

Date: 2022/02/16



智慧能源 服务世界

II – Rule 8 – 3 – 1 – 1



After receiving the complaint, the aftersales department will respond within 8 hours. Within 3 working days provide solution. Within 1 week of internal implementation to analyze the problem, find out the cause, the plan to improve and preventive. Finally, in 1 month, conduct a test to check the effectiveness of the improvement plan.

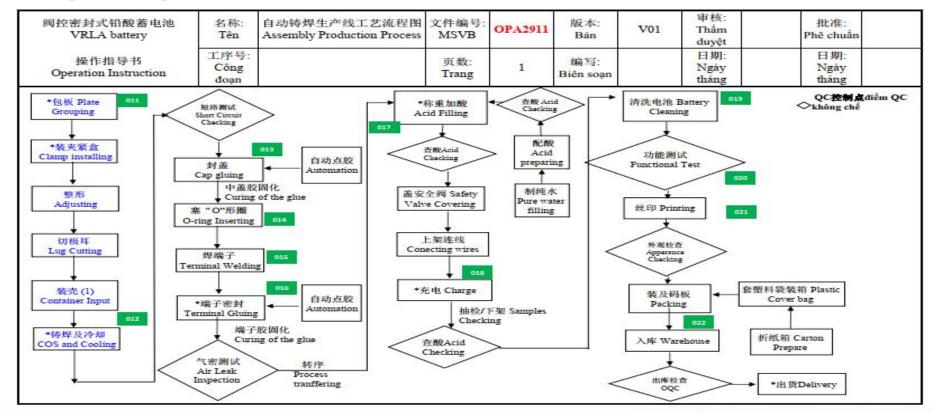


For Schneider customer (APC Philippines), proceed according to the 1+2+2 principle, within 1 day provide temporary corrective action, 2 weeks provide 8D report and within 2 months complete the whole improvement items.



1. The production process, parameters, application and maintenance of the battery.

A. The production process (refer to OPA2911 document)





Product models



- AGM CP Series
- AGM FM Series
- AGM UPS Series
- AGM CT&CTA Series

- CG Series
- EV Series
- AGM HP&HF Series
- Deep Cycle Series

AGM CP Series



General Features

- Adequate capacity
- Sealed Construction
- Long Services Life
- Maintenance-Free Operation
- Heavy Duty Grid
- Low Self Discharge



From 0.8Ah to 28Ah

- Alarm Systems
- Communications Equipment
- Toys
- Electronic Cash Registers
- Emergency lighting Systems
- Fire & Security System
- Geophysical Equipment
- Marine Equipment
- Medical Equipment
- Solar Powered System
- Telecommunications System
- Television & Video Recorder
- Uninterruptible Power Supplies
- Electrical System
- Vending Machines

AGM FM Series



General Features

- High Reliability and Good Quality.
- Deep Discharge Recovery .
- High Power Density .
- Long Service Life.



From 17Ah to 230Ah

- UPS
- Telecom Systems
- Solar Systems
- Cable TV
- Electric Wheelchair
- Power Station
- Marine Equipment
- Military Equipment
- Golf Car
- Electric Fork
- Electrical System
- Railway System



AGM CT&CTA Series



General Features

- Maintenance-Free Operation
- Low Self-discharge
- Front access terminals for easy and quick connection
- Low internal resistance
- Lower self discharge
- Design life 12+ years

From 50Ah to 200Ah

- Communication equipment
- Uninterruptible power supplies
- Telecommunication systems
- Electronic cash registers
- Microprocessor based office machines
- Other standby power supplies

AGM HP&HF Series





General Features

- Maintenance-Free Operation
- Positive and negative plates in lead-calcium tin alloy
- Operates at a low internal pressure.
- Power rang from 13W to 890W per cell for 10' @ 1.60Vpc
- Design life :HP-5 years/HF-10 years

