Users' Manual

For 3KW~20KW WTGS Controller

CE

- **Specification alterations without notice.**
- **Color or figuration of pictures mighe be varied against physical goods.**
- **Controller wiring and maintenance should be proceeded by professional electricians.**

Contents

1）Outstanding merits: The controller circuit should be totally separated from the main circuit(circuits excluding controller circuit). The controller can be grounded(eg. encloser grounded) or negatively grounded.

2）The real-time wind speed, voltage and current can be shown through numeral display function.

3）Over-charge and over-wind-speed protections

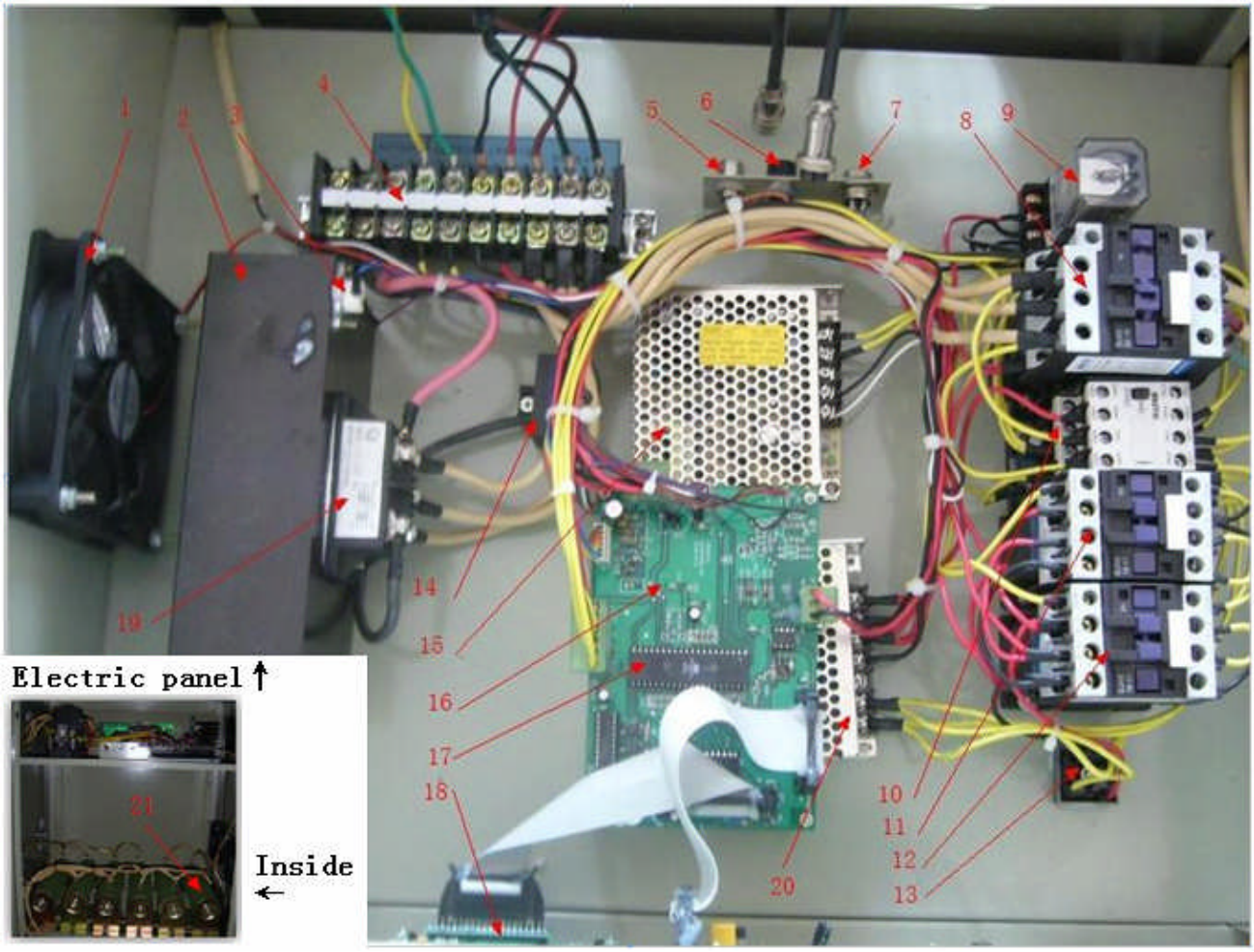
4）Cooperate with dogvane and yawing system to face wind correctly.

