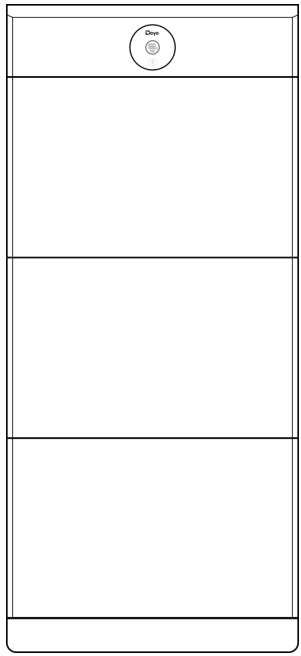
User Manual

High Voltage Battery System

GB-A



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Contents

1. About the Manual

⚠ Warning!

Read and follow carefully all safety warnings, instructions, illustrations and specifications provided with this product. Failure to follow instructions mentioned may results in electric shock, fire or serious injury.

Save all warnings and instructions for future reference.

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Disclaimer

This installation and operation manual only applies to countries meeting the certification requirements. Please observe the applicable local laws, regulations, and standards. Standards and legal provisions of other countries may be inconsistent with the provisions and specifications in this manual.

This manual does not cover all safety matters that should be followed, so you must also comply with relevant international, national or regional standards and industry practices.The manufacturer shall not be liable for personal injury, property loss, product damage and subsequent losses under the

following circumstances:

* Damages caused by force majeure, including earthquake, flood, volcanic eruption, mudslide,, lightning, fire, war, military conflict,typhoon, hurricane, and so on.
* The installation, operation and storage environment does not meet the relevant international, national or regional standards;
* Incorrect use of this product or failure to comply with the provisions of this manual.
* Unauthorized or unqualified personnel repair the product, disassembly the rack and perform other operations.
* Use of unapproved spare parts.
* Unauthorized modifications or technical changes to the product or software.
* Incorrect shipment by yourself or the third party commissioned by you.
* Unsatisfactory materials and tools from you own that do not meet the relevant international, national or regional standards.
* Damage caused by yourself or the third party's negligence, intent, gross negligence, improper operation, or other accidents not caused by Deye.

1.2 Definition of Terms

Term	Description
 Danger	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
 Warning	Indicates a hazard with a medium level of risk which, if not avoided, will result in death or serious injury.
 Caution	Indicates a hazard with a low level of risk which, if not avoided, will result in minor or moderate injury.
 Notice	Indicates a potentially hazardous situation which, if not avoided, could results in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 Note	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

2. Safety Instructions

2.1 Meaning of Symbols

Symbols on equipment:

The following types of warning, prohibition, and mandatory symbols are used on the equipment.

 **Danger!** It may cause an electric shock.

Even when the equipment is disconnected from the power grid, the voltage-free state will have a time lag.

 **Attention! The risk of chemical burns**

If the battery is damaged or fails, it may lead to electrolyte leakage, which in turn causes the formation of a small amount of hydrofluoric acid, among other effects. Contact with these liquids can cause chemical burns.

• Do not subject the battery pack to severe impact.

• Do not open, disassemble or mechanically change the battery pack.

• In case of contact with an electrolyte, wash the affected area with clean water immediately and seek medical advice promptly.

 **Attention! The risk of explosion**

Incorrect operation or fire may cause the lithium-ion battery unit to ignite or explode, leading to serious injury.

• Do not install or operate the battery pack in explosive or high-humidity areas.

• Store the battery pack in a dry place within the temperature range specified in the data sheet.

• Do not open, drill through or drop the battery cell or pack.

• Do not expose the battery cell or pack to high temperatures.

• Do not throw the battery cell or pack into the fire.

• When the lithium battery catches fire after being plugged in with AC power, unplug the power supply first to prevent electric shock during firefighting.

• If there is an open flame, use carbon dioxide or ABC dry powder fire extinguisher to put out the fire, and then cool down by using the nearby fire hydrant or pouring water until no white smoke appears

and the battery is completely cooled down. After extinguishing the fire, continue to monitor the battery for at least 1 hour to prevent re-ignition.

• If there is no open flame but a large amount of white smoke comes out of the battery, it is recommended to use a 6L portable water-based fire extinguisher (if any), and then cool down by using the nearby fire hydrant or pouring water until no white smoke appears and the battery is completely cooled down. After extinguishing the fire, continue to monitor the battery for at least 1 hour to prevent re-ignition.

• Do not use defective or damaged battery packs.

 **Caution! Hot surface**

• If a malfunction occurs, the parts will become very hot, and touching them may cause serious injury.

• If the energy storage system is defective, please shut it down immediately.

• If the fault or defect becomes obvious, special care should be taken when handling the equipment.

 **No open fire!** It is prohibited to handle open flames and ignition sources near the energy storage system.

 Do not insert any objects into the opening in the housing of the energy storage system! No objects, such as screwdrivers, may be inserted through openings in the casing of the storage system.

 **Wear safety goggles!** Wear safety goggles when working on the equipment.

 **Follow the manual!** When working and operating the equipment, the installation and operation manual provisions must be observed.

2.2 Safety Rules

1) After unpacking, please check product and packing list first, if any item is damaged or missing, please contact with the local retailer.
2) Before installation, make sure that all switches are off.
3) Wiring must be correct. Be careful to negative pole and positive of cable and terminals. Make sure no short circuit with the external device.
4) It is prohibited to connect the battery and AC power directly.
5) Please ensured the electrical parameters of battery system are compatible to related equipment.
6) Do not allow the terminals to contact exposed wire or metal.
7) Keep out of reach of children or animals.
8) Do not place batteries near fire, heater or high temperature sources. This will reduce the risk of explosion or possible injury.
9) Batteries can explode in the presence of a source of ignition, such as open flame. An exploded battery can propel debris and chemicals. If occurs, flush with water immediately.
10) Do not submerge the battery in water or expose it to moisture. Do not disassemble or alter the battery in any way.
11) If the battery system needs to be moved or repaired, the power must be cut off and the battery is completely shut down.
12) It is prohibited to connect the battery with different type of Battery.
13) It is prohibited to put the batteries into use with faulty or incompatible power conversion system (hereafter refers to "PCS").
14) It is prohibited to disassemble the battery.
15) In case of fire, only dry fire extinguishers can be used. Liquid fire extinguishers are forbidden.
16) Please do not open, repair, or disassemble the battery except qualified personnel. We do not undertake any consequences or related responsibility which be- cause of violation of safety operation or violating of design, production, and equipment safety standards.
17) Battery needs to be recharged within 48 hours after fully discharged.
18) Do not expose cable outside.
19) Do not expose battery to flammable or harsh chemicals or vapors.
20) Do not paint any part of Battery, include any internal or external components.
21) Do not connect battery with PV solar wiring directly.
22) Any foreign object is prohibited to insert into any part of battery.
23) Do not strike, drop, puncture or step on the battery. A damaged battery is subjected to explosion. Properly dispose of damaged battery immediately.
24) In case of electrolyte leakage, keep leaked electrolyte away from contact with eye or skin, If that occurs, wash immediately with clean water for at least 10 minutes, then seek immediate medical attention.