From 4.5Ah to 200Ah

- Office machines and Computers
- Telecommunications
- UPS Equipment
- Electrical System
- Vending machine

Deep Cycle Series



General Features

- Maintenance-Free Operation
- Environmentally friendly
- High Reliability and Good Quality
- Deep Discharge Recovery
- High Power Density
- Long Service Life, in Float or Cyclic
- International Standard, JIS and DIN



- Solar Systems
- Wheelchair
- Golf Cart
- Marine Equipment
- Power Station
- Railway Systems
- Telecom Systems
- Cable TV Systems
- Emergency Power System



CG Series



From 55Ah to 3000Ah

Introduction

• Our company is the first one to develop real power gel battery in strict accordance with international standards in china.

General Features

■ With the Sonnenschein gel technologies and standards, use the Germany most advanced high porosity PVC-SiO2 separator, and the silica gel fixed electrolyte.



C. The role of batteries for the fields





C. The role of batteries for the fields



UPS stands for "Uninterruptible Power Supplier", which means uninterruptible power supply. More simply, this is a backup power storage device, a device that has the function of preventing data safety and system safety problems when there are continuous power outages. When working with a desktop computer or other peripheral devices, if the power goes out, it will greatly affect the internal components. Therefore, the **UPS** - The connection point between the devices and the power source is created to overcome this situation by using a built-in battery. In addition, many people also use **UPS** to power fire alarms or security cameras continuously regardless of the main power being cut off.

The internal structure of the **UPS** consists of one or more batteries used to store electrical energy. And a board that converts direct current into alternating current with frequency and voltage suitable for use needs is 220V or 110V.





C. The role of batteries for the fields

Why use UPS?

For UPS users, computer equipment, household appliances, and office equipment are protected in the safest way, without disrupting production and business activities. At the same time avoid data loss that can cause serious damage to information security. Based on to the UPS, electronic devices are used with longer life, long-term companion with consumers, less damage. Switching speed is fast, less than 0 minutes, helping electrical equipment to operate safely, stably and without worrying about power failure at any time.

UPS on the market includes 2 main and popular types:

- * UPS Offline is used by many families because of its low demand, low cost and small operating capacity. This device contributes to overcome the unstable current situation, meeting the power consumption activities of the family.
- * UPS Online used for systems with large capacity, including many devices. However, the price is high. Therefore, USP Online is used a lot in businesses and corporate offices. If the family can afford it, they can also buy and use it.

智慧能源 服务世界 www.vision



C. The role of batteries for the fields

Telecomunication

In recent times, the phrase "telecommunications battery" is often mentioned a lot on forums and e-commerce websites. So what is "telecommunications battery" and why is it so concerned?

The telecommunications battery is actually an airtight battery (Type AGM VRLA - Absorbent Glass Mat / Valve Regulated Lead Acid). Batteries are airtight ie gas cannot escape; Once the gas cannot escape, the solution in the battery cannot "get out" in all different positions. If the battery is drained, it will not be able to function. The slower the evaporation of the solution, the longer the battery life. Therefore, the life of the battery will also increase accordingly. This product line is specifically designed for the telecommunications industry, solar panels (solar system), or places with strict requirements for the highest stability and durability. The two positive and negative poles of the products of this line are often designed to be very slim. This is understandable, as this battery is not intended for starting purposes but for environments where a steady discharge current is required and the discharge current is maintained for a long period of time. This product line is designed to be very diverse for many different purposes. Telecom batteries are very heavy in weight as well as possessing a lifespan 3 to 4 times longer than starter batteries.

www.vision-batt.com 智慧能源 服务世界



C. The role of batteries for the fields



What is a solar power system?

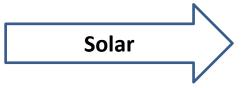
We will first introduce more about solar power system so that everyone knows better. This is a renewable energy source that our country and developed countries around the world are exploiting together. In the near future solar energy promises to be the main energy source of the world.

