

GREEN SOLUTIONS INC.

A Jiawei Company



Home E10 User Manual

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GREEN SOLUTIONS INC.

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General Information

1. General information

1.1. Introduction

This manual describes all necessary information for the installation of Green Solutions Inc. (GSI) residential energy storage system E10. Please keep this manual in good condition for later reference.

If you have any questions on the requirement and safety measures of this manual, please contact GSI:

Email: support@greensolutions.tech

1.2. Safety precautions

It is the installer's responsibility to read carefully for all contents and warnings in this manual.

- Avoid over-charge or connection errors, or it may cause damage to the E10.
- Before installing the E10, the grid AC inputs and PV DC inputs must be disconnected.
- All the wiring and cable connection must be performed by qualified technicians.
- Carefully read the labels with the warning and attention signs located at the top right side of the connection panel of the E10.
- Do not modify or reconstruct the E10.

1.3. Emergency actions

The E10 design incorporates safety features and precautions to minimize the risk of failures. When there is an emergency, please turn off the system. (Please refer to the section 3.3/3.4 power on/off procedures).

1.3.1. Cell leakage

When electrolyte leakage is observed from the E10, please avoid direct contact with the leaked fluid or gas. If there is a direct contact, please follow the steps below:

Inhalation: Depart from the contaminated area and seek immediate medical assistance.

Eye contact: Rinse eyes with fresh water for 15 minutes and seek immediate medical assistance.

Skin contact: Wash the affected area with soap and fresh water and seek immediate medical assistance.

1.3.2. Damaged E10

- The E10 should not be used when damaged.
- Do not charge or discharge a damaged E10.

1.4. Declaration

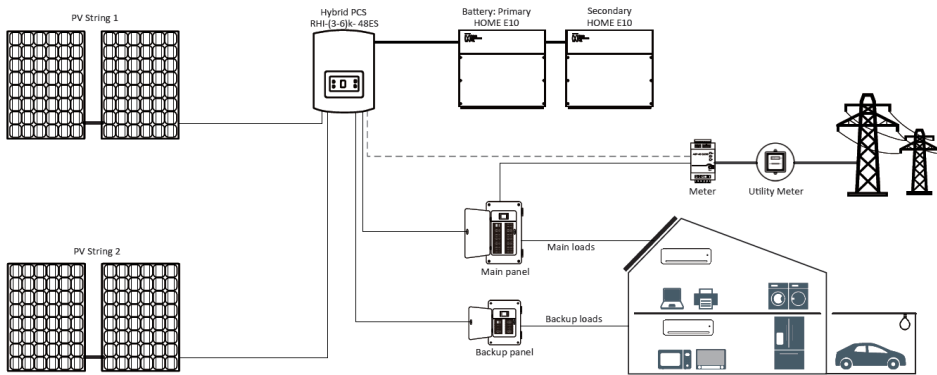
- The manual contains important information on safety and the proper way to install the E10 manufactured by Green Solutions Inc. (GSI).
- All the pictures in the manual are only used for explaining the system configuration and installation procedures.
- Before the installation process, please read the manual and follow all the instructions required throughout the entire installation process. GSI will not be responsible for any improper operation and installation.
- If users install the product in any location that is not mentioned in the manual, please contact GSI customer service.
- The manual is only suitable for the E10.

Product Introduction

2. Product Introduction

2.1. Operating system

- E10 is a 51.2V lithium ion (Lithium Iron Phosphate) energy storage system.
- E10 is designed for residential energy storage. It must be incorporated with an energy storage inverter for all applications.

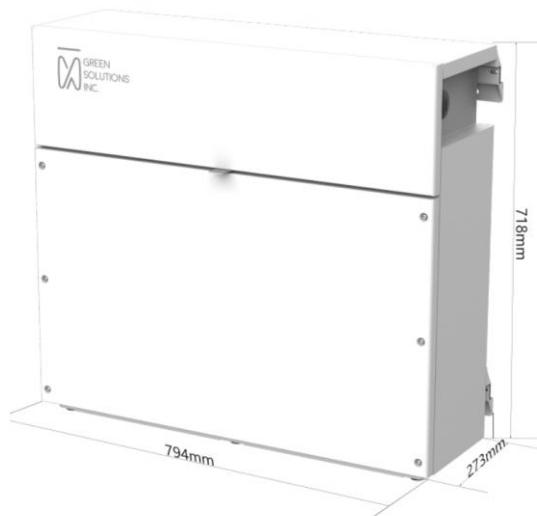


Home energy storage system E10 schematic diagram

2.2. Product specifications

2.2.1. Dimensions and weight

No.	Item	Measurement
1	Length	794 mm/31in
2	Width	273 mm/11 in
3	Height	718 mm/28 in
4	Weight	120 kg/264 lb



