



SOLTARO All-In-One ESS USER MANUAL

To secure the full 10-year product warranty, be sure to install the Soltaro All-In-One ESS by qualified installers.

Warning: Read this entire document before installing or using Sinlion All-in-one ESS. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or death, or can damage Soltaro LFP ESS, potentially rendering it inoperable.

PRODUCT SPECIFICATIONS

All specifications and descriptions contained in this document are verified to be accurate at the time of printing. However, because continuous improvement is a goal at Soltaro, we reserve the right to make product modifications at any time.

The images provided in this document are for demonstration purposes only. Depending on product version and market region, details may appear slightly different.

ERRORS OR OMISSIONS

To communicate any inaccuracies or omissions in this manual, please send an email to: service@soltaro.com.cn

ELECTRONIC DEVICE: DO NOT THROW AWAY



Proper disposal of batteries is required. Refer to your local codes for disposal requirements.



DEKRA



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Soltaro



SOLTARO
STORAGE SOLUTIONS FOR THE FUTURE

Soltaro Battery

Soltaro ESS



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Important Safety Instructions









SAVE THESE IMPORTANT SAFETY INSTRUCTIONS. Soltaro All-in-one ESS installation and repair instructions assume knowledge of high voltage electricity and should only be performed by Soltaro Certified Installers. Soltaro assumes no liability for injury or property damage due to repairs attempted by unqualified individuals or a failure to properly follow these instructions. These warnings and cautions must be followed when using Soltaro ESS.

SYMBOLS IN THIS DOCUMENT














This manual uses the following symbols to highlight important information:

 Warning:	WARNING indicates a hazardous situation which, if not avoided, could result in injury or death.
 Caution:	CAUTION indicates a hazardous situation which, if not avoided, could result in damage to the equipment.
Note:	NOTE indicates an important step or tip that leads to best results, but is not safety or damage related.



GENERAL INFORMATION

-  Warning: Read this entire document before installing or using Soltaro All-in-one ESS. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or death, or can damage Soltaro LFP Battery, potentially rendering it inoperable.
-  Warning: A battery can present a risk of electrical shock, fire, or explosion from vented gases. Observe proper precautions.
-  Warning: Soltaro LFP Battery installation must be carried out only by Soltaro Certified Installers, who have been trained in dealing with high voltage electricity.
-  Warning: Soltaro is heavy and challenging to lift.
-  Warning: Use Soltaro LFP Battery only as directed.
-  Warning: Do not use Soltaro LFP Battery if it is defective, appears cracked, broken, or otherwise damaged, or fails to operate.
-  Warning: Before beginning the wiring portion of the installation, first power off the inverter and then open the AC and DC disconnect switches (if applicable for the installation).
-  Warning: Do not attempt to open, disassemble, repair, tamper with, or modify Soltaro LFP Battery. Soltaro LFP Battery is not user serviceable. LFP Cells in Soltaro Battery are not replaceable. Contact the Soltaro Authorized Reseller who sold the Soltaro LFP Battery for any repairs.



Important Safety Instructions

-  **Warning:** Do not connect Soltaro LFP Battery to alternating current carrying conductors. Soltaro LFP Battery must be wired to either an inverter or a DC combiner panel that is then wired to an inverter. No other wiring configuration may be used.
-  **Warning:** Soltaro LFP Battery contains components, such as switches and relays, that can produce arcs or sparks.
-  **Warning:** To protect Soltaro LFP Battery and its components from damage when transporting, handle with care. Do not impact, pull, drag, or step on Soltaro LFP Battery. Do not subject Soltaro LFP Battery to any strong force. To help prevent damage, leave Soltaro LFP Battery in its shipping packaging until it is ready to be installed.
-  **Warning:** Do not insert foreign objects into any part of Soltaro LFP Battery.
-  **Warning:** Do not expose Soltaro LFP Battery or its components to direct flame.
-  **Warning:** Do not install Soltaro LFP Battery near heating equipment.
-  **Warning:** Do not immerse Soltaro LFP Battery or its components in water or other fluids.
-  **Caution:** Do not use cleaning solvents to clean Soltaro LFP Battery, or expose Soltaro LFP Battery to flammable or harsh chemicals or vapors.
-  **Caution:** Do not use fluids, parts, or accessories other than those specified in this manual, including use of non-genuine Soltaro parts or accessories, or parts or accessories not purchased directly from Soltaro or a Soltaro-certified party.
-  **Caution:** Do not place Soltaro LFP Battery in a storage condition for more than one (1) month, or permit the electrical feed on the Soltaro LFP Battery to be severed for more than one (1) month, without placing Soltaro LFP Battery into a storage condition in accordance with Soltaro's storage specifications.
-  **Caution:** Do not paint any part of Soltaro LFP Battery, including any internal or external components such as the exterior shell or casing.
-  **Caution:** Do not connect Soltaro LFP Battery directly to photovoltaic (PV) solar wiring.
-  **Caution:** When installing Soltaro LFP Battery in a garage or near vehicles, keep it out of the driving path. If possible, install the Soltaro LFP Battery on a side wall and/or above the height of vehicle bumpers.

ENVIRONMENTAL CONDITIONS

-  **Warning:** Install Soltaro LFP Battery at a height that prevents damage from flooding.
-  **Warning:** Operating or storing Soltaro LFP Battery in temperatures outside its specified range might cause damage to Soltaro LFP Battery.

