SWM Series

一 Module MPPT Wind Solar Hybrid Controller

User Manual

Product Model

HCM600-24-24

Contents

1. Important Safety Warning

Before Using the controller, please read all instructions and cautionary markings on the unit and this manual. Save the manual where it can easily be accessed.

This manual includes all safety warnings, installation, and operation guidance of SWM series wind&solar hybrid controllers.

➢ Before installing and using this controller, read all instructions and cautionary markings on the controller and all appropriate sections of this guide.

➢ Do not disassemble the machine, change the electrical components and parts yourself, or we will not responsible for the warranty items and related duties.

➢ To avoid a risk of fire and electric shock, make sure the existing wiring is in good condition and that the wire is connected tightly.

➢ Do not restart the controller immediately after it alarms. Please analyze the fault reasons and repair them at first, and then restart the controller until the fault is solved.

2. Basic Information

2.1 Introduction and Features

SWM series wind solar hybrid controller integrates the wind MPPT control, PV control and battery charge and discharge function in one machine.

Features：

➢ Recognize 12V/24V Battery automatically

➢ Wind turbine MPPT track point adjustable

➢ Electronic components in high quality

➢ Complete protection function

➢ Solar and wind generation capacity and electricity consumption visible.

➢ Seven modes of load output optional.

➢ RS232/RS485/RJ45/GPRS/Bluetooth/Zigbee monitoring modes optional

➢ Compatible with standard MODBUS communication protocol
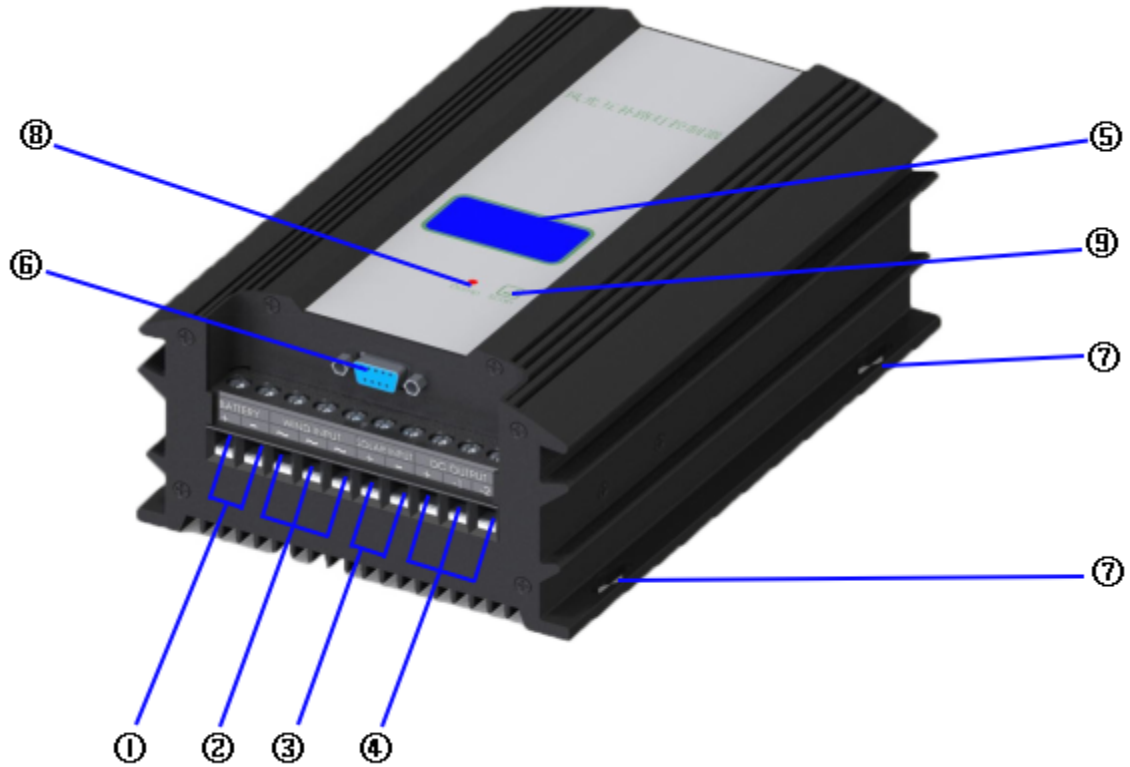
2.2 Product Structure