2.2.2. Performance parameters

No.	Item	Specifications
1	Nominal voltage	51.2V
2	Voltage range	40-58.2V
3	Nominal capacity	200.0Ah
4	Nominal energy capacity	10.2kWh
5	Usable energy capacity	9.7kWh
6	Nominal power	5kW
7	Max. continuous charge/discharge power	10kW
8	Peak power	12kW(3S)
9	Peak current	240A(3S)
10	Max. continuous charge/discharge current	100A
11	Battery short circuit current	400A
12	Depth of discharge	90%
13	Charge/discharge efficiency	≥98% (25°C/77°F at 60A)
14	Design lifetime	10 years
15	Ingress rating	IP65
16	Communication protocol	CAN 2.0
17	Cooling	Passive cooling

2.2.3. Cable specification

Power cable specification

1	Cross-section area	16~25mm ²
2	Diameter	7~9mm/0.27~0.35in
3	Ring size	8mm/0.31in
4	Max. cable length	2m/6.56ft

Communication cable specification

1	Cable category	8cores/Cat 5e
2	Max. cable length	2m/6.56ft

2.2.4. Operating conditions

1	Operating temperature	-20°C~55°C (4~131°F)
2	Best operating temperature	15°C~35°C (59~95°F)
3	Storage temperature	-20°C~45°C (-4~113°F)
4	Humidity	5~90%
5	Altitude	3000m/9843ft

2.3. Parts List

2.3.1. Parts included in package

No.	Item	Model	QTY	Unit
1	Ring terminal	SC25-8	4	Pcs
2	Block terminal	KEFA KF2EDGKN-3.81	3	Pcs
3	Communication plug	RJ45-8	2	Pcs
4	Concrete anchor	M8 8X80mm/3.1in Size: 10mm/0.39in	8	Pcs
5	SEMS screws	5X15mm/0.59in	2	Pcs
6	Positive power cable	10269 E248566 4AWG Red	1	Meter
7	Negative power cable	10269 E248566 4AWG Black	1	Meter
8	Communication cable	8 cores ethernet cable with RJ45 connector	3	Meter

Installation

3. Installation

3.1. Prerequisites

3.1.1. Make sure the installation location satisfies the following conditions:

- E10 should not be exposed to direct raining.
- Ambient temperature is within 15°C~30°C; and humidity within 65±20%RH.
- The area should have good ventilation.
- E10 should not be installed in offshore area.

3.1.2. Requirements on installers and operators:

- Licensed electrical contractor.
- Or North American Board of Certified Energy Practitioners (NABCEP)-certified solar installer.
- For Australia or New Zealand installer, an external circuit breaker with must be installed between E10 and inverter to provide isolation and over-current protection. Ratings are listed as following:

Rated insulation voltage: 1000V

Rated impulse withstand voltage: 6000V

Suitability for isolation: Yes

Rated operational current: 125A

Rated short-time withstand current (I_{cw}): 7.5KA

Rated short-circuit making capacity (I_{cm}): 10KA

Rated breaking capacity: 10KA

Warning

If the ambient temperature exceeds the allowed operating range, E10 will be powered off automatically to protect itself from damage. The best operating temperature range is 15°C/59°F to 30°C./86°F Frequent exposure to extreme temperatures can result in a degradation in the product's service life.

3.2. Mechanical requirement

3.2.1. Tools



6mm/0.23in
screwdriver



24" wrench



Hamme



RJ45 clamp



Impact driver
(Φ 10mm/0.39in)



Tape measure
(5m/16.4ft)



Laser leveler



Cramping for power cable head
(10mm²-25mm²)

Attentions:

- Use magnetized screwdriver with length 250-300mm.
- Use appropriate insulation tools to avoid electric shock. If insulated tools are not available, please use non-conductive tape to cover the metal surface.

3.2.2. Equipment



1,000Kg/2204lb trolley with adjustable
platform

Suggested trolley specifications: Minimum height: 210mm/8.26in;
Maximum height: 1,000mm/39.3in; Load: 1,000kg/2,204lb; Braking
system.

The weight of the E10 is approx. 120kg/264lb, 2 or more personnel are
recommended for the installation task.

