

**TPW-400N-12** 12V 400W Turbine  
**TPW-400N-24** 24V 400W Turbine

## NOTICE

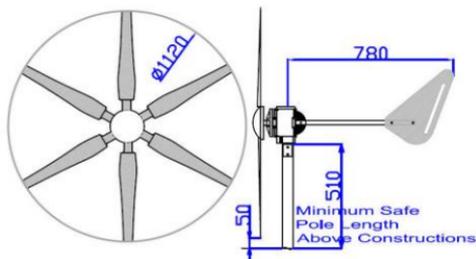
1. This information is believed to be reliable; however, We assume no responsibility for inaccuracies or omissions. The user of this information and product assumes full responsibility and risk.
2. All specifications are subject to change without notice.
3. Wind turbines must be installed following the guidelines established by local regulations.

## IMPORTANT

We include a battery charge controller with every wind turbine, this controller can only work with our wind turbine, it is not for individual sale.

If you do not use the recommended controller, please make sure the electric brake is properly designed and included in your electric circuit to prevent unexpected body injuries, property damage or death.

This wind turbine has a brake function and manual stop function, which is achieved with the supplied controller.



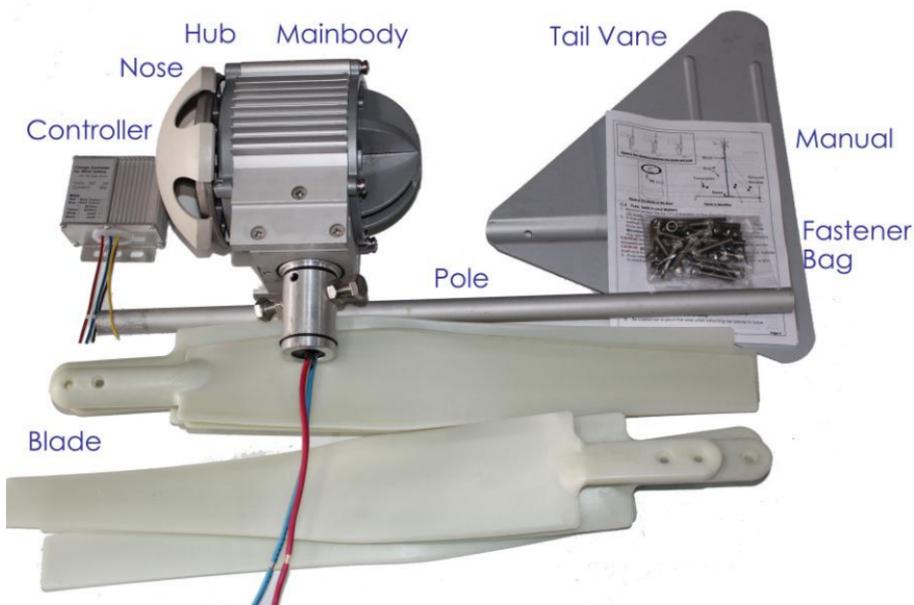
Rotor Diameter	1.12M
Net Weight	7 Kg
Cut-in Wind Speed	2.1M/S
Rated Power	250W
Max Power	400W
Pole Dimensions	Inner Diameter 41mm
Package Weight	About 10Kg

Figure 1-a: 400W Specification

## A. Package Contents

The wind turbine is shipped partially disassembled.

Please compare the parts shown in Figure 1 to ensure that all necessary parts are included.



### List of Materials:

1	Controller	1 pcs
2	Mainbody	1 pcs
3	Hub	1 pcs
4	Nose Cone	1 pcs
5	Blade	6 pcs
6	Pole for Tail	1 pcs
7	Tail Vane	1 pcs
8	Manual	1 pcs
9	Fastener & Tools	→

400W Fastener	Pcs	
M16 Nut	1	For Hub
Φ6*30 Screw	14 + 1 (spare)	For blades & tail
M6 Nut (Nyloc)	14 + 2 (spare)	For blades & tail
Tools		
5mm Hex Key	1	

## B. SAFETY PRECAUTIONS (Important)

1. Safety must be the primary concern as you plan the location, installation and operation. Please be aware of electrical, mechanical and blade hazards.
2. DO NOT install the turbine where anyone could approach the blades.
3. Use common sense and be careful.
4. Select the correct wire size, and the correct fuse size.
5. When installing, please make sure that the turbine is disconnected from the batteries.
6. Do not let the blades spin freely until the turbine is mounted on the pole.
7. Never approach the turbine during operation.

