
AWS M Series

AWS Wind Turbine Controller with MPPT

User Manual



AWS Series 48-24 Controller with MPPT-V1.3

Model WW15-24-48

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1. Important Safety Warning

Before Using the controller, please read all instructions and cautionary markings on the unit and this manual. Store the manual where it can easily be accessed.

This manual includes all safety warnings, installation, and operation guidance of MWM wind controllers.

- Before installing and using this controller, read all instructions and cautionary markings on the controller and all appropriate sections of this guide.
- Do not store flammable products within the same control room or area where the wind controller is installed.
- Do not open or dismantle any parts of the controller other than the required cable termination cover where fitted.
- Disconnect the AC input and DC output from controller before working on or maintain the controller. Do not work on the controller within 5 minutes of de energization.
- The controller is designed for indoor use only
- Maintain ventilation as detailed in this manual
- Install on noncombustible material only.
- The DC supply to the controller must be fused.
- Please use copper cable for line connection and choose the right diameter of cable according to the actual current.
- To avoid a risk of fire and electric shock, make sure the existing wiring is in good condition and that the wire is connected tightly.
- Use anti oxidizing past on all connections.

2. Basic Information

2.1 Introduction and Features

The AWS M series wind power generation controller is a controller which integrates MPPT control and charge and discharge control. The power curve can be set by setting the wind turbine voltage and current, which allows the wind turbine to operate within its best power output all the times. (All AWS wind controller solar with AWS Wind turbines are preset, do not alter these settings)

Features:

- Can be applied to grid-tied system, off-grid system and grid-tied energy storage system. Charge function is optional.
- MPPT tracking
- Protection functions.
- Solar PV integration.
- RS232/RS485/RJ45/GPRS/Bluetooth/Zigbee optional. (It can be monitored by app for those with GPRS/Bluetooth/RJ45 connection)

2.2 Product Structure

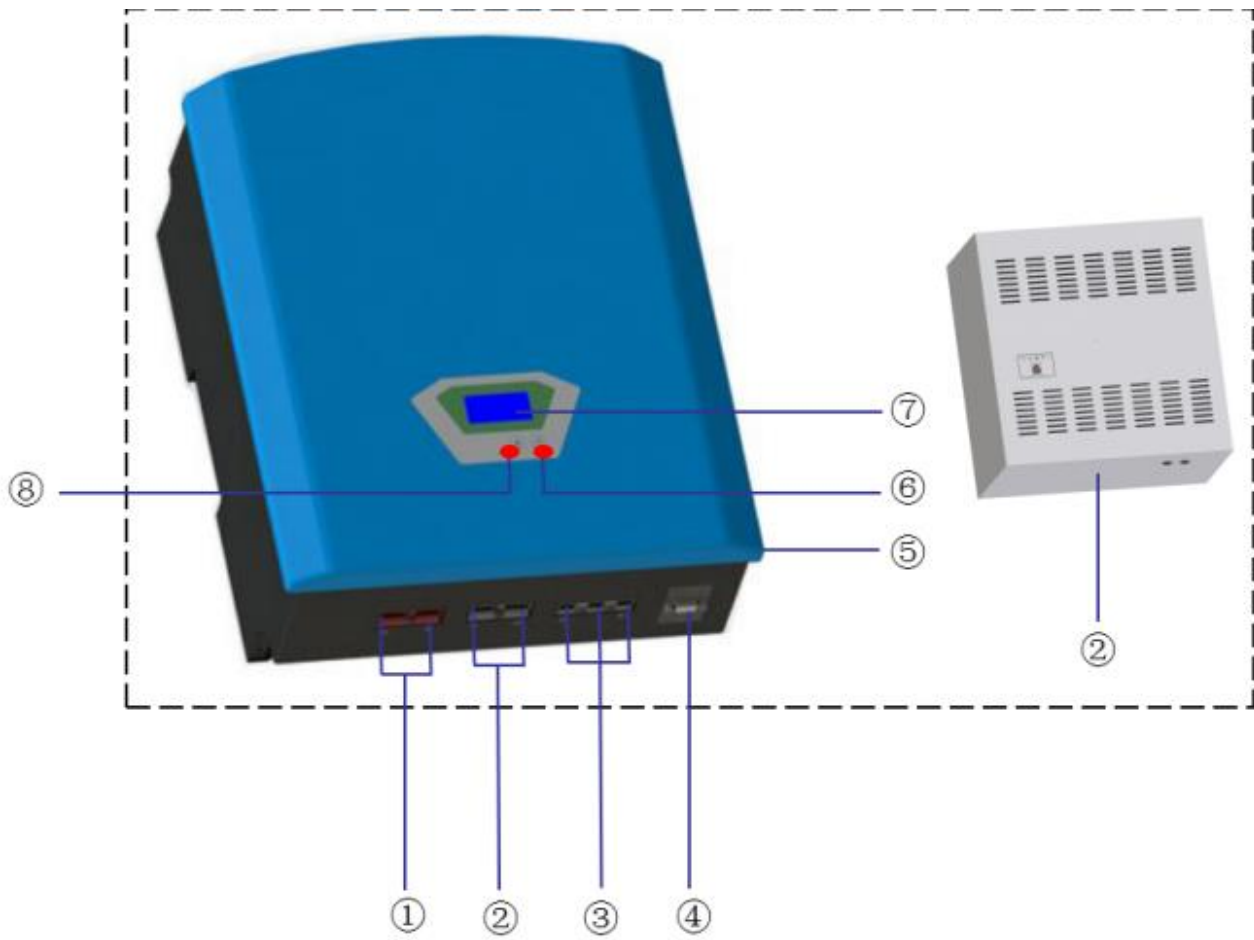


Chart1. Product Overview (1-3kW)

