USER MANUAL V1.01
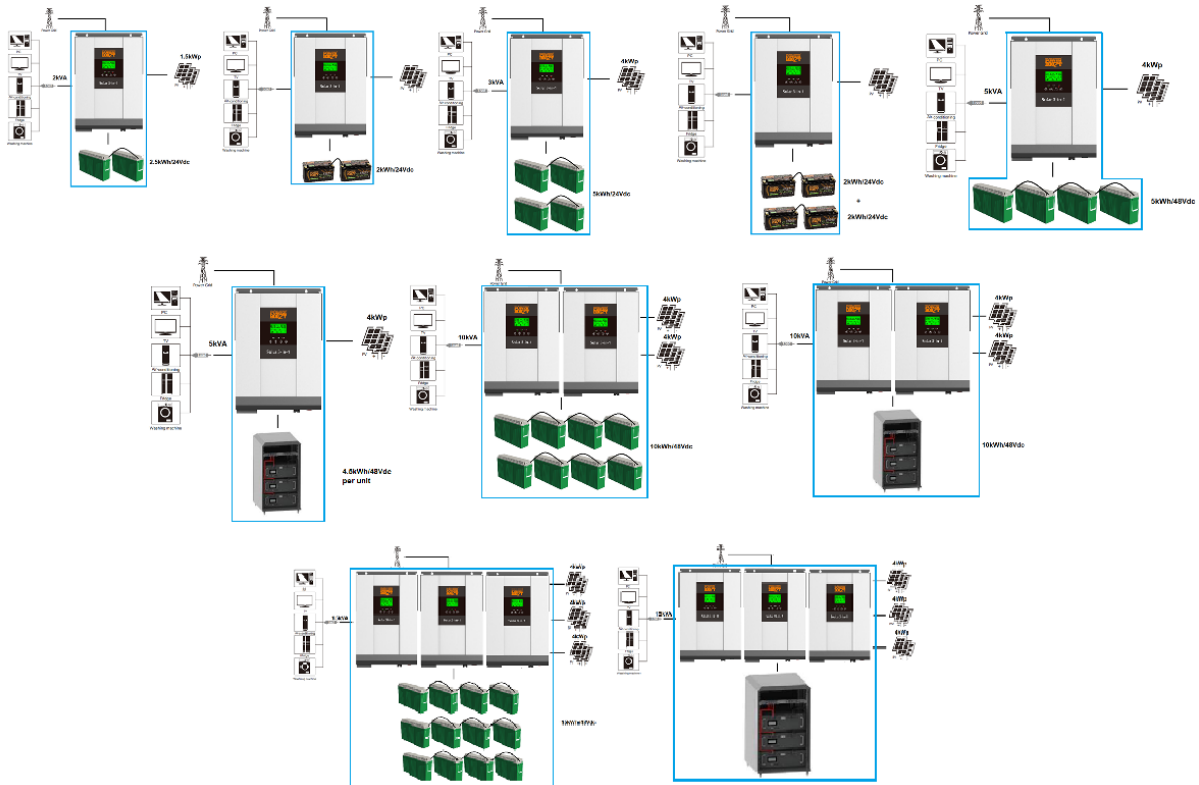
PB.UPS.2.2.24(.Li)

PB.UPS.3.5.24(.Li)

PB.UPS.5.5.48(.Li)

PB.UPS.10.10.48(.Li)

PB.UPS.15.15.48(.Li)

THE PB.UPS SYSTEMS ARE OFF-GRID SYSTEMS - THEY CANNOT BE USED TO INJECT ENERGY TO THE AC NETWORK.

IT IS TECHNICALLY IMPOSSIBLE FOR THE DEVICE TO DO THIS AND THERE ARE NO SETTINGS IN THE PROGRAMMING THAT CAN ACTIVATE THIS.

THE PB.UPS SYSTEMS ARE PROVIDED AS A WHOLE.

CONSISTING OF: INVERTER

                       BATTERIES

                       BATTERY BOX

                       CABLES AND ACCESSORIES

                       FUSES

IT IS IMPORTANT THAT THE SYSTEM IS INSTALLED WITH THE ABOVE

COMPONENTS.

WE ARE NOT RESPONSIBLE FOR EXTERNAL PARTS CONNECTED IN THE INSTALLATION THAT ARE NOT STANDARD IN THE PACKAGE.

THE WARRANTY ON THE SYSTEM WILL VOID IN THAT CASE.

TABLE OF CONTENTS

PB.UPS.2K24 - PB.UPS.3K24 - PB.UPS.5K48

PB.SC12-170

PB-Li-12-100D

LfeLi-48100TB

APPENDIX

PB.UPS.2K24

PB.UPS.3K24

PB.UPS.5K48

ABOUT THIS MANUAL

Purpose This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations.

Keep this manual for future reference.

Scope

This manual contains safety and installation guidelines, as well as information about tools and wiring.

The following cases are not covered by the warranty

1. Out of warranty period

2. Serial number has been changed or lost.

3. Battery capacity was reduced or external damage.

4 . The inverter was damaged caused from carriage shift, remissness, ect external factor.

5. The inverter was damaged caused by irresistible natural disasters.

6. Not in accordance with the electrical power supply conditions or operate environmental damage.

SAFETY INSTRUCTIONS

⚠

WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

1. Before using the device, read all instructions and warning markings on the device, batteries, and all relevant sections of this manual. CAUTION -- Only charge deep-cycle type rechargeable lead-acid batteries to reduce the risk of injury. Other types of batteries may burst, causing personal injury and damage.

3. Do not disassemble the device. Take it to a qualified service center when service or repair is required. Improper reassembly can result in a risk of electric shock or fire.

4 . To reduce the risk of electric shock, disconnect all wiring before performing maintenance or cleaning. Turning off the unit will not reduce this risk.

5. **CAUTION -** Only qualified personnel should install this device with battery.

6. **NEVER** charge a frozen battery.

7. For optimum operation of this inverter/charger, please follow required spec to select appropriate cable size.
It' s very important to correctly operate this inverter/charger.

8. Be very cautious when working with metal tools on or around batteries.
A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.

9. Please strictly follow installation procedure when you want to disconnect AC or DC terminals.
Please refer to INSTALLATION section of this manual for the details.

10. Fuses (1 piece of 200A, 58VDC for 3KW,4KW and 5KW) are provided as over-current protection for the battery supply.

11. GROUNDING INSTRUCTIONS- This inverter/charger should be connected to a permanent grounded wiring system.
Be sure to comply with local requirements and regulation to install this inverter.

12. NEVER cause AC output and DC input short circuited.
Do NOT connect to the mains when DC input short circuits.

13. **Warning!!** Only qualified service persons are able to service this device.
If errors still persist after following troubleshooting table, please send this inverter/charger back to local dealer or service center for maintenance.
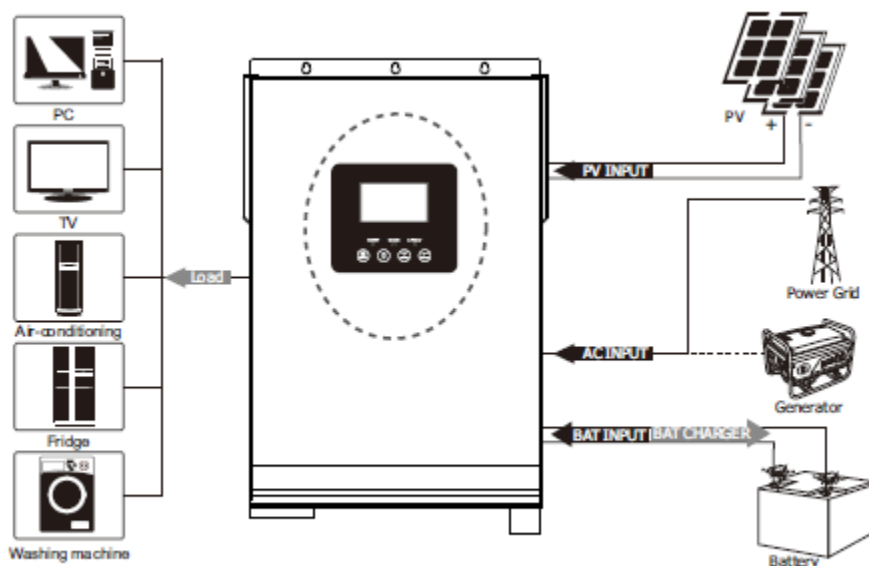
Figure 1 Hybrid Power System

PRODUCT OVERVIEW
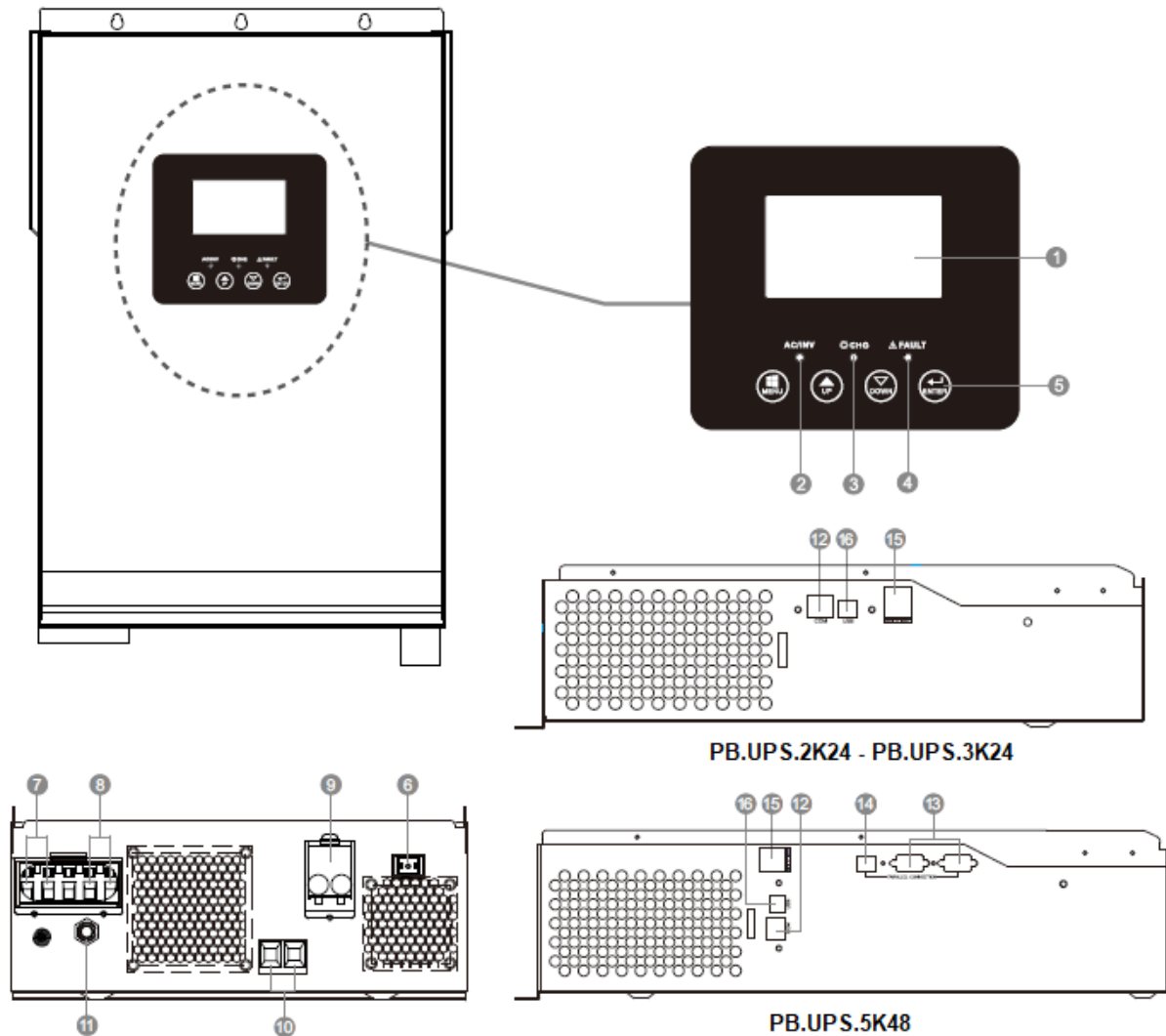
PB.UPS.2K24 - PB.UPS.3K24

PB.UPS.5K48

1. LCD display
2. Status indicator
3. Charge indicator
4. Fault Indicator
5. Function buttons
6. Power on/off switch
7. AC input (utility)
8. AC output (loads)
9. PV input
10. Battery input
11. Circuit breaker
12. RS485 communication port (not in use)
13. Parallel communication port
14. Parallel dipswitches
15. Potential-free contact
16. USB

INSTALLATION

Unpacking and Inspecting

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

The unit x 1

User manual x 1

Communication cable x 1

USB-cable x 1

Preparation

Before connecting all wirings, please take off bottom cover by removing two screws as shown below.
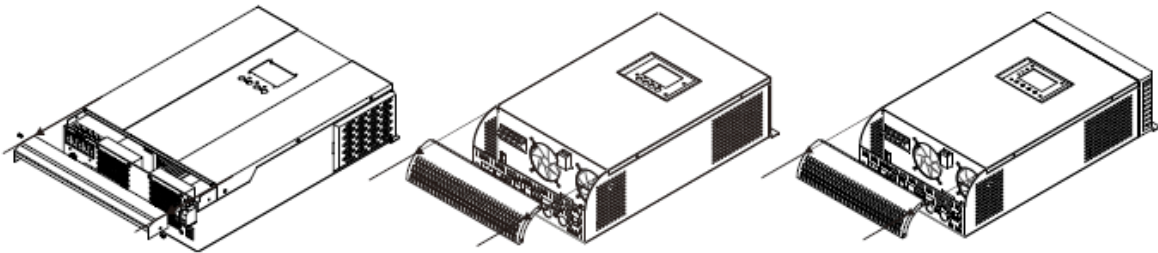
Mounting the device

Consider the following points before selecting where to install:

Do not mount the inverter on flammable construction materials.

Mount on a solid surface.

Install this inverter at eye level in order to allow the LCD display to be read at all times.

For proper air circulation to dissipate heat, allow a clearance of approx. 200 mm to the side and approx. 300 mm above and below the unit.

The ambient temperature should be between 0°C and 55°C to ensure optimal operation.

The recommended installation position is against a vertical wall.

Be sure to keep other objects and surfaces as diagram to ensure adequate heat dissipation and have enough space for cable removal.
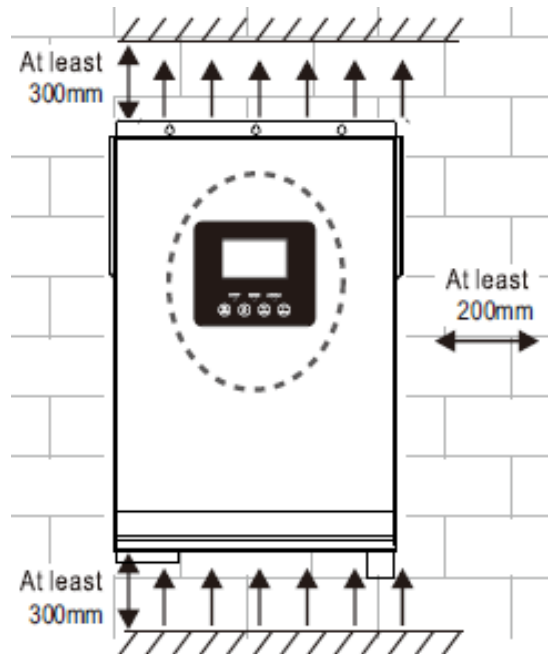
ONLY SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE

Install the unit by means of three screws.
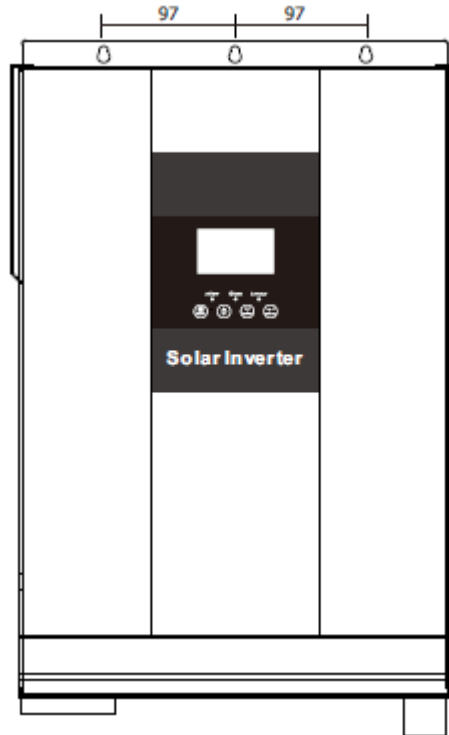
Battery connection

PAY ATTENTION: A separate DC power supply is requested for safety and regulatory compliance.

Install overcurrent protection or disconnect the device between battery and inverter. It may not be

asked to have a disconnect device in some applications, but

it is still prompted to install overcurrent protection.

warning! All wiring must be done by qualified personnel.

warning! It is very important for system safety and efficient operation to use

suitable cable for battery connection. To reduce the risk of injury, use the

the correct recommended cable and terminal size as specified in the diagrams on page.....

Follow the steps below to implement the battery connection:

1. Assemble the battery ring terminal based on the recommended battery cable and the size of the
   terminal.
2. Connect all batteries as instructed in the user manual.
3. Insert the ring terminal of the battery cable flat into the battery connector of the inverter, making

sure that the bolts are tightened with a torque of 2-3 Nm.

Make sure that the polarity on both the battery and the inverter/charge is correctly connected and that the ring terminals are securely screwed to the battery terminals.
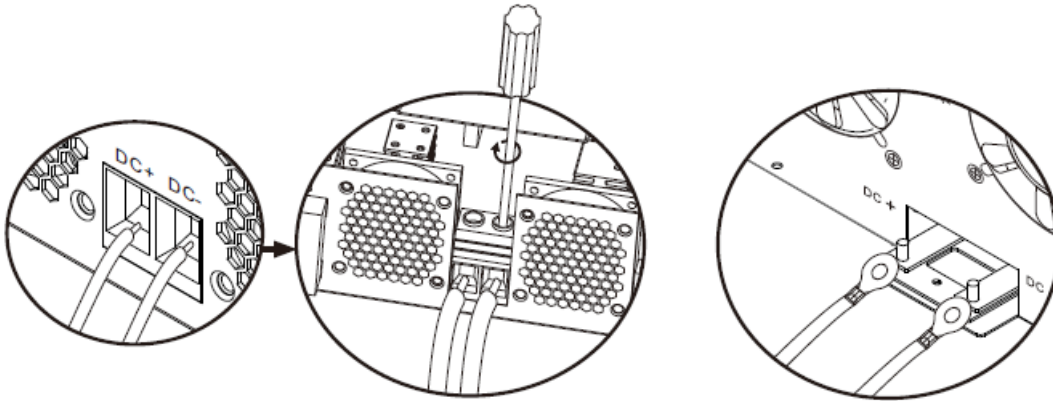
⚠	**WARNING: Shock hazard**
	Installation must be done with care due to high battery voltage in series.

⚠	**carefully!!** Do not place anything between the flat part of the converter terminal and the ring terminal.
	Otherwise, overheating may occur.
	Do not apply anti-oxidant substance to the terminals until the terminals are properly connected.
	PAY ATTENTION!! Before making final DC connection or closing DC breaker/disconnector:
	(+) must be connected to positive (+) and negative (-) must be connected to negative (-).

AC input/output terminal

carefully!! Before connecting to AC input power source, please install a separate AC breaker between inverter and AC input power source. This will ensure the inverter can be securely disconnected during maintenance and fully   protected   from over current of AC input.

The recommended specification of AC breaker is 20A for PB.UPS.2K243KW, 32A for PB.UPS.3K24 and 50A for PB.UPS.5K48 The recommended specification of AC breaker is 20A for PB.UPS.2K243KW, 32A for PB.UPS.3K24 and 50A for PB.UPS.5K48

carefully!! There are two terminal blocks with "IN" and "OUT" markings. DO NOT misconnect the input and output connectors.

warning! All wiring must be done by qualified personnel.

warning! It's very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below

Suggested AC Power Cables:

MODEL	TYPE	Koppel
PB.UPS.2K24	14AWG	0.8 – 1.0Nm
PB.UPS.3K24	10AWG	1,2 – 1,6Nm
PB.UPS.5K48	8AWG	1,4 – 1,6Nm

Follow the steps below to implement ac input/output connection:

1. Before making ac input/output connection, please open the DC protector or decoupler first.
2. Remove insulation sleeve 10mm for six conductors. And shorten phase L and neutral conductor N 3mm.
3. Route ac input cables according to the polarities marked on the terminal block and tighten the terminal screws. Make sure to connect the PE protective conductor first.⏚

   ⏚→**Ground (yellow green)**

   L Line (brown or black)→

   N→ **Neutral (blue)**
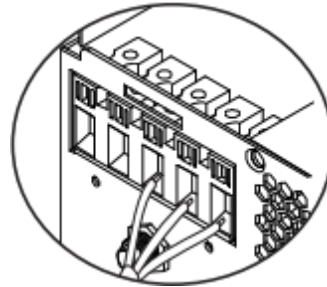
⚠	**warning:**
	Make sure the AC power source is disconnected before attempting to wire it to the device.

4 . Then position AC outlet according to the polarities marked on the terminal block and tighten the terminal screws.

   Be sure to connect the PE protective conductor first.⏚

⊕→**Ground (yellow green)**

L Line (brown or black)→

N→ Neutral (blue)
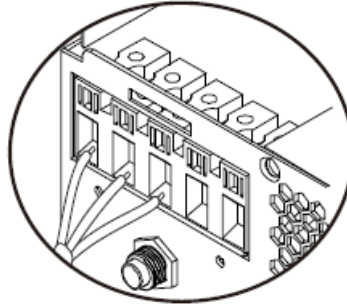
5. Make sure the wires are connected properly.

PAY ATTENTION: Important

Make sure to connect the mains cables with the correct polarity. Connecting L and N wires in reverse can cause a short circuit in the utility company when these inverters are used in parallel.

PAY ATTENTION: Devices such as air conditioners need at least 2~3 minutes to restart, because it should have enough time to balance refrigerant gas in circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected devices. To avoid this kind of damage, check with the manufacturer of the air conditioner if it is equipped with an installation delay function. Otherwise, this inverter/charger will cause overload error and turn off the output to protect your device, but sometimes it still causes internal damage to the air conditioner.

PV connection

PAY ATTENTION: Before connecting to PV modules, please install a DC switch between inverter and PV modules separately.

warning! All wiring must be done by qualified personnel.

**warning!** It is very important for system safety and efficient operation to use correct cable for PV module connection.

To reduce the risk of injury, use the correct recommended cable size as below.

MODEL	AMPERAGE	CABLE THICKNESS	COUPLE
PB.UPS.2K24	60A	8AWG	1,4 – 1,6Nm
PB.UPS.3K24	60A	8AWG	1,4 – 1,6Nm
PB.UPS.5K48	80A	6AWG	2,0 – 2,4Nm

PV module selection

When selecting the right PV modules, keep the parameters below in mind:

1. Open Circuit Voltage (Voc) of PV modules does not exceed the max PV array open circuit voltage of the inverter.

2. Open circuit Voltage (Voc) of PV modules must be higher than min battery voltage.

3. max. Power Voltage (Vmpp) of PV modules should be close to the best Vmp of inverter or within Vmp range for best performance. If one PV module cannot meet this requirement, it is necessary to have several PV modules in series connection. See the table below.

   Note:* Vmp: panel max power point voltage.

PV charging efficiency is maximized when the PV system voltage is close to the Best Vmp.

Maximum PV module numbers in series: Vmpp of PV module

  * X Pieces = Best Vmp from Inverter or Vmp Range

PV module numbers in parallel: Max. charging current of inverter / Impp
PV module numbers in parallel: Max. charging current of inverter / Impp

SOLAR CHARGING MODE:

MODEL	PB.UPS.2K24	PB.UPS.3K24	PB.UPS.5K48
Rated power	2000VA	3000VA	5000VA
MPPT charger			
Solar chargecurrent	80A	80A	80A
Max PV VoC	145Vdc	145Vdc	145Vdc
PV MPPT voltage range	20-130Vdc	30 – 130Vdc	60 – 130Vdc
Min. Battery voltage PV	17Vdc	17Vdc	34Vdc

Diagram:
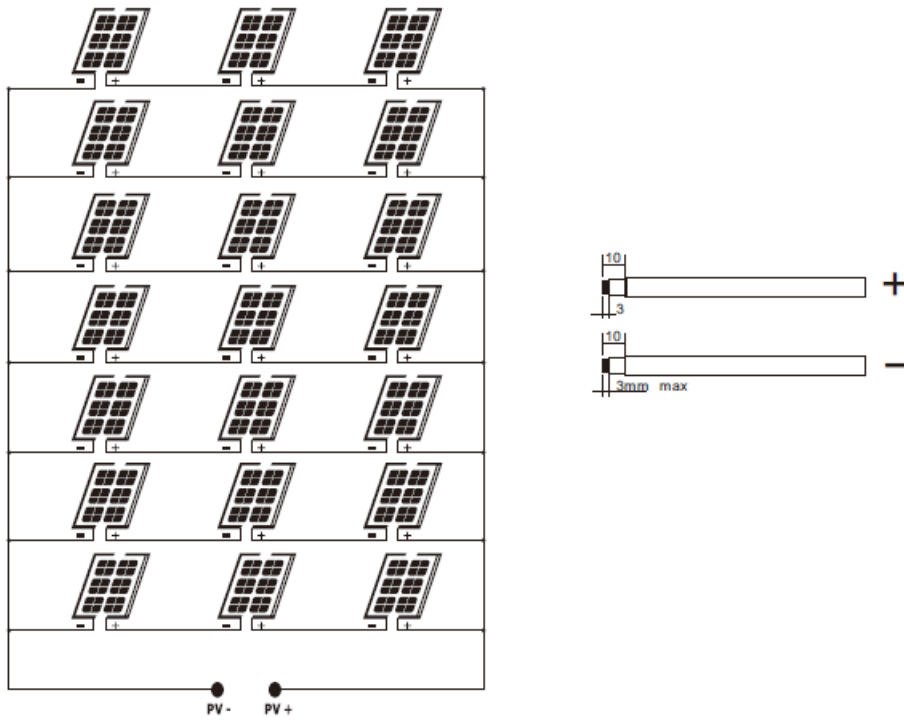
Follow the steps below to implement the PV module connection:

1. Remove insulation sleeve 10 mm for positive and negative conductors

2. Check the correct polarity of the connection cable of PV modules and PV input connectors.

   Then connect the positive pole (+) of the connection cable to the positive pole (+) of the PV input

   connector. Connect the negative pole (-) of the connection cable to the negative pole (-) of the PV

   input connector.
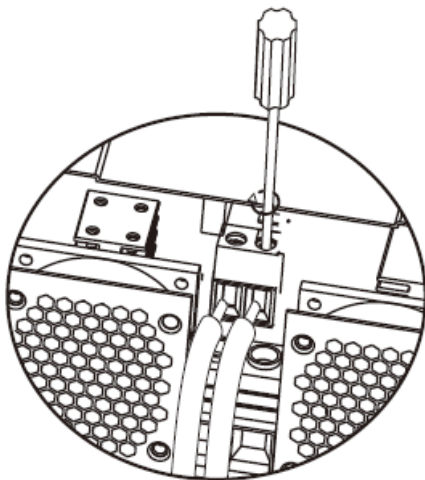
Make sure the cables are connected properly.

final assembly

After connecting all wiring, please put back bottom cover by two screws as shown below
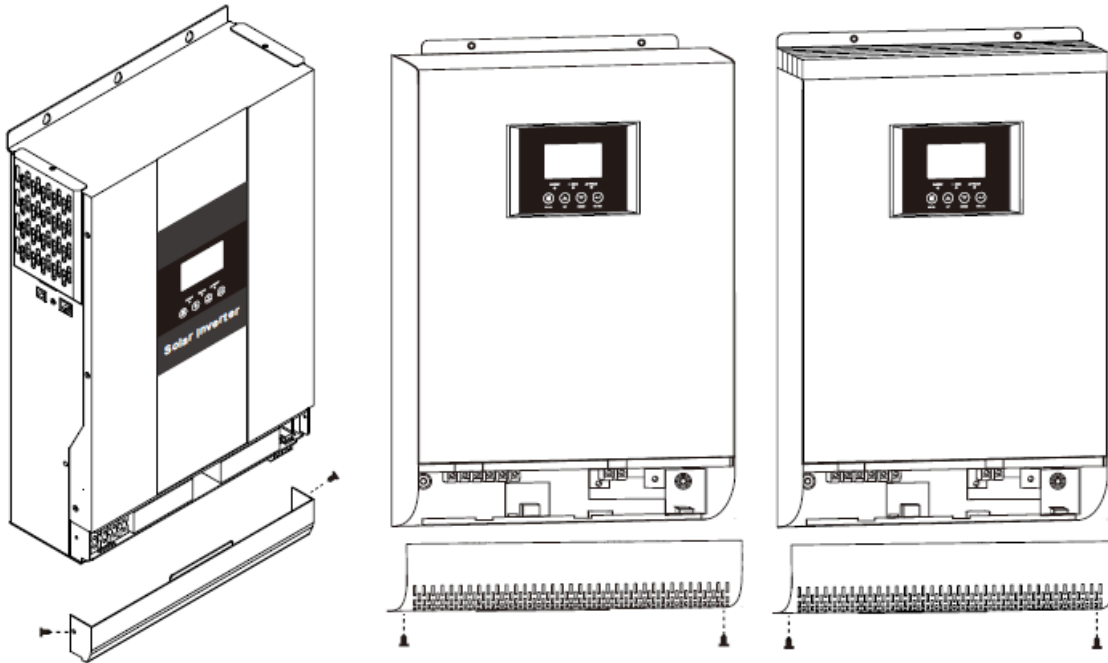
Communication Connection

Use the supplied communication cable to connect inverter and PC. Insert a supplied CD into a computer and follow the on-screen instructions to install the installing surveillance software. Consult the software user manual in the CD for the detailed software operation.

Potential-free contact

One potential free contact (3A/250Vac) is available.

This can be used to send a signal to an external device – for example a generator – when the battery voltage reaches a critical minimum.

Unit status	Condition			Dry contact port:	
				NC&C	NO&C
Power Off	Unit is off and no output is powered.			Close	Open
Power On	output is powered from Utility			Close	Open
	Output is powered from Battery or Solar.	Program 01 set as utility	Battery voltage<Low DC warning voltage	Open	Close
			Battery voltage>Setting value in Program 21 or battery charging reaches floating stage	Close	Open
		Program 01 is set as SBU, SUB, solar first	Battery voltage<Setting value in Program 20	Open	Close
			Battery voltage>Setting value in Program 21 or battery charging reaches floating stage	Close	Open

EMPLOYING

Switch on/off
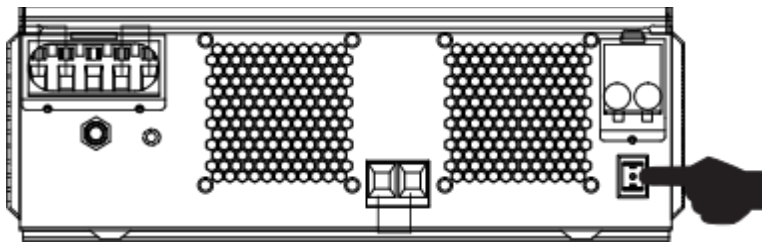
Once the device is properly installed and the batteries are properly connected, simply press the power switch (located on the button on the case) to turn on the device.

Control and display panel

The control and display panel, shown in the graph below, is located on the front panel of the drive. It includes three indicators, four function keys and an LCD display, which indicates the operating status and information about the input/output power.
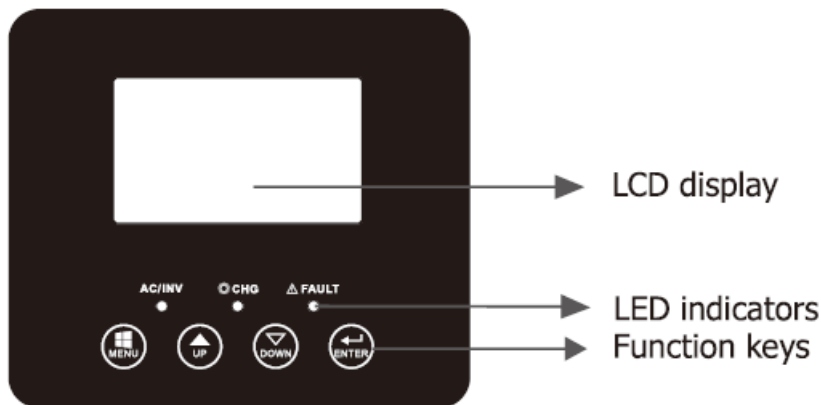
LED-indicator			Messages
AC/INV	green	Solid on	Output is powered by grid in Line mode.
		Flashing	Output is powered by battery or PV in battery mode.
CHG	yellow	Flashing	Battery is charging or discharging.
FAULT	red	Solid on	Fault occurs in the inverter.
		Flashing	Warning condition occurs in the inverter.

Function Keys

Function Keys	Description
menu	Enter reset mode or setting mode go to previous selection
up	Increase the setting data.
down	Decrease the setting data.
enter	Enter setting mode and Confirm the selection in setting mode go to next selection or exit the reset mode.

LCD-Display Icons
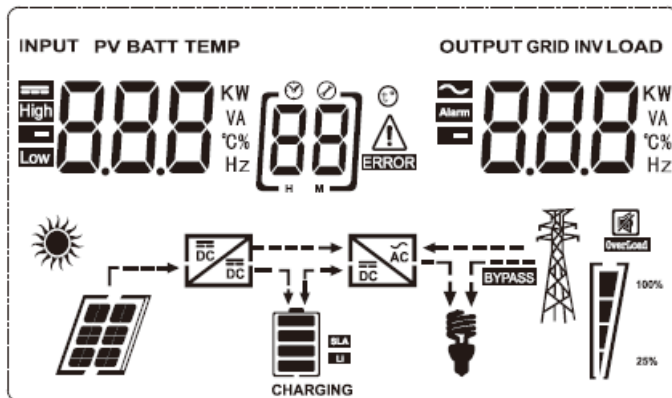
Pictogram	Function description
∿	Indictates the AC information
▭▭▭	Indicates the DC information

Indicate input voltage, input frequency, PV voltage and charger current

Indicate output voltage, output frequency, load in VA, load in W and discharging current

Indicates the setting programs

Warning: flashing with warning code

Fault: lighting with fault code

Indicates battery level by 0-24%, 25-49%, 50-74% and 75-100% in battery mode and charging status in line mode.

In AC mode, it will present battery charging status:

STATUS: Constant Current mode/Constant Voltage mode

Battery voltage	LCD-display
<2V/cel	4 bars will flash in turns.
2V/cel – 2,083V/cel	Bottom bar will be on and the other three bars will flash in turns.
2,083V/cel – 2,167V/cel	Bottom two bars will be on and the other two bars will flash in turns.
>2.167V/cel	Bottom three bars will be on and the top bar will flash.
Batteries are fully charged	4 bars will be on

In battery mode, it will present battery capacity:

Load Percentage	Battery Voltage	LCD-display
Load >50%	<1,717V/cell	
	1,717V/cell – 1,8V/cell	
	1,8V/cell – 1,883V/cell	
	>1,883V/cell	

50%> load>20%	<1,817V/cell	
	1,817V/cel – 1,9V/cell	
	1,9V/cel – 1,983V/cell	
	>1,983V/cell	
load<20%	1,867V/cell	
	1,867V/cell – 1,95V/cell	
	1,95V/cell – 2,033V/cell	
	>2,033V/cell	

Load Information

OVER LOAD   Indicates overload

Indicates the load level by 0% to 100%
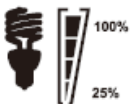
0%-24%	25%-49%	50%-74%	75%-100%

Mode Operation Information

Indicates unit connects to the mains

Indicates unit connects to the PV panel

BYPASS   Indicates load is supplied by utility power

Indicates the solar charger circuit is working

Indicates the DC/AC inverter circuit is working

Mute Operation

Indicates unit alarm is disabled

LCD Setting

After pressing and holding "ENTER" button for 2 seconds, the unit will enter setting mode.

Press "UP" or "DOWN" button to select setting programs.

And then, press "ENTER" or "MENU" button to confirm the selection and exit.

Setting Programs:

Program 00 – Exit setting mode

[00]ESC

Program 01 - Output source priority selection

[01]Sub   **SUB**

Solar energy provides power to the loads as first priority, If solar energy is not sufficient to power all

connected loads, Utility energy will supply power to the loads at the same time. The battery energy will supply power to the load only in the condition of the utility is unavailable. If the solar is unavailable, the utility will charge the battery until the battery voltage reaches the setting point in program 21.If the solar is available, but the voltage is lower than the setting point in program 20, the utility will charge the battery until the battery voltage reaches the setting point in program 20 to protect the battery from damage..

$\boxed{0\,1}\,5b\cup$ **SBU**

Solar energy provides power to the loads as first priority, If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 20 or solar and battery is not sufficient. The battery energy will supply power to the load in the condition of the utility is unavailable or the battery voltage is higher than the setting point in program 21(when BLU is selected) or program 20 (when LBU is selected). If the solar is available, but the voltage is lower than the setting point in program 20, the utility will charge the battery until the battery voltage reaches the setting point in program 20 to protect the battery from damage.

$\boxed{0\,1}\,5\cap L$ **SOL**

Solar energy provides power to the loads as first priority.

If battery voltage has been higher than the setting point in program 21 for 5 minutes, and the solar energy has been available for 5 minutes too, the inverter will turn to battery mode, solar and battery will provide power to the loads at the same time. When the battery voltage drops to the setting point in program 20, the inverter will turn to bypass mode, utility provides power to the load only, and the solar will charge the battery at the same time.

[0]Ut, UTI

The utility power supplies the loads as the first priority of power. Solar and battery energy the loads only supply power when utility power is not available

Program 02 – AC- input voltage range

[02]APL APL

If selected, the acceptable ac input voltage range will be between 90 and 280VAC

[02]UPS UPS

When selected, the acceptable ac input voltage range will be between 170 and 280VAC

[02]GEN GEN

When the user uses the device to connect the generator, select the generator mode.

[02]ᵁdE VDE

If selected, the acceptable ac input voltage range will conform to VDE4105 (184VAC-253VAC)

Program 03 – Output voltage

[03]230ᵥ 230V

Set the output voltage to **230Vac** for all systems

Program 04 – Output frequency

[04]50.0ₕᵤ [04]60.0ₕᵤ

Set the frequency to 50.0Hz for all systems

Program 05 – Solar energy delivery priority

[05] bLU

BLU

Solar energy provides power to charge the battery as the first priority.

When the utility is available, if the battery voltage is lower than the set point in program 21, the solar will never deliver to the load or feed into the grid, only charge the battery.

If the battery voltage is higher than the set point in program 21, the solar will supply the load or charge the battery – it will **NOT** supply to the grid.

[05] LbU

LBU

Solar energy supplies power to the loads as the first priority.

If the battery voltage is lower than the set point in program 20, the solar energy will never feed to the load or feed into the grid, only charge the battery.

If the battery voltage is higher than the set point in program 20, the solar will supply the load or charge the battery – it will **NOT** supply to the grid.

Program 06 – Bypass

Overload Bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode

[06] bYd

BYD

Bypass disable

[06] bYE

BYE

Bypass enable

Program 07 – Auto restart when overload occurs

Automatically restart when overload after loss

$[07]Lrd$ **LRD**

Disable Restart

$[07]LrE$ **LRE**

Enable Restart

Program 08 – Automatisch opstarten bij temperatuurschommelingen

Automatisch opnieuw opstarten na wegvallen oververhitting TRD

$[08]trd$ **TRD**

Opnieuw opstarten uitschakelen

$[08]trE$ **TRE**

Opnieuw opstarten inschakelen

Program 09 – inject to the grid – not applicable

Program 10 - priority charging

$[10]CSO$ **CSO**

Solar energy first

Solar energy charges the battery as the first priority. The utility power only charges the battery when solar power is not available.

$[10]SAU$ **SAU**

Solar energy and utility energy together

Solar energy and utility energy charge the battery at the same time

$[10]OSO$ **0S0**

Only solar energy

Solar energy is the only source of charging regardless of whether or not the utility energy is present

Program 11 – set charging current MPPT solar charger

[1] 80 ^

Settings per system:

PB.UPS.2.2.24	50A	PB.UPS.2.2.24.Li	50A
PB.UPS.3.5.24	50A	PB.UPS.3.5.24.Li	50A
PB.UPS.5.5.48	50A	PB.UPS.5.5.48.Li	50A
PB.UPS.10.10.48	100A	PB.UPS.10.10.Li	100A
PB.UPS.15.15.48	120A	PB.UPS.15.15.48.Li	150A

Program 12 - not applicable

Program 13 – set utility charging current

[13] 30 ^

Settings per system:

PB.UPS.2.2.24	50A	PB.UPS.2.2.24.Li	50A
PB.UPS.3.5.24	50A	PB.UPS.3.5.24.Li	50A
PB.UPS.5.5.48	50A	PB.UPS.5.5.48.Li	50A
PB.UPS.10.10.48	100A	PB.UPS.10.10.Li	100A
PB.UPS.15.15.48	120A	PB.UPS.15.15.48.Li	150A

Program 14 – Battery type

[14]AGn **AGM**   [14]GEL **GEL**   [14]FLd **WET**

[14]LEA **LEAD**   [14]Li **LITHIUM**   [14]USE **TO DEFINE**

When "User-Defined" LI is selected, the battery charge voltage and minimum discharge current are set in program 17, 18 and 19.

For the applications in the PB.UPS systems it is not necessary to activate it.

Settings per system:

PB.UPS.2.2.24	AGM	PB.UPS.2.2.24.Li	Li
PB.UPS.3.5.24	AGM	PB.UPS.3.5.24.Li	Li
PB.UPS.5.5.48	AGM	PB.UPS.5.5.48.Li	Li
PB.UPS.10.10.48	AGM	PB.UPS.10.10.Li	Li
PB.UPS.15.15.48	AGM	PB.UPS.15.15.48.Li	Li

When the system is set up via the computer, it is sufficient to check the capacity and battery type – the inverter adapts automatically.

Program 15 – not applicable

Program 16 – not applicable

Program 17 – set bulk charging voltage

[17]CV 28.2 v   PB.UPS.2K24
                        PB.UPS.3K24

[17]CV 56.4 v   PB.UPS.5K48

If user defined is selected in program 14, this program can be set.

The setting range is from 24.0V to 29.2V for 24Vdc model and 48.0V to 58.4V for 48Vdc model.

The increase of each click is 0.1 V.

For the applications in the PB.UPS systems it is not necessary to activate it.

Program 18 – set float charge voltage

[18]FLV 27.0 v   PB.UPS.2K24
                        PB.UPS.3K24

[18]FLV 54.0 v   PB.UPS.5K48

If user defined is selected in program 14, this program can be set.

The setting range is from 24.0V to 29.2V for 24Vdc model and 48.0V to 58.4V for 48Vdc model.

The increase of each click is 0.1 V.

For the applications in the PB.UPS systems it is not necessary to activate it.

Program 19 – battery minimum voltage settings

```
[19]COV 20.4ᵥ
```
PB.UPS.2K24
PB.UPS.3K24

```
[19]COV 40.8ᵥ
```
PB.UPS.5K48

If user defined is selected in program 14, this program can be set.

The setting range is from 20.0V to 24.0V for 24Vdc model and from 40.0V to 48.0V for 48Vdc model.

The increase of each click is 0.1 V.

Minimum battery voltage will be confirmed at the set point regardless of the percentage of the load that is connected.

Program 20 – switch from battery to utility (discharge)

```
[20]23.0ᵥ
```
PB.UPS.2K24
PB.UPS.3K24

```
[20]46.0ᵥ
```
PB.UPS.5K48

Battery stops discharging voltage when grid is available.

The setting range is from 22.0V to 29.0V for 24Vdc model from 44.0V to 58.0V for 48Vdc model.

