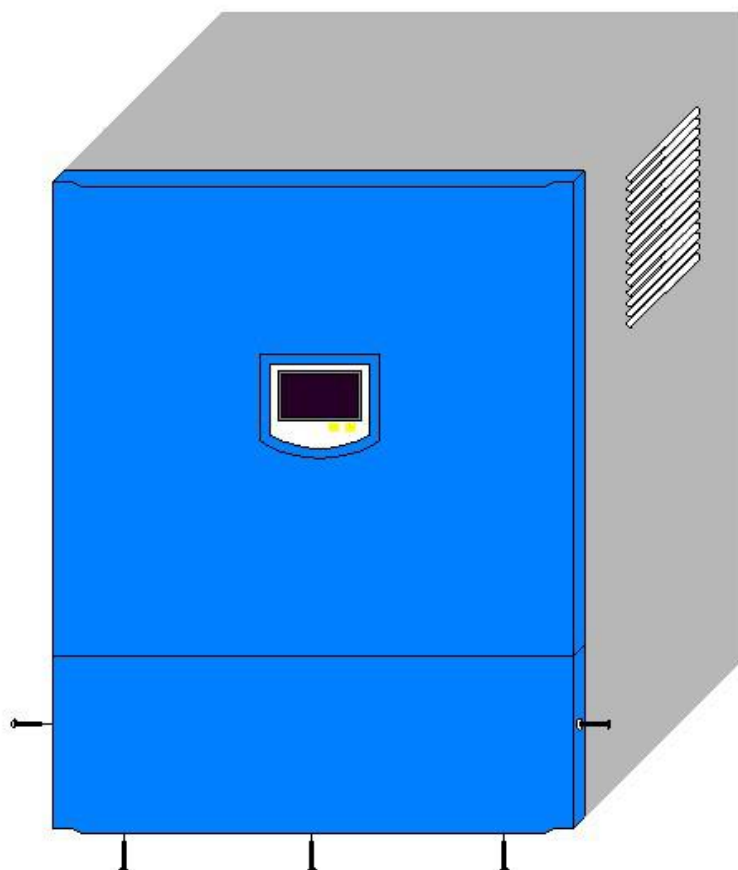
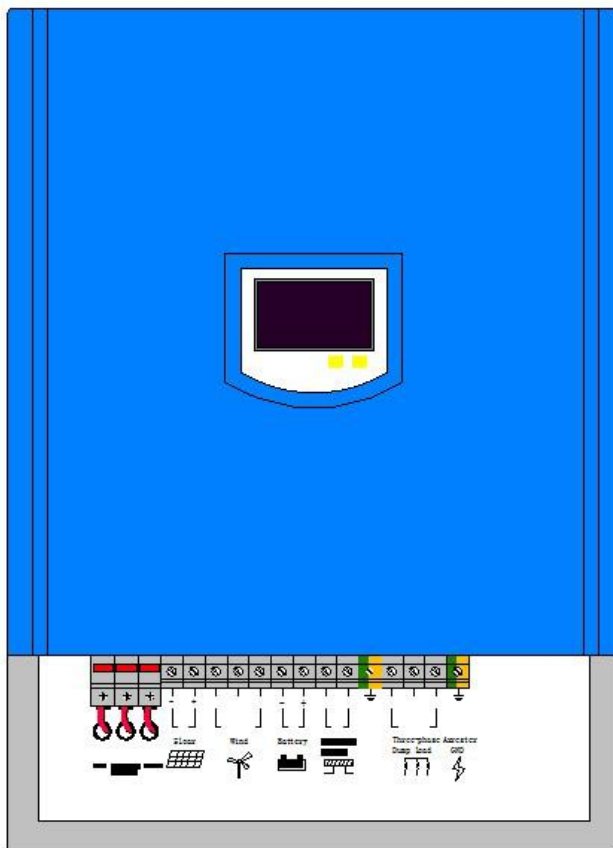
