



EP CUBE



Installation Manual V2.1

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About this Manual

- Read this manual carefully in its entirety before installation / operation.
- Retain this manual for reference purposes.

1.1. Applicable Products

This manual is valid for the EP Cube HES Series Only. EP Cube HES series includes following products:

EP Cube HES-EU1-706G;

EP Cube HES-EU1-710G;

EP Cube HES-EU1-713G;

EP Cube HES-EU1-716G;

EP Cube HES-EU1-720G;

1.2. Intended Target Group

The instructions contained in this installation manual must only be performed by qualified EP authorized personnel who must have completed installer training program provided by EP.

Prior skills required before taking installations are following:

- Understanding of how batteries and inverters work, and they are operated
- Understanding and complying with the local standards, directives and electrical connection requirements
- Training in dealing with the hazards associated with the installation and operation of electrical equipment and lithium batteries
- Training in the installation and commissioning of electrical equipment



WARNING: EP Cube products can only be installed, repaired, replaced and maintained by the EP authorized personnel for safety and warranty purposes.

1.3. Scope of this Manual

This manual describes the installation process and provides a set of guidelines for EP Cube system installers. It provides system's an overview of the system and installation instructions, electrical connections, commissioning, operation, expansion, decommissioning, troubleshooting, maintenance and storage. Please read thoroughly this manual before installation and follow the instructions during the entire installation process.

If you have any further queries regarding the product, please contact the EP Cube service team.

1.4. Copyright

All rights reserved. The disclosure, duplication, distribution, and editing of this document, or utilization and communication of the content are not permitted unless authorized in writing. All rights, including rights created by patent grant or registration of a utility model or a design, are reserved.

1.5. Disclaimer

This document has gone through rigorous technical review before being published to provide accurate information. However, EP believes in striving for continuous improvement of our products and specifications may change without prior notice. Thus, it will be revised regularly and any modifications and amendments will be included in subsequent issues. The illustrations and images in this manual are for demonstration purposes only. The responsibility of a safe and quality installation is of the qualified and licensed installation professional. Actual product details may vary in appearance on the installation site.

1.6. Declaration of Conformity

EP Cube system described in this manual complies with the applicable European directives. The certificate of compliance and completed certifications can be found in the download section of EP Cube website: <https://eternalplanetenergy.com/EN/manuals.html>

1.7. Abbreviated Terms

ABBR	Description
AC	Alternating Current
CT	Current Transducer
DC	Direct Current
kW	Kilowatt
L	Live
N	Neutral
PV	Photovoltaic

1.8. Contact Us

Eternalplanet Energy Co. Ltd

Service Hotline: +49 89 51996890

Email: service.es@epcube.com, (For Spain only)

Email: service.it@epcube.com, (For Italy only)

Email: service.de@epcube.com, (For Germany only)

SAFETY INSTRUCTIONS

Please read this section carefully and strictly implement its contents for personal protection and property safety before installing and using the product. EP is not liable for any loss caused by the violation of the instructions in this manual and relevant instructions on the equipment. All descriptions in the manual are for guidance only.

Ensure that the equipment is used in environments that meet its design specifications. Otherwise, it may result in equipment malfunction, component damage, personal injuries, and/or property damage.

All installations and maintenance should be performed by trained and knowledgeable technicians who are familiar with local standards and safety regulations. The safety instructions in this document are only supplemental to local laws and regulations.



DANGER: Indicates the situation which, if not avoided, will lead to death or serious injury.



CAUTION: Indicates the situation which, attention is necessary to avoid potential injury or property damage.

1. Conduct In case of fire

Caution

- Immediately contact the fire department or other relevant emergency response team.
- Notify all people who might be affected and ensure that they are able to evacuate this area.

In the event of fire or potential risk of battery modules or storage system catching fire:

1. Leave or do not enter the room in which the storage system and battery modules are located.
2. Avoid contact with escaping smoke or steam. If contact occurs, rinse the affected area thoroughly with water. In the case of irritation of the skin, eyes or mucous membranes, consult a doctor.
3. Contact the fire department.
4. Contact the EP service team for more instructions on how to handle EP Cube system.
5. There is a danger of electrocution when extinguishing a fire while the storage system is switched on. In the event of a fire in the vicinity of the product or in the storage system itself, proceed as follows before beginning any extinguishing measures:
 - a. Switching the storage system off to electrically isolate it. The battery modules will still be carrying voltage and stored power.
 - b. Switch off the mains circuit breakers/fuses in the building.
 - c. Only firefighters with appropriate personal protective equipment are permitted to enter the room where the storage system is located.

d. If the storage system or mains fuses cannot be safely switched off: Observe the minimum distances applicable for the specific extinguishing means used.

The storage system works with a nominal voltage of 230 V (AC) and 230.4 V (DC).

Extinguishing agents

1. A fire can be extinguished using conventional extinguishing agents. i.e. ABC or carbon dioxide.
2. Water is recommended as an extinguishing agent in order to cool the battery modules and therefore prevent thermal runaway in battery modules which are still intact.

2. General and Personal Safety

DANGER:

- EP Cube consists of EP Cube PCS and battery modules that are considerably heavy! It is recommended to use lifting equipment to avoid any potential injuries.
- Do not stack the unpacked products to avoid irreversible damage.
- Ensure that the power switch and the breaker of the EP Cube are always turned off prior to all installation, replacement, and maintenance processes.
- Do not attempt to open, disassemble, tamper with, or modify the EP Cube without prior written approval from the EP company.
- Do not operate the EP Cube out of the specified conditions and requirements.
- It is prohibited to touch the EP Cube internal components when it's running.
- Do not place the EP Cube or its components in water or other liquids.
- Do not expose EP Cube to flammable gases, other corrosive substances, and heating sources.
- Do not short-circuit the terminals of the battery modules to avoid causing electric shock and fire.
- Do not stand on, lean on, or sit on the top of EP Cube.
- Do not use water to clean electrical components inside or outside of a cabinet.



CAUTION:

- The transportation, installation, and commissioning of the EP Cube must be carried out under the specified conditions. Do not expose EP Cube to extreme conditions during these periods.
- EP Cube can only be installed, repaired, replaced, and maintained by the EP authorized personnel for safety and warranty purposes. PPE must be worn during any operations.
- Do not place foreign objects on top of the product or insert inside the product.
- Ensure there is enough space around EP Cube for ventilation.
- Be careful to protect the EP Cube from impact when installing it in a garage or near vehicles. If possible, install the EP Cube on a side wall or above the height of vehicle bumpers.
- Do not try reverse engineering, decompile, disassemble, adapt, implant, or perform other derived operations on the EP Cube firmware.
- Do not study the internal implementation of the product firmware source code and steal intellectual property rights.

3. Personnel Requirements

- Personnel who plan to install or maintain EP Cube equipment must receive thorough training, understand all necessary safety precautions, and be able to correctly perform all operations.
- Only qualified professionals or trained personnel are allowed to install, operate, and maintain the equipment.
- Only qualified professionals are allowed to remove safety facilities and inspect the equipment.
- Personnel who will operate the equipment, including operators, trained personnel, and professionals, should possess the local national required qualifications in special operations such as high-voltage operations, working at heights, and operations of special equipment.
- Only professionals or authorized personnel are allowed to replace the equipment or components (including software).

Professionals	personnel who are trained or experienced in equipment operations and are clear of the sources and degree of various potential hazards in equipment installation, operation, and maintenance
Trained personnel	personnel who are technically trained, have required experience, are aware of possible hazards on themselves in certain operations, and are able to take protective measures to minimize the hazards on themselves and other people
Operators	operation personnel who may come in contact with the equipment, except trained personnel and professionals

4. Personal Protective Equipment

Wear the following safety equipment properly to perform installations. Installers must meet the relevant requirements of applicable standards and local laws.



Safety goggles



Ear plugs



Insulated gloves



Safety gloves



Safety shoes

5. Electrical Safety

5.1 General Requirements

1. Ensure that all electrical connections comply with local electrical standards.
2. Obtain approval from the local electric utility company before using the equipment in grid-tied mode.
3. Ensure that the cables you prepared meet local regulations.
4. Use dedicated insulated tools when performing high-voltage operations.

5.2 Cabling Requirements

1. When routing cables, ensure that a distance of at least 30 mm exists between the cables and heat-generating components or areas. This prevents damage to the insulation layer of the cables.
2. Bind cables of the same type together. When routing cables of different types, ensure that they are at least 30 mm away from each other.
3. Ensure that the cables used in a grid-tied PV power system are properly connected and insulated and meet specifications.
4. In sections where cables are routed through pipes or holes, these cables must be protected to prevent from being damaged by sharp edges or burrs.
5. When the temperature low, violent impact or vibration may damage the plastic cable sheathing. To ensure safety, comply with the following requirements:
 - a. Cables must be laid or installed only when the temperature is higher than 0° C. Handle cables with caution, especially at a low temperature.
 - b. Cables stored at sub-zero temperatures must be put at room temperature for at least 24 hours before they are laid out.

6. For the equipment that needs to be grounded, install the protective earthing (PE) cable first when installing the equipment and remove the PE cable last when removing the equipment.
7. Do not damage the ground conductor.
8. Do not operate the equipment in the absence of a properly installed ground conductor.
9. Ensure that the equipment is connected permanently to the protective ground. Before operating the equipment, check the electrical connection to ensure that it is securely grounded.

5.3 Operation

1. Do not connect or disconnect power cables with power-on. Transient contact between the core of the power cable and the conductor will generate electric arcs or sparks, which may cause fire or personal injury.
2. Before connecting cables, switch off the breaker of the upstream equipment to cut off the power supply if people may contact energized components.
3. Before connecting a power cable, check that the label on the power cable is correct.
4. If the equipment has multiple inputs, disconnect all the inputs before operating the inverter

5.4 Battery Safety

1. The packaged battery modules are forbidden to be stacked more than the specified quantity. In addition, do not stand, lean on or sit on the product.
2. High temperatures, heating equipment, or sources of extreme heat, may cause the battery to go in a thermal runaway, thereby exceeding the ignition point of its material, causing a fire hazard. Please refer to applicable local requirements and norms on residential buildings, fire and energy storage system.
3. To avoid leakage, overheating or fire, do not disassemble, alter, or damage batteries. For example, do not insert foreign objects into batteries or place batteries in water or other liquids.
4. Do not squeeze, impact or puncture the battery.
5. Do not short circuit the battery terminals.
6. Do not reverse the polarity of the battery during cable connections.
7. The fire hazard of the lithium-ion/sodium-ion battery energy storage system is high. Consider the following safety risks before handling batteries:
 - a. Battery electrolyte is combustible, toxic, and volatile.
 - b. Battery thermal runaway can generate flammable and harmful gases such as CO and HF.

5.5 Storage Requirements

1. The storage environment must comply with local regulations and standards.
2. If a battery has been stored for longer than the allowed period, it must be checked and tested by professionals before use.
3. Place batteries according to the signs on the packing case during storage. Do not put batteries upside down or sidelong.
4. Stack packed batteries in compliance with the stacking instructions on the external package.
5. Handle batteries with caution to avoid damage. The storage environment requirements are as follows:
 - a. Ambient temperature: -10–55°C;
 - b. Recommended storage temperature: 20–30°C
 - c. Relative humidity: 5% to 80%
6. The batteries must be stored in a clean, dry, and well-ventilated place and be protected from dust and water vapor corrosion. Keep batteries away from direct sunlight, rain and water.

5.6 Transportation Requirements

Before transportation:

1. Check that the batteries are intact and there is no obvious smell, smoke, or fire. Otherwise, the batteries cannot be transported.

During transportation:

1. The batteries cannot be transported by rail or air.
2. Maritime transport must comply with the International Maritime Dangerous Goods Code (IMDG Code).
3. Road transport must comply with the International Carriage of Dangerous Goods by Road (ADR).
4. Comply with the requirements of the transportation regulatory authorities in the countries of departure, route, and destination.
5. Comply with the international regulations on the transport of dangerous goods and the requirements of the transport regulatory authorities of the respective countries.
6. Protect the product packing box from the following situations:
 - a. Being dampened by rains, snows, or falling into water
 - b. Falling or mechanical impact.
 - c. Being upside-down or tilted.

5.7 Installation Environment Requirements

1. The installation and use environment must meet regarding international, national, and local standards for lithium batteries, and are in accordance with the local laws and regulations.
2. Ensure that the EP Cube is not accessible to children and installed away from daily working or living areas, including but not limited to the following areas: studio, bedroom, lounge, living room, music room, kitchen, study, game room, home theatre, sunroom, restroom, laundry, and attic.
3. When installing the EP Cube in a garage, keep it away from the drive way. It is recommended that the battery is mounted on the wall higher than the car bumper to prevent collision.
4. When installing the EP Cube in a basement, keep good ventilation. Do not place flammable or explosive materials around the battery. It is recommended that the battery is mounted on the wall to avoid contact with water.
5. Install the EP Cube in a dry and well-ventilated environment. Secure the EP Cube on a solid and flat surface.
6. Install the EP Cube in a sheltered place or install an awning over it to avoid direct sunlight or rain.
7. Install the EP Cube in a clean environment that is free from sources of strong infrared radiation, organic solvents, and corrosive gases.
8. For areas prone to natural disasters such as floods, debris flows, earthquakes, and typhoons/hurricanes, take corresponding precautions for installation.
9. Keep the EP Cube away from fire sources. Do not place any flammable or explosive materials around the EP Cube .
10. Keep the EP Cube away from water sources such as taps, sewer pipes, and sprinklers to prevent water seepage.
11. Do not install the EP Cube in a position where it is easy to touch as the temperature of the chassis and heat sink is high when the EP Cube is running.
12. To prevent fire due to high temperature, ensure that the vents are not blocked when the EP Cube is running.
13. Do not expose the EP Cube to flammable or explosive gas or smoke. Do not perform any operation on the EP Cube in such environments.
14. Do not install the EP Cube on a moving object, such as ship, train, or car.
15. In backup power scenarios, do not use the EP Cube for the following situations: medical devices substantially important to human life, control equipment such as trains and elevators which may cause personal injury, locations near medical devices, other devices similar to those described above
16. Do not install the battery outdoors in salt-affected areas because it may corrode. A salt-affected area refers to the region within 1000 meters from the coast or prone to sea breeze. The regions prone to sea breeze vary with weather conditions.

5.8 Commissioning

When the equipment is powered on for the first time, ensure that an EP certified installer performs the configurations for the product correctly. Incorrect configuration may result in inconsistency with local regulations and affect the normal operation of the equipment.

5.9 Maintenance and Replacement

1. Maintain the equipment regularly with the help of the knowledge contained in this manual and using proper tools and testing equipment.
2. Before maintaining the equipment, power it off and follow the instructions on the High Voltage/Delayed Discharge label to ensure that the equipment is powered off(5 minutes after the shutdown).
3. Place temporary warning signs or build fences to prevent unauthorized access to the maintenance site.
4. If the equipment is faulty, contact your installer or distributor.
5. The equipment can be powered on only after all faults are rectified. Failing to do so may escalate in more faults or could damage the equipment.
6. Do not open the cover without prior authorization from EP. Otherwise, electric shocks may occur, and the resulting faults are beyond warranty scope.
7. Installation personnel, maintenance personnel, and technical support personnel must be trained to operate and maintain the equipment safely and correctly by taking comprehensive precautionary measures, and by being equipped with PPE.
8. Before moving or reconnecting the equipment, disconnect the main breakers and batteries, then wait for five minutes until the equipment powers off. Before maintaining the equipment, check that no dangerous voltages remain in the DC bus or components to be maintained by using a multi-meter.
9. Battery modules replacements should be carried out or supervised by personnel who are familiar with batteries and the precautions required.
10. When replacing battery modules, replace them with battery modules of the same type.
11. Take out all tools and parts used from the equipment after maintenance is complete.
12. If the equipment is not used for a long time, store and recharge battery modules according to this manual.

PRODUCT DESCRIPTION

The EP Cube HES consists of EP Cube PCS and Battery Modules as standard component. Optional accessories are also available besides EP Cube HES and users can choose according to site and customer-specific needs.

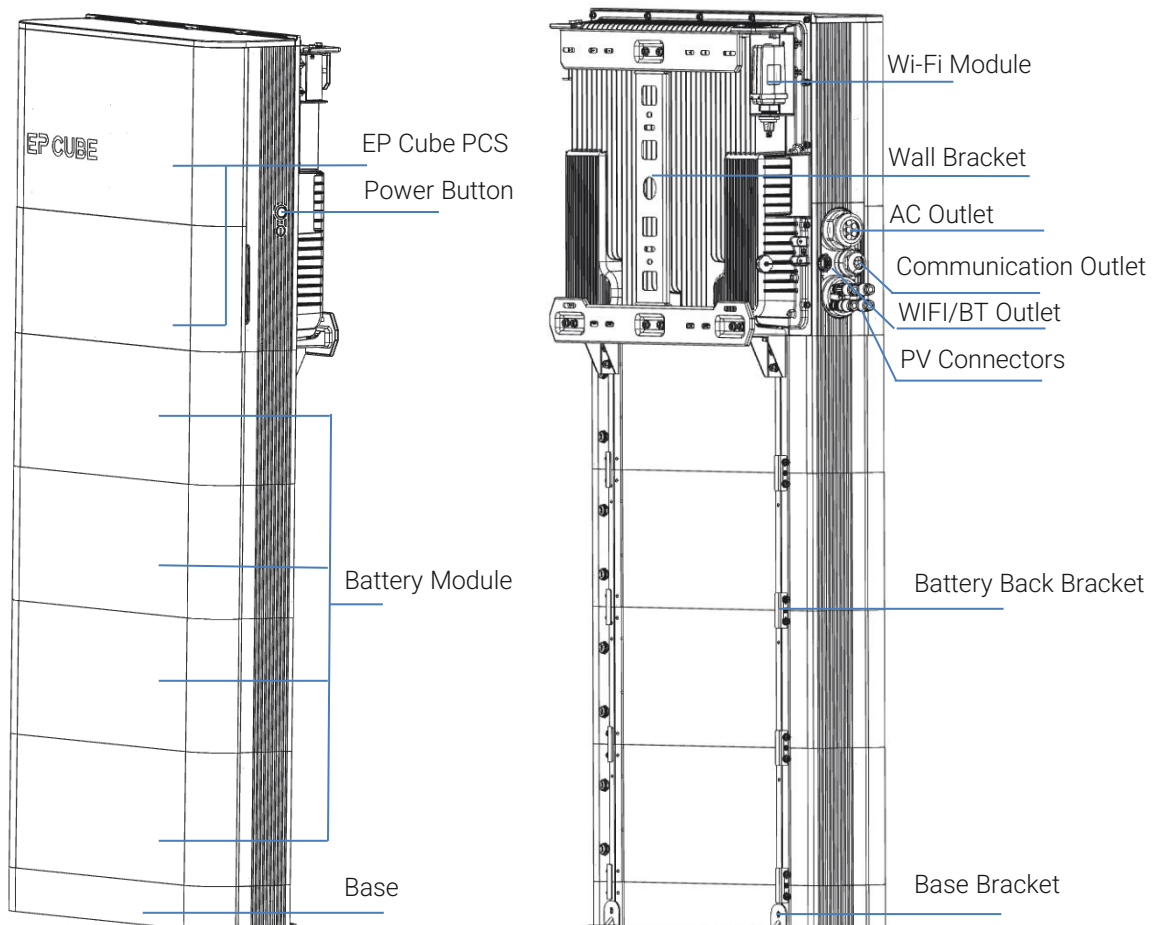
1. Appearance

1.1 EP Cube HES

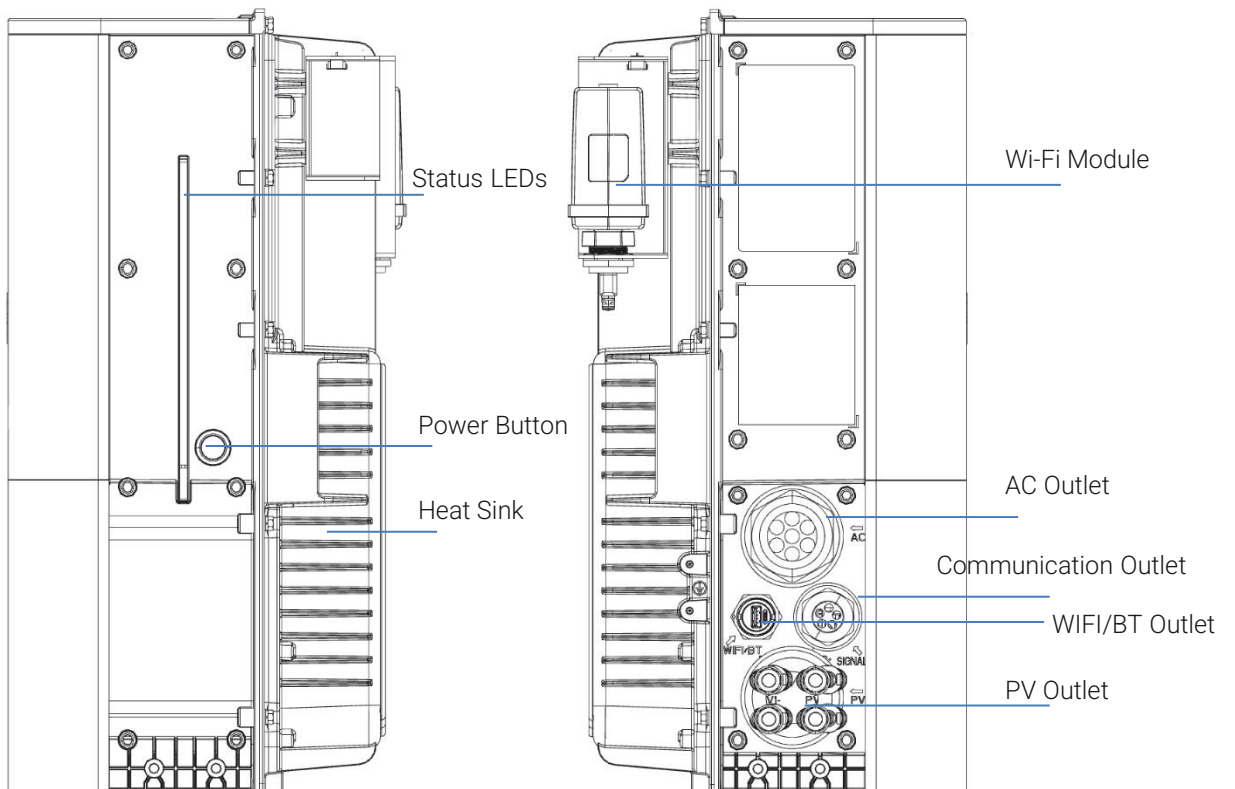
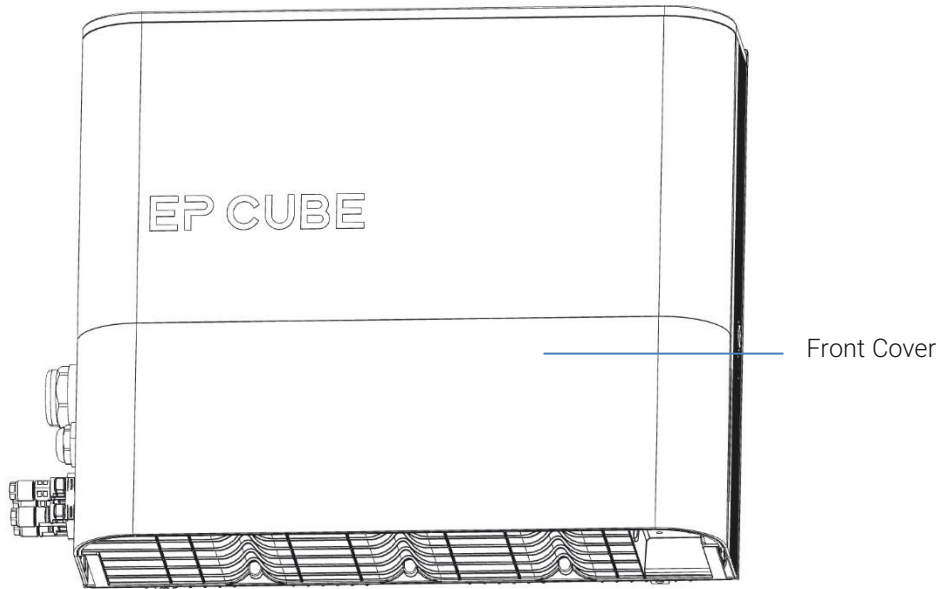
EP Cube HES is an integrated energy storage product that includes both EP Cube PCS and Battery Modules. The number of integrated battery modules can vary between a minimum of 2 modules to a maximum of 6 modules connected in series with EP Cube PCS. (Refer to EU Specification for more details)

