



CSPower BATTERY TECH LIMITED

Office Add. : 309, One Dimensional Space, , Xin'an Street, Bao'an District, Shenzhen China.

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Warranty Certificate

To All Of Our Respected Clients:

We (CSPower Battery Tech Co.,Ltd.) is a battery factory who owns 15 years of history of production battery plates and batteries. so far we have series different as below:

- CS12 series: 12V SLA AGM battery with 5-10 years design float life;
- CL2 series: 2V Deep Cycle AGM battery with 10-15 years design float life;
- FT12 series: 12V front terminal AGM battery with 8-10 years design float life;
- HTD6/12 series: 6V/12V Deep Cycle AGM battery with 10-15 years design float life;
- CG12 series: 12V durable GEL battery with 10-15 years design float life;
- FL12 series: 12V front terminal Gel battery with 10-15 years design float life;
- CG2 series: 2V Deep Cycle GEL battery with 15-20 years design float life;
- HTL12 series: 2V Deep cycle Gel battery with 15-20 years design float life;
- OPzV2 series: 2V Gel tubular plates battery with 20-25 years design float life;
- HLC12 series: 2V Deep cycle Gel battery with 15-20 years design float life;

Basing on different design float life, we provide different warranty by years:

- CS12 series: 1-3 years warranty by floating use at 25 degree
- CL2 series: 3 years warranty by floating use at 25 degree
- HLC12 series: 3 years warranty by floating use at 30 degree
- FT12 series: 2-3 years warranty by floating use at 25 degree
- HTD6/12 series: 2-3 years warranty by floating use at 25 degree
- CG12 series: 2-3 years warranty by floating use at 25 degree
- FL12 series: 2-3 years warranty by floating use at 25 degree
- CG2 series: 3 years warranty by floating use at 30 degree
- HTL12 series: 3 years warranty by floating use at 30 degree
- OPzV2 series: 5 years warranty by floating use at 30 degree

During above mentioned warranty period, if you find battery has any factory quality problem which leads battery can not give correct performance, please take photo to show us: 1. Battery code 2. What is the problem of the battery. We will give replacement generally in next of your shipment (in special situation, we can arrange ship them separately as soon as possible).

But following situations can show us that fault of battery comes from incorrect usage instead of factory fault.

We will not give replacement with following situations:

1. Over Discharge:

The reasons of resulting in over discharge :

- A, The voltage of the battery charging system was set too low or fails, eg : when floating use, the voltage is lower than 13.2V, the voltage is less than 14V when cycling use, etc. ;
- B, The voltage of discharge protection for the battery load system was set too low, or there is a fault , for example: the discharge voltage is lower than the 10V, etc. , still no deadline discharge;
- C, In the solar systems, the power of the solar charging panels is configured not enough (or no supplemental of wind , etc.) ,or haven't do recharge for the battery after discharge every time.

How to judge over discharge of battery:

open voltage of this fault battery is significantly low, generally less than 12V .



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Step one: use fixed 0.1C current charging this fault battery for 12 ~ 15hrs , the battery voltage returns to normal , then it means this battery was over discharge and now it comes back to normal and can be used continually.

Step two: if even after step one, this fault battery does not come back. Then please try to open top cover of one piece of fault battery (by professional person) and check voltage of each cell with a multimeter. If each cell's voltage are relatively consistent , there is no any one or two cell's voltage is significantly lower. Then it still means this battery was over discharged but it can not come back to normal.

2. Over Charge:

The reasons of resulting in over charge :

The voltage of the battery charging system was set too high or faults , eg : when floating use, the voltage is higher than 13.8V, and the voltage is higher than 14.9V when cycling use, etc.

How to judge over charge of the battery: open voltage of fault battery is significantly high (but there are a few cases, the voltage is low).

Step one: Try to open top cover of one piece fault battery (by professional person), check inside of cell, you will find every cell batteries are relatively dry, check with a multimeter, you can found that every single cell voltage are also more consistent.

Step two: try to fill in right amount of distilled water into each single cell (by professional person), then recharge the battery, battery voltage comes back to normal and it can give normal performance.

3. Improper operation:

Resulting in man-made damage to the battery, eg : battery casing damaged by dropping , etc. , over tighten the screws when wiring , causing terminals ignition when using the battery , etc. ;





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BATTERY USER MANUAL

1. NOTE

Thanks for choosing our valve regulated sealed free maintenance AGM/ GEL/Lead carbon battery. In order to use the battery safely and properly, please read the user manual before use. Please keep the manual so can accordingly when need.

The cell mentioned below means 2V unit cell in battery, accordingly, 12V battery has 6 cells, and 6V battery has 3 cells.

2. FOR SAFETY

Before use the battery, please read the manual carefully, as improper use may lead to battery leakage, hot, fat, explode even casualties. If you can not read this manual, please contact with us before use.

DANGER

1. Battery may release hydrogen, so please do not install this battery in the sealed environment or equipment which may occur spark.
2. Never connect with direct conductor between positive terminal and negative terminal of battery, and confirm the tool such as spanner used to install the battery is covered by electrical insulator. Because battery short circuit may lead to explode even casualties.
3. Never use this battery together with other different type battery (such as NiCD battery), otherwise may have risk of explode.