 The increment of each click is 0.1 V

Program 21 - switch from battery to utility (charge)

```
[21]27.0ᵥ
```
PB.UPS.2K24
PB.UPS.3K24

```
[21]54.0ᵥ
```
PB.UPS.5K48

Battery stops charging voltage when grid is available.

The setting range is from 22.0V to 29.0V for 24Vdc model from 44.0V to 58.0V for 48Vdc model.

 The increment of each click is 0.1 V

Program 22 – Auto turn page

[22]PtE **PTE**

If selected, the display screen will auto turn the display page.

[22]Ptd **PTD**

If selected, the display screen will stay at latest screen user finally switches.

Program 23 – Backlight control

[23]LON **LON** backlight on

[23]LOF **LOF** backlight off

Program 24 – alarm control

[24]bON **BON** alarm on

[24]bOF **BOF** alarm off

Program 25 – sound signal

[25]AON **AON** sound signal on

[25]AOF **AOF** sound system off

Program 26 – not applicable

Program 27 – record fault code

[27]FON   **FON**   record enable

[27]FOF   **FOF**   record disable

Program 28 - balancing solar energy

When enabled, the input voltage of the solar panels will be automatically adjusted according to
 the connected load.

[28]SbE   **SBE**   balancing solar power enable

When selected, the solar input is automatically adjusted according to the following formula:

max. solar input power = max. battery charging power + connected load power

when the machine is in OffGrid working status.

[28]Sbd   **SBD**   balancing solar power disable

if selected, the solar power input will be equal to the maximum charging capacity of the battery,

regardless of the number of consumers connected.

The max. charge power of the battery is based on the current set in program 11 (max. solar energy =

max. charge power of battery).

Program 29 – energy saving mode

[29]SdS   **SDS**   power saving mode disabled

When turned off, it doesn't matter whether the connected load is low or high, the on/off statusof the
inverter output will not be affected

[29]SEM   **SEM**   energie besparing ingeschakeld

When enabled, the inverter output will be off when the connected load is quite low or not detected

.

Program 30 – battery egalization

[30]EEП   **EEM**   Battery equalization enabled

[30]EdS   **EDS**   Battery equalization disabled

With the BP.UPS series the battery equalization must be turned off – so EDS.

Program 31 – voltage battery egalization

[31]EY 28.8ᵥ   Available options for 24V systems: 28.8V

[31]EY 57.6ᵥ   Options available for 48V systems: 57.6V

These options do not apply to the PB.UPS systems.

Program 32 – not applicable

Program 33 – time battery equalization

[33] 60

The setting range is from 5 minutes to 900 minutes.

  The increment of each click is 5 minutes.

These options do not apply to the PB.UPS systems.

Program 34 – time-out battery egalization

[34] 120

The setting range is from 5 minutes to 900 minutes.

  The increment of each click is 5 minutes.

These options do not apply to the PB.UPS systems.

Program 35 – interval battery equalization

[35]30d

The setting range is from 0 days to 90 days.

 The increment of each click is 1 day.

These options do not apply to the PB.UPS systems.

Program 36 – instant activation battery equalization

[36]AEN

AEM   activation enabled

[36]AdS

ADS   activation disabled

If the equalization function is enabled in program 30, this program can be set.

If "AEM" is selected in this program, the battery equalization will be activated immediately and

"EQ" appears on the LCD main page.

If "ADS" is selected, the equalization function will be canceled until the next activated

equalization time starts based on the setting in program 35.

At that time, "EQ" will also be displayed on the main LCD.

With the BP.UPS series, the immediate activation battery equalization must be turned off – so ADS.

After pressing and holding the "MENU" button for 6 seconds, it comes

device in the reset model.

Press the "UP" and "DOWN" button to select programs. And then press the button
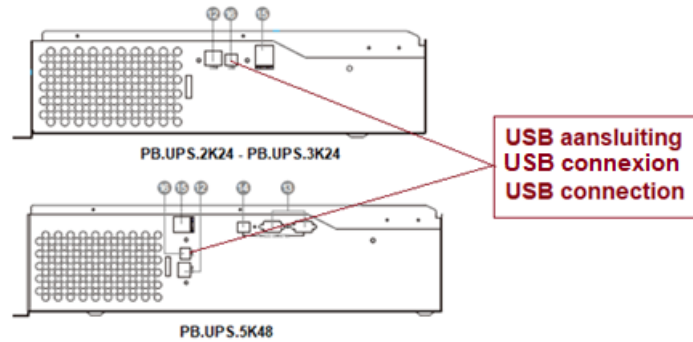
"ENTER" to exit.

SEt   [dt]ntt   reset disabled

[dt]rSt   Reset enabled

Programming via PC TOOL

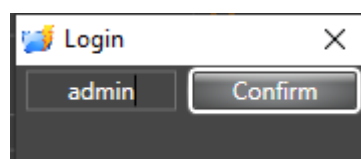Main window when connected to live PB-UPS via USB cable.

The main window shows the general operating status dashboard.
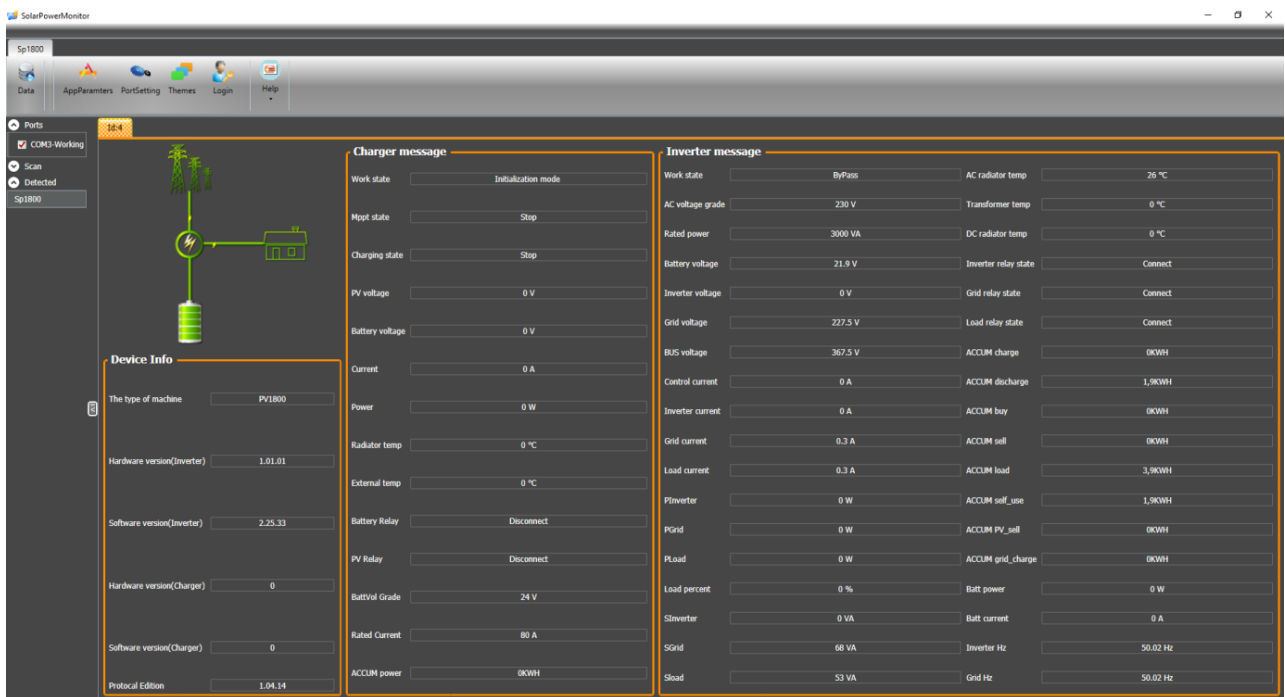
To access the settings, login with default password:
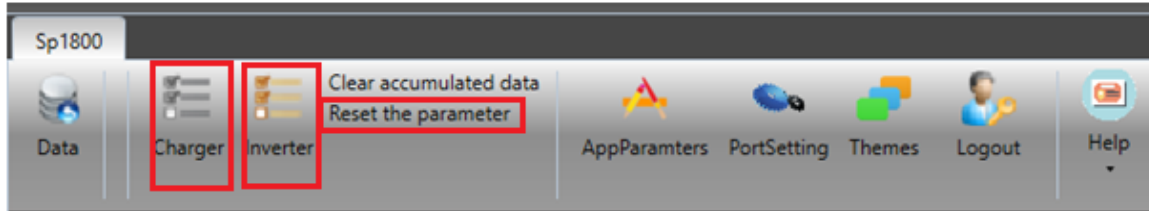
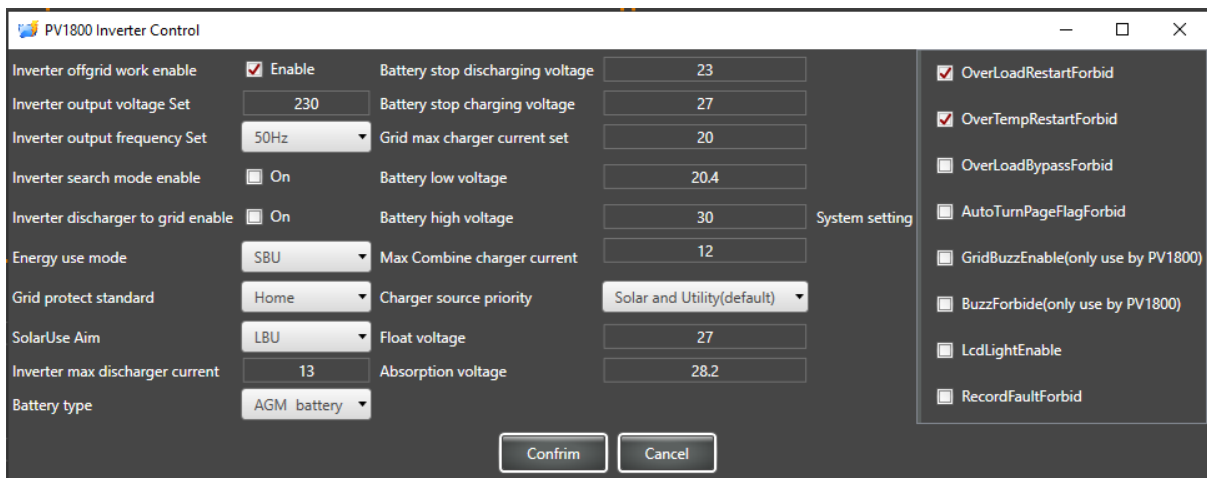The configuration buttons appear, all parameters were organized as "Charger" and "Inverter" (inverter).

And there is a button to reset all current configurations (to defaults).

Here are the parameters in 2 configuration pages
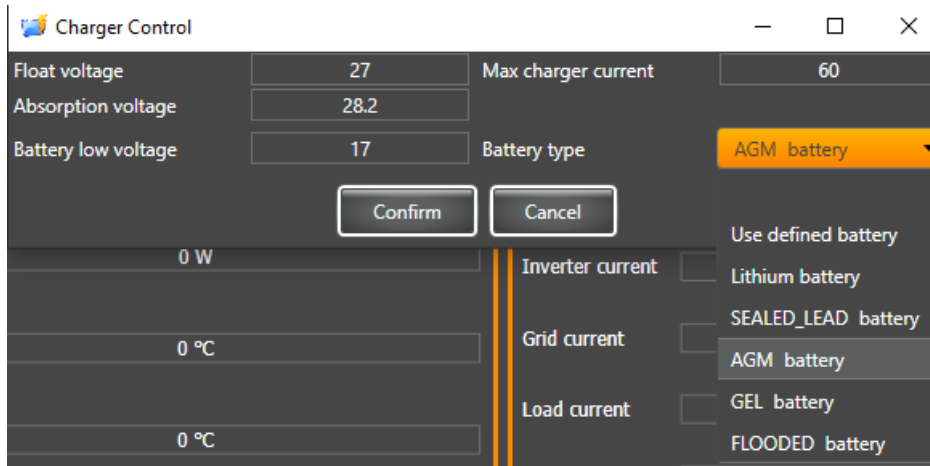
Error reference code

01	Fan is locked when inverter is off
02	Inverter transformer over temperature
03	Battery voltage is too high
04	Battery voltage is too low
05	Output short circuited
06	Inverter output voltage is high
07	Overload time out
08	Inverter bus voltage is too high
09	Bus soft start failed
11	Main relay failed
21	Inverter output voltage sensor error
22	Inverter grid voltage sensor error
23	Inverter output current sensor error
24	Inverter grid current sensor error
25	Inverter load current sensor error
26	Inverter grid over current error
27	Inverter radiator over temperature

[31] ⚠ ERROR	31	Solar charger battery voltage class error
[32] ⚠ ERROR	32	Solar charger current sensor error
[33] ⚠ ERROR	33	Solar charger current is uncontrollable
[41] ⚠ ERROR	41	Inverter grid voltage is low
[42] ⚠ ERROR	42	Inverter grid voltage is high
[43] ⚠ ERROR	43	Inverter grid under frequency
[44] ⚠ ERROR	44	Inverter grid over frequency
[51] ⚠ ERROR	51	Inverter over current protection error
[52] ⚠ ERROR	52	Inverter bus voltage is too low
[53] ⚠ ERROR	53	Inverter soft start failed
[55] ⚠ ERROR	55	Over DC voltage in AC output
[56] ⚠ ERROR	56	Battery connection is open
[57] ⚠ ERROR	57	Inverter control current sensor error
[58] ⚠ ERROR	58	Inverter output voltage is too low

Warning Indicator

[61] ⚠ ERROR	61	Fan is locked when inverter is on
[62] ⚠ ERROR	62	Fan 2 is locked when inverter is on
[63] ⚠ ERROR	63	Battery is over-charged

[64] ⚠ ERROR	64	Low battery
[67] ⚠ ERROR	67	Overload
[70] ⚠ ERROR	70	Output power derating
[72] ⚠ ERROR	72	Solar charger stops due to low battery
[73] ⚠ ERROR	73	Solar charger stops due to high PV voltage
[74] ⚠ ERROR	74	Solar charger stops due to over load
[75] ⚠ ERROR	75	Solar charger over temperature
[76] ⚠ ERROR	76	PV charger communication error
[77] ⚠ ERROR	77	Parameter error

Beschrijving bedrijfsstatus

Solar energy is higher than required power

Solar energy is lower than required power

Solar power is turned off
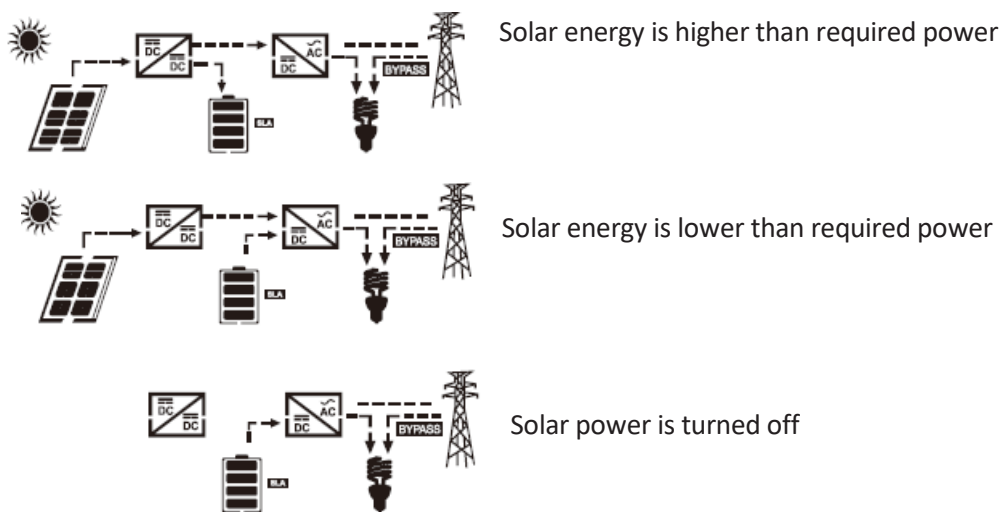
The DC power from your solar installation is converted into AC power by the inverter, which is then sent to your main electrical panel to be used by your home appliances.

Any excess power produced is not injected back into the grid, but stored in the battery.
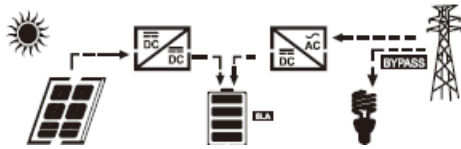
The battery is charged by the solar charger and the grid
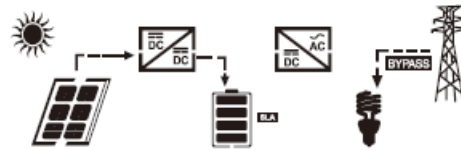
Errors are caused by inner circuit fault or external reasons such as over temperature, output short circuit and so on.
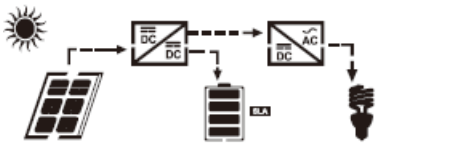
Off-grid status: Energy only comes from the solar panel
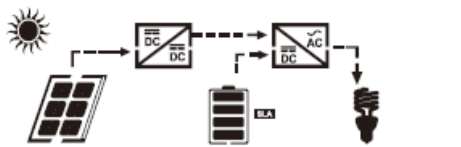
Off-grid status: energy comes from solar panel and battery
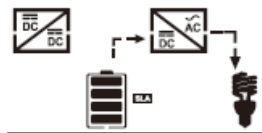
Off-grid status: energy comes from the battery

The inverter stops working if you disconnect the inverter turns off with the soft key or if an error has occurred in the state in which it does not work.

Display Setting

The LCD display information will be switched in turns by pressing "UP" or "DOWN" key. The selectable information is switched as below order: battery voltage, battery current, inverter voltage, inverter current, grid voltage, grid current, load in Watt, load in VA, grid frequency, inverter frequency, PV voltage, PV charging power, PV charging output voltage, PV charging current.

LCD-DISPLAY

Selectable information
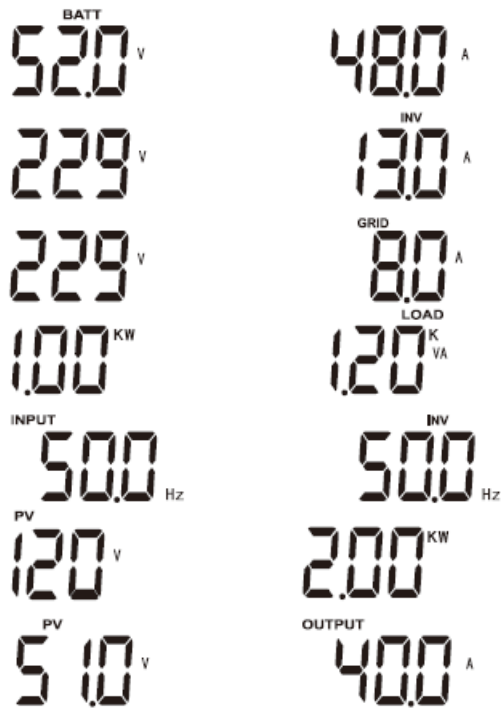
Display		Description
BATT 52.0 V	48.0 A	Battery voltage/DC discharging curren
229 V	**INV** 13.0 A	Inverter output voltage/Inverter output current
229 V	**GRID** 8.0 A	Grid voltage/Grid current
1.00 KW	**LOAD** 1.20 K VA	Load in Watt
INPUT 50.0 Hz	**INV** 50.0 Hz	Grid frequency/Inverter frequency
PV 120 V	2.00 KW	PV voltage and power
PV 51.0 V	**OUTPUT** 40.0 A	PV charger output voltage and PV charging current

Specifications

Specifications line-modus

Model	PB.UPS2K24 – PB.UPS3K24 – PB.UPS5K48
Input Voltage Waveform	Sinusoidal (utility or generator)
Nominal Input Voltage	230Vac
Low Loss Voltage	90Vac±7V (APL, GEN);170Vac±7V (UPS);186Vac±7V(VDE)
Low Loss Return Voltage	100Vac±7V (APL, GEN);180Vac±7V (UPS);196Vac±7V(VDE)
High Loss Voltage	280Vac±7V (UPS, APL, GEN);253Vac±7V(VDE)
High Loss Return Voltage	270Vac±7V (UPS, APL, GEN);250Vac±7V(VDE)
Max AC Input Voltage	300Vac
Nominal Input Frequency	50HZ/60HZ (Autodetection)
Output Short Circuit Protection	Line mode: Circuit Breaker
	Battery mode: Electronic Circuits
Efficiency (Line Mode)	>95%(Rated R load, battery full charged)
Transfer Time	10ms typical (UPS, VDE)
	20ms typical (APL)

Output power derating   When AC input voltage drops to 95V or 170V depending on models, the output power will be derated.
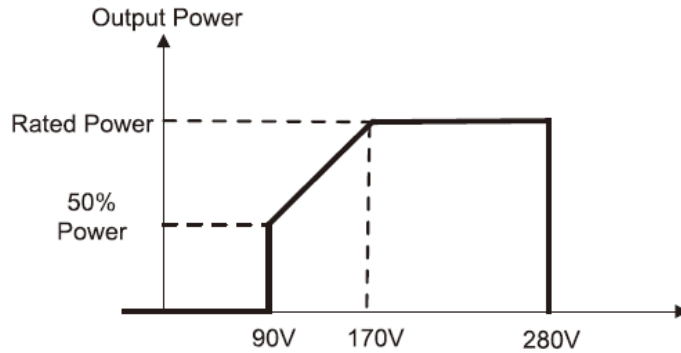
Specificatie's omvormer

	PB.UPS.2K24	PB.UPS.3K24	PB.UPS.5K48
Nominal battery voltage (Vdc)	24	24	48
Parallel configuration	-	-	3
monitoring via WIFI	yes	yes	yes
inverter			
power (W)	2000	3000	5000
peak power (W)	4000	6000	10000
Sinus	pure sinus		
Vac voltage regulation (batt.mode)	220Vac~240Vac (adjustable)		
efficiency (peak)	93%		
Transfer time	10ms (UPS, VDE) - 20ms (APL)		
AC input			
Voltage (Vac)	230		
Adjustable voltage range	170 ~ 280 Vac (for personal computers) 90 ~280Vac (for home applications) 184 ~ 253Vac (VDE4105)		
Frequency range (Hz)	50Hz / 60Hz automatic setting		
Battery			
Battery type	AGM - Lithium-ion		
Normal voltage (Vdc)	24		48
Floating voltage (Vdc)	27,4		54,8
Overcharge protection (Vdc)	30		60
MPPT solar charger			
Maximum open circuit voltage (Vdc)	145		
MPPT voltage range (Vdc)	30 ~ 130		60 ~ 130
Own consumption in standby (W)	2		
Pv- input power (W)	1500		4000

Max. charging current via solar (Adc)	80	
Maximum efficiency	98%	
AC-charger		
Max. charging current via input (Aac)	30	60
Maximum charging current	110	140
General		
Humidity Protection	5% tot 95% real humidity (non condensation)	
Operating temperature	-10°C ~ 50°C	
Storage temperature	-15°C ~60°C	
Dimensions	272 355*100	298*468*125

	PB.UPS.2K24	**PB.UPS.3K24**	**PB.UPS.5K48**
Low DC -Warning Voltage			
At load < 20%	22,0Vdc		44,0Vdc
20% < load < 50%	21,4Vdc		42,8Vdc
At load > 50%	20,2Vdc		40,4Vdc
Low DC -Return Voltage Warning			
At load < 20%	23,0Vdc		46,0Vdc
20% < load < 50%	22,4Vdc		44,8Vdc
At load > 50%	21,2Vdc		42,4Vdc
Lage DC cut-off voltage			
At load < 20%	21,0Vdc		42,0Vdc
20% < load < 50%	20,4Vdc		40,8Vdc
At load > 50%	19,2Vdc		38,4Vdc
High DC recovery voltage	27Vdc		58Vdc
High DC cut-off voltage	30Vdc		60Vdc

Charging current algorithm
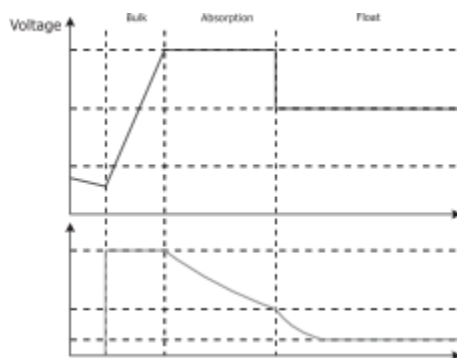
Lead Acid Battery   lithium battery
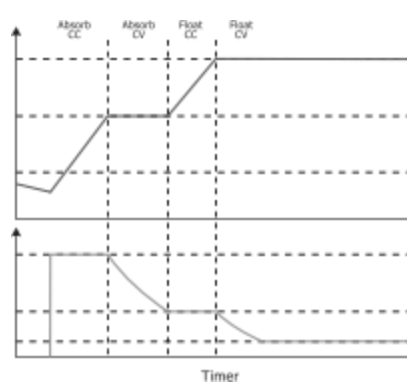
Possible problems and how to solve them

problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do
The device will shut down automatically during the boot process.	LCD/LEDs and buzzer are active for 3 seconds and then turn off.	The battery voltage is too low (< 1.91V/Cell)	1. Recharge the battery. 2. Replace the battery.
No response after power on.	No indication.	1. The battery voltage is much too low. (<1.4V/Cell) 2. The polarity of the battery is reversed. Entry guard is activated	1. Check that the batteries and cables are connected properly. 2. Recharge the battery. 3. Replace the battery.
Mains power present, but the device is running in battery mode.	The input voltage is displayed as 0 on the LCD and the green LED blinks.	Entrance protector is activated	Check that the circuit breaker has tripped and the ac wiring is properly connected.
	Green LED is flashing.	Insufficient quality of AC power (Shore or Generator)	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied) is working well or if input voltage range setting is correct.(Appliance=>wide)

When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected well.
Buzzer beeps continuously and red LED is on.	Fault code 07	Overload error. The inverter is overload 110% and time is up.	Reduce the connected load by switching off some equipment.
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.
	Fault code 02	Internal temperature of inverter component is over 90°C.	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.
	Fault code 03	Battery is over-charged.	Return to repair center.
		The battery voltage is too high.	Check if spec and quantity of batteries are meet requirements.
	Fault code 01	Fan fault	Fan fault
	Fault code 06/58	Output abnormal (Inverter voltage below than 202Vac or is higher than 253Vac)	1. Reduce the connected load. 2. . Return to repair center
	Fault code 08/09/53/57	Internal components filed.	Return to repair center
	Fault code 51	Over current or surge	Restart the unit, if the error
	Fault code 52	Bus voltage is too low	

	Fault code 55	Output voltage is unbalanced	happens again, please return to repair center.
	Fault code 56	Battery is not connected well or fuse is burnt.	If the battery is connected well, please return to repair center.

Geschatte Back-up tijdstabel

Model	Load(W)	Backup Time@24Vdc 100Ah(min)	Backup Time@24Vdc 200Ah(min)
PB.UPS.2K24	200	766	1610
	400	355	766
	600	198	503
	800	139	339
	1000	112	269
	1200	95	227
	1400	81	176
	1600	62	140
	1800	55	125
	2000	50	112
PB.UPS.3K24	300	449	1100
	600	222	525
	900	124	303
	1200	95	227
	1500	68	164
	1800	56	126
	2100	48	108
	2400	35	94
	2700	31	74
	3000	28	67
PB.UPS.5K48	500	613	1288
	1000	268	613
	1500	158	402
	2000	111	271
	2500	90	215
	3000	76	182
	3500	65	141
	4000	50	112
	4500	44	100
	5000	40	90

INSTALLATION GUIDE FOR PARALLEL AND THREE PHASE CONFIGURATION – PB.UPS.5K48

Introduction

The inverter can be used in parallel with two different operating modes.

-1- Parallel operation in one phase with up to 3 units PB.UPS.5K48.

    The maximum output power supported is 15kVA.

-2- Up to three units work together to support three-phase equipment.

    The maximum output power supported is 15kVA.

package contents

Inside the box you will find the following items in the package

Parallel kaart
Carte parallèle
Parallel board

Parallele communicatie kabel
Câble de communication parallèle
Parallel communication cable
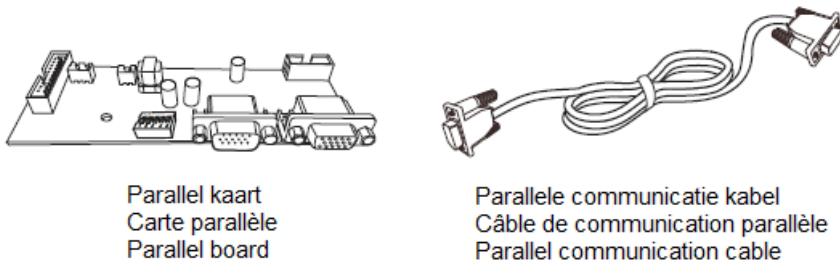
Building the unit

When installing multiple units, please follow the table below
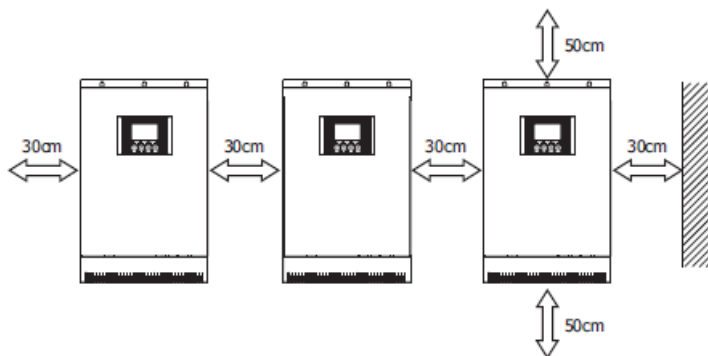
REMARK:

For good air circulation to dissipate the heat, leave a free space of about 30 cm to the side and about 50 cm above and below the appliance.

Make sure every appliance is installed at the same height

Connect

The cable size of each inverter is shown as below

M10
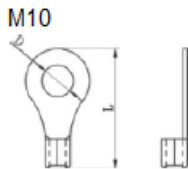
Cable thickness: 50mm²

Torque value: 2 ~ 3Nm

WARNING: Make sure the length of all cables is the same.

Otherwise, there will be voltage difference between the inverter and the battery and there is a risk that the inverters connected in parallel will not work.

Recommended grid and load cable size for each inverter: 8AWG – 1,4 ~ 1.6Nm

You must connect the cables of each inverter.

Take the battery cables for example: you need to use a connector or busbar as a connector to connect the battery cables together, then connect to the battery terminal.

The cable size used from joint to battery is X times cable size to inverter.

"X" indicates the number of inverters connected in parallel.

Regarding net and load, please also follow the same principle.

PAY ATTENTION!! Install the circuit breaker on the battery and mains side.

This will ensure the inverter can be safely disconnected during maintenance and fully protected against overcurrent from the battery or Grid.

If you want to use only one breaker on the battery side for the whole system, the rating must be of the breaker X times the current of the inverters connected in parallel.

Recommended mains-side circuit breaker for parallel arrangement:

       PB.UPS.10.10.48: 100A/230Vac

       PB.UPS.15.15.48: 150A/230Vac

REMARK 1:

You can also use a 50 amp circuit breaker, for just 1 unit, and eachinverter has a circuit breaker at its AC input.

REMARK 2:

For a three-phase system, you can use a 4-pole circuit breaker, where the current is equal to the current of the phase with the most units.

Or you can follow REMARK 1 suggestion.

Maximum recommended battery capacity:

PB.UPS.10.10.48: 15kWh (usable energy (3 x PB.SC5.48.10)

PB.UPS.15.15.48: 20kWh (usable energy (4 x PB.SC5.48.15)

WARNING! Make sure all inverters share the same battery bank.

Otherwise, the inverters will switch to fault mode

Parallel in mono-phase setup

- PB.UPS.10.10.48
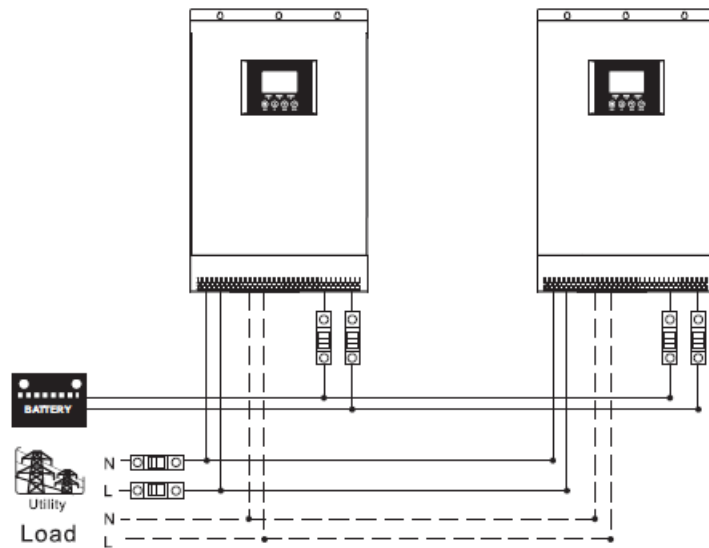
Connection communication:
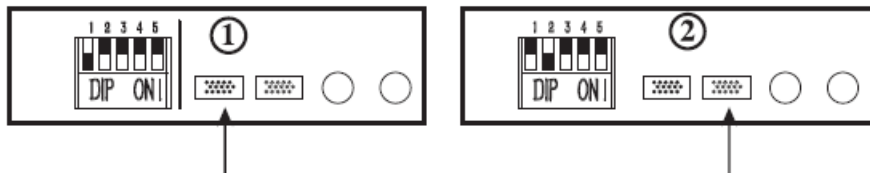
Inverter (1): set button 1 of the DIP switch to the bottom position, and buttons 2, 3, 4, 5 of the DIP switch in the upper position.

Inverter (2): set the button 2 of the DIP switch to the lowest position and the button 1, 3, 4, 5 of the DIP switch in the top position.

- PB.UPS.15.15.48
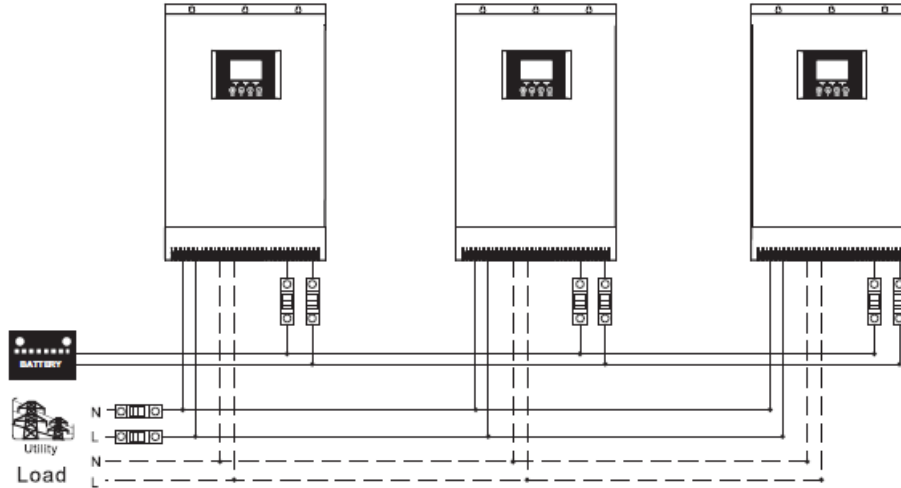
Connection communication:

Inverter (1): set button 1 of the DIP switch to the bottom position, and buttons 2, 3, 4, 5 of the DIP switch in the upper position.

Inverter (2): set the button 2 of the DIP switch to the lowest position and the button 1, 3, 4, 5 of the DIP switch in the top position.

Inverter (3): set the button 1, 2 of the DIP switch to the lower position and the button 3, 4, 5 of the DIP switch in the top position.

Drie-phase configuration

1 inverter per phase
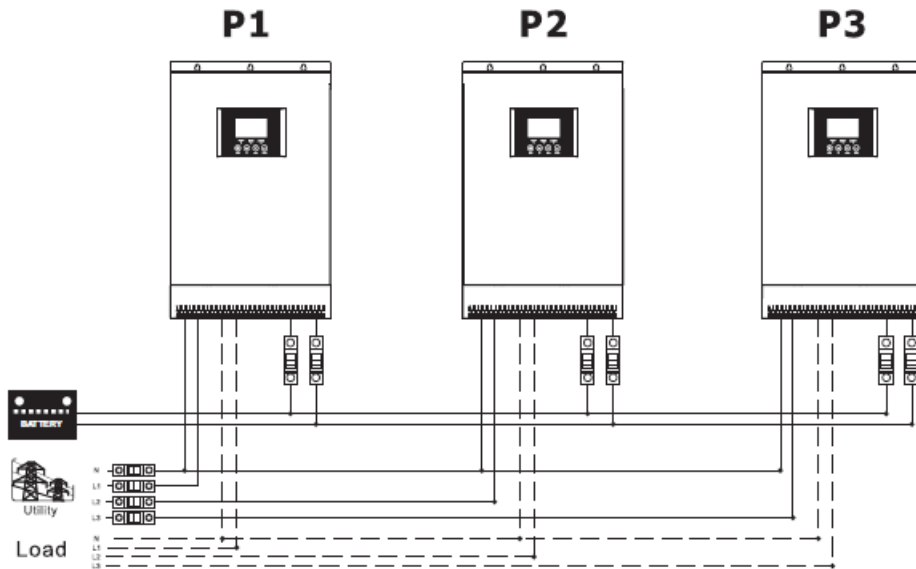
REMARK: It is not possible to make a three-phase setup in a DELTA connection.

Connection communication:

Inverter (1): set the button 1,3 of the DIP switch to the lower position, and the buttons 2, 4, 5 of the the DIP switch in the upper position.

Inverter (2): set the button 2,3 of the DIP switch to the lower position and the button 1, 4, 5 of the DIP switch in the top position.

Inverter (3): set the button 1, 2, 3 of the DIP switch to the lower position and the button 4, 5 of the DIP switch in the top position.

Connecting solar panel

Refer to the manual of the separate unit for the PV connection.

ATTENTION: each inverter must be connected to PV modules separately.

Fault reference code

[80] ⚠ ERROR	80	CAN fault
[81] ⚠ ERROR	81	Host loss
[82] ⚠ ERROR	82	Synchronization loss
[83] ⚠ ERROR	83	Battery voltage detected different
[84] ⚠ ERROR	84	AC input voltage and frequency detected different
[85] ⚠ ERROR	85	AC output current unbalance
[86] ⚠ ERROR	86	AC output mode setting is different
[87] ⚠ ERROR	87	Power feedback protection
[88] ⚠ ERROR	88	Firmware version inconsistent
[89] ⚠ ERROR	89	Current sharing fault
[90] ⚠ ERROR	90	CAN ID setting Error

Settings

Parallel in mono-phase – PB.UPS.10.10.48 – PB.UPS.15.15.48

STEP 1: Check the following requirements before commissioning:

  - Correct wire connection

  - Make sure all circuit breakers in the load side cabling are open andthat all neutrals of all units
  are connected to each other.

STEP 2: On the bottom panel of the inverter, there are 5 pin DIP switches, you can set it as
follows in the figure below
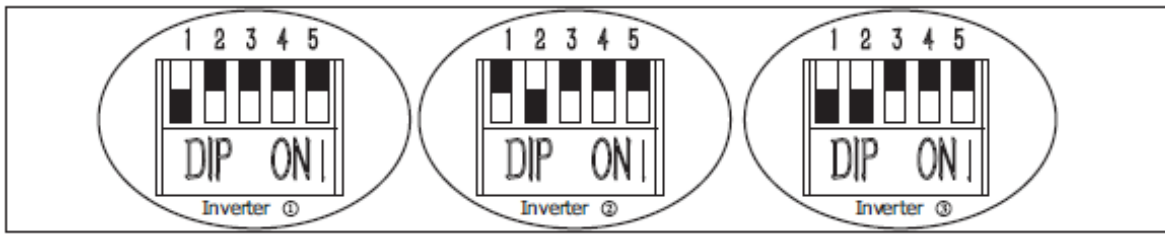
REMARK 1: If there are two inverters in parallel, you only need to set inverter (1) and inverter (2)
Set

REMARK 2: It is necessary to switch off the consumers when using the DIP switches Set, otherwise the
setting cannot be programmed.

STEP 3: turn on any inverter.
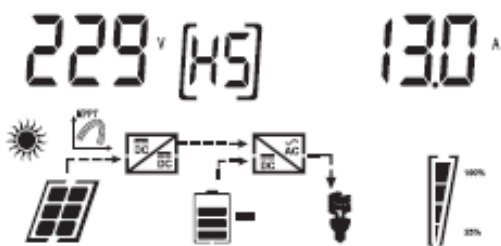
LCD screen on "MASTER" inverter   LCD screen on "SLAVE" inverter
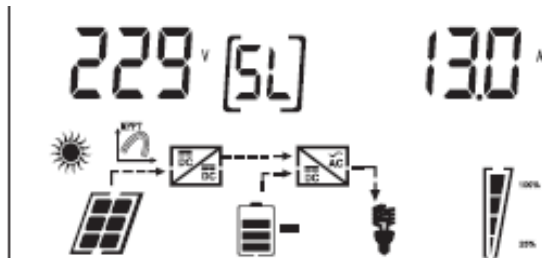
REMARK: Master and slave units are arbitrarily defined.

STEP4: Turn on all AC circuit breakers from cabling to the grid.

It is better to connect all inverters to the grid at the same time.

If not, the error 82 will appear in successive inverters. However, these inverters will restart automatically.

If they detect an AC connection, they will work normally.
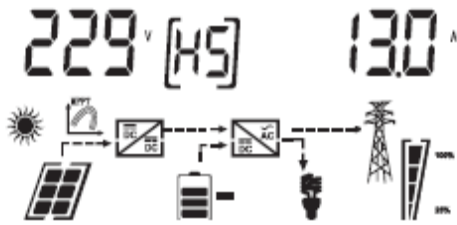
LCD screen on "MASTER" inverter   LCD screen on "SLAVE" inverter
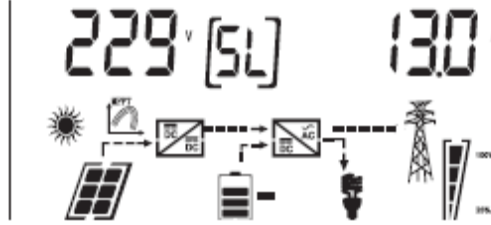
STEP 5: When there is no more fault alarm, the parallel system is fully installed.

STEP 6: Turn on all circuit breakers from the cabling to the load side.

This system will start supplying power to the load

Drie-phase configuration – PB.UPS.15.15.48

STEP 1: Check the following requirements before commissioning:

- Correct wire connection

- Make sure all circuit breakers in the load side cabling are open and

that all neutrals of all units are connected to each other.

