

LIVOLTEK

User Manual

Residential Energy Storage System BLF48100



BLF48100.R110 v1.0

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1. About This Manual

1.1 Products Covered by This Manual

Livolttek Residential Energy Storage Battery Series:





BLF48100.R110

1.2 Target Group

This manual is intended for a qualified electrician. Any electrical installation and maintenance on the battery must be performed by qualified electricians in compliance with standards, wiring rules or requirements of local grid authorities or bodies.

1.3 Symbols Used

The following types of safety precautions and general information symbols are used in this manual. These important instructions must be followed during installation, operation and maintenance of the battery.

Symbol	Description
 DANGER	Indicates a hazard with a high level of risk that, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazard with a medium level of risk that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazard with a low level of risk that, if not avoided, could result in minor or moderate injury.
 NOTICE	Indicates a situation that, if not avoided, could result in equipment or property damage.

1.4 Storage of the Manual

Please keep the manual properly and operate in strict accordance with all safety and operating instructions in this manual. The information in this manual is subject to change without notice. Please check www.LIVOLTEK.com for more information.

2. Safety

The manual describes the installation, commissioning, maintenance of the battery. Please read it carefully before operating. To prevent personal injury and property damage and to ensure long- term operation of the product, please read and follow all the instructions and cautions on the battery and this user manual during installation, operation or maintenance at all times.

2.1 Important Safety Instructions

DANGER

Danger to life from electric shock.

- Before performing any work on the battery, make sure the battery is power off and the DC isolator is disconnected.
 - Do not short connect the DC connectors of the battery, which may cause electric shock to personnel and damage to the product.
 - Do not touch DC connectors of the battery.
 - If an error occurs, contact your local distributor or qualified electricians.
-

WARNING

- Only authorized service personnel are allowed to install the battery or perform servicing and maintenance.
 - The power should be disconnected before attempting any maintenance or cleaning or working to the battery.
-

NOTICE

- Do not open the battery or change any components without authorization, otherwise the warranty commitment for the battery will be invalid.
 - Appropriate methods must be adopted to protect battery from electrostatic discharge; any damage caused by ESD is not warranted by the manufacturer.
-

2.2 Response to Emergency Situations

➤ Leaking Batteries

If the battery leaks electrolyte which is corrosive, avoid contact with the leaking liquid or gas. Direct contact may lead to skin irritation or chemical burns. If one is exposed to the leaked substance, do these actions:

- **Accidental inhalation of harmful substances:** Evacuate people from the contaminated area, and seek medical attention immediately.
- **Eye contact:** Rinse eyes with flowing water for 15 minutes, and seek medical attention immediately.
- **Dermal contact:** Wash the affected area thoroughly with soap and water, and seek medical attention immediately.
- **Ingestion:** Induce vomiting, and seek medical attention immediately.

➤ Wet Batteries or Damaged Batteries

- If the battery is wet or submerged in water, do not try to access it.
- If the battery seems to be damaged, they are not fit for use and may pose a danger to people or property.
- Please pack the battery in its original container, and then return it to your distributor

➤ Fire


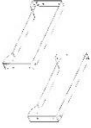





- If a fire breaks out where the battery is installed, do these actions:
- Extinguish the fire before the battery catches fire;
- If the battery has caught fire, do not try to extinguish the fire.
- Evacuate people immediately.

2.3 Limitation of Liability

Any product damage or property loss caused by the following conditions LIVOLTEK does not assume any direct or indirect liability.

- Product modified, design changed or parts replaced without LIVOLTEK authorization;
- Changes, or attempted repairs and erasing of series number or seals by non LIVOLTEK technician;
- System design and installation are not in compliance with standards and regulations;
- Failure to comply with the local safety regulations;
- The Product has been improperly stored in distributor's or end user's premises;
- Transport damage (including painting scratch caused by movement inside packaging during shipping). A claim should be made directly to shipping or insurance company as soon as the container/packaging is unloaded and such damage is identified;
- Failure to follow any/all of the user manual, the installation guide and the maintenance regulations;
- Improper use or misuse of the device;
- Insufficient ventilation of the device;
- The maintenance procedures relating to the product have not been followed to an acceptable standard;
- Force majeure (violent or stormy weather, lightning, overvoltage, fire etc.)
- Damages caused by any external factors.

3. Scope of Delivery

			
A	B	C	D
			
E	F	G	

Item	QTY	Designation
A	1	Battery
B	2	Mounting Bracket
C	12	Screws for Fixing Mounting Bracket
D	1	User manual
E	1 pair	Parallel Power cable- positive & negative, 4AWG;
F	1	Communication cable ;Double RJ45 plug;
G	1	MSDS report documents

NOTICE

Accessories for different applications may be different.

