# User manual

Low-voltage household energy storage products

ABL0X-05L20/ABL0X-10L20/ABL0X-16L20

# About this manual

This manual mainly introduces the transportation and storage, mechanical installation, electrical connection, power-up and power-down operation, fault handling, and maintenance methods of low-voltage household storage products.

## For the reader

This manual is intended for operators of low-voltage household energy storage and suitably qualified electrical technicians.

All installation and related operations shall be performed exclusively by qualified technical personnel. The qualified personnel must meet the following requirements:

- Have undergone specialised training.
- Have read this manual in its entirety and be aware of the relevant safety precautions.
- Be familiar with local standards and safety regulations for electrical systems.

## Use of the manual

Read the manual carefully before using the battery pack and keep it in an accessible place.

This product and its manuals are continually being improved and upgraded for the purpose of increasing customer satisfaction. If there is a discrepancy between the manual you have received and the battery pack, it may be due to an upgrade of the battery pack version, so please refer to the actual product.

The contents of the manual will be continuously updated and corrected, but there are inevitably slight discrepancies or errors with the actual product. Users are advised to refer to the actual product purchased, and can contact us at www.auxsol.com download or sales channels to get the latest version of the manual material.

The pictures in this manual are for reference only, and the actual product shall prevail.

## Use of symbols

In order to ensure the safety of the users and property when using the battery pack, and to use the battery pack more efficiently and optimally, information is provided in the manual and highlighted using the following symbols.

The following is a list of symbols that may be used in this manual, please read carefully for better use.

**Dangerous**

Indicates a situation with a high potential for danger which, if not avoided, will result in death or serious injury.

**Warnings**

Indicates moderate potential danger, if not avoided, which may result in death or serious injury to personnel.

**Careful**

Indicates a situation of moderate potential hazard that could result in death or serious injury if not avoided.

**Attention**

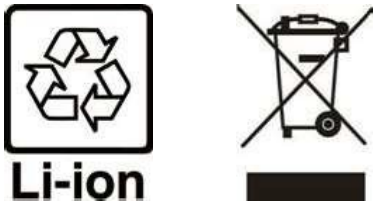
Indicates a potentially risky situation that, if not avoided, could result in equipment not functioning properly or property damage.

# 1 Safety considerations

Indicating potential risks, if not avoided, may result in equipment malfunction or property damage.

Attention

It is very important and necessary to read the User manual (in the Appendix) carefully before installing or using the battery. Failure to do so or to follow any instructions or warnings in this document may result in electric shock, serious injury or death, or may damage the battery, which may render it inoperable.




## 1.1. Personnel requirements

The transport, installation and wiring, operation and maintenance of low-voltage household storage products must be carried out by professional technicians in accordance with local norms. Operators need to meet the following requirements:

• Should have certain electronic, electrical wiring and mechanical expertise and be familiar with electrical and mechanical schematics.

• Should be familiar with the composition and working principle of low voltage household storage.

• Shall have received professional training related to the installation and commissioning of electrical equipment.

• Should have the ability to respond to emergencies in the event of hazards or emergencies during installation or commissioning.

• Should be familiar with the relevant standards and codes of the country where the project is located.

## 1.2. Electricity safety

Dangerous

• Touching the contacts, terminals, etc. connected to the power supply or device inside poses a risk of electric shock!

• Voltage may be generated on both sides of the battery. Before touching, always use a standard voltmeter to confirm that there is no voltage.

**Dangerous**

There is a deadly high voltage inside the device!

• Pay attention to and follow the warning signs on the equipment.

• Follow the safety precautions listed in this manual and other relevant documents of this device.

• Comply with the relevant protection requirements and precautions for batteries.

**Dangerous**

Disconnecting the power supply, the battery will not be immediately disconnected, be sure to wait 10 minutes to ensure that the device is completely unpowered before operating.

**Warnings**

All lifting and transport, installation and wiring, operation and maintenance must comply with the relevant codes and regulations of the region where the project is located.

**Warnings**

Always use low voltage household energy storage products in accordance with this manual. Failure to do so may result in damage to the equipment.

**Warnings**

Observe the following precautions to prevent uninvolved persons from approaching the low-voltage household storage product and operating it by mistake or having an accident:

• In the vicinity of low-voltage household storage products, place conspicuous warning signs to prevent accidents caused by misuse.

• Comb the warning signage or set up safety warning tape near the equipment.

