

# POWER-LEADER

## INSTALLATION AND OPERATOR'S MANUAL

Controller for wind power system

Ningbo Ginlong Technologies

### IMPORTANT SAFETY INSTRUCTIONS

#### SAVE THESE INSTRUCTIONS

This manual contains important instructions for model **power-leader** that shall be followed during installation and maintenance of the controller.

To reduce the risk of electrical shock hazards, and to make sure the equipment is safely installed, special safety symbols are used in this manual to highlight potential safety hazard and important safety information. The symbols are



**WARNING:** the paragraphs highlighted by this symbol contain processes and instructions that must be absolutely understood and followed to avoid potential danger to people.



**NOTE:** the paragraphs highlighted by this symbol contain processes and instructions that must be understood and followed to avoid potential damage to the equipment and wrong results.



**CAUTION:** Risk of electric shock. Please operate the GCI-2K under the following explanation.



**CAUTION:** Risk of hot.

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# 1 Power-leader Interface Description



**Figure 1: Power-leader**

The power-leader is designed to be used in the wind power system, it provides two functions:

- To rectify the “Wild AC” from wind turbine generator into DC input for the inverter.
- Diversion Load Control: The unit may apply to the turbine an external additional resistive load when the rectified DC voltage exceeds 400 Vdc (can be optional).



**WARNING:** This is only helpful to extend the usable wind range and to contain the input voltage for the connected Inverters. Never use it as safety brake. The turbine must have his proper safety brake, mechanical or electronic.

## 1.1 GCB-20K Operating Parameters

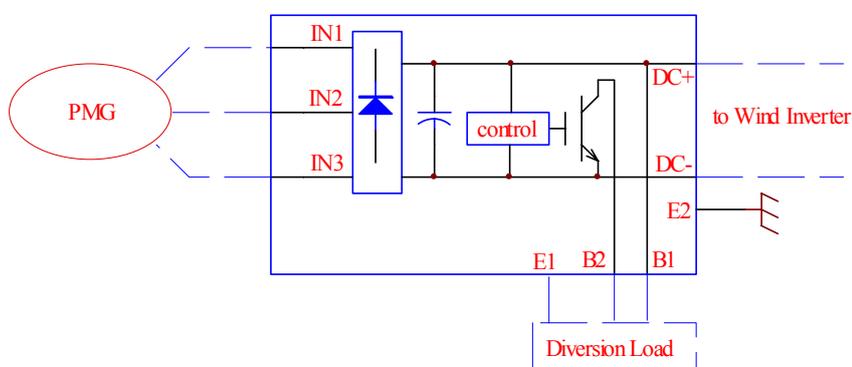
Description	Value of GCB-20K
Input voltage range (no damaging)	0 Vac to 500 Vac
Input voltage range (operating)	40 Vac to 500 Vac
Max. operating input current	Up to 40 A
Rating output power + diversion	12KW / 8 KW
Max. output current + diversion	40A dc continuous / 30 A rms.

load current	
Efficiency (@400Vac, PFC≥0.7)	>99%
Output Voltage range	0~750V
Operating ambient temperature	-25~60°C
Audible Noise	<40 dBA
Weight(kG)	6.4
Size (height x width x depth):	370mm*275mm*135mm

**Table 1: Operating Parameters**

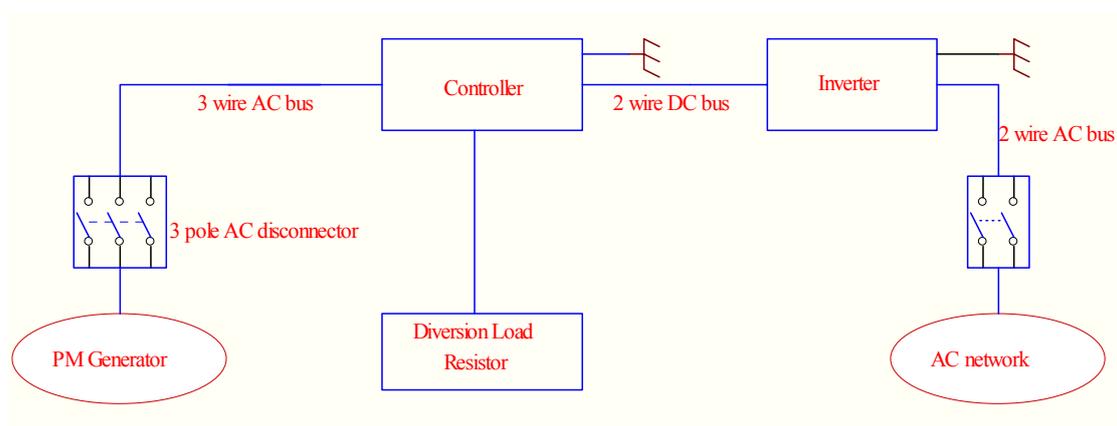
## 1.2 Power-leader Block Diagram

The GINLONG power-leader is designed to be used with the GINLONG wind inverter



**Figure 2: Power-leader Interface Block Diagram**

## 1.3 System Block Diagram



**Figure 3: Typical Wind System Block Diagram**



The wind turbine must have a primary safety means of limiting the wind turbine speed, this typically is a some type of furling method, blade stalling, self limiting airfoil design, electric safety brake or any other system may exist.

