



Aerofortis
Energy Solutions, Inc.

A-400 Ducted Wind Turbine

User Manual



Contents

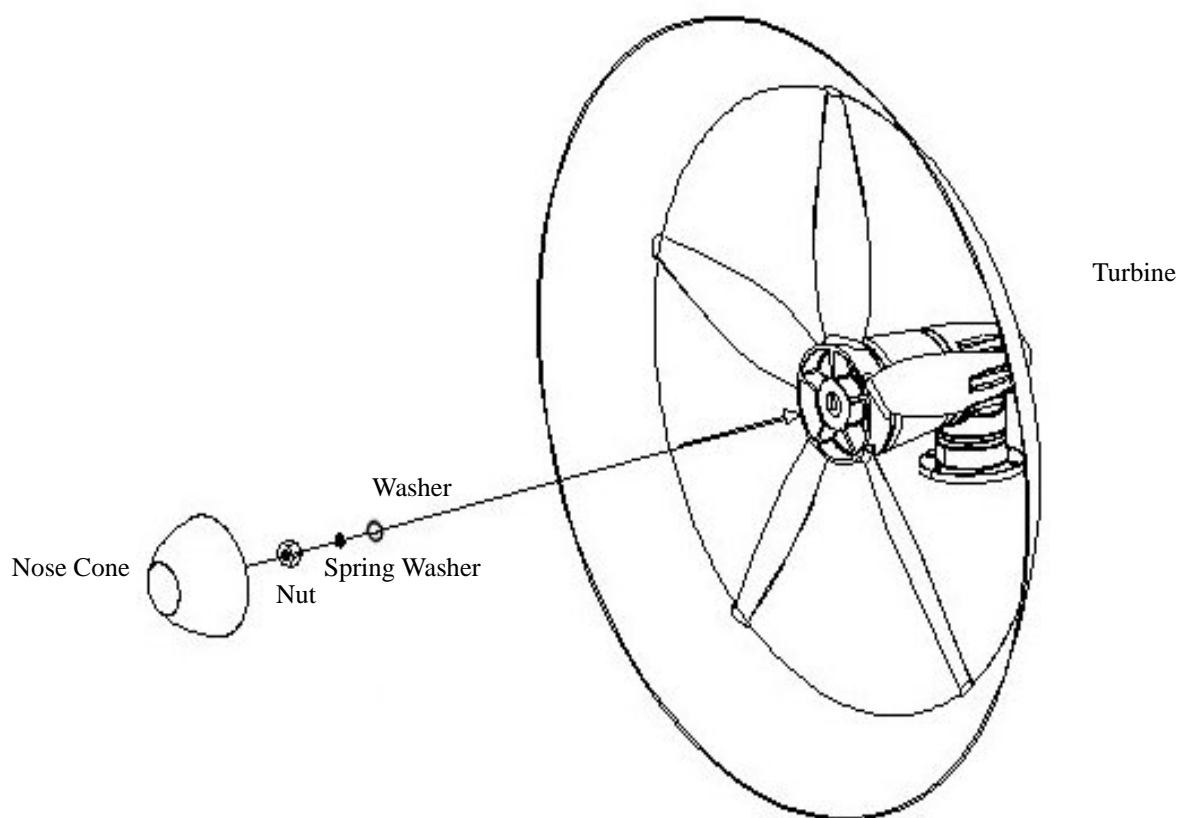
Assembly-----	P3
Installation-----	P4
Terminal Block Wiring Instructions-----	P5
Wiring Diagram-----	P6
Specification-----	P7
LED Display-----	P8
Charging Current Management Control-----	P9
Operation-----	P10
Load Control-----	P11
Protection Mechanism-----	P13
Warning-----	P13



Aerofortis
Energy Solutions, Inc.

Assembly

1. Attach blade to turbine.
2. Fasten washer, spring washer, and nut onto turbine. Then fasten nose cone.






Installation

- Before installation, confirm the polarity and diameter dimension of wire that link to batteries and solar panels. 24V 200AH battery is suggested.
- Confirm that the voltages of solar panel, wind turbine and battery are among the range shown in the specification.
- Install charger in cool, dry and ventilated location. Keep away from combustible.
- Do not use wires that are too long or use wires that has smaller diameter; the length of wires should not exceed 5 meters.