## 1.3. Battery safety

In order to use the battery pack safely, technicians should read and observe the following safety requirements. Product functions caused by Abnormalities or damage to parts, personal safety accidents, property damage, etc., are not the responsibility of our company.

– Loss of capacity or irreversible damage to the battery due to overdue charging of the battery by the customer, etc.

– Battery damage, dropping, liquid leakage, etc. caused by improper operation

or failure to operate the battery in accordance with the requirements.

- Battery damage caused by over-discharge of the battery due to failure to power up the battery in time for customer reasons.

- Battery damage caused by using improper equipment for charging and discharging due to customer reasons.

- Frequent over-discharge of the battery due to improper maintenance by the customer, expansion of the capacity at the customer's site or failure to be fully charged for a long time.

- Battery damage caused by the customer's failure to correctly set battery operation parameters.

- Direct damage to the battery caused by the site operating environment not meeting the environmental requirements for normal operation.

- Changing the use of the battery by the customer, including but not limited to connecting additional loads to the battery by the customer.

- The customer does not carry out proper maintenance of the battery according to the system manual of the supporting equipment.

- Damage to the battery pack caused by the customer's continued use of batteries that have exceeded the warranty period.

- Product damage caused by the use of defective or deformed batteries.

- Mixing the batteries provided by the Company with other batteries, including but not limited to: mixing with batteries of other brands, mixing with batteries of different rated capacities, etc.

- Improper handling of the battery by the customer, including, but not limited to cleaning the battery with cleaning solvents. exposing the battery to flammable or irritating chemicals or gases. painting any part of the battery, including any internal or external components. and making direct wiring connections to photovoltaic solar energy.

- Product damage or other property damage caused by storing or installing batteries with flammable/explosive or other materials.

- Battery-related operations must be performed by professionals, personal safety accidents, property damage, etc. caused by operating without wearing protective equipment that meets standards.

- Battery damage caused by eating, drinking, smoking and other behaviours in the vicinity of the battery.

- Battery theft.

Direct or indirect damage caused by the above matters are not included in the Warranty.

## 1.4. Installation and wiring

**Warnings**

During the whole process of machinery installation, the relevant standards and requirements of the project site must be strictly adhered to.

**Warnings**

Use only AUX-designated equipment. Failure to use AUX-designated equipment may result in impaired protection and injury to personnel.

## 1.5. Operation and Maintenance

**Dangerous**

Disassembling or incinerating the battery may cause it to catch fire.

**Warnings**

Personal Protective Equipment (PPE) is required for maintenance, overhaul and other work on low voltage household storage products.

Maintenance personnel must wear safety goggles, helmets, insulated shoes, gloves, etc.

**Warnings**

There are no user-serviceable parts inside the battery unit.

The user is not allowed to maintain the battery themselves and only AUX approved personnel should remove, replace, or dispose of the battery.

**Warnings**

To reduce the risk of electric shock, do not perform any other operations beyond those described in this manual.

If necessary, contact AUX Customer Service for repairs.

**Warnings**

To ensure continuous fire protection, replacement of internal devices should only be carried out by specialised personnel.

Note

• Do not spray any device inside or outside the equipment.

• Do not use cleaning agents to clean the equipment or expose the equipment to harsh chemicals.

## 1.6. Product obsolescence

When the energy storage system as a whole or the separate internal equipment needs to be discarded, it must not be disposed of as regular scrap. Some components of the internal machine can be recycled for reuse, while others can cause pollution to the environment.

Please contact your local authorized professional recycling agency for proper disposal of the battery pack and internal components.

# 2 Product Description

## 2.1 Products

ABL series low voltage household storage products are mainly applied to the reliable power supply of all kinds of equipment and systems on the user side.

-Suitable for application scenarios with high power, limited installation space and long cycle life.

Built-in BMS battery management system can manage and monitor battery information, including voltage, current and temperature. More importantly, the BMS can balance the battery charging/discharging to extend the battery cycle life.

-Multiple batteries can be connected in parallel to expand capacity and power in parallel with larger capacity and longer output time requirements.

The following diagram shows the basic application of this product.

★Please consult your system integrator for other possible system architectures, depending on your requirements.

