

Photonic Universe

Sealed maintenance-free 500Ah 2V AGM VRLA deep cycle battery

Model AGM-DC-2V500AH

INSTRUCTION MANUAL

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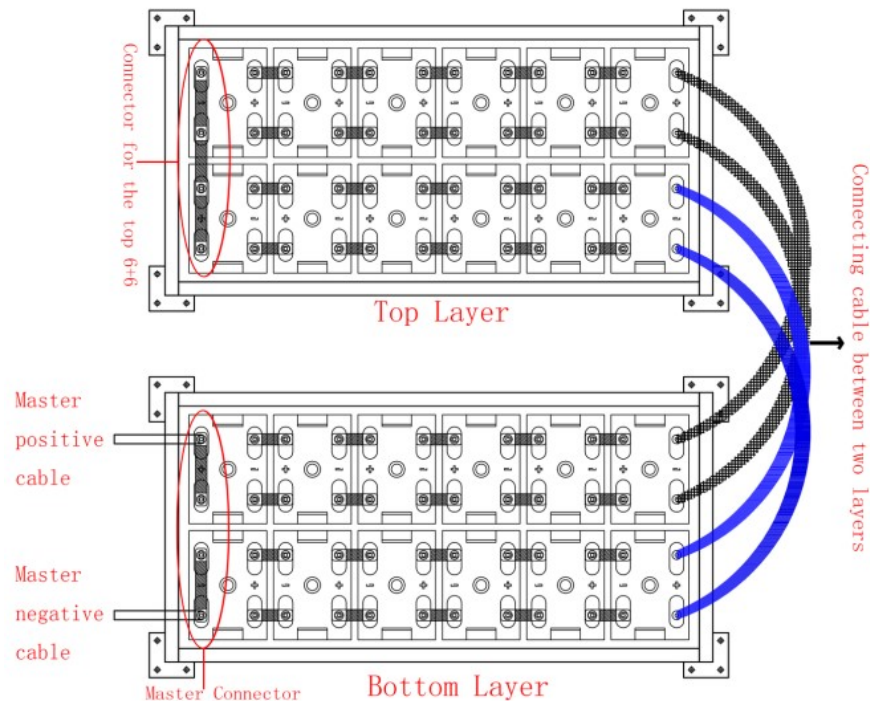
Web: www.photonicuniverse.com

I. INSTALLATION AND CONNECTION

- A) Keep the battery in a cool, dry, ventilated and clean place.
- B) When connecting the wires, screw all the nuts, bolts and washers tightly.
- C) If you use the battery within other equipment, keep it away from a heat generating source (e.g. transformer) and install it in an upright position as low as possible with proper ventilation.
- D) The battery may produce combustible gas. Avoid installation in a closed compartment or near sparks (e.g. near a switch or fuse)
- E) Use well insulated tools when installing the battery.
- F) Avoid using the battery in the following places:
- Areas exposed to direct sunlight or any heat source
 - Areas with radiant heating, infrared radiation or ultraviolet radiation
 - Areas filled with organic solvent, vapour, dust or corrosive gases and substances
 - Areas with abnormal vibration or risk of mechanical damage
- G) When connecting the battery to a charger or a load, keep the circuit switched OFF and connect the battery's positive(+) terminal to the positive(+) pole of the charger or the load and the battery's negative(-) terminal to the negative(-) pole of the charger or the load.
- H) Never use batteries with different capacities or different performance characteristics within the same battery bank. Do not use new and old batteries together in the same bank.
- I) Ambient discharge temperature: from -10 °C to +40 °C.

II. CONNECTION SCHEME

- A) To form a 48V battery bank, connect 24 x 2V batteries in series as shown on the diagram below using metal plate connectors and heavy duty cables:



Use a separate [Installation manual for the 48V battery bank on a rack](#) for details about assembly, installation and connection of the battery bank and the racking unit. This separate manual is included in your battery bank delivery.

Make sure you always tighten the terminals well. Loose connections reduce performance, generate heat and increase the risk of fire.

