solitia

CASIA LVP48-400A

SOLAR LI-ION BATTERY PARALLEL BOX

USER MANUAL

Content

1 Overview 1

2 Product Diagram 1

2.1 Appearance and Dimension 1

2.2 Interface 2

2.3 Main Components 2

3 Product Performance 4

4 Wiring 5

4.1 Wiring diagrams 5

4.2 Power cable connectors 18

5 Generality 20

5.1 Warranty 20

5.2 Shipping 20

5.3 Cautions 20

1. Overview

LVP48-400A is a main control box product independently developed and manufactured by SOLITIA. The main control box is used for junction, short circuit protection, lightning protection, and isolation of DC and AC circuits. It is designed for parallel system based on **LV4850** and **LV48100** battery.

LVP48-400A supports up to 400A or 19kW input and output to three inverters.

The performance of **LVP48-400A** delivered by SOLITIA fully meets the parameters and functions listed in this specification. At the same time, the customer should fully comply with this **Specification** and the **Installation Manual** to install and use it.

2. Product Diagram

2.1 Appearance and Dimension

Fig 2.1 Front view

Fig 2.2 Back view

2.2 Interface

This section details the interface functions of the front panel:

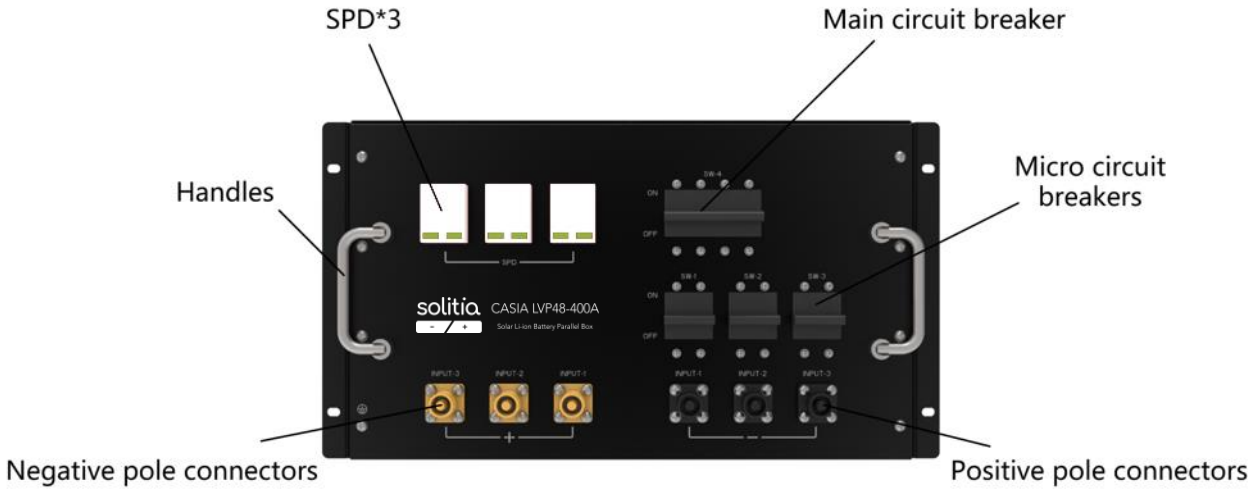


Fig 2.3 Interface definition of LVP48-400A

2.3 Main Components

LVP48-400A is composed of connectors, bus bars, circuit breakers, SPDs and metal box, etc.

The main components in this main control box are as follows：

Table 2.1 Main components

NO.	Item	Type	QTY	Note
1	P+ connectors	NF20001NNXAC0900	3	Nominal current 150A
2	P- connectors	NF20001NNXAC0900	3	Nominal current 150A
3	Micro circuit breaker	CELHPK111-1-52-150.-A-01-V	3	Nominal current 150A
4	Copper bus	500A	2	
5	Main circuit breaker	CELHPK1111-1-52-400. -A-01-T	1	Nominal current 400A, isolate battery and inverter.
6	SPD	DG M TN 275 CN FM	3	Current capacity 20kA
7	Metal box	440×460×266mm	1	SPCC
8	Output connectors	DSTB60-06	1	To inverters
9		DSTB8-03	1	To DC equipment within 30A

3. Product Performance

Table 3.1 Parameters

NO.	Items	Parameters	Remark
1	Number of input channels	3	Battery side
2	Max. number of batteries connected	9	Every three batteries are connected to one channel in parallel
3	Max. continuous current of per channel	150A	
4	Max. peak current of per channel	200A	1S
5	Number of output channel	3	Inverter side
6	Max. output continuous current	400A	
7	Max. output peak current	500A	1S
8	Rated operating voltage range	0~60V	
9	Overload protection function	Yes	
10	Short circuit protection function	Yes	
11	Lightning protection function	Yes	
12	SPD current capacity	20kA	
13	Operating ambient temperature	-40℃~60℃	
14	Operating environment relative humidity	10%~90%	No condensation
15	Dimension	440×460×266mm	W×D×H
16	Weight	~15kg	

4. Installation Guidance

4.1 Before installation

▸ Before installation, be sure to cut off the inverter grid power and make sure every battery is in the turned-off mode;

▸ Make sure that all circuit breakers on the main control box is in off status;

▸ Wiring must be correct, do not mix-connect the positive and negative cables, and ensure no short circuit with the external device;

▸ It is prohibited to connect the main control box with AC power directly;

▸ Please ensure the electrical parameters of the battery system are compatible to the inverter;

▸ The installation site must be suitable for the size and weight of the main control box;

▸ It's better to install the unit in a waterproof cabinet;

▸ The distance between the battery and the main control box should not be too long;

▸ There are no flammable or explosive materials in proximity.

▸ The ambient temperature is better within the range from 0°C to 45°C.

▸ The temperature and humidity is maintained at a constant level.

▸ There is minimal dust and dirt in the area.

4.2 Tools and gears

The following tools are required to install the unit:

▸ Cross screwdriver;

▸ Torque wrench

▸ Wire cutter;

▸ RJ45 crimping plier;

▸ Hydraulic cable plier;

▸ Multimeter.

NOTE

▸ Use properly insulated tools to prevent accidental electric shock or short circuits.

▸ If insulated tools are not available, cover the entire exposed metal surfaces of the available tools, except their tips, with electrical tape.