3.3. Unboxing the crate

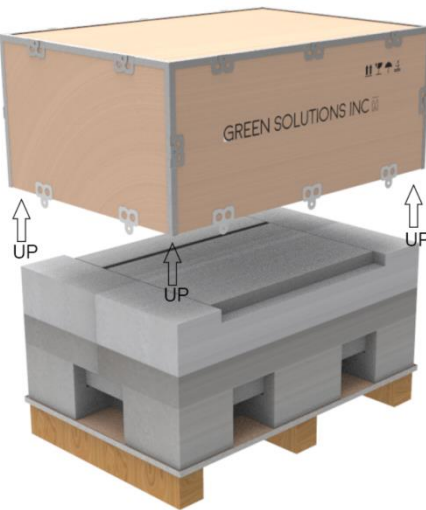
The packaging crates made from recyclable plywood.

3.3.1. Unbuckling

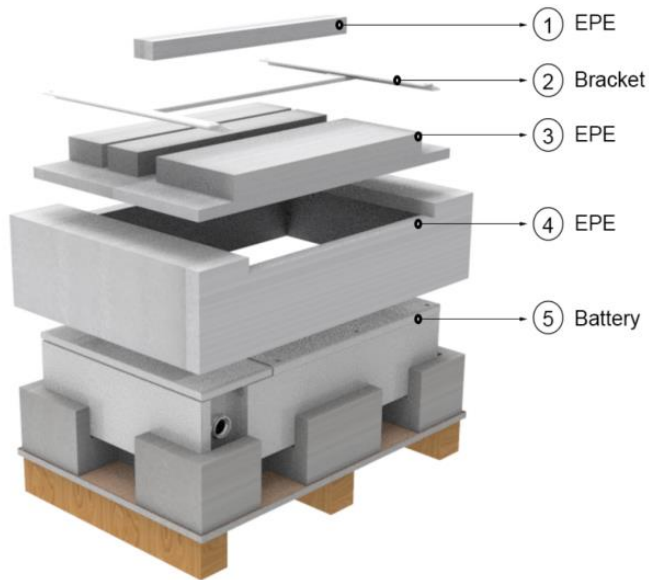


1. Set the crate on a stable platform.
2. Prepare the screwdriver and the hammer in the tools list.
3. Unfold the crate buckles on each side of the crate.

3.3.2. Remove the crate top cover



Remove the crate top cover by lifting it upward.

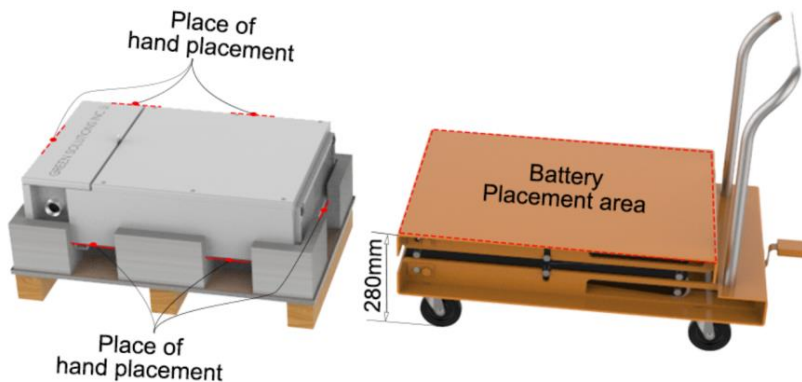


Follow the sequences 1-5 indicated in the picture above to take out the bracket and EPE pads.

Please pay attention while opening crate:

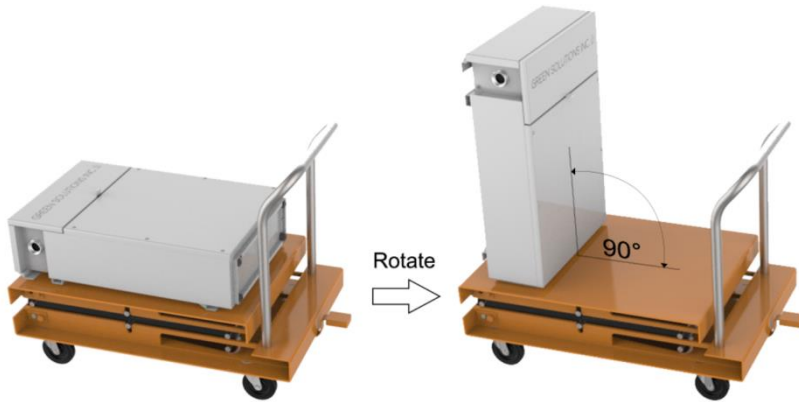
1. Ensure the parts listed in section 2.3.1. are available.
2. Ensure there is no observable damage on the E10.

