



EP CUBE



3Phase Installation Manual V1.5

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1. 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 Cube2 IEC-T-10G;

EP Cube2 IEC-T-15G; EP Cube2 IEC-T-20G; EP Cube2 IEC-T-25G; EP Cube2 IEC-T-30G; EP Cube2 IEC-T-35G; EP Cube2 IEC-T-40G.

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.

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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://epcube.com/eu/documents.html>

1.7 Abbreviated Terms

ABBR	Description
AC	Alternating Current
CT	Current Transformer
DC	Direct Current
HES	Home Energy Storage
L	Line
N	Neutral
PV	Photovoltaic
SOC	State of Charge

1.8 Contact Us

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2. 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 malfunctions of equipment, 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 situations which, if not avoided, will lead to death or serious injury.

 **CAUTION:** Indicates situations in which attention is necessary to avoid potential injury or property damage.

2.1 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 case of irritation of the skin, eyes or mucous membranes, consult a doctor.
3. Contact the EP service team for more instructions on how to handle EP Cube system.
4. 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 3PH system works with a nominal voltage of 380/400 Volt, supporting TN/TT earthing systems.

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 to cool the battery modules and therefore prevent thermal runaway in battery modules which are still intact.

2.2 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.

2.3 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 personal hazards in certain operations, and are able to take protective measures to minimize the hazards on themselves and other people
Operators	operation personnel, other than trained personnel and professionals, who may come in contact with the equipment.

2.4 Personal Protective Equipment

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



2.5 Electrical Safety

2.5.1 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.

2.5.2 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 them from being damaged by sharp edges or burrs.
5. When the temperature is 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.
2. 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.
3. Do not damage the ground conductor.
4. Do not operate the equipment in the absence of a properly installed ground conductor.
5. 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.

2.5.3 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 EP Cube.

2.5.4 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 systems.
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 electrolytes are combustible, toxic, and volatile.
 - b. Battery thermal runaway can generate flammable and harmful gases such as CO and HF.

2.5.5 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. Recommended storage temperature: 0–35° C; for shelf life up to 1 year.
 - b. Ambient storage temperature: -20–0° C and/or 35-50° C; for shelf life of 1 month.
 - c. Relative humidity: 0% to 95%.

It is recommended that battery modules be charged after 6 months of storage to avoid any irreversible damage. Refer to the “Technical Note EP Cube Battery Module Storage” document for more details regarding storage and charging.

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.

2.5.6 Transportation Requirements

Before transportation:

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 rain, snow, or submersion in water.
 - b. Falling or mechanical impact.
 - c. Being upside-down or tilted.

2.5.7 Installation Environment Requirements

1. The installation and use of the environment must meet 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 driveway. 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. 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. Do not install EP Cube at an extremely low temperature outside the operating temperature range. EP Cube batteries cannot be charged in temperature below 0°C.
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 EP cube outdoors in salt-affected areas directly exposed to sea breeze because it may corrode. A salt-affected area refers to the region within 500 meters from the coast or prone to sea breeze. Please consult the EP Cube technical support on the use of EP Cube in special climates (i.e. salt, sulfur, or ammonia areas) which may affect the product warranty.

2.5.8 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.

2.5.9 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 multimeter.
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.

3. PRODUCT DESCRIPTION

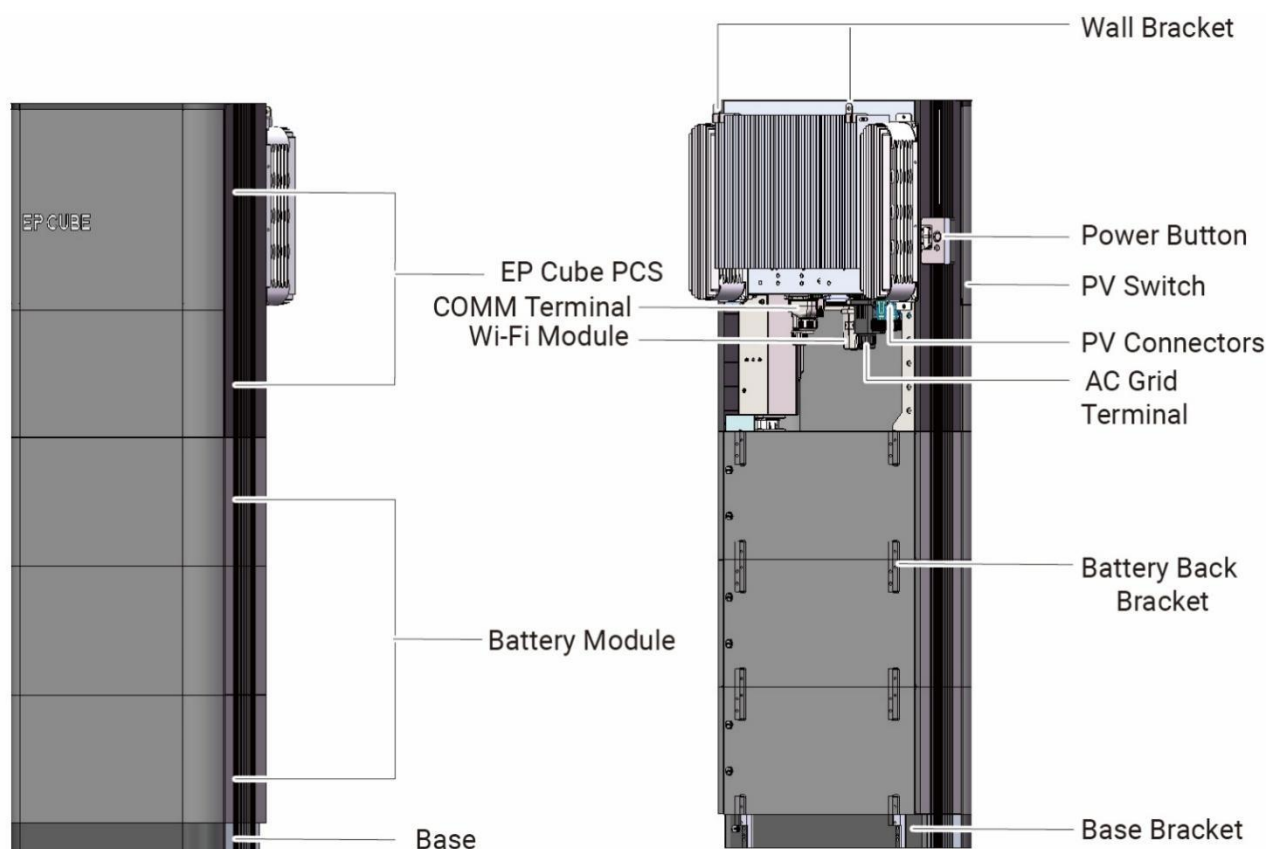
The EP Cube HES consists of the EP Cube PCS and Battery Modules as standard components. Optional accessories are also available besides EP Cube HES and users can choose according to site and customer-specific needs.

3.1 Appearance

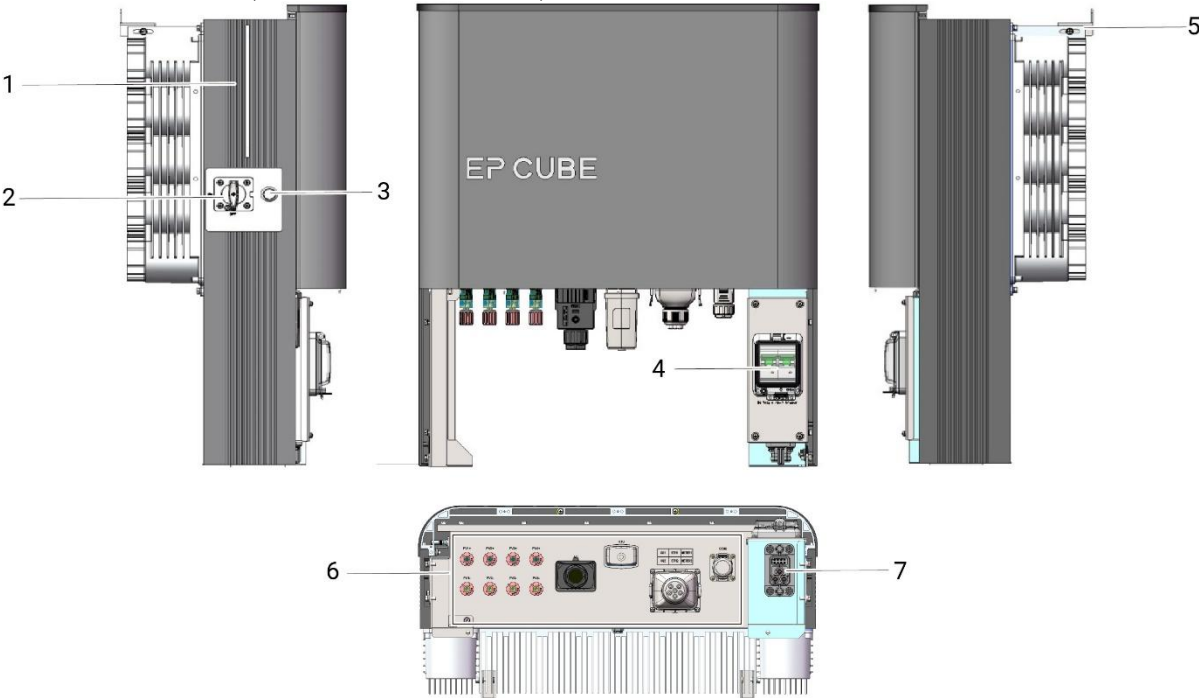
EP Cube HES

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 8 modules connected in series with EP Cube PCS. (Refer to EU Specification for more details)

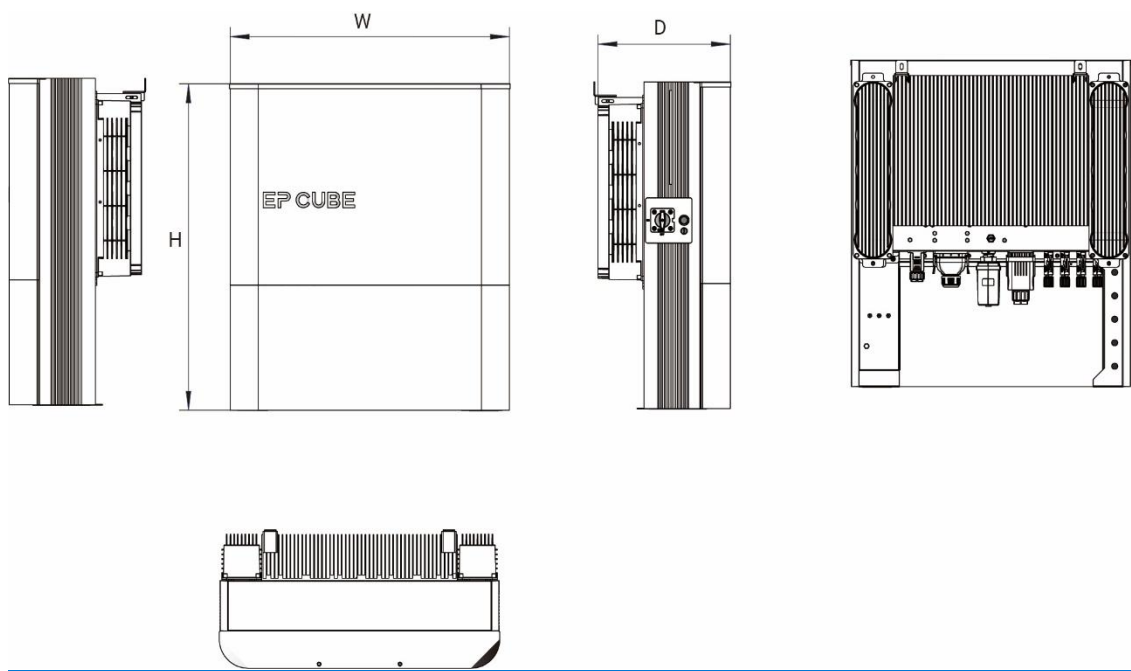
Reference Model: EP Cube2 IEC-T-15G EP Cube PCS + 3x Battery Modules



A. EP CUBE PCS (EP Cube HEU2-T12G1)

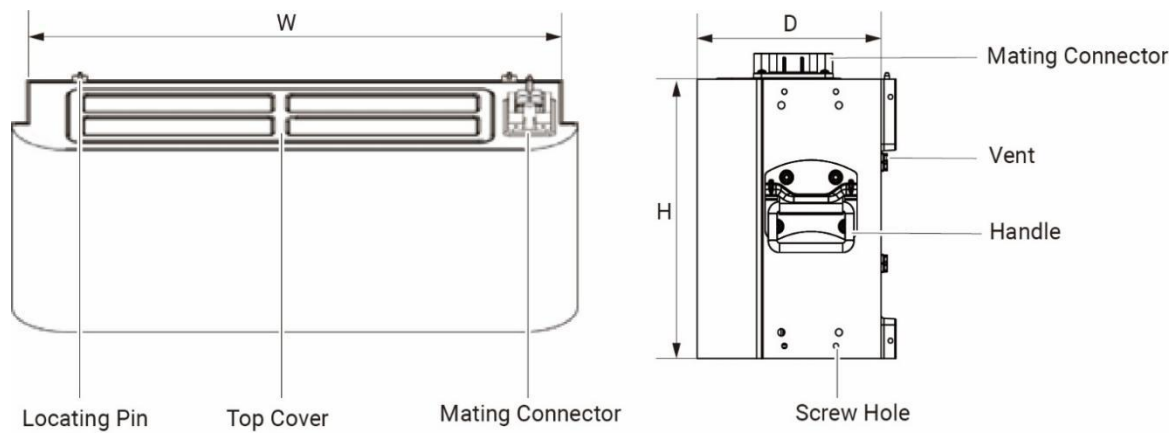


No.	Name	Description
1	LED Indicator	Indicates the current working state of the inverter
2	PV Switch	Disconnect and connect PV
3	Power Button	Power on and power off PCS
4	Battery breaker	Battery switch with protection (Over current and short circuit protection)
5	PCS Bracket	Fix the inverter on the wall
6	Wiring area	Includes DC terminals, AC terminals, communication terminals and an additional grounding terminal.
7	Battery connector	Connect to battery



W	H	D	Weight
600 mm	695mm	285mm	48kg

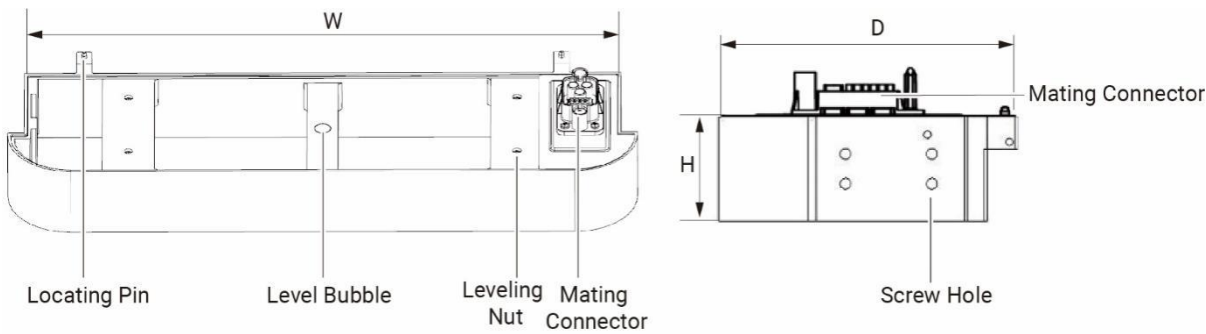
B. EP Cube Battery Module (EP Cube B2-5G2)



W	H	D	Weight
600mm	266mm	200mm	42kg

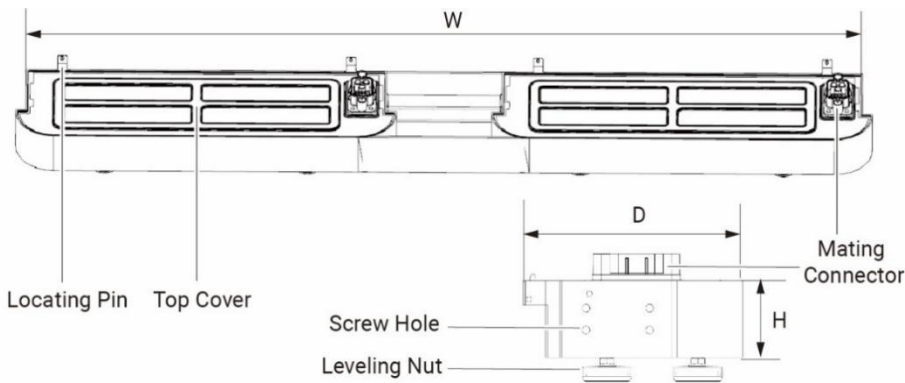
C. EP Cube Base

a. Single Base (EP Cube Base2-G4 or EP Cube Base2-G5)

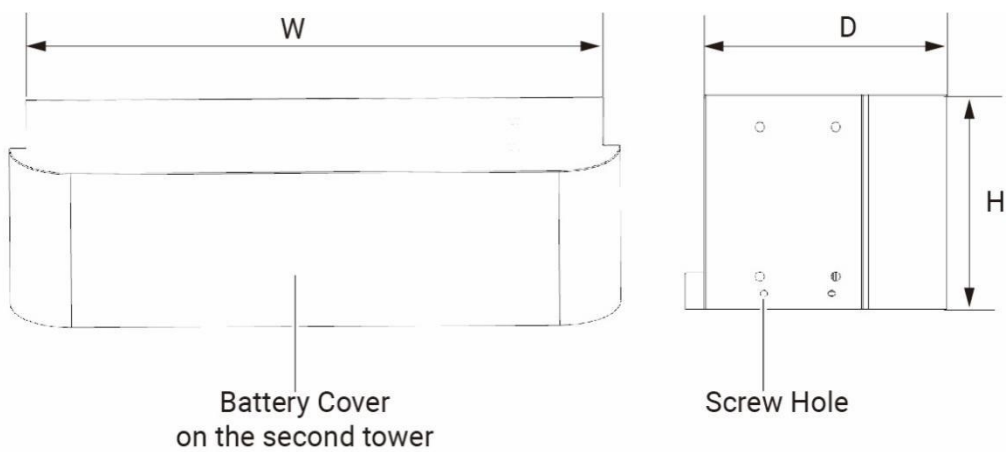


W	H	D	Weight
600mm	70mm	200mm	3.5kg

b. Double Base (EP Cube Base2-G3)

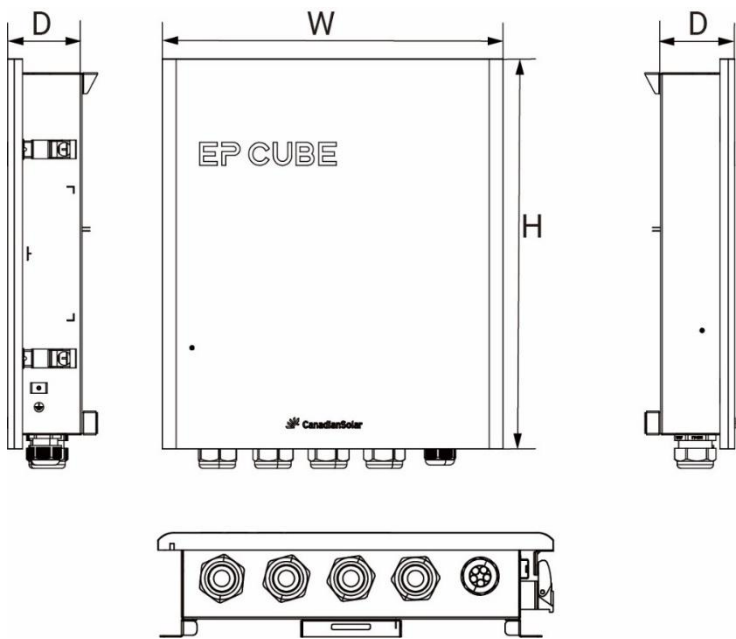


W	H	D	Weight
1350mm	95mm	200mm	9kg



W	H	D	Weight
600mm	165mm	200mm	3.5kg

D. EP Cube Smart Gateway (Optional)



W	H	D	Weight
490mm	590mm	130mm	18kg

3.2 Operation Modes

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

3.2.1 Self-Consumption Mode

During this mode power generated by PV is utilized to supply power to connected loads as a priority. In the daytime, the PV system supplies power to loads and battery modules. Any surplus power is then used to charge the battery modules. Only once battery modules are fully charged, power is exported to grid. At night, the batteries and power grid supply power to loads. This mode maximizes the use of PV power.

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

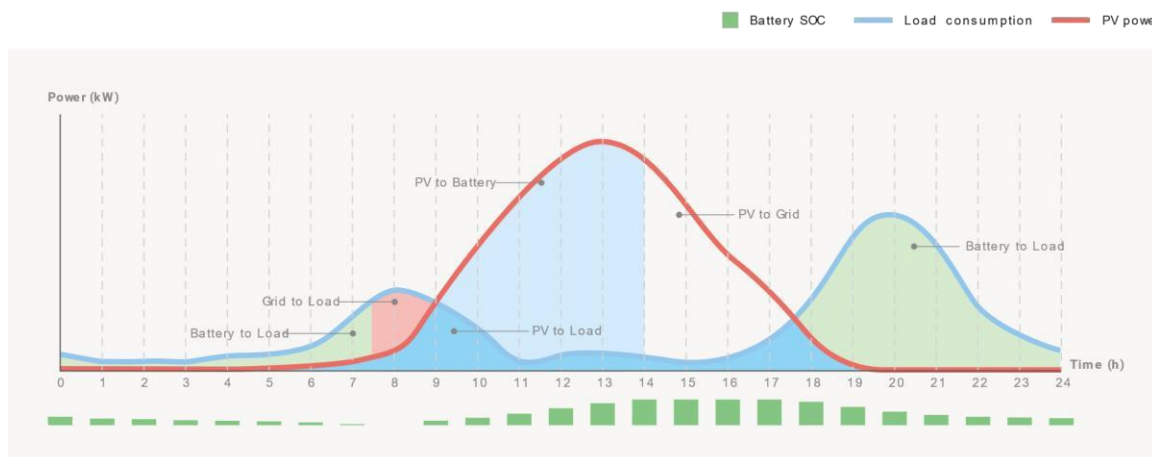
- If $PV > \text{Loads}$, the excess PV electricity will charge the battery. If the battery is fully charged, and the PV electricity is allowed to be exported to the grid, then the excess PV electricity is exported to the grid; If the PV electricity is not allowed to be exported, the PV will be restricted to the load only.
- If $PV < \text{loads}$, then battery will not be charged, and grid power will be used to support the loads.

When battery reaches the reserve soc, it is not discharged to the loads.

NOTE: During off-grid operation, the battery SOC can only be discharged to 15%. This is to ensure that battery does not completely drain during prolonged grid outage or in severe weather conditions.

- PV Power Usage Priority: Load > Battery > Grid
- Load Energy Source Priority: PV > Battery > Grid
- Battery Charging Source: PV only

Once the EP Cube SOC reaches the value of Reserve SOC (set through the app) household loads will be supported by grid power. The self-consumption mode is depicted in the following figure:



3.2.2 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.

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

During Off-peak hours, the EP CUBE will be charged from PV as the priority power source. If PV power is not sufficient, then the end-user can allow the EP CUBE to charge from the grid at a low price of electricity, to ensure that battery modules are fully charged before peak hours.

- Battery Charging Source: PV > Grid
- Load Energy Source Priority: PV > Grid

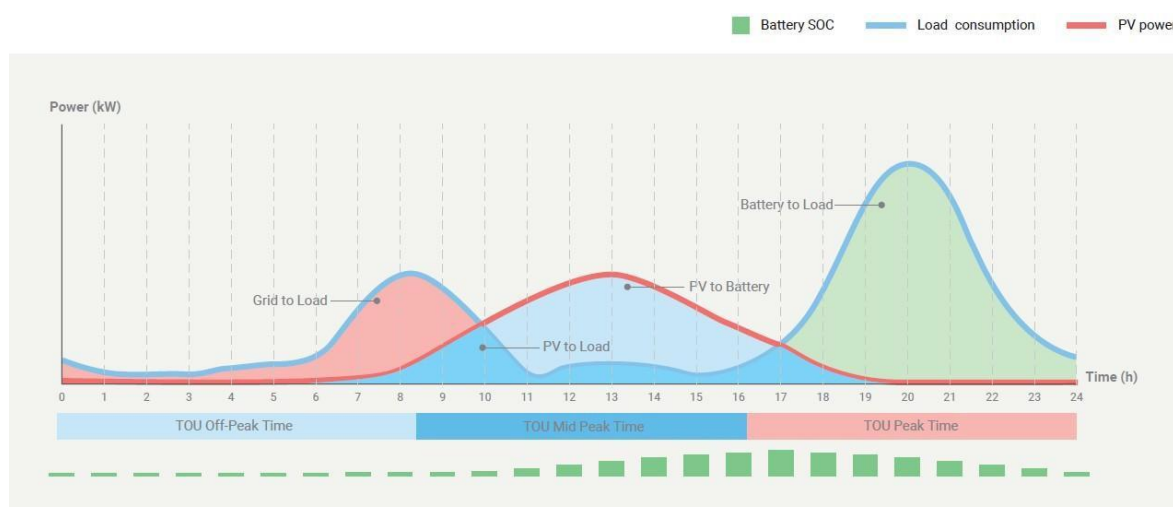
During mid peak hours, loads are supported by PV as priority power source. Any additional consumption is covered by grid. The battery does not discharge during the mid peak hours (Except off-grid operation). PV is the only battery charging source during mid peak hours.

In case PV is available, and PV > loads, surplus PV will be used to charge the battery as much as fully charged. When battery is fully charged, if electricity is allowed to be sold, the excess PV energy will enter the grid. If it is not allowed to enter the grid, the PV power will be limited to the load only.

- PV Power Usage Priority: Load > Battery > Grid
- Load Energy Source Priority: PV > Grid
- Battery Charging Source: PV only

During peak hours, the EP CUBE supports the load's power consumption from PV power and battery to avoid using grid electricity at a high price. Loads are supported by PV and battery as priority power sources. Any additional consumption is covered by the grid. During peak hours, the system operation is similar to the "Self-Consumption" mode. The following figure depicts the system operation during TOU mode.