Product Features

- The whole module is non-toxic, non-polluting and environmentally friendly.
- The cathode material is made of LiFePO4, which provides safety performance and long cycle life.
- The battery management system (BMS) has over-discharge, over-charge, over-current, and high and low temperature protection.
- The system automatically manages charging and discharging states, equalising the current and voltage of each cell.
- Flexible configuration, multiple battery modules can be connected in parallel to expand capacity and power.
- Modules have low self-discharge, shelving up to 6 months without charging, no memory effect, and excellent shallow charging and discharging performance.
- Battery modules are easy to maintain and support remote monitoring and firmware upgrade.
- High power density: Flat design, wall-mounted and floor-standing, saves installation space.

## 2.2 Technical parameters

| Performance Parameters | | | |
|---|---|---|---|
| Model | ABL0X-05L20 | ABL0X-10L20 | ABL0X-16L20 |
| Storage capacity(kWh) | 5.12 | 10.24 | 16.07 |
| Cell Specification(Ah) | 100 | 205 | 314 |
| Number of batteries | 16 | 16 | 16 |
| Cell Type | LiFePO4 | | |
| Operating Voltage Range(V) | 43.2～58.4 | | |
| Charge/discharge current(A) | 100 | 100 | 157 |
| Communication | | | |
| Display | SOC, Faults, and Operating Status | | |
| Communication method | RS485/CAN | | |
| General parameters | | | |
| Total weight(kg) | 52.5 | 88 | 120 |
| Dimension (W*H*D mm) | 420*660*160 | 420*660*245 | 420*895*250 |
| Number of parallel machines | 15 | | |
| Cycle life | ≤6000 times | | |
| Operating Temperature | Charge：0～50 ℃,Discharge：-20～50 ℃ | | |
| Storage Temperature | -20～45 ℃≤1 month；-20～35 ℃≤6 months | | |
| Relative Humidity | 5%～95%(non-condensing) | | |
| Cooling method | Natural cooling | | |
| Installation | Floor/Wall Mount | Floor/Wall Mount | Floor |
| Installation environment | Inside | | |
| Protection class | IP20 | | |
| Maximum working altitude | 2,000 m | | |
| Protection strategy | Over-voltage, over-current protection, short circuit protection, over-temperature protection | | |
| Reference standard | | | |
| Accreditation | CE,UN38.3 | | |

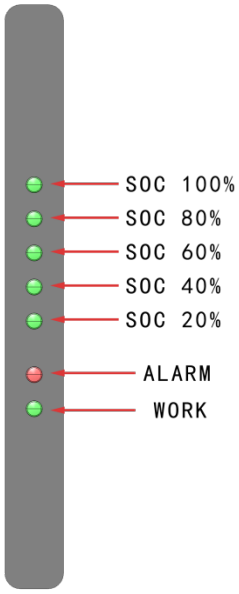
## 2.3 External design

2.3.1 ABL0X-05L20 The appearance of the battery pack is shown in the picture below


2.3.2 ABL0X-10L20 The appearance of the battery pack is shown in the picture below


2.3.3 ABL0X-16L20 The appearance of the battery pack is shown in the picture below

## 2.4 LED




| Mode | Normal/Alarm/ Protection | Work | Alarm | 20% | 40% | 60% | 80% | 100% |
|---|---|---|---|---|---|---|---|---|
| | | ● | ● | ● | ● | ● | ● | ● |
| Turn off | Dormant | OFF | | | | | | |
| Pragmatic | Normal | Flash 1 | OFF | Based on the power indication | | | | |
| | Alarm | Flash 1 | Flash 3 | | | | | |
| Charge | Normal | ON | OFF | Based on the power indication (power indication max LED flash 2) | | | | |
| | Alarm | ON | Flash 3 | | | | | |
| | Overcharge protection | ON | OFF | ON | | | | |
| | Temperature, over current and failure protection | OFF | ON | OFF | | | | |
| Discharge | Normal | Flash 3 | OFF | Based on the power indication | | | | |
| | Alarm | Flash 3 | Flash 3 | | | | | |
| | Under voltage protection | OFF | OFF | OFF | | | | |
| | Temperature, over current, short circuit, reverse connection, failure protection | OFF | ON | | | | | |
| Run out | | OFF | ON | | | | | |

Notes:
Flash 1: light 0.25 seconds, extinguished 3.75 seconds.
Flash 2: light 0.5 seconds, extinguished 0.5 seconds.
Flash 3: light 0.5 seconds, extinguished 1.5 seconds.

