

HX-VWG2008

Wind & Solar Hybrid Charge Controller

User Manual



Please read this manual very carefully. Failure to do so may result in serious injury and permanent damage to the hybrid charge controller and attached wind turbine. While every attempt has been made to ensure the information contained in this guide is accurate, we advise that we will not be liable for any omissions or inaccuracies.

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A: Safety

This manual must be fully read and understood before installation.

If you feel you do not have the necessary ability to connect this device contact your distributor.

Failure to connect the hybrid charge controller as indicated in Part C of this manual could result in the destruction of both the hybrid charge controller and the wind turbine.

Wind turbines **must** be connected to a load at all times. The hybrid charge controller is designed to fully protect the attached turbine.

Other important matters:

- Do not allow the unit to be exposed to moisture, rain or other liquids
- Protect the unit from direct sun and excess heat
- Ensure the unit is protected from unauthorised access including children
- Ensure all components are rated at the same voltage i.e. If you have a turbine rated at 12 volts, the solar panel and battery should also be rated at 12 volts. The same applies for 24 volt systems.
- Ensure the total wattage of the unit is not exceeded ie for the HX-VWG2008 the TOTAL input is 600 watts with the ideal mix being 500 watt turbine and 100 watt solar
- Ensure all connections are firmly tightened
- Select suitably wire sizes for the currents being generated

B: Features

The HX-VWG2008 hybrid charge controller is a smart controller.

The integrated micro computer monitors all the necessary inputs and outputs to ensure precise control.

Key features:

- LCD display with input keys to allow user to alter values
- The unit will store information such as
 - Total amps generated
 - Total Kw hours generated
 - Amps used by load
 - And many more
- Connection of both solar and wind
- Auto sensing of voltage of batteries connected
- Ensures the battery is maintained in best possible condition by preventing overcharging and over discharging.
- Automatic braking of the turbine when battery fully charged and/or no load connected
- Automatic braking of the turbine when charge current is too high i.e. in very high winds
- Manual brake switch
- A “Load” output where external devices can be switched on and off at user determined voltages.
- The “load” output is also current limited to protect the connected device
- Brake time is programmable
- Reverse polarity protection for both battery and solar panel.
- Protection from lightening strike

C: Connection

IMPORTANT: Failure to connect the hybrid charge controller as indicated could result in the destruction of both the hybrid charge controller and the wind turbine and possible serious injury or death.

Refer to connection diagram on next page.

Do not erect or connect the turbine to the charge controller in windy conditions.

Always have the 3 wires from the turbine shorted together if not connected to the hybrid charge controller.

Ensure correct polarity is observed at all times i.e. Positive (+) to positive and negative (-) to negative for ALL connections. Failure to comply to this will void warranty.

Steps:

1. **Always** connect the battery to the charge controller **first** as shown in the diagram on the next page.
2. Ensure brake switch is on.

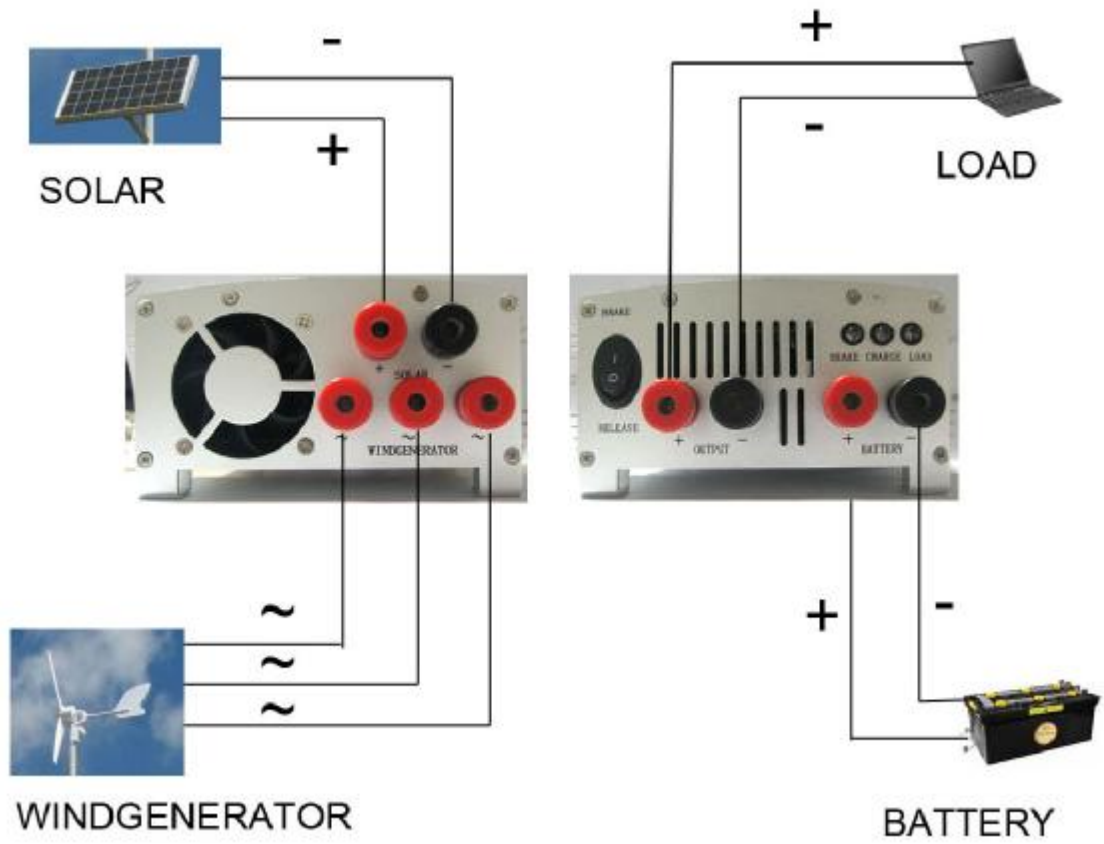
Do not proceed to the next step in windy conditions.

