



PowerDepot A1 Energy Storage System (ESS)

User Manual

V1.1

BPE PowerDepot A1 Installation Guide

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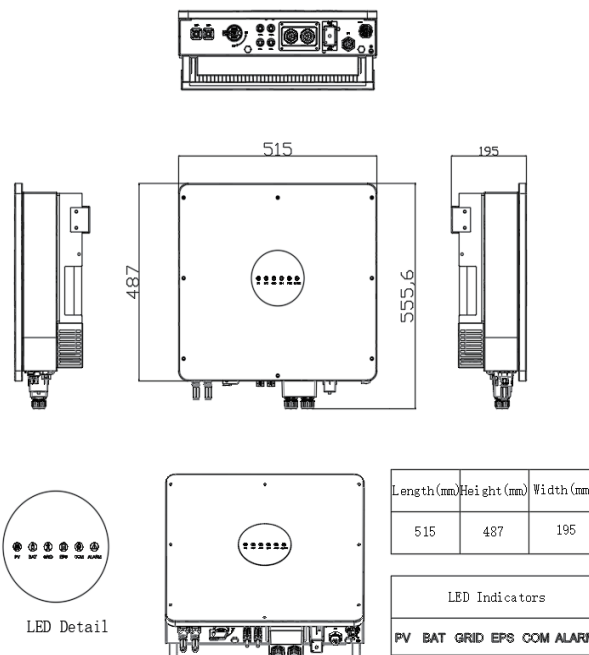
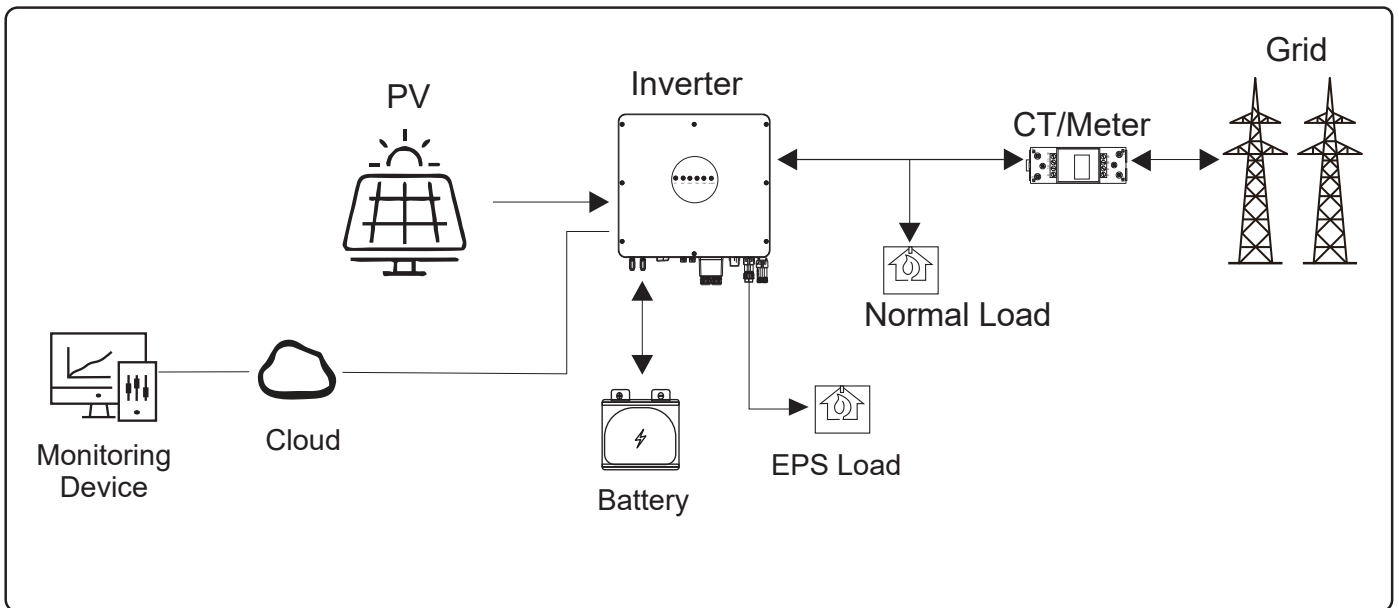
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1 Product Introduction

1.1 System Introduction

Our all-in-one Hybrid PV inverter combines Solar PV, Battery Charging and Emergency Backup Power together with an easy-to-use App to manage your home's complete power needs. The BPE PowerDepot A1 allows you to simply add on more storage as required and still maintains a slim and sleek looking design that will blend into any room in your property.

The Lithium Iron Phosphate batteries are scalable from 5.22kWh to 15.66kWh, allowing you to power your entire home for hours at a time.

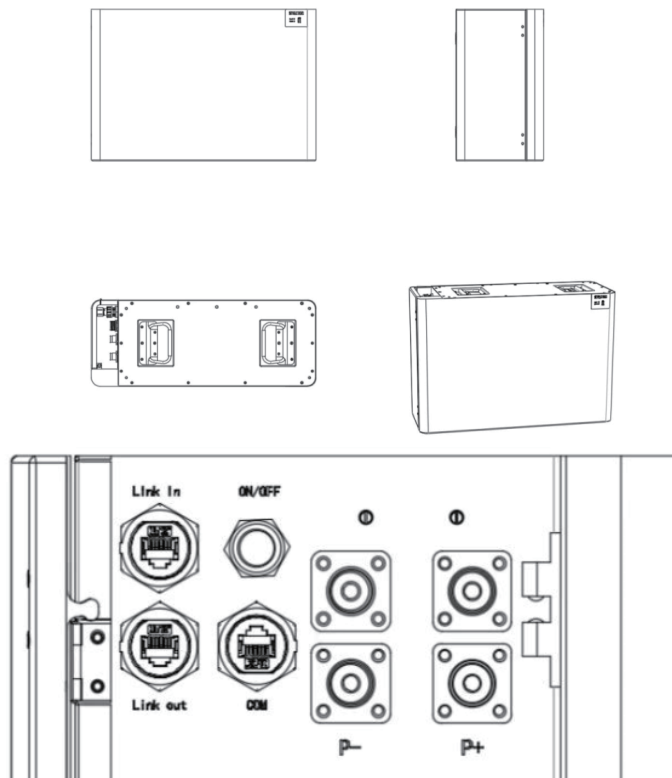


1.2 BPE-HI-SP-3.6/5.5K Datasheet

| Inverter Specifications | | BPE-HI-SP-3.6K | BPE-HI-SP-5.5K |
|-------------------------|-------------------------------------|--------------------------|----------------|
| Efficiency | Max Efficiency (PV to AC) | 97.3% | |
| Input (PV) | Max PV Power | 9000W | |
| | Max PV Voltage | 550V | |
| | Max Input Current (input A/input B) | 15A/15A | |
| | Max Short Current (input A/input B) | 20A/20A | |
| | Start Operating Voltage | 90V | |
| | MPPT Voltage Range | 70V-520V | |
| | Number of MPPTs | 2 | |
| | String per MPPT | 1 | |
| Input (BAT) | Compatible Battery Type | Lithium/Lead-acid | |
| | Nominal Battery Voltage | 48V | |
| | Battery Voltage Range | 40V-60V | |
| | Max Charge/Discharge Current | 120A/120A | |
| | Max Charge/Discharge Power | 3680W/3680W | 5500W/5500W |
| | Lithium Battery Charge Curve | Self-adaption to BMS | |
| Protection | Protection Category | Class I | |
| | DC Switch | Integrated | |
| | Anti-Islanding Protection | Integrated | |
| | AC Overcurrent Protection | Integrated | |
| | AC Short Circuit Protection | Integrated | |
| | DC Reverse Connection | Integrated | |
| | Surge Arrester | DC Type III, AC Type III | |
| | Insulation Detection | Integrated | |
| | Leakage Current Protection | Integrated | |
| | PV Overvoltage Category | II | |
| | AC Overvoltage Category | II | |

| Inverter Specifications | | BPE-HI-SP-3.6K | BPE-HI-SP-5.5K |
|-------------------------|------------------------------------|--|----------------|
| Output (Grid) | Nominal AC Output Power | 3680W | 5500W |
| | Max AC Output Apparent Power | 3680VA | 5500VA |
| | Max AC Output Power (PF=1) | 3680W | 5500W |
| | Max AC Output Current | 16A | 25A |
| | Rated AC Voltage | 220V ±10% | |
| | AC Voltage Range | 150V-300V (Adjustable) | |
| | Rated Grid Frequency | 50Hz/60Hz | |
| | AC Frequency Range | 45Hz-55Hz/55Hz-65Hz (Adjustable) | |
| | Grid Connection | Single Phase | |
| | Power Factor | > 0.99 @ rated power (Adjustable 0.8 LD – 0.8 LG) | |
| | THDI | <3% (Rated Power) | |
| Output (Back up) | Nominal Output Voltage | 230V | |
| | Nominal Output Frequency | 50Hz/60Hz | |
| | Nominal Output Power | 3680W | 5500W |
| | Nominal Output Current | 16A | 25A |
| | Transfer Time | 10ms(typ) / 20ms(max) | |
| | THDV | <3% @ 100 % R Load | |
| Certifications | Grid | VDE-AR-N4105, IEC 61727/62116, AS 4777.2, EN 50549-1:2019, C10/11, G98, G99, CEI 0-21, NRS 097-2-1, RD 1699/661/413, NTS | |
| | Safety | IEC 62109-1&2, IEC 62040-1, IEC 62477-1 | |
| | Warranty | 5 Years | |
| General | Max Operation Altitude | 4000m | |
| | Noise Emission | <35dB | |
| | Ingress Protection Degree | IP65 | |
| | Operating Temperature Range | -25°C ~ 60°C | |
| | Relative Humidity | 0 ~ 100% | |
| | Cooling Concept | Natural Cooling | |
| | Mounting | Wall Bracket | |
| | Dimensions (W*H*D) | 515mm*485mm*175mm | |
| | Weight | 25Kg | |
| | PV Connection Via | MC4 | |
| | Battery Connection Via | Dedicated DC Connector | |
| | AC Connection Via (grid & back up) | Dedicated AC Connector | |
| | Compatible Batteries | BPE, Dyness, Pylontech & Aodo | |
| HMI & COM | Display | LED & APP | |
| | Communication Interface | RS485/CAN (for BMS), RS485, USB, DRM/RS485 (for Meter), Wi-Fi | |

1.3 BPE 5.22kWh Stackable Battery Information



| 5.22kWh Battery Modules | BPE-PD-5.22kWh |
|----------------------------------|------------------------|
| Module Capacity (kWh) | 5.22 |
| Module Voltage (Vdc) | 51.2 |
| Number of Battery Modules | 1 |
| System Capacity | 5.22kWh |
| Max Charging Current | 100A |
| Nominal Charging Current | 80A |
| Max Discharging Current | 100A |
| Nominal Discharging Current | 80A |
| Cell Capacity (Ah) | 102 |
| Max Scalability | 3 Batteries (15.66kWh) |
| Module Cell Quantity (Per Batt.) | 16 |
| Dimensions (W*D*H) | 515*200*512 |
| Weight (Kg) | 46 |
| Battery Warranty | 10 Years |
| Operating Temperature | 0°C ~ +50°C |
| Storage Temperature | -20°C ~ +60°C |
| Transportation Certificate | UN38.3 |
| Certificates | UKCA, CE |

Powering the Batteries ON/OFF

ON:

When using only a single Battery module, press and hold (for more than 3 seconds) the ON/OFF button, the Normal LED will illuminate on the battery icon and the battery will begin to operate normally.

For multiple Battery modules in parallel, press and hold (for more than 3 seconds) the ON/OFF button on the Master battery (the module connected to the inverter), the normal LED will illuminate and the BMS will automatically encode and assign an ID to each slave battery.

Note: For multiple batteries in parallel, only the Master battery SOC LED will be on to show the whole system SOC level, slave battery SOC LEDs are off, but the Normal & Alarm LED will function as normal.

Link COM Port

The Link Com Port is the interface between the Master battery and the inverter. The inverter retrieves the battery data such as SOC, DOD, charge current via this connection.

Connect this port to the BMS port on the inverter using the included BMS cable. If you need to extend or create your own BMS cable, use this wiring guide for your RJ45 terminal wiring:

| PIN | BPE-PD-5.22kWh |
|-------|----------------------------|
| PIN 1 | RS485-B (to Pcs, reserved) |
| PIN 2 | RS485-B (to Pcs, reserved) |
| PIN 3 | GND-2 |
| PIN 4 | CANH (to Pcs) |
| PIN 5 | CANL (to Pcs) |
| PIN 6 | RS232_TX |
| PIN 7 | RS232_RX |
| PIN 8 | RS232_GND |

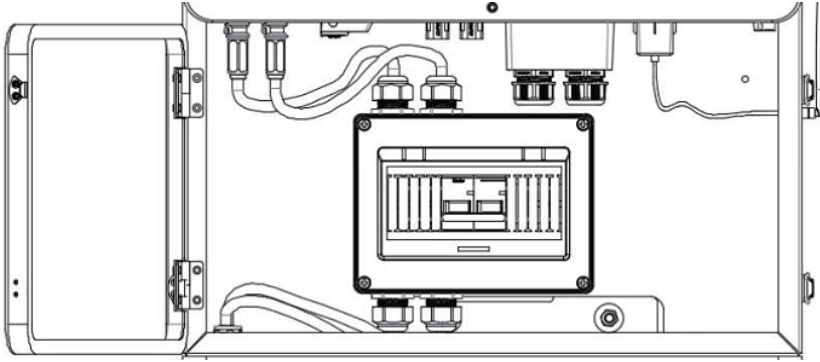
Link In/Link Out Port:

The Link In/Link Out ports are used for the communication between the battery modules.

LED Indicator Description:

| Status | Normal | Fault | Battery Level Indicator | | | | | | Descriptions | |
|-----------|--------------|---------|--------------------------------|-------|-------|-------|-------|-------|---|---|
| | L8 | L7 | L6 | L5 | L4 | L3 | L2 | L1 | | |
| Shut down | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | All OFF |
| Standby | Flash 1 | OFF | According to the battery level | | | | | | Indicates Standby | |
| Charging | Normal | Light | According to the battery level | | | | | | The highest capacity indicator LED flashes (flash 2), others lighting | |
| | Full Charged | Light | Light | Light | Light | Light | Light | Light | Light | Turn to standby status when charger off |
| | Protection | OFF | Light | OFF | OFF | OFF | OFF | OFF | OFF | Stop charging |
| Discharge | Normal | Flash 3 | According to the battery level | | | | | | | |
| | UVP | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Stop charging |
| | Protection | OFF | Light | OFF | OFF | OFF | OFF | OFF | OFF | Stop discharge |
| Fault | OFF | Light | OFF | OFF | OFF | OFF | OFF | OFF | OFF | Stop charging and Discharge |

1.4 System Enclosure Information



There is a DC breaker between battery and inverter located inside of the System Enclosure. This allows you to safely work on the batteries while they are isolated from the inverter.