STEP 2: On the bottom panel of the inverter, there are 5 pin DIP switches, you can set it as

follows in the figure below
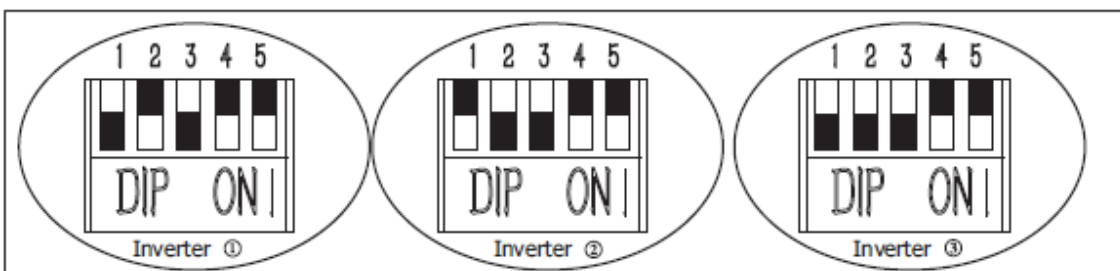
REMARK : It is necessary to switch off the consumers when using the DIP switches
Set, otherwise the setting cannot be programmed

STEP 3: Turn on all inverters in sequence.

| LCD display in L1 | LCD display in L2 | LCD display in L3 |
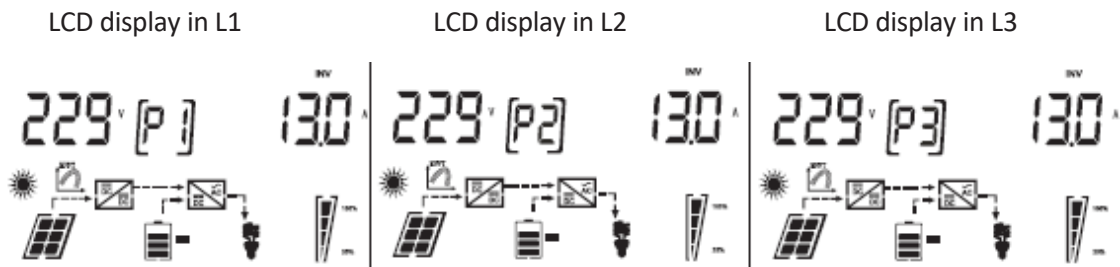
STEP 4: Turn on all AC circuit breakers from the cabling to the Grid.
   If the grid is detected and the three phases match the setting of the
   device, they will work normally.
   Otherwise, the AC icon   will flash and they will not work in line mode.

| LCD display in L1 | LCD display in L2 | LCD display in L3 |
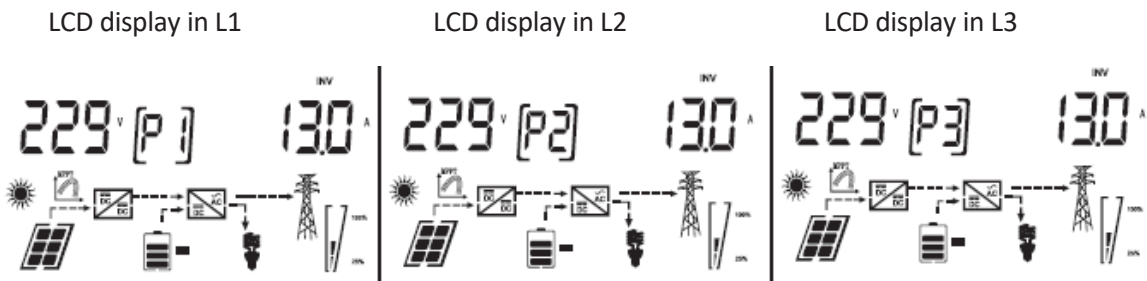
STEP 5: When there is no more fault alarm, the system is to support 3-phase equipment
   fully installed.

STEP 6: Turn on all circuit breakers from the cabling to the load side.
   The system will start supplying power to the load

REMARK 1: To avoid overload, it is better to run the whole system first before turning on the load-side
switches.

REMARK 2: The transfer time for this transaction exists.
Power interruption can happen to critical devices, which cannot bear transfer time

Problems and how to solve them

Situation		Solution
Fault code	description	
80	CAN fault	Check if the communication cables are connected properly and restart the inverter.
81	Host loss	
82	Synchronization loss	
83	Battery voltage detected different	Make sure all inverters share the same groups of batteries together.
84	AC input voltage and frequency detected different	Check the utility wiring connection and restart the inverter.
85	AC output current unbalance	Restart the inverter.
86	AC output mode setting is different	Turn off the inverter and check the DIP setting.
87	Power feedback protection	Restart the inverter.
88	Firmware version inconsistent	Update all inverter firmware to the same version
89	Current sharing fault	Check if the communication cables are connected properly and restart the inverter
90	CAN ID setting Error	switch of the inverter and check the setting of the DIP switch.
If the problem persists, please contact your installer		

PB.SC12-170

ABOUT THIS MANUAL

Purpose

This manual describes the information about the structure, characters, performance, specifications, usage and storage etc

Intended Audience

This document applies to the following users:

1.   Sales engineer
2.   Technical support engineer
3.   Maintenance engineer

Symbols list

The symbols that may be found in this document are defined as follows

⚠ DANGER	Danger that can cause serious injuries or even death.
⚠ WARNING	Used to indicate potential danger, it may cause death or serious injury if not avoided
⚠ CAUTION	Used to indicate medium or low potential danger, it may be cause of minor or normal injuries.
⚠ attention	Used as a warning of potential dangers, if this information is ignored, it may result to equipment damage, data lost, decrease in equipment's performance and other unpredictable results. This should not provoke any human injuries.
📖 NOTE	Valuable additional information readers should make note of

SECURITY

Overvieuw

Read this manual carefully before installation, operation and maintenance.
All safety information in this manual can be used as a guide to
to obtain equipment.

Attention

That statement marked with special characters addresses all safety issues, and must
users should take into consideration.

Compliance with local laws and regulations

Make sure you comply with local laws and regulations before you start.

Pre-Installation Requirements

Only qualified persons with adequate training and familiar with all safety regulations
may install, operate or maintain PB.SC.12-170 batteries.

* Installation, operation or maintenance should only be performed by authorized personnel.
* Only authorized personnel should disassemble or repair PB.SC12-170 batteries.
* Only authorized personnel should replace the parts of PB.SC12-170 batteries.
* Any problem that could jeopardize safety should be brought to the attention of the regulators
   reported.
* Product warranty does not cover damage caused by improper use

PRODUCT SPECIFICATION

Product characteristic

- Adopt super carbon technology + deep cycle technology.

- Outstanding PSOC cycle performance.

- Excellent charging acceptance and super fast charge/large discharge performance.

- Modular design and installation for less space, easy installation & maintenance.

- UL94-V0 ABS Container.

- Integrating Gel and AGM technology, there is no liquid electrolyte.

- Oxygen recombination efficiency:≥97%.

- Nominal operating temperature range: -20℃~55℃.

- Long Deep Cycle Life

- Innovative robust design to ensure superb safety and reliability.

  Horizontal installation, solve the problem of electrolyte stratification and save space.

Product structure
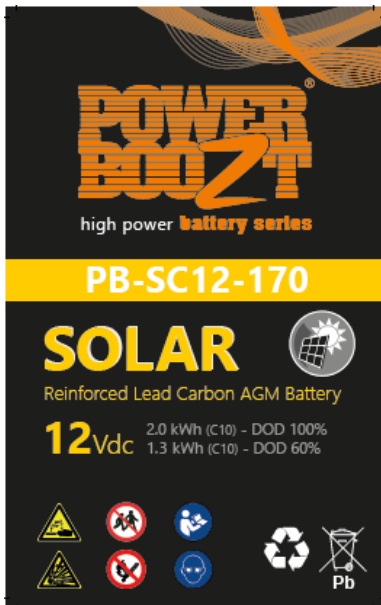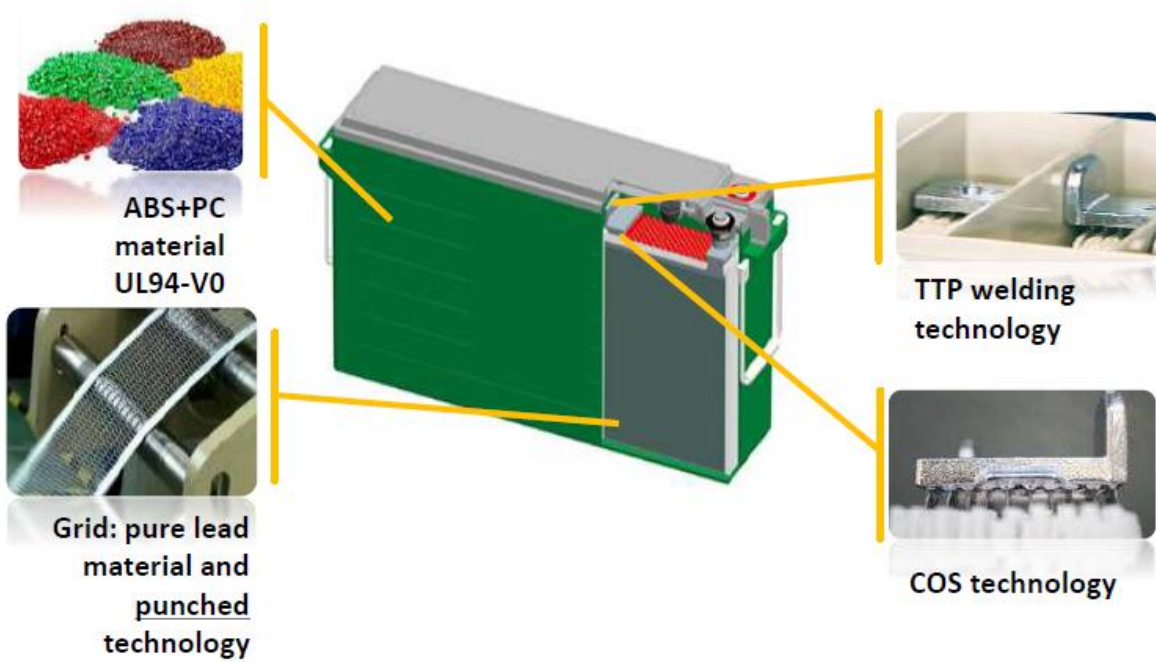
PB-SC12-170

PB: Powerboozt

SC: Solar Carbon

12: 12Vdc

170: 170Ah (C10)

2.0kWh: energy at 100% discharge (DOD100%) (at C10)

1.3kWh: energy at 60% discharge (DOD60%) (at C10)

C10: according to EUROBATNORM: discharge at 10% of the

Capacity (17A) for 10 hours from 100 charged to 100%

discharge (10.8Vdc) at an ambient temperature of 25℃.

Components

Part	function
Grid	Carries the active material and currentmade by lead alloy,The current will equably spread in it.
Plate	Plate is compiled by the grid and active material.It holds electric power. The service life mostly depends on the plate design and characteristics.
Separator	The separator has a porous design and absorbs most of the electrolyte, so the ions can move from positive to negative plates without allowing the battery shorting circuiting. Separators hold the active material too.
Valve	Keeps water,H2O inside the battery forgas recombination and only releases gas above a certain pressure point to prevent the battery from bulging.
Container	Contains the electrolyte,plates etc. Keep the poisonous out and active material in so that the reaction could carry on. Also it helps ventilation.It is made from strong plastic materials with insulating and anti-corrosion properties.

Structure

- AGM separator

  The separator has a porous design and absorbs the electrolyte, so the ions can move from positive to negative plates without allowing the battery shorting circuiting. Separators hold some active material too.Oxygen pass through them and take a part in the recombination reactionMost of the electrolyte is absorbed in the separator also the AGM helps to increase the pressure when the battery is being built.

- Multi-layer seal structure.

  The unique seal design of LRC batteries ensure high efficiency of recombination reaction over 97% with no risk of leakage.

- Maintenace-free design

The consumption of electrolyte is very small because of the advantage of their own institutions,no need to check the proportion of acid and add water etc in using process.

- Vent valves

  One way control valves with flame arrestor design are built in to each cell of the batteries in order to release excess pressure when present inside the battery container. This prevents any damages to the battery case.

- Cycle life

  Cycle life is affected by the depth of discharge. 60%DOD≥3200@25℃.

  Float charge life 15 jaar@25℃.

- Low selfdischarge

  The self discharge rate of LRC batteries is less than 3% of rated capacity at 20℃ ~25℃ storage temperature.This low self discharge rate indicates a storage time under the aforementioned temperature range of approx 6 months.

- Working temperature

  Discharge: -20℃~55℃; Lading: 0℃~40℃; Storage: -15℃~50℃.

- Recovery performance

  The storage batteries of LRC have good capacity on charge accepting and recovering,also can be recovered well after deep discharged.

PRINCIPLE OF WORKING

Principle of reaction

Electrical energy is converted into chemical energy during charging and becomes electrical energy during discharging,. The chemical process is shown below.

Positive plate: $$PbSO_4 + 2H_2O \underset{discharge}{\overset{charge}{\rightleftharpoons}} PbO_2 + H_2SO_4 + 2H^+ + 2e^-$$

Side reaction: $$H_2O \xrightarrow{charge} \frac{1}{2}O_2 + 2H^+ + 2e^-$$

Negative plate: $$PbSO_4 + 2H^+ + 2e^- \underset{discharge}{\overset{charge}{\rightleftharpoons}} Pb + H_2SO_4$$

Side reaction: $$2H^+ + 2e^- \xrightarrow{charge} H_2$$
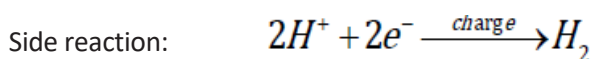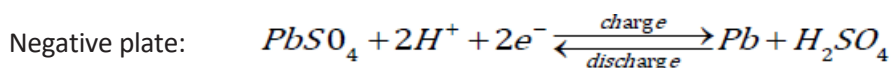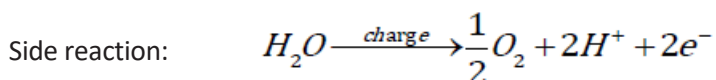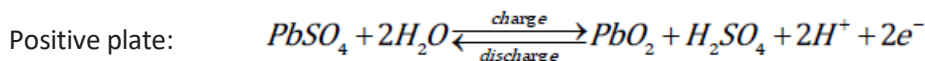
Water is resolved into hydrogen in the negative electrode (starts to evolve when approx. 90% fully charged) and oxygen in the positive electrode (starts to evolve when approx. 70% fully charged) during charging. In the early years battery fail mostly because of dry out the evolved gas cannot recombined again, so it required acid or water refill. The latest VRLA battery overcome this disadvantage gas will be recombination and hydrogen generation controlled too.

Principle of oxygen recombination

Generally speaking, negative plates are designed to have more active material. The oxygen which is generated from the positive electrode will travel through the separators to the negative electrode to oxidize the Pb sohygrogen generation is controlled. This recombination process allows VRLA batteries to have minimal water loss over years of operation making them essentially maintenance free. No refilling is necessary.

Postive: $PbSO_4 + H_2O \longrightarrow PbO_2 + O_2$

Negative: $PbSO_4$

H_2O

$Pb \qquad O_2 \qquad$ spread

$H_2SO_4 + PbO$
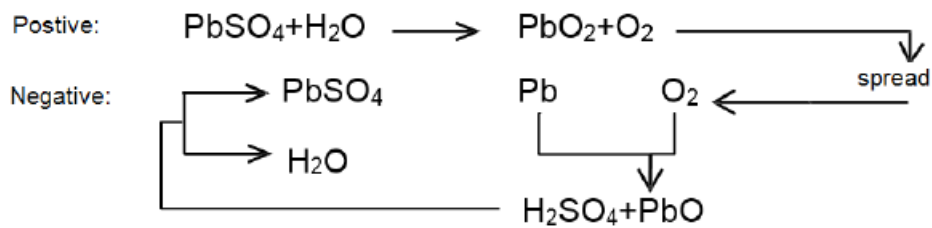
The cathode plays a dual role in VRLA batteries.

1. The spongy lead of the plate reacts with oxygen generating from the anode and is oxidized to lead oxide.
The lead sulfate of the plate has to accept the electrons which are transferred through the external circuit, react to spongy lead from lead sulfate.

General specifications

It is recommended to use less than 4 strings in parallel connection.

Serial connections should be made first.
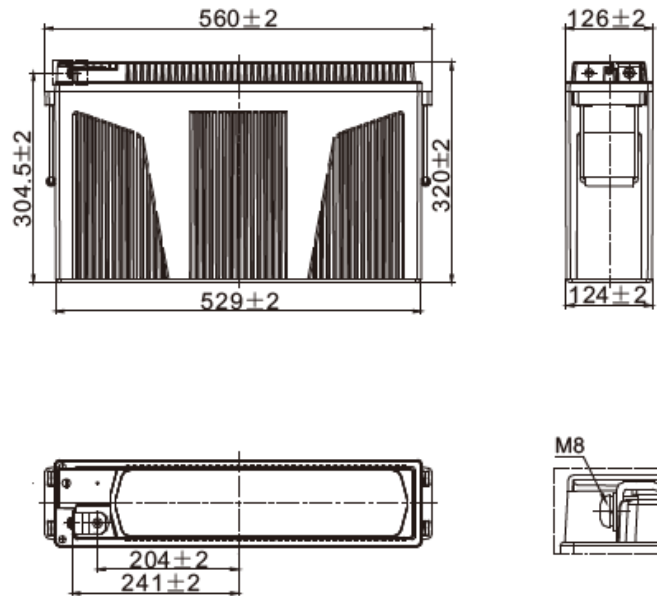
DISCHARGE SPECIFICATIONS

Discharge characteristics

Capacity depends on discharge current (discharge rate).

The smaller the discharge current, the more the discharge capacity will be increased.

The larger the discharge current, the lower the discharge capacity will be decreased.

C_{10} means the rated capacity discharged at 25℃ with final voltage 1.80V/Cell in 10 hours.

The figure below shows the discharge characteristics of PB-SC12.170 batteries under 25 ℃.
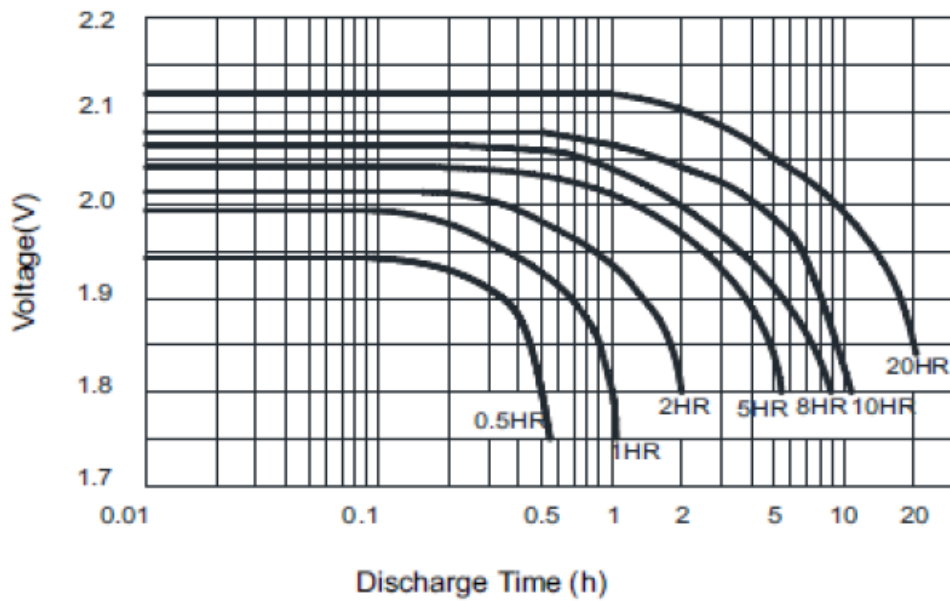
📖 NOTE   The final voltage is based on the discharge current and minium allowed voltage when the discharge process stops.

Temperature characteristic

Capacity increase with the temperature, it can be affect by the discharge current(discharge rate) ,it becomes more obvious when discharged at bigger current.

The figure below shows the effects of different temperatures with regard to the battery capacity for PB.SC12-170 batteries.
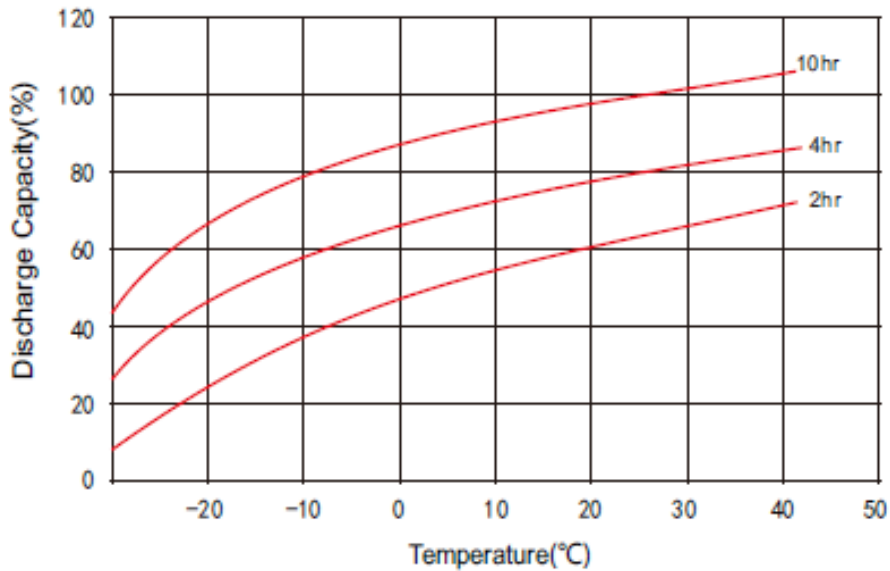
Final voltage

As we can see from the discharge curve, the voltage will drop rapidly when it reaches critical and little energy can be harvest, if we continue to discharge it will has some bad influence on the battery.

So the discharge must be stop at the critical voltage and we call the critical voltage the final voltage.

The final voltage decrease with the increasing of the discharge current.

A lot of lead sulfate will be generated when the battery charged under small current and it will cause damage to the battery.

The volume will increase 0.57×10^{-3} (liter/Ah) at the negative plate and 0.43×10^{-3} (liter/Ah) at the positive plate, these increased volume will damage the plate and cause the active material fall off.

Check the table for more information about the final voltage.

Discharge rate	Final voltage (V/cell)
Lower than $0.1C_{10}$	1.80
Lower than $0.25C_{10}$ or around	1.75
Lower than $0.55C_{10}$ or around	1.70
Above $1C_{10}$	1.60

CHARGE SPECIFICATIONS

   Charge characteristic

The figure below shows the constant charging characteristic, the charging voltage increases with the charging time.

However, at the final stage the charge voltage will increase rapidly for the oxygen is produced on the

positive plate and PbSO4 becomes lead dioxide.

So we can tell the charge status by the charge voltage.

The charge voltage should increase with the decreasing of the temperature.
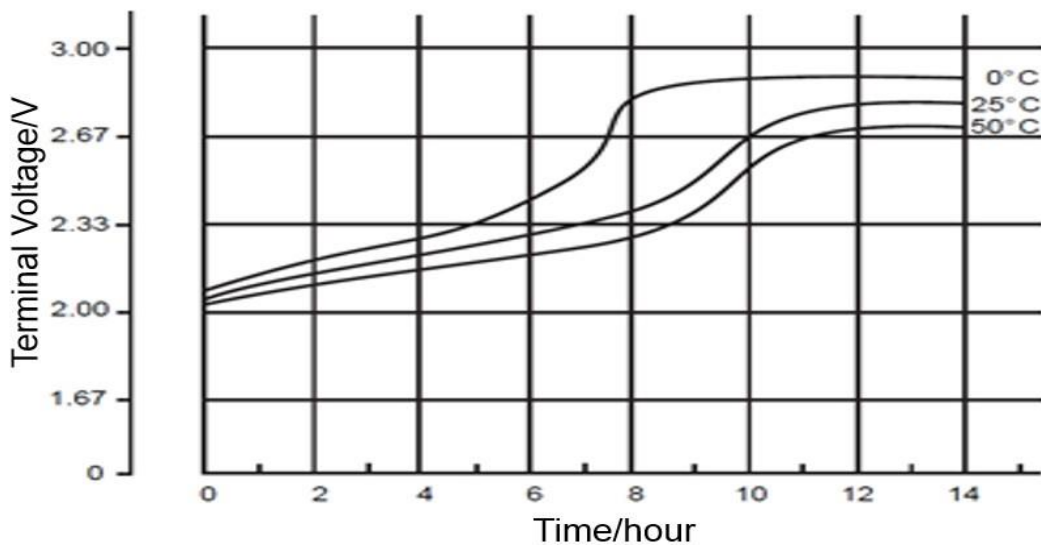
The figure below shows the constant voltage charging characteristic.

The default setting is 2.25V/cell and the max initialize charge current is 0.2C10 .

The charge current decrease with the charge time and reach the minimum at the final stage
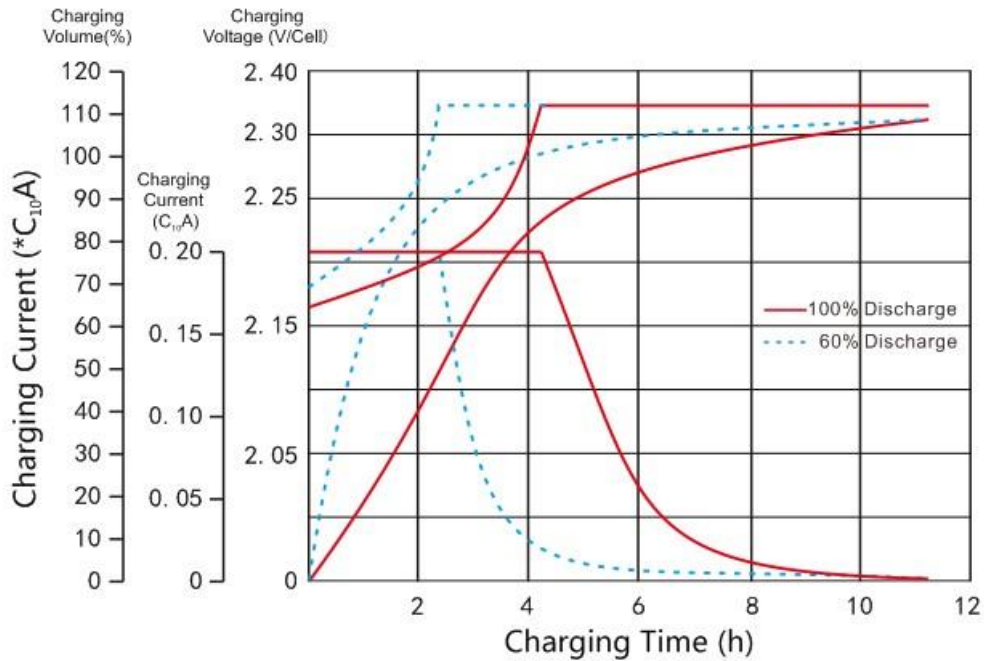
Charge voltage

Equalization charge the battery with any one of the below conditions.

- Discharged capacity is above the 20% or according to power supply's setting.
- Storage time above 3 months or longer.
- In battery group when the float charge voltage of one unit is below 2.16V/Cell.
- New battery is installed and debugged, but not in operation model yet.
- Float charge use for more than 3~6 months.

Temperature compensation

To get a better battery usage life take the temperature compensation into consideration(deviated from 25℃).

When temperature compensation is used, it can charge in different temperature condition, even when the temperature increase, the current will not become too big at the end of charge time, so it will avoid the heat effect caused by the high temperature.

In float charge state, temperature compensates using 25℃ as datum mark, the coefficient is – 3mV/cell/℃.

Decrease -4mv/cell for every one 1℃ increasement (Compensation -4mv/cell/℃) on cycle use.

STORAGE

Environment

Self-discharge will increase with the increasement of the temperature during the transportation, there is also another risk for fire and explosion so keep them away from fire heater or organic solvent. Keep the batteries under dry cool environment when they are stored. Please recharge the batteries using the instructions.

Self-discharge

The batteries will need to be recharged due to the self-discharge.

The self-discharge increases as the temperature increases, see the figure below for more information.
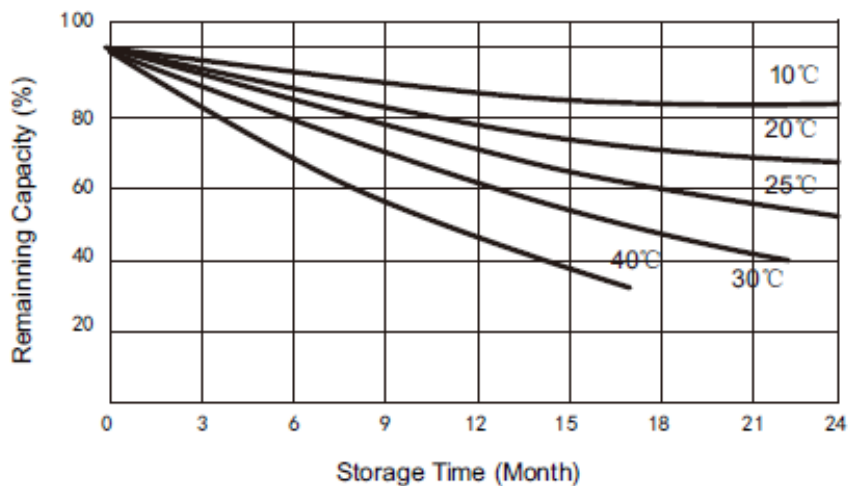
OCV versus SOC

The open-circuit voltage（OCV） of lead battery varies with the specific gravity of electrolyte. It can be stored for a long time.

With the discharge process, the specific gravity of electrolyte changes greatly (it is impossible to measure, only calculate the results), so the open circuit voltage is measured. The approximate residual capacity can be calculated.

The figure below shows the relationship between the open clamp voltage and the state of charge (state of charge – SOC）.
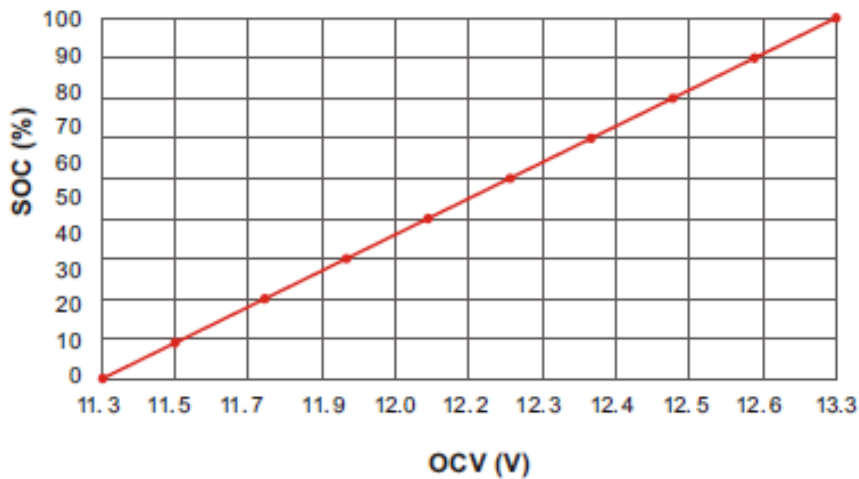
Recharge

Generally speaking, lead sulfate will be produced in the battery negative plate, this is called "sulfate" after they were stored for a long time.Because lead sulfate is an insulator, it will influence the performance of the charge. therefore it is recommended that the battery is stored in a dry, cool the environment.

Temperature   Time before rechargment

-1- <20°C   9 months

-2- 20°C ~ 30°C   6 months

-3- >30°C ~ 40°C   3 months

Recharge management:

-1- Constant voltage (2,23 ~ 2,27)V/Cell, current limit 0.25C10 (2 ~ 3) days.

-2- Constant voltage (2,30 ~ 2,40)V/Cell, current limit 0,25C10 (10 ~ 16) hours.

-3- 0,1C1 constant current charge for 8h or 0,05C10 constant current charge.

LIFESPAN

Float life

The lifespan of Floating in an optimal working environment is shown in the figure below.

The life is affected by the floating charge voltage and working environment.

The oxygen produced during the charge will be recombined in the negative plate with the hydrogen and become water again so the electrolyte will loss slowly when the battery is under normal float charge state(eg. 2.25V/Cell).

The corrosion speed will increase with the increasement of the temperature and charge current.

The estimate battery float life can be judged by the standard high temperature accelerated life test.

The actual float life is affected by the working temperature and some other conditions
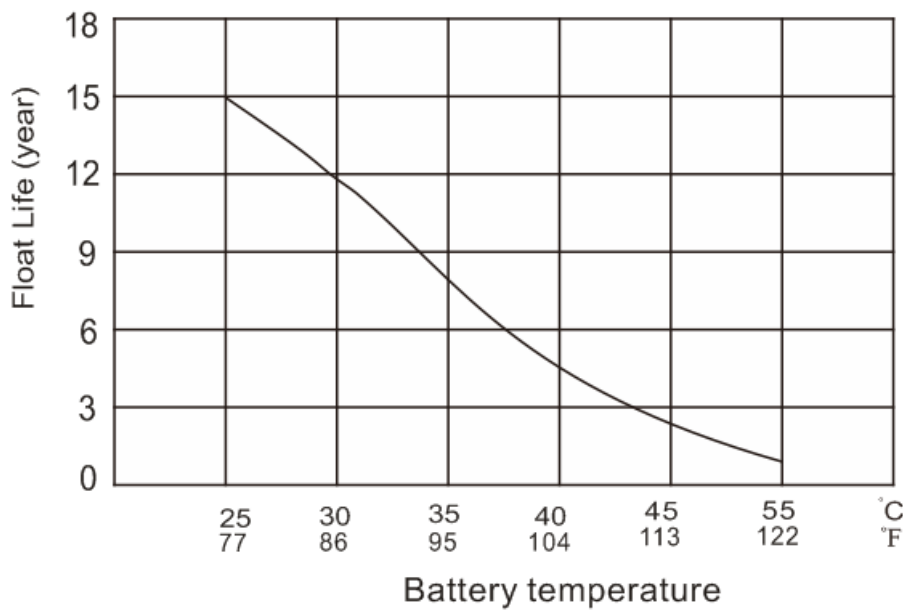
Cycle service life

The Lifespan During Floating VS. DOD under optimal working environment is shown in below figure.

The cycle service life is related to the frequency, depth of discharge, floating charge voltage and working environment.

Capacity will increase in the early stage however the bond between the active materil will drop. The deeper you discharge the cycle life will shorter.

Battery require a proper charge voltage and current,corrosion increase with the chage voltage and decrease with the charge current but if the charge current is too small there is a risk of lack of charge then battery die.

The actual cycle life is depends on DOD and some other conditions.
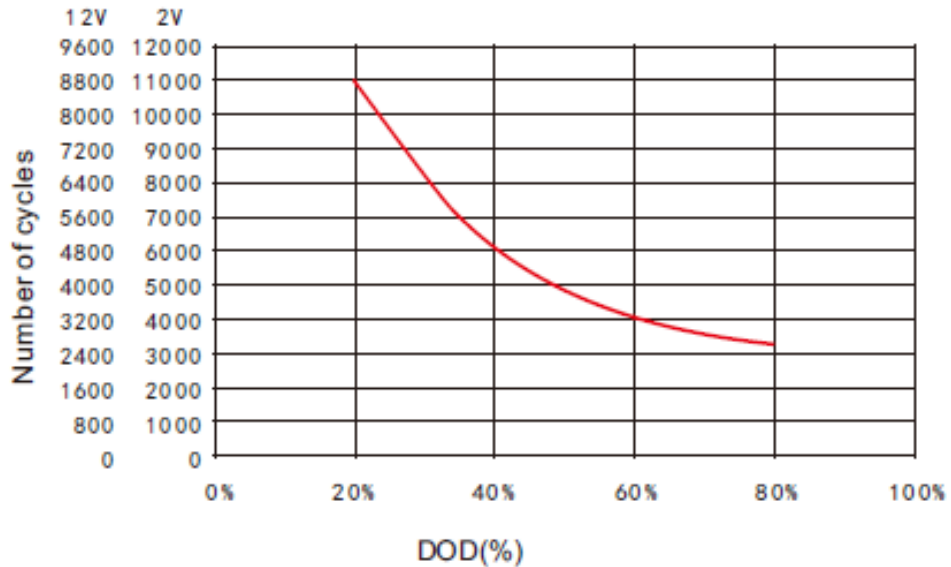
ENVIRONMENT PROTECTION

Toxic and poison

		Toxic and poison					
		Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Terminal	Cu	O	O	O	O	O	O
	Pb	X	O	O	O	O	O
Container		O	O	O	O	O	O
Inner material		X	O	O	O	O	O

Recycle

This mark indicates that the product can not be classified with other waste. In order to prevent potentially hazardous substances from hazardous waste disposal hazards to the environment and human health, please refer to the classification of waste recycling in order to promote the sustainable use of material resources.

In order to recycle the used equipment, please use the recycling system or contact the manufacturer or seller of the product or the local authority to manage the waste products.

SPECIFICATIONS PB.SC12-170

PB.SC12-17			
Rated voltage		12Vdc	
Nominal capacity		174Ah	C10 - 1,80V(cell)
Dimensions	Length	560mm	
	Width	126mm	
	Total height	320mm	
Weight		62kg	
Connection		M8	
container material		ABS	
Nominal capacity (25°C)		174Ah	10 uur - 17,4A - 1,80V/cell
		146,5Ah	5 uur - 29,3A - 1,75V/cell
		131,1Ah	3 uur - 43,7A - 1,75V/cell
Short-circuit current		1706A	
Internal resistance (25°C)		± 4,0mΩ	
Temperature range	During discharge	-20°C ~ 55°C	
	While charging	0°C ~ 40°C	
	When in storage	-20°C ~ 50°C	
Rated operating temperature		25 ± 3°C	
Maximum discharge current (25°C)		85,0A	
Maximum charging current (25°C)		51,0A	
Charging voltage (25°C)	Cyclical load	2,30 ~ 2,40V(Cell)	
Relationship temperature versus capacity	bij 40°C	106%	
	bij 25°C	100%	
	bij 0°C	86%	
Self-discharge		≤3,5% per month at 25°C	

PB-Li-12-100D

SAFETY INSTRUCTIONS, SAFETY MEASURES AND GUIDELINES

General / Intended Use

This manual must be kept with the product at all times and must be used when the product is sold
product are included.

Read this manual before using the product.

The PowerBoozt Lithium Iron Phosphate batteries may only be used for the applications
described in this manual.

If another application is used without consultation with the manufacturer, this may void the warranty
expired, as this is considered improper use.

The manufacturer is not liable for damage caused by incorrect or improper use, nor is it
liable for incorrect use of this product.

- Installation and maintenance by qualified personnel only.
- Always wear personal protective equipment when working on the battery.

Avoid short circuits, as the terminals are always live, avoid direct connection of the terminals to
each other.

- Do not place tools or objects on the battery
- Only extinguish with class D fire extinguisher, foam or CO2 fire extinguisher
- The wires from the battery to the loads must be secured with an external
fuse.
- Never open the battery
- The battery case must not be damaged, dropped, cut, drilled
not in, does not deform (danger of short circuit)
- Always keep the battery case dry and clean
- Do not permanently expose the battery to direct sunlight
- When connecting loads and charging equipment, observe the correct polarity, the
markings are on the battery.
- Disconnect all consumers from the battery when storing it or not using it for a long time
- Only use chargers that meet the required charging parameters (see technical data in
this manual)
- Do not use batteries of any other manufacturer, capacity, type or chemistry with the
PowerBoozt LiFePO4 batteries.

Transport

When transporting LiFePO4 batteries, always follow all national and international regulations and laws.

The transport may only take place in the original packaging or in packaging compatible with it corresponds. Never transport damaged LiFePO4 batteries, this may only be done in specified container.

PowerBoozt LiFePO4 batteries are certified according to UN38.3, the test report can be supplied on Request are sent.

LiFePO4 batteries not incorporated into equipment are classified according to

UN3480, Class 9. For further information, please refer to the Safety Data Sheet.

Waste disposal

LiFePO4 batteries should not be disposed of with household or commercial waste registered, but

must be handed in for disposal/recycling at the collection points of the

common take-back system.

This can also be done at a seller's or manufacturer's point of sale. Unload the

battery and cover the terminals before disposing of it.

With the CE marking, the manufacturer declares that this product complies with the basic requirements and other relevant requirements of the directive

(Directive) 2014/53/EU. If necessary, the declaration of conformity can be requested at service@powerboozt.de..

Markers

The following symbols and labels are attached to the PowerBoozt LiFePO4 batteries, please remove them please never. The statements are here .

Warning against corrosive substances

Warning for explosives

🚫	Not suitable for children
🚫	No open fire; fire, open source of ignition and smoking prohibited.
ℹ️	Read the user manual
👓	Use safety glasses

PRODUCT DESCRIPTION

Product Features and Benefits

By buying this PowerBoozt Lithium Iron Phosphate (LiFePO4) battery, you have chosen the safest lithium chemistry.

Compared to other lithium technologies, LiFePO4 batteries have the decisive advantage that the thermal runaway temperature is 270°C higher, so they are not susceptible to thermal runaway where extinguishing would no longer be possible.

The PowerBoozt offers many other advantages over lead-acid batteries (including lead acid, AGM and GEL batteries) and lithium batteries from other manufacturers:

- Only about 40-50% of the weight of a lead-acid battery of the same capacity
- Integrated battery management with adaptive cell balancing
- Protection against short circuit, over voltage, over current, under voltage
- 100% capacity can be used without damaging the battery
- Higher energy density compared to lead
- Partially charged condition will not damage the battery
- Does not need to be fully charged after each use
- Faster charging possible thanks to higher charging currents
- Nearly constant voltage level during discharge, so very suitable for inverter operation
- Low self-discharge when not in use
- Absolutely maintenance-free, no need to top up with distilled water

- Battery monitoring through built-in Bluetooth module via an app for your

Smartphone

- Much more charge cycles (charging and discharging) compared to lead-acid batteries, so

Much longer service life After 2000 cycles, at least 80% of the capacity is still available.

- In many cases it fits into existing battery holders (same housing as the

lead-acid battery), so that no conversion measures are necessary (L5 housing)

- Can be installed in any position

- Expandable by series and/or parallel connection

- In most cases, the existing charger can still be used

- Lower cost per cycle than lead-acid batteries

Areas of application

- As a residential battery in motorhomes, caravans, motorhomes

- Drive battery for caravan movers

- Storage battery for solar energy applications

- Drive battery in many other mobile applications

- Consumable battery or propulsion battery in boats

- emergency power supply

BMS – Battery Management System

The Battery Management System integrated into every PowerBoozt LiFePO4 battery monitors and
protects the battery from damage due to improper use or settings.
In addition, the BMS performs active internal cell balancing to always ensure maximum performance
preserve. In detail, the tasks of the BMS:

- Protection against overload due to too high a charging current or too high a discharge current.

- Protection against overcharging or overvoltage

- Under-discharge protection

- Over-temperature protection

- Short circuit protection

- Automatic cell balancing (equalization of the individual cells in the battery so that they

have the same charge level)

If one of the above protective devices disconnects the cells from the terminals, no voltage can be
measured at the terminals.
If the reason for disconnecting no longer exists, the battery will automatically reconnect

enabled.

Restarting after over-discharge protection can take up to several hours.

INSTALLATION

General

Check the battery for external damage before installing it.

If there is any visible damage, do not install or use the battery and immediately contact

contact your supplier.

The battery must always be used with an appropriate external fuse in the load circuit.

The battery can be installed upright, portrait or landscape.

The battery must be installed firmly and securely in the vehicle or system; very possible in campers

often use the existing confirmation.

The terminals and terminals must be covered after installation to protect against

short circuit, existing round terminal blocks can be used.

Never connect batteries with consumers switched on to avoid sparking.

-Do not expose the battery to direct sunlight and install the battery indoors, away from

heat sources.

Charge before use, the battery is only charged to 40-60% during transport.

Series – parallel connection

PowerBoozt LiFePO4 batteries can be connected in series and/or parallel, note:

Before installation, check that the batteries have a voltage difference of max. 50mV; if not this

if so, charge them both separately to 100% and then equalize them by separating them

to discharge

With series connection (max. 4 batteries) the voltage increases, but the capacity does not.

When connected in parallel (max. 4 batteries), the capacity increases, the voltage does not change. The

currents for both charging and discharging increase accordingly.

A circuit in which the batteries are connected in both series and parallel is theoretically possible,

but is not recommended.

In case of series or parallel connection, the positive and negative cables for the mutual

connections have the same cable length. The cross-sections must also be equal.
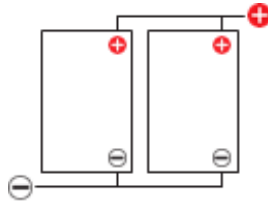
Consumers and chargers must be connected "diagonally" in case of parallel connection,

i.e. positive of the first battery, negative of the last or vice versa.

