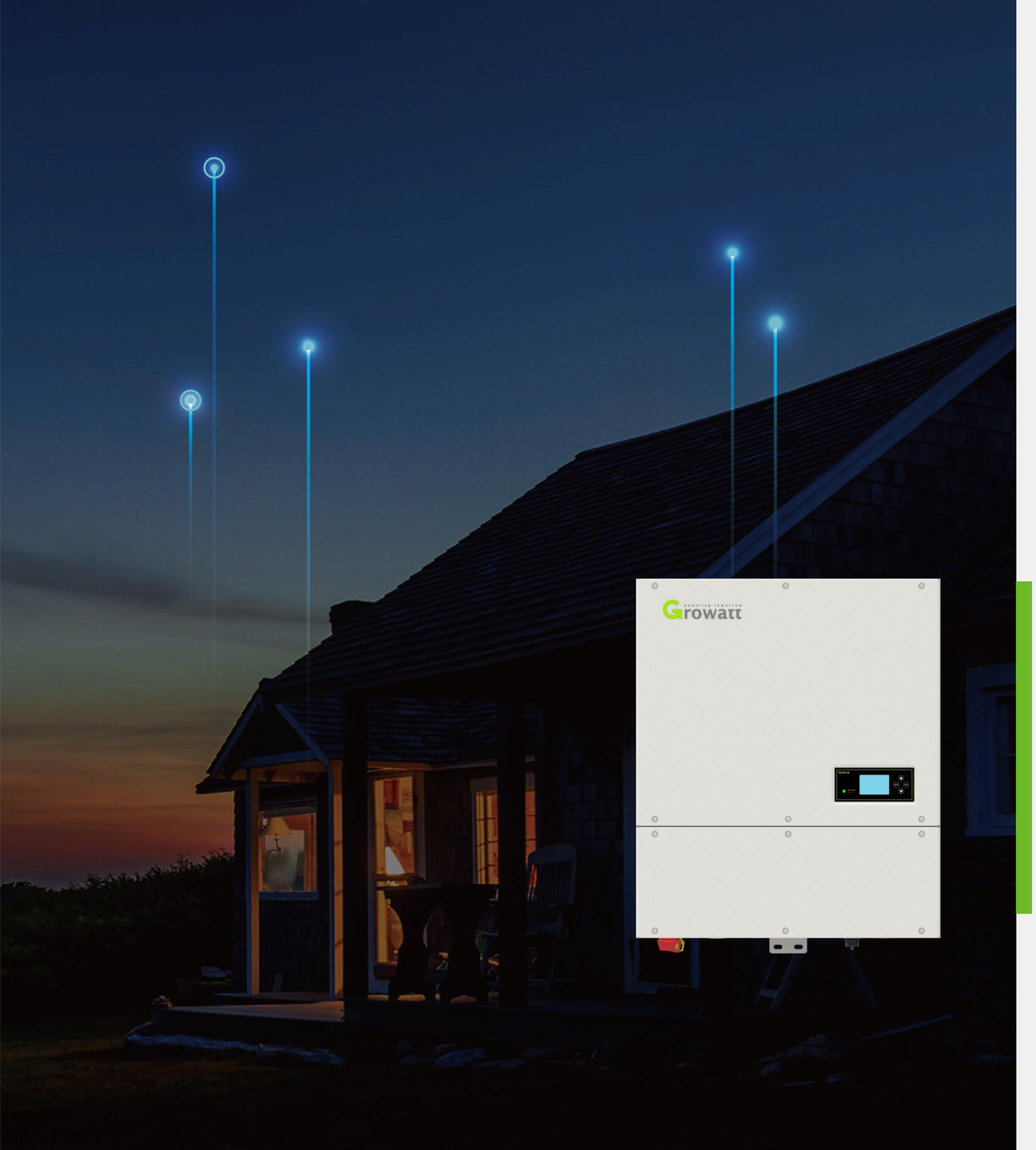
SPH 3000~6000TL BL-US

SHENZHEN GROWATT NEW ENERGY
TECHNOLOGY CO.,LTD

GROWATT


Dedicated to Becoming a Global Leader
of Smart Energy Solutions



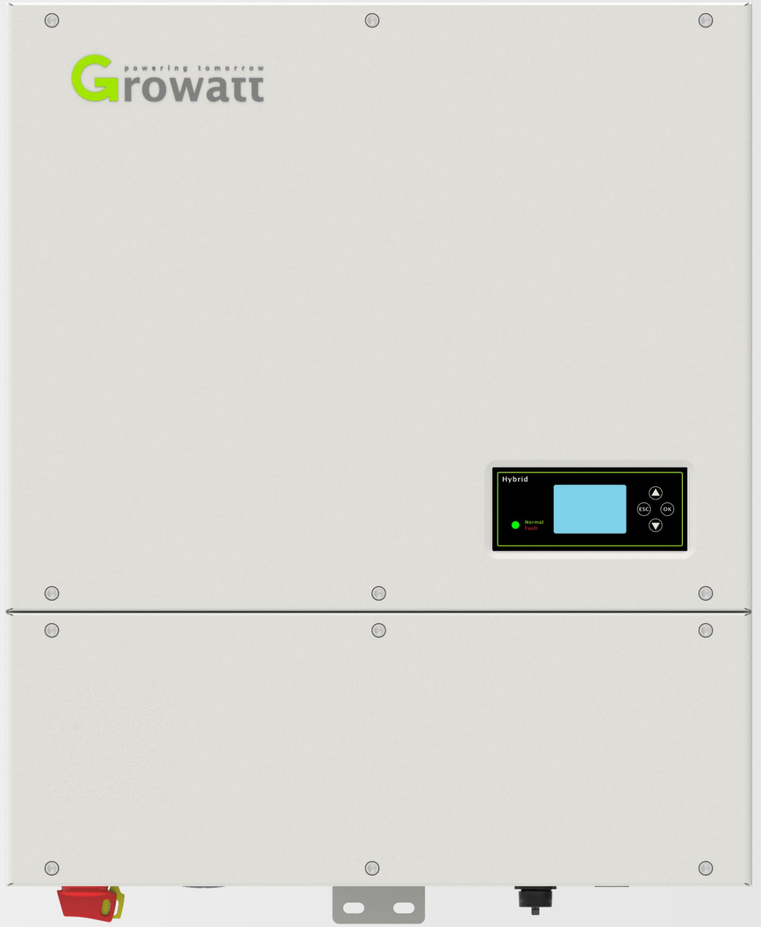
CONTENTS

01

System Solution Introduction

System Solution

SPH3000~6000TL BL-US Single Phase Hybrid Inverter



User Friendly

- LCD quick commission
- Smart APP control
- Quick 15 mins installation

Powerful Functions

- Multiple work modes configurable
- Integrated AFCI and RSD protection

Protection

- NEMA 4X rating. Dustproof & waterproof
- 10-year product warranty

System Solution

SPH3000~6000TL BL-US Single Phase Hybrid Inverter

Leading Features

Higher Yields

- Power range: 3.0-6.0kW
- String current 13A
- 2 MPP Trackers
- 1.3 DC/AC Ratio

Comprehensive Protection

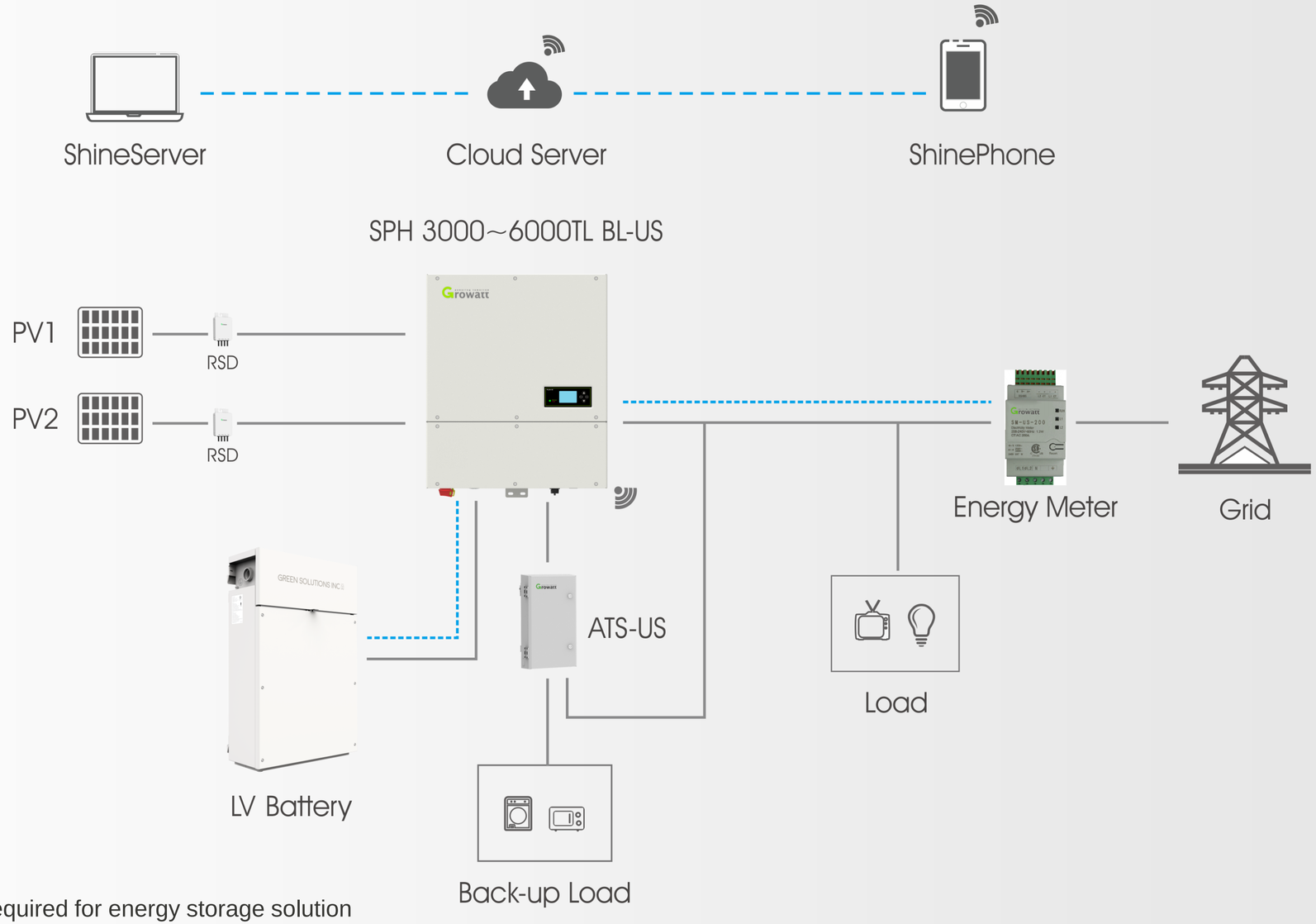
- Integrated DC Switch
- Integrated AFCI protection
- Integrated RSD protection
- NEC 2017 compliant

Harsh Environmental Tolerance

- Operation temperature: –13°F ~ +140°F
- 100% Humidity
- NEMA Type 4X

System Solution

SPH3000~6000TL BL-US single phase hybrid inverters and HOMe11 Battery



* ATS-US and Smart Meter are both required for energy storage solution

System Solution

Multiple battery options

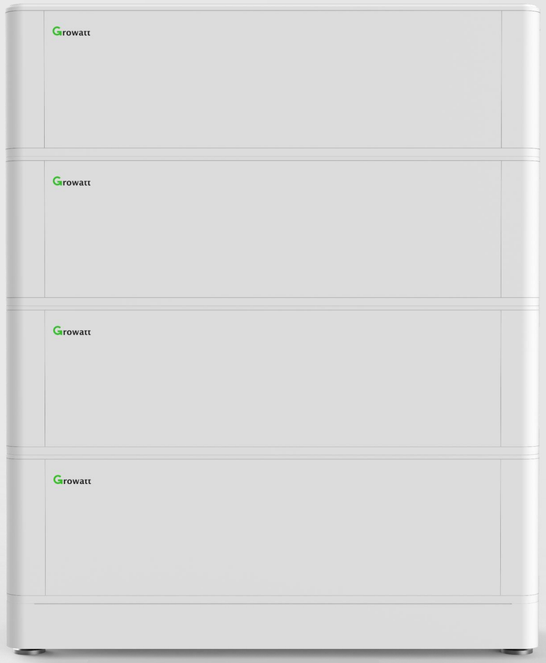
HOMe11

11kWh/pcs
Max. 2 pcs in parallel

ML33RTA

3.3kWh/pcs
Max. 6 pcs in parallel

ARK LV Battery System



2.56kWh/pcs
Max. 10 pcs in parallel

System Solution

Safe and reliable of the battery system

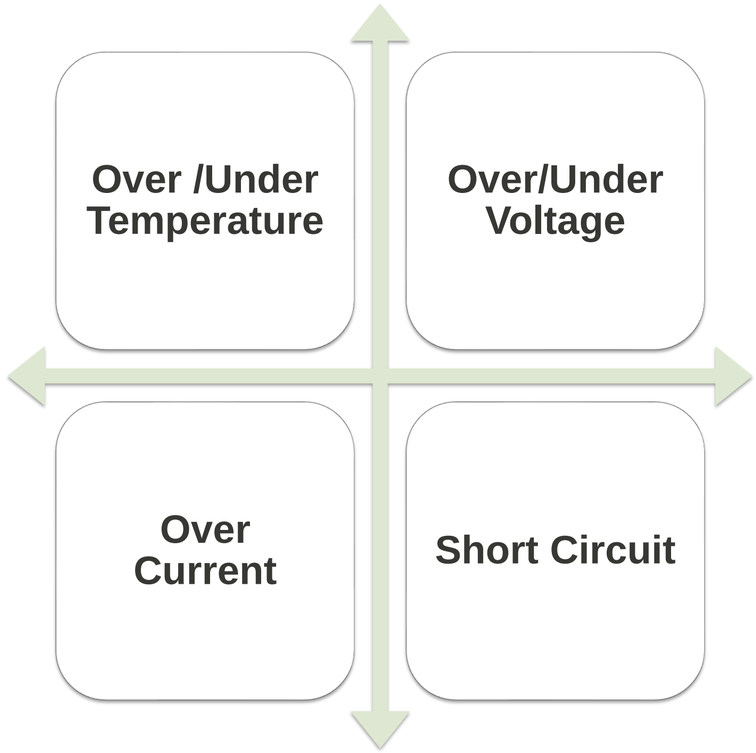
Material: LiFePO4

LFP is more reliable chemistry & safest for residential ESS

	LFP	NCM
Safety & Environmental	Reliable	Acceptable
Cycle ability	Reliable	Acceptable
Energy Density	Acceptable	Better
Power Density	Reliable	Acceptable
Long Term Cost	Better	Acceptable
Plateau Voltage	3.2V	3.7V
Operation Temperature	-4 ~ 131 °F	-4 ~ 113 °F

LiFePO4 chemistry features stable structures with thermal runaway temperature is over 480℃ which is 100% higher than NCM and NCA chemistry