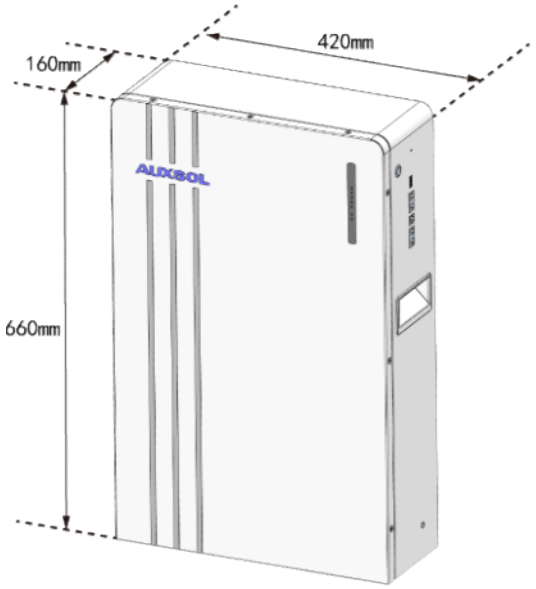
| SOC indicator | | Charge | | | | |
|---|---|---|---|---|---|---|
| | | 20% | 40% | 60% | 80% | 100% |
| | | ● | ● | ● | ● | ● |
| Capacity | 0~20% | ON/Flash 2 | OFF | OFF | OFF | OFF |
| | 20~40% | ON | ON/Flash 2 | OFF | OFF | OFF |
| | 40~60% | ON | ON | ON/Flash 2 | OFF | OFF |
| | 60~80% | ON | ON | ON | ON/Flash 2 | OFF |
| | 80~100% | ON | ON | ON | ON | ON/Flash 2 |

| SOC indicator | | Discharge | | | | |
|---|---|---|---|---|---|---|
| | | 20% | 40% | 60% | 80% | 100% |
| | | ● | ● | ● | ● | ● |
| Capacity | 0~20% | ON | OFF | OFF | OFF | OFF |
| | 20~40% | OFF | ON | OFF | OFF | OFF |
| | 40~60% | OFF | OFF | ON | OFF | OFF |
| | 60~80% | OFF | OFF | OFF | ON | OFF |
| | 80~100% | OFF | OFF | OFF | OFF | ON |

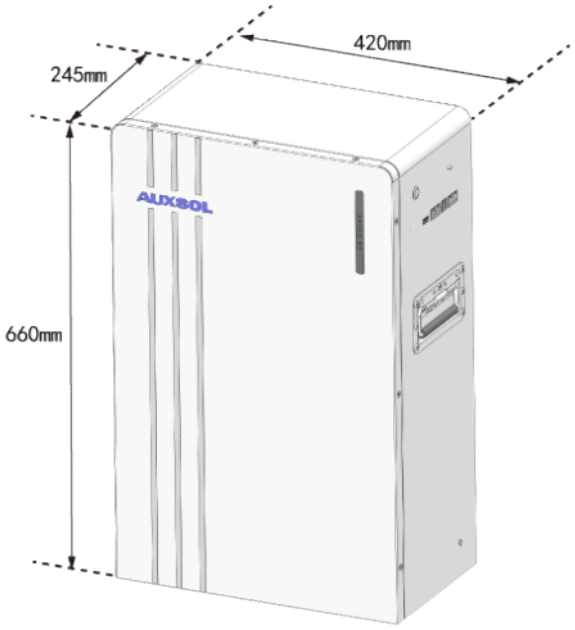
## Note

The nameplate contains important parameter information related to BESS and should be protected during all operations such as transport, installation, maintenance and overhaul. Destruction or removal is strictly prohibited!

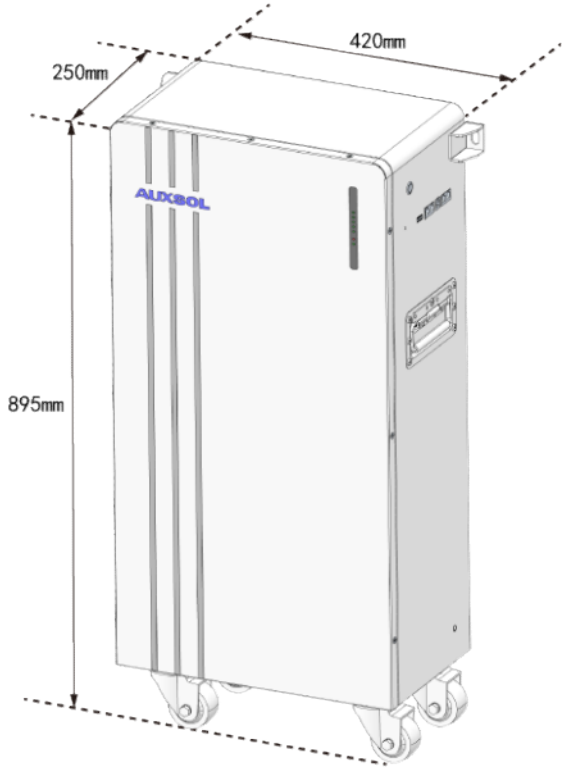
2.3.4 ABL0X-05L20 Mechanical parameters.