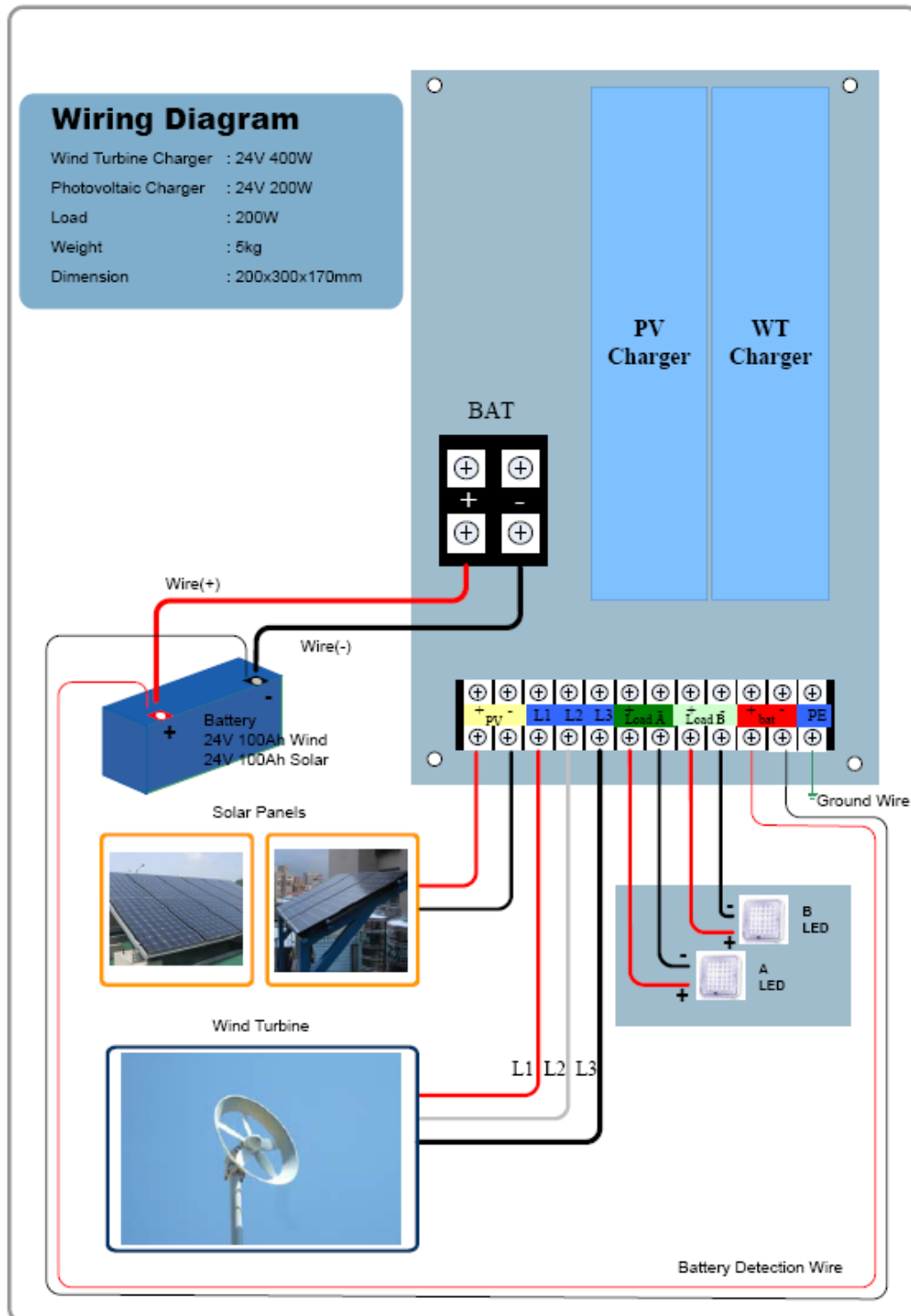
Terminal Block Wiring Instructions

 Please confirm that the charger and battery are connected before connecting wind turbine (solar panel) to charger.

 Remove the connection between wind turbine (solar panel) and charger before disconnecting the battery and charger.