Chart1. Product Overview

①	Battery terminal	⑥	Communication port
②	Wind turbine terminal	⑦	M4 screw install hole
③	PV terminal		
④	Load terminal	⑧	Dump load light
⑤	LCD Display	⑨	button

3. Product Installation

3.1 Installation Notes

1) The machine should be kept indoors and well ventilated;

2) Environment temperature: -20～+40℃; Humidity: <=95%，no condensing

3) Altitude should not be more than 4000m. （＞1000 m derating according to the GB/T3859.2 regulations）

4) Avoid using the machine in direct sunlight, sun exposure, rain, humidity, acid fog, and dust.

5) To guarantee the lifespan, it is suggested that the space around the device has no other items within 30CM.

6) The machine can only charge for the battery in the rated voltage range.

7) The machine can only be connected to the wind turbine and PV with allowed power and voltage.

3.2 Installation and Wiring

3.2.1 Installation Steps

Please refer to the specific installation situation. Generally speaking, if it is used in street light pole, you can fix the controller to the rail inside the light pole.

If it is installed in the power box, the power box is drilled according to the hole size, and the controller is fixed with M4 screw.
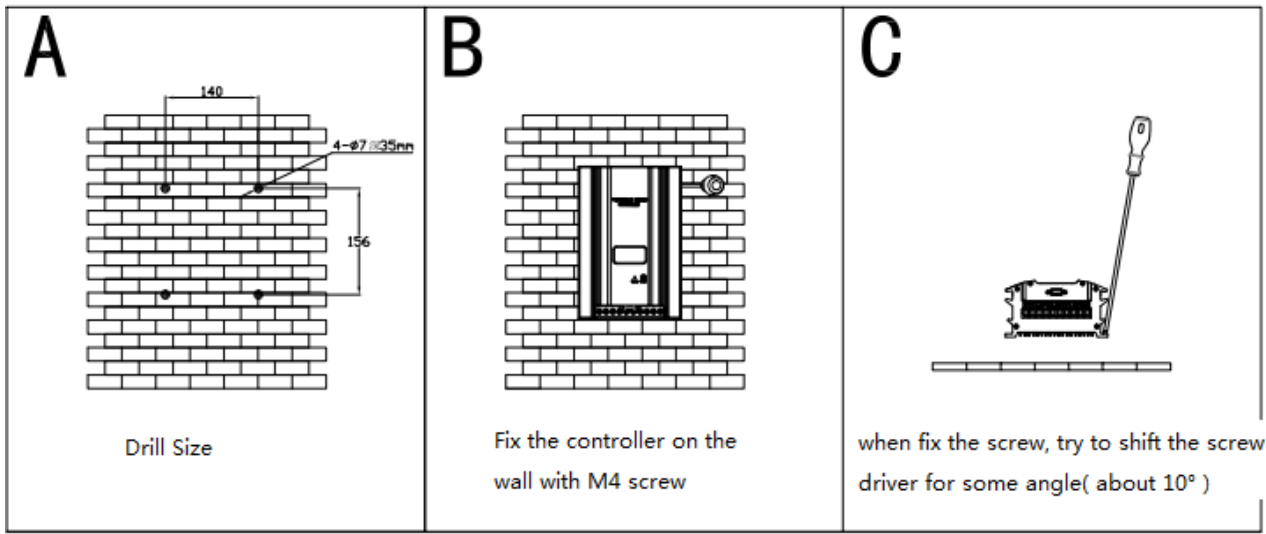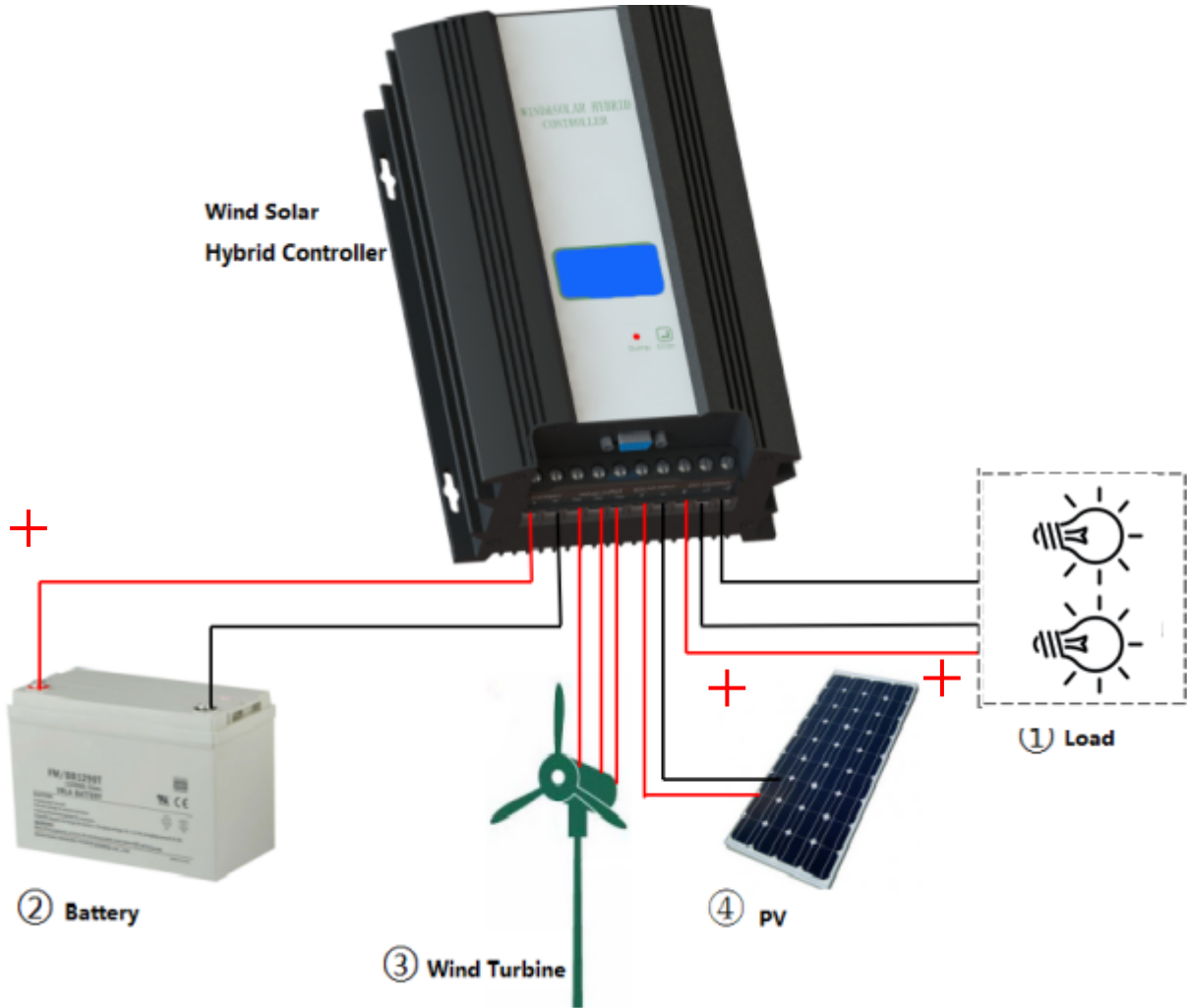
A	B	C
Drill Size	Fix the controller on the wall with M4 screw	when fix the screw, try to shift the screw driver for some angle(about 10°)

Chart 2: Installation Steps

3.2.2 Electrical Connection

Wind Solar
Hybrid Controller

① Load

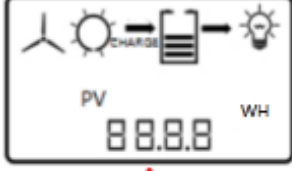② Battery

③ Wind Turbine
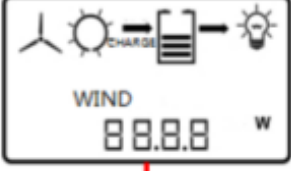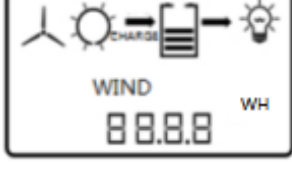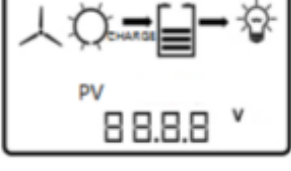
④ PV