It is recommended to wear the following safety gear when install or maintain the unit:

▸ Insulated gloves;

▸ Safety goggles;

▸ Safety shoes.

4.3 Overview of installation process

▸ Frist: Fix the batteries and the main control box in the installation position;

▸ Second: Install the internal parallel wires between the batteries;

▸ Third: Connect the communication wire between the batteries, and set the address for each battery.

▸ Fourth: Connect the input power cable between batteries with the main control box according to “4.4 Power cable connection instructions”. (The connection must be firm).

▸ Fifth: Connect the communication wire between batteries.

▸ Sixth: Connect the power cable between the main control box and the inverters.

4.4 Power cable connection instructions

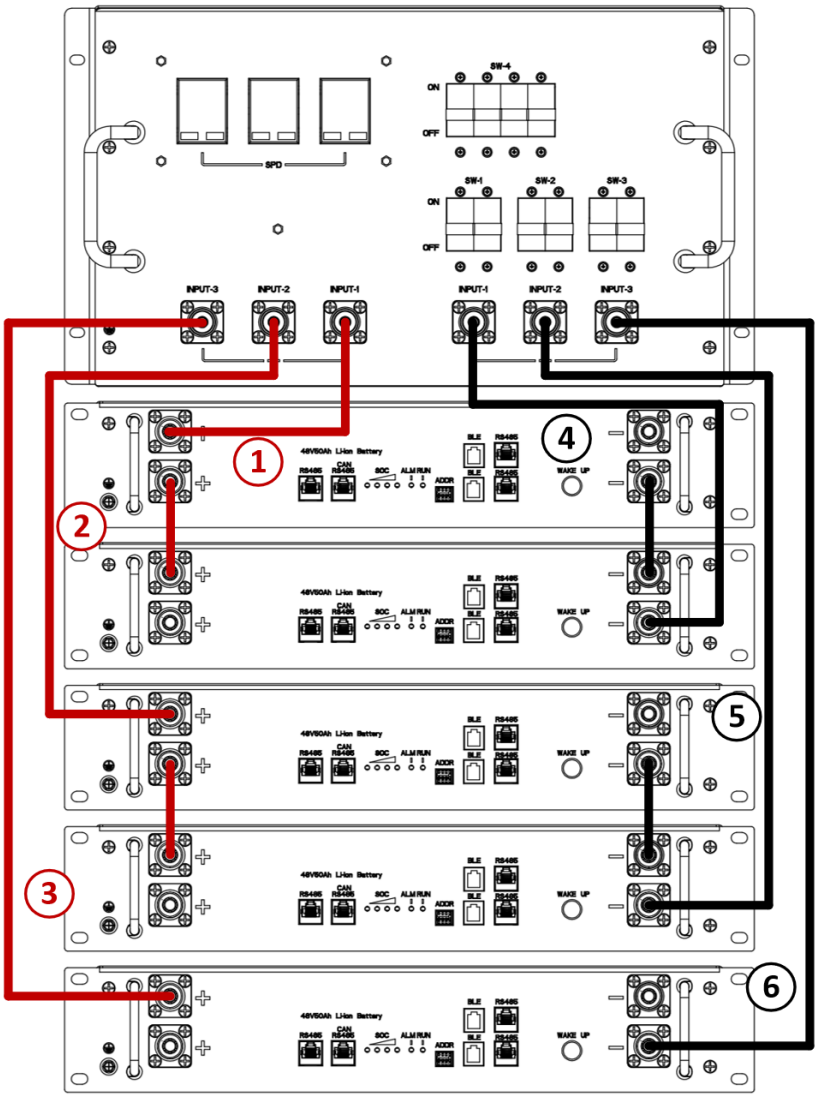
1) Before formal connection, please make sure that the voltage difference of all batteries to be connected in parallel is less than 1V.

2) Please make sure that all circuit breakers are OFF state before formal connection.

3) Before the formal wiring, please make sure that all batteries are off and the LED lights are not on.

4) The battery side of the main control box supports 3 input channels and max. 9 batteries. Please refer to the following wiring diagram:

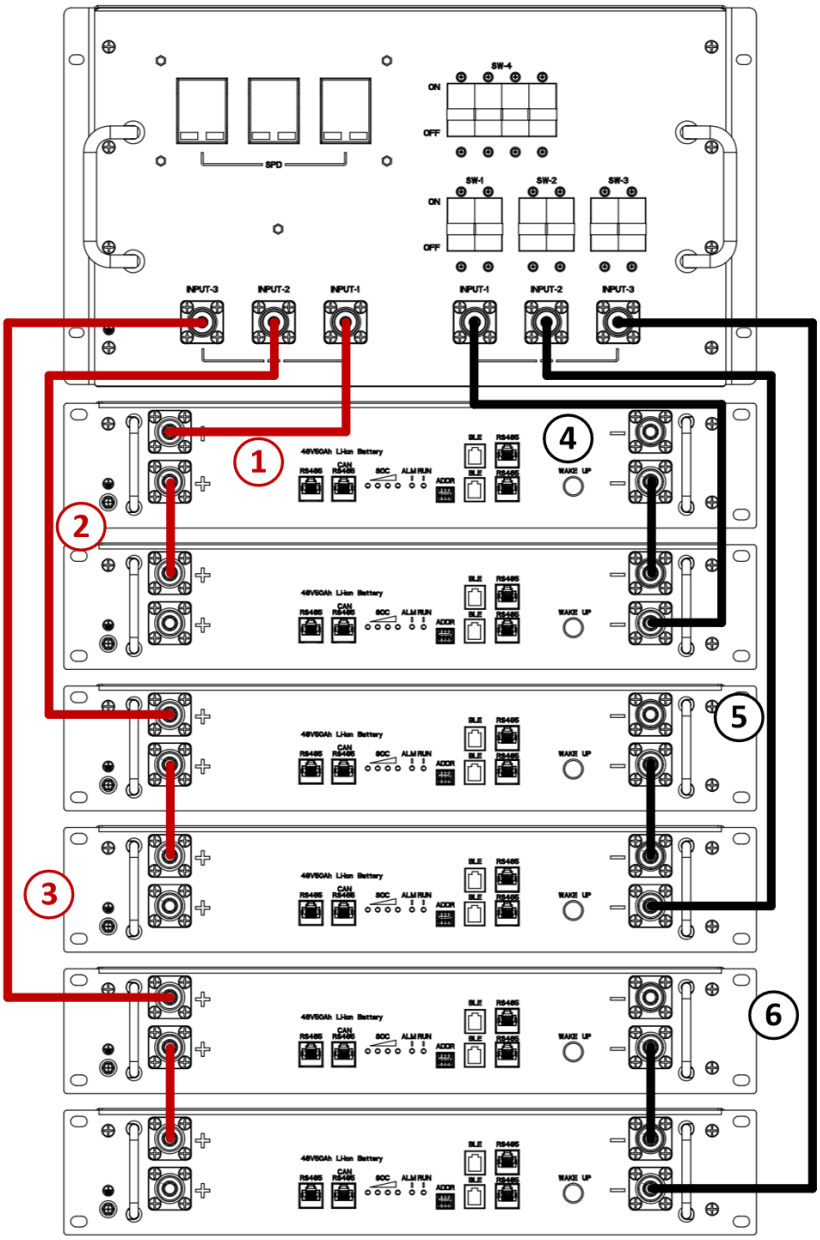
Wiring diagram of five batteries in parallel:



