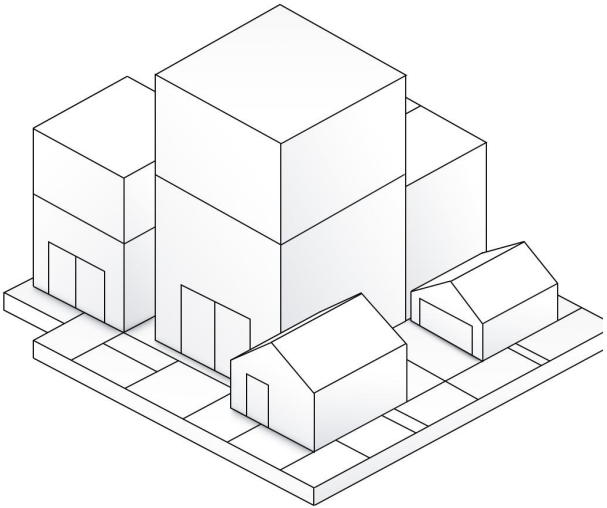
Residential ESS Lithium-ion Battery

LUXAR-16 User Manual



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About RESS Li-ion Battery

LUXAR-16 can be installed in Parallel.

About this Manual

The Manual is intended for the LUXAR-16 Residential ESS, the hybrid inverter and any other equipment are not included.

Contents

1 Safety Instructions

1.1 Important Safety Instructions

This manual contains important instructions for:

Residential ESS Lithium-ion Battery Product

This manual must be followed when installing and using this product.

with all electrical and electronic equipment, certain precautions must be observed with regard to product installation and/or operation. To reduce the risk of personal injury and ensure safe installation and manipulation of the product, it is required to carefully read and follow all instructions, cautions and warnings in this manual.

1.2 Warnings in this Document

A warning describes a possible hazard to equipment or personnel, which calls attention to a procedure or practice. Improper enforcement or compliance with warnings could result in damage or destruction of part or all of the equipment and/or other equipment connected to the equipment or personal injury.

Symbol	Description
	Beware of risk of electric shock
	Heavy enough may cause severe injury
	Keep the battery away from open flame or ignition sources
	Keep the battery away from children
	Do not dispose of the product with household waste
	Recycling
	Read this manual before installation and operation

For safety reasons, installers are responsible for familiarizing themselves with the contents

of this manual and all warnings before performing installation.

If the battery is not used for more than 6 months from the production date, it shall be charged once. The failure caused by the overdue failure to perform the standard operation is not within the scope of warranty.

1.3 Battery handling guide

Use the battery pack only as directed.

1.4 Response to emergency situations

The Residential ESS Lithium-ion Battery is designed with multiple safety strategies to prevent hazards resulting from failures. However, Cannot guarantee their absolute safety for uncertain situations.

1.4.1 Leaking batteries

If the battery pack leaks electrolyte, direct contact with the leaking liquid or gas must be avoided. Contact with electrolyte may cause skin irritation and chemical burns due to its corrosiveness. If one is exposed to the leaked substance, the following actions should be taken:

Inhalation: Evacuate the contaminated area, and seek medical attention immediately.

Eyes contact: Rinse eyes with flowing water for 15 minutes, and seek medical attention immediately.

Skin contact: Wash the affected area thoroughly with soap and water, and seek medical attention immediately.

Ingestion: Induce vomiting as soon as possible, and seek medical attention immediately.

1.4.2 Fire

In case of a fire, make sure that an ABC or carbon dioxide extinguisher is placed nearby and do not extinguish the fire by water.

WARNING

The battery pack may catch fire when heated above 130°C.

If a fire breaks out where the battery is installed, please take the following actions:

1) Extinguish the fire before the battery catches fire.

2) If the battery has caught fire, do not try to extinguish the fire, and evacuate people immediately.

Do not approach in case of any contact with poisonous gases once the battery catches fire.

1.4.3 Wet battery

If the battery is wet or submerged in water, do not try to access it. It's proper to contact customer careline or your distributor for technical assistance.

1.4.4 Damaged battery

If the battery is damaged, please contact customer careline or your distributor for appropriate countermeasures as soon as possible, because damaged batteries are dangerous and must be handled with extreme caution. Damaged batteries are not suitable for use and may pose a danger to people or property. If the battery seems to be damaged, it also should be returned to your distributor.

CAUTION

Given the high possibility of damaged batteries exporting electrolyte or flammable gas, the correct action is to contact your distributor for advice and information immediately. Such cases will be addressed within 48h.

1.5 Installers

Residential ESS Lithium-ion Battery is suggested to be installed by skilled workers or electricians. A skilled worker is defined as a person who has received professional training and qualified electrician or possesses all of the following skills and experience:

- ✓ Knowledge of the functional principles and operation of on-grid energy storage systems.
- ✓ Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.
- ✓ Knowledge of the installation of electrical devices.
- ✓ Knowledge of adherence to this manual and all safety precautions and optimal practices.