Reference Model:

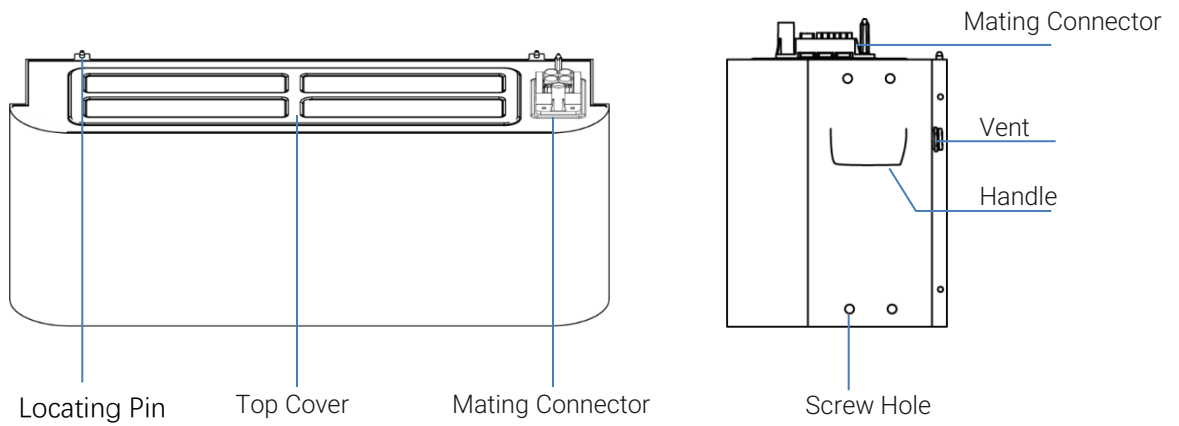
EP Cube PCS + 4x Battery Modules



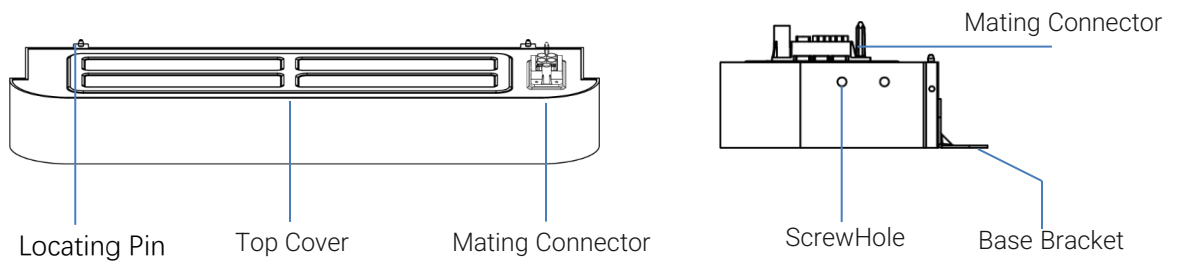
A. EP Cube PCS



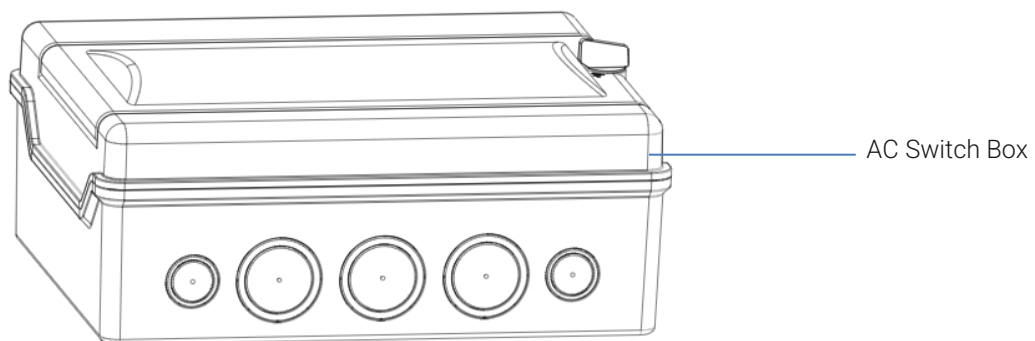
B. EP Cube Battery Module



C. EP Cube Base



D. EP Cube AC Switch Box(optional)



2. Operation Modes

The EP Cube has 3 different operation modes designed to accommodate a wide range of energy preferences and different needs .

2.1. Self-Consumption Mode

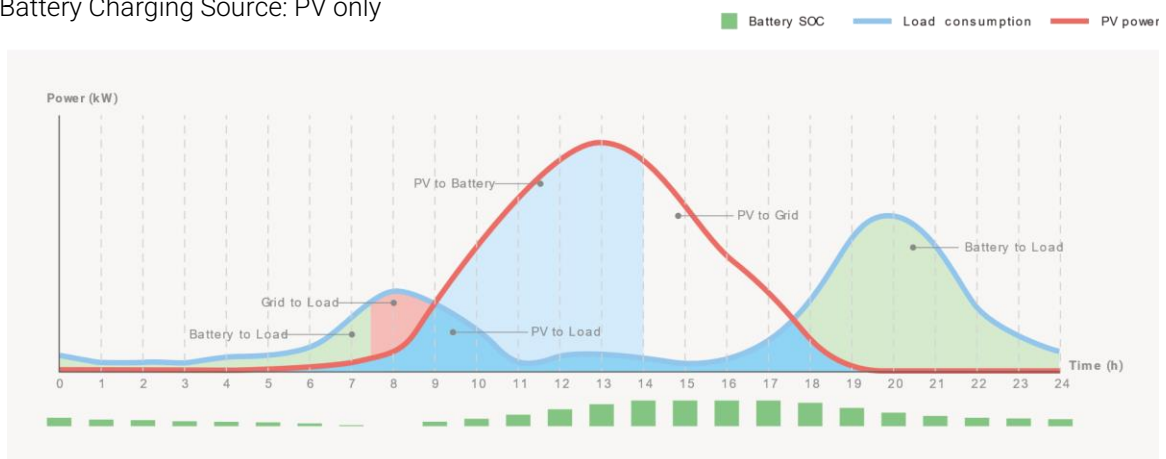
During this mode power generated by PV is utilized to supply power to connected loads as a priority. Any surplus power is then used to charge the battery modules. Only once battery modules are fully charged, power is exported to grid.

In self-consumption mode, the user can set the lowest threshold for the Reserve SOC(state of charge) value in order to save some energy for emergency use only.

PV Power Usage Priority: Load > Battery > Grid.

Load Energy Source Priority: PV > Battery > Grid

Battery Charging Source: PV only



2.2. Backup Mode

During this mode, energy stored by the battery modules is reserved for backup only, and batteries only get discharged in case of grid blackout or other power failures.

This mode also offers the user to set a threshold value for Reserve SOC in order to use stored energy for emergency/backup use only.

PV Power Usage Priority: Battery > Load > Grid

Load Energy Source Priority: Grid > PV > Battery

Battery Charging Source: PV > Grid

2.3. Time of Use Mode

This mode offers time-based control for best cost efficiency if the electricity cost varies throughout the day. TOU mode offers mainly 3 features to configure EP Cube to meet diverse power needs under different scenarios.

- a. Allows to input TOU time window.
- b. It allows to choose whether to charge the batteries via grid or not during off-peak hours.
- c. Allows to enable/disable Daylight Saving Time (DST) if TOU time window changes due to DST.

During peak hours:

PV Power Usage Priority: Load > Battery > Grid.

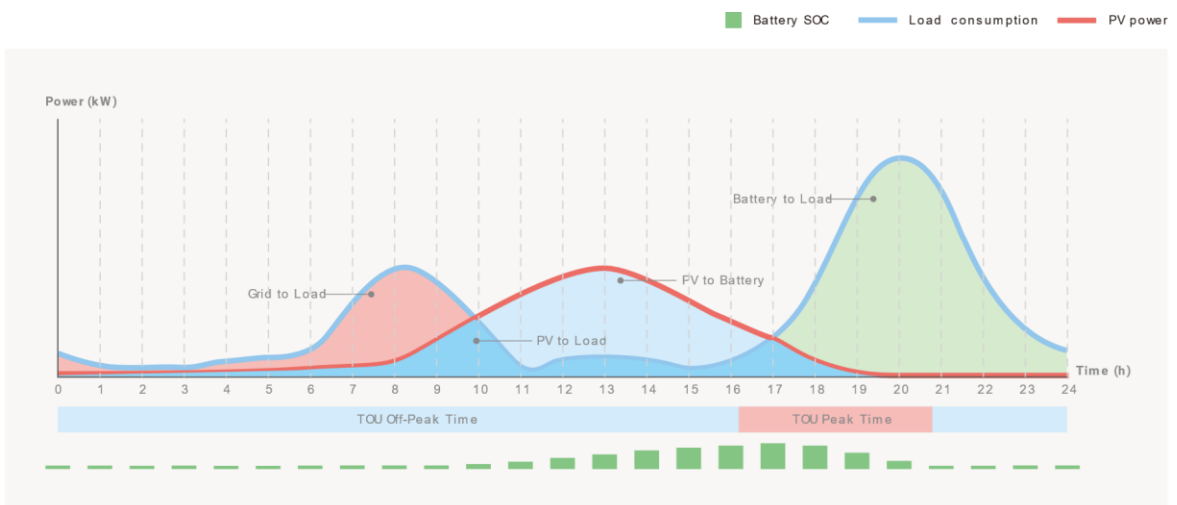
Load Energy Source Priority: PV > Battery > Grid

Battery Charging Source: PV only

During off-peak hours:


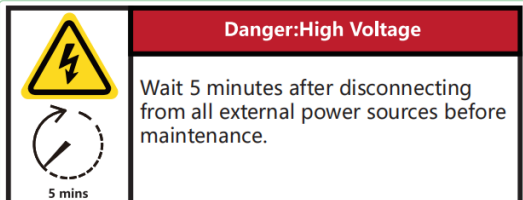

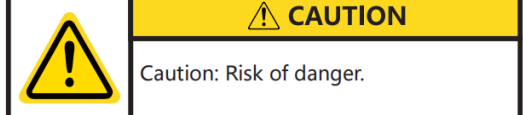
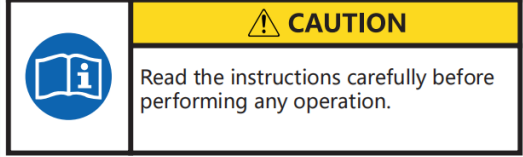

Load Energy Source Priority: PV > Grid

Battery Charging Source: PV > Grid






3. Warning Labels Description




Below table lists down all the warning labels that are visible on product enclosure after unpacking. Please read the descriptions, and follow the instructions.

Label	Name	Description
	High Temperature	Burn Hazard! Do not touch the product surface to avoid being burnt as it can get hot
	High Voltage/Delayed Discharge	Risk of Electric shock! High voltage exists even after the EP Cube is powered off. Wait 5 minutes after power off until the components are completely discharged.
	Electrical Hazard	Risk of Electric shock! Only qualified and trained electricians authorised by EP Cube are allowed to install, operate and repair.
		
	Ref. to Documentation	Read Instruction! It reminds to read the instructions provided for proper installation and operation carefully before performing any actions.
	Ground	Indicates the position of connection point for PE wires on EP Cube PCS.

4. Product Labels

Figures given below show the product labels of EP Cube PCS, and EP Cube Battery Modules. These product labels provide key parameters for inverter and batteries including nominal voltages, currents, rated power, storage capacity, and operating conditions. This information is visible to qualified professionals during the installation and operation.

EP CUBE	
	EP Cube HES-EU1-706G <input type="checkbox"/> EP Cube HES-EU1-710G <input type="checkbox"/> EP Cube HES-EU1-713G <input type="checkbox"/> EP Cube HES-EU1-716G <input type="checkbox"/> EP Cube HES-EU1-720G <input type="checkbox"/>
INVERTER PARAMETERS	
GRID SUPPORT UTILITY INTERACTIVE INVERTER	
Model	EP Cube PCS -EU1-7G
PV PARAMETERS	
MPPT voltage range	90~550VDC
Maximum input current per MPPT*2	16A
Maximum short circuit current per MPPT	20A
AC PARAMETERS	
Nominal grid voltage	230VAC :L-N
Nominal frequency	50Hz
Power factor	-0.8 to +0.8
Maximum continuous power (On-Grid side)	<input type="checkbox"/> 4.6kW <input type="checkbox"/> 5kW <input type="checkbox"/> 6kW <input type="checkbox"/> 7.6kW
Maximum continuous current(On-Grid side)	<input type="checkbox"/> 20.0A <input type="checkbox"/> 21.7A <input type="checkbox"/> 26.1A <input type="checkbox"/> 33.0A
Maximum continuous power (AC-Boost side)	7.6kW
Maximum continuous current (AC-Boost side)	33.0A
BATTERY PARAMETERS	
Battery quantity	2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/>
Battery type	Rechargeable Li-ion Battery(LIFEPO4)
Rated capacity	90Ah
Nominal capacity	<input type="checkbox"/> 6.6kWh <input type="checkbox"/> 9.9kWh <input type="checkbox"/> 13.32kWh <input type="checkbox"/> <input type="checkbox"/> 16.65kWh <input type="checkbox"/> 19.98kWh <input type="checkbox"/>
Nominal voltage	<input type="checkbox"/> 76.8V <input type="checkbox"/> 115.2V <input type="checkbox"/> 153.6V <input type="checkbox"/> 192V <input type="checkbox"/> 230.4V
Maximum charge / discharge current	55A
ENVIRONMENTAL PARAMETERS	
Ambient operating temperature	-20~50 °C
Ingress protection	IP65
Protective class	Class I
  	
ETERNALPLANET Add: 27th Floor, Building 3A, Longgang Intelligent Park, Shenzhen, China Web: www.eternal-planet.com	
Made in China	

BATTERY MODULE	
	EP Cube B1-3G
Battery type	Rechargeable Li-ion Battery (LIFEPO4)
Rated capacity	90Ah
Total energy	3330Wh
Nominal voltage	38.4VDC
Weight	35kg
Ambient operating temperature (charging)	0~50°C
Ambient operating temperature (discharging)	-20~50°C
Ingress Protection	IP65
Protective class	CLASS I
Maximum elevation	3000m
  	
ETERNALPLANET Add: 27th Floor, Building 3A, Longgang Intelligent Park, Shenzhen, China	
Made in China	

EP Cube INSTALLATION

EP Cube can be mounted on the floor and comes with all required mounting brackets including the screws and fasteners needed for installation. It can also be mounted on the wall and requires different mounting brackets and installation process. However, fasteners for foundation installation are not included.

1. Installation Site Requirements

Complete site information by gathering data through a site survey

1.1 General Environmental Condition:



WARNING

Do not install the EP Cube in places and conditions mentioned below:

- Places where it is difficult to install and operate the EP Cube system.
 - Places exposed to rapid temperature changes and extreme weather conditions.
 - Places exposed to volatile, flammable, corrosive and other harmful gases.
 - Places exposed to significant vibrations or shock.
 - Places exposed to water vapor, oil vapor, or condensation.
 - Places exposed to strong electric fields.
 - Places exposed to excessive direct rain and snow accumulation.
 - Places where there is a risk of flooding.
 - Places exposed to direct sunlight or near other heat sources.
- Temperature where the operation temperature range as followed: -20~50°C.
- Places affected by heavy salt damage as defined in this section.
 - Places with altitude higher than 3000m above sea level.



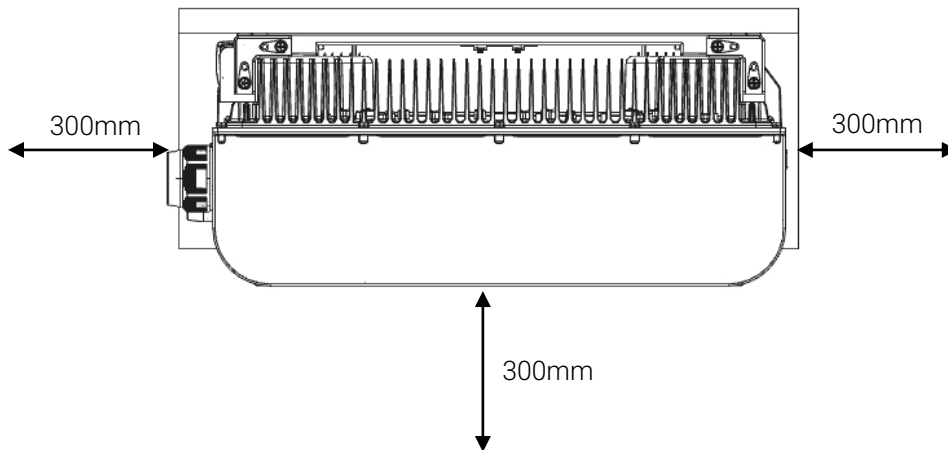
CAUTION

Installation considerations for the areas with extreme snow fall:

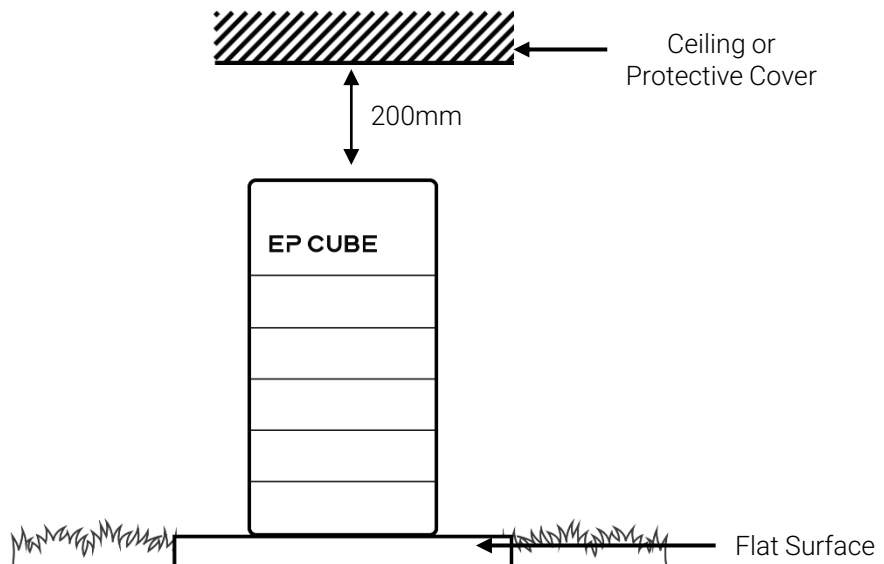
- It is highly recommended to not install EP Cube HES in places where it is directly exposed to snow or where snow can be accumulated in surrounding spaces.
- Ensure to install a protective roof cover and snow fence. If the installation must be performed outdoor in such conditions.
- Check the local regulations related to snow conditions, and ensure complete compliance to them .
- Choose appropriate foundation/base with enough height to avoid any accumulated water from melted snow.
- keep the surrounding area free of accumulated snow.

In order to ensure a convenient installation and operation, all sides should have enough clearance for safe operation and installation while meeting the local electrical codes and regulations.

- The minimum space required from the back of the EP Cube to the mounting wall is adjusted by the wall bracket and PCS L bracket. Refer to the details on page 30 for the base installation.
- The minimum space from the sides and between any two units is 300mm.
- The minimum space between the ceiling/cover and the top of EP Cube is 200mm.
- For wall mounting installation, the minimum distance from the door, and windows should be at least 1000mm.



Note: All the dimensions are expressed in mm.

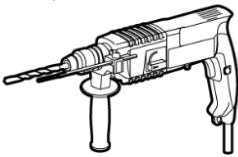


1.2 Required Tools

This section lists down the required tools and materials needed during the installation process of EP Cube HES.

Tools & Materials

1.



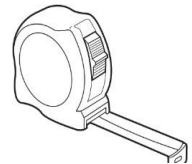
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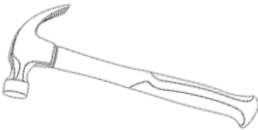
3.



4.



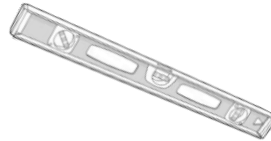
5.



6.



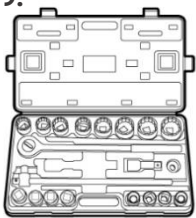
7.



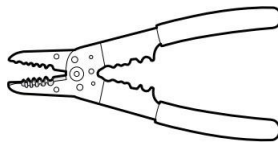
8.



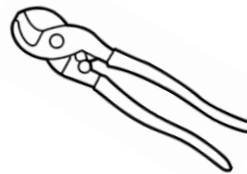
9.



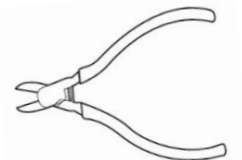
10.



11.



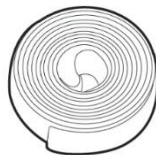
12.



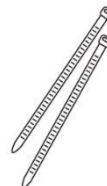
13.



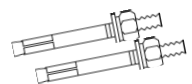
14.



15.



16.



17.



18.

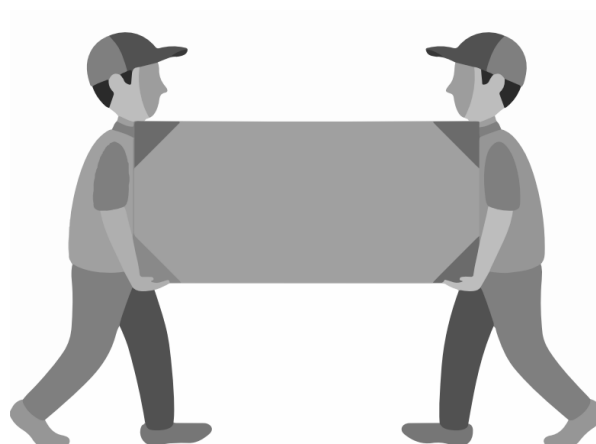


Tools & Materials

S. No	Tool	Specs/Quantity
1	Drilling Machine	with Drill bit
2	Cutter	01
3	Marking Pen	01
4	Tape measure	01
5	Hammer	01
6	Electric Screwdriver	Cross head
7	Spirit Level	01
8	Digital Multimeter	01
9	Socket Set	01
10	Wire Stripper	01
11	Wire Cutter	01
12	Plier	01
13	Wrench	01
14	Insulation sleeve	As required
15	Cable Ties	As required
16	Anchor Bolts	As required, $\Phi 5.5 \times 8$ Pcs
17	Crimping Tool	01
18	Wires	2.5mm ² , 6-8 mm ²

1.3 Required person

Two people are needed to complete the installation.



1.4 Installation Space

In order to ensure a safe installation, please pay attention in choosing the right mounting method either floor or wall. The Installation surface should be able to support the product weight with suitable concrete strength and anchors specifications.

Ensure that the installation surface is flat by using a spirit level.

Ensure there is no gap between the installation surface and EP Cube brackets. Any gaps may lead to accumulated exposure of water. It can cause corrosion and therefore the product could fall .

Model No	Weight
EP Cube HES-EU1-706G	< 111.5 Kg
EP Cube HES-EU1-710G	< 146.5 Kg
EP Cube HES-EU1-713G	< 181.5 kg
EP Cube HES-EU1-716G	< 216.5 kg
EP Cube HES-EU1-720G	< 251.5 kg

Product Name	Weight
EP Cube PCS	38 Kg
EP Cube Battery Module	35 Kg
EP Cube Base	3.5 Kg

2.On-site Installation

WARNING :

EP Cube can only be installed, repaired, replaced, and maintained by the EP authorized personnel for safety and warranty purposes. It is prohibited to install any third-party component or devices inside the EP Cube without prior approval from the EP service team.

For personal protection and property safety, please read the safety chapter and ensure complete compliance during the entire installation process.

Please ensure to avoid the installation of the EP Cube in environments where it is exposed to excessive rain, direct sunlight, dust, flooding, or accumulating snow.

During the installation and handling of EP Cube batteries or PCS, extreme care is required to avoid dropping, bumping, or stomping the modules. This can lead to damage to the paint or bent edges.

NOTE: Anchor bolts and fasteners are needed for installation of the base on the floor and Wall Bracket, respectively, and they need to be provided by the installer. Installer must ensure to carry M6 and M8 anchor bolts for the installation of Base or wall mount kit, and if it is the Wooden wall, Wooden Screws_5.5*80mm should be prepared.

Packing List

Below figure and table lists down all the components that should be available for successful installation. Please carefully unpack, locate and promptly contact EP if a component is misplaced or damaged during transportation.

EP Cube Base Box

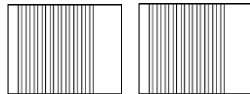
1.



2.



3.



4.