1# Cable: 200mm 4# Cable: 440mm
2# Cable: 460mm 5# Cable: 630mm
3# Cable: 660mm 6# Cable: 710mm

Fig 4.1 Five batteries connection

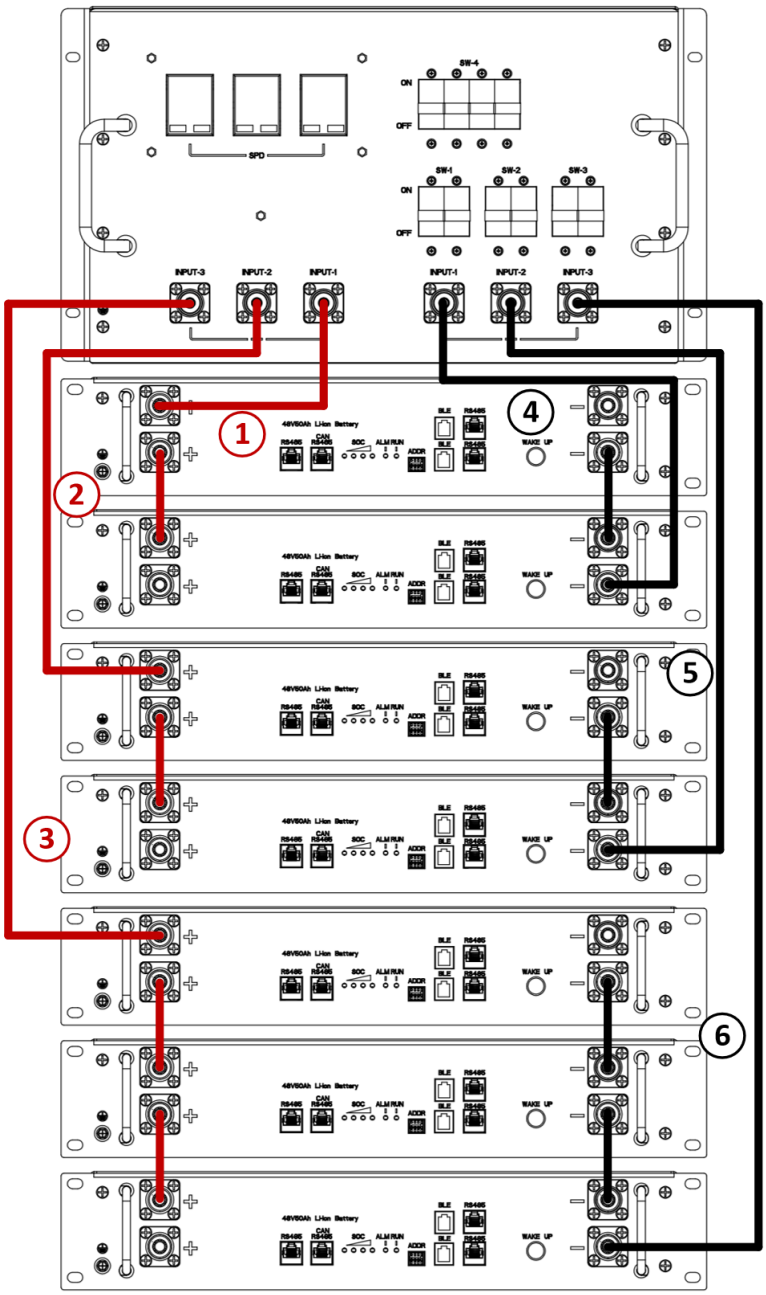
Wiring diagram of six batteries in parallel:



1# Cable: 200mm 4# Cable: 440mm
2# Cable: 460mm 5# Cable: 630mm
3# Cable: 660mm 6# Cable: 810mm