Full Protection



System Solution

Load First Mode

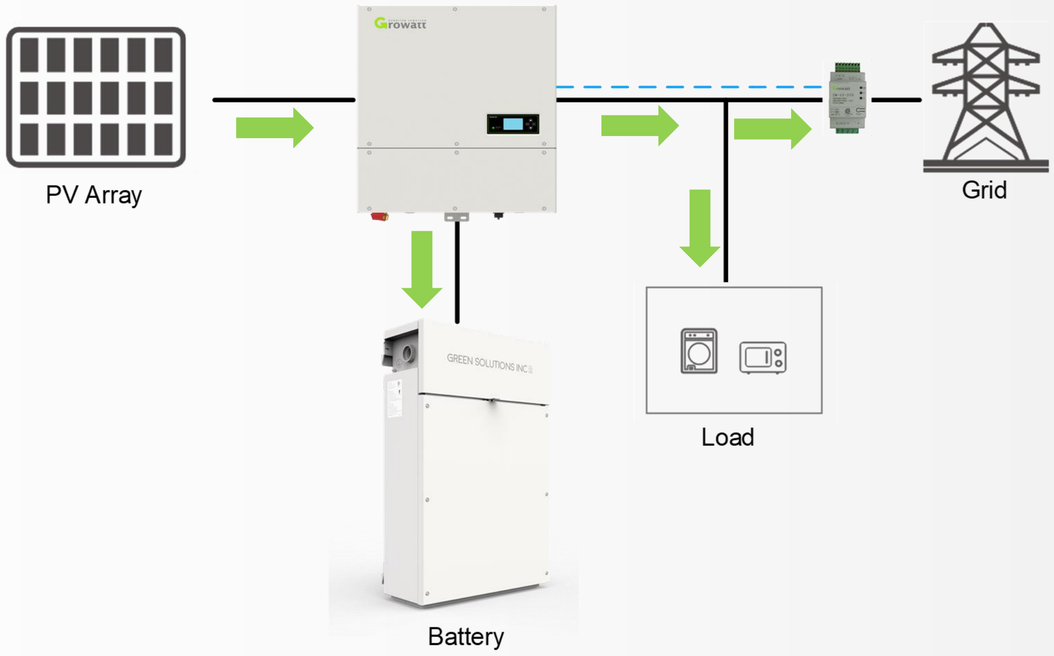
Default mode and could maximize the solar energy, lower the power imported from grid

Features: Maximize the solar self-consumption, more independent from the grid

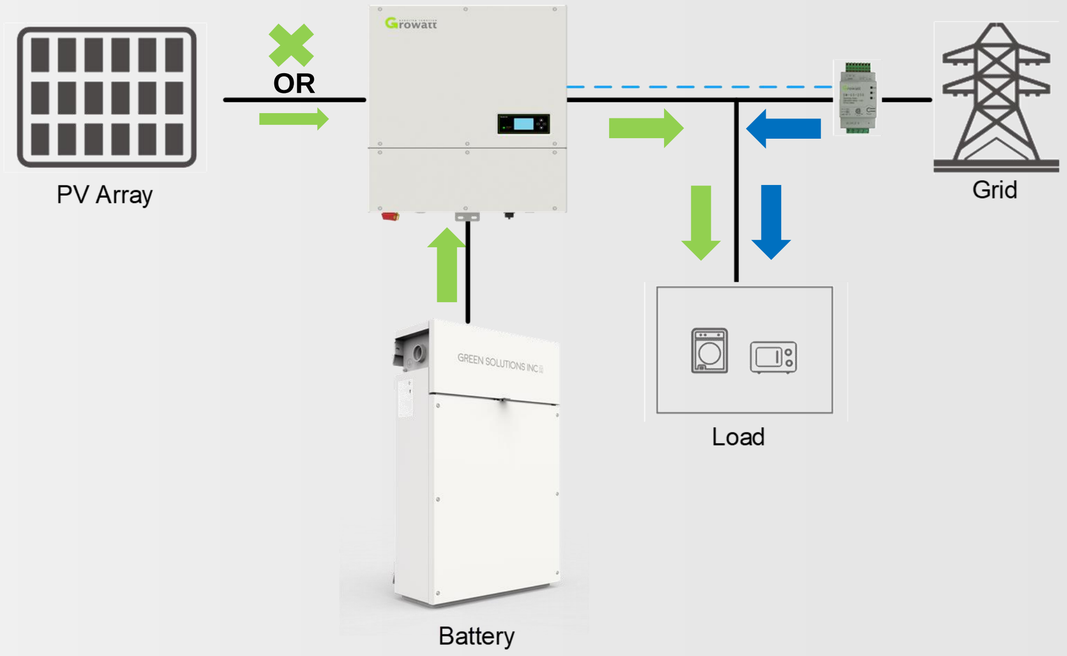
Priority: Load > Battery > Grid

How it works?

solar power is sufficient



solar power is insufficient



System Solution

Battery First Mode

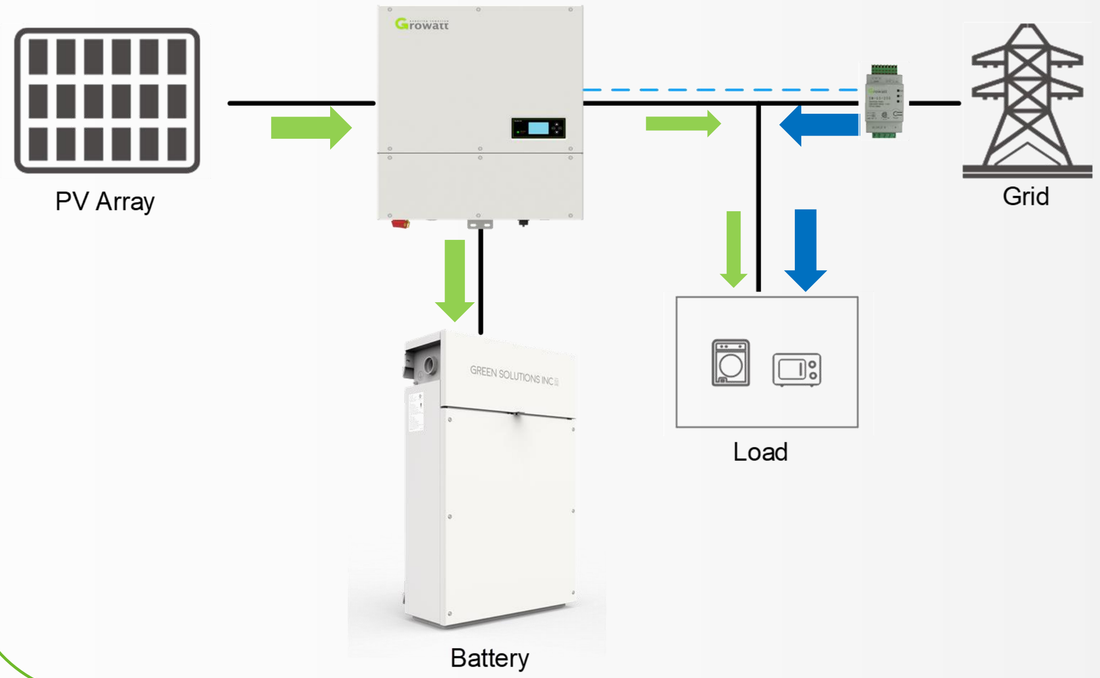
For multi-step electricity, could store the energy into the battery when the electricity price is low or store the energy before blackout happens

Features: Maximize the solar self-consumption, more independent from the grid

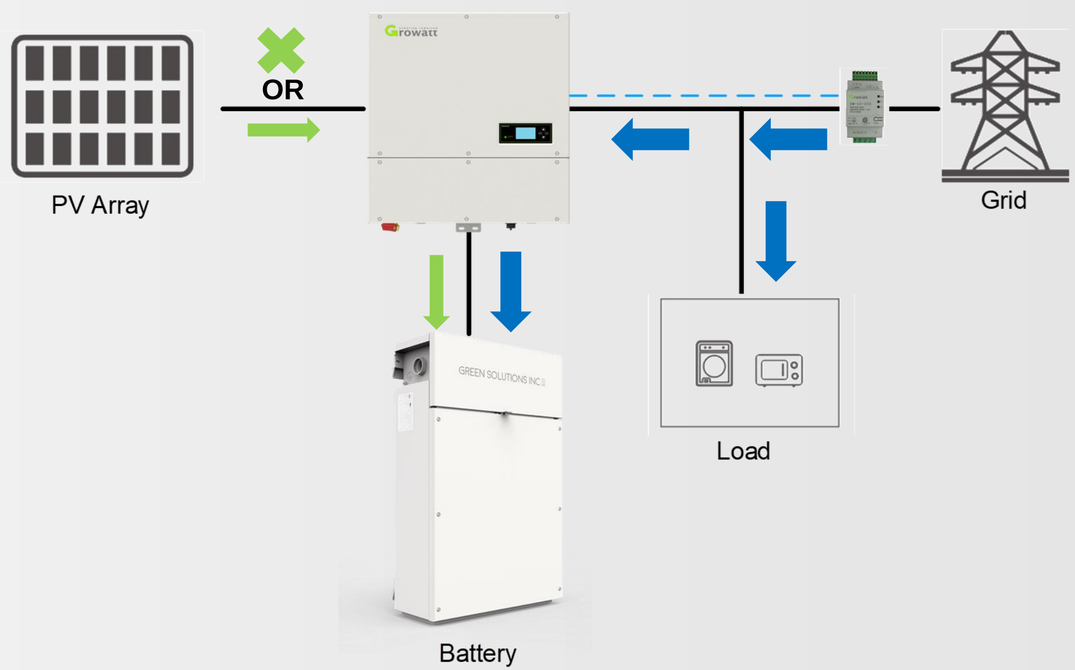
Priority: Load > Battery > Grid

How it works?

solar power is sufficient



solar power is insufficient



System Solution

Grid First Mode

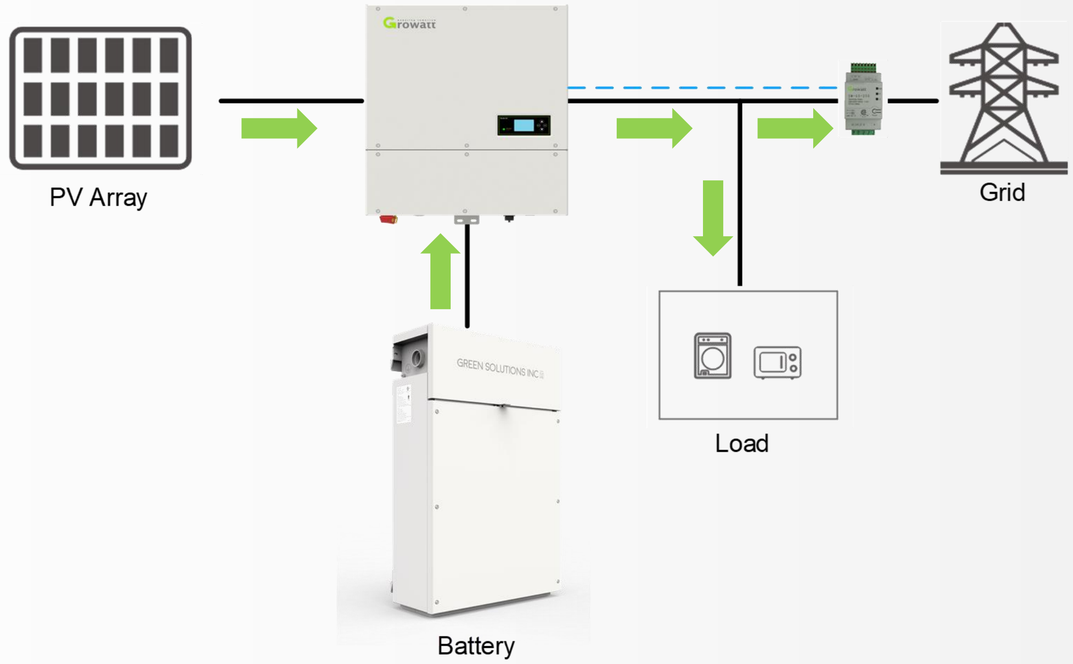
Export the energy into the grid in response to the grid scheduling

Features: Earn more profit from the grid

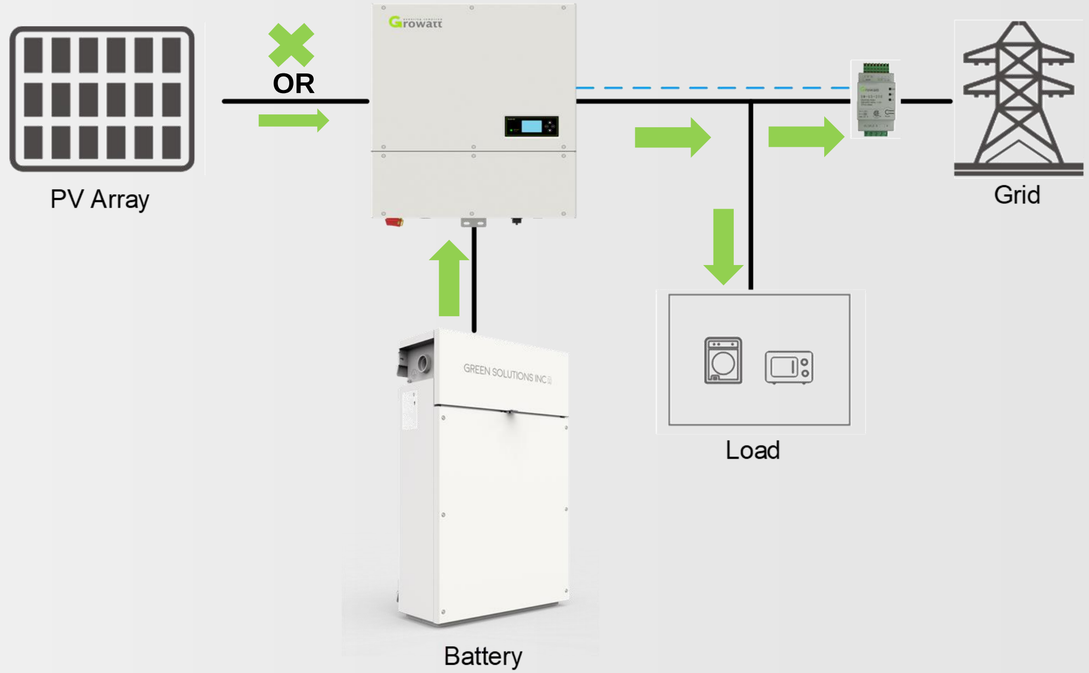
Priority: Load > Grid > Battery

How it works?

