ Gel: No/ Flooded:14.8V							
Boost Charging Voltage※	Sealed:14.4V/ Gel:14.2V/ Flooded:14.6V							
Float Charging Voltage※	Sealed/Gel/Flooded:13.8V							
Low Voltage Reconnect Voltage※	Sealed/Gel/Flooded:12.6V							
Low Voltage Disconnect Voltage※	Sealed/Gel/Flooded:11.1V							
Self-consumption	≤9.2mA/12V;≤11.7mA/24V; ≤14.5mA/36V;≤17mA/48V							
Temperature compensation coefficient	-3mV/℃/2V（25℃）							
Charge circuit voltage drop	≤0.29V							
Discharge circuit voltage drop	≤0.16V							
LCD working temperature range	-20℃~+70℃							
Environment temperature	-25℃~+55℃(Product can work continuously at full load)							
Relative humidity	≤95%, N.C.							
Enclosure	IP30							
Grounding	Common Positive							
USB output	5VDC/2.4A(Total)							
Dimension(mm)	142x85x41.5	160x94.9x49.3	181x100.9x59.8		194x118.4x63.8		214x128.7x72.2	
Mounting size(mm)	130x60	148x70	172x80		185x90		205x100	
Mounting hole size(mm)	Φ4.5		Φ5		Φ5		Φ5	
Terminals	4mm²/12AWG	10mm²/8AWG	16mm²/6AWG		16mm²/6AWG		25mm²/4AWG	
Net weight	0.22kg	0.35kg	0.55kg	0.58kg	0.76kg	0.88kg	1.02kg	1.04kg

※Above the parameters are in the 12V system at 25℃, twice in the 24V system, triple in the 36V system and quadruple in the 48V system.

Any changes without prior notice! Version number: V2.1