Chart 3: System Overview
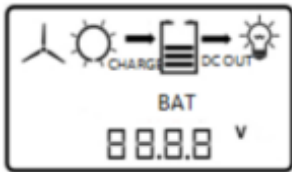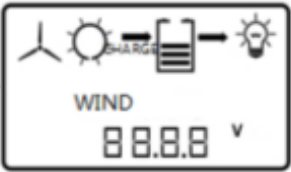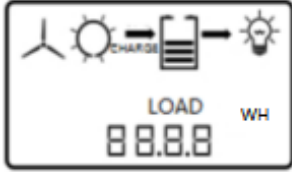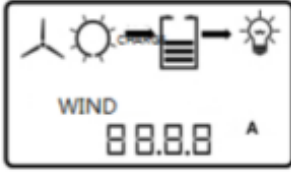
Please connect those parts according to the order of ①②③④, and notice the following items.

1. Connect the load positive and negative terminal to the "DC OUTPUT" terminals as"+""-1""-2"relatively. 2 output loads share the same "+" terminal.

2. Connect the battery bank to the controller by the terminal which marks "BATTERY". (do not reversed the connection of positive and negative terminals)

3. When wind turbine is still or running in a low speed, connects its output cable to the "WIND INPUT" terminal on the controller.

4. Connected the terminals of solar panels to "SOLAR INPUT" terminals "+""-"on the controller;

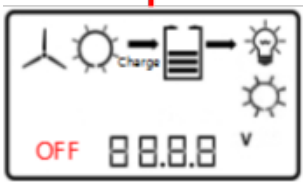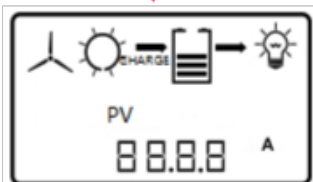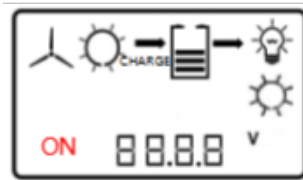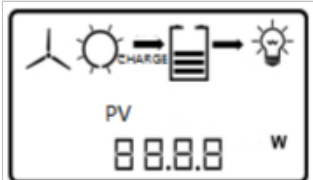5. Check all the connection to make sure they are connected rightly and tightly.
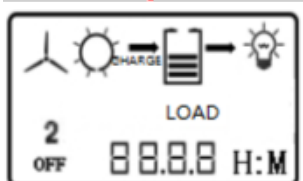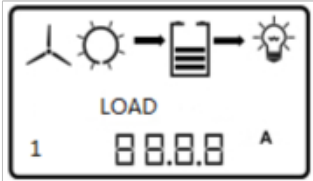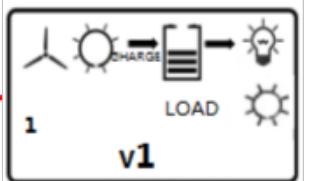
4. Operation Interface Introduction

4.1 LCD Display

After the power is connected, the whole screen is in a browsing status. It shows battery voltage, and can be changed to the following information by press related buttons.