1. Base- 1pcs

2. Base Back Bracket- 2pcs

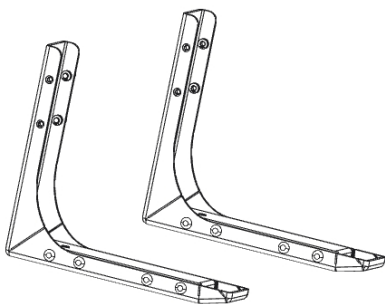
3. Base Side Cover- 2pcs

4. Base Bracket M6 Screws- 4pcs

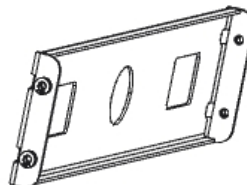
Note: Put the Side Covers aside until installation is complete.

EP Cube Wall Mounting Kit Box (optional)

1.



2



3.



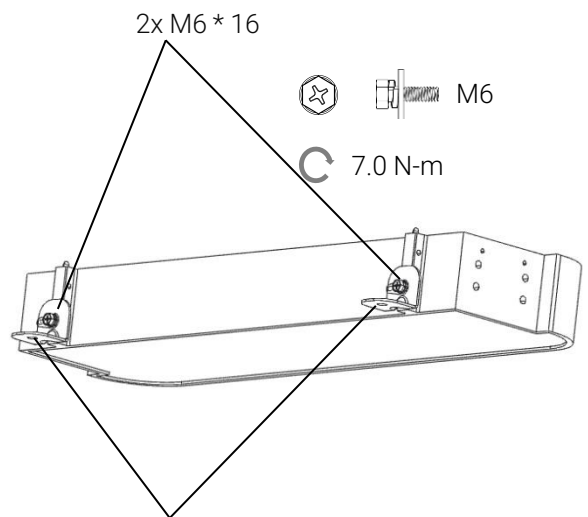
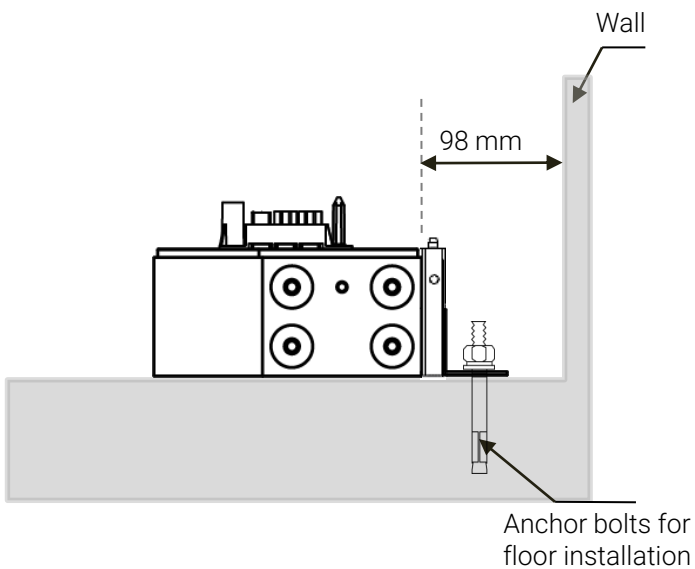
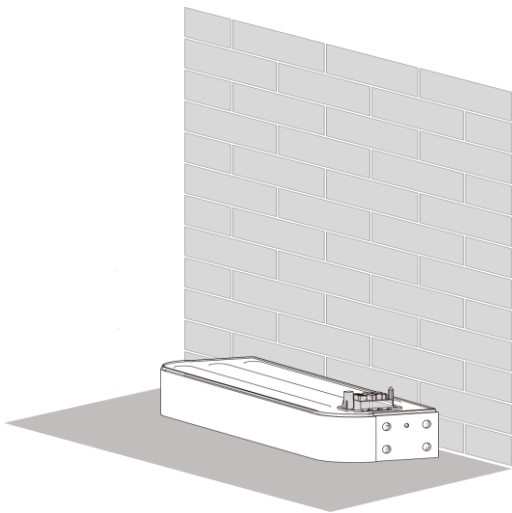
1. Wall Mount Bracket E1- 2pcs

2. Wall Mount-Bracket E2_1pcs

3. Wall Mount-Bracket M6 Screws- 4pcs


Floor Mounted: Install the EP Cube Base on the floor

- Once the installation space has been decided, place the base on the floor.
- Make sure that base is aligned with wall for straight installation, and use level to check the base surface level.
- The required minimum distances between base and wall must be measured for a convenient and proper installation of EP Cube PCS.
- Ensure that the base bracket is properly installed with base. Tighten the (2x M6*16) bolts.



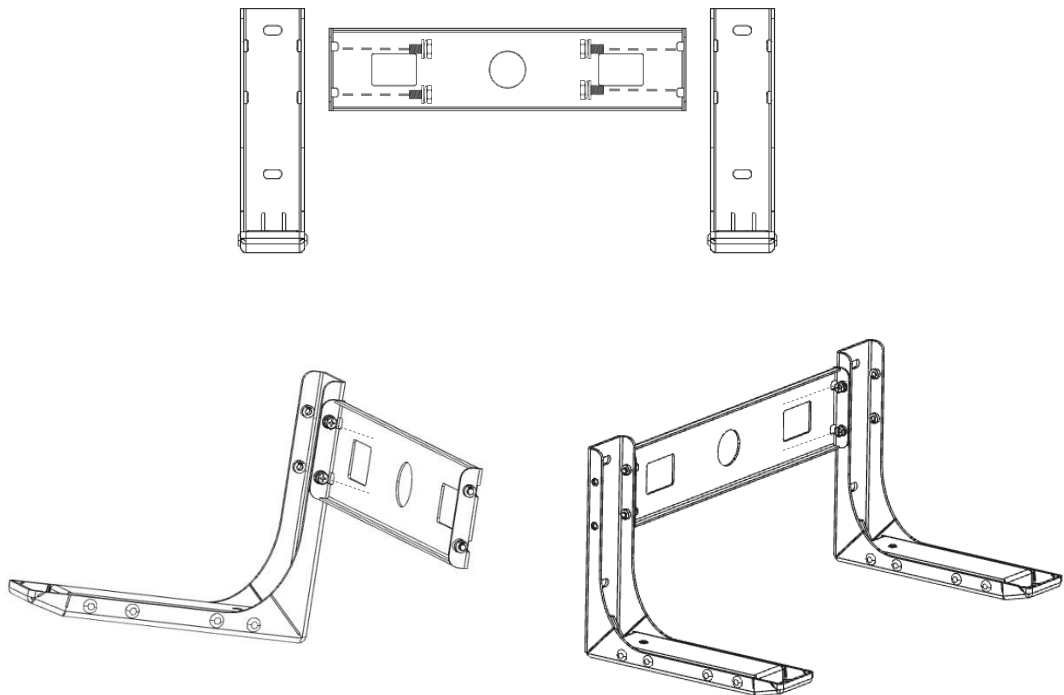
Holes for Floor Installation: M8

Note: Bolts for installation on foundation are not provided by EP .

 **CAUTION:** Please keep a safe distance between the EP Cube HES and other objects.

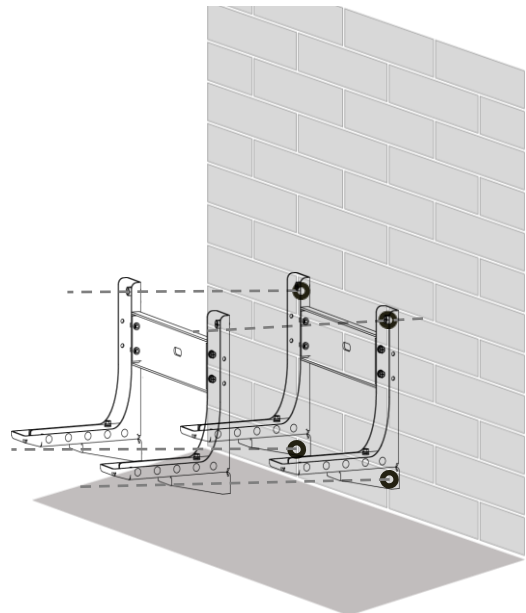
Wall mounted: Install Wall-mount Kit and Base

a. Assemble the Wall-Mount bracket (referred as E), attach Bracket E1 to the Bracket E2 from the left and right sides with the M6 bolts. Tighten the bolts by using the screwdriver.



b. Place and align wall-mount kit (Bracket E) on the wall and mark the mounting holes positions. Ensure that the bracket is straight and level with the help of spirit level to avoid improper installation.

c. Once drilling positions are marked, remove the base and use an appropriate drilling machine with a drill bit of Φ M8 to drill through the concrete wall. In case of a wooden wall, drilling is not required.



d. After drilling the holes, insert anchor bolts in the drilled holes. Remove the washers and nuts. Place the wall-mount bracket on the bolts, place the washers and fasten the nuts manually. Check the level of installed wall mount bracket with spirit level, and use electric screwdriver to tighten nuts to properly install the wall-mount kit on wall.

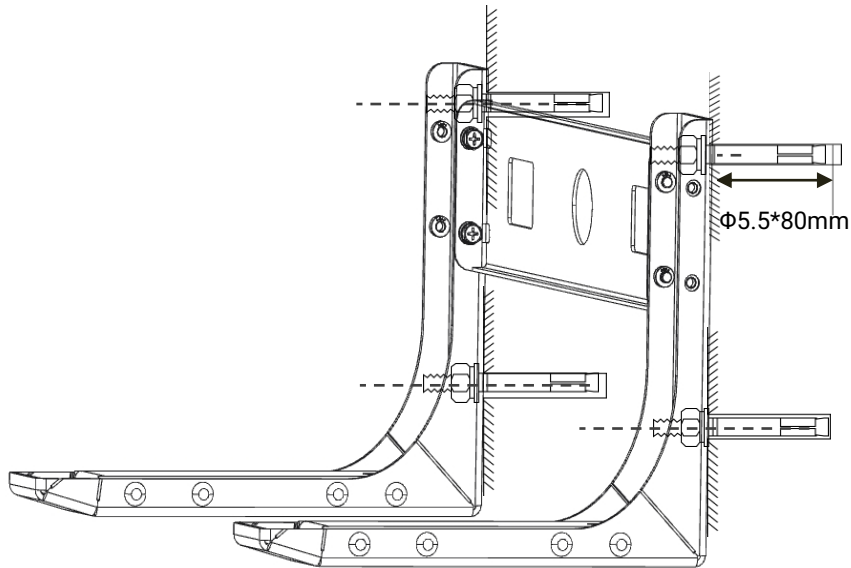


Fig. 4x $\Phi 5.5$ anchor bolts to install the Wall-mount Kit.

e. Align the base bracket oval holes with the holes on the base, then use the screws ($M6 \times 20\text{mm}$) to fasten together.

f. Now, place the base with pre-installed base bracket on the wall-mount kit. Align the round holes of the base brackets with the holes on the wall mount kit, and use screws ($M6 \times 20\text{mm}$) to fasten base to the wall-mount kit. Verify that the Base is level using the level tool.

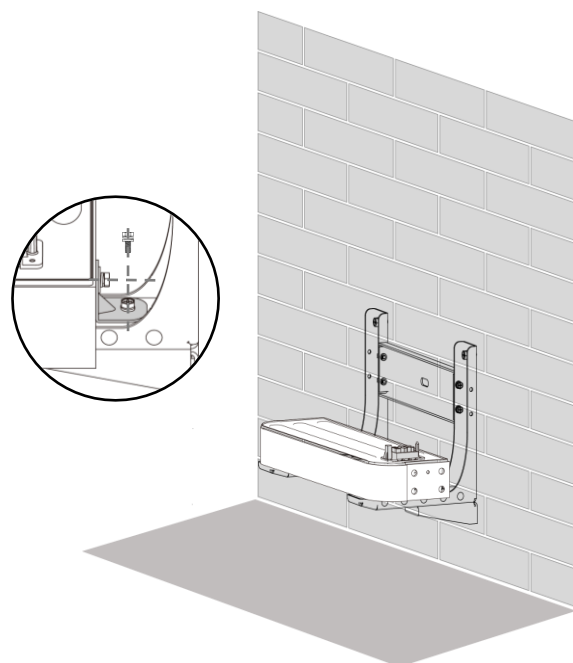
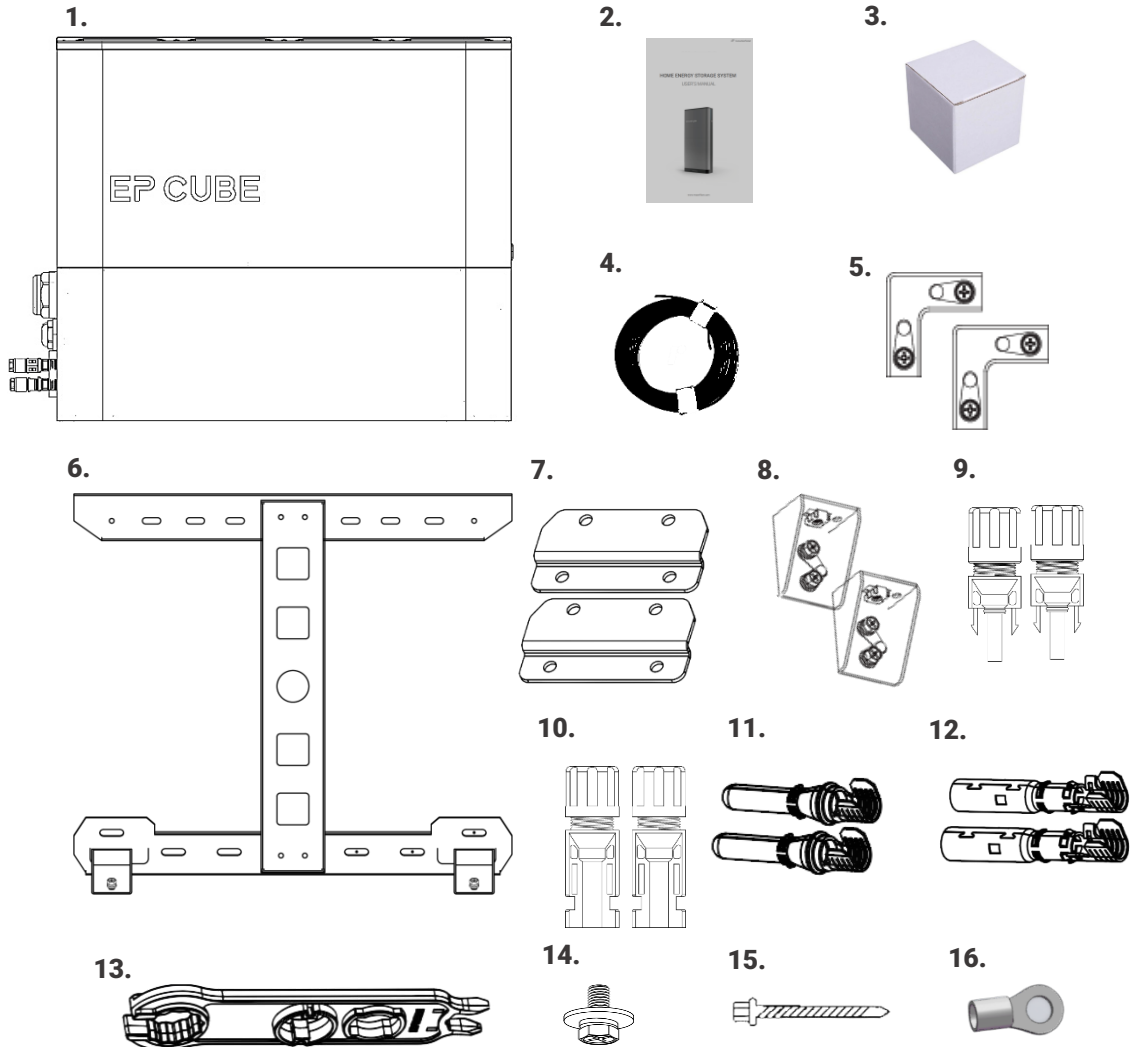


Fig. Fasten Base on Wall-mount Kit

Packing List

Below figure and table lists down all the components that should be available for successful installation. Please carefully unpack, locate and promptly contact EP if a component is misplaced or damaged during transportation.

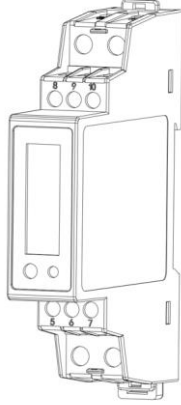
EP Cube PCS Box



- | | |
|--|---|
| 1. EP Cube PCS- 1pcs | 9. Davelon PV Connectors (Male) -2pcs |
| 2. EP CUBE HES User Manual- 1pcs | 10. Davelon PV Connectors (Female) -2pcs |
| 3. Single Phase Smart Meter- 1pcs | 11. Davelon Connector Contact Pins (Male) - 2pcs |
| 4. Smart Meter Communication Cable (10m)- 1pcs | 12. Davelon Connector Contact Pins (Female) - 2pcs |
| 5. PCS L bracket- 2pcs | 13. Davelon PV Connector disassembly tool-1pcs |
| 6. PCS Wall Mount Bracket- 1pcs | 14. M5 Screws-8pcs |
| 7. PCS Side Bracket- 2pcs | 15. self-drilling self-tapping screws $\Phi 5.5$ -10pcs |
| 8. Battery Top Bracket- 2pcs | 16. OT-shaped termination-3pcs |

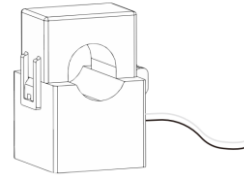
Single Phase Smart Meter Box

1.



1. Single Phase Meter - 1pcs

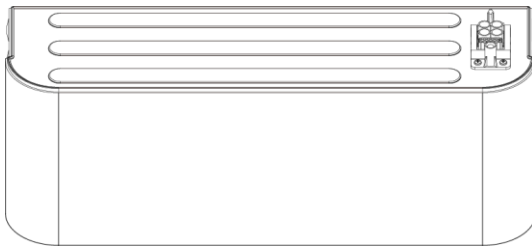
2



2. CT(with 5m cables)- 1pcs

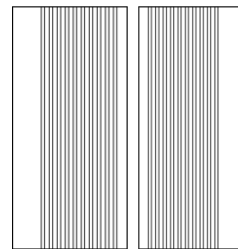
EP Cube Battery Module Box

1.

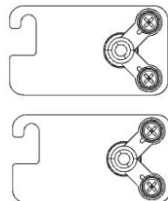


1. EP Cube Battery Module- 1pcs
2. Battery Module Side Cover- 2pcs

2.



3.



4.

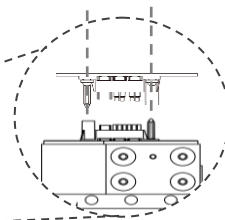
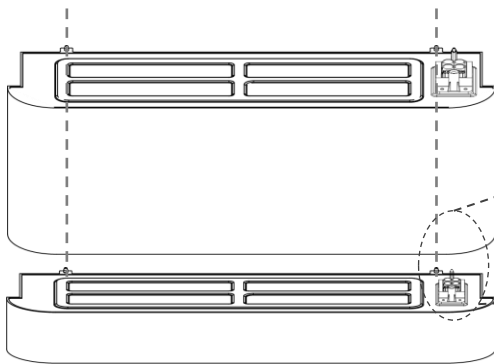


3. Battery Side Bracket- 2pcs
4. Battery Back Bracket- 2pcs

Note: Put the Side Covers aside until installation is complete.

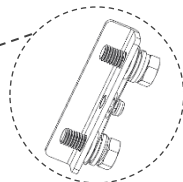
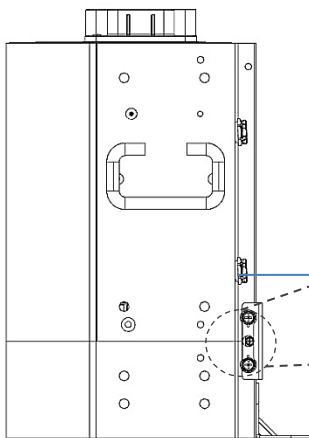
Install the First Battery Module

- a. Carefully place the **Frist Battery Module** on top of the base and ensure that battery mating connector sockets are well aligned.

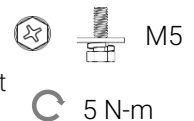


Matting Connectors

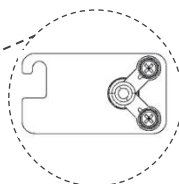
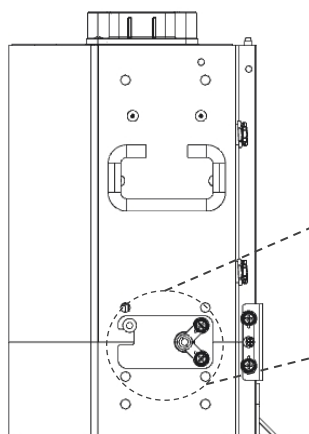
- b. Fasten the back brackets between the battery module and base using screws, and manually tighten them. The sockets for screws are on the protruding columns on both the left and right sides.



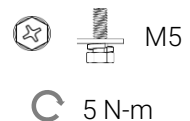
Back Bracket



- c. Fasten Side Brackets between adjacent battery module and base, on both the left and right sides with the screws, and manually tighten them.

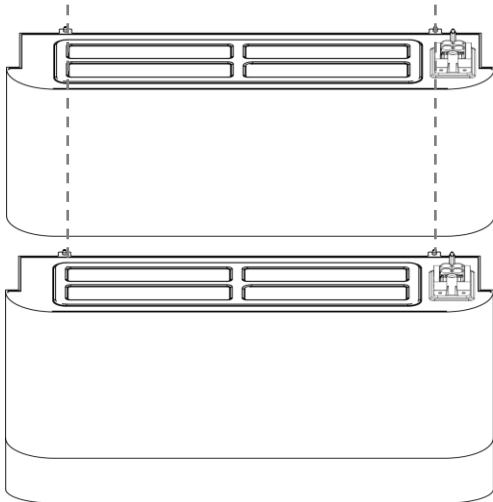


Side Bracket



- d. Tighten all the screws with an electric screwdriver according to the specified torque values.

Note: Both side brackets and back brackets have the screws latched with the brackets.



Install the Second Battery Module

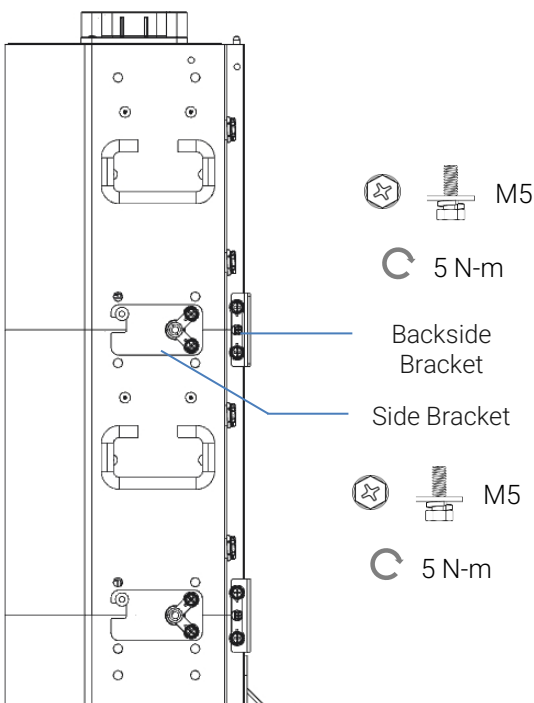
a. Carefully place the **Second Battery Module** on top of the first Battery module and ensure that battery mating connector sockets are well aligned.

b. Fasten the back bracket between adjacent battery modules, on the protruding column at the back of the battery modules using screws (on both the left and right sides), and manually tighten them.

c. Attach side brackets between adjacent battery modules, on both the left and right sides with the screws, and manually tighten them.

d. Tighten all screws with electric screwdriver according to the specified torque values.

Repeat steps and to stack the required number of battery modules on top of the base according to the configuration.