①	Battery terminal	⑤	Manual brake switch
②	Dump load terminal	⑥	Browse button
③	Wind turbine terminal	⑦	LCD display
④	Communication device port	⑧	Unload indicator light

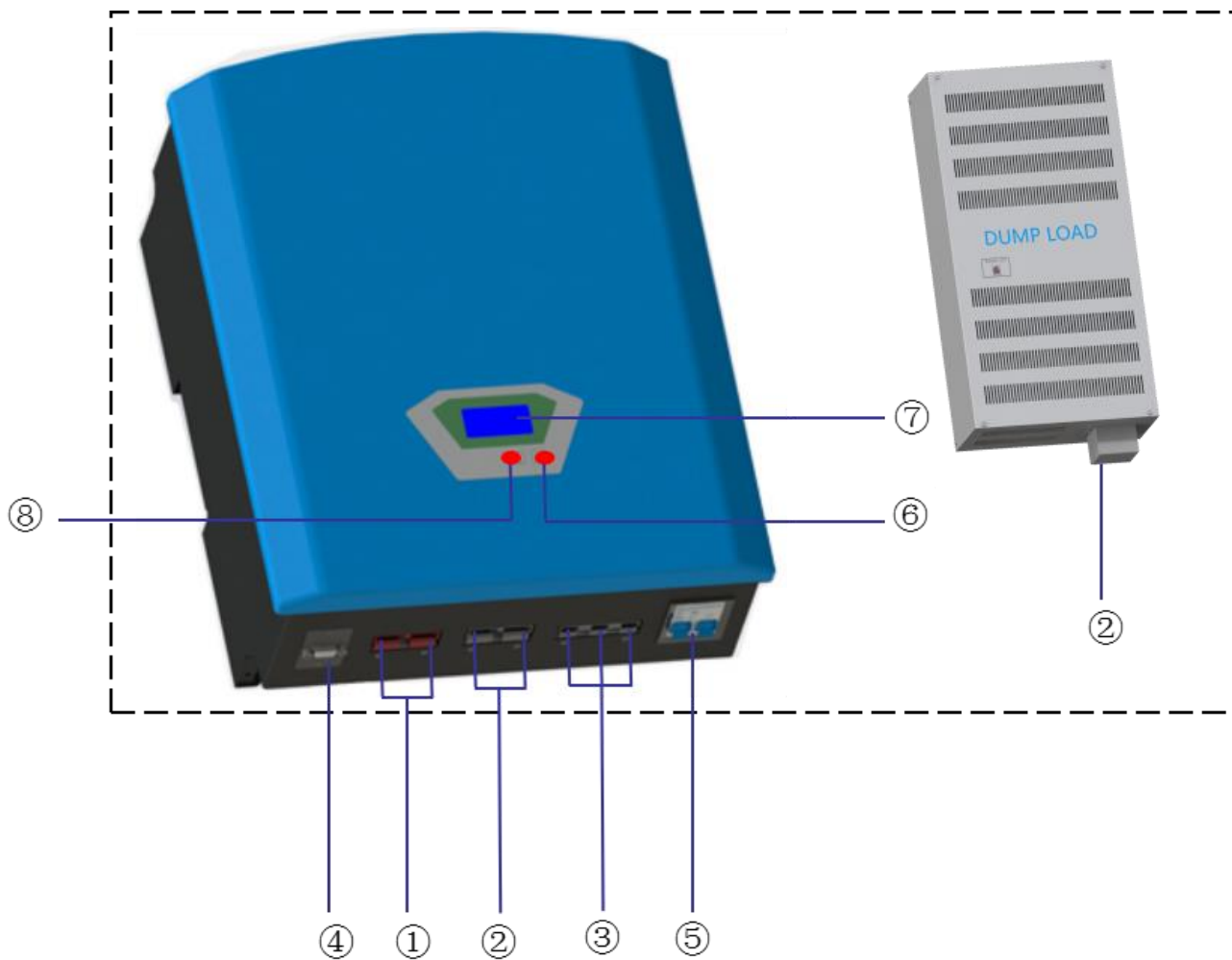


Chart2. Product Overview (5-10kW)

①	Battery terminal	⑤	Manual brake switch
②	Dump load terminal	⑥	Browse button
③	Wind turbine terminal	⑦	LCD display
④	Communication device port	⑧	Unload indicator light

