SALUS CONTROLS

BATTERY 3 PHASE 5KW

Model: BAT-INV-5000W-3P

MULTI-LANGUAGE MANUAL

Quick Guide

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Introduction

Thank you for choosing the SALUS High Voltage Battery System, model BAT-INV-5000W-3P, designed specifically for solar-panel and hybrid-inverter applications within the SALUS Solar System.

This quick guide provides a comprehensive overview of installation, electrical connections, commissioning, operation, maintenance and troubleshooting of the BAT-INV-5000W-3P system. To ensure safe and effective use, please familiarise yourself with all product features, functions and safety instructions before installation or operation.

The complete system comprises a High Voltage Battery Control Unit (PDU HV-BCU) and between two to five battery modules (BAT-INV-5000W-3P). Each module contains 50 Ah cells arranged in a 1 parallel × 32 serial (1P32S) configuration, delivering a nominal 102.4 V output. Connecting multiple modules in series expands energy-storage capacity and output, making the system highly scalable for diverse solar-energy requirements.

Compatible with hybrid inverters, the SALUS BAT-INV-5000W-3P system offers a reliable, modular approach to renewable-energy storage, enhancing both performance and flexibility of your solar installation.

Product Warranty

The warranty period of the battery is 4000 cycles or 10 years.

Safety Information

When installing or using a battery system, the safety information contained in this section must always be followed. For safety reasons, it is the installer's responsibility to be familiar with this manual and all warnings before installation.

This battery system has been designed and tested to meet international safety standards. Before installation or use, carefully read and follow all safety instructions. SALUS accepts no responsibility for issues resulting from:

- Damage during or due to improper transport, storage, installation, or use
- Lack of correct handling information
- Installation by unauthorised personnel
- Failure to follow this guide's instructions and safety precautions
- Unauthorised modifications, disassembly, or software removal
- Missing components or tampered labels
- Use in unapproved environments
- Charging delays exceeding six months
- Force majeure (e.g., lightning, fire, flood, earthquakes)
- Expired warranty

Safety Precautions

- Do not expose the battery to temperature above 50°C or heat sources.
- Do not install or use the battery in wet locations, area with moisture, corrosive gases or liquids, such as bathroom.
- Do not expose the battery to direct sunlight for extended periods.
- Place the battery in a safe place away from children and animals.
- Battery power terminals shall not touch conductive objects such as wires.
- Do not dispose of batteries in a fire, which may cause an explosion.
- The battery system shall not come in contact with liquids.

Operation Precautions

- Do not touch the battery system with wet hands.
- Do not disassemble the battery system without permission.
- Do not crush, drop or pierce the battery pack and BCU.
- Dispose of batteries according to local safety regulations.
- Store and recharge battery in accordance with this manual.
- Ensure the connection of ground wire reliable.
- Remove all metal objects such as watches and rings that could cause a short-circuit before installation, replacement and maintenance.
- The pack shall be repaired, replaced or maintained by skilled personnel that has been authorized.
- When storing or handling batteries, do not stack batteries without package.
- Do not break the battery. The released electrolyte may be toxic and harmful to the skin and eyes.
- Packaged batteries should not be stacked more than the specified number stipulated on the packing case.
- Do not use damaged, failed or deformed batteries, which may lead to high temperature or even dangerous accidents. Continued operation of the damaged battery may result in electrical shock, fire or even worse.

Product Overview

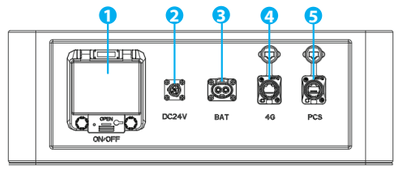
The SALUS High Voltage Battery System comprises a High Voltage Battery Control Unit (LV-BCU) and multiple battery modules (BAT-INV-5000W-3P).

Each battery module is built from 100Ah cells, configured in a 1P16S layout, delivering a nominal voltage of 51.2 V. To increase storage capacity and output, two to six modules can be connected in series.

This system is fully compatible with hybrid inverters, enabling seamless integration into solar energy installations.

High Voltage Controller

The high voltage controller is composed of BCM board of BMS, DC breaker, power supply, RS485 / CAN box, Pre-charge RES, relay, fuse and communication terminals. The appearance of the product is shown below.