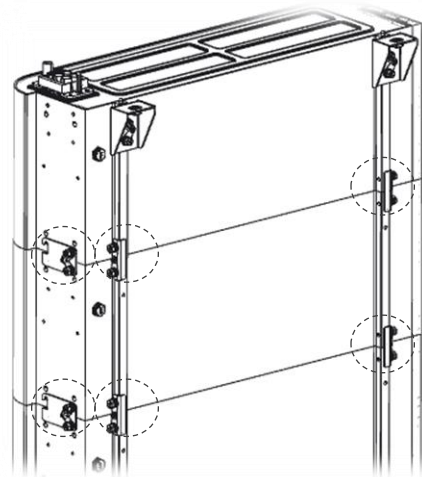
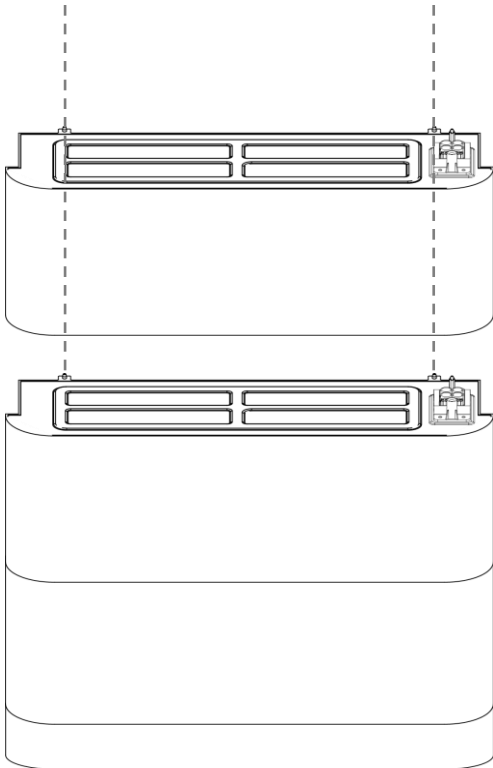
CAUTION: The battery module is heavy. For safety reasons, use lifting tools or multiple people to lift it, especially when doing the installation of the top modules.

Install the remaining Battery Modules

Carefully install the remaining **Battery Modules** one by one by repeating the steps "a and d". Ensure that battery mating connector sockets are well aligned for each battery module.

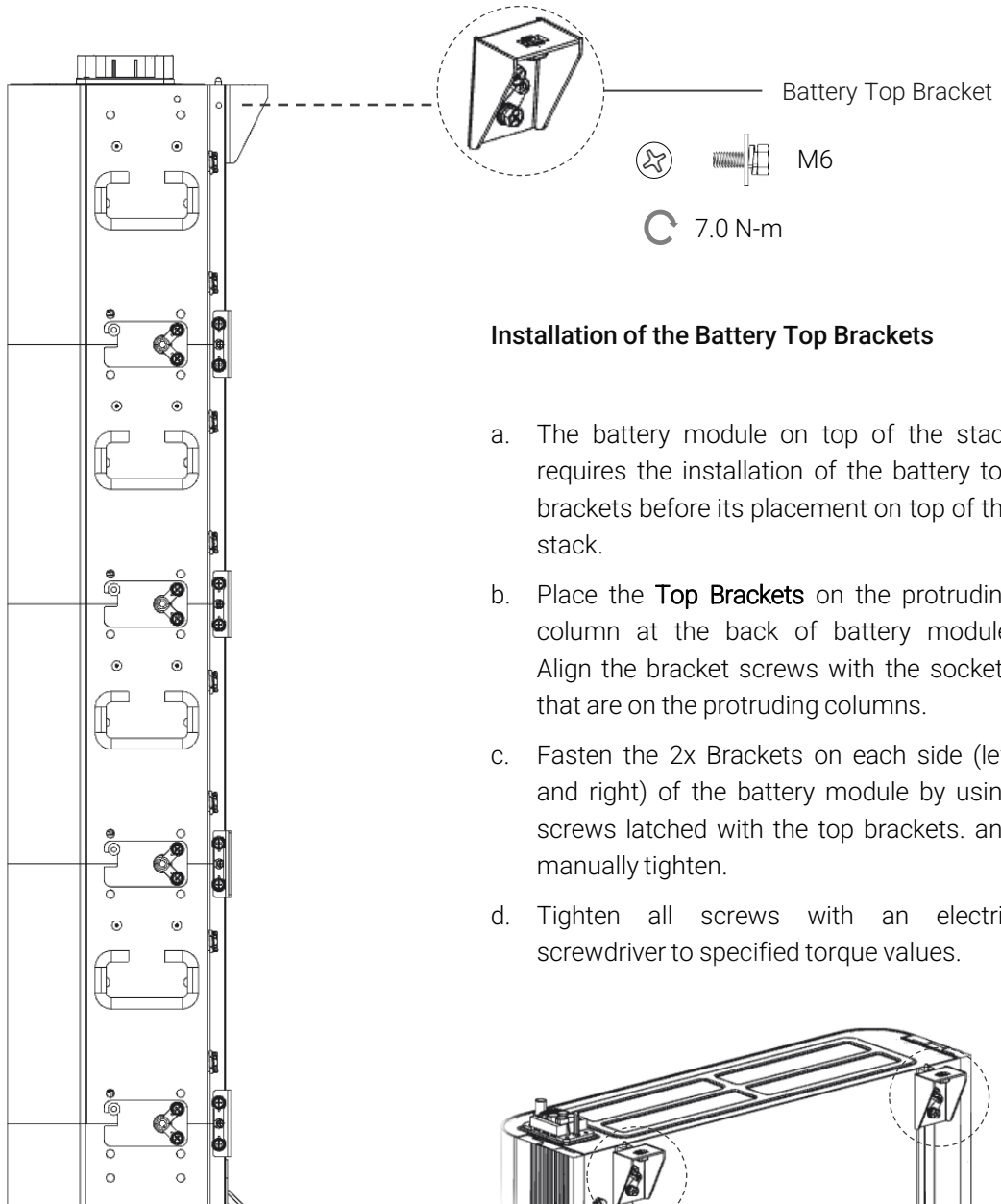
The pair of protruding columns at the back of each module also have a locating pin on top to help with the alignment of adjacent modules.

Tighten all screws with an electric screwdriver to specified torque values.



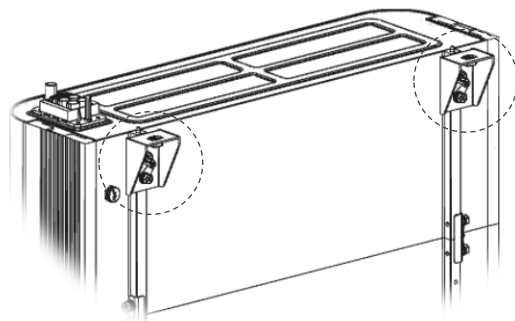
Note: Only the battery module on top of the stack needs additional brackets. Refer to the next page for more details.

CAUTION: The battery module is heavy, use lifting tools or multiple people to lift it for personnel safety especially when doing installation for top modules.



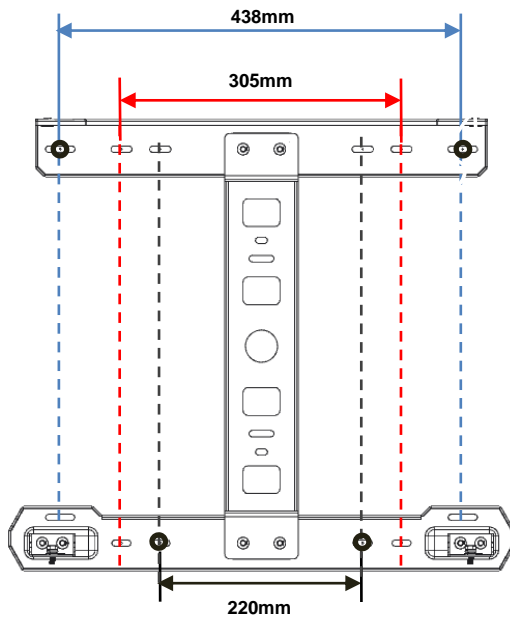
Installation of the Battery Top Brackets

- The battery module on top of the stack requires the installation of the battery top brackets before its placement on top of the stack.
- Place the **Top Brackets** on the protruding column at the back of battery module. Align the bracket screws with the sockets that are on the protruding columns.
- Fasten the 2x Brackets on each side (left and right) of the battery module by using screws latched with the top brackets, and manually tighten.
- Tighten all screws with an electric screwdriver to specified torque values.



- Finally, install the battery module by repeating the steps a to d on page 36.

An overview on the Wall Bracket



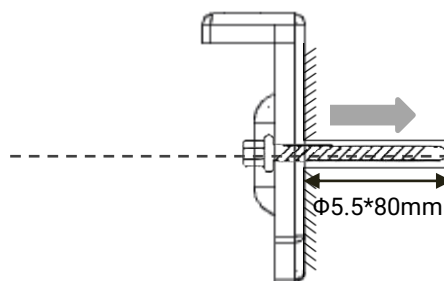
The wall bracket supports different spacing based on selection of mounting holes positions. Choose any 2 holes on both upper and lower branch of the wall bracket.

Choose the holes and mark them on the wall through the bracket using a pencil.

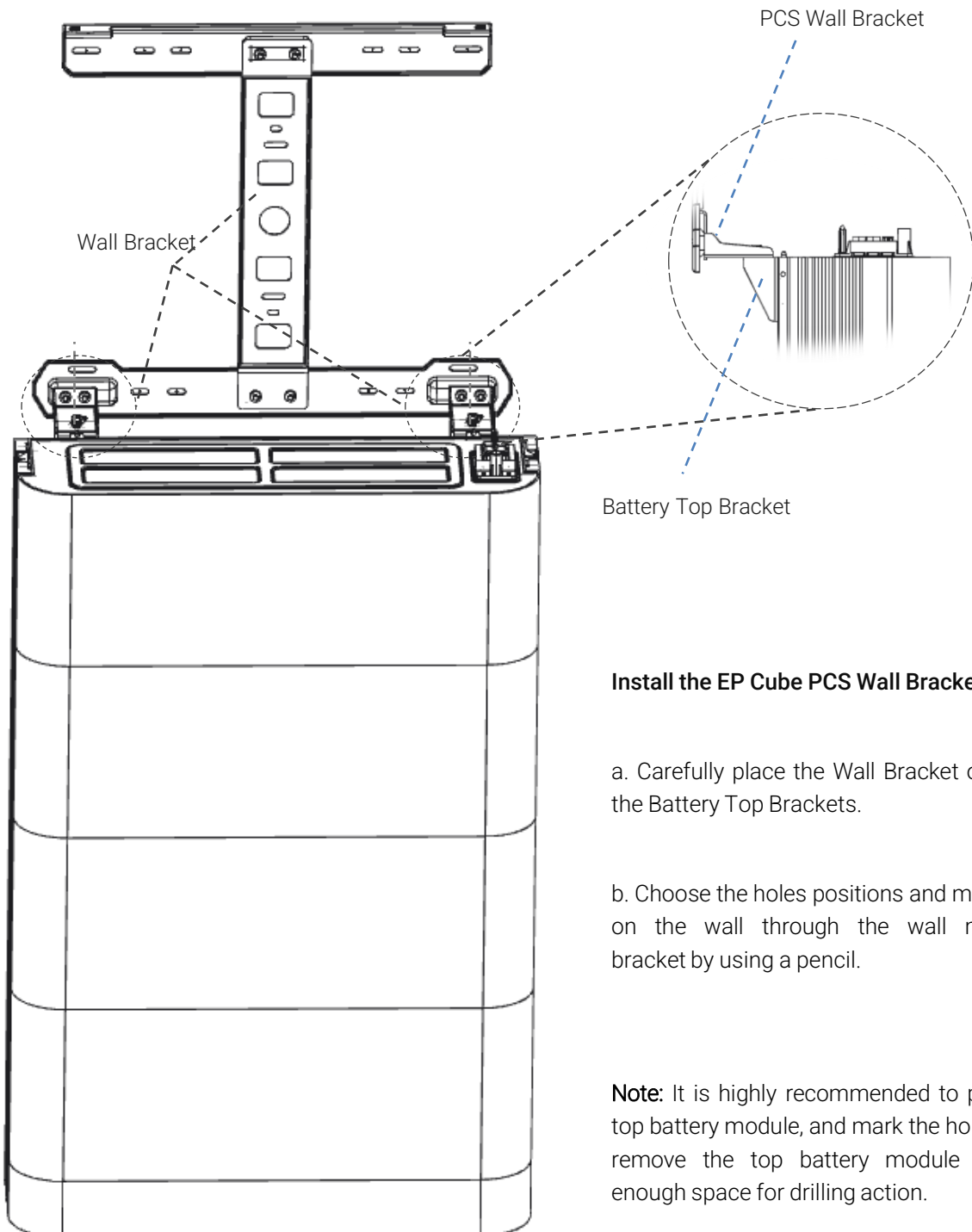
Drill the holes to mount the EP Cube PCS Wall Bracket.

For Concrete walls: Use anchor bolts $\Phi 5.5 \times 80 \text{mm}$ or use the $\Phi 5.5 \times 80 \text{mm}$ hex flange head self-drilling tapping screws with wall plugs.

For wooden wall: Use the $\Phi 5.5 \times 80 \text{mm}$ hex flange head self-drilling tapping screw wooden screws.



Use anchor bolts or wooden screws to install the Wall Bracket on concrete or wooden walls.

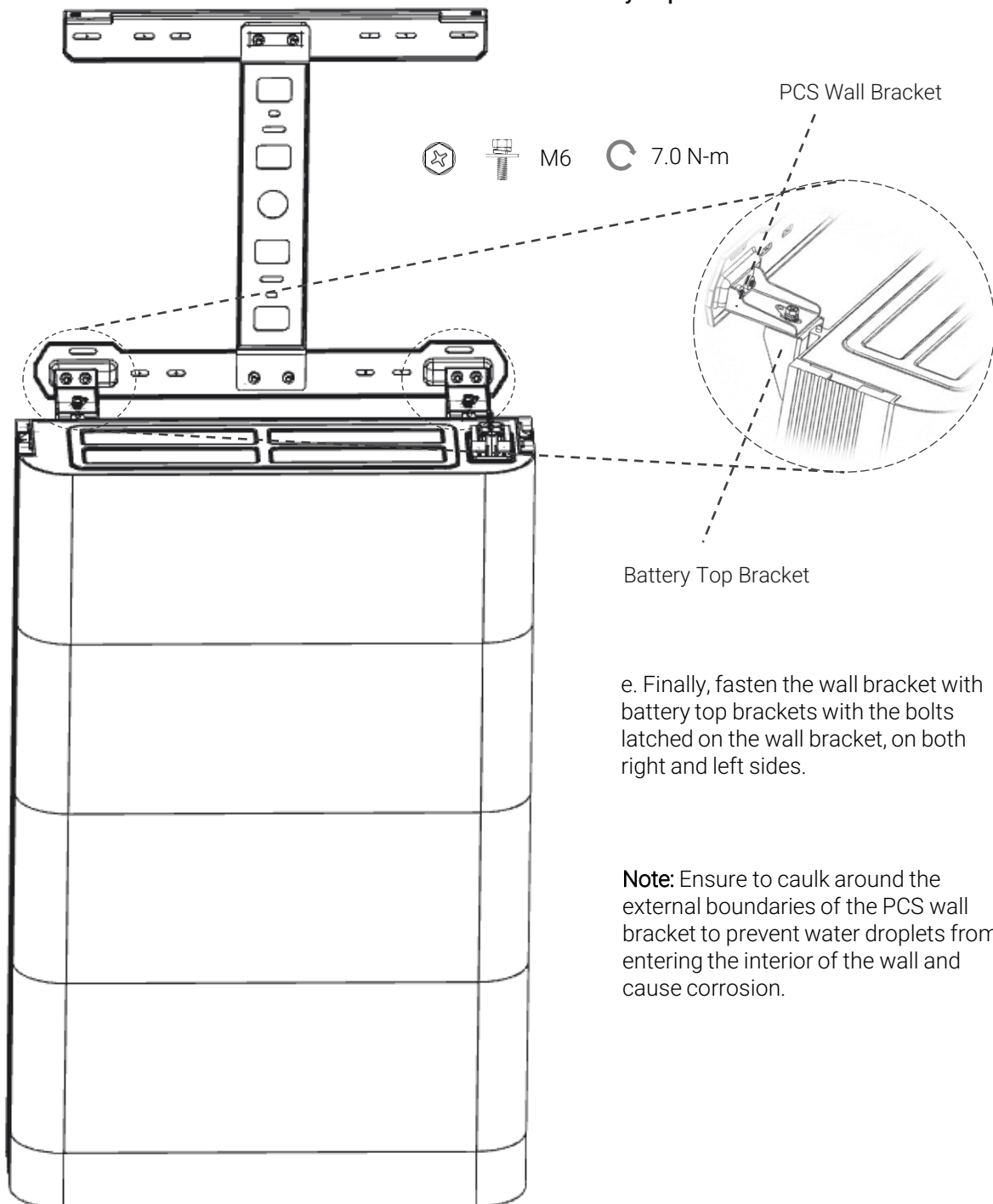


Install the EP Cube PCS Wall Bracket

- Carefully place the Wall Bracket on top of the Battery Top Brackets.
- Choose the holes positions and mark them on the wall through the wall mounting bracket by using a pencil.

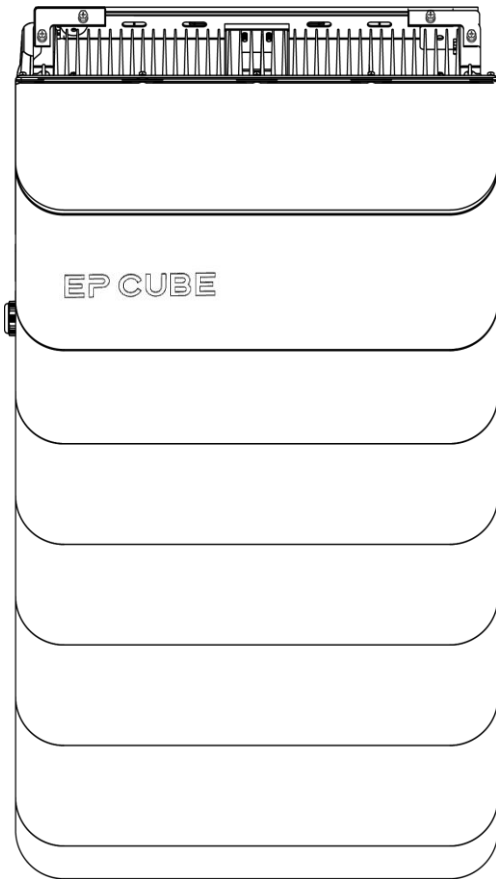
Note: It is highly recommended to place the top battery module, and mark the holes. Then remove the top battery module to have enough space for drilling action.

Fasten the EP Cube PCS Wall Bracket to the Battery Top Bracket



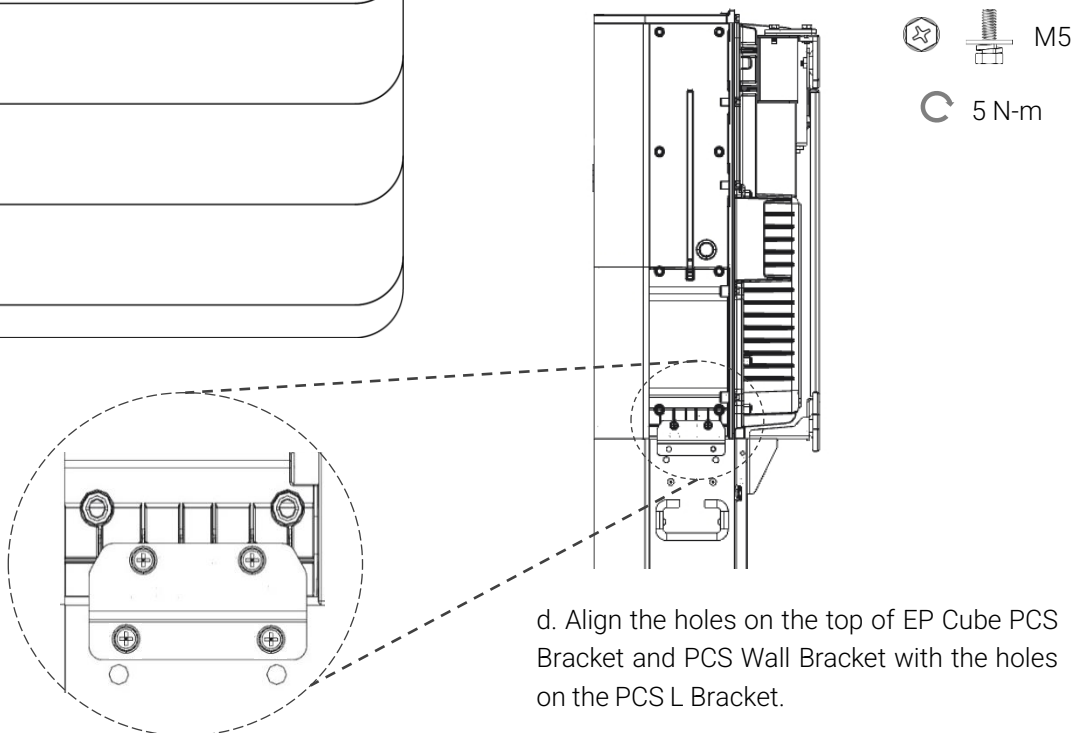
e. Finally, fasten the wall bracket with battery top brackets with the bolts latched on the wall bracket, on both right and left sides.

Note: Ensure to caulk around the external boundaries of the PCS wall bracket to prevent water droplets from entering the interior of the wall and cause corrosion.



Install the EP Cube PCS

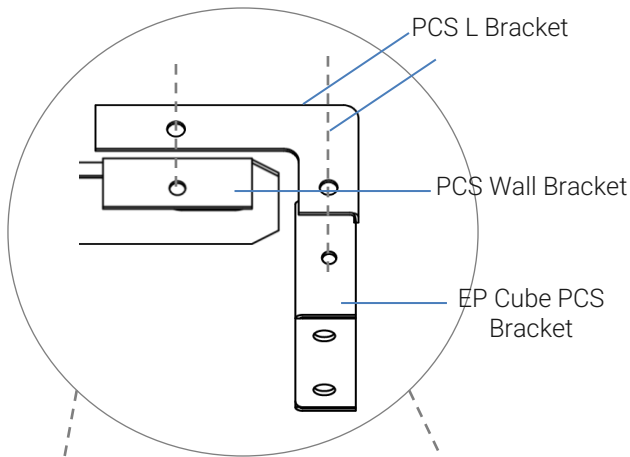
- Carefully place the EP Cube PCS on top of the Battery stack.
- Align the edges of both the EP Cube PCS and the Battery Module.
- Fasten PCS Side Brackets between the EP Cube PCS and adjacent top battery module, on both the left and right sides with the two M5 screws, and manually tighten.



- Align the holes on the top of EP Cube PCS Bracket and PCS Wall Bracket with the holes on the PCS L Bracket.

CAUTION: The Side Brackets between the EP Cube PCS and top battery module must be installed first, only after that fasten the EP Cube PCS Bracket & PCS Wall Bracket with the help of PCS L Bracket.

The EP Cube PCS is heavy, Please use lifting tools or multiple people to lift it for your own safety.



Fasten the EP Cube PCS on the wall

- Place the L Bracket on the PCS Wall-Mount Bracket and EP Cube PCS Bracket.
- Align the holes of L Bracket with the PCS Wall Bracket and the EP Cube PCS Bracket.
- Tighten all screws to fasten the EP Cube PCS with the PCS Wall Bracket by using electric an screwdriver to specified torque values.
- After finishing installation, make sure there is no visible gap between the PCS and the battery top module

⚠ CAUTION: NON-FLAT WALL ALERT!! Do not fix the last two screws (right and left L-brackets to the wall side) until you make that check.

The EP Cube PCS is heavy, Please use lifting tools or multiple people to lift it for your own safety.

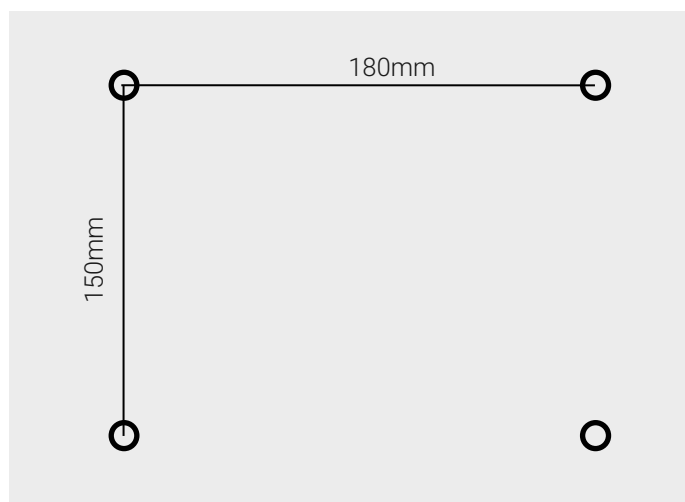
3.Installation of the AC Switch Box(Optional)

This section introduces the AC Switch Box installation process in sequence..

Start Installation :

Locating the mounting holes

- a. Mark the drill positions for the holes on the installation area by using a tape level tool, and pencil. Place the AC switch Box on the wall, choose and mark the appropriate hole positions.



- ⚠ CAUTION:** Please keep enough clearance between the AC Switch Box and other objects. e.g. On all sides of the AC switch box, the minimum clearance should satisfy ample space for safe operation and installation.