solar power is sufficient



solar power is insufficient



System Solution

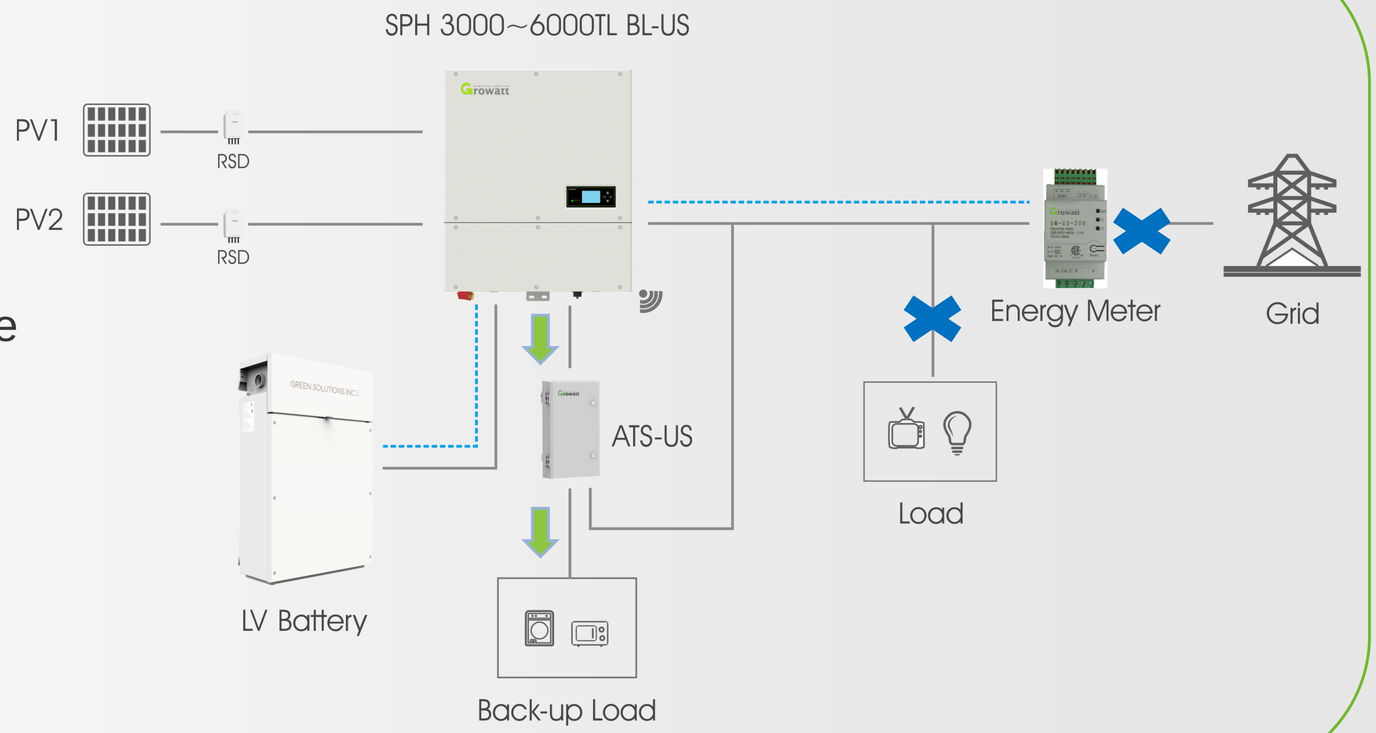
Backup Function:

Reserve full capacity of the battery system all the time in case the blackout happens, to protect the critical loads from the foreseeable power outage from the typhoon, mountain fire, etc,

How it works?

- Always keep the battery at the full capacity state for seven days.
- The backup function will be disabled after seven days to ensure the reasonable usage of the battery system

Next Version: The timer of the backup function supports to be configurable for the flexible application demand of the customer.



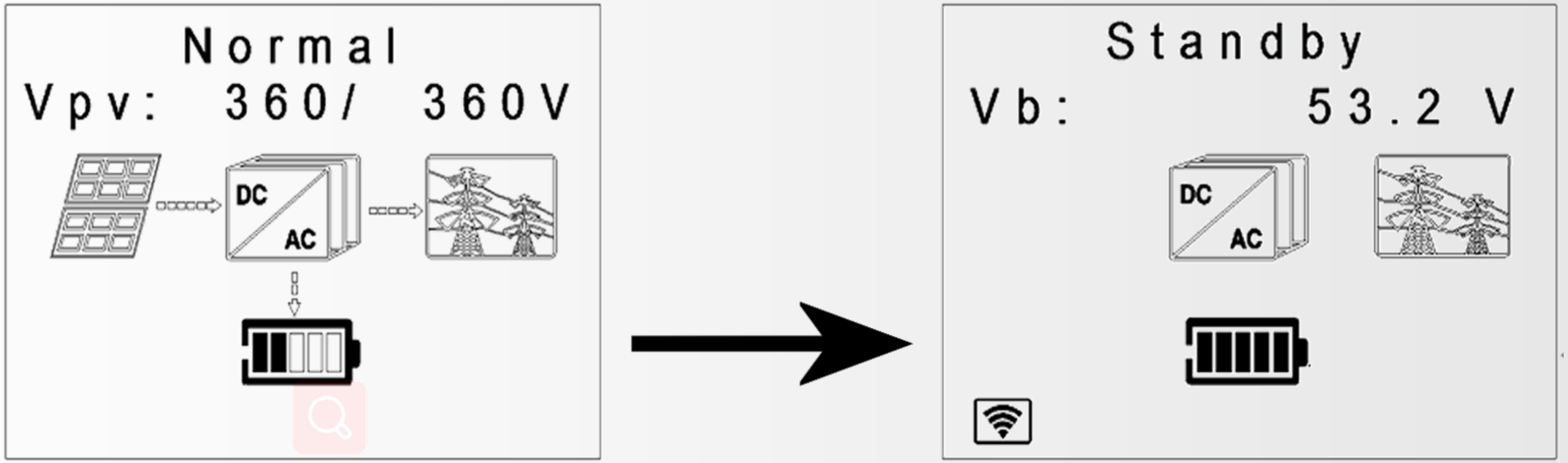
System Solution

RSD Function:

- The purpose of the PV RSD function is to protect the personal safety of installation and maintenance personnel and quickly reduce the PV voltage of string to below 30V, the default brand of RSD supplier is Tigo, and AP system could be integrated as well.

How it works?

- There is a PV RSD SWITCH button at the bottom of the machine. When the button is pressed, the PV voltage drops below 30V within the 30 seconds.
- Press the PV RSD SWITCH button, and please confirm whether the PV panel logo on the LCD disappears after 30 seconds, and check whether the PV voltage on the LCD screen is less than 30V



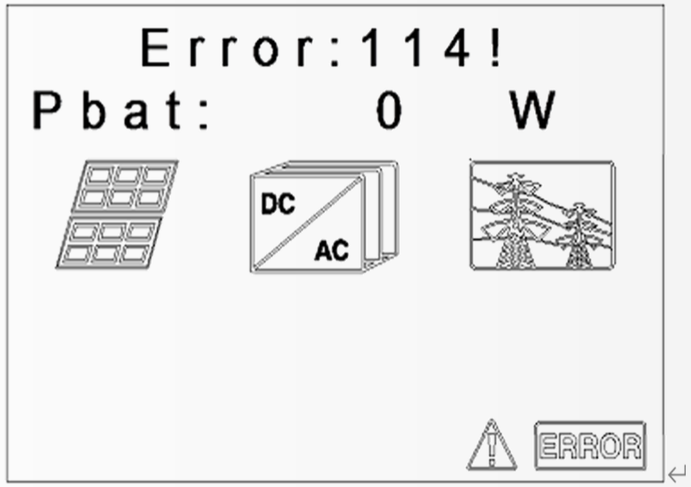
System Solution

AFCI Function:

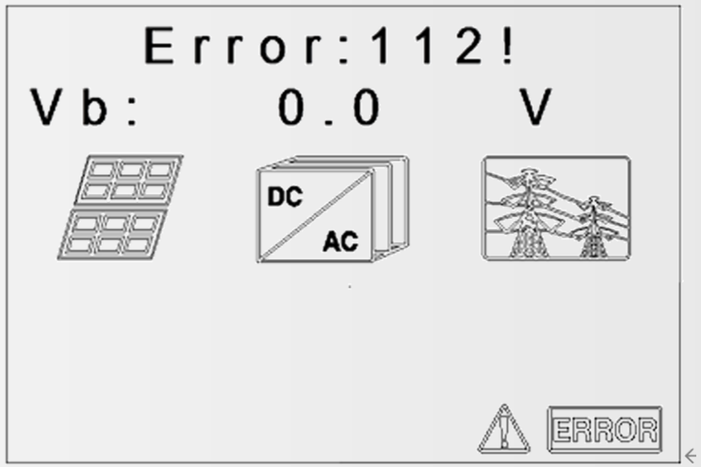
- It is a circuit protection device whose main function is to prevent fires caused by arc faults. For example, electrical insulation aging and breakage of wires, loose connections, air breakdown caused by humid air, etc. may cause electric sparks, that is, electric arcs

How it works?

- Function self-test: Before entering the AFCI test, it will check whether the arc detector is connected properly; if there is a problem with the arc detector connection, the LCD will display: Error: 114!
- Arc detection: After the self-inspection is successful, arc detection will continue, if there is an arc on the PV wiring, the LCD will display: Error: 112!



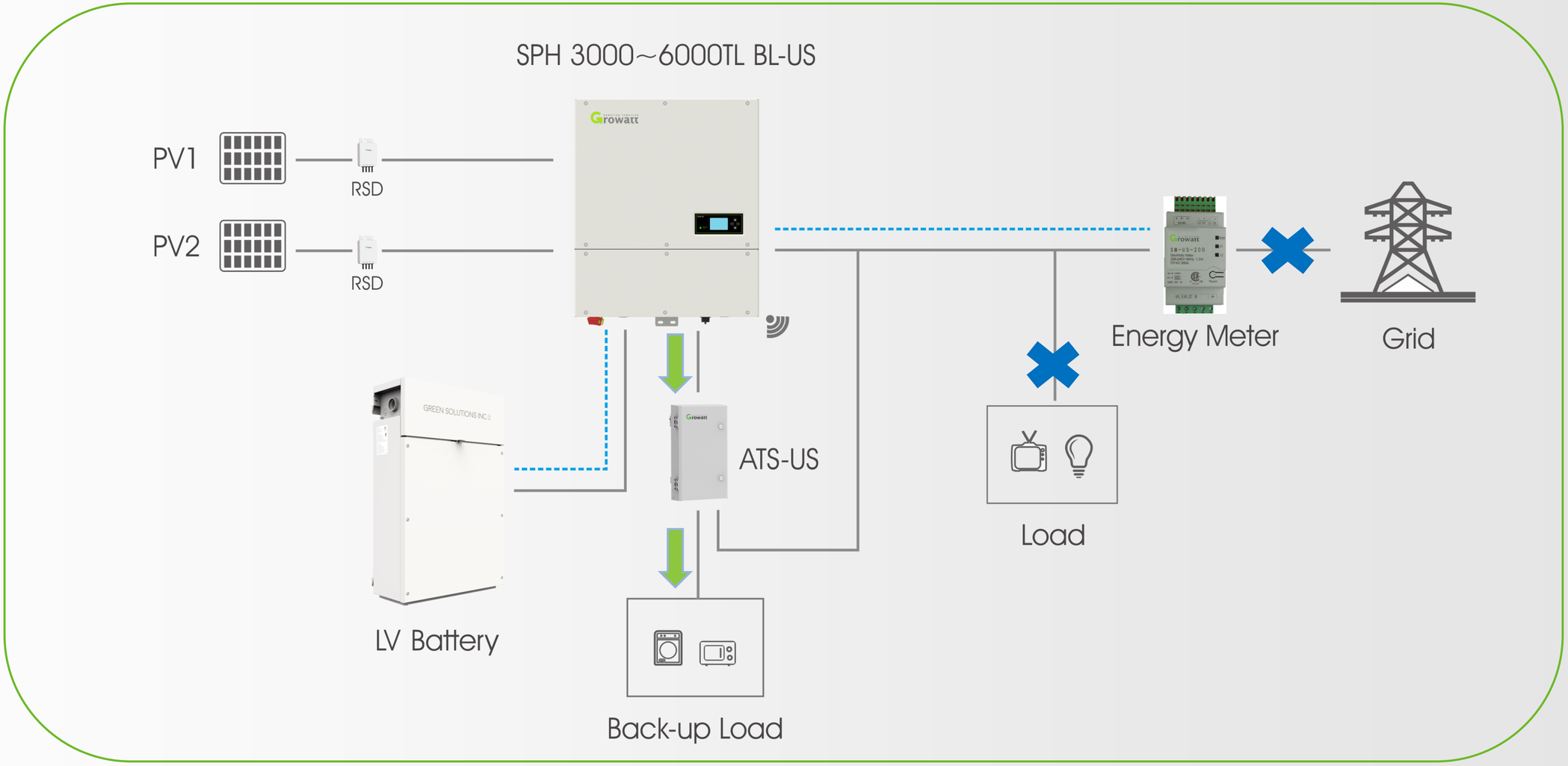
Self-test error interface



Arcing error interface

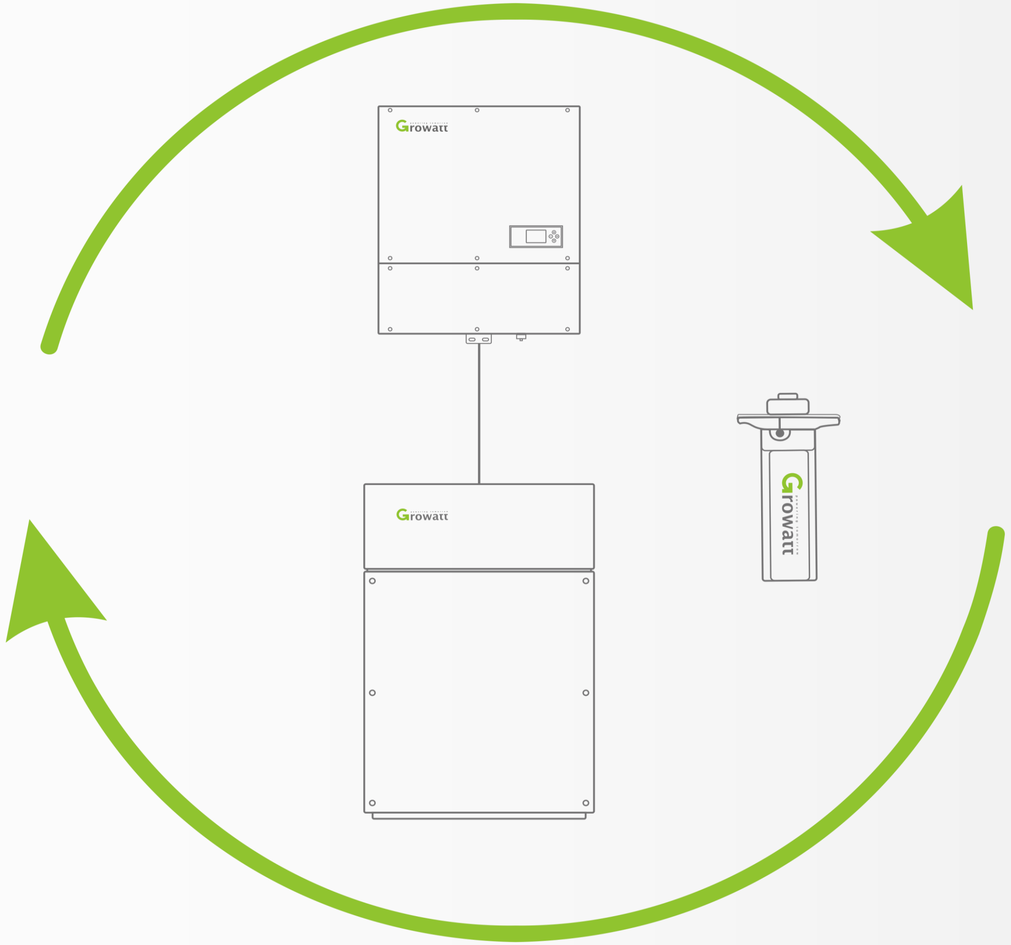
System Solution

ATS-US: It's auto-transfer switch with 240/120Vac transformer, could work with SPH-US to switch to the EPS power automatically if blackout happens



