DAKOTA LITHIUM®

STACKABLE BATTERY ENERGY STORAGE SYSTEM
ESS48400-HSD8H2-R32

USER MANUAL

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1 CHAPTER 1: OPERATION GUIDE

Thank you very much for choosing the Stackable Battery Energy Storage System (hereafter referred to as "ESS") developed and produced by Dakota Lithium. Before installing and using this product, please carefully read and understand all the contents of this manual. If you have any suggestions during use, please feel free to contact **Support@DakotaLithium.com**.

1.1 SYMBOLS

This manual may have the following symbols, which have the following meanings:

SYMBOL	MEANING
	Indicates a high-risk hazard that, if not avoided, can lead to death or serious injury.
	Indicates a hazard with a moderate risk level that, if not avoided, can lead to death or serious injury.
	A hazard indicating a low level of risk that, if not avoided, can result in minor or moderate injury.
	Warning information about device or environmental safety. If not avoided, it may result in equipment damage, data loss, performance degradation, or other consequences

1.2 IMPORTANT NOTICES

Before installing, operating, and maintaining the equipment, please read this manual and follow the symbols on the equipment and all safety precautions in this manual.

- This manual complies with local safety regulations and specifications when installing, operating, and maintaining equipment. Only trained professionals can install, operate, and maintain the equipment. Dakota Lithium shall not be liable for any losses caused by violating general safety operation requirements or violating safety standards for design, production, and use of equipment. The equipment must be used in an environment that meets the design specifications. Otherwise, the equipment may fail, and the resulting equipment malfunction or component damage, personal safety accidents, and property losses are not within the scope of the equipment's quality assurance. The safety precautions in this manual are only supplements to local laws, regulations, and norms. The company shall not be liable for any of the following situations:
- The device is not operating under the operating conditions described in this manual
- The installation and operating environment exceeds the requirements of relevant international or national standards
- The product has been disassembled or changed, or the software code has been modified without authorization
- Failure to comply with operating instructions and safety warnings related to products and documents
- Equipment damage caused by abnormal natural environments (force majeure, such as earthquakes, fires, storms)
- Transportation damage is caused during the customer's own transportation process
- Storage conditions do not meet the requirements of product related documents, resulting in damage
- The open circuit voltage of the photovoltaic module exceeds the maximum allowable voltage
- Damage caused by working environment temperature exceeding the limit working temperature range
- Unauthorized disassembly and maintenance of ESS

1.3 ELECTRIC SAFETY

1.3.1 GENERAL REQUIREMENTS

Before making cable connections, please ensure that the equipment is not damaged or there is a possibility of electric shock or fire.

Do not install or remove any power cords when the power is turned on. When cables come into contact with wires, electric arcs or sparks may be generated, which may cause fire or personal injury.

- The cable connection must meet the electrical standards of the country and region where the project is located.
- Cables prepared by users themselves should comply with local laws and regulations.
- Before connecting the power cord, please ensure that the label identification on the power cord is correct.
- Other operations on the device are only allowed 5 minutes after the device is completely shut down.
- Do not use cables in high-temperature environments, as the insulation layer of the cable may age or be damaged
- Cables of the same type should be bundled together, and cables of different types should not be wrapped or crossed together.

1.3.2 GROUNDING REQUIREMENTS

- When installing the grounding device, the protective grounding wire must be installed first, and when removing the device, the protective grounding wire must be removed last.
- Prohibit damaging the grounding wire.
- If the grounding wire is not installed, it is prohibited to operate the equipment.
- The equipment should be permanently connected to the protective grounding wire. Before operating the equipment, the electrical connections of the equipment should be checked to ensure that it is grounded.

1.4 INSTALLATION ENVIRONMENT REQUIREMENTS

- It is recommended to install this product in an environment with a temperature of 5°F (-15 °C)~ 140°F (60 °C)
- The equipment should be installed in a dry and well ventilated environment to ensure good heat dissipation performance
- The equipment can be installed at a maximum altitude of 6500 ft (~2000 meters)
- The installation and use of this product should be kept away from children and animals, and the installation location should be well protected
- The installation location should be away from water sources, such as faucets, sewers, sprinkler devices, etc., to avoid exposure to entering water
- Do not place any flammable or explosive materials around the equipment
- Choose a sturdy and flat ground that cannot be placed on a slope
- At least 200mm space shall be reserved at the outlet of ESS wiring to ensure natural convection and dispersion
- Inverters and batteries cannot be installed in enclosed spaces
- When the equipment is running, do not block the air vents or heat dissipation system, as it may cause high temperatures and cause fires.

The operating life and service life of ESS are related to the operating temperature.
It should be installed at a temperature equal to or better than the ambient temperature.

Ambient temperature	Ambient humidity	Installation environment
5°F (-15 ℃)~ 140°F (60 ℃)	＜85%	indoor

2 CHAPTER 2 PRODUCT INTRODUCTION

2.1 PRODUCT DESCRIPTION

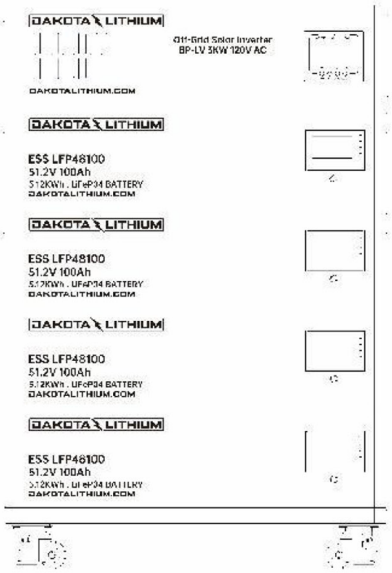
The Dakota Lithium Stackable Battery ESS household energy storage system adopts a modular design, including battery modules and inverter modules. The energy storage module adopts a Lithium iron phosphate battery with high performance and long service life. Each energy storage module is integrated with an intelligent BMS system internally, making it easy to expand and can be combined into up to 20.48KWh of battery capacity. This BMS uses a professional protection board testing system to conduct comprehensive testing before going online, ensuring that the BMS provides comprehensive and effective protection for the battery pack during use. This product uses a 3,000 watt off grid solar inverter with MPPT controller.