2 Installation

2.1 Installation Site Requirements

2.1.1 General

The BPE PowerDepot A1 is designed to be installed indoors to make the most use of its all-in-one sleek design.

The PowerDepot A1 is naturally ventilated and the location should therefore be kept clean, dry and adequately ventilated. The mounting location must allow for easy access to the unit for installation and maintenance purposes, and the battery compartment doors must not be blocked.

The following location are no suitable for installation:

- Habitable rooms;
- In loft spaces that are not specifically considered suitable;
- Access/exit areas or near emergency exit areas;
- In rooms that reach below zero degrees C;
- Seismic areas- additional security measures are required;
- Sites higher than 2000 meters above sea level;
- Places with an explosive atmosphere;
- Locations with direct sunlight or a large change in the ambient temperature
- Within 60 cm of any exit;
- Within 60 cm of any window or ventilation opening;
- Within 90 cm of any electrical outlets;

The PowerDepot A1 must not be installed near any explosive or flammable gases/materials. This reduces the risk of any damage being caused to the property or the PowerDepot system.

Ensure the ground is level and that it can support the weight of the batteries and the inverter. The battery baseplate has adjustable feet so it can flexible for minor adjustments that need making to ensure the entire system remains level.

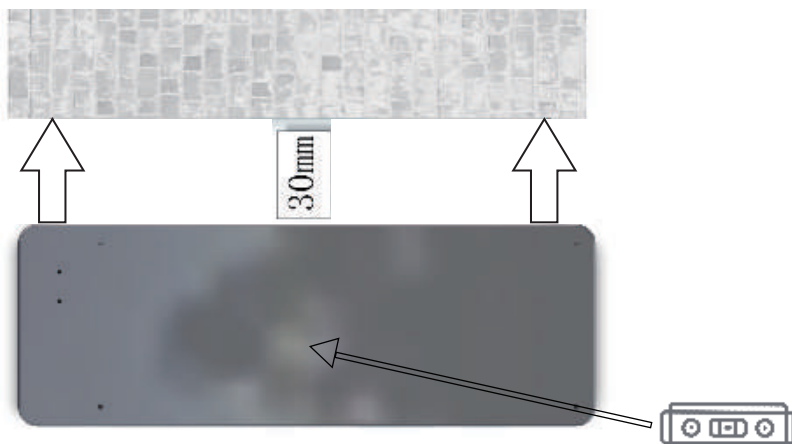
If the PowerDepot A1 is mounted to the wall, ensure that a distance of 30mm from the wall or structure is maintained. Use the following guide for determining the amount of space that should be left around the PowerDepot system:

- (i) 600 mm left and right
- (ii) 600 mm above
- (iii) 600 mm below

Note:
The PowerDepot A1 must be mounted so that the highest point is not more than 2.2m above the ground or the platform.

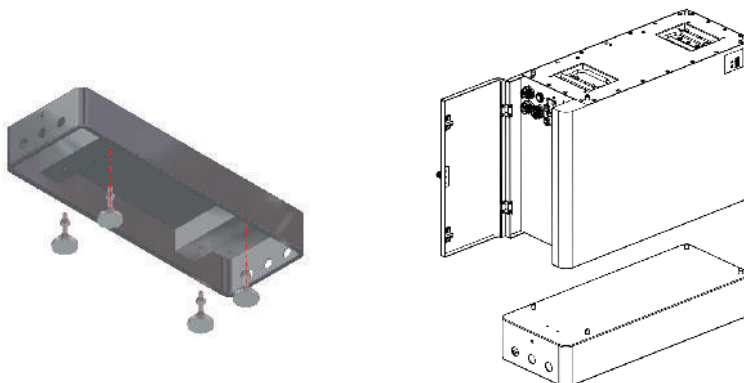
2.2 Installation Steps

Place the battery baseplate 30mm away from the wall or mounting surface. Ensure that it is level.



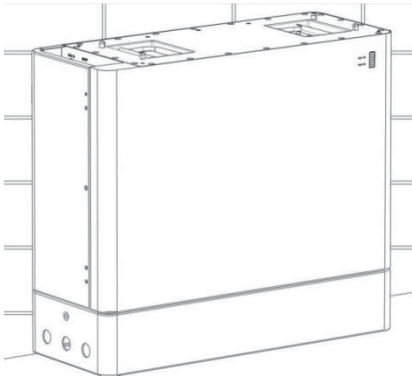
Step 2

Using the included 4 x feet, screw them into the battery baseplate. Next, using 4 x dowel screws, insert them into the four corners on the top of the battery baseplate.



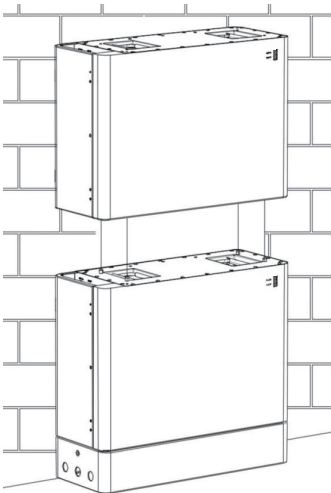
Step 3

Place the 5.22kWh battery module on top of the baseplate and secure it using the included L-bracket to the base.



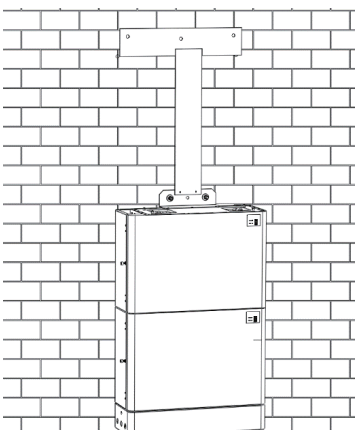
Step 4

Repeat the previous step by inserting another 4 x dowel screws into the four corners of the battery and add on the additional battery packs if applicable. Secure the batteries together using the included square brackets.



Step 5

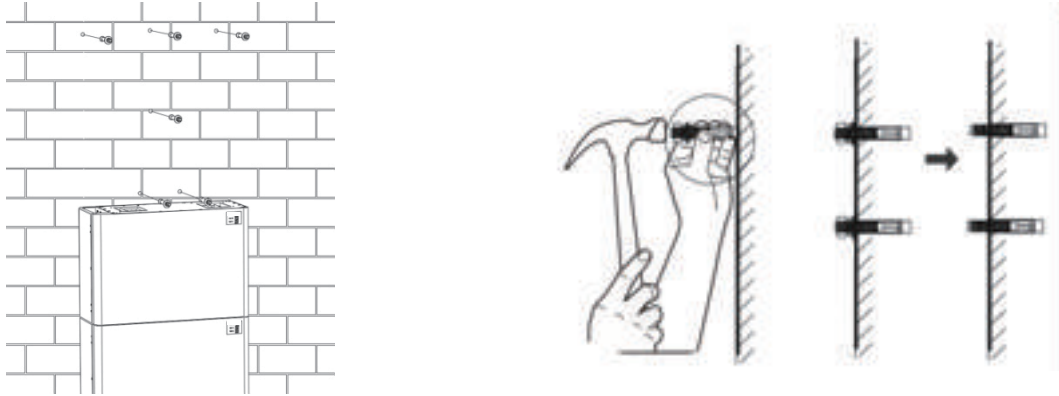
Assemble the wall mounting bracket by combining the three metal brackets together. This includes: the long L bracket, vertical support bracket and the wall plate. Mark where the wall fixings will be drilled into the wall.



Step 6

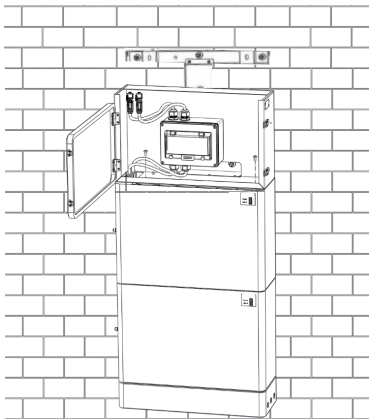
Take off the L shape metal and the mounting plate and drill hole on the wall. Use a 10mm drill bit to drill your pilot holes and insert the wall plugs.

NOTE:
Place a dust cover over the batteries before drilling. Knock the expansion screw kit into the hole together with a hammer.



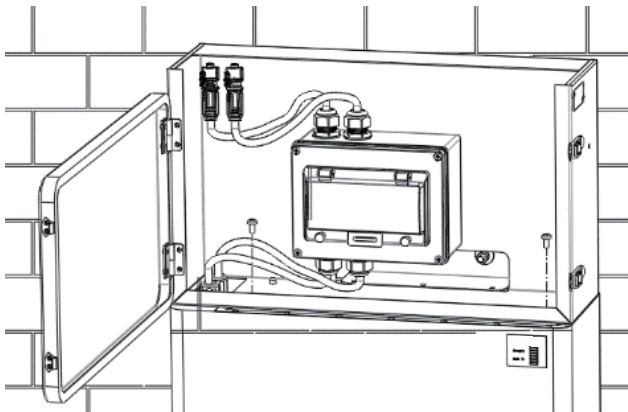
Step 7

Once the mounting bracket securely to the wall, install the System Enclosure on top of the highest battery.



Step 8

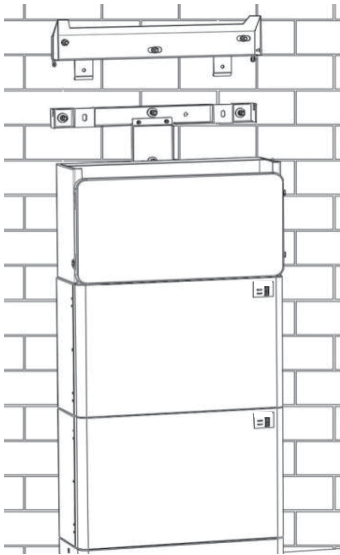
Fix the system enclosure to the battery using the included M5 screws.



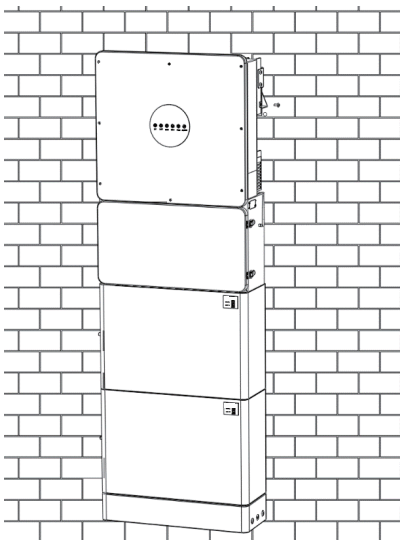
Step 9
Fix the inverter bracket (from inverter packaging box) with the hanging board (from the system box) using hex M6 screws as shown below.



Step 10
Insert the bracket into the mounting plate as below

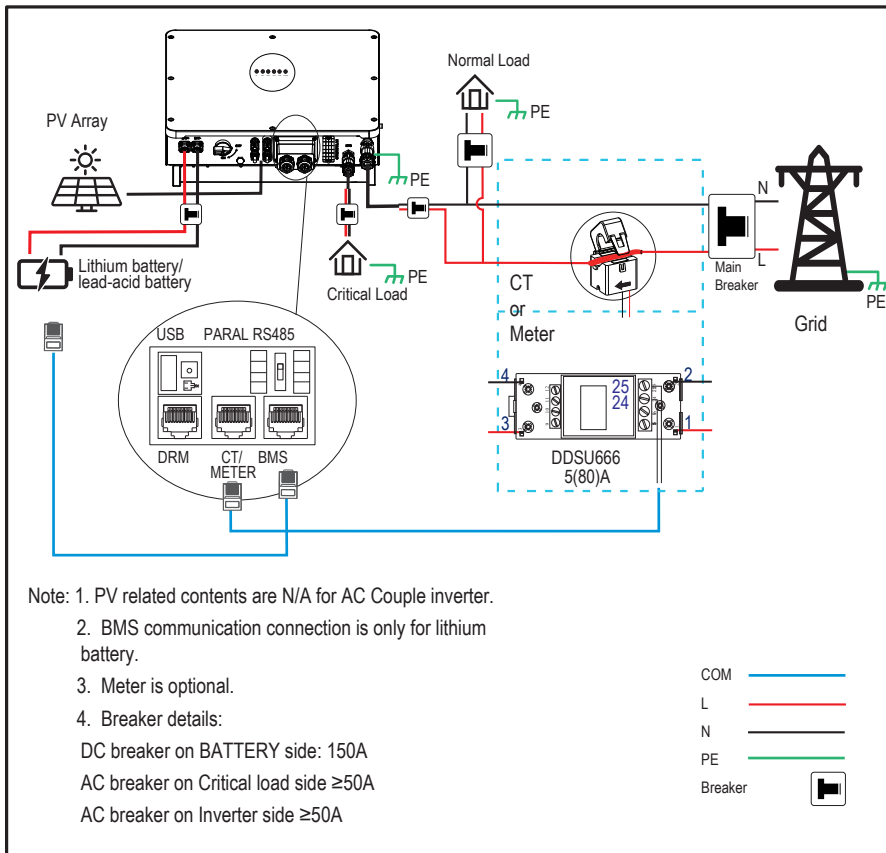


Step 11
Install the inverter onto the mounting bracket. Then lock the inverter using the security screw M6 (from inverter packaging box).



3 Electrical Connection

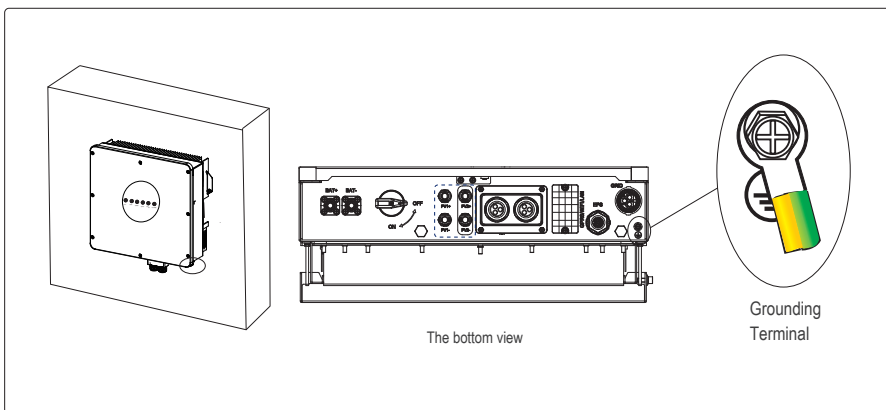
This chapter shows the details connection of BPE Hybrid Inverter.