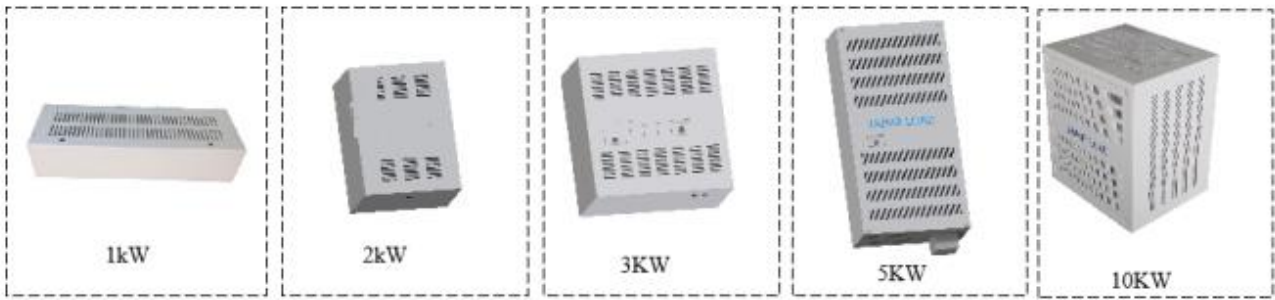


Chart3: Dump Load with different power

3. Product Installation

3.1 Installation Notes

- 1) The controller must be kept indoors and well ventilated;
- 2) Environment temperature: $-20\sim+40^{\circ}\text{C}$; Humidity: $\leq 95\%$, no condensing
- 3) Altitude should not be more than 4000m (> 1000 m derating according to the GB/T3859.2 regulations).
- 4) Not to be installed in direct sunlight, sun exposure, rain, humidity, acid fog, and dust.
- 5) Ensure the correct battery voltage and polarity is connected to the controller.
- 6) The controller can only be connected to a wind turbine and PV within and the rated Voltage, current and power characteristics.