Here are examples of series and parallel connections
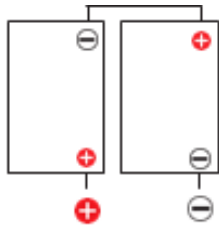
Series connection   parallel connection

Maintenance

LiFePO4 batteries require no regular maintenance except cleaning with a damp cloth,

they are absolutely maintenance free.

Nevertheless, check from time to time that the connections are tight.

Cyclic use once a year is recommended, charging to 100%.

Opslag en ontmanteling

If the battery remains installed in the vehicle for more than 6 months and is not used, you must:

if possible, disconnect the battery terminals or turn off the battery isolating switch to avoid

to prevent discharge via hidden consumers.

If the battery is stored removed, the terminals must be covered with a protective cap

or be masked.

Ideal is storage in a dry place at a temperature of approx. 20°C.

Before storing the battery, charge the battery to about 70-80%, it will give enough slack

to compensate for self-discharge (<3% per month) and to store the battery for several months.

USING THE LIFEPO4 BATTERIES

Charging

LiFePO4 batteries do not need to be recharged after each use, put them in a partially charged

leaving it in this state will not harm the battery.

The battery can be charged with a high charging current to shorten the charging time, max.

charging current per battery, see data sheet.

If the BMS disconnects the battery due to low voltage to protect against deep discharge,

the battery should be recharged as soon as possible.

Otherwise, the cells can be permanently damaged.

LiFePO4 batteries can be safely charged in the temperature range 0°C - 55°C, below 0°C will

the BMS prevent the battery from charging to avoid damage to the cells.

Charge the battery with an IU charger that does not exceed the final charge voltage of 14.6 V or

with a charger with LiFePO4 characteristics.

The BMS will shut down the battery if it gets too hot.

When the temperature drops, it automatically switches the battery back on.

The balancing of the cells is done automatically during loading or, if necessary, during a

standby phase.

Discharging

Discharge to 100% of capacity is possible, but a maximum discharge of 90% is recommended.

Safe discharge in the temperature range from -20°C to 60°C.

The BMS will shut down the battery if it gets too hot. When the temperature drops, it switches off

automatically put the battery back in.

USING THE BLUETOOTH APP

Bluetooth communication is already built into your PowerBoozt LiFePO4 battery.

 You can download the corresponding APP from the Google® Play Store® and the Apple® App Store®.

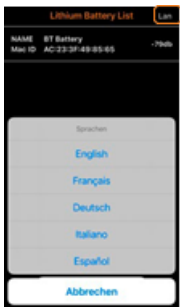The respective QR code will direct you to the download page in these stores.

Always use the latest version of the app.

Here the individual pages of the app and their meaning are explained.

Home screen of the PowerBoozt APP

Tapping the Lan key at the top right will open the language selection menu.

Selection list of the batteries nearby.

Here you can see the name of the battery (if assigned) and the MAC address of the

Bluetooth module.

By tapping your battery's MAC address

(You can find the MAC address of your battery on the small sticker on the battery)

makes theapp connection to the battery.

If no MAC addresses are listed, press the Scan key.

If your battery is still not showing,
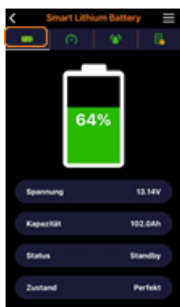
Current state of charge (SOC) in %.

Current voltage in volts

Total battery capacity in Ah

Current operating status Battery status

Current voltage in volts

Charge or discharge current in A Current internal temperature of the battery

Total number of cycles used so far

Congestion Indicators (Green = OK, Red = Error)

- Overvoltage

- Under pressure

- Charging current too high

- Discharge current too high

- Temperature too low while charging

- Temperature too low when discharged

- Temperature too high during charging

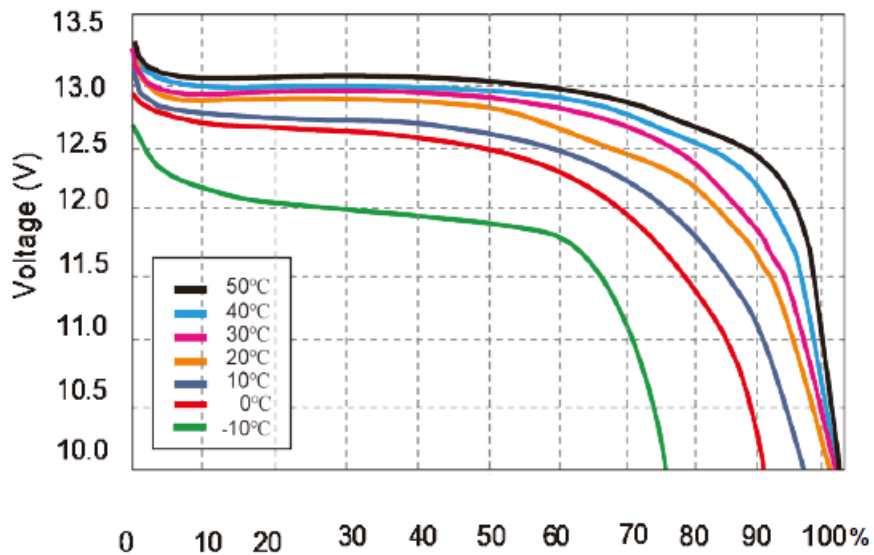- Temperature too high when discharged

- Short circuit

Contact information for Administrator access

GRAPHS

discharge graph

Discharge with different currents at 25°C
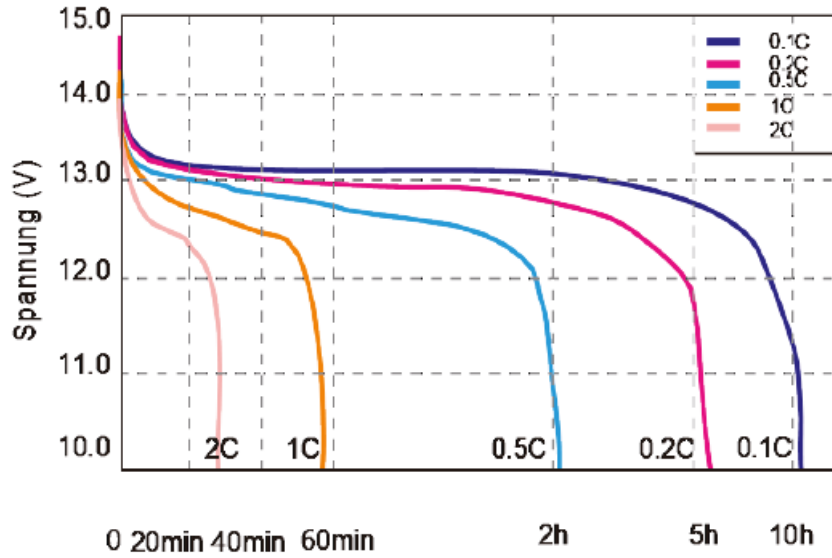
Discharge at different temperatures

Charging graph

State of charge (SOC) with 0.5C at 25°C
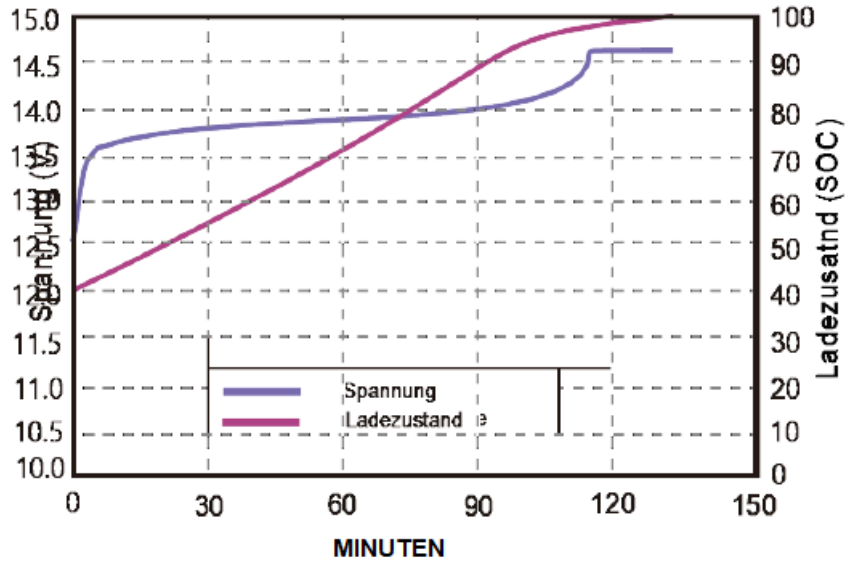
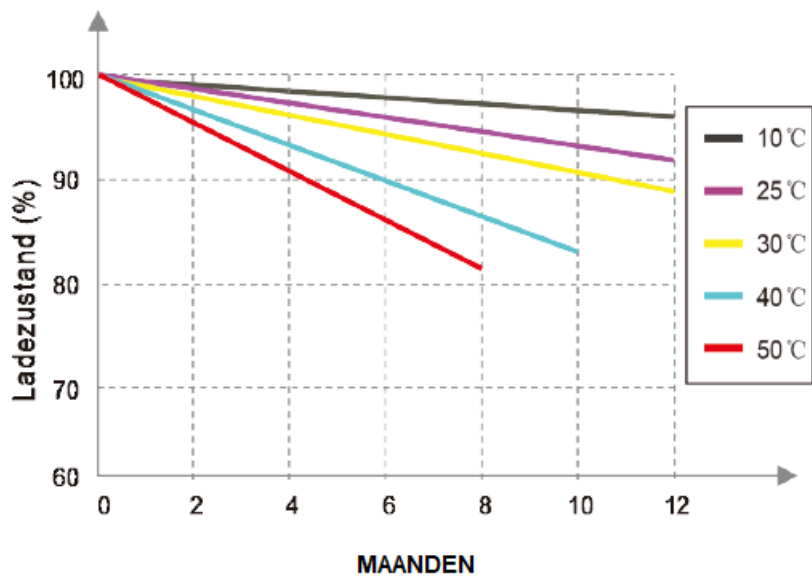Charging characteristic with 0.5C at 25°C
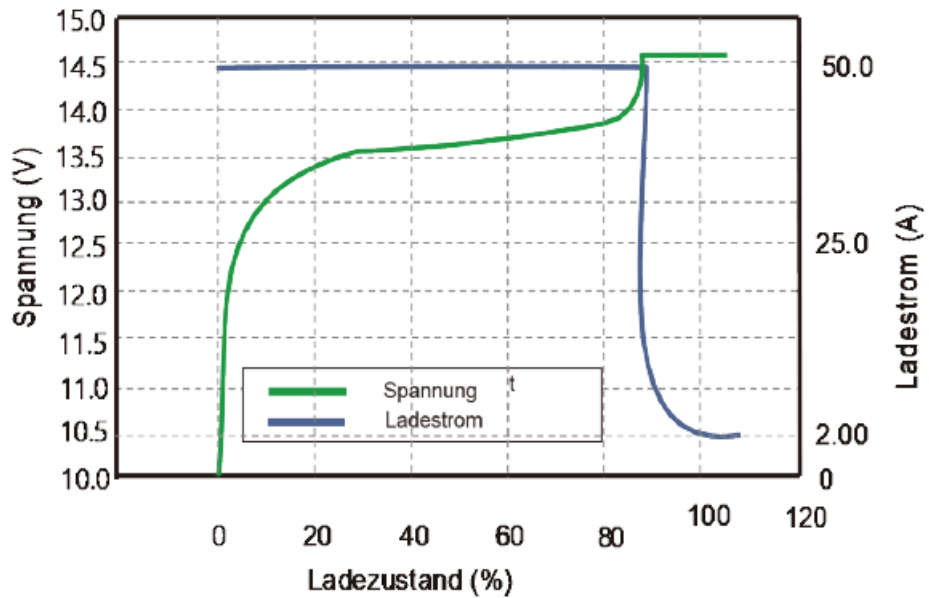
Longevity and Self-discharging graph

Number of Cycles with 1C
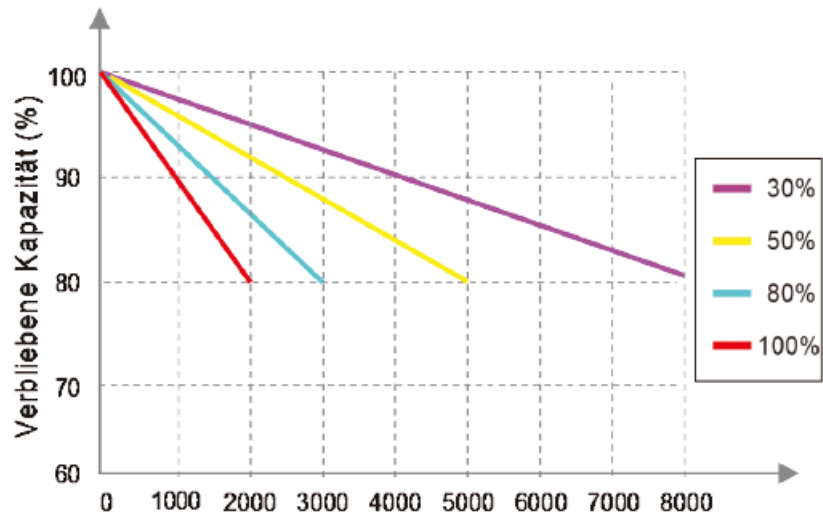
Self-discharge at different temperatures

FAQ

Can I continue to use my current charger?

That depends on which charger is installed.

If the charger has a setting for GEL or AGM batteries, it can usually be
used.

However, the final charge voltage should not exceed 14.6 V.

Characteristics for lead-acid batteries with liquid electrolyte should not be
used.

Ideally, the charger should have an IU characteristic for LiFePO4 batteries.

Which LiFePO4 battery do I need to replace my two heavy AGM batteries of 95 Ah each?

If the previous capacity was sufficient, two 95Ah AGM or Gel batteries can be used
replaced by one 100Ah PowerBoozt battery.

Should the lithium battery be left on the charger permanently during winter?

That is not necessary, on the contrary.

Fully charge the battery to approx. 60-80% and then disconnect or disconnect the battery from
the vehicle.

In my vehicle it sometimes gets to 50°C and more in the summer. Will it damage my lithium battery?

The operation of the PowerBoozt lithium batteries is possible up to 60°C without any problems.

And what about sub-zero temperatures??

Discharging to -20°C is also possible here, but charging below 0°C must be recharged
limited or prevented.

This can be done with a charge booster and/or a temperature controlled charger.

Will the PowerBoozt batteries fit into the installation space where my previous batteries were
installed?

If 92-95Ah AGM batteries or 80Ah GEL batteries are installed, the PowerBoozt
Lithium too, it has the same dimensions and mountings.

In the VW Bus the 90Ah fits under the seat, in the Ducato the 100Ah.

Should the lithium battery always or regularly be fully discharged?

No, lithium batteries have no memory effect, they can be used continuously in a partially charged state.

Is it true that lithium batteries are very expensive compared to lead batteries?

No, the opposite is the case.

Lithium batteries have the lowest cost per cycle compared to lead-acid batteries

due to the high number of cycles.

Of course, the purchase is many times higher, but here too the prices have been strong lately

decreased.

Can I also run an inverter in the vehicle on my lithium batteries?

Lithium batteries are particularly suitable for inverter use because the voltage level

remains constantly high during the discharge and therefore does not switch off the inverter.

However, the maximum continuous discharge current of the battery must not be exceeded.

Can I extend lithium batteries with parallel connection of other batteries?

Yes, provided the manufacturer, type and capacity are the same.

Also, the ages should not be too far apart, and the voltages of the battery

are attuned to each other.

Other questions?

Contact your seller.

POSSIBLE ERRORS AND THEIR CORRECTION

I can't find my battery with my APP

- Is the battery charged? Check with a voltmeter, the voltage should be above 11V.

- Is the location sharing activated on your smartphone?

- Is your mobile device's Bluetooth function activated?

- Could the battery be already connected to another device via Bluetooth? There is only 1 connection possible.

- Is your smartphone already connected to another Bluetooth device via Bluetooth? Only 1 connection is possible

The battery switches off during operation, the voltage is 0V.

There is an error, the BMS has disconnected the battery due to one of the in 2.3
mentioned causes. Please eliminate the cause.

My new battery is already showing cycles in the APP.

It is normal that up to 3 cycles are already displayed as the battery before sale
controlled by the manufacturer and reseller.

The state of charge of my two identical batteries connected in parallel is different.
Actually, they should be exactly the same.

This is normal with new batteries or after some time of use.

With new batteries this should equalize after a few cycles.

For older batteries, please fully charge them individually and parallel them again with max.
50mV deviation from each other.

Also check the cabling, always connect the inputs and outputs diagonally, so that the batteries
be taxed evenly.

WARRANTY HANDLING

All POWERBOOZT batteries are manufactured according to the strictest quality criteria and
POWERBOOZT guarantees that the LiFePO4 batteries are delivered in perfect condition.
POWERBOOZT grants the legal warranty for manufacturing and material defects that were present
at the time of delivery of the product.
The warranty does not apply to defects resulting from natural wear and tear, improper
use, lack of maintenance or failure to follow this manual.
Any use of the product is at the user's own risk.
A warranty claim can only be accepted if a copy of the
the proof of purchase is attached. Under no circumstances will the warranty affect the value of the
product exceed.
For the rest, the General Terms and Conditions of DE HOEVE MULTIPOWER BV apply.
By using the product you accept the above terms and conditions and accept the entire
responsibility for the use of this product.
The values stated by POWERBOOZT regarding weight, dimensions or technical data
should be construed as approximate values and not a formal obligation for these
data.

Technical changes made in the interest of the product, even without prior notice, may result in different values.

SERVICE

If you have any questions about your battery after purchase or during use, please contact the seller of the product.

He will explain the further procedure to you.

If the seller cannot help you, please contact POWERBOOZT.

Please contact us in advance by e-mail with information and explanation about the problem, possibly with photos.

If it happens that you want to send a battery to us, please pay attention to the following tips for a quick handling:

- If possible, use the original packaging as a shipping box.
- If you no longer have the original packaging, make sure you have enough
  protection against transport damage with suitable (UN-certified) packaging.
- If the goods are not shipped in the original packaging or in the NON-certified packaging,
  shipped, we have to charge for the new packaging when the product is sent
  sent back.
- Shipment is at the sender's own risk.

Please include the following with the return shipment:

- Copy of the invoice
- Reason for the return
- An exact and detailed description of the error

SPECIFICATIONS PB-Li-12-100D

Electrical specifications:

Rated voltage	12.8V
Nominal capacity	100Ah
Open circuit voltage at 100%	13.6V
Energy	1280Wh
Internal resistance	<10mΩ
Consumption BMS	<100μA

Self discharge   <3%/maand

Maximum number of batteries in series 4

Mechanical Specifications:

Dimensions (LxWxH)	353x175x190mm
Weight	12.0kg
Terminal type	Automotive
torque value	9 – 11Nm
Material container	ABS
Protection	IP56
Cell type	Cylindrical
Chemistry	LiFePo4

Discharge:

Maximum continuous discharge current	100A
Peak discharge current	200A (4.5 seconds ±2.5seconds)
BMS shutdown on discharge	250A (±50A)
Recommended Shutdown	11V
Back on	11.2V

Charge:

Recommended charging current	50A
Maximum charging current	100A
BMS shutdown when charging (current)	250A (±50A)
Recommended charging voltage:	14.6V
BMS shutdown when charging (voltage)	15.0V

Temperatures

When discharging	-20 tot 60°C
Bwhen charging	0 tot 45°C
Storage	0 tot 40°C

Communication

Bluetooth 4.0 with App Android/iOS

LfeLi-48100TB

ABOUT THIS MANUAL

Goal

This manual describes the information about the structure, characters, performance, specifications,use and storage and so on.

Intended Audience

This document applies to the following users:
4.   Sales team
5.   Technical installer
6.   Service engineer

Symbol list

The symbols that can be found in this document are defined as follows:

⚠ DANGER	Danger that can cause serious injury or even death.
⚠ WARNING	Used to indicate potential danger, could be death or serious cause injury if not avoided.
⚠ CAUTION	Used to indicate medium or low potential hazard, may cause minor or major injuries.
⚠ attention	Used as a warning of potential hazards, this information, if ignored, lead to equipment damage, loss data, equipment performance degradation and otherunpredictable results. This must not cause human injuries.
📖 NOTE	Valuable Additional Information Readers Should Note

RUN	Running

ALM	Alarm

PRODUCT SPECIFICATIONS

Explanation name

LFeLi-48100TB

①　②　③　④　⑤⑥
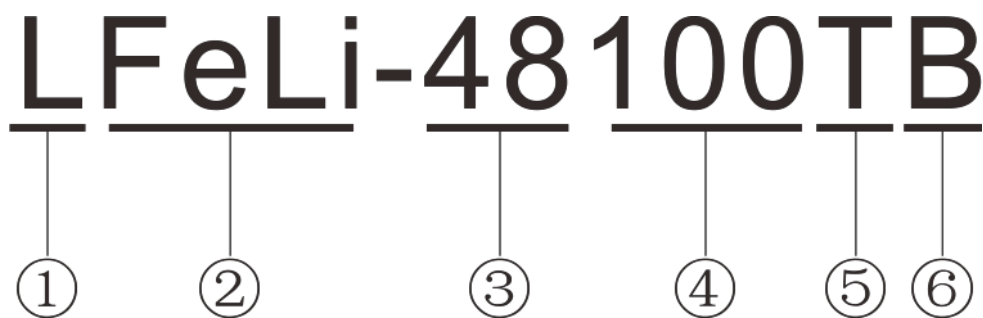
1.　　Technology: Lithium

2.　　Chemical: LiFeLo4 – Lithium Iron Phosphate

3.　　Tension: 48V

4.　　Capacity: 100Ah

5.　　High Quality Series

6.　　With LCD screen

Product Profile

The LfeLi-48100TB is a battery with a long life cycle, small size, lightweight and with
stable performance,
Battery with respect for safety and environment that can be used in harsh outdoor environments.
The system also includes an advanced "Battery Management System" (BMS), which is responsible
is for managing the charge, discharge, temperature control, communication, balance, and data
management
It has remarkable advantages in specific applications, such as a backup power supply, which
is used to remotely access the network equipment, exchange,
mobile communication equipment, transmission equipment and satellite communication.

Product structure
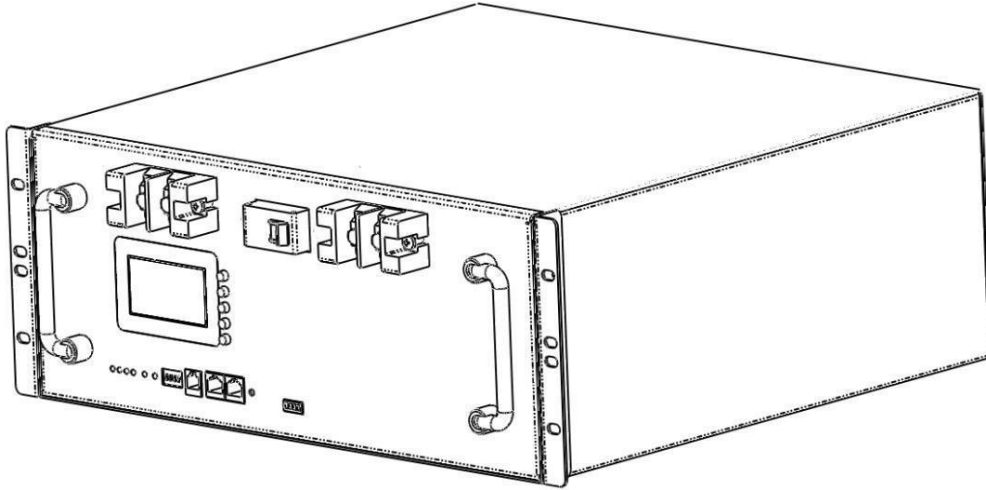
LFeLi frontpanel
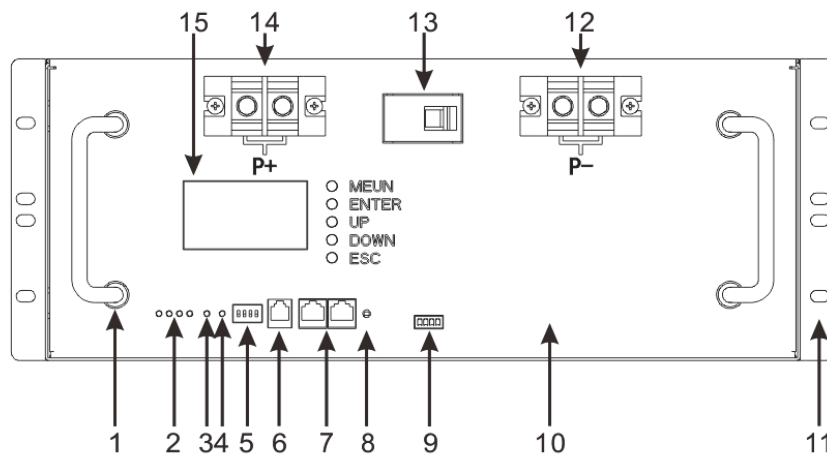
1 : handle		6 : RS232		11: mounting holes
2 : SOC (state of charge)		7: RS485		12: Exit -
3 : ALM (alarm)		8: RESET		13: MCB (fuse)
4 : RUN		9: potential-free contact		14:Exit +
5: ADD		10: frontpanel		15: LCD screen

Made of galvanized steel, making it suitable for transportation.

SOC

SOC indicates the state of charge of the battery via light indicator.

●	●	●	●	Capacity
¤	¤	¤	¤	75%-100%
¤	¤	¤	○	50%-75%
¤	¤	○	○	25%-50%
¤	○	○	○	0%-25%

📖INTRO ¤ indication for "on" ○ indication for "out"

ALM & RUN

"RUN" en "ALM" indicates battery status

Function	interpretation	color	blink frequency	Indication
Running	RUN	Groen	Does not blink	Does not work
			Flashing slowly (every 3 seconds)	Standby status
			Fast blink	Work status
Alarm	ALM	Rood	Do not blink	Normal
			Constantly burning	Alarm

If the battery is not working properly, the "ALM" light will be red.

While charging, the "RUN" light will blink.

ADD

The dip switches on the front panel indicate the name of a module in a pack (Master/Slave).

Refer to the table below to identify the installed models

set accordingly.

Address Code						ADD	PACK	Explanation
							Definition	
1	2	3	4	5	6			
OFF	OFF	OFF	OFF			0		Single use
ON	OFF	OFF	OFF			1	PACK	Use as MasterPack, can apply Telecom RS-232
OFF	ON	OFF	OFF			2	PACK1	Use as SlavePack1
ON	ON	OFF	OFF			3	PACK2	Use as SlavePack2
OFF	OFF	ON	OFF	/	/	4	PACK3	Use as SlavePack3
ON	OFF	ON	OFF			5	PACK4	Use as SlavePack4
OFF	ON	ON	OFF			6	PACK5	Use as SlavePack5
ON	ON	ON	OFF			7	PACK6	Use as SlavePack6
OFF	OFF	OFF	ON			8	PACK7	Use as SlavePack7

Address Code						ADD	PACK	Explanation
							Definition	
1	2	3	4	5	6			
ON	OFF	OFF	ON			9	PACK8	Use as SlavePack8
OFF	ON	OFF	ON			10	PACK9	Use as SlavePack9
ON	ON	OFF	ON			11	PACK10	Use as SlavePack10
OFF	OFF	ON	ON			12	PACK11	Use as SlavePack11
ON	OFF	ON	ON			13	PACK12	Use as SlavePack12
OFF	ON	ON	ON			14	PACK13	Use as SlavePack13
ON	ON	ON	ON			15	PACK14	Use as SlavePack14
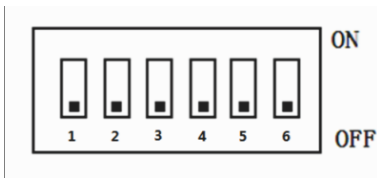
📖INTRO   Address code 5 and 6 is spare and plays no role

RS232

The system uses RS-232 series to transfer data such as alarm and de

system parameters and status.

Telecom RS-232 communicates at a speed of 1200bps and through this port the end user has

access to a single unit and check its status.

The RS-232 Telecom module can see a unit with any address, but a single unit can be seen

with RS232 (not all units in the package).

Software and manual are supplied with the unit on a CD.
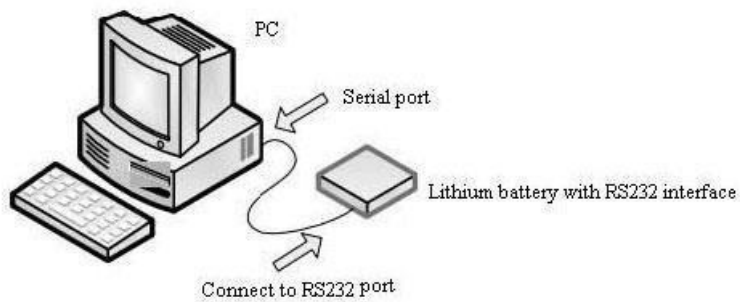
RS485

When the system is in parallel mode, it can use the RS-485 serial Telecom

for data transfer.

The main system gets the data for each Slave Pack through the Master.

A USB to Modbus adapter is required for connection to the master pack via the RS485 port.

The USB to RS485 is not provided by POWERBOOZT.
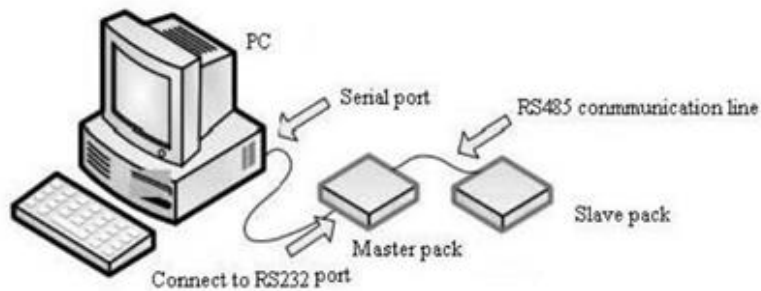
POWER ON / RESET

>The reset button acts as an on switch (dual function).

>To turn on the unit - press and hold the RST button for 3 seconds.

>To turn off the unit, press and hold the RST button for 3 seconds.

>The reset function is reached when the unit is turned on and by pressing the RST button 6

>hold for seconds and release.

DRY CONTACT (potential-free contact)

>The function of the potential free contact is to provide an interface for the status of the

>remote monitoring battery.

>Failure alarm indicates BMS or battery failure, including but not limited to charging and

>discharge MOS failure, cell voltage below 0.5V, NTC shutdown.

>Protection alarm: Output short circuit, charge and discharge over current, charge and discharge

>over/low temperature.

OUTPUT (exit)

>A total of 4 output terminals, 2 positive and 2 negative marked P+ & P-.

>Each clamp has the specification for M8 Stud. Required Torque Settings: 6.1N-7.5N.

MCB (Mini Circuit Breaker)

>Protects circuits against short-circuit and overload currents.

LCD screen

>LCD display shows Battery status, cell status, firmware version, security/alarm, etc.

MENU OPERATING INSTRUCTIONS

The LCD display interface is user-friendly as shown in the figure below.

It provides a 320*240 dot matrix graphic display.

The LCD can display the alarm information in real time and display the history of the

alert records for the user to request and provides a reliable basis for a

any faulty battery diagnosis condition.

Users can easily browse the battery parameters through the LCD interface and access

get to information about the current condition of the battery. The interface has a total of 5

menu keys. The functions are described below.

Display function keys
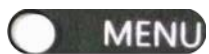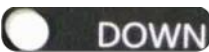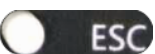
MENU	Main menu
ENTER	Confirm, enter
UP	Page up
DOWN	Page down
ESC	Return, launch

Operating procedures

1) Press once MENU the LCD screen lights up and the welcome interface appears.

Welcome To Use
Smart BMS
_____
Press MENU Key

2) Then click again ⬤ MENU to go to the main menu bar.

⟫ Analog Info⟫
---BMS Status⟫
---Para Setting⟫
---Sys Setting⟫
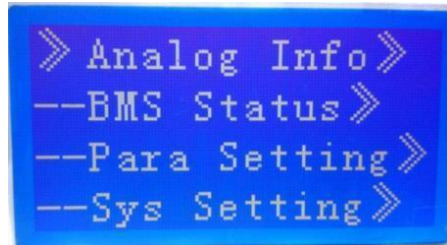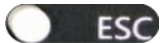
3) Scroll page up and page down ⬤ UP ⬤ DOWN go to it

Menu screen, when the arrow ⟫ points to the corresponding bar, press Enter to to confirm.

4) Go back to the menu bar and then click ⬤ ESC

LCD menu structure
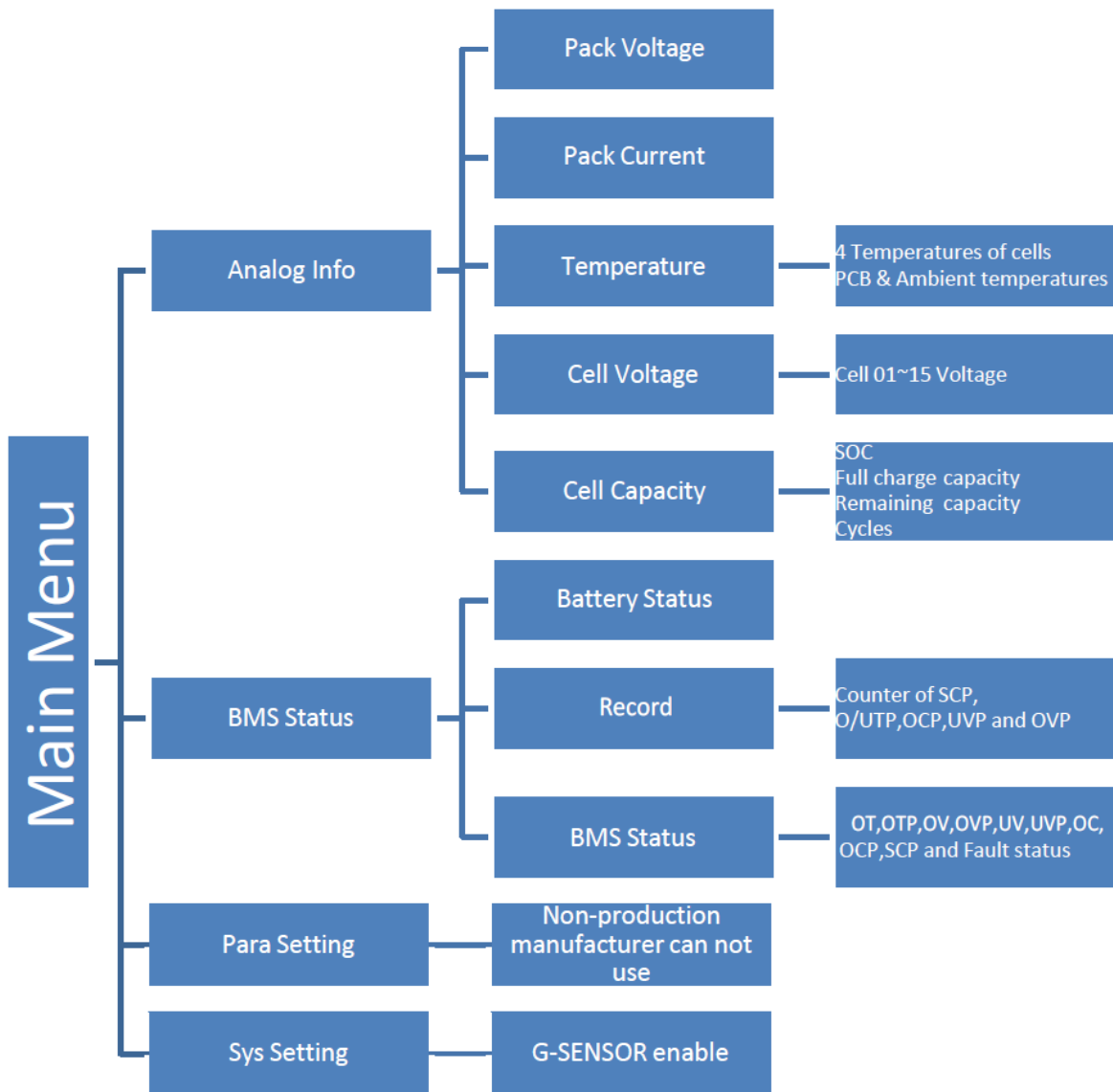
Firmware upgrade

The BMS needs to upgrade the firmware to add new features or fix a bug.

POWERBOOZT provides the software to upgrade the battery firmware.
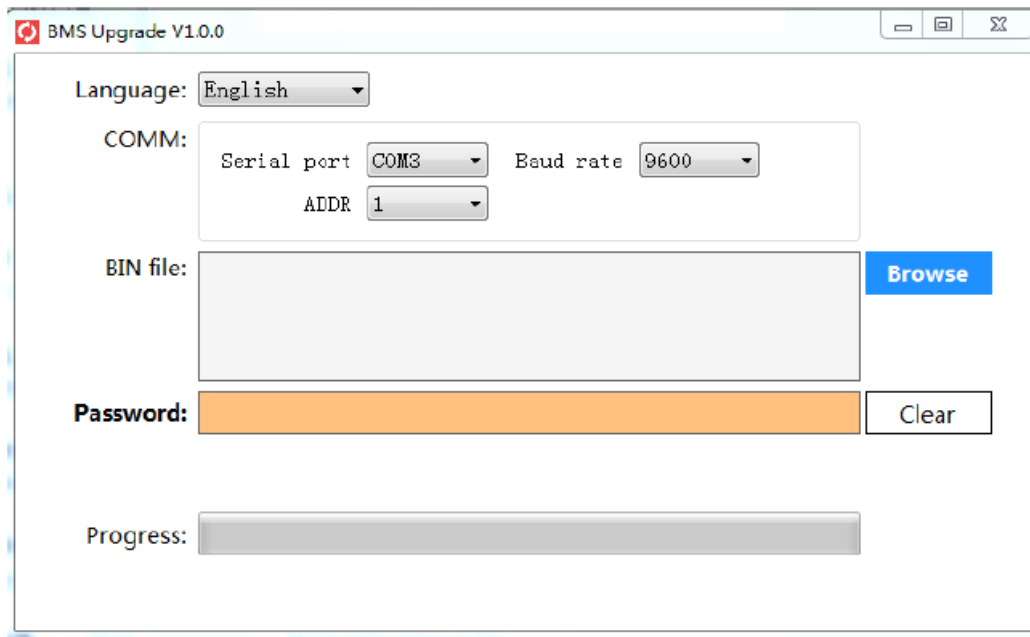
When upgrade, first make sure the BMS product is in standby state.

Please switch off charger and consumer.

Uses USB to RS232 cable to connect the computer and the RS232 port of the battery.

Open Upgrade tools **BMS Upgrade V1.0.0** interface as follows:

Select the correct serial port and baud* value, click "Browse" to view the corresponding bin-

file to select.

After selecting the correct address and entering the password, click the button

"Upgrade" to perform the upgrade.

After opening the upgrade tool, the first upgrade will ask, "The upgrade is complete. Are you sure you want to upgrade?"

Click "OK" to continue the upgrade, and there will be no prompt after that; click on "Cancel"

to exit the upgrade

__Baud__ is a unit that indicates the number of signal changes either symbols per second on a data transmission channel, or more generally, on an information link.
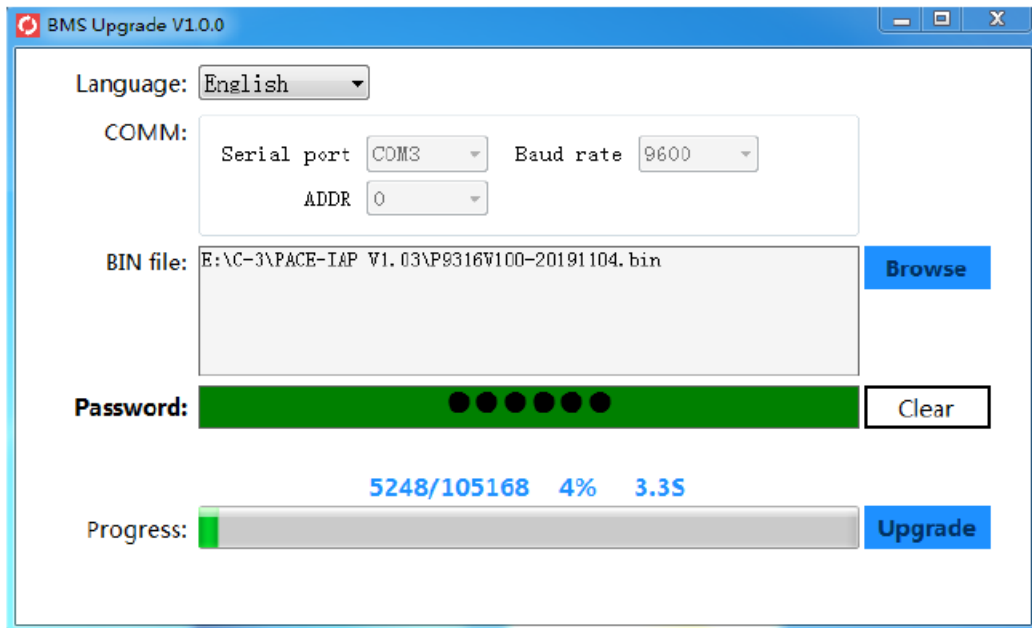
Make sure the progress is 100%, then the upgrade is complete.

Operating principle

The lithium battery pack is equipped with a charge and discharge management module and monitoring module (BMS).

The charge and discharge management module manages battery discharge and charge functions (in terms of processes, not in terms of current/voltage change), prevents overloading, overcurrent the discharge, change from charge to discharge and vice versa.

The monitoring module monitors the equilibrium function and the power, the temperature and the SOC.

The control module transmits the real-time information generated by it during the operation of the product network of the Telecommunications Protocol is collected to the control platform, and the user can check the operation status of the battery in each group through the display screen perceive.

A single module (48V 100Ah) with a large capacity, can be used in accordance with user requirements.
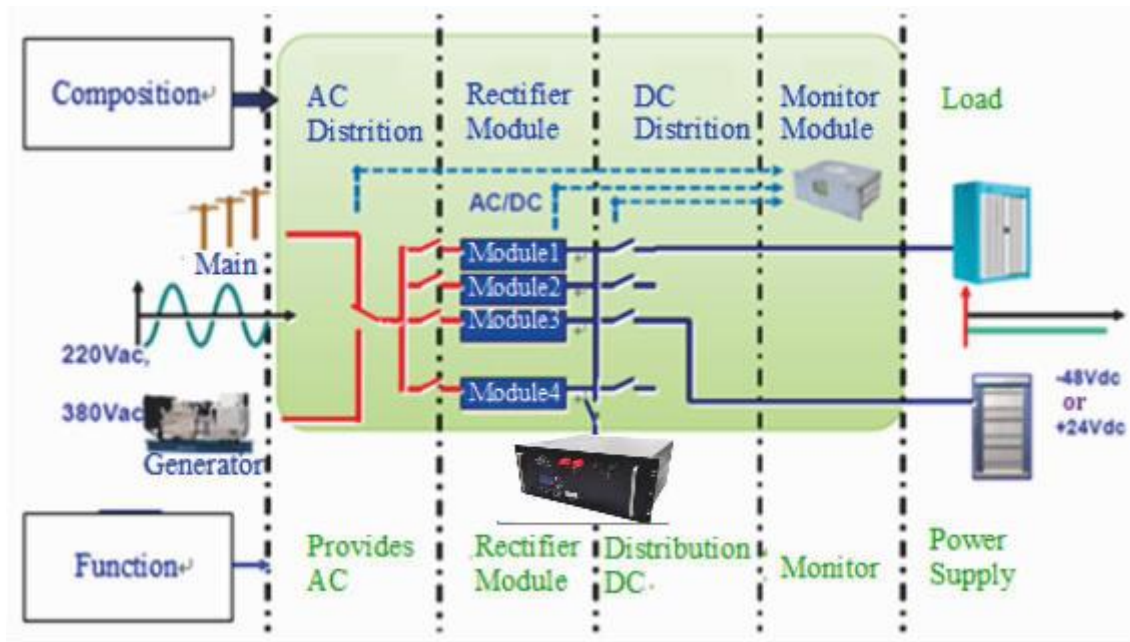
Product features

The integrated lithium battery pack has the following remarkable features:

- The lithium iron phosphate as cathode material promotes long life cycles and is also safe.
- The operating temperature range is: 0 ~ 45 ℃.
- It has strong charge and discharge capacity. Charge and discharge rate is 1.0C.
- It can support multiple batteries for expansion. 15 batteries maximum capacity communicate in parallel.
- During storage and transportation, the battery may enter sleep mode to avoid the loss of capacity to decrease.
- Easily accessible front connectors to facilitate installation of one or more units.
- Lightweight, convenient size, easy to install and maintain, conforms to the requirements of the standard cabinets.
- It can be wall mounted or pole mounted, using the right design brackets.
- The battery status parameter is real-time monitoring for current and voltage, temperature, alarms and protections.
- "Four remote" function (telemetry, remote signaling, remote regulating and remote monitoring) can be connected by computer to remote control center. Only possible via RS232.