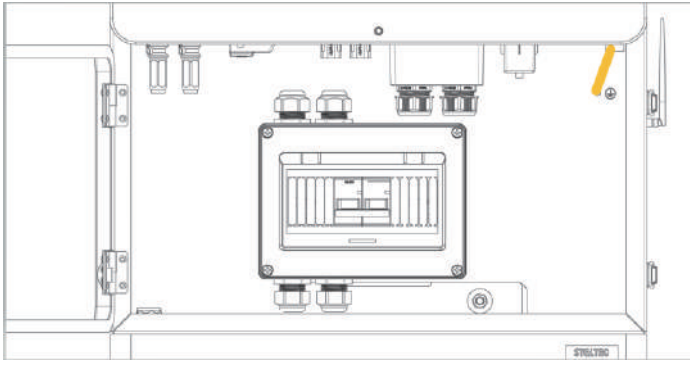
| | | |
|--|---------------|--|
| | DANGER | Ensure that inverter and all cables to be installed are completely powered off during the entire installation and connection. Otherwise, fatal injury can occur due to the high voltage. |
|--|---------------|--|

3.1 Grounding

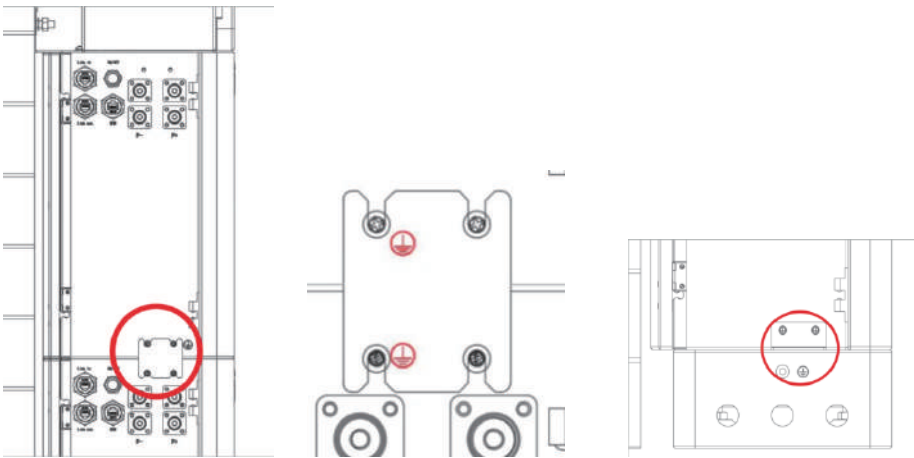
a. Connect the ground wire between inverter and system enclosure using an M5 screw



| | | |
|--|----------------|--|
| | WARNING | The inverter must be grounded; otherwise, there may be a risk of electric shock. |
|--|----------------|--|

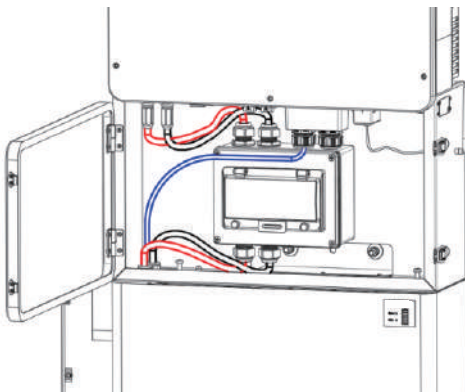


b. Connect the battery to ground with a small metal plate, using the M4 screws from the system enclosure packaging, as seen in the diagram below

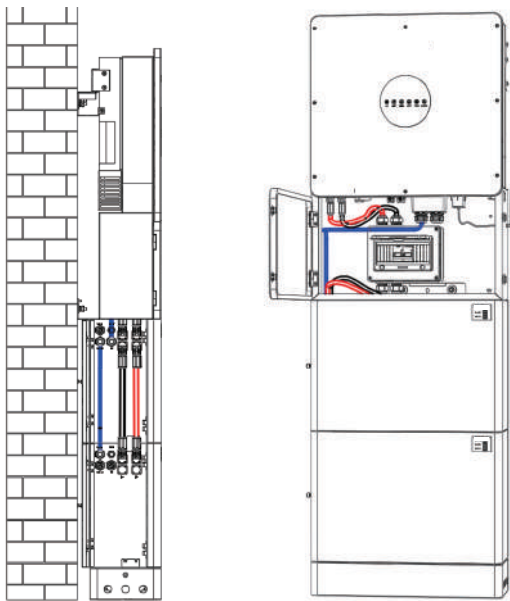
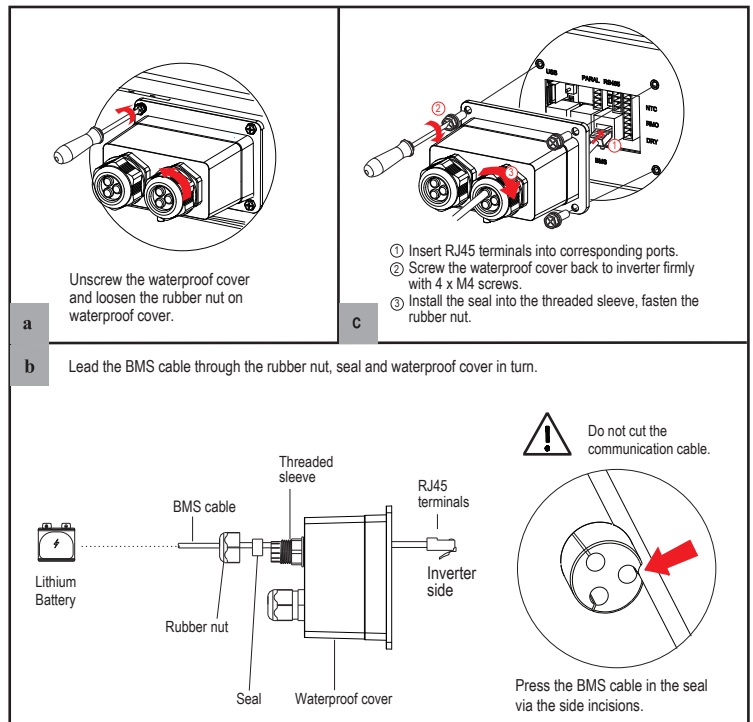


3.2 Battery Power and Communication Cable Connection

a. Connect the battery power cables down the side of the breaker box in the system enclosure to the upper battery which is the master battery. Connect the battery power cables to the battery DC inputs located on the bottom of the inverter. Connect the battery in parallel using power cables and communication cables as shown in the next step.



b. Connect the BMS cable to the inverter BMS port directly through the system enclosure

a Unscrew the waterproof cover and loosen the rubber nut on waterproof cover.

b Lead the BMS cable through the rubber nut, seal and waterproof cover in turn.

c ① Insert RJ45 terminals into corresponding ports.
② Screw the waterproof cover back to inverter firmly with 4 x M4 screws.
③ Install the seal into the threaded sleeve, fasten the rubber nut.

Do not cut the communication cable.

Press the BMS cable in the seal via the side incisions.

3.3 Grid/EPS Connection

For connecting the Grid/EPS connection please refer to the step below.

An AC breaker should be installed between inverter and the Grid/EPS.

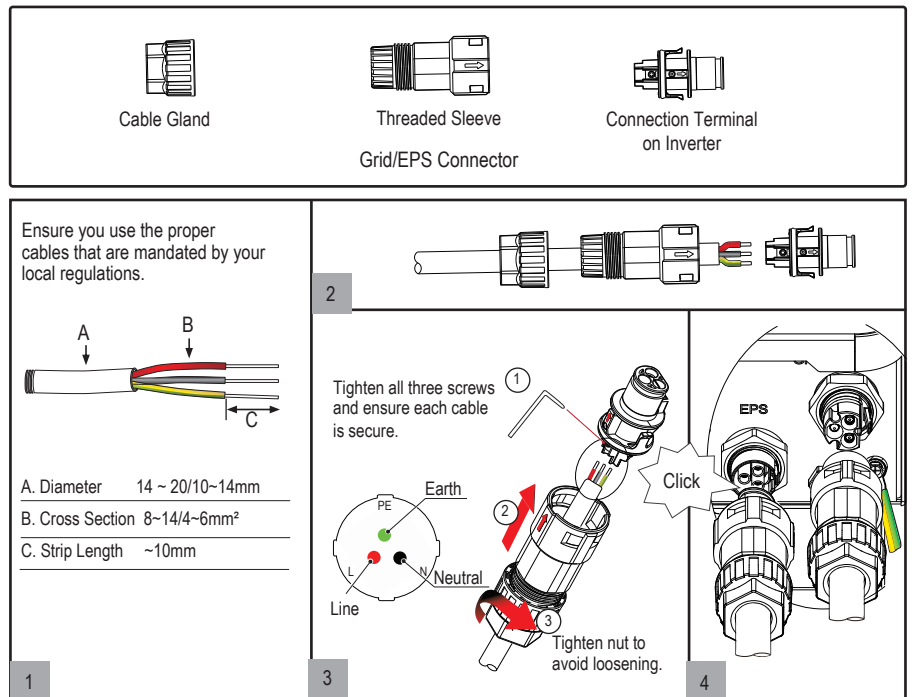
a. Before connecting the AC cable from the inverter to the AC breaker, you must confirm the AC breaker is set to the off position.

b. Connect the PE conductor to grounding electrode, and connect the N and L conductors to AC breaker.

c. Finally, connect the Grid/EPS connector to the Hybrid Inverter and ensure you hear a click.

NOTICE:

Multiple inverters in parallel are not allowed to share a circuit breaker.



Cable Gland Threaded Sleeve Connection Terminal on Inverter

Grid/EPS Connector

Ensure you use the proper cables that are mandated by your local regulations.

A. Diameter 14 ~ 20/10~14mm
B. Cross Section 8~14/4~6mm²
C. Strip Length ~10mm

1 Tighten all three screws and ensure each cable is secure.

2

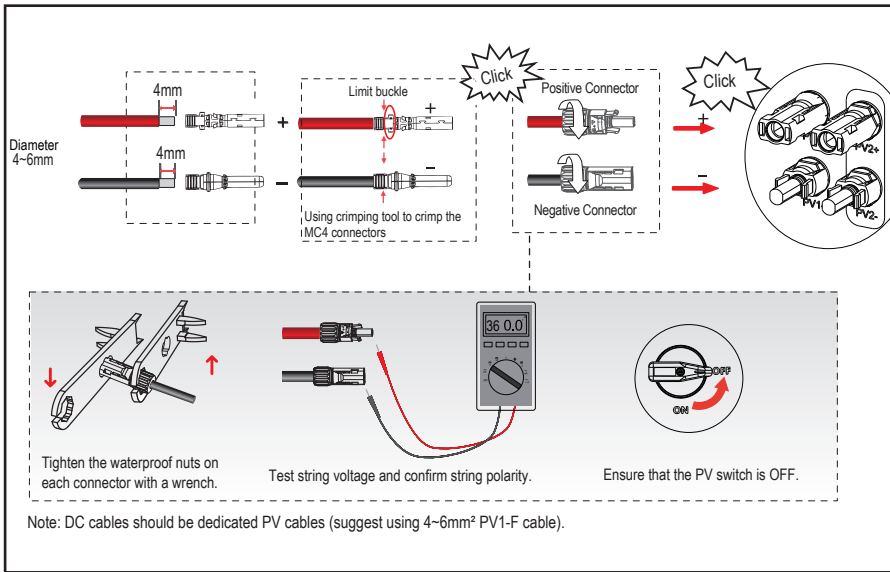
3 Tighten nut to avoid loosening.

4 Click

PE Earth
L Neutral
Line

EPS

3.4 PV Connection



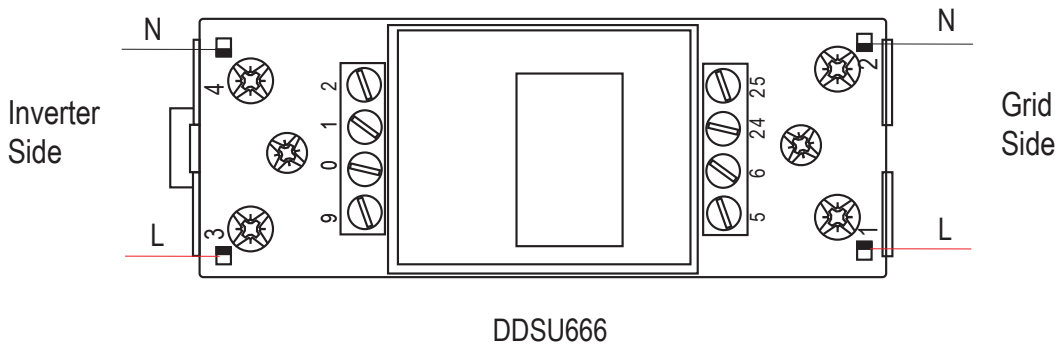
| | |
|--------|--|
| NOTICE | <ul style="list-style-type: none"> • Before connection the PV panels, ensure the MC4 connector has the correct polarity. Incorrect polarity could permanently damage the inverter. • The PV array shouldn't be connected to a grounding conductor. • The minimum insulation resistance to ground of the PV panels must exceed 18.33kΩ, there is a risk of shock hazard if the requirement of minimum resistance is not met. |
|--------|--|

3.5 Meter/CT Connection

You can monitor usage with a meter or a CT. The meter and CT can't be installed at the same time. The meter is optional.

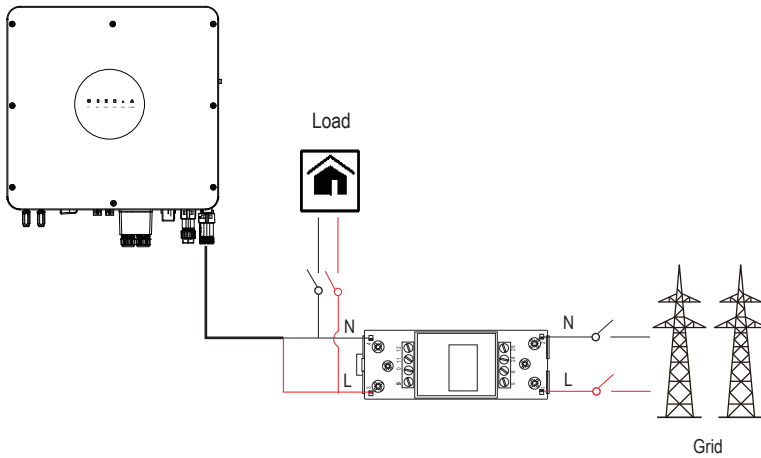
Meter Connection

The PowerDepot A1 inverter only supports the CHNT-DDSU666 meter.



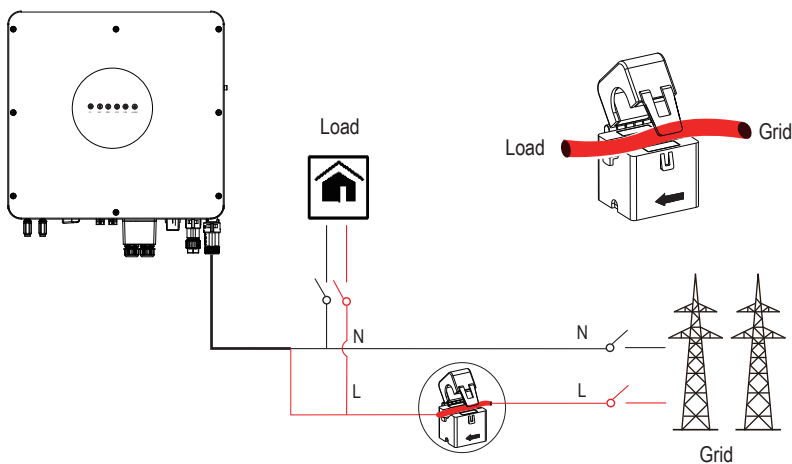
Before connecting to Grid, please install a separate AC breaker ($\geq 60A$; not included) between the meter and Grid. This ensures the inverter can be safely disconnected for maintenance.

