

EP CUBE

HOME ENERGY STORAGE SYSTEM

USER MANUAL



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MANUAL DESCRIPTION

Thank you very much for choosing the EP Cube HES product series. We sincerely believe that EP Cube will optimize your home energy, and also look forward to your feedback on the performance of the product for improvement and better service.

About This Manual

This manual contains the product information, instructions for use and care, safety instructions, service and storage instructions, etc..

General Description

- EP Cube can only be used under conditions provided in the manual and any applicable local standards, laws and regulations. Any other use may cause personal injury and property damage.
- The illustrations and images provided in this manual are for demonstration purposes only. Actual product details may vary slightly in appearance on the installation site. Eternalplanet Energy Co., Ltd ("EP") has the right to final interpretation for all the related details of the product.
- The product shall be used in a situation conforming to the design specifications. Otherwise, it may cause product failure, resulting in abnormal product function or component damage. Personal safety accidents and property loss are not within the scope of product quality assurance.
- This manual and other product-related documents are an integral part of the product and need to be properly kept for the on-site installation personnel and relevant technical personnel to review it further.

Abbreviated Terms

- AC Alternating Current
- PCS Power Conversion System
- PV Photovoltaic
- HES Home Energy Storage
- MCB Miniature Circuit Breaker

SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS – This manual contains important instructions for the following Models:


EP Cube HES-EU1-706G, EP Cube HES-EU1-710G, EP Cube HES-EU1-713G,
EP Cube HES-EU1-716G EP Cube HES-EU1-720G.


These instructions must be followed during installation, use and maintenance of the EP Cube system.


For personal protection and safety, please read this part carefully and strictly comply with its contents, during the entire installation and use of the product. EP is not liable for any losses caused by the violation of instructions provided in this manual.

General Notice

This part contains the following symbols with important information for safety use.

 **WARNING:** Hot surface! To reduce the risk of burns, do not touch!

 **DANGER:** Indicates a situation which if not avoided, can lead to death or serious injury.

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

DANGER

- EP Cube products are equipped with batteries that are heavy! Use of lifting equipment is recommended. Do not stack the unpacked products to avoid the irreversible damage.
- It is prohibited to touch the internal components of EP Cube when it's running. Ensure that the inverter is powered off and the AC On-Grid and AC Boost (back-up) breakers of EP Cube are always off prior to all installation, replacement, and maintenance processes.
- Do not attempt to open, disassemble, tamper with, or modify EP Cube.
- Do not squeeze, impact or puncture the battery, to avoid unnecessary damage and loss.
- Do not operate EP Cube outside of the specified conditions and requirements including but not limited to standing, leaning on, or sitting on the product.
- Do not place the EP Cube or its components in water or other liquids or expose EP Cube to flammable gases or other corrosive substances.


⚠ CAUTION

- The transportation, installation, and commissioning of the EP Cube must be carried out under the specified conditions detailed in the datasheet and installation manual. Do not expose EP Cube to conditions outside of those specified.
- EP Cube can only be installed, repaired, replaced, and maintained by licensed authorized personnel for safety and warranty purposes. Personnel must wear protective equipment during any operations.
- Do not place foreign objects on top of the product or insert them anywhere in the product. Ensure sufficient room for ventilation on top of the EP Cube.
- Do not stack more than the specified quantity of battery modules or reverse the polarity of the battery.
- Protect the EP Cube from impact when installing EP Cube in a garage or near vehicles.
- Operating or placing the EP Cube in a high temperatures environment, near heating equipment or sources of extreme heat will cause the battery modules to be thermally unstable, thereby exceeding the thermal runaway point of its material and potentially causing a fire.

Emergency Procedures

If any fault is found that may cause personal injury or product damage, the operation shall be terminated immediately, and effective protective measures shall be taken.

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


In case of fire

- Turn off the Grid Circuit Breaker, AC On-Grid and AC Boost (back-up) Circuit Breakers.
- Turn off the DC PV switch inside the EP Cube PCS to isolate PV input.
- Turn off the EP Cube. (Refer to Page 13)
- Acceptable fire extinguisher types are carbon dioxide-based fire extinguishers, standard ABC fire extinguishers, and dry chemical fire extinguishers.

