

Control System Manual

(Designed for WM-300, WM-500, WM-1000, WM-2000, WM-3000)



Please read the manual carefully before operation!

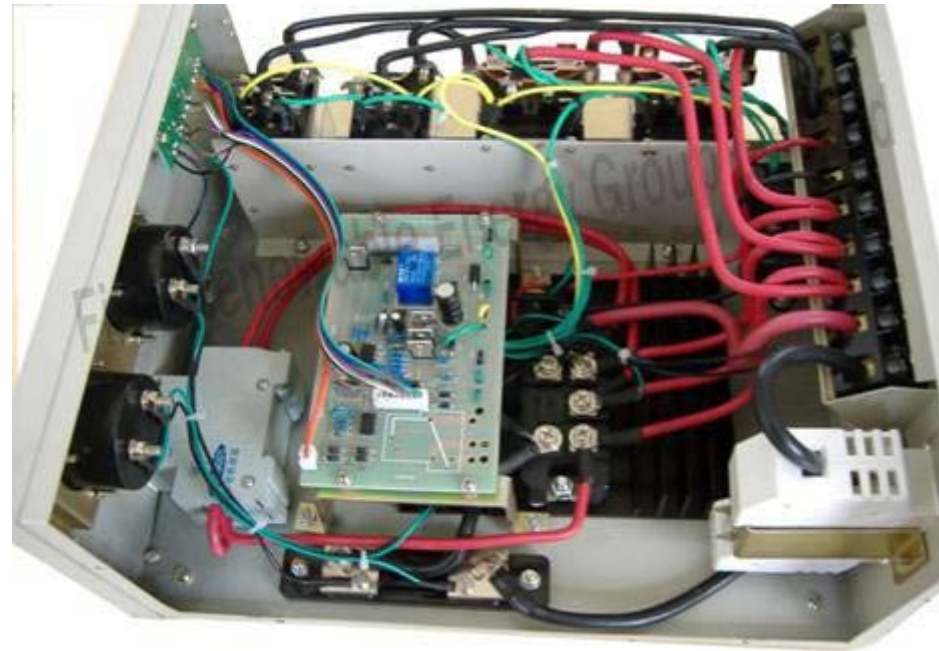
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1. Summarize

- 1.1. This control system is composed of a separate controller and a separate dump load/diversion load, the two unit work together to form a complete wind generator control system. This control system is designed for easy operation with added protection functions;
- 1.2. This control system is used to convert the three phase variable AC power from wind turbine to the controller and rectified to DC voltage, then charges storage battery banks, and in the same time, to unload the extra power through the dump load, so that it can protect the battery bank from damage.
- 1.3. The dump load is composed of group of resistors;
- 1.4. The controller has built-in automatic electric brake. The controller also has a manual electric brake which is convenient for installation and maintenance.
- 1.5. Controller is also built-in fuse which protects the battery bank from damage due to over current.
- 1.6. The controller has built in LED indicator light, so that users clearly understand the wind turbine working conditions.
- 1.7. The Controller has the battery bank voltage meter and charge current meter.

Remark: The hook- on controller is on the optional, but the prices will be on the higher side, please confirm with it before place order. .

2. Control system picture(View P1,P2,P3,P4)**P1: Control system****P2: Inside of control system**



P3: Dump Load



P4: Front Panel

3.The introduction of front panel indication lighting(View P5)

P5: LED Indicator Lights, and control buttonP6: Controller rear panel indicator

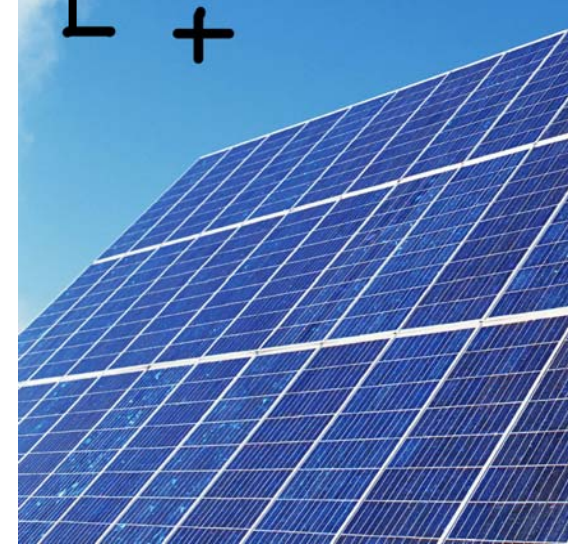
- Wind:** Wind turbine input signal indicator light, Light turns Green when controller is on. The indication light is green when there is wind power input;
- Solar:** Solar Input signal indicator light, Lights turns Green under normal working conditions. The indication light is green when there is solar power input;
- Low voltage:** Battery bank voltage indicator light. Lower-voltage indicator light is off under normal working conditions. It is Yellow color when the battery bank voltage is below the low voltage setting value. The low voltage value can be set as per customer's requirements, the default setting value is: 40V (for a 48V battery bank system).
- Over voltage:** Battery bank voltage indicator light, it is off under normal working conditions. It is Yellow color when the battery bank voltage is higher than the over-voltage setting value. The over voltage value can be set as per customer's requirements, the default value is: 60V (for a 48V battery bank system);
- Fuse Burn:** Fuse indicator light, it is off under normal working conditions. It change to be RED when the charge current is too strong ,in the same time the fuse will be burned. Please use manual switch to stop the wind turbine, and change the same value fuse.
- Battery polarity reverse:** Battery bank polarity indicator light, It is off under normal working conditions. It change to be RED when the connection of the battery bank polarity is reverse;
- Manual brake:** Manual electronic brake switch
- ON:** Wind turbine is in normal operation.
- OFF:** wind turbine is in brake state.
- DC voltage meter:** Battery bank voltage meter (Unit for V)
- Charge current meter:** Charge current meter for the battery bank (Unit for A) .