The connection diagram when using a meter is as shown in the figure below:



Please refer to the meter instruction manual for details.

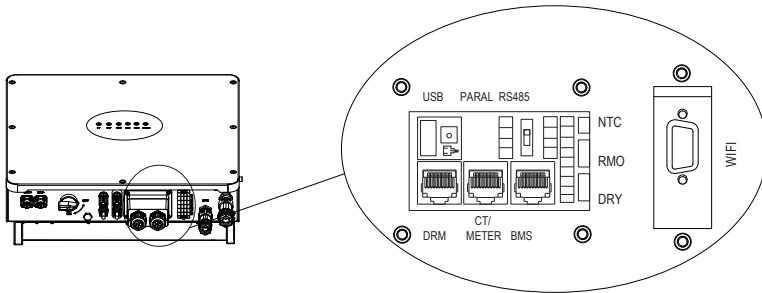
CT Connection



Note: The arrow on the CT indicates the current flow direction from grid to the inverter.

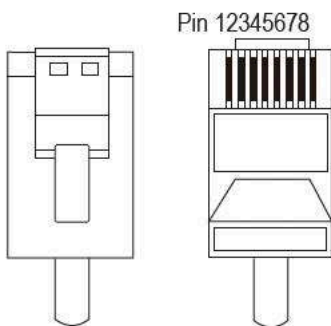
3.6 Communication Connection

The inputs for all communication devices are located on the bottom of the Hybrid Inverter.

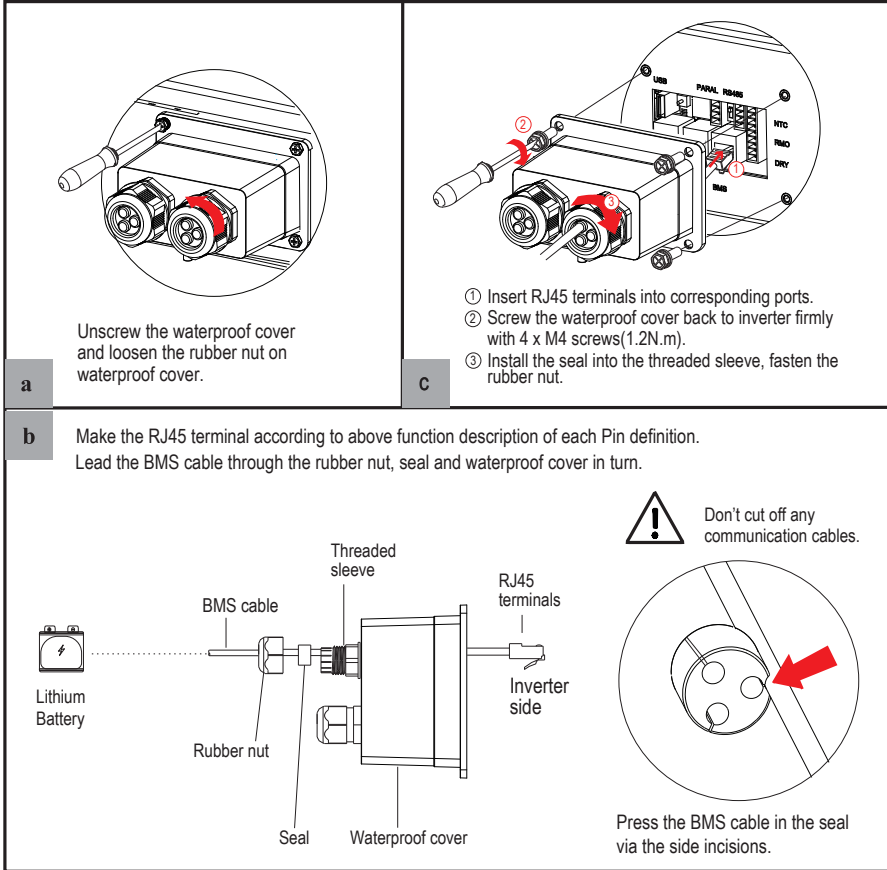


| Interface | | Description |
|-----------|-----|--|
| USB | | For USB communication upgrade |
| LAN | | For ethernet communication upgrade |
| BMS | | Lithium battery communication interface |
| DRM | | Demand response mode |
| METER/CT | | For Meter/CT communication |
| 9-Pins | NTC | Temperature sensor terminal of lead-acid battery |
| | RMO | Remote control |
| | DRY | DI/DO control |
| GPRS/WIFI | | For GPRS/WIFI communication |

BMS Connection (Inverter BMS port definition)

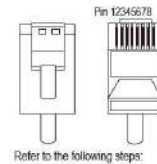
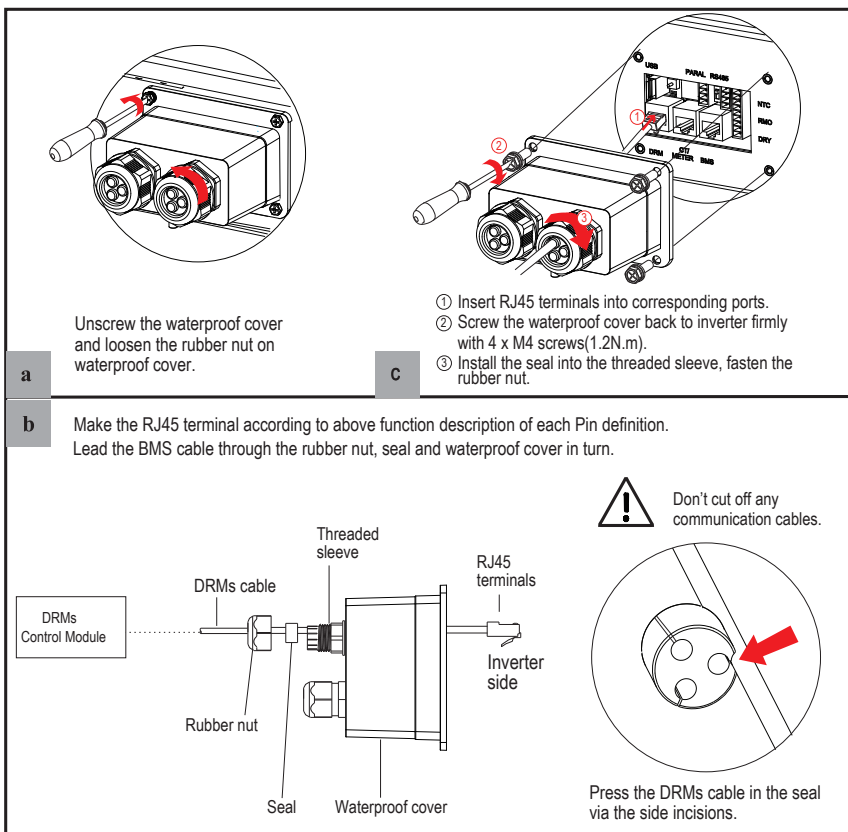


| | | | | |
|----------------------|---------|---------|-------|-------|
| PIN | 1 | 2 | 3 | 4 |
| Function Description | RS485_A | RS485_B | GND_S | GND_S |
| PIN | 5 | 6 | 7 | 8 |
| Function Description | GND_S | GND_S | CAN_L | CAN_H |



DRMs Connection

DRMs is a shortened form for "inverter demand response modes". It is a compulsory requirements for inverters in Australia.



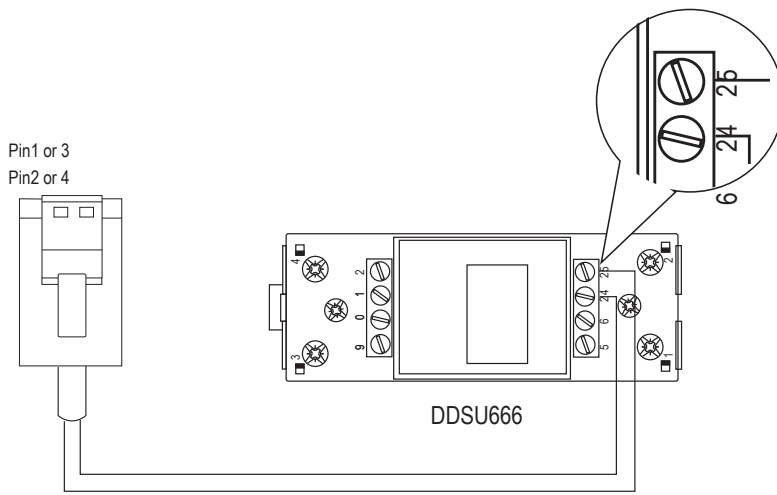
| | | | | |
|----------------------|--------|----------|--------|--------|
| PIN | 1 | 2 | 3 | 4 |
| Function Description | DRM1/5 | DRM2/6 | DRM3/7 | DRM4/8 |
| PIN | 5 | 6 | 7 | 8 |
| Function Description | REF | DRM0/COM | NC | NC |

3.7 Meter/CT Communication Connection

RJ45 Terminal Configuration of Meter/CT Communication

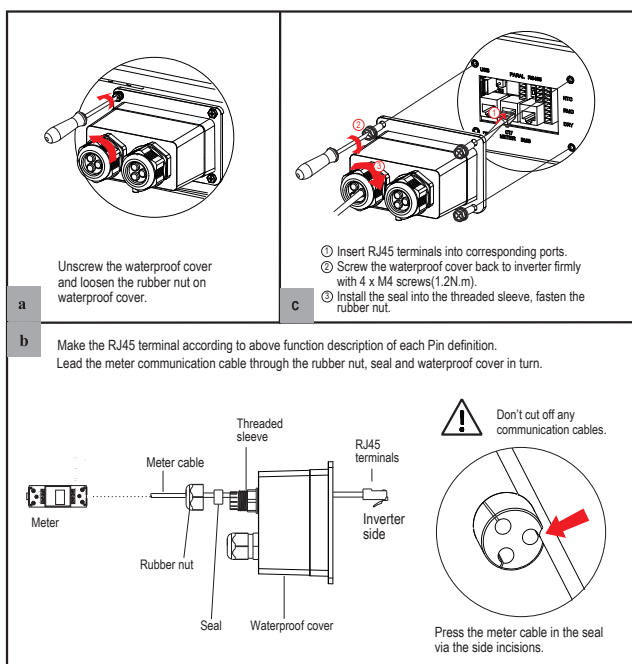
| PIN | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------------|---------|---------|---------|---------|-----|-----|----|----|
| Function Description | RS485_A | RS485_B | RS485_A | RS485_B | CT+ | CT- | NC | NC |

Meter Connection



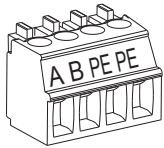
| Inverter | Meter |
|------------------------|-------|
| Pin1 or Pin3(RS485_A) | Pin24 |
| Pin2 or Pin4(RS485_B) | Pin25 |

Connect meter. Refer to the following steps:



3.8 RS485 Connection

RJ45 Terminal Configuration of RS485 Communication



| PIN | A | B | PE | PE |
|----------------------|---------|---------|----|----|
| Function Description | RS485_A | RS485_B | PE | PE |

Connect RS485. Refer to the following steps:

a Unscrew the waterproof cover and loosen the rubber nut on waterproof cover.

c

- ① Insert 4-Pins terminal into corresponding ports.
- ② Screw the waterproof cover back to inverter firmly with 4 x M4 screws(1.2N.m).
- ③ Install the seal into the threaded sleeve, fasten the rubber nut.

b Make the 4-Pins terminal according to above function description of each Pin definition. Lead the RS485 cable through the rubber nut, seal and waterproof cover in turn.

RS485 Control Module

RS485 cable

Rubber nut

Seal

Threaded sleeve

Waterproof cover

4-Pins terminal

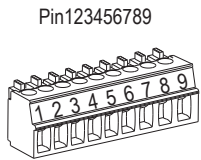
Inverter side

Don't cut off any communication cables.

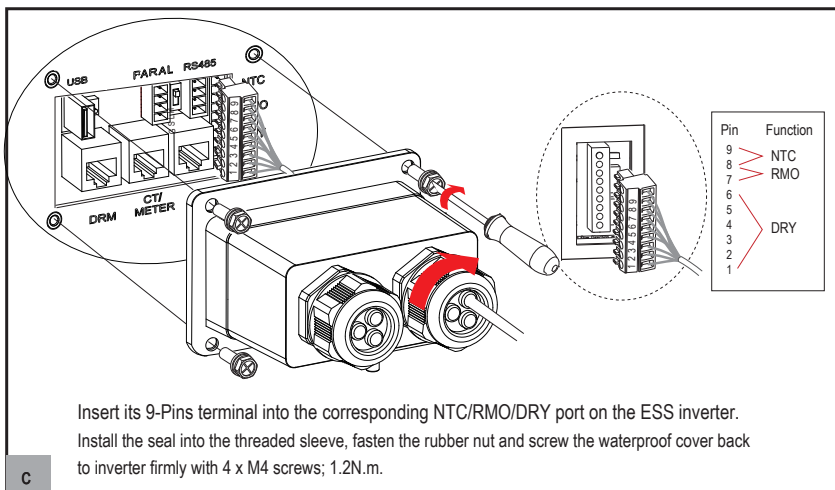
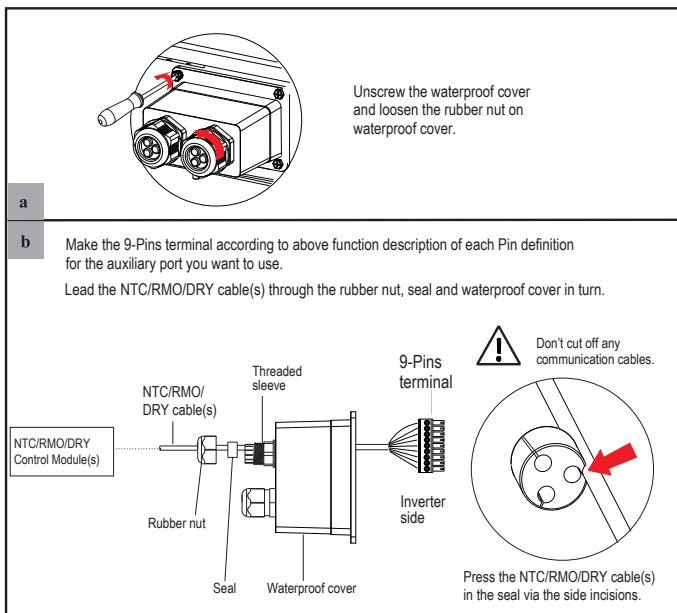
Press the RS485 cable in the seal via the side incisions.