Solar power is electricity converted from sunlight through solar panels. Based on the photoelectric effect of the semiconductors inside the solar panel. To exploit solar energy, we connect many devices to form a solar power system. From there, it converts the light energy of the sun into electricity to provide for human activities and production.





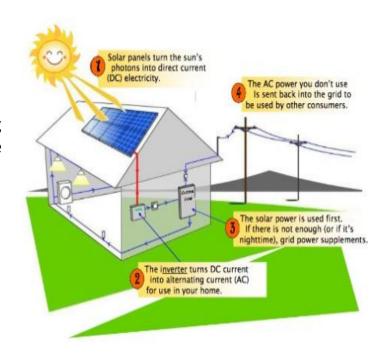
C. The role of batteries for the fields



Structure of solar power:

Solar battery system also known as photovoltaic battery. Solar panels are responsible for collecting and converting solar energy into electricity. Then supply power to the whole system to operate.

- * Solar charging: The solar charging system is responsible for ensuring the charging of energy from the solar cell to the battery system. Make sure that the batteries are not overcharged or over-discharged. Helps the battery as well as the system to work better and prolong the life.
- * Inverter converts the power source: The inverter device is responsible for converting the DC power of the solar cell to the standard 220v sine alternating current.
- * Storage battery system: The batteries are used to store electricity. Then provide for the consumption load when the grid power is lost or the solar power system does not produce electricity.





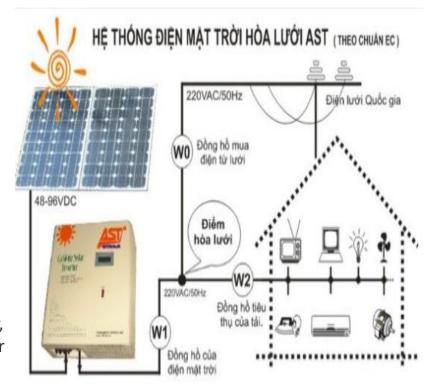
C. The role of batteries for the fields



Working principle of solar power:

First, the solar battery system is installed on the roof, wall or other convenient places to receive the most sunlight. Sunlight shining directly on the solar cell will be converted into direct current by photovoltaic effect.

This direct current will be converted by the inverter device into alternating current. When the current is stimulated into 220v standard sine alternating current with the same capacity and frequency as the national electricity. Then, through solar charging, the storage battery system will be fully charged. Then directly connected to the state grid. Both power sources will supply power to the power consuming loads in parallel. However, priority will be given to using solar power. Only when solar power does not produce enough to supply the system, will the consumed loads receive electricity from the national electricity.





D. Maintenance

1. Cleaning

- Keep the bottle and the environment clean and dry.
- Avoid creating an electrostatic environment during cleaning.
- Use a cloth to wipe, do not use gasoline, alcohol or organic solvents to clean.

2. Inspection and maintenance:

In order to understand the operation of the battery and equipment, to prevent problems when using, we conduct periodic product inspection according to the following steps:

Monthly maintenance

Quarterly maintenance

Yearly maintenance



--- Check periodically every month.

| Checklist | Check content | Standard | Maintenance |
|--|---|---|--|
| 1. Total floating charge voltage of the battery group. | Use a voltage meter at the positive and negative terminals. | The measured value and the value on the system are not much different. Error voltage after charged must be less than 50mV. | Using the controller to adjust the voltage without setting the allowable range, it is necessary to repair the controller. |
| 2. Battery case | Swollen, leaking or damage | Normal case | Determine the cause and replace if necessary. If the battery swells, it must be replaced immediately, avoiding close proximity to each other will easily cause fire and explosion. |
| | Dust, dirty Are the connector and terminals rusty? | No rust | Use wet cloth to clean Clean the rusted part, replace the connector and spray anti-rust solution. |
| 3. Battery temperature | Use an infrared thermometer to measure the temperature of the terminal and the battery shell. Measure ambient temperature inside and outside the site. | Smaller than 35°C In range 25 5 °C | If the temperature is higher than the standard, check the cause and deal with it accordingly. If the ambient temperature is high, it is necessary to install air conditioning equipment for the site |