5）Hall current transformer for checking current.

6）Prevent cables from enwinding intellectually.

2 Operational principle

Operational principle of controller will be divided into two type, namely, on-grid controller and off-grid controller, according to the difference of application environment. The following sketch map is for on-grid controller. The differences between on-grid controller and off-grid controller are listed in the remarks(please see the following table).



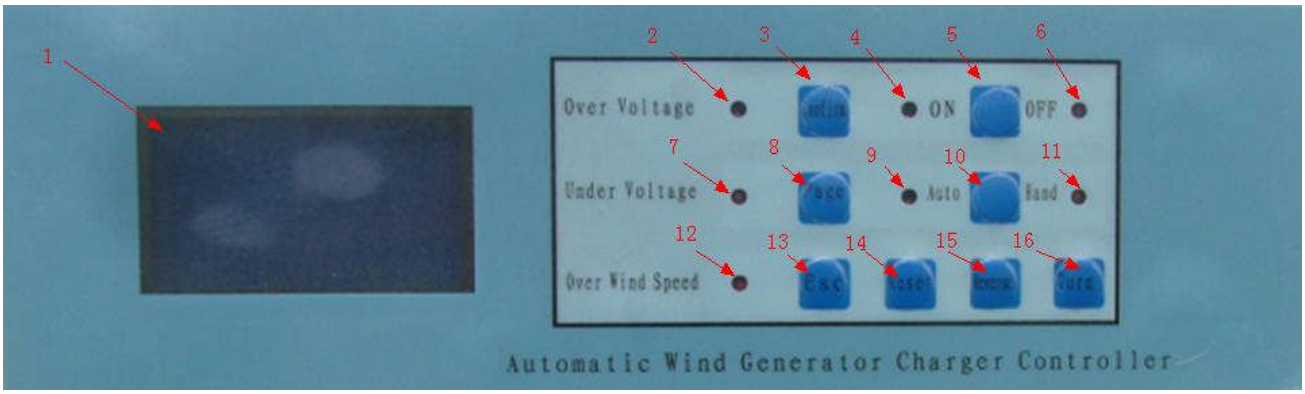
Serial No.	Name	Function	Remarks
1	Fan	air exhaust	
2	Radiator		
3	Temperature Thermo Switch	to start the fan when temperature goes high	
4	Line bank	to connect wind turbine generator, on-grid inverter and public mains	Please refers to page 12 to see the difference of off-grid controller against the on-grid one.
5	Anemoscope	to connect anemoscope	

	connectorr		
6	Fuse		For the yawing DC motor 3KW~10KW:5A 20KW:15A
7	Dogvane connector	to connect dogvane	
8	DC contactor	to access the unloader	CJX2-3210
9	DC relay	to power the DC contactor(8)	JTX-3C
10	AC contactor	To automatically operate when power from the public mains is connected.	No this part in off-grid controller
11	DC contactor	positive yawing	CJX2-1801
12	DC contactor	negative yawing	CJX2-1801
13	Single-phase bridge	to power the DC motor	No this part in off-grid controller
14	Current transformer	to check the current	HDC-50B
15	Swiching power supply	to power the fan when unloader working	S-A-15
16	Circuit board		
17	Chip		
18	Screen board with buttons	to display data of wind speed, running state and operational buttons	
19	Three-phase rectification bridge	to rectify three-phase AC into DC	MDS 100-10
20	Swithcing power supply	to power the circuit board and other components	T-40B
21	Dump loader		