3 Product Introduction

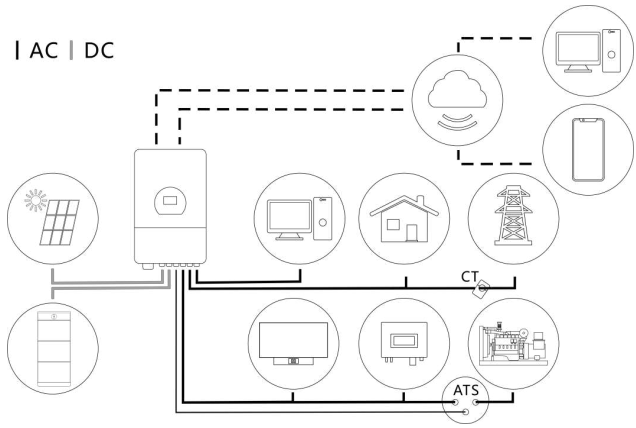
3.1 Application Scenarios

The following illustration shows basic application of this battery.

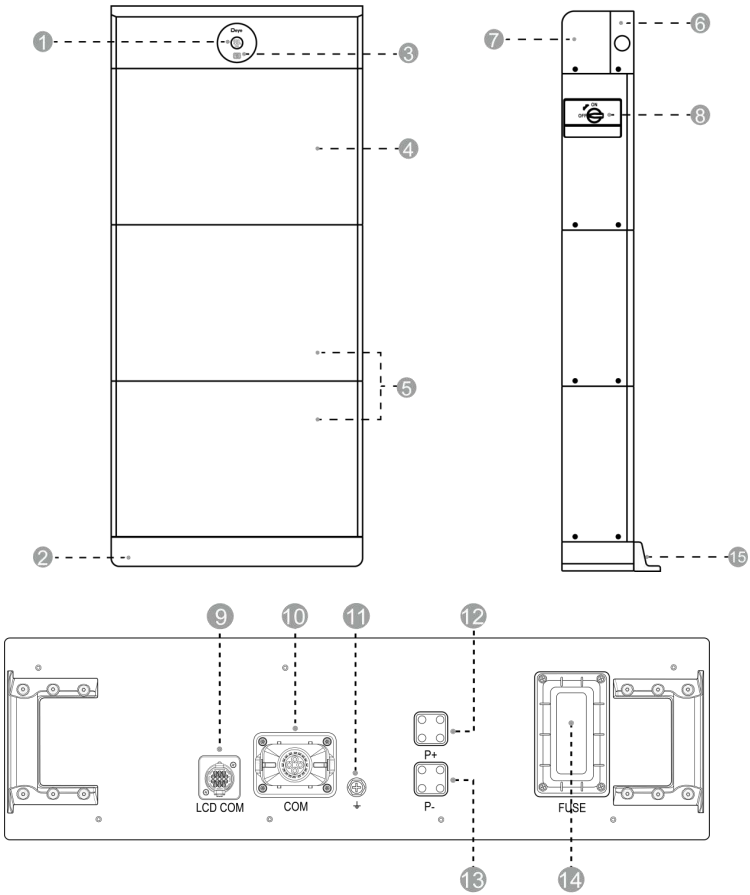
It also includes following devices to have a complete running system.

- Generator or Utility
- PV modules
- Low voltage Hybrid PCS (Charge & Discharge)

Consult with your system integrator for other possible system architectures depending on your requirements.



3.2 Product Overview



1. LCD screen	9. LCD COM
2. Base	10. COM port
3. Start	11. Ground
4. Battery Pack GB-A-Pack4	12. P+ port
5. Battery Pack GB-A-Pack6	13. P- port
6. Rear cover	14. Fuse
7. Front cover	15. Bracket
8.Service switch	

Start

Press for 2s to stat/stop the battery.

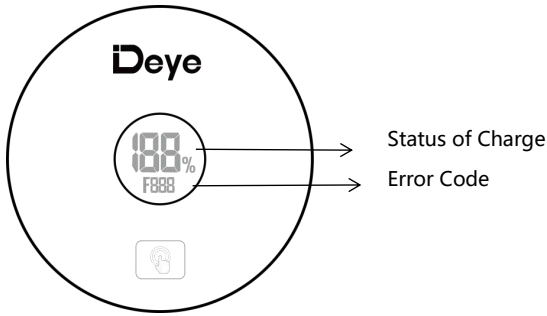
COM port

Follow the CAN protocol (baud rate: 500K), used to output battery information to the PCS.

Definition of COM port pin			
No.		No.	
1	BMSCANL	9	BMSCANL
2	BMSCANH	10	BMSCANH
3	PE	11	PE
4	DO+	12	DI-
5	DO-	13	DI-
6		14	PCSCANL
7	POWER-	15	PCSCANH
8	POWER+	16	

LCD screen

To indicate the state of the battery system.



1. During the first 2 seconds after startup, all items that are used together to deliver information on the screen light up.
2. After startup, the screen is on for 20 seconds hand then off. Once any operation occurs on it, the screen will be on for 20 seconds, and then turned off until that happens again.
3. Each error code will be displayed for 5 seconds, and then switch to the next one.
4. If all faults are rectified, the last fault will be on the screen for 5 seconds and disappear.

Error code		**Description**
F001	ALARM_ID_SUM_OVER_VOLT_LEV_2	The total pressure is too high
F002	ALARM_ID_SUM_LOW_VOLT_LEV_2	The total pressure is too low
F003	ALARM_ID_CHG_OVER_TEMP_LEV_2	Charging temperature is too high
F004	ALARM_ID_DSG_OVER_TEMP_LEV_2	Discharging temperature is too high
F005	ALARM_ID_CHG_LOW_TEMP_LEV_2	The charging temperature is too low
F006	ALARM_ID_DSG_LOW_TEMP_LEV_2	The discharge temperature is too low.
F007	ALARM_ID_OVER_DIFF_VOLT_LEV_2	Excessive pressure differences
F008	ALARM_ID_OVER_DIFF_TEMP_LEV_2	Excessive temperature differences