In case of flooding

- Stay out of the water if any part of the Battery Module, EP Cube PCS, or wiring is submerged.
- Turn off the EP Cube. (Refer to Page 13)
- If possible, protect the system by finding and stopping the source of the water and pumping water away.
- If the EP Cube service team has confirmed that it is safe to re-energize, let the area dry completely before use.

In case of an unusual smell or smoke from EP Cube

- Turn off the Grid Circuit Breaker, AC On-Grid and AC Boost (back-up) Circuit Breakers.
- Turn off the DC PV switch inside the EP Cube PCS to isolate PV input.
- Turn off EP Cube. (Refer to Page 13).
- Clear the area around the EP Cube HES and AC Switch Box or Service panel.
- Ventilate the room.
- Contact EP service team or your installer.

In case of EP Cube making unusual noises

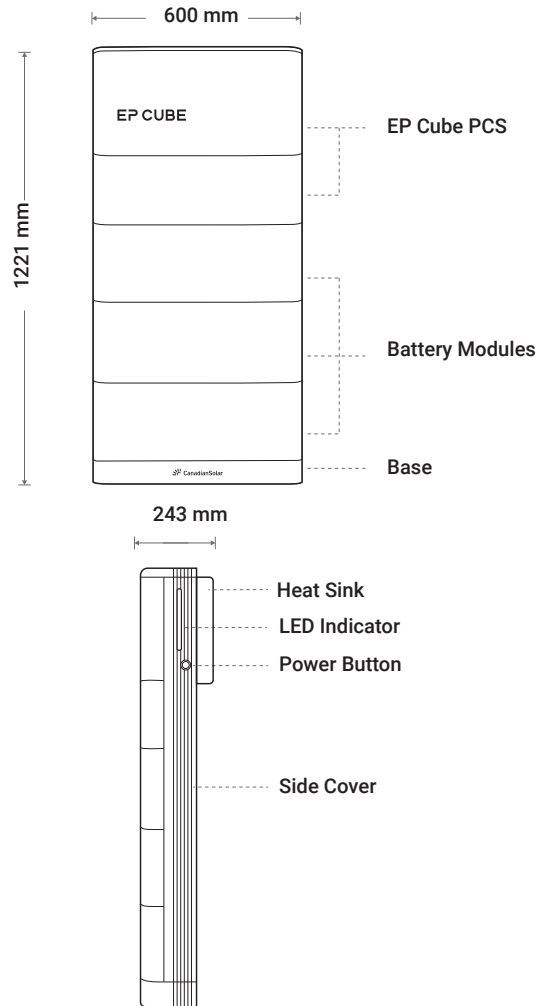
- Turn off the Grid Circuit Breaker, AC On-Grid and AC Boost (back-up) Circuit Breakers.
- Turn off the DC PV switch inside the EP Cube PCS to isolate PV input.
- Turn off the EP Cube. (Refer to Page 13).
- Contact the EP service team or your installer.

PRODUCT INSTRUCTIONS

EP Cube Description

The EP Cube HES integrates the EP Cube PCS, Battery Modules and the EP Cube Base. Accessory components including the EP Cube AC Switch Box and EP Cube Smart Meter Box are also provided for various installation scenarios.