During operation, the wind turbine system are powered by batteires(off-grid system) or public mains(on-grid system). Normally, the power, generated by generator, is to charge the batteries(off-grid system)or to feed on-grid inverter(on-grid system) through the circuit board after being rectified by rectifying bridge. Provided that the wind direction changes, the circuit board will controll the pickup of DC contactor(11) or DC contactor (12) according to the data collected by dogvane, while the DC yawig motor will rotate positively or reverse to drive the wind turbine to face wind direction once more. Suppose that wind speed exceeds the set yawing wind speed, the DC yawing motor will operate to cause a certain angle(left avertence) between wind

direction and wind turbine generator, which will slow down the wind turbine for the sake of protection. If voltage surpasses the set value, DC contactor (8) will pick up and the dump loader(21) will come to work. Meanwhile, the system will go to yaw(left avertence). For on-grid system, provinded that the public mains fails or on-grid inverter works abnormally, dump loader and yawing system will work in order to prevent the wind turbine from burning down.

3 Display & operation explanation



Serial No.	Name	Function	Remarks
1	LCD screen	To display wind speed, voltage, current and alarm state	
2	Over-voltahe indicator	Be on when system is over-voltage and the buzzer alarms	
3	Confirmation key	to confirm the current state	
4	Startup indicator	Be on when the system working normally	
5	Turn-on/off key	To switch on/off state	
6	Switch-off indicator	Be on when system switch off	
7	Low-voltgae indicator	Be on When voltage is low, meanwhile the buzzer alarms	
8	Page turning	No	
9	Automatically running indicator	Be on when wind turbine face wind automatically and yawing	
10	Automatical/manual	To switch automatic/manual running state	

	running key		
11	Manual running indicator	Be on when wind turbine face wind automatically and yawing	
12	Over-speed indicator	Be on when wind speed exceeds the set value, meanwhile the buzzer alarms	
13	esc	to exit the current interface	
14	reset	to reset the controller	
15	reverse	to controll the wind turbine left avertence	
16	turn	to controll the wind turbine right avertence	

Initially "auto" and "startup are shown on th controlling board". Under this state, when wind speed reach or exceed 3 m/s, wind turbine will trace wind direction automatically. Wind over-speed or over-voltage, the wind turbine will yaw automatically until shutdown(yawing 90 degrees). For on-grid system, when the public mains is not available or on-grid inverter fails, wind turbine will go to dump load and shut down automatically. The syste can be set as "manual" through Turn-on/off key(5). At this point, the wind turbine will not face wind automatically. Neither will shut down automatically. Press the Reverse key(15) or Turn key(16) to controll wind turbine or the yawing. Unless exceptional circumstances occures, choice of setting manual running state is not recommended.

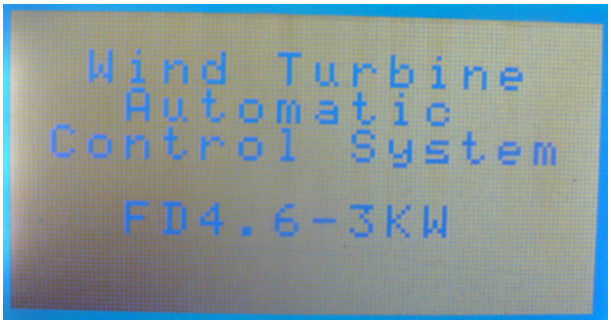
Provinded any need to force wind turbine shut down, you can set the mode of "auto" and "shutdown". The wind turbine will yaw 90 degrees to achieve shutdown.

Buzzer alarm may exposed when the system is under the state of low-voltage, over-voltage or over-speed. The state indicator may be on accordingly. You can press twice the confirmation key(3) to cancel the alarm.