F009	ALARM_ID_CELL_OVER_VOLT_LEV_2	Cell overvoltage
F010	ALARM_ID_CELL_LOW_VOLT_LEV_2	Cell undervoltage
F011	ALARM_ID_PRE_CHG_RES_OVER_TEMP_LEV_2	The temperature of the precharge resistance is too high
F012	ALARM_ID_NORTH_CONNECTOR_OVER_TEMP_LEV_2	The temperature of the BMS connector is too high
F013	ALARM_ID_SOUTH_CONNECTOR_OVER_TEMP_LEV_2	The temperature of the BMU connector is too high
F014	ALARM_ID_CHG_OVER_CUR_LEV_2	Charging current fault
F015	ALARM_ID_DSG_OVER_CUR_LEV_2	Discharge current fault
F016	ALARM_ID_SOC_OVER_LEV_2	High SOC fault
F017	ALARM_ID_INSULATION_FAILURE_TWO	Insulation fault
F018	ALARM_ID_HEAT_OVER_TEMP_LEV_2	The heating film is too high
F019	ALARM_ID_SOC_LOW_LEV_2	The SOC is too low
F020	ALARM_ID_DSG_RELAY_ADHESION	The total voltage is too low
F021	ALARM_ID_POS_RELAY_ADHESION	Total positive relay bonding
F022	ALARM_ID_CHG_RELAY_ADHESION	The charging relay is glued
F023	ALARM_ID_HEAT_RELAY_ADHESION	The heating relay is glued
F024	ALARM_ID_ULTIMATE_PROTECTION	Ultimate protection
F025	ALARM_ID_POWER_SUPPLY_FAULT	Abnormal supply voltage
F026	ALARM_ID_FUSE_BLOWN	Blown fuse
F027	ALARM_ID_BMU_ADDR_REPEAT	The BMU repeatedly fails
F028	ALARM_ID_BMS_ADDR_REPEAT	The BMS is faulty repeatedly
F029	ALARM_ID_INTERNAL_COMM_ERROR	The internal CAN communication fails
F030	ALARM_ID_PCS_CAN_COMM_FAIL	The PCS CAN communication fails
F031	MBMS_SAM_SIG_ID_PCS_ERROR_STATE	The PCS RS485 communication fails

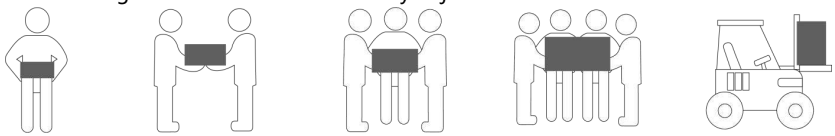
F032	ALARM_ID_PCS_RS485_COMM_ERROR	The PCS RS485 communication is abnormal
F033	ALARM_ID_FUSE_VOLT_SAMP_ERROR	The FUSE total pressure collection is abnormal
F034	ALARM_ID_BAT_VOLT_SAMP_ERROR	Abnormal internal total pressure collection
F035	ALARM_ID_MOT_VOLT_SAMP_ERROR	The Mot total pressure collection is abnormal
F036	ALARM_ID_HTP_VOLT_SAMP_ERROR	The heating total pressure collection is abnormal
F037	ALARM_ID_CELL_VOLT_SAMPLE_ERROR	Voltage collection fault
F038	ALARM_ID_TEMP_SAMPLE_ERROR	Temperature acquisition fault
F039	ALARM_ID_CURRENT_SAMPLE_ERROR	Current acquisition fault
F040	ALARM_ID_CURRENT_MODULE_FAULT	Current module fault
F041	ALARM_ID_POS_RELAY_DRIVE_FAULT	Total positive relay drive failure
F042	ALARM_ID_CHG_RELAY_DRIVE_FAULT	Charging relay drive failure
F043	ALARM_ID_DSG_RELAY_DRIVE_FAULT	Discharge relay drive failure
F044	ALARM_ID_HEAT_RELAY_DRIVE_FAULT	Heating relay drive failure
F045	ALARM_ID_EEPROM_ERROR	The EEPROM storage is faulty
F046	ALARM_ID_PRECHAGE_ERROR	The precharge failed
F047	ALARM_ID_CHG_VOLT_LOW	The charging voltage is too low
F048	ALARM_ID_BMU_COMM_ERROR	The BMU communication is faulty
F049	ALARM_ID_BMU_NUMBER_ERROR	The number of BMUs is abnormal
F050	ALARM_ID_MBMS_NTC_BREAKLINE_ERROR	Temperature collection of the BMS connector is abnormal
F051	ALARM_ID_BMU_NTC_BREAKLINE_ERROR	The temperature collection of the BMU connector is abnormal
F052	ALARM_ID_PACK_THERMAL_RUNAWAY	PACK thermal runaway fault
F053	ALARM_ID_PACK_FIRE_FAULT	PACK fire failure
F054	ALARM_ID_TCP_CONNECT_FAIL	TCP connection failure
F055	ALARM_ID_W5500_SPI_COMM_	The W5500SPI communication fails

	FAIL	
F056	ALARM_ID_LC_COMM_LOST	LC communication loss
F057	ALARM_ID_PACK_AFE_COMM_ERROR,	BMU AFE communication fails
F058	ALARM_ID_BLE_INIT_FAULT	Description Bluetooth initialization failed
F059	ALARM_ID_CELL_TYPE_MISMATCH_ERROR	The battery type does not match

4 Preparation for Installation

4.1 Moving Heavy Objects

After arrival of your goods, perhaps you need move it to designated working area. Refer to the following table for movement of heavy objects.



Weight	Method	Recommendation
<18 kg (40lbs)	Manual handling	1 person
18~32 kg (40~70lbs)	Manual handling	2 persons
32~55 kg (40~70lbs)	Manual handling	3 persons
55~68 kg (121~150lbs)	Manual handling	4 persons
> 68 kg (150lbs)	Moving device	Forklift

When moving heavy objects manually:

• If multiple persons need to move a heavy object together, determine the manpower and work division with consideration of height and other condition to ensure that the weight is equally distributed.

• If two persons or more move a heavy object together, ensure that the object is lifted and landed simultaneously and moved at a uniform pace under the supervision of one person.

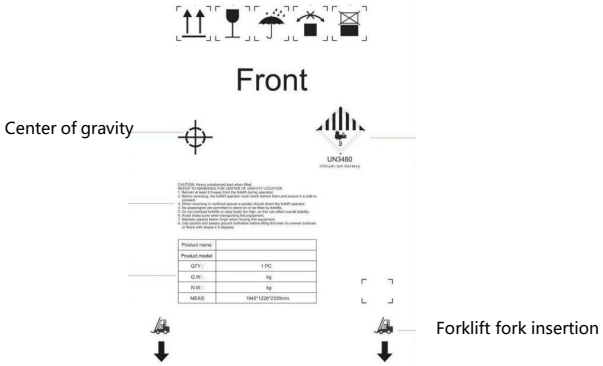
• Wear personal protective gears such as protective gloves and shoes when manually moving the equipment.

• To move an object by hand, approach to the object, squat down, and then lift the object gently and stably by the force of the legs instead of you back. Do not lift it suddenly or turn your body around.