## C. Prepare for install

### C.1 The following general tools may be required for installing.

Multi-meter	Wrench or spanner
Screw driver	Heat shrink or electrical tape
Soldering iron	

### C.2 Controller

We include a wind battery charge controller with the wind turbine. It is used to protect the batteries and the wind turbine. You can also make your own hybrid system using solar panels and a solar charge controller. Refer to the solar controller user guide for details regarding wiring and operation of the solar controller.

### C.3 Wire

If the cross section area of the wires are NOT sufficient, the wires will heat up and could create a fire hazard. Please choose the right size of the wires.

Minimum Wire Size (X-Section Area):

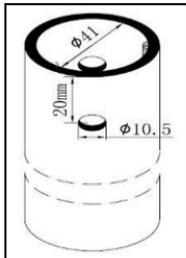
Distance From Batteries to Turbine	0-9M	9-18M	18-27M	27-45M
Wire X-Section Area for 12V Wind Turbine	4mm <sup>2</sup> 12AWG	6mm <sup>2</sup> 10AWG	8 mm <sup>2</sup> 9AWG	10mm <sup>2</sup> 8AWG
Wire X-Section Area for 24V Wind Turbine	2.5mm <sup>2</sup> 14AWG	4mm <sup>2</sup> 12AWG	6mm <sup>2</sup> 10AWG	8mm <sup>2</sup> 8AWG

### C.4 Pole or Mast

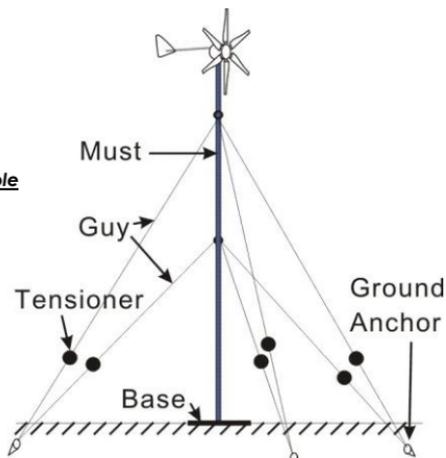
1. This wind turbine is designed to fit inside an aluminum or steel tube with a standard internal diameter of 41mm. Do not use plastic pipe. An inner diameter 41mm (1 5/8") iron pole is readily available (water pipe or scaffold tube). Usually it has an internal weld seam. The adapter of the wind turbine has a flat on one side to clear the seam.
2. A suitable mounting pole can be erected using a 6 meter galvanized tube supported by 3 or 4 guy wires.
3. Make sure a minimum 50 mm clearance is provided between the blade tips and any obstructions. Refer to [Figure 3](#).
4. Mark and centre-punch two positions diametrically opposite, at 90° to the pipe seam, 20mm from top of the tube (Refer to [Figure 4](#)).
5. Drill two 10.5mm diameter holes.



**Figure 3: The clearance between the blade and pole**



**Figure 4: The Whole on the Must**



**Figure 5: Mounting**

## C.5 Fuse, Switch and Meters

### 1. Recommended Size for Circuit Breakers or Slow-Blow Fuses:

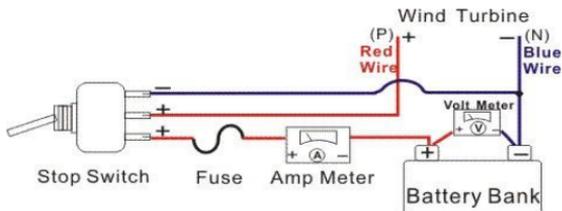
**12V model: 25A DC    24V model: 15A DC**

2. A stop switch is not necessary, but sometimes useful. It provides a convenient method for shutting down the turbine manually. A 20-amp single-pole double throw switch wired as shown in **Figure 6** is OK for this application. The switch disconnects the battery and then shorts the turbine wires causing the turbine to stop spinning (in high winds the blades will spin slowly).