System Solution

Whole System Service



Complete Equipment Supply

Inverter, Battery, ATS and Monitoring,

Compatibility with lithium battery

Whole System Guarantee

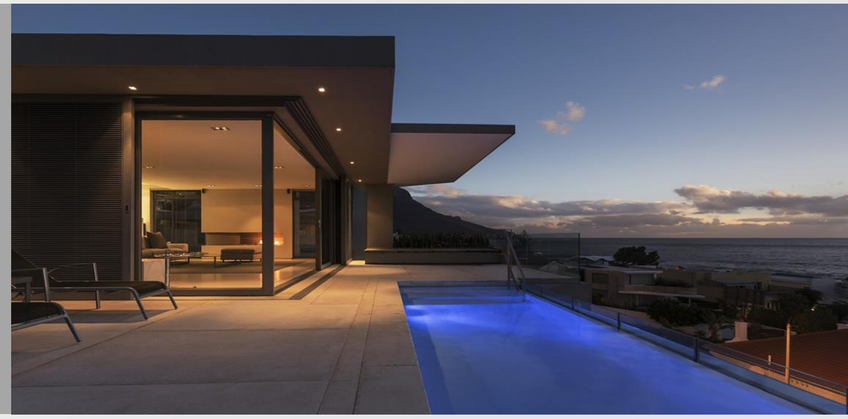
Guidance and help of the whole system,

Warranty for all devices,

Professional and local service team

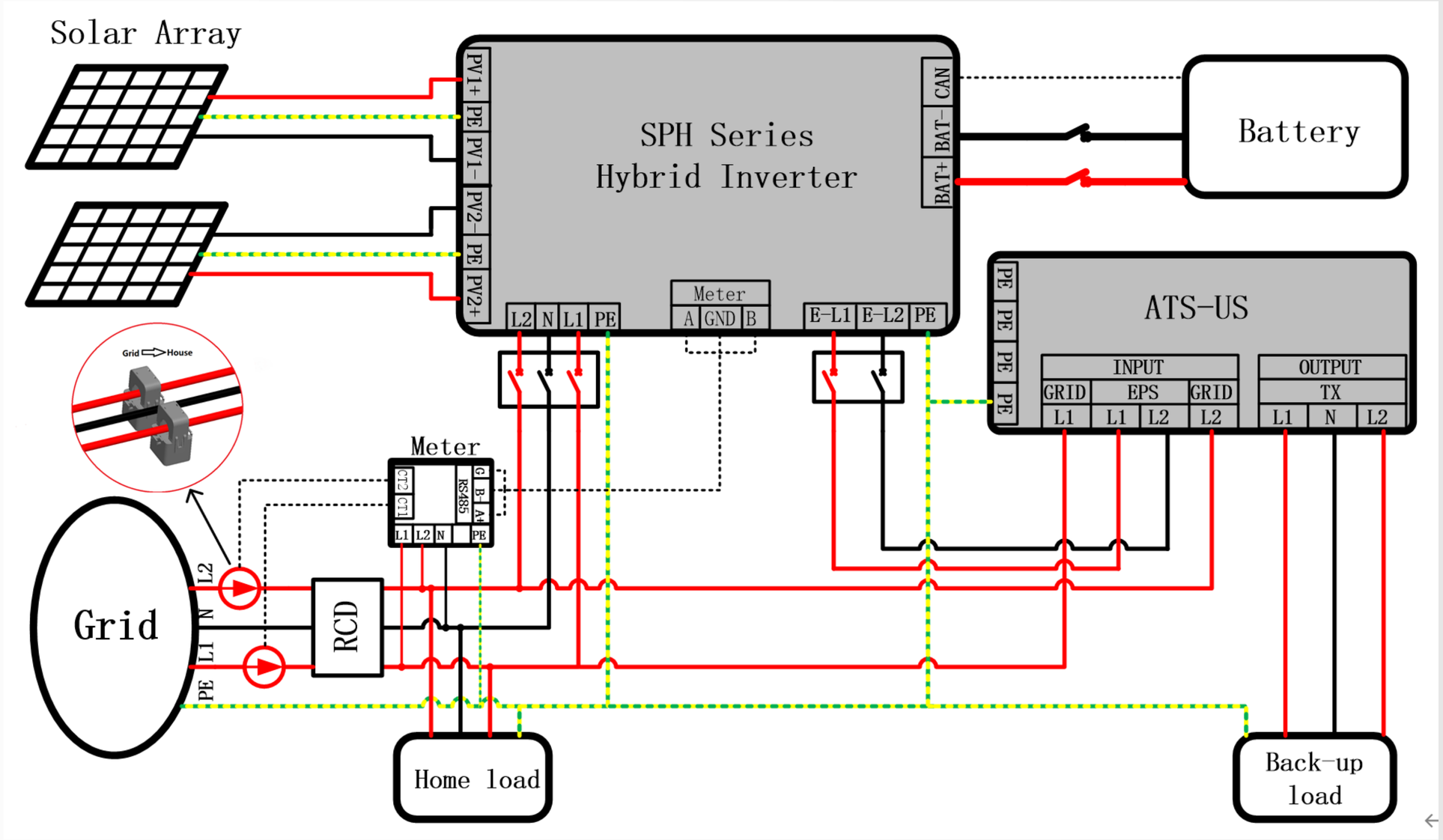
02

SPH 3K-6KTL BL-US
Hybrid Inverter Installation



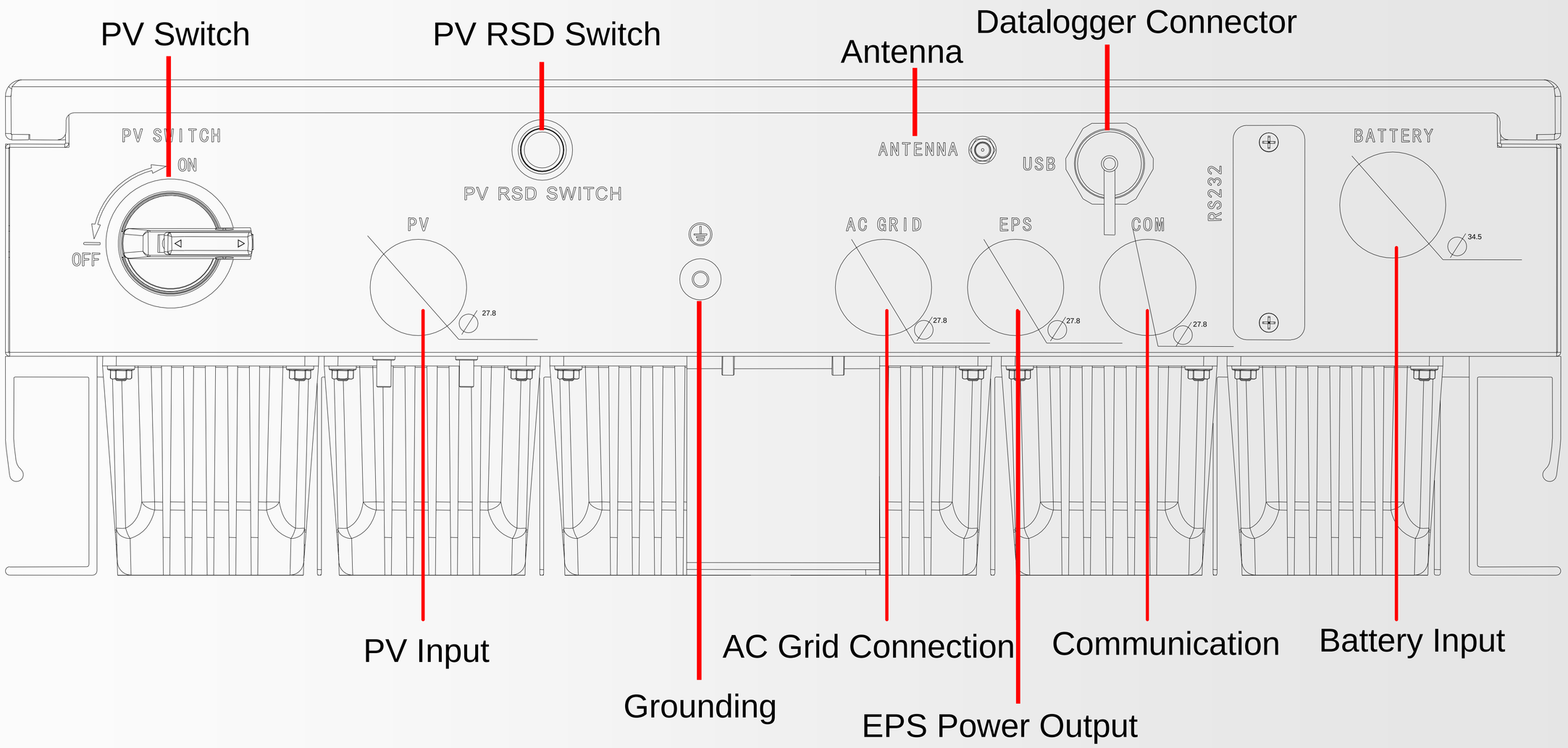
SPH 3K-6KTL BL-US Hybrid Inverter Installation

System connection diagram



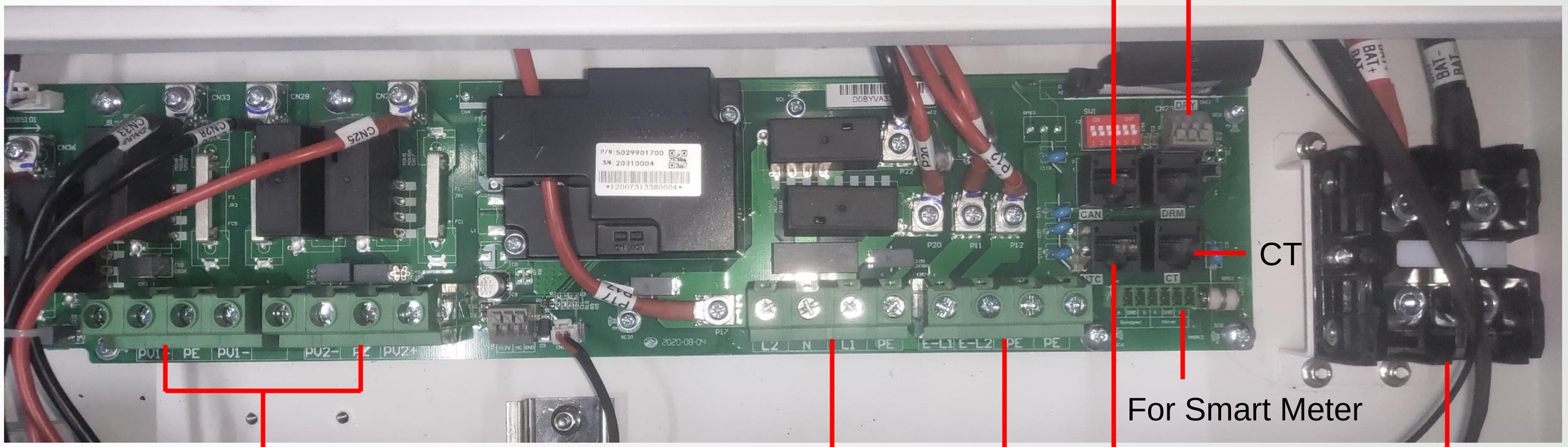
SPH 3K-6KTL BL-US Hybrid Inverter Installation

SPH TL BL-US Ports Introduction



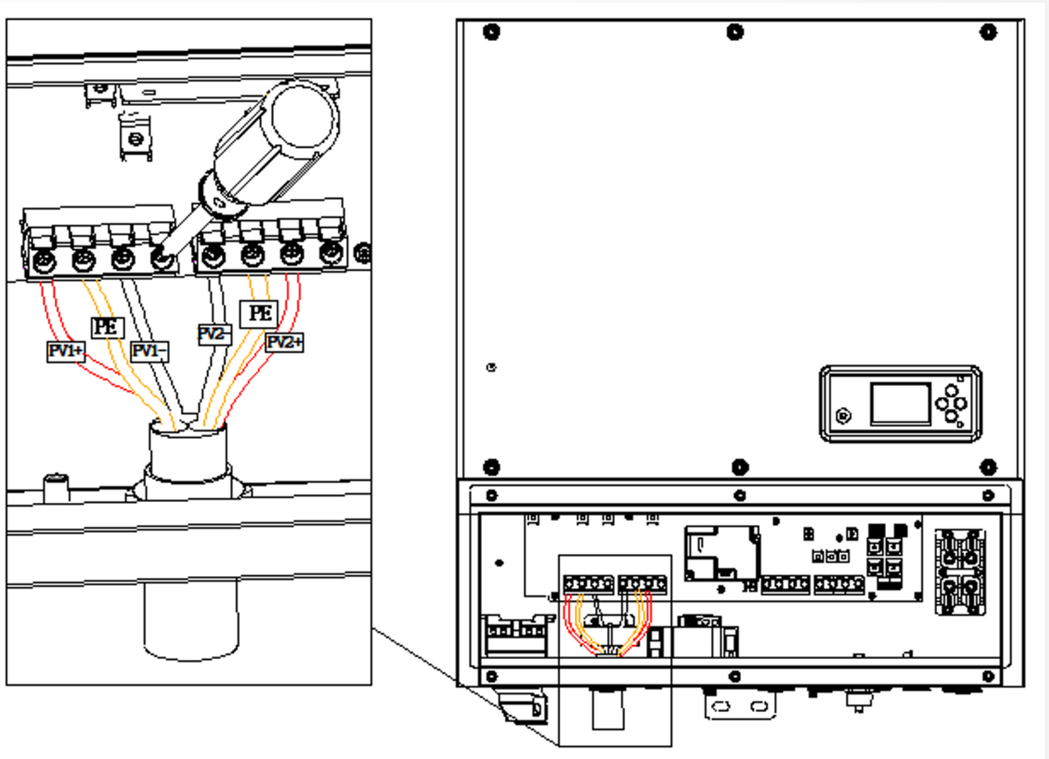
SPH 3K-6KTL BL-US Hybrid Inverter Installation

SPH BL TL-US Terminals Introduction



SPH 3K-6KTL BL-US Hybrid Inverter Installation

PV Input Terminals Connection



Connection steps:

1. Ensure the PV switch is off
2. Connect the wires to the PV1+, PV1- and the PV2+,PV2- terminals
3. Connect the PE wire from solar panels to the PE terminal

Limitation:

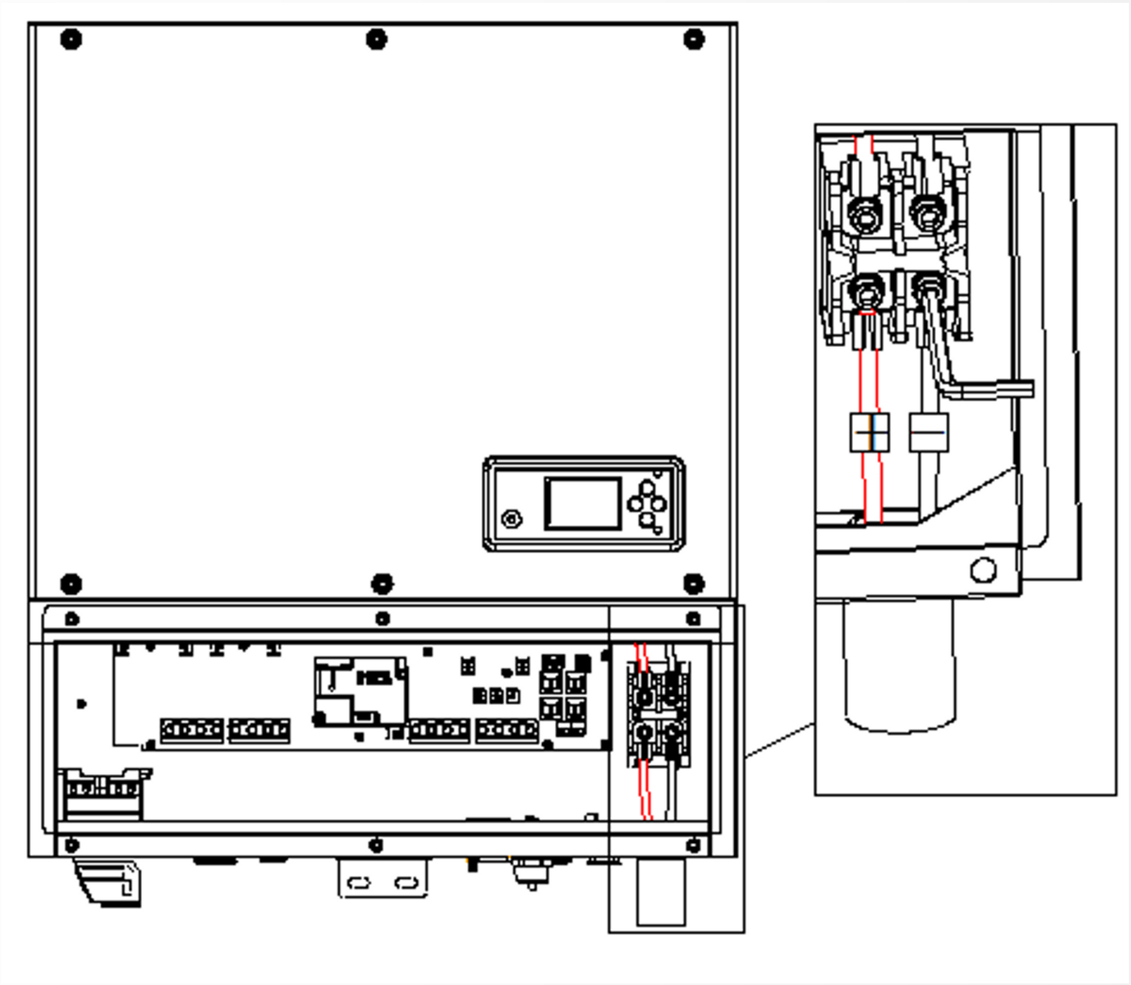
1. Max PV voltage: 550V (consider the lowest temperature)
2. Max. PV input current: 13A
3. Max. Recommended PV Power (STC): 1.3 times AC rated power.

Note:

Suggest to use the PV input cable ≥10 AWG to connect.

SPH 3K-6KTL BL-US Hybrid Inverter Installation

Battery Input Terminals Connection



Connection steps:

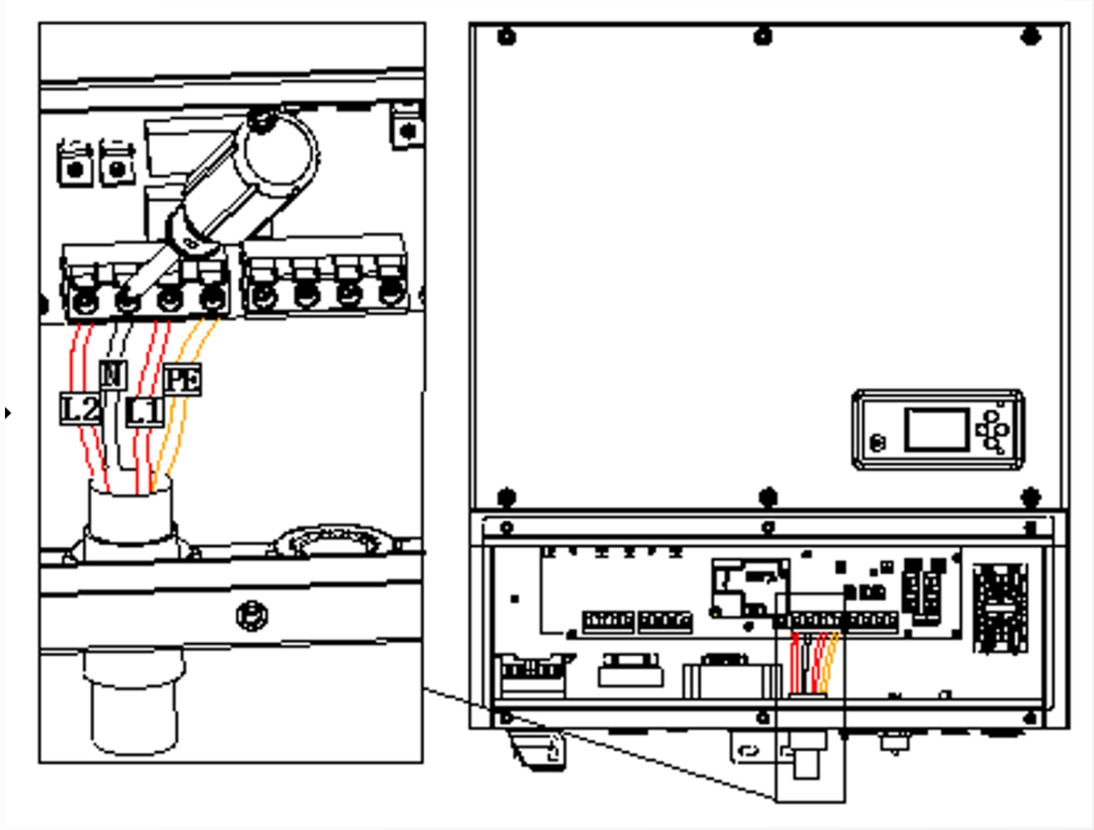
Connect the wires from battery to BAT+/- terminal

Note:

We suggest the distance between battery and SPH no longer than 1.5m, and the power line must be larger than 6 AWG

SPH 3K-6KTL BL-US Hybrid Inverter Installation

AC grid connection terminals connection



***Connection steps*:**

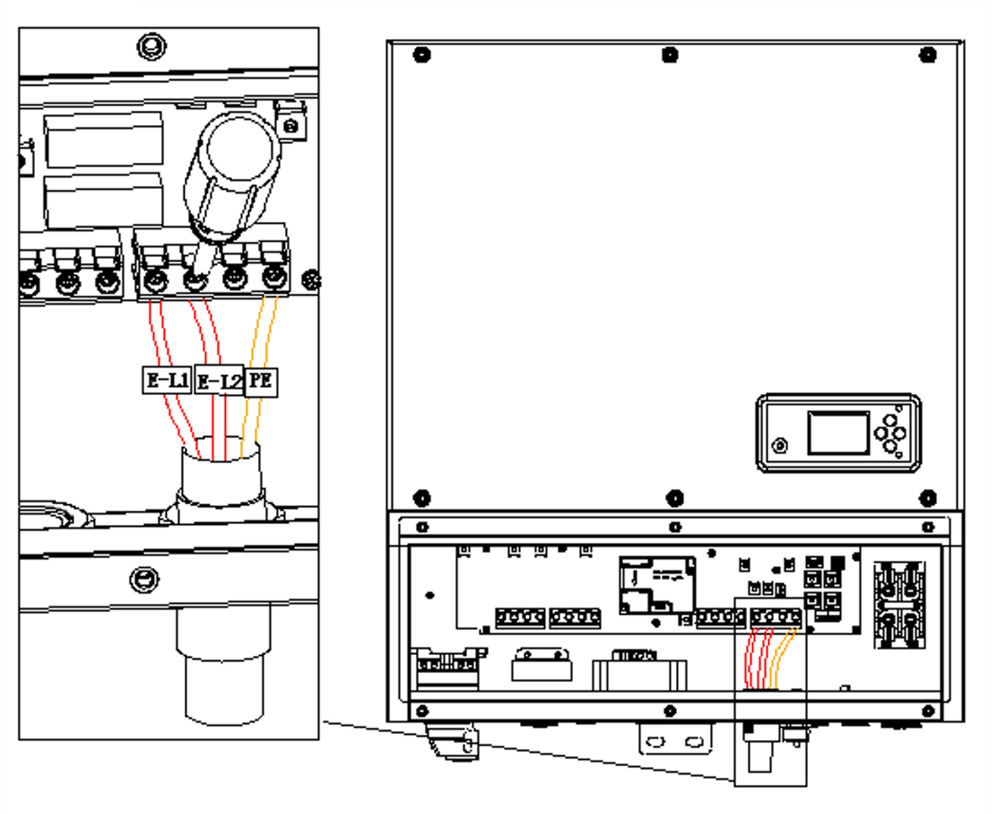
1. Connect the wires form AC grid to the L1,N,L2, terminals of GRID
2. Connect the PE wire form the ground bar.

Note:

Suggest to use the AC grid connection cable ≥8 AWG to connect.

SPH 3K-6KTL BL-US Hybrid Inverter Installation

Back-up output terminals connection



Connection steps:

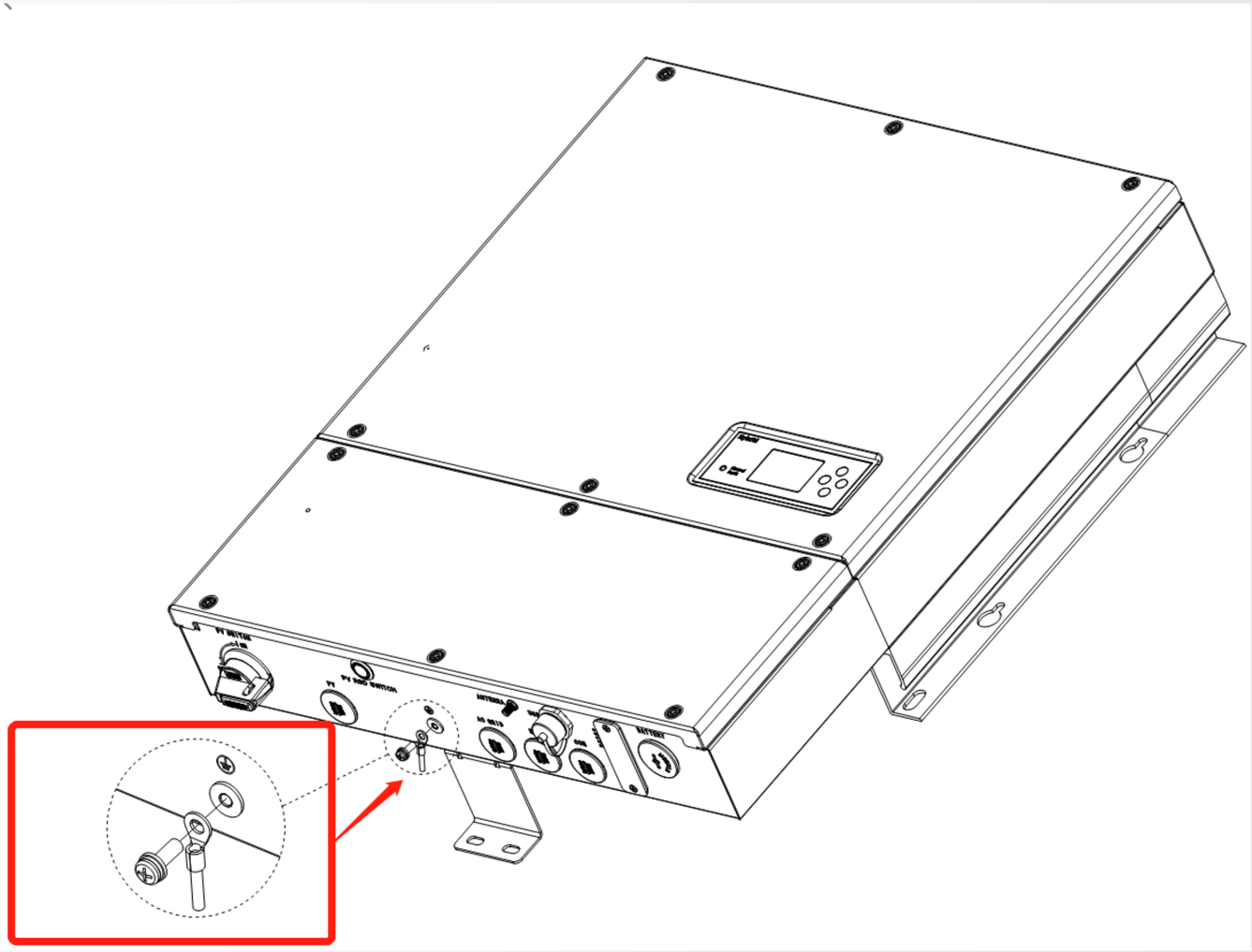
1. Connect the wires from the ATS-US to the E-L1,E-L2 terminals of BACKUP
2. Connect the PE wire from ATS-US to the PE terminal

Note:

1. Suggest to use the Back-up output cable ≥8 AWG to connect.
2. *DO NOT* connect the backup output terminal and AC grid connection terminal together.