- PV Power Usage Priority: Load > Battery > Grid
- Load Energy Source Priority: PV > Battery > Grid
- Battery Charging Source: PV only



NOTE: During off-grid operation, in the case of no PV, there is a load, and the discharge will be carried out; the discharge ends at 15% of the off-Grid reserve SOC, and the discharge will be stopped.

When there is DC PV, and PV power > load power loads, PV will charge the battery, and finally the battery can be fully charged, then PV will be current-limited and only used for load.

If there is PV < load, PV + battery will support the loads.

Additionally, the EP Cube carries a Day-Light Saving Time (DST) function in case your peak and off-peak hours change when DST is active in your time zone. It allows the user to set different off-peak and peak hours for the months when DST is enabled.

3.2.3 Backup Mode

Smart Gateway is required to support this function.

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

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

NOTE: During off-grid operation, the battery SOC can only be discharged to 15%. So the value set by the user can't be lower than 15%, otherwise it can't enter the backup mode.

- PV Power Usage Priority: Battery > Load > Grid
- Load Energy Source Priority: Grid > PV > Battery
- Battery Charging Source: PV > Grid

3.2.4 Dynamic Pricing

This mode dynamically optimizes the charging and discharging strategies through intelligent algorithms based on tariff forecasts and PV and load predictions to reduce the electricity bills and increase the utilization rate of green electricity.

During this mode, customers need to set a threshold to decide the charging time. If customers are using stock exchange pricing and have to pay an additional fee per kwh depending on their energy contract, the threshold is the value as stock exchange pricing + additional fee.

■ Command Response:

Execute charging commands from the app at specified power.
Default to self-consumption if no command is received.

■ Load Priority:

Consumption: Battery charging > Load consumption (PV charges battery first; surplus powers load).

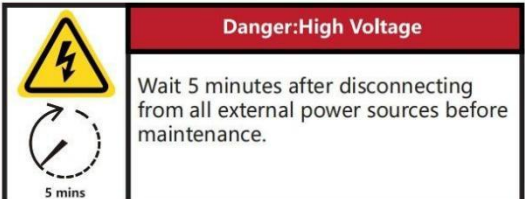
- Charging: PV > Grid.
- Discharging: PV > Grid > Battery.

■ Grid Charging Logic:

- If real-time price < threshold → Grid charging allowed
- If real-time price ≥ threshold → Grid charging stopped

3.3 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 authorized by EP Cube are allowed to install, operate and repair.
		
	Ref. to Documentation	Read the Instructions! A reminder 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.

3.4 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 the 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.

Notice: Please use the marker pen to mark the corresponding parameters.

EP CUBE	
EP Cube2 IEC-T- 10G□ 15G□ 20G□ 25G□ 30G□ 35G□ 40G□	
HYBRID INVERTER PARAMETERS	
Model	HEU2-T12G1
PV SPECIFICATIONS	
Max PV input voltage	1000Vdc
MPPTs	4
Number of input per MPPT	1
Max. PV power per MPPT	12kW
Max. PV input power	24kW
MPPT voltage range	85~850Vdc
Max. MPPT input current per MPPT	17Adc
Max. MPPT short circuit per MPPT	24Adc
AC SPECIFICATIONS	
Nominal grid voltage	3L+N+PE / 400Vac
Nominal frequency	50Hz
Power factor	0.8ind.~0.8cap.
Max. continuous power (On-Grid side)	10kW□ 12kW□
Max. continuous current (On-Grid side)	15Aac□ 18Aac□
Max. continuous power (AC-Backup side)	12kVA
Max. continuous current (AC-Backup side)	18Aac
SYSTEM PARAMETERS (only available when the Batteries Modules are connected)	
Battery quantity	2□ 3□ 4□ 5□ 6□ 7□ 8□
Cell technology	Rechargeable Li-ion Battery(LiFePO ₄)
Rated capacity	100Ah□
Nominal capacity	10kWh□ 15kWh□ 20kWh□ 25kWh□ 30kWh□ 35kWh□ 40kWh□
Nominal voltage	102Vdc□ 153Vdc□ 204Vdc□ 256Vdc□ 307Vdc□ 358Vdc□ 409Vdc□
Max. charge / discharge current	60Adc□
SYSTEM SPECIFICATIONS	
Ambient temperature (operating / recommended)	-20~50°C / 0~30°C
Ingress protection	IP65
Protective class	Class I
  	
Add:27th Floor,Building 3A,Longgang Intelligent Park,Shenzhen,China Web:www.etalnet-planet.com	
Made in China	

BATTERY MODULE	
EP Cube B2-5G2	
Battery type	Rechargeable Li-ion Battery (LiFePO ₄)
Rated capacity	100Ah
Nominal capacity	5000Wh
Nominal voltage	51.2V
Weight	42kg
Ambient operating temperature (charging)	0~50°C
Ambient operating temperature (discharging)	-20~50°C
Ingress protection	IP65
Protective class	CLASS I
Maximum elevation	3000m
  	
 Add:27th Floor,Building 3A,Longgang Intelligent Park,Shenzhen,China	
Made in China	

EP CUBE SG	
Model	SGEU2-50G1
ELECTRICAL SPECIFICATIONS	
Rated Voltage	3L+N+PE / 400V AC
Rated Frequency	50Hz
GRID AC Rated Current	50A
BACKUP AC Rated Current	50A
INV1/INV2 AC Rated Current	18A
OTHERS	
Ingress protection	IP65 (operating surface IP20C)
Operating Temperature	-20°C~+50°C
Dimensions (W x H x D)	490mm×560mm×130mm
Relevant Standards	EN IEC 61439-1 EN IEC 61439-3
 	
 Add.: 27th Floor, Building 3A, Longgang Intelligent Park, Shenzhen, China.	
Web:www.etalnet-planet.com	
Made in China	

4. EP Cube INSTALLATION

EP Cube can be mounted on the wall and comes with all required mounting brackets including the screws and fasteners needed for installation.

4.1 Installation Site Requirements

Complete site information by gathering data through a site survey.

A4.1.1 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.
- ☐ Places in salt-affected areas where it is directly exposed to sea breeze because it may corrode.

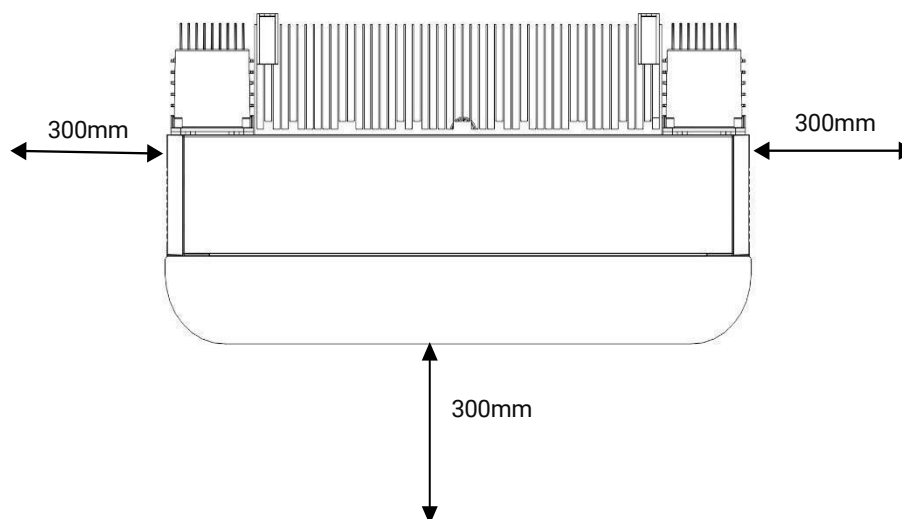
CAUTION

Installation considerations for the areas with extreme snowfall:

- ☐ It is highly recommended not to install EP Cube HES in places where it is directly exposed to snow or where snow can accumulate in surrounding spaces.
- ☐ Ensure to install a protective roof cover and snow fence in case the installation must be performed outdoors 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.

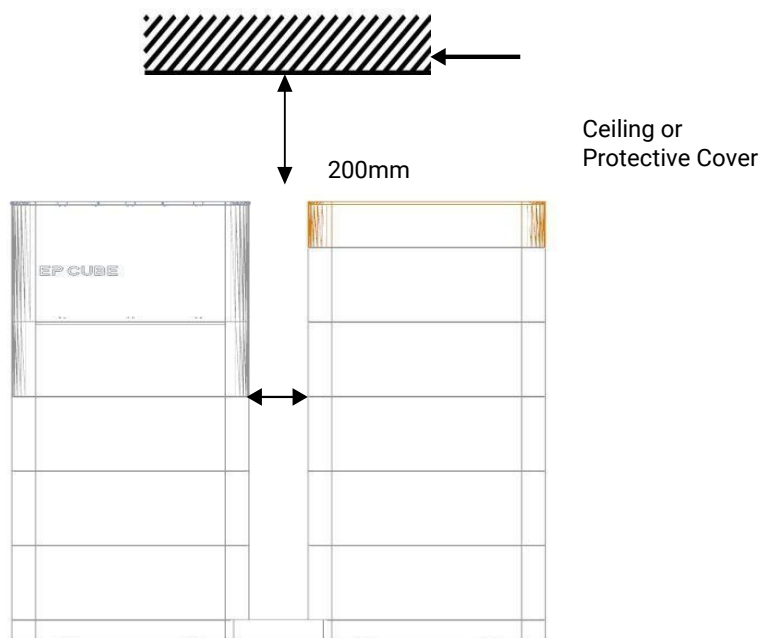
To ensure convenient installation and operation, all sides should have enough clearance for safe operation and installation while meeting the local electrical codes and regulations.

- 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.

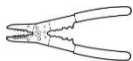
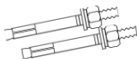


4.1.2 Required Tools

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

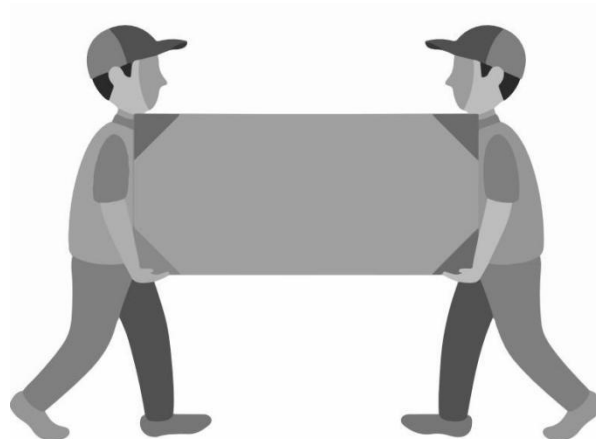
Tools & Materials

S. No	Icon	Tool	Specs/Quantity
1		Drilling Machine	With Drill bits
2		Cutter	1
3		Marking Pen	1
4		Tape measure	1
5		Hammer	1
6		Electric Screwdriver	Cross head
7		Spirit Level	1
8		Digital Multimeter	1
9		Socket Set	1

S. No	Icon	Tool	Specs/Quantity
10		Wire Stripper	1
11		Wire Cutter	1
12		Plier	1
13		Wrench	1
14		Insulation sleeve	As required
15		Cable Ties	As required
16		Anchor Bolts	As required, $\Phi 5.5 \times 60$
17		Crimping Tool	1
18		Wires	2.5mm^2 , $6\text{mm}^2 \sim 8\text{mm}^2$

4.1.3 Handling and Installation

NOTE: Two people are recommended.



4.1.4 Installation Space

To ensure a safe installation, please pay attention in choosing the right mounting method. 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 Cube2 IEC-T-10G	< 124.5 kg
EP Cube2 IEC-T-15G	< 146.5 kg
EP Cube2 IEC-T-20G	< 192 kg
EP Cube2 IEC-T-25G	< 234 kg
EP Cube2 IEC-T-30G	< 276 kg
EP Cube2 IEC-T-35G	< 318 kg
EP Cube2 IEC-T-40G	< 360 kg

Product Name	Weight
EP Cube PCS	48 kg
EP Cube Battery Module	42 kg
EP Cube Base	3.5 kg
EP Cube Long Base	7 kg

4.2 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 ground installation to fix the base to the wall, PCS wall bracket and for the optional wall mount kit, 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_5.5×60mm should be prepared.

4.2.1 Packing List

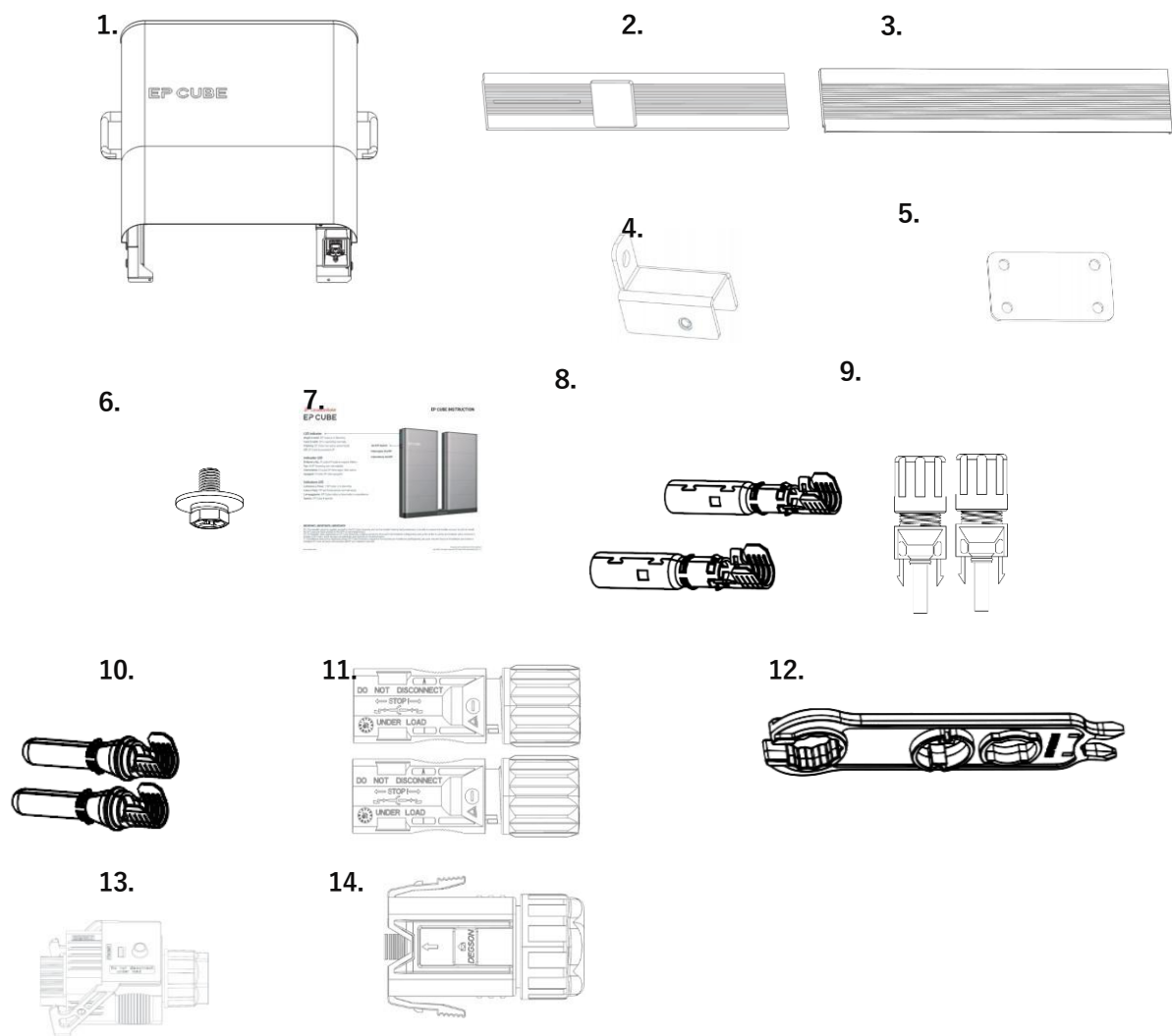
Below figure and table list down all the components that are required for successful installation. Please carefully unpack, locate and promptly contact EP if a component is misplaced or damaged during transportation.

Overview:

EP Cube PCS Box	Component	Quantity (PCS)
	EP Cube PCS-EU2-T12G1	1
	PCS Left decorative panel	1
	PCS Right decorative panel	1
	PCS Top bracket	2
	PCS Side Bracket	2
	M5 Screws	12
	Instructions page	1
	Davelan PV Connectors (Male)	4
	Davelan PV Connectors (Female)	4
	Davelan Connector Contact Pins (Male)	4
	Davelan Connector Contact Pins (Female)	4
	Davelan PV Connector disassembly tool	1
	AC connector	1
	Signal connector (Male)	1
Three Phase Smart Meter Box	Three Phase Meter	1
	CT (with 5m cables)	3
	Meter communication cable(10cm)	1
EP Cube Battery Box	EP Cube Battery Module	1
	Battery Module Side Cover	2
	Battery Side Bracket	2
	Battery Back Bracket	2
EP Cube Base2-G4 Box	Base	1
	Wall Mount Bracket	2
	Base Side Cover	2

EP Cube Base2-G4 Box	Component	Quantity (PCS)
	Base Bracket M6 Screws	4
EP Cube Base2-G3 Box	Base	1
	Wall Mount Bracket	4
	Base Side Cover	2
	Side Bracket	2
	Base Bracket M6 Screws	4
	Battery Cap	1
	Battery Cap side cover	2
	Side Bracket	2
EP Cube Wall Mounting Kit Box (Optional)	Wall Mount-Bracket E1	2
	Wall Mount-Bracket E2	1
	Wall Mount-Bracket M6 Screws	4
	Base Back Bracket	2
Smart Gateway Box (Optional)	Smart Gateway	1
	Top Bracket	1
	Position Paper	1

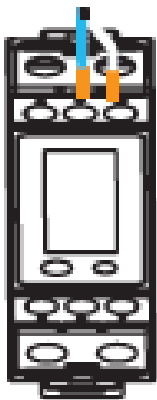
a. EP CUBE PCS BOX



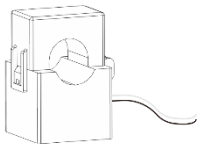
NO.	Component	Qty (PCS)
1	EP Cube PCS-EU2-T12G1	1
2	PCS Left decorative panel	1
3	PCS Right decorative panel	1
4	PCS Top bracket	2
5	PCS Side Bracket	2
6	M5 Screws	12
7	Instructions page	1
8	Davelan Connector Contact Pins (Female)	4
9	Davelan PV Connectors (Female)	4
10	Davelan Connector Contact Pins (Male)	4
11	Davelan PV Connectors (Male)	4
12	Davelan PV Connector disassembly tool	1
13	AC connector	1
14	Signal connector (Male)	1

b. Three-Phase Smart Meter Box

1.



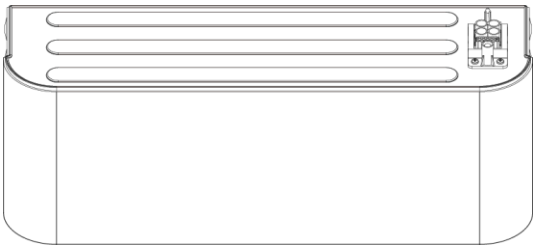
2.



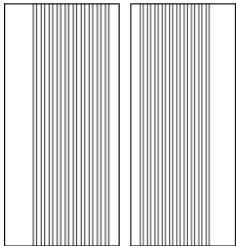
NO.	Component	Qty (PCS)
1	Three Phase Meter	1
2	CT (with 5m cables)	1

c. EP Cube Battery Module Box

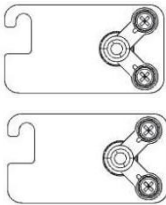
1.



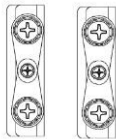
2.



3.



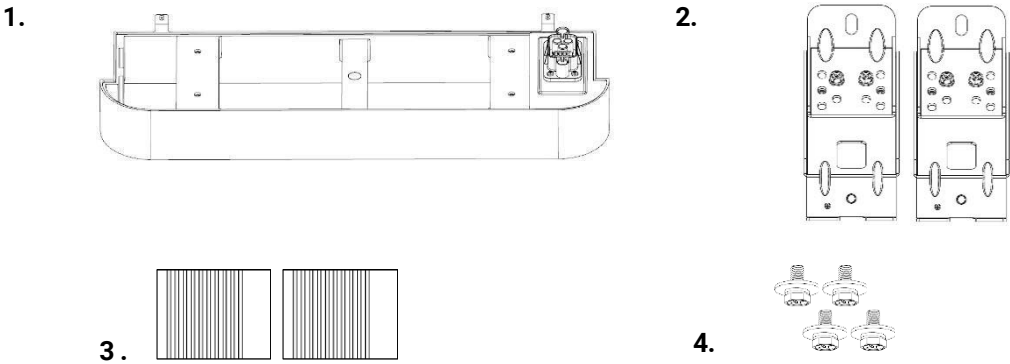
4.



NO.	Component	Qty (PCS)
1	EP Cube Battery Module	1
2	Battery Module Side Cover	2
3	Battery Side Bracket	2
4	Battery Back Bracket	2

NOTE: The Battery Back Bracket is optional when doing the installation. Put the Side Covers aside until installation is complete.

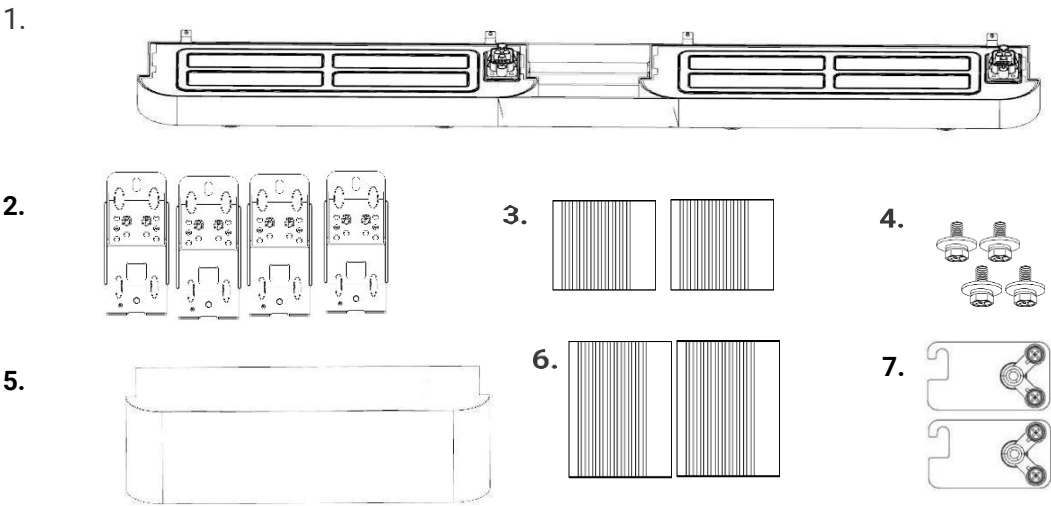
d. EP Cube Base2-G4



NO.	Component	Qty (PCS)
1	Base	1
2	Wall Mount Bracket	2
3	Base Side Cover	2
4	Base Bracket M6 Screws	4

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

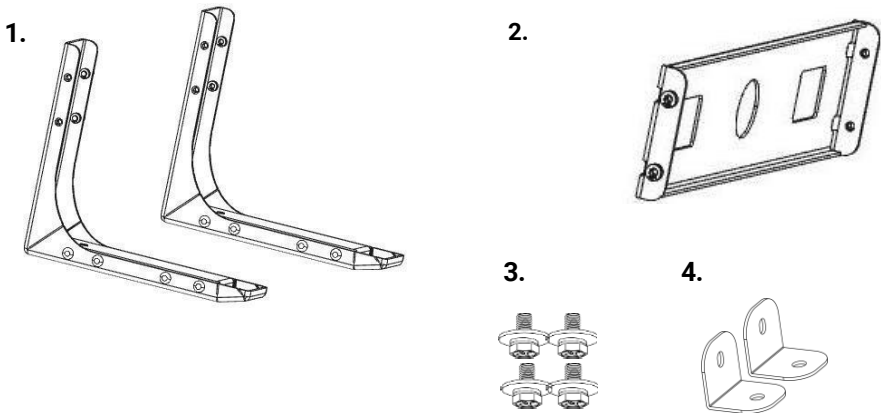
e. EP Cube Base2-G3



NO.	Component	Qty (PCS)
1	Base	1
2	Wall Mount Bracket	4
3	Base Side Cover	2
4	Base Bracket M6 Screws	4
5	Battery Cap	1
6	Battery Cap side cover	2
7	Side Bracket	2

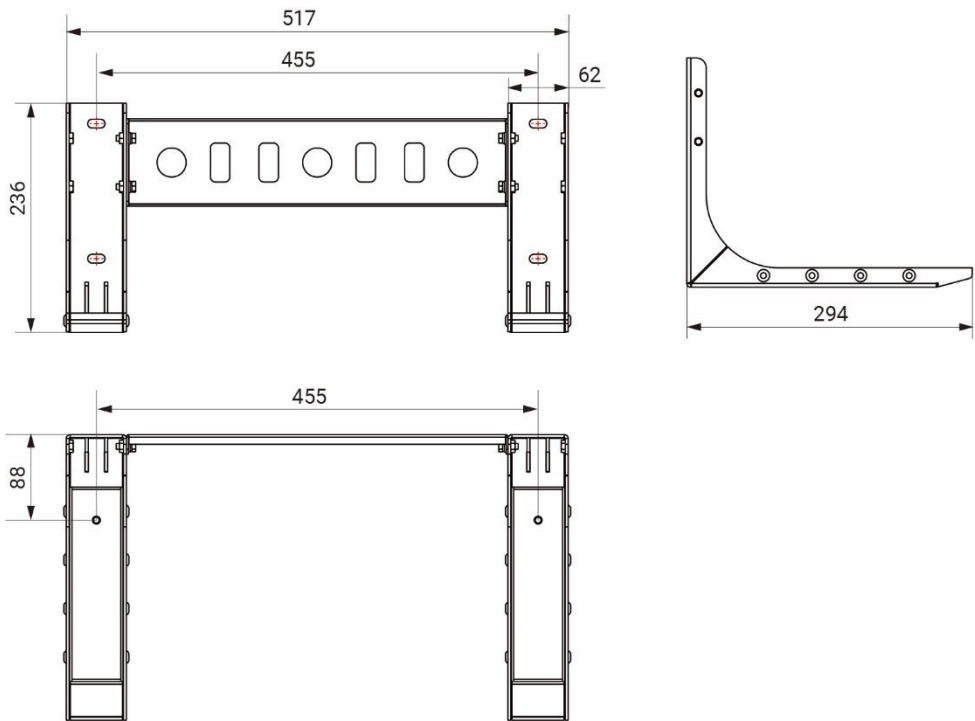
NOTE: When the battery number is ≤ 4 , we can choose Base2-G4 or Base 2-G3. When the battery number is ≥ 5 , please choose Base2-G3.