- It's eco-friendly.

📖 **INTRO**

Telemetry: voltage, current, temperature, SOC, SOH (optional), etc.

Tele signal state of charge and discharge, overcharge/overcurrent, under voltage overcurrent alarm/

alarm, environmental / battery /PCBA / battery temperature alarm, low ambient temperature alarm, low

battery capacity, battery temperature / voltage / current sensor failure alarm, battery failure alarm

(just not cut off the monomer pressure high limit alarm) (optional), battery failure alarm

(optional).

Remote control: charge/discharge (optional), alarm sound off, intelligent intermittent

charge mode, current limiting charge mode, etc.

Optional: The battery charge/discharge management parameters and the output parameters of the

switching power system.

INSTALLATION GUIDE

Installation Precautions

Comply with local laws and regulations

Be sure to follow local laws and regulations when using the equipment takes.

Staff Requirements

Technicians responsible for installation and maintenance must first pass a strict

undergo training to ensure smooth and safe installation, operation and maintenance.

To maximize equipment efficiency, get the best possible operating results

and to ensure maximum service life, please pay careful attention to the

correct installation and use instructions.

Personal safety

- Insulated tools and gloves should always be used and worn.

During the installation process, watches, bracelets, rings and other metal products

be deleted.

- Avoid falls or collisions during the installation process.

- Do not remove the battery parts. Battery maintenance should be performed by a professional technician.
- The process must be performed and supervised by engineers who have experience and
   be able to take preventive measures for potential hazards from the battery.

Terrain and surroundings - Requirements for the location

1) Cleanness

Lithium batteries should not be placed in or near trash cans, or accidentally fall or be placed in smaller waste containers, as their interaction with metals short circuit and endanger the safety of the system and personnel.

2) fire protection

No flammable, explosive or other dangerous goods may be stored in the room,
and the room must be equipped with effective fire equipment (such as CO2 fire extinguishers).

3) Ventilation and heat dissipation

In order to protect the operation and maintenance of the equipment against heat, a space of 10 to 30 cm on the left and right and 50 cm at the top must be respected.
The room should be equipped with exhaust fan to ensure a good indoor.

4) Installation Requirements

The Lithium battery should be installed in a flat and level place to avoid uneven or uneven places to avoid. The battery should not be placed in direct sunlight or exposed
to rain or wet or damp conditions.
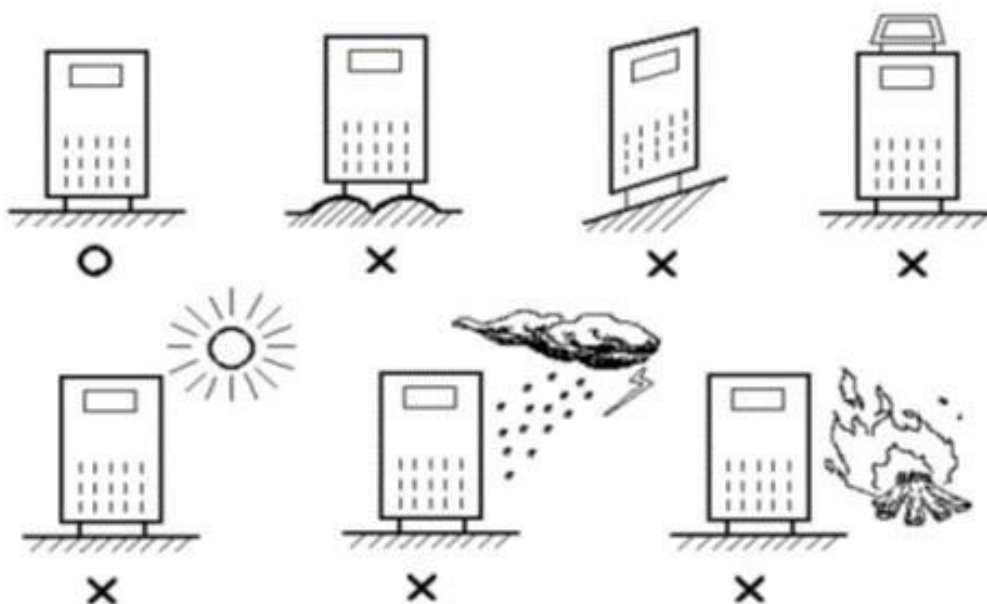
- Environmental requirements Ambient temperature: (-10~+40) °C.

Relative humidity: 0%RH~95%RH, no condensation.

Verticality: no vibration and the vertical slope is not more than 5º.

Cooling method: air conditioned

Altitude above sea level: accord with the standard requirement of GB3859.2-93. Pollution Level: Level ii.

Recommended operating temperature: (20~25), humidity level control within 50%.

⚠ caution

- Do not install in a working environment with metallic conductive dust.
- Do not install in a working environment with corrosive gases.
- Do not install the module in dusty/dirty environments.
- Do not place any objects on top of the lithium-ion battery. People should never be on the

   battery sit or stand.

Check power

Before installation, check the load capacity of the battery connecting wires

meets the requirements of the new equipment.

Check that the power supply corresponds to the equipment nameplate regarding

voltage and frequency and whether the current capacity has decreased due to the aging of the

cables.

If in doubt, contact your local office for advice on the

power supply.

Ground wire

Ground terminal is ready; the zero voltage is required in the room and should not exceed 5V.

- DC output voltage and load capacity

Lithium-ion battery pack with rated DC output power 48V.

⚠ caution

- When installing the lithium-ion battery, the user should check beforehand that the contacts and
  connectors are securely in place to prevent an open or short circuit.
- During installation, the lithium ion battery terminals must be connected correctly to
  to avoid short circuits (plus on plus, minus on minus).
- Do not connect the terminals without protection or insulation protection to reduce the risk of
  electrical to avoid shocks

Preparation of the installation

Unpacking and Inspection

Lithium batteries and accessories are shipped in cardboard or wooden boxes.

When unpacking, be careful when disassembling.

Check that the device and accessories correspond to the packing list and that nothing during
 the shipment was damaged.

In addition, make sure that all parts are present.

If equipment or accessories are damaged in transit, or are incomplete or incompatible,

make a note of the equipment, accessories and ordering information and contact us immediately

with the local branch or the office of the company DE HOEVE MULTIPOWER.

Installation material

Frequently used tools are shown

Adjustable Wrenches	Philips screwdriver	Slotted screwdriver
socket wrench	torque wrench	spanners
Dubbele ringsleutel	Diagonal Cutting Pliers	wire cutters
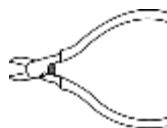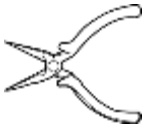
Needle pliers

Marker pen

work gloves

Ladder
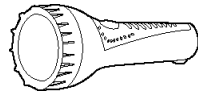
Flashlight

Measuring tape

Drilling machine

Gereedschap voor levering en uitpakken
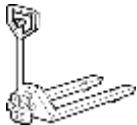
Manual Forklifts

Electric Forklift
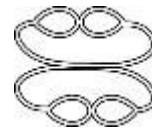
support ring(weight≥400kg)

Leverage (weight≥400kg)

Electrical installation tools

Insulated gloves
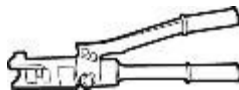
Power cable crimping tool
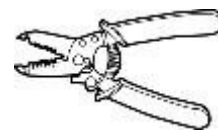
Wire Stripping Pliers
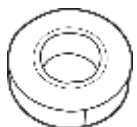
Insulation tape

Measuring tools

Clamping Pliers Meter

Installatie en bekabeling

caution
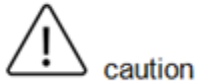
Before installing, make sure that the switching power supply system and the system switch
of the battery is turned off.

Make sure that the cabling, bus and terminals are clean, remove all dust

After installation, check all connections whether everything is tight, torque setting: 6.1N-7.5N

We appoint a person responsible for checking this

When the installation is complete, disconnect the battery and turn off the rectifier without plugging in
the mains to switch.

The battery must be recharged for normal operation.

Standard installation of the cabinet

Mounting

These units are suitable for 19" racks.

The units have two lugs on each side of the front panel, each
with three screw holes for mounting the units.

The mounting is done with a total of 6 x m6*15 bolts.

Aansluiting batterij-uitgang

The positive and negative battery terminals on the chassis of
the lithium-ion battery system are connected to the positive and
negative poles of the DC system, using color-coded cords (regional
requirements have different colors, so please contact your
installer).
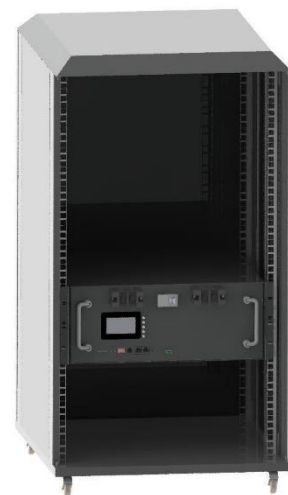
Switch power settings

After inserting the batteries, check whether there is a short circuit.

If not, the power can be turned on.

The parameters of the switching power supply should be set according to the table below:

Item	Parameters
Floating charging voltage	51.00V ~ 51.75V
Uniform charging voltage	52.50V ~ 54.00V

After the parameters are set, the module can be used.
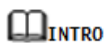
📖INTRO
Before parallel installation, set the battery to limited charge mode. Please refer to for detailed operations the software manual.

To ensure the longest possible life of the lithium-ion battery pack, the modules are properly and regularly maintained and inspected.

Maintenance records must be kept thoroughly and accurately so that the control parameters of the batteries can be easily checked.

Electrical maintenance

The table below lists the check points, the method of detection, the indications that repair is required and the actions to be taken during maintenance.

Check Points	Detection method	indication that repair is required	aktion
voltage	Check with a multimeter that the voltage on the circuit is within the normal range.	Battery voltage out of set range	Check the next section of the troubleshooting section
Fault inspection	Check whether the light indication corresponds to the manual	Alarm	
Cabling	Check the insulation	Insulation torn, aging	replace the cables
	Check the condition of the terminals	corrosion of the terminals	replace the terminals

Battery maintenance

Frequency	Check points	Aktion
Monthly	Environment	Keep away from heat sources and avoid direct sunlight.
	Visual inspection	In case of breakage, leakage or deformation, isolate the problematic battery and contact your installer.
quarterly	Cleaning the cabinet	Use a cotton cloth to clean the housing. Be careful while cleaning because the voltage is high.
	Connection status	Check each terminal and the bolt. If it's loose, tighten it
Every 6 months	Measure and record the voltage	At the last stage of charging, record the voltage; make sure the positive and negative voltage of the battery are equal. If not, check and repair the corresponding connection cable.
		Collect discharge data at least every six months for the first year.
		In the second year, you should measure the capacity every three months.

📖INTRO

The figure below shows a schematic diagram of the battery maintenance procedure.
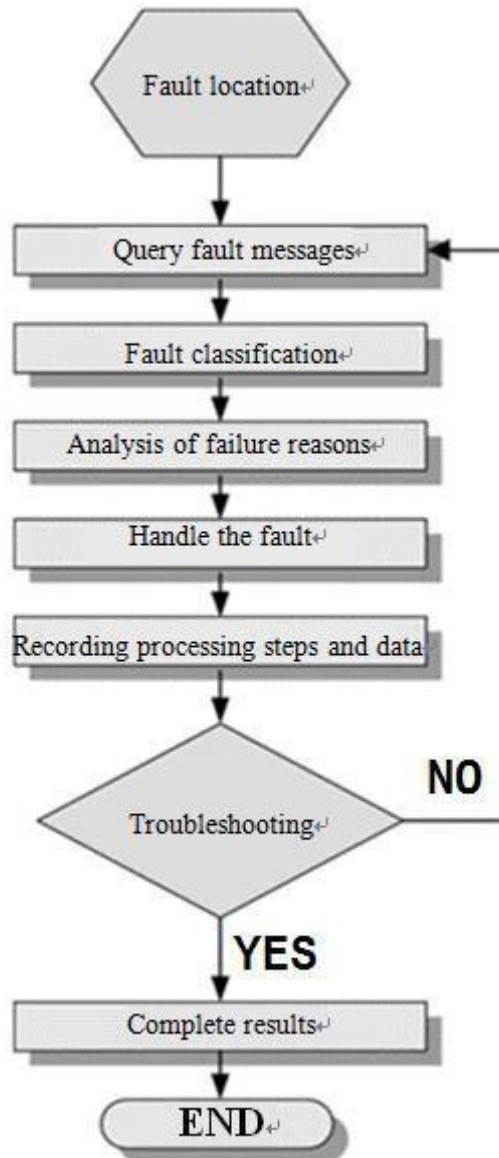
Step 1: Check the LEDs to determine which part is faulty.

Step 2: Check the information in case of failure in the monitoring module.

Step 3: Classify the information (DC, AC, modules, batteries, control, etc.).

Step 4: Find the root cause.

Step 5: Fix the fault.

Step 6: Register the data during processing.

Step 7: Confirm the issue is resolved.

Step 8: Fill in the report.

Step 9: If the problem is not solved, repeat the Stepping procedure.

FAULTS AND HOW TO SOLVE

Voltage to high

Unreasonable DC Over Voltage Alarm Set.

Check whether the DC overvoltage alarm point (default value is 58.5V) is acceptable

is. If not, adapt it to the current situation.

The supply voltage is set too high in manual mode.

Check if the hand control increases the voltage of the system.

If yes, confirm the cause and return to the normal value when the operation is

completed.

Faulty rectifier module.

Pull out the rectifier module one by one to check if the alarm goes off.

If not, place the rectifier module in its home position.

If the alarm disappears, replace the module.

Voltage to low

No AC power.

Check the DC undervoltage alarm point (default value is 45V).

If it is not reasonable, please adjust it according to the actual situation.

Alarm point DC undervoltage monitoring module set.

Check whether the value of the power system current is greater than the

current capacity of the power system and, if so, increase the

capacity configuration or reduce the load on the power system.

The system configuration is unreasonable.

Decrease the voltage of the system, in that case confirm the reason, after completion

from the action to get back to normal.

In manual control mode, the supply voltage is set too low.

Verify that the rectifier module is working properly and that the system capacity meets

the load requirements. If not, replace the rectifier module.

Interruption of module communication.

Check the exchange of power cuts and restore the AC power supply.

No voltage/current

loose contact.

If there is an alarm for the commutation module and the communication interruption,

plug and unplug the commutation module of the communication interruption to check

if the alarm goes off.

If the alarm continues, replace the rectifier module.

Fault monitoring

Reinstall the monitoring module.

If the alarm still sounds, replace the module.

Ambient temperature is too high

Temperature alarm parameter setting not working properly

Check the alarm value for the ambient temperature value (default 50℃).

If not, adjust it

The temperature control system of the cabinet, where the temperature sensor is located, is not

working properly.

Check the cabinet temperature control system.

If it is not within an acceptable range, address the interference from the temperature
control system.

When the temperature in the system cabinet returns to the normal range, turns off the

alarm automatically.

The temperature sensor is defective.

Check if the temperature sensor is faulty, if so, replace the temperature sensor.

Ambient temperature is too low

Low temperature alarm parameter setting alarm point.

Check whether the ambient temperature (alarm value: default 0℃) is reasonable.

If not, adjust it.

The temperature sensor system box in the control system is not working.

Verify that the system's cabinet temperature is acceptable; if not, act if the

temperature control system is faulty.

After the temperature in the system cabinet returns to the normal range, the alarm will

sound automatically.

The ambient temperature sensor is not working.

Check if the ambient temperature sensor is faulty and if so, replace the

ambient temperature sensor.

Battery temperature is too high

Battery temperature is set too high alarm point.

Check if the battery temperature is too high (alarm value: default

53℃).

If yes, then adjust it.

Battery compartment cooling system malfunction.

Check if the battery compartment temperature control system is faulty, and if so, deal

with the temperature control system.

When the battery temperature returns to normal, the alarm will sound automatically.

The temperature sensor does not work anymore.

Check if the temperature sensor is defective.

If yes, replace the temperature sensor.

Battery temperature is too low

Battery temperature is set too low alarm point.

Check if the battery temperature is too low (default: 0℃).

If yes, adjust battery temperature.

Battery compartment heating system defective.

Check if the battery compartment temperature control system is faulty, and if so, deal

with the temperature control system.

When the battery temperature returns to normal, the alarm will sound automatically.

The temperature sensor is defective.

Check if the temperature sensor is faulty, and if so, replace the temperature sensor.

📖INTRO
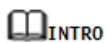
Only if the power system is equipped with a temperature sensor for the battery, there is a temperature

alarm.

TECHNIcan specifiactions

Charge and discharge parameters

Parameters for charging of one module

	Voltage (V)	Capacity (Ah)	Limit	Charge current (A)	
			Charge voltage	Default value	Maximum value
	48	100	54.0	20	100

Parameters for discharge of one module

	Voltage (V)	Capacity (Ah)	Limit	Charge current (A)	
			Charge voltage	Default value	Maximum value
	48	100	40.5	20	100

Parameters for charging multiple modules in parallel

Voltage (V)	Capacity (Ah)	Charge voltage limit(V)			Maximum current (A)	nota
		minimum value	Default value	maximum value		
48	100	50.3	51	54	20	1 parallel
48	200	50.3	51	54	40	2 in parallel
48	300	50,3	51	54	60	3 in parallel
48	400	50.3	51	54	80	4 in parallel
48	500	50.3	51	54	100	5 in parallel
48	600	50.3	51	54	120	6 in parallel
48	700	50.3	51	54	140	7 in parallel
48	800	50.3	51	54	160	8 in parallel

Parameters for discharging multiple modules in parallel

Voltage (V)	Capacity (Ah)	ontlaadspanning limiet(V)			Maximum current (A)	nota
		minimum value	Default value	maximum value		
48	100	40.5	42	43.5	30	1 parallel
48	200	43.2	42	43.5	60	2 in parallel
48	300	43.2	42	43.5	90	3 in parallel
48	400	43.2	42	43.5	120	4 in parallel
48	500	43.2	42	43.5	150	5 in parallel
48	600	43.2	42	43.5	180	6 in parallel
48	700	43.2	42	43.5	210	7 in parallel
48	800	43.2	42	43.5	240	8 in parallel

The main battery performance index

0.1C charging performance

Discharge time ≥ 600min

Standard battery charge, 1h within 1h with 0.1C discharge current at 40.5V, record the discharge time.

0.5C discharge performance

Discharge time ≥ 115min

Standard battery pack, 1h within 0.5C discharge current to 40.5V, record the discharge time.

High Temperature Performance

Discharge time ≥ 600min

After the battery is charged in the standard at high temperature(60±2℃) for 4 hours, then discharged to 40.5V at 0.1C, record the discharge time.

Low Temperature Performance (- 10 ℃)

Discharge time ≥ 180min

After charging, the battery pack is put in the low temperature box of -10 ± 2℃ for 6 hours, then discharged to 40.5V at 0.2C at this temperature, record the discharge time.

Low Temperature Performance (-20 ℃)

Discharge time ≥ 120min

After charging, the battery can stand for 6 hours at (-20 ± 2) , then discharge to 40.5V
at 0.2C at this temperature.

Record discharge time.

ENVIRONMENTAL PROTECTION

Ecolabel

The product described in this manual does not contain any toxic or hazardous substances and
elements.

It is a green product.

It should be recycled and not thrown away.

Recyclage

This mark indicates that the product should not be disposed of with other types of waste.

To prevent potentially hazardous substances from being released into the environment and to human
health, please refer to the classification of waste recycling, to promote the
sustainable use of material resources.

You can recycle the used equipment or contact the manufacturer or seller of the equipment
product or with the local government for the management of the products.

SPECIFICATIONS LfeLi-48100TB
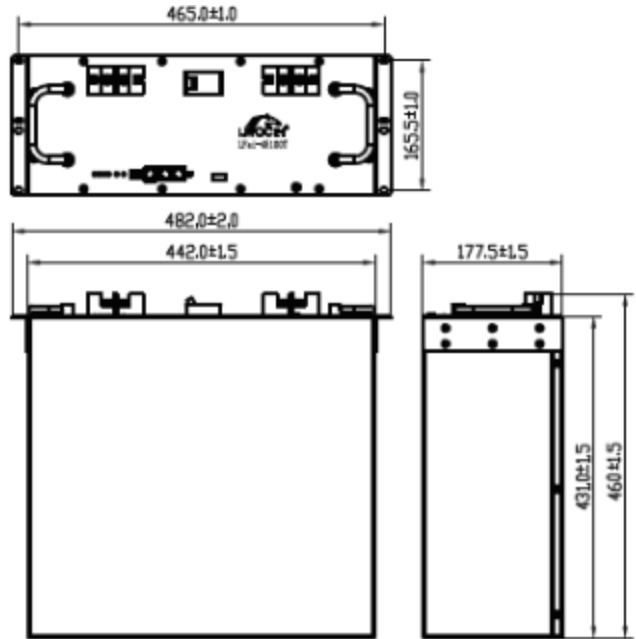
- Anti-theft with G-sensor, siren 85db

- Flame retardant system according to UL94V-0

- Good high temperature performance

- High cycle times and long life

- Safe Lithium Iron Phosphate Technology

- Thousands of cycles, under normal conditions

- High energy density and conversion efficiency

- Environmentally friendly, without heavy metals

- Complete with built-in Battery Management System (BMS)

- Can use most standard VRLA chargers for this system

- Low self-discharge rate of 2 years before required recharge

- Easy installation, can be wall-mounted in 19 inch standard cabinet or

- Built-in automatic protection against over-charge, over-discharge and over-temperature

current/power at constant discharge at 25°C					
minimum discharge voltage 42,0V	95A	94A	33A	20A	10A
	4460W	2295W	1550W	940W	475W

Karakteristics

Nominal Capacity (5hrs):		100Ah
Nominal Voltage:		48.0V
Minimum discharge voltage:		42.0V
Maximum charge voltage		54.0V
Maximum charging current:		100A
Maximum continu laadstroom:		100A
Weight:		about 43Kg
Display:		With LCD display screen
Parallel circuit:		Up to 15 units maximum
Dimensions (Length x Width x Height):		442 x 431 x 177.5mm
Cell:		Prismatic
Lifetime in years:		More than 20 years
Cycle Life:		Over 3500 cycles at 100% discharge
IP class:		IP31
Casing material:		Black lacquered steel cabinet
Temperature:	at charging:	0 tot +55°C
	At discharging:	-20 tot +60°C
	At storage:	-20 tot +60°C

APPENDIX

Connection cables

If groups (4~10) of parallel sets of lithium batteries are not supplied by battery racks, you can choose the customized wiring cables to replace them.

Relevant technical requirements are the number of the power cable and the number of parallel battery packs.

Make sure that the specifications of each extension cable (length, diameter and material) are the same.
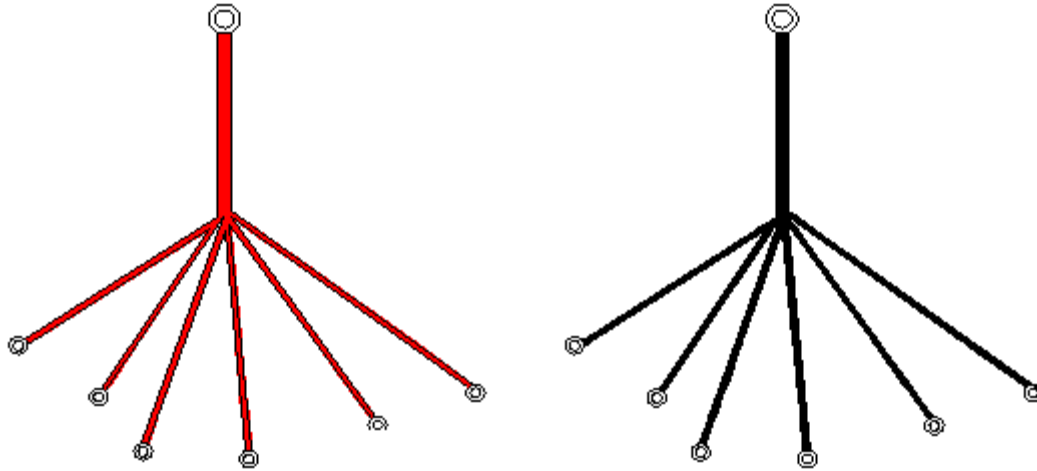
According to customer's requirement, the selection of the appropriate switch, cables, extension cable specifications are made, according to the relevant cable specifications provided in list below are given

AWG	Diameter (mm)	Intersection (mm²)	Resistance (Ω/km)	nominal current (A)	Maximum current (A)
0	11.68	107.22	0.17	423.2	482.6
0	10.40	85.01	0.21	335.5	382.6
0	9.27	67.43	0.26	266.2	303.5
0	8.25	53.49	0.33	211.1	240.7
1	7.35	42.41	0.42	167.4	190.9
2	6.54	33.62	0.53	132.7	151.3
3	5.83	26.67	0.66	105.2	120.0
4	5.19	21.15	0.84	83.5	95.2
5	4.62	16.77	1.06	66.2	75.5
6	4.11	13.30	1.33	52.5	59.9
7	3.67	10.55	1.68	41.6	47.5
8	3.26	8.37	2.11	33.0	37.7
9	2.91	6.63	2.67	26.2	29.8
10	2.59	5.26	3.36	20.8	23.7
11	2.30	4.17	4.24	16.5	18.8
12	2.05	3.332	5.31	13.1	14.9
13	1.82	2.627	6.69	10.4	11.8
14	1.63	2.075	8.45	8.2	9.4

The installation steps are shown below:

1) Preparation before installation: Insulate using metal mounting tools (such as Phillips screwdriver, wrench), electrical tape and modified wiring cables.

2) Lithium-ion battery must be installed in a suitable place.

3) Connect each connector in turn to each of the output ends of the lithium-ion battery pack.

Connect all lithium-ion batteries to the positive ("+") terminals first, then all negative ("-") terminals of the lithium-ion batteries

BMS connections - control instructions

1. disassemble BMS

Tools: Screwdriver, insulating tape

2. Turn off the battery. Remove the fasteners on both sides of the battery

3. Loosen the screws from the front panel and from the bottom plate.

4. Open the front panel and bottom plate

5. Remove the BMS sample leads from the sockets in the following order: 4.3,2,1.
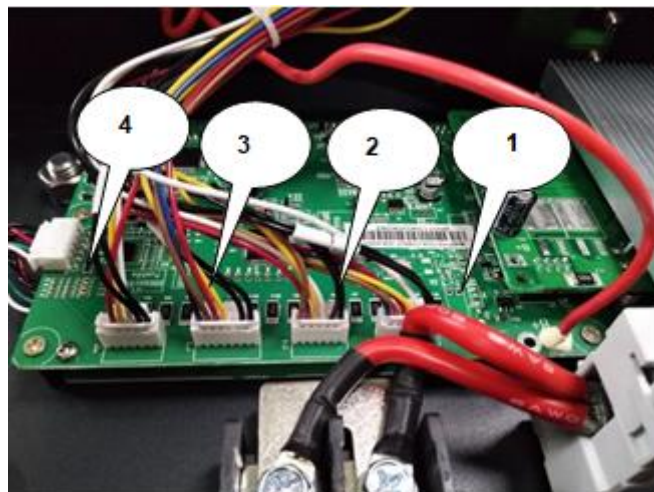
7.   Install the BMS sample cables from the receptacles in the following

order: 1,2,3,4.
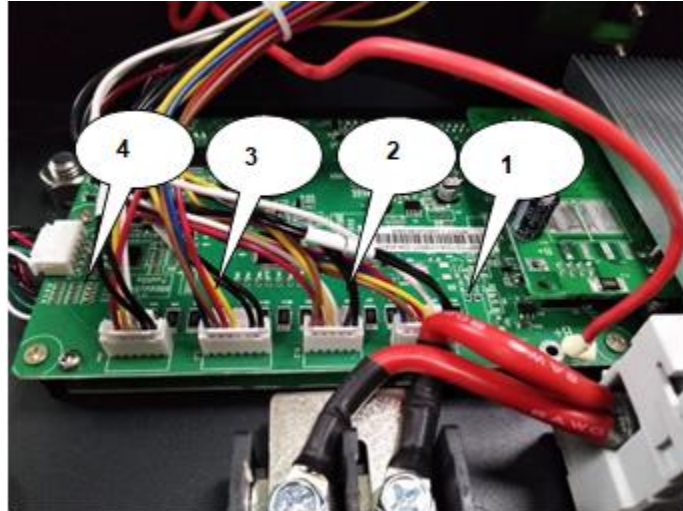
7.   Install the front panel, plate and fastener
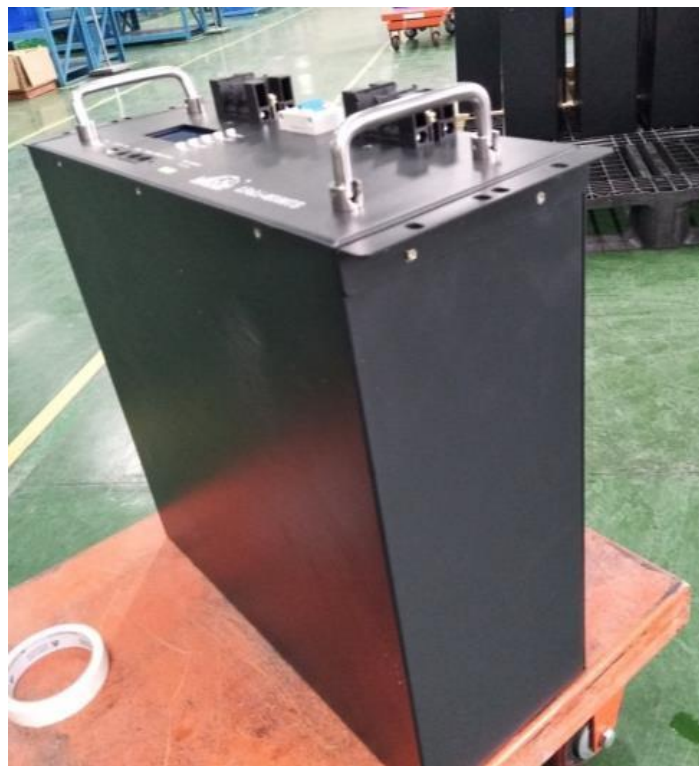
Reset the battery by pressing the reset button for 6 seconds.

APPENDIX
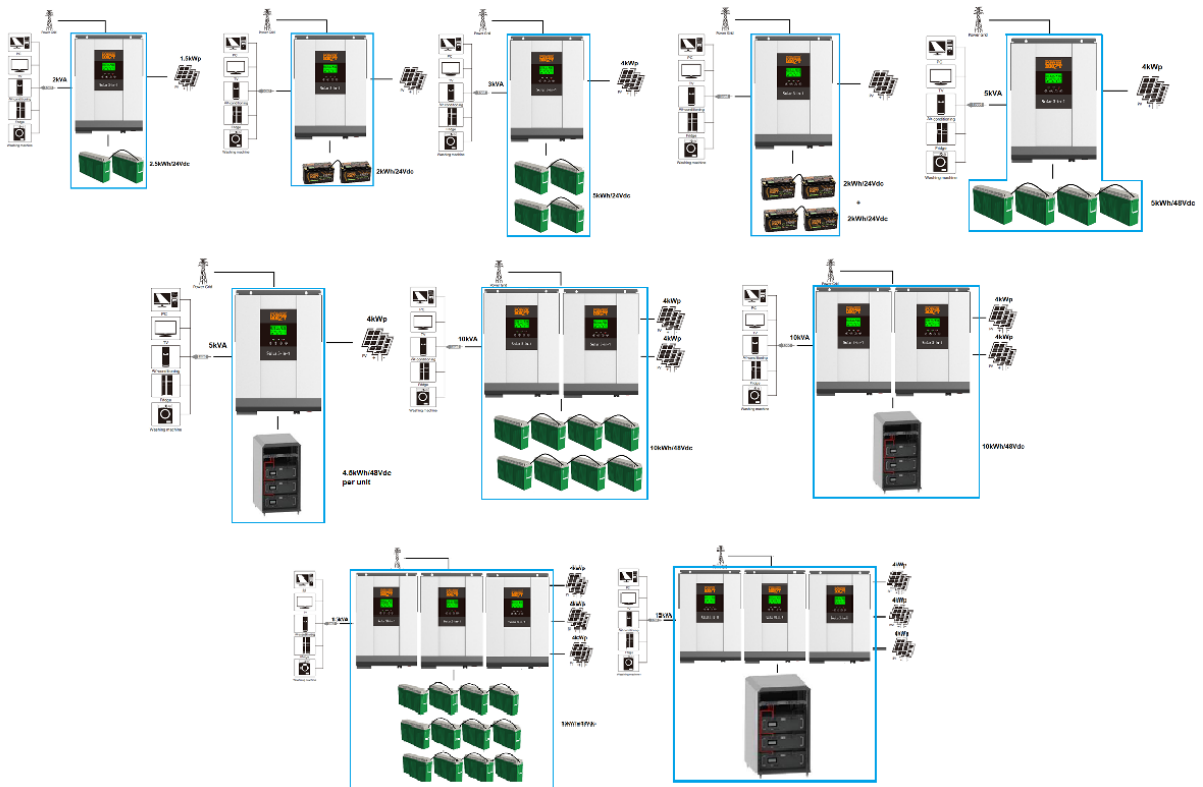
COMPOSITION AND SETTINGS SYSTEMS

PB.UPS.2.2.24
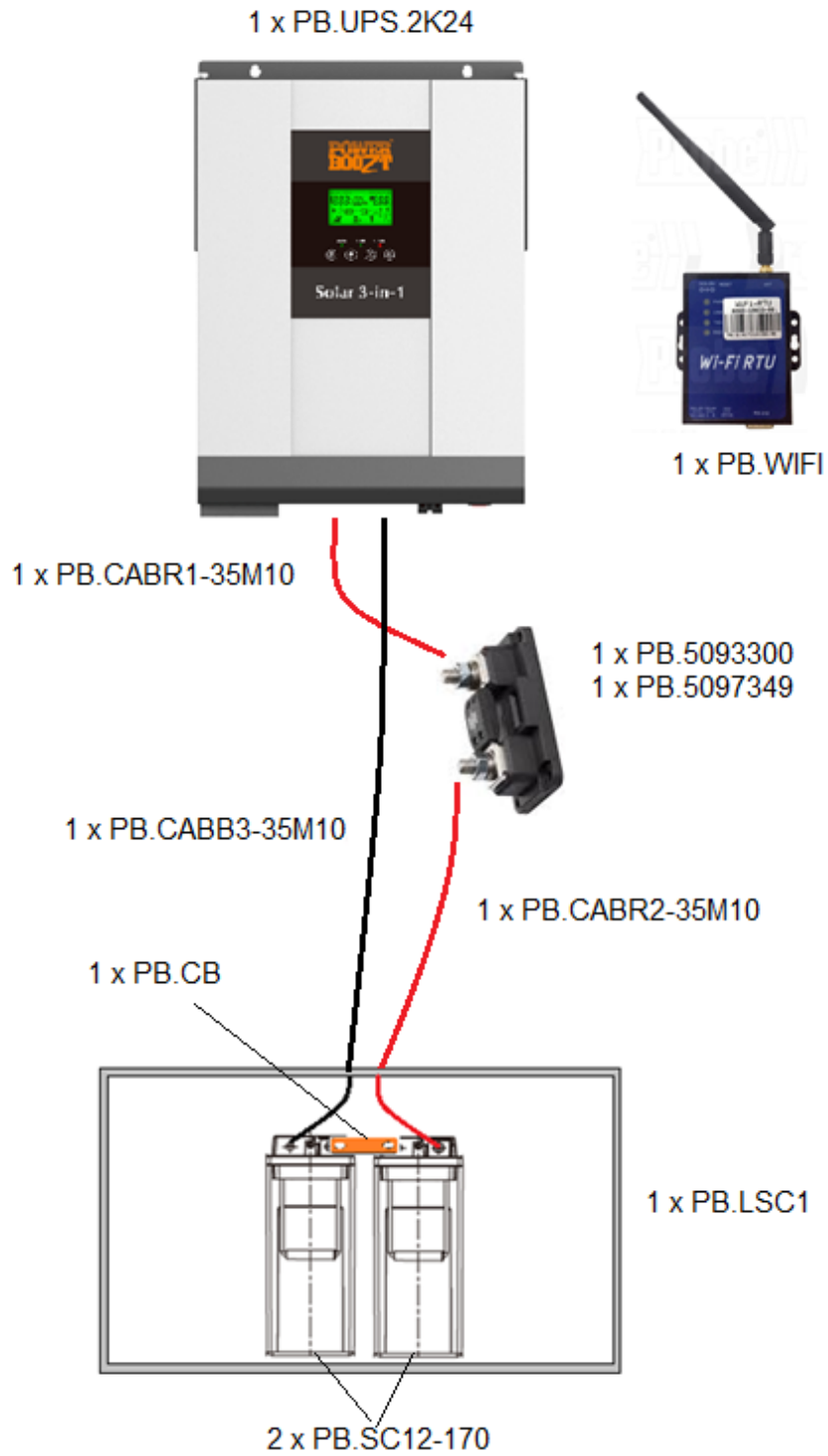
1 x PB.UPS.2K24

1 x PB.WIFI

1 x PB.CABR1-35M10

1 x PB.5093300
1 x PB.5097349

1 x PB.CABB3-35M10

1 x PB.CABR2-35M10

1 x PB.CB

1 x PB.LSC1

2 x PB.SC12-170

Contains: 1 x PB.UPS.2K24: inverter, charger, solarcharger – 2kVA / 24Vdc→230Vac

1 x PB.WIFI: WIFI RTU

1 x PB.CABR1-35M10: red cable 1m, 35mm³ with M10 cable eyes

1 x PB.CABR2-35M10: red cale 2m, 35mm² with M10 cable eyes

1 x PB.CABB3-35M10: black cable 3m, 35mm² with M10 cable eyes

1 x PB.5093300: MEGA fuseholder

1 x PB.5097349-2: MEGA fuses 250A/32V

1 x PB.SC12-170: battery lead-acid AGM 12V-170Ah(C10)

1 x PB.CB: copper connection between batteries PB.SC12-170

1 x PB-LSC1: battery cabinet for 4 pieces PB12-170 with key

PB.LSC.1

700

540

Vooraanzicht - Vue de face
Front view - Vorderansicht

700

Zijaanzicht - Vue de cöté
Side view - Seitenansicht

Ø22

115

100

700

700

Bovenaazicht - Vue de dessus
Top view - Ansicht von oben

PB.SC12-170

560±2

304.5±2

320±2

529±2

126±2

124±2

204±2
241±2

M8

PB.UPS.2K24

272

97   97

Solar Inverter

355

100

PB.UPS.3.5.24

1 x PB.UPS.3K24

1 x PB.WIFI

1 x PB.CABR1-35M10

1 x PB.5097349-2
1 x PB.5093300

1 x PB.CABB3-35M10

1 x PB.CABR2-35M10

2 x CABB0.3-35M10

2 x PB.CB

1 x PB.LSC1

4 x PB.SC12-170

Contains:
- 1 x PB.UPS.2K24: inverter, charger, solar charger – 3kVA / 24Vdc→230Vac
- 1 x PB.WIFI: WIFI RTU
- 1 x PB.CABR1-35M10: red cable 1m, 35mm³ with M10 cable eyes
- 1 x PB.CABR2-35M10: red cable 2m, 35mm² with M10 cable eyes
- 1 x PB.CABB3-35M10: black cable 3m, 35mm² with M10 cable eyes
- 2 x PB.CABB0.3-35M10: black cable 0.3m, 35mm² with M10 cable eyes
- 1 x PB.5093300: MEGA fuseholder
- 1 x PB.5097349-2: MEGA fuses 250A/32V
- 1 x PB.SC12-170: battery lead-acid AGM 12V-170Ah(C10)
- 2 x PB.CB: copper connection between batteries PB.SC12-170
- 1 x PB-LSC1: battery cabinet for 4 pieces PB12-170 with key
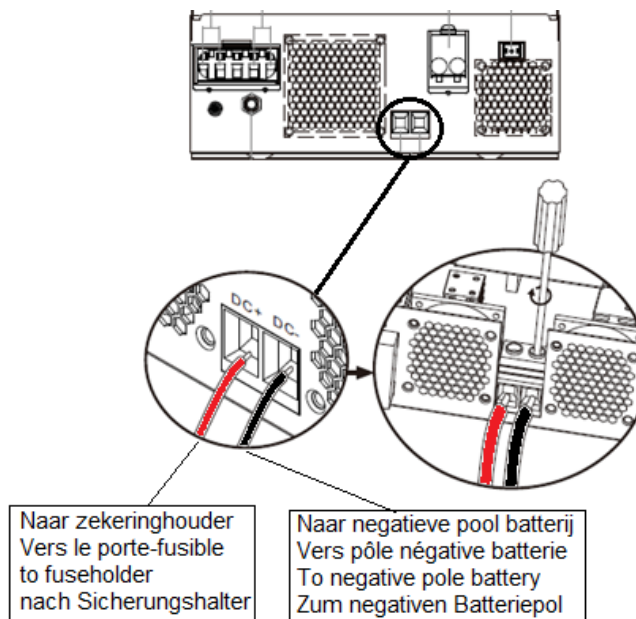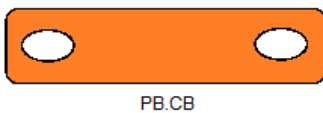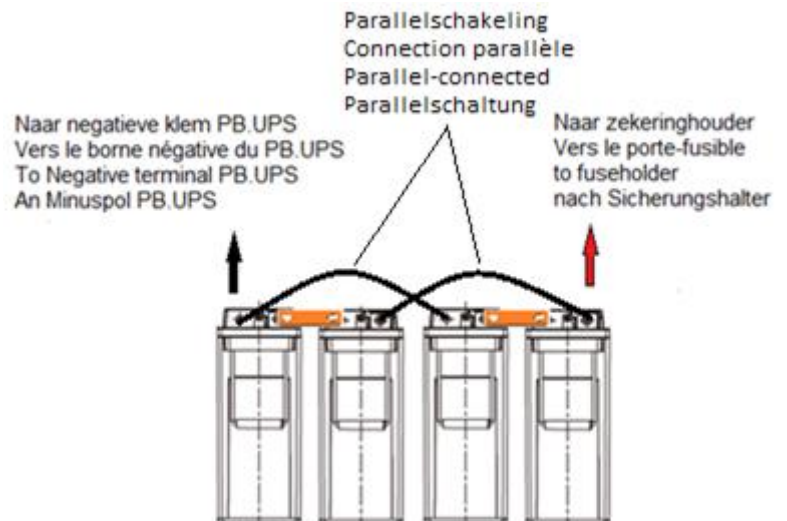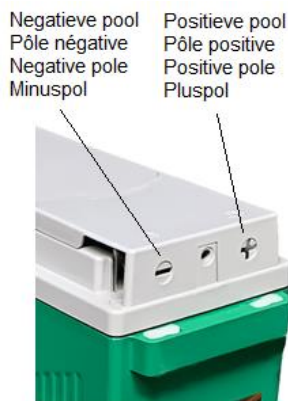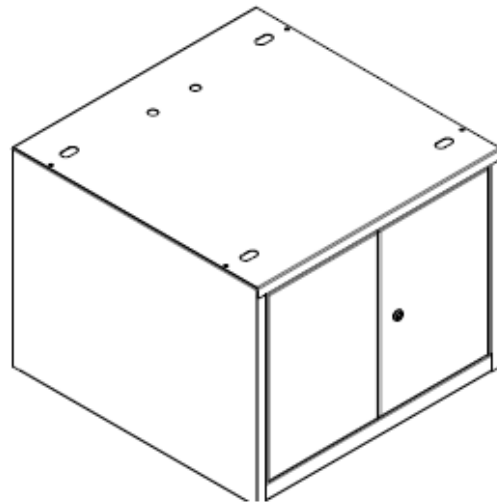
PB.LSC.1 – dimensions in mm
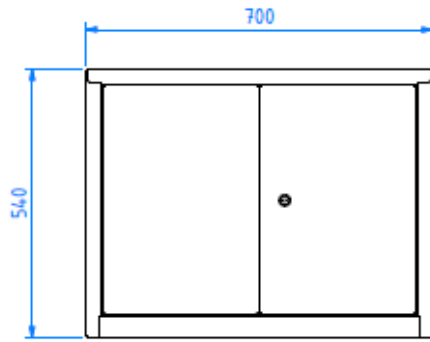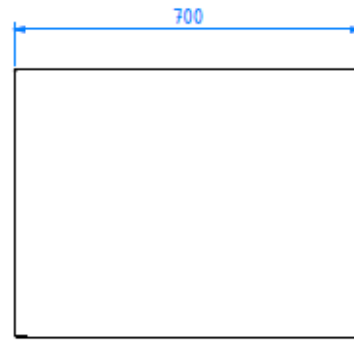
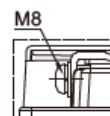**Vooraanzicht - Vue de face**
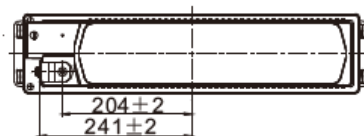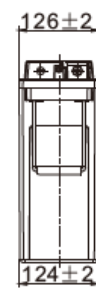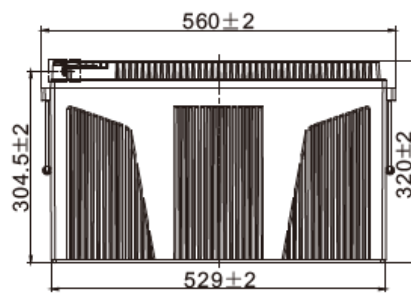**Front view - Vorderansicht**