Important Safety Instructions

-  **Warning:** Do not expose the Soltaro LFP Battery to ambient temperatures above 60°C (140°F) or below -30°C (-22°F).
-  **Caution:** Ensure that no water sources are above or near Soltaro LFP Battery, including downspouts, sprinklers, or faucets.

What is Soltaro All-in-one ESS?

THE FUTURE OF SUSTAINABLE ENERGY

Soltaro All-in-one ESS is a lithium-ion(LiFePO₄) battery system that turns solar panels into an all-day resource while offering backup power in the event of a grid outage. Soltaro All-in-one ESS enables storage of renewable energy, allowing optimized home energy control and an increasing amount of total electricity production to come from renewable sources. Reliable renewable energy improves the resiliency of the grid, reduces energy costs, and increases the impact of electric vehicle ownership.

POWER WHEN NEEDED

Soltaro All-in-one ESS enables the storage of energy from solar panels during the day, or from the grid when energy rates are low; discharges energy for backup or use at night; and automatically optimizes home energy. Soltaro All-in-one ESS thereby maximizes solar consumption and reduces energy spending.

A FLEXIBLE SOLUTION

Soltaro All-in-one ESS can be charged from solar or grid power and can provide backup power.

If greater amounts of energy are needed, multiple Soltaro All-in-one ESS can be installed together to work as a larger system.



Specifications



The future of clean energy is here.

Discover the Soltaro Superior LiFeP04 Range

Lithium-Iron Phosphate (LiFeP04) battery technology is one of the most reliable, safe and long-lasting lithium technologies on the market. Due to its uniquely high chemical stability, the battery's application reliability is second to none, with exceptional durability and an IP65 rating for outdoor application.



PHYSICAL SPECIFICATIONS

	-2KWH	-4.5KWH
Scalability Range/Mode	Max 5 modules*	No Limitation**
Installation Mode	Wall mounted / Sit on ground	
Dimensions [WxHxD]	412 x 387 x 183	412 x 746 x 183
Weight	33 kg	38 kg

* Parallel without BMU

** With BMU

COMPLIANCE SPECIFICATIONS

	LiFeP04 Range
Data Communications	RS485/CAN
Temperature	0-45°C Charge * -20°C-55°C Discharge
Enclosure Protection Rating	IP 65
Standard Warranty	10,000 cycles @90% DOD, or 10 years
Certificates (Cell)	UL 1642, IEC62133
Certificates (Pack)	UL 1973, IEC62619, UN38.3
Compatible Inverters	Soltaro, SolaX and Mass Energy

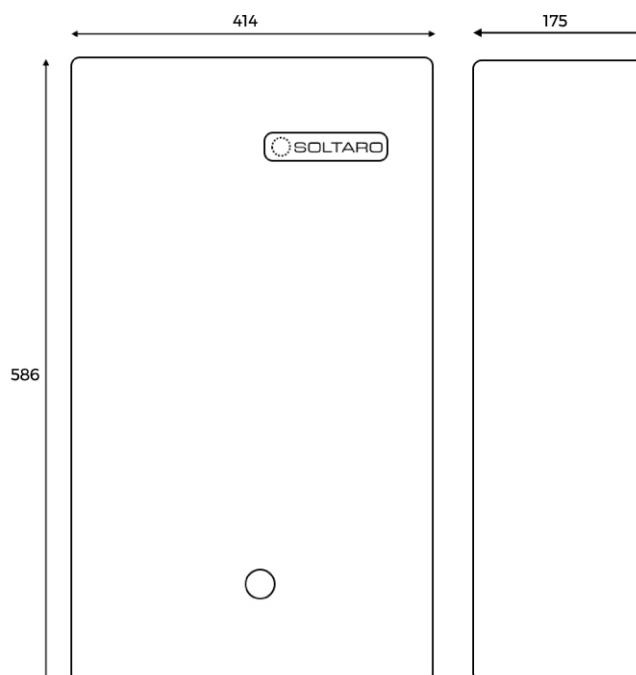
* Optional -45°C low temperature charge

PERFORMANCE SPECIFICATIONS

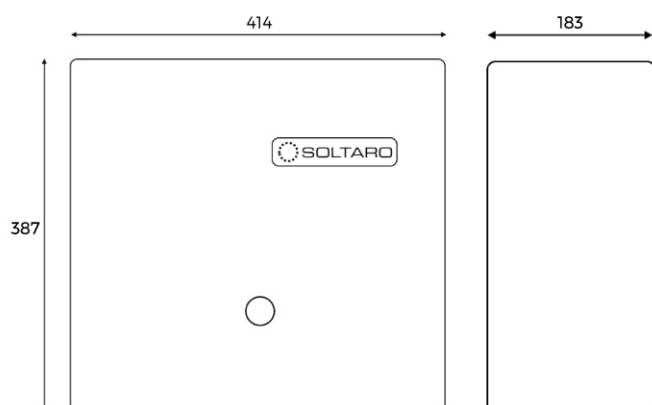
	-2KWH	-4.5KWH
Total Energy [kWh]	2 kWh	5 kWh
Usable Energy [kWh]	1.8 kWh	4.05 kWh
Nominal Voltage [V]	51.2 V	51.2 V
Nominal Capacity [Ah]	40 AH	90 AH
Operation Voltage Range [V]	40V-58.4V	40V-58.4V
Nominal Charge Current [A]	40 A(I C)	90 A(I C)
Nominal Discharge Current [A]	40 A(I C)	90 A(I C)
Peak Discharge Current [A]	60 A(1.5C)*	120 A(1.2C)*
Calendar Life [Year]	20 years @25°C, 15 years @35°C, 10 years @45°C	
Depth of Discharge	90%	