1.6 Scrap battery

For scrap battery, please treat with local laws or regulations to recycle.

2 Product Introduction

2.1 Technical data

Model	LUXAR-16
Total Energy	16.08kWh
Dimensions (W*D*H)	564*157*954mm
Rated Capacity	314Ah
Voltage	48~56 Vd.c
Max. Discharge Power	10.0 kW
Nominal Voltage	51.2 Vd.c
Operating Condition	Indoor
Charge Operating Temperature	-10~70℃
Discharge Operating Temperature	-20~70℃
IP Rating	IP 65
Protective Class	I

Parallel or Series Support	8 Parallel
Relative Humidity (RH)	0~95% (No condensed water)
Cooling Type	Ambient cooling
Case Material	Metal
Installation	Floor Standing
Communication	CAN / RS485
Protection Mode	Triple Hardware Protection
Battery Protection	Over-Current/ Over-Voltage/ Short Circuit/ Under-Voltage/Over Temperature
Safety Certificate	UN3480/CE

✧ Testing Conditions Based on Temperature 25℃ at The Beginning of Life.

✧ Total Energy/Usable Energy Measured Under Specific Conditions From 0.2C CC/CV

2.2 Indicator and ports

LCD can display the SOC status of the battery, and the red indicates a battery fault condition.

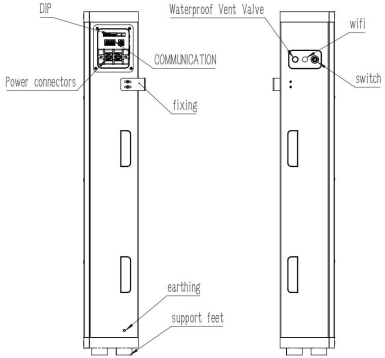
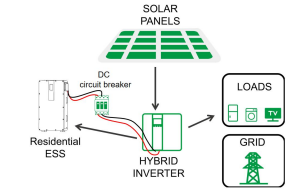
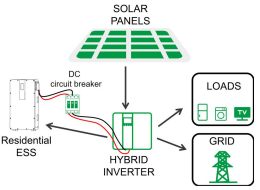
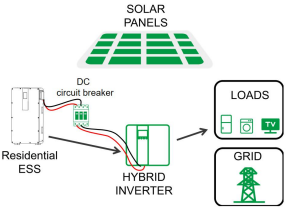
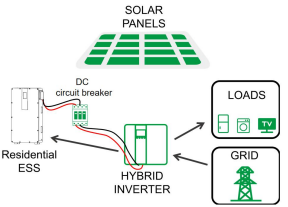


Figure 1. LUXAR-16

LUXAR-16 DIP Switch Definition

Form	Name	Functional Definition	Note
Power	B+	Positive extremist	
	B-	Negative extremist	
DIP	SW1	1,2 UP: 485 3,4 UP: CAN	Communication method selection
	SW2	CANH/485A	Address selection
	SW3	CANL/485B	
	M/S IN	Internal communication	uplink
	M/S OUT		Next level communication 120 Ω resistor connected at the end
	Inverter	Battery and inverter communication interface	Communication with PCS

2.4 How it works

Morning	Afternoon
	
Optimized self-consumption will be achieved. ESS is used to store excess energy produced by PV system.	Extra energy will be fed into the grid when ESS is fully charged and system has already reached its self-consumption requirement.
Evening	**Night**
	
ESS will power the AC load at sunset.	If the ESS capacity is insufficient to meet self consumption requirement, electricity will be obtained from the grid.

2.5 Feature

Residential ESS Lithium-ion Battery is characterized with:

- ✓ **Energy storage unit:** This battery is suitable for PV solar system compatibility.
- ✓ **Battery management system (BMS):** The battery's built-in BMS monitor prevents

the battery from running outside its design limitations.

- ✓ **Expandability:** The battery capacity can be increased by adding another battery of the same batch and specification.

3 Guidance for batteries during shipment

1) Cartons that have been crushed, punctured, or torn in such a way that contents are revealed shall be set aside in an isolated area and inspected by a skilled person. If the package is deemed to be not shippable, relevant contents shall be promptly collected and segregated. Meanwhile, it is required to contact the consignor or consignee.

2) The DC circuit of Residential ESS has been disconnected before outgoing.

3) A precautionary label must be affixed to the shipping carton to alert individuals that the battery within the package has been disconnected; otherwise, the battery should not be transported.

4) We have conducted comprehensive tests of our equipment distributed around the world to ensure safety for shipping transport. These products shall be handled with care and immediately inspected if visibly damaged. It needs to contact with customer careline in case of any visible damage to cartons to confirm whether the battery could be used safely or not.