**CAUTION:** The center post must be positive from the turbine. Outside posts can be swapped as either battery positive or battery/turbine negative.

**CAUTION:** **DO NOT** connect the turbine "backwards" to the battery (i.e. turbine positive to battery negative). This will damage the circuit inside the turbine.

3. If you need an Amp Meter (DC30A or 20A) and a Volt meter (DC30V or 50V) to monitor your system. Please see the **Figure 6**.



**Figure 6: Stop Switch Wiring**

## D. Installation

### D.1 Please follow these precautions during the installation:

- 1) **THINK SAFETY!** Have someone available to help when installing.
- 2) Disconnect batteries from turbine wiring.
- 3) Be careful not to pinch the wires when attaching the turbine to pole.

## D.2 Step-By-Step Instructions

### Fix the wires and the yaw bearing

- 1) Run the 2 wires from the controller (usually put the controller near the battery), through the pole to the top of the tower. DO NOT connect the wires to the battery until everything else has been completed. Strip the insulation back from each side of wires. Mark both ends of the wires with tape to identify the polarity: **Red = Positive (+); Blue = Negative (-)**

**CAUTION:** If you are uncertain of the polarity of the wires, simply spin the rotor shaft clockwise and measure the voltage direction with a volt meter.

- 2) Connect the wires from the wind turbine to the wires running to the controller. Insulate the connections using either heat shrink tubing or a quality electrical tape or wire nuts.
- 3) Once the wires are attached to the turbine, gently pull the wires down through the tower sliding the yaw shaft over the steel pipe. Slide the yaw shaft down over the end of the pole carefully, so as not to pinch the yaw wires. Leave enough slack in the wires so that, if necessary, the turbine can be removed from the pole.
- 4) Once the yaw shaft is mounted on the pole,
  - (A) First, firmly tighten the two 10mm screws with a wrench.
  - (B) Then, firmly tighten the two 10mm nuts to hold the pole tightly.

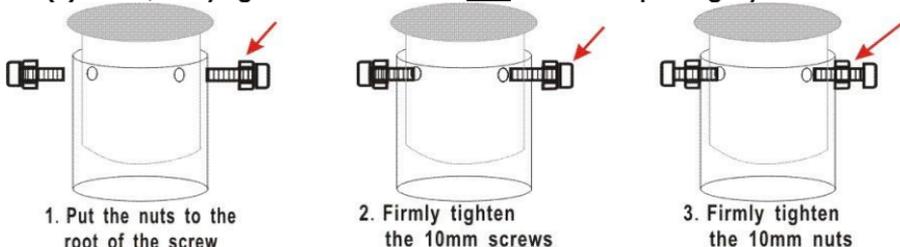


Figure 7

**CAUTION:** Make sure that your turbine is securely attached to the pole. Remember that this attachment will have to hold in high winds.



Figure 8.1: Blades & Hub



Figure 8.2: Cotter Pin



Figure 8.3: Tail Pole (400W)



Figure 8.4: Tail Pole (200W)

### Fix the blades and the Hub

- 5) Hold the shaft with a screw driver, turn the Hub anticlockwise to remove the Hub from the shaft. (The Hub is mounted to the shaft at the factory.)
  - 6) Attach the blades to the Hub. Securely tighten all the screws and nuts. (Figure 8.1)
- CAUTION:** Make sure the front face of the blade is toward the wind.
- 7) Put the M16 nut onto the middle of the Hub, then put the Hub on the top of the rotor shaft. Hold on the rotor shaft with a screw driver and turn the Hub clockwise to tighten it onto the shaft. (Figure 8.1)

- 8) Insert the cotter pin into the small hole on the top of the shaft. (Figure 8.2)
- 9) Assemble the nose cone to the head of the shaft by snapping into place.