EP Cube Wall Mounting Kit Box (optional)



NO.	Component	Qty (PCS)
1	Wall Mount Bracket E1	2
2	Wall Mount-Bracket E2	1
3	Wall Mount-Bracket M6 Screws	4
4	Base Back Bracket	2

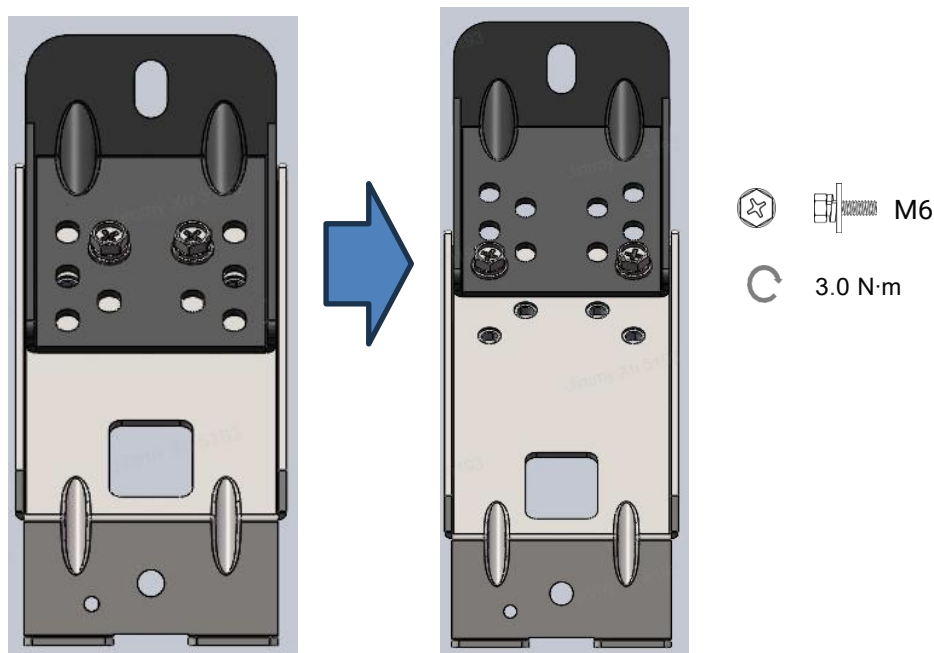
EP Cube Wall Mounting Kit Dimension



4.2.2 Installation Process

Floor mounted: Install the EP Cube Base on the floor (EP Cube Base2-G4)

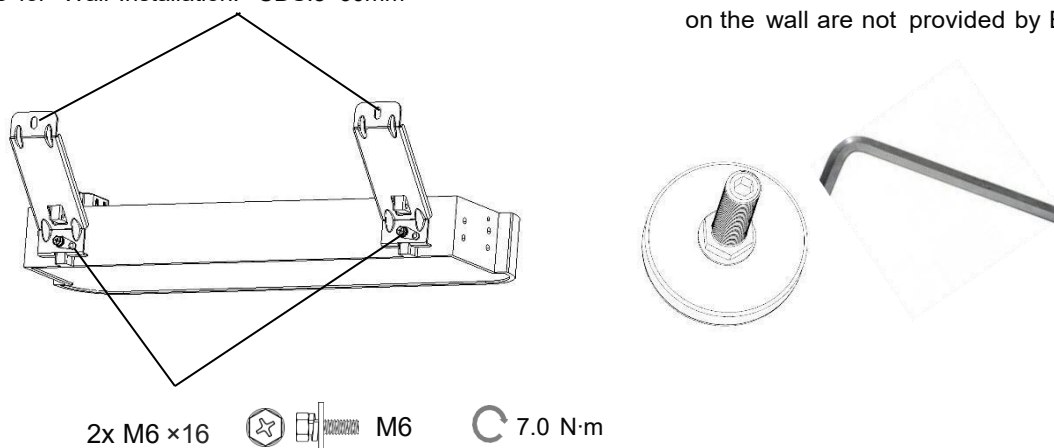
a. Please adjust the Wall Mount Bracket two bolts position as can be seen here:



b. Assemble the Wall Mount Bracket and base with the M6 bolts. Tighten the bolts with a screwdriver.

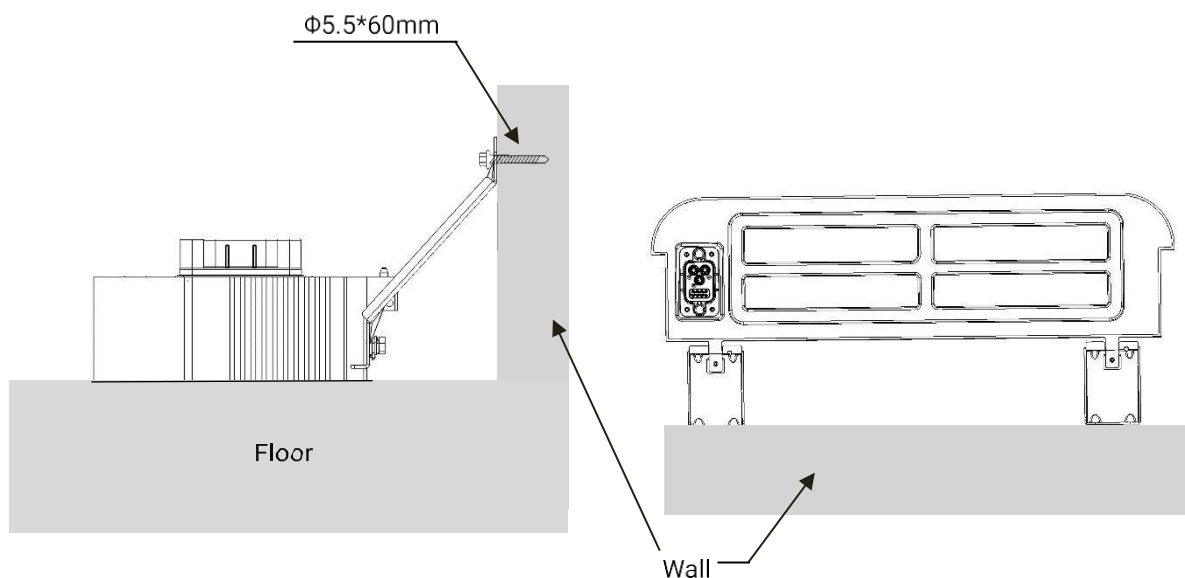
Holes for Wall Installation: CDS.5×60mm

NOTE: CI>S.5×60mm bolts for installation on the wall are not provided by EP.



NOTE: Please check if the floor is flat or not, if not, please use Allen key 5# to adjust the height, until the level bubble is in the center position.

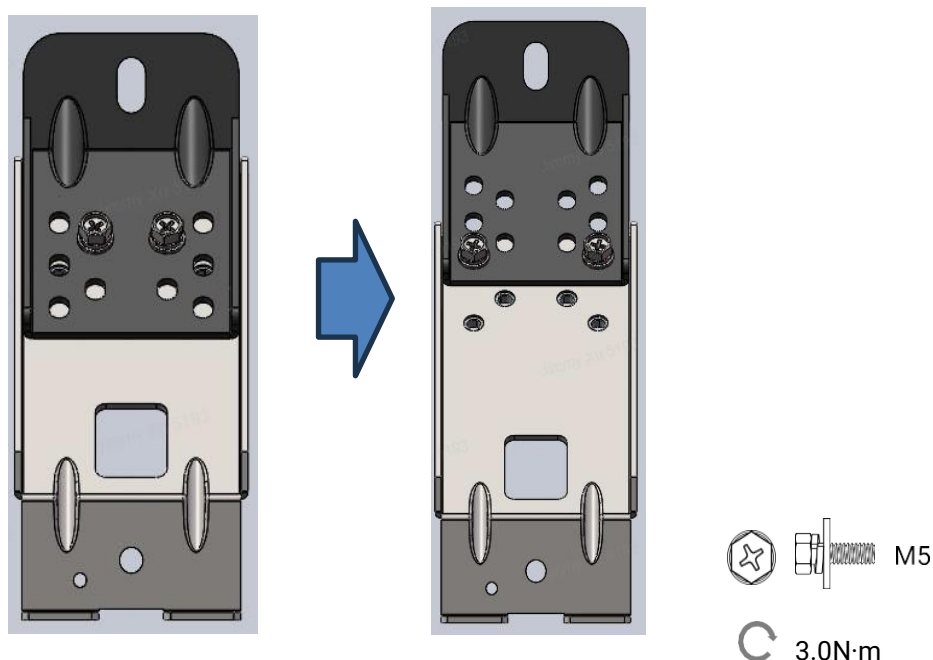
- c. Align the Wall Mount Bracket on the wall and mark the locations of the mounting holes. Ensure that the bracket is properly aligned and level with the help of a spirit level to avoid the risk of improper installation.
- d. Once drilling positions are marked, remove the base and use an appropriate drilling machine with a drill bit of Φ M6 to drill through the concrete wall. In the case of a wooden wall, drilling is not required.
- e. Check the Level Bubble state and use electric screwdriver to tighten screws to firmly secure the base to the wall.



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

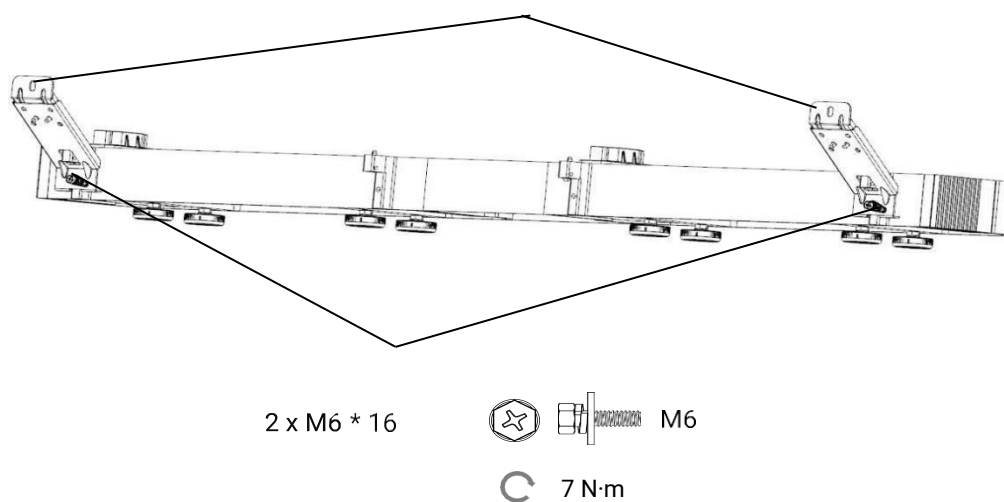
Floor mounted: Install the EP Cube Base on the floor (EP Cube Base2-G3)

- a. Please adjust the Wall Mount Bracket two bolts position as can be seen here:

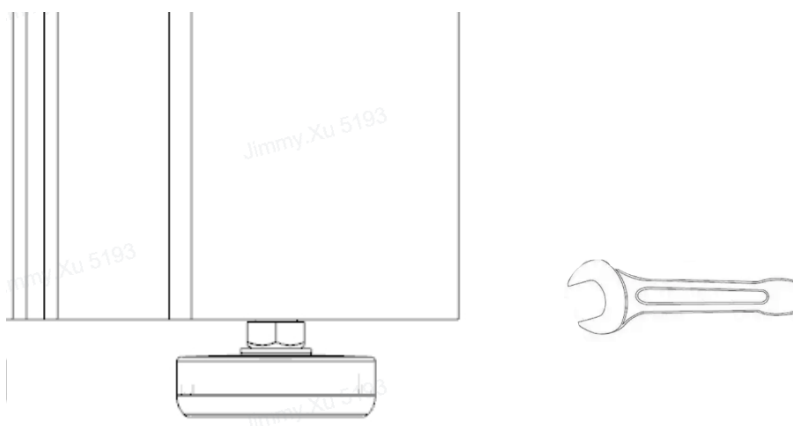


- b. Assemble the Wall Mount Bracket and base with the M6 bolts. Tighten the bolts by using the screwdriver.

Holes for Wall Installation: $\Phi 5.5 \times 60\text{mm}$



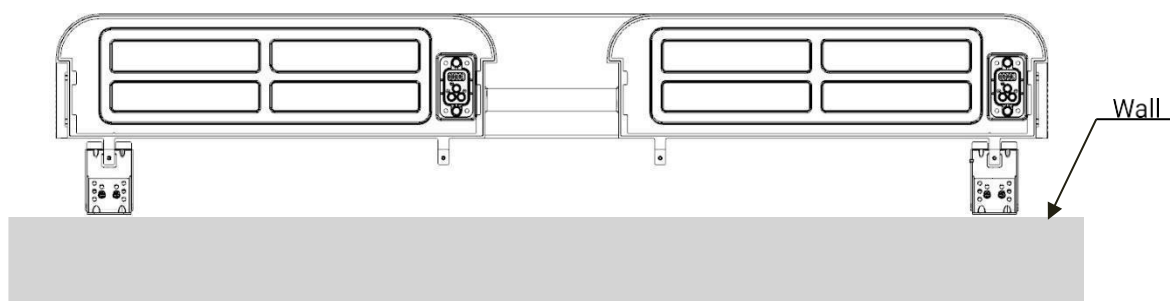
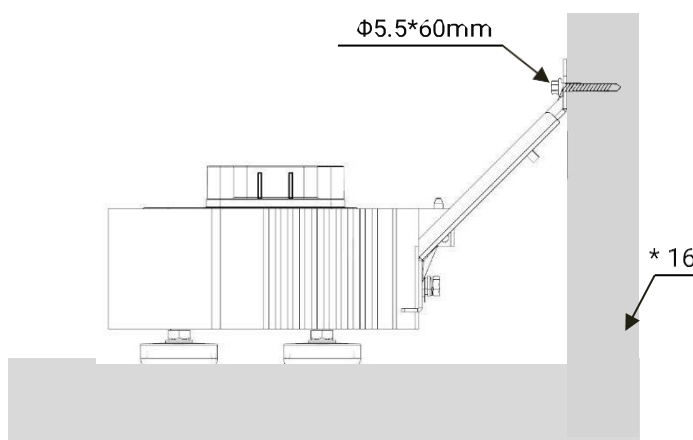
NOTE: $\Phi 5.5 \times 60\text{mm}$ bolts for installation on the wall are not provided by EP.



Note: Please check if the floor is flat or not, and if not, please use open-end wrench to adjust the height, until the base leveling is okay, and use leveling tool to double check here.

c. Align the Wall Mount Bracket on the wall and mark the locations of the mounting holes. Ensure that the bracket is properly aligned and level with the help of spirit level to avoid the risk of improper installation.

d. Once drilling positions are marked, remove the base and use an appropriate drilling machine with a drill bit of Φ M6 to drill through the concrete wall. In the case of a wooden wall, drilling is not required.

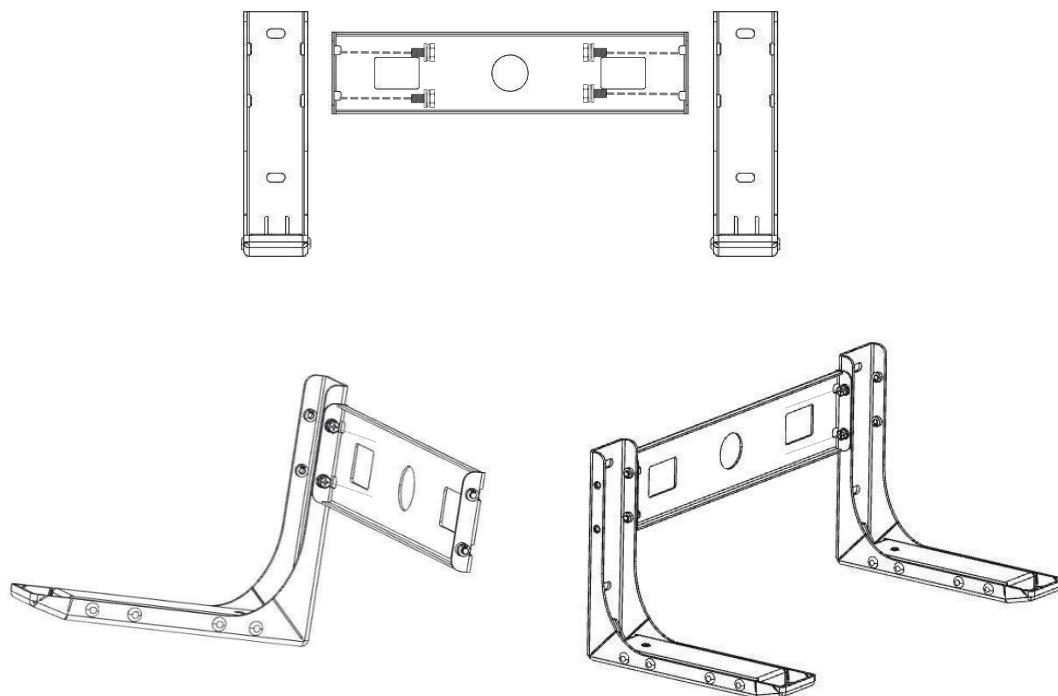


e. Check the leveling of installed base with spirit level and use electric screwdriver to tighten screws to firmly secure the base to the wall.

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

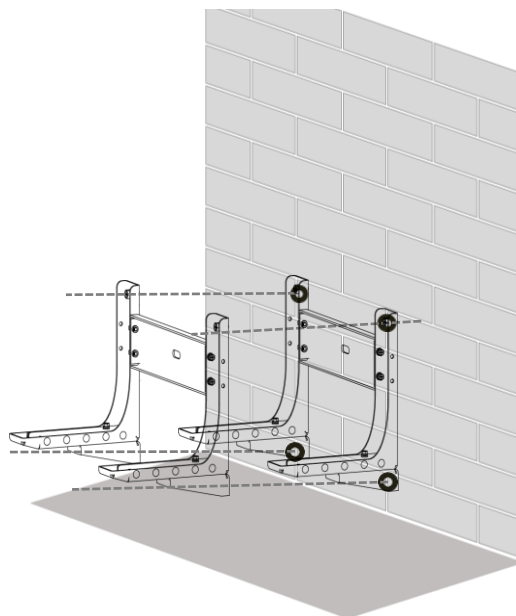
Wall mounted: Install Wall-mount Kit and Base

- 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 with a screwdriver.



- b. Place and align wall-mount kit (Bracket E) on the wall and mark the locations of the mounting holes. Ensure that the bracket is properly aligned and level with the help of spirit level to avoid the risk of 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 the case of a wooden wall, drilling is not required.



- d. After drilling the holes, insert anchor bolts into the drilled holes. Remove the washers and nuts. Position the wall-mount bracket on the bolts, place the washers and tighten the nuts by hand. Check the level of installed wall mount bracket with spirit level and use an electric screwdriver to tighten nuts to firmly secure the wall-mount kit to the wall.

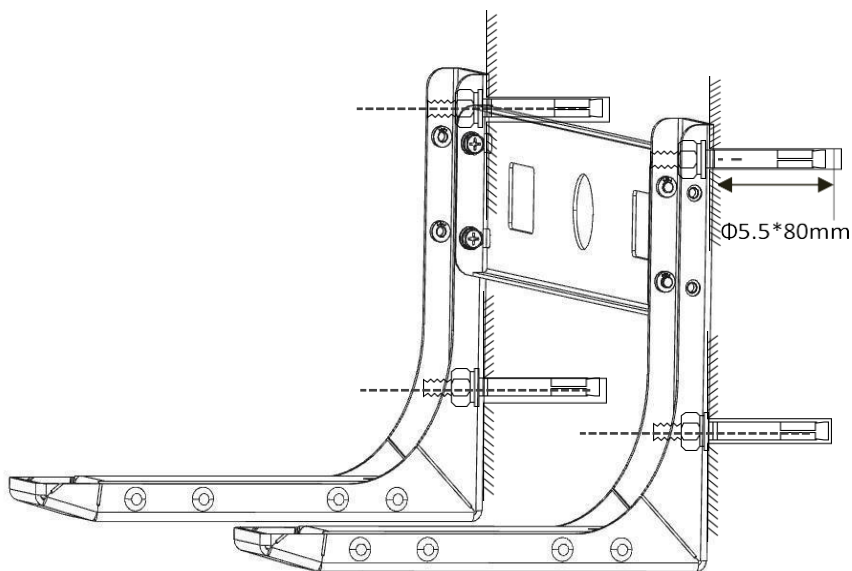


Fig. 4x Φ5.5 anchor bolts to install the Wall-mount Kit.

- e. Align the base bracket oval holes with the holes on the base, then use the screws (M6×20mm) to fasten together.
- f. Now, place the base with preinstalled 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 (M6×20mm) to fasten base to the wall-mount kit. Verify that the Base is level using the level tool.

NOTE: Wall-mount kit is compatible only with Base2- G4, it is not compatible with Base2-G3.

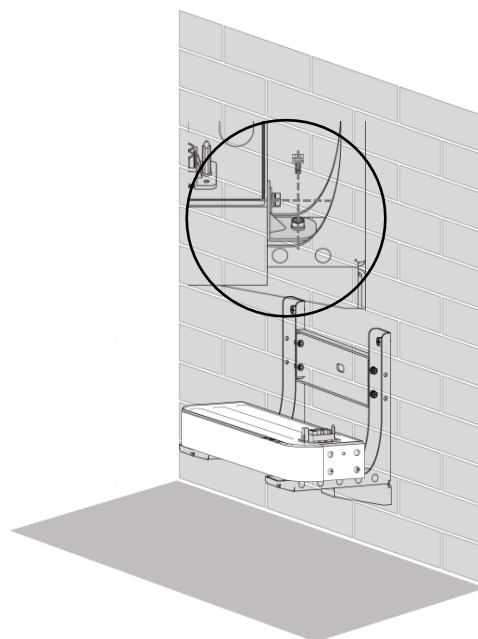
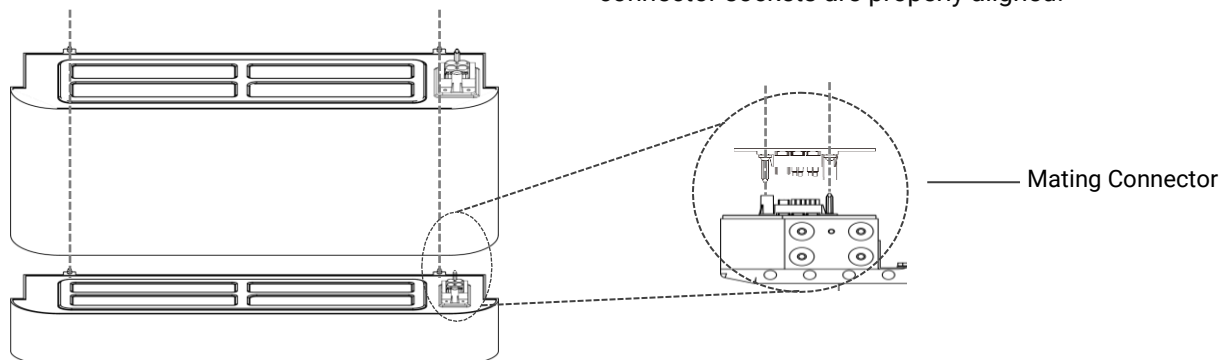


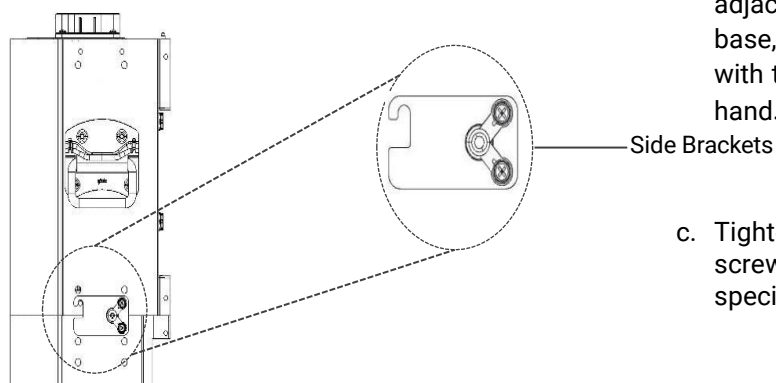
Fig. Fasten Base on Wall-mount Kit

Install the First Battery Module

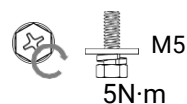
- a. Carefully place the First Battery Module on top of the base and ensure that the battery mating connector sockets are properly aligned.



- b. Fasten the side brackets between adjacent battery module and the base, on both the left and right sides with the screws, and tighten them by hand.

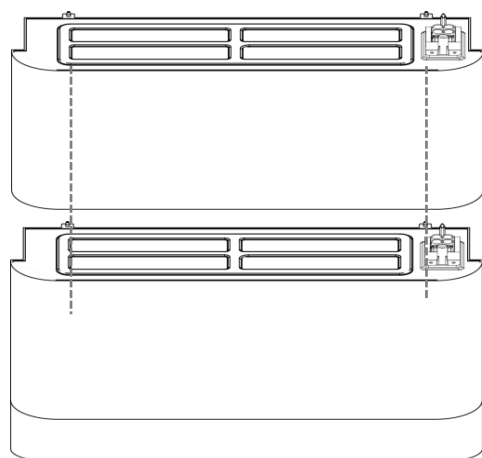


- c. Tighten all the screws with an electric screwdriver according to the specified torque values.