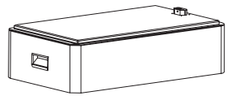


Location	Component	Function
1	Power Breaker	Turn on / off PDU
2	24V DC Power port	External DC Power source for PDU
3	Communication port	Communication port to PCS
4	4G COM	Connect to 4G terminal
5	HV DC Out Terminal	Battery DC terminal to PCS

Battery Pack

Battery pack BAT-INV-5000W-3P consists of battery module (including cell and mechanical parts), Battery management system(BMS) as well as power and communication terminals. The product appearance is shown below.

Dimensions: 700mm x 370mm x 165mm



Battery Base

Battery Base consists of Mechanical base and connectors. The product appearance is shown below.

Dimensions: 700mm x 370mm X 100 mm

Installation

- **Qualified Personnel Only:** Installation must be carried out by trained technicians with valid technical certification.
- **Read Before Use:** Always read this guide thoroughly before installation to understand product features and safety instructions.
- **System Knowledge:** Operators should be familiar with the photovoltaic system, grid, battery functions, and relevant national/regional standards.
- **Safety Equipment:** Use insulated tools and appropriate personal protective equipment (PPE) during installation.
- **Warranty Notice:** Damage resulting from improper storage, transport, installation, or use is not covered under warranty.
- **Hazardous Areas:** Do not install near flammable or explosive materials.
- **Ventilation & Temperature:** Use only in well-ventilated areas, within -10°C to 50°C operating temperature.
- **Clean Environment:** Minimise exposure to dust and dirt.
- **Avoid Humid Locations:** Do not install in high-moisture areas such as bathrooms.

Caution:

Before installing the battery packs in parallel, make sure the battery pack has two LEDs on with SOC remanence of 16.60% and above.
When installing the batteries, we recommend that the manufacturing date of batteries in the same system should be within 12 months. Make sure the version of battery pack are the same.

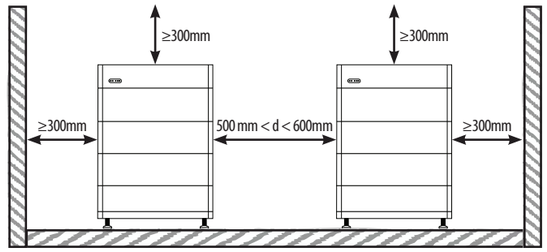
*This indicate the battery pack version.

Installation Environment

The battery system may be installed indoors or outdoors, but must always be placed on the ground.

Important considerations:

- Do not install the battery pack upside down.
- Maintain adequate spacing between battery modules for ventilation and safety.
- When installing outdoors, it is necessary to install sunshades and rain shelters to avoid direct exposure to sunlight and rain.



Safety Distance Positioning

Installation Tools and Precautions

Before drilling, please make sure to avoid the pre-buried water pipe and electricity lines in the wall to avoid danger.

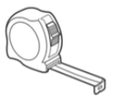
Required tools for installation:

Drill

Screwdriver

Wrench

Pencil



Ruler

Multimeter

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

Insulated Gloves

Safety Goggles

Safety Shoes

Installation Procedures

⚠ The ambient temperature for the installation of the battery system shall be above - 10℃, below 50℃, and the humidity shall between 5% and 95%.

Pre-installation Check

✓ **Inspect the Package**: Before opening, examine the pack for damage or other abnormalities. If anything looks amiss, do not open it—contact your supplier immediately.

✓ **Verify Power Status**: Ensure the battery pack is completely powered off before beginning installation.

✓ **Check Contents**: Compare all parts against the packing list. Report any missing or damaged items to your supplier.

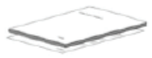
HV-BCU

HV - Battery Module

HV - Base

Power Cable x 1
Battery to PCS - 1.5 m)

COM Cable x 1



Package List x1
Quick Guide x 1
Warranty Card x 1

Mounting Feet x 4

Floor Standing Installation

1. Fit Support Feet ✓
Attach the four support feet to the base and position it where the system will sit.

2. Stack Modules ✓
Place each battery module onto the base, one at a time, ensuring they slot together horizontally.

3. Mount the BCU ✓
Sit the Battery Control Unit (BCU) on top of the uppermost module.

4. Secure Connections ✓
Insert all inter-module connectors and tighten every screw.

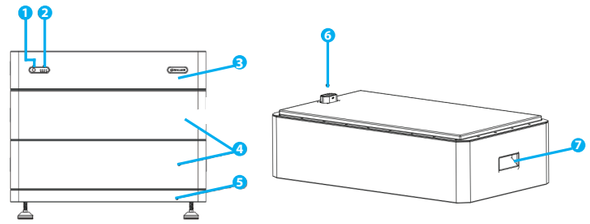
5. Final Check ✓
Confirm all screws are firm so that the assembly does not wobble.