• Move a heavy object stably with balanced force at an even and low speed. Put down the object stably and slowly to prevent any collision or drop from scratching the surface of the equipment or damaging the components and cables.

• When moving a heavy object, be aware of the workbench, slope, staircase, and slippery places. When moving a heavy object through a door, ensure that the door is wide enough to avoid bumping or injury.

When moving with forklift:



• Suggest to insert the forklift tooth into the position indicated by the "Forklift fork insertion" in package material. See the above figure.

• When lifted heavy unbalanced load, refers to the marking for center of gravity location.

• Keep at least 2m away from the forklift during operation.

• No passengers are permitted to stand on or be lifted by forklifts.

• Do not overload forklifts or raise loads too high, as this can affect overall stability.

• Maintain speeds below 3mph and avoid sharp turns.

• Before reversing, the forklift operator must check behind them and ensure it is safe to proceed.

• When reversing in confined spaces, a spotter is needed,who directs the forklift operator.

• Use caution when lifting this load on uneven surfaces.

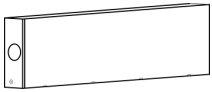
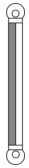
• Never operate the forklift on slopes ≥ 5 degrees.

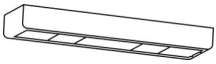
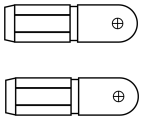
• During movement, avoid tilting the battery system or placing it upside down. If the battery system must be tilted or inverted , please straighten it as soon as possible, and the system needs to be left standing for 2 hours before it can be powered on.

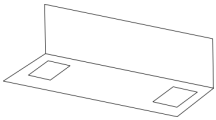
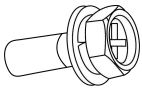
4.2 Unpacking List

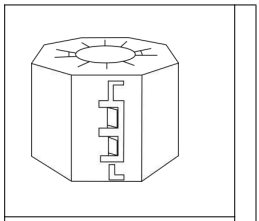
After unpacking, check that packing contents are intact and complete , and free from any damage. If any item listed in the *Unpacking List* is missing or damaged, contact your vendor.

4.2.1 Base and Cover Package

		
Front cover*1 pcs	Rear cover*1 pcs	Ground wire*1 pcs

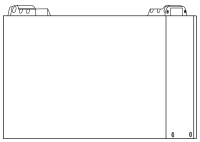
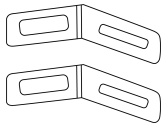
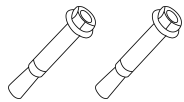
		
Base*1 pcs	Connector*1 pair	Allen key*1pcs

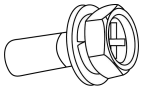
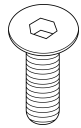
		
Auxiliary measurement tool*1	Bolt*4 pcs (M6)	Bracket*2 pcs



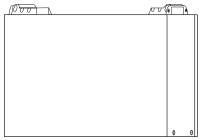
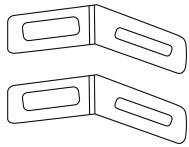
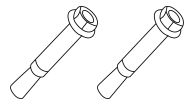
Ferrite ring*1

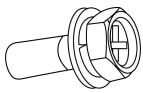
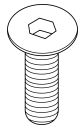
4.2.2 Battery GB-A-Pack4 Package

		
Battery pack*1 pcs	Fixed support*2 pcs	Expansion bolt*2 pcs (M6)

		
Bolt*2 pcs (M5)	User Manual*1 pcs	Screw*4pcs (M5)

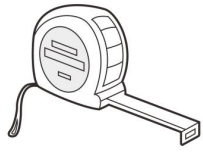
4.2.3 Battery GB-A-Pack6 Package (Optional)

		
Battery pack*1 pcs	Fixed support*2 pcs	Expansion bolt*2 pcs (M6)

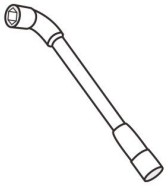
	
Bolt*2 pcs (M5)	Screw*4pcs (M5)

4.3 Required Tools

These tools are required to install the battery.

		
Hammer	Drill	Tape measure

		
Hex wrench	Phillips screwdriver	Marker


Hexagon socket wrench

Note:

Use properly insulated tools to prevent accident tale electric shock or short circuits. If insulated tools are not available, cover the entire exposed metal surfaces of the available tools, except their tips, with electrical tape.

4.4 Safety Gear

It is recommended to wear the following safety gear when dealing with the battery pack.

		
Insulated gloves	Safety goggles	Safety shoes

5 Installation Instructions

5.1 Installation Requirements

5.1.1 Installation Personnel

•Only qualified professionals or trained personnel are allowed to install the equipment.

-Professionals: personnel who are familiar with the working principles and structure of the equipment, trained or experienced in equipment operations and are clear of the sources and degree of various potential hazards in equipment installation.

-Trained personnel: personnel who are trained in technology and safety have required experience,are aware of possible hazards on themselves in certain operations and are able to take protective measures to minimize the hazards on themselves and other people.

•Personnel who plan to install the equipment must receive all necessary safety precautions and local relevant standards.

•Only qualified professionals are allowed to remove safety facilities and inspect the equipment.

•Knowledge of electronic, electrical wiring and mechanical expertise, and be familiar with electrical and mechanical schematics.

• Understanding and complying with this document and other applicable documents.

5.1.2. Installation Environment

Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.

Do not store any flammable or explosive materials in equipment area.

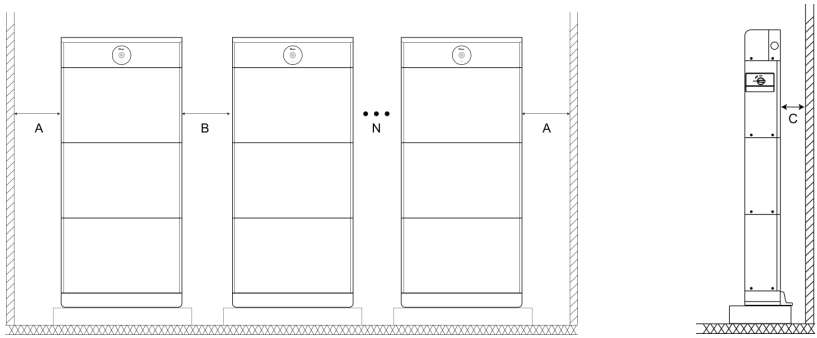
Do not place the equipment near heat sources or fire sources, such as smoke, candies, heaters, or other heating devices. Overheat may damage the equipment or cause a fire.

Install the equipment in an area far away liquids. Do not install it under areas prone to condensation, such as under water pipe and air exhaust vent, or area prone to water leakage, such as air conditioner vents, or ventilation vents . Ensure that no liquid enters the equipment to prevent faults or short circuits.

To prevent damage or fire due to high temperature, ensure that the ventilation vents or heat dissipation systems are not obstructed or covered by other objects while the equipment is running.