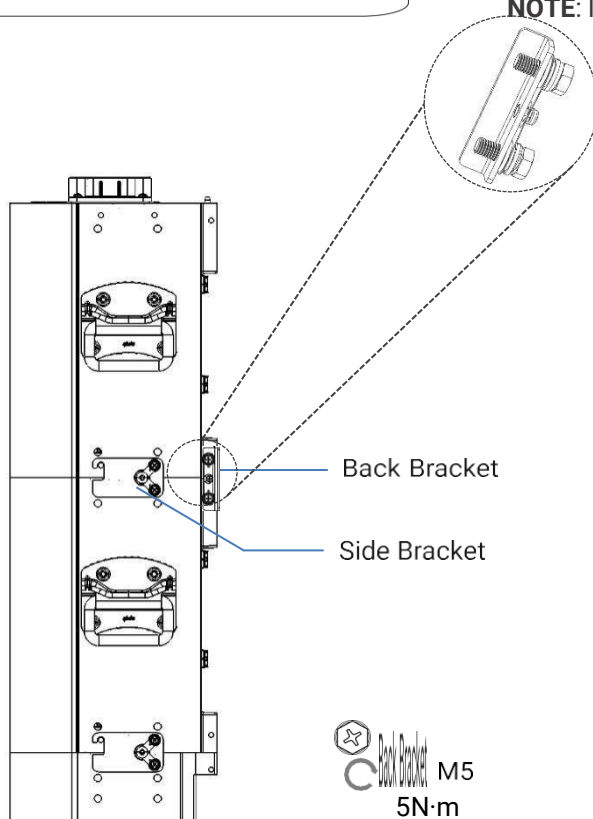
NOTE: Side brackets have the screws latched with the brackets.

Install the Second Battery Module



- Carefully place the Second Battery Module on top of the first Battery module and ensure that battery mating connector sockets are properly aligned.
- Fasten the back bracket between the 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.

NOTE: Installing the battery back bracket is optional.

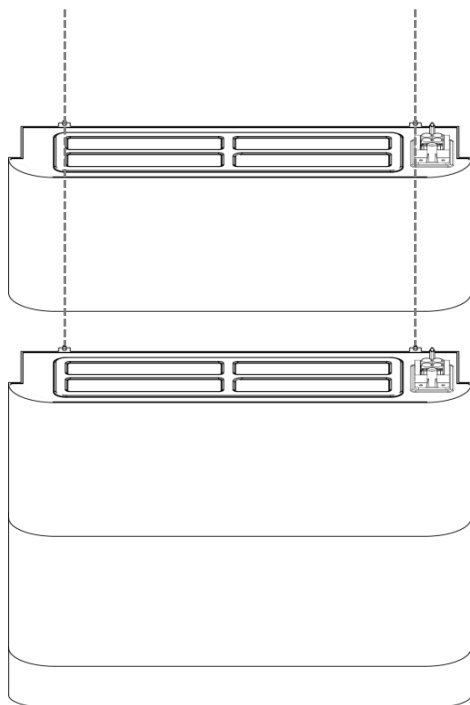


- Attach side brackets between adjacent battery modules, on both the left and right sides with the screws and tighten them by hand.
- Tighten all screws with an electric screwdriver according to the specified torque values.

Repeat steps and 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 installing the top modules.

Install the remaining Battery Modules



Carefully install the remaining Battery Modules one by one by repeating the steps “a” through “d”. Ensure that the battery mating connector sockets are aligned properly 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 the adjacent modules.

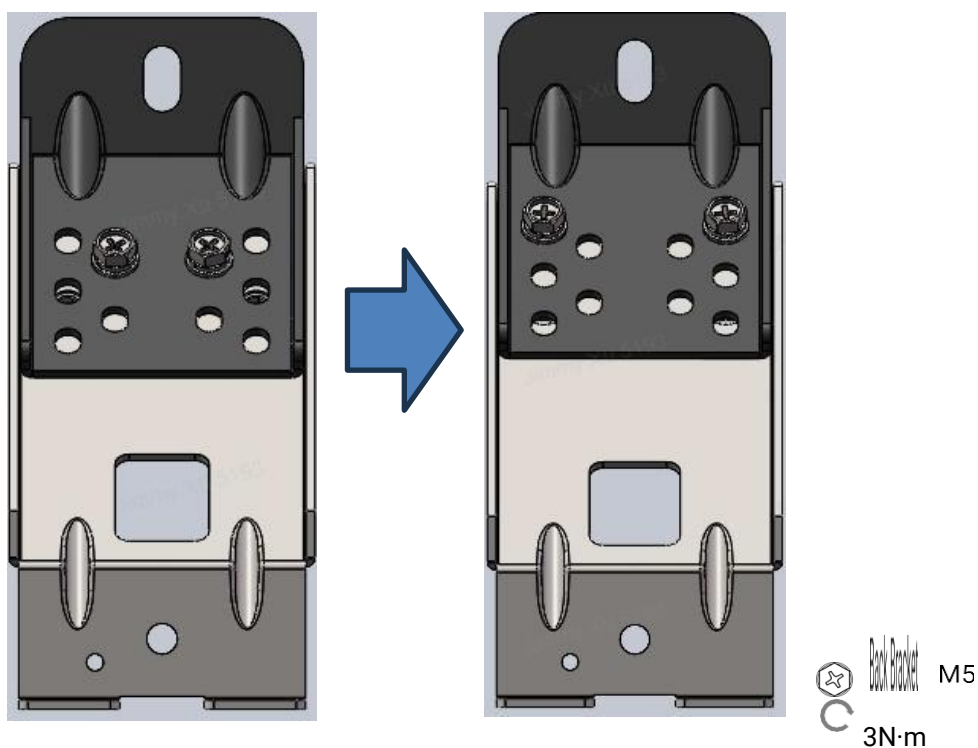
Tighten all screws with an electric screwdriver to the specified torque values.

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

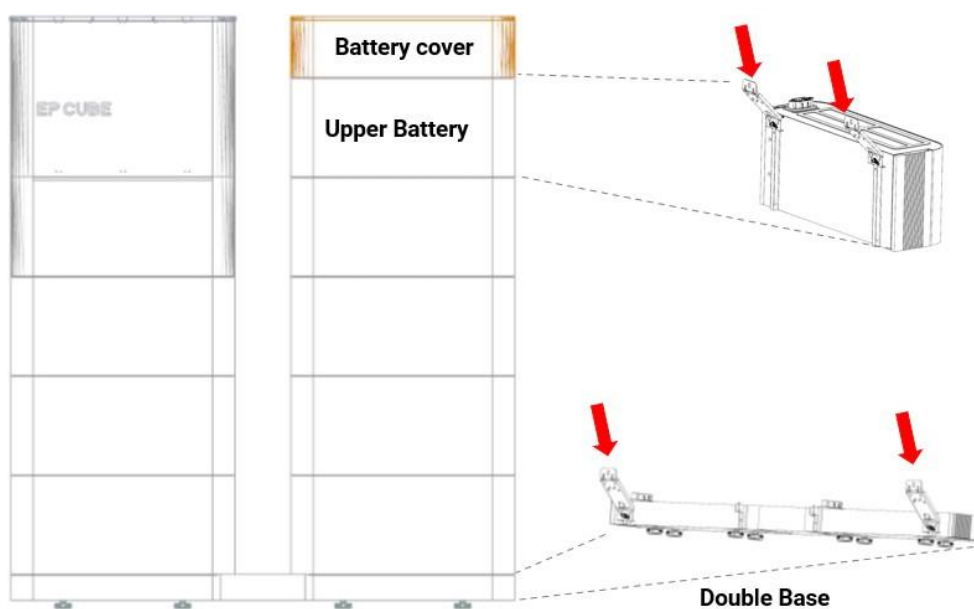
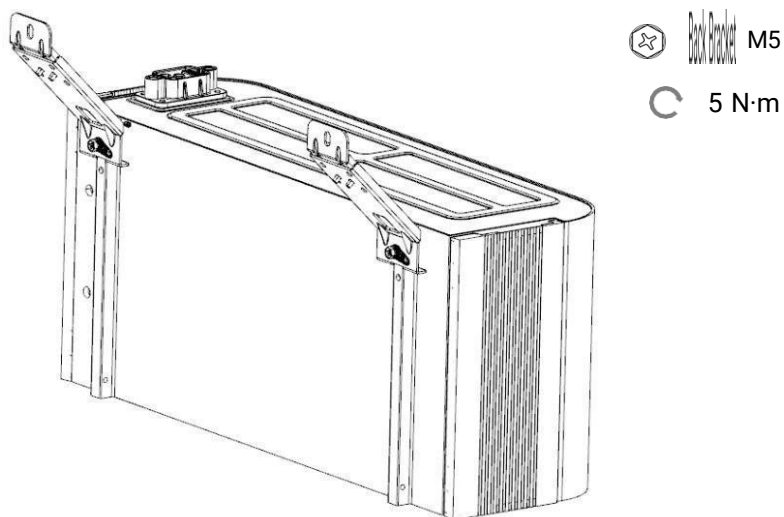
Install the top Battery Module in the long base (optional)



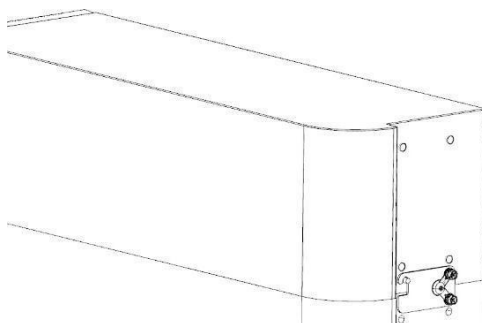
1. Please adjust the Wall Mount Bracket two bolts position as seen below:



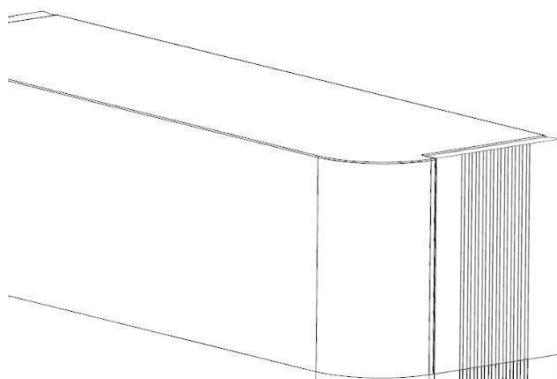
2. First, install the Wall Mount Bracket and mark the hole on the wall.
3. Drill the hole on the wall.



4. Install the top battery and then lock the nut onto the wall.
5. install the battery cap onto the top battery.

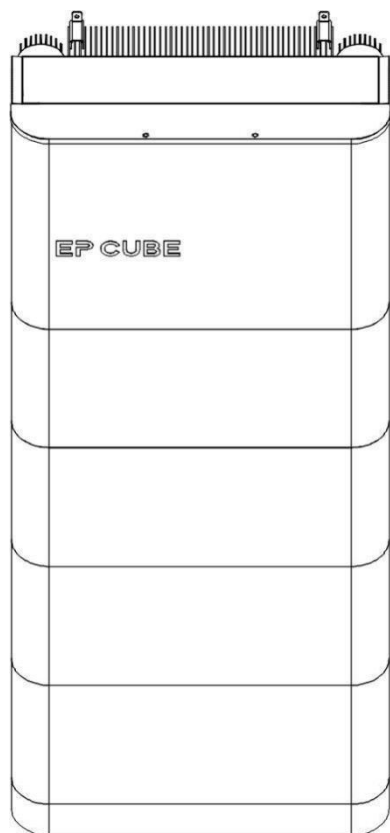


6. Install the side bracket to connect the battery. Lock the nuts in the battery and battery cap.
7. Install the decorative plate on the cap.

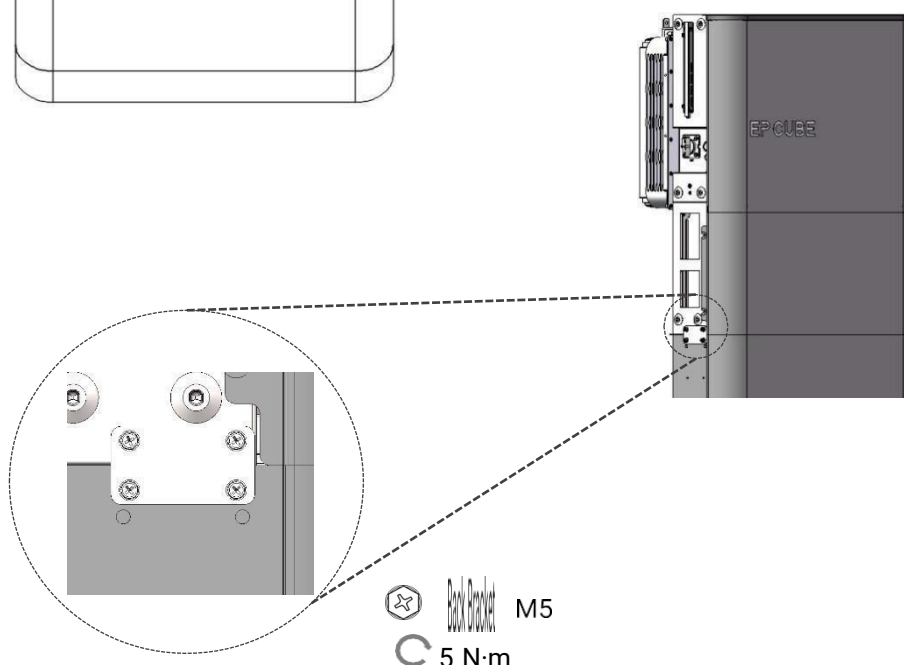


Notice: please tighten the screws on the battery cap.

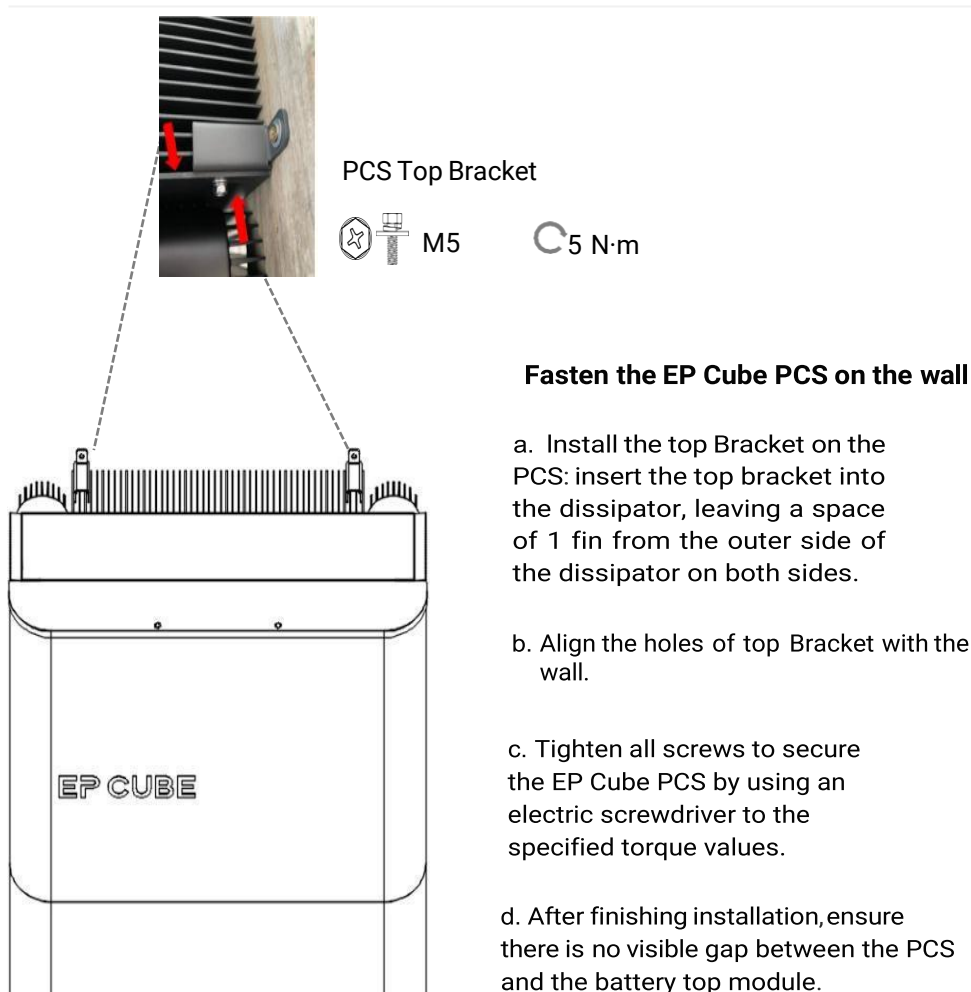
Install the EP Cube PCS



- Carefully place the EP Cube PCS on top of the last 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 four M5 screws and tighten by hand.



NOTE: In the case of a battery-ready inverter without batteries installed, the side brackets must be fixed to the base using three screws on each side to secure the inverter. The fourth hole in the side bracket remains unused and should not be screwed.



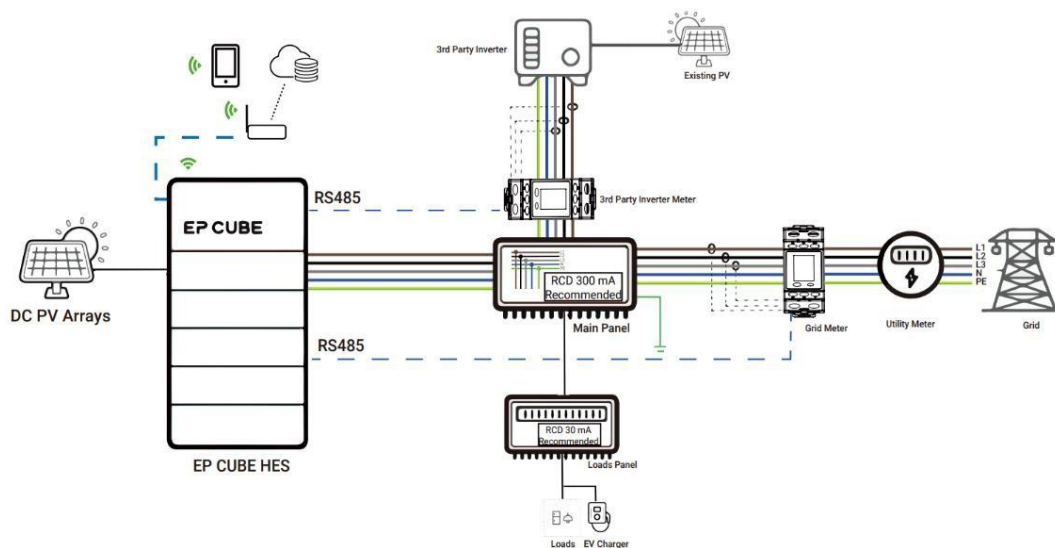
CAUTION:

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

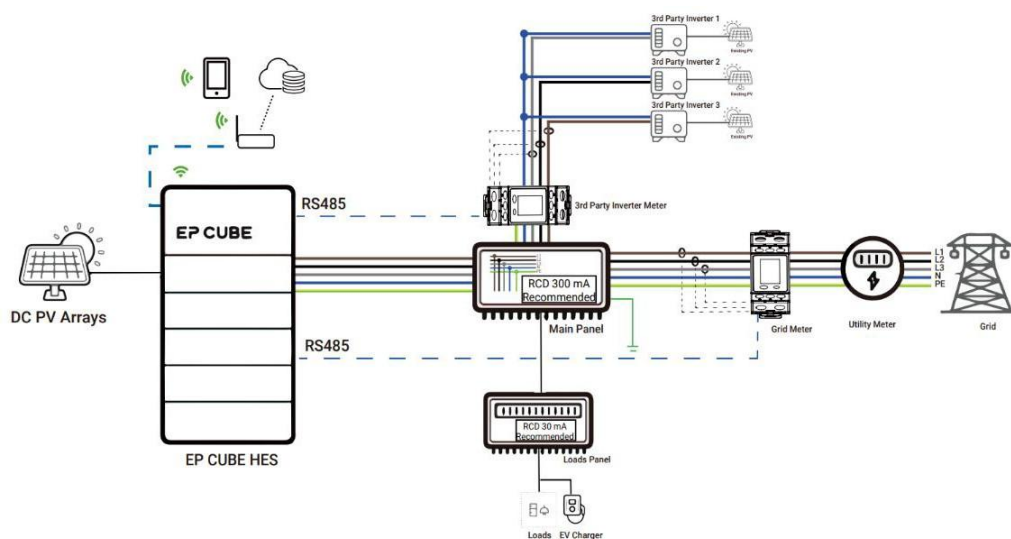
5. THE EP Cube System

5.1 Three Phase System Topology

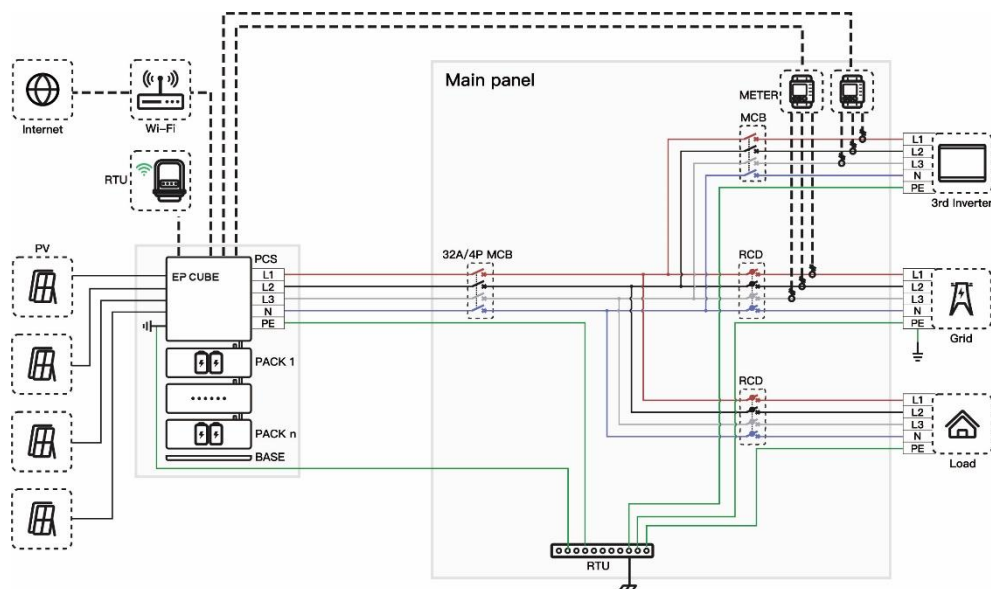
- In the scenario of connecting EP Cube with a three-phase 3rd party inverter:



- In the scenario of connecting EP cube with single phase 3rd party inverters:



Wiring the EP CUBE PCS



NOTE: Please add the RCD devices as recommended and ensure to follow any applicable local electrical codes and Standards.

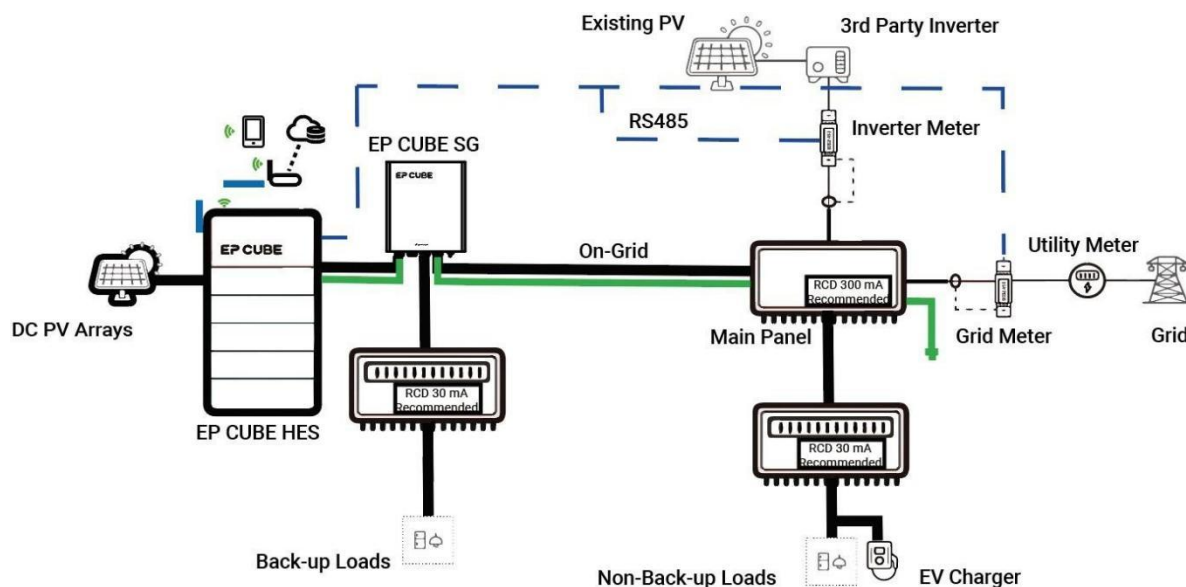
5.2 System Topology with EP Cube Smart Gateway

EP Cube HES has a full back up port¹ to support connected loads up to 12 KW², which can be powered at any time, remain powered in the event of a grid outage, and support the full load (12 kW*).

NOTE:

1: The backup function is only possible when using the Smart Gateway.

2: please refer to the datasheet for the max. power output available (model and country).



- ① (MCB) Depends on household loads and inverter capacity (Optional)
- ② (MCB) 3P-32A «single unit» (63A «two units»)/400V AC (RCD) 300mA Type A (recommended)
- ③ (MCB) Depends on household loads (RCD) 30mA(recommended, MCB-3P- 32A/400V AC)
- ④ (MCB) 3P-32A «single unit» (63A»twounits»)/400 V AC (RCD) 30mA (recommended)

The EP Cube Smart Gateway is an optional component. If a homeowner chooses not to install it, then EP Cube can only support the on-grid function. In that scenario, the back-up port will not be connected.