3.3.3. Transportation



Place the E10 on the platform trolley and move it to the installation area.

3.3.4. Lift the E10 upright



After moving the E10 to installation area, lift it upright, and move it to the end of the trolley.

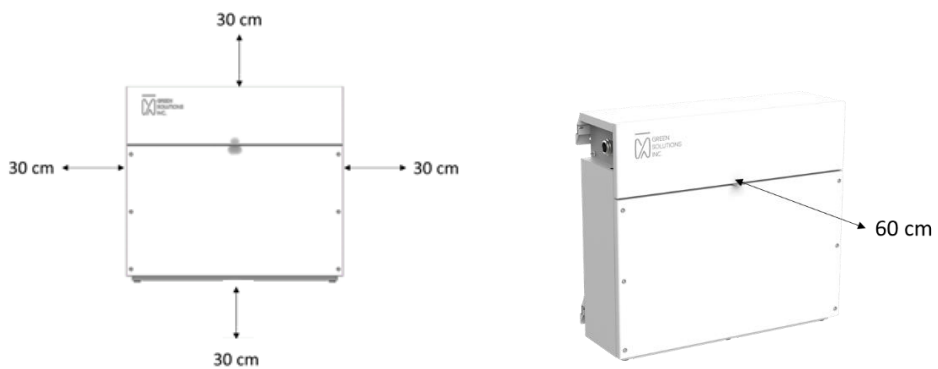
3.4. E10 installation

Installation Locations

- The E10 can be installed indoor only.

Clearance

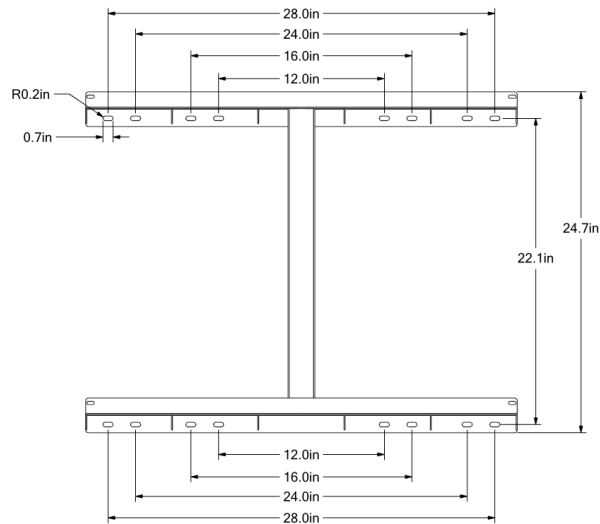
The E10 must be installed with clearance on the left, right, top, bottom and front of the product as shown in the figure below.



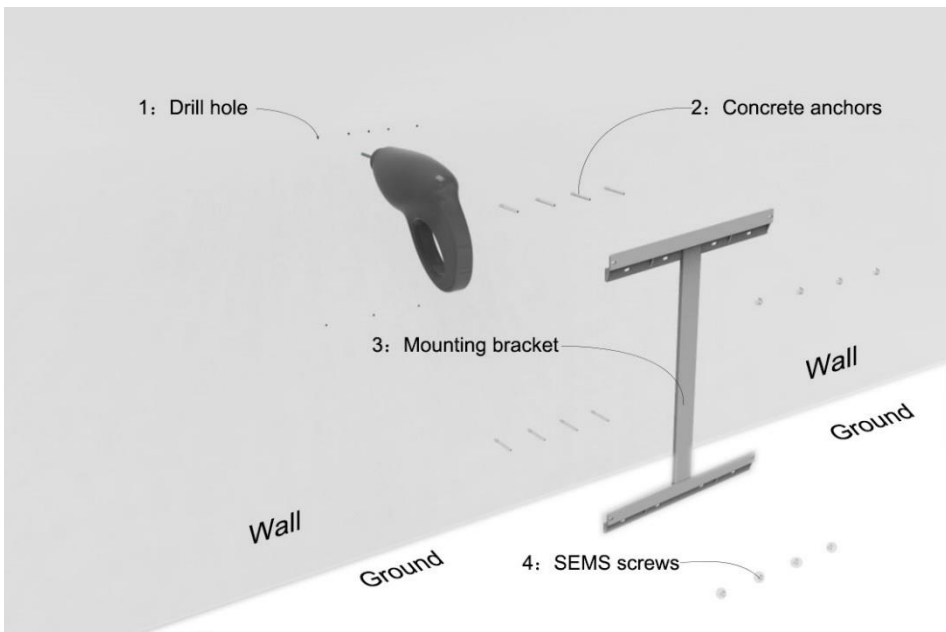
The clearance below the product is required for wall mounting only.