Fig 4.2 Six batteries connection

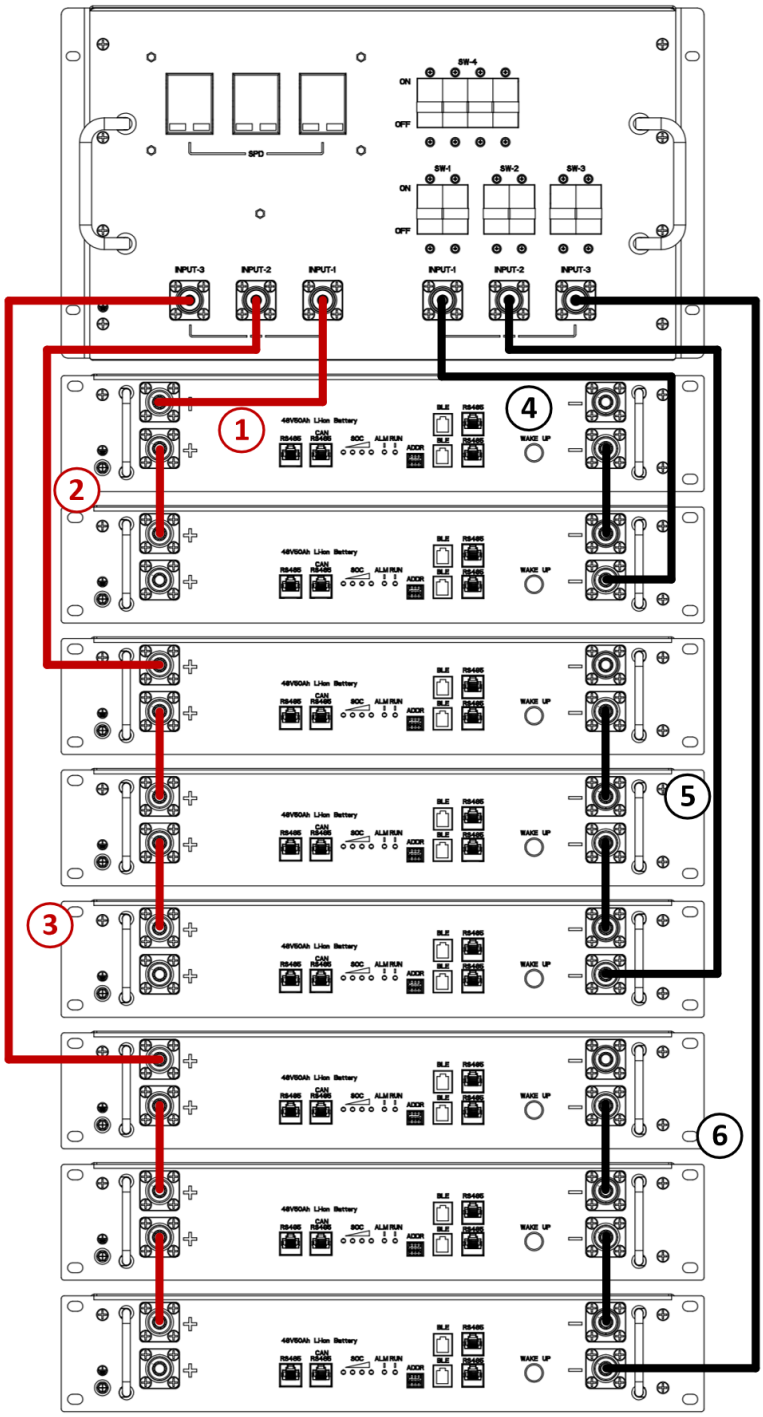
Wiring diagram of seven batteries in parallel:



1# Cable: 200mm 4# Cable: 440mm
2# Cable: 460mm 5# Cable: 630mm
3# Cable: 660mm 6# Cable: 915mm

Fig 4.3 Seven batteries connection

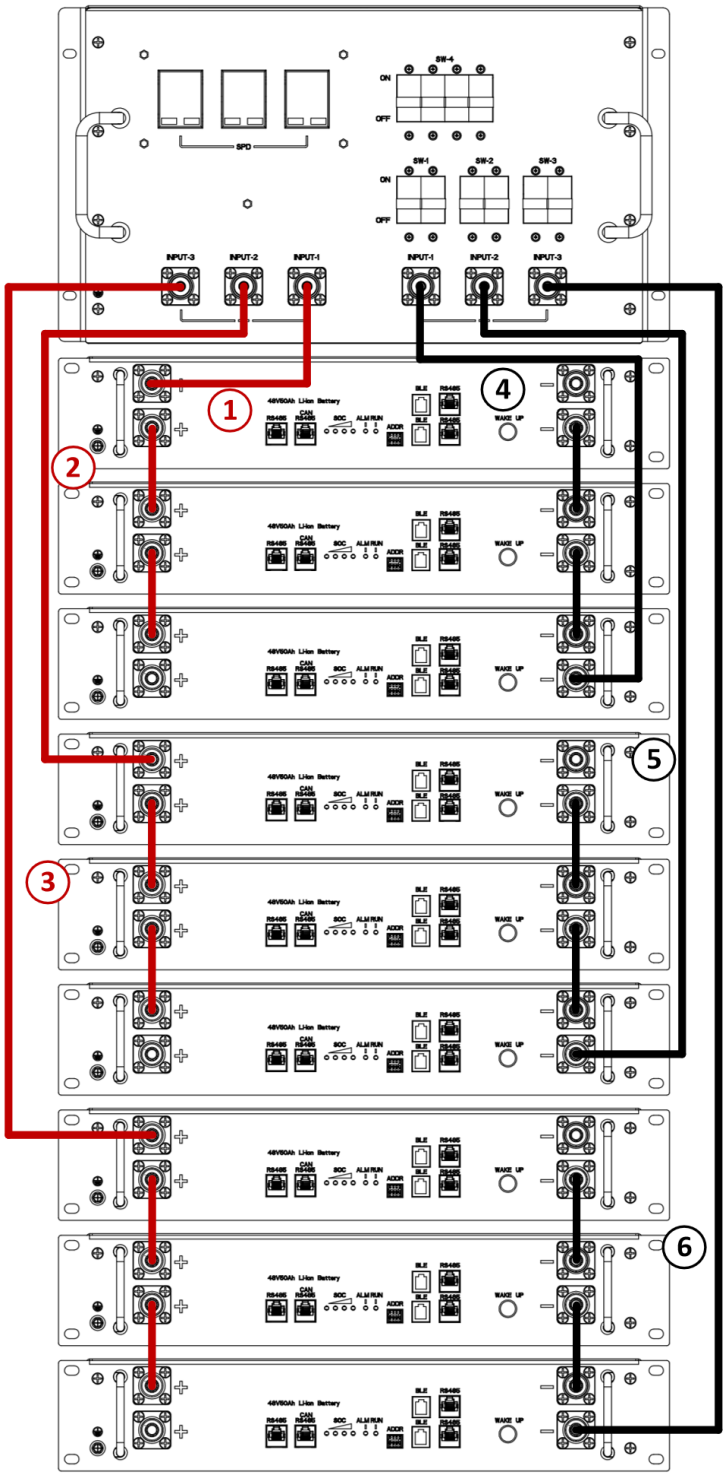
Wiring diagram of eight batteries in parallel:



1# Cable: 200mm 4# Cable: 440mm
2# Cable: 460mm 5# Cable: 745mm
3# Cable: 765mm 6# Cable: 1020mm