6. WIRING & COMMISSIONING

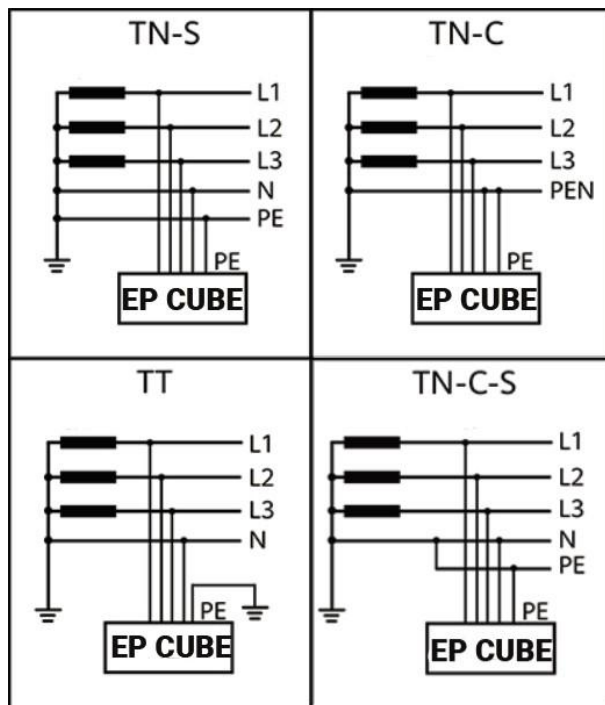
This section introduces the EP Cube system wiring connections and commissioning steps.

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.

The 3PH system works with a nominal voltage of 380/400 Volt, supporting TN/TT earthing systems.



EP Cube System Wiring

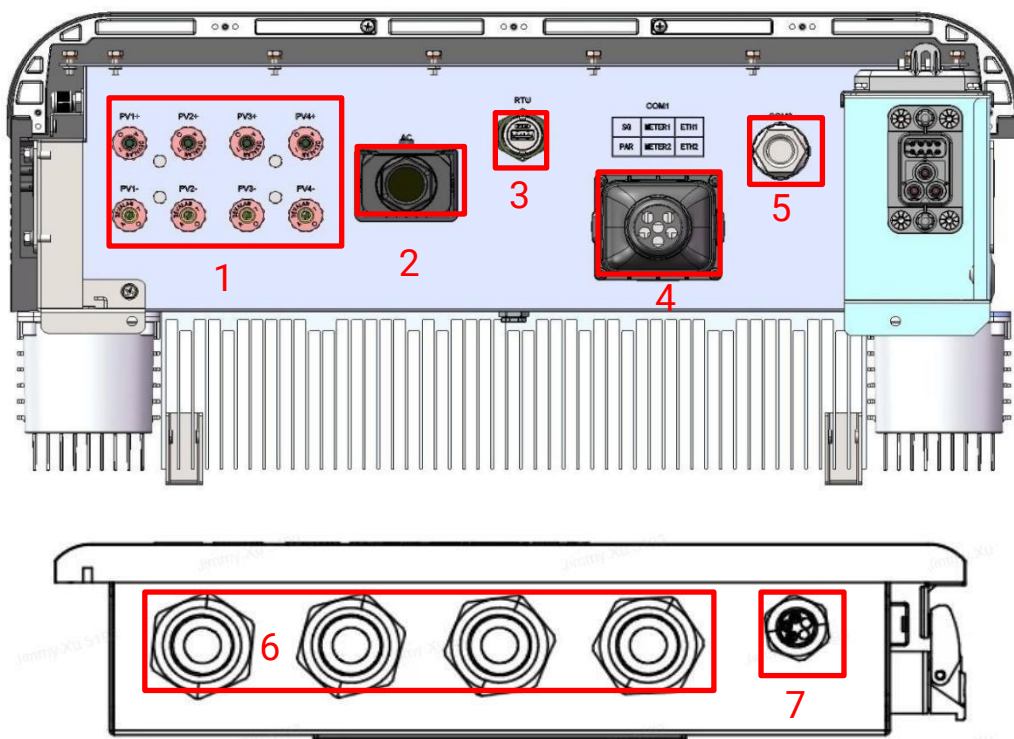
This section introduces the EP Cube system wiring process.

 **NOTE:** To find more details about installing and wiring of the SG, please refer to the SG Installation Manual.

Preparation

Based on the formulated EP Cube system configuration and wiring scheme:

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



No.	Name	Description
1	PV Connect Port	Connect to the PV Module
2	AC Grid Port	Power supply of the PCS
3	RTU Port	Connect to RTU
4	Com1 Port	Connect to SG, Parallel (another PCS), Ethernet, Meter.
5	Com2 Port	Connect to RS485 port: emergency stop
6	SG Power Port	Connect to Grid, PCS, Load
7	SG Com Port	Connect to PCS for communication

Recommended Wire Gauges

Wiring Connection	Wire Type/Wire Size	Length
AC Power Wire	90°C 5-Core cable /4mm ² ~6mm ²	Custom
PV Wires	PV system Cable/4mm ² ~6mm ²	Custom
RS485 Wires	2-core shielded twisted pair cable/0.2mm ² ~1mm ²	Custom
EPO Wires	2-core signal cable/0.2mm ² ~1mm ²	Custom
Ethernet Wires	CAT5E Network Cable/T568B (Need to prepare another one for meter connection)	Custom

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

 **CAUTION:**

The requirements for the installation of protection equipment are as follows:

1. General Safety Requirements

To ensure safe installation, maintenance, and operation of all electrical systems, it is mandatory to implement comprehensive protective measures. These include over-current protection, residual current protection, and lightning surge protection, which work synergistically to mitigate electrical hazards and ensure system reliability.

2. Over-Current Protection Device (OCPD) Requirements

All AC power sources or loads must be equipped with an Over-Current Protection Device (OCPD) before integration into the main electrical system. This requirement applies to all connected equipment, including:

- EP Cube energy storage systems
- DC-coupled photovoltaic (PV) systems
- AC-coupled photovoltaic (PV) systems
- Grid-tied and off-grid inverters

Installers must ensure OCPDs are properly sized according to the device's rated current and system voltage specifications. Circuit breakers are the recommended OCPD type, with ratings matching or exceeding the maximum load current while providing adequate short-circuit protection.

3. Residual Current Device (RCD) Installation

- Residual Current Devices (RCDs) must be installed in accordance with local electrical codes and safety regulations. RCDs provide critical protection against electric shock by monitoring and interrupting circuit current when dangerous leakage currents are detected.

- EP Cube system is compatible with either Type A or Type B RCD in compliance with the IEC 62109 standard requirements.

4. Surge Protection Module Requirements

To protect electrical systems from transient overvoltage caused by lightning strikes and switching surges, installers must integrate dedicated surge protection modules at critical system interfaces.

This is particularly important for outdoor installations and systems connected to overhead power lines.

4.1 Protection Zones and Installation Points

Surge protection modules should be installed at the following locations:

- Service Entrance: At the main utility connection point to protect against incoming surges from the grid.
- PV System Interfaces: Between solar arrays and inverters in both DC and AC-coupled systems.
- Energy Storage Connections: At the input/output terminals of EP Cube and other battery storage systems.
- Critical Equipment Interfaces: Before sensitive electronic components such as monitoring systems and communication devices.

4.2 Installation Guidelines

- Install surge protection modules as close as possible to the equipment being protected.
- Use short, direct wiring connections to minimize inductance.
- Ensure proper grounding of protection modules in accordance with local earthing regulations.
- Coordinate with system grounding design to create equipotential bonding.
- Label all protection modules clearly for identification during maintenance.

5. Installation & Maintenance Procedures

- All protective devices must be installed by qualified electrical personnel with appropriate certifications.
- Post-installation testing must include:
 - ☐ OCPD trip current verification
 - ☐ RCD residual current sensitivity testing
 - ☐ Lightning protection module continuity and grounding resistance measurement
- Regular maintenance inspections should be conducted annually or after significant electrical events.
- Damaged or non-functional protective devices must be replaced immediately with certified components.

6.1 Wiring from Solar Panels to EP Cube PCS

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 Davelan 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.
- Balance PV strings across PCS units to prevent reverse power flow.
Uneven distribution causes high-output PCS1 to feed idle PCS2's battery, triggering dual conversion losses (DC-AC + AC-DC) and 10~15% extra energy waste.

Configuration Comparison (2 PCS + 4 Strings):

Configuration	String Assignment	Energy Flow	System Efficiency	Loss Cause
✗ Incorrect	PCS1: Strings 1,2,3,4 PCS2: None	PCS1 → DC bus → PCS2 battery (reverse charging)	~85%	Dual conversion: PCS1 inverts, PCS2 rectifies → 8~10% extra loss
✓ Correct	PCS1: Strings 1,2 PCS2: Strings 3,4	Each PCS operates independently → no inter-unit flow	~96%	No reverse current; each MPPT optimizes its own strings

- b. EP Cube PCS supports the connection with 4x PV strings. Each string is connected to the EP Cube PCS via a pair of standard industrial Davelan PV connectors. Carefully connect the PV+ and PV- wires to the corresponding terminals of the EP Cube PCS. (Refer to the *Figure 6-1 Preparing Davelan connectors for PV Strings* on the next page)
- Insert the Davelan PV connector into the mating connectors on the EP Cube PCS until both connectors are properly locked in place. The Davelan connectors need to be prepared on site. Refer to the *Figure 6-2 EP Cube PCS to PV Array DC Input Wiring* on the next page.

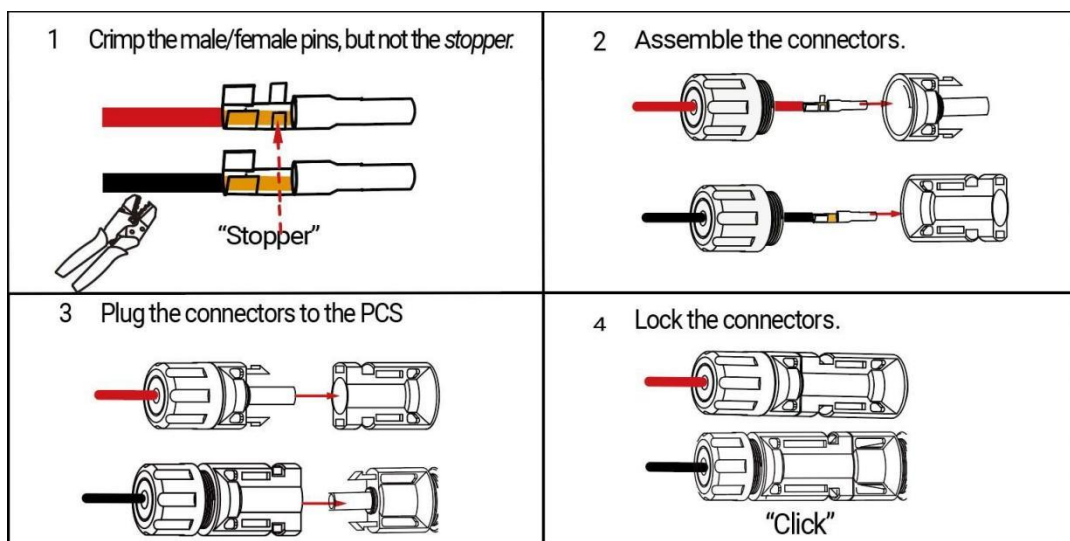
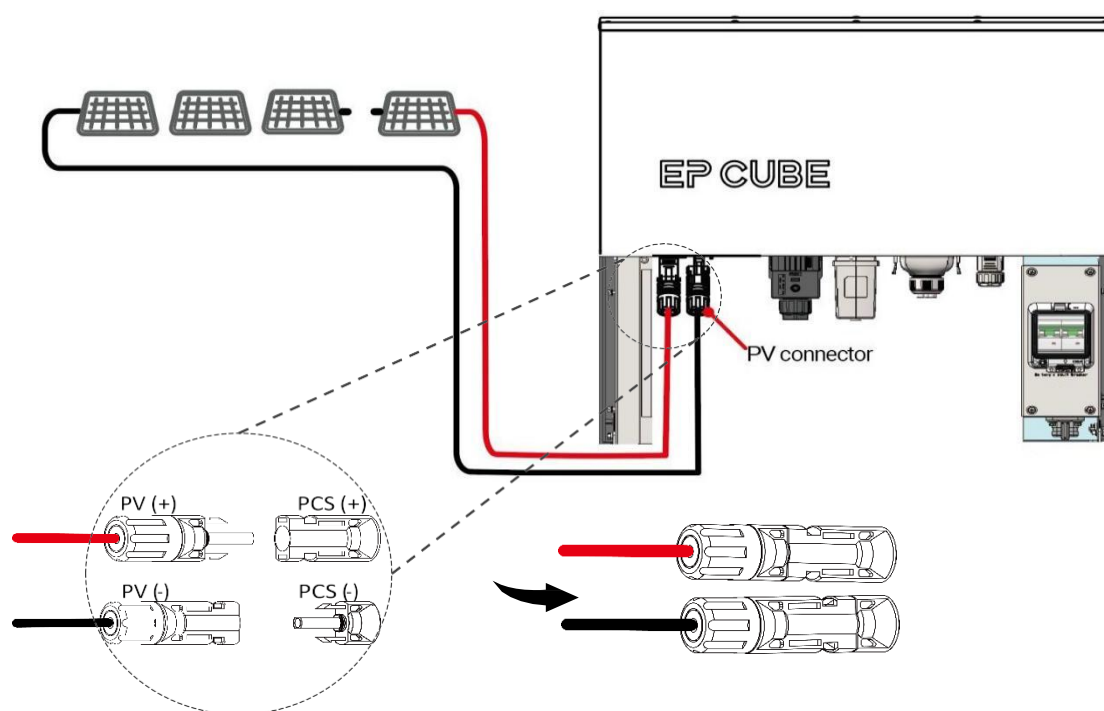


Figure 6-1 Preparing Davelan connectors for PV Strings



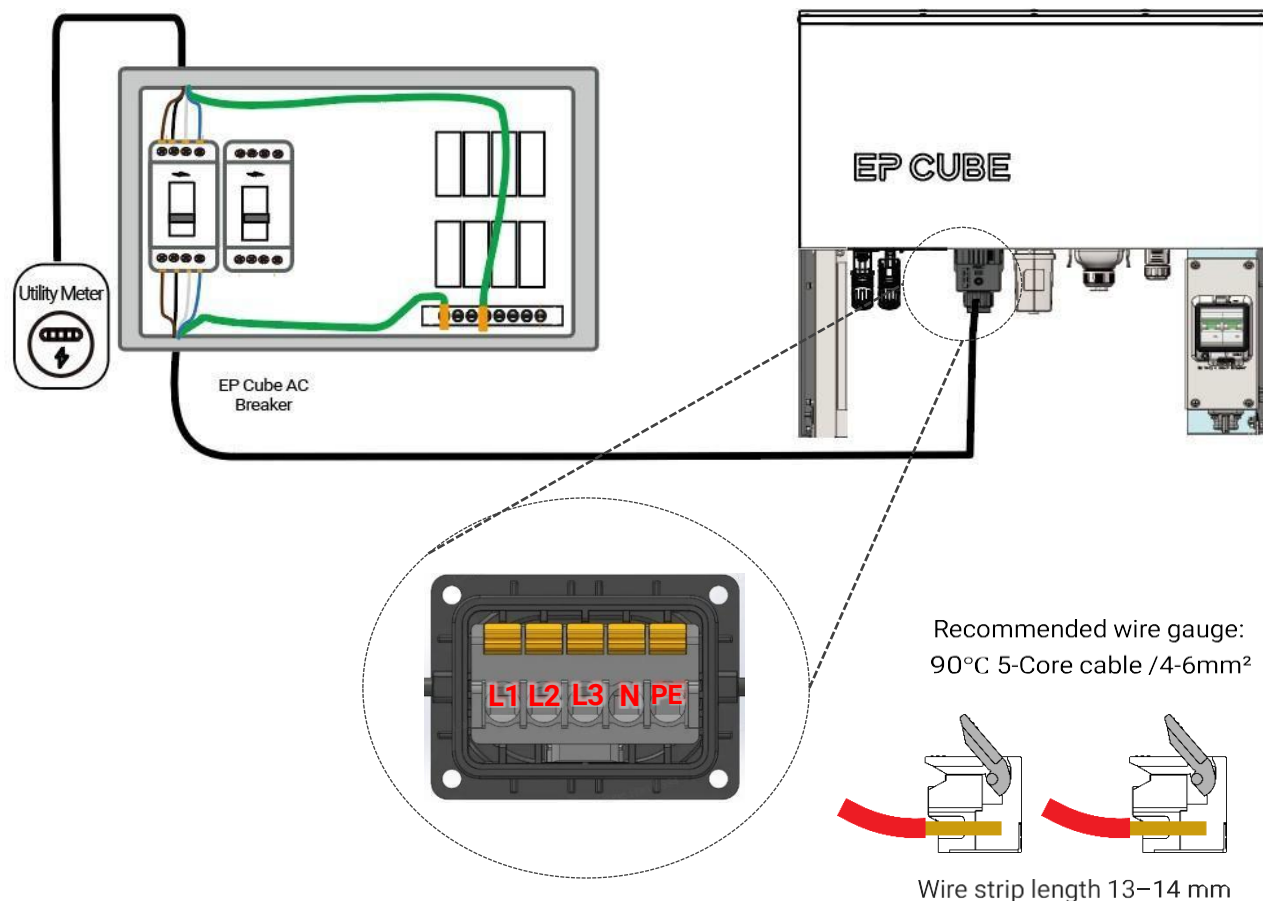
Recommended wire gauge: Davelan connector PV cable 4mm²~6mm²

Figure 6-2 EP Cube PCS to PV Array DC Input Wiring

6.2 AC Wiring from EP Cube PCS to Grid

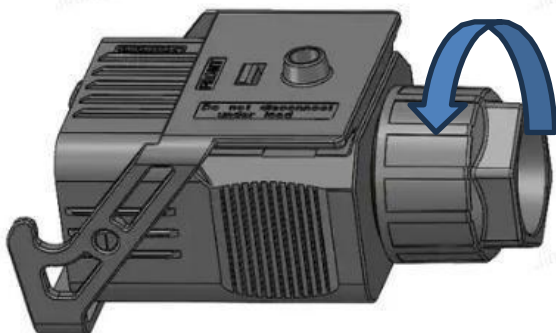
Connect EP Cube PCS AC Wires to AC Mains panel Terminals

- Prepare the wires for connection between the EP Cube PCS and Grid MCB terminals in AC Mains panel.
- Route the wire through the cable entry point on the AC Mains panel, then carefully connect the wires to the terminals of the Grid MCB.

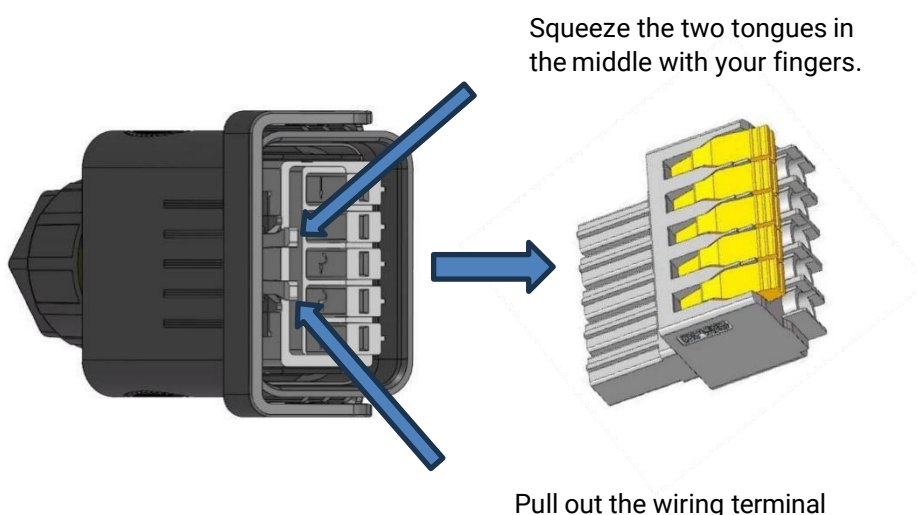


1. Pull the mechanical flap upwards to open terminals.
2. Insert the conductors into the terminals.
3. Push down the mechanical flap back to its original position to lock the terminals.

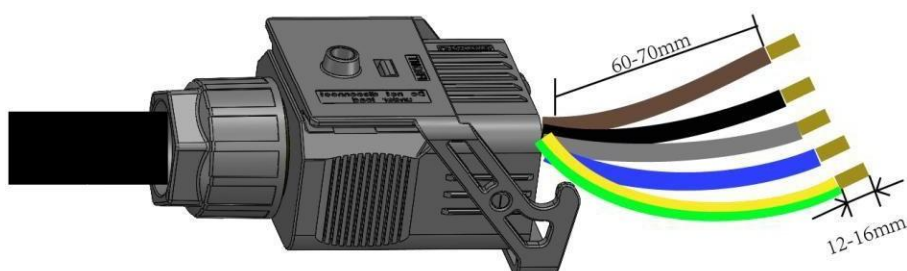
Step 1: Unscrew the swivel nut of the AC connector (CCW).



Step 2: Take the terminal plug out of its housing.

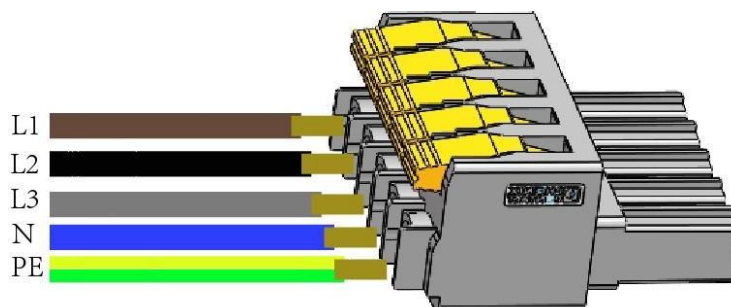


Step 3: Thread the AC cable of suitable length through the swivel nut and the housing. Recommended cable length can be seen in the picture.

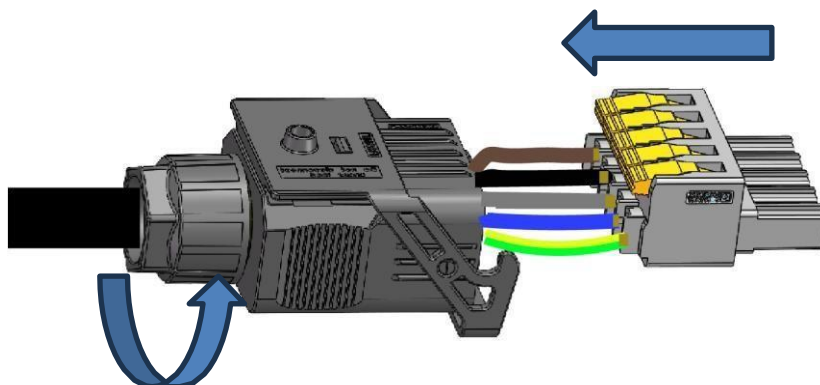


Step 4: When wiring, the five wires should be correctly positioned according to the marks and inserted into the terminal at the same time.

Connect the wires according to the markings



Step 5: Ensure that the wires are securely in place by slightly pulling them. Tighten the swivel nut to the housing.



Step 6: Insert the AC connector into the AC Port on the inverter, pull the hanger, then use a screwdriver to tighten the nut.

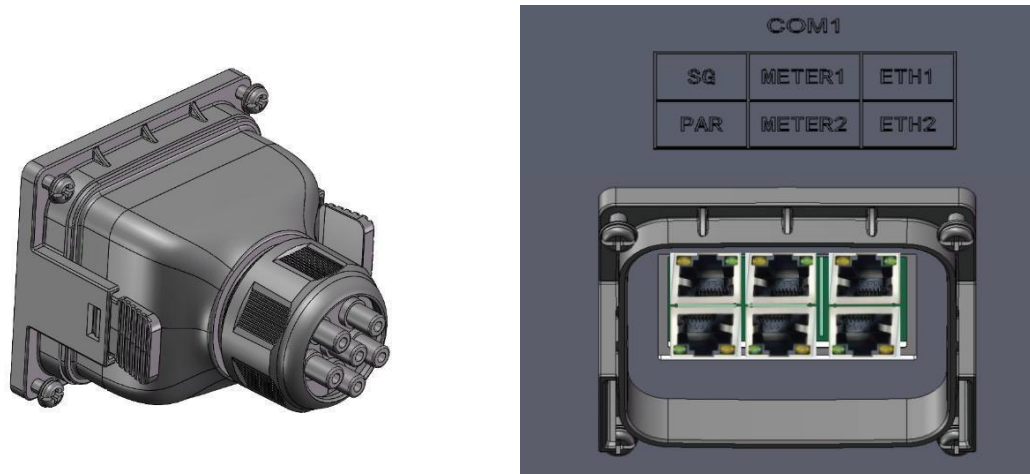


After plugging in the AC terminal, remember to tighten the screws on top.

6.3 Wiring of Other Components in the COM1 port

⚠ 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.

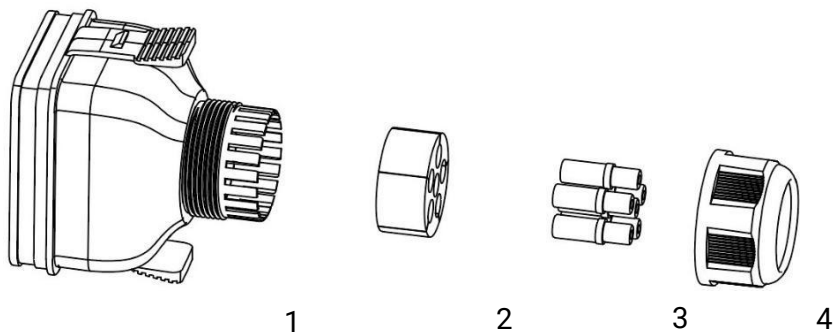
There are 6 Ethernet ports for connection.
Important: Meter 1 is for 3rd party meter. Meter 2 is for Grid meter.



We can uninstall the cap by pressing the two ears in the side and firmly locking the cable.

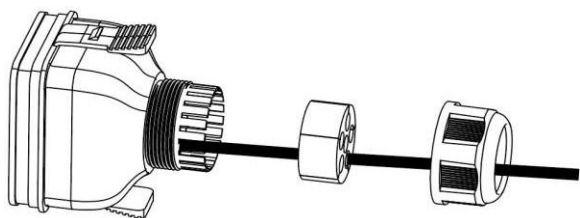
Port Name	Definition
SG	Communication with SG
PAR	Communication with another pcs
METER1	Connect with 3 rd inverter meter
METER2	Connect with grid meter
ETH1	Connect with Ethernet
ETH2	Connect with Ethernet

Step 1: Unscrew the swivel nut of the connector.