* For 2 minutes

ST-4.5KWH-LFP



ST-2KWH-LFP





Hybrid/AC Coupled Inverter 4.5KWH LFP Battery



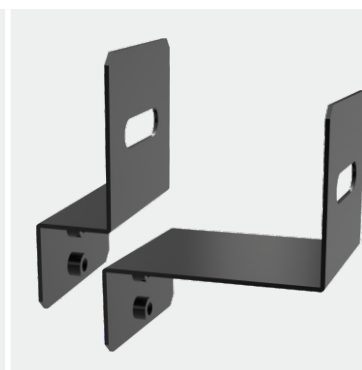
Inverter Backsheet



Battery Backsheet



Inverter Holder



Inverter Positioner



Battery <--> Inverter Power Cables 25mm²



Battery <--> Inverter RJ45 Communication Cable



M6 Expansion Screws



M5/M4/M8 Hexagon Socket Head Cap Screw

Main Applications Target

SOLTARO AC COUPLED ALL-IN-ONE ESS

- Retrofit existed on-grid solar system to hybrid;
- Maximum PV Generation self-consumption;
- Automatic Emergency Power Backup(<10ms UPS level);
- Peak shaving(timer setting for charge&discharge);
- Building AC BUS for micro-grid system;



SOLTARO PORTAL



INTERNET



ROUTER



UTILITY GRID



UTILITY METER FOR BILL PURPOSES

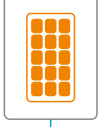


SOLTARO ENERGY METER



1. REGULAR RETROFIT SOLAR SYSTEM

PV GENERATOR



STRING INVERTER



APPLIANCE



SOLTARO WIFI SOCKETS



APPLIANCE

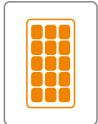


SOLTARO AC COUPLED ALL-IN-ONE ESS-IP 65



2. WIND/SOLAR/DIESEL/STORAGE MICRO-GRID SYSTEM BASED ON SOLTARO AC COUPLED ALL IN ONE ESS

PV GENERATOR



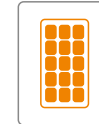
SOLTARO MPPT BOX



SOLTARO AC COUPLED ESS



PV GENERATOR



STRING INVERTER



WIND GENERATOR



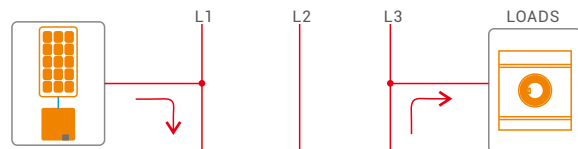
WIND INVERTER



LOAD



3. ASYMMETRIC LOAD ON THE THREE-PHASE GRID IS NO PROBLEM FOR SOLTARO AC COUPLED ALL IN ONE ESS



SOLTARO RETRO CLUSTER



SOLTARO HYBRID ALL-IN-ONE ESS

- New building solar hybrid system;
- Maximum PV Generation self-consumption;
- Automatic Emergency Power Backup(<10ms UPS level);
- Peak shaving(timer setting charge&discharge);
- Building AC BUS for micro-grid system;