It is suggested that the distance between the E10 and the ground level is less than 1 meter to avoid damage in case of dropping accidentally. Make sure the E10 is always exposed to the ambient environment because the E10 is cooling passively. Use the mounting bracket to fix the position.

Please see the bracket illustration and screw positions.



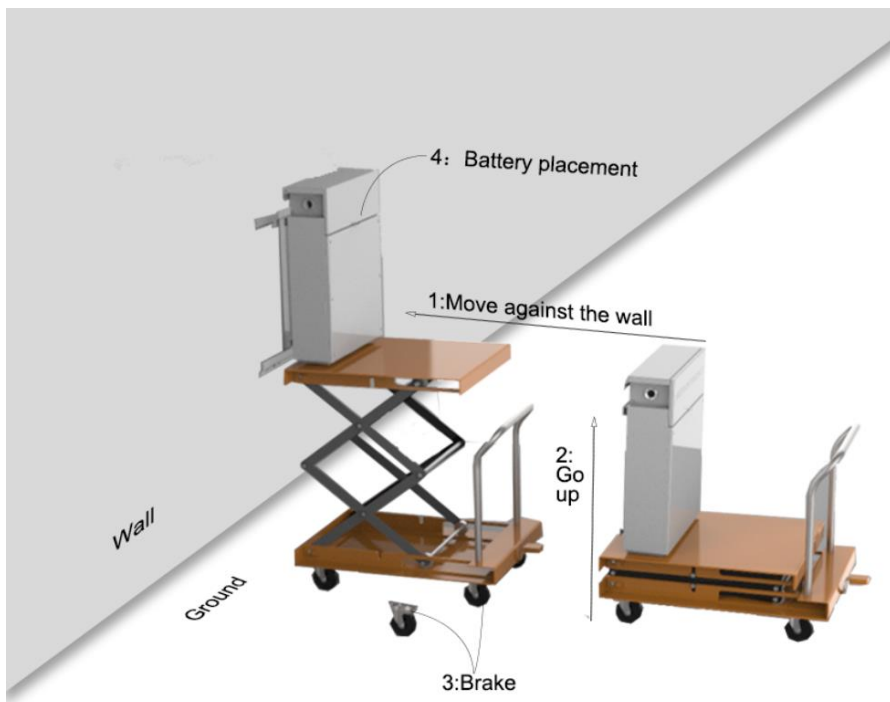
3.4.1. Drill holes on the wall and place concrete anchors in the drilled holes



1. Drill holes with size: $\varnothing 10\text{mm}$ X100mm/3.93in.
2. Screw in the M8X80/3.14in concrete anchors. For concrete wall, 4-6 anchors are recommended; for wooden wall, 8 anchors are recommended.
3. Place the mounting bracket on the wall. Make sure the orientation is correct
4. Tighten the anchors and bracket with torque 20N.m.

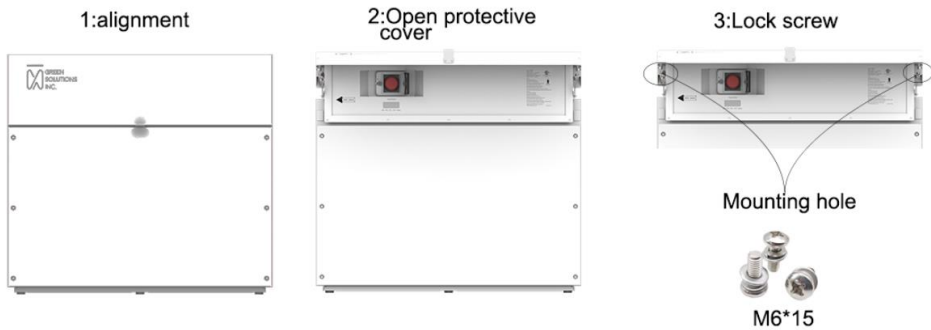
Attention: Please ensure the bracket is horizontally drilled into the wall and measured by a leveler to avoid uneven force exerted to the E10.