This product has superior performance, stability and reliability, green environmental protection, high energy density, long charging and discharging cycle life, good safety performance, compatibility and operability, and other characteristics. It is your trustworthy green environmental protection product. As a stacked household energy storage system, the ESS household energy storage can significantly reduce transmission losses and realize the efficiency of power grid transmission. Convenient, simple, and mobile, it can save space, and can utilize mains and photovoltaic power to supply power to the load in case of power outage.

2.2 DAKOTA LITHIUM STACKABLE BATTERY ENERGY STORAGE SYSTEM PARAMETERS

System operation mode	1. Adopting pure sine wave AC output. 2. It has two output modes: mains bypass and inverter output, and has the function of uninterrupted power supply. 3. WiFi remote monitoring. 4. Advanced MPPT technology. 5. LCD screen design, dynamic display of system data and operating status. 6. The air switch controls the AC output. 7.This stacked system is an off-grid type, and the input power of the load device needs to be confirmed as the only input device. It is prohibited to use it in parallel with other input AC power sources to avoid damage.	
System Capability	AC output	110V（Can be set to 100V, 110V, 120V）
	Load capacity	3kVA
	Reserve capacity	51.2V400Ah 20.48kWh
System configuration	Inverter power supply	3kVA
	LiFePO4 Battery Pack	51.2V100Ah 5.12kWh*4
System dimensions (tolerance ± 2%)	695mm(L)×458mm（W)×1020mm(H Including wheel height)	
System weight (4 batteries, one inverter)	About 640lbs (290kg)	

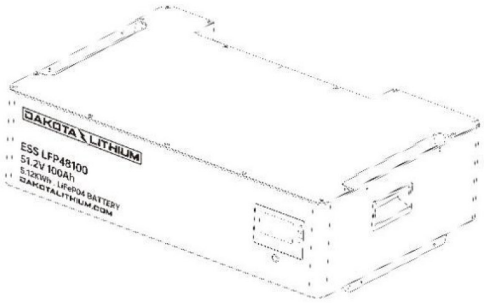
2.3. PRODUCT APPEARANCE DIMENSION

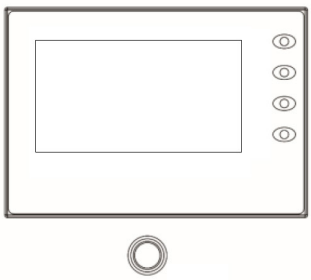


2.4 BATTERY MODULE

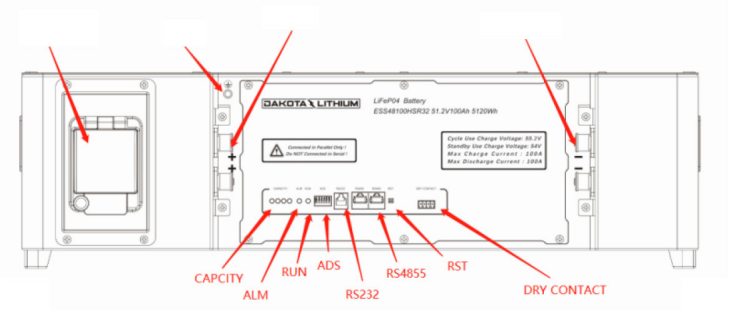
The ESS adopts a Lithium iron phosphate battery with high performance and long service life, and the matching group adopts intelligent sorting, which is accurate and reliable. At the same time, a modular structure design was also adopted. Each energy storage module is integrated with an intelligent BMS system internally, making it easy to expand, and can be combined into up to 20.48KWh battery packs.

2.4.1 BATTERY MODULE APPEARANCE





2.4.2 BATTERY MODULE PARAMETER

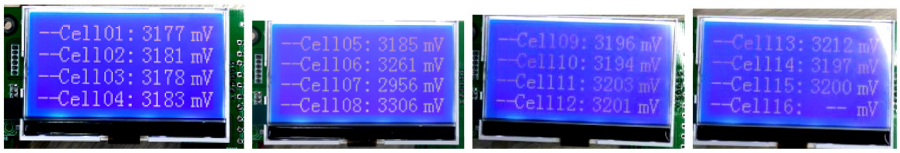
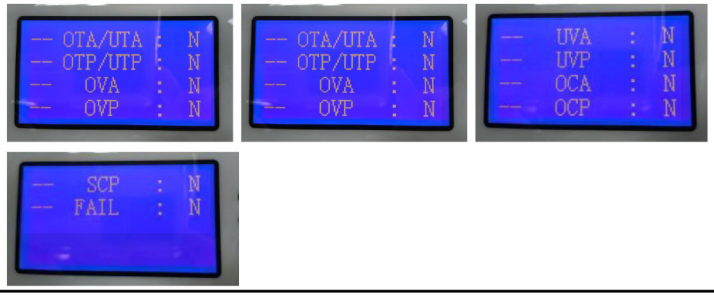


DAKOTA LITHIUM STACKABLE BATTERY MODULE		
Charge characteristic	Nominal voltage	51.2V
	Chemical system	LiFePO4
	Nominal capacity/Min.capacity	100Ah/98Ah
	Cycle life	≥ 1600 times/70% DOD, 70% EOL, 0.2C room temperature 25 ± 5 ℃ charge and discharge
Electrical characteristics	Max. continuous charging current	100A
	Max. continuous discharge current	100A
	Discharge termination voltage	45V
Mechanical properties	Shell material	Cold rolled steel plate
	Dimensions (tolerance ± 2%)	695X458X200mm
	Weight	About 143lbs (65kg)
	IP Grade	IP20
Temperature characteristic	Charge Temperature	32°F (0℃) to 113°F (45℃)
	Discharge Temperature	-4°F (-20℃) to 140°F (60℃)
	Optimal performance temperature	50°F (10℃) to 104°F (40℃)