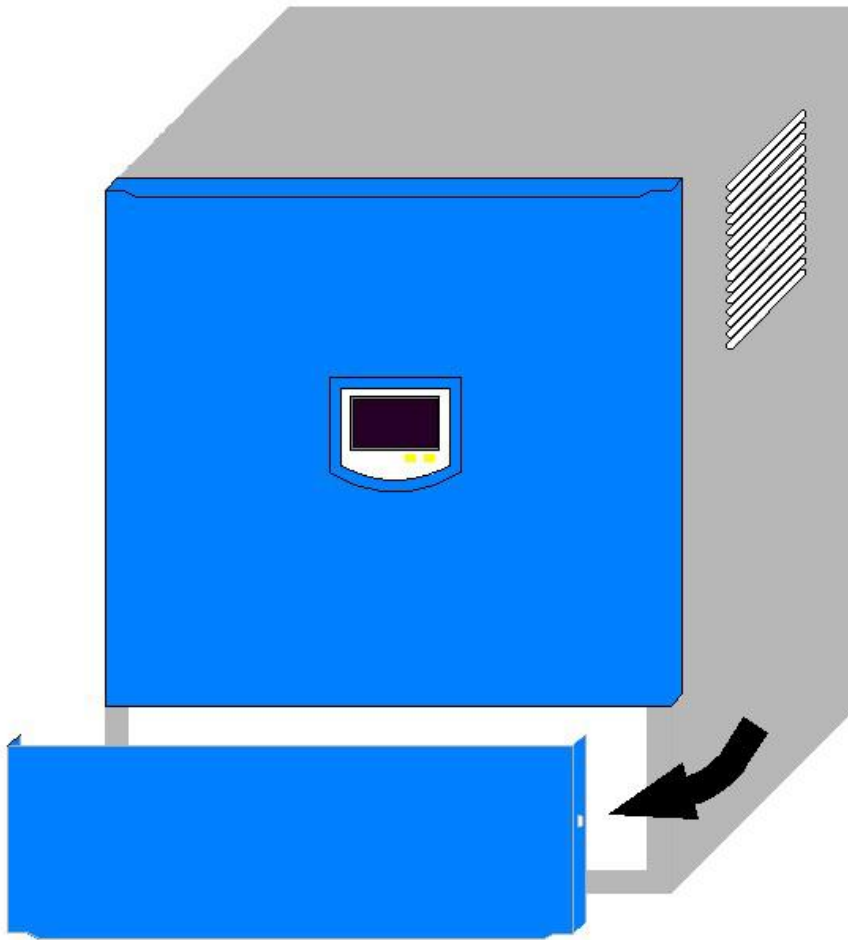