3.9 NTC/RMO/DRY Connection(s)

9-Pins Terminal Configuration of Auxiliary Communication

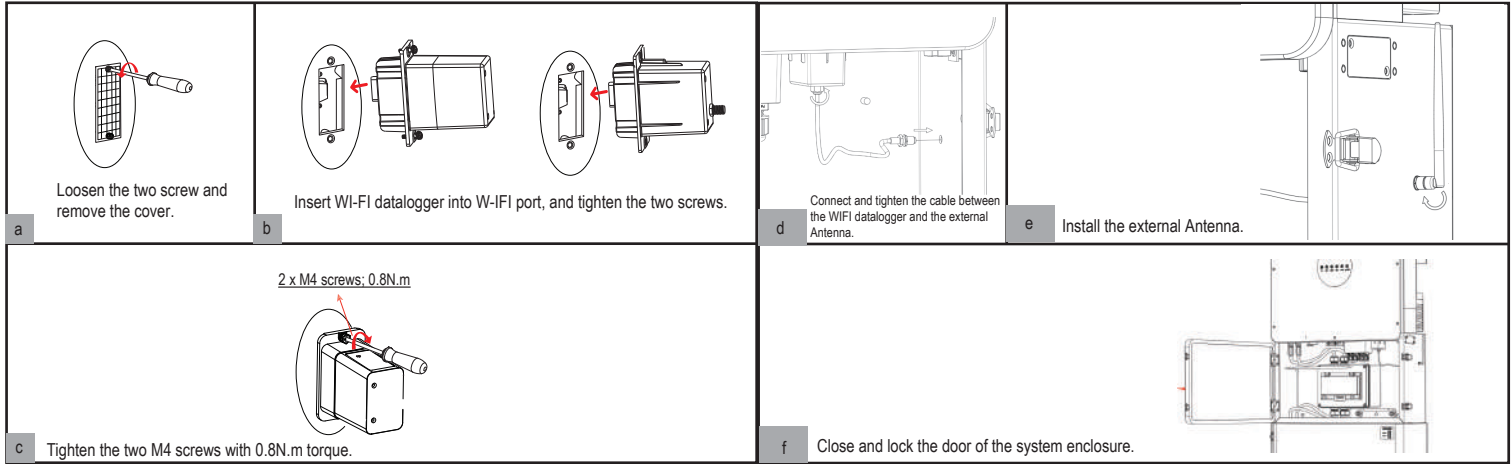


| PIN | Function Description |
|-----|----------------------|
| 1 | NO1 (Normal Open) |
| 2 | N1 |
| 3 | NC1 (Normal Close) |
| 4 | NC2 (Normal Close) |
| 5 | N2 |
| 6 | NC2 (Normal Close) |
| 7 | REMO OFF |
| 8 | GND S (NTC BAT) |
| 9 | NTC BAT+ |



3.10 Wi-Fi Datalogger Connection

This datalogger is used for connecting to Wi-Fi to use Solarman online monitoring.



4 System Operation

4.1 Inverter Working Modes

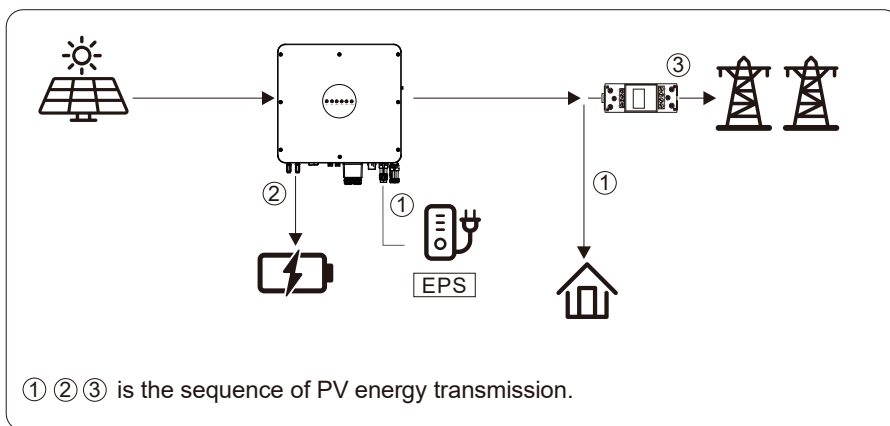
The PowerDepot A1 supports several different working modes which can be programmed on the SolarHope App.

4.1.1 Self Used Mode

Go to the "Hybrid Work Mode" menu, and select the "Self Used Mode" work mode. Under Self Used Mode, the priority of PV energy will be Load > Battery > Grid, that means the energy produced by PV gives priority to local loads, excess energy is used for charging the battery, and the remaining energy is fed into the grid. This is the default mode to increase the self-consumption rate.

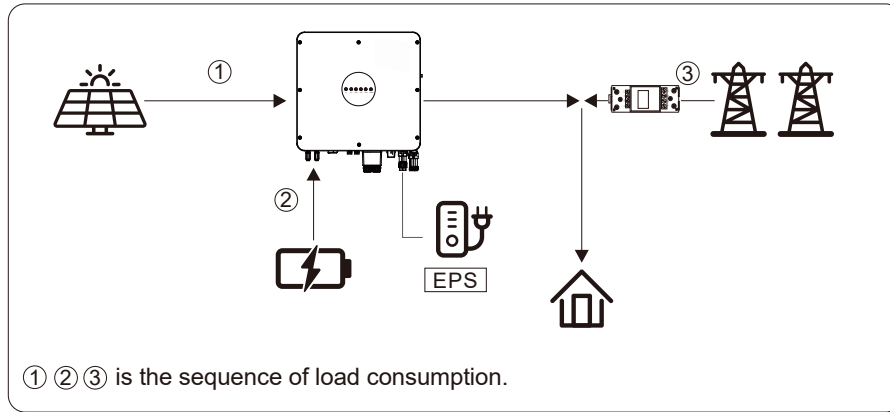
a) Excess PV Energy

When there is plenty PV energy available, the PV energy will be first consumed by loads, the excess energy will be used to charge the battery. Then, the remaining energy will be fed into the grid.



b) Limited PV power

When the PV energy is not enough to cover all the loads, all the PV energy will be used for load, and the remaining part will be supported by the battery. If this does not satisfy the load, more power will be taken from the Grid.



4.1.1.1 Time-Based Control Mode

At the bottom of the page in the SolarHope App, you will see an option for "Time-based Control". By enabling this mode, you can control the charging and discharging of the battery. You can set the following parameters based on your requirements:

- Charge and discharge frequency: one time or daily
- Charging start time: 0 to 24 hours
- Charging end time: 0 to 24 hours
- Discharge start time: 0 to 24 hours
- Discharge end time: 0 to 24 hours

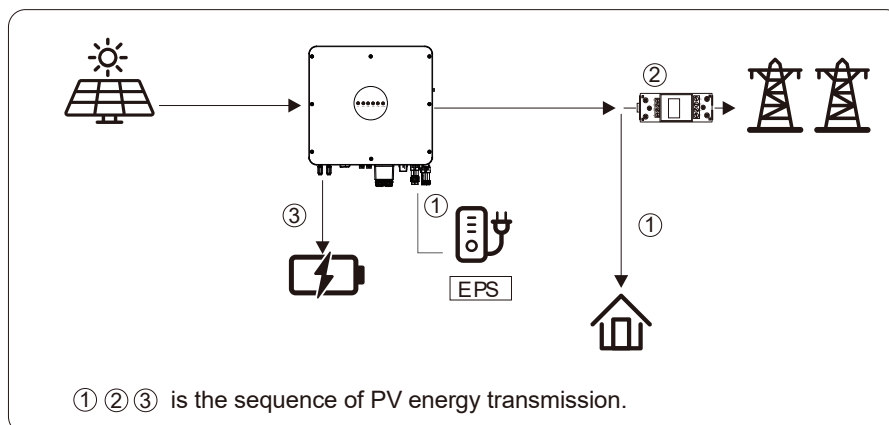
You can also choose whether to allow the grid to charge the battery, which is disabled by default. If the user enables the "Grid Charge Function", the "Maximum Grid Charge Power" and "Capacity of Grid Charge End" can be set. When the battery capacity reaches the set value of "Capacity of Grid Charge End", the grid will stop charging the battery.

4.1.2 Feed-in Priority Mode

Go to the "Hybrid Work Mode" menu, and select the "Feed-in Priority Mode" working mode. Under this mode, the priority of PV energy will be Load > Grid > Battery, that means the energy produced by PV gives priority to local loads, excess energy is fed into the grid, and the remaining energy is used for charging the battery.

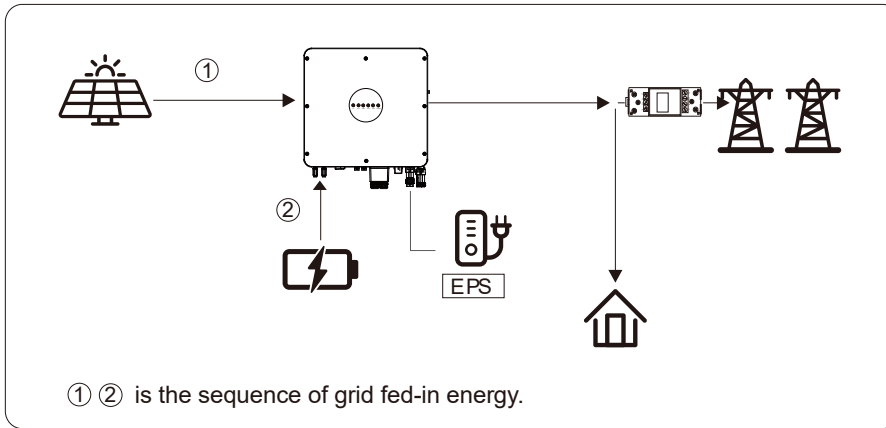
a) Excess PV Energy

When there is plenty of PV energy, the PV energy will be first consumed by loads, if there is excess PV power, then the excessive power will be fed into grid. If there is any remaining PV power, it will redirected to charge the battery.



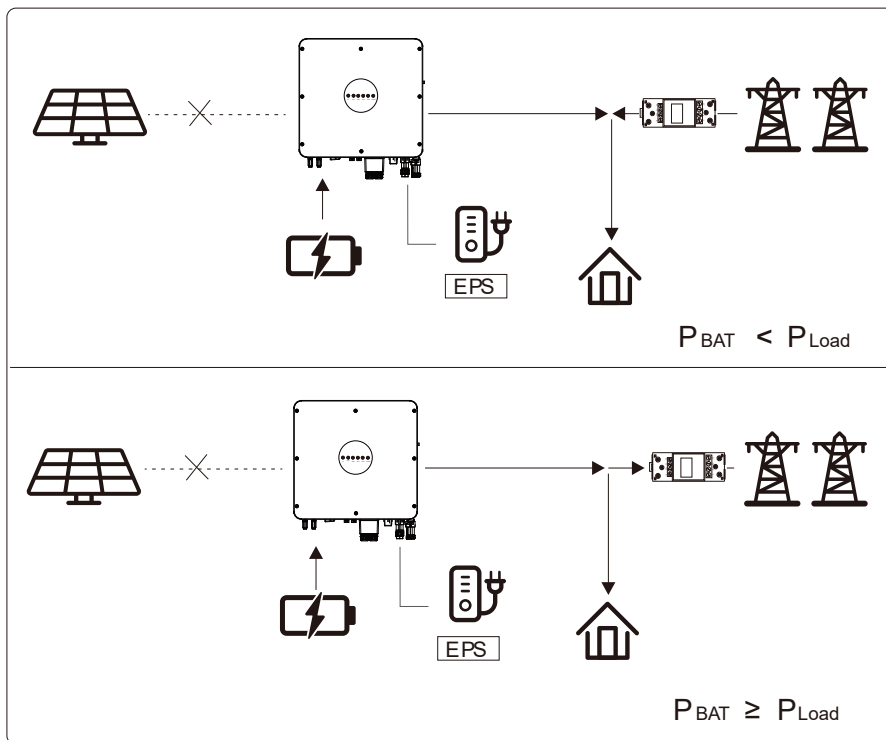
b) Limited PV Energy

When PV energy is limited and can not meet the feed-in grid power, the battery will discharge to meet it.



c) No PV Input

The inverter will first discharge the battery energy for home load consuming when no PV input is detected. If the demand is not met by the battery, then the inverter will consume energy from the grid.



4.1.4 Back-up Mode

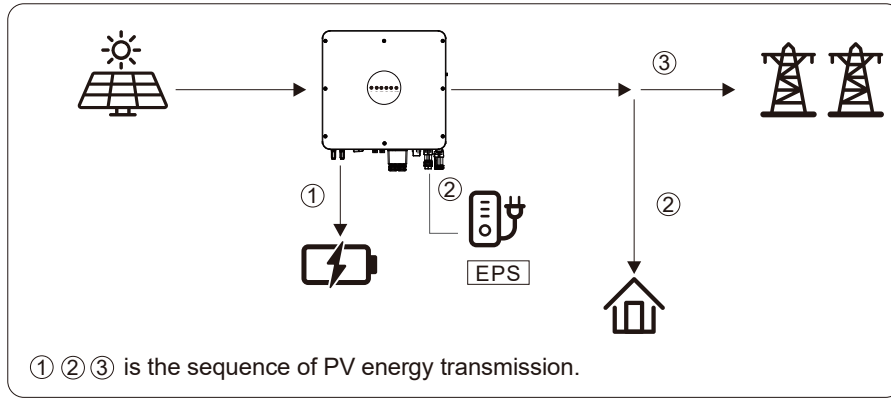
Go to the "Hybrid work mode" menu, and select the "Back-up Mode" working mode. Under this mode, the priority of PV energy will be Battery > Load > Grid. This mode aims at charging the battery quickly, and at the same time, you can choose whether to allow grid to charging the battery.

Disable Grid Charging

In this mode, the battery can be charged only with PV power, and the charging power varies depending on the available PV power.

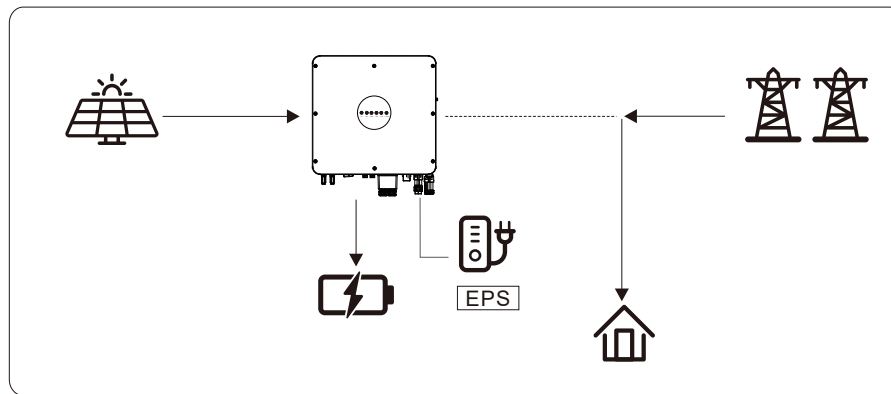
a) Excess PV power

When there is plenty of PV energy, PV charges the battery first, then meets the load requirements, and the rest is fed into the grid.



b) Limited PV power

When PV energy is limited, PV gives priority to charging the battery, and the grid directly meets the load demand.