4 Installation Prerequisites

4.1 Installation location

Make sure that the installation location meets the following conditions:

- ✓ Far away from the sea to avoid salt water and humidity.
- ✓ The floor is flat and level.
- ✓ No flammable or explosive materials nearby.
- ✓ Optimal ambient temperature is between 15℃ and 30°C.
- ✓ Temperature and humidity stay at a constant level.
- ✓ Minimal dust and dirt in the area.
- ✓ No corrosive gases present, including ammonia and acid vapor.
- ✓ The Residential ESS is rated at IP65, so the battery could be installed indoors.
- ✓ Reserve enough physical space for airflow and heat dissipation—min.20mm horizontal gap from walls/equipment; keep vertical ventilation paths clear.
- ✓ Maintain good airflow during use via natural convection or forced ventilation.

- ✓ Stay at least 1m away from high-temperature sources (e.g., transformers, heaters, direct sun).
- ✓ No open flames, sparks, or arc-producing devices within 3m of the system.
- ✓ Ensure a minimum horizontal clearance of ⩾20 mm is maintained between the equipment side and the wall.
- ✓ If the ambient temperature exceeds the operating range, battery will protect itself by shutting down. The optimal operating temperature of the battery is 15°C to 30°C.

4.2 Installation process

The battery should be installed according to the following flow chart.

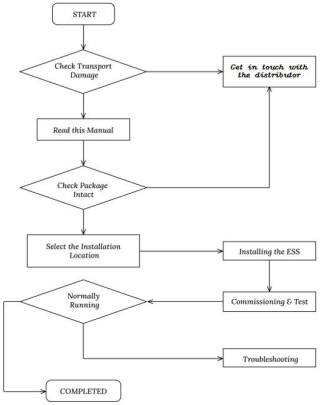


Figure 2. Installation flow chart

4.3 Installation materials

Following installation materials should be prepared by installers.

- ✓ Power cable
- ✓ Communication cable
- ✓ Earth wire
- ✓ DC circuit breaker

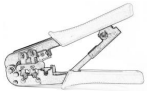
NOTICE

Please note that the required cross-sectional area for charging cables is 42-50 mm².

A breaker between battery and inverter is recommended to install, and LUXAR-16 its min current should be over 200A or comply with local regulations.

4.4 Tools

To install the battery pack, those following tools are probably required:

			
Phillips screwdriver	Torque wrench	Cable crimper	Wire clamp
			
Voltmeter	Tape measure	Drill	Flat-head screwdriver

In order to protect the safety of operators and installers, it is necessary to select and employ suitable tools and measuring instruments that are certified for precision and accuracy.

4.5 Safety instruments

When dealing with the battery, following safety gears should be equipped. Installers must meet relevant requirements of IEC 60364 or domestic legislations and other relevant international standards.

		
Insulated glove	Safety goggles	Safety shoes

4.6 Communication cable

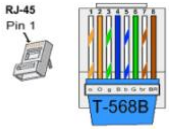


Figure 3. Diagram of network cable interface

If needed, the network cable should be made as shown in that diagram. But the network cable between battery and inverter should be produced following the definition of inverter.

If available, a LAN cable tester can be used to check whether the cable is faulty.

4.7 Storage

If the battery is not to be installed immediately, it should be removed from operation. It is secure and proper to be stored in an appropriate location, if long period storage is needed. Instructions for storage are:

- ✓ Do not stack more than 8 battery boxes.
- ✓ The temperature of battery stored is recommended in the range of 0°C to 45°C.
- ✓ Do not expose to water.

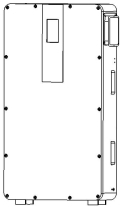
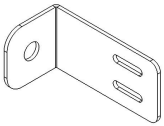
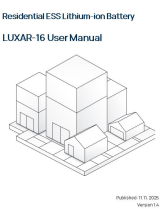
The ESS box should be upright and not stacked upside down when being stored.

If the ESS needs to be stored over 3 months, the DC circuit of battery is suggested to be disconnected. Otherwise, the battery would discharge at a minimum rate and capacity degrades with storage time. Generally, the battery self-consumption is less than 5w. And, if the battery is stored over 6 months, it is suggested to connect the battery with inverter for system commissioning.

5 Battery Installation

5.1 Package items

These items are included in the package LUXAR-16

		
Battery*1	Wall Mount Bracket*2	User Manual*1
		
Expansion screw*2	Output Cable *2 (1500mm) communication Cable*1 (2000mm)	

5.2 Checks before installation

Check the battery voltage.

WARNING

If this checking process is executed for any reason after the battery is fully installed, make sure that the inverter is turned off or disconnected from battery while checking the battery.