Check periodically every month.

| | Use torque to check the terminal connection. | Pay attention to the connection part of the terminal. | Re-tighten if the connection is loose | |
|-------------------------------|--|---|---|--|
| 4. Connection | Clean connector and terminals | No rust | Disassemble the connect and clean all the rust, replacif the connecting rod is to rusty. Reconnect after spraying antirust solution. | |
| 5. Safety valve checking (2V) | Manually check the tightness of the safety valve. Check the air release part of the safety valve, there are no air bubbles around the safety valve. | The plug is not loose. There will be periods when there will be air bubbles. | Re-tighten the loose plug. The safety valve opens or closes continuously is an abnormal situation, we should replace the valve with a new one. Also check the amount of solution lost in the battery. | |
| 6. Convert | When disconnected from AC power will automatically switch to UPS or DC power | When AC power is available, it will automatically stop moving to UPS or DC power. | - | |

智慧能源 服务世界



Periodic check every quarter.

| Checklist | Checking content | Standard | Maintenance |
|---|--|--|---|
| 1. Floating charge voltage of each battery | Use a 4.5 digits multimeter to measure the temperature of the floating charge voltage and the battery compartment. | the compartment must be according to the | If the deviation is more than the allowable standard, discharge the power and recharge the battery, then follow up within 1-2 months after floating. If deviations persist, contact the manufacturer. |
| 2. Restoration of batteries with voltage drop prevention. | 1. Boost charge for the whole group within 10 hours or more, serious condition must conduct recharging 3 times to replenish. 2. Restore the battery compartment in on-line mode: remove the connector and proceed to charge directly for the battery with reduced capacity. | voltage difference between the battery cells must meet the following standards: | |
| 3. Activate the discharge process | Perform a charge-discharge cycle, using a standard low boost charge to proceed. | Discharge about 30% of rated capacity. | For a floating charging system that has not discharged for 6 months, proceed as follows. |



Periodic check every year.

| Checklist | Checking Content | Standard | Maintenance |
|----------------------|---|------------------------------|--|
| 1. Do discharge test | | | With non-standard results, discharge the electricity and boost charge again, then follow up within 1-2 months after the transfer. If deviations persist, contact the manufacturer. |
| 2. Capacity test | Battery discharge atcurrent C10 to 1.80V/cell | Maintain 80% higher capacity | Check the relevant data during discharge, if there is any low capacity. |

智慧能源 服务世界



*Battery problems.

Low capacity.

Low voltage.

Swelling.

Leakage

→ Short-Circuit

→ High IR

Burning



Low capacity.