4. Product Appearance

Thank you for choosing the LIVOLTEK battery. The **BLF48100 Series** battery is a series of Low Voltage Lithium-ion battery. It is designed for residential energy storage system. It must only be connected with a officially tested inverter (Hybrid or Off-Grid series).

Table 1-1 Mechanical features

Parameter	Value
Dimensions	W450 *H180*D415 mm
Weight	≤ 45 kg
Installation	Rack-mounted installation/Stackable installation with brackets/Wall Mounted

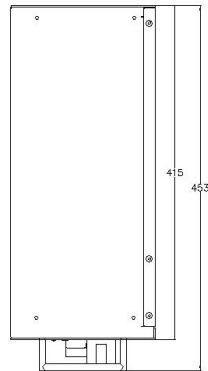
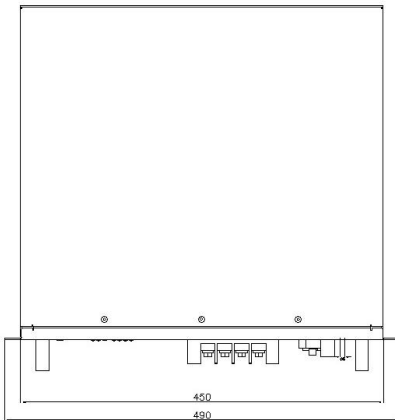
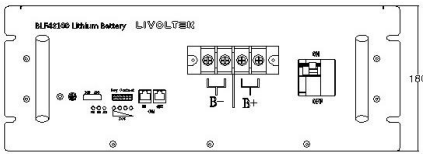
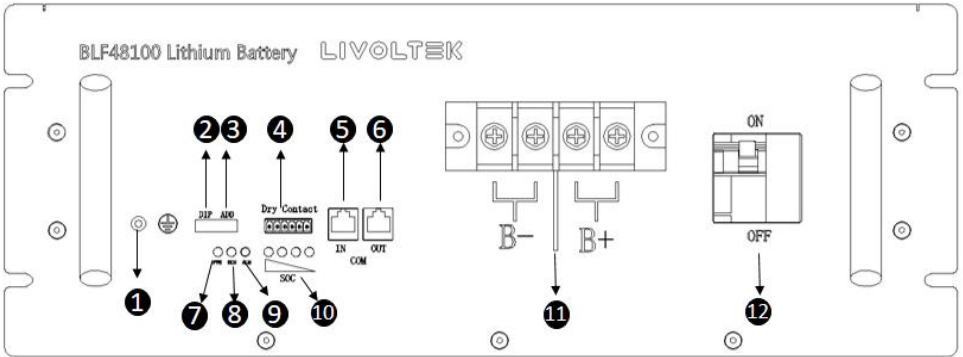



Table 1-2 Ports and terminals



No.	Label	Name
1		Grounding terminal
2	DIP	Set Communication terminal resistor
3	ADD	
4	Dry contact	Two-channel dry contact port
5	COM IN	Network port for parallel connection
6	COM OUT	Network port for parallel connection
7	Power	Display the power ON/OFF status of the battery
8	RUN	Display the running status of the battery
9	ALM	Display the alarm status of the battery
10	SOC	Display the battery capacity, and each indicator represents 25% SOC
11	B+/B-	Positive and negative power terminals
12	Breaker	DC Breaker

⚠ CAUTION

If the battery is not used or not installed for a long time, it is recommended to measure the voltage and charge it before use for better maintenance.

5. Mounting

5.1 Environment Requirements

NOTICE

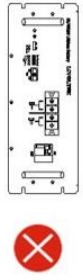
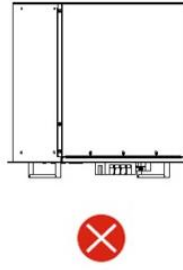
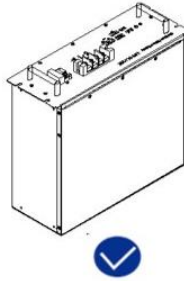
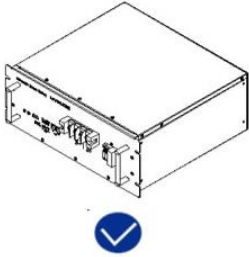
It is recommended to install the battery into a cabinet and place it indoor. If you install it outdoor, select a cabinet with a sufficient IP rating. Build sunshade & rain shelter to avoid direct exposure to sunlight and rain for outdoor application.