2.3.5 ABL0X-10L20 Mechanical parameters.

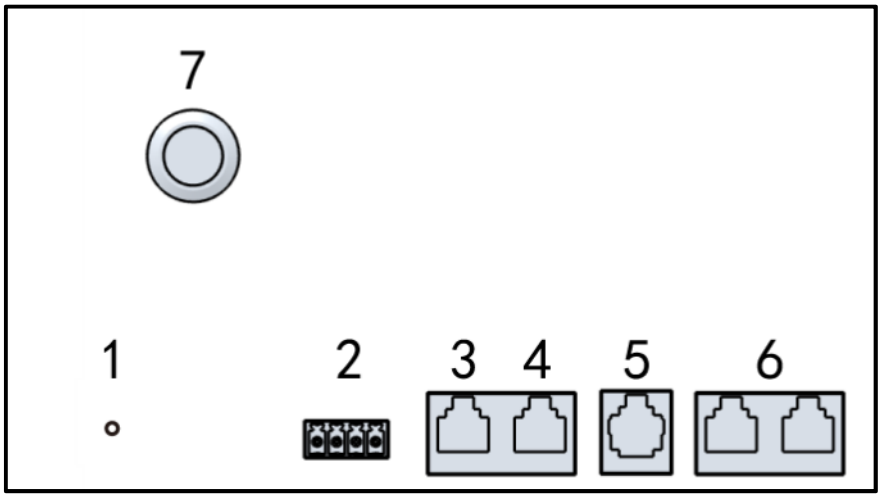


2.3.6 ABL0X-16L20 Mechanical parameters.



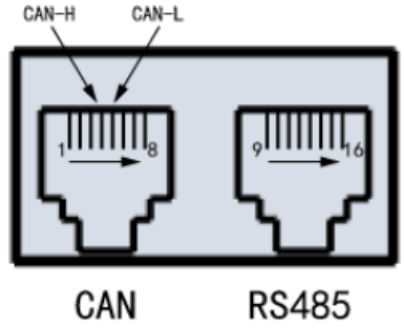

2.3.7 Electrical Interface Description.

2.3.7.1 Interface Description.



| Part Name | Clarification |
| --- | --- |
| 1 Reset switch | Reset, or switch off the BMS (please use the pin to do so). |
| 2 Dry contact | When there is a voltage or current fault, the dry contact can be triggered to close or disconnect. |
| 3 RS485 port for communication with the inverter | When communicating with inverters, it can be used to communicate with all brands of RS485 protocols. |
| 4 CAN port for communication with the inverter | When communicating with inverters, it is applicable to CAN protocol of various inverters. |
| 5 Upper computer communication port for communication with RS232 | Used to connect to the host computer to monitor data, read working status, modify parameters, etc. |
| 6 RS485 parallel port | Adopting 8P8C second-order RJ45 socket, using standard network cable docking, for parallel operation, can also be used to connect to the host computer (using RS485 cable). |
| 7 Device switch | For equipment switching. |

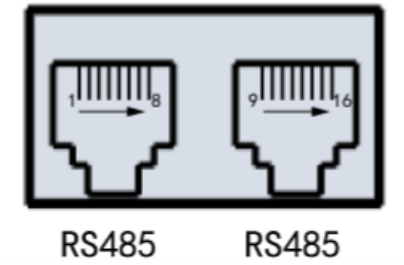
2.3.7.2 Interface definition (PCS connection)




CAN&RS485 PORT

| CAN--Uses 8P8C vertical RJ45 sockets | | RS485--Uses 8P8C vertical RJ45 sockets | |
|---|---|---|---|
| RJ45 Pin | Definition notes | RJ45 Pin | Definition notes |
| 1、3、6、7、8 | NC | 9、16 | RS485-B1 |
| 4 | CAN-H | 10、15 | RS485-A1 |
| 5 | CAN-L | 11、14 | GND |
| 2 | GND | 12、13 | NC |