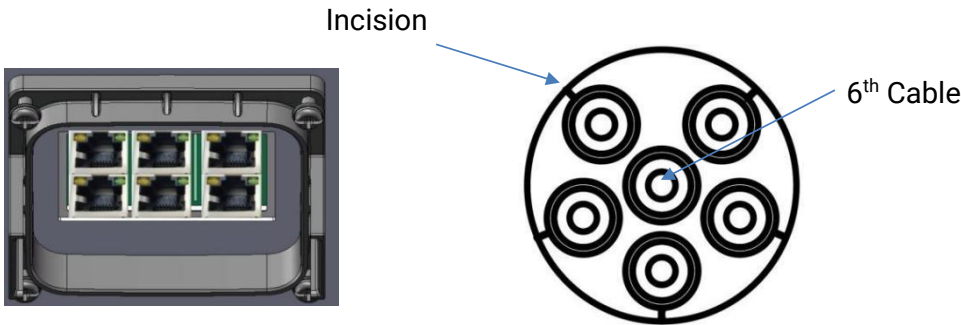


No.	Item	No.	Item
1	Main Body of the Cover	3	Waterproof plug
2	Sealing ring	4	Swivel nut

Step 2: Remove the plug and lead the cable through the cable gland



Step 3: Insert the RJ45 plug into the front plug connector until there is an audible click and tighten the housing. Install the gasket and fasten the swivel nut.



Notice: for the 6th cable in this connector, you will need to crimp the RJ45 connector after making the cable through the gland.

A. Wiring Connections of Grid Meter & Inverter Meter (For Grid and 3rd Inverter)

- Pay attention to CT's orientation, otherwise the system will not work correctly. The CT's arrow direction on phase wire shall be from Grid to MCB (Grid → MCB).
- The CTs provided with the EP Cube have a standard cable length of 5m. The CT's Wire Gauge: 2-core signal cables/0.50mm²-0.34mm²
- The recommended cable size & gauge values are RJ45 cable. **At minimum a Cat5e cable type T568B is required, with max. length of 100m. For longer distances, please use RS485 cable (2-core shielded twisted pair cable/0.2-1mm²). Use Pin 3 for Channel A, Pin 6 for Channel B.**
- Connect the AC power/Grid Terminals to the AC Input Terminals (L1&L2&L3&N) inside the Meter. (Refer to Figure 6-4)
- Finally, connect the RJ45 wire between the Meter terminals and EP Cube PCS Com1 Terminals. Terminate the one end of the RJ45 wire inside the Smart Meter and connect the other end onto the EP Cube PCS Com 1 port. (Refer to Figure 6-3)
- Perform these steps for both the Grid Meter and 3rd party Inverter Meter.
- Connect Grid meter to EP Cube PCS1 Com1 meter 2 port and connect the 3rd inverter meter to EP Cube PCS1 meter1 port. (Refer to Figure 6-3)

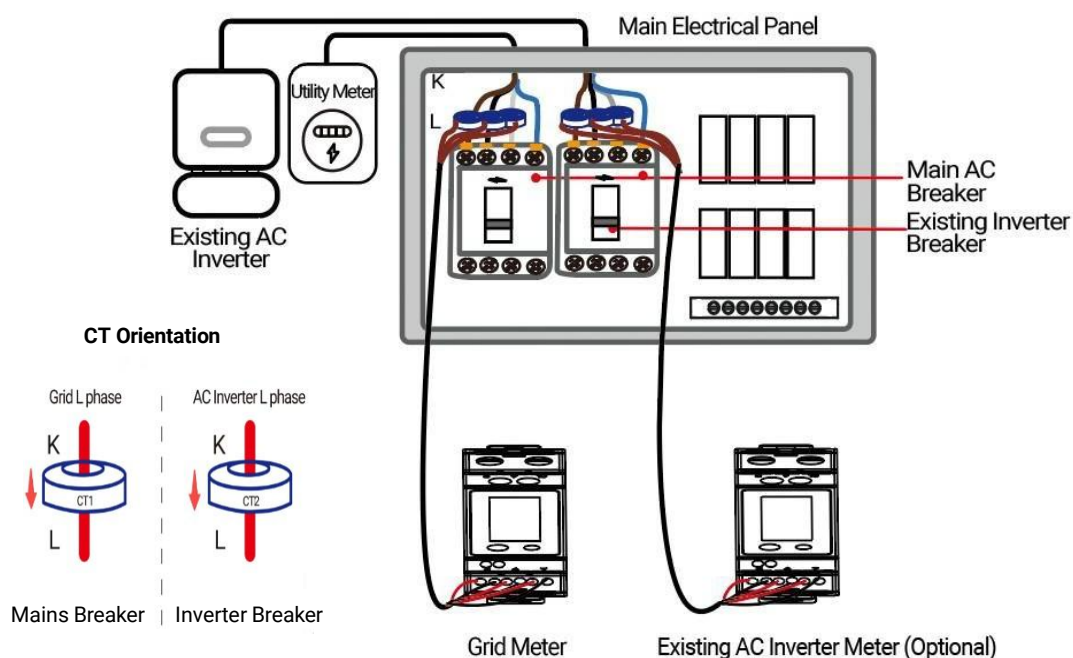


Figure 6-3

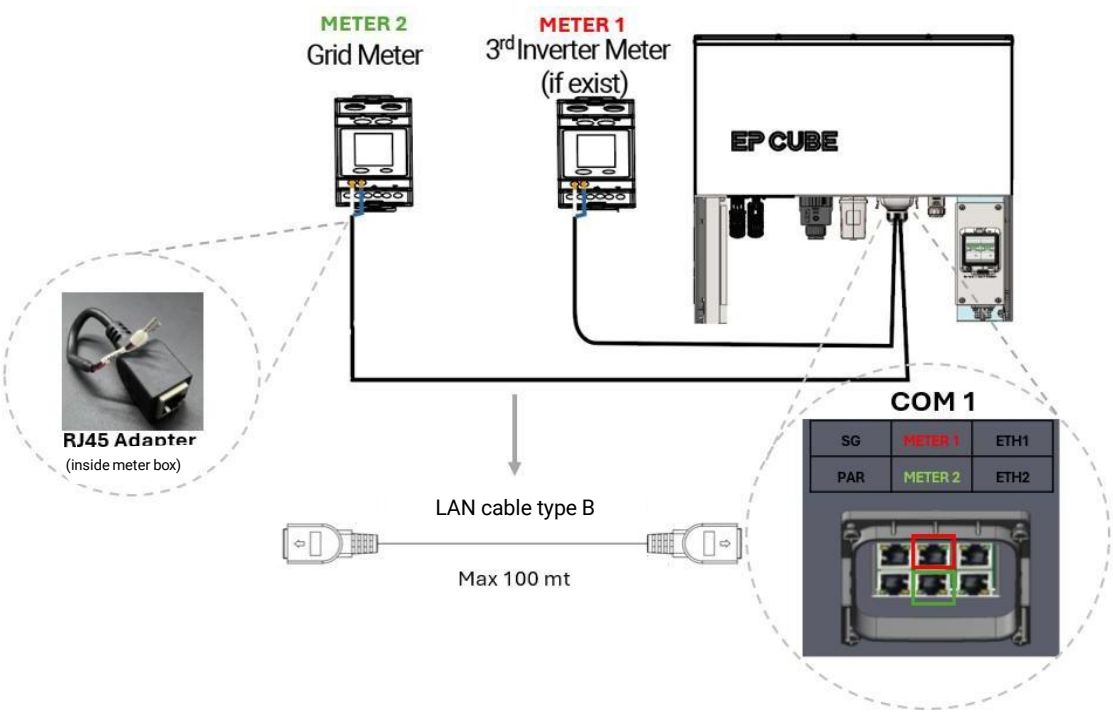
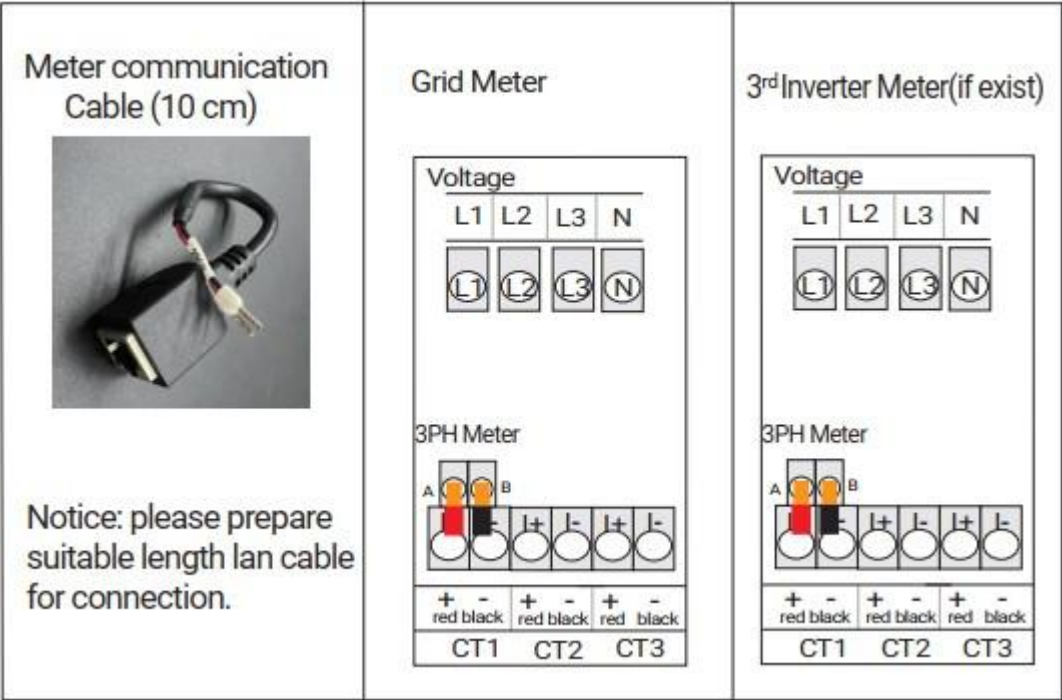


Figure 6-4

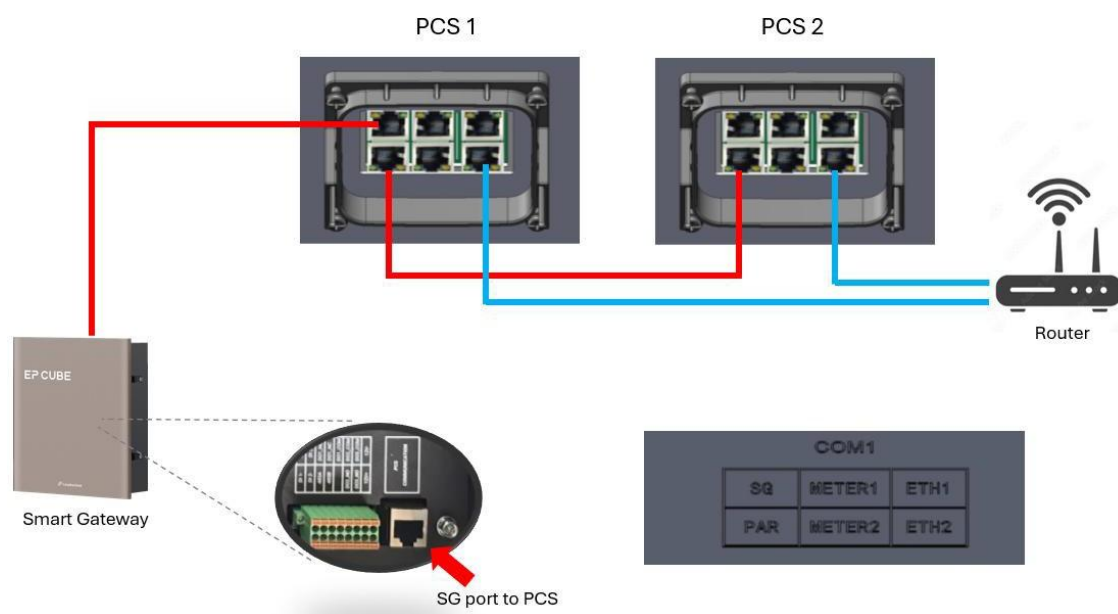


B. Wiring Connections of Ethernet

- Connect RJ45 wire directly to the router, we **strongly suggest using ETH 2 port**, as that port will support faster speed than ETH1 port.

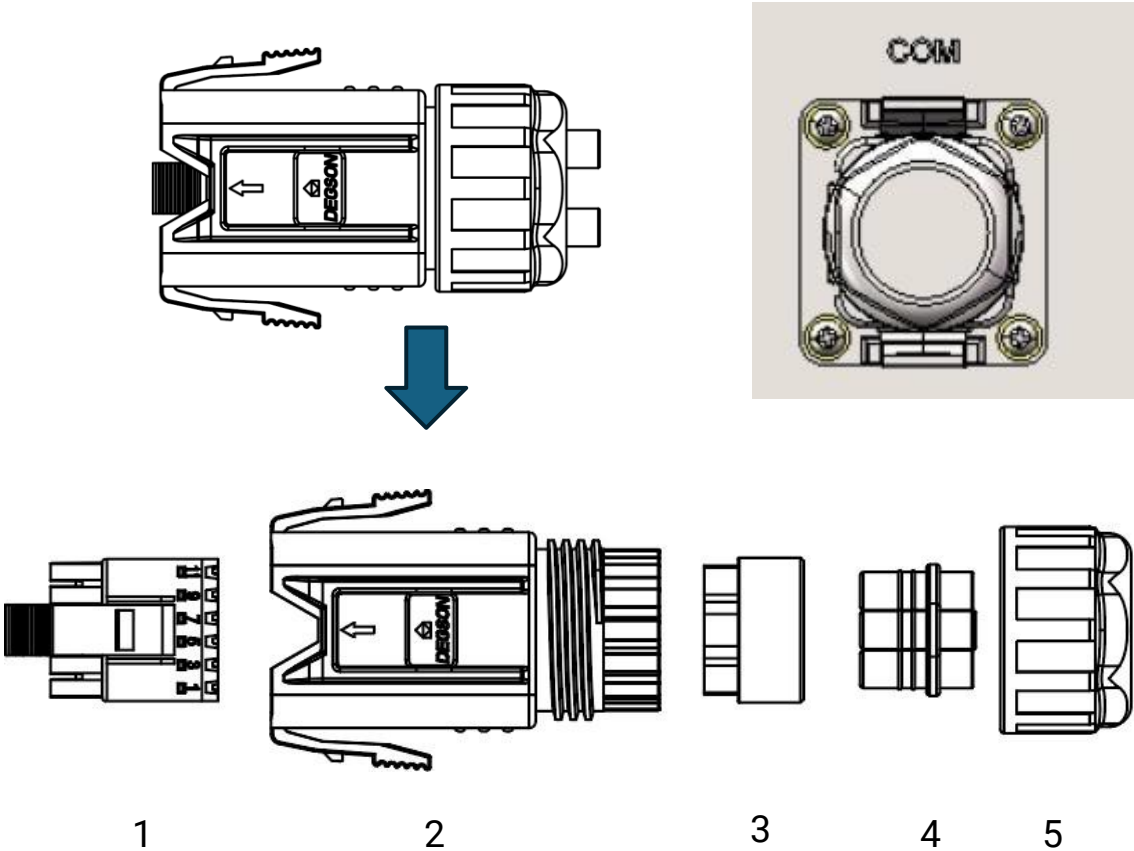
C. Wiring Connections of SG

- Connect RJ45 wire to SG port directly, the other end is connected to SG port for PCS communication.



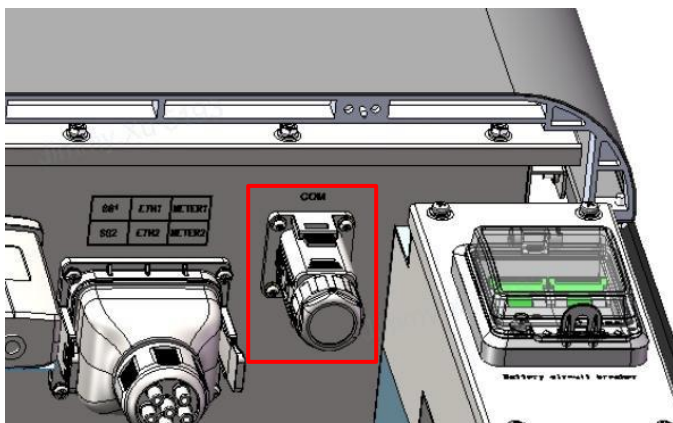
6.4 Wiring of Other Components in COM 2 port (Optional)

⚠ 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.

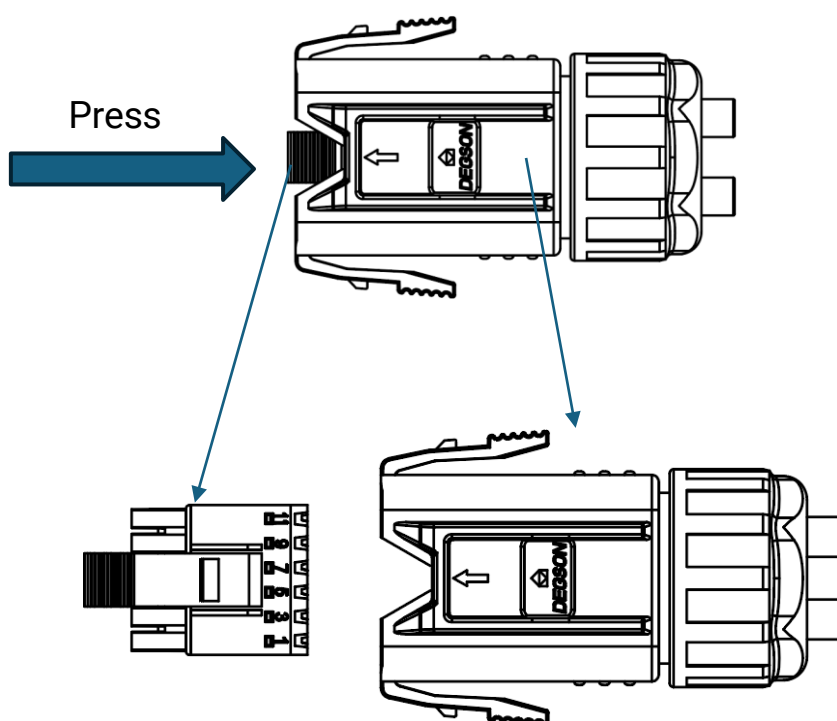


Num	Item
1	Plug contact
2	Plug Shell
3	Sealing ring
4	Waterproof plug
5	Wire Lock Nut

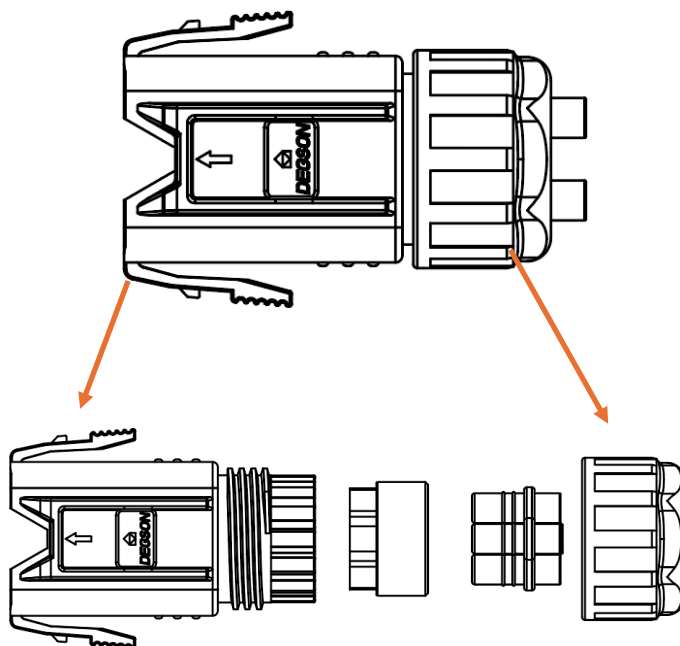
Step 1: Press both sides of the connector and remove the signal connector from the com 2 port.



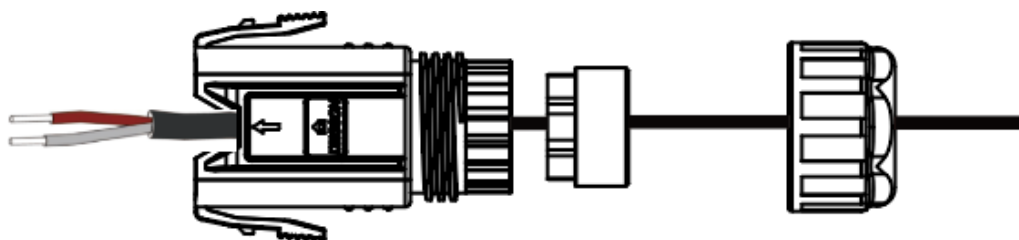
Step 2: Press the long green cover plate, uninstall the plug contact from the signal connector.



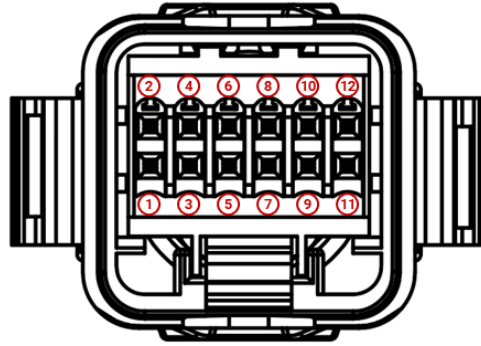
Step 3: Unscrew the swivel nut from the connector, take out the inner sealing ring, Remove the waterproof plug if necessary.



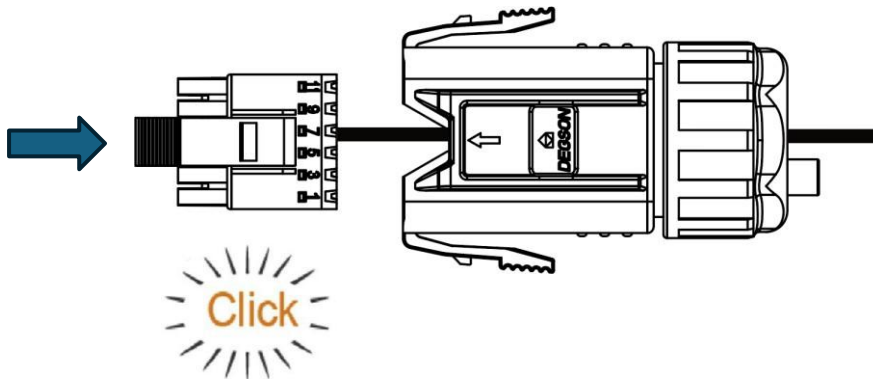
Step 4: Remove the cable jacket and strip the wire insulation.



Step 5: install the cable in the correct hole with a screwdriver.



Step 6: insert the component into connector, until there is a “click” sound, Screw the swivel nut onto the connector.



Step 7: Insert the connector into the PCS until it clicks into place.

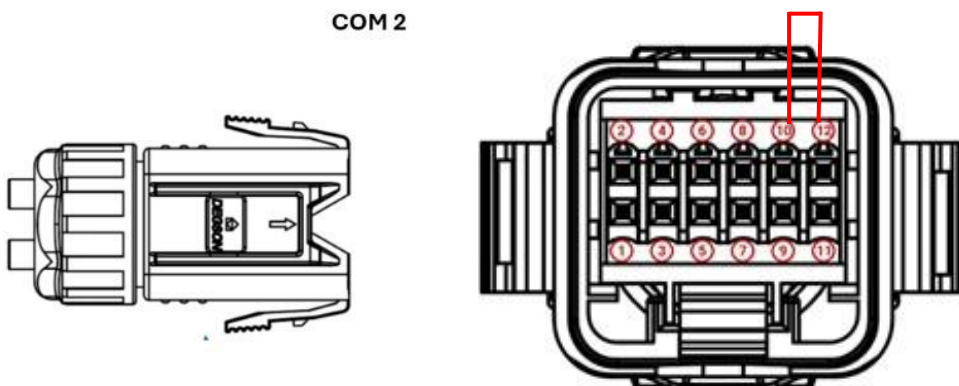
Wiring of Emergency Stop (optional*)

- Wiring on the EP Cube COM connector between the PIN 10(+) and PIN 12(-).



- Connect emergency stop wires to terminals PIN 10 (EPO+) & PIN 12(EPO-).
- Connect the wires to the E-Stop button.
- Do a test run at least once during the system commissioning and debugging to ensure that it's functioning properly.

***IMPORTANT:** when not using the E-stop, it is mandatory to connect the COM2 connector in order to activate the built-in jumper that simulates the E-stop button as unpressed.



7. EP Cube System Commissioning

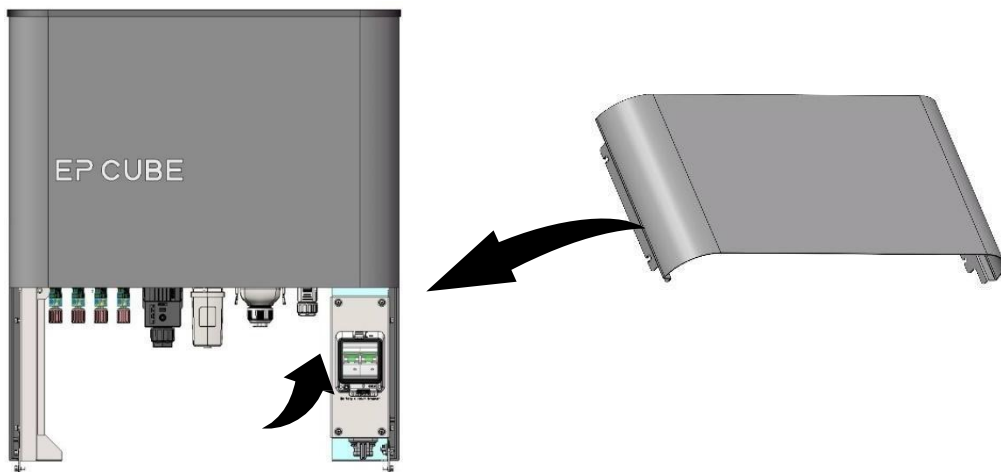
This section introduces the EP Cube system's initial commissioning and operating process.