Install the AC Switch Box

NOTE: Select suitable M5*20 (or similar) screws to mount the AC Switch Box on different types of walls.

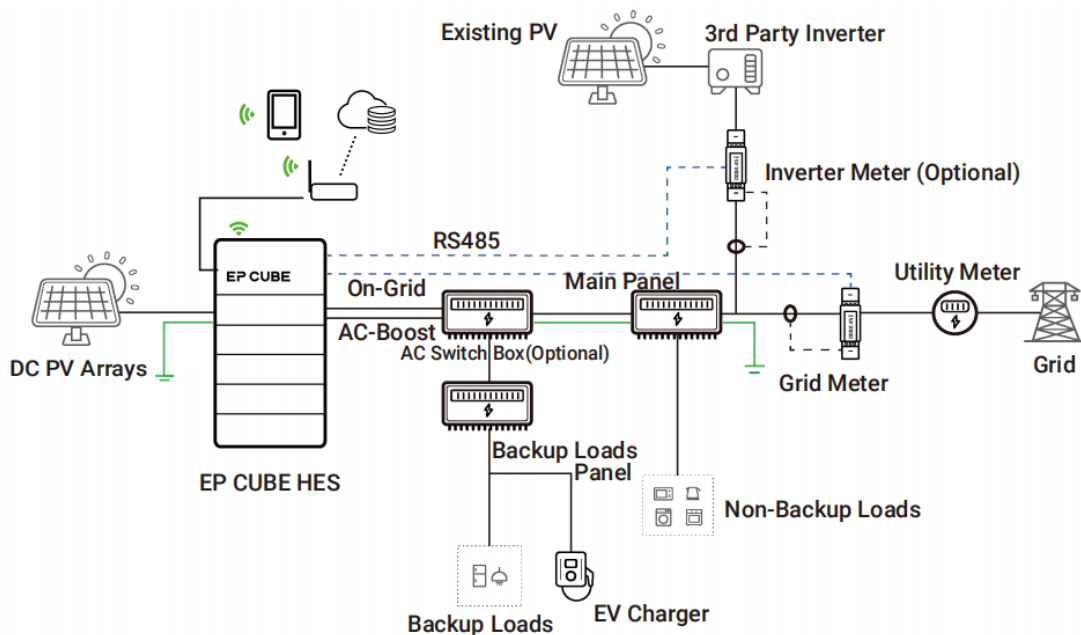
- a. Drill holes if needed, insert the M5 screws with washers and lightly stroke with hammer to properly insert if needed.
- b. Then hang the switch box on the inserted screws, and tighten the screws manually..
- c. Place the level tool on box to measure its level and tighten the anchor nuts to specified values.

THE EP Cube System

System Topology with AC Switch Box

EP Cube HES supports partial home backup system topology, and retrofits in any existing home electrical network. Only the backup loads will be powered when a grid power outage occurs in partial-home backup topology.

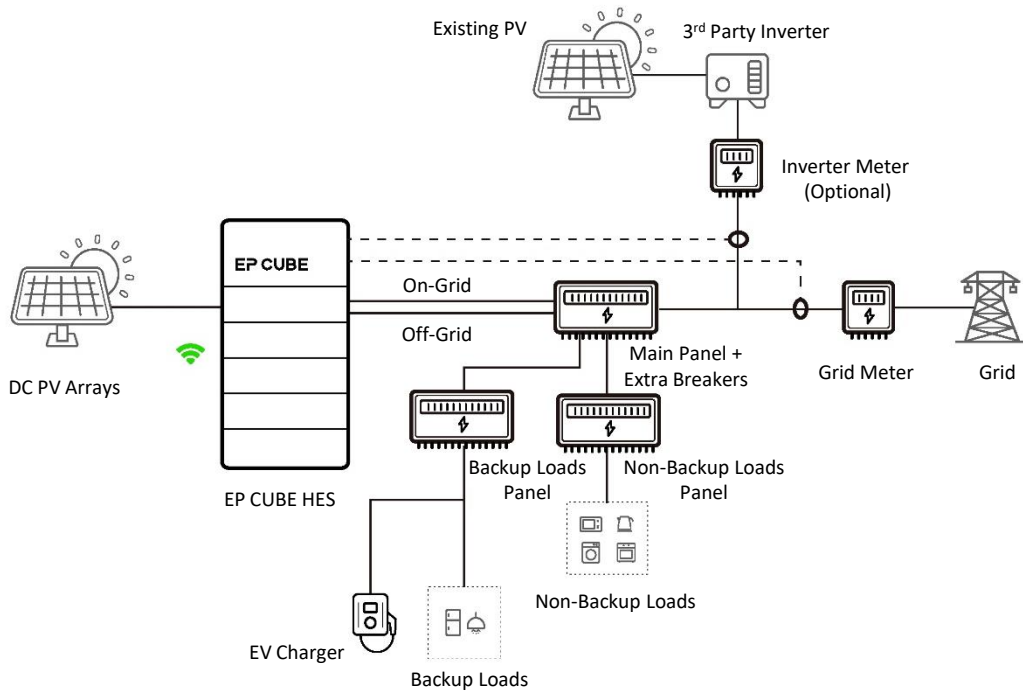
NOTE: Ensure to follow any applicable local Electrical codes and Standards.



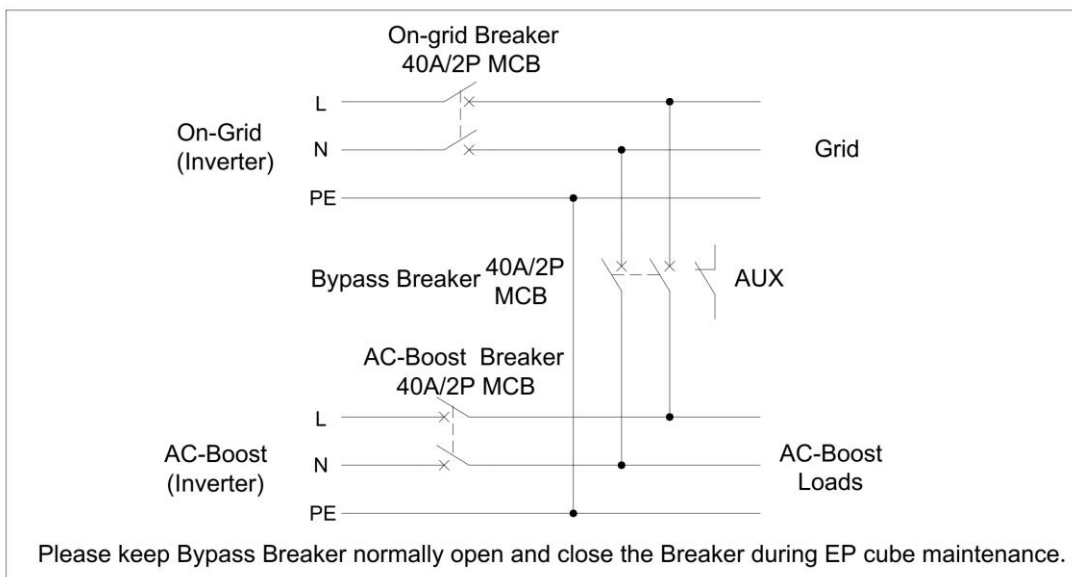
System Topology Without AC Switch Box

The EP Cube AC switch box is an optional component. If a homeowner chooses not to install it then it is the installer's responsibility to ensure that wiring the connections are carried out in a manner that guarantees the same functionality as with the optional EP Cube AC switch box.

Installers may choose to use a customized subpanel to install the extra needed circuit breakers i.e. Breaker for On-Grid, AC Boost and Bypass Breaker. An alternate approach may have these breakers installed in the main panel as well. The below figure shows a simplified topology without the optional AC switch box combining all the breakers into the AC main panel.



Wiring the EP CUBE PCS without EP Cube AC Switch Box



NOTE: Ensure to follow any applicable local Electrical codes and Standards.

WIRING & COMMISSIONING

This section introduces the EP Cube system wiring connections and commissioning steps.

WARNING :

The EP Cube does not require any annual maintenance. If a malfunction or error occurs, the product may only be installed, repaired, or replaced by the EP authorized personnel for safety and warranty purposes.

For personal protection and property safety, please read the safety chapter and ensure complete compliance during the entire installation process.

1. EP Cube System Wiring

This section introduces the EP Cube system wiring process.


Preparation

According to the formulated EP Cube system configuration and wiring scheme:

- Prepare the appropriate quantity and dimensions of electrical and installation materials.
- Prepare the appropriate auxiliary tools and equipment.

Recommended Wire Gauges

Wiring Connection	Wire Type/Wire Size	Length
ON-Grid AC Power Wire	90°C 3-Core cable /10mm ²	Custom
AC-Boost AC Power Wire	90°C 3-Core cable /10mm ²	Custom
PV Wires	PV system Cable/4mm ² -6mm ²	Custom
RS485 Meter	2-core shielded twisted pair cable/20-22AWG	10m
EPO	2-core signal cable/20-22AWG	Custom
Ethernet Wire	CAT5E, 24 AWG	Custom

 **CAUTION:** For safe operation during installation, maintenance and operation, it is a good practice to install over-current protection device(OCPD). All AC-generating or consuming devices require an OCPD before the integration into the system. So any connected devices, such as an EP Cube, DC, or AC-coupled PV system will need an OCPD before it is connected with the EP Cube. It is recommended that the installer should add circuit breakers before connecting these devices to the system. Please add the RCD devices according the local rules . Please ensure all circuit breakers are turned off., and wear the appropriate PPE before beginning.

⚠ CAUTION: Please ensure all circuit breakers are turned off. Wear the appropriate PPE before beginning.

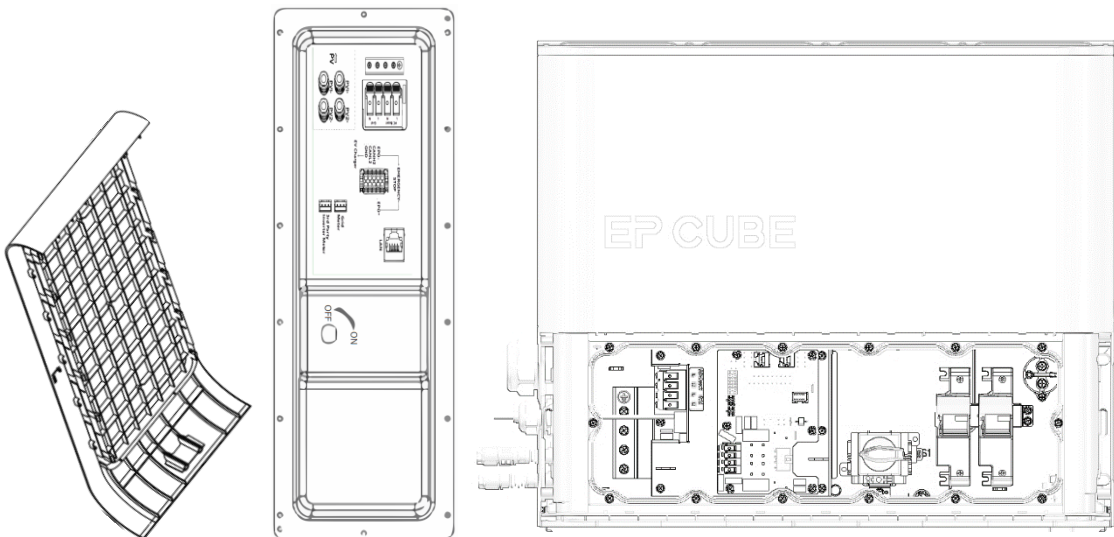
1.1. Wiring From Solar Panels to EP Cube PCS

Step-1

Open the EP Cube PCS for Wiring

a. Remove the EP Cube PCS panel covers:

- Open the two EP Cube PCS panel latches and remove the inverter cover.
- Use an electric screwdriver to remove the screws on **the PV switch** and **the dead-front cover** of the EP Cube PCS.
- Remove the dead front cover



Step-2

Connect PV Wiring Cables to EP Cube PCS

a. Prepare the flexible PVC conduit for PV wires between the EP Cube PCS and PV installation.

- Route the wires through the conduit, and connect the wires to the PV Davelon terminals of EP Cube PCS.

⚠ NOTE: Each set of PV wires, PV+ and PV-, must be connected to the correct terminal of the EP Cube PCS.

b. EP Cube PCS supports the connection with 2x PV strings. Each string is connected to the EP Cube PCS via a pair of standard industrial Davelon PV connectors. Carefully connect the PV+ and PV- wires to the corresponding terminals of the EP Cube PCS (Refer to the figure on the next page)

- Push the Davelon PV connector into the mating connectors on the EP Cube PCS until both connectors are locked into proper place. The Davelon connectors need to be prepared on site. Refer to the figure on the next page.

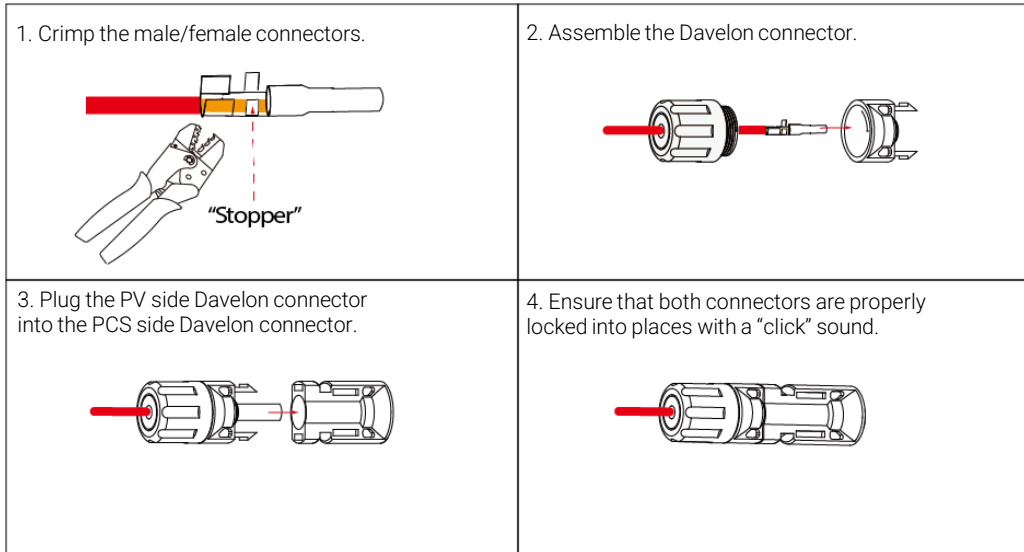
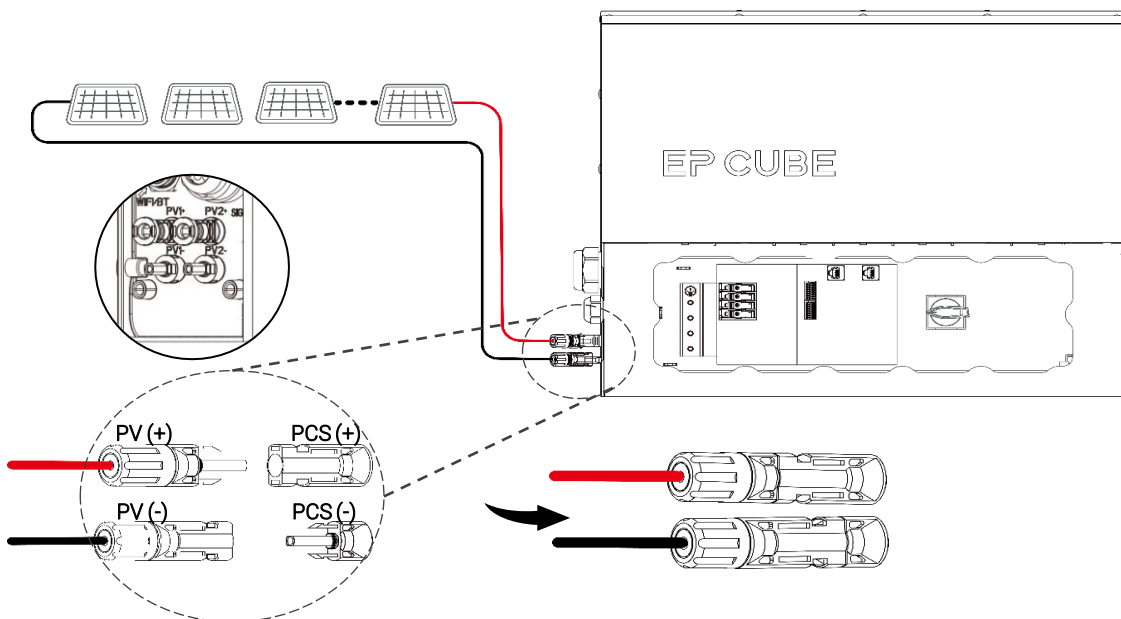


Figure. Preparing Davelon connectors for PV Strings



Recommended wire gauge: Davelon connector PV cable 4mm²-6mm²

Figure. EP Cube PCS to PV Array DC Input Wiring

1.2. AC Wiring From EP Cube PCS to AC Switch Box

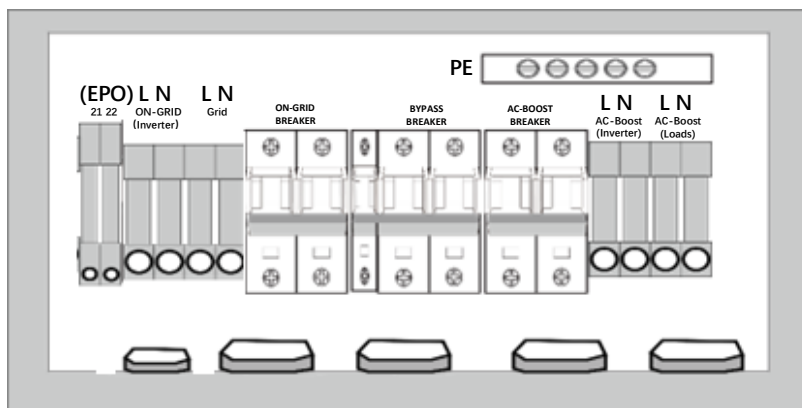
Step-1

Open the AC Switch Box for Wiring

a. Remove the Switch box cover:

- Open the AC Switch Box 's semi-transparent cover.
- Once the cover is open, use the screwdriver to remove 4x screws and remove the dead front cover to access the wiring terminals. Refer to the figure below for details of the wiring terminal blocks.

AC Switch Box Terminals



NOTE: The AC Switch Box is optional.

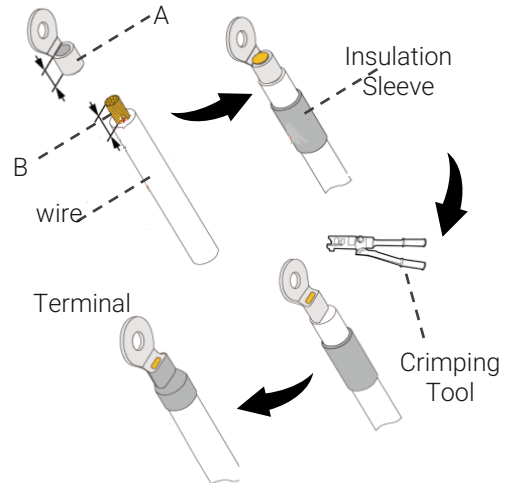
Step-2

Connect EP Cube PCS AC Wires to AC Switch Box Terminals– ON-GRID

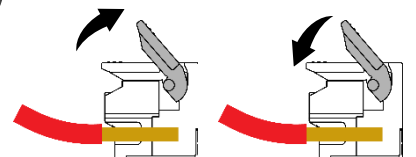
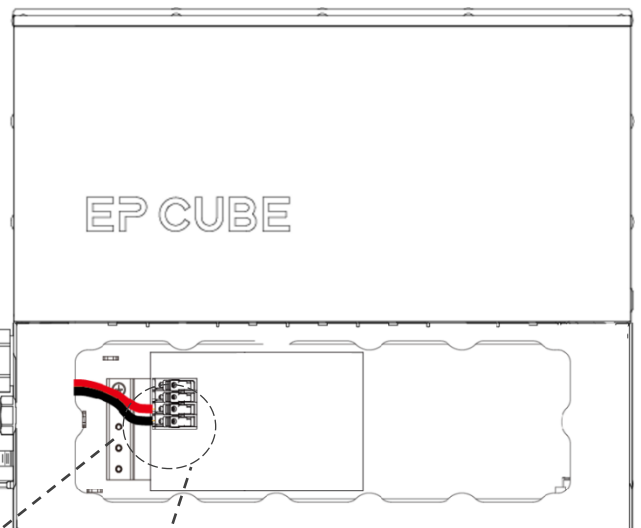
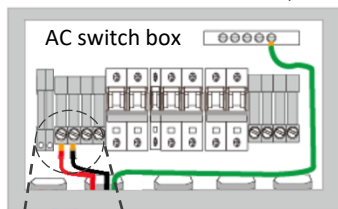
- Prepare the wires for connection between the EP Cube PCS and the AC switch box terminals.
- Route the wires through the cable gland on the bottom of AC switch box, and connect them to the terminals labelled as L and N of On-Grid port.
- Use a flat-head screwdriver to loosen the terminal screws, insert the cables and fasten the screws to properly secure the connections. Use the appropriate wire colours for live and neutral wires according to local regulations and standards.
- Route the other end of the wires through the cable gland dedicated for the AC power, and connect the wires to the terminals labelled as L and N of Grid terminals inside EP Cube PCS.
- Connect the ground wire to the grounding busbar on both ends. (Refer. to figure below)

Preparing Cables with Crimping OTs for Ground Wire

- Take appropriate OT/OD terminals according to the wire gauge size.
- Strip the wire, and conductor length (B) should be few 2-3 mm longer than OT/OD length (A).
- Insert conductor inside the OT/OD terminal and crimp the terminal.
- Move insulation sleeve to insulate the terminals, and secure terminals with screws.

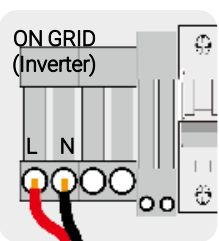


Recommended wire gauge:
90°C 3-Core cable /10mm²

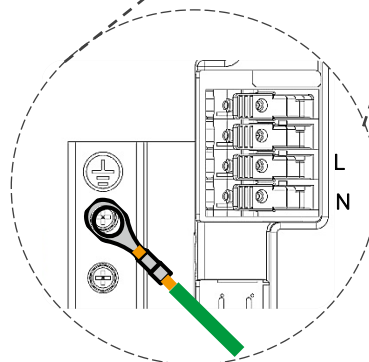


Wire strip length 13-14mm.

1. Pull the mechanical flap upwards to open terminals.
2. Insert the conductors in terminals.
3. Push down the mechanical flap back to its original position to lock the terminals.



Wire strip length 10mm.