4. Controller rear panel connection indication(View P6)

- 4.1. Fuse:** when the fuse is burned, please open the fuse box and take off the fuse ,then replace with same value.
- 4.2. Battery bank:** Battery bank two connection terminal, please verify positive and negative connections.
- 4.3. Wind:** Wind turbine 3 connection terminal. The wind turbine 3-phase wires do not have a specific polarity.
- 4.4. Solar:** Solar input connection terminal, please verify positive and negative connections.
- 4.5. Dump load:** dump load 3 input connection terminals, polarity not applicable.
- 4.6. 冫:** Underground terminal

5. Connection sketch drawing (View P7)





- CAUTION:** 1. Please note the positive and the negative connections to battery bank and the PV solar;
2. The wind turbine, dump load- polarity not applicable.

6.Product specification:

Model	C12300	C24300	C12500	C24500	C241000	C481000	C482000	C483000
Wind Turbine rated power	300w	300w	500w	500w	1kw	1kw	2kw	3kw
Solar Power	50w	100w	100w	100w	100w	100w	100W	200W
Matching Battery Bank voltage	12v	24v	12v	24v	24v	48v	48v	48v
Control system function	rectify the variable AC power to DC power, Charge power to battery bank , battery bank protection							
Dump load voltage (v)(default)	15±1	30±1	15±1	30±1	30±1	60±1	60±1	60±1
Turbine stop voltage (v) (default)	15±1	30±1	15±1	30±1	30±1	60±1	60±1	60±1
Recover charge voltage(v) (default)	13±1	26±1	13±1	26±1	26±1	54±1	54±1	54±1
Low voltage indication(V) default	10.5±1	21±1	10.5±1	21±1	10.5±1	21±1	21±1	21±1
Cable size (mm ²)	>6	>4	>10	>4	>10	>4	>10	>16
Fuse(A)	30	25	63	30	63	30		
Notice: 1. The above battery bank voltage is the normally voltage, the other voltage can be custom-make, please confirm with us when placing order;								

2. The three parameter can be custom-make (Dump load voltage, turbine stop voltage, recover charge voltage), please confirm with us when placing order;

7. Connection sequence:

- 7.1. Connect dump load to controller;
- 7.2. Connect battery bank to controller;
- 7.3. Connect wind turbine to controller;
- 7.4. Connect solar to controller (solar input can be optional);

CAUTION: Please connected the accessories strictly according to the following sequence.

8. Connection method:

- 8.1. Place the manual brake switches to “OFF” position;
 - 8.2. Please take off the 4 screws using screw tool according to the following drawing (View P7);
 - 8.3. There are battery bank connection wires, wind turbine output wires, solar energy connection wires(to be optional), dump load connection wire, totally 4 group connection wires to run each wires separately through the hole of connection box, to secure the terminals separately;
 - 8.4. Please connect different group electricity wires and wiring terminal orderly as per the above drawing , please refer the technical parameter table (connection wires specification).
 - 8.5. Please cover the connection box, and fasten the screws tightly;
 - 8.6. Connect the underground wires;
- CAUTION:** 1.when connect battery bank and solar panel, please pay attention to positive and negative connection, otherwise the controller may be severely damaged.
2. The connection wires must fasten it tightly.

9. Operation procedures

- 9.1. Check all wires carefully before putting unit into operation. Place the Manual brake to ON position after confirmed it is ok.
- 9.2. Check the front panel indicator lights.
- 9.3. Place the Manual brake to OFF position when the maintenance work is required.
- 9.4. The wind turbine automatically is electric brake to stop charge the battery bank when the dump load is working and the battery bank voltage is to be full voltage setting value(for the 48V battery bank , it is 60V). In the same time, the Over voltage indicator light is ON.
- 9.5. It recover charge the battery bank when the battery bank voltage is below the low voltage setting value(for the 48V battery bank , it is 52V), and Over Voltage indicator light is OFF
- 9.6. Please switch off inverter and DC load to protect the battery bank when the battery bank voltage is below the low voltage setting value(for the 48V battery

bank , it is 42V), and Low Voltage indication light is ON.