3.4.2. E10 installation



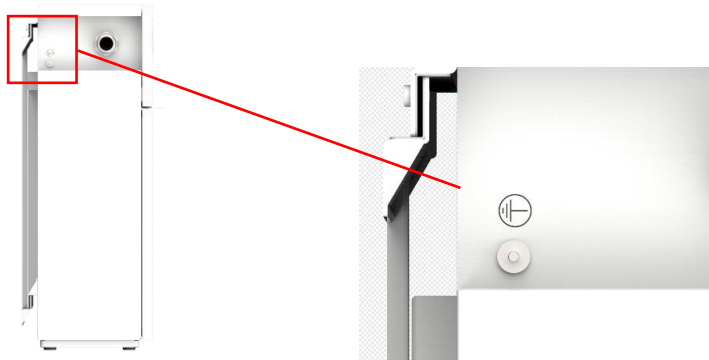
1. Move the trolley close to the wall.
2. Raise the E10 to the same level as the mounting bracket. Keep the E10 less than 1 meter from the ground.
3. Brake the trolley.
4. Place the E10 on the mounting bracket.

3.4.3. Mount the E10



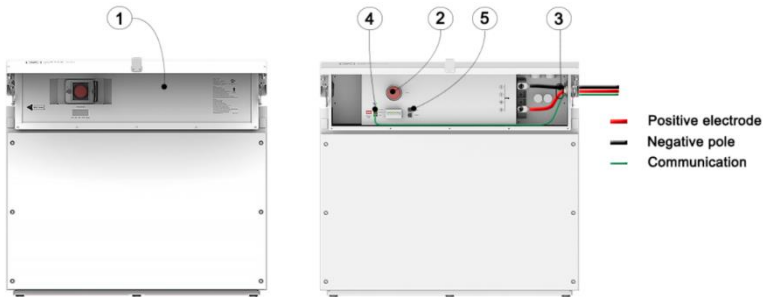
1. Align the E10 and mounting bracket.
2. Open the protection cover.
3. Tighten the mounting holes with 6X15mm/0.59in screws per indicated.

3.4.4. Grounding

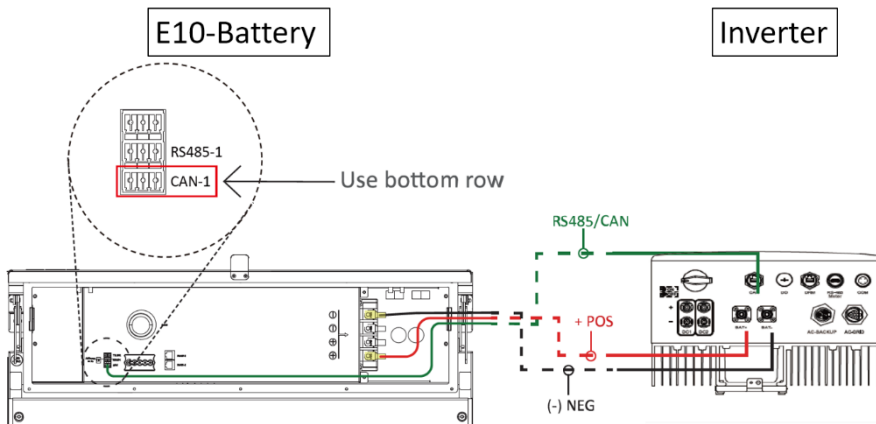


1. Connect the grounding pole to SC4-6 copper nose. Make sure the connection is tight and fixed. The max. torque is 5N
2. Turn off the battery before grounding
3. Do not connect the grounding wire to the painted metal structure or surface, or do not wind the connector for grounding

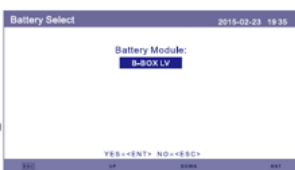
3.5. Connect E10 (DC connection)



1. Open the protection cover.
2. Verify and turn off the battery.
3. Connect the inverter with power cable, mind the +ve/-ve polarities.
4. Connect communication cable.
5. This is RS485 port, which can be used as computer or screen connection (cannot be used as inverter connection at the same time).
6. DC connection and communication diagram (Solis RHI inverter)



7. Setting the monitoring with the RHI inverter. After connecting battery and inverter, perform the settings to ensure the best performance from the combination. All monitoring setting is achieved via inverter monitoring interface. No other monitoring setting is required



Go to more options and enter password "0010" to enter energy storage setting. Select battery "GREEN"