② Wall hanging installation diagram

## VII Remove wiring step controller



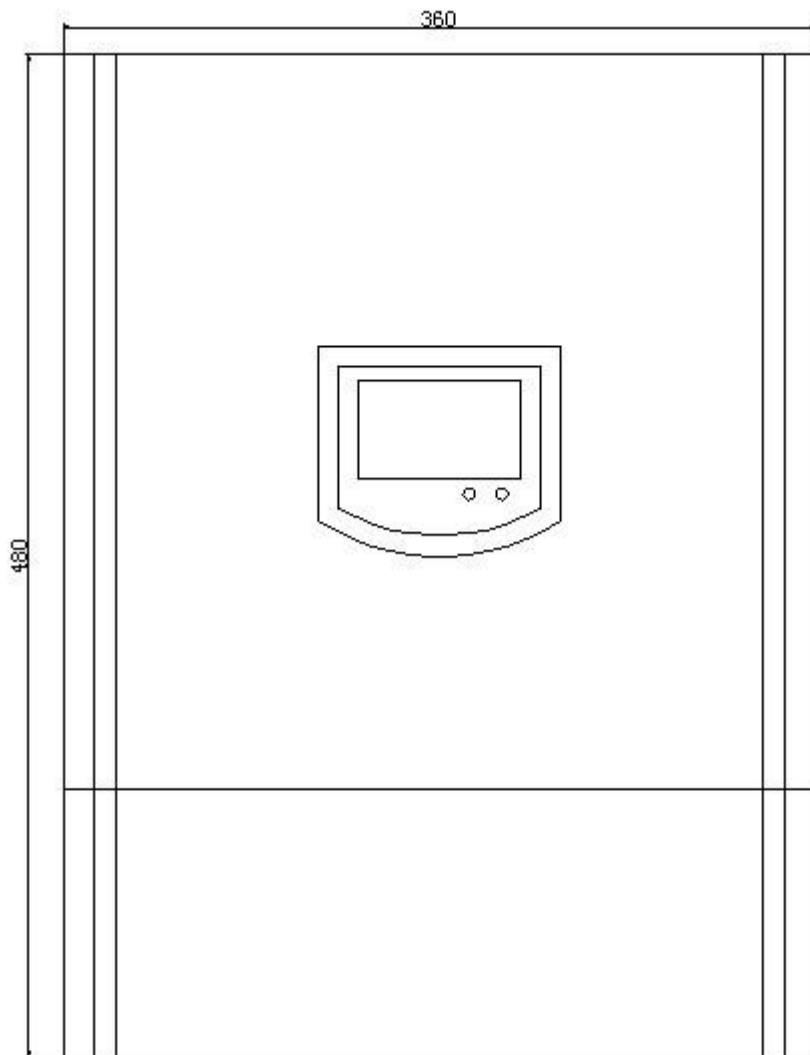
①



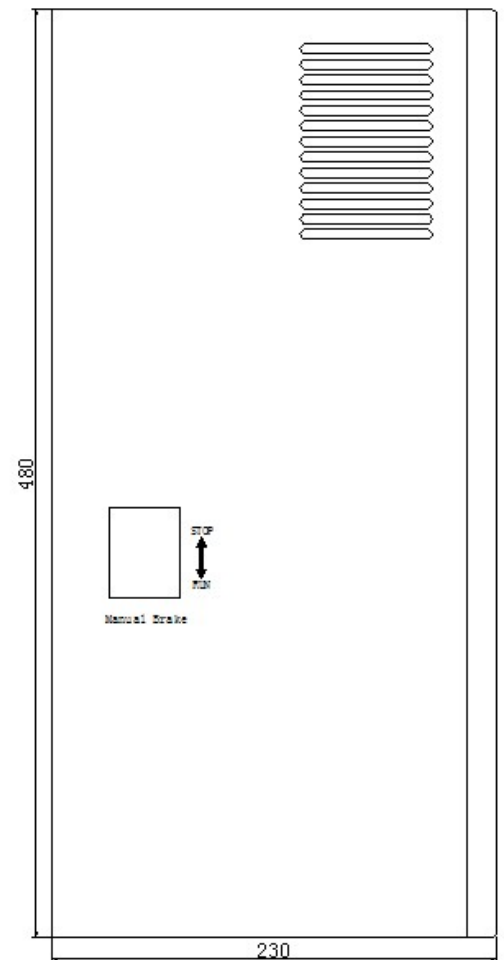
3

## VIII Failure Analysis

1. When the wind turbine is running normally but the controller makes the repeated pi-pa noises (or the wind turbine can not work), the wind turbine shall be turn off immediately to check whether the fuse is blown, the battery is connected well or the battery is damaged.
2. After the battery is connected, but the wind turbine can not work and there is no indicator, check whether the charging fuse is blown, the battery is connected well, the electrode is misconnected or the battery is damaged.



(360\*480)



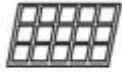
(230\*480)



Image



Wind



Solar

Explanation

Wind turbine

The wind turbine images display, showed that wind generators running normally.

Solar panel

The solar panels images display, showed that solar panels working normally.

Battery

Battery internal strip graphics, showed battery power.