A. EP CUBE HES (Reference Model: EP Cube HES-EU1-710G)



B. EP Cube AC Switch Box (optional)



EP Cube ASB1-40

C. EP Cube Meter Box (optional)

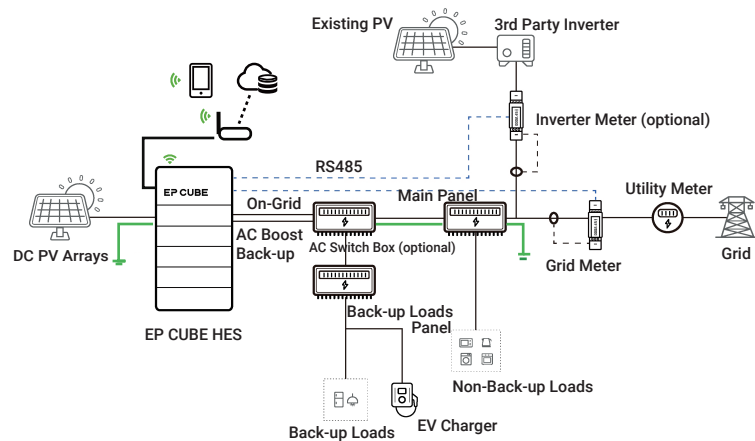


EP Cube 1PHMB1

System Topology

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

Meter boxes (for grid and inverter) are all optional accessories. If an end-user choose not install these boxes then the required meters for grid and inverter can also be installed in the main electrical panel or in a sub panel as per design schema.



Operation Modes

The EP Cube has three different operation modes: Self-Consumption, Back-up and Time Of Use. The end-user can select the desired operation mode according to the description shown in the chart below.

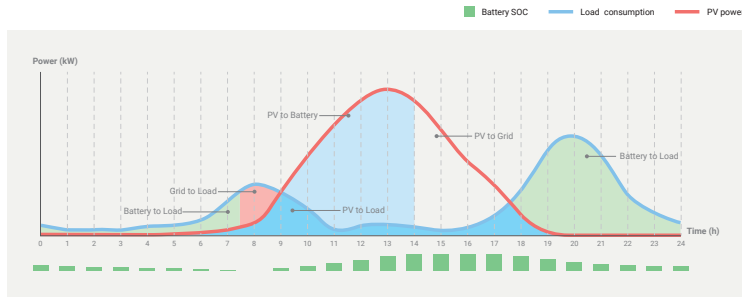
Operation Mode	Description
Self-Consumption	Store surplus solar energy in the battery modules, and manage it to discharge to support your home appliances when solar power is not enough.
Back-up	The end user can select the back-up mode on app to prioritize charging the battery modules as home back-up energy.
Time Of Use	Differentiate battery charge/discharge behavior during peak time and off-peak time based on your utility Time Of Use billing package to save on electricity bills.

Get to Know the Different Operation Modes

A. Self-Consumption

During self-consumption mode the power generated by PV is utilized to supply power to connected loads as a priority. Any surplus power is then used to charge the EP Cube. Power is exported to the grid only after battery modules are fully charged. When PV generated power is not sufficient to support all the load consumption, battery modules are discharged to support the load. 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:

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



B. Backup Mode

During back-up mode power, the EP CUBE is charged until the batteries reach the SOC value set by the user. After that the batteries go into standby mode. Battery modules are charged primarily from PV power, and if at a certain moment PV power is not enough, then batteries can be charged from the grid. If the batteries are fully charged and the SOC value set by the user is lower than 100%, the stored energy between the SOC value and the maximum battery capacity can be used by the loads. When a power failure or grid outage occurs, EP CUBE seamlessly switches to provide back-up power to household load.

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

C. Time-of-Use (TOU):

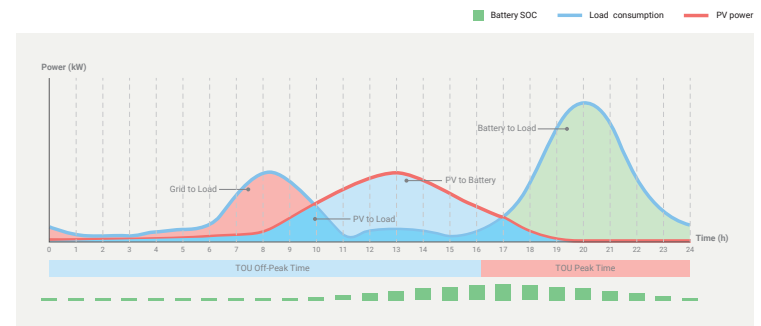
During TOU mode user can set off-peak, mid-peak and peak hours. 3 time-slots can be set for each category.