### Assemble the tail

- 10) Attach the tail vane to the tail pole, securely tighten the screws and nuts.
  - 11) For 400W turbine, insert the end of the pole into the hole of the rear cover, securely tighten the screws. (Figure 8.3); For 200W turbine, refer to Figure 8.4.
- CAUTION:** *The tail vane should be perpendicular to the ground.*

### Connect the controller < Please see the controller guide>

- 12) Run the wires from the turbine to the Controller. Attach positive (Red) wire to a fuse. Attach wires to the Controller.  
**Red** = Positive (+); **Blue** = Negative (-)
- 13) Before attaching the wiring from controller to the battery, make sure:
  - All circuit breakers are in the off position
  - The stop switch is in the "stop" or shorted position (if installed).
- 14) Attach wires to the battery.
- 15) Turn on the stop switch if you have installed one.
- 16) You have now completed the installation process.

### D.3 Operation

Check support structures, blades, and electrical systems.

1. Do not let the rotor blades come in contact with a solid object. Use common sense about safety when locating the turbine.
2. Before you inspect the wind turbine or approach the path of the blades, disconnect the power leads from the battery and tie the wind turbine output leads together (short-cut) to stop or slow down the blade rotation. The turbine can also be shut down through the use of a stop switch. See Figure 6.
3. The bearings in the turbines may require about 100 hours of operation in normal wind before they are running at peak efficiency. It is called 'break-in period'.

### D.4 Trouble shooting

1. An AMP meter is recommended to be connected in your system, to verify the output current when the blades are rotating.
2. The wind turbine has an auto-protect device. It will shut down when over speed, over voltage or over current is detected and will reset automatically.

Wind turbine	Please Check
No output	If controller and battery are well connected,. Battery voltage, make sure it is not over-charged, or failed.
	Connect the battery without the controller, to see if current is OK.
	Check the controller, check the fuse inside it.
Vibration	Check if all the fasteners are fixed tightly.
Click-click noise	Check if all the fasteners are fixed tightly.
	Check if the blades move smoothly.

If you can't determine cause of the problems, such as 1) big vibration; 2) no output; 3) very small output in large wind; please uninstall the wind turbine immediately and check. You can check voltage output by disconnecting from battery and spinning by hand. Voltage measured at output leads should be >12V for 12V model and >24V for 24V model. If low or no output turbine may require repair.

# Wind Battery Charge Controller Guide

- This controller is designed for our Wind Turbine to charge Lead-Acid battery only. It is not designed to work with other equipment.
- We include this controller free with our wind turbine. It also can help lower the total cost of your renewable power system.
- Please use the corresponding voltage rating model for your particular system.
- Do not exceed the current rating (20A). If the load is larger than 20A, please connect the load directly to the battery.
- For a single wind turbine, please follow the *Figure b*.
- In a wind and solar hybrid power system, please follow the *Figure c*. You can use a solar controller with this wind controller.