- **Keep children away from the equipment.**
- The optimal ambient temperature for the battery is 15~35°C.
- Avoid exposing the equipment to direct sunlight or rain.
- Install the equipment away from heat/cold source.
- Do not install the equipment in the place where the temperature changes extremely.
- Install the equipment away from strong interferences to ensure its regular work.
- Do not install the equipment in places prone to accumulate water.
- Do not put inflammable or explosive matters near the equipment.

5.2 Battery Installation Orientation



The battery supports stackable installation with brackets. At most 4 batteries can be athwart stacked. Ensure that you install the battery in correct directions. Please refer to figures below (✓ means acceptable and X unacceptable).



5.3 Battery Installation

5.3.1 Unpack and Check for Transport Damage

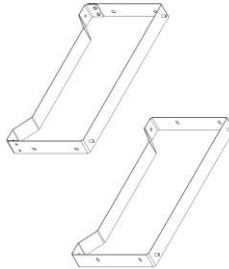
Unpacking the battery package and make sure the battery is intact during transportation. If there are some visible damages, such as cracks, or missing, please contact your dealer immediately.

5.3.2 Procedure for Stackable Installation

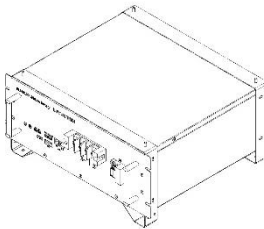
STEP 1: Battery check

Check and confirm the battery is powered off and battery breaker is turned off before any process.

STEP 2: Prepare support brackets and screws .

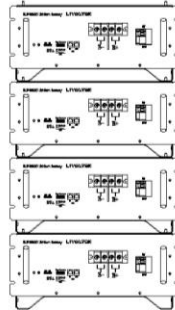
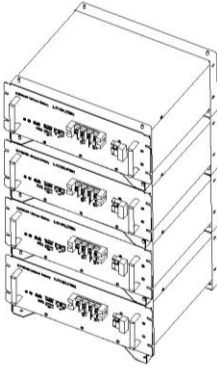


STEP 3: Set the battery into the 2 brackets from the rear of the battery and fasten the screws.



STEP 4: Stack battery packs with brackets

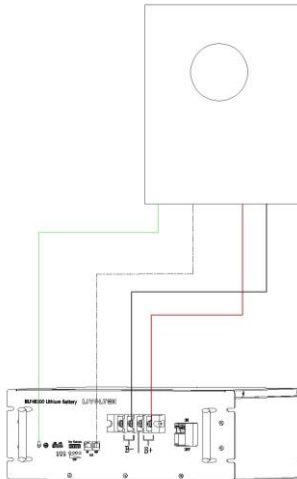
At most 4 battery packs can be stacked in this way.



6 Electrical Connection

6.1 Battery Power Connection

Battery connection diagram



Procedure:

⚠ CAUTION

Before connecting the power cables, please check and confirm the battery is powered off and battery breaker is turned off .

Procedure:

STEP 1:

- Please assemble the connectors if they are not pre-assembled.



STEP 2:

- Use an M4 screw to fasten the grounding wire to grounding terminal and fix the other end to the specified position .



Step 3:

- Install the connectors to battery power ports; make sure the polarities are correct.

Step 4:

- Install the other ends of power cables to the inverter. Please contact with your inverter vendor for detailed information or read the operation manual carefully and follow the instruction of the inverter.
-

6.2 BMS Communication Connection

Please check whether the BMS communication cable in the accessory box is appropriate for the battery. If you are not sure for that, please confirm with your vendor for help.

Procedure:

STEP 1:

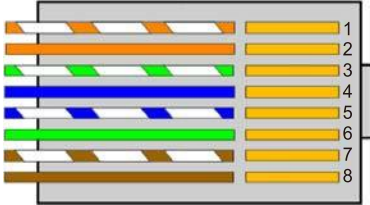
- Please insert the RJ45 connector into the BMS port of battery.

STEP 2:

- Please insert the other end of the cable in the corresponding port of inverter.
-

BMS RJ45 Connector Pin Definition:

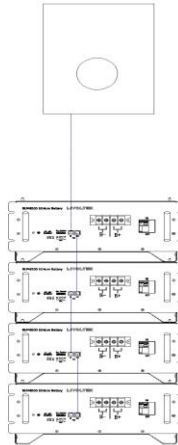
- 1. BMS_CAN_H
- 2. BMS_CAN_L
- 3. BMS_485_A
- 4. GND
- 5. BMS_485_B
- 6. NULL
- 7. PCS_485_A
- 8. PCS_485_B



6.3 Parallel Connection of Multi-batteries

Expandability: Up to 16 units of **BLF48100** can be parallel connected in one system.