WARNING

1. Please charge the battery according to this manual, other ways may lead to battery leakage or other damage in risk.
2. Do not install the battery in humid area, to avoid battery terminals been corroded or electric shock risk.
3. Please wear insulating gloves when testing batteries, to avoid electric shock risk.
4. Please confirm the positive and negative correct when using batteries.
5. Do not put the battery near fire.
6. Do not open the battery, may lead to battery leakage or risk of fire.
7. Please replace the battery once expired, to avoid battery leakage or risk of fire.
8. Please flush with water once contact sulfuric acid with eye or skin.

ATTENTION

1. Do not use the battery once it is corroded, break, fat or hot, please contact with us at once to avoid risk.
2. Keep the battery away from children.
3. Below is the battery normal use temperature range, if work beyond this may shorten the battery life or lead to damage:

Charge: 15~30C

Discharge: 15~30C

Storage: 20~30C

4. The discharge current can not be higher than the limits, to avoid battery leakage, hot or explode.
 5. Move the battery from the equipment which not been used long time, as the over discharge of battery will shorten the battery life and performance.
 6. Do not weld on battery terminals directly, to avoid battery leakage.
 7. Do not use the battery inverted.
 8. Do not crash the battery.
 9. Do not clean the battery with organic solution, cleaner, paint or oil, to avoid the cover leak.
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3. INSTRUCTIONS



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3.1 CHARGE

A. FLOAT CHARGE

1. The constant charge voltage of battery is 2.27V/cell (25°C). When ambient temperature is below 5°C or above 35°C , adjust the constant charge voltage according to the temperature compensation factor, the recommended factor is -3.3m V/°C/cell.
2. The initial charge current is 0.25CA or less, C means the rated capacity Ah of battery, A means current Amp.
3. Suggest to charge in ambient temperature between 5°C and 35°C , to extend battery life.

B. CYCLE CHARGE

1. The constant charge voltage of battery is 2.37~2.40V/cell (25°C). When ambient temperature is below 5°C or above 35°C , adjust the constant charge voltage according to the temperature compensation factor, the recommended factor is -5m V/°C/cell.
2. The initial charge current is 0.25CA or less, C means the rated capacity Ah of battery, A means current Amp.
3. To avoid over charge, suggest to stop charging or reduce the constant charge voltage to 2.275V/cell (25°C) after finish charging.
4. Suggest to charge in ambient temperature between 5°C and 35°C , to extend battery life.
5. If need fast charge, please contact us.

3.2 DISCHARGE

1. The continuous discharge current can not higher than 3CA, and maximum discharge current (5s) can not higher than 6CA.
2. The discharge current and end of discharge voltage according to Table1. Long time over discharge will shorten battery life.

Table1: (C means the rated capacity Ah of battery)

Discharge Current (A)	End of Discharge Voltage (V/cell)
(A)<0.1C	1.80
0.1C≦(A)<0.2C	1.75
0.2C≦(A)<1.0C	1.70
(A)≧1.0C	1.60

3. Recharge the battery immediately after discharge, do not stock the battery before charge full. If the battery has not been charged long time after discharge, it will be problem to recharge to full capacity.

3.3 INSTALL

1. Confirm the battery appearance normal then install the battery to fixed place. Please ensure the battery install tightly and safely, to avoid strike or distortion.
2. When the battery installed in equipment, please keep it away from heater (transformer etc.), install it vertically in the place as low as possible, and ensure good ventilation.
3. The battery may release harmful gas, Do not install it in sealed environment and keep away from flammable (switches or fuse).
4. Use correct torque on all terminals, ensuring every connecting nut and screw is secure; see torque settings as Table 2

Table 2 Suggested Torque

S/N	Terminal	Torque
T1	M5	2.0~3.0 N*m
T2	M6	4.0~6.0 N*m
T3	M8	10~14 N*m



T4	M10	17~19 N*m
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5. Do not make the terminal distortion or weld directly.
6. Caution:
 - A. Avoid exposed to sunlight.
 - B. Avoid radiation with extreme infrared ray or ultraviolet ray.
 - C. Avoid contact with organic fog, dust or corrosive gas.
 - D. Avoid unusual vibration.
7. When connect the battery with charger or load equipment, ensure the switch is off, and connect the battery positive with positive of charger and equipment, the battery negative with negative of charger of equipment.
8. Do not mix use batteries with different capacity, different type or new and old.

4. CAUTIONS

4.1 BEFORE USE

A. STORAGE AND AUXILIARY CHARGE

1. During storage, the battery will discharge itself, place the battery in the environment cool and dry. Auxiliary charge at least once must be realize every three months, 100% full discharge and charge at least once must be realize every 12months.

CHARGE	CHARGE TIME (H)	AMBIENT TEMPERATURE (°C)
CONSTANT VOLTAGE 2.45V/cell	6-12	15-30
CONSTANT CURRENT 0.05CA	6-12	

2. Please charge the stock battery to full before use it.

B. TRANSPORT

1. Avoid violent vibration or strike.
2. Place the battery vertically during transport.

4.2 DAILY INSPECT AND USE

1. The battery will damage and need replace when happen below:
 - A. Voltage unusual.
 - B. Any physics affect (strike or distortion)
 - C. Battery leakage.
 - D. Very hot.
2. Clean the battery just with wet cloth, Do not clean the battery with organic solution, cleaner, paint or oil, to avoid the cover leak.
3. 100% full discharge and charge must be realized at least once every 6 months. User must inspect the battery capacity every year. The charge after discharge adopt constant voltage charge with limit current.
Voltage: 2.40V~2.45V/cell, Current<0.2CA, Time: 18~24hours.