Fig 4.4 Eight batteries connection

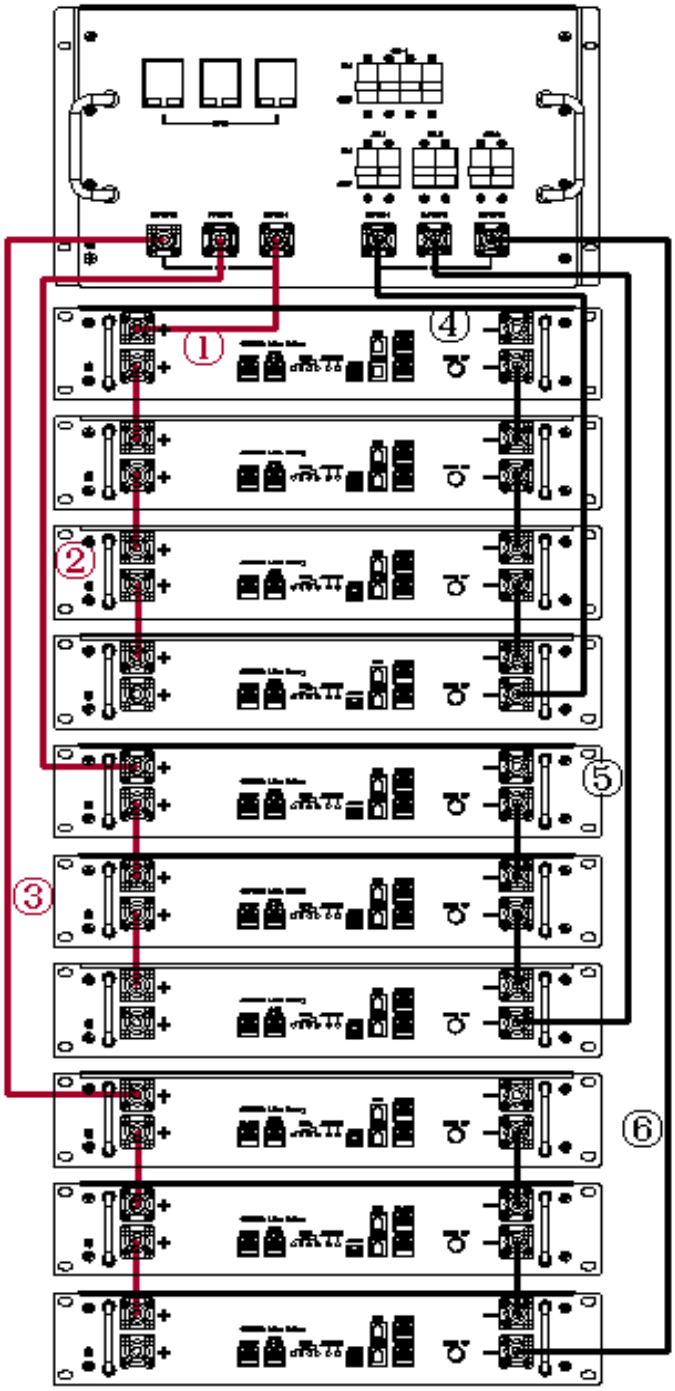
Wiring diagram of nine batteries in parallel:



1# Cable: 200mm 4# Cable: 545mm
2# Cable: 565mm 5# Cable: 850mm
3# Cable: 870mm 6# Cable: 1125mm

Fig 4.5 Nine batteries connection

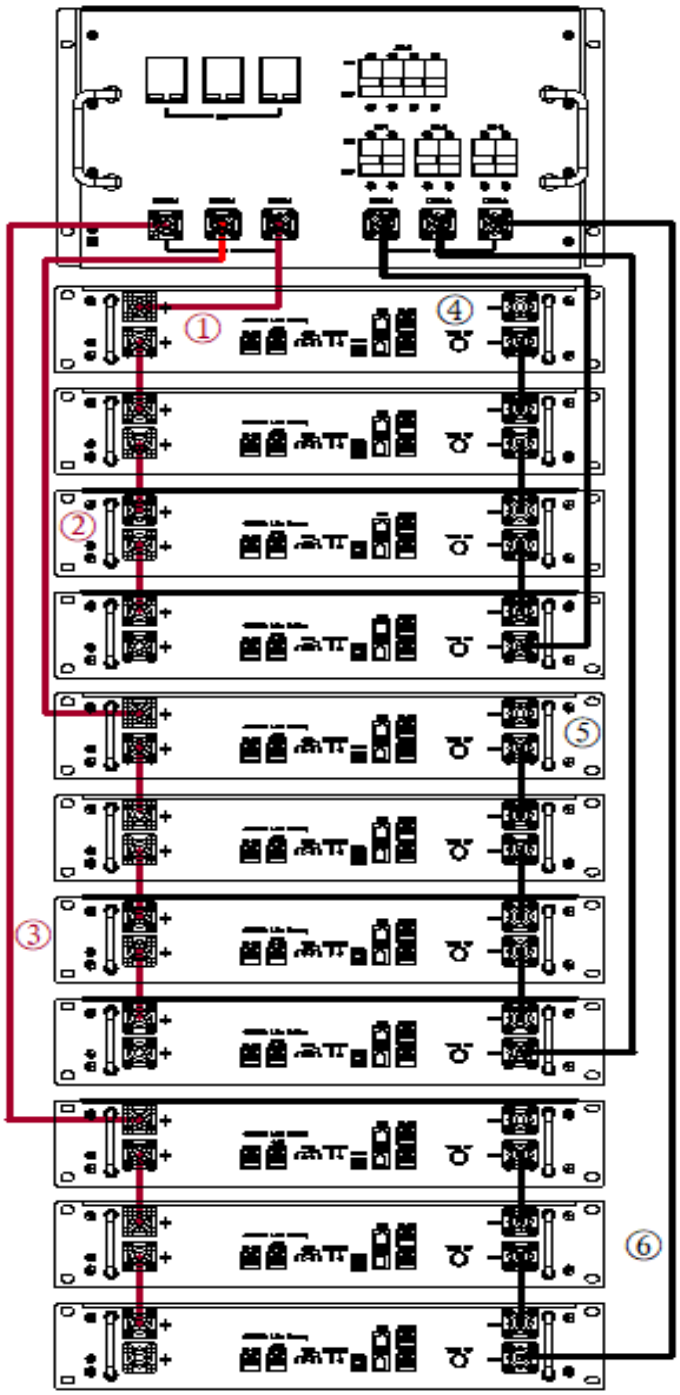
Wiring diagram of ten batteries in parallel:



1#cable: 100mm 4#cable:750mm
2#cable: 760mm 5#cable: 1000mm
3#cable: 1050mm 6#cable: 1300mm

Fig 4.6 Ten batteries connection

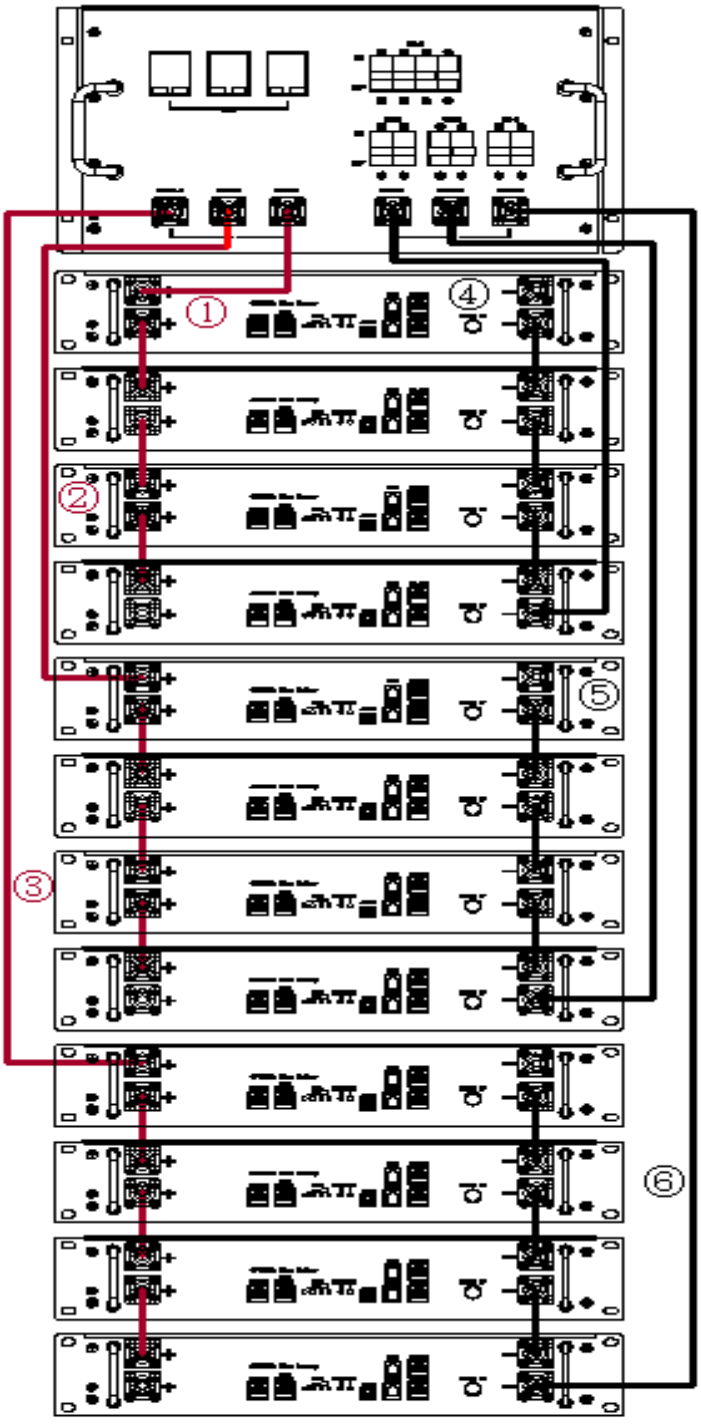
Wiring diagram of eleven batteries in parallel:



1#cable: 100mm 4#cable:750mm
2#cable: 760mm 5#cable: 1100mm
3#cable: 1150mm 6#cable: 1400mm

Fig 4.7 Eleven batteries connection

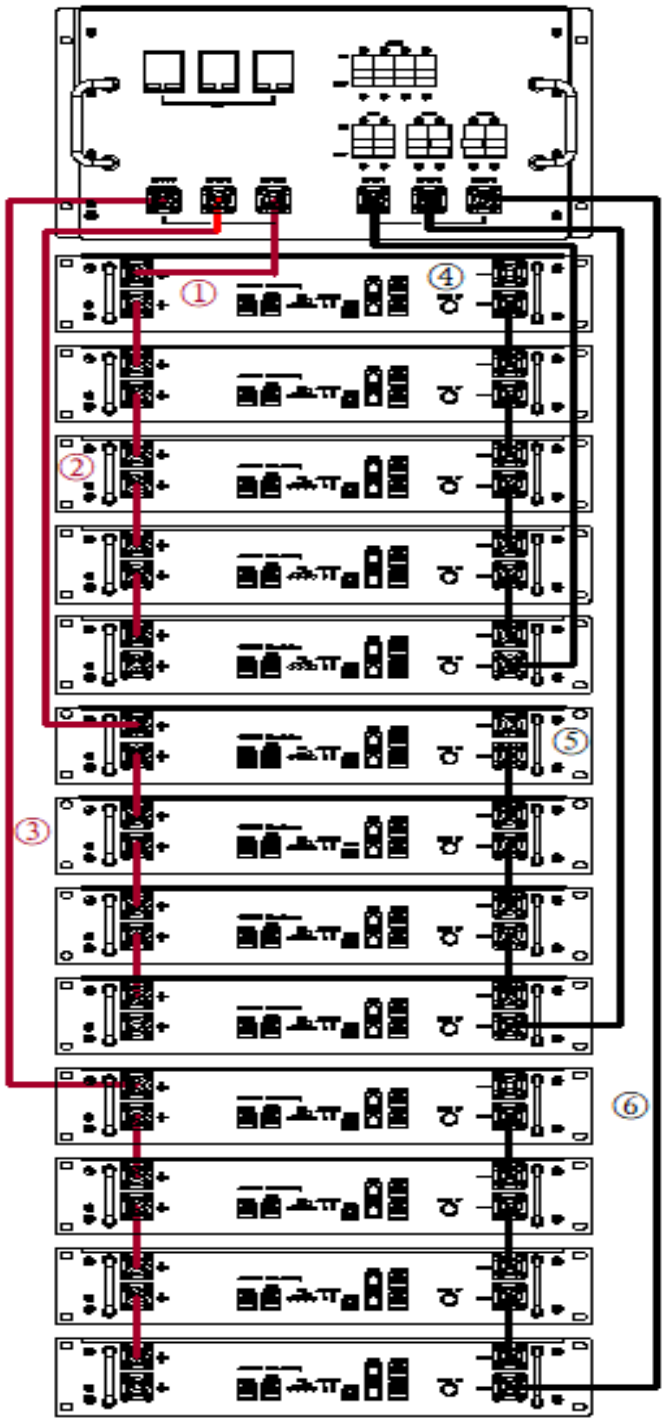
Wiring diagram of twelve batteries in parallel:



1#cable: 100mm 4#cable:750mm
2#cable: 760mm 5#cable: 1100mm
3#cable: 1150mm 6#cable: 1500mm

Fig 4.8 Twelve batteries connection

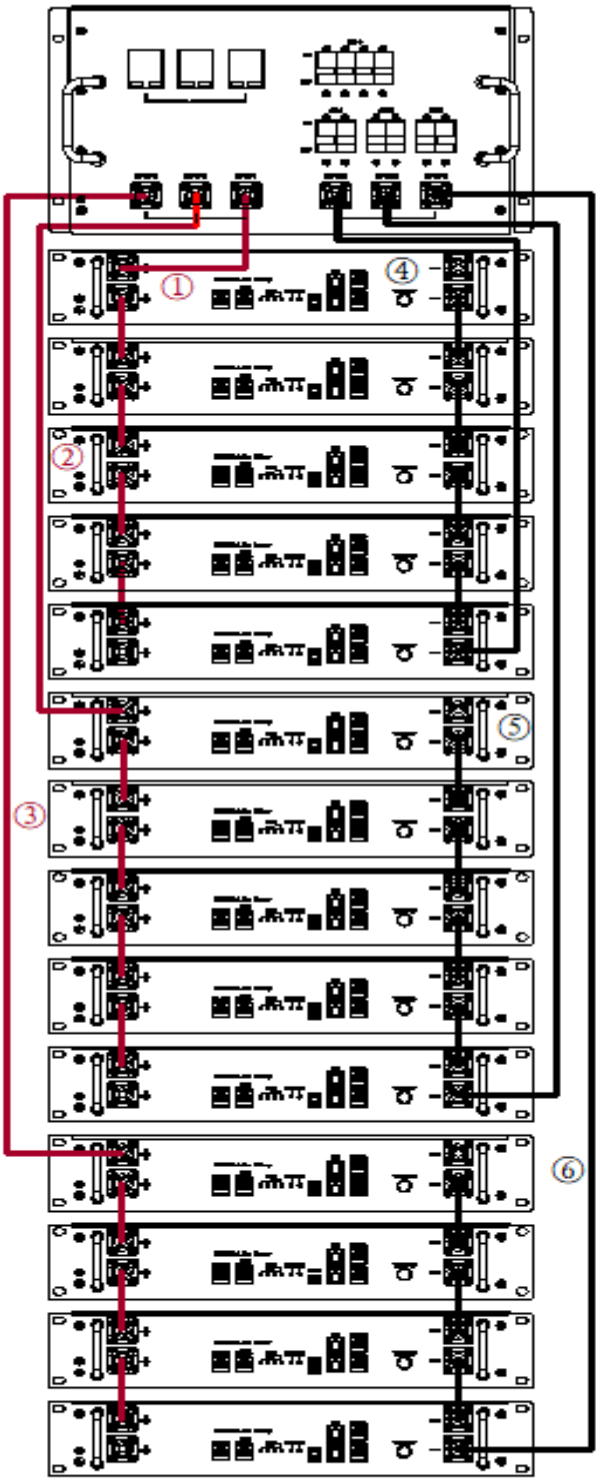
Wiring diagram of thirteen batteries in parallel:



1#cable: 100mm 4#cable: 850mm
2#cable: 860mm 5#cable: 1200mm
3#cable: 1250mm 6#cable: 1600mm

Fig 4.9 Thirteen batteries connection

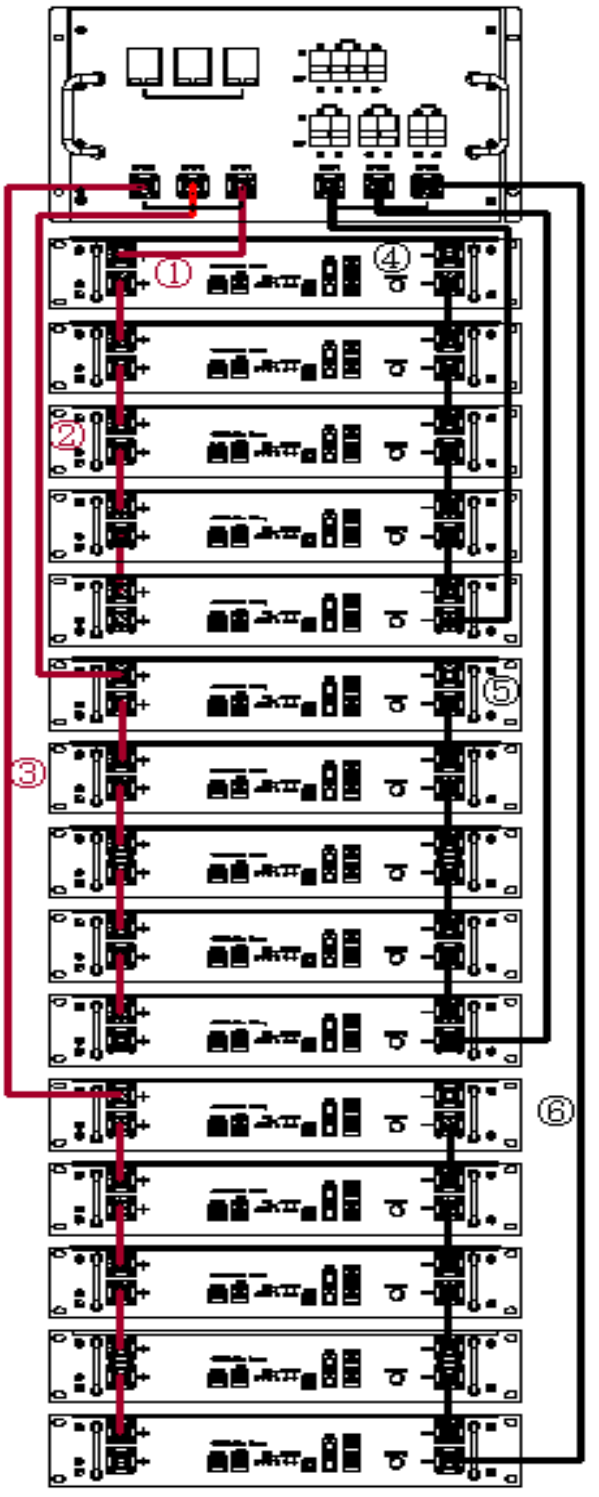
Wiring diagram of fourteen batteries in parallel:



1#cable: 100mm 4#cable: 850mm
2#cable: 860mm 5#cable: 1300mm
3#cable: 1350mm 6#cable: 1700mm

Fig 4.10 Fourteen batteries connection

Wiring diagram of fifteen batteries in parallel:



1#cable: 100mm 4#cable: 850mm
2#cable: 860mm 5#cable: 1300mm
3#cable: 1350mm 6#cable: 1800mm

Fig 4.11 Fifteen batteries connection

*For parallel connection between two batteries, must use the parallel cable attached with the battery.

5) Only when the power cable between battery and main control box is well connected, the main control box and inverters can be connected.

6) The battery parallel cable and the power cable between the battery and the main control box adopt the anti-loose plug, please pay attention to plug it tightly.

4.5 Connectors' introduction

For the internal power connection between batteries, NF20001NNXAC0900 connectors are adopted. This connector has the characteristics of high temperature resistance, salt fog resistance, flame retardant, convenient installation and long service life.

Fig 4.6 Connector diagram

The main parameters of connector are as follows:

Table 4.1 Connector parameters

SN	Description	Parameter
1	MAX. operation voltage	1000V
2	Nominal current	150A
3	MAX. continuous current	200A
4	Temperature range	-40℃~125℃
5	IP level	IP67
6	Insulation resistance	≥200MΩ
7	Plug life	＞500 times

For the External power connection with inverters, DSTB60-06 connector is adopted. Up to three inverters can be connected with the main control box in parallel.
The main control box also provides a DSTB8-03 connector for auxiliary equipment power supply, such as cabinet fan, air conditioner, etc. The maximum continuous power is 1.5kW.

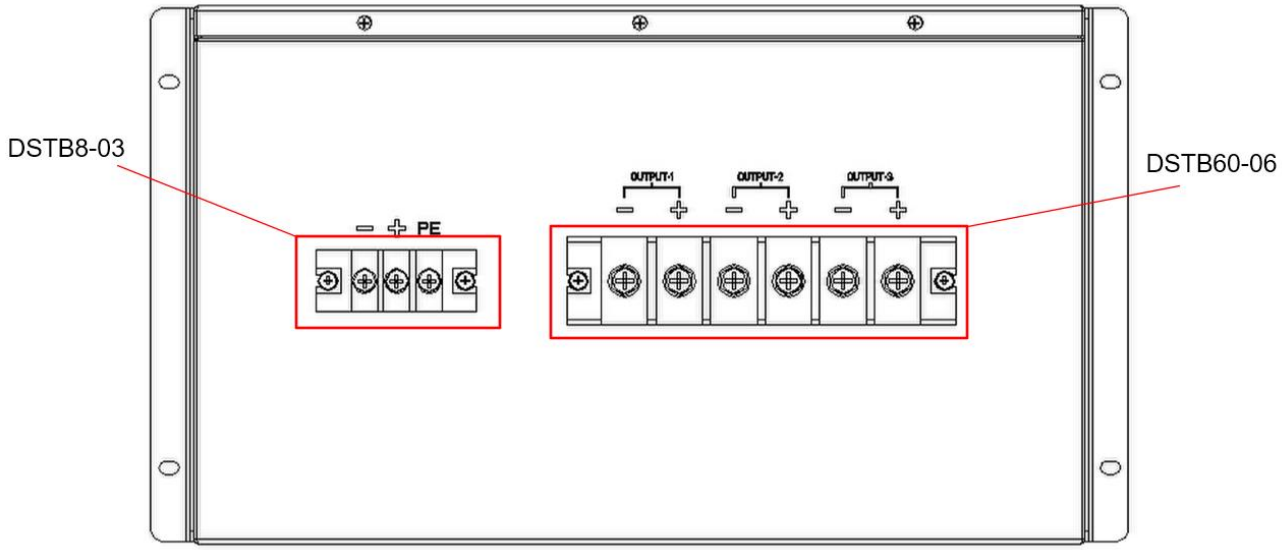


Fig 4.7 Connectors diagram

It is suggested that the cables output to inverter cross-sectional area is 70mm^2 and the screw is M8.

4.6 Power on operation

1) Activate each battery through the wake-up button.
2) Turn the micro circuit breakers on the main control box to ON state.
3) Turn the main circuit breakers on the main control box to ON state.
4) Turn on the DC switch of the inverter.

5 Generality

5.1 Warranty

As long as the LVP48-400A is used in accordance with this **Product Specification** and **Installation Guidance**, the manufacturer under the SOLITIA brand model warrants that the main control box should be free from any defect for a period of 10 years (25℃±3℃) from the date of shipment.

5.2 Shipping

During transportation, keep the main control box from acutely vibration, impacting, solarization, drenching.

5.3 Cautions

- Installation and maintaining should be operated by professional electric personnel.
- Don't push your hands or foreign bodies deep into the interior of the product.
- Do not open the product without a professional.
- Do not mechanically damage the main control box (perforation, deformation, peeling, etc.).
- Please use dry powder extinguisher as extinguishing agent.
- Do not allow the main control box to contact abnormal metals or conductors.
- Do not continue to use the product after a short circuit.
- Do not expose the product to flammable or hazardous chemicals or vapors.

Space for handwritten notes of customer / installer

www.solitia.eu