3.2 Installation and Wiring

3.2.1 Installation Steps

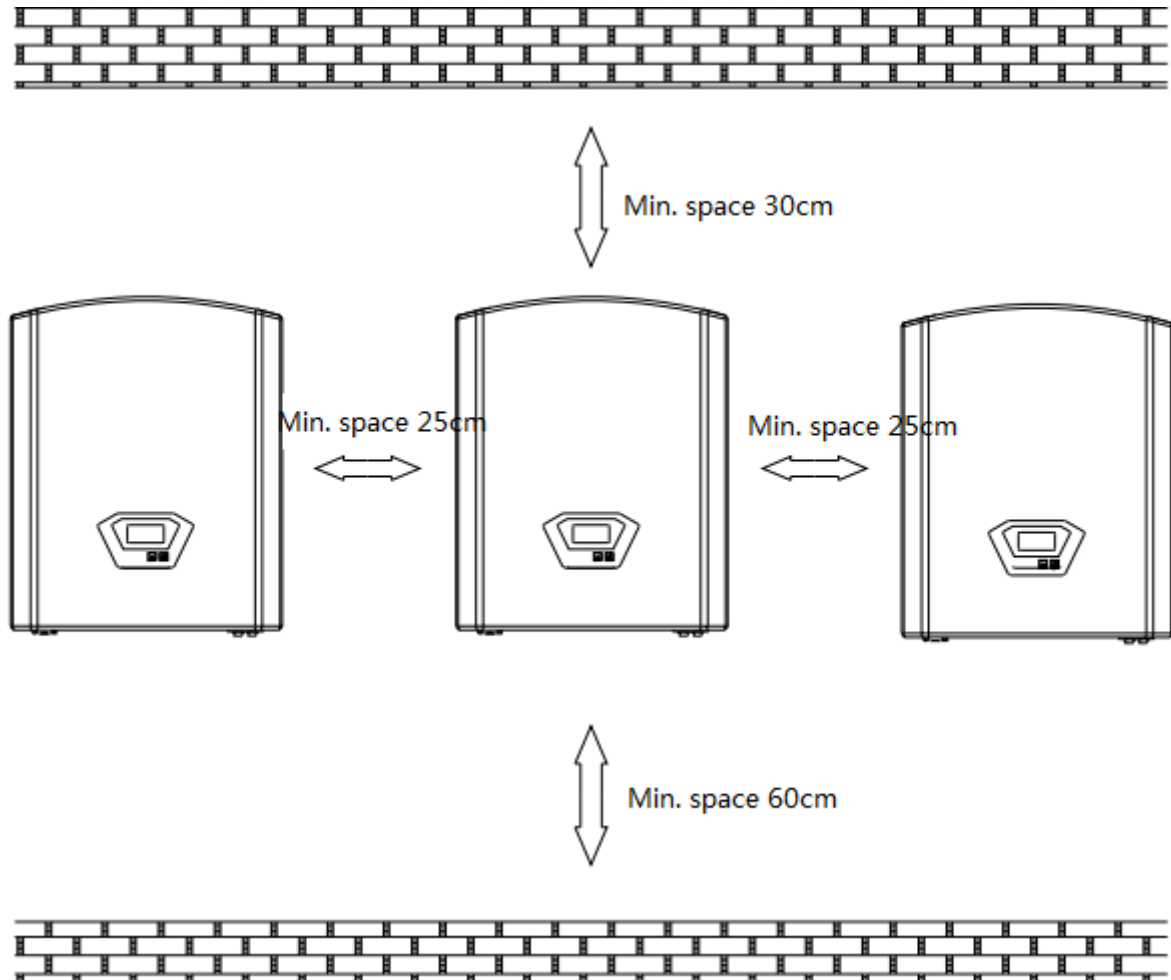


Chart 4: Installation Overview

3.2.2 Installation Steps

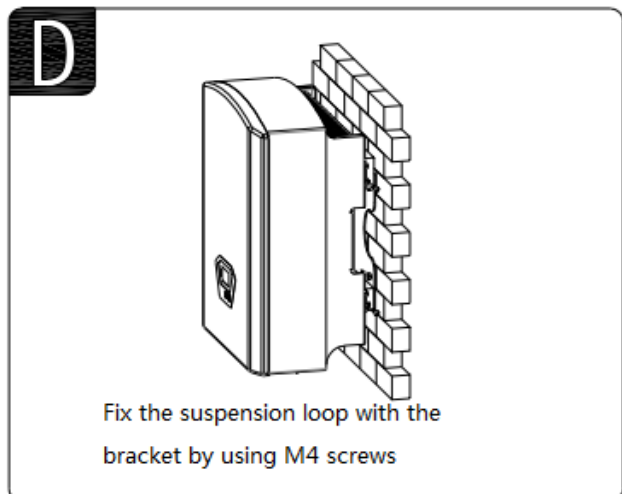