• The installation and usage environment must meet relevant international,the local laws and regulations.The user is obliged to protect the battery system against fire or other hazards.
• Keep out of the reach of children and away from daily working or living area, including but not limited to the following areas:studio, bedroom, lounge, living room, music room, kitchen,game room, room theater, sunroom,toilet,bathroom,laundry,and attic.
• Do not install the equipment in places that are enclosed, unventilated without proper fire fighting facilities, or difficult for firefighters to access.
• Do not install the equipment in an easily accessible position because the temperature of the enclosure and heat sink is high when the battery system is running.
• Do not install the battery system on a moving object, such as ship, train, or car.
• Ensure that the equipment is installed in a clean, dry and well ventilated area with proper temperature, humidity and altitude range.Check for more data in the "***Technical Specifications***" section.
• Do not install the equipment in an environment with magnetic dust, volatile or corrosive gases, infrared and other radiations, organic solvents, conductive metal,or salty air.
• Do not install the equipment in an area conducive to growth of microorganism such as fungus or mildew.
• Do not install the equipment in an area with strong vibration, noise, or electromagnetic interference.
• Do not install the equipment in an position that may be submerged in water.

5.1.3. Installation clearance requirements

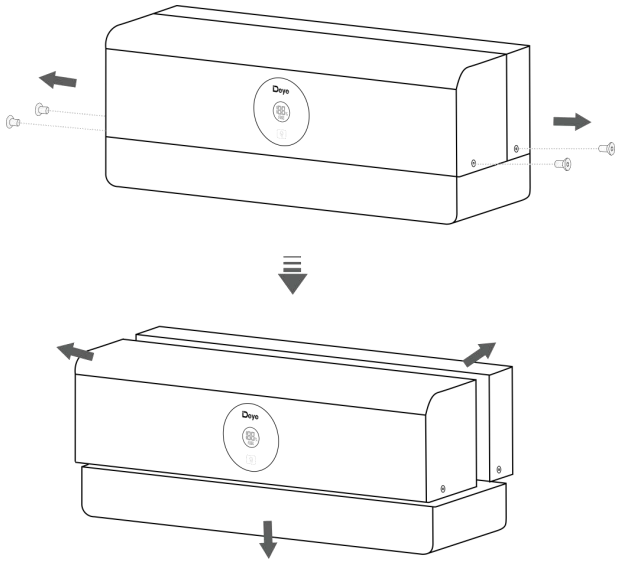


Item	Distance (mm)
A	≥600
B	≥600
C	50≤C≤80

5.2 Installing the Battery

You product is delivered with some detachable parts preset with screws at the factory. Therefore, please remove these fasteners before installation.

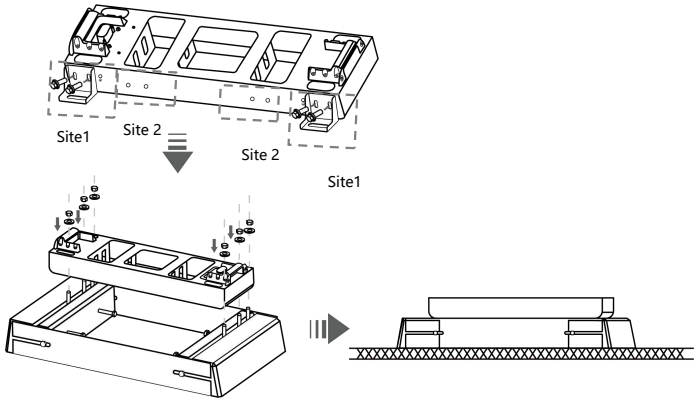
1. Remove the base, front cover and rear cover out of their packing cases at first. Then disassemble them by removing screws using an Allen wrench.



2. Mounting the base:

1) Attach two brackets to the base with 4 bolts (M6). It is noted that we provide you with two installation sites to mount your brackets. Correspondingly, adjust the installation site of the base according your choice of bracket installation site.

2) Place the base over the well-mounted foundation and then secure with 6 sets of bolts (M12) and washers.


Site1
Site 2
Site 2
Site1

3. Place the auxiliary measurement tool over the base and mark positions of two assembly holes (Figure.1&Figure.2). Drill holes (Φ=8mm) on the wall using an impact drill(Figure.3). **After each battery pack is put in place, locate and drill holes in the same way.**

Note!

1) When drilling holes, pay attention to prevent dust from entering the battery, which may affect the battery performance and function.

2) Ensure that the floor is level enough so as to avoid to influence hole drilling, such as height or location.

3) After drilling, never forget to clean up the floor.