2.4.3 BATTERY MODULE LCD OPERATION INSTRUCTIONS

Illustrate	TP-LCD-05 LCD screen display content
LCD screen button definition	
Introduction to Display Interface	
Enter the interface display	

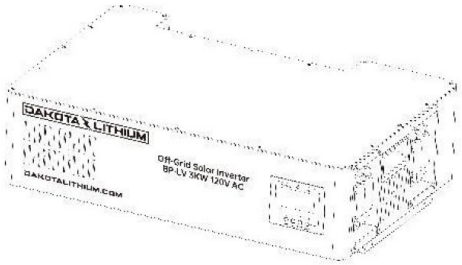
2.4.3 BATTERY MODULE LCD OPERATION INSTRUCTIONS: CONTINUE

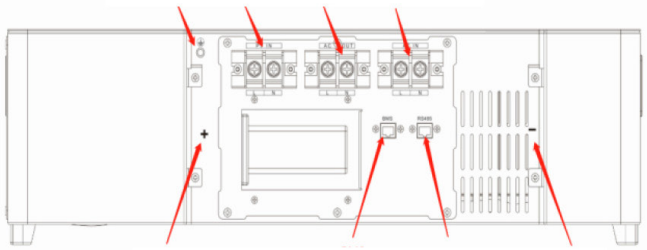
Entering temperature collection	
Voltage entering the battery cell	
Capacity display interface	
Battery working state	
Entering abnormal accumulation	
Alarm/protection status	

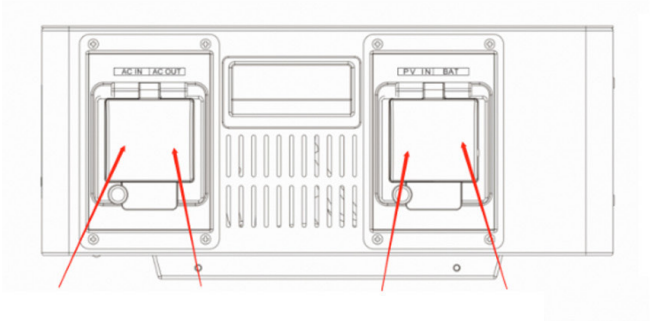
2.5 INVERTER MODULE

This product features a rated power of 3KW, small size, light weight, and the ability to carry both solar and mains power simultaneously. It comes with RS232/RS485 for communication with BMS and is monitored remotely using WIFI/GPRS. This series features advanced MPPT technology to maximize solar energy, a display screen and indicator light that dynamically displays system data and operating status, reduces no-load losses in power-saving mode, utilizes adjustable speed fans for efficient heat dissipation, and has comprehensive protection functions.

2.5.1. INVERTER MODULE APPEARANCE



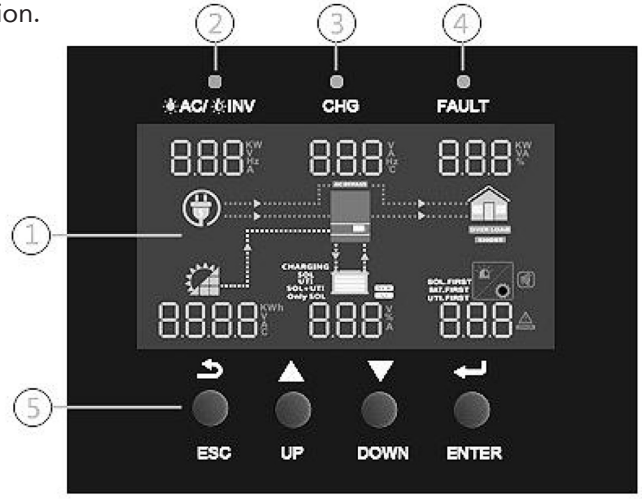




PANEL DISPLAY

Operation and display panel. It includes three indicator lights, four function buttons, and a LCD display to indicate the working status and input/output power information.

1. LCD display
2. status indicator
3. Charging indicator light
4. Fault Indicator
5. Function button



LED indicator light			Information
AC / INV	Green	On	The output is powered by utility equipment in line mode.
		Flash	The output is powered by the battery or PV in battery mode.
CHG	Green	On	The battery is fully charged.
		Flash	The battery is charging.
⚠ FAULT	Red	On	The inverter has malfunctioned.
		Flash	Warning situation in inverter

2.5.2. INVERTER MODULE PARAMETER

Off-grid solar inverter -3KW		
Mechanical properties	Shell material	Cold rolled steel plate
	Dimensions (tolerance ± 2%)	695*453*200mm
	Weight	About 64 lbs (29kg)
	IP Grade	IP20
Temperature characteristic	Operating temperature range	32°F (0℃) to 131°F (55℃)
	Storage temperature	5°F (-15℃) to 140°F (60℃)
Photovoltaic input	Max. PV open circuit voltage	250Vdc
	MPPT voltage range	120-250Vdc
	Max. photovoltaic input current	22A DC
	Max. usable power of photovoltaic panels	4000W
AC input	Max. AC input current	40A AC
AC output	Output voltage waveform	Pure sine wave
	Rated AC output power	3000VA/3000W
	Rated output voltage	110V（Settable 100V, 110V, 120V）
	Output frequency range	50Hz/60Hz Automatic recognition
	Peak power	6000W 5 seconds
Battery charging	Battery Chemistry System	LiFePO4
	Rated voltage of battery	48V
	Rated capacity	400Ah
	Rated electric quantity	20.48KWh
	Max. AC charging current	40A
	Max. photovoltaic charging current	80A
	Max. total charging current	80A