ⓘ **Please note:**

A module base is required whenever you use more than one battery.

The BCU must always go on the top module. If your battery stack exceeds five modules, begin a second cluster with a new base and BCU.

Always wear an ESD wrist strap, plus safety gloves and goggles during assembly.



Item	Component Name
1	Sleep Button
2	LED Light
3	Battery Control Unit
4	Battery Module
5	Battery Base
6	Module Connection interface (BAT+ / BAT-)
7	Module Handle

Electric Wiring Connection

⚠ **Power Down** - Ensure the system is completely switched off before beginning installation.

⚠ **Protective Earth** - Always fit the earth (ground) conductor to safeguard the system.

⚠ **Communication Link** - Connect the communication plug on the final battery module—omitting this will cause system failure.

⚠ **Dual-Row Setup** - For two-row installations, procure an extended serial cable and an RJ45 HUB box.

⚠ Do not forget to wear ESD wrist strap and gloves, safety gloves and goggles.

Polarity Check - When fitting the power wiring harness, ensure correct polarity: red leads to positive (+), black leads to negative (–).

PCS Communication - Use the dedicated PCS communication terminal to link the battery system with the PCS unit.

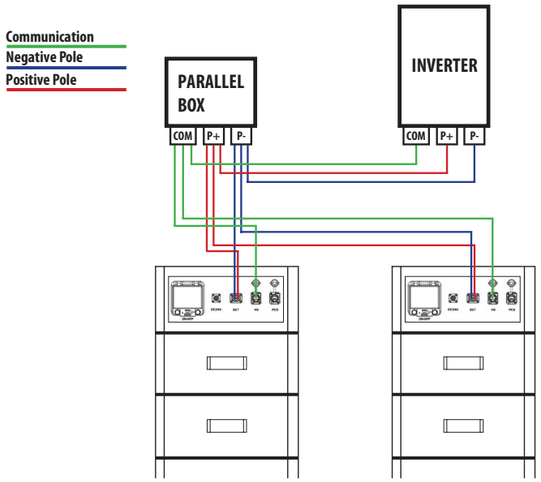
Protective Breaker - Install a moulded-case circuit breaker between the PCS and the LV-ESS with:

ⓘ **Rated working voltage ≥ 700 V**

ⓘ **Rated working current ≥ 125 A**

System Connection Diagram

When wiring the system, always match cable colours to the corresponding terminals to prevent short circuits. The battery pack includes an internal DC circuit breaker; if you require an additional breaker between the battery system and the PCS, procure one rated at **700 / 1000 V DC** and **125 A**.



⚠ Never install while the system is powered; always switch off before starting.

⚠ Fit the ground (earth) wire to ensure system safety.

⚠ Always connect the BCU's communication plug—omitting it will cause system failure.

⚠ For dual-row setups, procure an extended serial cable and a junction HUB box.

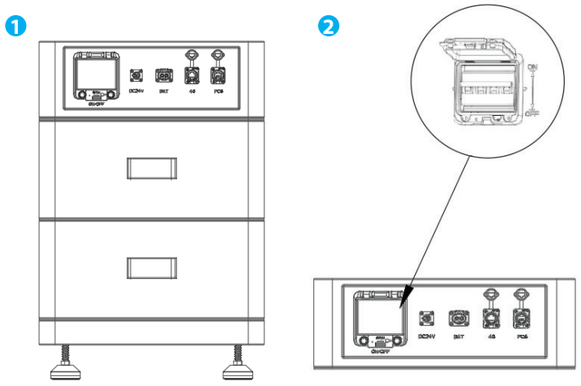
⚠ Obtain the cable for PCS connection from your supplier.