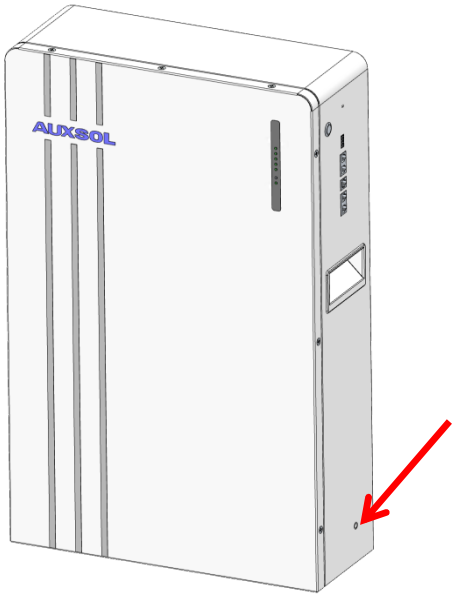
2.3.7.3 Parallel interface definition (parallel)




Parallel communication port

| CAN--Uses 8P8C vertical RJ45 sockets | | RS485--Uses 8P8C vertical RJ45 sockets | |
|---|---|---|---|
| RJ45 Pin | Definition notes | RJ45 Pin | Definition notes |
| 1、8 | RS485-B | 9、16 | RS485-B |
| 2、7 | RS485-A | 10、15 | RS485-A |
| 3、6 | GND | 11、14 | GND |
| 4、5 | NC | 12、13 | NC |

2.3.7.4 PE port

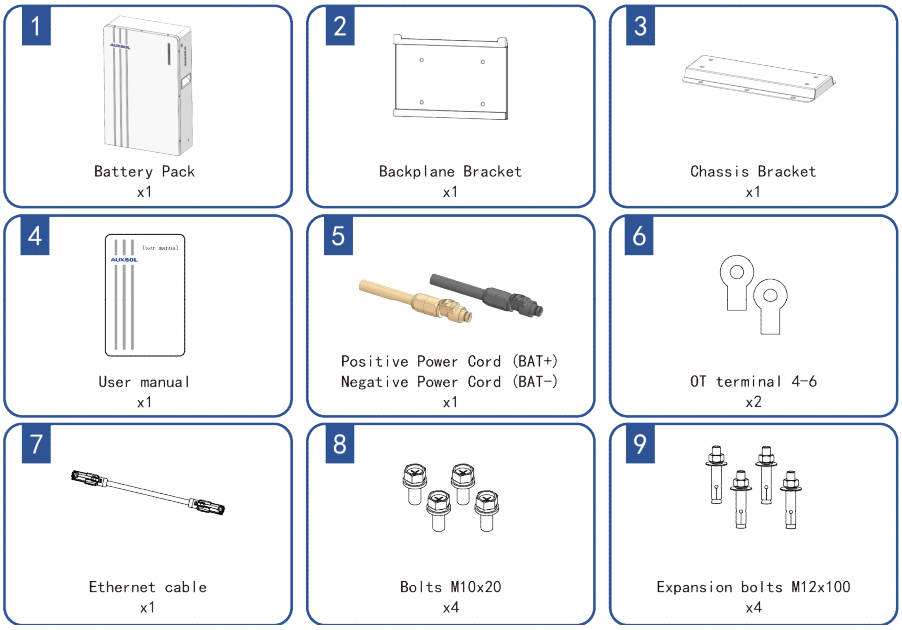



The grounding wire is used to connect the PE (Protective Earth) to the product's enclosure. Its function is to conduct any potential electrical current on the metal casing to the ground, thereby preventing electric shock.