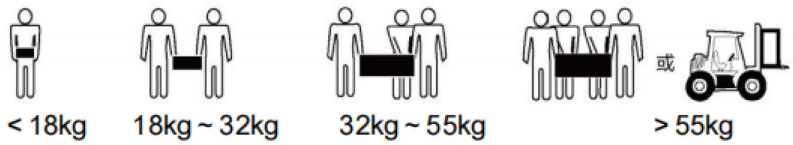
3 CHAPTER 3: EQUIPMENT INSTALLATION

3.1 INSTALLATION PRECAUTIONS

1. Before connecting to an external device, leave the device in a disconnected state
2. ESS must be handled with care during transportation and placement, and it is strictly prohibited to drop, impact, throw, or strike the ESS to avoid damaging it or causing safety hazards;
3. Do not install ESS in harsh environments or areas that are damp, greasy, flammable, explosive, or prone to dust accumulation;
4. When ESS is working, do not open the terminal protection cover;
5. Prohibit parallel use with other input AC power sources to avoid damage;
6. It is prohibited to place metal objects near the installation location in order to prevent short circuits in ESS.
7. Outdoor installation should avoid direct sunlight and rainwater infiltration;
8. The polarity of the input end cannot be reversed;
9. The input power of the load device needs to be confirmed that this ESS is the only input device. It is prohibited to use it in parallel with other input AC power sources to avoid damage.

INSTALLATION SPACE REQUIREMENTS

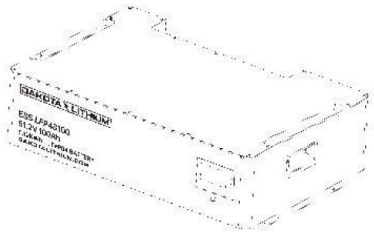
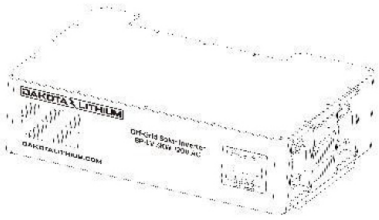
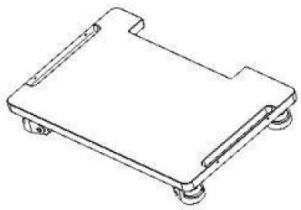
1. Choose a sturdy and flat ground;
2. Up to 4 batteries can be installed. The inverter should be installed on the top, with consistent wiring and panel directions;
3. After installation, check if the equipment is stable and fixed;
4. When handling any heavy objects, be prepared to bear the goods to avoid crushing or twisting;
5. When handling equipment by hand, protective gloves should be worn to avoid injury.



3.3. PRODUCT INSTALLATION

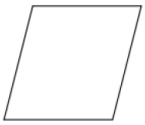
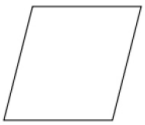
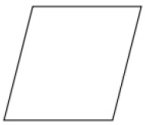
Unpacking inspection: Before opening the ESS outer packaging, check for obvious damage on the outer packaging and inspect the ESS. If there is any damage to the ESS packaging or model, please contact us as immeidately.
(This manual is used for stacking energy storage ESS48400 with a capacity of 20.48KWh.).

Inverter module size 695 * 453 * 200mm, base module size 691 * 453 * 115mm, battery module size 695 * 458 * 200mm.

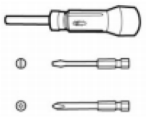
DELIVERABLE INSPECTION

After opening the outer packaging of the energy storage device, check whether the delivered item is complete and whether there is visible external damage. If any items are lost or damaged, please contact us at **Support@DakotaLithium.com**.

Material	Picture	Material	Specifications
Inverter module (1PCS)		Red positive plug wire (4PCS)	
Battery Module (4PCS)		Black negative plug cable (4PCS)	
Base (1PCS)		Battery communication cable (4PCS)	
Grounding leads (4PCS)		M6 Grounding Screw (5PCS)	
Flat head screw (20PCS)		ESS LFP48400 Product User Manual (1PCS)	
Inverter manual (1PCS)		WiFi Installation Manual (1PCS)	

2.3.1. INSTALLATION STEPS

PREPARATION OF TOOLS AND INSTRUMENTS

Type	Tools and instruments		
Personal protective equipment			
Installation tools			

1. Place the base in a stable place, lock the universal wheel, and prohibit the base from moving freely;

2. Stack a battery module on the base, with the notched side of the base and the wiring side of the battery module facing the same side. After the battery modules are stacked smoothly, use screws to fix the first battery module and base together, with the screw holes positioned next to both handles. Use a Phillips screwdriver to tighten the screws;

3. Stack the second battery module on top of the first battery module, with the wiring side of the battery module and the wiring side facing the same side, and the display screen of the battery module facing the same side. After the battery module is stacked, use screws to fix the first and second battery modules together, with the screw holes located by the two handles. Use a Phillips head screwdriver to tighten the screws;