| Title | =: | IR-Measurement | | | | | | | | | | | | | |
|----------|-----------|----------------|-----------|------|-----------|---------------------|----------------|-----------------------------|--|--|----------------------------------|--------------------|--------------------------------------|------------------|----------------------------|
| | | Batterietype | | | data acco | rding to data sheet | | meas | ured data | | | | d | ischarge tes | t |
| Batt Nr. | ArtNr. | Туре | Date code | Volt | Ah (C20) | Dimensons [mm] | weight [kg] | IR acc. Datasheet (25°C) | IR after charge (4 hours rest time) | OCV after Charge (4 hours rest time) | end of discharge/ Cell [V] | Temperatur [°C] | 30min discharge current [A] | Capacity [Ah] | discahrge time [min] |
| 1 | SSB100081 | SSB SB 2.3-12 | 210415 | 12V | 2,3Ah | 178 x 35 x 61(67) | 0.99 | appr. 60mOhm | 101 | 13.01 | 1.8 | 20 | 2 | 13.9 | 70 |
| 2 | SSB100081 | SSB SB 2.3-12 | 210415 | 12V | 2,3Ah | 178 x 35 x 61(67) | 0.99 | appr. 60mOhm | 98 | 12.99 | 1,8 | 20 | 2 | 22.35 | 113 |
| 3 | SSB100081 | SSB SB 2.3-12 | 210415 | 12V | 2,3Ah | 178 x 35 x 61(67) | 0.99 | appr. 60mOhm | out of range | 10.91 | 1.8 | 20 | 2 | not po | ssibe |
| 4 | SSB100081 | SSB SB 2.3-12 | 210415 | 12V | 2,3Ah | 178 x 35 x 61(67) | 0.99 | appr. 60mOhm | out of range | 12.05 | 1.0 | 1.8 20 | 2 | not po | ssibe |
| 5 | SSB100081 | SSB SB 2.3-12 | 210415 | 12V | 2,3Ah | 178 x 35 x 61(67) | 0.99 | appr. 60mOhm | out of range | 12.02 | 1.8 | 20 | 2 | not po | ssibe |
| 6 | SSB100081 | SSB SB 2.3-12 | 210415 | 12V | 2,3Ah | 178 x 35 x 61(67) | 0.99 | appr. 60mOhm | out of range | 11.95 | 1.0 | 20 | 2 | not po | ssibe |
| 7 | SSB100081 | SSB SB 2.3-12 | 210415 | 12V | 2,3Ah | 178 x 35 x 61(67) | 0.99 | appr. 60mOhm | out of range | 10.72 | 1.8 | 20 | 2 | not po | ssibe |
| 8 | SSB100081 | SSB SB 2.3-12 | 210415 | 12V | 2,3Ah | 178 x 35 x 61(67) | 0.99 | appr. 60mOhm | out of range | 11.63 | 1.0 | 20 | 2 | not po | ssibe |
| 9 | SSB100081 | SSB SB 2.3-12 | 210415 | 12V | 2,3Ah | 178 x 35 x 61(67) | 0.99 | appr. 60mOhm | out of range | 12.95 | 1.8 | 20 | 2 | not po | ssibe |
| 10 | SSB100081 | SSB SB 2.3-12 | 210415 | 12V | 2,3Ah | 178 x 35 x 61(67) | 0.99 | appr. 60mOhm | out of range | 9.7 | 1.8 | 20 | 2 | not po | ssibe |

Factory reason:

- Lack of acid
- Separator not in position.
- Deformed plate
- Bad welding plate

Customer site reason:

- Do not fully charge
- Temperature and using condition
- 3. No maintenance
- Bad equipment at site
- Ripple current
- A lot of cycle using.



Low Voltage & High Internal Resistance.



Factory Reason:

- 1. Micro short-circuit
- 2. Not fully charge
- 3. Reverse assembly cell
- 4. Bad welding plate

. . .

Customer site reason:

- 1. No fully charge, no boost charge
- 2. Bad temperature (store & use)
- 3. No maintenance.
- 4. Bad equipment at site.

...



→ Swelling.



Factory reason:

- 1. Overcharged
- 2. High temperature
- 3. High power input
- 4. Cell acid lacking

...

Customer site reason:

- 1. Overcharged & overdischarged
- 2. High temperature.
- 3. Short- circuit
- 4. High IR

. . .



Acid leaking



Factory reason:

- 1. Bad terminal
- 2. Due to the operation during welding, the terminal is burned, after the timeservice life lead by acid corrosionto acid leakage at the terminal.
- 3. Side leak (battery case)
- 4. Damage (moving)

. . . .

Customer site reason:

- 1. Wrong installation
- 2. Damage when installing
- 3. Wrong operation on installation

....



Short-circuit



Factory reason:

- 1. Crack of separator
- 2. Separator not in position
- 3. Dust and lead powder
- 4. Deformed plate

Customer site reason:

- Overcharging and Discharging.
- Usage environment.
- Equipment used.
- 4. Wrong parameter setting

....