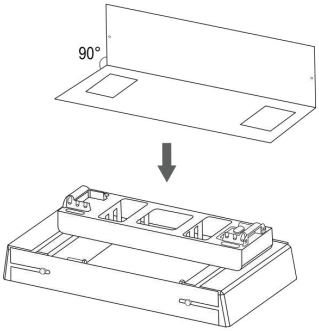


Figure.1

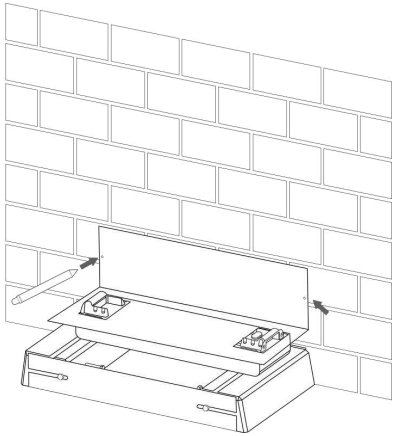


Figure.2

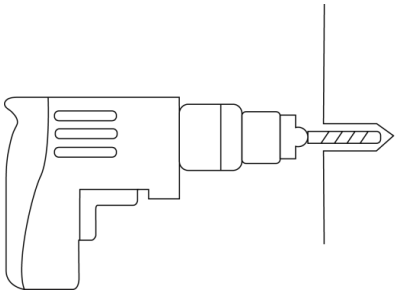
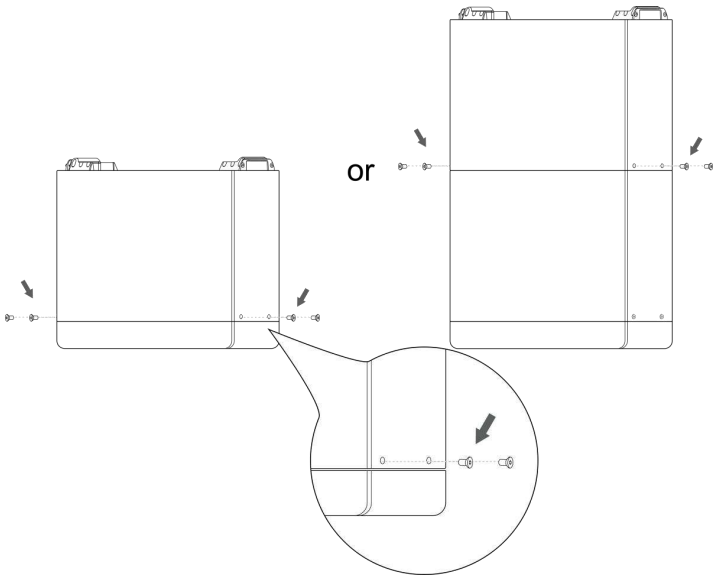
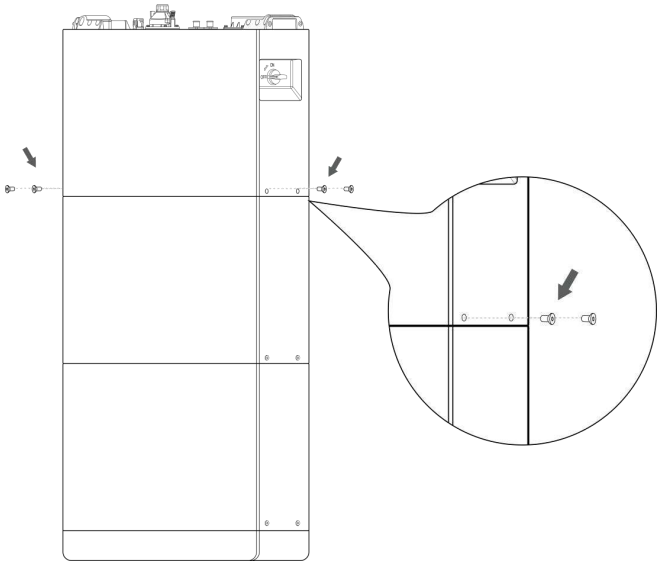


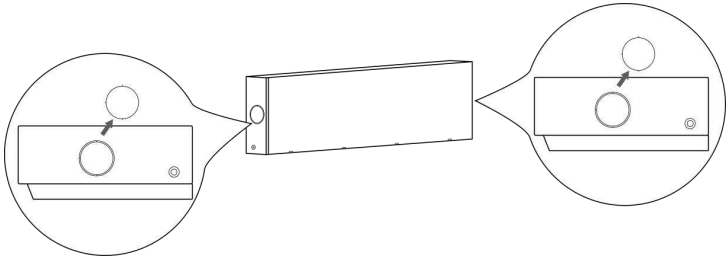
Figure.3

4.When every battery pack needs to be put in use, 4 screws (M5) are provided to help secure one battery to another one. It is noted that the quantity of the battery pack GB-A-Pack6. is optional, depending on your demands. However, the battery pack GB-A-Pack6 is mandatory, which is so designed that it needed to be placed on the top in order to connect the battery system to other devices or facilities.

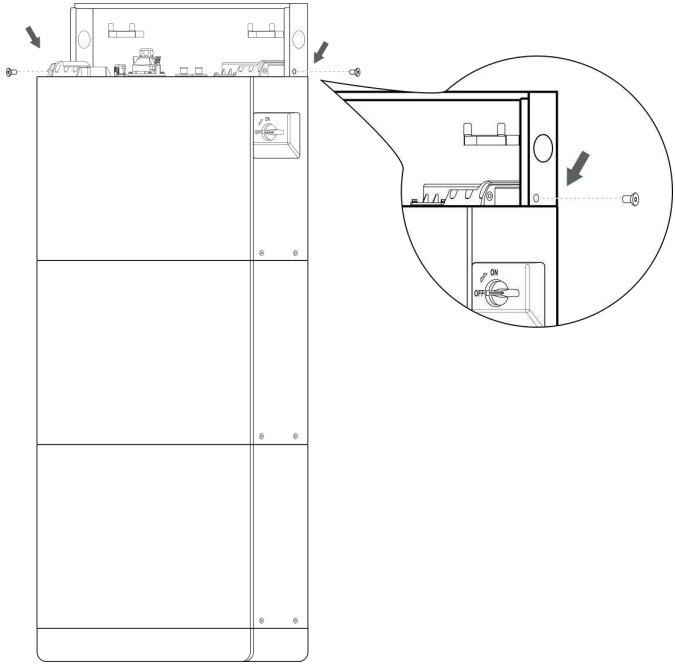




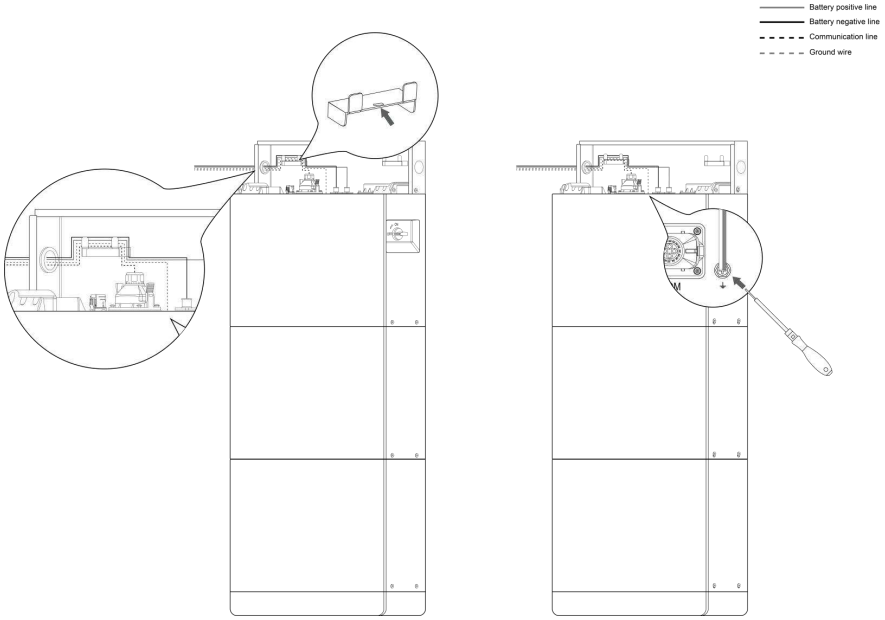
5. It is necessary to make corresponding knockout-holes into through-holes (Φ=43mm) with tools according to your demands, and then install suitable connectors. The recommended connector is PF36xG1-1/4.