TYPICAL INSTALLATION

PV GENERATOR



SOLTARO HYBRID ALL-IN-ONE ESS-IP 65



APPLIANCE



SOLTARO WIFI SOCKETS



APPLIANCE



SOLTARO PORTAL



INTERNET



ROUTER



UTILITY GRID



UTILITY METER FOR BILL PURPOSES

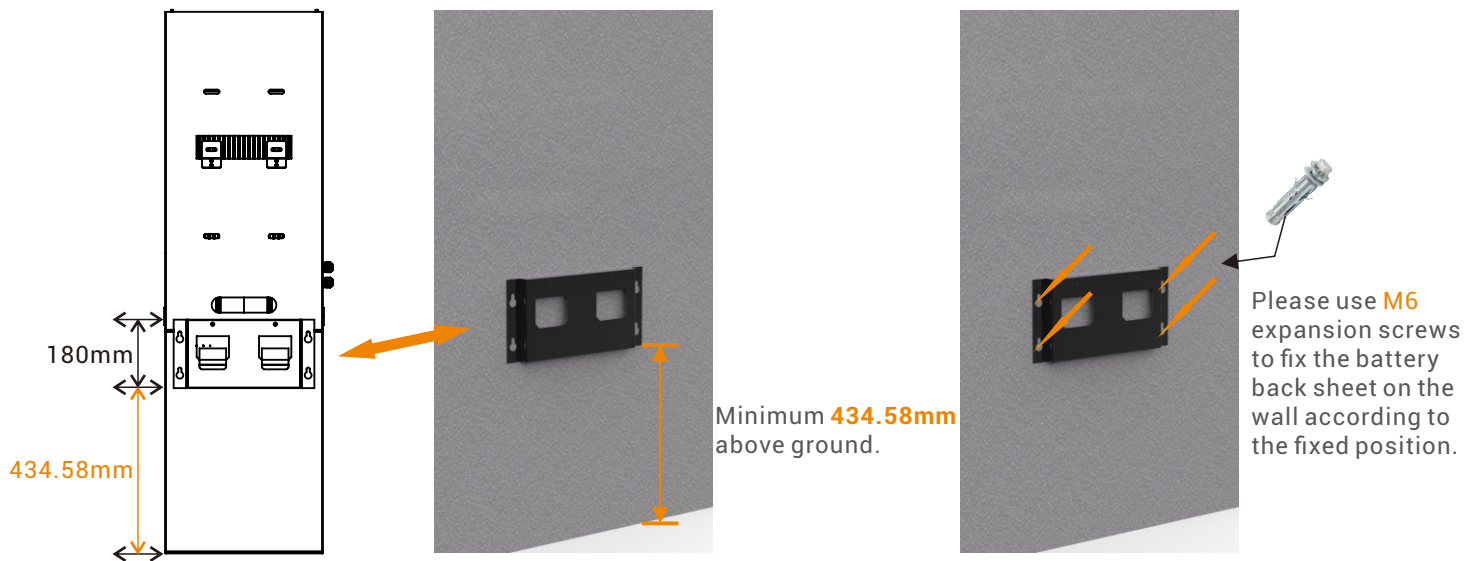


SOLTARO ENERGY METER

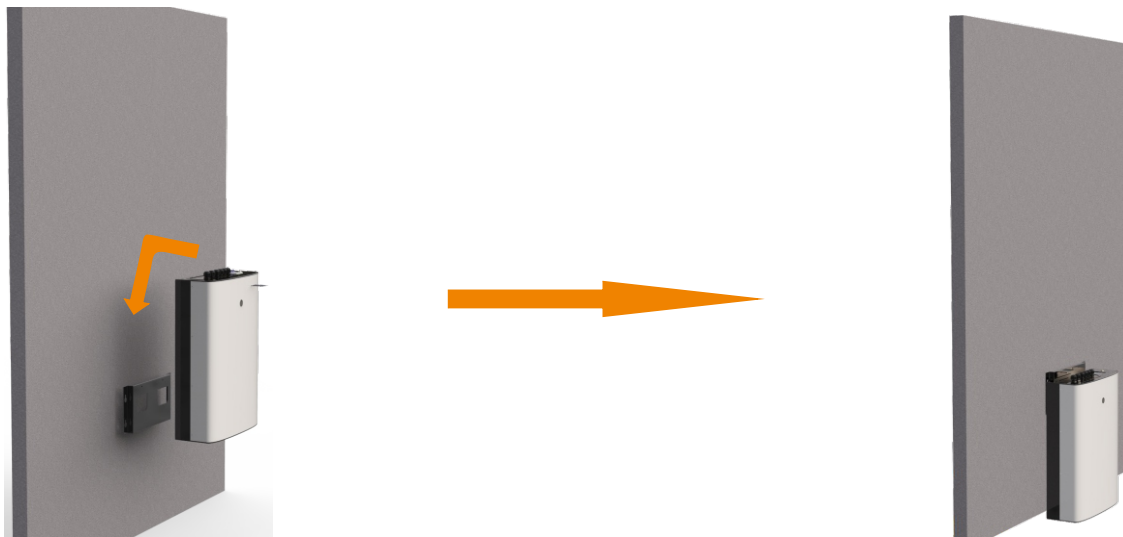


Mechanical Installation

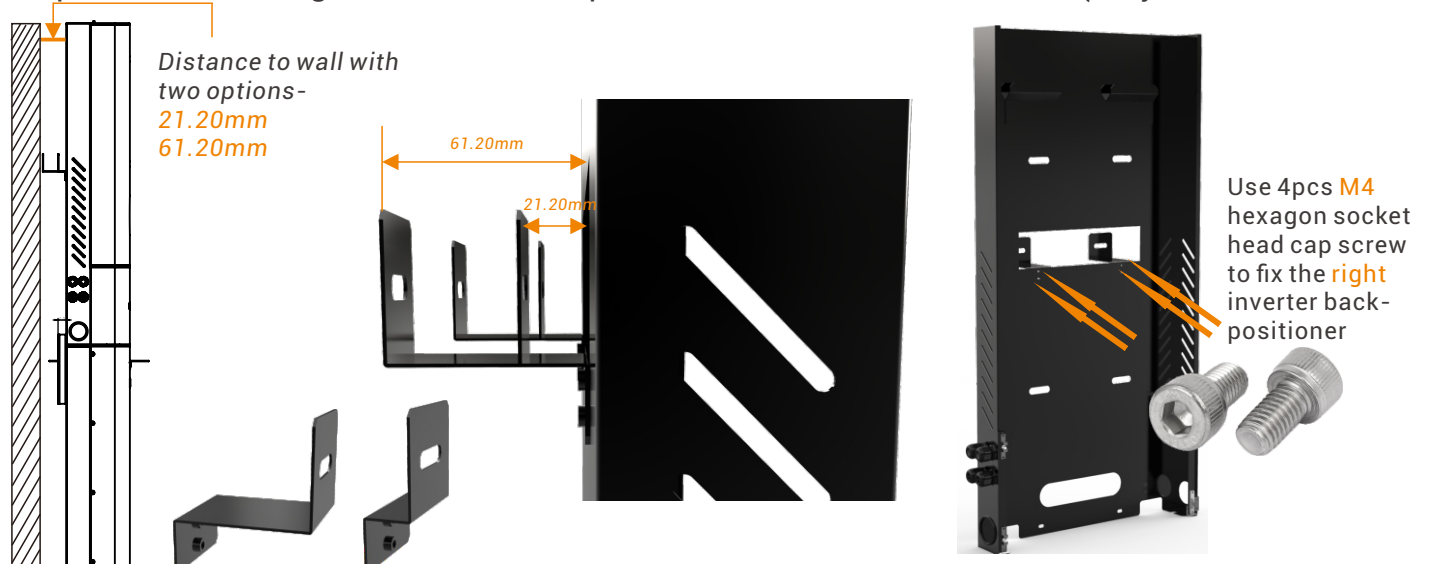
Step-1, Confirm the exact mounting position of battery backsheet-