智慧能源 www.vision-batt.com 服务世界



Burning



Factory reason:

- 1. Case, safety valve...failure lead to acid leakage at the customer site.
- 2. Risk of short circuit and fire.
- 3. Micro short circuit at the factory gradually short circuit in the following customer a overcharge time leads to swelling and fire and explosion.

....

Customer site reason:

- 1. Charge and Discharge mismatch, over power or excessive temperature for a long time will lead to fire and explosions.
- 2. The equipment at the site has a leak or a problem. No timely maintenance.
- 3. The power supply and the power cord are short-circuited.....



2. How to resolve customer complaints via email.



For capacity failure issue:

- Information to be clarified:
- Check with customer, focus on OCV before discharge (or float voltage), end voltage as well as abnormal voltage during

discharge, discharge current, discharge time, environment and heat degree.

- Determine whether the customer charges the battery before discharging, charging method (including charging Technology voltage / current / charging time).
- Determine if the customer's charging method meets the requirements to fully charge the battery and the battery is defective.

Internal investigation: according to the information provided by the customer, check the engraving number, order and inspection report of the production and quality, determining whether defects were caused in the manufacturing process.

A: If it is a factory fault, make compensation (compensation or compensation). In the event that the customer requests improvement, after-sales staff cooperates with the Quality Manager to make improvement reports (8D, RCA, 5 Whys,)

B: If the customer-supplied parameters do not indicate that the battery is defective, ask the customer to recharge and retest.



2. How to resolve customer complaints via email.

For low vo

For low voltage & high internal resistance and short circuit problem:

- Information to clarify:
- Ask customers to provide OCV & IR images.
- Batteries used or still in storage.
- Charging parameters and frequency of periodic maintenance (3 months 6 months).-
- Environment & temperature of use or storage. Internal investigation: used to engrave the number of customers provided for internal inspection including: OCV report in line, OCV computer function, OCV & IR sample withdrawal report of OQC department, discharge report in the laboratory.
- In case it is found that the battery can be improved by charging, ask the customer to recharge and check again.
- If it is found that the fault is caused by the factory, make compensation or make up for the customer's goods.
- In case the customer requires improvement, the after-sales staff cooperates with the Quality Manager to make a improvement report (8D, RCA, 5 Whys,)



2. How to resolve customer complaints via email.

-

For swelling issue:

<u>Information to clarify:</u>

- Ask the customer to provide a picture of the swelling
- Confirm with customers about: temperature status, operation of air conditioners.
- Ask for information about the UPS or the operating condition of the power supply (mainly about output voltage/current, whether there is overvoltage, overcurrent and other abnormal readings, etc.) as well as internal voltage/resistance of the battery and other data..
- Analyze customer supplied voltage data, verify if there is a battery short circuit, in principle a swollen battery can be caused by poor charging, if there are individual low voltage batteries in a nest then may be due to individual batteries leading to other batteries being charged with high pressure, which after a long time will lead to all the batteries in this group swelling.



2. How to resolve customer complaints via email.

-

Acid leaking issue:

- Information to clarify:
- Ask the customer to provide a picture of the acid leak location along with purple litmus paper.
- Determine if the battery is a product of our company, then locate the defect and root cause and proceed with compensation.
- If the reason is from the case, investigate whether the cause was created through shipping or customer operation & installation. Investigate with the case supplier.
- If it is a leak from the terminal/cap/safety valve, make a note to find out the internal cause and improve.