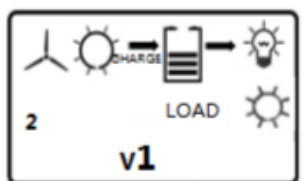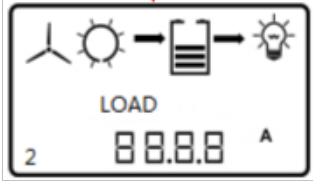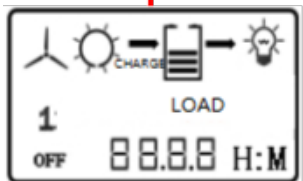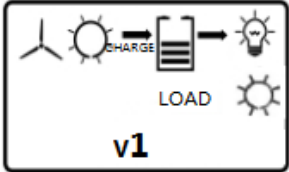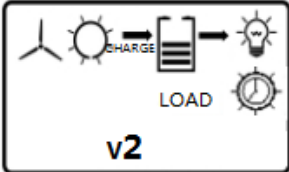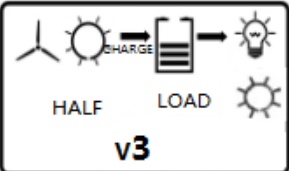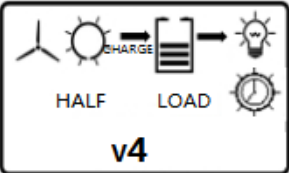| Interface Introduction	Display interface	Display interface	Interface Introduction
Battery Voltage	BAT 88.8.8 V	WIND 88.8.8 V	Wind turbine voltage
Accumulative total electricity consumption	LOAD WH 88.8.8	WIND 88.8.8 A	Wind turbine current
Accumulative total Solar generation capacity	PV WH 88.8.8	WIND 88.8.8 W	Wind turbine power
Accumulative total wind turbine generation capacity	WIND WH 88.8.8	PV 88.8.8 V	PV voltage
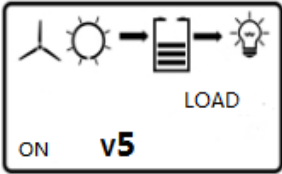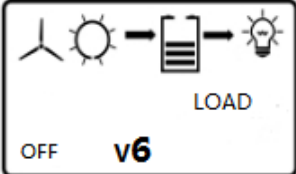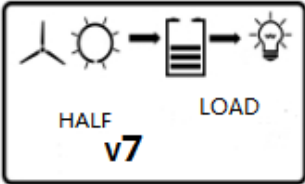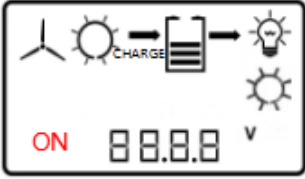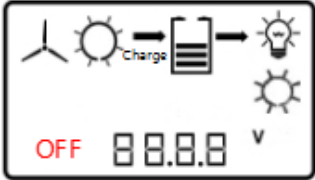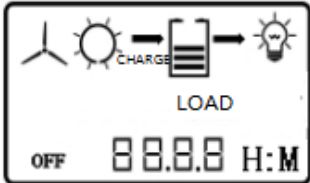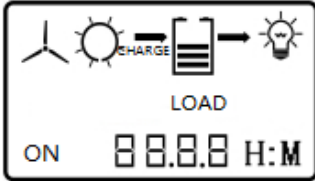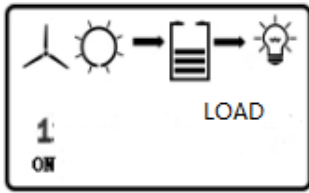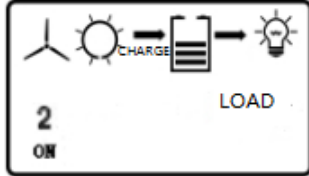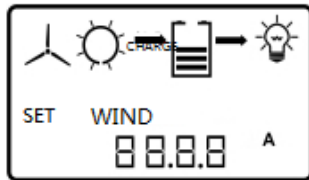
Left Label	Display (left)	Display (right)	Right Label
Light control off voltage	OFF 88.8.8 V	PV 88.8.8 A	PV current
Light control on voltage	ON 88.8.8 V	PV 88.8.8 W	PV power
Load 2 Control off time	2 OFF 88.8.8 H:M LOAD	1 88.8.8 A LOAD	Load 1 current
Load 2 output mode	2 LOAD v1	2 88.8.8 A LOAD	Load 2 current
Load 1 off time	1 OFF 88.8.8 H:M LOAD	1 LOAD v1	Load 1 output mode

4.2 LCD Information Define

Name	Icon	Status
Wind Turbine	(turbine)	Rotate means wind turbine works normally
	BRAKE	Brake by hand
Solar	(sun)	Day
	(moon)	Night or PV is not connected

Battery		Battery	
		Flickering meansover voltage	
		Flickering means over -discharge	
Load		Output normally	
		No output.	
		Flickering means overload	
		Flickering means short circuit	
7 load output control modes		Light control on/off	
		Light control on, time control off	
		Light control on, time control half power, light control off	
		Light control on, time control half power, time control off	

	ON v5 LOAD	Keep on
	OFF v6 LOAD	Keep off
	HALF v7 LOAD	Keep half power
Light control on/off voltage	ON 8 8.8.8 V	Light control on voltage
	OFF 8 8.8.8 V	Light control off voltage
Time control time	OFF 8 8.8.8 H:M LOAD	Time control off time
	ON 8 8.8.8 H:M LOAD	Time control half power time

Load		1st Load
		2nd Load
Power curve		Current at cut-in voltage or current at rated wind turbine voltage
Others	**88:88**	Parameters display
	"SET"	"SET" icon. When it appears, you can set related parameters by press the scan button.