Zijaanzicht - Vue de cöté
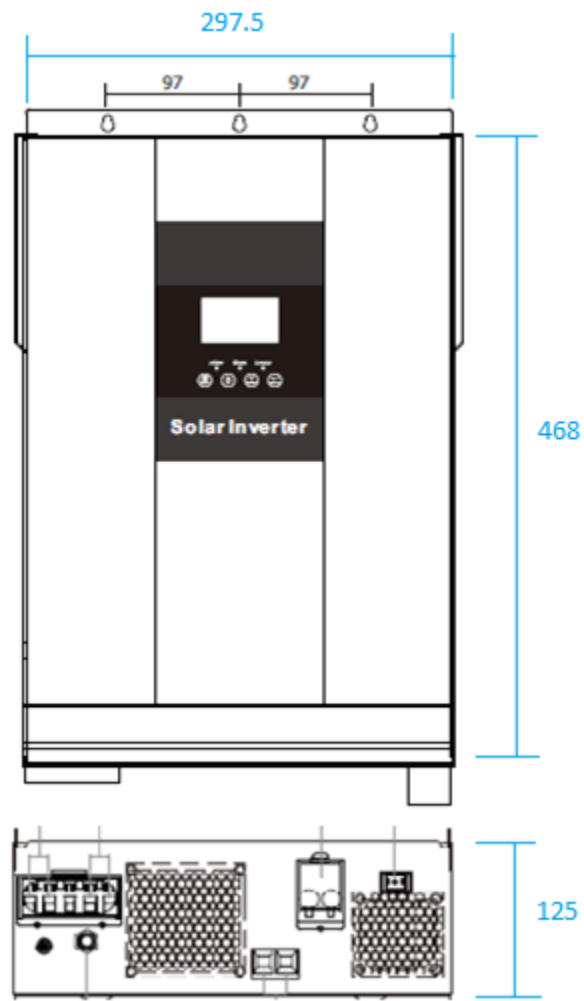**Side view - Seitenansicht**
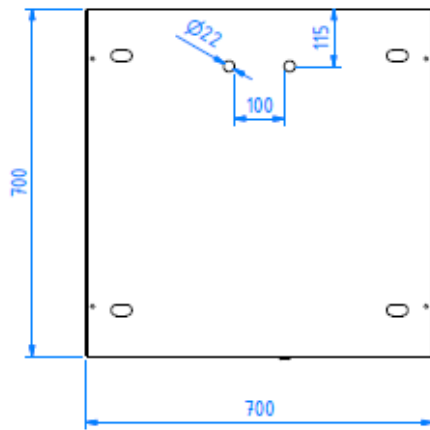
Bovenaazicht - Vue de dessus
Top view - Ansicht von oben
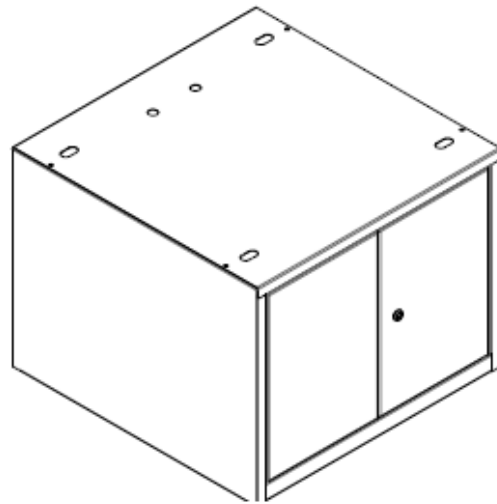
PB.SC12-170 - dimensions in mm
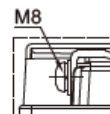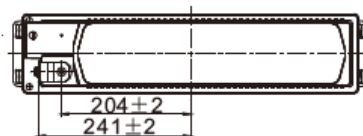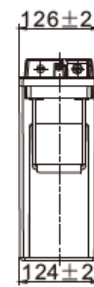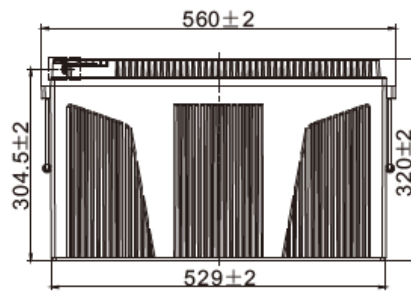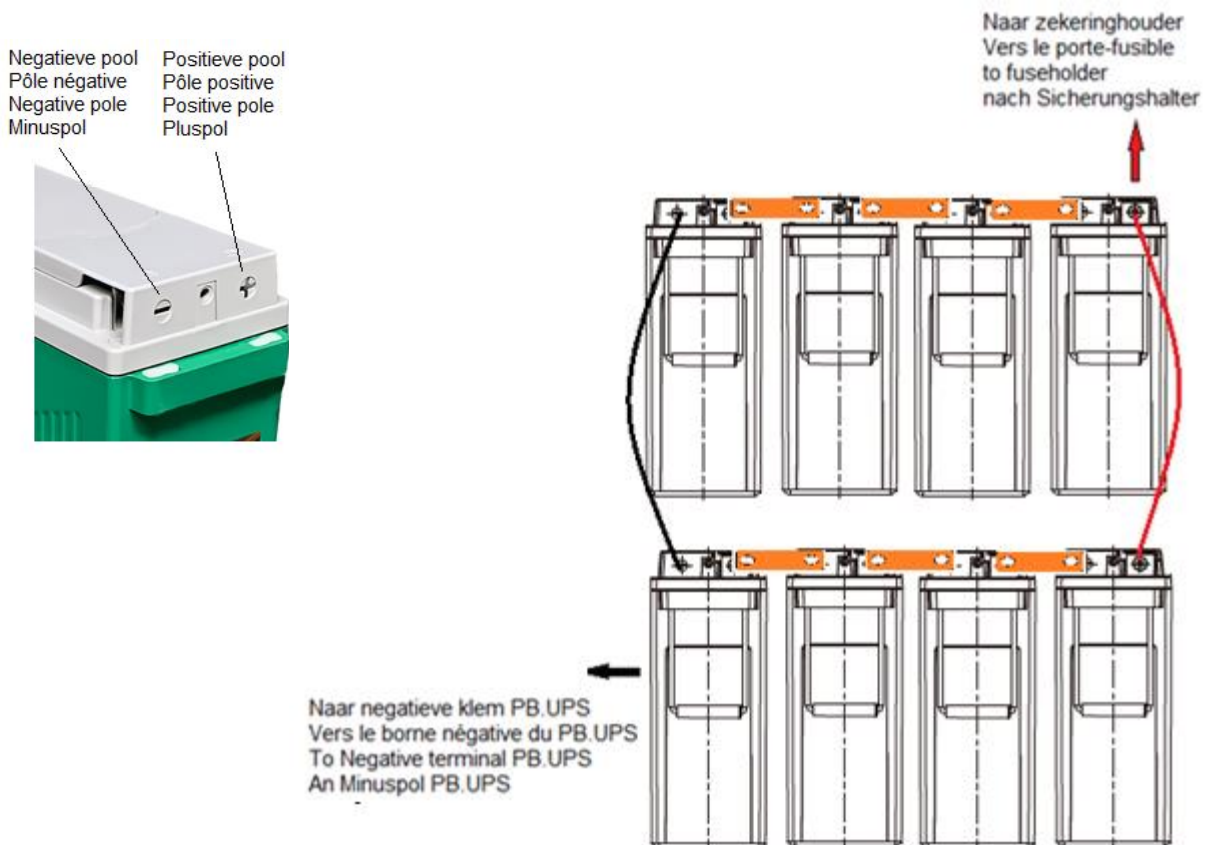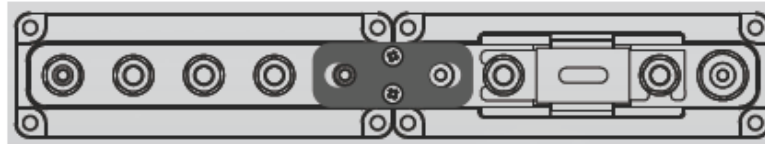
PB.UPS.3K24 – dimensions in mm
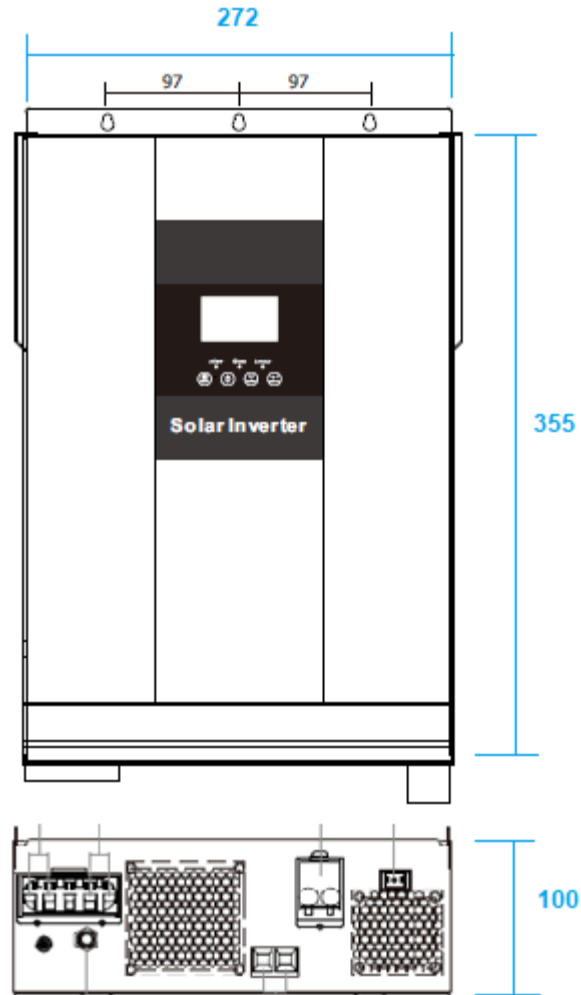
PB.UPS.5.5.48
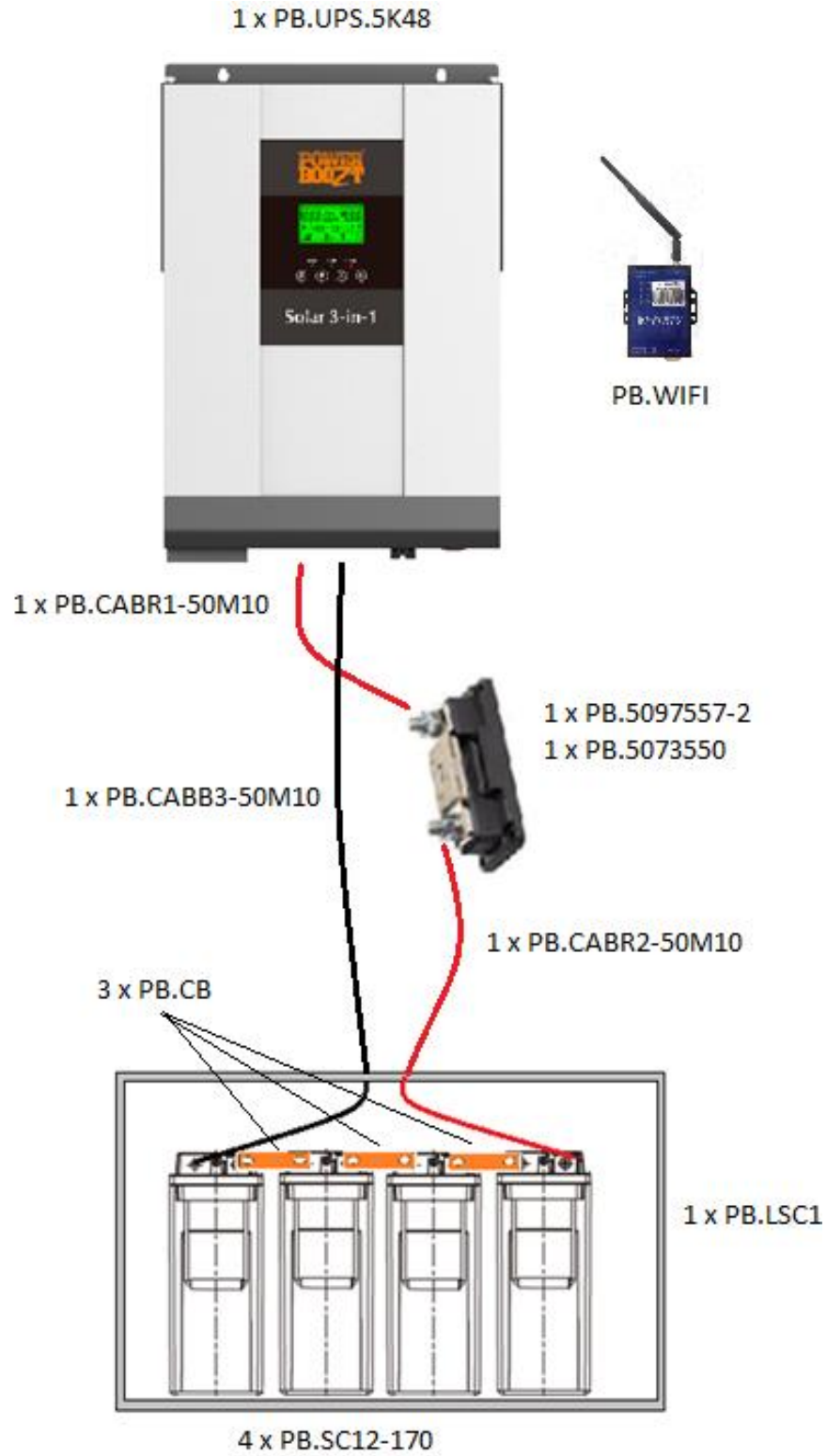
1 x PB.UPS.5K48

PB.WIFI

1 x PB.CABR1-50M10

1 x PB.5097557-2
1 x PB.5073550

1 x PB.CABB3-50M10

1 x PB.CABR2-50M10

3 x PB.CB

1 x PB.LSC1

4 x PB.SC12-170

Contains:
- 1 x PB.UPS.5K48: inverter, charger, solar charger – 5kVA / 48Vdc→230Vac
- 1 x PB.WIFI: WIFI RTU
- 1 x PB.CABR1-50M10: red cable 1m, 50mm³ with M10 cable eyes
- 1 x PB.CABR2-50M10: red cable 2m, 50mm² with M10 cable eyes
- 1 x PB.CABB3-50M10: black cable 3m, 50mm² with M10 cable eyes
- 1 x PB.5073550: ANL fuseholder
- 1 x PB.5097557-2: ANL fuses 250A/32V
- 4 x PB.SC12-170: battery lead-acid AGM 12V-170Ah(C10)
- 3 x PB.CB: copper connection between batteries PB.SC12-170
- 1 x PB-LSC1: battery cabinet for 4 pieces PB12-170 with key

Negatieve pool / Pôle négative / Negative pole / Minuspol

Positieve pool / Pôle positive / Positive pole / Pluspol
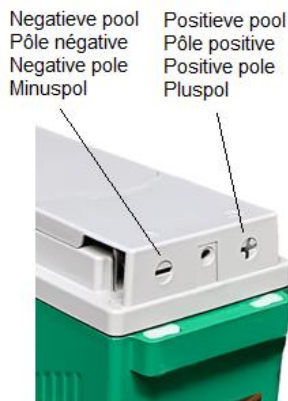
Naar negatieve klem PB.UPS / Vers le borne négative du PB.UPS / To Negative terminal PB.UPS / An Minuspol PB.UPS

Naar zekeringhouder / Vers le porte-fusible to fuseholder / nach Sicherungshalter
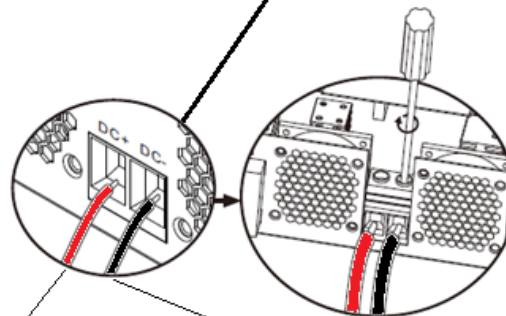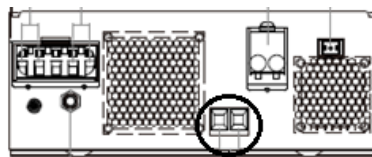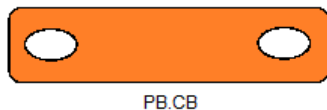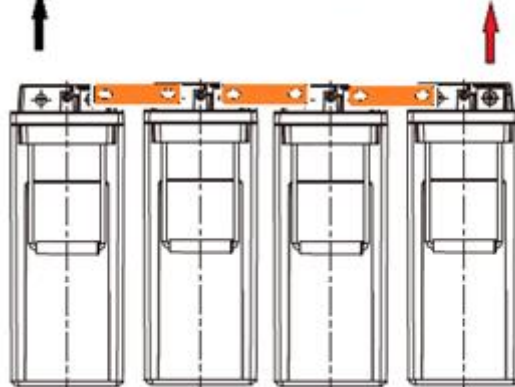
PB.CB

DC+ DC-

Naar zekeringhouder / Vers le porte-fusible to fuseholder / nach Sicherungshalter

Naar negatieve pool batterij / Vers pôle négative batterie / To negative pole battery / Zum negativen Batteriepol

PB.LSC.1 – dimensions in mm
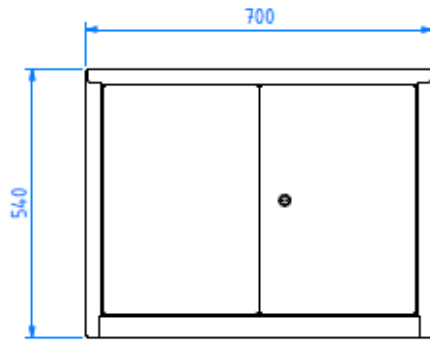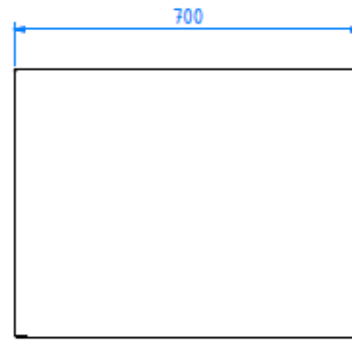
Vooraanzicht - Vue de face
Front view - Vorderansicht

Zijaanzicht - Vue de côté
Side view - Seitenansicht

Bovenaazicht - Vue de dessus
Top view - Ansicht von oben

PB.SC12-170 – dimensions in mm

PB.UPS.5K48 – dimensions in mm

PB.UPS.10.10.48

2 x PB.UPS.5K48

PB.WIFI

2 x PB.CABR1-50M10

2 x CABB1-50M10

1 x PB.5073180

PB.PARALLEL

1 x PB.5079062

1 x PB.5073180

1 x PB.5097557-2
1 x PB.5073550

6 x PB.CB

1 x PB.CABB2-70M10

1 x PB.CABR2-70M10

1 x PB.CABB1-70M10

1 x PB.CABB1-70M10

1 x PB.LSC2
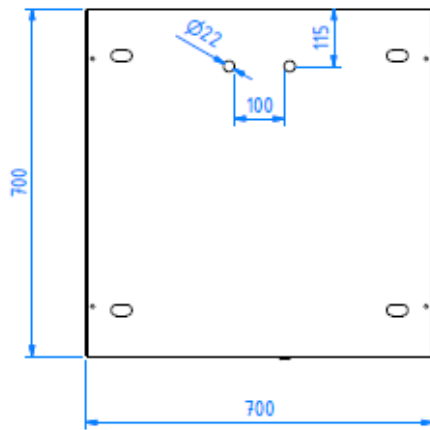
8 x PB.SC12-170
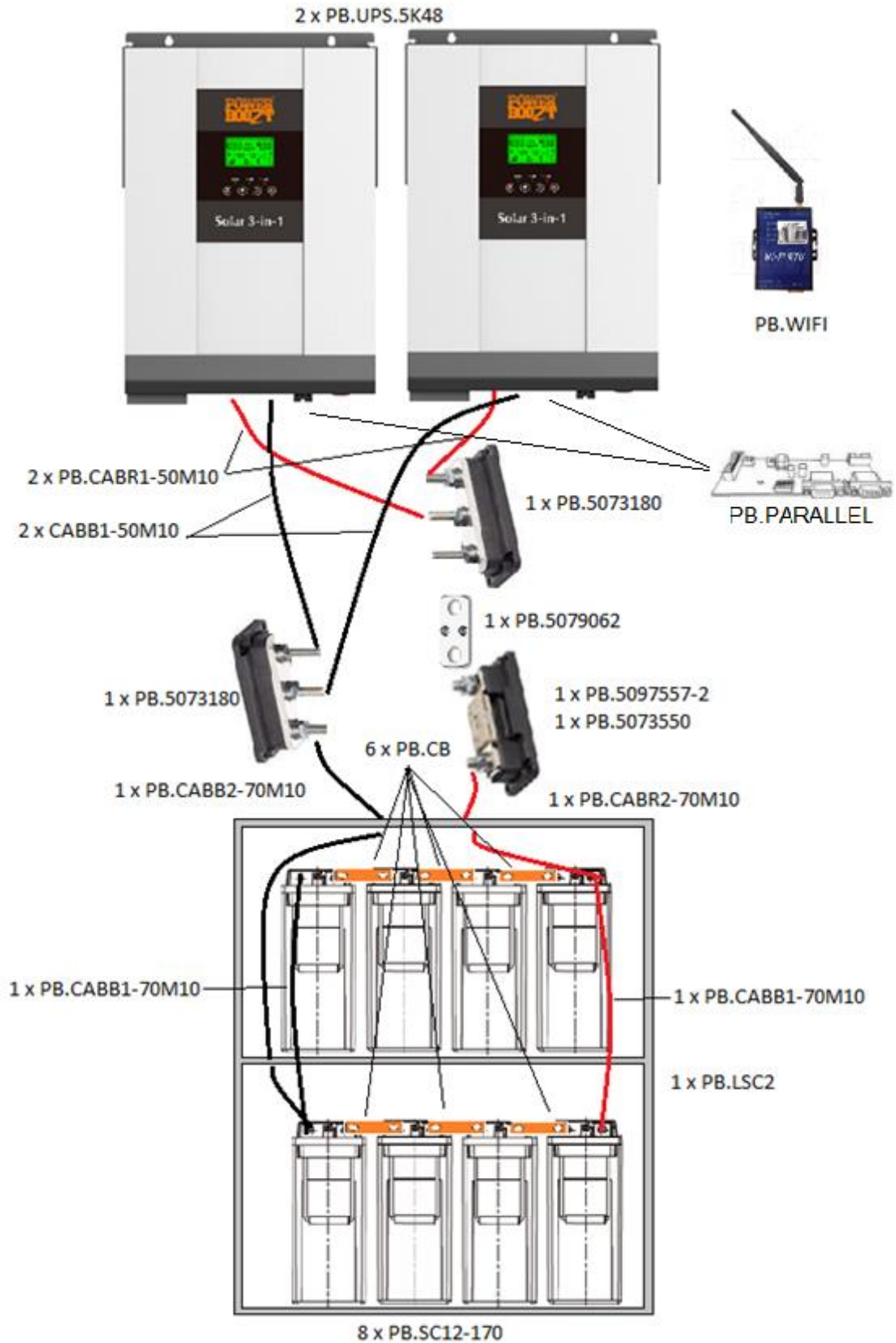
Contains: 2 x PB.UPS.5K48: inverter, charger, solar charger – 5kVA / 48Vdc→230Vac

1 x PB.WIFI: WIFI RTU

2 x PB.PARALLEL: circuit board for parallel communication

2 x PB.CABR1-50M10: red cable 1m, 50mm³ with M10 cable eyes

2 x PB.CABR2-50M10: red cable 2m, 50mm² with M10 cable eyes

1 x PB.CABB2-70M10: black cable 3m, 70mm² with M10 cable eyes

1 x PB.CABR2-70M10: red cable 2m, 70mm² with M10 cable eyes

1 x PB.CABB1-70M10: black cable, 70mm² with M10 cable eyes

1 x PB.CABR1-70M10: red cable, 70mm² with M10 cable eyes

1 x PB.5073550: ANL fuseholder

1 x PB.5097557-2: ANL fuses 250A/32V

2 x PB.5073180: busbar with three contacts

1 x PB.5079062: connection between ANL fuse holder and busbar

8 x PB.SC12-170: battery lead-acid AGM 12V-170Ah(C10)

6 x PB.CB: copper connection between batteries PB.SC12-170

1 x PB-LSC2: battery cabinet for 8 pieces PB12-170 with key

Negatieve pool
Pôle négative
Negative pole
Minuspol

Positieve pool
Pôle positive
Positive pole
Pluspol

Naar zekeringhouder
Vers le porte-fusible
to fuseholder
nach Sicherungshalter

Naar negatieve klem PB.UPS
Vers le borne négative du PB.UPS
To Negative terminal PB.UPS
An Minuspol PB.UPS

busbar

Verbinding	Zekeringhouder
Connexion	Porte-fusible
Connection	Fuseholder
Verbindung	Sicherunghalter

PB.CB

DC+ DC-

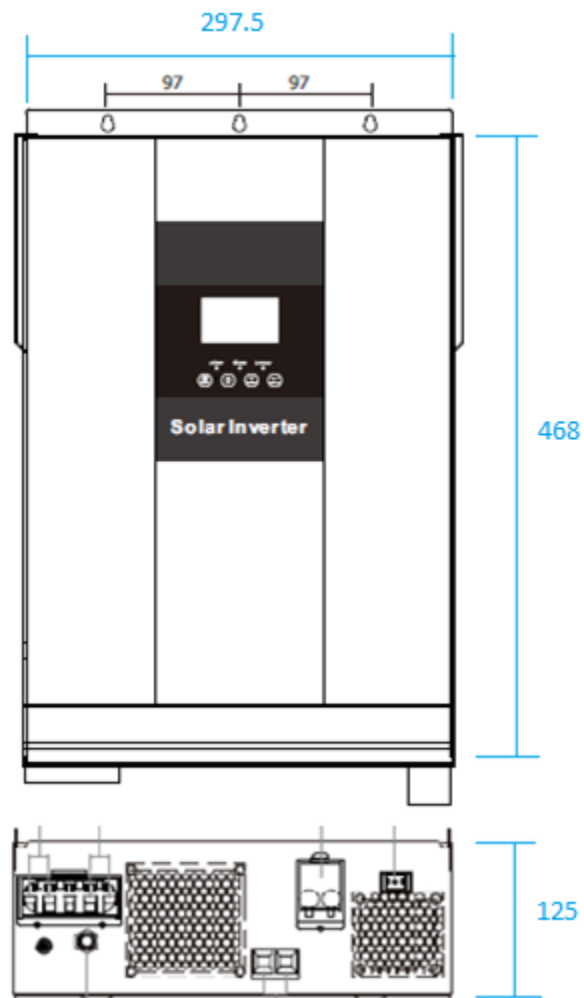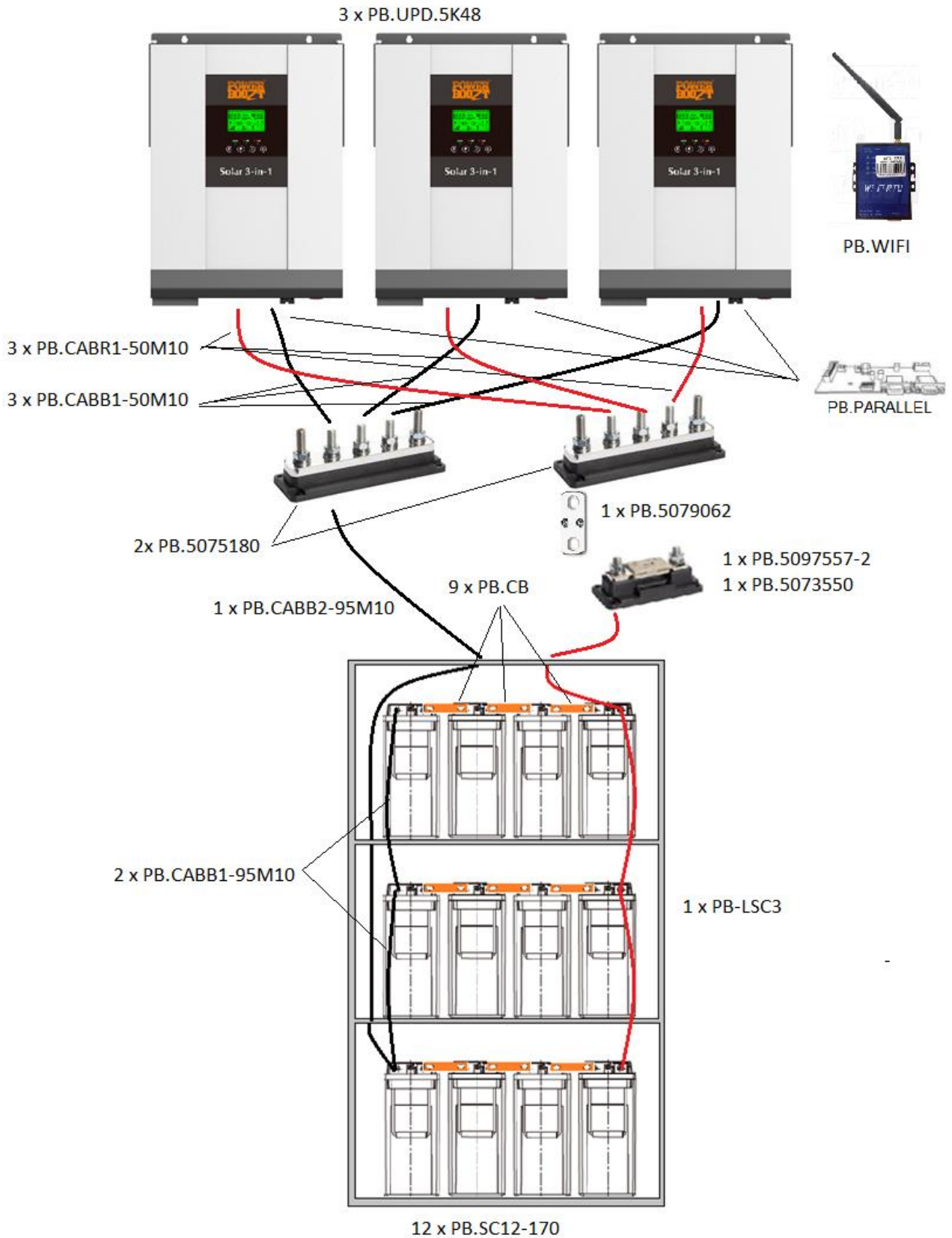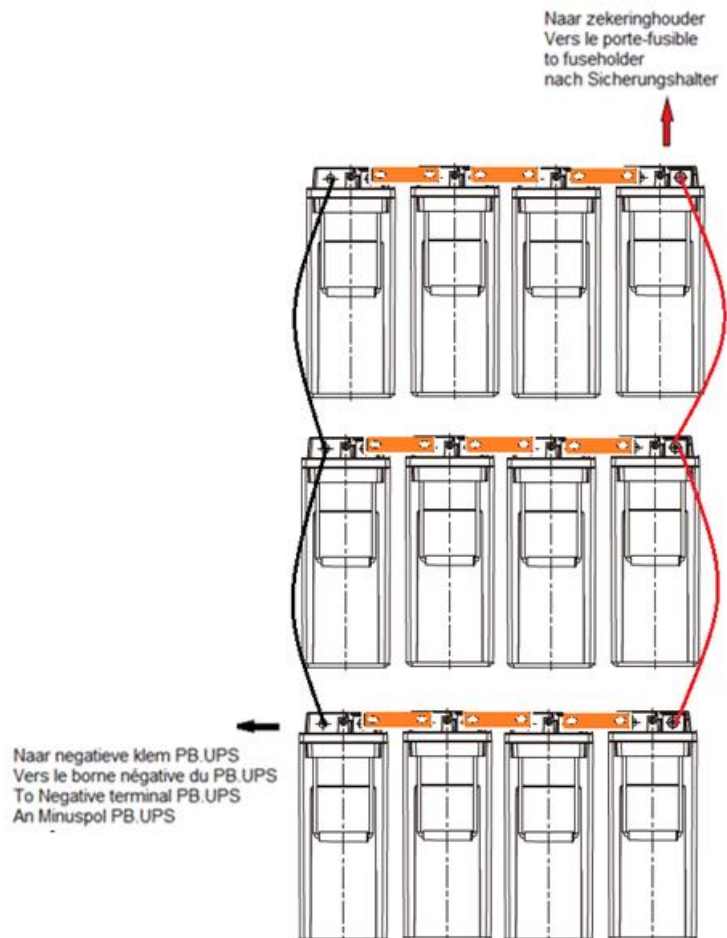| Naar zekeringhouder | Naar negatieve pool batterij |
Vers le porte-fusible	Vers pôle négative batterie
to fuseholder	To negative pole battery
nach Sicherungshalter	Zum negativen Batteriepol

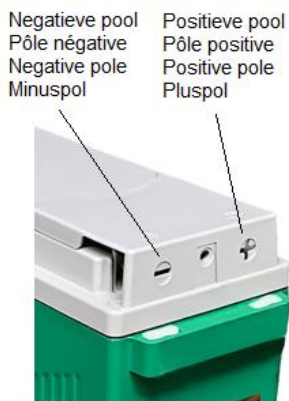PB.LSC.2 – dimensions in mm

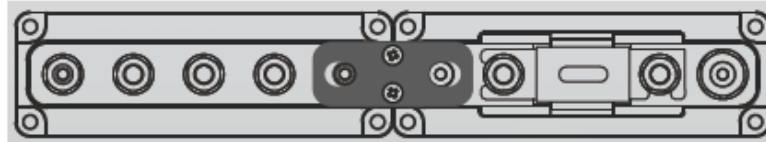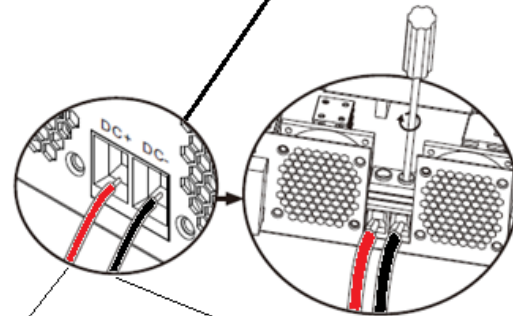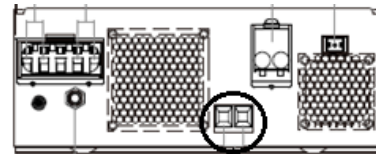B.SC12-170 – dimensions in mm

PB.UPS.5K48 – dimensions in mm

PB.UPS.15.15.48

3 x PB.UPD.5K48

PB.WIFI

3 x PB.CABR1-50M10

3 x PB.CABB1-50M10

PB.PARALLEL

1 x PB.5079062

2x PB.5075180

1 x PB.5097557-2
1 x PB.5073550

9 x PB.CB

1 x PB.CABB2-95M10

2 x PB.CABB1-95M10

1 x PB-LSC3

12 x PB.SC12-170
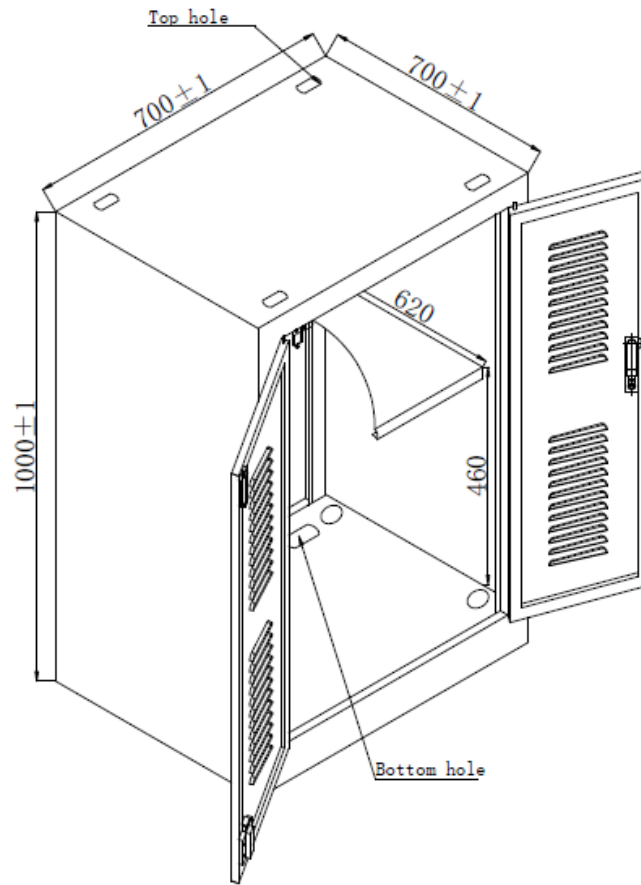
Contains:
3 x PB.UPS.5K48: inverter, charger, solar charger – 5kVA / 48Vdc→230Vac

1 x PB.WIFI: WIFI RTU

3 x PB.PARALLEL: circuit board for parallel communication

3 x PB.CABR1-50M10: red cable 1m, 50mm³ with M10 cable eyes

3 x PB.CABR2-50M10: red cable 2m, 50mm² with M10 cable eyes

1 x PB.CABB2-95M10: black cable 3m, 95mm² with M10 cable eyes

1 x PB.CABR2-95M10: red cable 2m, 95mm² with M10 cable eyes

2 x PB.CABB1-95M10: black cable, 95mm² with M10 cable eyes

2 x PB.CABR1-95M10: red cable, 95mm² with M10 cable eyes

1 x PB.5073550: ANL fuseholder

1 x PB.5097557-2: ANL fuses 250A/32V

2 x PB.5075180: busbar with four contacts

1 x PB.5079062: connection between ANL fuse holder and busbar

12 x PB.SC12-170: battery lead-acid AGM 12V-170Ah(C10)

9 x PB.CB: copper connection between batteries PB.SC12-170

1 x PB-LSC3: battery cabinet for 12 pieces PB12-170 with key

Negatieve pool / Pôle négative / Negative pole / Minuspol
Positieve pool / Pôle positive / Positive pole / Pluspol

Naar zekeringhouder / Vers le porte-fusible / to fuseholder / nach Sicherungshalter

Naar negatieve klem PB.UPS / Vers le borne négative du PB.UPS / To Negative terminal PB.UPS / An Minuspol PB.UPS

busbar

Verbinding	Zekeringhouder
Connexion	Porte-fusible
Connection	Fuseholder
Verbindung	Sicherunghalter