Parallel Connection Diagram



Procedure:

STEP 1: Assemble the connectors to wire

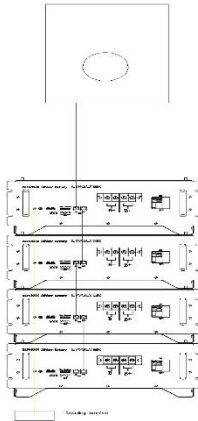
- Please assemble the connectors if they are not pre-assembled.

STEP 2: Connect network cables

- Connect the COM ports of each battery.
- Then connect the COM IN port of the uppermost battery to inverter.

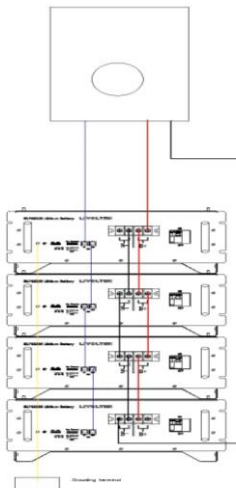
STEP 3: Connect grounding wires

- Use an M4 screw to fasten the grounding wire to grounding terminal of each battery to a specified grounding position.
-



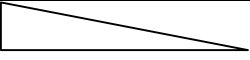
STEP 4: Connect power wires

- Connect the +/- terminals of each battery with power cables in the accessory box.
- Then connect the + terminal of the uppermost battery, and - terminal of the bottom battery to the inverter.



7 Operating of the Battery

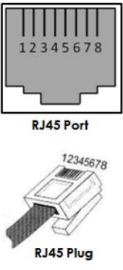
7.1 LED status indicator

Battery status	SOC	Green	Green	Red				
		POWER	RUN	ALRM	LED4	LED3	LED2	LED1
Power off	/	-	-	-	-	-	-	-
Standby	$75\% \leq \text{SOC} \leq 100\%$	ON	ON	-	ON	ON	ON	ON
	$50\% \leq \text{SOC} < 75\%$	ON	ON	-		ON	ON	ON
	$25\% \leq \text{SOC} < 50\%$	ON	ON	-			ON	ON
	$10\% \leq \text{SOC} < 25\%$	ON	ON	-				ON
	$0\% \leq \text{SOC} < 10\%$	ON	ON	●				
Charging	SOC=100%	ON	ON		ON			
	$75\% \leq \text{SOC} < 100\%$	ON	ON		Flashing	ON	ON	ON
	$50\% \leq \text{SOC} < 75\%$	ON	ON			Flashing	ON	ON
	$25\% \leq \text{SOC} < 50\%$	ON	ON				Flashing	ON
	$10\% < \text{SOC} < 25\%$	ON	ON					Flashing
$0\% \leq \text{SOC} \leq 10\%$	ON	ON	●				Flashing	
Discharging	$75\% \leq \text{SOC} \leq 100\%$	ON	ON		ON	ON	ON	ON
	$50\% \leq \text{SOC} < 75\%$	ON	ON			ON	ON	ON
	$25\% \leq \text{SOC} < 50\%$	ON	ON				ON	ON
	$10\% < \text{SOC} < 25\%$	ON	ON					ON
	$0\% \leq \text{SOC} \leq 10\%$	ON	ON	●				

Flashing: green light on 0.5s then off 0.5s.

7.2 COM IN/OUT Definition

Pin No	Definition
1	PCS_CAN_H
2	PCS_CAN_L
3	BMS_485_A
4	GND
5	BMS_485_B
6	GND
7	PCS_485_A
8	PCS_485_B



7.3 Turn On/Off the Battery

- When turn on the battery, turn on the DC breaker.
- When turn off the battery, turn off the DC breaker.

8 Technical Data

Electrical Data	BLF48100
Cell Type	LFP
Total Energy	4.8kWh
Depth of Discharge	90%
Usable Energy	4.3 kWh
Nominal Voltage	48 V
Nominal Capacity	100 Ah
Operating Voltage Range	37.5-54.75 V
Max. Charge/Discharge Current@25°C	100A/100A
Max. Parallel Number	16 Units
General Data	
Mounting information	Rack-mounted /Stackable installation with brackets/Wall Mounted
Communication	CAN / RS485
Operating Temperature	0~50°C charge / -10~55°C discharge
Dimension(W*H*D)	450*180*415 mm
Weight	45 kg
IP Protection Type	IP20
Authentication Level	IEC62619/CE/UN38.3

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