7.1 EP Cube Start Up

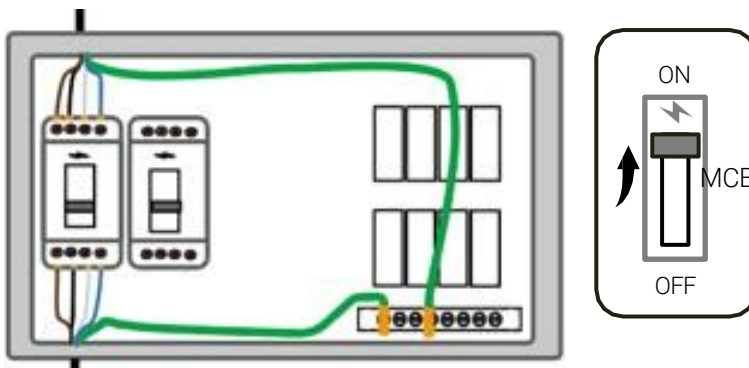
CAUTION:

- Please ensure PPE is worn properly before getting started.
- EP Cube commissioning requires EP Cube PCS to have AC Power. It must be ensured that the Grid MCB is in "on" state, but please do not press the power on/off button on the left side of the EP Cube PCS.

a. Turn on battery breaker of the PCS



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



The LED lights on the WI-FI module will turn on upon completion of start-up steps.

7.2 Commissioning via EP Cube app

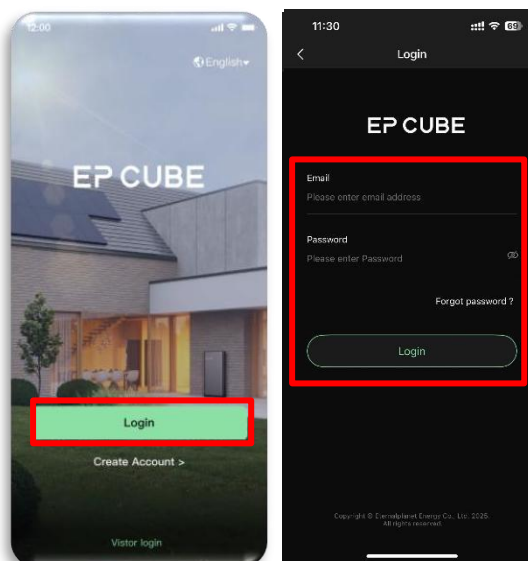
The System commissioning and the setup of the EP Cube must be made with the EP Cube app. An installer account is mandatory to be able to use the EP Cube App for commissioning, monitoring and service procedures (troubleshooting and error analysis).

The App is available for iOS and Android.

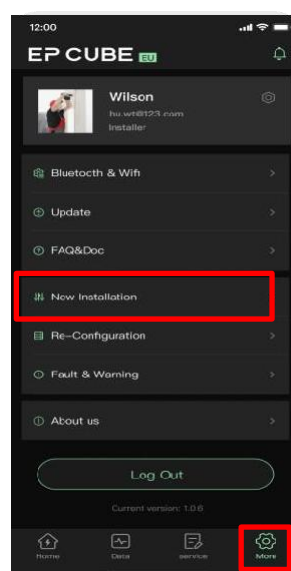
NOTE: You can receive an installer account for EP Cube by visiting our EP Cube University and completing the free of charge installer training that includes a lot of useful information.



IOS/ Android APP

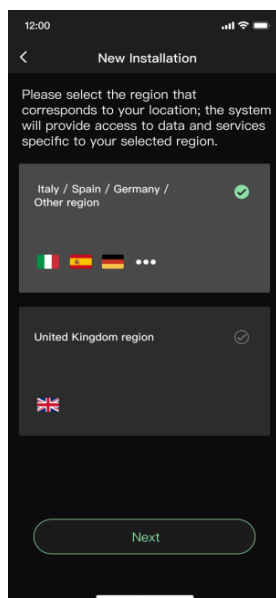


Click Login → Login with your installer account

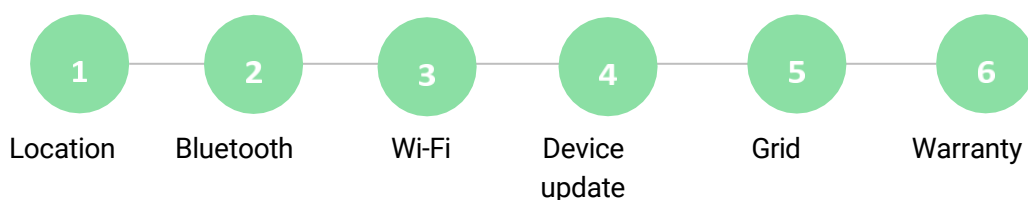


Click Login → Click New Installation

NOTE: Before commissioning, a region must be selected.

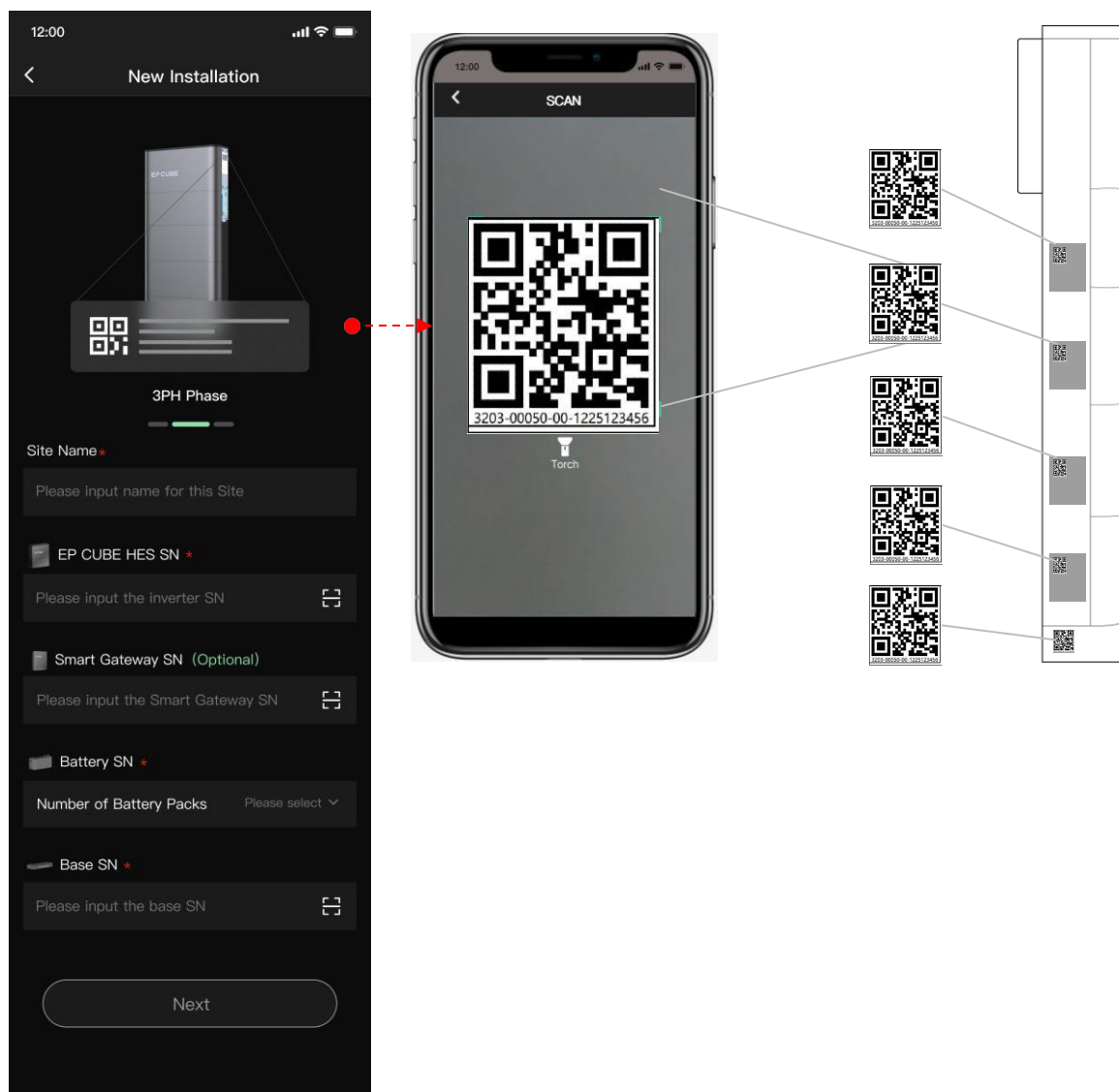


Follow the step-by-step process to configure all the connected devices within your EP Cube system including Network (i.e. Bluetooth/Wi-Fi), Grid, and Warranty Registration. The figure below shows the order of configuration steps. At each step, there are 3 navigation buttons: enter “Config”, move to “Next”, or go “Back” to any step.



First, start by adding the site name, then add the SNs of the 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 6.

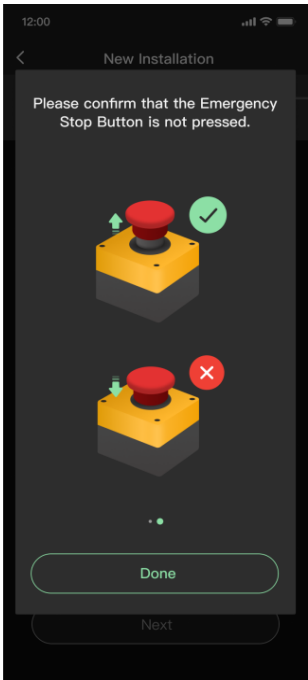
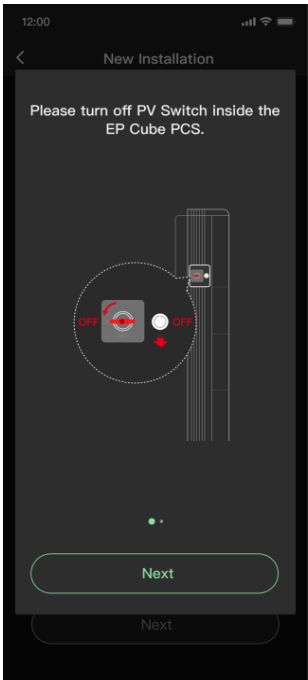


Select the correct number of battery packs, more lines will show below according to the inserted amount.

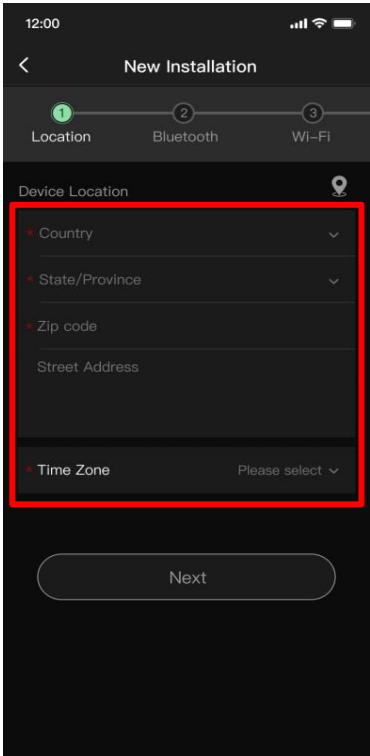
Once all devices are successfully added, Click on the next button.

***Before going to the next step, we need to confirm the following:**

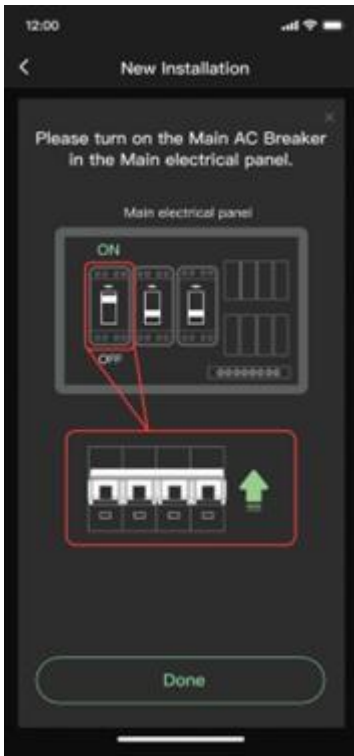
- PV switch inside the PCS is turned off
- Emergency Stop button is not pressed,



1. Location: Implement information related to the location and time zone. Finally, click Next.

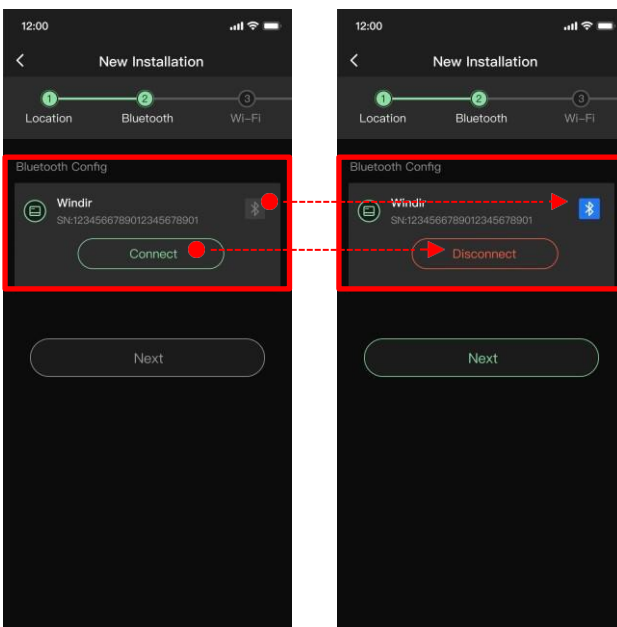


Device Location	Country	Choose country name from the list.
	Province	Choose Province name from the list.
	Zip Code	Write area zip code.
	Street	Write down the street (not mandatory)
Time Zone	Time zone	Choose applicable time zone from the list.



NOTE: before going to the next step, please make sure the Main AC breaker is powered on.

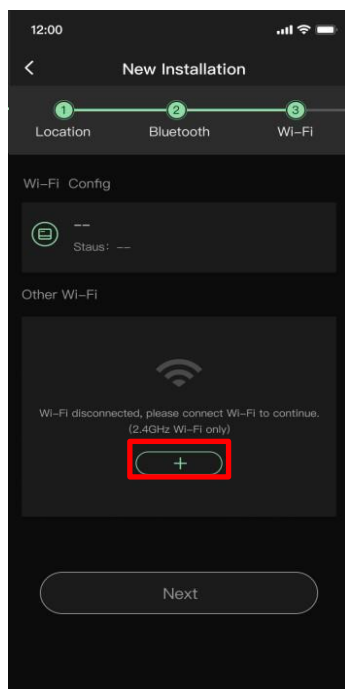
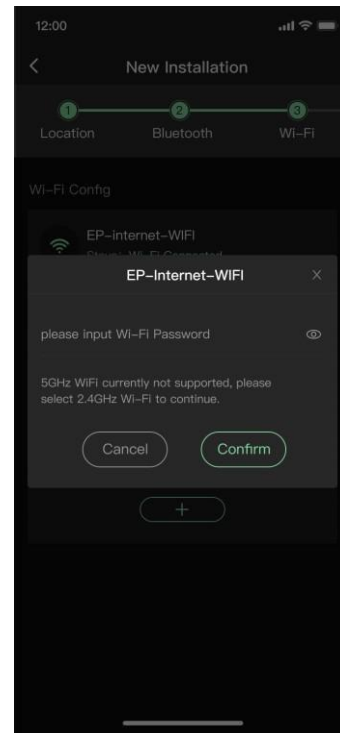
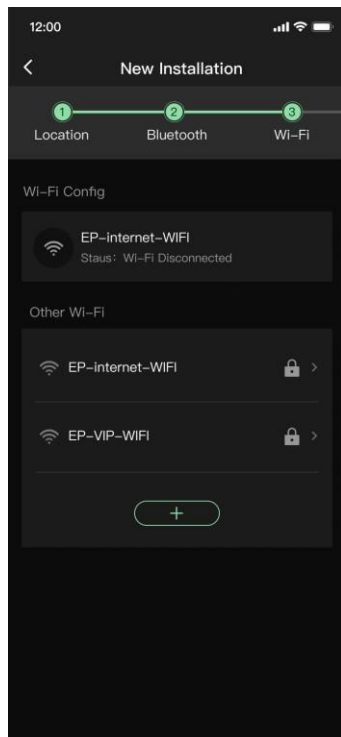
- Bluetooth:** In this step, the Bluetooth configuration is completed. Click on your desired device to set it as the current device. Then, click “connect” button to pair your phone with the newly added device. Upon success, Bluetooth status will change to connected and the color of the Bluetooth icon will turn blue.



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

3. Wi-Fi: 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 to 2.4Ghz Wi-Fi Networks.

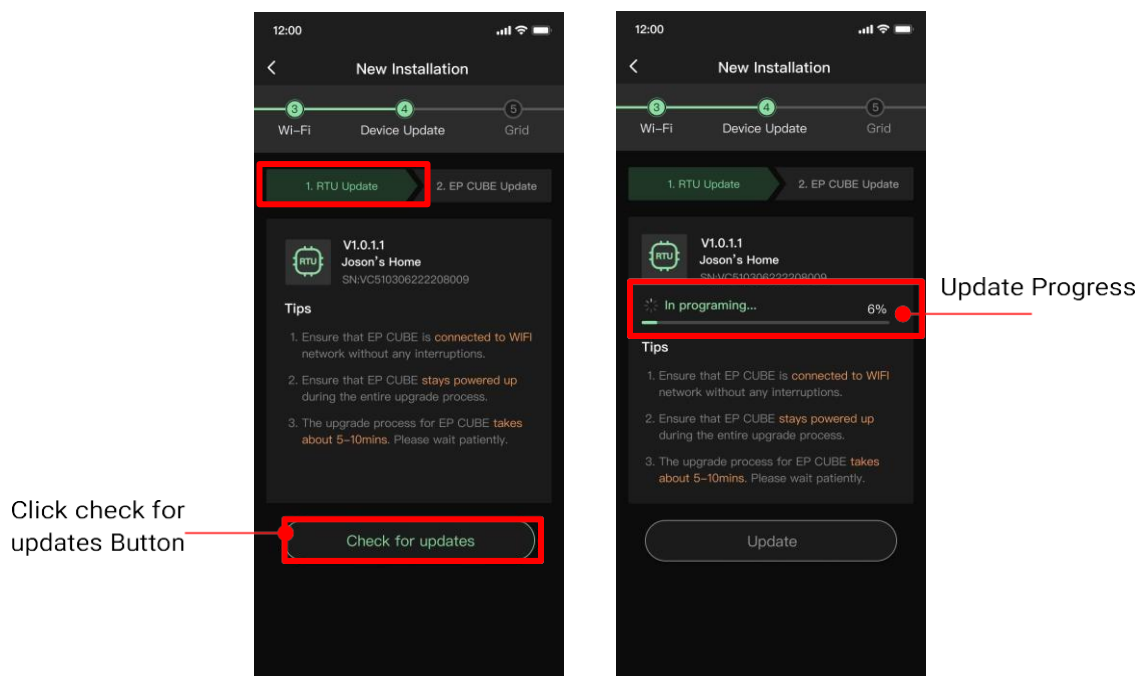


NOTE: Ensure that your installation site has Wi-Fi coverage and strong signal strength. EP Cube supports 2.4GHz Networks only.

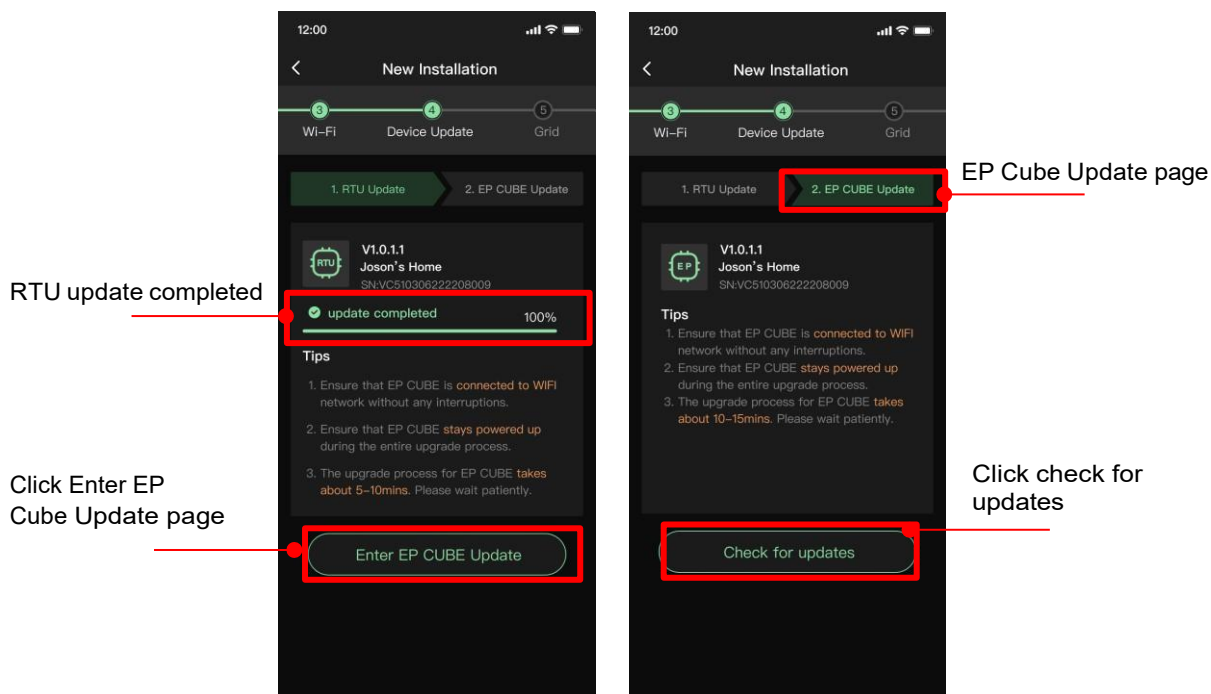


Device Update: In this step the firmware of the RTU and EP CUBE are updated to the latest available versions.

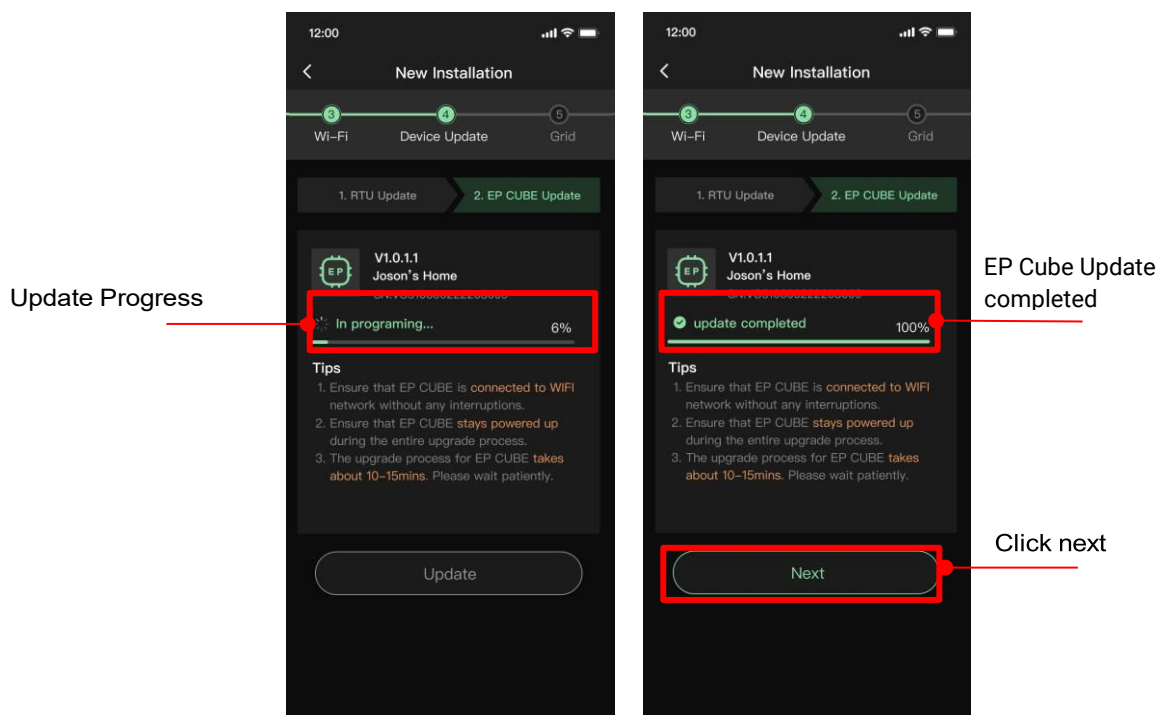
In the first step, click “check for updates” button to start RTU update process. Pay attention to the tips.



Once the update is completed successfully, an “Enter EP Cube” button will appear. Clicking on the button will start the second part of the update, which is EP Cube system firmware update.



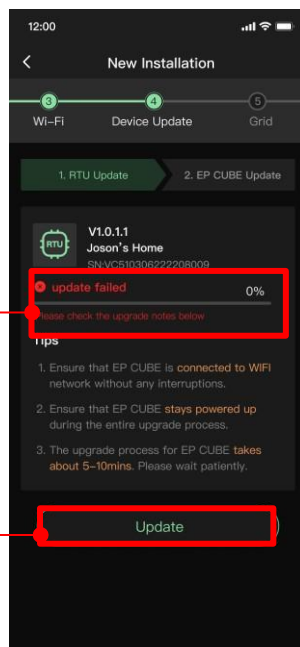
Click "check for updates" button on EP Cube page to start the update. Once the update is completed successfully, click next button.



If the update process failed for any reason, the “Update Failed” message will be displayed. Click update button to restart the update process again.