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, in order to ensure that battery modules are full charged before peak hours.

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

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



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. PV is the only battery charging source during mid peak hours.

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

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.

INSTRUCTIONS FOR USE AND CARE

Using the EP Cube

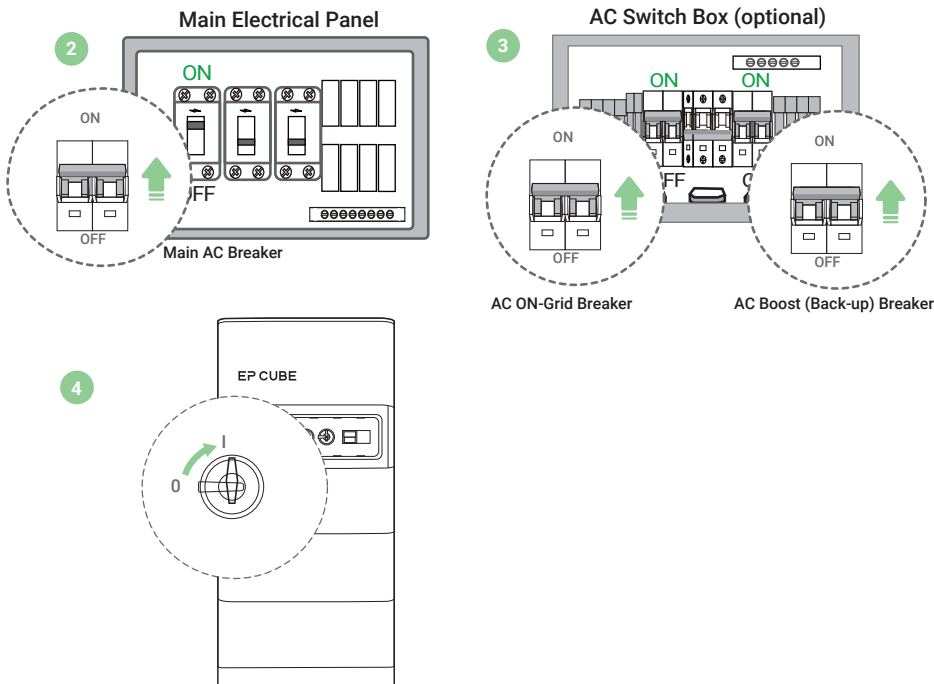
A. EP Cube App

The end-user is able to monitor power and energy flow and system performance via the app.

Download the app for iOS and Android from your app store

B. Energize the EP Cube System

1. Turn on the Main AC Breaker in the Main Electrical Panel.
2. Turn on the AC ON-Grid Breaker and AC Boost (Back-up) Breaker inside AC Switch Box.
3. Turn on the PV Switch inside the EP Cube PCS.
4. Turn on EP Cube HES. (Refer to section C)

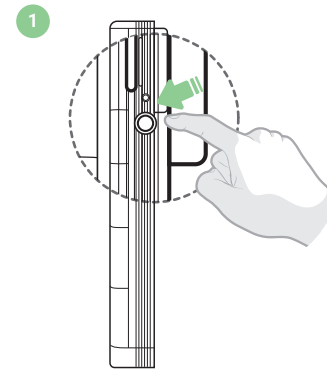


C. Turn On the EP Cube

Once the condition that EP Cube HES is energized. (see item B).

1. Turn on the EP Cube HES by pressing down the power button on the right side of the EP Cube for three seconds.

* Note: The EP Cube does not support black start i.e. if Grid and PV are down, then the system cannot be turned on.)

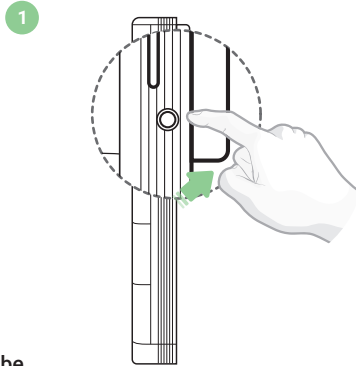


LED indicators: The EP Cube has three operational states shown in the below table.