5. Trouble Shooting

Fault Type	Description	Possible reasons and solutions
No display on LCD	The connection between the battery and the controller is not tight	Check the wiring, and reconnect it.
	Battery is connected in wrong polarity to battery input terminals.	Need change the internal fuse in controller, and reconnect the battery.
No charging	The connection cable between wind turbine and controller is loose.	Reconnect the cable tightly.
	Wind turbine output voltage haven't reached the charging voltage,	Check whether the system voltage is reasonable.

	Wind turbine is in "Brake" status	Press the button for 5s to release the brake status if it is manual brake. Wait the wind turbine recover automatically(about 10 mins) if it brakes for other reasons.
	The connection cable between solar panel and controller is loose.	Reconnect the cable tightly.
	The Solar panel is connected negatively to the controller.	Reconnect the cable.
	PV output voltage is not in accordance with the system voltage.	Check the PV output and the system parameters.
No load output	Load over load	Check if the load connection is normal. Remove the over load , press the set button on the load interface to recover output
	Load short circuit	Check the load, and press the set button on the load interface to recover output
	Battery undervoltage for the second time	Check if the battery icon on the LCD display flickers. If yes, it needs about 4 hours to recover automatically, or cut off the power and reconnect again.

6. Technical Parameters

Model	HCM600-24-24
Wind Turbine Input	
Rated input power	600W
Rated input voltage	24V
Input voltage range	4~32V
Rated input current	25A
Manual Brake	Keep press the button for 5s to unload completely, and then recover by hand.

Brake by over current	25A (factory default,0~30A settable) unload completely when reached the set current, and recover automatically after 10 mins.
Brake by overvoltage	Refer to "output overvoltage" control
PV Input	
Rated input power	300W
Max. Open circuit voltage	48V
Rated input current	13A
Reversed connection protection	YES
Charge Parameters	
Rated battery voltage	24V
Output overvoltage point	28V
Output overvoltage recovery point	25.6V
DC Load Output	
Output loops	2 loops
Output control mode	Both 2 loops could be set in 7 modes, such as light control on&off, light control on and time control off.
Output voltage range	21.6V~32V
Undervoltage recovery point	Refer to "rated battery voltage"
Rated output current	10A/each loop
Overload protection	120% rated DC output -1min,150% rated DC output -10s
Short circuit protection	Instant protection
General Parameters	
Rectifier mode	Uncontrolled rectifier
Display mode	LCD
Display information	Battery voltage, wind turbine voltage/current/ power, PV power/voltage/current, light control on voltage, light control off voltage, time control duration, load current, wind power generation capacity,

	solar power generation capacity, load power consumption, and so on.
Monitoring mode (optional)	RS232
Monitoring Contents	Real-time display: Battery voltage, wind turbine voltage/current/ power, PV power/voltage/current, wind power generation capacity, solar power generation capacity, Battery status, wind turbine status, day and night, DC overload, DC load short circuit, and so on.
	Parameter setting：Output overvoltage point, wind turbine over current point, wind turbine start voltage, DC load overvoltage/undervoltage/undervoltage recovery point, output mode choice for two loops,light control on voltage, light control off voltage, and wind turbine brake settings.
Lightning protection	YES
Static loss	＜0.6W
Ambient temperature	-20℃～+40℃
Humidity	0~90% ,No condensing
Noise	≤65dB
Cooling mode	Natural cooling
Installation mode	Wall-mounted
Cover protection class	IP52
Product dimension (W*H*D)	150×220×83mm
Product net weight	2.3kg
Note: Part of parameters can be adjusted according to customer's specific demand.	

7. Warranty

The product shall be in warranty for one year from production. Please take contract as the final one if it has special terms on warranty.