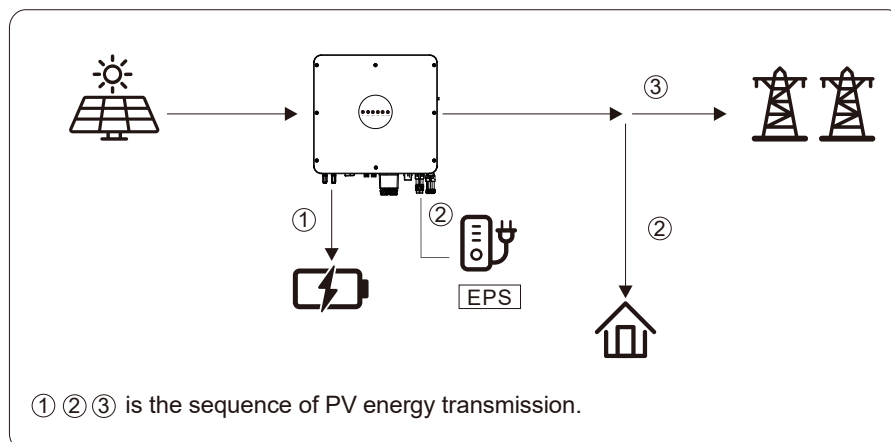


Allow Grid Charging

In this situation, the battery can be charged both with PV and grid.

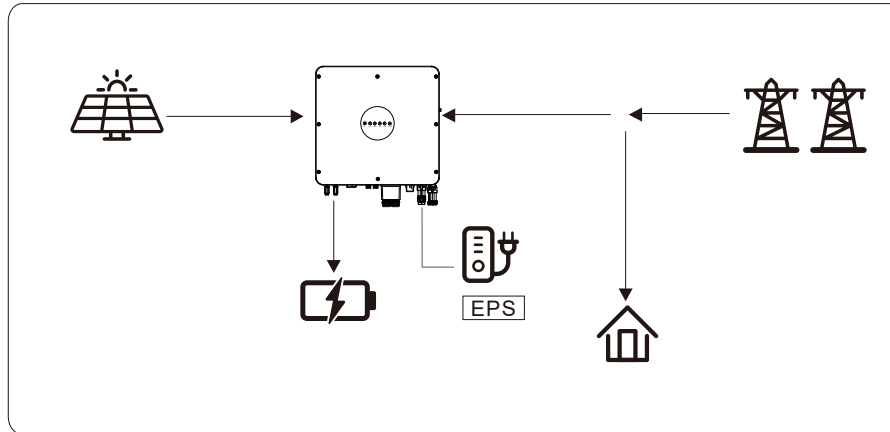
a) Excess PV power

When there is plenty of PV energy, PV charges the battery first, then meets the load requirements, and the rest is fed into the grid.



b) Limited PV power

When the PV energy is not enough to charge the battery, the grid energy will charge the battery as required. Meanwhile, the grid energy is consumed by loads.



4.2 Powering on the System

Check and confirm the installation is secure to the wall and that all connections are tight. Then confirm the connections of AC, Battery, PV etc. are correct. Confirm the parameters and configurations conform to relevant requirements.

| | |
|------------------------|--------------------------|
| AC Frequency 50/60Hz | PV Voltage 90~530V |
| Battery Voltage 42~60V | Grid AC Voltage 180~270V |

Make sure all the above aspects are correct, then follow the procedure below to start up the inverter:

- 1) Power on PV.
- 2) Power on the Battery.
- 3) Power on the AC.
- 4) Power on the EPS.
- 5) Connect the SolarHope App via Bluetooth. Please refer to Section 7.2 for details.
- 6) Click on "Quick Setup" and follow the start up steps. Please refer to Section 7.2 for details.

4.3 Shutdown Procedure

For routine system maintenance, please follow the below procedure:

- 1) Connect the SolarHope App via Bluetooth. Please refer to Section 7.2 for details.
- 2) Click the Power OFF on the App. Please refer to Section 7.2 for details.
- 3) Power off the EPS.
- 4) Power off the AC.
- 5) Power off the Battery.
- 6) Power off the PV.
- 7) If you need to disconnect the inverter cables, please wait at least 10 minutes before touching these parts of inverter.

5 Commissioning and Inspection

It is mandatory to properly commissioning your PowerDepot A1 system, this ensures your equipment works as intended and prevents the risks of failure.

5.3.1 Inspection

Before commissioning, the installer must inspect the system carefully and make sure:

1. The system is securely installed and that all safety precautions laid out in this manual were followed
2. All the terminals and cables are in good condition.
3. No items are left on the inverter or within the required minimum distances around the inverter

5.3.2 Commissioning Procedure

Follow these steps for properly commissioning the PowerDepot A1 system:

Power on all of the breakers by referring to the Startup section 4.2.

Setting the parameters on the SolarHope App according to user's requirements.







Ensure that all components are operating as intended

6 User Interface

6.1 LED

| LED Indicator | Status | Description |
|---------------|--------|---|
| PV | On | PV input is normal. |
| | Blink | PV input is abnormal. |
| | Off | PV is unavailable. |
| BAT | On | Battery is charging. |
| | Blink | Battery is discharging. Battery is abnormal. |
| | Off | Battery is unavailable. |
| GRID | On | GRID is available and normal. |
| | Blink | GRID is available and abnormal. |
| | Off | GRID is unavailable. |
| COM | On | Communication is ok. |
| | Off | Power supply is unavailable. |
| EPS | On | EPS power is available. |
| | Blink | EPS output is abnormal. |
| | Off | EPS power is unavailable. |
| ALARM | On | Fault has occurred and inverter shuts down. |
| | Blink | Alarms has occurred but inverter doesn't shut down. |
| | Off | No fault. |

This section describes the LED panel. LED indicator includes PV, BAT, GRID, EPS, COM, ALARM indicators. It includes the explanation of indicator states and summary of indicator states under the running state of the inverter.

| | | | | | |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| PV | BAT | GRID | EPS | COM | ALARM |

| Details | Code | PV LED | Grid LED | BAT LED | EPS LED | COM LED | ALARM LED |
|-------------------------------------|------|--------|----------|---------|---------|---------|-----------|
| PV normal | | ● | ⊙ | ⊙ | ⊙ | ⊙ | ○ |
| No PV | | ○ | ⊙ | ⊙ | ⊙ | ⊙ | ○ |
| PV over voltage | B0 | | | | | | |
| PV under voltage | B4 | | | | | | |
| PV irradiation weak | B5 | ★ | ⊙ | ⊙ | ⊙ | ⊙ | ○ |
| PV string reverse | B7 | | | | | | |
| PV string abnormal | B3 | | | | | | |
| On grid | | ⊙ | ● | ⊙ | ⊙ | ⊙ | ○ |
| Grid over voltage | A0 | | | | | | |
| Grid under voltage | A1 | | | | | | |
| Grid absent | A2 | | | | | | |
| Grid over frequency | A3 | ⊙ | ★ | ⊙ | ⊙ | ⊙ | ○ |
| Grid under frequency | A4 | | | | | | |
| Grid abnormal | A6 | | | | | | |
| Grid over mean voltage | A7 | | | | | | |
| Neutral live wire reversed | A8 | | | | | | |
| Battery in charge | | ⊙ | ⊙ | ● | ⊙ | ⊙ | ○ |
| Battery absent | D1 | ⊙ | ⊙ | ○ | ⊙ | ⊙ | ○ |
| Battery in discharge | | ⊙ | ⊙ | ★★ | ⊙ | ⊙ | ○ |
| Battery under voltage | D3 | | | | | | |
| Battery over voltage | D2 | | | | | | |
| Battery discharge over current | D4 | ⊙ | ⊙ | ★ | ⊙ | ⊙ | ○ |
| Battery over temperature | D5 | | | | | | |
| Battery under temperature | D6 | | | | | | |
| Communication loss (Inverter - BMS) | D8 | | | | | | |
| EPS output active | | ⊙ | ⊙ | ⊙ | ● | ⊙ | ⊙ |
| EPS output inactive | | ⊙ | ⊙ | ⊙ | ○ | ⊙ | ⊙ |
| EPS short circuit | D8 | | | | | | |
| EPS over load | D9 | | | | | | |
| EPS output voltage abnormal | D7 | ⊙ | ⊙ | ⊙ | ★ | ⊙ | ○ |
| EPS over dc-bias voltage | CP | | | | | | |

| Details | Code | PV LED | Grid LED | BAT LED | EPS LED | COM LED | ALARM LED |
|----------------------------------|------|--------|----------|---------|---------|---------|-----------|
| RS485/DB9/BLE/USB | | ⊙ | ⊙ | ⊙ | ⊙ | ● | ⊙ |
| Inverter over temperature | C5 | | | | | | |
| Fan abnormal | C8 | | | | | | |
| Inverter in power limit state | CL | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ★ |
| Data logger lost | CH | | | | | | |
| Meter lost | CJ | | | | | | |
| Remote off | CN | | | | | | |
| PV insulation abnormal | B1 | | | | | | |
| Leakage current abnormal | B2 | | | | | | |
| Internal power supply abnormal | C0 | | | | | | |
| Inverter over dc-bias current | C2 | | | | | | |
| Inverter relay abnormal | C3 | | | | | | |
| GFCI abnormal | C6 | | | | | | |
| System type error | C7 | | | | | | |
| Unbalance Dc-link voltage | C9 | | | | | | |
| Dc-link over voltage | CA | ⊙ | ⊙ | ⊙ | ⊙ | ⊙ | ● |
| Internal communication error | CB | | | | | | |
| Internal communication loss(E-M) | D9 | | | | | | |
| Internal communication loss(M-D) | DA | | | | | | |
| Software incompatibility | CC | | | | | | |
| Internal storage error | CD | | | | | | |
| Boost abnormal | CG | | | | | | |
| Dc-dc abnormal | CU | | | | | | |

Remark: ● Light on ○ Light off ⊙ Keep original status
 ★ Blink 1s and off 1s ★★ Blink 2s and off 1s

6.2 App Setting Guide

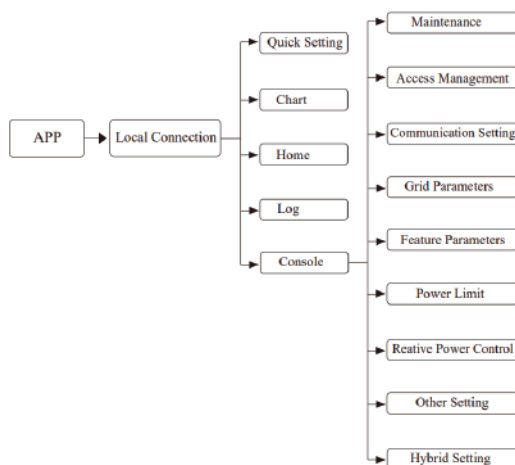
6.2.1

Download “SolarHope” from the App Store or Google Play store.

The App will need access to some permissions such as device’s location to function correctly.

6.2.2 App Architecture

Local connection: The SolarHope App receives data from inverter through the Bluetooth connection. This uses Modbus protocols to display and configure inverter parameter.



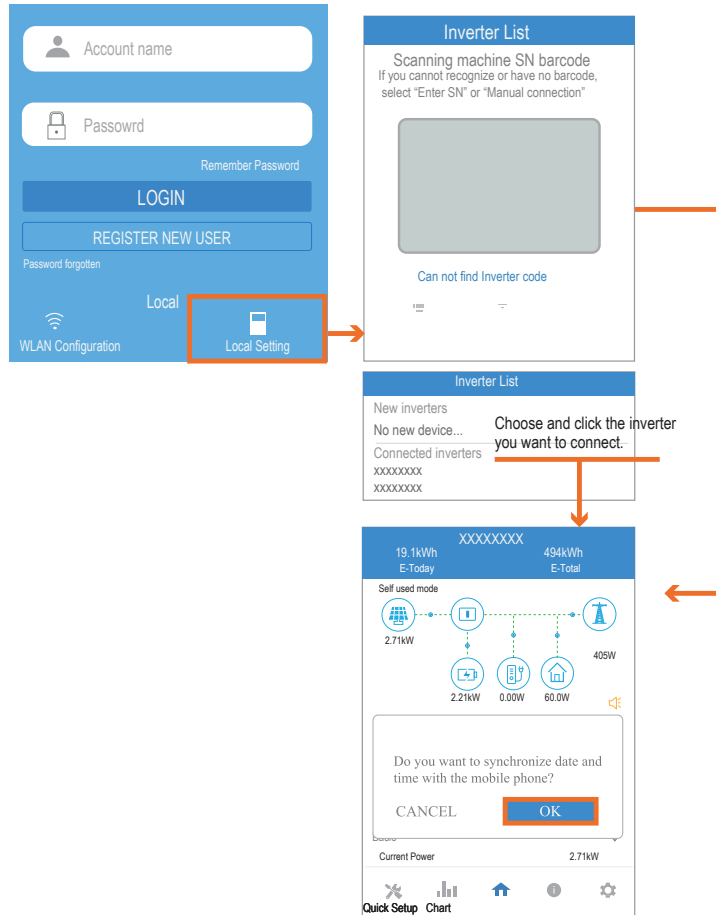
6.2.3 Local Setting

Access Permission

Before using the local setting, "SolarHope" App will need access to some permissions.

Connect Inverter

First, tap on "Bluetooth Connection" and then select "Manual Connection". This will allow you to connect to the inverter by selecting its serial number from the menu on the screen.

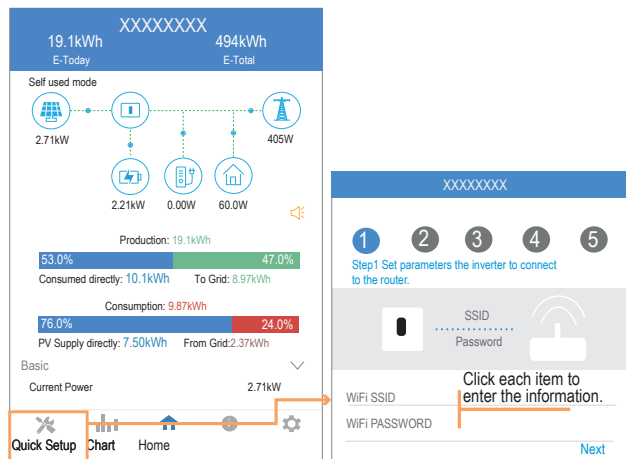


SolarHome App Quick Setup Guide

1. Connect to the Router.

Step 1 Enter the Quick Setup page.

Step 2 Enter in the Wi-Fi network SSID and password, then hit **Next**.



2. Set Grid parameters

Step 1 Click each item to enter the Grid parameters.
Step 2 Click [Next](#).


3. Set Power Limit parameters.

Step 1 Click each item to enter the Power Limit parameters.
Step 2 Click [Next](#).

4. Set the Inverter Work Mode


Step 1 Select the preferred work mode and enable EPS Output if required.
Step 2 Click [Next](#).