Step-2, Hanging on the battery module to the mounted battery backsheet-

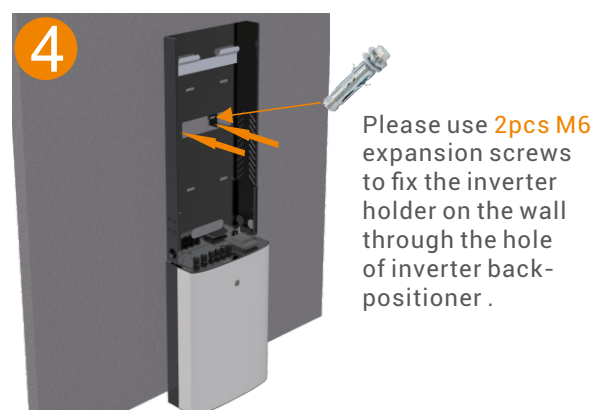
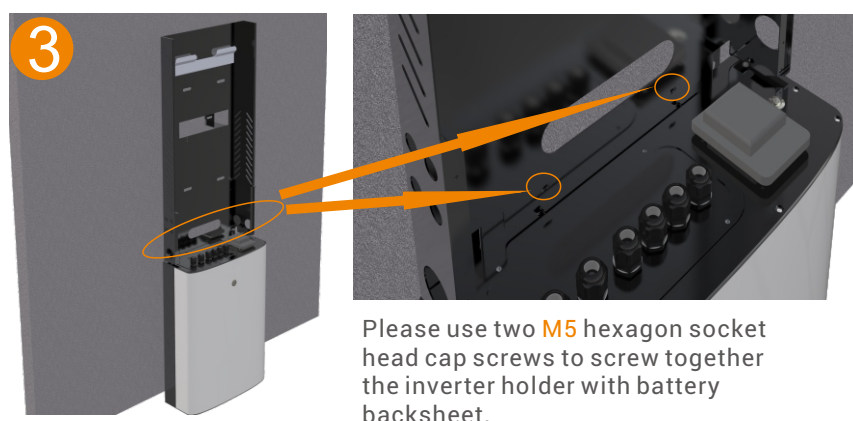
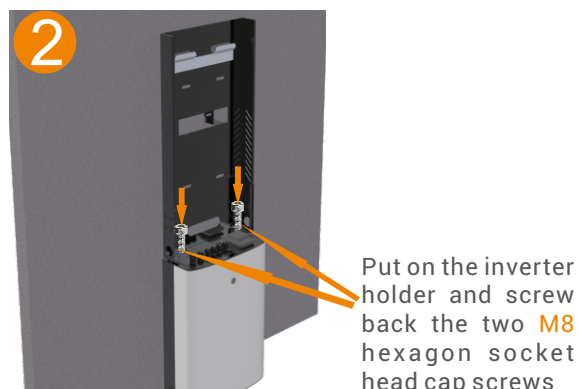
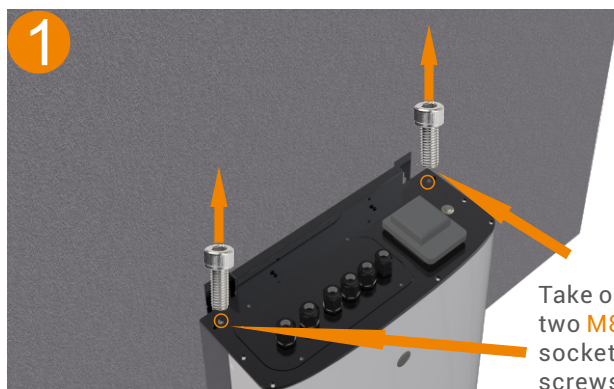


Step-3, Select the right Inverter back-positioner to the inverter holder(only one shall be chosed)