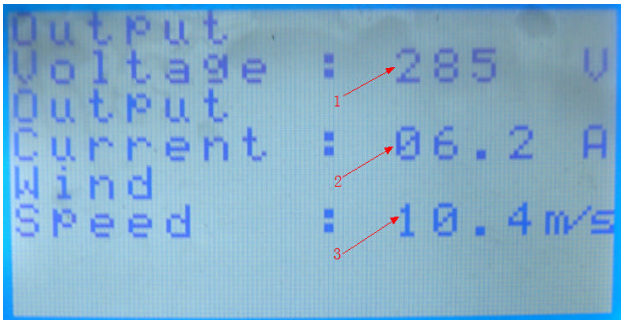
Provided that there is time differnece of 250 seconds between the left avertence and right avertence, the controller will drive the wind turbie to rotate 250 seconds against the opposite direction to release the cable from being entwined.

4 Screen display

4.1 Screen startup

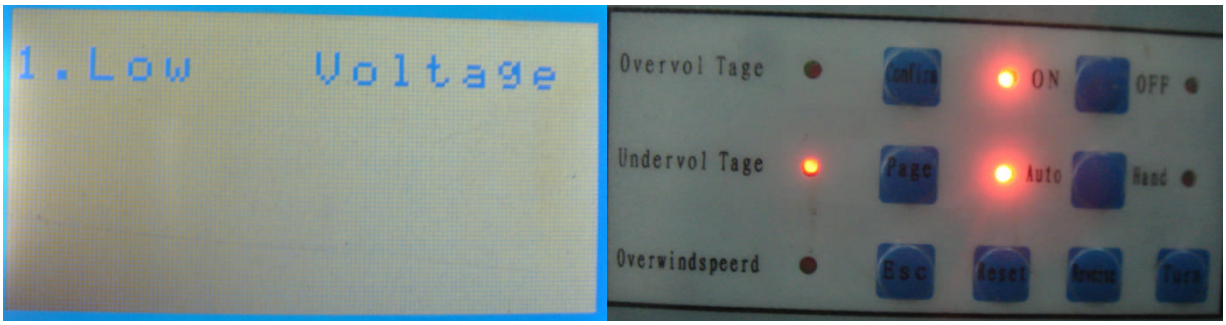


4.2 Normal operating state

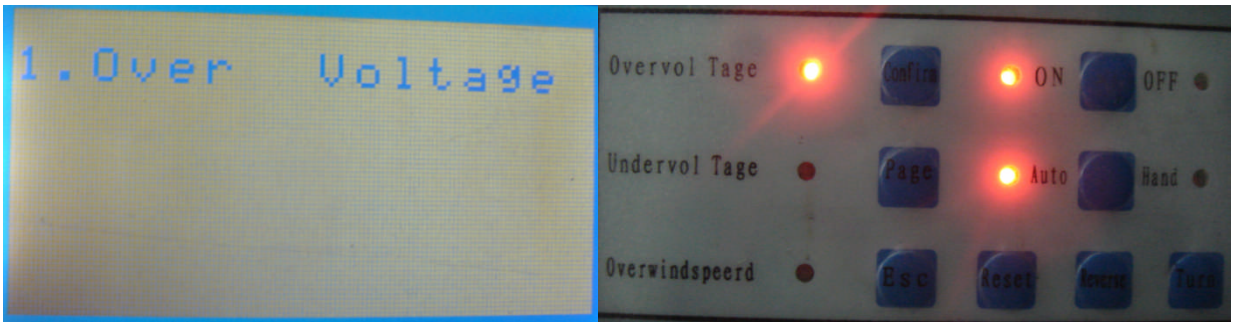


Notes: 1. voltage; 2. Current: 3. Wind speed

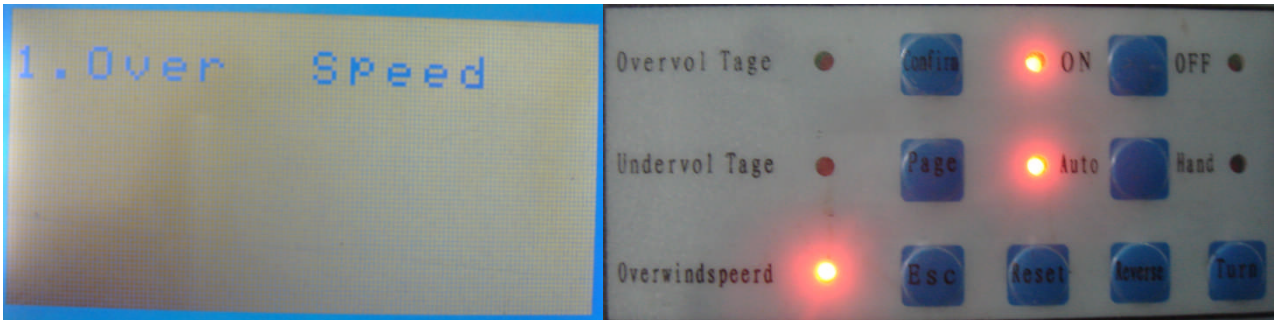