When the battery charged enough, the battery voltage reached 125% of the rated voltage. The wind turbine will automatically carry out three-phase dump load discharging to stop charging. The 3 strip graphics in battery box all display. When the battery voltage drops to 108% of the rated voltage, the wind turbine recovers to charge the battery.

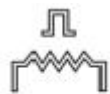


Battery

When the battery voltage is too low, the frame of the battery image will flashing, remind users battery is low voltage, at this time, please stop using battery, to charge battery, until stop flashing, just can be used.

PWM dump load

In the conditions of strong or super-strong wind, battery charged by the wind turbine generator under constant voltage and current. Then this image display. When voltage of the battery drops to 108% of the rated voltage, the image not displayed.



PWM  
Dump Load

Three-phase dump load

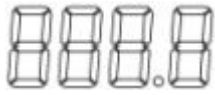
When the battery is full (the battery pressure reaching 125% of the rated pressure), the controller will automatically carry out three-phase dump load discharging to stop charging battery. Then this image display.



Three-phase  
Dump Load

When the battery voltage reduces to 108% of the rated

pressure, the three-phase dump load will stop discharging to automatically recover battery charging. Then the image not displayed.



LCD display in digital form show the parameters value.

Fuse burn


Fuse burn indicator light, when fuse burn, remind users replace the fuse.

Polarity Reverse

Polarity Reverse indicator light, when the battery polarity reversed. Remind users properly connected to the battery.

### 3. LCD display parameters browse

(1) After plus electric, system is in viewing conditions, LCD display battery voltage: Battery XXX.XV.

(2) In viewing conditions,  striking the front panel of the case, will according to the following order cyclic display parameters.

Battery voltage → charge current → charge power → Wind turbine voltage → Wind turbine charge current → Wind turbine power → Solar panel voltage → Solar panel charge current → Solar panel power → Battery voltage.

## X Attentions

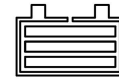
We have taken full consideration of possibilities of occurring all kinds of accidents in design of the machine and adopted relative protective measures. But there is no perfect protective measure. Frequent use of some functions (e.g.: short-circuit protection, battery reverse connection protection) can cause great damage to the internal components of the machine. So, users shall not depend on these protective measures. The following attentions are very important for prolonging the service life of the machine:

1. Failures can be caused by many main reasons, among which are exhaustion of battery or battery group and poor contact.

- In the charging process, exhausted battery or poor contact of the battery can

cause over voltage or low voltage; Frequent unload and braking can lead to damage of the controller.

- It is suggested that the capacity of the battery be checked periodically (with specific measuring tools instead of universal meter). Each and every battery shall go through checks of the capacity, contact condition and timely erasing of rust on the terminals of positive and negative electrodes. (The checks shall be done when the wind turbine is in brake state.)





- The battery voltage drop to less than 85% rated voltage, Battery the frame of the battery image will flashing, remind users battery is low voltage, at this time, should stop used immediately, timely to charge battery. Otherwise, battery will be damaged.

- This machine can not charge the exhausted or damaged battery. When voltage of the battery is 75% lower than the rated voltage, replace the battery in time or charge the battery separately.

2. The maintenance-free battery shall be maintained periodically in accordance with user manual of the maintenance-free battery.

 3. Misconnection of the electrode of the battery is forbidden.

 4. Owing to the unloader equipped on this machine can produce high temperature in working , please put it in the place with better ventilation and heat dispersion and 2 meters away from the host and where the man or livestock can not reach. Covering with other objects or using it under the flammable or explosive gas environment is forbidden to prevent fire.

 5. The machine should be managed by professionals for your safety. It should be grounded reliably to resist electric shock. The ground resistance should be less than  $1\Omega$  and the connecting wire should be larger than  $10^2\text{mm}$ .