- **L1 L2 L3** : Wind turbine output terminal
- **PV+ PV-** : Solar panel output terminal
- **BAT+ BAT-** : 24V Battery terminal
- **bat+ bat-** : 24V Battery terminal, battery voltage detection
- **PE** : Ground wire
- **LOAD A** : Discharge for 12 hours at night or day time
- **LOAD B** : Discharge control mode, able to set the desired time of discharge

Wiring Diagram



Specification

Model	A-400C	
	Solar	Wind
Rated/Max Power	200W	300/400W
Input Voltage Range	6~50Vdc	11~70Vac
Charging Start/Stop Voltage	6V/4Vdc	11V/8Vac
Rated Input Current	15Adc	7Adc
Max. Charger Efficiency/MPPT Efficiency	>85% / >90%	
Sleeping Mode/Solar Start Voltage	10Vdc @1min	
Battery	24Vdc min.200AH	
Max. Charging Current	9Amp	10Amp
Float Voltage	27.6V±5%	
Battery Protection Voltage	28.8V±5%, 1min charging per 10 mins	
Load Discharge Voltage	24V±5%	
Load Discharge Stopping Voltage	23V±5%	
Load DC Output Current	DC 16Amx	
Load Management	16 Seg.	
Sleep Mode Battery Voltage	21V±5%	
Sleep Mode Power	<0.1mA@sleep mode	
Operational Temperature	-40~60°C	
Damp and Moisture Proof	Optional	
Dimension (HxWxD)	200x300x170mm	
Weight	5kg	

LED Display

Maximum power point tracker (MPPT) charging instruction with display of battery voltage status and discharge output mode.

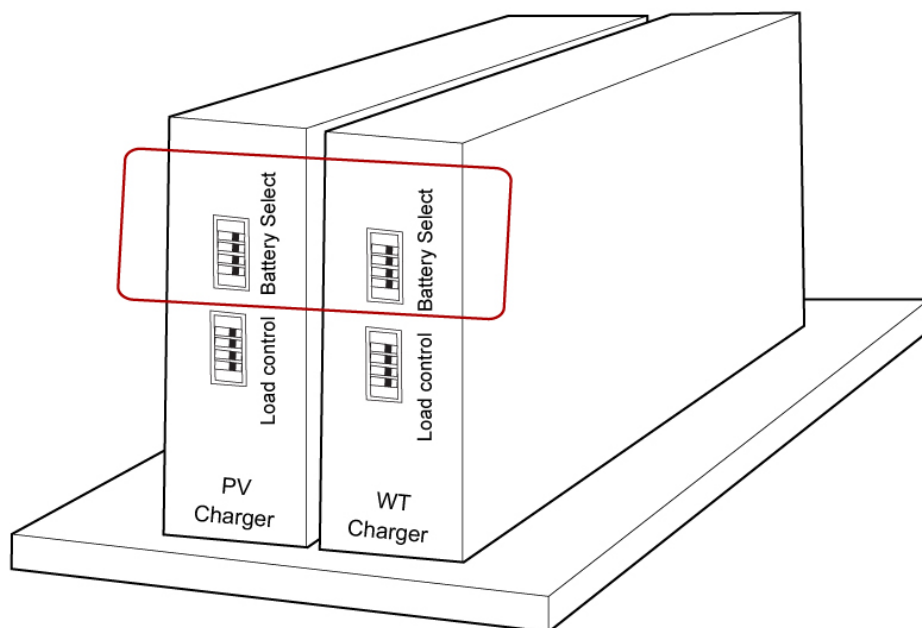
Indicator light	Status	A-400C
Solar (RED LED)	Flashing	Flashes every second while charging
Battery (RED LED)	Flashing	Stop discharging below $23V \pm 5\%$
Battery (RED LED)	Bright	$24V \sim 25.6V \pm 5\%$
Battery (YELLOW LED)	Bright	$25.6V \sim 27.6V \pm 5\%$
Battery (GREEN LED)	Bright	Above $27.6V \pm 5\%$
Load (GREEN LED)	Flashing	Flashes every second while discharging






- **SOLAR (RED LED)** : Solar MPPT flashes every second while charging.
- **WIND (RED LED)** : Wind MPPT flashes every second while charging.
- **BATTERY (RED LED)** : Battery low lighting, the output discharge are prohibited when flashing every second.
- **BATTERY (YELLOW LED)** : Battery normal lighting.
- **BATTERY (GREEN LED)** : Battery full lighting.
- **LOAD (GREEN LED)** : Loading discharge flashes every second.



Aerofortis
Energy Solutions, Inc.

Charging Current Management Control



Discharge Mode (0/OFF, 1/ON)	Charge Current
0001 	5A
0010 	10A
0100 	15A
1000 	20A
0000 	25A

Operation

Discharge Mode Option:

LOAD A : Discharge for 12 hours at night or during day time

LOAD B : Total of 16 stages and 14 switch modes

Day or Night Mode Judging Function: The function is in accordance to the input voltage of solar panel. To apply this function, install the solar panel in advance.