Go to energy storage setting->mode->off-grid->open->over discharge and input 20%



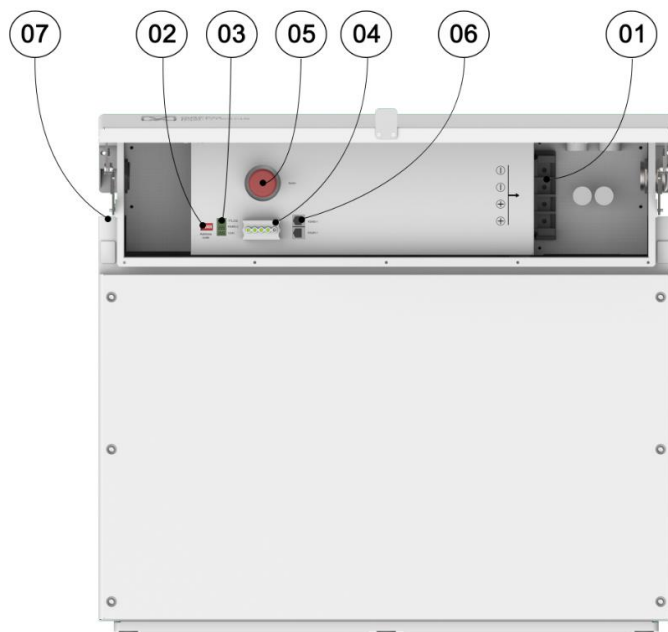
Go to enter energy storage setting. Select battery "GREEN" -> Over discharge SOC ->force charge SOC and input 10%

Operating instructions

4. Operating instructions

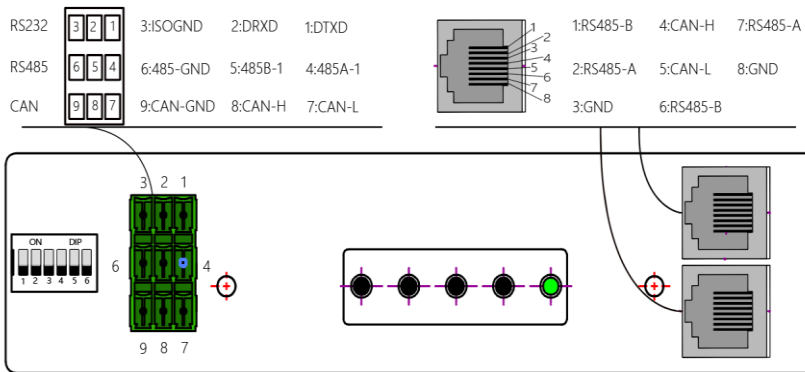
4.1. Power switch and connection panel

Connection panel is the area where user can access and operate. Good understanding of its structure is beneficial for later usage.



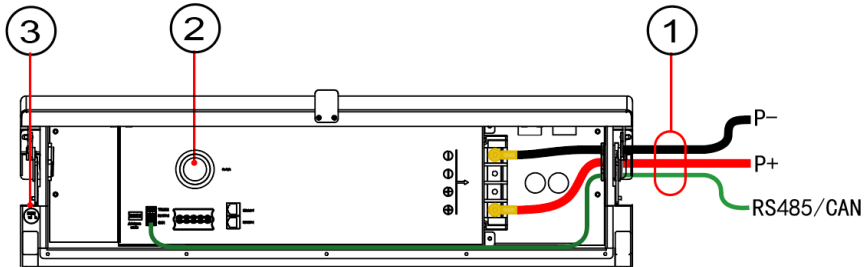
No.	Name	Model	Function
1	Terminal block	TBD315	Power terminal (left)
2	DIP switch	PX19B-6 digit	Set E10 address
3	Inverter communication terminal	2EDGKRH-3.5	Communicate with inverter
4	Status indication	LED	E10 Status indication
5	Emergency stop	XB4BS84441	For emergency shutdown
6	PC communication terminal	RJ45	BMS-PC communication
7	BMS On/Off button	MPB19-AOF10-JQ	Switching On/Off for E10