Power On/Off Battery System

Beware:
Before energising the battery, ensure all cables are correctly connected and the inverter is switched off. Installation and operation must be performed only by qualified technicians, taking care not to touch any live parts. Affix a "Non-professionals, do not touch" warning sign to the battery. If any abnormality arises during startup, immediately power down the system, resolve the issue, and only then resume operation.

Switching sequence:

1. The high-voltage version does not have an independent switch, just turn on the main switch.
2. Turn ON / OFF the DC breaker, this will turn On or Off the entire battery system



** If both RUN and SOC lights turn on normally, the system is powered on successfully.*
** If ALM light turns red, there is a failure and should solve it before power on again.*

Maintenance

⚠ Before maintenance, please make sure that the battery system is powered off with the DC circuit breaker in off.

Battery Pack or PDU Replacement

1. **Safety First** - Wear safety gloves.
2. **Power Down** - Switch off the breaker and isolate the battery system.
3. **Disconnect -** Remove all power and CAN-bus cables.
4. **Remove Unit** - Unscrew the safety fasteners on each side and lift out the old pack or PDU.
5. **Pack for Repair** - Place the removed unit in its transport box per repair procedure and send to the designated site.
6. **Pre-Charge** - Charge both the new and existing batteries to 100 % SOC before installation.
7. **Storage Maintenance** - If unused, cycle the battery every three months (no more than six months between cycles) to preserve performance.

System Failure Information and Troubleshooting Suggestions

Error Indication	Error Description	Error Cause	Suggested Actions
ALM			
● ALM Light Flickers	Discharge under voltage protection	Single cell voltage below the threshold for under-voltage protection	There is over discharge risk. User should stop discharging and arrange recharge.
	Charge over voltage protection	Single cell voltage exceeding threshold for protection threshold	1. There is no safety threat. 2. User should stop charging. Wait for the battery system to automatically resolve the fault.
	High temperature protection	The temperature exceeds the protection value	It is dangerous. Please stop using the battery immediately, and wait for the battery temperature to drop. The fault will be automatically resolved.
	Low temperature protection	The temperature is below the protection value	No safety risk. Wait for the temperature to rise, the fault will be automatically resolved.
	Discharge short circuit	External short circuit of battery system	There is safety risk and user should stop using battery. User should contact installer to repair PCS and battery.
	Pre-charge short circuit		
	Pre-charge overtime		
	Voltage sampling anomaly protection	BMS Voltage sampling failure	There is safety risk and user should stop using battery. User should contact installer to repair battery.
	Current sampling fault	BMS Current sampling failure	
	Main circuit fault	BMS Main power circuit failure	There is safety risk and user should stop using battery. User should contact installer to repair battery.
	Interior Communication failure	Communication loss between two packs	1. Check whether the communication and battery pack are connected OK. 2. Check whether the communication line between the PDU and the battery pack is connected OK.
	External CAN Communication failure	Communication loss between PCS and battery system	1. There is no safety threat and user should stop using battery. 2. Check if PCS and battery communication terminal is well connected. 3.If PCS and battery system cannot communicate when the communication wire is confirmed well connected, user should contact installer to repair battery.

Technical Specifications

Number of modules	2	3	4	5
Nominal energy	10.2kWh	15.3kWh	20.4kWh	25.5kWh
Max Power	5kW	8kW	12kW	16kW
Rated Capacity	200Ah @25℃	200Ah @25℃	200Ah @25℃	200Ah @25℃
Nominal Voltage	204.8V	307.2V	409.6V	512.0V
Voltage Range	192V~230.4V	288V~345.6V	384V~460.8V	480V~576V
Dimensions (mm)	700/370/643	700/370/808	700/370/973	700/370/1138
Weight	126kg	175.3kg	224.6kg	273.9kg
Rated current	25A			
Max current	40A			
Fault current	47A			
DoD	90%			
Operating ambient temperature	-10℃~50℃			
RTE	≥95%			
Battery pack in series	Maximum support 5 units in series, series voltage difference ΔV≤0.5V			
Humidity	5%~95%			
Storage temperature	- 20℃~50℃/7 days; -20℃~40℃/6 months; 95%RH			
Cooling method	Natural cooling			
Installation	Floor stacking installation			
Altitude	≤2000m			
Communication method	CAN (to PCS)			
Certified product	IEC62619/IEC60730/ UKCA/CE			
IP rating	IP65			