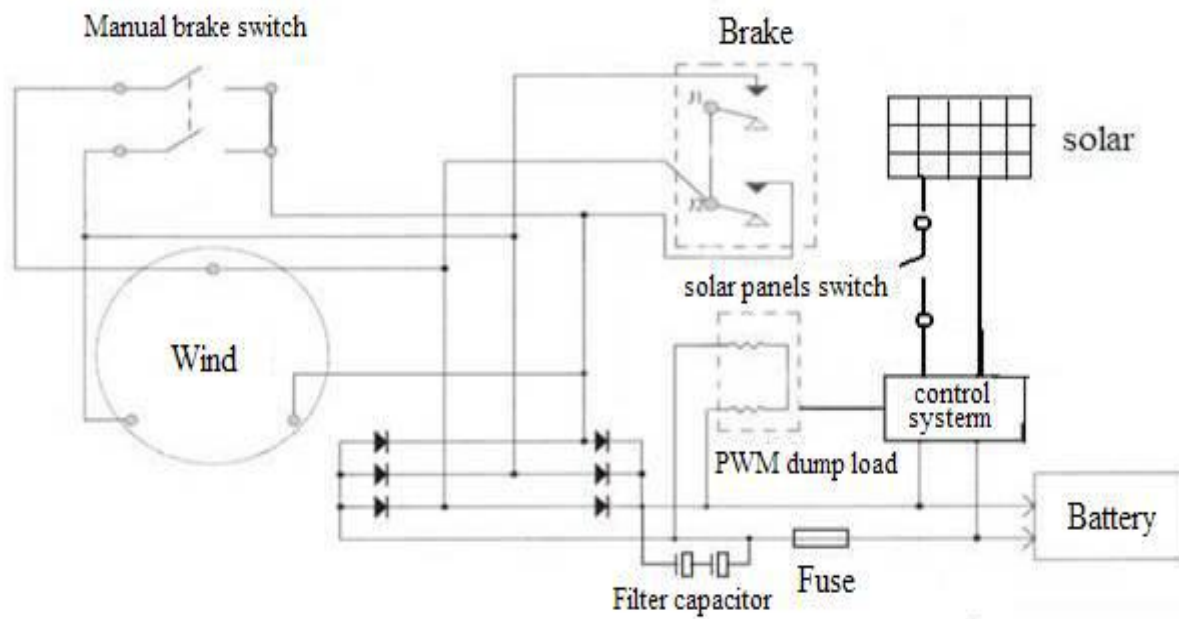
## **X | Maintenance of Battery**

Maintenance of battery is a key link in work. Different maintenance methods are used to different kinds of batteries or battery series. For the lead-acid battery (except the maintenance-free type), the following attentions shall be paid in routing maintenance:

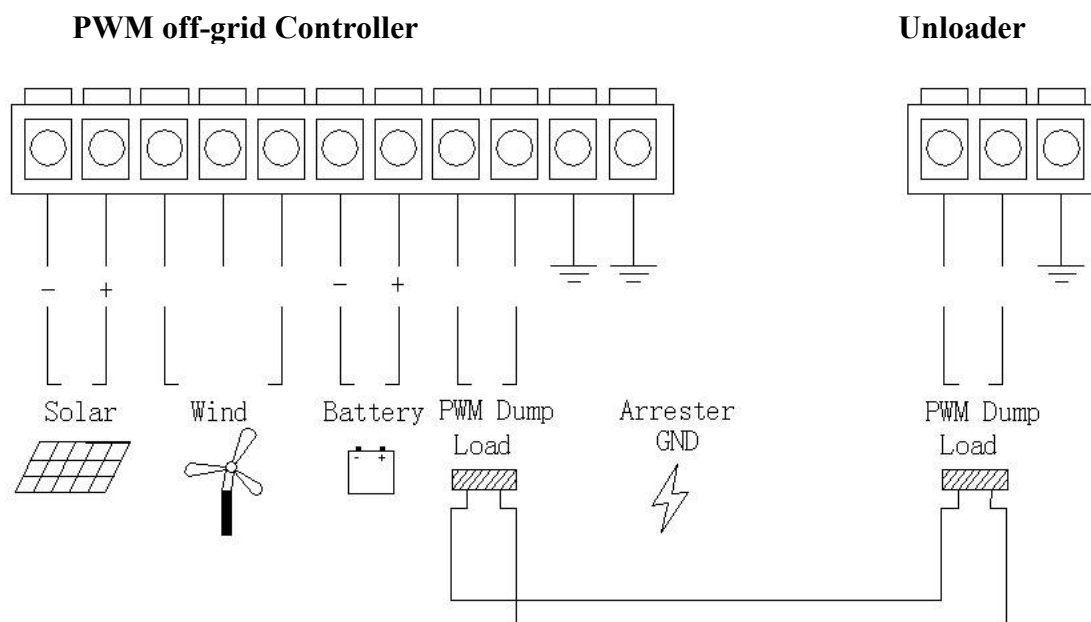
1. Keep the battery clean always;
2. Prevent any external impurities dropping into the battery;
3. All the tools and materials shall be stored in clean and sheltered place;
4. Sulphuric acid traces and dust on the entire battery must be cleaned periodically.
5. The contact devices and connecting wires among every single battery must be completely reliable.
6. If there is clogging up on sealing cap and vent hole, the vent hole shall be checked and wiped clearly.
7. Pay attention to the liquid height of the electrolyte. Don't let the pole plate and the partition board reveal on it.
8. The electrolyte shall be adjusted to normal density-(1.26-1.28) g/ cm<sup>3</sup>-(this parameter may be based upon the user manual) and this can only be done after battery charging is ended;
9. Check the battery terminal voltage and the density of electrolyte frequently and watch out for discharging process, and never allow the battery terminal voltage and the density of electrolyte to be lower than the degree which this battery discharging rule permits;
10. The electrolyte temperature shall not go beyond the rated value in the user manual, which is generally 45°C;
11. If the battery is laid aside for a long time, it shall be recharged each month to avoid excessive self-discharge and serious vitriolization.
12. Check the battery once a month, and replace those batteries which are damaged or with excessively low capacitance



## X II Functional Diagram



## X III Wiring diagram



## X IV Technical Parameters

Type	FKJ-B(PWM)1.5KW-24Vdc
Wind turbine rated power	1.5KW
Wind turbine max. power	3KW
Solar panel rated power	300W
Battery	24Vdc
Function	Rectifier,charge, control

Display mode	LCD
Display content	Wind turbine voltage, wind turbine current, wind turbine power, battery voltage, charge current
PWM constant pressure voltage	>29Vdc
3-phase load voltage of the wind turbine	30±1Vdc
Recovery charging voltage of the wind turbine	27±1Vdc
Solar controller stop charging voltage	29±1Vdc
Solar restore charge voltage	27±1Vdc
Low-voltage of the battery	20±1Vdc
Self-provided connecting wire of the battery	>8mm <sup>2</sup>
PWM fuse	63A
Solar fuse(circuit breaker)	16A
Charging fuse	100A
Work environment temperature	-30-60°C
Relative humidity	<90% No condensation
Noise (1m)	<40dB
Degree of protection	IP20 (Indoor)
Cooling method	Forced air cooling
*Communication interface (optional)	RS485/USB/GPRS/Ethernet
*Temperature compensation (optional)	-4mv/°C/2V,-35°C~+80°C, Accuracy:±1°C
Size of the controller (mm)	510*360*240
Weight of the controller	12Kg
Size of the dump load (mm)	290*250*120
Weight of the dump load	4.5 Kg



**Warning: Dismantlement of the unloader in the use is forbidden. The unloader must be connected in accordance with the wiring diagram strictly. Otherwise the wind turbine will be damaged because loss of control and the controller will be damaged due to the over-high voltage!**

### Particular Notice

When you connect wires on the controller, please indeed use the multi-brand BVR cable.