## 1.4 Operating Modes of the Wind System

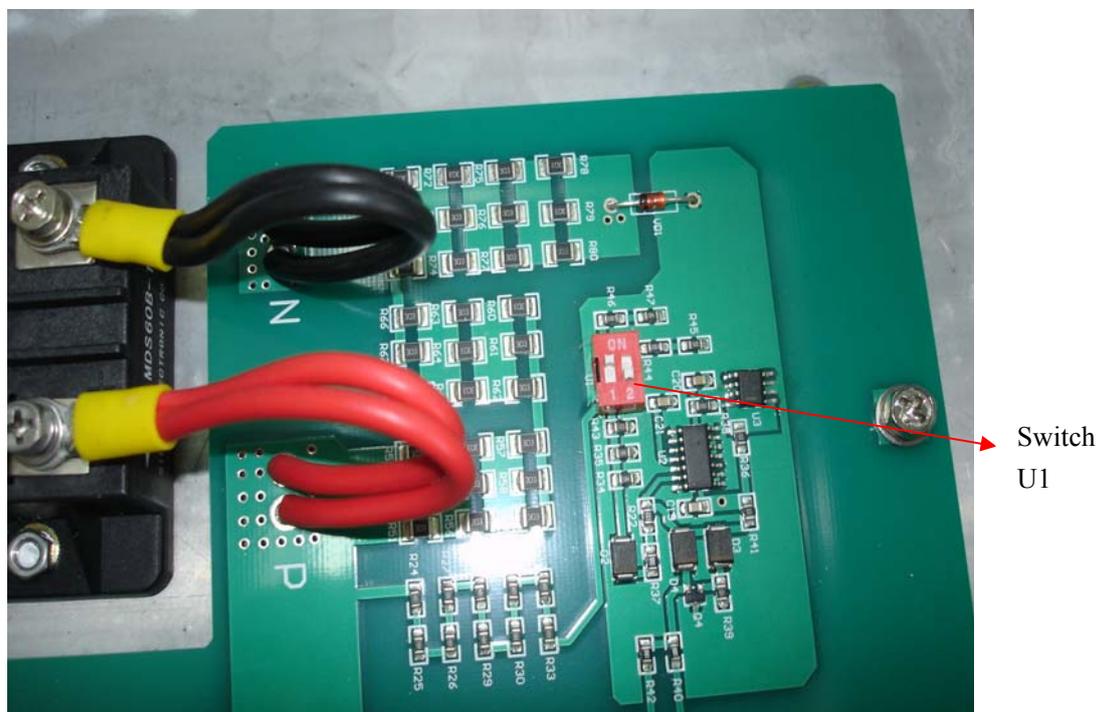
Power-leader is used to transmit power to grid through the inverter. GCB-20K's rating output power totally is 20 KW, it includes power transmitted to both inverters and diversion load. Normally, there is no current through diversion load. When the wind is too strong and the output voltage is too high, the diversion circuit will work and redundant power will be divided to the load; when the inverter failed to connect grid, the output voltage of generator will be higher, and then the power from generator will be transmitted to diversion load by power-leader. By detecting output voltage, power-leader can protect the whole system.

## 1.5 Turning On/Off Voltage for Diversion

User can regulate diversion voltage by switching unit U1.

Switch U1 Mode	Voltage (Vdc)
1, 2 OFF	$V_{ON}=400, V_{OFF}=300$
1 ON, 2 OFF	$V_{ON}=500, V_{OFF}=400$
1 OFF, 2 ON	$V_{ON}=500, V_{OFF}=400$
1, 2 ON	$V_{ON}=600, V_{OFF}=500$

**Table 2: Switch Mode and Diversion Voltage**



**Figure 4: Switch for Regulating Diversion Voltage**

## 2 Connections

There are 3 I/O ports: input, diversion and output ports. Input ports connected to generator, diversion port to diversion load\* and output port to inverter. Connection terminals are shown in the following Fig. 5.

\* This connection is optional if the wind turbine will self-limit and prevent overvoltage under any condition.