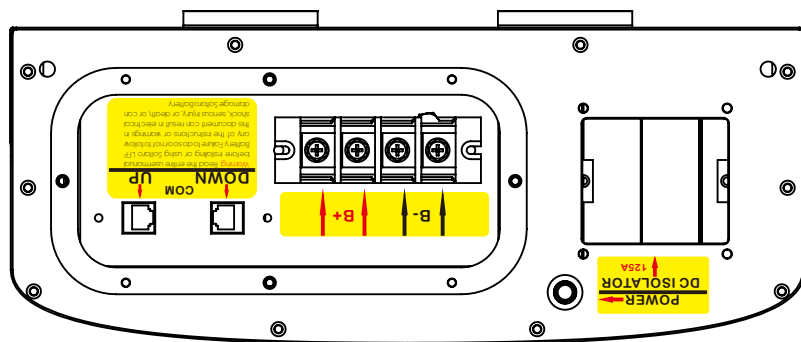
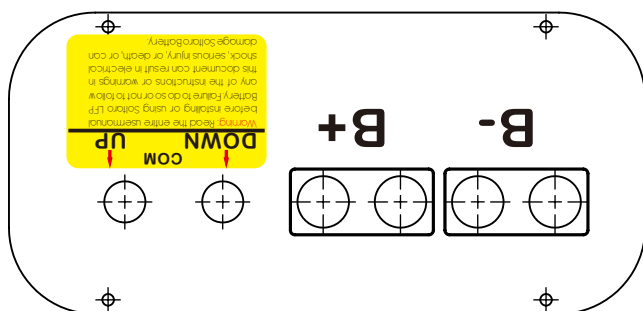


Mechanical Installation

Step-4, Install the inverter holder-

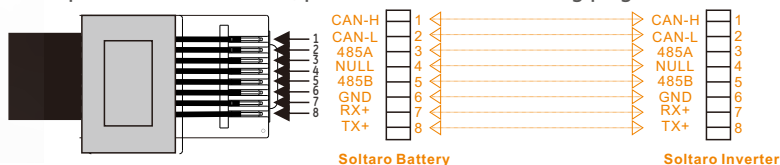


Step-5, Install battery power cable and communication cable



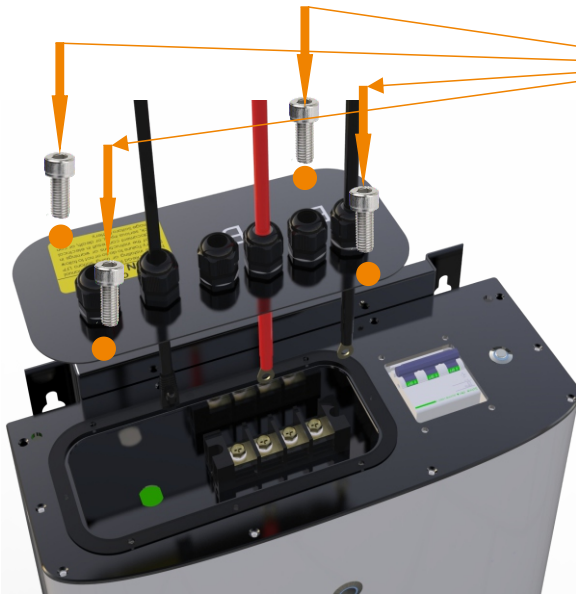
Connection terminals inside battery module

- Loosen the waterproof terminals, then put through the Positive /Negative/Communication cables according to each position, then using cold compression pincer to connect the power cables (+/-) with OT-25-6 connectors, then use Philips Screwdriver to screw the power cables to battery power interface accordingly.
- Please take out the communication cable from inverter box, cut battery RJ45 end, put the cable through in cables cover, then Use RJ45 cable clamp to crimping the communication cable with RJ45 connector and plug-in the battery COM interface-if one battery connected, either Up or Down is ok, if for multi batteries parallel connection, please refer to following page.



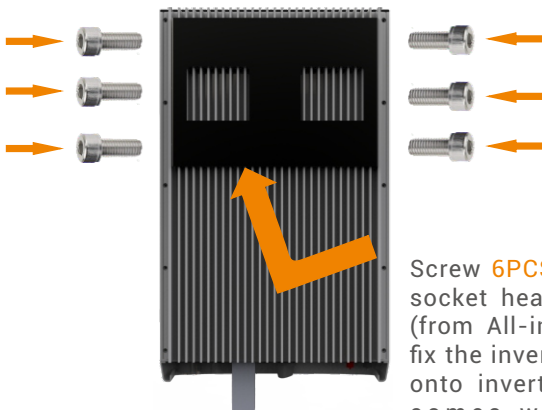
Mechanical Installation

Step-6, Fix the cables cover onto battery



Screw back the 4PCS M hexagon socket head cap screws(from battery accessories) to fix the cables cover back onto battery module, please guarantee the tightness in case installing the ESS outside house.

Step-7, Mounting the inverter



Screw **6PCS M5** hexagon socket head cap screws (from All-in-one Kits) to fix the inverter backsheet onto inverter, if inverter comes with another backsheet, please remove it.



Please remove the black protection plate from inverter if it comes from inverter to make it ready for all-in-one installation.