SPH 3K-6KTL BL-US Hybrid Inverter Installation

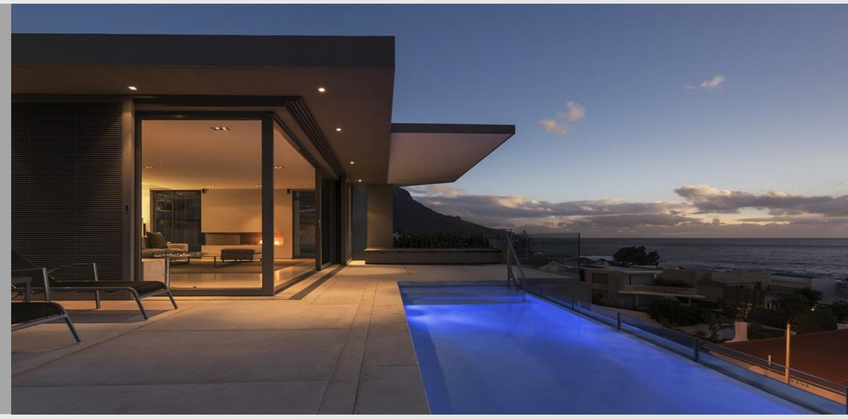
Grounding connection



The grounding connector is at the bottom side of the inverter. PE cable ≥10 AWG

03

Smart Meter Connection



Smart Meter Connection

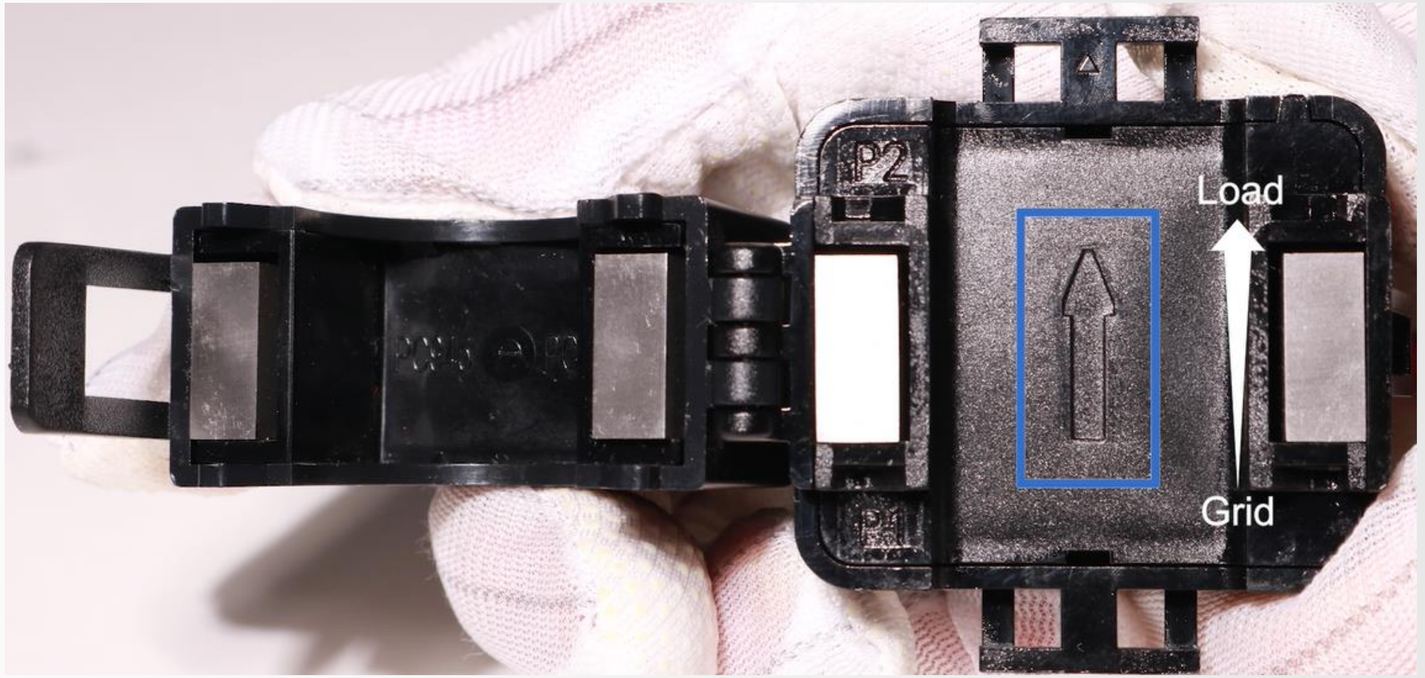
Smart meter

Features:

- ANSI C12.20,Class 1.0
- With 2 CTs

Smart Meter Connection

CT Installation

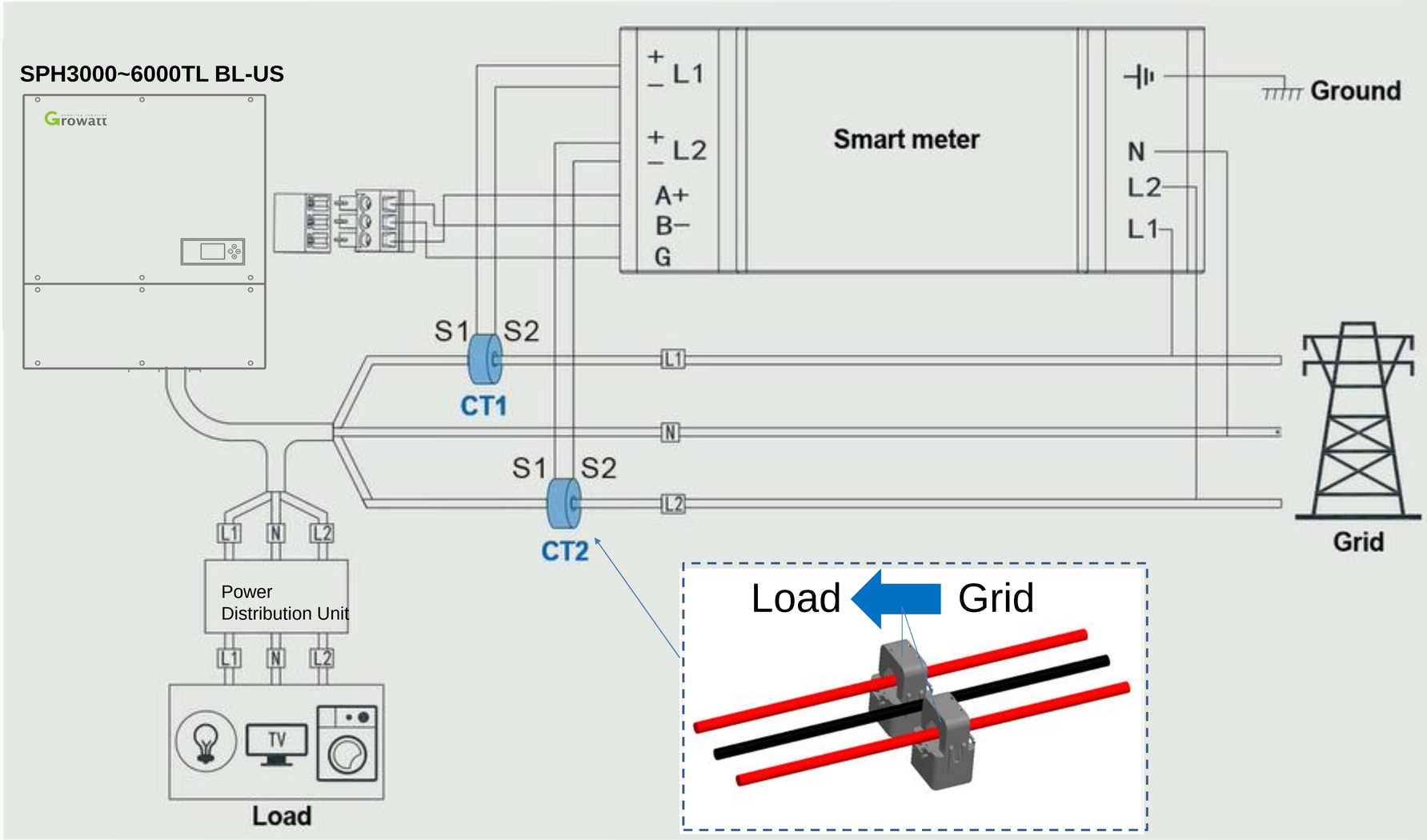


Install the CT on the power cable between the load and grid.

Check the direction of the CT then open the current transformer first and you can see an arrow labeled which indicates the current direction and the direction of the arrow means the direction from public grid to user load.

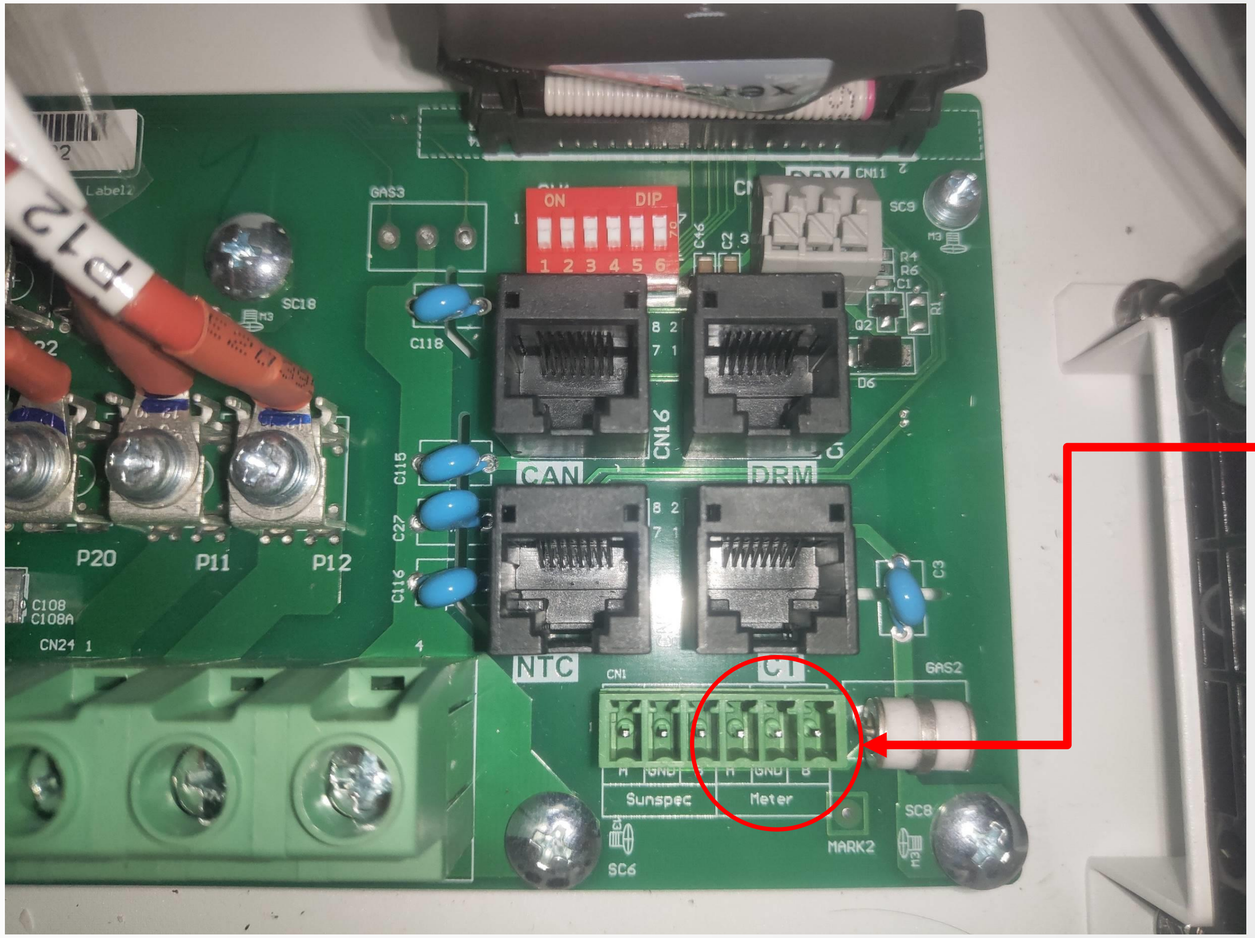
Smart Meter Connection

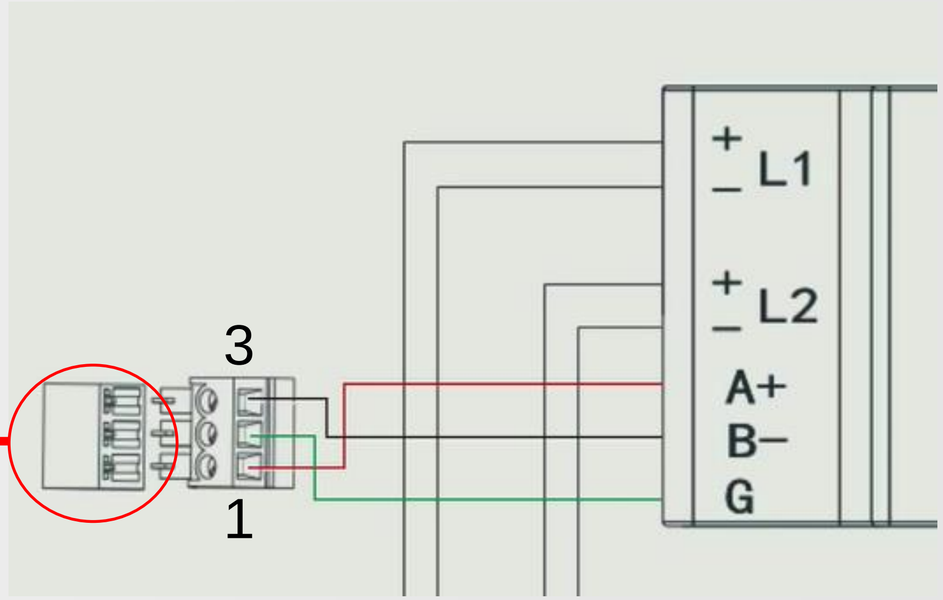
Smart meter cable connection



Smart Meter Connection

Smart meter communication cable connection

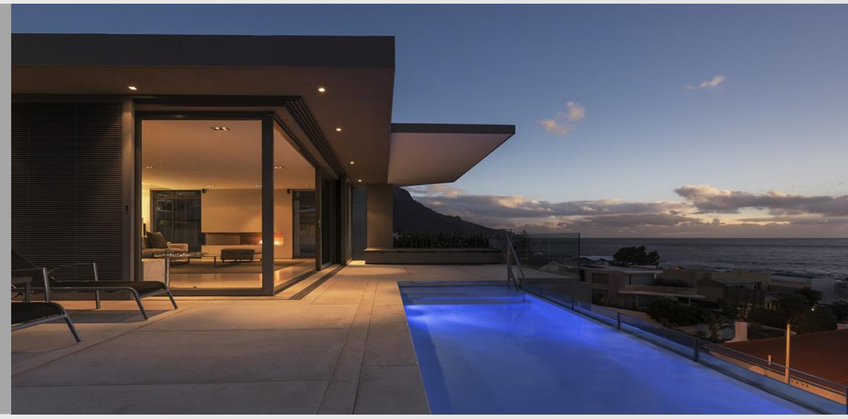




Meter terminal	A+	G	B-
Connector PIN	1	2	3
485 port in the SPH TL BL-US	485A	GND	485B

04

ATS-US Connection



ATS-US Connection

ATS-US

- ATS-US comes with built-in transformer.
- The maximum sum of L1-N and L2-N simultaneous output is 3680Watt
- Maximum continuous power of the SPH TL BL-US under off-grid mode is 3680Watt