6. Install the rear cover and then secure with 2 screws (M5).

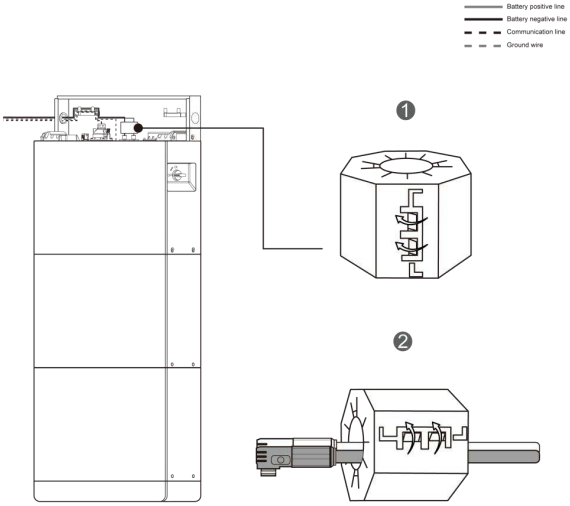


7. Carry out the wire connection and grounding according to your needs. Harness the cables with a zip-tie by threading the zip-tip through one hole reserved for tying up cables if necessary.



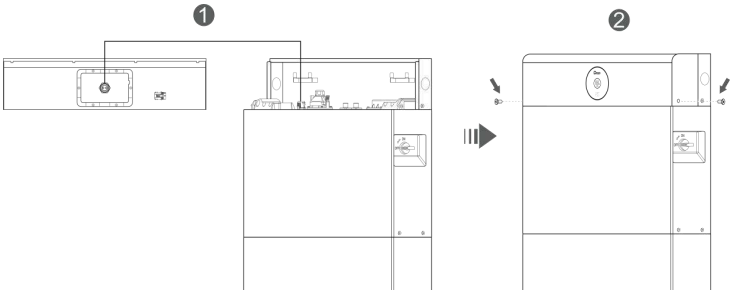
8. Thread both the positive and negative battery power cables through the ferrite ring as shown in the following picture.

NOTE: You have to pass the two wires **in parallel and in the same direction** through the ferrite ring.

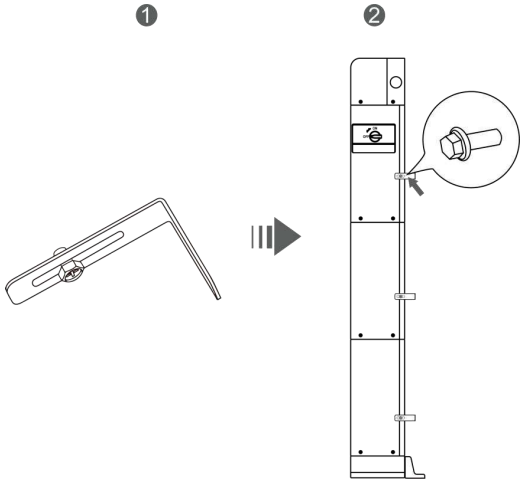


NOTE: You have to pass the two wires in parallel and in the same direction through the ferrite ring

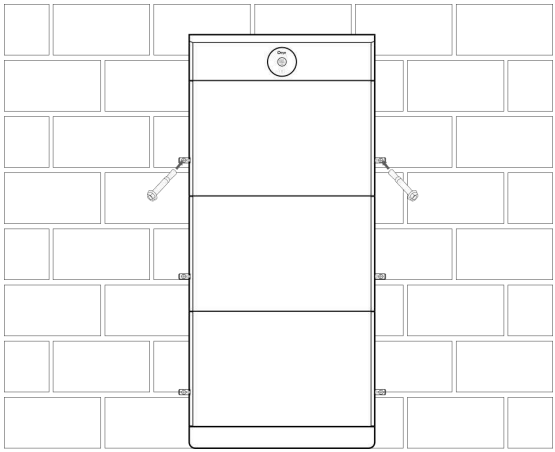
9. Install the front cover and then secure with 2 screws (M5).



10. Two bolts (M5) are provided for every battery pack to secure 2 fixed supports to the left and right side of the battery.



11.Secure every battery to the wall with 2 expansion bolts (M6).



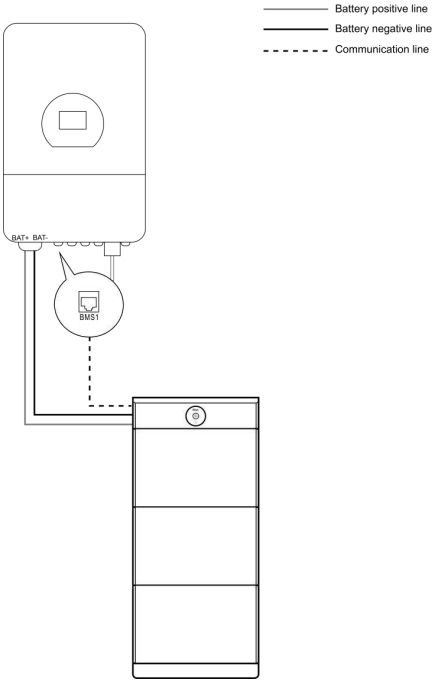
6 Electrical Connection

6.1 Wire connection

Caution!

It should be noted that the maximum current of single battery system is 40A . Exceeding 40A will cause heating of the connectors and cable, and in severe cases, it will cause a fire accident. As for cables, the recommended cross section of them should be at least **6AWG** or **12mm²**.

Schematic diagram of single battery system:



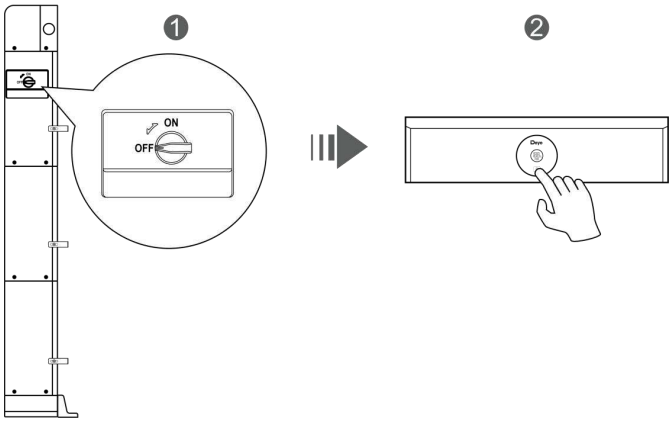
6.2 Tips on Wiring

- Note the positive and negative ends of cables.
- Be careful to avoid misuse of lines used for communication between PCS and battery, battery and battery. Once the PCS communication line is connected to "+" port or "-" port, which may form inappropriate clearance, waterproof effects will not be reached.
- When connecting one battery to another one, battery negative lines and battery positive lines are expected be wired to "-" port and "+" port on one side of the battery at the same time instead of on two sides respectively.
- Battery lines threading through ports on the left side of the battery should be connected to the left column of positive copper bar and of negative copper bar. So are lines on the right. Namely, left to left, right to right, try to avoid cross-connection.

7 Power on/off the Product

Before operating the product, ensure that:

- All cables are wired correctly and firmly.
- All fasteners including bolts and screws are tightened firmly.
- No bystanders or animals enter into the working area.
- Keep foreign objects , especially metal, away from the battery .