After your battery bank has been assembled, put covers on top of batteries (if they are included with your batteries) and make sure that there are no other objects above the battery bank which might fall on it.

III. CHARGE & DISCHARGE *(data and values are provided per 1 battery)*

A) CHARGE

● For Cycle Use

(when the battery is used as a regular power source and it's discharged / charged frequently)

Charging voltage (at 25 °C)	Initial charging current	Temperature coefficient
2.30V – 2.35V	100A max	-5mV/°C

If the battery is in cycle use, it is important to fully charge it regularly to minimise sulphation that may cause a reduction in battery capacity. For best results use an intelligent multi-stage battery charger / charge controller and make sure the battery is charged all the way to the final stage.

● For Standby Use

(when the battery is mainly used as an emergency power source)

Charging voltage (at 25 °C)	Initial charging current	Temperature coefficient
2.26V – 2.28V	100A max	-3mV/°C

Note: at the end of charging, the battery will generate flammable gas. Avoid using the battery near sources of heat, sparks or in closed containers.

B) Discharging Current & Cut-off Voltage

In order to extend the lifetime of your battery, please do not allow it to get discharged completely. The final battery voltage at which you should disconnect any load and stop discharging the battery depends on the discharging current:

Discharging Current (A)	< 10A	10A - 80A	80A - 120A	120A - 300A	> 300A
Load cut off voltage (V)	1.85V	1.8V	1.75V	1.7V	1.6V

IV. HANDLING INSTRUCTIONS

A) Storage and refresh charge

1. Store the battery in a cool, dry place
2. During storage, the charge held by the battery decreases due to constant self-discharging. When the monthly average temperature is more than 25°C but less than 40°C, please carry out supplementary charging every 3 months. When the monthly average temperature falls below 25°C, please carry out supplementary charging every 6 months.

3. When you need to use the battery after storage, always carry out supplementary charging first.

B) Transportation

1. When transporting the battery, protect it from excessive vibration or mechanical impact.
2. We recommend transporting the battery in the upright position.
3. When transporting the battery used within some other equipment, secure it firmly and keep the circuit open and power switched off.
4. Never transport the battery when it is loaded on a rack.

C) Daily Inspection and Servicing

1. When the following abnormalities are observed, discover the cause and replace any defective batteries:
 - a. Any voltage abnormalities
 - b. Any physical defects (e.g., a cracked or deformed container)
 - c. Any electrolyte leakage
 - d. Any abnormal heat generation
2. Clean any dust contamination with a wet cloth. Never use organic solvents (e.g., petrol or thinner), otherwise the container or cover may develop cracks.
3. When installing the battery as an emergency power supply for fire-fighting or other equipment, inspect it according to the existing standards and regulations.

D) Dos & Don'ts

DOS:

1. Sealed lead-acid battery must be recycled or disposed of properly.
2. Examine the appearance of the battery before use.
3. Recharge the battery that has been stored more than 3-6 months.
4. Charge the battery in a well-ventilated environment.
5. Secure the battery firmly when installing it.
6. Switch your equipment / load off when you connect or disconnect the battery.
7. Protect your eyes and skin when working with the battery
8. Use well insulated tools

DON'TS:

1. Do not expose the battery to flames or excessive heat, keep it in a cool and ventilated place.
2. Do not burn the battery or put it next to / into fire.
3. Never short-circuit the battery positive and negative terminals.
4. Do not use the battery in a closed container without proper ventilation.
5. Do not dissect the battery.
6. Do not throw, drop or treat the battery roughly. Always treat it as a fragile product.
7. Do not attempt to use a cracked, deformed or leaky battery.
8. Do not expose the battery to excessive vibration or anything which can cause mechanical damage.



Disclaimer

Working with electricity and batteries can be dangerous. The information provided in this manual is for general guidance only. All work should follow the safety standards and should be carried out by an appropriately qualified person.

Photonic Universe Ltd is not responsible for any damage or injury caused by inappropriate installation or use of the product.