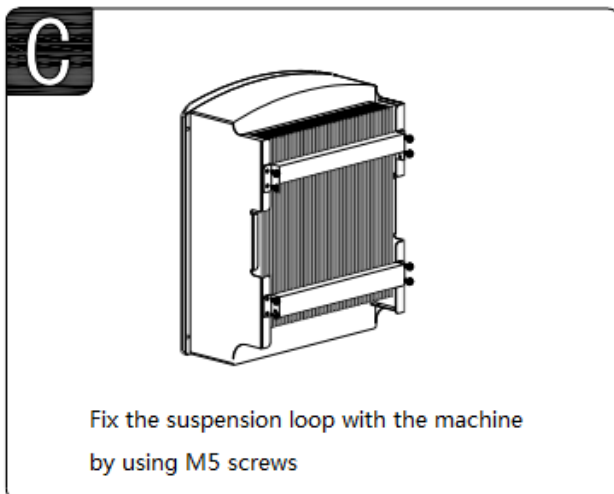
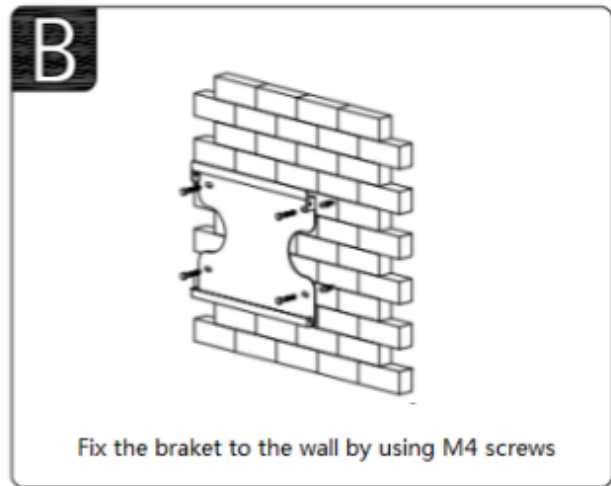
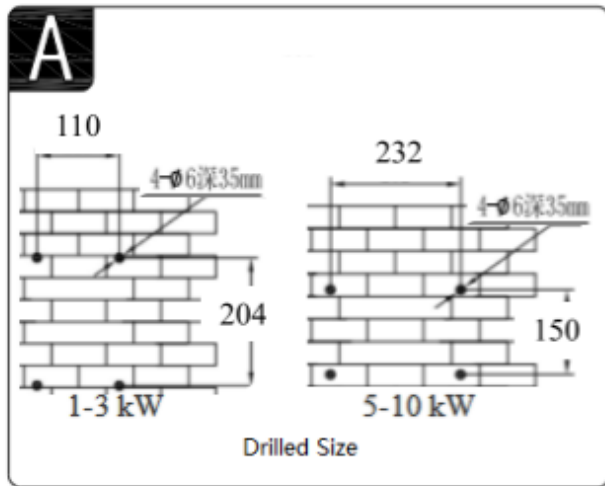
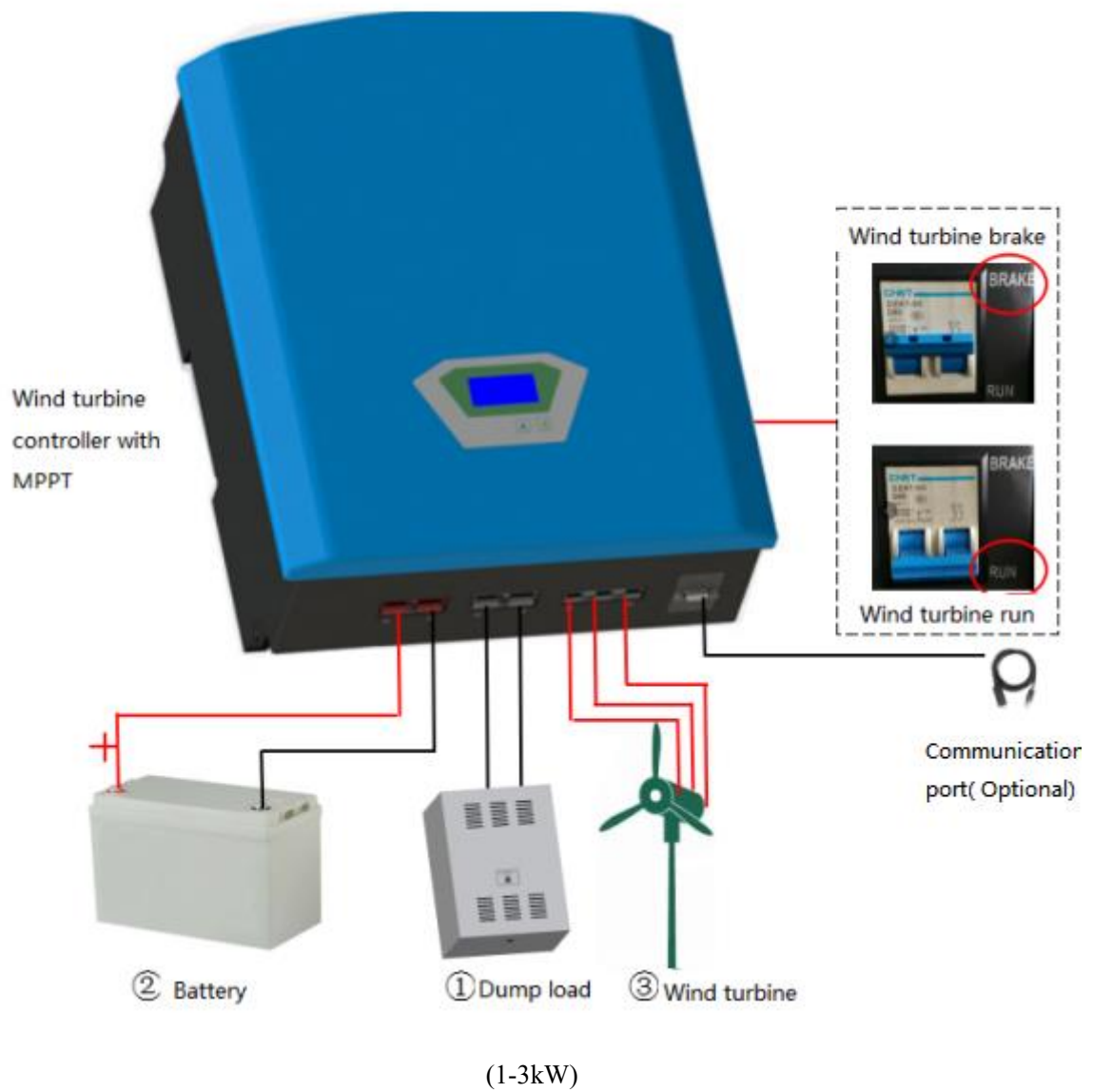