5. Start Inverter


Step 1 Click .


App Power Chart


The power chart can be displayed by Day, Month and Year. For each option, you can view both Production and Consumption. The different icons and colours are used to display the different elements of the inverter.


- 


Colour: Blue
Definition: Load consumption only from PV
- 

Colour: Red
Definition: Battery charging from PV or Grid
- 

Colour: Red
Definition: Battery discharge power for load consumption or feed-in grid
- 

Colour: Purple
Definition: Consumption power from grid
- 

Colour: Purple
Definition: Feed-in grid power from PV or Battery
- 

Colour: Orange
Definition: Home loads
- 

Colour: Orange
Definition: PV generating power

1. Viewing Inverter Data

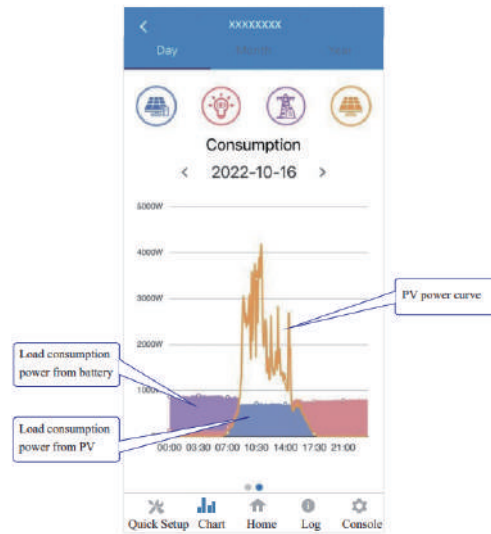
Go to Chart, then select the Day page. It will show the Daily Production or Consumption Curve on this page. You can swipe the screen left and right to switch between graphs.

Day Chart--Production



The day chart shows the PV production power distributed with three parts:
 Load consumption power (Blue)
 Battery charge power (Red)
 Feed-in grid power (Purple)

▪ Day Chart--Consumption

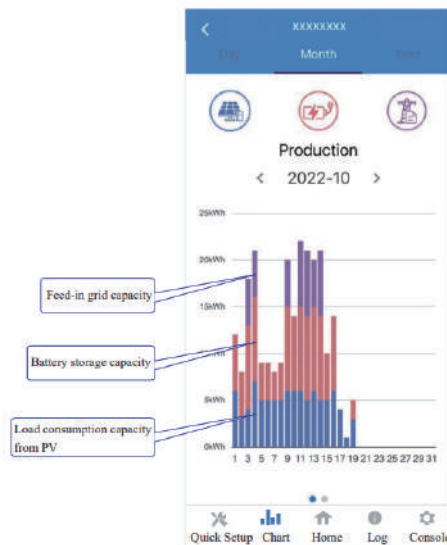


The day chart shows the load consumption power from three parts: PV generation power (Blue)
 Battery discharge power (Red)
 Grid power (Purple)
 Power supported by PV + power supported by battery + power supported by grid = Load consumption power.

2. Monthly Inverter Data

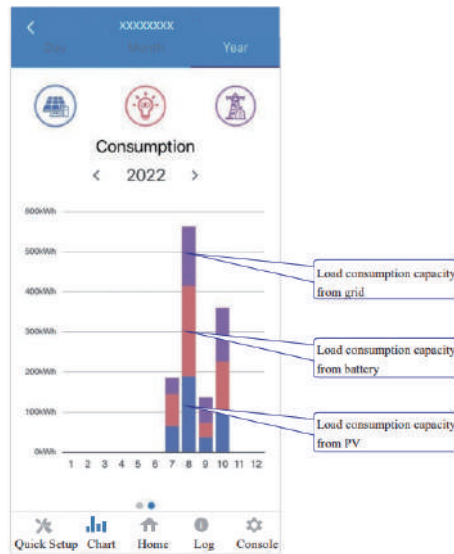
Go to Chart > Month page. It will show the Monthly Production or Consumption Curve in this page. You can swipe the screen left and right to switch between the graphs.

Month Chart--Production



The above combination day chart shows the load consumption power from three parts:
 Load consumption capacity (Blue)
 Battery storage capacity (Red)
 Feed-in grid capacity (Purple)

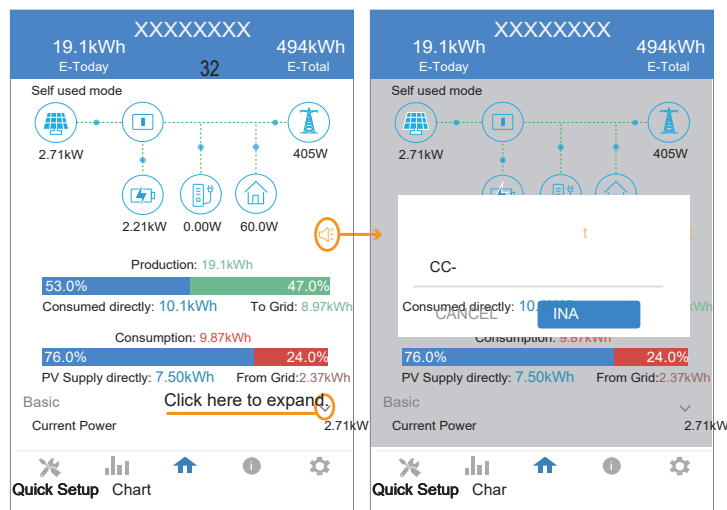
■Year Chart--Consumption



The above combination year chart shows the load consumption capacity from three parts:
 PV generation capacity (Blue)
 Battery discharge capacity (Red)
 Grid capacity (Purple)

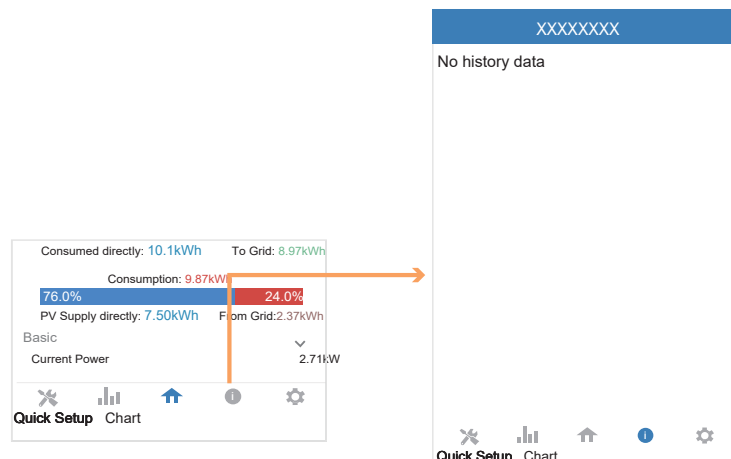
2. Local Setting Homepage

This page shows the basic information of the inverter as well as any alarms.



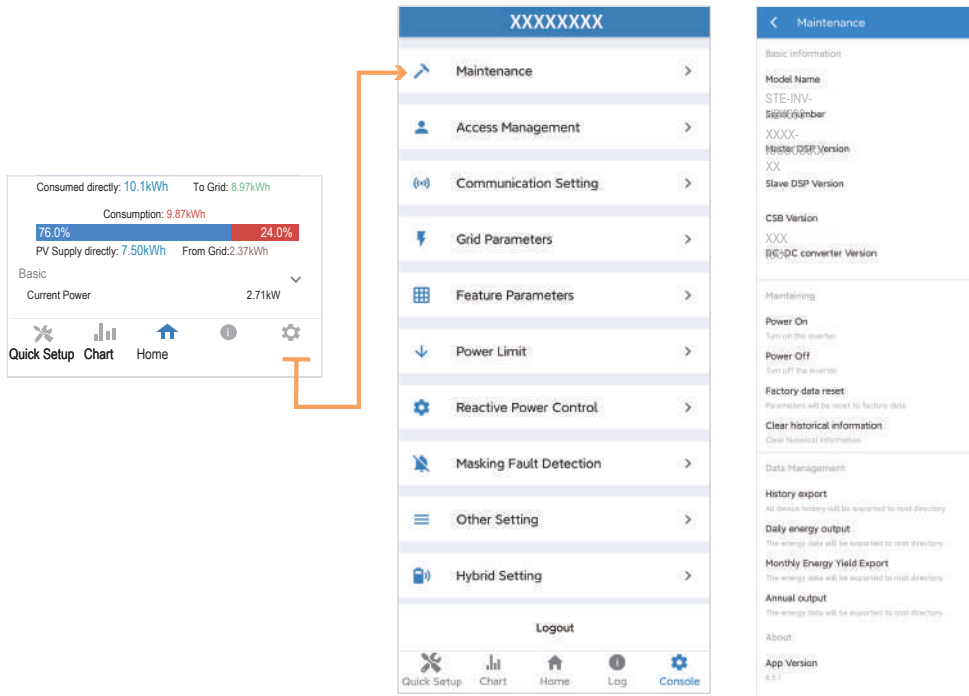
History Log

Press Log at the bottom and then go to the history logpage (as shown below). It contains all the logs for the inverter



■ Maintenance

Go to [Console](#) page. And click [Maintenance](#)

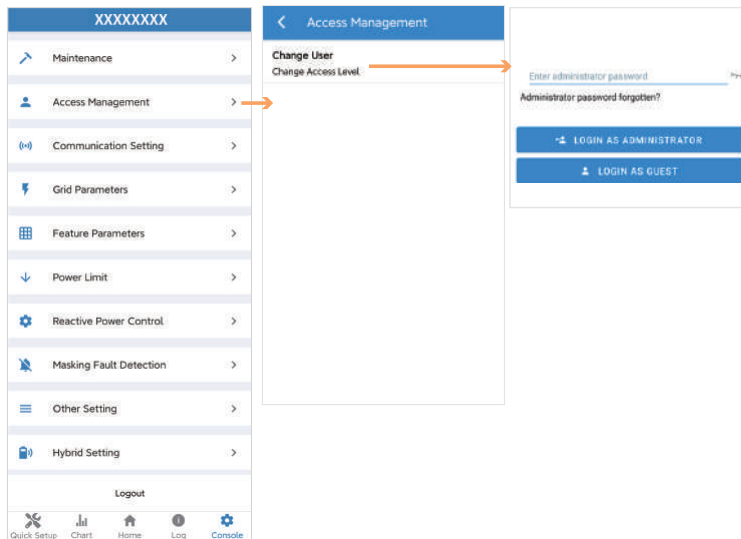


In this page, you can view the basic information such as firmware versions and perform some maintaining operations like turn off/on the inverter and manage data.

■ Console

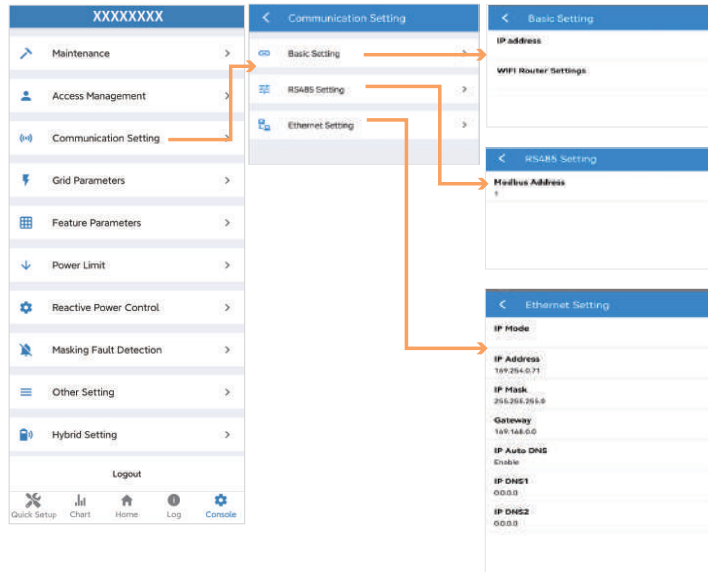
Access Management

Go to [Console](#) > [Access Management](#) page. In this page, you can switch the login permission. This page is only required when speaking with Technical Support, they will provide you with the password.



Communication Setting

Go to [Console > Communication Setting](#) page. In this page, you can set or change the parameters of communication settings: Basic Setting, RS485 Setting and Ethernet Setting.



Grid Parameters

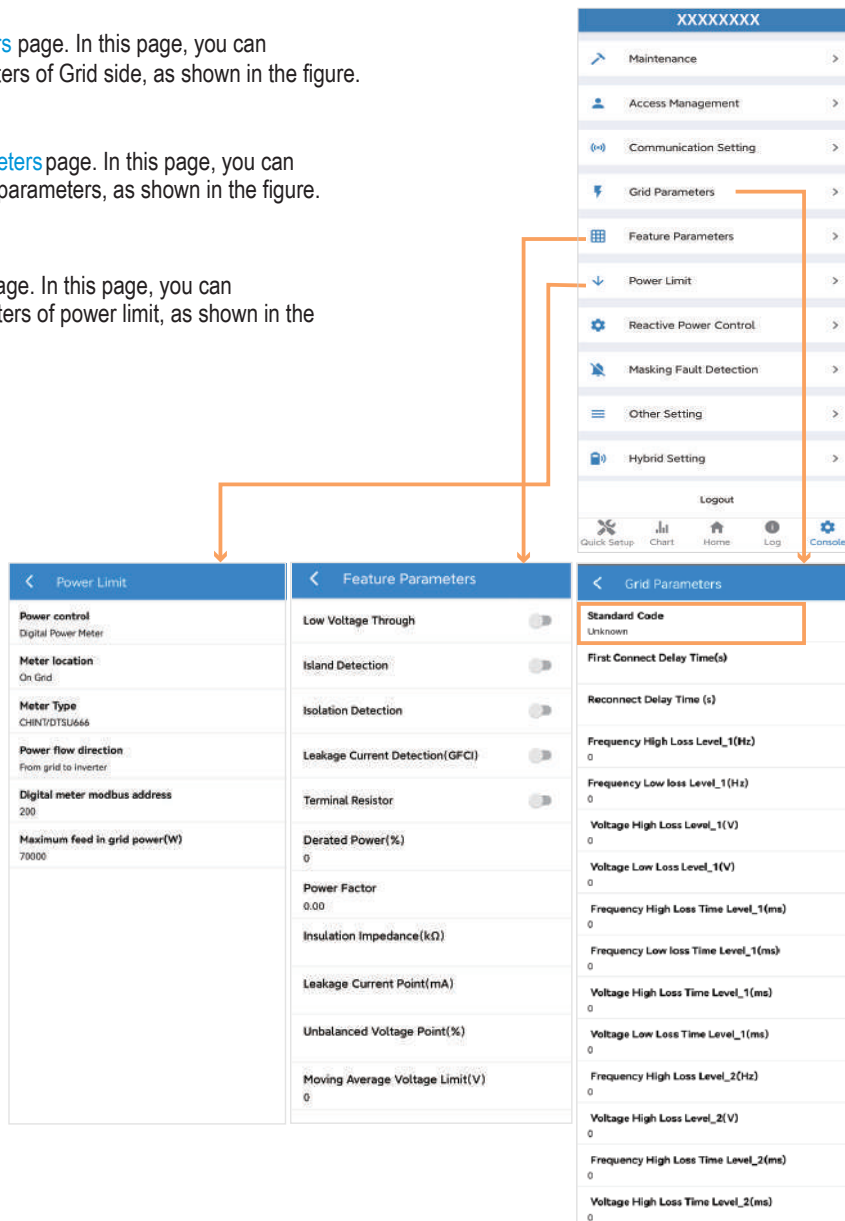
Go to [Console > Grid Parameters](#) page. In this page, you can set or change the parameters of Grid side, as shown in the figure.