PB.CB

DC+ DC-

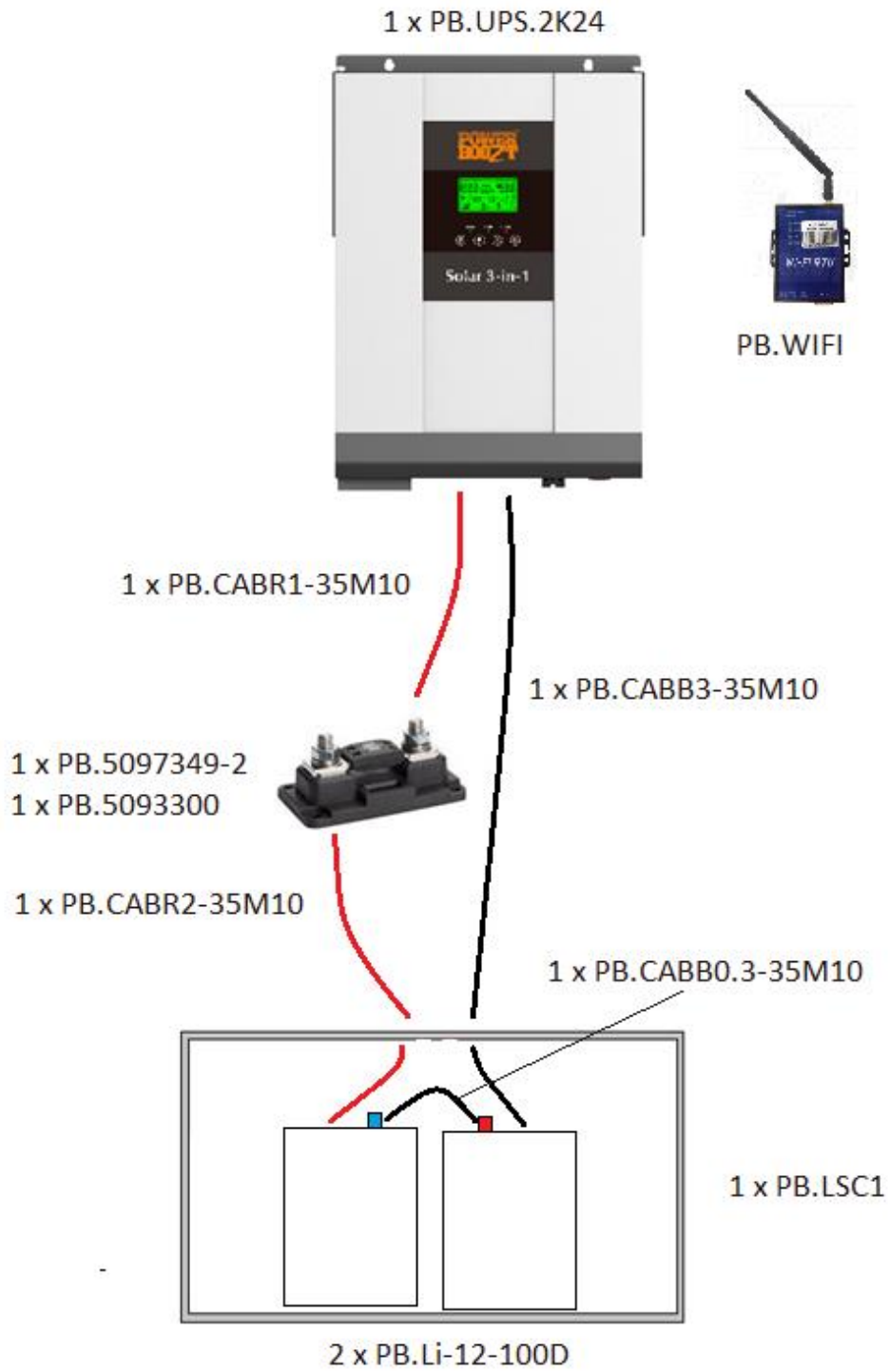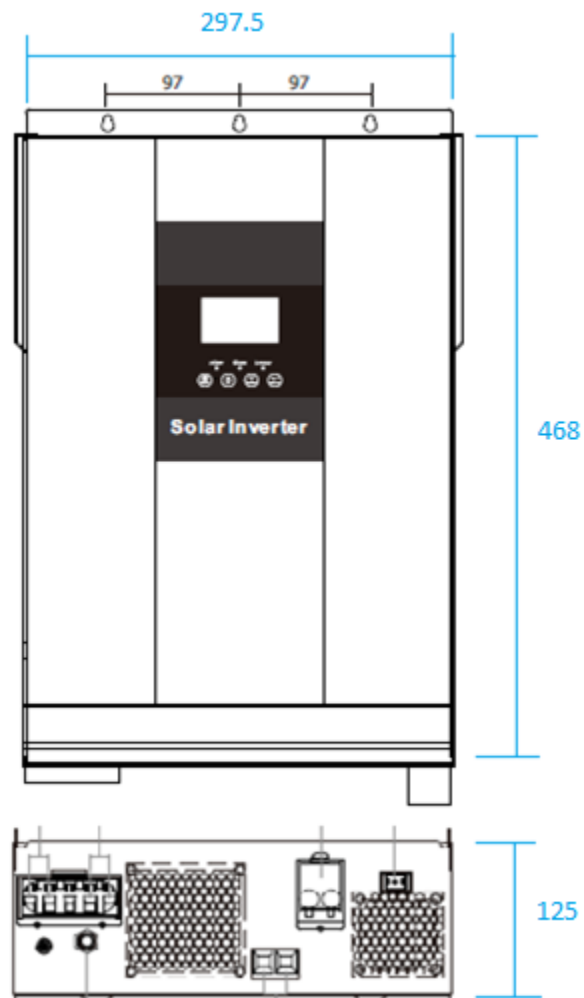| Naar zekeringhouder | Naar negatieve pool batterij |
Vers le porte-fusible	Vers pôle négative batterie
to fuseholder	To negative pole battery
nach Sicherungshalter	Zum negativen Batteriepol

PB.LSC.2 – dimensions in mm

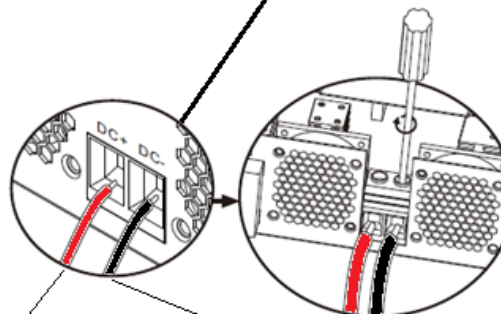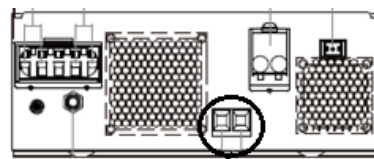B.SC12-170 – dimensions in mm
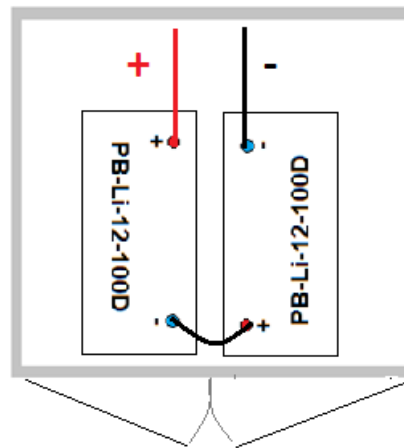
PB.UPS.5K48 – dimensions in mm

PB.UPS.2.2.24.Li

1 x PB.UPS.2K24

PB.WIFI

1 x PB.CABR1-35M10

1 x PB.CABB3-35M10

1 x PB.5097349-2
1 x PB.5093300

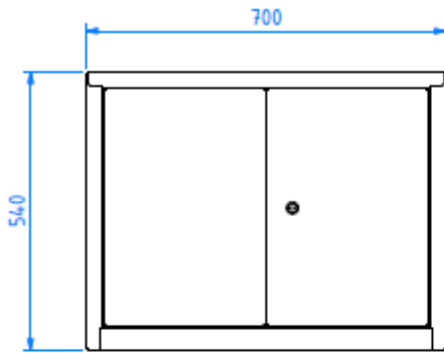1 x PB.CABR2-35M10

1 x PB.CABB0.3-35M10

1 x PB.LSC1

2 x PB.Li-12-100D

Contains:
1 x PB.UPS.2K24: inverter, charger, solar charger – 2kVA / 24Vdc→230Vac

1 x PB.WIFI: WIFI RTU

1 x PB.CABR1-35M10: red cable 1m, 35mm³ with M10 cable eyes

1 x PB.CABR2-35M10: red cable 2m, 35mm² with M10 cable eyes

1 x PB.CABB3-35M10: black cable 3m, 35mm² with M10 cable eyes

1 x PB.CABB0.3-35M10: black cable 0.3m, 35mm² with M10 cable eyes

1 x PB.5093300: MEGA fuseholder

1 x PB.5097349-2: MEGA fuses 250A/32V

2 x PB.Li-12-100D: battery LiFePo4 - 12V-107Ah

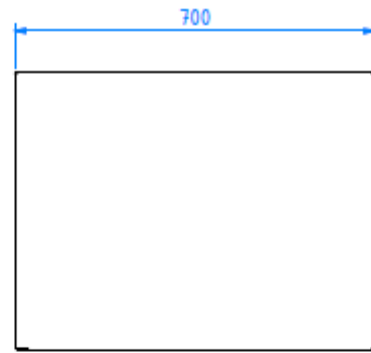1 x PB-LSC1: battery cabinet for 2 pieces PB.Li-12-100D with key

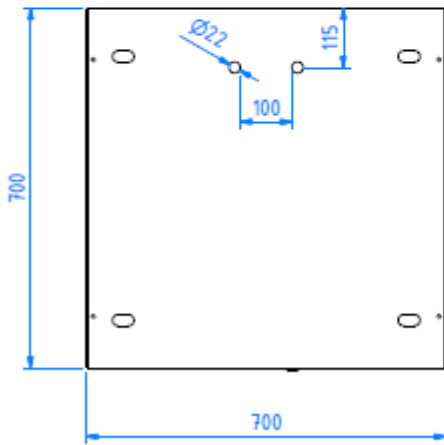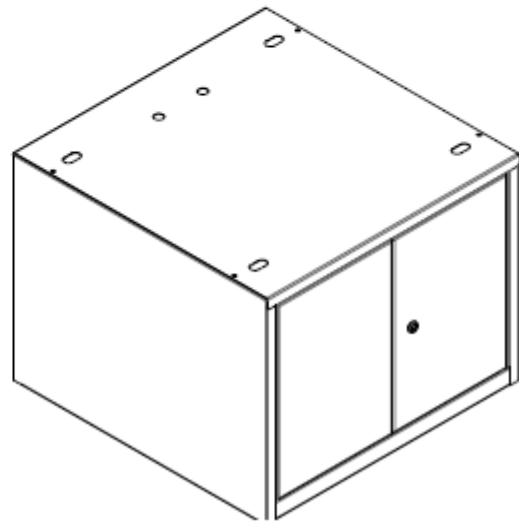| Naar zekeringhouder	Naar negatieve pool batterij
Vers le porte-fusible	Vers pôle négative batterie
to fuseholder	To negative pole battery
nach Sicherungshalter	Zum negativen Batteriepol

PB.LSC.1

Vooraanzicht - Vue de face
Front view - Vorderansicht

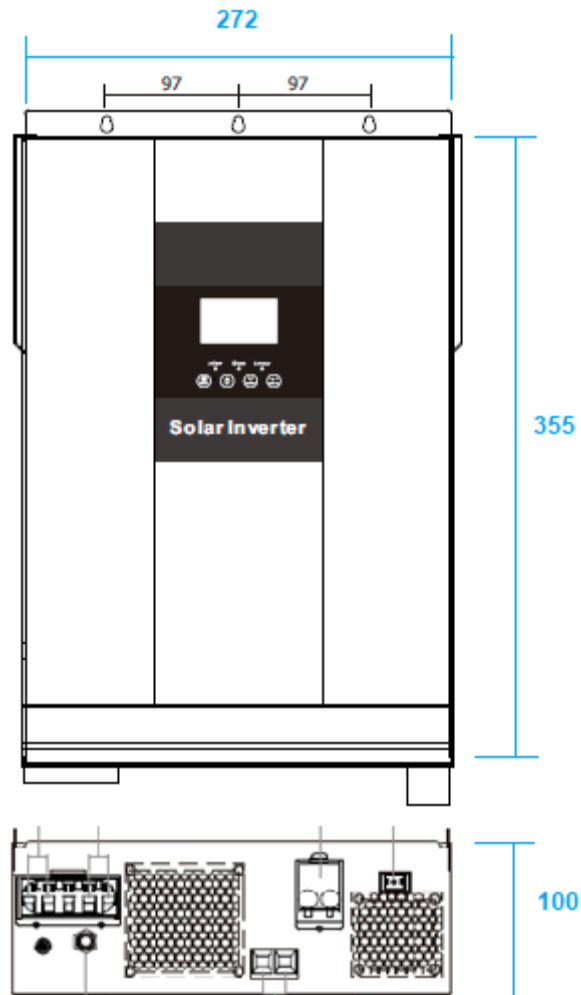**Zijaanzicht - Vue de cöté**
Side view - Seitenansicht

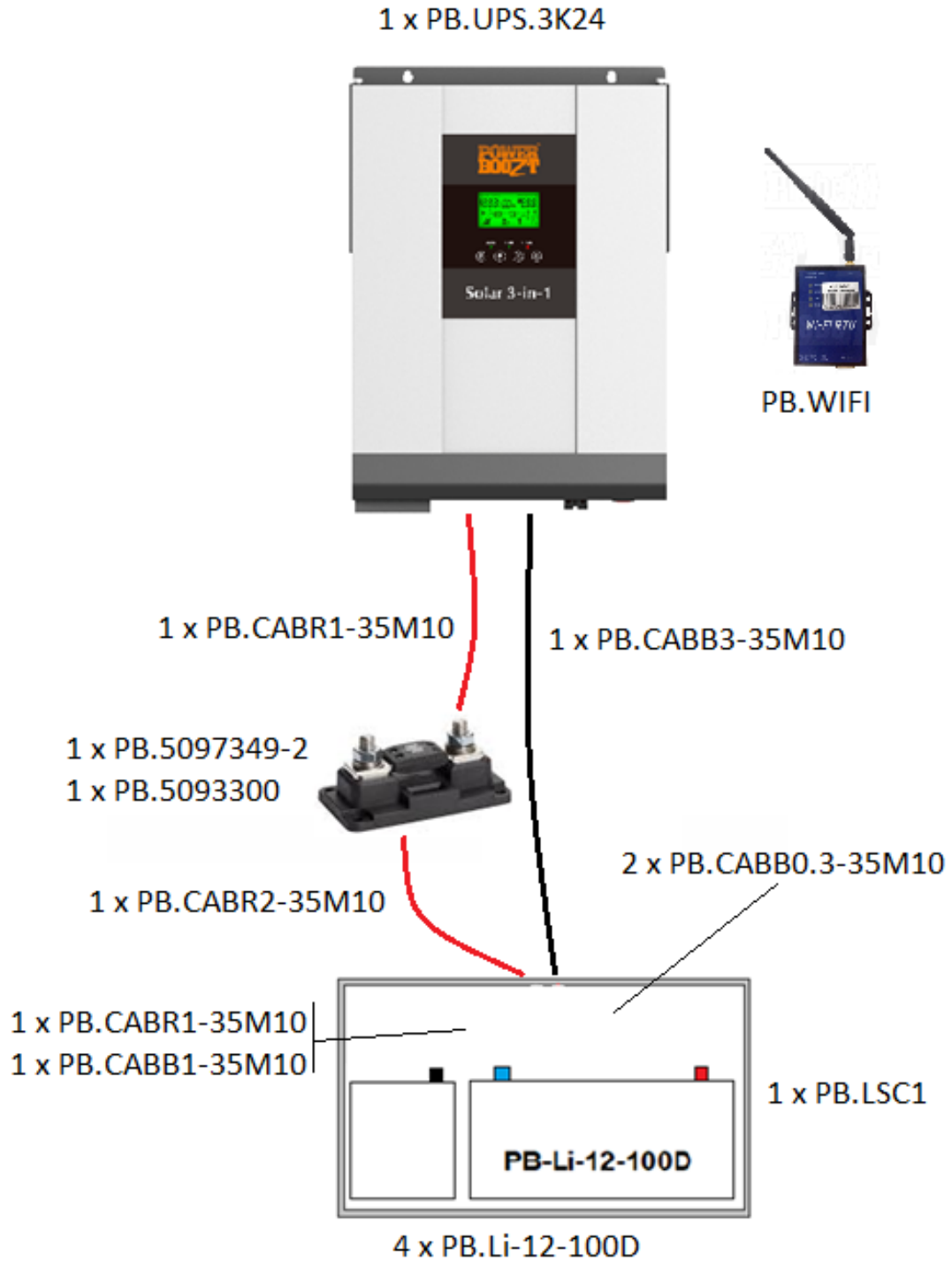**Bovenaazicht - Vue de dessus**
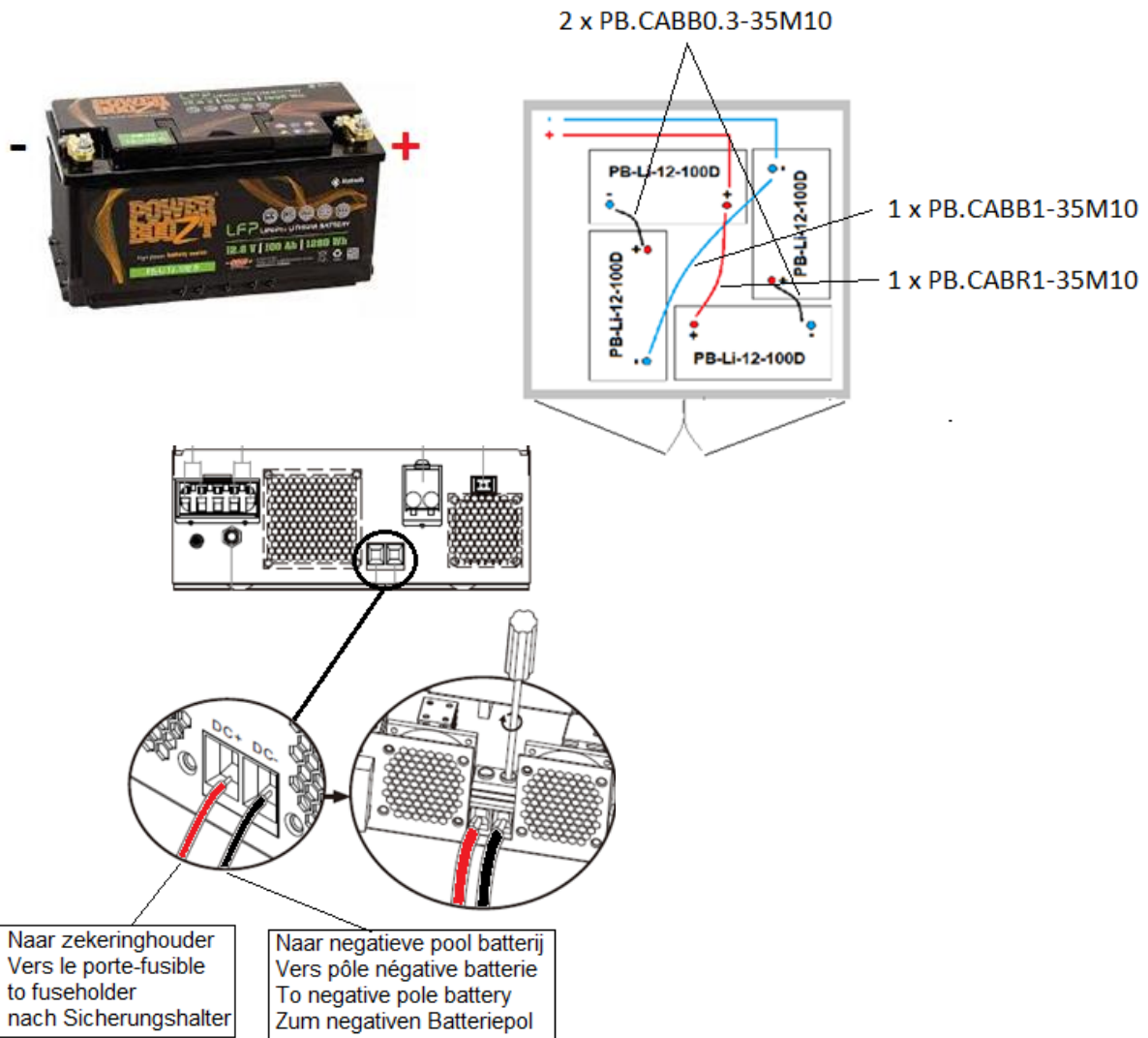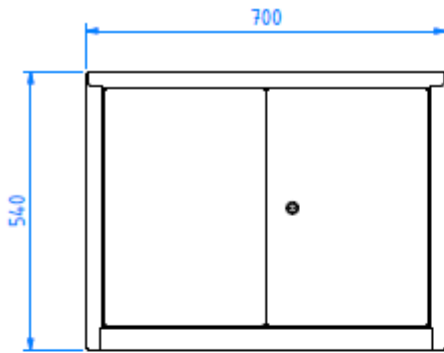**Top view - Ansicht von oben**

PB.Li-12-100D

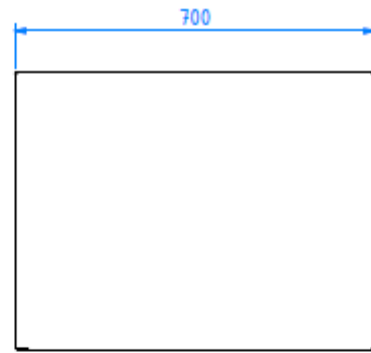PB.UPS.2K24

PB.UPS.3.5.24.Li

1 x PB.UPS.3K24

PB.WIFI

1 x PB.CABR1-35M10

1 x PB.CABB3-35M10

1 x PB.5097349-2
1 x PB.5093300

2 x PB.CABB0.3-35M10

1 x PB.CABR2-35M10

1 x PB.CABR1-35M10
1 x PB.CABB1-35M10

1 x PB.LSC1

PB-Li-12-100D

4 x PB.Li-12-100D

Contains:
1 x PB.UPS.2K24: inverter, charger, solar charger – 2kVA / 24Vdc→230Vac

1 x PB.WIFI: WIFI RTU

3 x PB.CABR1-35M10: red cable 1m, 35mm³ with M10 cable eyes

1 x PB.CABR2-35M10: red cable 2m, 35mm² with M10 cable eyes

1 x PB.CABB3-35M10: black cable 3m, 35mm² with M10 cable eyes

1 x PB.CABB1-35M10: black cable 1m, 35mm² with M10 cable eyes

2 x PB.CABB0.3-35M10: black cable 0.3m, 35mm² with M10 cable eyes

1 x PB.5093300: MEGA fuseholder

1 x PB.5097349-2: MEGA fuses 250A/32V

4 x PB.Li-12-100D: battery LiFePo4 - 12V-107Ah

1 x PB-LSC1: battery cabinet for 2 pieces PB.Li-12-100D with key

2 x PB.CABB0.3-35M10

PB-Li-12-100D

PB-Li-12-100D

PB-Li-12-100D

PB-Li-12-100D

1 x PB.CABB1-35M10

1 x PB.CABR1-35M10

DC+ DC-

Naar zekeringhouder	Naar negatieve pool batterij
Vers le porte-fusible	Vers pôle négative batterie
to fuseholder	To negative pole battery
nach Sicherungshalter	Zum negativen Batteriepol

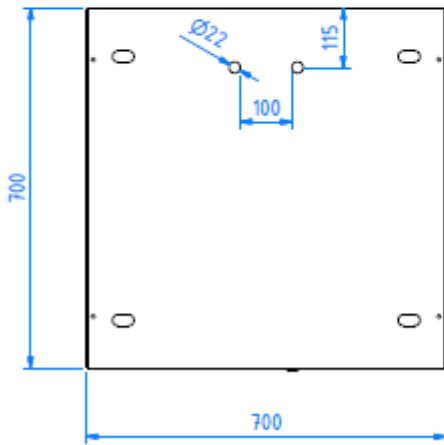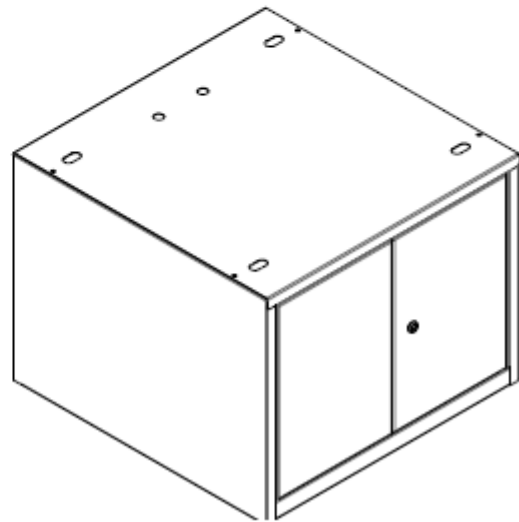PB.LSC.1

Vooraanzicht - Vue de face
Front view - Vorderansicht

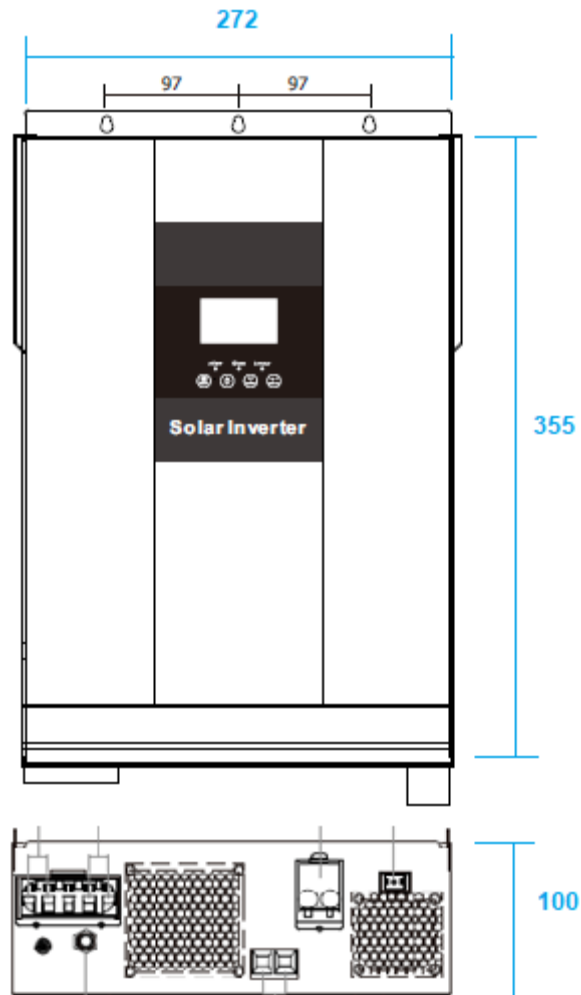**Zijaanzicht - Vue de cöté**
Side view - Seitenansicht

Bovenaazicht - Vue de dessus
Top view - Ansicht von oben

PB.Li-12-100D
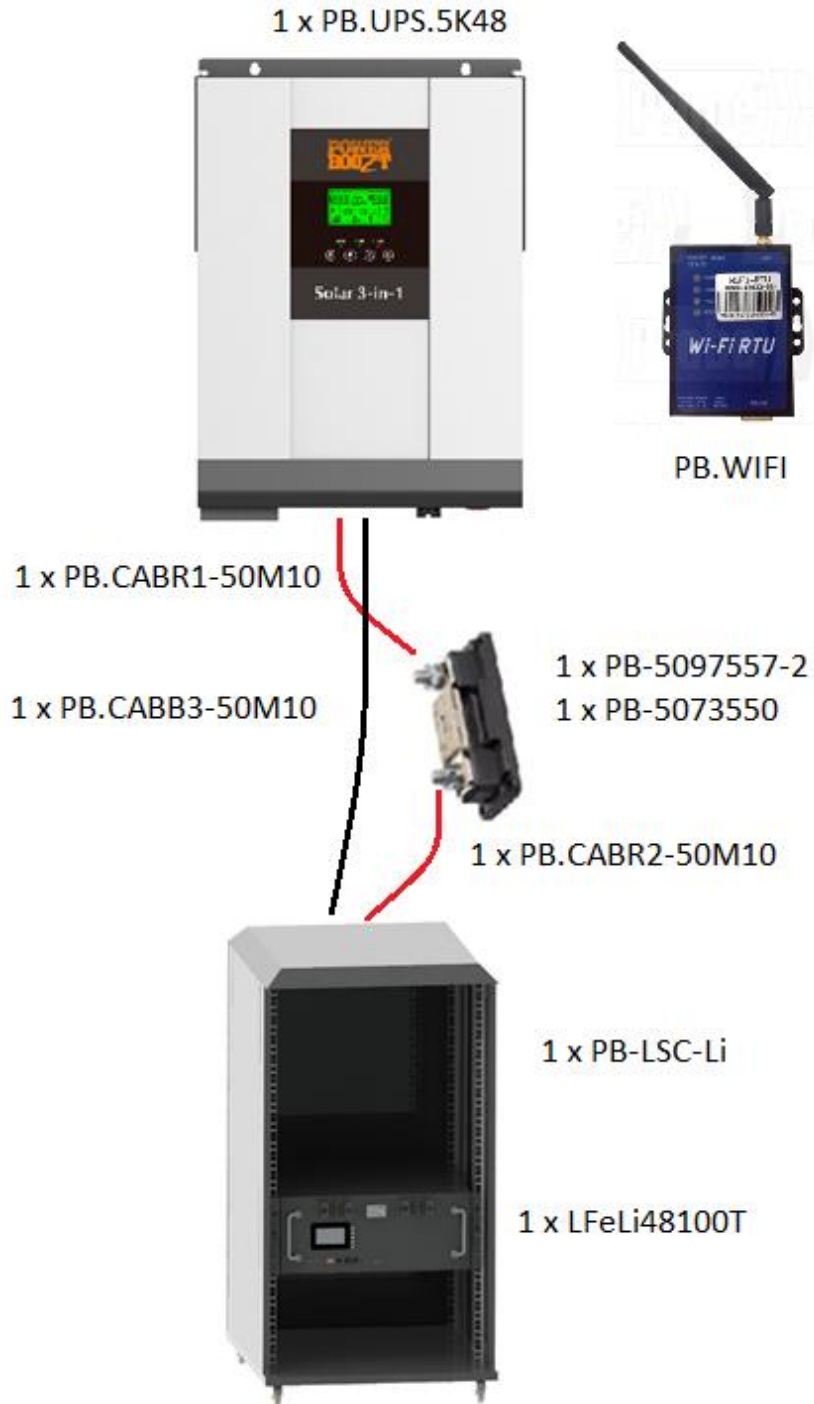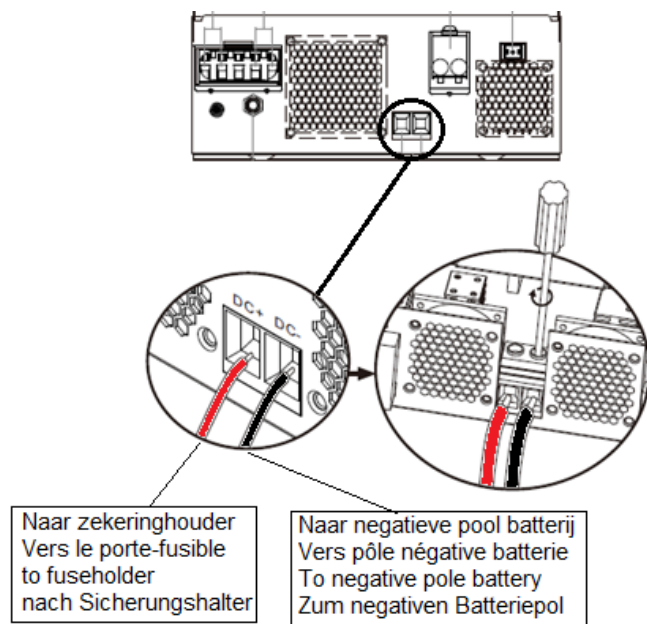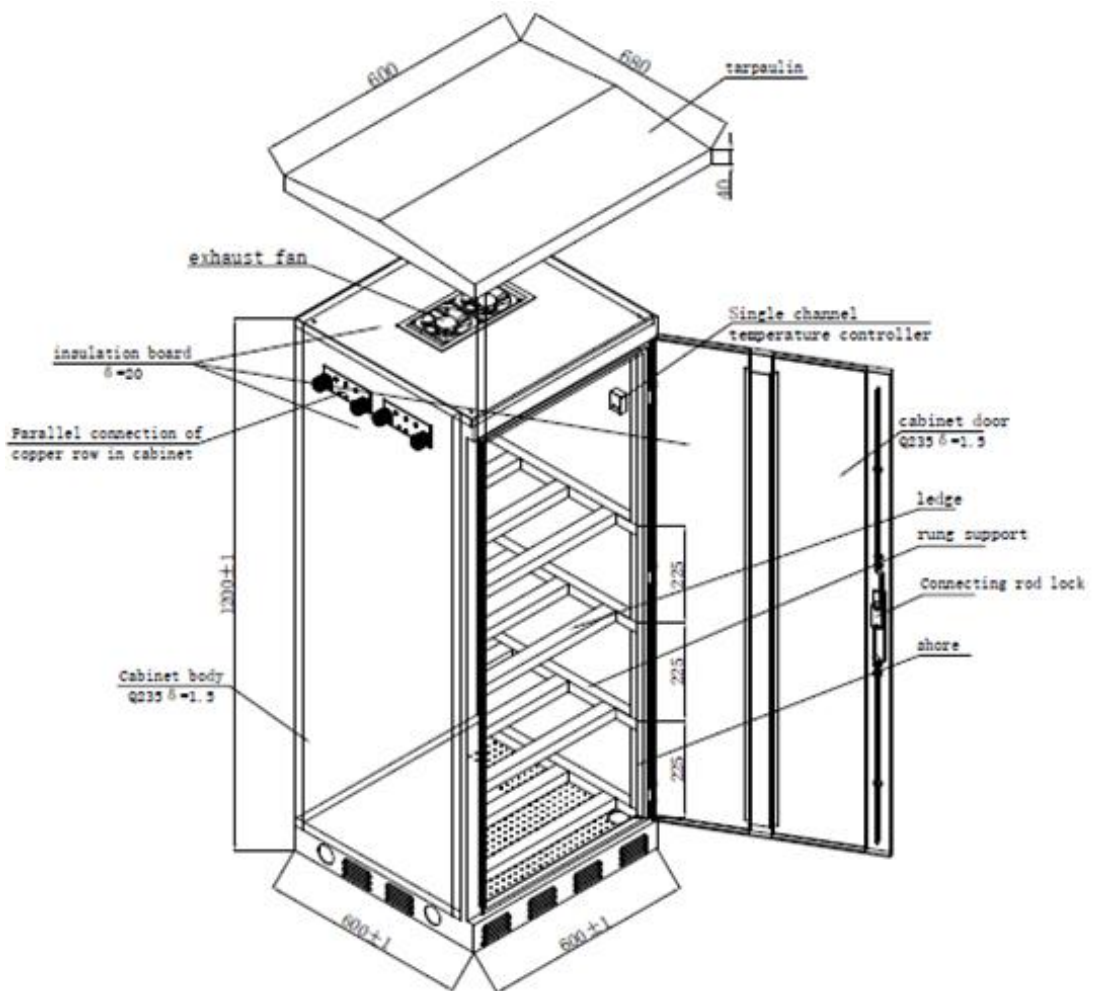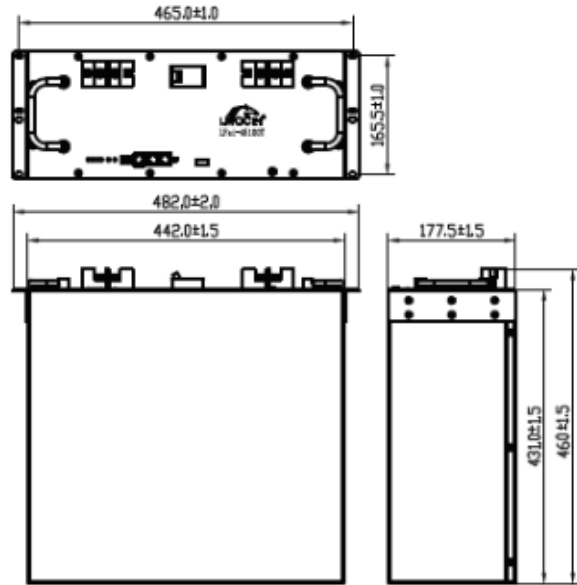
PB.UPS.2K24

PB.UPS.5.5.48.Li

1 x PB.UPS.5K48

PB.WIFI

1 x PB.CABR1-50M10

1 x PB.CABB3-50M10

1 x PB-5097557-2
1 x PB-5073550

1 x PB.CABR2-50M10

1 x PB-LSC-Li

1 x LFeLi48100T

Contains:
  1 x PB.UPS.5K48: inverter, charger, solar charger – 5kVA / 48Vdc→230Vac

  1 x PB.WIFI: WIFI RTU

  1 x PB.CABR1-50M10: red cable 1m, 50mm³ with M10 cable eyes

  1 x PB.CABR2-50M10: red cable 2m, 50mm² with M10 cable eyes

  1 x PB.CABB3-50M10: black cable 3m, 50mm² with M10 cable eyes

  1 x PB.5073550: ANL fuseholder

  1 x PB.5097557-2: ANL fuses 250A/32V

  1 x LfeLi48100T: battery LiFePo4 48V-100Ah

  1 x PB-LSC-Li: battery cabinet for LfeLi48100T

Naar zekeringhouder
Vers le porte-fusible
to fuseholder
nach Sicherungshalter

Naar negatieve pool batterij
Vers pôle négative batterie
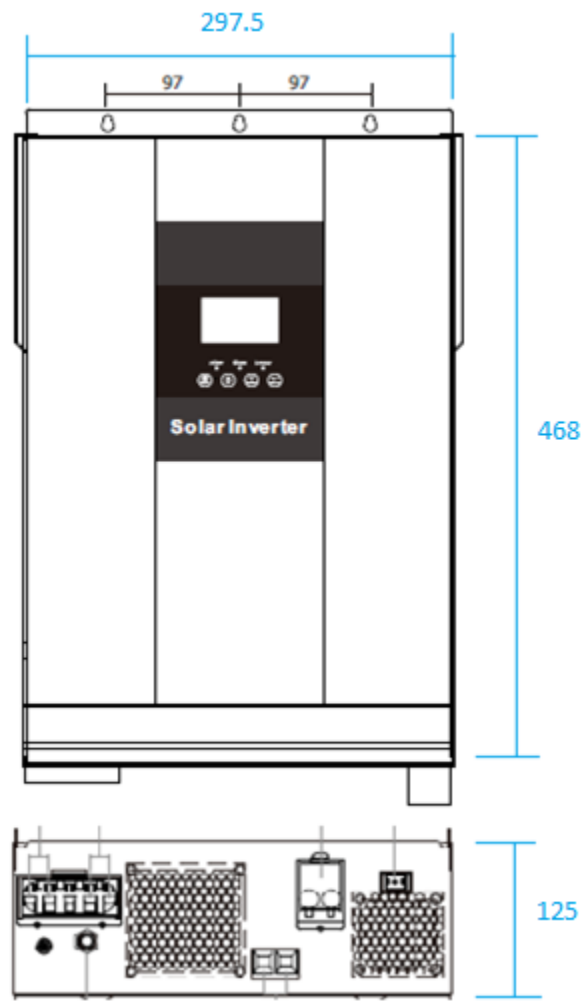To negative pole battery
Zum negativen Batteriepol

LfeLi48100T-dimensions in mm

PB—LSC-Li – dimensions in mm

PB.UPS.5K48 – dimensions in mm

PB.UPS.10.10.48.Li

2 x PB.UPS.5K48

1 x PB.WIFI

2 x PB.CABR1-50M10

2 x PB.CABB1-50M10

2 x PB.50773180

1 x PB.5097557-2
1 x PB.5073550

1 x PB.CABB2-70M10

1 x PB.CABR2-70M10

2 x PB.PARALLEL

1 x PB-LSC-Li

2 x LFeLi48100T
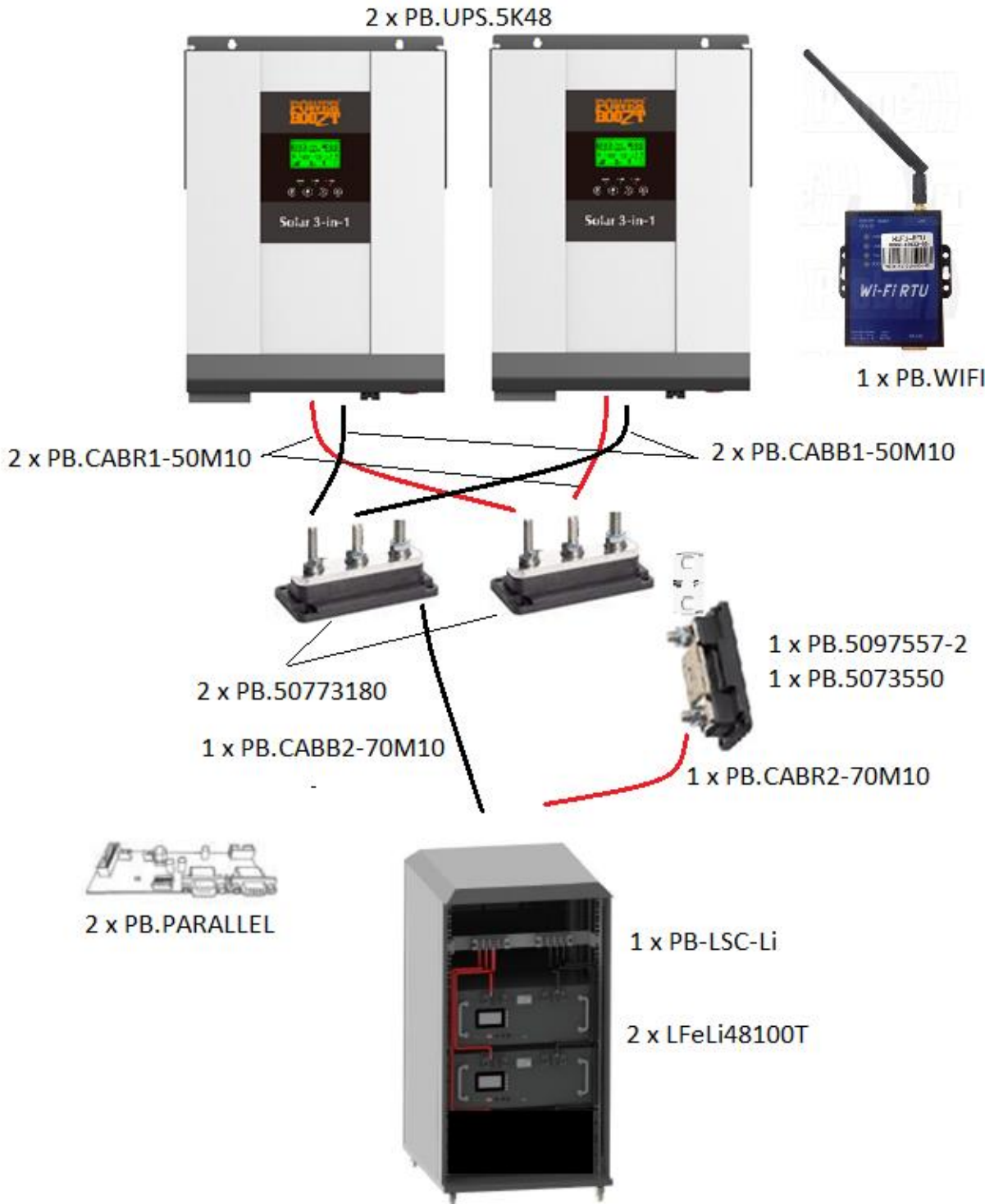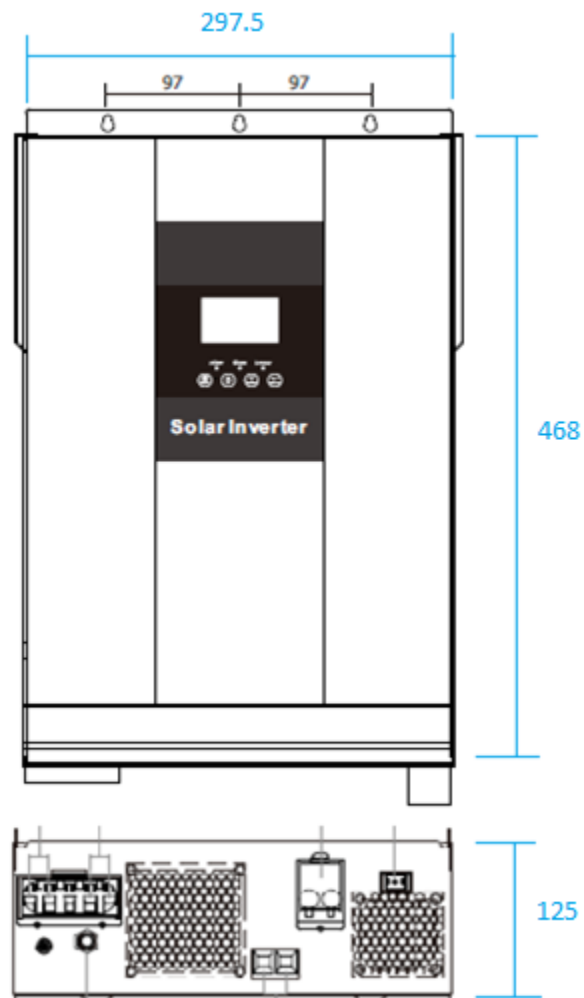
Contains:
2 x PB.UPS.5K48: inverter, charger, solar charger – 5kVA / 48Vdc→230Vac