	Press the switch to ensure it is in the open state, and then measure the voltage at the terminal interface with a voltmeter. If the voltage is lower than 44 V, do not use the battery and contact customer careline or your distributor.

5.3 Installation of the battery

NOTICE

	This symbol is on the underside of the battery. For parallel connection, the earth wire must be installed. Apply silica gel or paint around the earth terminal after the earth cable is connected. The grounding cable shall use multi-strand flexible wire of ≥16mm² high-purity oxygen-free copper. Grounding terminals must be connected via tin-plated copper lugs. The system grounding resistance shall be ≤4Ω (dry environment) or ≤10Ω (humid environment), with periodic inspection of terminal oxidation or loosening. The grounding connector shall be made of copper alloy with tin-plated terminals, support anti-loosening design, be UL/IEC certified, and use corrosion-resistant materials for outdoor applications.

5.3.1 Connect with 51.2Vdc Inverter

To prevent the battery from moving, make sure the battery is properly installed.

NOTICE

If the battery is installed above the floor or on a platform, make sure that the wall or platform is capable of supporting the battery's weight.

5.4 Cable connections

WARNING

Before connecting battery with inverter, please make sure the inverter turns off.

5.5 Transportation

Due to the large weight of battery components, in order to ensure safety, it is recommended to use a forklift that meets the requirements for movement and transportation, and should avoid dropping and throwing; the transportation process should prevent equipment collision and strong vibration.

Figure 4. Diagram of Handling Tools

6 Commissioning

6.1 Commissioning battery

If there is only one battery installed, the following steps are used to put it in operation:

1) Press the switch to ensure it is in the open state .
2) Make sure that the LCD is on. If it stays off, do not use the battery and contact your distributor.
3) Turn the inverter on, and wait for the start-up sequence to complete fully.

When there are two or more batteries connected with parallel mode, after the charging cable and the data cable are connected correctly, these steps are needed to follow to put them in operation:

1) Check and ensure the battery voltage level is above 44V.

   If battery voltage is under 44V, please contact your distributor after service customer careline for help.

2) Press the switch to ensure it is in the open state.

For all batteries, make sure that the LCD is on.

a. Make sure the maximum voltage difference between batteries is less than 2.0V.

b. If not, the installer should balance the battery voltage and then connect batteries together in parallel.

c. Turn the inverter on, and wait for the start-up sequence to complete fully.

6.2 Shutting down battery

Shut down the battery only when there is no charge or discharge current.

1) Press the switch to ensure it is in the off state.

2) Make sure that LCD on the battery is off.

7 Maintenance Procedures

7.1 Daily Maintenance

1) Check battery voltage, SOC , and ensure no overcharging/over-discharging.

2) Inspect grounding connections for oxidation or looseness; clean terminals and re-tighten if necessary.

3) Ensure proper ventilation and no obstructions affecting heat dissipation.

4) Inspect outdoor enclosures for dust, rain erosion, or physical damage.

7.2 Periodic In-Depth Maintenance

1) For systems idle >30 days: Charge to 60%-80% capacity and store. Recharge every 3 months to prevent deep discharge.

2) Inspect cable joints and terminal lugs for oxidation; apply anti-corrosion grease and re-tighten.

3) Validate grounding resistance.

7.3 Long-Term Storage (>6 Months)

1) Perform a full charge-discharge cycle before storage (charge fully, rest 2 hours, then discharge).

2) Store in a dry environment (humidity ≤70%) at 15°C–25°C, away from heat sources or flammable materials.

3) Disable inverter/PCS output and disconnect grid/load connections. Retain

battery-independent circuit protection.

4) For extended storage, remove batteries and store separately to avoid parasitic drain from UPS/PCS.

8 Troubleshooting Guidance

8.1 Fails to Charge

Symptom: No change in charge level or error message during charging.	
Possible Causes	Resolution Steps
Low battery voltage (deep discharge from long-term idle).	Check battery status via BMS; recharge with an external charger if SOC < 10%.
BMS communication failure or parameter errors.	Restart the system or restore factory settings.

8.2 Fails to Discharge

Symptom: Load power outage or abnormal output.	
Possible Causes	Resolution Steps
Over-discharge protection triggered (SOC < 20%).	Verify load power does not exceed rated capacity.
DC circuit breaker tripped or loose wiring.	Check breaker status and terminal connections.

8.3 Sudden Capacity Drop

Symptom: Actual capacity < 50% of rated value.	
Possible Causes	Resolution Steps
Battery cycle life exhausted (>5000 cycles).	Check charge/discharge curves via APP.
Cell damage from long-term overcharging or over-discharging.	Replace faulty cells or entire battery pack (professional operation required).

8.4 Technical Support

Remote Diagnosis: Upload fault codes and logs via the app for online analysis by engineers.

Emergency Contact: Response within 48 hours (retain photos of the fault scene).