1. Turn the service switch to the "ON" position.

2. Press the start button for 3 seconds at least.Once the LCD screen lights up, you can use the battery system normally.

3. After you finish your work, please switch off the service switch ,and then press the start button to shut down the equipment.

8 Charging your battery

GB-A4/GB-A10/GB-A16:

1. Before charging, let the battery rest for 2 minutes.

2. Firstly, charge with a constant current of 20A until the highest single-cell voltage reaches 3.55V or the total voltage reaches 113.6V/284V/454.4V.

3. Secondly, continue charging with a constant current of 14A until the highest single-cell voltage reaches 3.58V or the total voltage reaches 114.5V/286.4V/458.2V.

4. Finally, charge with a constant current of 7A until the highest single-cell voltage reaches 3.6V or the total voltage reaches 115.2V/288V/460.8V, then stop charging and let the battery rest for 5 minutes.

9 Inspection, Cleaning and Maintenance

9.1 General Information

- The battery product is not fully charged. It is recommended that the installation be completed within 3 months after arrival;
- During the maintenance process, do not re-install the battery in the battery product. Otherwise, the performance of the battery will be reduced;
- It is forbidden to dismantle any battery in the battery product, and it is forbidden to dis- sect the battery;
- After the battery product is over-discharged, it is recommended to charge the battery within 48 hours. The battery product can also be charged in parallel. After the battery product is connected in parallel, the charger only needs to connect the output port of any product battery.
- Never attempt to open or dismantle the battery! The inside of the battery does not contain serviceable parts.
- Disconnect the Li-Ion battery from all loads and charging devices before performing cleaning and maintenance activities.
- Place the enclosed protective caps over the terminals before cleaning and maintenance activities to avoid the risk of contacting the terminals.
- All the battery terminals must be disconnected for maintenance.
- Please contact the supplier within 24 hours if there is something abnormal.
- Do not use cleaning solvents to clean battery.

9.2 Inspection

- Inspect for loose and/or damaged wiring and contacts, cracks, deformations, leakage, or damage of any other kind. If damage to the battery is found, it must be replaced. Do not attempt to charge or use a damaged battery. Do not touch the liquid from a ruptured battery.
- Regularly check the battery' s state of charge. Lithium Iron Phosphate batteries will slowly self-discharge when not in use or whilst in storage.
- Consider replacing the battery with a new one if you note either of the following conditions:
  - The battery run time drops below 70% of the original run time.
  - The battery charge time increases significantly.
  -

9.3 Cleaning

If necessary, clean the Li-Ion battery with a soft, dry cloth. Never use liquids, solvents, or abrasives to clean the Li-Ion battery.

9.4 Maintenance

If any maintenance is required, please contact the service center or service engineers for help.

10 Storage

- The battery product should be stored in a dry, cool, and cool environment;
- If the battery is stored for long time, it is required to charge them every six months, and the SOC should be no less than 50%.
- Generally, the maximum storage period at room temperature is 6 months. When the battery is stored over 6 months, it is recommended to check the battery voltage. If the volt- age is higher than 51.2V, it can continue to store the battery. In addition, it is needed to check the voltage at least once a month until the voltage is lower than 51.2V. When the voltage of the battery is lower than 51.2V, it must to be charged according to the charging strategy.
- When the battery product is stored, the source of ignition or high temperature should be avoided and it should be kept away from explosive and flammable areas.
- The charging/ discharging strategy: discharge the battery to the cutoff voltage and then charge
  with 0.5C(19.05A) current for about 2 hours. Keep the SOC of the battery at 40%~60% whe n stored.

11 Troubleshooting

When any error exists in your equipment, please contact the service center or service engineers for help. If the system lock is triggered, users are also expected to refer the maintenance manual or contact the service center for detailed solutions.

12 Technical Specifications

Main Parameter		GB-A-Pack 6	GB-A4	GB-A10	GB-A16
Composition		GB-A-Pack 6	GB-A-Pack 4	GB-A-Pack 4+GB-A-Pack 6*1	GB-A-Pack 4+GB-A-Pack 6*2
Battery Chemistry		$LiFePO_4$			
Battery Module Capacity (Ah)		39.1			
Battery Module Energy(kWh)*		2			
Battery Module Nominal Voltage (V)*		51.2			
System Nominal Voltage (V)		153.6	102.4	256	409.6
System Energy (kWh)		6	4	10	16
Charge Current (A)	Recommend	20			
	Max	28			
Discharge Current (A)	Recommend	20			
	Max	37			
Other Parameter					
Recommend Depth of Discharge		90%			
Dimension (W/D/H, mm)		700*200*440	700×200×695	700×200×1135	700×200×1575
Weight Approximate(kg)		57	59	116	173
Discharge termination voltage		125.2/2.61V	83.5/2.61V	208.8/2.61V	334/2.61V
Status Indicator		Yellow: Battery High Voltage Power On Red: Battery System Alarm			
IP Rating of enclosure		IP65			
Ambient Operating Temperature		Charge/Discharge: -15℃～55℃			
Recommended Storage Temperature		0℃～35℃			
Relative Humidity		5%~95%			
Altitude		≤3000m			
Cycle Life		≥6000(25℃±2℃,0.5C/0.5C,70%EOL)			
Installation		Floor-Mounted, Wall-Mounted			
Communication Port		CAN2.0, RS485			

* Refer to 2kWh battery module

12 Environmental Disposal

Used batteries can not be disposed of as household waste. You are obliged to handle waste batteries, such as removal of privacy on product, and return them to designated or authorized recovery point according to applicable regulations and standards on waste battery disposal.

Attention:

1. Do not dispose of batteries and rechargeable batteries as domestic waste!

You are legally obliged to return used batteries and rechargeable batteries.

2. Waste batteries may contain pollutants that can damage the environment or your health if improperly stored or handled.

3. Batteries also contain iron, lithium and other important raw materials, which can be recycled.

For more information, please visit http://www.deyeess.com. Do not dispose of batteries as household waste!

13 Transportation Requirements

1. The battery products should be transported after packaging and during the transportation process. Severe vibration, impact, or extrusion should be prevented to prevent sun and rain. It can be transported using vehicles such as cars, trains, and ships.
2. Always check all applicable local, national, and international regulations before transporting a Lithium Iron Phosphate battery.
3. Transporting an end-of-life, damaged, or recalled battery may, in certain cases, be specially
limited or prohibited.
4. The transport of the Li-Ion battery falls under hazard class UN3480, class 9. For transport over water, air and land, the battery falls within packaging group PI965 Section I. Use Class 9 Miscellaneous Dangerous Goods and UN Identification labels for transportation of lithium-ion batteries which are assigned Class 9. Refer to relevant transportation documents.

Class 9 Miscellaneous Dangerous Goods and UN Identification Label