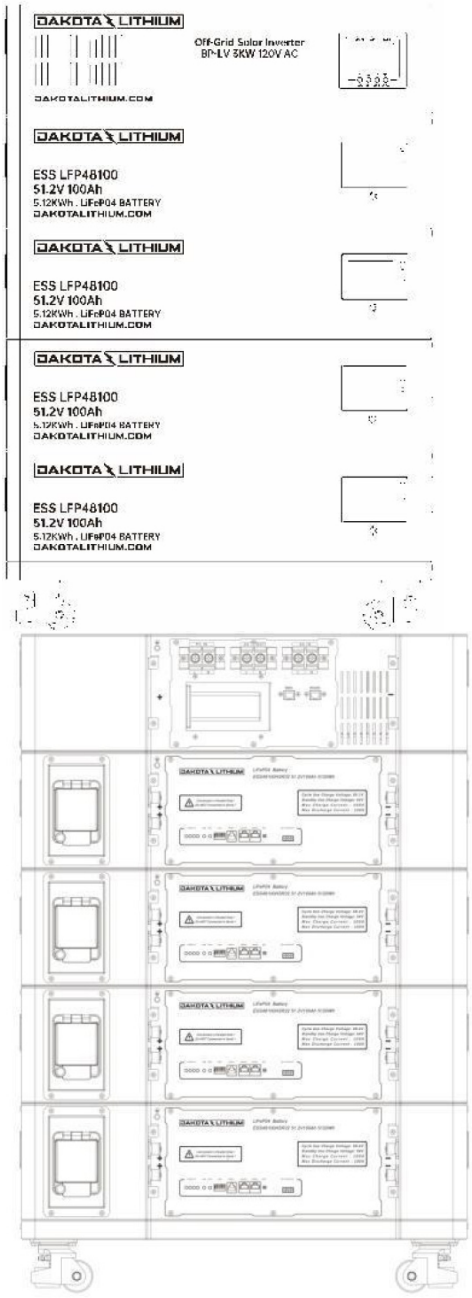
4. Stack the third battery module on top of the second battery module, with the wiring side of the battery module and the wiring side facing the same side, and the display screen of the battery module facing the same side. After the battery module is stacked, use screws to fix the second and third battery modules together, with the screw holes located next to both handles. Use a Phillips head screwdriver to tighten the screws;

5. Stack the fourth battery module on top of the third battery module, with the wiring side of the battery module facing the same side as the wiring side of the battery module, and the display screen of the battery module facing the same side. After the battery module is stacked, use screws to fix the third and fourth battery modules together, with the screw holes located next to both handles. Use a Phillips head screwdriver to tighten the screws;

6. Stack the inverter module on the fourth battery module, with the wiring side of the battery module and the wiring side of the inverter module facing the same side, and the inverter display screen and battery module display screen facing the same side. After the inverter module is stacked, use screws to fix the fourth battery module and inverter module together, with the screw holes located by the two handles. Use a Phillips head screwdriver to tighten the screws;

7. Use a Phillips head screwdriver to remove the baffle at the wiring position and proceed with the next step of wiring.

8. After the wiring is completed, ensure that the unused interfaces are blocked. Use a Phillips head screwdriver to lock the outer baffle tightly. Pay attention to placing the wiring harness inside the baffle, and fasten the locking baffle from the first one on the ground, upward in sequence, until all the baffles are securely fastened.



2.3.2. WIRING

Before the electrical connection please ensure that the energy storage switch is in the "off" state. Otherwise, the high voltage of the ESS device may cause electric shock.

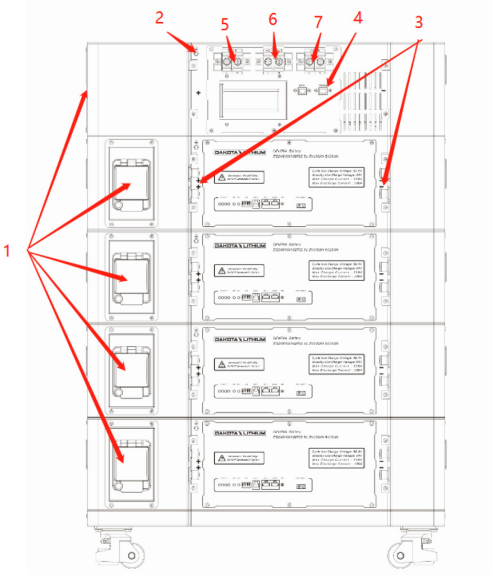
Operations related to electrical connections must be carried out by professional electrical technicians. When making electrical connections, operators must wear personal protective equipment.

WIRING REQUIREMENTS

- The AC input wire diameter, AC output wire diameter, PV input wire diameter, and battery module wire diameter must comply with the usage standards;
- Ensure that the external circuit breakers of each battery module and inverter module are disconnected before wiring;
- The red line voltage corresponds to the red positive electrode position, and the black line corresponds to the black negative electrode position.
- After tightening the rear shell, check for any gaps. If there are no gaps, the installation is complete
- When using in parallel, the positive pole of the power interface between the batteries is connected to the positive pole, and the negative pole is connected to the negative pole. The last reserved power interface of the battery needs to be covered with a protective cover.
- In accordance with the installation and connection requirements, the parallel power lines between batteries should be as short as possible.
- The wire diameter is only for reference. If the distance between the Photovoltaic system and the inverter or between the inverter and the battery is far, the use of thicker wire can reduce the voltage drop to improve the system performance.

WIRING SEQUENCE

1. Disconnect all external circuit breakers
2. Start grounding wire
3. Connect battery module positive/negative wire
4. Signal wire
5. Connect PV input
6. Connect AC output
7. Connect AC input, and seal unused interfaces with protective sleeves.