## X.1 Diagram

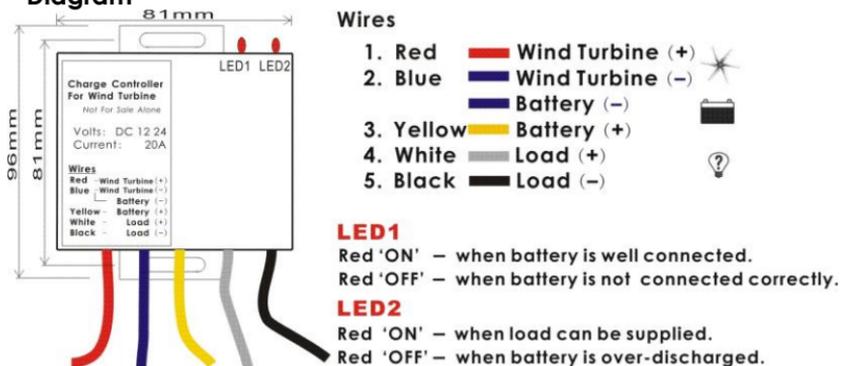


Figure a. The diagram of the controller

## X.2 Wiring the controller in wind system

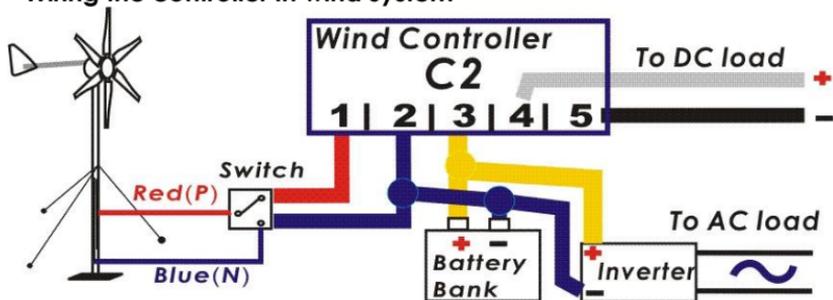


Figure b. Wiring the controller with a wind turbine

1. The switch is optional.
  2. First, connect the wind turbine red wire(+) and blue wire(-) to the controller red(+) and Blue(-) wires.
  3. Second, connect the DC load (+) and (-) to the White(+) and Black(-) controller wires.
- Note:** Do not connect Black controller wire to case ground.
4. Third, connect the battery (+) and (-) to the Yellow (+) and Blue (-) controller wires. The left LED1 will be ON.

**Note:** Please connect the Wind Turbine(-) and the Battery(-) together to the blue wire of the controller.

5. Sometimes an inverter is desired to provide AC power for your load.

**Note:** If you have an inverter in the system, please connect it directly to the battery. Most inverters have a low battery detection feature.

### X.3 Wiring a wind and solar hybrid system.

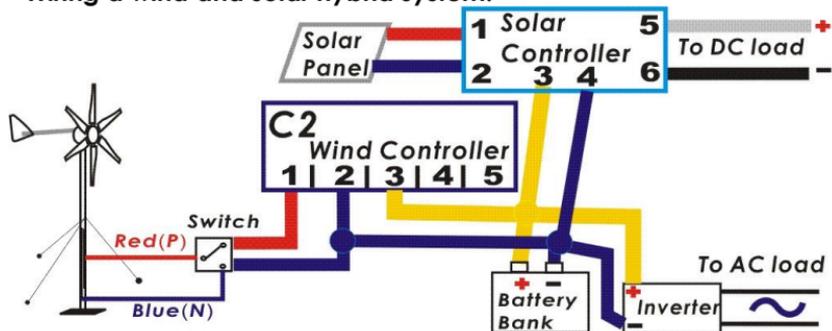


Figure c. Wiring the controller with a wind turbine

1. Follow the Figure c or Figure d when wiring the hybrid system.
2. The DC load can connect to the solar controller. In the hybrid street lamp system, choose a solar controller with lamp control function. This system is lower cost and more stable.

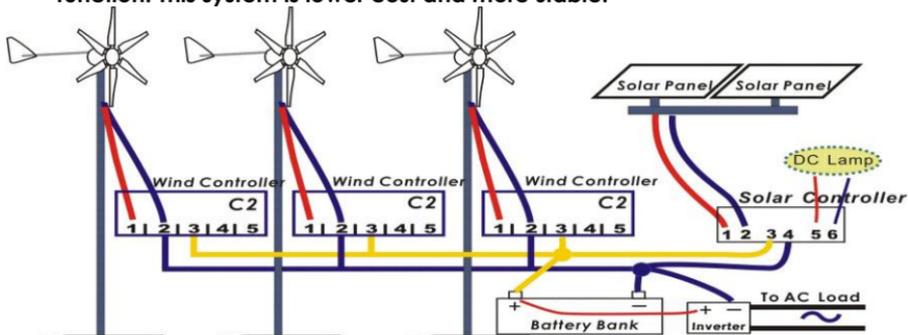


Figure d: System Wiring

### X.3 Specification of the Controller:

Voltage	12V or 24V
Max amp of Fuse	20A
Self-consumption	6 mA
Temperature	-40 to +60°C
Enclosure	IP65

	12V Type	24V Type
Battery Disconnect(Over-charged)	16.1V	32.2V
Battery Reconnect	14.7V	30.3V
Low V Disconnect (Over-Discharged)	11.0V	22.0V
Low voltage Reconnect	12.2V	24.0V

1. After over charge condition, the controller will resume working when the battery is back to 14.7V (or 30.3V for 24V battery).
2. After over discharge condition, the controller will resume working when the battery voltage is over 12.2V (24V for 24V battery).