2. How to resolve customer complaints via email.

For burning problem

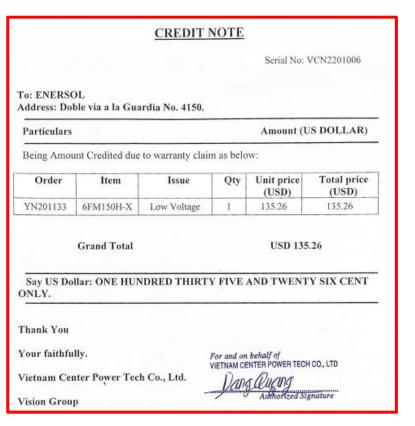
- <u>Information to clarify:</u>
- Serious battery problems such as fire, explosion, after the customer notices and sends pictures, the first thing is to recommend that the customer keep a UPS history record (chargers, equipment at the station, maintenance). about the nearest plug and power cord, security camera footage, etc.), keep the damaged battery sample, keep it at the scene, then send a technician to the place.
- If a customer reports that he or she suffers major economic damage/injury, first notify the insurance company to get to the scene together.
- **Note:** Fire and explosion is a very sensitive issue, we should deal with it skillfully, using confidential handling methods (don't let other companies or industry organizations know about it).



3. What is credit note? What is MBH/FBH?

Credit note is a form of compensation for customer.

Customer can use this credit note to deduct money for their next order (usually used for foreign customers))





A. How to make and manage credit notes.

B1: Fill in the word file form with clear customer complaint information (order, quantity, item code, amount)

| Order | Item | Issue | Qty | Unit price (USD) | Total price (USD) |
|----------|-----------|-------------|-----|---------------------|----------------------|
| YN201133 | 6FM150H-X | Low Voltage | 1 | 135.26 | 135.26 |

Grand Total

USD 135.26

B2: Write an application for a seal to clearly state the contents for the superior to sign.

| Tên văn bản | 抽款单 | | |
|--------------|----------------|------------------|-------------|
| Nội dung | Snersol 客户投诉业只 | 长事X-NOSIMAS | 也电压低 |
| SL giấy tờ | of of | Số tiền | 135. 26 USD |
| Người xin | 范登光 图加入 | Giám đốc bộ phận | V, V |
| 3P liên quan | 1 1111 | Tổng giám đốc | I La |



B3: After the General Manager signed, the after-sales staff in charge of stamping and signing. Then send it by email to the customer. => close the case.



B4: Fill in the information of the credit note sent to the customer on the management file (total claim) for easy statistics and controlcontrol and used to make data for monthly, quarterly, and annual reports.

| 投诉编号 Claim no | 制单人 Incharge | 客户名称 Customer | 责任部门 Responsible department | 是否开箱验 收不合格 Issues at opening | 原因查找 Rootcause analysis & 8D report | 补货或索赔 Replacement/ Credit note | 成本(USD) Cost |
|------------------|-----------------|------------------|-----------------------------------|---------------------------------------|--|--------------------------------------|-----------------|
| 2201001 | Archi | FULGUR BATTMAN | 组装二 | 否 | 电池未退回 | 扣款 VCN2201001 | 1762.56 |
| 2201002 | Archi | YHI | 组装一 | 否 | 电池未退回 | 扣款 VCN2201002 | 65.27 |
| 2201002 | Archi | YHI | 组装二 | 否 | 电池未退回 | 扣款 VCN2201002 | 49.69 |
| 2201002 | Archi | YHI | 组装二 | 否 | 电池未退回 | 扣款 VCN2201002 | 83.83 |
| 2201002 | Archi | YHI | 组装二 | 否 | 电池未退回 | 扣款 VCN2201002 | 284.48 |
| 2201002 | Archi | YHI | 组装一 | 否 | 电池未退回 | 扣款 VCN2201002 | 54.5 |



3. What is credit note? What is MBH/FBH?

MBH/FBH is a form of compensation for customers on a replacement. Goods will delivered to customers according to the next order

by or express delivery individually. (usually used for domestic guests)

- *Note:
- MBH is a replacement order for batteries only new production or replacement of accessories for customers (stamps, crates, screws...).
- FBH is a return order only customer's recirculation, or just use inventory to refresh then make up for customer. (Will not charge on OA).