Use **2PCS M4** to fix the Wifi stick to inverter from bottom



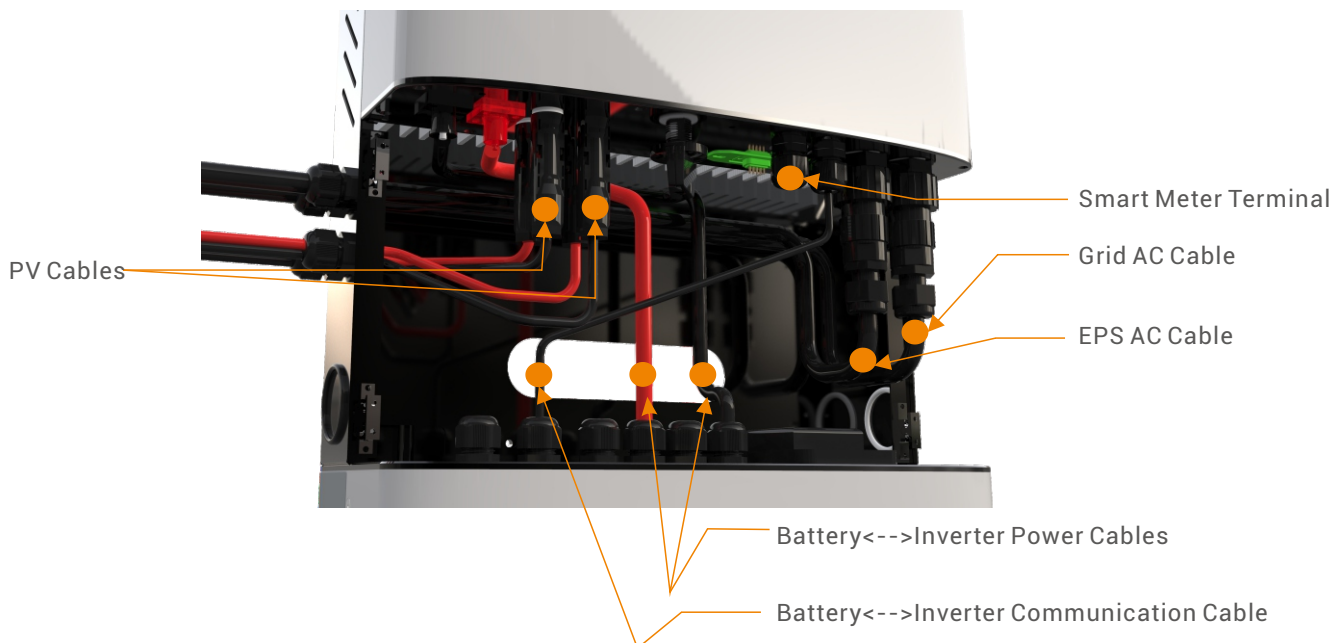
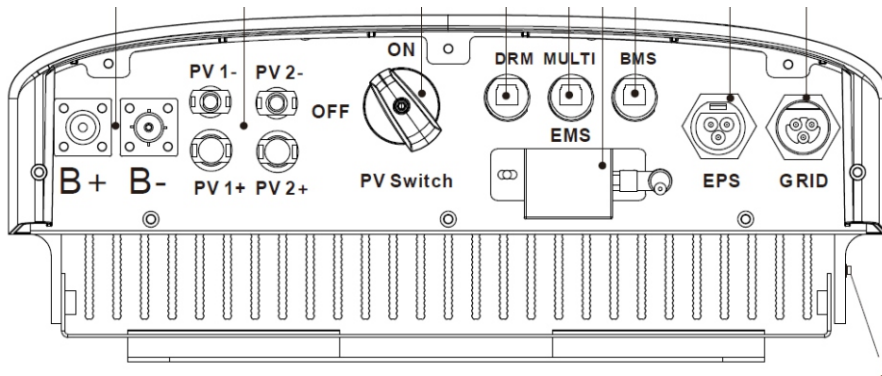
Hanging the inverter onto battery holder

Step-8, Screw the waterproof terminals onto inverter holder



Please screw the water proof terminals onto inverter holder, to make it ready for all-in-one ESS cables in/out.

Step-9, Cables connection inside Soltaro All-in-one ESS



Note:

For detailed Hybrid&AC Coupled Inverter diagram, please refer to Hybrid Inverter- document "**Manual Soltaro Hyper-LV-1P-EU1.04**"
AC Coupled Inverter- document "**Manual Soltaro Retro-LV-1P-EU1.04**"

System Setting

Step-10, Battery&Inverter Setting

Please refer to following manuals-

Hybrid Inverter- document "**Manual Soltaro Hyper-LV-1P-EU1.04**"

AC Coupled Inverter-document "**Manual Soltaro Retro-LV-1P-EU1.04**"

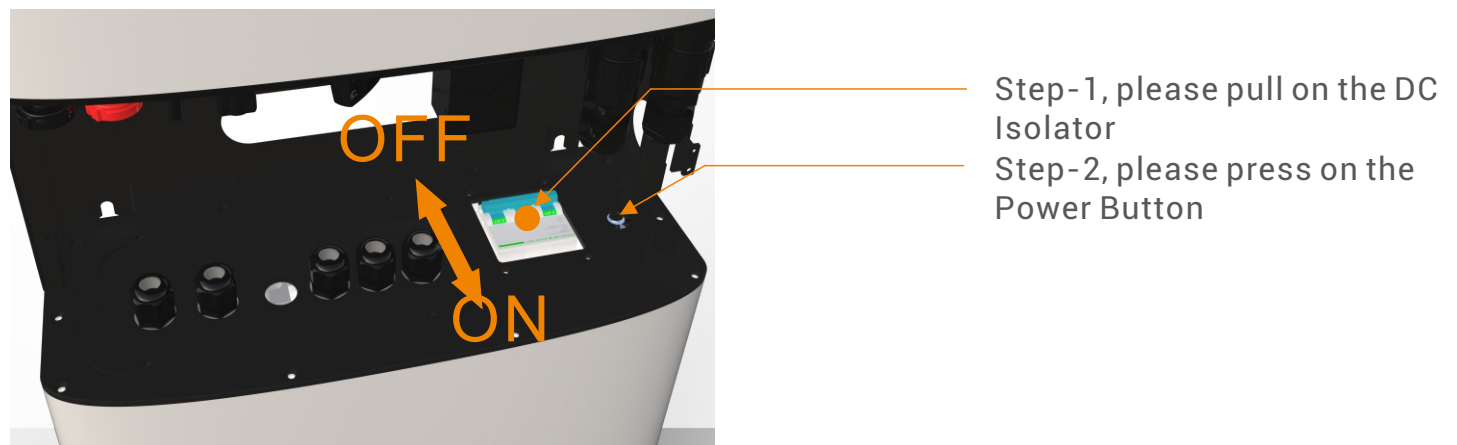
Step-11, How to start the system?

