WWS20-48 Wind/Solar Hybrid Charge Controller - Specification Sheet

Model: WWS20-48 **Type:** Wind/Solar Hybrid Charge Controller (PWM) **Compatibility:** Designed for off-grid wind and solar power systems, suitable for 2kW wind turbines (like Sunnily X2000) and solar panels.

Electrical Specifications

Parameter	Value	Unit	Notes
Rated Battery Voltage	48	V DC	
Rated Wind Turbine Input Power	2000 (2)	W (kW)	
Maximum Wind Turbine Input Power	3000 (3)	W (kW)	Allows for peak power handling.
Wind Turbine Input Voltage Range	0 - 64	V DC	
Wind Turbine Brake Current	42	A	Engages electromagnetic braking.
Rated Solar Input Power	600	W	For combined wind and solar charging.
Max. Solar Open Circuit Voltage	96	V DC	
Rated Solar Input Current	13	A	
Charge Shutoff Voltage	58 (approx. 57.4 - 58)	V DC	Prevents battery overcharging.
Charge Recovery Voltage	54 - 52.8 (approx.)	V DC	Charging resumes when battery voltage drops.
Battery Under Voltage Shutoff	43.2	V DC	Protects battery from over-discharge.
Battery Under Voltage Recovery	48	V DC	Allows battery to recover before load reconnection.
Max. Output Current	42	A	Total current to battery/load.
Rectifier Mode	Uncontrolled rectifier		For converting AC from wind turbine to DC.
Conversion Efficiency	≥95	%	
Standby Power Loss (Quiescent Current)	≤65(≤20)	mA	Low power consumption when idle.

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Control & Protection Features

- **PWM Charging Mode:** Optimized for efficient battery charging and extended battery lifespan.
- **Automatic Dump Load Function:** Diverts excess power to an external dump load resistor to prevent battery overcharging and turbine over-speeding in high winds.
- **Manual Brake Function:** Allows for manual stopping or slowing of the wind turbine.
- **Comprehensive Protection:**
  - Battery reverse polarity protection.
  - Battery open circuit protection (controller not damaged if battery is disconnected).
  - Solar panel reverse charge protection (battery won't charge PV panel in reverse).
  - Solar panel anti-reverse connection protection.
  - Over-voltage braking (adjustable setting for output overvoltage point).
  - Over-current braking (adjustable setting for wind turbine overcurrent point).
  - Short-circuit protection.
  - Lightning protection.
- **Battery Type Compatibility:** Supports Lead-Acid, Gel, AGM, and often Lithium batteries (may require parameter adjustment via communication port for lithium).
- **Temperature Compensation (Optional):** Adjusts charging voltage based on ambient temperature (e.g., -3mV/°C/2V or -4mV/°C/2V).
- **Micro-current Charge Function (Optional):** Enables gentle charging at low wind speeds.

Display & Monitoring

- **Display Mode:** LCD (Liquid Crystal Display)
- **Display Information:**
  - DC Output Voltage
  - Wind Turbine Voltage, Current, Power, RPM (Revolutions Per Minute - optional with sensor)
  - Battery Voltage, Charge Status (graphical indicator for full/over-discharge/over-charge)
  - PV (Solar) Voltage, Current, Power
  - System Faults (e.g., Over Voltage, Under Voltage, Over Load, Short Circuit)
- **User Interface:** Multi-function selector button and LED indicators.

Communication & Optional Functions

- **Communication Ports (Optional):** RS232, RS485, RJ45, GPRS, Bluetooth, Zigbee.
- **Remote Monitoring:** Via PC software or mobile app (with appropriate communication module).
- **Parameter Setting:** Allows setting of output overvoltage point, wind overcurrent point, and manual brake settings.

- **Wind Speed Detection (Optional):** Displays real-time wind speed.
- **Rotational Speed Control (Optional):** Displays real-time wind turbine rotational speed.
- **Dry Contact Signal Output (Optional):** For starting external devices (e.g., diesel generator).
- **SD Card Function (Optional):** Stores system history data.
- **Touch Screen Display (Optional):** 4.3-inch TFT touch screen display.

Mechanical & Environmental

- **Dimensions (L x W x H):**
  - Approx. 440 x 425 x 170 mm (Controller)
  - Note: Dump load box dimensions may vary if separate. Some listings show 420 x 440 x 175 mm or 445 x 425 x 170 mm.
- **Net Weight:** Approx. 11 kg - 12 kg (Controller only; dump load box is separate weight).
- **Cooling Mode:** Fan (some sources also mention natural cooling).
- **Installation Mode:** Wall-mounted.
- **Protection Grade:** IP20 (Indoor protection), not waterproof. Must be installed in a well-ventilated, sheltered environment.
- **Ambient Temperature Range:** -20°C to +55°C (or -20°C to +40°C for some variants).
- **Ambient Humidity:** 0-90% RH (No Condensation) or 35-85% RH (No Condensation).
- **Noise Level:** ≤65 dB.
- **Altitude:** ≤4000 m.