3. Remove one wire from the turbine leaving the other two shorted together and connect it to the hybrid charge controller as shown below
4. Remove the second wire and connect it to the hybrid charge controller. Note that at this point there is no load on the turbine until the second wire is connected to the hybrid charge controller so do this step as quickly as possible and NEVER do this in windy conditions.
5. Connect the third turbine wire.

The turbine is now protected.

6. Connect solar if have it as shown below.
7. Release brake switch and confirm turbine spins
8. Do not connect the load at this time until you have programmed the hybrid charge controller to values to suit the load

Connection diagram



8GA cable size is recommended for short cable runs < 15 metres and heavier cable for longer runs to reduce cable losses

D: Menu system

HX VWG2008V2 NL/H B ---- LCD display MENU ---- press button

n Menu display



n Boot screen

HX VWG2008V2 NL B: 12V battery mode

HX VWG2008V2 NH B: 24V battery mode

n Examine battery voltage and charge current

U xx.xxV I xx.xx A: U (Battery voltage, unit: V) I (charge current, unit: A)

n Setup battery charge-off voltage

Charge off xx.xx V à + - à Charge off xx.xx V

n Examine charge cumulative AH:

Charge xxxAh Charge (charging AH, Unit: AH)

n Examine wind generator and PV total power generated

Charge xxx KWH: Charge (power generated, Unit: KWH)

n Examine wind generator and PV instantaneous power

Power xxx W Power (Instantaneous power, Unit: Watts)

n Examine discharge total AH

User xxx Ah: User (discharge AH, Unit: AH)

n Setup load power off voltage

User off xx.xx V à + - à User off xx.xx V

n Setup load boot-strap voltage

User on xx.xx V à + - à User on xx.xx V

n Examine discharge current

User XX.XX A

n Setup brake current

Brake on XXA à + - à Brake on XXA

n Setup brake time

Brake time xxx SEC à + - à Brake time xxx SEC

n Load over current protection

Load overCurrent à Reset à HX VWG2008V2 XXV

E: Understanding batteries and suggested menu settings

The HX-VWG2008 hybrid charge controller is preconfigured with default settings in the user programmable locations.

	Default 12 volt battery	Default 24 volt battery
Charge off	14.32 volts	28.64 volts
User off	10.98 volts	21.97 volts
User on	12.44 volts	24.88 volts
Brake current	40 amp	20 amp
Brake time	50 seconds	50 seconds

The information below is provided as a guide only. The users should do their own research.

Wet Cell (flooded), **Gel Cell**, and **Absorbed Glass Mat (AGM)** are various versions of lead acid batteries.

Lead acid batteries should never be run flat. The maximum recommended discharge is 75% of the total. This means that the battery should have a minimum of 25% of charge remaining when it is put on charge.

The chart below indicates the amount of charge a battery has at the voltages shown.

Charge State	12 volt battery	24 volt battery
100% (fully charged)	12.65 volts	25.30 volts
75%	12.45 volts	24.90 volts
50%	12.24 volts	24.48 volts
25%	12.06 volts	24.12 volts
Discharged	11.9 volts	23.8 volts

If you wish to get the maximum life from a battery it is best to ensure it is not discharged more than 75% at any time. In fact slightly less is ideal.

Therefore for maximum battery life set User off to 12.46V (24.92V) and User on to 12.65V (25.30V)

If you use very little load and the turbine is constantly braking due to a fully charged battery condition reducing the Charge off voltage to 13.5V (27V) will also prevent constant overcharge conditions.

F: Troubleshooting

Condition	Cause	Fix
No display	Battery discharged, not connected or faulty	Recharge battery, check connections or replace battery
LCD Display "Overload"	The load is drawing excess current	Correct overload condition (short circuit?) and press Reset
Turbine not spinning	Brake switch is on	Turn off brake switch
Battery not charging	Battery too old	Replace battery

G: Specifications

Main parameters:

MODEL	VWG2008
Rated Power	600W (Best rasion: wind turbine500W, PV cells100W)
Applicable batteries	12/24V,100-300Ah(automatic distinguish voltage)
Wind turbine automatically braking voltage	17.5V/32.5V (DC voltage after rectification)
Battery full charge cut	14.4V/28.8V(default, adjustable)
Battery low voltage disconnect load	10.5V/21.8V (default, adjustable)
Load on voltage	12.6V/25.2V(default, adjustable)
Charge current max	40A/20A
Load current max	35.61A/17.80A
Recovery time after the automatic braking	1min(default, adjustable)
No load loss	≤40mA
Dimensions	228×133×75mm
Weight	1.2kg
Working environment	Environment temperature -10℃~+50℃, Relative humidity 0~90%