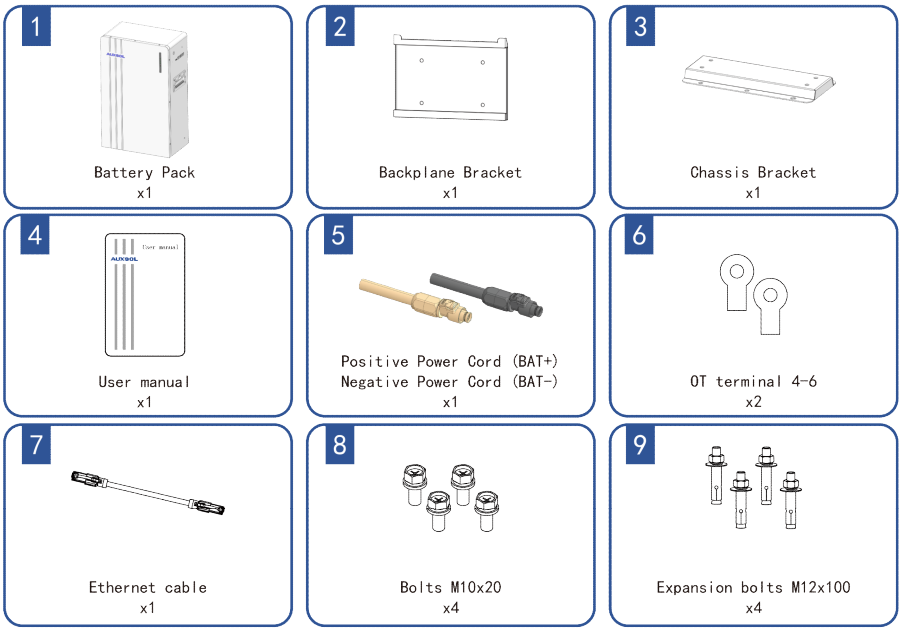
# 3 parts list

Check the unit before installation. Make sure there is no damage in the package. You should have received the following items in the package. Make sure there is no damage in the package.

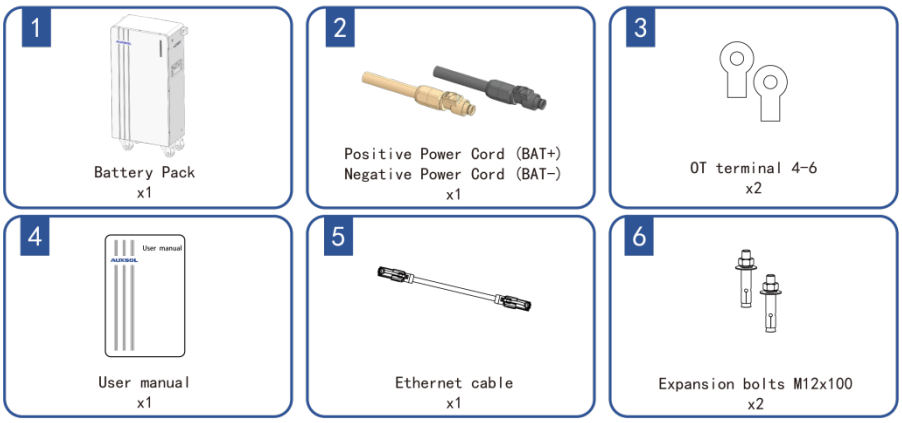
## 3.1 ABL0X-05L20




## 3.2 ABL0X-10L20



## 3.3 ABL0X-16L20



# 4 Inspection, cleaning and maintenance

## 4.1 Pre-maintenance instructions

**Warnings**

- Do not open the door of the battery outdoor cabinet for maintenance in rainy, wet or windy weather, AUX will not be liable for any damages caused if this is not avoided.
- To reduce the risk of electric shock, do not perform any maintenance or overhaul beyond what is described in this manual. Please contact AUX Customer Service for maintenance and overhaul if required.

## 4.2 Maintenance project list and cycle time

The following are recommended maintenance intervals. Actual maintenance intervals should be adjusted to the specific installation environment of the battery pack.

Factors such as installation location and site environment will affect the maintenance cycle of the battery pack. If the operating environment is sandy or dusty, it is necessary to shorten the maintenance cycle and increase the maintenance frequency.

4.2.1 Maintenance work (maintenance once a year)

| Project List | Inspection methods |
|---|---|
| Battery status and cleaning | Check the following items. If they do not meet the requirements, correct them immediately:<br>-Check if the battery pack is damaged or deformed.<br>-Check whether there is any abnormal noise during the operation of the equipment.<br>-Check if the battery temperature is too high.<br>-View whether the battery temperature and humidity are within the normal range. Clean if necessary. |
| Warning symbol | Check that warning signs and labels etc. are clearly visible and not defaced. Replace if necessary. |
| Cable Shield Grounding | Check for good contact between cable shield and insulation sleeve. |
| Lightning protection equipment and fuses | Check that lightning protection equipment and fuses, etc., are well fastened. |
| Corrosion | Look for conditions such as oxidation or rust on the equipment. |