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

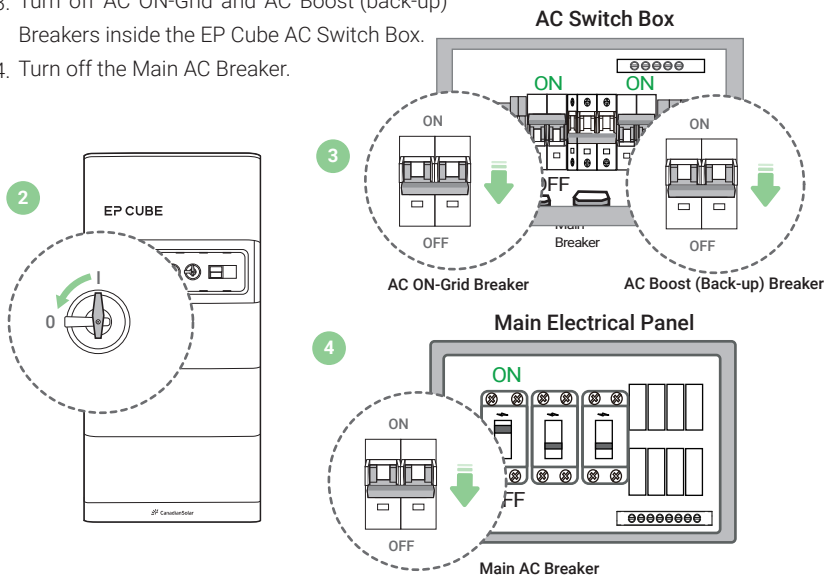
D. Turning Off th EP Cube

1. Turn off the EP Cube HES by pressing the power button located on the right side of the EP Cube PCS for three seconds.



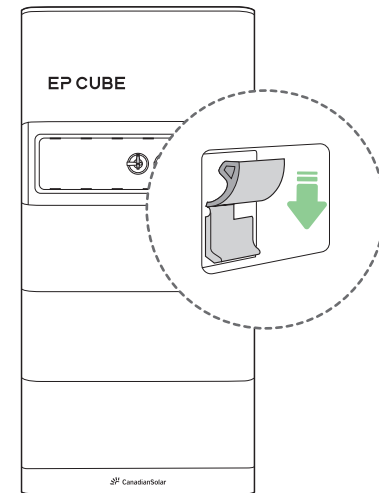
E. De-energizing the EP Cube

1. Turn off the EP Cube HES, (refer to section D)
2. Turn off the PV Switch inside the EP Cube PCS.
3. Turn off AC ON-Grid and AC Boost (back-up) Breakers inside the EP Cube AC Switch Box.
4. Turn off the Main AC Breaker.



F. Disconnecting the fuse (for maintenance only)

- ⚠ Do not disconnect the fuse without the supervision of the EP authorized service team.
- ⚠ Do not disconnect the fuse during normal operation!
- ⚠ Only disconnect for maintenance once the product is powered off and de-energized.
- ⚠ After power off, wait 5 minutes to allow the components to completely discharge.



General Operation And Care

A. Operation and Maintenance


If an end-user is absent for a period of time exceeding 30 days, please ensure that:

1. The EP Cube has a dry and clean environment at an ambient temperature range of 0 °C-30 °C to protect the batteries without charge/discharge.
2. The batteries SOC (state of charge) is between 30%-50% and switch off the EP Cube HES to avoid the batteries being completely discharged.
3. Charge the batteries once every 6 months to prevent damage to the batteries i.e. using back-up or Time Of Use modes (see page 9) to force charge the batteries.

B. Visual Inspection

1. Ensure that no objects are leaning on, stacked on top of, or hanging from the EP Cube or from wires or conduit leading to the EP Cube.
2. Ensure that brackets attached to the wall are stable. Contact the EP Cube service team or your local installer if it is loose or detaching in any way.
3. Ensure that EP Cube internet connection works properly and system firmware is up to date.
4. If you notice an unusual noise or abnormal behavior, contact the EP Cube service team or your local installer for assistance.

