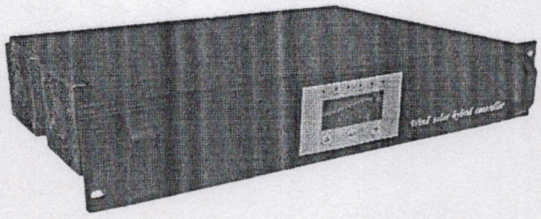
Wind/Solar Hybrid Charging Controller Manual



HX-WS3K-48B

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Please read this manual carefully before installation and use

1. Functions and features of the Product

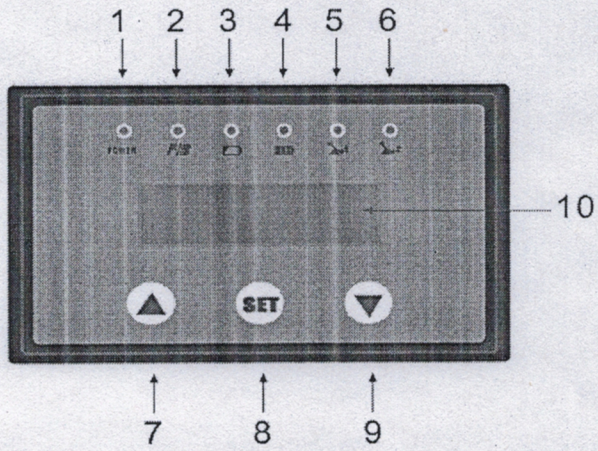
Welcome to use the most intelligent Wind/Solar Hybrid Charging Controller, which adopts the latest intelligent chips and semi-conductor technology. A new generation of wind and solar energy control system. The Product boasts the following features:

- Adoption of the most advanced MPPT power tracking technology to ensure optimum utilization of wind and solar energy.
- Remote monitoring through computers with software update and parameters setting.
- Control through intelligent software to ensure precision.
- Floating charge function.
- Intelligent wind turbine shut-down system.
- Temperature compensation function.
- Automatic identification functions of temperature sensor.
- Automatic calculation of power output.
- Excellent man-machine interface, LCD and indicators showing operational status.
- Setting of all operational parameters possible.
- Output capacity of high-power load.
- Control ability of high current wind energy charging.
- Control ability of high current solar energy charging.

2. Function description of Wind/Solar Hybrid Controller

2.1 Function description of display (optional)

★Instructions on icons and indicators on display



Indicator and keys	Description
POWER 1. Standby	Standby indicator illuminates after starting the controller.
F/ 2. Charging	The indicator flickers when the battery is being charged by wind or solar energy; the indicator is off when there is no charging.
3. Under-voltage	The indicator will be illuminated when the controller detects that chargeable battery voltage is below the set lower limit; the indicator turns off when voltage returns within normal limits.
4. Over-voltage	Indicator will be illuminated when controller detects that chargeable battery voltage exceeds the upper limit; indicator turns off when voltage is reduced to within normal limit. Overvoltage causes the controller to disconnect solar energy charging and start up the intelligent wind turbine shut-down system.
7. Up	The Up key and setting of "Plus" key.
SET 8. Down	Setting.
9. Down	Down key and setting of "Minus" key.

10. Display window	It displays all data of controller.

2.2 Instructions on display parameters

★Context instructions on display on the first page

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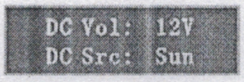
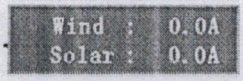


- DC voltage: real-time display of battery voltage.
- Charging supply: display of wind/solar energy charging status

★Context instructions on display on the second page

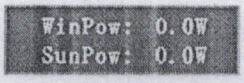
- Power: the totality of wind/solar energy charging power
- Electrical output: the totality of wind/solar energy charging output. The total output returns to zero for another round of calculation when accumulated electrical output reaches 9999.9 KWh.

★Context instructions on display on the third page



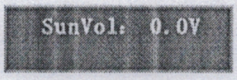
- Wind energy: display of current charging current by wind energy
- Solar energy: display of current charging current by solar energy.

★Context instructions on display on the fourth page



- Power of wind energy: current charging power by wind energy.
- Power of solar energy: current charging power by solar energy.

★Context instructions on display on the fifth page



- Voltage of solar energy: input voltage of solar energy.

3. Setting and operation of parameters of Wind/Solar Hybrid Charging Controller

Attention: Press and hold the "Down" key ▽ under the parameter setting option for 3

1. Solar energy-: Cathode input of solar energy charging.
2. Solar energy+: Anode input of solar energy charging.
3. Battery-: Cathode input of chargeable battery.
4. Battery+: Anode input of chargeable battery.
5. Wind U: U phase input of wind turbine.
6. Wind V: V phase input of wind turbine.
7. Wind W: W phase input of wind turbine.
8. RS232 communication interface.
9. Circuit breaker of wind turbine.
10. Input switch of battery.