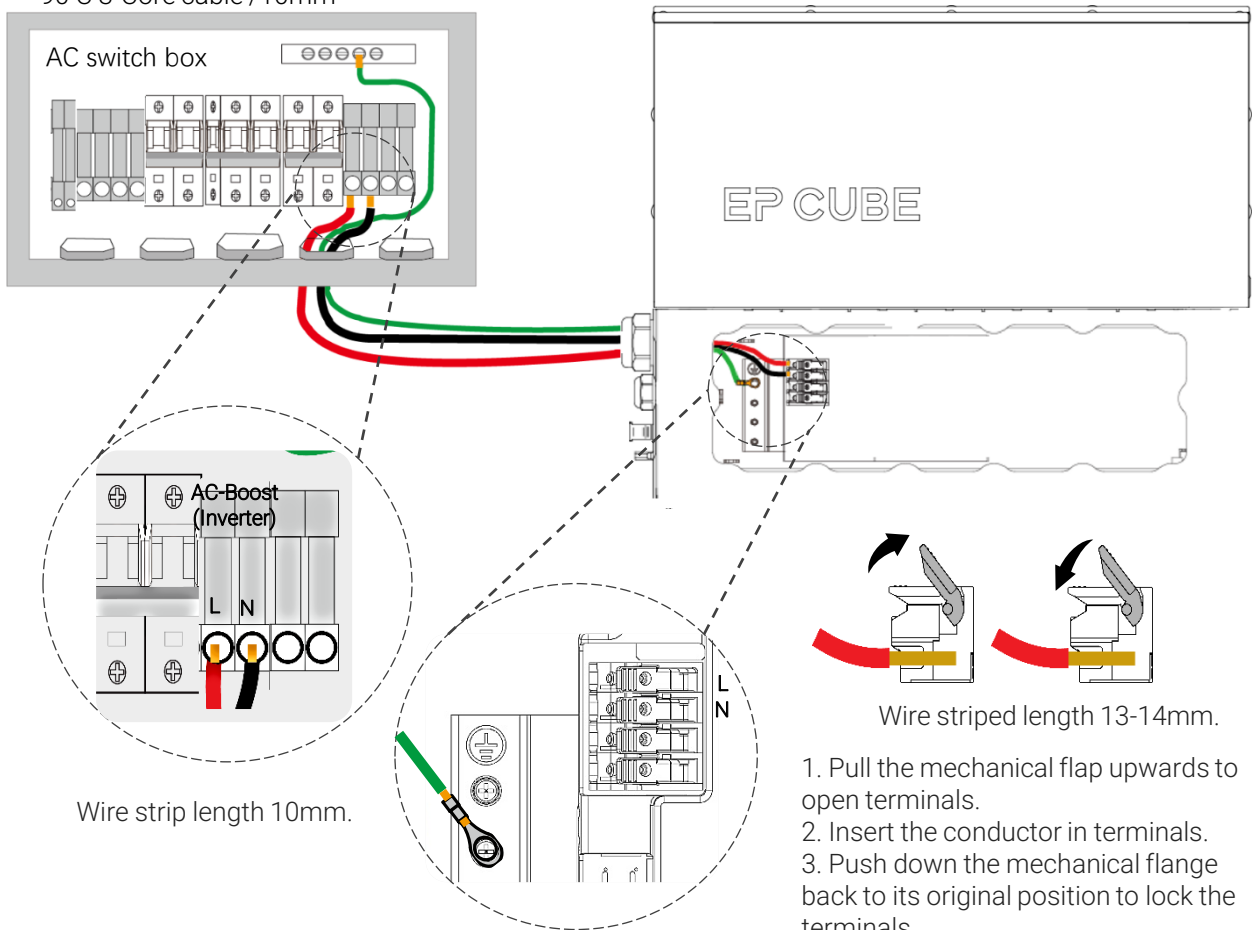


Step-3

Connect EP Cube PCS AC Wires to AC Switch Box Terminals-AC BOOST

- Prepare the wires for connection between EP Cube PCS and the AC switch box terminals.
- Route the wires through cable gland on the bottom of AC switch box, and connect it to terminals labelled as L and N of AC Boost port.
- Use a flat-head screwdriver to loosen the terminal screws, insert the conductors and fasten the screws to properly secure the connections. Use the appropriate wire colours for live and neutral wires according to local regulations and standards.
- Route the other end of the wires through the cable gland dedicated for the AC power, and connect the wires to terminals labelled as L and N of AC Boost terminals inside EP Cube PCS.
- Connect the ground wire to the grounding busbar on both ends. (Ref. to figure below)

Recommended wire gauge:
90°C 3-Core cable /10mm²

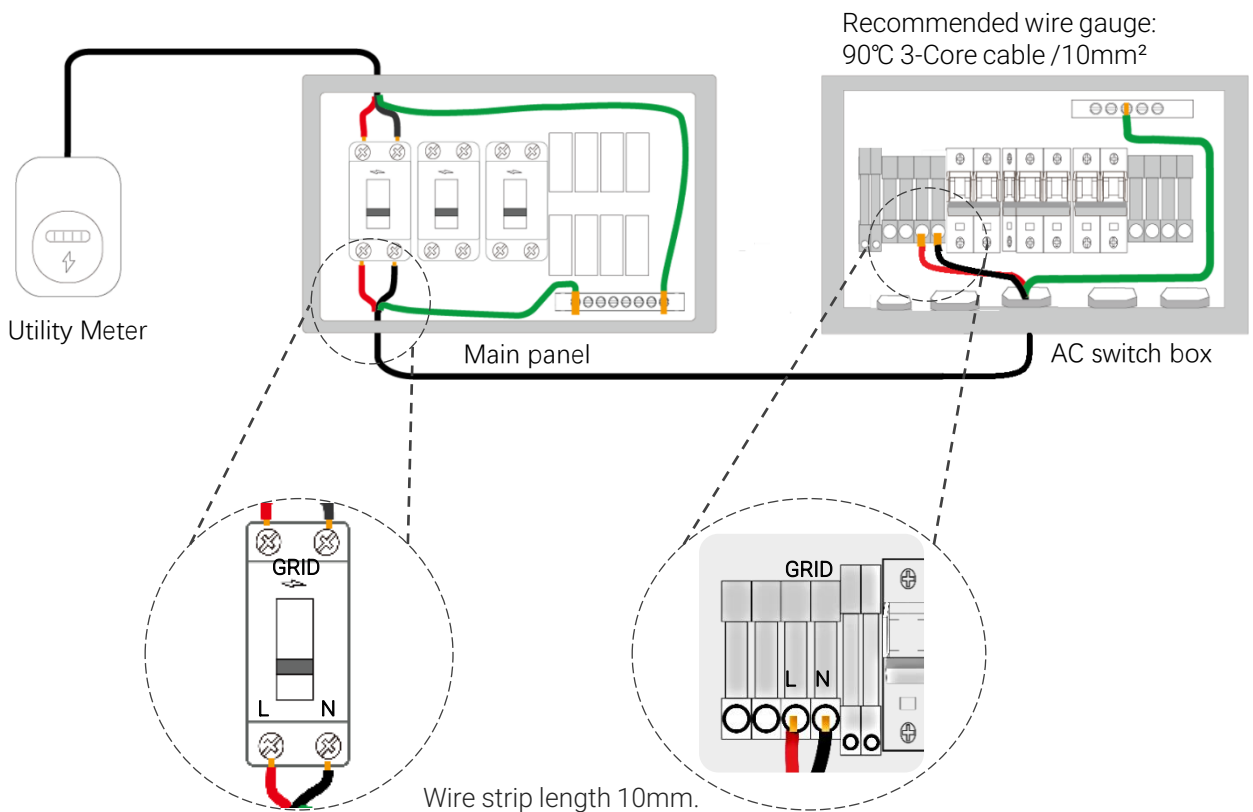


Refer to picture above for wiring the AC power L, N, and ground cable between the EP Cube PCS and AC switch box terminals.

Step-4

Wiring Connections of Grid

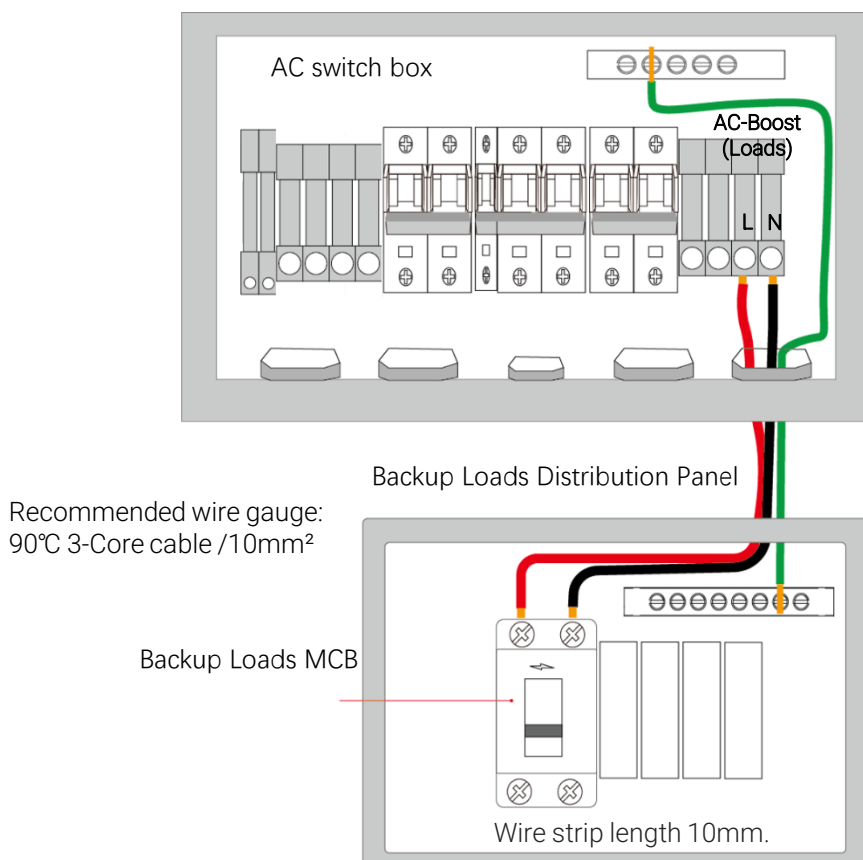
- Prepare the wires for connection between Grid MCB terminals in AC Mains panel and the AC switch box grid terminals.
- Route the wires through cable gland on the bottom of AC switch box, and connect it to terminals labelled as L and N of GRID port.
- Use a flat-head screwdriver to loosen the terminal screws, insert the conductors and fasten the screws to properly secure the connections. Use the appropriate wire colours for live and neutral wires according to local regulations and standards.
- Route the other end of the wire through the cable entry point on the AC Mains panel, and carefully connect the wires to L and N terminals of Grid MCB.
- Use a flat-head screwdriver to loosen the terminal screws, insert the conductors and fasten the screws to properly secure the connections. Use the appropriate wire colours for live and neutral wires according to local regulations and standards.
- Connect the ground wire to the grounding busbar on both ends. (Ref. to figure below)



Step-5

Wiring Connections of Loads

- Prepare the wires for connection between Home Loads MCB terminals in AC Mains panel and the AC switch box Loads terminals.
- Route the wires through cable gland on the bottom of AC switch box, and connect it to terminals labelled as L and N of Loads port.
- Use a flat-head screwdriver to loosen the terminal screws, insert the conductors and fasten the screws to properly secure the connections. Use the appropriate wire colours for live and neutral wires according to local regulations and standards.
- Route the other end of the wire through the cable entry point on the Backup loads distribution panel, and carefully connect the wires to L and N terminals of Backup Loads MCB terminals.
- Use a flat-head screwdriver to loosen the terminal screws, insert the conductors and fasten the screws to properly secure the connections. Use the appropriate wire colours for live and neutral wires according to local regulations and standards.
- Connect the ground wire to the grounding busbar on both ends.(Ref. to figure below)



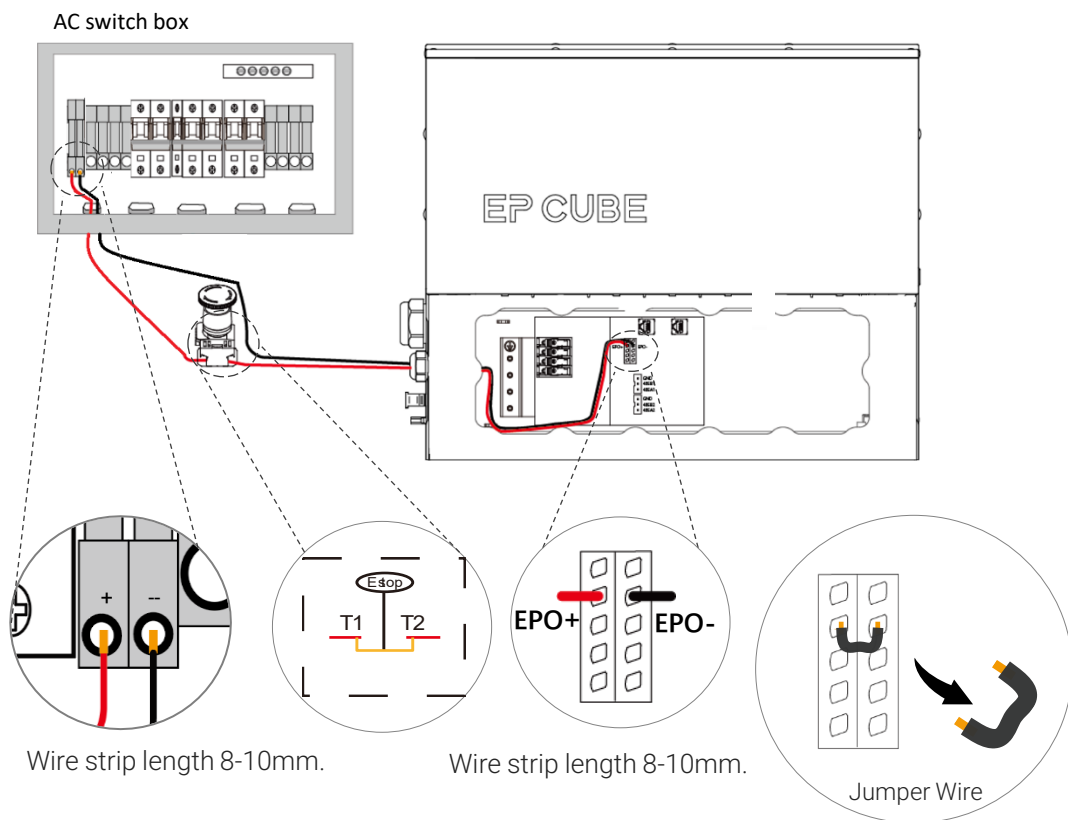
1.3. Wiring of Other Components (Optional)

CAUTION: Please ensure all circuit breakers are turned off and PPE is properly worn before getting started. Please ensure that the main breaker of the Grid is turned off and protected with Lockout/Tagout.

A. Wiring of Emergency Stop

a. Remove the press-fit jumper or jumper wire on the EP Cube PCBA connector between the EPO+ & EPO- terminals.

Recommended Wire Gauge:
2-core signal cable/ 0.50mm²-0.34mm²



E-Stop Wiring Connections

- Connect emergency stop wires to terminals EPO+ & EPO-.
- Connect the wires to EPO signal terminals inside the AC Switch Box through the E-Stop button.
- Do a test run at least once during the system commissioning and debugging to ensure that its functioning properly.

B. Wiring Connections of Grid CT & Inverter CT (For Grid and AC Inverter)

- Pay attention to the CT's orientation, otherwise the system will not work correctly. The CT's arrow direction on phase wire (L phase) shall be from Grid to MCB (Grid → MCB).
- The CTs provided with the EP Cube has a standard cable length of 5m.
- The recommended cable size & gauge values are 2-core signal cable/20-22AWG.
- Connect the CT's wires to the CT terminals (+ & -) inside the Meter.(Refer to figure. a)
- Connect the AC power/Grid Terminals to the AC Input Terminals (L & N) inside the Meter. (Refer to figure. b)
- Finally, connect the RS485 wire between the Meter terminals and EP Cube PCS RS485 Terminals. terminate the one end of the RS485 wire inside the Smart Meter, and connect the other end onto the EP Cube PCS connector on the PCBA. (Refer to figure. c)
- EP Cube PCBA hosts 2x 3-pin JST connectors male connector, upper connector is dedicated for Grid Meter while lower one is dedicated for AC Inverter Meter.
- Simply plugin the mating 3-pin JST female connectors of the RS-485 wire into the slot.
- Perform these steps for both Meter (for Grid) and Meter (for Inverter)

CT's Wire Gauge: 2-core signal cable/0.50mm²-0.34mm²

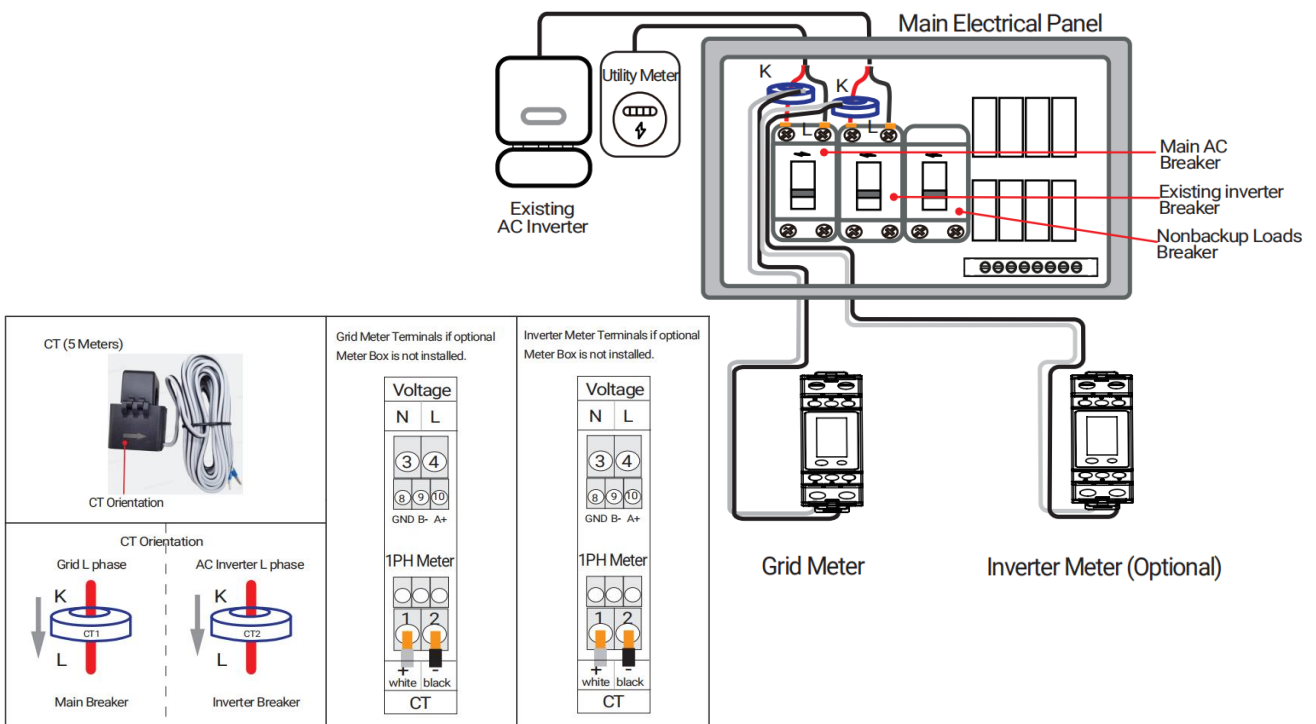


Figure. a

Meter AC Power Wiring

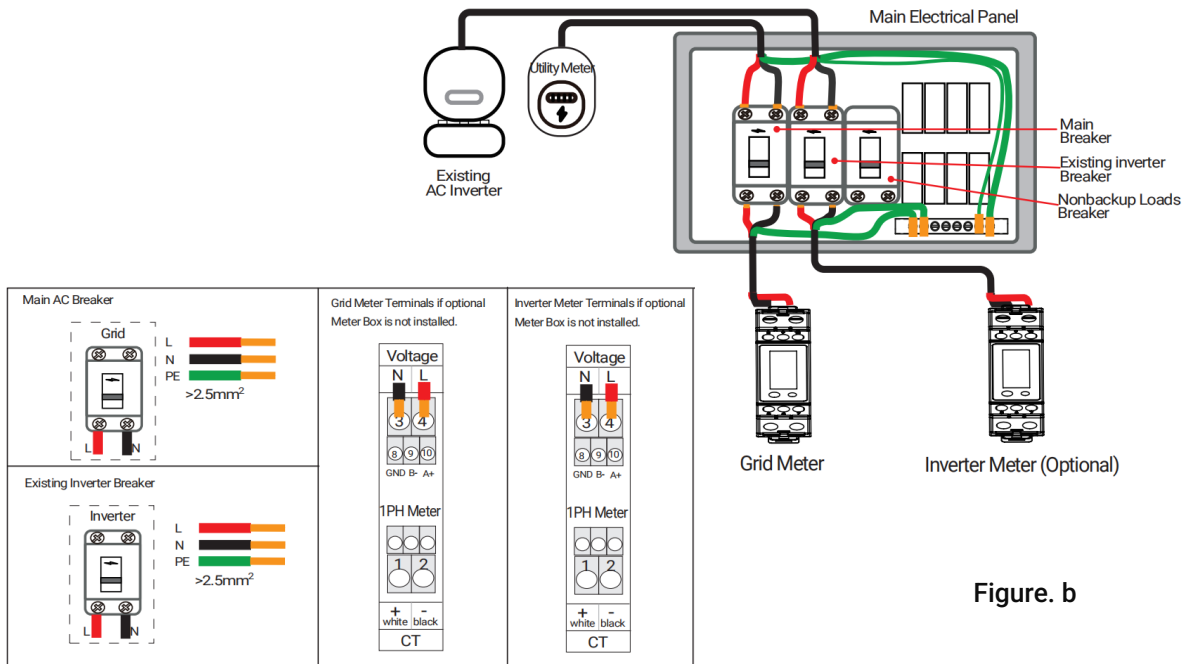


Figure. b

RS 485 Signal Wiring Between Meter and PCS

RS485 Wire Gauge:

2-core shielded twisted pair cable/0.50mm²-0.34mm²

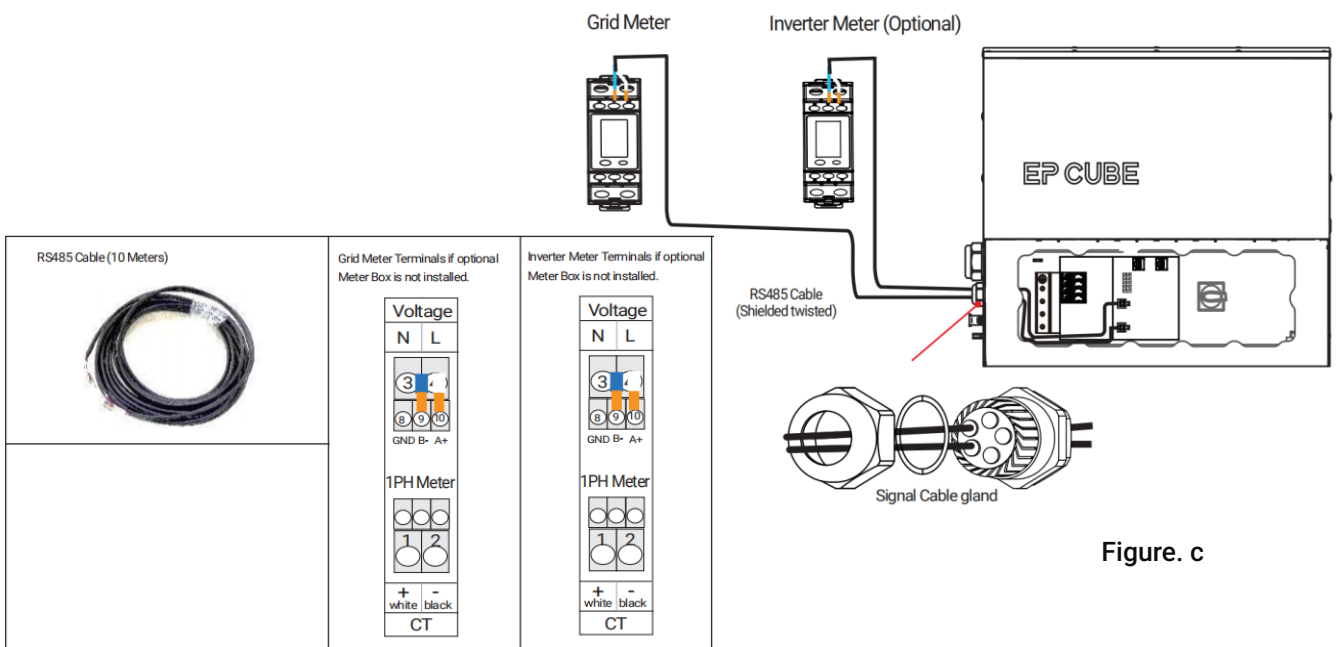


Figure. c

2. EP Cube System Commissioning

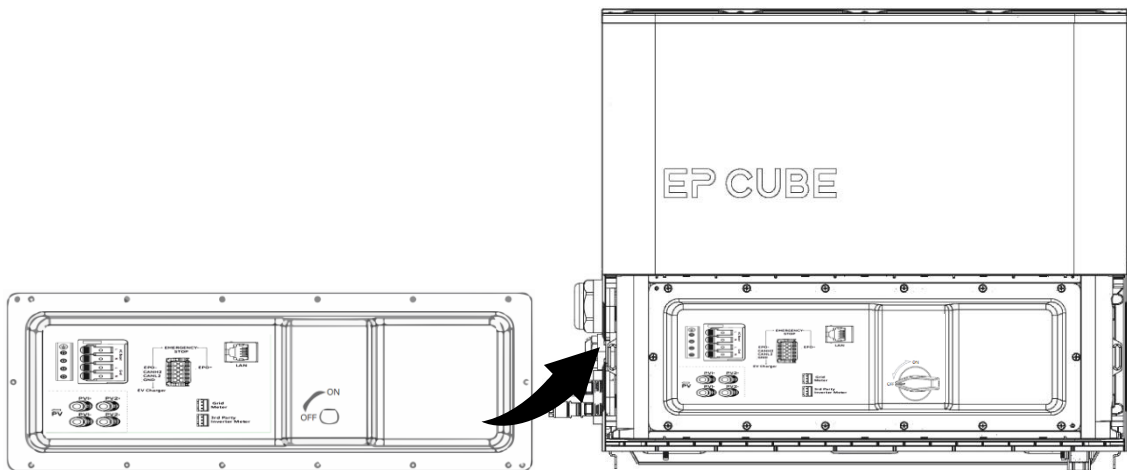
This section introduces the EP Cube system's initial commissioning and operating process.