Chart5: Installation Steps

3.2.3 Electrical Connection



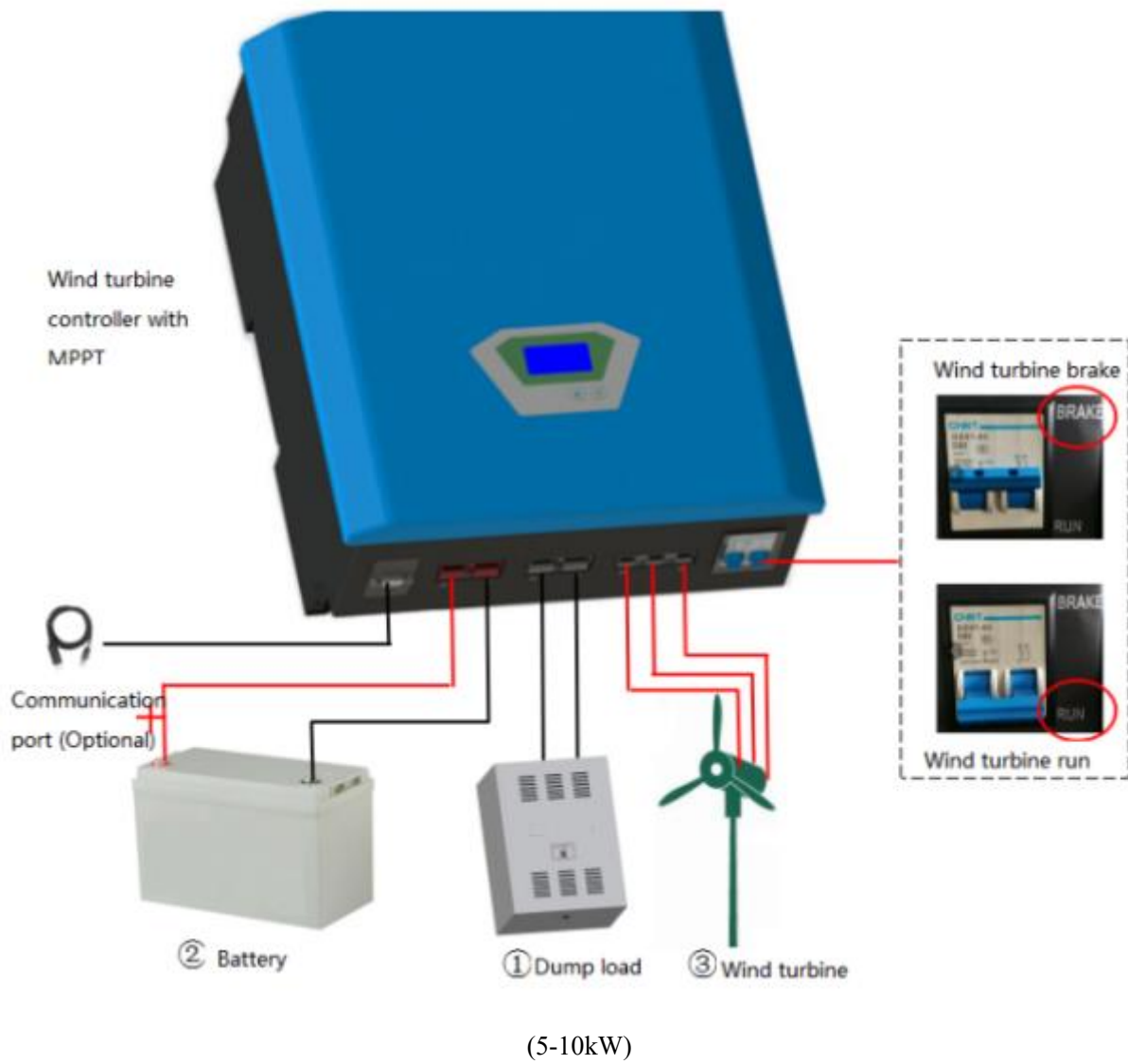


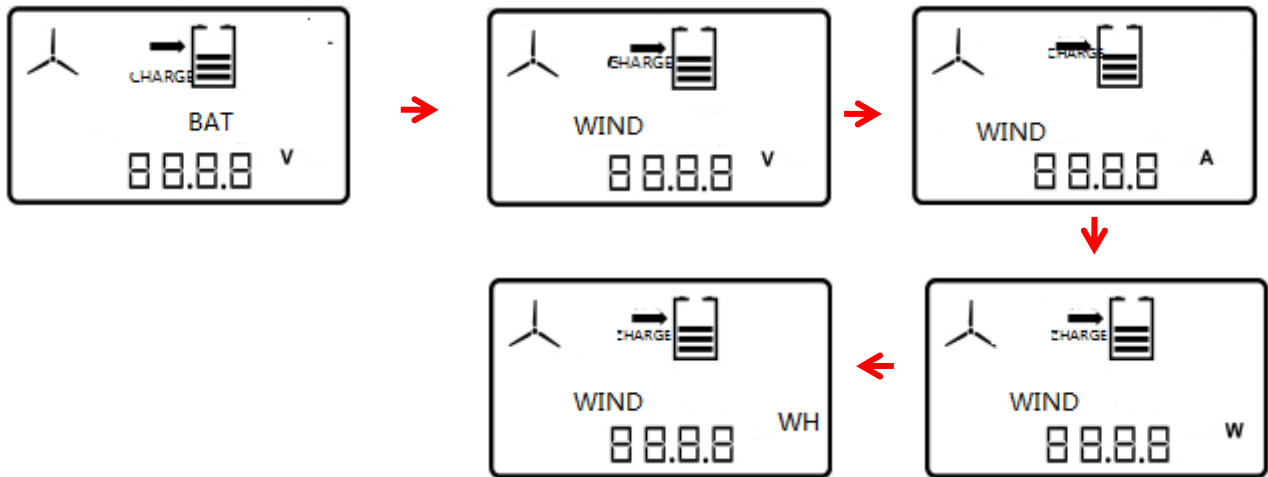
Chart 6: System Overview

1. Connect Dump load to the controller terminal “DUMLOAD” by using copper conductor cable.
2. Connect the battery bank to the controller by the terminal which marks “BATTERY”. (do not reversed the connection of positive and negative terminals)
3. Connect the wind turbine output to the “WIND INPUT” terminal on the controller (in any order). Ensure a wind brake switch is installed at the tower and the brake is activated prior to connection.
4. Check all the connection to make sure they are connected rightly and tightly.







4. Operation Interface Introduction

4.1 LCD Display

After the power is connected, the screen is in a browsing status. It shows battery voltage and can be changed to the following information by press related buttons.



4.2 LCD Information Define

Name	Icon	Status
Wind Turbine		Rotate means wind turbine is working normally
	BRAKE	Brake mode has been activated from the controller
Battery		Charging
		Fully charged. flickering for over voltage, stop flickering when it recovers from over voltage
		Flickering means over -discharge
Browse button		Press it to enter next LCD display.
		Press it for 5s to enter the brake status
		Press it for another 5s to recover charging status.
Dump load indicator light		Red light is on means the machine is on unload status or brake status.
		The light is off when it works normally.

5. Trouble Shooting

Fault Type	Description	Possible reasons and solutions
No display on LCD	The connection between the battery and the controller is not tight	Check the wiring and reconnect it.
	DC breaker is not on between battery and controller	Turn on the breaker
	Low battery voltage	The system parameters are not matched correctly. Recheck the label and parameters on the machine.
		The battery doesn't work. Install a new one.

	Battery is connected in wrong polarity to battery input terminals.	Need change the internal fuse in controller and reconnect the battery.
No charging	The connection cable between wind turbine and controller is loose.	Reconnect and fix the cables.
	Wind turbine output voltage hasn't reached the charging voltage,	Check whether the system voltage is reasonable.
	Wind turbine is in "Brake" status	Wait the wind turbine recover if it brakes automatically. Press the button for 5s to release the brake status if it brakes by hand.
	Battery is already fully charged.	Check if the battery voltage has reached its output overvoltage.

6. Technical Parameters

1KW

Model	WW10-48-48	WW10-240-48
Type	Boost	
Wind Turbine Input		
Rated input power	1kW	
Rated input voltage	56Vdc	
Input voltage range	0~64Vdc	
Start charge voltage	12Vdc (factory default, 8Vdc~64Vdc settable)	
Rated input current	21Adc	
Brake by hand	Keep press the button for 5s to unload completely, and then recover by hand. Switch "ON" the brake switch	
Brake by over current	25A (factory default, 0~25A settable) unload completely when reached the set current and recover automatically after working 10mins.	
Brake by overvoltage	Refer to "output overvoltage" control	Refer to "output overvoltage" control
Brake by over wind speed (optional)	18m/s (0-30m/s settable), unload completely when reached the set wind speed, and recover automatically after working 10mins.	
Brake by over rotational Speed (optional)	500r/min (factory default,0~1000r/min settable) Unload completely when reached the set rotational speed and recover automatically after working 10mins.	