Day or Night Judging Time: Wind-solar hybrid charger determines day time and night time through the input voltage of solar panel. The initial judging time will require 20 minutes, and 10 minutes afterwards. Mode will activate during the coming day time or night time, for example, setting of night time mode at 9:00 am will be in effect later that day. Setting of day time mode at 9:00am will be in effect on the next day.

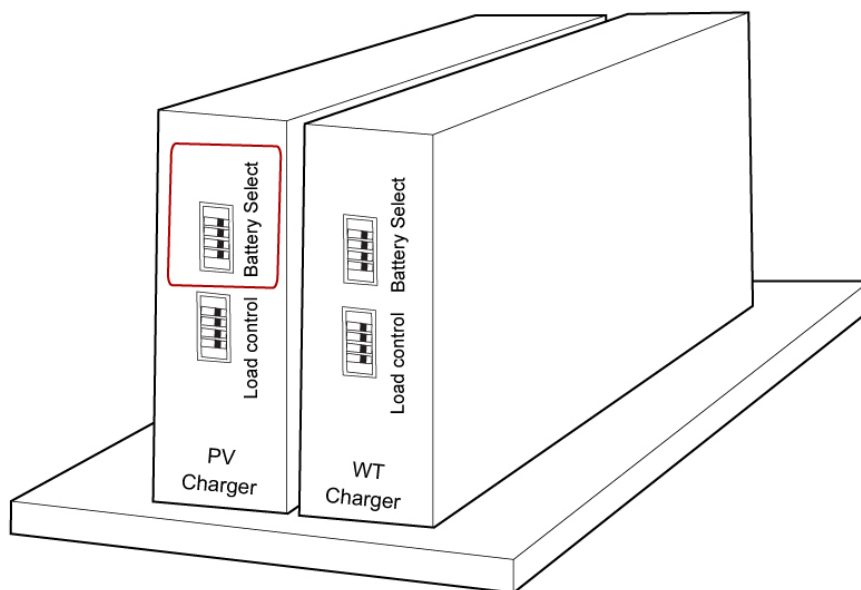
Discharge Mode	Initial Judging Time After Switched On	Judging Time	Load A Discharge Time	Load B Discharge Time
Test Mode	Immediate	Immediate	24 Hrs	5 Mins
Day Mode	20 Mins	10 Mins	Day time	Setting Time
Night Mode	10 Mins After PV	10 Mins	Night Time	Setting Time
24 Hrs Mode	5 Seconds	5 Seconds	24 Hrs	24 Hrs

- **Charger in Day Time Mode:** The charger automatically activates and charges the battery through wind and solar energy. Discharge will activate if charger has adjusted to daytime discharging mode.
- **Charger in Night Time Mode:** The charger will continue to charge through wind energy, but charging through solar energy will end; charger will activate the discharge automatically if discharging mode has been adjusted to night time mode.



















Aerofortis
Energy Solutions, Inc.

Load Control



LOAD B can adjust the time of discharge, 16 stages of load adjustment in total.



Discharge Mode (0/OFF, 1/ON)	LOAD A	LOAD B
0000 	Off after 5minutes of load testing	Off after 5minutes of load testing
0001 	Night time output	2hrs night time output
0010 	Night time output	4hrs night time output
0011 	Night time output	6hrs night time output
0100 	Night time output	8hrs night time output
0101 	Night time output	10hrs night time output
0110 	Night time output	12hrs night time output

0111		All day output	all day output
1000		Off after 5minutes of load testing	Off after 5minutes of load testing
1001		Day time output	2hrs day time output
1010		Day time output	4hrs day time output
1011		Day time output	6hrs day time output
1100		Day time output	8hrs day time output
1101		Day time output	10hrs day time output
1110		Day time output	12hrs day time output
1111		All day output	All day output

Protection Mechanism

- **Exceeding Voltage Input Protection:** Protect the charger from thunder struck.
- **Low Battery Voltage Protection :** When battery voltage is below the protection point, the charger will stop discharging and remain charging in order to prevent the battery from over discharging.
- **Battery Over Charging Protection :** When battery voltage is higher than the charging limit, charger will shut down and activate the floating mode, which will charge for 1 minute in every 10 minutes.

Warning

-  Do not install any wind turbine, solar panel and battery which are beyond the charger's stated specification.
-  If the polarities between charger and wind turbine are misplaced, the internal fuse will be blown. This will cause eternal damage to charger.