4.2. Communication terminals



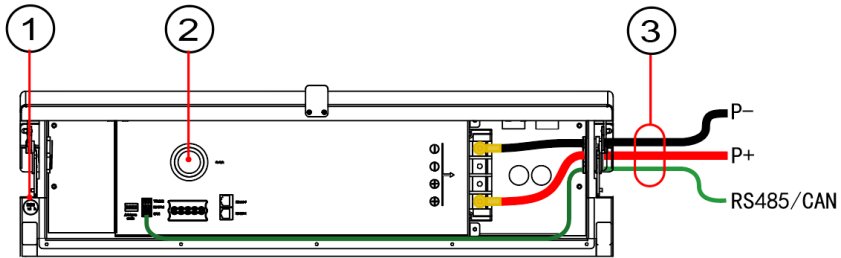
4.3. Power On/Off procedures

4.3.1. Power On procedures



1. Connect the inverter with the E10 communication cable and power cable. Please also refer to section 3.5 Cable connection.
2. Switch the main circuit breaker to ON position (position 2). The way to switch on is to rotate the button in clockwise direction until the button pops up.
3. Press the push button located on the left side of the E10 (position 3) to turn on the E10.
4. If there is no warning signal observed, the power on process is completed.

4.3.2. Power Off procedures



1. Press the push button (position 1) to turn off the E10.
2. Switch the main circuit breaker to OFF position (position 2). The way to switch off is to press the button until a click sound is heard.
3. Disconnect the communication and power cable between the inverter and the E10.
4. The power off process is completed.

4.4 Status LED

Status	LED Color	Mode
Normal	Green	Flashing
Alarm	Red	Flashing
Protection/Failure	Red	Stay on

Please contact GSI for technical support when alarm or protection is on.

4.4.1. Capacity percentage

Capacity percentage			
SOC	White	Green/Red	Warning
0%	● ● ● ●	●	→ Undervoltage
25%	○ ● ● ●	●	
50%	○ ○ ● ●	●	→ Normal
75%	○ ○ ○ ●	●	
100%	○ ○ ○ ○	●	→ Overvoltage
	●	○	●
	LED off	LED on	LED on

Please contact GSI for technical support when alarm or protection is on.

Others

5. Others

5.1. Certifications

No.	Items	Standards certified
1	Battery safety	UL1973, IE62619
2	Cell safety	UL1973/GBT31484 GBT31485/GBT31486
3	Hazardous material classification	Class 9
4	Ingress rating	IP65
5	Transportation	UN38.3

5.2. Compatible inverters

5.2.1. Inverter configuration

- System spec: Hybrid (PV + Grid + Battery).
- Please refer to the following table for paring inverters.

Compatible inverters				
Supplier	Growatt	GoodWE	Solis	Lux Power
Model	SPH 4000	GW3648D-ES	RHI-(3-6)k-48ES	LXP 5K
	SPH 5000	GW5048D-ES		
	SPH 6000			
	SPH 6000-US			
Remarks	<ul style="list-style-type: none"> - E10 supports both CAN and RS485 protocol. - Before installation, please ensure the software version supports the inverter used. 			

5.3. System maintenance

The E10 must be charged at least once every three months if it is not in use. It is NOT recommended to have the E10 stayed in idle or turned off for more than three months.

For every 12 months, visually inspect the exterior of the unit and associated cabling is suggested. For any signs of damage, report these to support@greensolutions.tech.

Further maintenance should only be conducted by qualified individuals under the instructions of the manufacturer.

5.4. Transportation and storage

5.4.1. Transportation

- Do not drop, impact or pierce the E10 enclosure.
- Do not disassemble or use any expired E10.
- Use tools and equipment during transportation. Operators should wear safety tools.

Transportation temperature	5 °C~30 °C
Transportation humidity	65±20%RH

5.4.2. Storage

- Do not expose the E10 under direct sunlight. Do not locate the E10 in a high ambient temperature environment above 55°C or expose to fire.
- Do not immerse the E10 in water or other fluid or expose to humid environment.
- Do not store the E10 inside the area with corrosive gas.

5.5. Warranty

5.5.1. Scope

GSI's liability under this Warranty shall be limited to replacement, repair, refund, and compensation when the E10 is installed and used according to the installation manual. The warranty will be voided for improper use.

5.5.2. Limited liability

Damage to the Products resulting from any of following activities is NOT covered by this Limited Warranty

- Improper transportation or storage.
- Improper installation.
- Use the E10 in inappropriate environment and conditions.
- Improper operation.
- Failed to follow safety cautions and instructions.
- Unauthorized maintenance and modification.
- Force majeure.
- Paired and used with unqualified inverter.

5.6. Uninstallation

5.6.1. Uninstallation

Before uninstalling the E10, please follow the procedures of section 2.4 and 2.5 to power off the system.

All non-usable E10 must be uninstalled by qualified engineers.

Installer should read section 3 Installation process before uninstalling the E10.