Feature Parameters

Go to [Console > Feature Parameters](#) page. In this page, you can set or change the feature parameters, as shown in the figure.

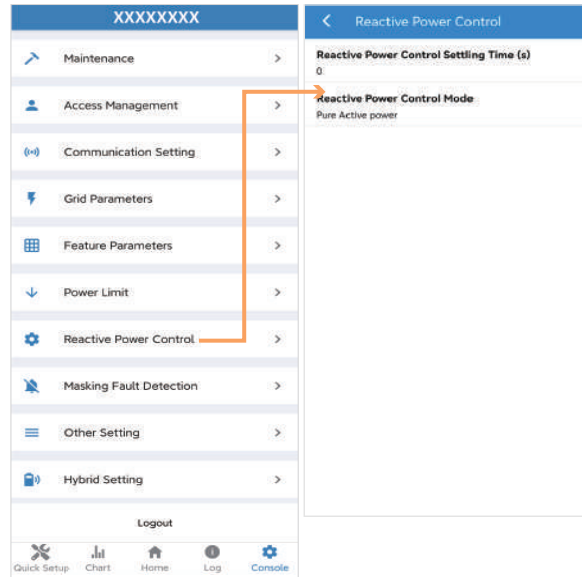
Power Limit

Go to [Console > Power Limit](#) page. In this page, you can set or change the parameters of power limit, as shown in the figure.



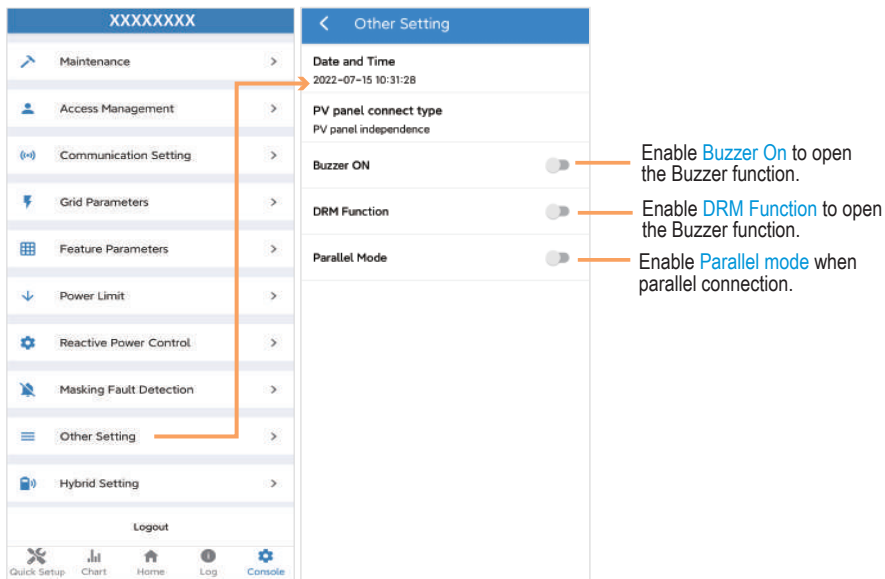
Reactive Power Control

Go to [Console > Reactive Power Control](#) page. In this page, you can set or change the Reactive Power Control parameters.



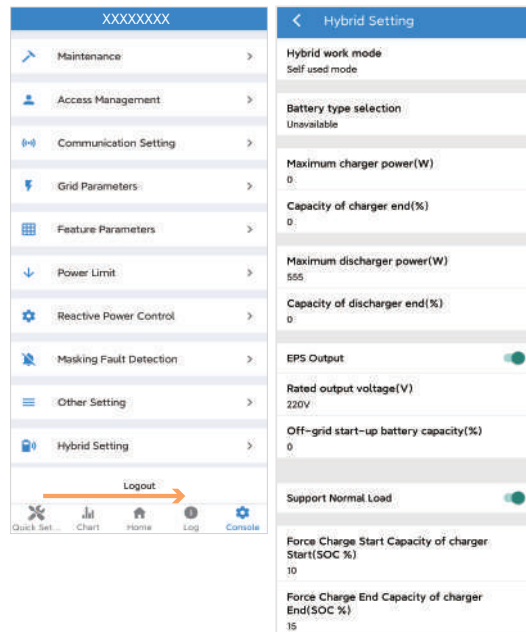
Other Setting

Go to [Console > Other Setting](#) page. In this page, you can set other setting parameters.



Hybrid Setting

Go to [Console](#) > [Hybrid Setting](#) page. In this page, you can set Hybrid Setting parameters.



6.3 Remote Monitoring

6.3.1 Remote Monitoring

Included with every BPE PowerDepot A1 system is a Wi-Fi data logger that connects the inverter to the online monitoring platform Solarman.

| | |
|--|---|
| | <p>CAUTION</p> <p>Before maintaining and commissioning inverter and its peripheral distribution unit, switch off all the charged terminals of the inverter and wait at least 10 minutes after the inverter is powered off.</p> |
|--|---|

7. Maintenance

7.1 Routine Maintenance

| Items | Check Content | Maintain Content | Maintenance Interval |
|------------------------------------|---|--|----------------------|
| Inverter output status | Statistically maintain the status of electrical yield, and remotely monitor its abnormal status. | N/A | Weekly |
| PV inverter cleaning | Check periodically that the heat sink is free from dust and blockage. | Clean periodically the heat sink. | Yearly |
| PV inverter running status | Check that the inverter is not damaged or deformed. Check for normal sound emitted during inverter operation. Check and ensure that all inverter communications are running well. | If there is any abnormal phenomenon, replace the relevant parts. | Monthly |
| PV inverter electrical connections | Check that all AC, DC and communication cables are securely connected; Check that GND cables are securely connected; Check that all cables are intact and free from aging. | If there is any abnormal phenomenon, replace the cable or re-connect it. | Semiannually |

7.2 System Troubleshooting

| Code | Alarm Information | Suggestions |
|------|--------------------------------|--|
| A0 | Grid over voltage | 1. If the alarm occurs occasionally, possibly the power grid voltage is abnormal temporarily, and no action is required. 2. If the alarm occurs repeatedly, contact the local power station. After receiving approval of the local power bureau, revise the electrical protection parameter settings on the inverter through the App. 3. If the alarm persists for a long time, check whether the AC circuit breaker /AC terminals is disconnected, or if the grid has a power outage. |
| A1 | Grid under voltage | |
| A3 | Grid over frequency | |
| A4 | Grid under frequency | |
| A2 | Grid absent | Wait till power is restored. |
| B0 | PV over voltage | Check whether the maximum input voltage of a single PV string exceeds the MPPT working voltage. If yes, modify the number of PV module connection strings. |
| B1 | PV insulation abnormal | 1. Check the insulation resistance against the ground for the PV strings. If a short circuit has occurred, rectify the fault. 2. If the insulation resistance against the ground is less than the default value in a rainy environment, set insulation resistance protection on the App. |
| B2 | Leakage current abnormal | 1. If the alarm occurs occasionally, the inverter can be automatically recovered to the normal operating status after the fault is rectified. 2. If the alarm occurs repeatedly, contact your dealer for technical support. |
| B4 | PV under voltage | 1. If the alarm occurs occasionally, possibly the external circuits are abnormal accidentally. The inverter automatically recovers to the normal operating status after the fault is rectified. 2. If the alarm occurs repeatedly or last a long time, check whether the insulation resistance against the ground of PV strings is too low. |
| C0 | Internal power supply abnormal | 1. If the alarm occurs occasionally, the inverter can be automatically restored, and no action is required. 2. If the alarm occurs repeatedly, please contact the customer service. |

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| C2 | Inverter over dc-bias current | 1. If the alarm occurs occasionally, possibly the power grid voltage is abnormal temporarily, and no action is required. 2. If the alarm occurs repeatedly, and the inverter fails to generate power, contact the customer service. |
| C3 | Inverter relay abnormal | 1. If the alarm occurs occasionally, possibly the power grid voltage is abnormal temporarily, and no action is required. 2. If the alarm occurs repeatedly, pls. refer to the suggestions or measures of Grid over voltage. If the inverter fails to generate power, contact the customer service center. If there is no abnormality on the grid side, the machine fault can be determined. (If you open the cover and find traces of damage to the relay, it can be concluded that the machine is faulty.) And pls. contact the customer service. |
| CN | Remote off | 1. Local manual shutdown is performed in APP 2. The monitor executed the remote shutdown instruction. 3. Remove the communication module and confirm whether the alarm disappears. If yes, replace the communication module. Otherwise, please contact the customer service. |
| C5 | Inverter over temperature | 1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, please check whether the installation site has direct sunlight, bad ventilation, or high ambient temperature (such as installed on the parapet). Yet, if the ambient temperature is lower than 45° C and the heat dissipation and ventilation is good, please contact customer service. |
| C6 | GFCI abnormal | 1. If the alarm occurs occasionally, it could have been an occasional exception to the external wiring. The inverter can be automatically recovered. No action is required. 2. If it occurs repeatedly or cannot be recovered for a long time, please contact customer service. |
| B7 | PV string reverse | Check and modify the positive and negative polarity of the input string. |
| C8 | Fan abnormal | 1. If the alarm occurs occasionally, please restart the inverter. 2. If it occurs repeatedly or cannot be recovered for a long time, check whether the external fan is blocked by other objects. Otherwise, Please contact customer service. |
| C9 | Unbalance Dc-link voltage | 1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service. |
| CA | Dc-link over voltage | |

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| CB | Internal communication error | 1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service. |
| CC | Software incompatibility | |
| CD | Internal storage error | 1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service. |
| CE | Data inconsistency | |
| CF | Inverter abnormal | 1. If the alarm occurs occasionally, the inverter can be automatically recovered. No action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Please contact customer service. |
| CG | Boost abnormal | |
| CJ | Meter lost | 1. Check the meter parameter settings 2. Check whether the communication address of the inverter is consistent with that of the electricity meter through local APP. 3. The communication line is connected incorrectly or in bad contact 4. electricity meter failure. 5. If exclude the above faults, the alarm continues to occur, please contact the customer service center. |
| P1 | Parallel ID warning | It is Parallel ID Alarm. Pts. check the parallel communication cable, and check whether any inverter joins or exits online. All inverters are powered off completely, check the line, and then power on the inverters again to ensure that the alarm is lifted |
| P2 | Parallel SYN signal warning | Parallel synchronization signal is abnormal. Check whether the parallel communication cable is properly connected. |
| P3 | Parallel BAT abnormal | The parallel battery is abnormal. Check whether the battery of the inverter is reported low voltage or the battery is not connected. |
| P4 | Parallel GRID abnormal | The parallel grid is abnormal. Check whether the grid of the inverter is abnormal. |

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| D2 | Battery over voltage | 1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. Check whether the battery overvoltage protection value is improperly set. 3. The battery is abnormal. 4. If exclude the above, the alarm continues to occur, please contact customer service. |
| D3 | Battery under voltage | 1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. Check the communication line connection between BMS and inverter (lithium battery). 3. The battery is empty or the battery voltage is lower than the SOC cut-off voltage. 4. The battery undervoltage protection value is improperly set. 5. The battery is abnormal. 6. If exclude the above, the alarm continues to occur, please contact the customer service center. |
| D4 | Battery discharger over current | 1. Check whether the battery parameters are correctly set. 2. The battery is undervoltage. 3. Check whether a separate battery is loaded and the discharge current exceeds the battery specifications. 4. The battery is abnormal. 5. If exclude the above, and the alarm continues to occur, please contact customer service. |
| D5 | Battery over temperature | 1. If the alarm occurs repeatedly, please check whether the installation site is in direct sunlight and whether the ambient temperature is too high (such as in a closed room) 2. If the battery is abnormal, replace it with a new one |
| D6 | Battery under temperature | 3. If exclude the above, and the alarm continues to occur, please contact the customer service center. |
| D7 | EPS output voltage abnormal | 1. Check whether the EPS voltage and frequency Settings are within the specified range 2. Check whether the EPS port is overloaded 3. When not connected to the power grid, check whether EPS output is normal 4. If exclude the above, and the alarm continues to occur, please contact customer service. |
| D8 | Communication error (Inverter-BMS) | 1. Check whether the battery is disconnected. 2. Check whether the battery is well connected with the inverter. 3. Confirm that the battery is compatible with the inverter. It is recommended to use CAN communication. 4. Check whether the communication cable or port between the battery and the inverter is faulty. 5. If exclude the above, and the alarm continues to occur, please contact the customer service center. |

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| DE | Internal communication loss (E-M) | <ol style="list-style-type: none"> 1. Check whether the communication cables between EPS, electricity meter and inverter are well connected and whether the wiring is correct. 2. Check whether the communication distance is within the specified range. 3. Disconnect the external communication and restart the electricity meter and inverter. |
| DA | Internal communication loss (M-D) | <ol style="list-style-type: none"> 4. If exclude the above, and the alarm continues to occur, please contact the customer service center. |
| CU | Dcdc abnormal | <ol style="list-style-type: none"> 1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. If the alarm occurs repeatedly, please check: <ol style="list-style-type: none"> 1) Check whether the MC4 terminal on the PV side is securely connected. 2) Check whether the voltage at the PV side is open circuit, short circuit or ground to ground, etc. If exclude the above, and the alarm continues to occur, please contact the customer service center. |
| CP | EPS over dc-bias voltage | <ol style="list-style-type: none"> 1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Pls contact the customer service center. |
| DB | EPS short circuit | <ol style="list-style-type: none"> 1. Check whether the live line and null line of EPS output are short-circuited. 2. If it is confirmed that the output is not short-circuited or an alarm, please contact customer service to report for repair (after the troubleshooting of alarm problems, EPS switch needs to be manually turned on during normal use). |
| DC | EPS over load | <ol style="list-style-type: none"> 1. Disconnect the EPS load and check whether the alarm is lifted. 2. If the load is disconnected but the alarm still exists, please contact the customer service. (After the alarm is lifted, the EPS switch needs to be manually turned on for normal use.) |

7.3 Removing the Inverter

WARNING Before removing DC input connector, double check DC input switch is turned to OFF to avoid inverter damage and personal injury.

Perform the following procedures to remove the inverter:

Step 1. Disconnect all cables from the inverter, including communications cables, DC input power cables, AC output power cables, and protective ground (GND) cable, as shown below.

PV Connectors Removing Detail

NOTE

To remove the PV/Grid/EPS connectors, insert the removal tool into the lock according to the position indicated in the drawing, press inward, and then remove the connector.

Grid/EPS Connectors Removing Detail

Step 2. Remove the inverter from the mounting bracket.