Please refer to following manuals-

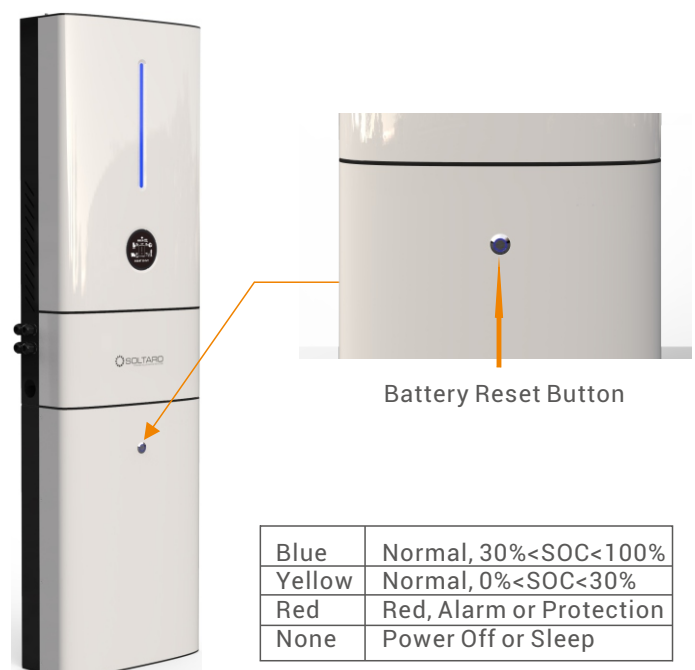
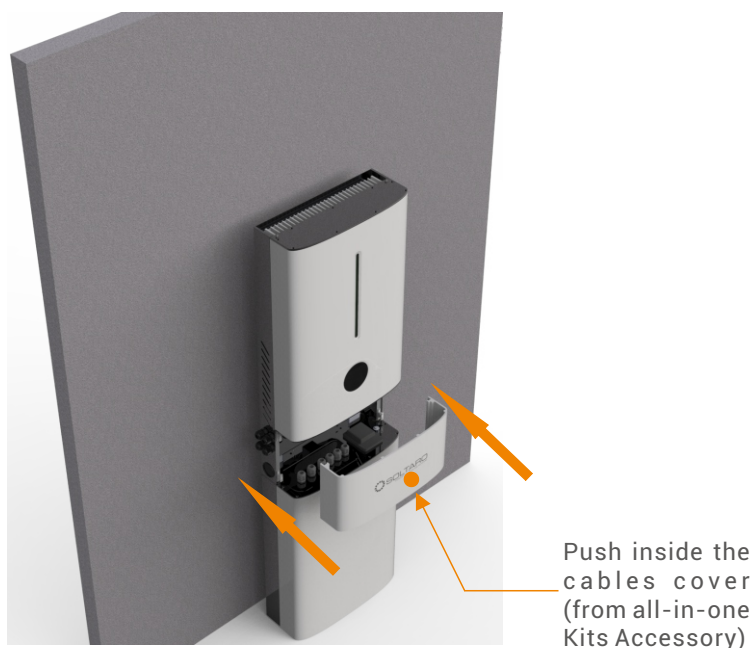
Hybrid Inverter- document "**Manual Soltaro Hyper-LV-1P-EU1.04**"-Page 27

AC Coupled Inverter-document "**Manual Soltaro Retro-LV-1P-EU1.04**"-Page 25

When power on battery, please refer to following steps-



Step-12, Put in the Cables Cover



START THE BATTERY ARRAY

NORMAL OPERATION

During normal operation, if Soltaro All-in-one ESS are installed correctly, the inverter and battery will start communication immediately, then begin to process power commands. See the inverter manual for further configuration instructions.



Warning: Do not operate Soltaro All-in-one ESS unless all covers are in place.



Warning: Do not disconnect anything from or add anything to Soltaro All-in-one ESS.



Caution: Do not try to communicate with Soltaro LFP Battery using third party tools or diagnostics between Soltaro LFP Battery and the inverter.



Caution: Do not lean on, stack anything on top of, or hang anything from Soltaro LFP Battery or the conduit.

SOLTARO ALL-IN-ONE ESS CARE

Keep the top edge of Soltaro All-in-one ESS clear of articles to maintain optimal airflow.

To clean Soltaro All-in-one ESS, use a soft, lint-free cloth. The cloth can be dampened with only water if needed. It should not be dripping.



Caution: Do not use cleaning solvents to clean Soltaro All-in-one ESS.