- REMARK:** 1. The charge current to be Zero when the wind turbine blades is not running, and Wind indicator light is OFF;
2. The Solar light is off without connect solar energy
3. Place the Manual Brake to OFF position before maintenance in a calm day.

10. CAUTION:

- 10.1.** Forbidden to open the fuse and change the fuse when the wind turbine is in operation, in case it get shock or damage the machine;
10.2. Please place Manual Brake to OFF position before changing the fuse, disconnect the solar connection and also the battery bank connection , please check it carefully again, then change if necessary, Refer to specification table for the fuse specification;
10.3. Strictly connect the accessories as per drawing.
10.4. We have considered all of the possible accidents in the design of our control system and wind turbine and have taken relevant protective measures, but frequent wrong connection will damage controllers; for example: battery bank polarity connection is reverse;
10.5. Forbidden wind turbine to work without connect battery bank;
10.6. All of the connection wires must be reliable, and firmly , especially for the battery bank connection;
10.7. The controller must be grounded.
10.8. Forbidden battery bank, solar panel input terminal polarity is reverse;
10.9. Controller , battery bank, inverter connection wires must be fasten tightly, otherwise it will cause the charge voltage sometimes to be over-voltage or lower-voltage. Please note that it can damage the controller if the over voltage and stop machine frequently happen in a short time;
10.10. Please cut off the load ,stop battery bank supply power when the Low Voltage is ON . It can protects the battery bank from damage.
10.11. When purchase the inverter, please choose the inverter with automatically Low Voltage protection function, so that it can prolong the battery bank life;
10.12. As the controller is charge unit, not supply power machine, so the inverter should build in automatically Low-Voltage protection circuit. The controller only has with low-voltage warning indicator (Note: automatically lower voltage protection function is mean the inverter stop work when the battery bank voltage is lower than the lower voltage setting value);
10.13. Forbidden to charge the failed battery bank;
10.14. Regularly check the battery bank capacity, voltage and connection, and clean the rust stain of positive and negative terminal timely(please stop the wind turbine when do the cleaning).
10.15. Forbidden locate in a flammable and explosive place ,it should be out of the reach of children.
10.16. Forbidden users repair it casually when there is breakdown, in case it can't be recovery and bring loss to you;
10.17. When the machine don't operate normally, please check it according the following tables to analysis and solve the breakdown. If the breakdown still exist, please stop the machine immediately , in the same time, please describe the breakdown details(controller panel indicator light etc) send to us , it is better to send some pictures ,that assist us to analysis and solve the breakdown. Please don't repair it and replace it casually, otherwise, the user

bear all of the caused losses

11. Using environment :

- 11.1. Place the controller cabinet in a clean, dry, ventilated environment area.
- 11.2. Avoid direct sunshine and damp areas
- 11.3. Dump load should be place on the ventilation place.
- 11.4. The dump load dissipate heat, so it should be placed out of the reach of children.
- 11.5. Do not place around or near flammable or explosive equipment.

12. The usage and maintenance of battery bank

- 12.1. Recommend use no maintenance , deep cycle battery bank;
- 12.2. Battery bank should always keep clean;
- 12.3. Don't let any thing drop into the battery bank;
- 12.4. Must check battery bank regularly;
- 12.5. Different type, and different series battery bank, the maintenance is different. Please refer to battery bank maintenance introduction;

13 .Breakdown analysis and solution.

Item	Breakdown	Breakdown analysis	Solution
1	“Wind” is OFF	1. Blades not spinning	1: Lack of wind of wind is too low
			2: Controller “OFF” position, please place Manual Brake switch to ON
		2 . Generator connection wires are loose	Connect the wire again
2	“Solar” is OFF	1. PV Solar damage	Maintain or replace PV Solar
		2. Solar connection is loose	Connect the wire again
3	Low Voltage in ON	1. Battery bank voltage is lower than setting value	Switch off the inverter output and DC load timely
4	Fuse burn is ON	1. The fuse burned	Switch off the wind turbine and solar input, and change the same value fuse
5	Wind turbine working normally, but the controller repeat “papa”	1. Battery bank is damaged	Stop the wind turbine and wait for change the battery bank
		2. Battery bank connection wires is loose	Stop the wind turbine and check the connection wires
		3. The fuse is burned	Stop the wind turbine and replace the same value fuse
6	Others breakdown	Contact us and wait analysis	Stop wind turbine and take on-site pictures and controller LED indicator light pictures, please send us to analysis and wait the results.

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