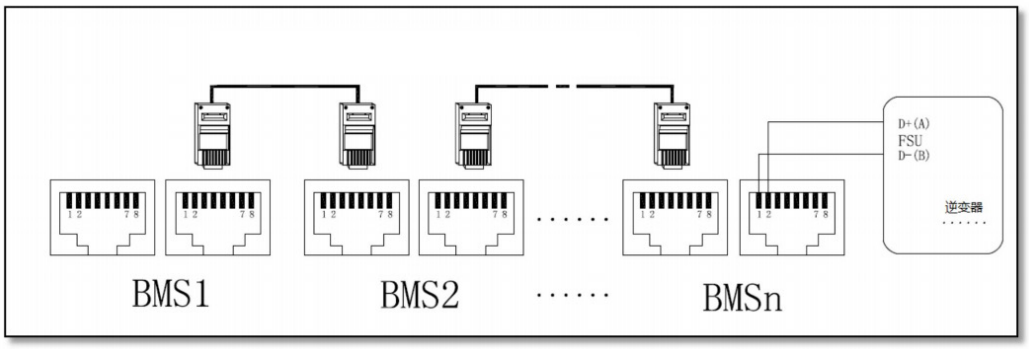


1. **Disconnect external circuit breaker.** Leave all external circuit breakers in the open state, totaling 8 circuit breakers.
2. **Wiring method for ground wire.** Before wiring, confirm that the external circuit breaker has been disconnected and whether the cables used comply with outdoor usage standards (it is recommended to use UL10269/10AWG for battery input wire diameter); Connect the terminal wire with yellow and green colors, and connect the SC10-6 terminals at both ends, with a wire length of 160mm; Lock the inverter and battery module from top to bottom with a round head cross three combination screw, and finally connect the ground wire of the lowest module to the ground wire where the user placed it.
3. **Wiring method for battery module:** Before wiring, confirm that the external circuit breaker has been disconnected and whether the cables used comply with outdoor usage standards (it is recommended to use UL10269/2AWG for battery input wire diameter); The wiring terminal must be tightly pressed against the BAT wire to prevent excessive heating caused by excessive contact impedance; Connect the positive pole of the battery to the positive wire, and the negative pole of the battery to the negative wire. Connect the BAT wire correctly.
4. **Signal wire Wiring Method.** The function of the two battery communication lines is the same: avoid using RS485 cables with protective sleeves. When multiple machines are used in parallel, the communication interface between the batteries is connected in series with a network cable, and the last communication interface of the battery is connected to a terminal resistor.

R485 INTERFACE CONNECTION DIAGRAM: (TWO 485 INTERFACES)

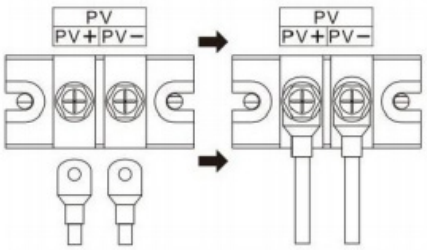
1. After the installation of the battery system is completed, it is necessary to connect the 485 port of the BMS module with a communication network cable. Multiple BMS modules can be cascaded through communication network cables (there is no need to cascade when using a single module).
2. When multiple BMS modules are used in parallel, a communication address (i.e. the dial switch ADS) needs to be set. When multiple modules are used, a dial address needs to be set, and the dial reference address is dial 4.5.

   The BMS battery pack room can communicate in parallel through the RS485A1 bus, and can also communicate with devices with RS485A2 bus. The RS485A interface enables communication with PC or other intelligent terminals, and human-machine interaction with any battery pack information parallel to the RS485 bus. The multi-machine parallel bus interface is shown in the following figure.

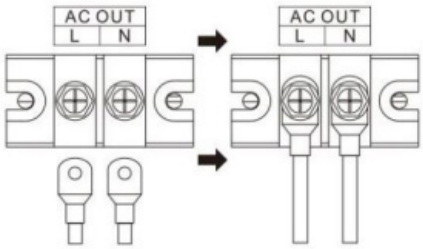


NOTE: When a two-485 interface BMS is connected in parallel, one by one corresponds to the network cable. One RS485 port of the first group of batteries is directly connected to the RS485 port of the second group of batteries, and so on. Finally, the other RS485 port of the first group is connected to the terminal ESS device or inverter, and the wiring sequence is 1B2A. (If there are differences, please refer to the definition of the communication protocol)

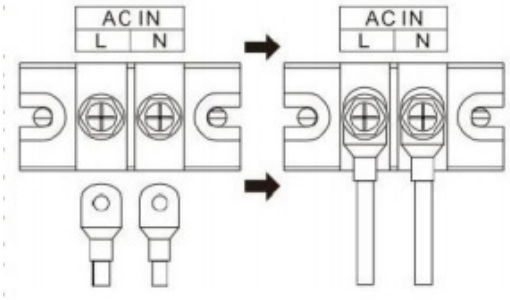
5. **PV Input Wiring Method:** Before wiring, confirm that the external circuit breaker has been disconnected and whether the cable used meets the usage standards (the PV input wire diameter is UL10269/10AWG wire); Connect the positive pole to PV+, the negative pole to PV -, correctly connect the PV input wire, live wire, and zero wire;



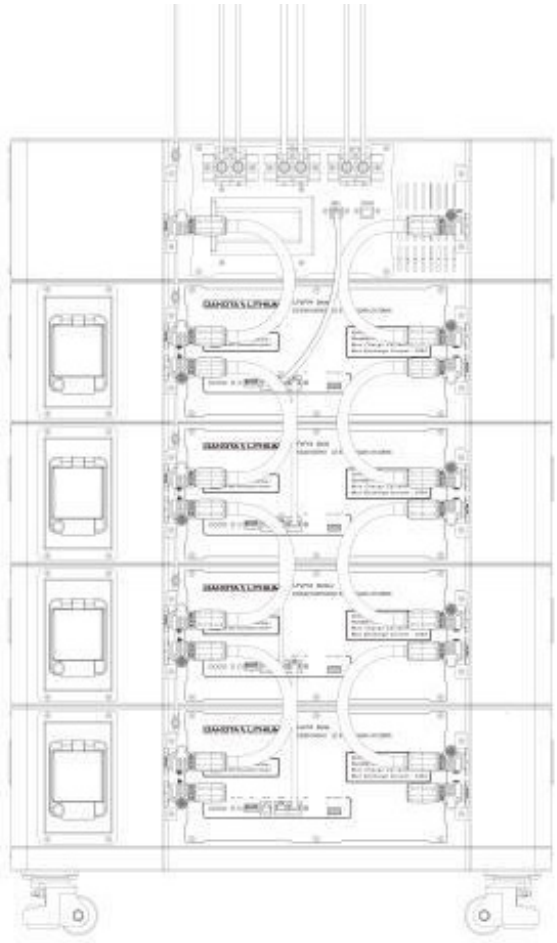
6. **AC output wiring method:** Before wiring, confirm that the external circuit breaker has been disconnected and whether the cables used comply with the usage standards (UL10269/8AWG wires for AC output must comply with the usage standards); Then connect the AC output terminal, correctly connect the AC output line, live wire, and zero wire;