2.1. EP Cube Startup

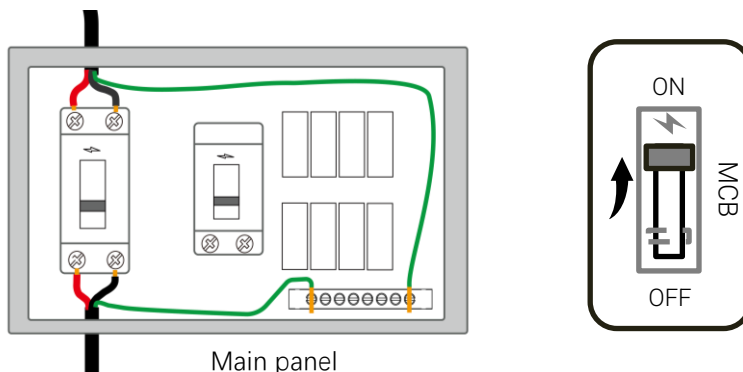
⚠ CAUTION:

- Please ensure PPE is properly worn before getting started.
- EP Cube commissioning requires EP Cube PCS to have AC Power. It must be ensured that Grid MCB is at on state. But Do not press the power on/off button on the right side of the EP Cube PCS

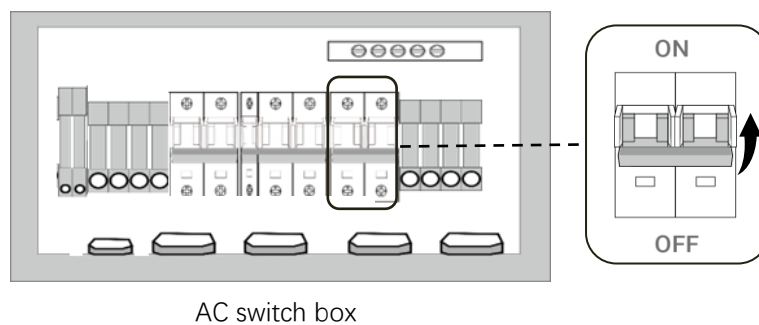
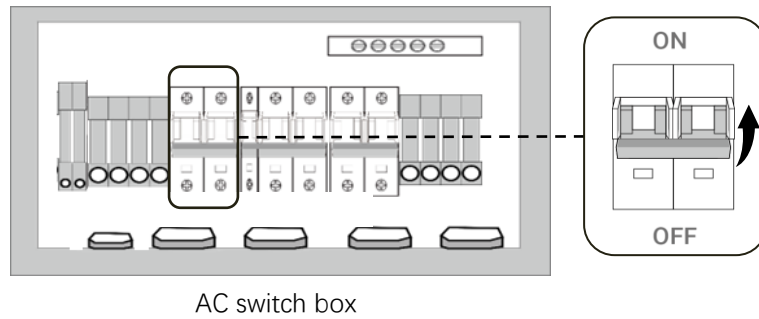
a. Make sure the fuse of PCS is connected, install the dead-front cover using the screws, and ensure no live electrical components will be exposed during operation. then install the knob of the PV switch using a screwdriver.



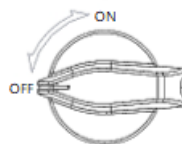
b. Turn on the Grid MCB inside the Main Home Electrical panel.



c. Turn on the MCBs (ON GRID Breaker & AC Boost Breaker) inside the AC Switch Box. Ensure that the Bypass MCB is turned off, and locked out & Tagged out.



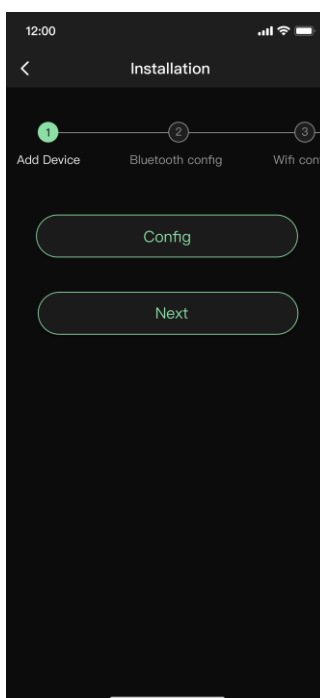
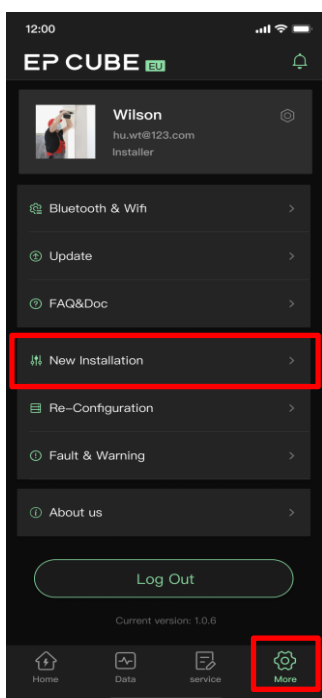
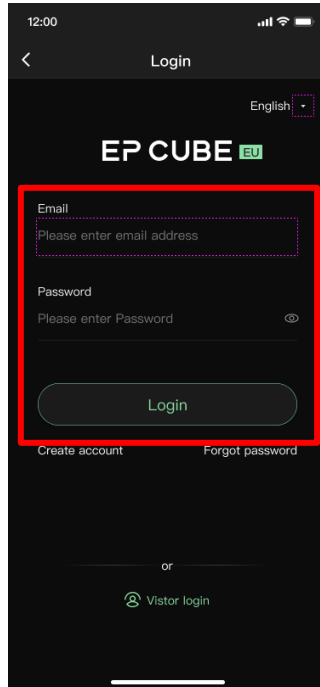
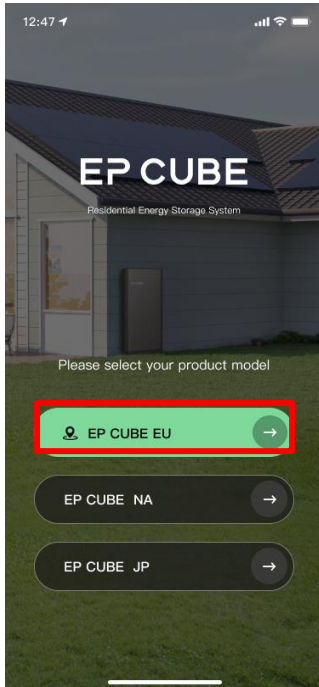
d. Turn on the PV Switch by turning knob from OFF to ON. Both PV1 & PV2 are controlled through a single switch. If



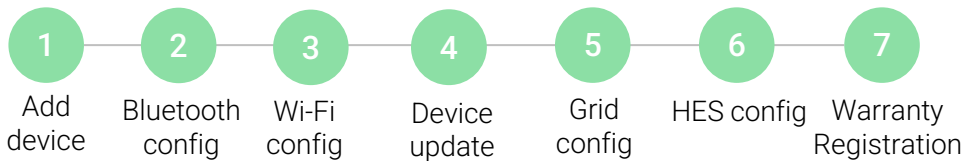
2.2. Commissioning via EP Cube app

System commissioning and setup have been made easy by the EP Cube app. It enables the user with system commissioning, monitoring and basic troubleshooting by providing errors and fault lists with the installer account.

Select your product model → Login with your installer account → Click More → click New installation → Config.



Follow the step by step process to configure all the connected devices within your EP Cube system including Network i.e. Bluetooth/Wi-Fi, Grid, HES config, and warranty registration. Below fig shows the order of configuration steps. At each step, there are 3 navigation buttons to enter "Config", and move to "Next" or go "Back" to any step.

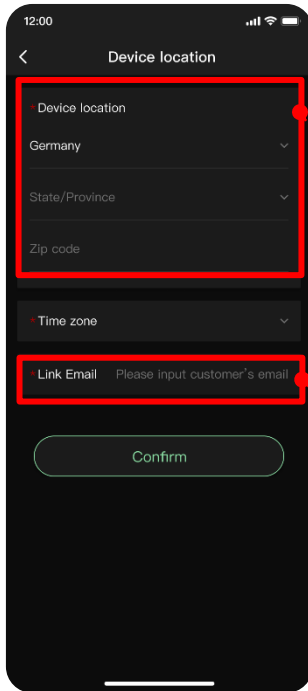


1. Add Device: Beginning with the add device step, Click "config" to start adding device name, EP CUBE PCS, battery modules and base according to connected devices in the system. Scan the QR code to add the SN of each module.

⚠ Note: If the QR code of a certain device cannot be recognized and scanned then input the SN individually by manually inputting the SN to continue with the Installation process. In this case, take the photos of the QR code label on the device and upload it in step 8.

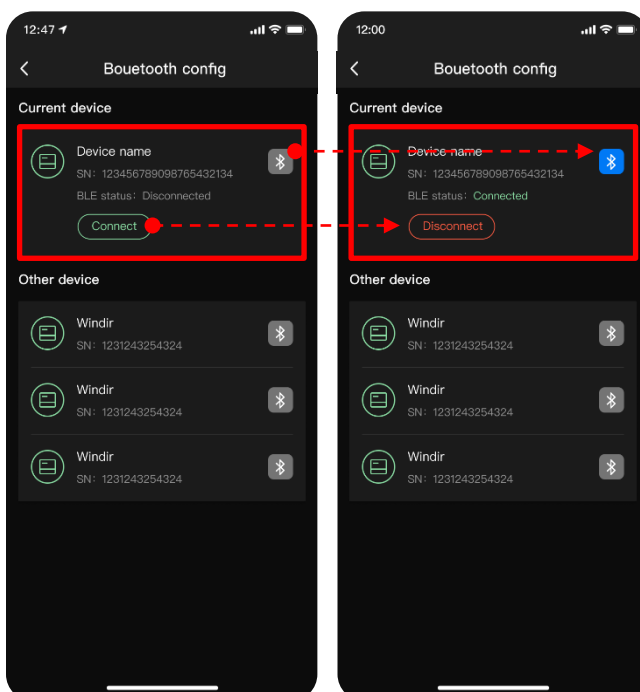


Click on the "+" button marked in red box to add more devices to the list. Once all devices are successfully added, Click on the next button to move to Device Information page to complete information related to location site, time zone and most importantly linking the email address for the end user's account. Finally, click submit.



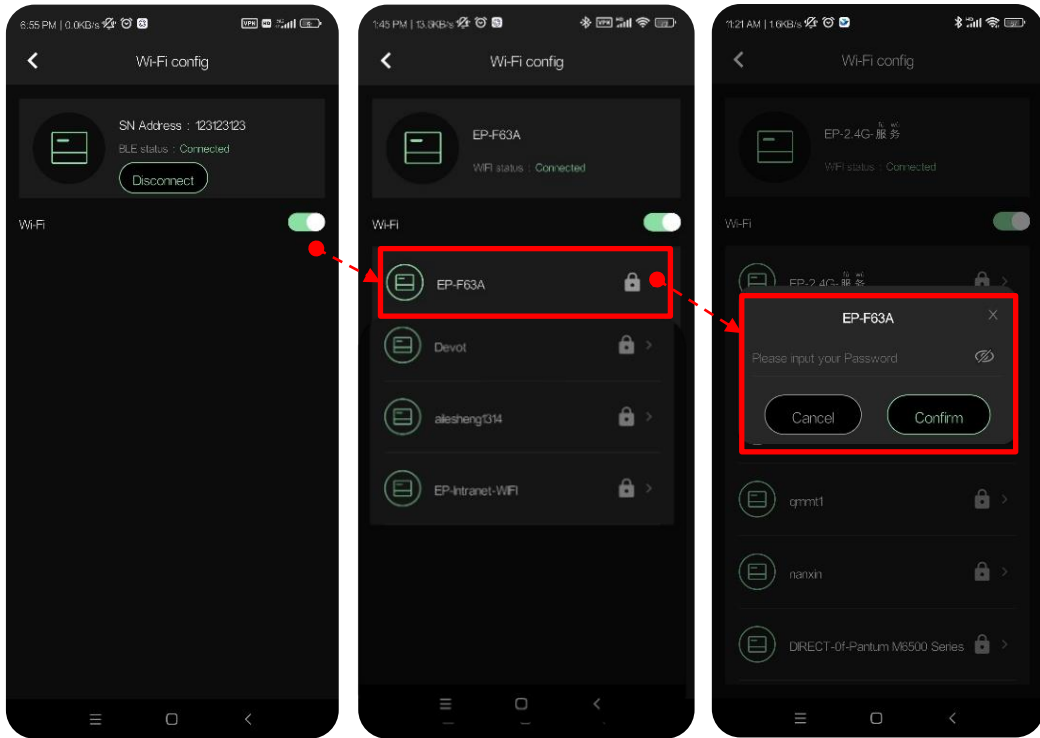
Device Location	Country	Choose country name from the list
	State	Choose state name from the list
	Zip Code	Write area zip code
Time Zone	Time zone	Choose applicable time zone from the list
Link Email	Email	Input customer's email address

2. Bluetooth Config: In the second step, the Bluetooth configuration is completed. Click on your desired device to set it as the current device. And click connect button to pair your phone with the newly added device. Upon success, Bluetooth status will change to connected and colour of the Bluetooth icon will turn blue.



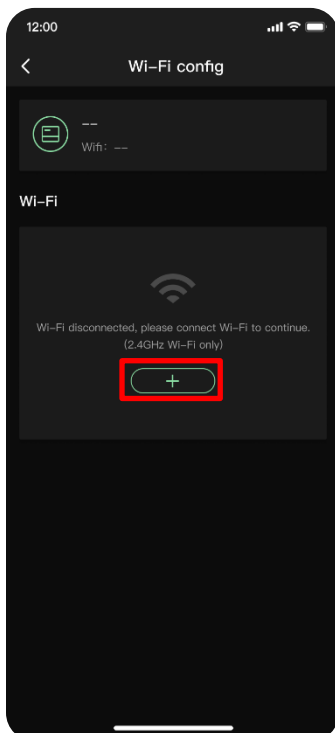
1. Turn on your phone's Bluetooth
2. Choose your added device
3. Click on connect button
4. Upon success, Bluetooth icon will turn blue.
5. Connect button will be replaced by the Disconnect button.

3- Wi-Fi Config: it allows you to choose your home Wi-Fi network to connect your device with it. Input the password and click confirm. **Note: EP Cube can only connect with 2.4Ghz Wi-Fi Networks.**



Turn on Wi-Fi

Input the password and confirm



Note: Ensure that your installation site must have Wi-Fi coverage and strong signal strength. EP Cube only supports 2.4GHz Networks only.

5G ❌

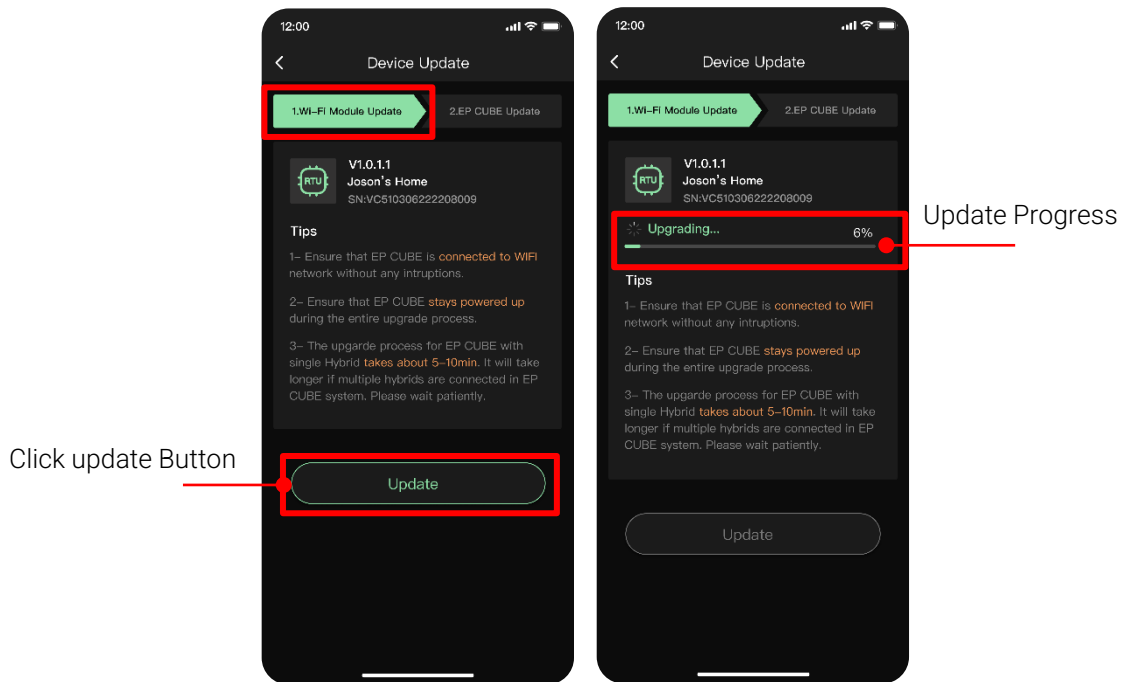


2.4G ✅

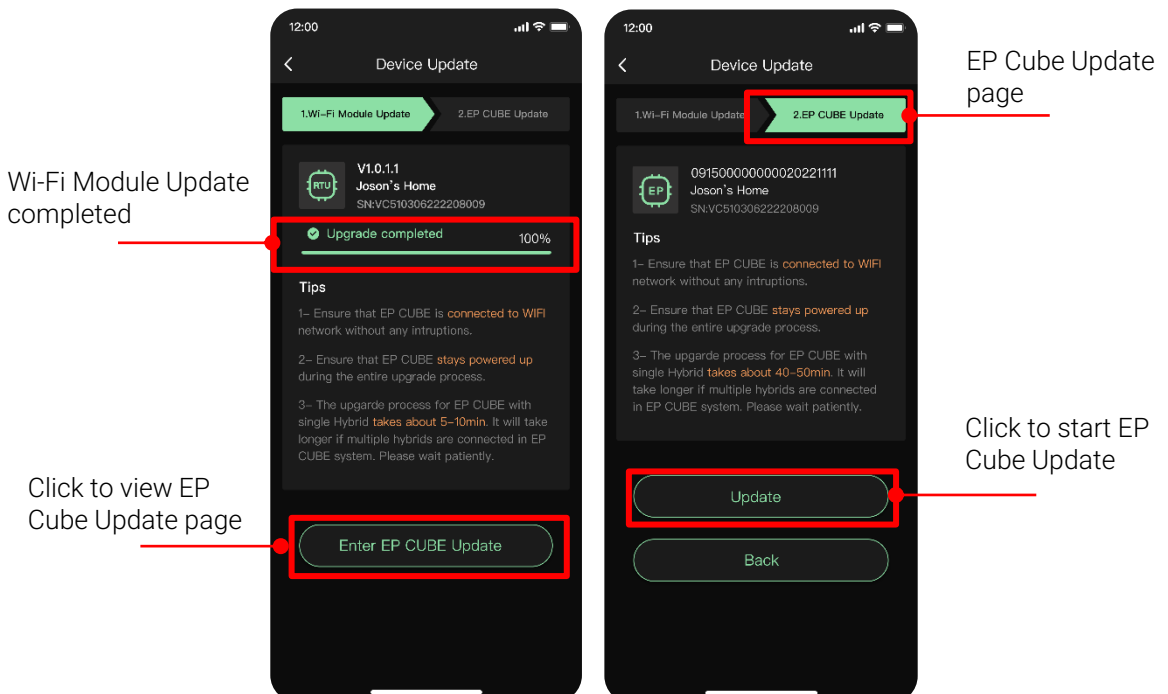
** For the iOS version, the list of Wi-Fi networks will not be displayed. If your iPhone is connected to a Wi-Fi network, only that network will be displayed. To add a new Wi-Fi, click add Wi-Fi Button to add desired Wi-Fi name and Password.

4- Device Update: In this step firmware of the Wi-Fi Module and EPCUBE are updated to latest available versions automatically.

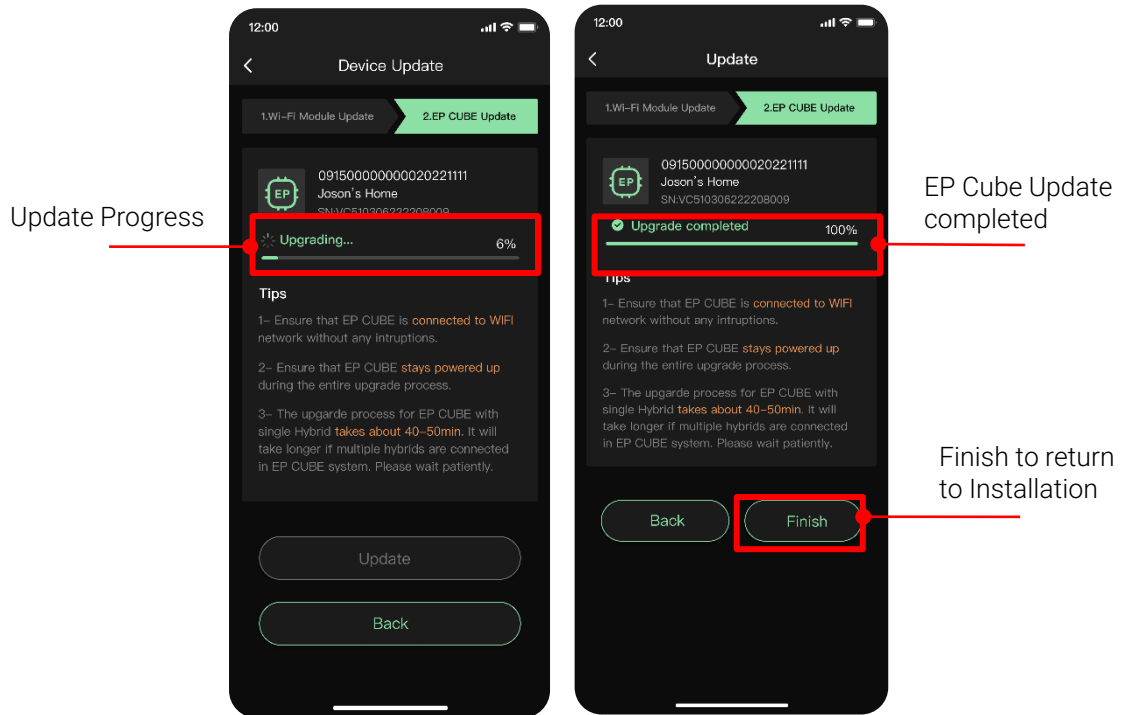
In 1st step, click the update button to start Wi-Fi Module update process. Pay attention to the tips.



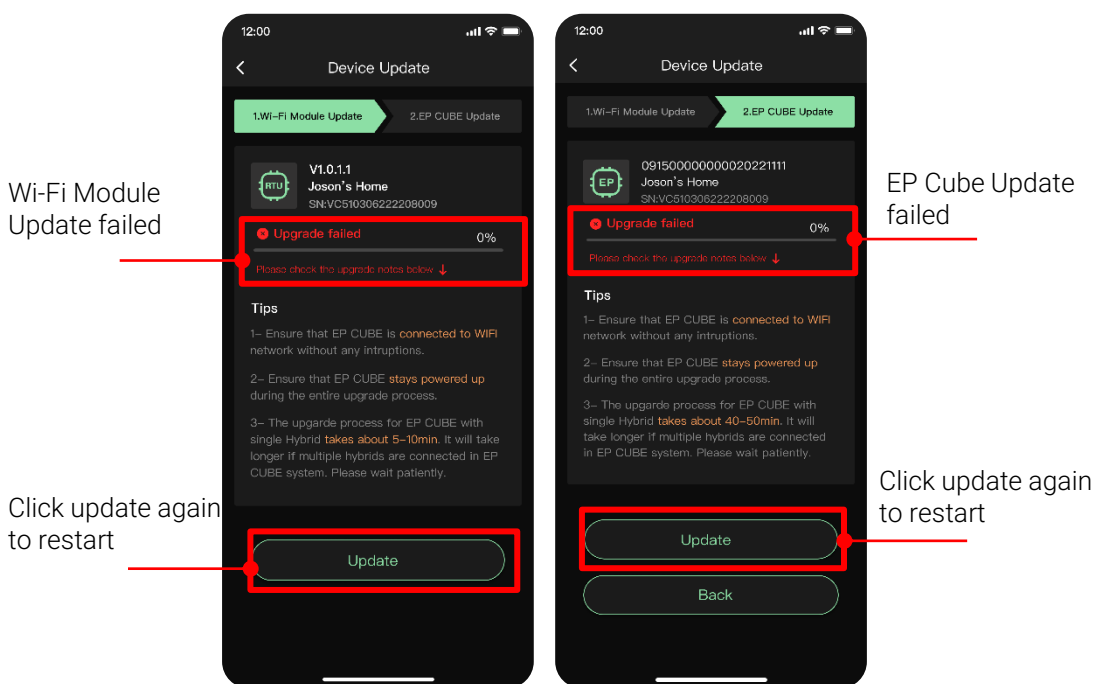
Once the update is completed successfully, Enter EP Cube button will appear. Clicking on the button will start the second part of the update that's EP Cube system firmware update.