4.3 Low-voltage alarm



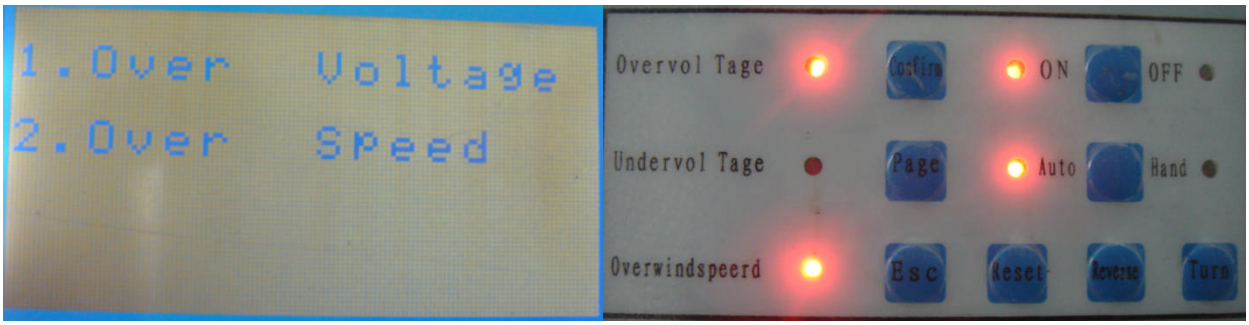
4.4 Over-voltage alarm



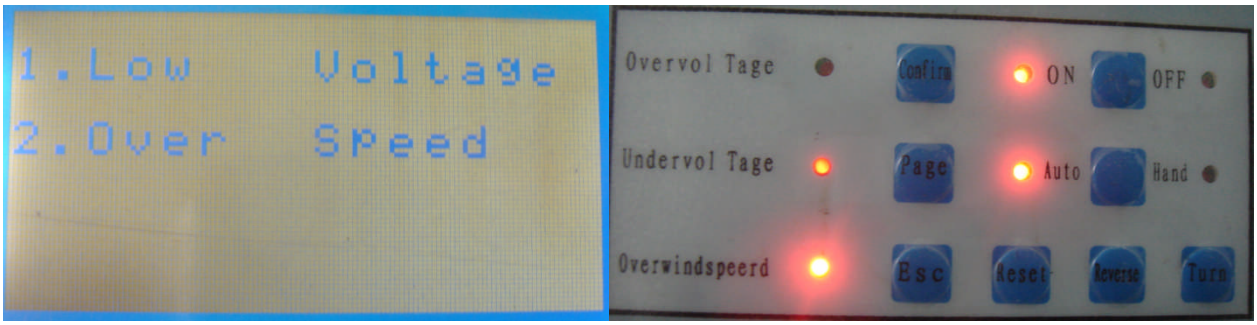
4.5 Over-speed alarm



4.6 Over-votlage & over-speed alarm simultaneously



4.7 Low-voltage & over-speed alarm simultaneously

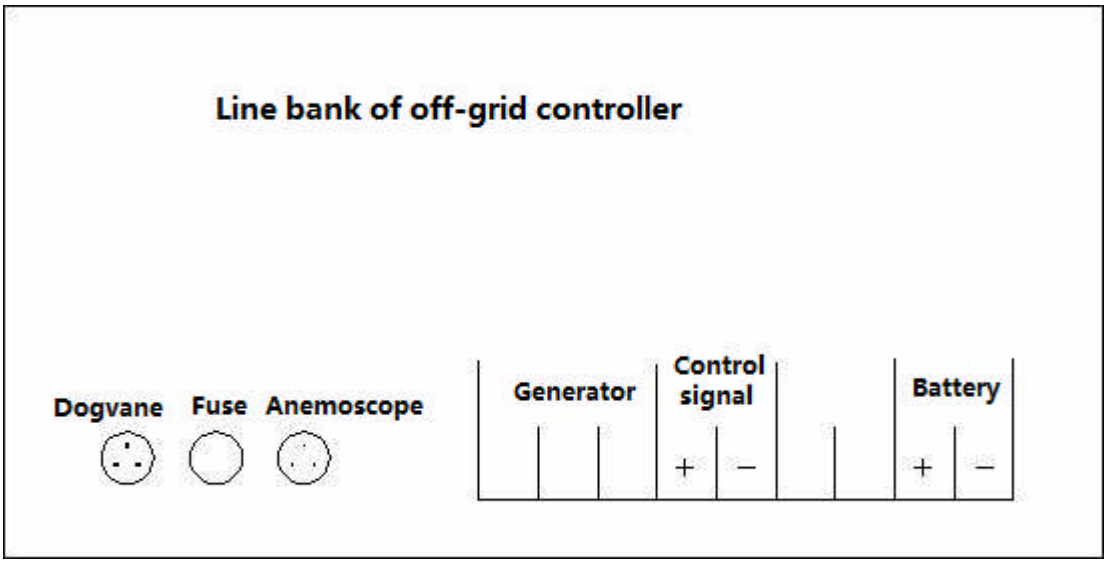


5 Parameter table

Model		3KW	5KW	10KW	20KW
Wind speed (yawing 30 degrees) （m/s）		12	12	12	13
Wind speed (yawing 60 degrees) （m/s）		15	15	15	16
Wind speed(yawing 90 degrees) （m/s）		18	18	18	20
Yawing voltage （V）	off-grid	290	290	290	450
	On-grid	340	340	340	450
Load-absent voltage（V）	Off-grid	310	310	310	450
	On-grid	350	350	350	450
Yawing-resume votalge（V）	Off-grid	280	280	280	420
	On-grid	300	300	300	420
Load-rsume voltage(V)	Off-grid	290	290	290	420
	On-grid	310	310	310	420
Dump-loader power(W)		5000	5000	10000	18000
Low-voltage value(V)		210	210	210	315
Over speed（m/s）		18	18	18	20
Measurement（mm）		58*47.5*64.5	58*47.5*64.5	58.5*48*84.5	58.5*48*84.5
Weight（kg）		50	50	70	70