7. **AC Input Wiring Method:** Before wiring, confirm that the external circuit breaker has been disconnected and whether the cable used meets the usage standards (UL10269/8AWG wire with AC input diameter must meet the usage standards); Connect the AC input terminal again, correctly connect the AC input wire, live wire, and zero wire;



WIRING OVERVIEW DIAGRAM



3.4. DEFINITION OF LED INDICATOR LIGHTS

LED lights: 4 green capacity indicator lights, 1 red alarm indicator light, and 1 green operation indicator light

SOC				ALM	RUN

Capacity indication

State	Charge				Discharge			
Capacity Indicator light	L1	L2	L3	L4	L1	L2	L3	L4
0-25%	Flash 2	Off	Off	Off	On	Off	Off	Off
25-50%	On	Flash 2	Off	Off	On	On	Off	Off
50-75%	On	On	Flash 2	Off	On	On	On	Off
75-100%	On	On	On	Flash 2	On	On	On	On
Operation indicator	Light				Flash 3			

STATUS INDICATION

System state	Running state	RUN	ALM	Power LED	Illustrate
Shutdown	Low power mode	Off	Off	Off	
Standby	Normal	Flash 1	Off	Based on battery capacity	
	Alarm	Flash 1	Flash 2		
Charge	Normal	On	Off	Based on battery capacity (the highest indicator LED flash 2)	
	Alarm	On	Flash 2		
	Overcharge protection	On	Off	On	
	Temperature protection	Off	On	Off	
	Fail-safe	Off	On	Off	
Discharge	Normal	Flash 3	Off	According to the battery capacity	
	Warning	Flash 3	Flash 3		
	Under voltage protection	Off	Flash 3	Off	
	Overcurrent and short circuit protection	Off	On	Off	
Lose efficacy		Off	On	Off	

Flashing Description

Flashing mode	On	Off
Flash 1	0.25S	3.75S
Flash 2	0.5S	0.5S
Flash 3	0.5S	1.5S

2.5. DIP ADDRESS

1. When conducting multi-machine parallel communication operations, it is necessary to first configure the dialing address of each PACK. The dialing code is in BCD format. The definition of address 0  is that the black dot is in the OFF state, and the blank space is in the ON state (the same as below Address 1  , Address 2  Other addresses and so on.
2. The host needs to be set to 0, and each pack needs to be set to 1-15.

NOTE: DIP 5 and 6 are reserved, please do not dial them for normal use

Slave settings (Table 1)

Address Number of parallel machines	Dial switch position 1#	2#	3#	4#
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF

3.6. POWER ON/OFF

PRE-STARTUP INSPECTION:

Before starting, check if the wiring is connected correctly and firmly, especially if the ground wire contact is good, whether the positive and negative terminals of the battery input are reversed, whether the positive and negative terminals of the PV input are reversed, and whether the AC input terminal is incorrectly connected to the AC output terminal. Ensure the installation location of ESS is convenient for operation and maintenance, the installation space is convenient for ventilation and heat dissipation, the installation environment is clean and tidy, the cable binding meets the routing requirements, the distribution is reasonable, and there is no damage. Confirm that unused ports have been blocked. Finally, fix the baffle in front of the wiring harness with screws to avoid accidental contact.

POWER ON:

Open the circuit breakers of the battery module in sequence from bottom to top to the "ON" state, then input AC, PV, BAT, and finally output the circuit breakers in the "ON" state. The "AC/IN" indicator light flashes to indicate that the inverter is working normally. When the display screen lights up, the panel can be operated to use ESS.

SHUTDOWN:

If this ESS is not used for a long time (unused for more than 3 months), turn off the device and store it as required. First, disconnect the circuit breakers for AC output, BAT, PV input, and AC output. Finally, disconnect the circuit breakers for the battery module from top to bottom until the display screen and LED lights are all turned off, indicating a successful power outage. It must be stored in a dry and cool place with a storage SOC of 50%. ESS should be stored in a clean environment with a temperature between 5 °F and 140 °F (-15 °C and 60 °C) and a humidity of below 85%.

ATTENTION: After the system is turned off, there is still residual power and heat in the chassis, which may cause electric shock or burns. Please pay attention to safety. If supplying power to different AC loads, it is recommended to first turn on the load with high surge current and wait for the load to stabilize before turning on the load with low surge current.

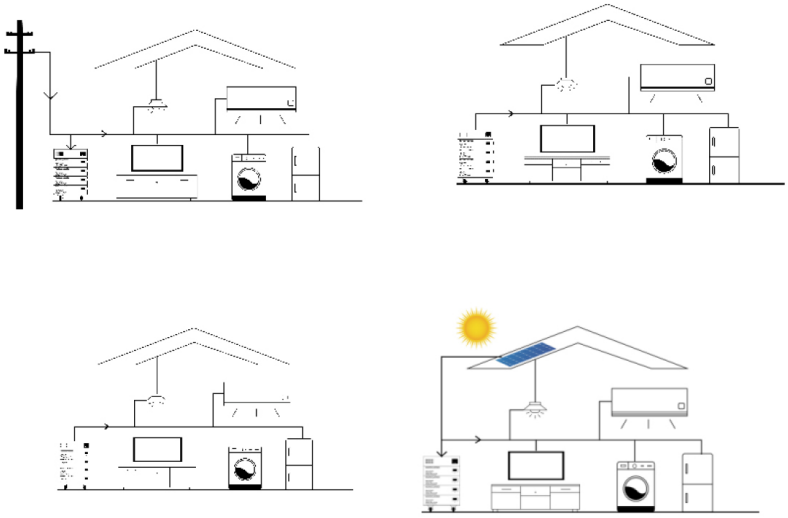
3.7. WIFI MONITORING INSTALLATION

Refer to the WiFi monitoring installation guide manual.