Charge Parameters (optional)		
Rated battery voltage	48Vdc	240Vdc
Temperature compensation function (optional)	-3mV/°C/2V	
Output Parameters		
Rated output voltage	48Vdc	240Vdc
Start unload voltage	56Vdc (factory default, 44Vdc~64Vdc settable)	280Vdc (factory default, 220Vdc~320Vdc settable)
Complete unload voltage	60Vdc (factory default, add 4V to the start unload voltage)	300Vdc (factory default, add 20V to the start unload voltage)
Max. Output current	21A _{dc}	5A _{dc}
General Parameters		
Rectifier mode	Uncontrolled rectifier	
Display mode	LCD	
Display information	DC output voltage, wind turbine voltage/current/power. For those with charge control function, Battery voltage is showed as well.	
Monitoring mode (optional)	RS232/RS485/RJ45/GPRS/ Bluetooth /Zigbee	
Monitoring Contents	Real-time display: DC output voltage, wind turbine voltage/current/power. For those with charge control function, Battery voltage is showed as well.	
	Parameter setting: Output overvoltage point, wind turbine over current point, wind turbine start voltage, and wind turbine brake settings.	
Lightning protection	YES	
Conversion efficiency	≥92%	
Static loss	<2W	<2W
Ambient temperature	-20°C~+40°C	
Humidity	0~90%, No condensing	
Noise	≤65dB	
Cooling mode	Forced air cooling	
Installation mode	Wall-mounted	
Cover protection class	IP42	

Product dimension (W*H*D)	300×375×145mm
Product net weight	10kg
Dump load dimension (W*H*D)	360*80*120mm
Dump load net weight	2.8kg
Note: Part of parameters can be adjusted according to customer's specific demand.	

2KW

Model	WW20-48-48	WW20-48-240
Type	Boost	Buck
Wind Turbine Input		
Rated input power	2kW	
Rated input voltage	56Vdc	280Vdc
Input voltage range	0~64Vdc	0~320Vdc
Start charge voltage	12Vdc (factory default,8Vdc~64Vdc settable)	60Vdc (factory default,40Vdc~320Vdc settable)
Rated input current	42A	9A
Brake by hand	Keep press the button for 5s to unload completely, and then recover by hand. Switch "ON" the brake switch	
Brake by over current	50A (factory default,0~50A settable) Unload completely when reached the set current and recover automatically after working 10mins.	10A (factory default,0~10A settable) Unload completely when reached the set current and recover automatically after working 10mins.
Brake by overvoltage	Refer to "output overvoltage" control	320Vdc (factory default,220Vdc~320Vdc settable) PWM unload step by step once reached the set unload voltage, and it will unload completely if the voltage rise 20Vdc more.

Brake by over wind speed (optional)	18m/s (0-30m/s settable) Unload completely when reached the set wind speed and recover automatically after working 10mins.
Brake by over rotational Speed (optional)	500r/min (factory default,0~1000r/min settable)Unload completely when reached the set rotational speed, and recover automatically after working 10mins.
Charge Parameters (optional)	
Rated battery voltage	48Vdc
Temperature compensation function (optional)	-3mV/°C/2V
Output Parameters	
Rated output voltage	48Vdc
Start unload voltage	56Vdc (factory default,44Vdc~64Vdc settable)
Complete unload voltage	60Vdc (factory default, add 4V to the start unload voltage)
Max. Output current	42A
General Parameters	
Rectifier mode	Uncontrolled rectifier
Display mode	LCD
Display information	DC output voltage, wind turbine voltage/current/power. For those with charge control function, Battery voltage is showed as well.
Monitoring mode (optional)	RS232/RS485/RJ45/GPRS/Bluetooth/Zigbee
Monitoring Contents	Real-time display: DC output voltage, wind turbine voltage/current/power. For those with charge control function, Battery voltage is showed as well.
	Parameter setting: Output overvoltage point, wind turbine over current point, wind turbine start voltage, and wind turbine manual brake button.
Lightning protection	YES
Conversion efficiency	≥92%
Static loss	<5W
Ambient temperature	-20°C~+40°C
Humidity	0~90%, No condensing
Noise	≤65dB
Cooling mode	Forced air cooling
Installation mode	Wall-mounted
Cover protection class	IP42

Product dimension (W*H*D)	300×375×145mm
Product net weight	10kg
Dump load dimension (W*H*D)	300*400*210 mm
Dump load net weight	9kg
Note: Part of parameters can be adjusted according to customer's specific demand.	

3KW

Model	WW30-48-240	WW30-120-120	WW30-240-240
Type	Buck	Boost	
Wind Turbine Input			
Rated input power	3kW		
Rated input voltage	280Vdc	140dc	280Vdc
Input voltage range	0~320Vdc	0~160Vdc	0~320Vdc
Start charge voltage	60Vdc (factory default,40Vdc~320Vdc settable)	30Vdc (factory default,20Vdc~160Vdc settable)	60Vdc (factory default,40Vdc~320Vdc settable)
Rated input current	13A	25A	13A
Brake by hand	Keep press the button for 5s to unload completely, and then recover by hand.		
	Switch "ON" the brake switch		
Brake by over current	15Adc (factory default,0~15A settable) Unload completely when reached the set current and recover automatically after working 10mins.	30A (factory default,0~30A settable) Unload completely when reached the set current and recover automatically after working 10mins.	15Adc (factory default,0~15A settable) Unload completely when reached the set current and recover automatically after working 10mins.