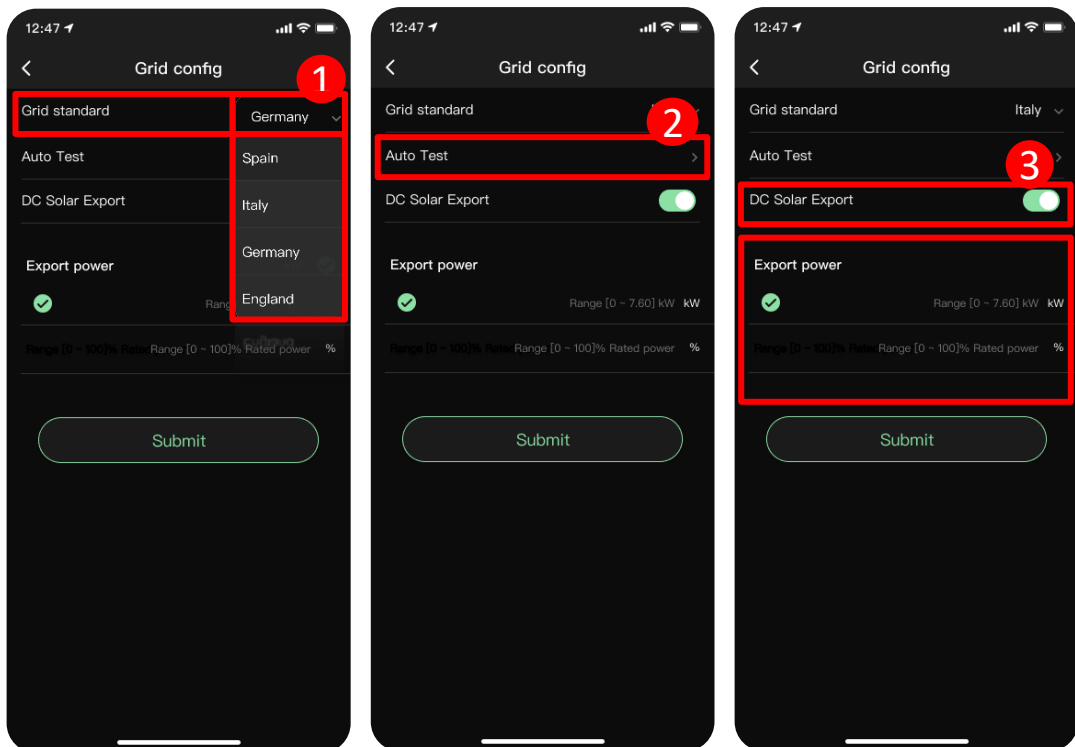
Click update button on EP Cube page to start the update. Once the update is completed successfully, click the finish button.



For any reason if update process failed, the Upgrade failed message will be displayed. Click update button to restart the update process again.



5- Grid Config: choose your system's applicable grid standard. Dropdown list already have various applicable standards listed. Next in the line is the auto test feature that's a standard requirement for different regions. selection of applicable grid standard. Further down the list, Enable or Disable DC Solar Export button, and choose one of the desired settings from the 2 options given below. After selection click submit and return to installation step.



6- HES Config: HES config step allows the user to setup and input different system related information and connected devices. i.e.

Step 1. Set system time as per local standard time.

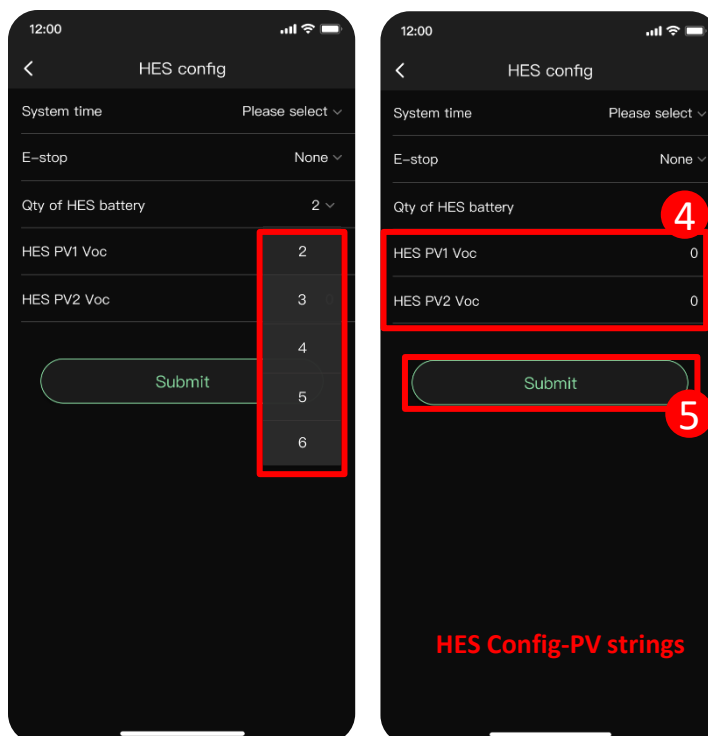
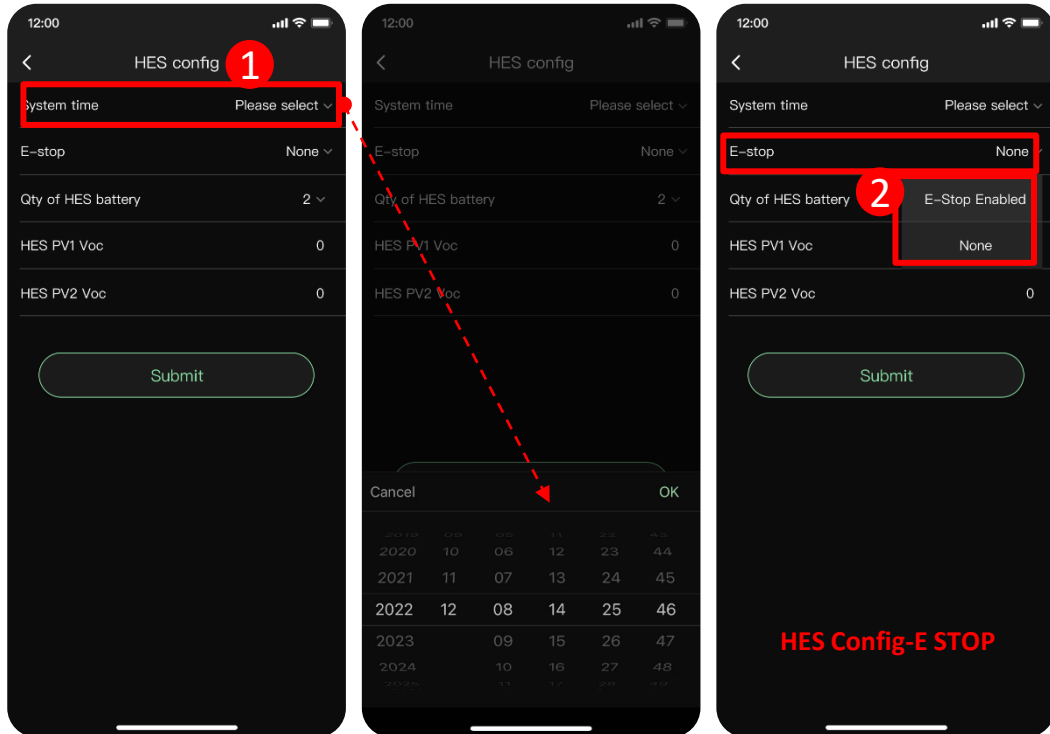
Step 2. Choose to Enable or disable the E Stop by choosing E-stop Enabled or None from dropdown list, respectively.

Step 3. Then choose the number of batteries from the dropdown list as per actual scenario. Note: maximum 6x battery modules are integrated with an HES (EP Cube PCS).

Step 4. Finally, input open circuit voltage (Voc) for the connected PV strings.

Note: maximum 2x PV array can be connected with an HES(EP Cube PCS) module.

Step 5. Click Submit & return to installation steps.

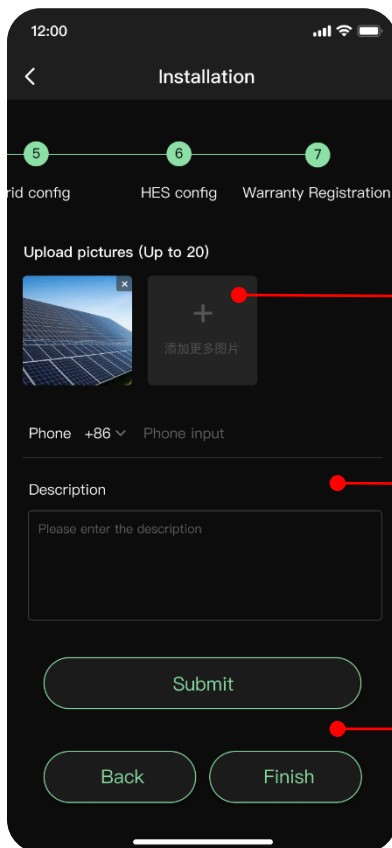


7- Warranty Registration: In the final step, take photos of the completed installation from different aspects and upload using add button. Maximum 20 pics can be added.

Note: If you had trouble with scanning any QR codes at add device step, then manually input the device SNs, take photos of the QR code and upload the photos of the problematic QR code here.

Input the user's phone number, add any remarks or comments if needed and click the submit button for EP Team's review and approval .

Then click the finish button to close installation process.

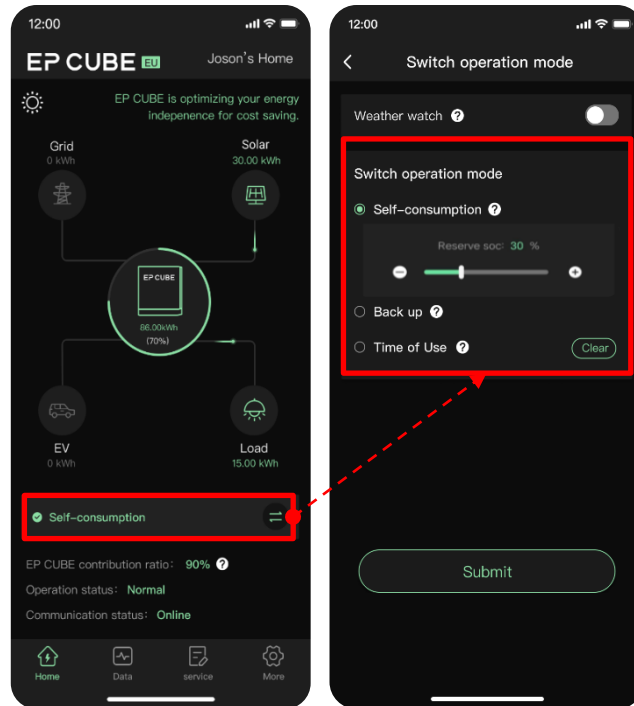


Click on the add photos section to upload photos

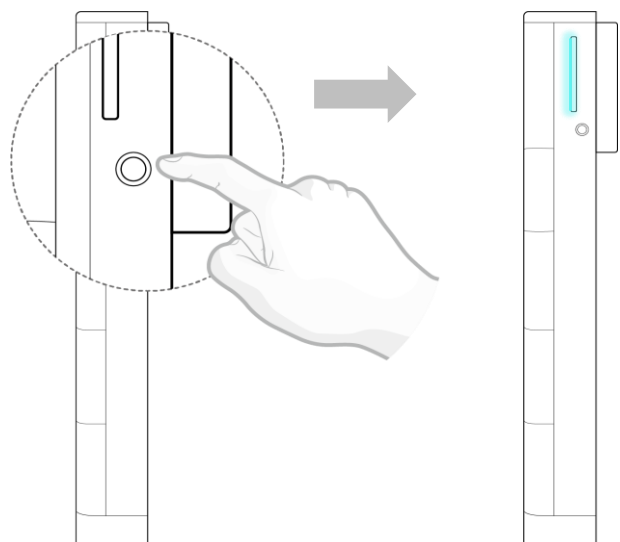
Add end user's phone number, and add any comments if needed.

Click submit button & then click finish to return to home page.

After completing the finish step, return to home page. Select an appropriate operation mode and Reserve SOC value according to energy usage preferences.

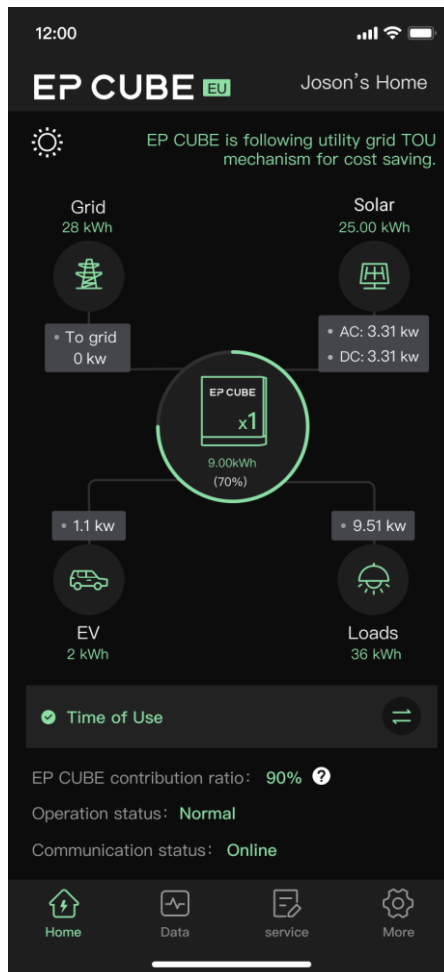


Now, install the side covers and switch on the EP Cube PCS via the power button as shown in the figure below



Observe and verify that EP Cube is working as per desired settings. Pay attention to EP Cube indication LED and energy flow on the EP Cube App.

Status	LED Indication	Description
Stand by Mode	Bright & Solid	Stand by
Run Mode	Faint & Solid	Normal Operation
Fault	Flash per 0.5s	Malfunction
Off	Off	



3. EP Cube System Energize and De-energize

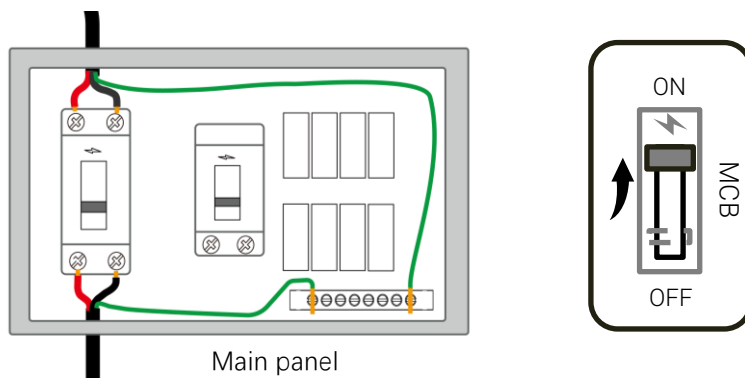
This section introduces the EP Cube system's energize and de-energize process.

3.1. EP Cube Energize

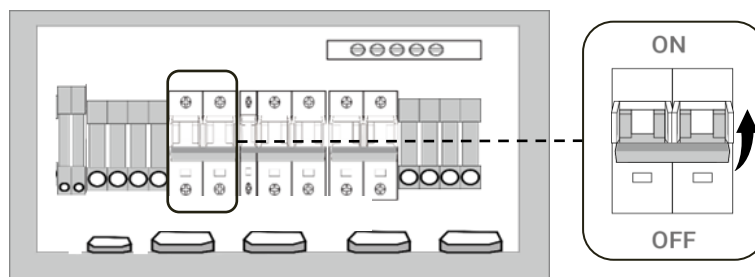
⚠ CAUTION:

- Please ensure all the cables are connected well before getting started.

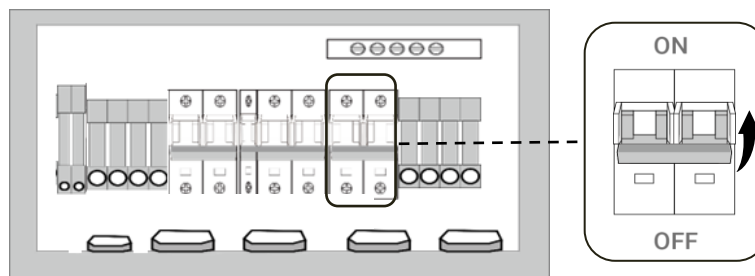
a. Turn on the Grid MCB inside the Main Home Electrical panel.



b. Turn on the MCBs (ON GRID Breaker & AC Boost Breaker) inside the AC Switch Box. Ensure that the Bypass MCB is turned off, and locked out & Tagged out.

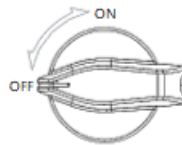


AC switch box

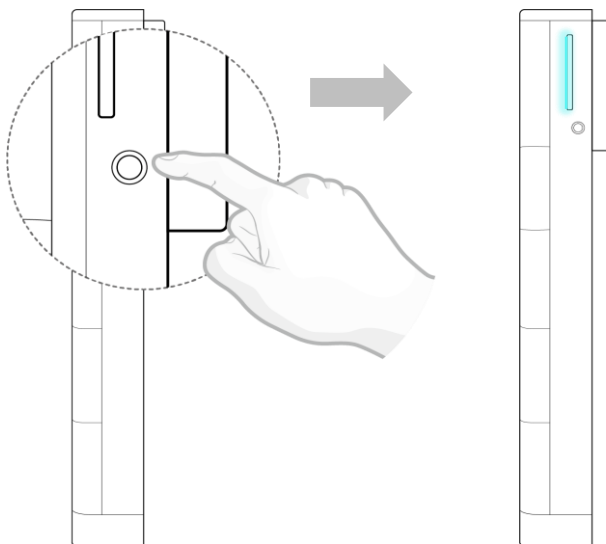


AC switch box

c. Turn on the PV Switch by turning knob from OFF to ON. Both PV1 & PV2 are controlled through a single switch.

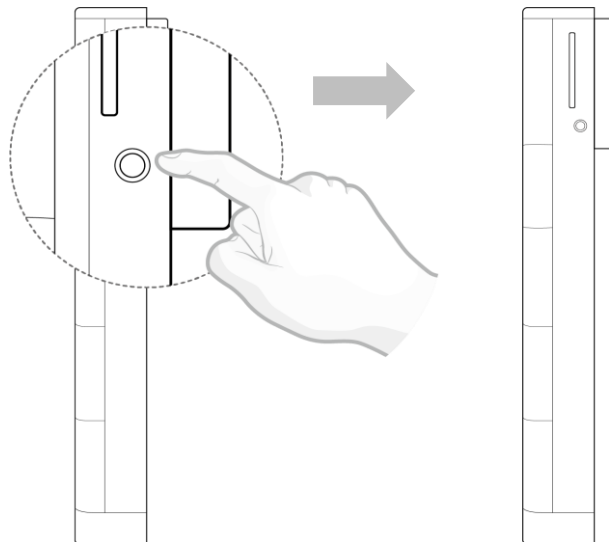


d. Switch on the EP Cube PCS via the power button as shown in the figure below

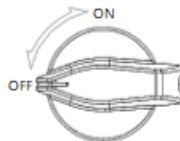


3.2. EP Cube De-energize

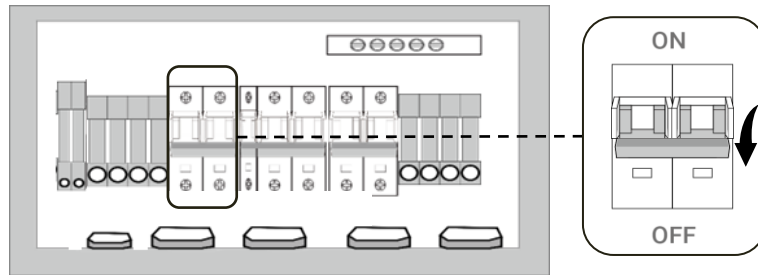
a. Switch off the EP Cube PCS via the power button as shown in the figure below



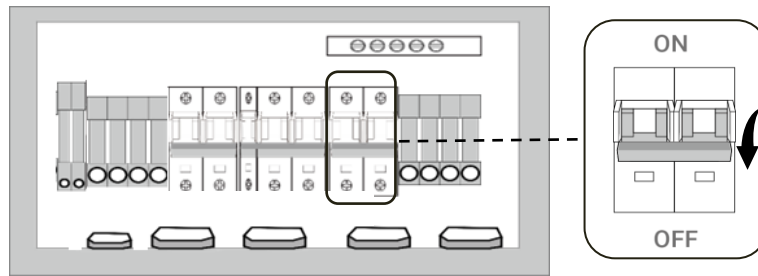
b. Turn off the PV Switch by turning knob from ON to OFF. Both PV1 & PV2 are controlled through a single switch.



c. Turn off the MCBs (ON GRID Breaker & AC Boost Breaker) inside the AC Switch Box. Ensure that the Bypass MCB is turned off, and locked out & Tagged out.

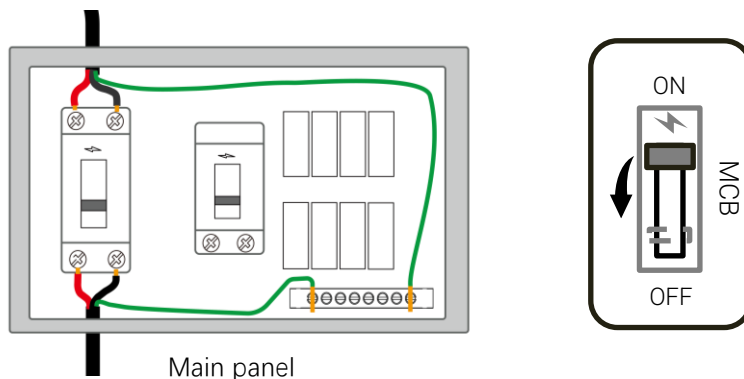


AC switch box



AC switch box

d. Turn off the Grid MCB inside the Main Home Electrical panel.



Main panel

TROUBLESHOOTING & MAINTENANCE

1- System Overload

EP Cube can provide continuous power up to 7.6kW. You can back up any number of appliances, so long as their combined power usage does not exceed the total power rating of your EP Cube system.

Starting some loads with a high inrush current during a power outage, like air conditioners and motors, may overload EP Cube and cause it to stop providing power to your home. If this occurs, turn off these loads, and EP Cube will attempt to restart automatically. Otherwise, consider manually restarting EP Cube.

During manual restart/cycling perform following steps:

- 1- Turn off the EP Cube PCS.
- 2- Turn off the Main Grid Circuit Breaker
- 3- Turn On the Main Grid Circuit Breaker
- 4- Turn on the EP Cube PCS (by pressing the power button on the right side of the PCS)

And system should be able to restart. . In that case you can check on the Indication LEDs on the right side of EP Cube PCS to see if LEDs are flashing or lit solid. If the system is in restart process, then LEDs will be flashing.

EP Cube have several warning associated with this particular case. You may expect one of the following on EP Cube App:

- a- Overload
- b- Severe Overload
- c- Off Grid power limit alarm, Please reduce the load in 5 mins

A soft start device should be used in combination with a large electrical appliance such as air conditioner to avoid frequent shut down due to high inrush current drawn by device at start up. While operating Off grid, EP Cube can support normal backup loads that does not require high LRA. Your device may exceed supported LRA value in start up stage, leaving EP Cube overloaded. Instead of drawing a massive amount of electric current instantly, the soft starter device increases the current supply gradually until the AC compressor starts working completely.

EP Cube APP

In an event of fault occurrence, EP Cube app can help narrow down the possible reasons behind a fault. your EP Cube App Installer account gives you access to Warning and Fault sections. Login and set your desired device as current device to see logged warnings and faults. If you find out a certain fault logged in the list of faults, please refer to EP Cube Guidelines on Troubleshooting Codes for more information on relevant errors, maintenance and corrective actions to be performed to restart the system.

APPENDIX

Technical Specs: Please refer to Technical datasheet for more specific parameters.