ATS-US Connection

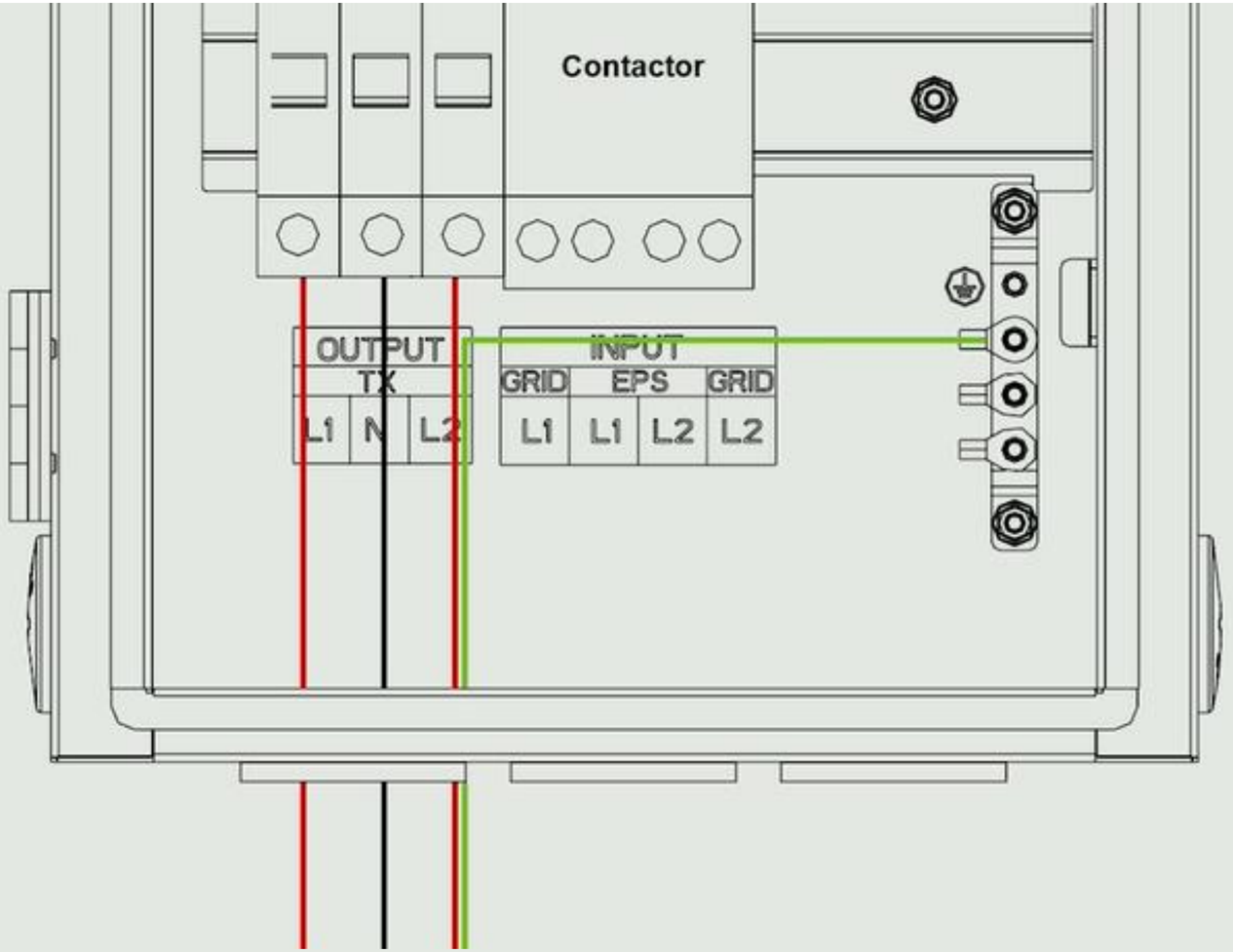
Back-up load connection

Corresponding Connection
(Cable size10AWG)

L1 port of OUTPUT TX– Back-up Load L1

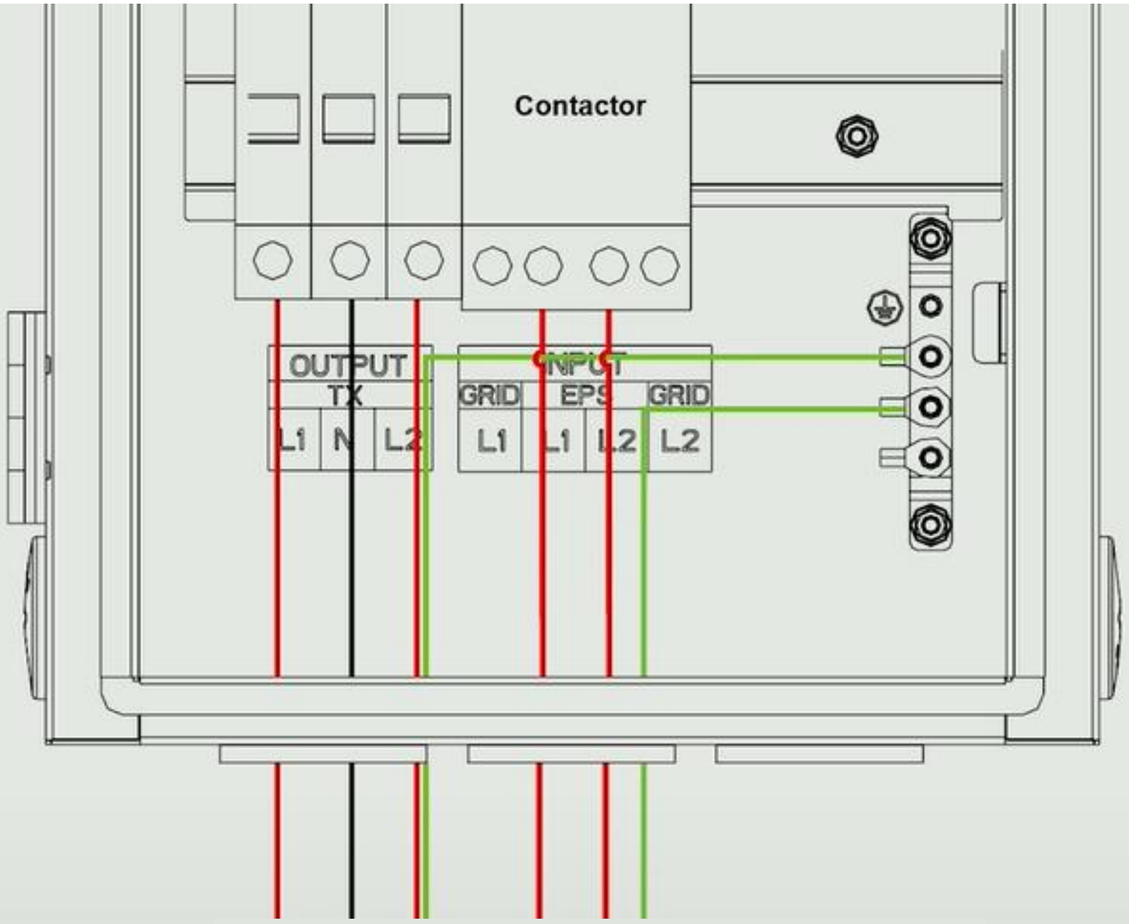
N port of OUTPUT TX – Back-up Load N

L2 port of OUTPUT TX– Back-up Load L2



ATS-US Connection

Back-up output port of SPH TL BL-US connection



Back-up load

Back-up output
port of SPH3000-6000TL BL-US

Corresponding Connection
(Cable size10AWG)

L1 port of INPUT EPS --BACKUP E-L1 port of SPH TL BL-US

L2 port of INPUT EPS --BACKUP E-L2 port of SPH TL BL-US

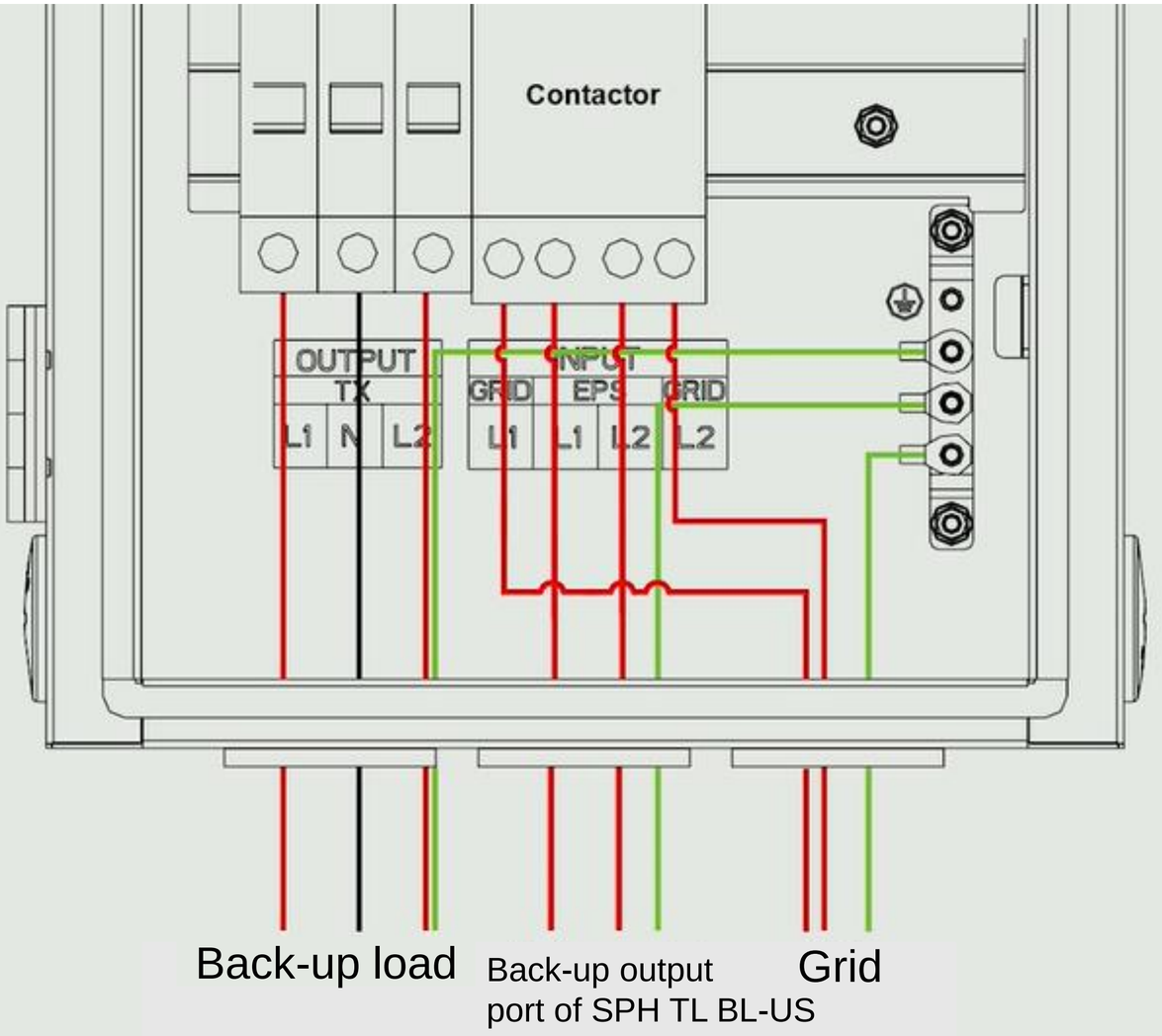
ATS-US Connection

Grid connection

Corresponding Connection
(Cable size10AWG)

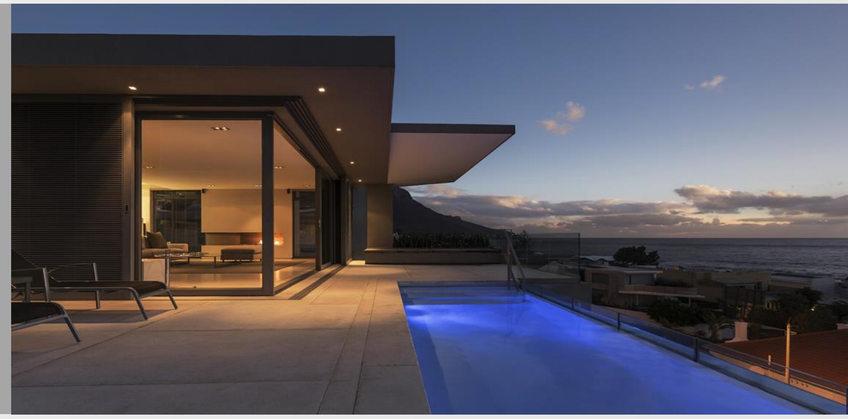
L1 Port of INPUT Grid – Grid L1

L2 Port of INPUT Grid – Grid L2



05

Battey System Installation



Battery System Installation

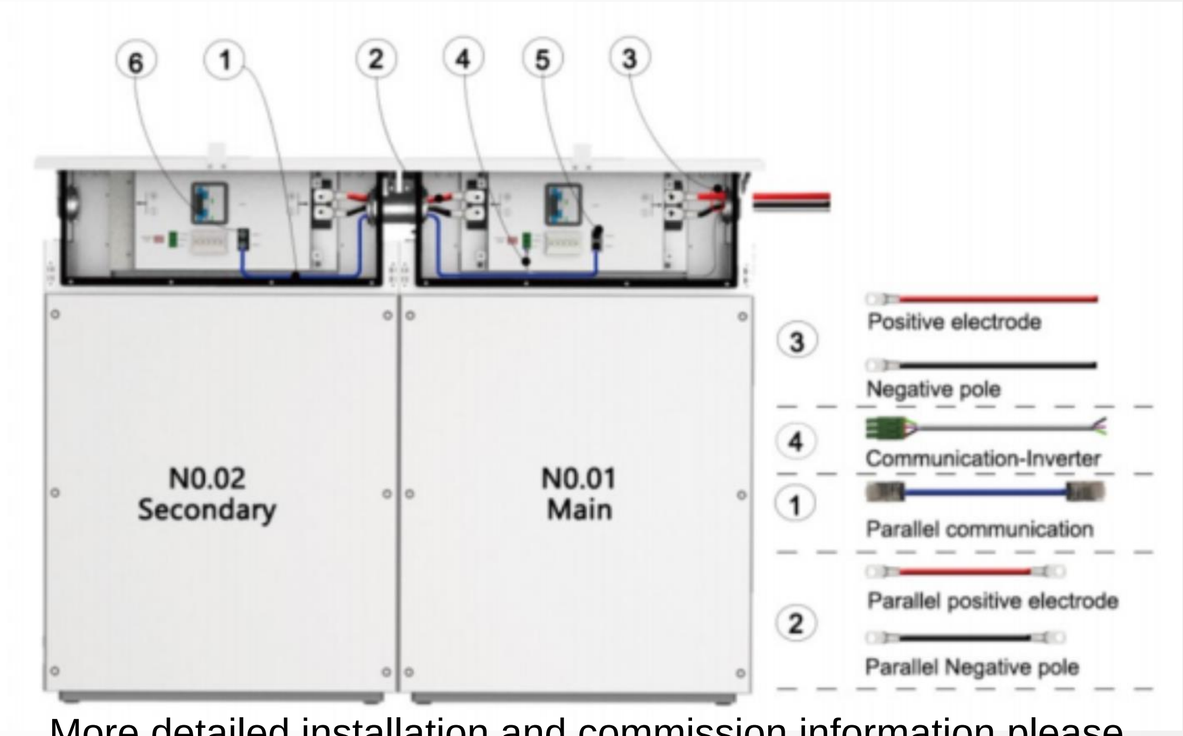
HOMe 11 Battery System

Feature:

- Seamless capacity expansion to 22 kWh
- Compact size and easy installation
- High energy density and efficiency
- Excellent safety of LiFePO4 battery