C. Cleaning

-  Use a lint-free cloth or vacuum cleaner to remove dust and stains on the enclosure of the product. The use of organic solvents, corrosive liquids, etc. is prohibited.

Product Update

Updating the firmware to optimize performance of the EP Cube is of primary importance. Enable the OTA (Over-the-Air) function on the update page of mobile app. With this, your product will be updated automatically whenever a new firmware is available.

Internet Connection

EP Cube connects to the internet through home ethernet and WIFI networks (2.4G).

When offline:

Go to the "more" tab in the EP Cube App, and click "Bluetooth & WIFI" to configure your WIFI network again by choosing desired network and inputting the latest WIFI

Disposal Instruction

The EP Cube HES is an electronic product, do not dispose of with household waste. The EP Cube has integrated battery modules and proper disposal of the lithium batteries is required. Refer to your local codes and regulations related to disposal of lithium batteries.

Warranty

Check the *Limited Warranty* information **within 45 days** from the product installation date and ensure that the EP Cube has internet access for better aftersales service experience. Refer to Limited Warranty for more details.

Check your warranty information in the EP Cube App, find it by clicking on "More" button and then clicking on "Warranty Information".

Check the *Limited Warranty* status on the portal: <http://epcube.com/eu/>

Click: Top menu >> Support >> Warranty >> Input the serial number of the device (PCS).

If the warranty is not available, please contact your local installer or the EP Cube Service team.

APPENDIX 1- PRODUCT AND SAFETY LABELS



Add: 27th Floor, Building 3A,
Longgang Intelligent Park, Shenzhen, China
Web: www.eternal-planet.com

EP CUBE PCS

- EP Cube HES-EU1-706G
- EP Cube HES-EU1-710G
- EP Cube HES-EU1-713G
- EP Cube HES-EU1-716G
- EP Cube HES-EU1-720G

INVERTER PARAMETERS GRID SUPPORT UTILITY INTERACTIVE INVERTER

Model EP Cube PCS-EU1-7G

PV PARAMETERS

MPPT voltage range 90~550VDC
Maximum input current per MPPT*2 16A
Maximum short circuit current per MPPT 20A

AC PARAMETERS

Nominal grid voltage 230VAC :L-N
Nominal frequency 50Hz
Power factor -0.8 to +0.8
Maximum continuous power (on-grid side) 4.6kW 5kW 6kW 7.6kW
Maximum continuous current (On-Grid side) 20A 21.7A 26.1A 33.0A
Maximum continuous power (AC-Boost (back-up) side) 7.6kVA
Maximum continuous current (AC-Boost (back-up) side) 33.0A

BATTERY PARAMETERS

Battery quantity 2 3 4 5 6
Battery type Rechargeable Li-Ion Battery (LiFePO₄)
Total energy 6.66kWh 9.99kWh 13.22kWh
16.65kWh 19.98kWh
Voltage range 76.8V 115.2V 153.6V 192V 230.4V
Maximum charge / discharge current 55A

ENVIRONMENTAL PARAMETERS

Operating temperature range -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

BATTERY MODULE EP Cube B1-3G

Battery type Rechargeable Li-Ion Battery (LiFePO₄)
Rated capacity 90Ah
Nominal capacity 3330Wh
Nominal voltage 38.4VDC
Weight 35kg
Ambient operating temperature (charging) 0~50°C
Optimum operating temperature (discharging) -20~50°C
Ingress Protection IP65
Protective class CLASS I
Maximum elevation 3000m

SAFETY LABELS

	Danger: High Voltage
	Maintenance of the EP Cube must only commence 5 minutes after disconnection from all external power supplies.
	Danger: Electrical Hazard
	Only certified professionals are allowed to install and operate.
	CAUTION
	Caution, risk of danger.
	CAUTION
	Read the instructions carefully before performing any operation.

	CAUTION
	HOT SURFACE To reduce the risk of burns DO NOT TOUCH