Caution: Terminals marked with grounding signal ⏚ must be earthed.

★Installation procedures

1. Check whether the voltage and power of the controller matches with those of wind turbine, solar array and chargeable battery.
2. Check with universal electric meter whether the voltage of battery packs is correct and confirm anode and cathode of battery pack.
3. Switch chargeable battery of controller off and turn wind turbine switch to short circuit and state of static.
4. Connect chargeable battery pack to controller.
5. Connect wind turbine to controller (It is not advisable to install while wind turbine is at high rotary speed. Connect when not rotating).
6. Check with universal electrical meter whether voltage of photoelectrical cell unit is correct (It is normal when the open circuit voltage of photocell is 1.5 times as nominal voltage.).
7. Connect solar energy battery pack to controller (Please mind the polarity!).
8. Make sure short circuit switch of wind turbine is turned off after installation.

Caution: Tension and torsion tests are necessary after installation of connecting wire in case of burning-out of connecting terminal and controller caused by high current and poor contact. Moment of force of fastening should be no smaller than 1.2N.m with no loosing under tension of 50N.

★Inspection method

1. Solar energy charging inspection: When there is light, the indicator of the controller"F/⊞" flickers, and the display should show the charging current and power (The current intensity

2. Wind turbine charging inspection: When there is wind (greater than level 3), observe whether the turbine is operating normally. When the direct voltage of the turbine is higher than that of the rechargeable battery, the indicator of the controller "F/⊞" flickers, and the display should display the charging current and power (the existence and intensity of the current depend on the intensity of the wind and the capacity of the rechargeable battery).

7. Operating environment of facilities

7.1. Dryness: No immersion or exposure to water; away from flammable and combustible.

7.2. Shade and coolness: environment temperature is -40℃—45℃.

8. Frequently asked questions and treatment processes

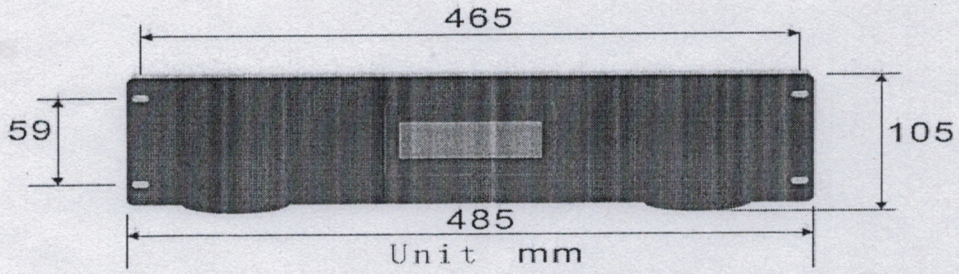
★On-scene judgment and problem solving

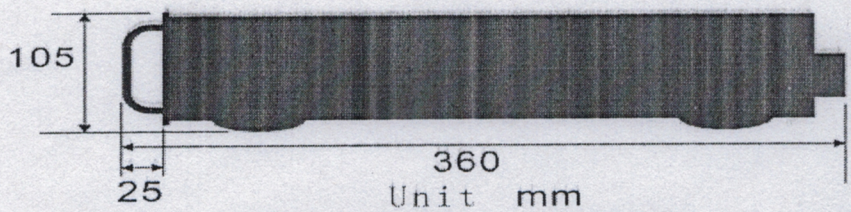
a) No charging or display: open the top cap of controller and check whether DC fuse shim of controller has burnt out. If the fuse protector is detected to have burnt out, check whether polarity of chargeable battery and photocell unit is reversed. After correction, please replace with new DC fuse shim of the same specifications.

b) Out-of-function of wind turbine: When there is sufficient wind, one wind turbine stops working or turns slowly while others work normally. Please check whether rear control of wind turbine is in the same direction with wind; check whether controller indicates over-voltage. If everything turns out normal, please disconnect controller and battery; then connect to the battery after controller stops working. If wind turbine still doesn't work or turns slowly, disconnect wind turbine and controller. If wind turbine is working normally, there is something wrong with controller intelligent shut-down system in need of replacement.

c) Over-voltage of charging: when voltage of chargeable battery exceeds the upper limit of protection voltage of over-charging by more than 5% and there is still charging current on photocell unit or wind turbine, there may be damage to charging controller in need of replacement.

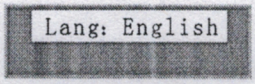
9. Appearance dimensions



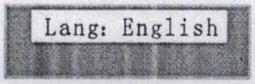


seconds to quit parameter setting status back to running parameter display interface.