1 x PB.WIFI: WIFI RTU

2 x PB.PARALLEL: circuit board for parallel communication

1 x PB.CABR2-70M10: red cable 2m, 70mm³ with M10 cable eyes

2 x PB.CABR1-50M10: red cable 1m, 50mm² with M10 cable eyes

1 x PB.CABB2-70M10: black cable 2m, 70mm² with M10 cable eyes

2 x PB.CABB1-50M10: black cable 1m, 50mm² with M10 cable eyes

1 x PB.5073550: ANL fuseholder

1 x PB.5097557-2: ANL fuses 250A/32V

2 x PB.5073180: busbar with three contacts

1 x PB.5079062: connection between ANL fuse holder and busbar

2 x LFeLi48100T: battery LiFePo4 48V-100Ah

1 x PB-LSC-Li: battery cabinet for Battery(s) LfeLi48100T

Naar zekeringhouder
Vers le porte-fusible
to fuseholder
nach Sicherungshalter

Naar negatieve pool batterij
Vers pôle négative batterie
To negative pole battery
Zum negativen Batteriepol
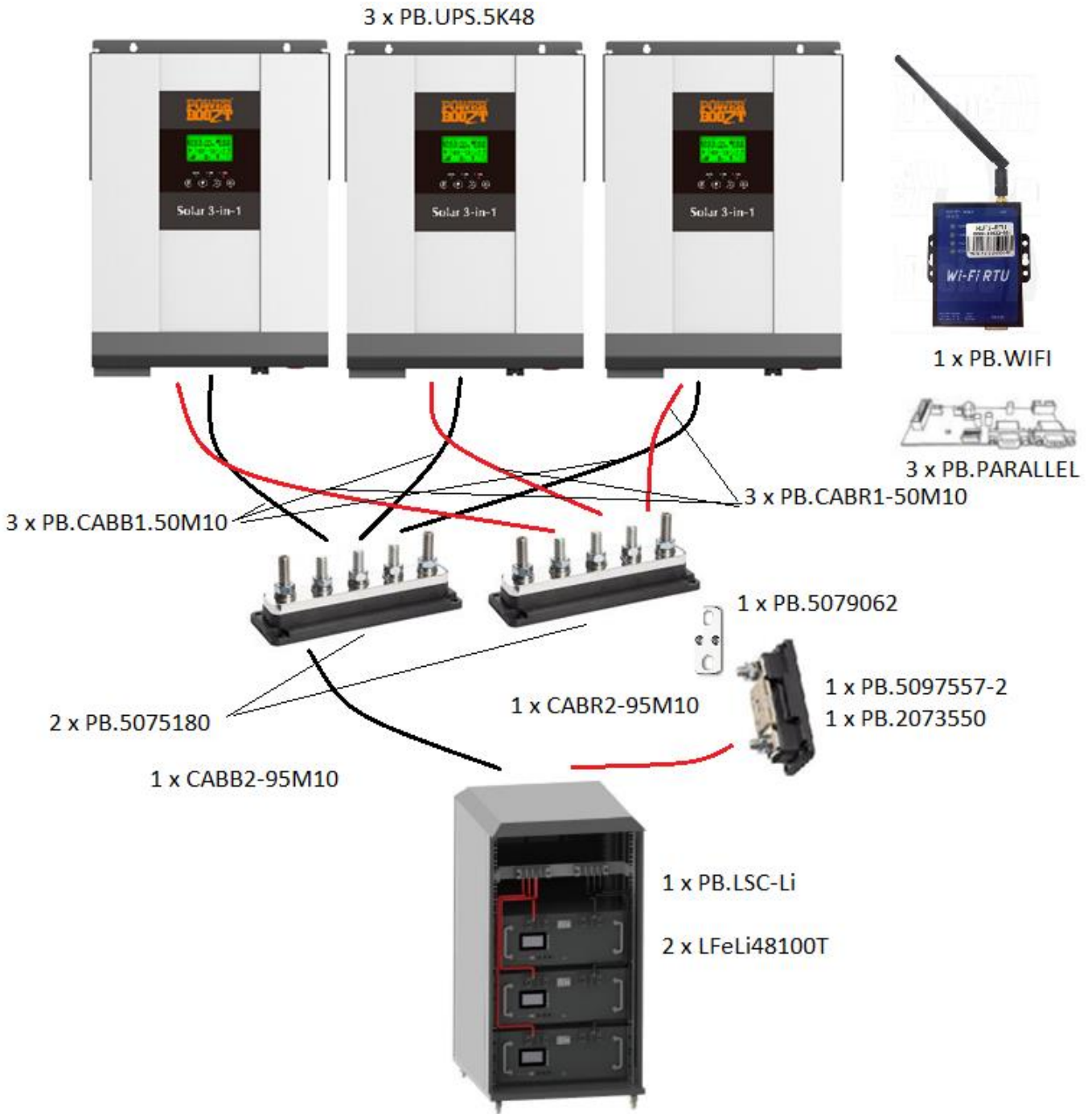
LfeLi48100T-dimensions in mm

PB—LSC-Li – dimensions in mm

PB.UPS.5K48 – dimensions in mm

PB.UPS.15.15.48.Li

3 x PB.UPS.5K48

1 x PB.WIFI

3 x PB.PARALLEL

3 x PB.CABR1-50M10

3 x PB.CABB1.50M10

1 x PB.5079062

1 x CABR2-95M10

1 x PB.5097557-2
1 x PB.2073550

2 x PB.5075180

1 x CABB2-95M10

1 x PB.LSC-Li

2 x LFeLi48100T
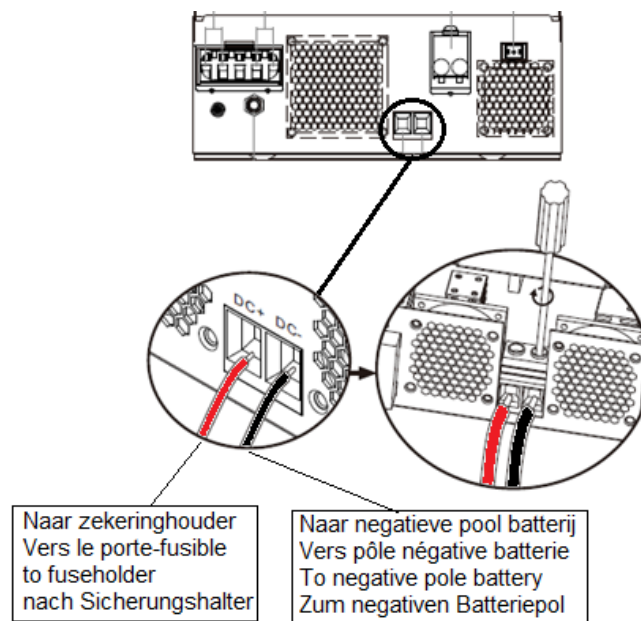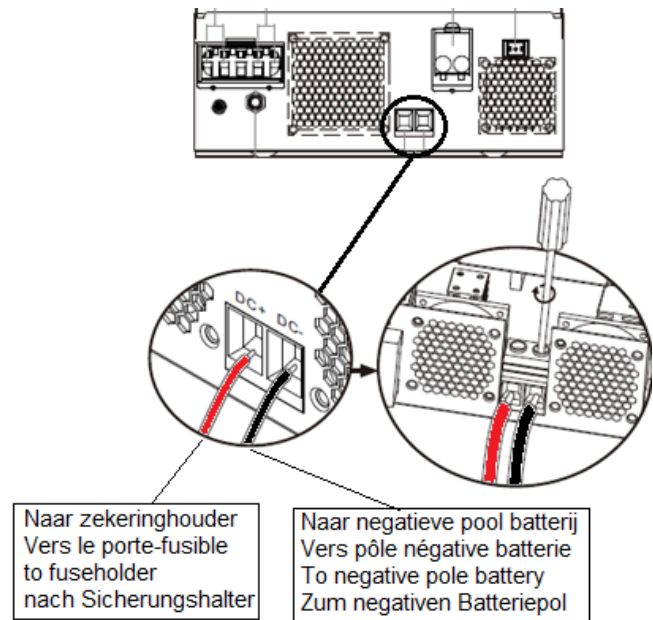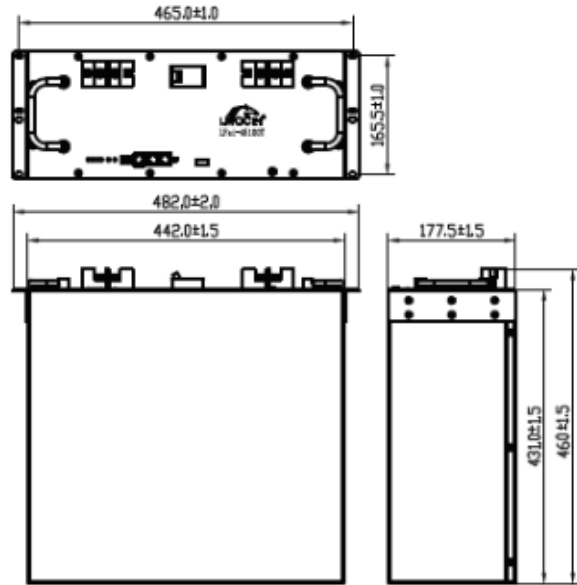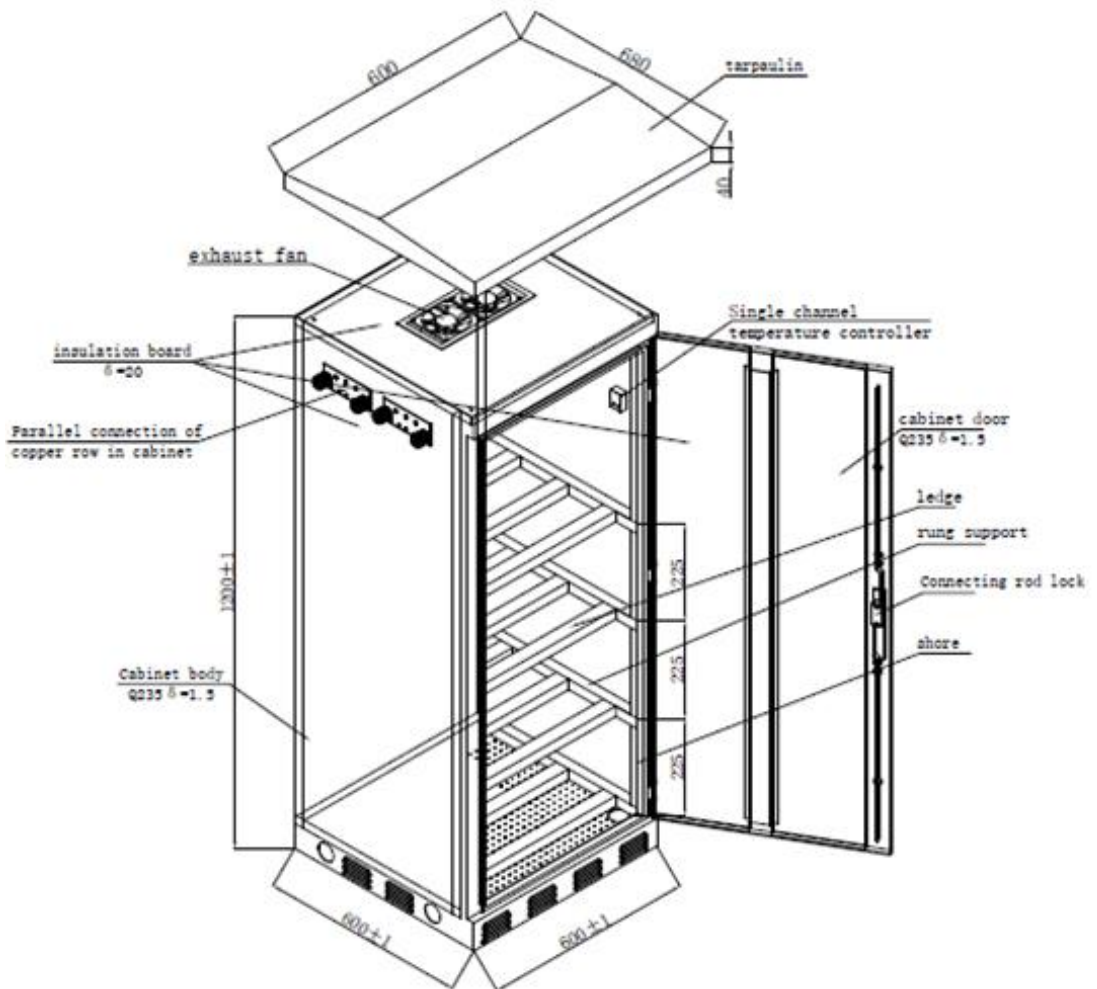
Contains: 3 x PB.UPS.5K48: inverter, charger, solar charger – 5kVA / 48Vdc→230Vac

1 x PB.WIFI: WIFI RTU

3 x PB.PARALLEL: circuit board for parallel communication

1 x PB.CABR2-95M10: red cable 2m, 95mm³ with M10 cable eyes

3 x PB.CABR1-50M10: red cable 1m, 50mm² with M10 cable eyes

1 x PB.CABB2-95M10: black cable 2m, 95mm² with M10 cable eyes

3 x PB.CABB1-50M10: black cable 1m, 50mm² with M10 cable eyes

1 x PB.5073550: ANL fuseholder

1 x PB.5097557-2: ANL fuses 250A/32V

2 x PB.5075180: busbar with five contacts

1 x PB.5079062: verbinding tussen ANL zekeringhouder en busbar

3 x LFeLi48100T: battery LiFePo4 48V-100Ah

1 x PB-LSC-Li: battery cabinet for Battery(s) LfeLi48100T

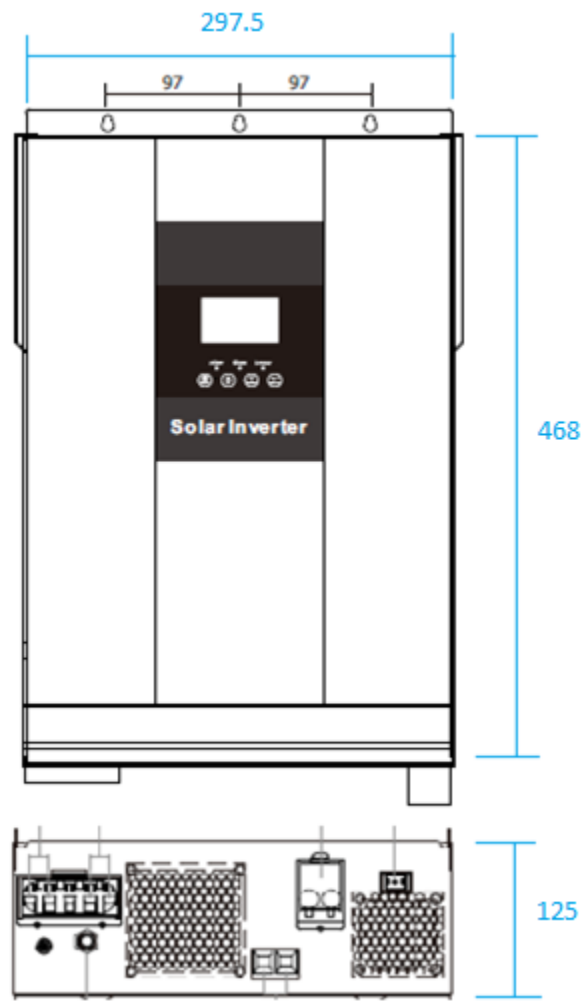| Naar zekeringhouder
Vers le porte-fusible
to fuseholder
nach Sicherungshalter | Naar negatieve pool batterij
Vers pôle négative batterie
To negative pole battery
Zum negativen Batteriepol |

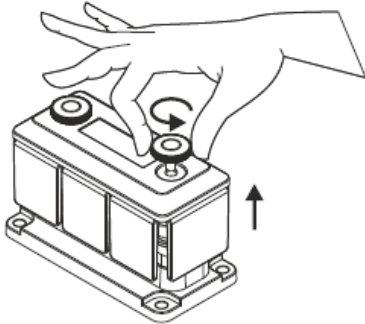LfeLi48100T-dimensions in mm

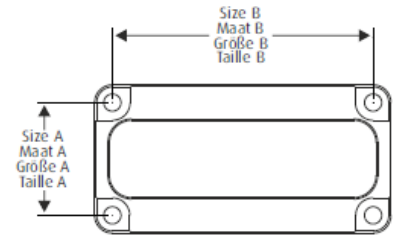PB—LSC-Li – dimensions in mm

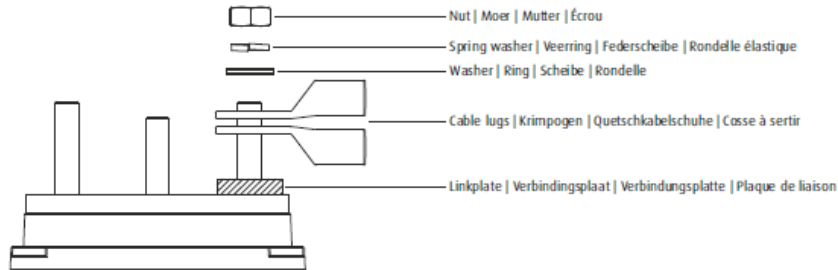PB.UPS.5K48 – dimensions in mm
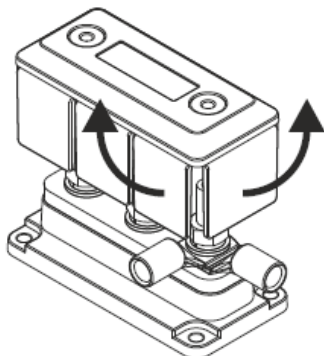
FUSEHOLDERS AND BUSBAR

BUSBAR

Removing the top cover | Verwijderen van de afdekkap | Entfernen der oberen Abdeckung | Démontage du couvercle supérieur
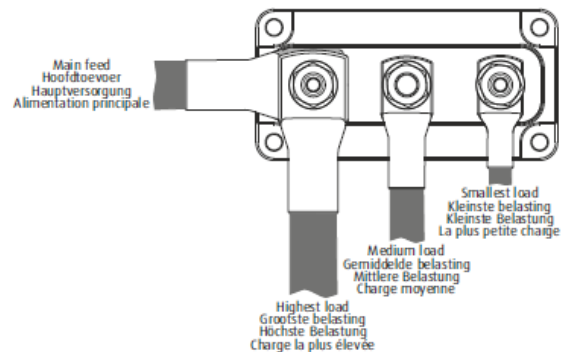
Drilling template | Boormal | Bohrungsvorbild | Positions de foret

Size B | Maat B | Größe B | Taille B

Size A | Maat A | Größe A | Taille A

Nut | Moer | Mutter | Écrou
Spring washer | Veerring | Federscheibe | Rondelle élastique
Washer | Ring | Scheibe | Rondelle
Cable lugs | Krimpogen | Quetschkabelschuhe | Cosse à sertir
Linkplate | Verbindingsplaat | Verbindungsplatte | Plaque de liaison

Assembly sequence of nut, washers and cable lugs (see also precaution 4) | Assemblage volgorde voor moer, ringen en krimpogen (zie ook voorzorgsmaatregel 4) | Montagereihenfolge für Mutter, scheiben und Quetschkabelschuhe (siehe auch Vorsichtsmaßnahme 4) | Séquence de montage de l'écrou, des rondelles et des cosses de câble (voir également la précaution 4)

Break out cover sides by hand at required cable access locations | Zijkanten van de afdekkap kunnen met de hand worden verwijderd op de kabeltoevoer locaties | Die Abdeckungsseiten an den erforderlichen Kabelzugrifforten von Hand heraus brechen | Détachez à la main les côtés du couvercle aux points d'accès de câbles nécessaires

Main feed
Hoofdtoevoer
Hauptversorgung
Alimentation principale

Smallest load
Kleinste belasting
Kleinste Belastung
La plus petite charge

Medium load
Gemiddelde belasting
Mittlere Belastung
Charge moyenne

Highest load
Grootste belasting
Höchste Belastung
Charge la plus élevée

Best wiring practices (see also precaution 6) | Beste bedradingsvolgorde (zie ook voorzorgsmaatregel 6) | Beste Verdrahtungsmethoden (siehe auch Vorzichts-maßnahme 6) | Bonnes pratiques de câblage (voir également précaution 6)

PRECAUTIONARY MEASURES:

Install this product only in a dry environment

To avoid the risk of fire, only use correctly dimensioned cables, which are suitable

for the expected flows in your installation.

To avoid damage to the busbar or a fire hazard, make sure that all nuts

sufficiently – 13Nm for M8 nuts and 22Nm for M10 nuts.

To avoid damage to the busbar or risk of fire, the spring washer and the flat washer should be

always be located directly under the nut.

Never place rings between: busbar and cable lug, multiple cable lugs on the same bolt,

busbar and connection plate or cable lug and connection plate.

Provide adequate strain relief on all cables.

This is to prevent too high a mechanical load on the busbar.

To avoid excessive electrical losses when using high current busbars,

the wiring must be followed a so-called "top-down" method.

To avoid excessive electrical losses when using high current busbars,

the wiring must be followed a so-called "top-down" method.

The cables for the smaller loads can then be attached to the bolts further away from them

to be mounted.

CHARACTERISTICS:

High purity tinned copper base plates ensure optimum electrical conductivity.

Optimal corrosion resistance by using stainless steel bolts, washers and nuts

Unique grid-based base dimensions allow highly compact formations of multiple DC

add products.

Special fiber reinforced plastic base offers excellent high temperature properties, good
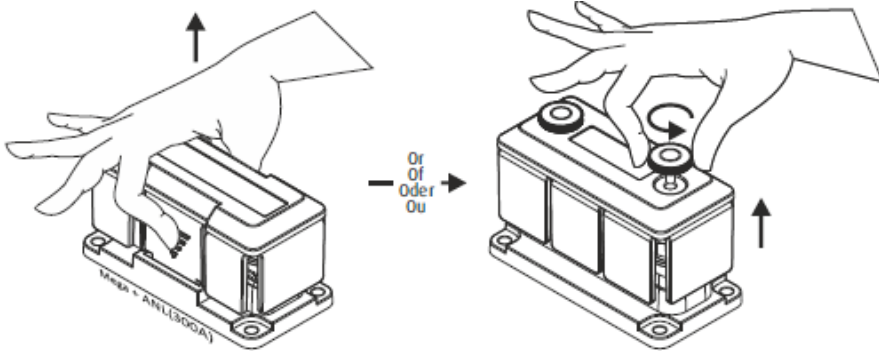
chemical resistance and very high tensile strength.

Common connection heights allow multiple DC products to be easily connected

jumpered using connecting plates.

Robust transparent cover caps with break-out sides allow cable connections from
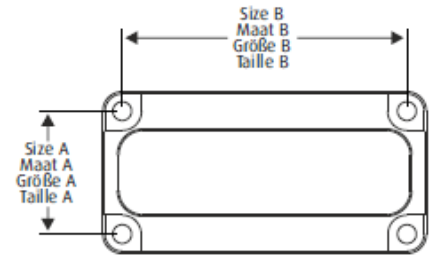
multiple directions.

Due to a clever terminal design, two crimp eyes can also be mounted in a mirrored manner.

Connections can be easily reached afterwards because the cover caps on the top
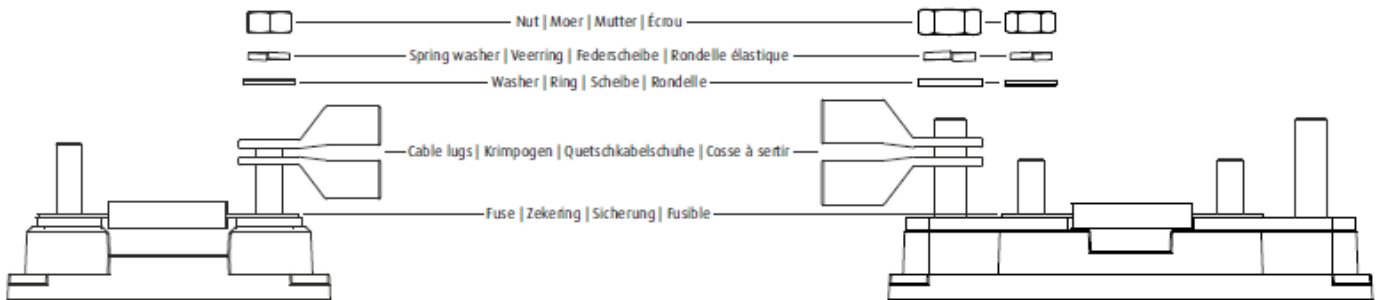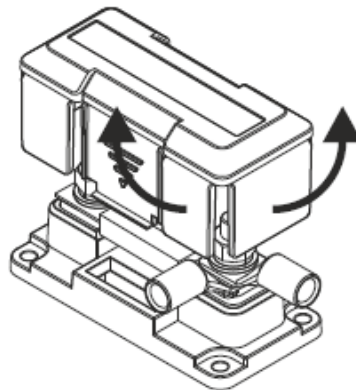
be locked.

ANL - MEGA

Removing the top cover | Verwijderen van de afdekkap | Entfernen der oberen Abdeckung | Démontage du couvercle supérieur

Or
Of
Oder
Ou

Size B
Maat B
Größe B
Taille B

Size A
Maat A
Größe A
Taille A

Drilling template | Boormal | Bohrungsvorbild | Positions de foret

Nut | Moer | Mutter | Écrou

Spring washer | Veerring | Federscheibe | Rondelle élastique

Washer | Ring | Scheibe | Rondelle

Cable lugs | Krimpogen | Quetschkabelschuhe | Cosse à sertir

Fuse | Zekering | Sicherung | Fusible

Assembly sequence of nut, washers and cable lugs (see also precaution 4) | Assemblage volgorde voor moer, ringen en krimpogen (zie ook voorzorgsmaatregel 4) | Montagereihenfolge für Mutter, scheiben und Quetschkabelschuhe (siehe auch Vorsichtsmaßnahme 4) | Séquence de montage de l'écrou, des rondelles et des cosses de câble (voir également la précaution 4)

Break out cover sides by hand at required cable access locations | Zijkanten van de afdekkap kunnen met de hand worden verwijderd op de kabeltoevoer locaties | Die Abdeckungsseiten an den erforderlichen Kabelzugrifforten von Hand heraus brechen | Détachez à la main les côtés du couvercle aux points d'accès de câbles nécessaires

PRECAUTIONARY MEASURES

Install this product only in a dry environment.

To avoid the risk of fire, only use correctly dimensioned cables, which are suitable

for the expected flows in your installation.

To avoid damage to the fuse holder or a fire hazard, make sure that all

nuts are sufficiently tightened.

Please refer to our recommended tightening torques of 22Nm for M10 nuts.

To avoid damage to the fuse holder or risk of fire, the spring washer and flat

washer must always be directly under the nut.

Never place washers between: fuse and crimp eye, multiple crimp eyes on the same bolt, busbar and

connection plate.

Provide adequate strain relief on all cables

This is to prevent excessive mechanical stress on the fuse holder.

CHARACTERISTICS

High purity tinned copper base plates ensure optimum electrical conductivity.

Optimal corrosion resistance by using stainless steel bolts, washers and nuts.

Unique grid-based base dimensions allow highly compact formations of multiple sizes

combinations?

Special fiber reinforced plastic base offers excellent high temperature properties, good

chemical resistance and very high strength.

Robust transparent cover caps with break-out sides allow cable connections from

in several directions.

Due to a clever terminal design, two crimp eyes can also be mounted in a tilted position.

The DCM MEGA FUSEHOLDER (PB.5093300) is suitable for the following fuses: "Littlefuse"

MEGA and Cooper Bussman "AMG".

The DCM ANL Fuseholder (PB.5073550) is suitable for the following fuses: Cooper Bussman

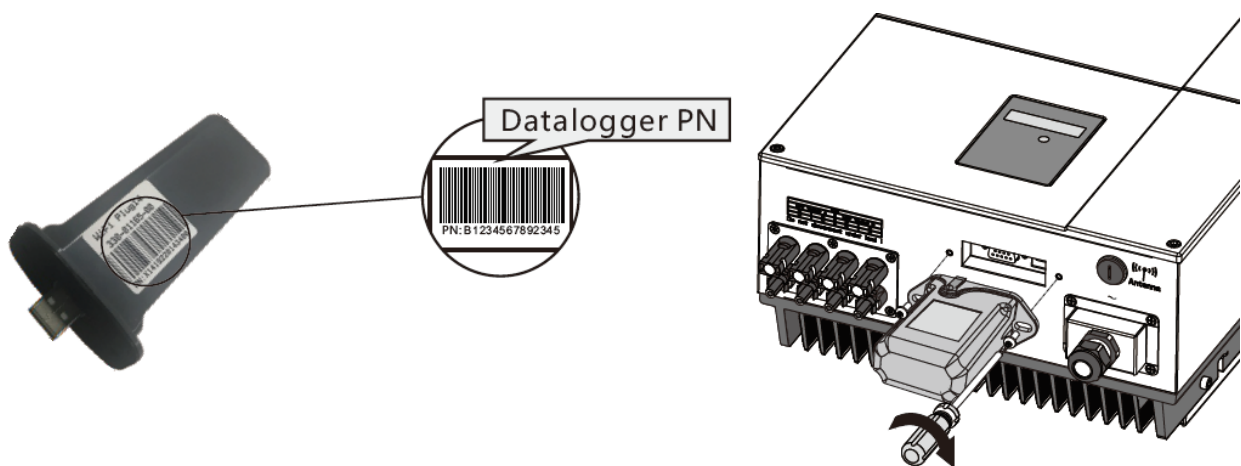"ANL" and "ANN" and Littlefuse "CNN" and 3CNL"

PB.WIFI SETTINGS

iOS   Android

Installation

Align the USB interface of the Wi-Fi plug 14 with the inverter and insert the plug firmly in touch.

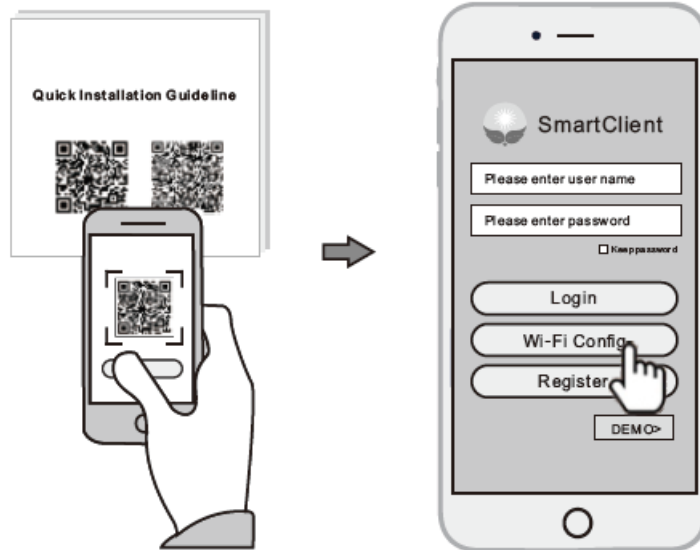Secure the Wi-Fi plug 14 to the inverter with the screw.

Check the status of the LED indicator (when you see the orange LED light from the case lights up, it indicates normal working status).
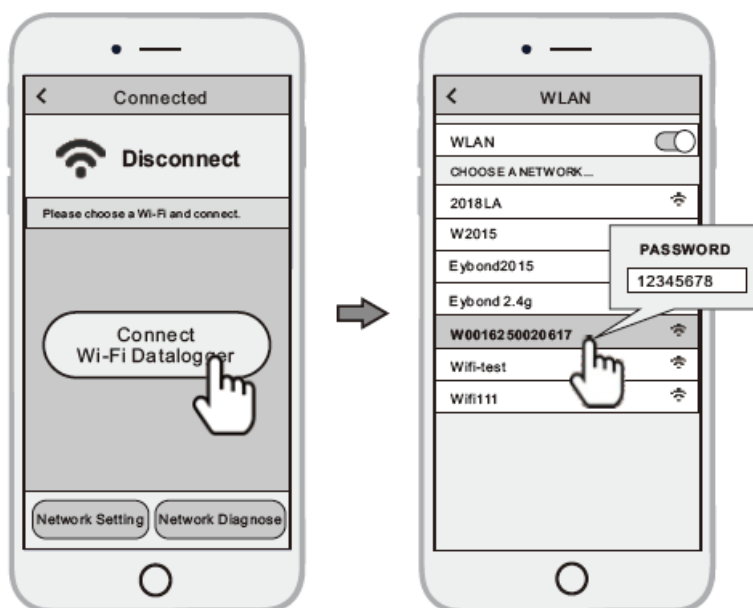
Wireless Router Connection

Scan the QR code on the previous page and download the APP.

Open the APP, tap the Wi-Fi Config button to enter this page.

Tap the Connect Wi-Fi Data Logger button on the connected page. (For Android phones, this one is Step not necessary).
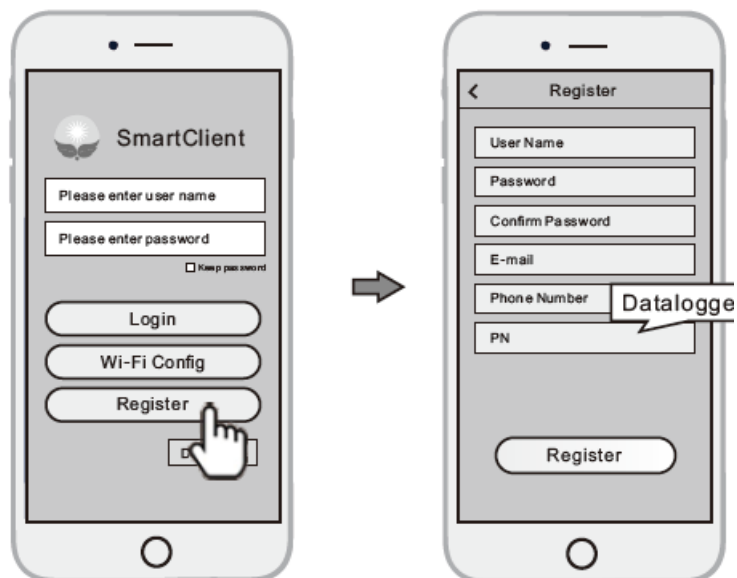
Select the same number of Wi-Fi plug PN to connect. (Initial password 12345678)

After the connection is established, tap the Network Setting button.

Enter the information according to the prompts to complete the network setup.

Reconnect the Wi-Fi.
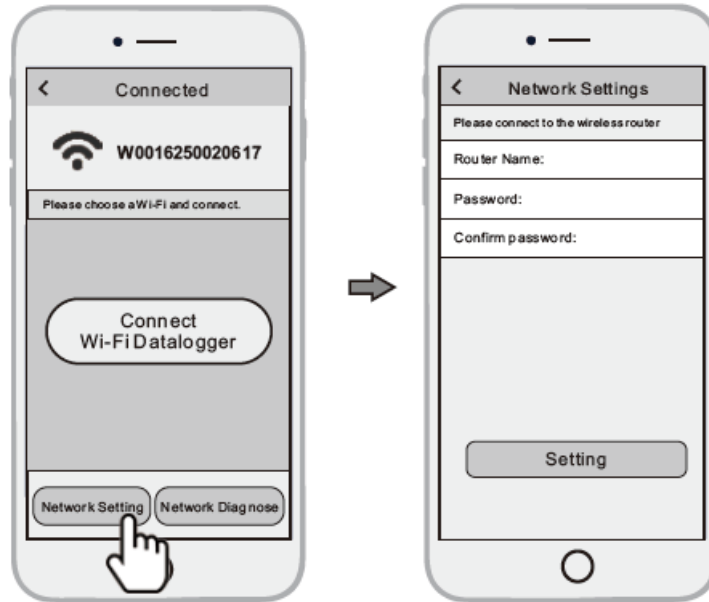
Open the APP, tap the Register (Register) button

Complete account creation according to prompt information

Log in to the account and click the List (List) button at the bottom of the home page.

Tap the "+" button in the top right corner of the List (List) page.

Type the information to complete the installation creation according to the prompt information
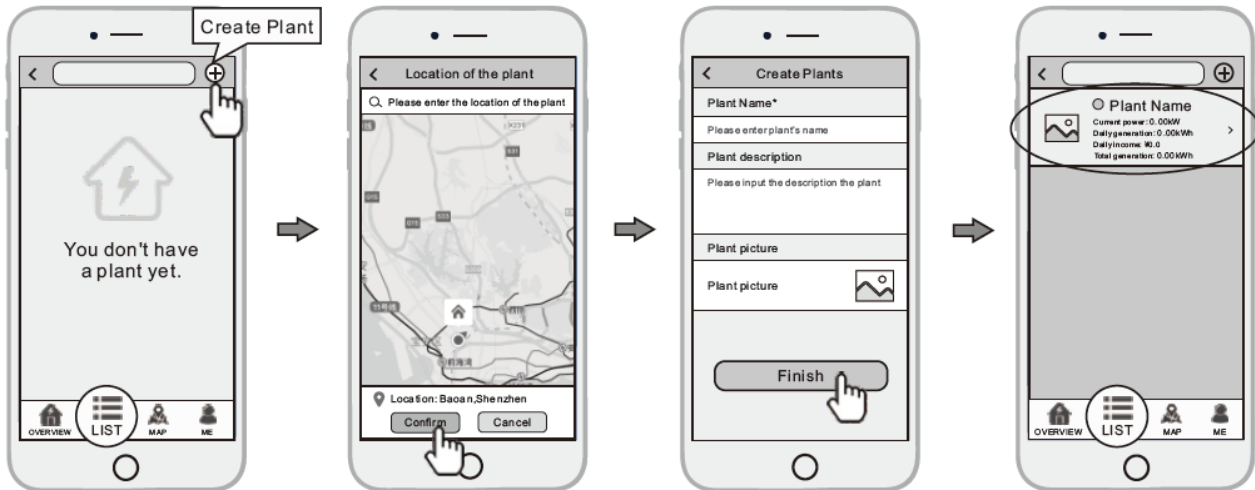
Add multiple Dataloggers

Note: One account can create multiple systems and one system can create multiple data loggers to add.
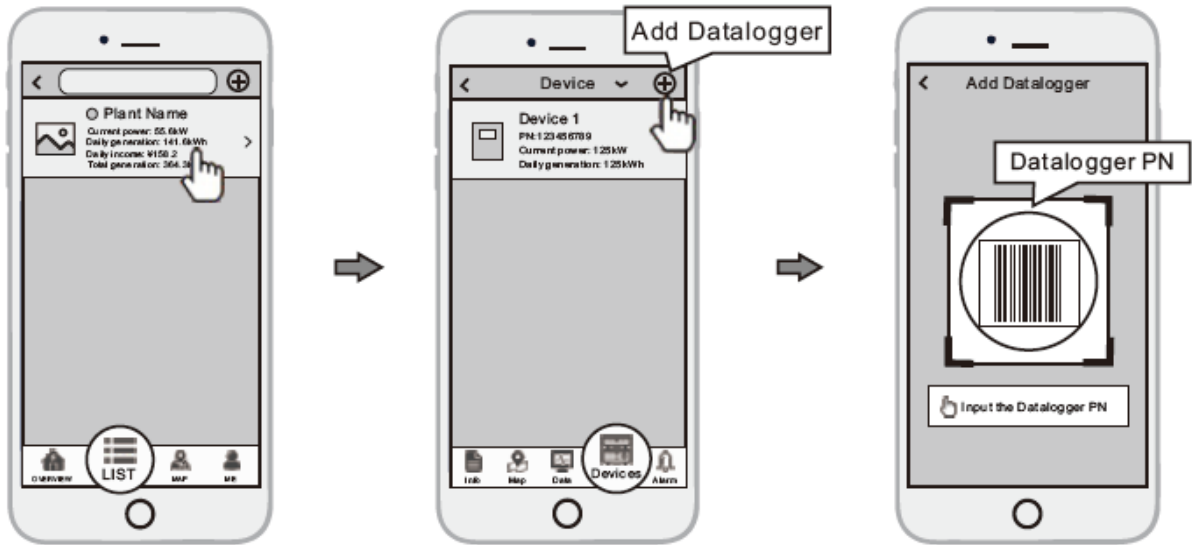
If you only have one datalogger, you can skip this last step.

Tap the new installation you just created and go to the home page.

Click the Device button at the bottom of the home page.

Tap the "+" button in the top right corner to add the data logger.

Scan the PN of the data logger on the WiFi Plug 14, or enter it manually

Finally

Note: In addition to the SmartClientApp, you can also monitor your installations remotely with the mini-program **WeChat.**

Scan the Wechat QR code to use the mini program.

DE HOEVE
MULTIPOWER

Prof. Eykmanweg, 27
5144 ND Waalwijk - Nederland
Tel: 0031 416 693 155
Mail: info@de-hoeve.nl
Website: www.de-hoeve.nl

CE-DECLARATION OF CONFORMITY

DE HOEVE MULTIPOWER BV hereby certifies that the products listed below comply with the attached standards

BP.UPS.2.2.24
BP.UPS.3.5.24
BP.UPS.5.5.48
BP.UPS.10.10.48
BP.UPS.15.15.48

PB.UPS.2K24 - PB.UPS.3K24 - PB.UPS.5K48

EN 61000-6-3:2007+A1:2011+AC:2012 / EN 61000-3-2:2014 / EN61000-6-1:2007
EN62109-1:2010 / EN62109-2:2011

All Cables

CEI EN 50363
directives 73/23, 93/68 EC and 2014/35/EU

5097349-2(fuse 250A) - 5093300(fuseholder 250A) - 5097557-2(fuse350A) - 5073550(fuseholder 350A)
5073180(3xM10 busbar) - 5074180(5xM10 busbar)

Craft Directive 2003/44/EC (amending 94/25/EC)
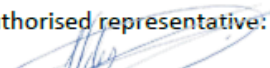RoHS Directive 2011/65/EU

PB.SC12-170

Compliance with IEC 61427, BS EN 61427 standards
OHSAS 18001, ISO 9001 and ISO 14001

PB-Li-12-100

CE - UN38.3 - UL1642 & IEC2133
shipping classification: UN 3480, klasse 9
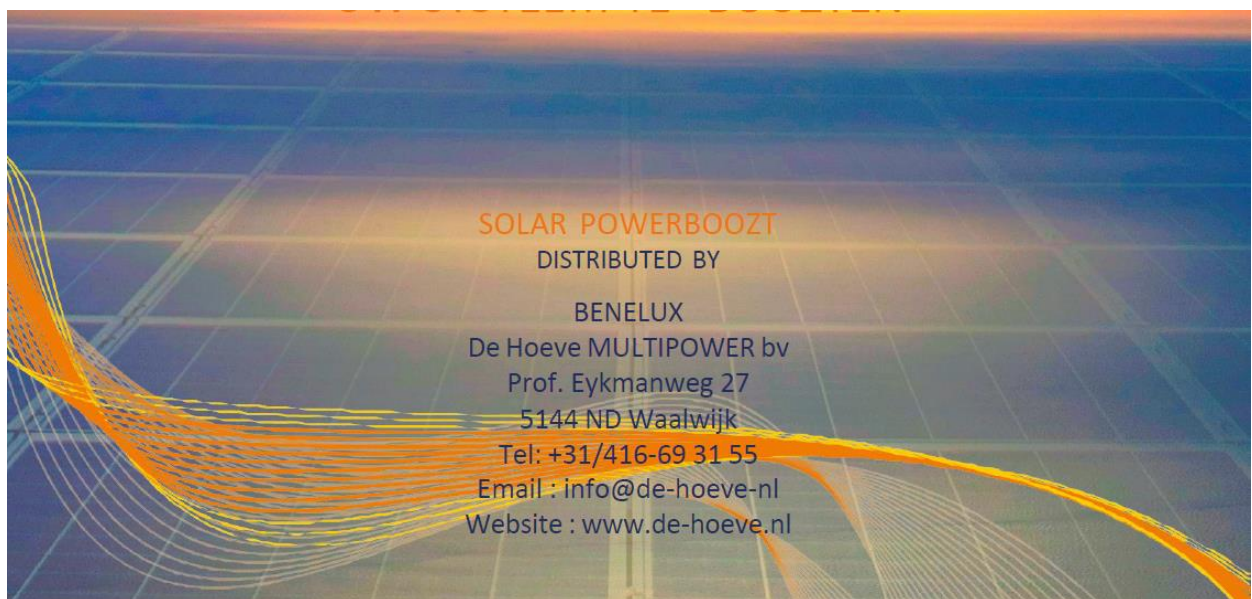
LFeLi-48100TB

EN 61000-6-3:2007/A1:2011
EN 61000-6-1:2007
EN 55032:2015
EN 55024:2010/A1:2015

Date: 1-8-2021
Name of authorised representative: Hans De Jong
Position of authorised representative: Direction
Signature:

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DISTRIBUTED BY

BENELUX
De Hoeve MULTIPOWER bv
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5144 ND Waalwijk
Tel: +31/416-69 31 55
Email : info@de-hoeve-nl
Website : www.de-hoeve.nl