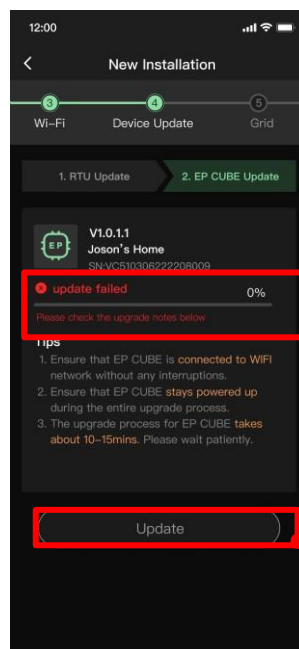
RTU Update failed

Click update again to restart

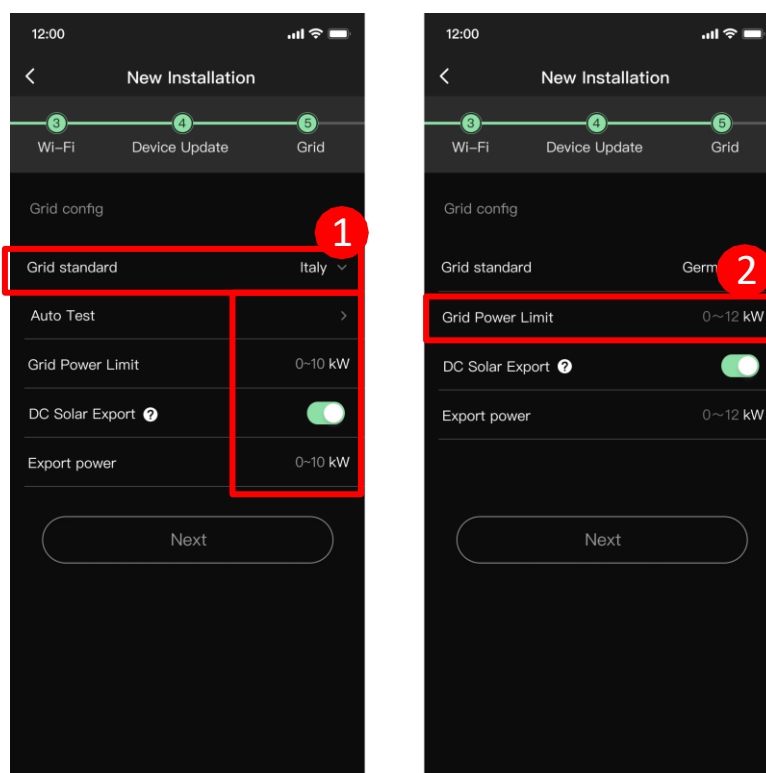


EP Cube Update failed

Click update again to restart



- 4. Grid Config:** choose your system's applicable grid standard. The dropdown list already includes grid standards listed for Italy and Germany. Further down the list is the setting for max power import (from grid) that lets the user input any value within the applicable range. Last item on the list is the "enable" or "disable" button for DC Solar Export, and it allows to input any value of power export within the applicable range for each country. After selection click submit and return to installation step.



- 5. Warranty Registration:** In the final step, take photos of the completed installation from different angles and upload them using the "add" button. A maximum 20 pictures can be added.

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

Add any remarks or comments if needed and click the submit button for EP Team's review and approval.

Then, click the next button to close installation process.

Input the owner email.

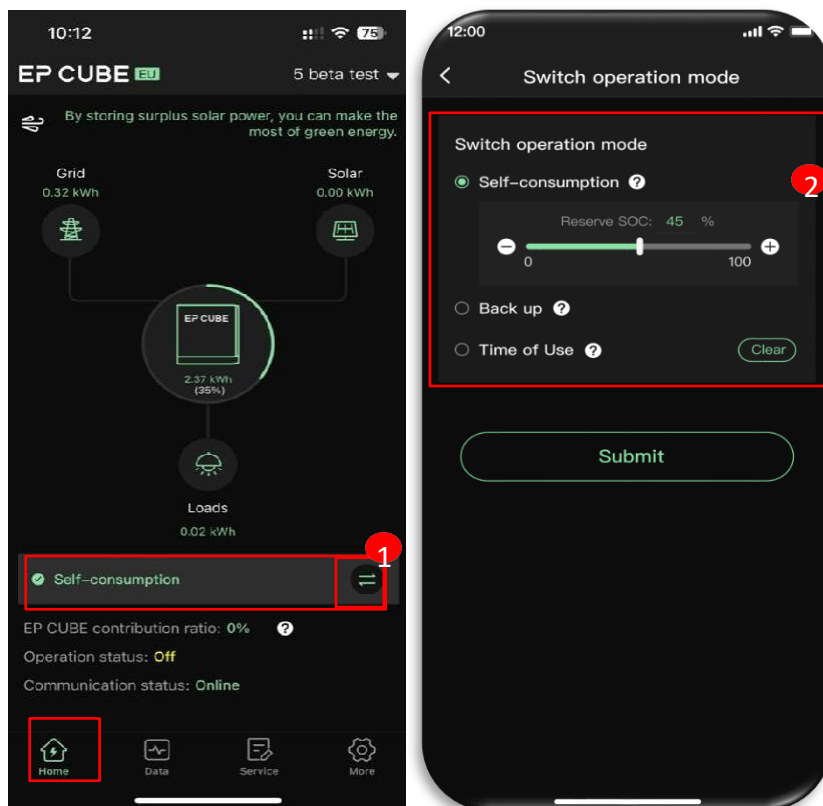
Note: this step is not mandatory, you can go to re-configuration and input this information again later. The owner email account must be created before it's added here.

Click on the add picture section to upload photos

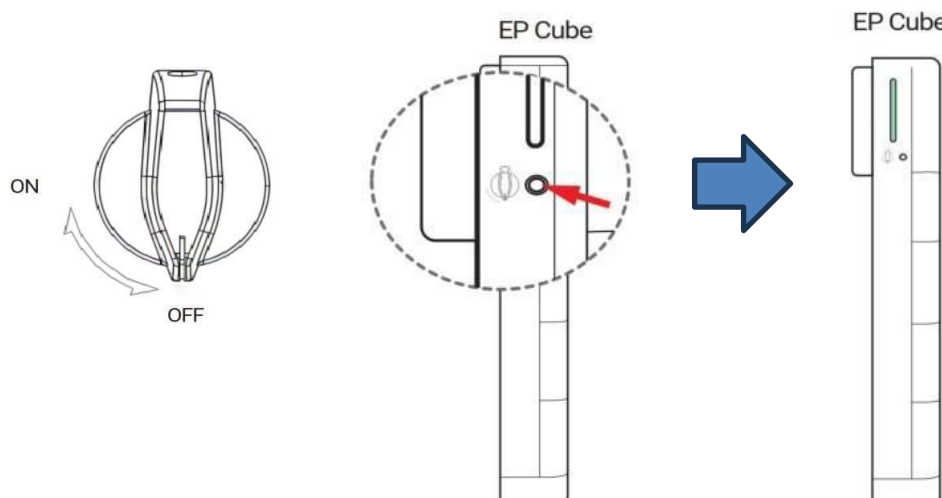
Input the distributor code here

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

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



Now, install the side covers, turn on the PV switch on the panel and switch on the EP Cube PCS via the power button by pressing it for 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.

EP Cube LED status Logic

Status	Lighting Logic
Startup	LED strip in high brightness (default:100%)
On Grid Operation	LED strip in user defined brightness value. (default:100%).
Off Grid Operation	LED strip in user defined brightness value. (default:100%). The strip dynamically adjusts based on battery SOC percentage, visually reflects the battery's charge level by dimming proportionally from the top downwards (e.g. at 50% SOC, only the lower half remains lit)
Low power mode	Breathing light: gradual flash (increase and decrease light) in pre-set brightness (user-defined value; cycle: 2s on → 2s off).
Fault (excluding warning)	Continuous blinking (0.5s on → 0.5s off; highest priority, overrides all other states). Stop flashing until faults are handled by user/ automatically.
Shutdown	LED strip is off.

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 in the app. Login and set your desired device as current device to see logged warnings and faults. In case you find a 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.

8. EP Cube System Power-ON & Power-OFF

This section introduces the EP Cube system's Power-ON & Power-OFF process.

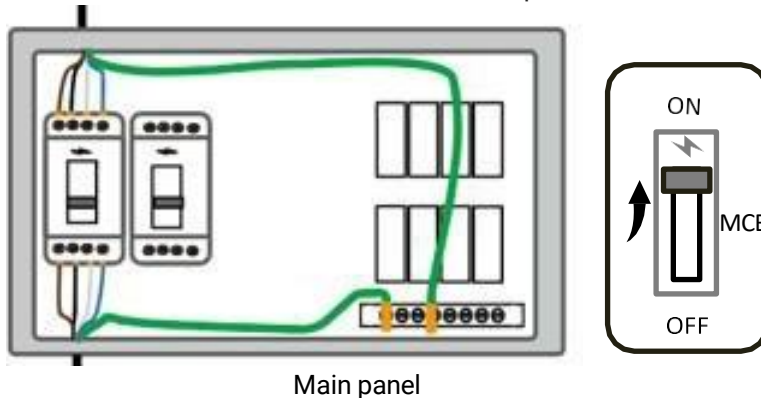
8.1 EP Cube Power-ON

CAUTION:

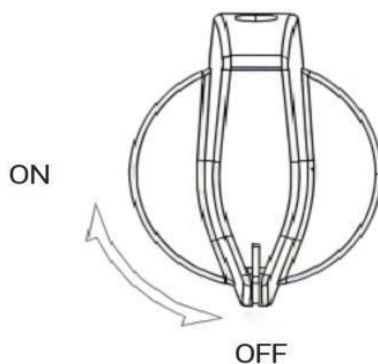
- Please ensure all the cables are connected well before getting started
 - a. Turn on the battery breaker.



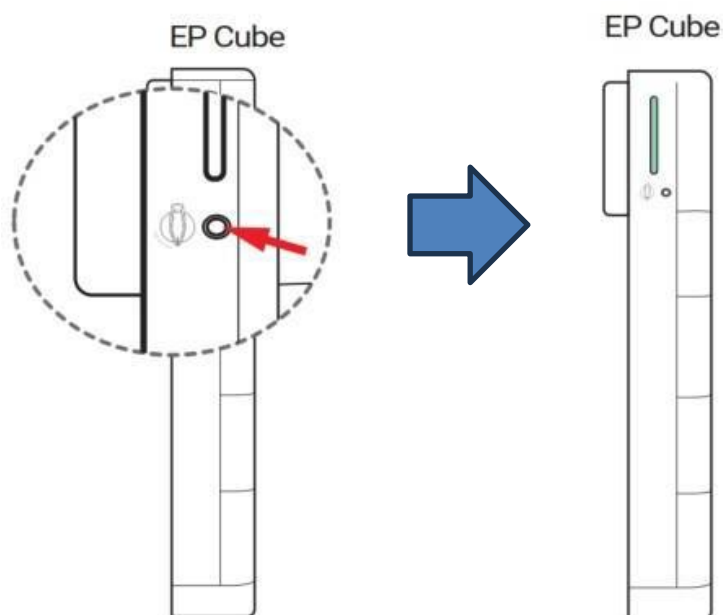
- b. Turn on the Grid MCB inside the Main Home Electrical panel.



- c. Turn on the PV Switch by turning the knob from OFF to ON. All PV (PV1, PV2, PV3, PV4) are controlled through a single switch.

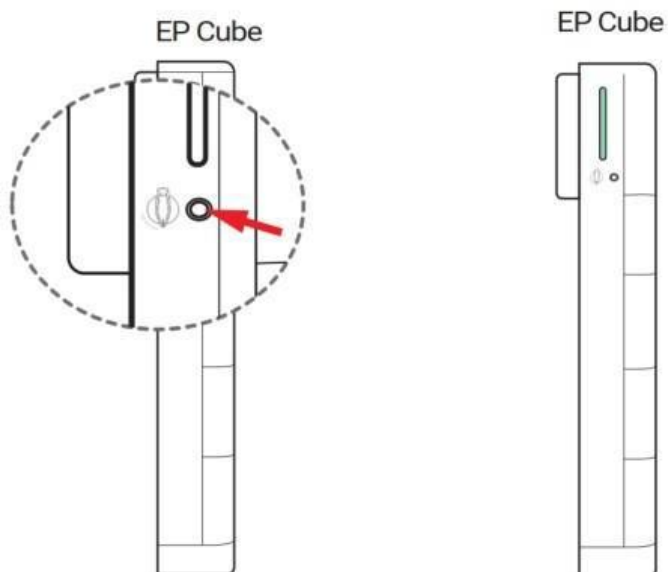


- d. Switch on the EP Cube PCS via pressing the power button as shown in the figure below.

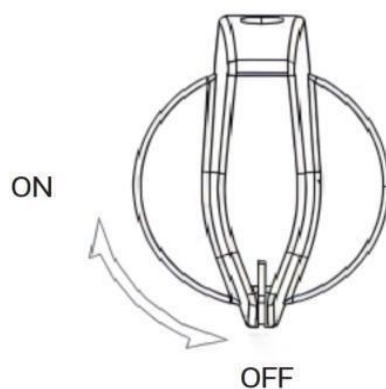


8.2 EP Cube Power-OFF

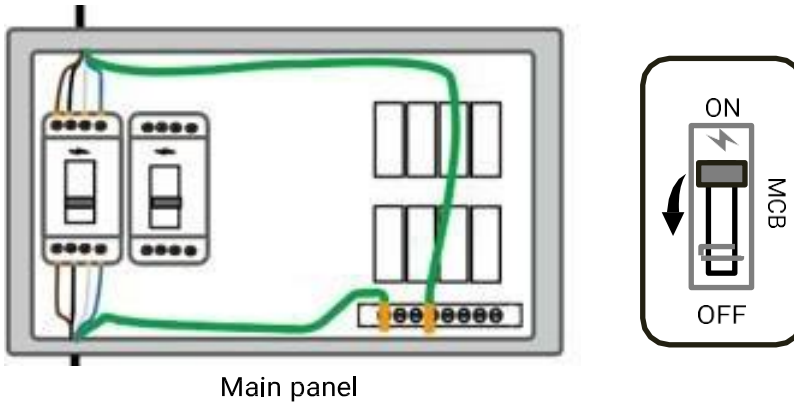
- a. Switch off the EP Cube PCS by pressing the power button as shown in the figure below.



- b. Turn off the PV Switch by turning the knob from ON to OFF. All PV (PV1, PV2, PV3, PV4) are controlled through a single switch.



- c. Turn off the Grid MCB inside the Main Home Electrical panel.



- d. Turn off the battery breaker.



IMPORTANT! Remember to always turn off the battery switch when planning to leave an EP Cube system turned off and disconnected from AC power for a long time. This is to avoid self-discharging of the batteries. Please note that natural self-discharging of the batteries is always expected to happen. More information can be found in the Storage Requirements section.

APPENDIX1: TROUBLE SHOOTING

NO.	Issue	Solution
1	Electric Meter Disconnection Fault	1. Verify the normal operation of the electricity meter display, ensuring all indicators and readings are functioning as expected. 2. Inspect the wiring connections of the electricity meter to confirm compliance with installation specifications and electrical safety standards. 3. Validate the correct installation of the Current Transformer (CT), including verification of its orientation to prevent reverse connection issues. 4. Upon confirmation of no anomalies in the above checks, proceed to coordinate the replacement of the electricity meter through authorized channels.
2	Battery characteristic parameters fail to update	1. Attempt remote restart for system recovery. 2. If remote restart fails to restore normal operation, proceed with battery replacement.
3	Midpoint bias fault	1. Attempt remote restart for system recovery. 2. If remote restart fails to restore normal operation, proceed with PCS replacement.
4	Battery Overcharge Malfunction	In the event of automatic recovery with subsequent normal system operation, no further action is required. Should the system fail to recover automatically or resume normal functionality, please contact the after-sales support personnel immediately for assistance.
5	Input Pre-charging Malfunction	1. Attempt remote restart for system recovery. 2. If remote restart fails to restore normal operation, proceed with PCS replacement.

NO.	Issue	Solution
6	DC Contactor Welding Failure	1. Attempt remote restart for system recovery. 2. If remote restart fails to restore normal operation, proceed with PCS replacement.
7	Abnormal Quantity of Battery Packs Malfunction	1. Attempt remote restart for system recovery. 2. If remote restart fails to restore normal operation, proceed with PCS replacement.
8	PV Polarity Reversal	Replace the PV wiring and correct the polarity connection.

APPENDIX2: Implementation of §14a ENWG / §9 EEG in Germany

This is a regulation only relevant to Germany.

1. § 9 EEG (Renewable Energy Sources Act)

For newly installed PV systems (2kWp – 25kWp):

- Without Smart Meter (MPO): The feed-in power of the energy storage system must be continuously limited to 60% of the PV system's rated capacity.
- With Smart Meter (MPO): The DSO (Distribution System Operator) can temporarily limit the storage system's output power to 60% of the PV system's rated capacity via a control signal box (e.g., FNN Box, EMS) when grid stability is insufficient.

2. § 14a EnWG (Energy Industry Act)

All controllable consumer facilities (e.g., heat pumps, EV charging stations, home storage systems) exceeding **4.2 kW** must be capable of being controlled by the DSO.

- Without Smart Meter (MPO): The charging power drawn from the grid by the controllable load must be limited to below 4.2 kW.
- With Smart Meter (MPO): The DSO can temporarily limit the power drawn from the grid

by the controllable load to below 4.2 kW during grid instability or emergencies.

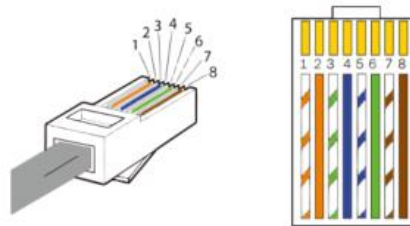
Note regarding EP Cube: The EP Cube is considered a controllable load only when charging the battery. This means the restriction applies solely to the charging power drawn from the grid by the EP Cube.

3. Important Note

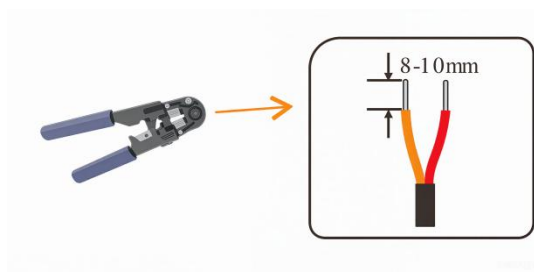
In a parallel operation state (multi-unit setup), all EP Cube systems must be treated as a single system. The control logic must apply to the total input/output of the entire system relative to the grid.

- **Preparation**

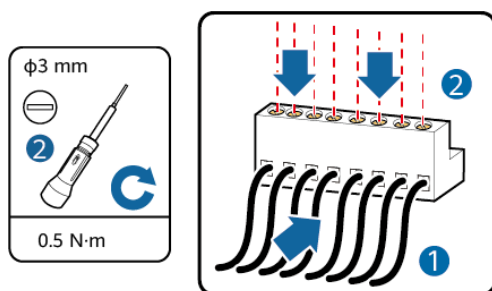
1. Prepare cable: 0.2mm²~1mm² two-core or multi-core wire.



2. Strip 8mm~10mm of insulation from end of the cable.

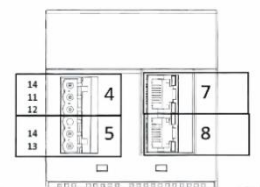
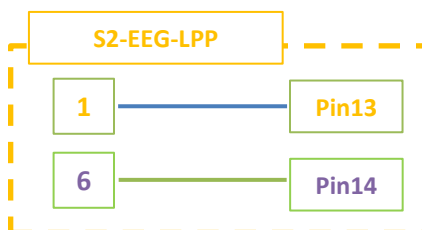
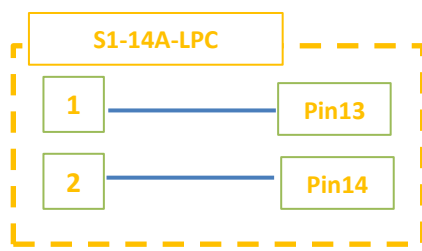
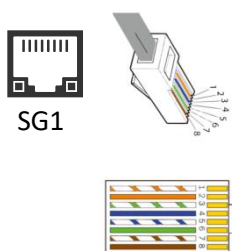
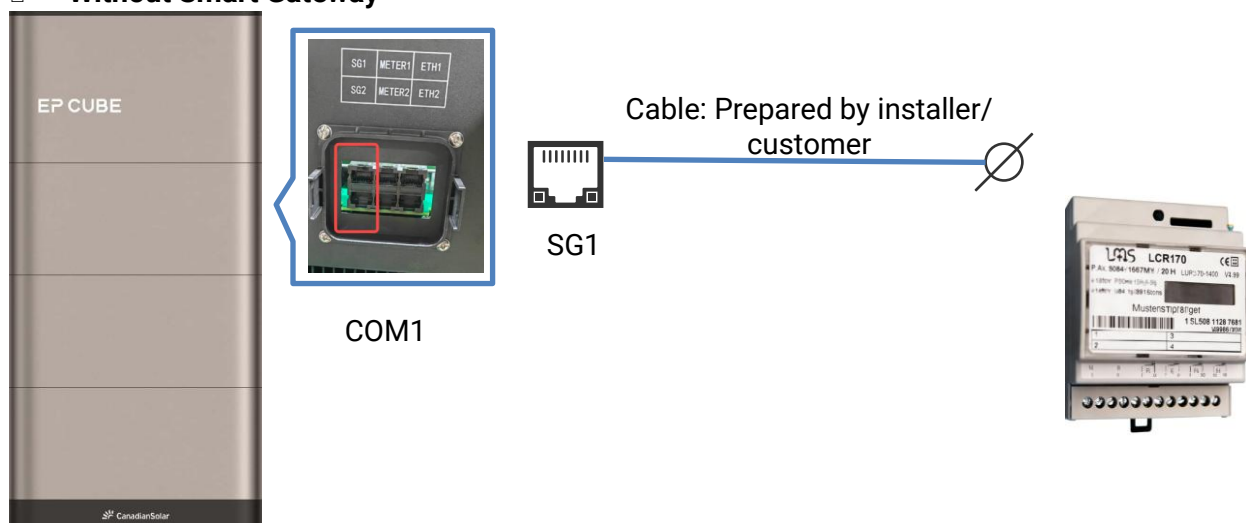


3. Use a flathead screwdriver to connect the cable to the cable terminal block and tighten it.

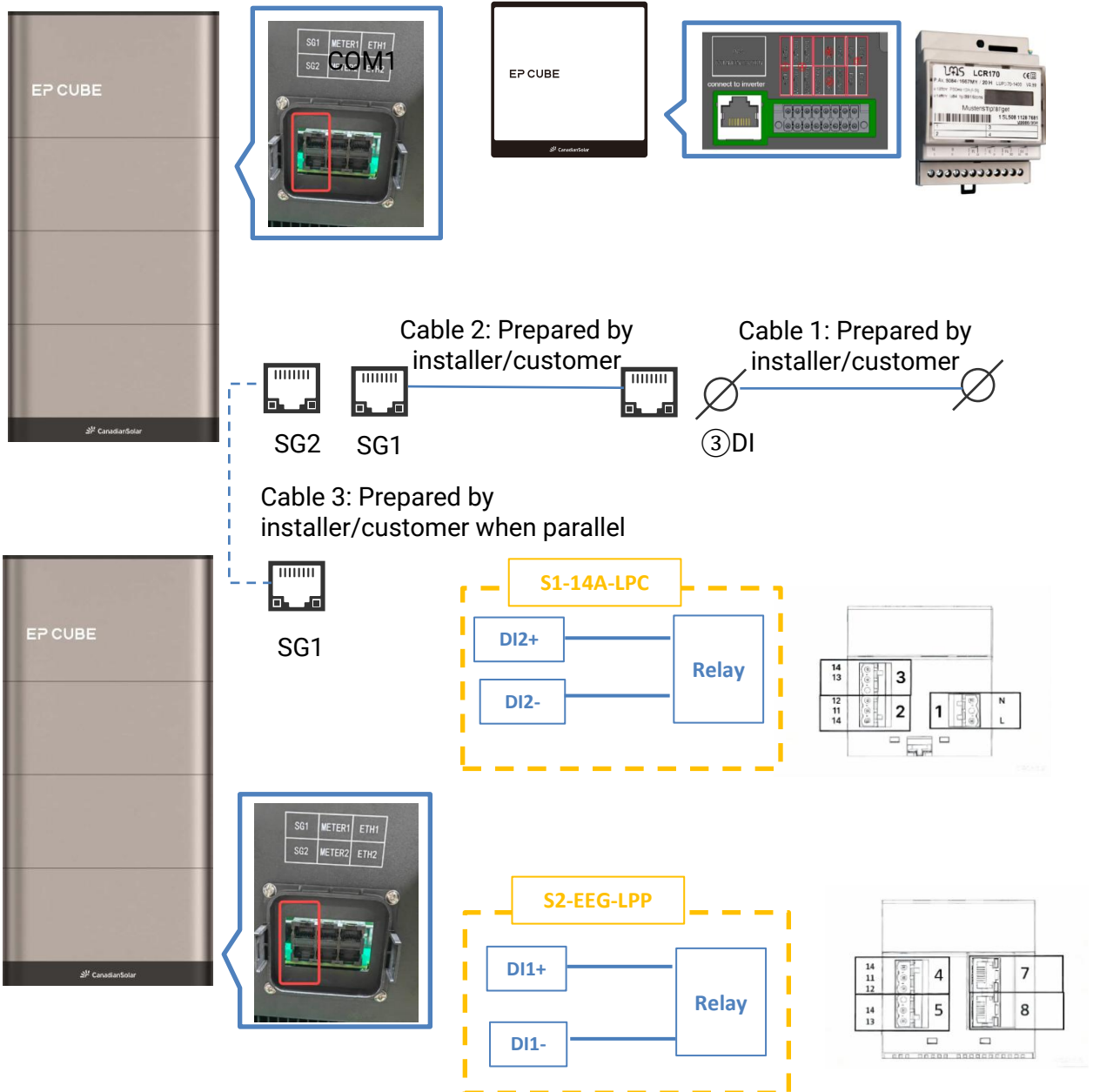


Scenarios

Without Smart Gateway



- **With Smart Gateway**



□ With EEBUS