Connection		Input	Diversion	Output
Terminals		IN1, IN2, IN3	B1, B2, E1*	DC+,DC-,E2**
Absolute Max. values	Voltage	500 Vac	750 V	750 V
	Current	40 A ac	30 A	40 A
	Wire	7 AWG or 2*10 AWG	9 AWG OR 2*12 AWG	7 AWG OR 2*10 AWG

**Table 3: GCB-20K Connection Table**

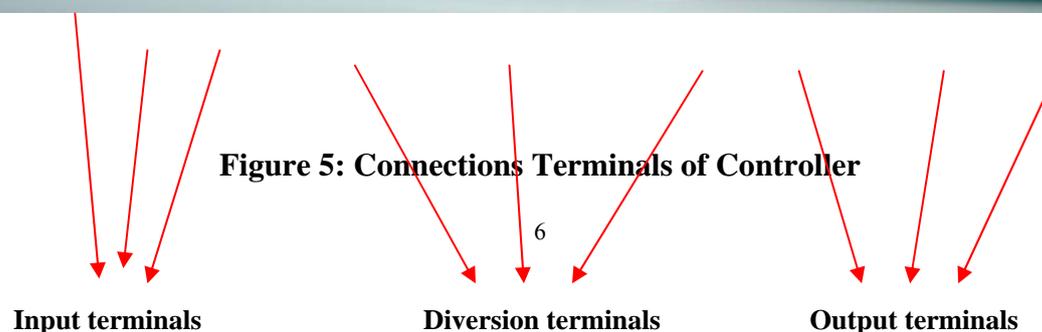
\* E1 is connected to green/yellow wire of diversion load. The two B1 is parallel and the two B2 is parallel. The diversion load two wires must connect to the B1 and B2 separately.

\*\* E2 is the ground terminal.

\*\*\* If diversion load's wires are not long enough.

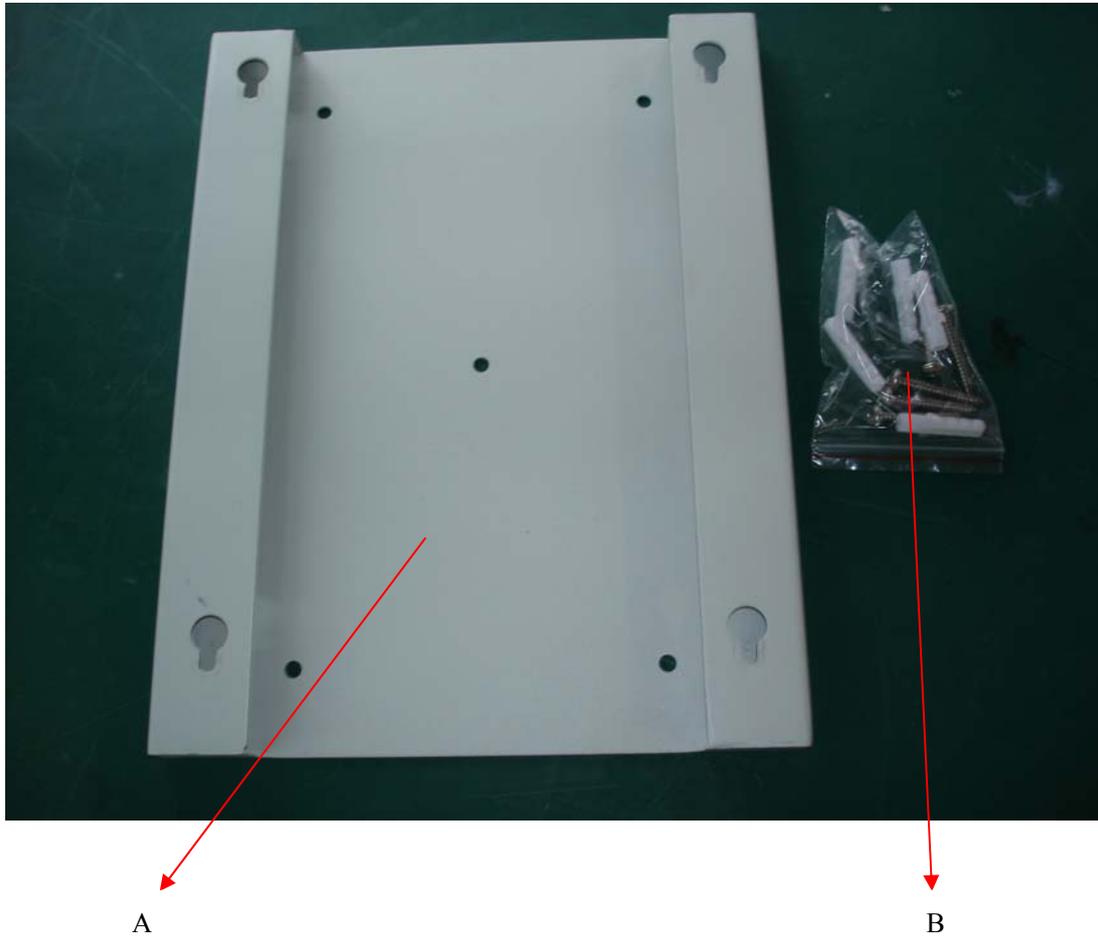


**Figure 5: Connections Terminals of Controller**



### 3 Installation

The controller should be mounted vertically to a flat, solid surface as wallboard or wood siding. The demand accessories are shown in figure 6. Using A (self-tapping screw) to fix B (mounting bracket) onto wall, then hang controller on it.



**Figure 6: Accessories for Installation**



WARNING: Bracket shall be mounted vertically on wall.