3.8. APPLICATION SOLUTION FOR MAIN POWER SUPPLY AND PHOTOVOLTAIC

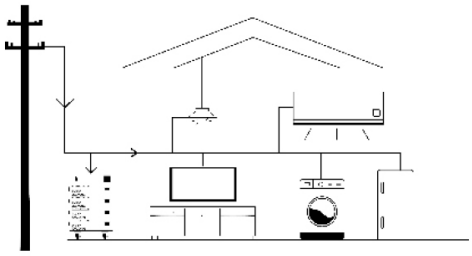
When the power supply is normal, it charges the battery and supplies power to the load; When the power supply is disconnected or stopped, the battery supplies power to the load through the power module.

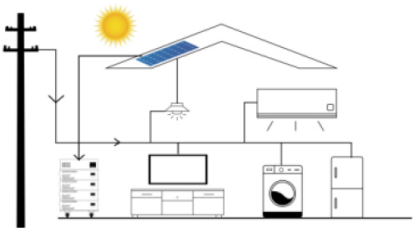
During the day, photovoltaic power generation directly supplies power to the load when charging the battery. At night, the battery supplies power to the load through the power module.

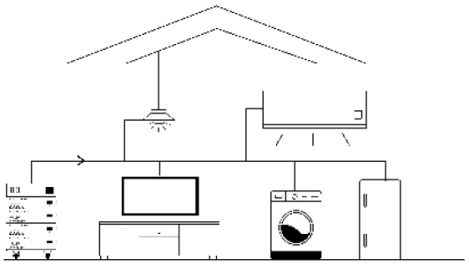


2.8. CONTINUE

During the day, both municipal electricity and photovoltaic power generation will simultaneously charge the battery and supply power to the load. At night, the mains supply power to the load, and if the battery is not fully charged, continue to charge the battery. If the power supply is disconnected, the battery supplies power to the load through the power module.







4 CHAPTER 4: SYSTEM MAINTENANCE

4.1. PERIODIC MAINTENANCE

To ensure the long-term good operation of the energy storage system, it is recommended to carry out daily maintenance as described in this section.

Item	Method	Maintenance interval
System operation status	● Observe whether the appearance of the ESS is damaged or deformed. ● Listen for any abnormal sounds during ESS operation。 ● Is the ESS indicator light correct during operation.	Every six months。
Electrical connections	● Check if any cable connections are closed or loose. ● Check for cable damage, especially if there are cuts on the sheath where the cable comes into contact with the metal surface.	Six months after the first debugging and testing, and then every six months to one year for testing.
Grounding reliability	Check if the grounding cable is reliable	Six months after the first debugging and testing, and then every six months to one year for testing.

4.2. STORAGE AND MAINTENANCE

Do not let the ESS catch fire. Do not open or damage the ESS device. Electrolytes flowing from the ESS device are harmful to the skin and eyes.

1. ESS should be used with caution and damage to the ESS is strictly prohibited.
2. Requirements for storage environment.
   - Environmental temperature: 5 °F to 140 °F (-15 °C to 60 °C); Suggested storage temperature: 5 °F to 140 °F (-15 °C to 60 °C); Recommended working temperature: 32 °F to 131°F (0 °C to 55 °C)
   - Relative humidity: 15%RH-85%RH
   - Dry, well ventilated, and clean
   - Keep away from corrosive organic solvents, gasses, and other substances
   - Avoid direct sunlight exposure
   - The distance from the heat source should not be less than 2 meters
   - Equipment must not be exposed to rain
   - The storage location should be kept away from flammable, explosive, and corrosive materials.
3. When storing ESS, it should be disconnected from external connections. If there is an indicator light on the ESS panel, the indicator light should go out.
4. ESS should be stored and recharged according to this user manual.
5. When storing or transporting ESS, it is not allowed to reverse the polarity of the ESS. Unprotected packaging is not allowed to be stacked, and the number of stacked ESS must not exceed the quantity specified on the packaging.
6. In order to avoid damaging the battery, users need to regularly charge it to replenish the battery when it is not in use for a long period of time (storage time exceeds three months). After discharging it during use, it is necessary to charge it in a timely manner within 12 hours to prevent the battery from discharging to 0V due to self consumption. Customers are required to place obvious regular maintenance signs on the battery casing.
7. All operators of ESS should comply with the user manual, installation and service manual, and quality assurance requirements. Any equipment damage caused by negligence or misreading of the user manual will invalidate the product warranty.
8. If the ESS is put on hold and not used for a long time to prevent the battery from discharging to 0V due to self consumption, customers are required to place obvious regular maintenance signs on the battery casing.

For ESS and long-term storage, routine maintenance is required.
Please charge the ESS to SOC of 50% according to the requirements in the table below.

Storage temperature	Relative humidity in storage environment	Storage time	SOC
＜-15℃	/	Prohibit	/
-15℃~10℃	＜85%	＜12 months	45%≤SOC≤60%
10℃~35℃	＜85%	＜12 months	45%≤SOC≤60%
35℃~60℃	＜85%	＜12 months	45%≤SOC≤60%
＞60℃	/	Prohibit	/

4.2. PRODUCT CLEANING

It is recommended to clean and maintain the product occasionally. When cleaning, a soft dry cloth or vacuum cleaner should be used to remove dust and debris from the product, especially to clean the heat dissipation and ventilation openings on both sides of the product to avoid dust and debris affecting its functionality. This product must not be cleaned with organic solvents, corrosive liquids, or other cleaning products.

GO FURTHER. LAST LONGER. PLAY HARDER.

STACKABLE BATTERY ENERGY STORAGE SYSTEM
ESS48400-HSD8H2-R32