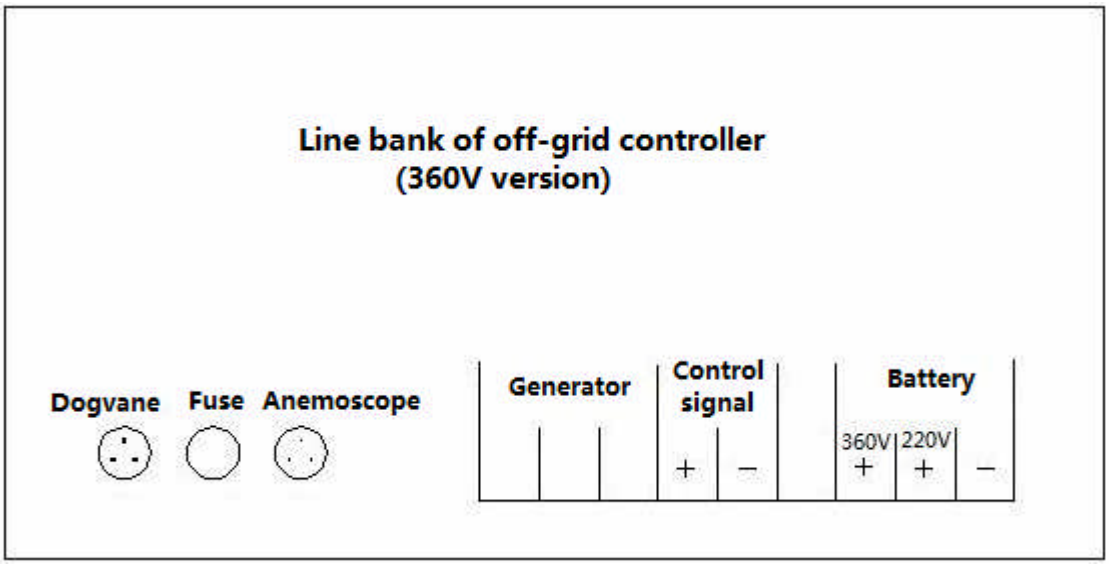
6 Line Bank

6.1 0ff-grid controller



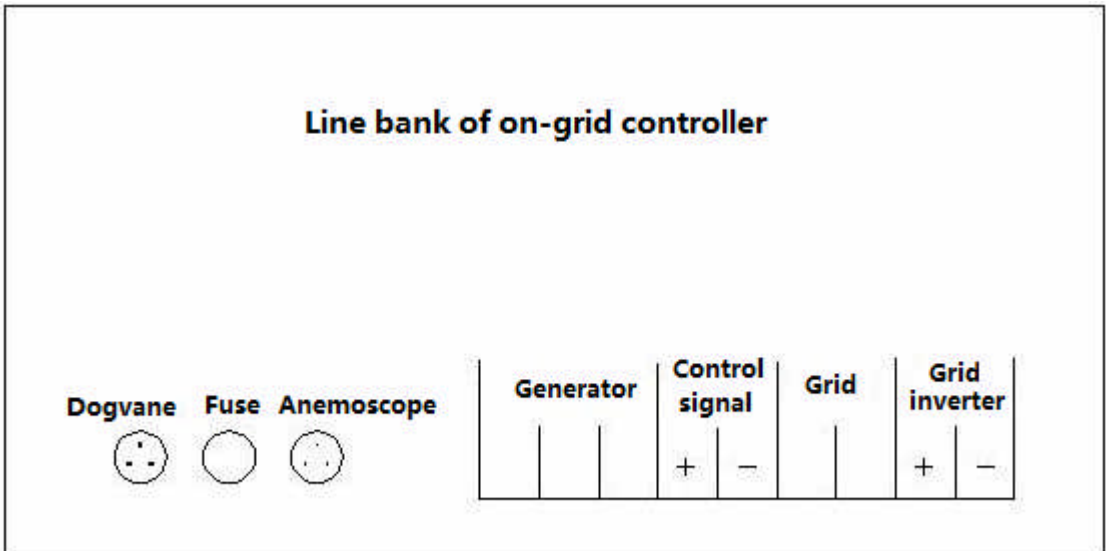
When wiring, please following the order: dogvan, anemoscope→batteries & controller→controller signal wire→generator→inverter→battery bank.

Notes: For 360V version controller, please see the following sketch map.



Please connect the "360V+" terminal with positive pole of battery bank(360V). "220V+" terminal connect to the part of the whole battery bank. The votlage for this part should be 229V.

6.2 On-grid controller



When wiring, please following the order: dogvan, anemoscope→controller signal wire→on-grid inverter→public mains→generator.

Notes: Special attation should be pay to matching of controller output voltage and public mains' one when connecting public mains(110V/120V/220V/230V/240V)