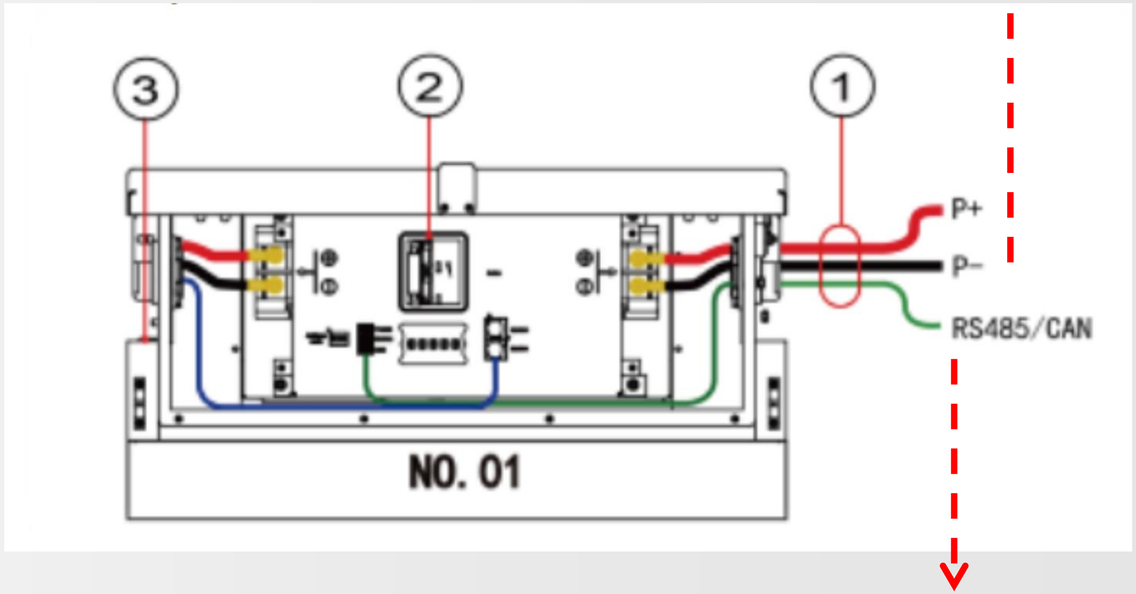
Battery System Installation

HOMe11 battery electrical connection



More detailed installation and commission information please refer the user manual of HOMe11

Positive and negative power terminals are connected with the corresponding battery input of the SPH-US



RS485/CAN port is connected to the CAN port of the SPH-US

Battery System Installation

ML33RTA Battery Module

Feature:

- Flexible capacity options, 3.3kWh - 19.8 kWh
- Compact size and easy installation
- High energy density and efficiency
- Excellent safety of LiFePO4 battery
- Long lifespan, 10 years warranty
- Remote firmware upgrade

Battery System Installation

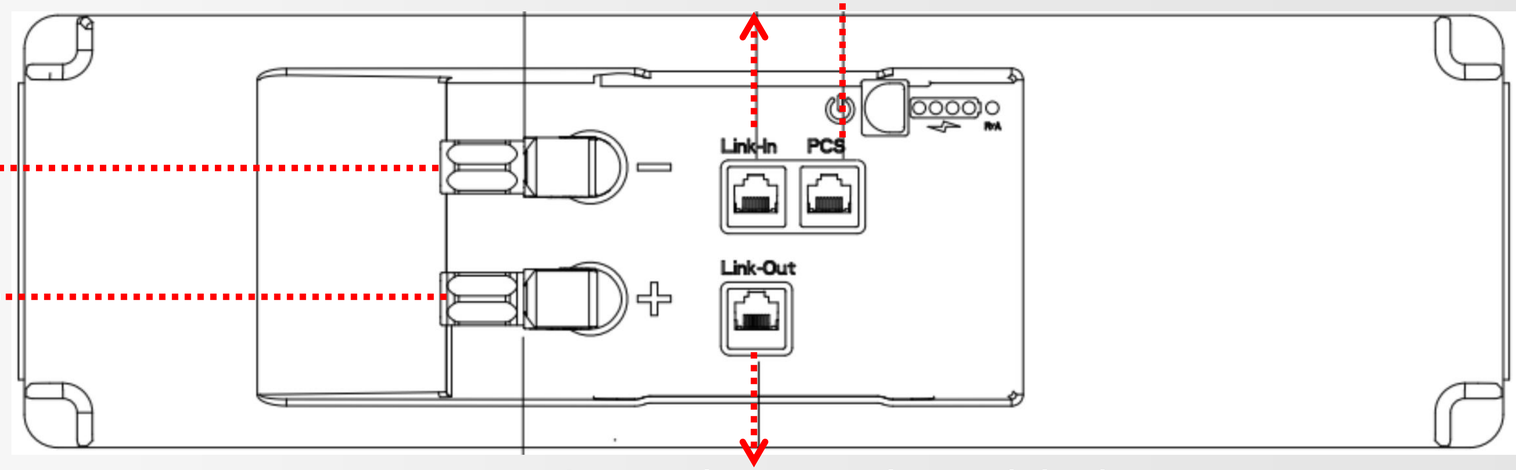
Single ML33RTA electrical connection

PCS port is connected to the CAN port of the SPH-US

Insert the crystal port (plug)

Negative power terminals is connected with the negative battery input of the SPH-US

Positive power terminal is connected with the positive battery input of the SPH-US



Insert the crystal port (plug)

Battery System Installation

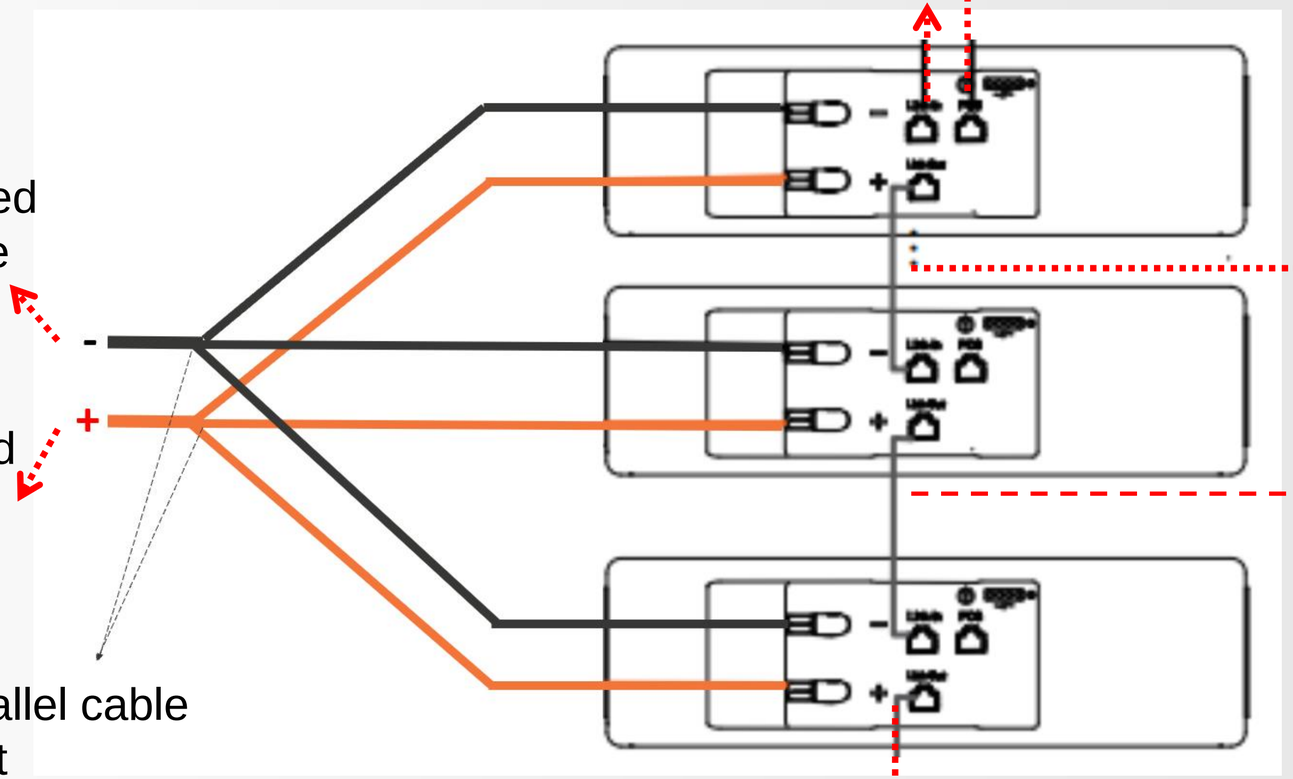
Multiple ML33RTA batterys electrical connection

PCS port is connected to the CAN port of the SPH-US

Insert the crystal port (plug)

Negative power terminal is connected with the negative battery input of the SPH-US

Positive power terminal is connected with the positive battery input of the SPH-US



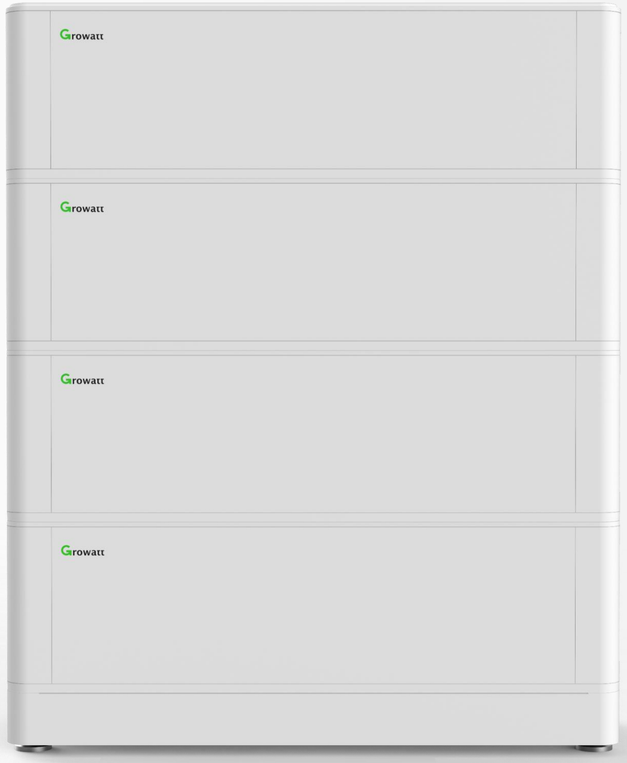
Battery parallel communication cable

Multiple battery parallel cable provided by Growatt

Insert the crystal port (plug)

Battery System Installation

ARK LV Battery System



Feature:

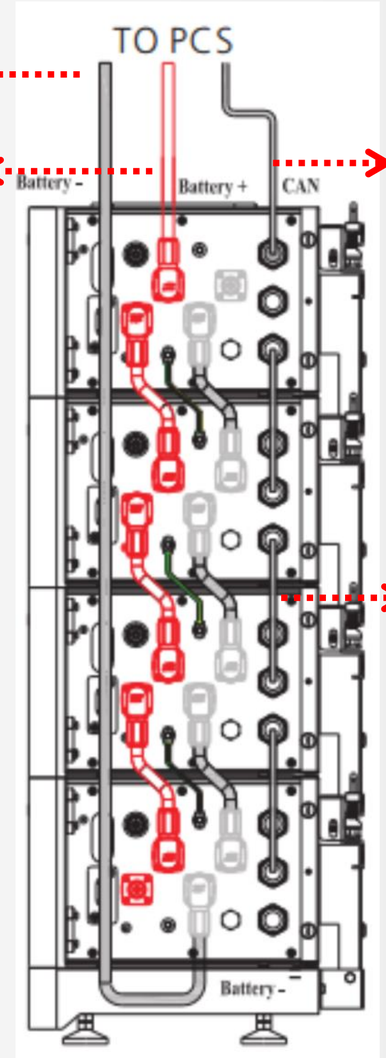
- Flexible capacity options, 2.56kWh to 25.6kWh
- Excellent safety of cobalt free LiFePO4 battery
- Easy installation with modular and stacked design
- Long lifespan, 10 years warranty
- Remote firmware upgrade

Battery System Installation

ARK LV battery system electrical connection

Negative power terminal is connected with the negative battery input of the SPH-US

Positive power terminal is connected with the positive battery input of the SPH-US



CAN port is connected to the CAN port of the SPH-US

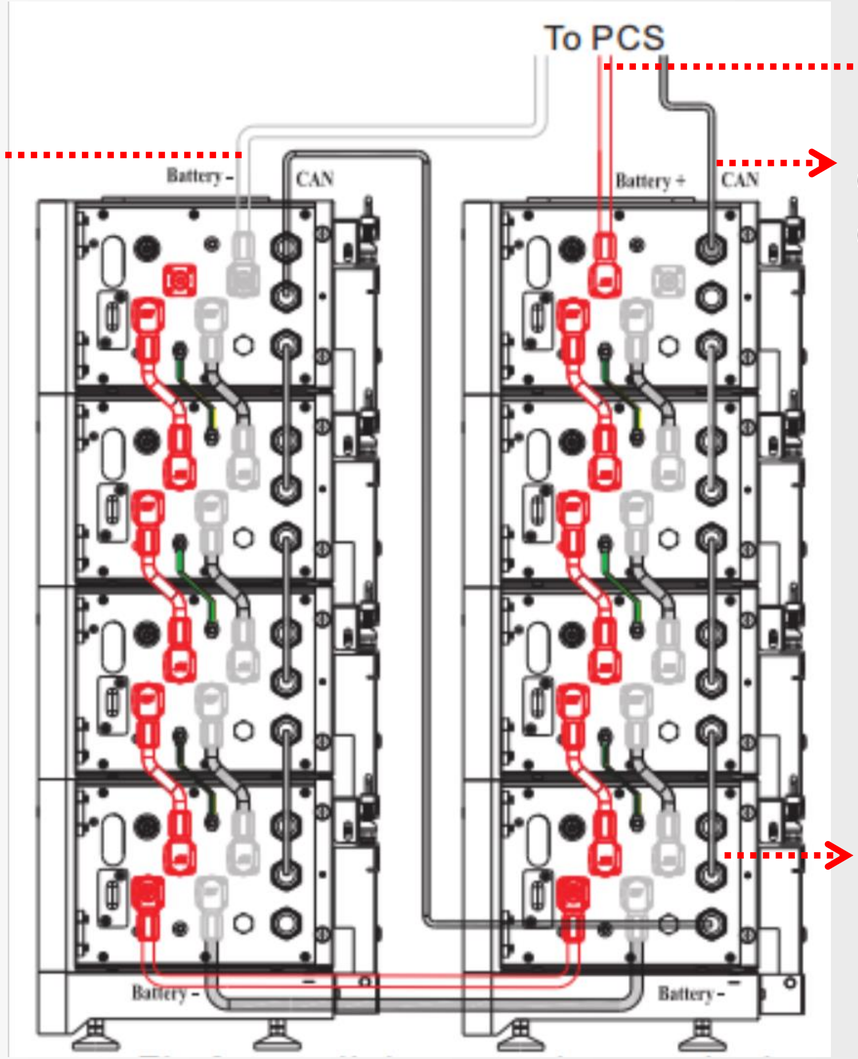
Battery parallel communication cable

Parallel connection of four battery modules

Battery System Installation

ARK LV battery system electrical connection

Negative power terminal is connected with the negative battery input of the SPH-US



Positive power terminal is connected with the positive battery input of the SPH-US

CAN port is connected to the CAN port of the SPH-US

Battery parallel communication cable

Parallel connection stacked in two lines

Thanks!

www.ginverter.com

Growatt New Energy

GROWATT