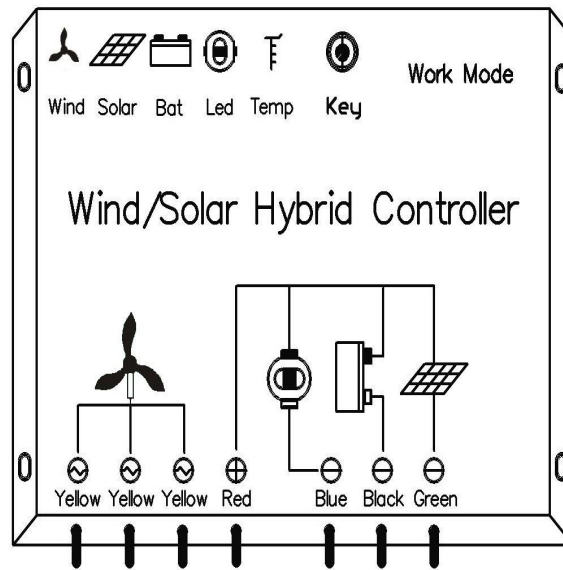


Wind/solar hybrid controller instructions

■ Key Features:

1. U.S. imports of products based on expert-level micro controller and dedicated control software;
2. With battery overcharge、over discharge、reverse protection; Tan fan with auto unloading、auto brake、manually brake、speed detection、over-speed protection; Load short-circuit protection、overload protection; Solar reverse polarity protection; All protection does not damage any parts。
3. Solar and Wind use buck MPPT function,; With a float,constant voltage,current limiting charging function; Wind speed and braking recovery time can be set and modified;
4. Batteries with precision temperature compensation;
5. All the control uses the industrial chip, in the cold, high temperature, damp environment to run freely. At the same time, use a crystal oscillator for timing control, timing control precision。
6. Using the intuitive LED digital display, a key type operation can complete all settings, the setting time and nixie tube display digital is corresponding to each other, and show more intuitive。
7. Fully waterproof, pure aluminum housing designed to increase awareness of environmental failure prevention, and to achieve good cooling effect, can effectively extend the service life of the controller。

■ Controller panel Figure:



■ System Description:

- ✓ This controller is designed for wind turbines and solar power DC power supply system, street lighting system design, and the use of special computer chip intelligent controller. One-touch touch switches, complete all operations and settings.
- ✓ Wind control with speed, unloading, constant voltage, current limiting, floating charge, auto unloading, auto brake function;

Set the Fan speed detection method:

Z: Set parameters; N: Rated speed fan/Minute; D: Number of pole pairs;

$$Z = (N * D) / 60$$

Wind opportunity brakes several situations:

1. Battery is fully charged, stop charging protection;
2. Manual brake controller;

3. Wind speed protection brakes;

Automatic release braking conditions to be met:

1. The battery voltage is lower than the charge return voltage;
 2. Braking time has reached the brake Recovery Time;
- ✓ Solar control with reverse polarity protection,reverse charge protection,constant voltage limiting charge,floating charge,light control function;
- ✓ Load short-circuit protection、 overload protection;

■ The LED indicator function definition:

The wind charging indicator			The solar charging indicator		
Light color	instructions state	system state	Light color	instructions state	system state
/	No bright	No charge	/	No bright	No charge
green	Normally on	Charging normally	green	Normally on	Charging normally
Red	Normally on	Brake status	green	1/2Hz flash	Battery is fully charged
Battery status indicator					
Light color	instructions state	system state			
Green	1/4Hz Flash	Over-high	Load indicator		
Green	1/2Hz flash	Full	Light color	instructions state	system state
Green	Normally on	Normal	/	No bright	No output
Yellow	Normally on	Lower	Green	Normally on	Normal
Red	Normally on	Too low	Green	1/2Hz flash	Output overload
Red	1/2Hz flash	Ultra-low	Green	1/4Hz flash	Output short

■ Installation Instructions:

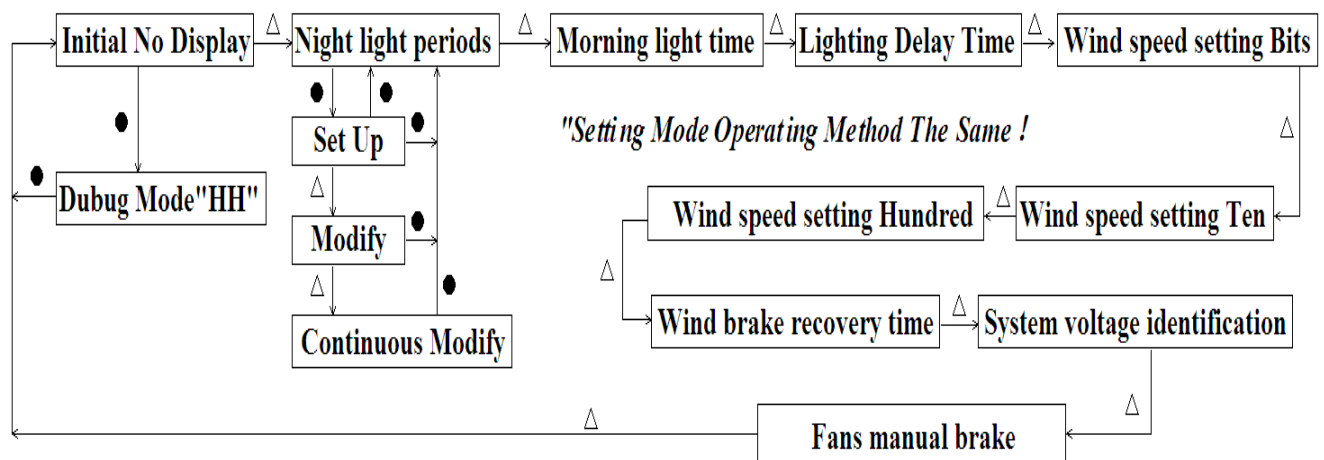
1. Controller solidly fixed. $L * W * H = 120 \text{ mm} \times 93 \text{ mm} \times 28 \text{ mm}$;
2. Wire preparation: It is recommended to use strands insulated copper wire. Firstly, make sure the length of the cord, secondly, ensure the installation location in the circumstances, thirdly, try to minimize the connection length to reduce power consumption. According to not more than $4\text{A}/\text{mm}^2$ in accordance with the current density of selected cross-sectional area of copper wire, the controller side of the first strip 5mm of insulation should be shucked off.
3. Access to the battery connection terminals on the controller battery, note + - pole, do not reverse; If the connection is correct, Battery indicator should be lighted, according to buttons to check. Otherwise, need to check the connection. In case of reverse, will not burn any part of the insurance and damage any part of controller, fuse only as the end protection of a controller itself to protect the amount of internal short circuit damage
4. Connect the wire of load to the controller output, and pay attention to +, -, do not be reverse. Otherwise, it would burn appliances out.
5. Photovoltaic cells' wires is connected, first connect solar panels termination to the controller, and then the other end is connected to solar panels. Pay attention to +, -, do not be reverse. If it is a sunny day, charging indicator light should be bright. Otherwise, there is need to check the connection
6. Wind turbines wire connection, communication, regardless of the direction of wind turbines leads, free access to;

▲ Special advising: Charged state controller, Never happened solar terminals shorted,short-circuit operation !

■ Buttons definition:

Short Button: press the button for < 1.5s, like ▲ ;

Long Button: press the button for > 1.5s, like ● ;



■ LED digital display and setting mode relations correspond to set the table

LED display		Working code (Ten)	Working code (Bits)	Calculation (Bits ×)
Ten	Bits			
0	≡	Time control mode	Normally open	Multiplied by 24Hour
01 To 12		Night lighting time	Light-off open + 1 To 12 hour delay	Multiplied by 1Hour
2	0 To 9	Morning light time	Chen Liang open+ 0 To 270 Minute delay	Multiplied by 30Minute
3	0 To 9	Delay time of turning on	Range from 0 minutes to 27 minutes Corresponding from 1 to 9	Multiplied by 3minutes
4	0 To 9	Wind speed setting Bits	Corresponding from 0 to 9	Multiplied by 1
5	0 To 9	Wind speed setting Ten	Corresponding from 0 to 9	Multiplied by 10

6	0 To 9	Wind speed setting Hundred	Corresponding from 0 to 9	Multiplied by 100
7	1 To 9	Wind brake recovery time	Time corresponding from 10 to 90 Minute	Multiplied by 10Minute
8	A\h\L	System voltage identification	A: AUTO; h: Fixed 24V; L: Fixed 12V	
U.	N.	Relieve Wind manually brake	Wind run	Maintain
N.	C.	Use Wind manually brake	Wind brake	Maintain
H	H	Debug mode	Manual Relieve of overload, short-circuit condition	

■ Common fault phenomena and processing methods:

When the following phenomenon appeared, please according to the following method for inspection:

phenomenon	Analysis
PV modules exposed to direct sunlight,the green charging light does not shine	Check the battery power of light across the wiring is correct,the connection is reliable;
Under windy conditions,wind does not turn	Please check whether the controller through the light manually or automatically brake;
Load indicator flashes and no output	Output short circuit or overload,check the line and load for shorts;releasing a short circuit enters debug mode(HH),return to normal;
Battery status indicator is red or flashing red,and no output	Battery under voltage protection,forced off load output;the battery is fully charged automatically discharged after;

■ Technology index

Model	Double time model		
The system rated voltage	AUTO 12V/24V		
Wind rated Power	12V300W/24V400W(A Model) 12V400W/24V600W(B Model)		
Wind speed setting range	0~999	Wind brake recovery time	10*N(1-9) Minute
Wind speed setting method	=((Wind rated speed/Minute)*Wind number of pole pairs)/(60/Second)		
Solar rated charging current	10 Ampere	Load output rated current	10 Ampere
Over-load protection	1.25 rated current 30sec or 1.5 rated loads current 3 sec, overload protection 3 rated load current, short circuit protection		
No-load loss	≤ 25 mA		
Charging circuit voltage drop	≤ 0.15 V		
Load circuit voltage drop	≤ 0.06 V		
Work temperature	Technical grade: -35℃to +55℃		
Over voltage protection	16.5V ; ×2/24V; (keep working until drop to the point of Boost charge voltage action)		
Boost charge voltage	14.8V; ×2/24V; (Immediately stop charge) (Only applied when over discharge appears)		
Full charge voltage	14.5V; ×2/24V; (keep 10-min)		
Floating Charge voltage	14.2V; ×2/24V;		
Charge return voltage	13.2V; ×2/24V; (Interval time ≥ 10 min)		
Over discharge return voltage	12.0V; x2/24V		
Lower voltage indicate	11.0V; x2/24V		
Over discharge voltage	10.5V; x2/24V		
Temperature compensation	-4mV/℃/2V		
Control mode	The way of Buck MPPT		

Attention: If product instruction has the modification, Please forgive has not informed.