| | |
|---|---|
| Cabinet Exterior | Check each of the following and correct them immediately if they do not meet the requirements:<br>-Check for the presence of flammable objects on top of the unit.<br>-Check to see that the weld points to the foundation steel plate are secure and that there is no rust or corrosion.<br>-Look for damage, paint loss, oxidation, etc. on the equipment housing.<br>-Look for seals, etc. that are well secured. |
| Wiring and cable routing | The inspection should be started only after the Energy Storage Integrated System equipment has been completely de-energised! If any non-conformities are found during the inspection, please correct them immediately!.<br>Check whether the cable arrangement is standardised, and whether there is any short circuit, etc. If there is any abnormality, it needs to be corrected immediately.<br>Check that all inlet and outlet holes are well sealed.<br>Check the unit for water ingress.<br>Check that the power cable connections are not loose and retighten them according to the torque previously specified.<br>Check power cables and control cables for damage, especially for cut marks on the skin in contact with metal surfaces.<br>Check that the insulating wraps of the power cable terminals are not detached. |
| Ground connection | Check that the earth connection is correct. |
| Screw | Check for dropped screws etc. |

4.2.2 Enclosure Maintenance.

4.2.2.1 Cleaning the outer surface of the box.

It is recommended to clean the top first and then the sides. It can be cleaned directly or rinsed with water while cleaning.

Check the exterior of the box for damage:

Dirty surfaces due to water damage and dust can be cleaned straight away.

Maintenance operations:

makings:

- washcloth
- Water
- Alcohol or other non-corrosive cleaning agents

**Movement:**

Use a rag (or other scrubbing tool) moistened with water to scrub the soiled surface.

If water does not scrub the surface clean, scrub with 97% alcohol until the

surface is acceptably clean. (Alternatively, try using a non-corrosive cleaner commonly used locally.)

## 4.3 Maintenance Precautions

**Attention**

In order to service and maintain the equipment safely and efficiently, maintenance personnel are advised to carefully read and observe the following safety requirements:

- Must hold an electrician's licence issued by the Safety Supervision Bureau and be qualified by professional training before taking up the job must comply with the relevant safety precautions, use the necessary tools and wear personal protective equipment.
- Metal accessories such as jewellery or watches are strictly prohibited.
- Under any circumstances, it is strictly prohibited to touch the high-voltage positive and negative poles of the energy storage system with both hands at the same time.
- Disconnect all high and low voltage switches before performing maintenance on the battery storage system.
- When carrying out cleaning operations, it is strictly prohibited to use water to clean directly, if necessary, use a hoover to clean up.
- Plugging and unplugging cables should be standardised, not brute force or violent operation.
- After maintenance, please clean up your tools and materials in a timely manner and check whether there are any metal objects left inside or on top of the equipment.
- If you have any questions about the operation of the equipment, please contact the AUX Service Centre, as unauthorised operation is strictly prohibited.

## 4.4 Equipment Maintenance

**Attention**

- Recommended ambient temperature: 15℃~30℃ during charging and discharging, typical value is 25℃.
- Avoid charging and discharging PACKs at large multiples, and the continuous charging and discharging current of a single PACK should not exceed the rated current.
- When the battery energy storage system is left unused for a long time, the system should be charged and discharged once every 6 months so that the system SOC reaches 30%~40%, and the SOC needs to be maintained after replenishment.
- Before the first use of the long-standing system, at least one full charge to restore the performance of the battery to its optimal state.
- Regularly check whether the fastening bolts of the battery storage system are loose, whether the contact is good, and whether the surface of the terminals is seriously rusted or oxidised.
- Regularly check the positive and negative high-voltage protection covers of the PACK for deterioration, breakage and absence.
- Regularly check the cables for looseness, aging, breakage and fracture, and whether the insulation is good or not.
- Regularly check whether there is any irritating odour in the battery cabinet and whether there is any burning odour in the high-voltage connection parts.
- Regularly check whether the voltage, temperature and other data of the monitoring upper computer are normal, and whether there is any abnormal alarm in the alarm bar.
- Regularly check whether the battery storage system status and alarm indicators

are intact and function normally.

- Periodically check that the emergency stop switch of the battery storage system is effective to ensure that the system can be stopped quickly in case of emergency.
- Prohibit the use of different types of battery modules in series or parallel.

**Warnings**

- Batteries are potentially hazardous and must be operated and maintained with proper precautions!
- Incorrect operation of may result in serious personal injury and property damage!
- Batteries must be operated with the correct tools and protective equipment.
- Battery maintenance must be carried out by persons with specialist knowledge of batteries and safety training.

# 5 Contact Information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