Brake by overvoltage	320Vdc (Factory default), PWM unload step by step once reached the set unload voltage, and it will unload completely if the voltage rise 20Vdc more.	Refer to “output overvoltage”		
Brake by over wind speed (optional)	18m/s (0-30m/s settable), Unload completely when reached the set wind speed, and recover automatically after working 10mins.			
Brake by over rotational Speed (optional)	500r/min (factory default,0~1000r/min settable) Unload completely when reached the set rotational speed, and recover automatically after working 10mins.			
Charge Parameters (optional)				
Rated battery voltage	48Vdc	120Vdc	240Vdc	
Temperature compensation function (optional)	-3mV/°C/2V			
Output Parameters				
Rated output voltage	48Vdc	120Vdc	240Vdc	
Start unload voltage	56Vdc (factory default,44Vdc~64Vdc settable)	140Vdc (factory default,110Vdc~160Vdc settable)	280Vdc (factory default,220Vdc~320Vdc settable)	
Complete unload voltage	60Vdc (factory default, add 4V to the start unload voltage)	150Vdc (factory default, add 10V to the start unload voltage)	300Vdc (factory default, add 20V to the start unload voltage)	
Max. Output current	63A	25A	13A	
General Parameters				
Rectifier mode	Uncontrolled rectifier			
Display mode	LCD			
Display information	DC output voltage, wind turbine voltage/current/power. For those with charge control function, Battery voltage is showed as well.			
Monitoring mode (optional)	RS232/RS485/RJ45/GPRS/Bluetooth/Zigbee			
Monitoring Contents	Real-time display: DC output voltage, wind turbine voltage/current/power. For those with charge control function, Battery voltage is showed as well.			
	Parameter setting: Output overvoltage point, wind turbine over current point, wind turbine start voltage, and wind turbine manual brake button.			

Lightning protection	YES	
Conversion efficiency	≥92%	
Static loss	<5W	
Ambient temperature	-20°C~+40°C	
Humidity	0~90%, No condensing	
Noise	≤65dB	
Cooling mode	Forced air cooling	
Installation mode	Wall-mounted	
Cover protection class	IP42	
Product dimension (W*H*D)	360×440×191mm	300×375×145mm
Product net weight	13kg	10kg
Dump load dimension (W*H*D)	400×390×210mm	
Dump load net weight	12kg	
Note: Part of parameters can be adjusted according to customer's specific demand.		

**5-
10kW**

Model	WW50-48-240	WW50-120-240	WW50-240-240	WW100-240-240
Type	Buck		Boost	
Wind Turbine Input				
Rated input power	5kW		10kW	
Rated input voltage	280Vdc			
Input voltage range	0~320Vdc			
Start charge voltage	60Vdc (factory default,40Vdc~320Vdc settable)			
Rated input current	21A		42A	
Brake by hand	Keep press the button for 5s to unload completely, and then recover by hand.			
	Switch "ON" the brake switch			

Brake by over current	25A (factory default,0~25A settable) Unload completely when reached the set current and recover automatically after working 10mins.		50A (factory default,0~50A settable) Unload completely when reached the set current and recover automatically after working 10mins.	
Brake by overvoltage	320Vdc (factory default,220Vdc~320Vdc settable) PWM unload step by step once reached the set unload voltage, and it will unload completely if the voltage rise 20Vdc more.		Refer to “output overvoltage” control	
Brake by over wind speed (optional)	18m/s (0-30m/s settable), Unload completely when reached the set wind speed, and recover automatically after working 10mins.			
Brake by over rotational Speed (optional)	500r/min (factory default,0~1000r/min settable) Unload completely when reached the set rotational speed, and recover automatically after working 10mins.			
Charge Parameters (optional)				
Rated battery voltage	48Vdc	120Vdc	240Vdc	240Vdc
Temperature compensation function (optional)	-3mV/°C/2V			
Output Parameters				
Rated output voltage	48Vdc	120Vdc	240Vdc	240Vdc
Start unload voltage	56Vdc (factory default,44Vdc~64Vdc settable)	140Vdc (factory default,110Vdc~160Vdc settable)	280Vdc (factory default,220Vdc~320Vdc settable)	
Complete unload voltage	60Vdc (factory default, add 4V to the start unload voltage)	150Vdc (factory default, add 10V to the start unload voltage)	300Vdc (factory default, add 20V to the start unload voltage)	
Max. Output current	105A	42A	21A	42A
General Parameters				
Rectifier mode	Uncontrolled rectifier			
Display mode	LCD			
Display information	DC output voltage, wind turbine voltage/current/power.			

	For those with charge control function, Battery voltage is showed as well.		
Monitoring mode (optional)	RS232/RS485/RJ45/GPRS/Bluetooth/Zigbee		
Monitoring Contents	Real-time display: DC output voltage, wind turbine voltage/current/power. For those with charge control function, Battery voltage is showed as well.		
	Parameter setting: Output overvoltage point, wind turbine over current point, wind turbine start voltage, and wind turbine manual brake button.		
Lightning protection	YES		
Conversion efficiency	≥95%		
Static loss	<8W	<6W	<8W
Ambient temperature	-20°C~+40°C		
Humidity	0~90%, No condensing		
Noise	≤65dB		
Cooling mode	Forced air cooling		
Installation mode	Wall-mounted		
Cover protection class	IP42		
Product dimension (W*H*D)	360×440×191mm		
Product net weight	13kg		
Dump load dimension (W*H*D)	680×390×182mm	520×607×430mm	
Dump load net weight	19kg	45kg	
Note: Part of parameters can be adjusted according to customer's specific demand.			

7. Warranty

The AWS Wind controller is warranted for 5 years against fault or defect when operated and installed as detailed in this manual.