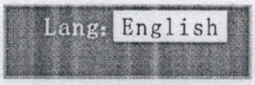
★Setting of language and battery management



•Language setting: Press the "SET" key and enter into the setting page. Press the Up or Down key to set language. Setting details are given in the following



•Select one setting item and press "SET" key to select a language for setting.

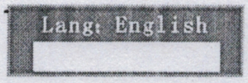


• Press "▲" key or "▼" key to choose the language. After setting, press "SET" key and exist the set of language.

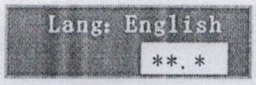
•Language: Set display language; both Chinese and English are available currently.

★Battery management

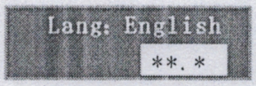
•Enter into setting of battery management; password will be needed for access to battery management.



Attention: Password will be needed for access to battery management and display will not show the setting concerning battery management. If setting is needed, please contact the supplier or agency for password. Improper setting may cause damage to the system.



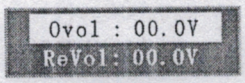
•Press the "SET" key, input the password to enter into the setting page.



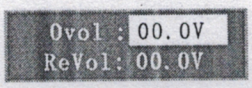
•After choosing a parameter, press Up key "▲" for plus and Down key "▼" for minus. Press and hold the Up or Down key for about 3 seconds, the plus and minus process will be accelerated.

4. Setting and operation of battery management of Wind/Solar Hybrid Controller

★Overcharging and restoring for overcharged battery



•Enter into setting of battery management, press Set key "SET" to select a parameter for setting.



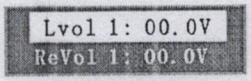
• After choosing a parameter, press Up key "▲" for plus and Down key "▼" for minus. Press and hold the Up or Down key for about 3 seconds, the plus and minus process will be accelerated.

After setting, press Set key "SET" to set next parameter. When the current parameter doesn't need any setting, press the Set key "SET" directly to go to the next parameter.

•Overcharging point: The voltage of the point when battery over-voltage occurs. When battery overvoltage occurs, the system starts intelligent shut-down system automatically and stops charging solar battery for 1 minute.

•Restoring point: Restore wind and solar energy charging when battery voltage is below the restoring point voltage.

★ Setting of under-voltage value and under-voltage recovery value

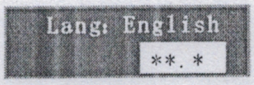


• Setting methods are the same as above.

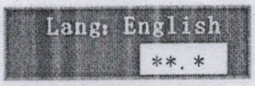
• Under-voltage point: The current voltage of battery under-voltage point. The system indicates battery under voltage automatically while battery is under-voltage, the indicator will blink.

•Under-voltage recovery point: The current voltage of battery under-voltage point, the system exists under voltage instruction automatically while battery under-voltage recovers.

Attention: Over-voltage of battery must be above the restoration point of battery over-voltage; restoration point of battery under-voltage must be above the under-voltage of battery.



•Press the "SET" key, input the password to enter into the setting page.



•After choosing a parameter, press Up key "▲" for plus and Down key "▼" for minus. Press and hold the Up or Down key for about 3 seconds, the plus and minus process will be accelerated.

5. Specifications

5.1 Environment and safety

Model	**HX-WS3K-48B**
Measurement (length*wide*height)	225×570×430
Weight（kg）	10
Operating temperature	-20℃~+45℃
Transport/storage temperature	-20℃~+85℃
Operating humidity	0~95%R.H. (No condensation)
Operating altitude	≤5000 (De-rating in accordance with GB/T3859.2 is necessary at an altitude of over 1000m)
Protection grade	IP22
Safety design reference standard	LVD EN60950-1
EMC (Electro Magnetic Compatibility) design reference standard	FCC PART 15 CLASSB,EN55022/24,EN61000-4
Quality control reference standard	ISO9001，CE
Communication interface RS232	RS232 is multi-functional interface
LCD display	LCD display is connected to the controller through RS232 signal. Remote monitoring or communication does not involve LCD display.

5.2 Electrical specifications

Model	HX-WS3K-48B
Rated voltage of chargeable battery	48V
Maximum rated power of wind turbine	3000W
Range of input current	0-75A
Maximum input power of wind turbine	3100W
Start intelligent shut-down system	58V
Maximum charging current of solar energy	20A
Protection voltage of over-discharging of chargeable battery	42V
Restoration voltage of over-discharging of chargeable battery	49V
Static current	50mA

6. Installation instructions

★Cautions

1. No exposure to rain.
2. Make sure the polarity of chargeable battery, load and solar panel is not reversed.
3. Keep good ventilation of controller for radiation.
4. Regular inspection of working condition of controller in case of adverse impact.

★Installation is illustrated as follows: wiring terminals from left to right are numbered as 1-10. Detailed definition is given as follows: