

Home Energy Storage System  
Ultra Series

**S40K**

Support by  
Kowint Energy  
Technical Support Department

# User Manual



## KOWINT ENERGY (SHENZHEN) CO., LTD

Version: V1.0  
03 Jan 2023

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# 1. Safety

## 1.1. Safety Instructions

For safety reasons, installers are responsible for familiarizing themselves with the contents of this manual and all warnings before performing installation.

### 1.1.1. General Safety Precautions



#### WARNING!

Please don't crush or impact the battery, and always dispose it according to the safety regulation.

Observe the following precautions:

- Risks of explosion  
Do not subject the battery to strong impacts. Do not crush or puncture the battery.  
Do not dispose of the battery in a fire.
- Risks of fire  
Do not expose the battery to temperatures in excess of 55°C. Do not place the battery near a heat source, such as a fireplace. Do not expose the battery to direct sunlight.  
Do not allow the battery connectors to touch conductive objects such as wires.
- Risks of electric shock  
Do not disassemble the battery.  
Do not touch the battery with wet hands.  
Do not expose the battery to moisture or liquids. Keep the battery away from children and animals.
- Risks of damage to the battery  
Do not allow the battery to get in contact with liquids. Do not subject the battery to high pressures.  
Do not place any objects on top of the battery.



#### CAUTION!

If the battery is not installed within three month since the battery arrived, the battery should be perform the maintenance charge operation, the target is keep the SOC not less than 50% .

## 1.2. Response to Emergency Situations

### 1.2.1. Leaking Batteries

If the battery leaks electrolyte which is corrosive, avoid contact with the leaking liquid or gas. Direct contact may lead to skin irritation or chemical burns. If one is exposed to the leaked substance, do these actions:

Accidental inhalation of harmful substances: Evacuate people from the contaminated area and seek medical attention immediately.

Eye contact: Rinse eyes with flowing water for 15 minutes and seek medical attention immediately.

Dermal contact: Wash the affected area thoroughly with soap and water and seek medical attention immediately.

Ingestion: Induce vomiting and seek medical attention immediately.

### 1.2.2. Fire

In case of a fire, make sure an ABC or carbon dioxide extinguisher is nearby.



#### WARNING!

The battery pack may catch fire when heated above 150°C.

If a fire breaks out at where the battery is installed, do these actions:

1. Extinguish the fire before the battery catches fire.
2. If the battery has caught fire, do not try to extinguish the fire. Evacuate people immediately.



#### WARNING!

If the battery catches fire, it will produce noxious and poisonous gases. Do not approach.

### 1.2.3. Wet Batteries and Damaged Batteries

If the battery is wet or submerged in water, do not try to access it.

If the battery seems to be damaged, they are not fit for use and may pose a danger to people or property.

Please pack the battery in its original container, and then return it to your distributor.



#### CAUTION!

Damaged batteries may leak electrolyte or produce flammable gas. If you suspect such damage, immediately contact your distributor for advice and support.

### 1.3. Qualified Installer



#### WARNING!

All operations of S40k relating to electrical connection and installation must be carried out by qualified person.

A skilled worker is defined as a trained and qualified electrician or installer who has all the following skills and experience:

Knowledge of the functional principles and operation of on-grid systems

Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.

Knowledge of the installation of electrical devices

Knowledge of and adherence to this manual and all safety precautions and best practices

## 2. Product Introduction

### 2.1. Product Overview

The S40k series product is a 51.2V lithium iron phosphate battery storage system independently developed by Kowint Energy (ShenZhen)Co.,Ltd, The rated voltage of the system is 51.2V, and the maximum Output power can reach to 15kw . The parallel connection of multi systems is supported.

Product Dimension: W x H x D= 645mm x 1306mm (20kwh) x 268mm

### 2.2. Product Architecture

#### 2.2.1. Product Overview

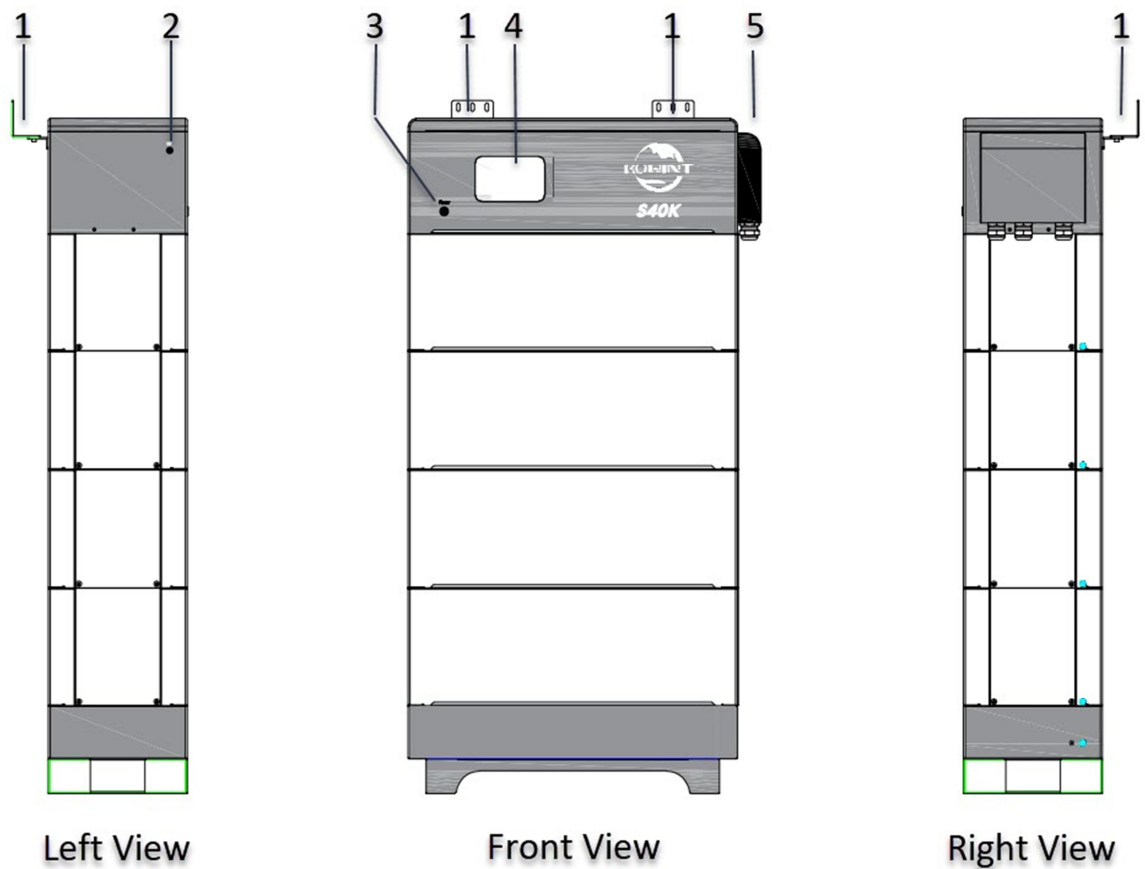


Table 1: Architecture introduce

## 2. Product Introduction

No.	Items	Instructions
1	WIFI Interface	WIFI Antenna Interface
2	Bracket	Wall mount Bracket*2
3	Power Button	Power Button
4	Display Screen	The system monitor display screen
5	Interface cover	Interface panel cover

### 2.2.2. Module design

The S40k Battery Energy Storage System modularity was defined in order to realize the best compromise between the following constraints:

- Flexible growth from 10.24kwh to 30.72kwh.
- High reliability and ease of maintenance.
- Maximize the power output.

The S40k is based on the following Modules:

**Battery Base Module (BBM)** is responsible for the base function of the S40k.

**Battery Modult (BM)** storage the energy .

**Main Control Module (MCM)** integrated the BMS and communication function, is responsible for the battery system management and communication with the other S40k system and inverter.

### 2.2.3. Battery Base Module

The Battery Base Module is an empty module, it's designed for the system's base.

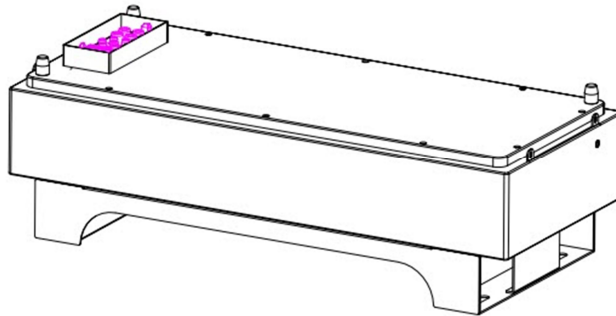


Table2: Battery Base Module Parameters

No.	Items	Parameters
1	Model	S40K-Base
2	Weight (Approx.)	5kg
3	Dimensions (W*D*H)	635*268*184±2mm

### 2.2.4. Battery Module

The Battery Module is composed of 51.2V Battery pack and BMS, each Battery Module can support 5.12kWh energy.



## 2. Product Introduction

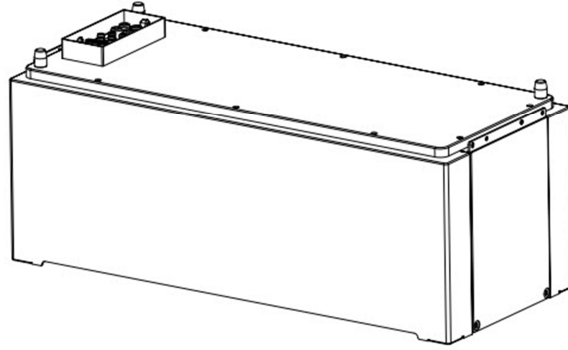


Table3: Battery Module Parameters

No.	Items	Parameters
1	Model	C-UM05-L01
2	Cell Configuration	16S1P
3	Nominal Capacity	100Ah
4	Nominal Energy	5120Wh
5	Weight (Approx.)	49kg
6	Dimensions (W*D*H)	606*268*237±2mm

### 2.2.5.Main Control Module

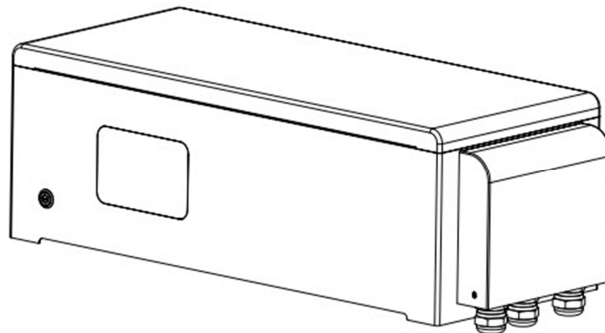


Table4: Main Control Module Parameters

No.	Items	Parameters
1	Model	C-Ulrta-MC300T1
2	Operation Voltage Range	36V~60V
3	Maximum Operation Current	≤300A
4	Communication	CAN、RS485、WIFI
5	Weight (Approx.)	18kg
6	Dimensions (W*D*H)	645*268*211±2mm

### 2.2.6. Interface panel description

The Interface panel at the right side of the MCM (Main Control Module).

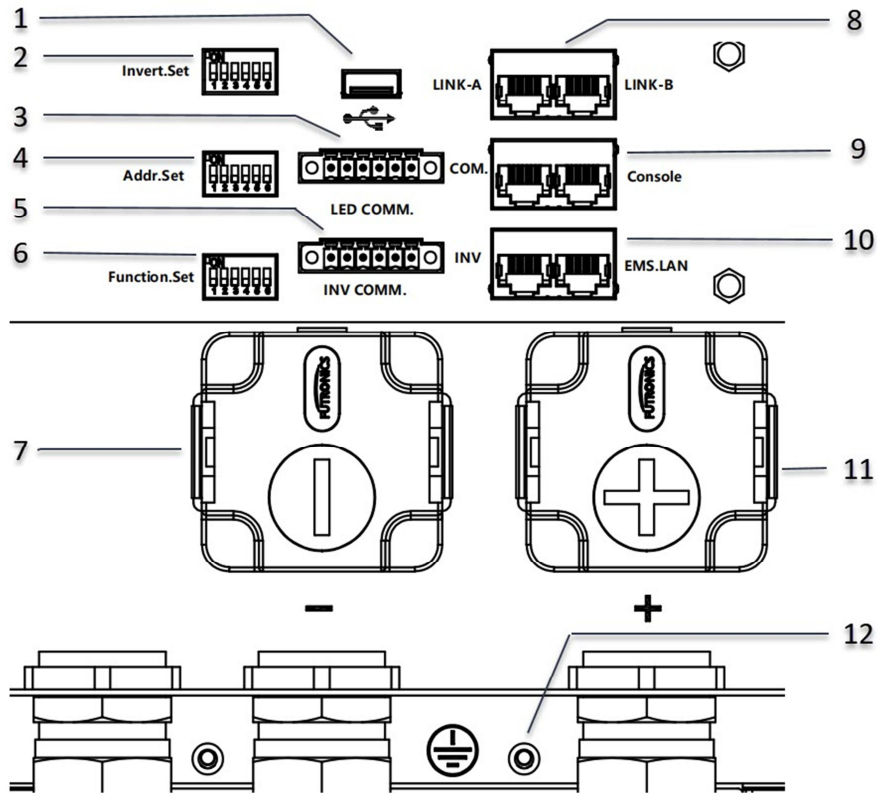


Table5: Interface panel introduce.

No.	Items	Instructions
1	USB	USB connection Port
2	Invert. Set	Inverter communication match select switch
3	LED COMM	LED communication Port
4	Addr Set	Address Dial Switch
5	INV COMM	Inverter RS485/CAN communication port
6	Function Set	The Battery role setting switch
7	-	Power cathode
8	Link-A/Link-B	Multi-device parallel connection
9	Console	CAN communication connection
10	INV COMM	Inverter RS485/CAN communication port
11	+	Power anode
12	GND	Grounding connection

### 2.3. Benefits

- Extreme safety ---lithium iron phosphate battery, long life.

## 2. Product Introduction

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- High performance---a single system supports 15kw load.
- Data Visualization ---large screen display, the running status is clear at a glance.
- Easy installation---stacked design, the system automatically recognizes the module.
- Excellent scalability --- 2~6 modules in a single system can be flexibly configured, and 30 systems can be connected in parallel.
- High operability ---multi-system parallel, one-key switch.
- High maintainability --- support cloud monitoring and cloud upgrade (optional).
- Strong adaptability---outdoor design, suitable for installation in outdoor environment.
- High compatibility---matching test with mainstream photovoltaic inverter.

## 2.4. Specification

Table6: product parameters

No	Items	Parameters					
1	Model	S40K Series					
2	Main Control Module	C-Ulrta-MC300T1					
3	Battery Module Type	C-UM05-L01					
4	Battery Module Chemistry	LiFePO4					
5	Battery Module QTY	2	3	4	5	6	
6	Nominal Capacity (Ah)	200	300	400	500	600	
7	Nominal Energy(kWh)	10.24	15.36	20.48	25.6	30.72	
8	Voltage	Nominal(V)	51.2				
		Recommend Charging(V)	56.8				
		Max. Charging(V)	58.4				
		Discharge Cut-off(V)	43.2				
9	Current	Max. Charging(A)	190	285	300	300	300
		Max. Discharging(A)	190	285	300	300	300
		Peak for 10s(A)	200	330	350	350	350
10	Weight (Approx.)	236kg @25.6 kWh					
11	Dimensions (W*H*D) mm	645*844*268	645*1072*268	645*1300*268	645*1528*268	645*1756*268	
12	Communication	RS485, CAN, WIFI					
13	Cycle Life	≥6000 times @25°C					
14	Designed Calendar Life	≥10 years					
15	Safety Function	Over-charge, Over-discharge, Over-current, Low/High-temperature, Low-voltage, Short-circuit Protections					
16	Parallel Capability	Maximum 30 units (Recommended 8 units)					
17	Charging Temperature Range	0°C~50°C					
18	Discharging Temperature Range	-20°C~50°C					
19	Best Operating Temperature Range	15°C~35°C					
20	Storage Temperature Range	-20°C~55°C					
21	Best Storage Temperature Range	0°C~35°C					
22	Humidity	10%RH~90%RH					
23	Altitude	0~2000m					

## 3. Installation

### 3.1. Installation Prerequisites

Make sure that the installation location meets the following conditions:

The building is designed to withstand earthquakes.

The location is far away from the sea, to avoid saline water and humid air.

The floor is flat and level.

There are no flammable or explosive materials nearby.

The ambient environment is shady and cool, and away from heat as well as direct sunlight.

The temperature and humidity stay at a constant level.

There is minimal dust and dirt in the area.

There is no corrosive gases present, including ammonia and acid vapor.

The ambient temperature is within the range from 0°C to 55°C, and the optimal ambient temperature is between 15°C and 35°C.



#### NOTE !

The S40k battery is rated at IP55 and thus can be installed outdoors as well as indoors. However, if installed outdoors, do not expose the battery directly to sunlight and moisture.



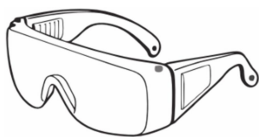
#### NOTE !

If the ambient temperature is beyond the operating range, the battery will stop operating to protect itself. The optimal temperature range for the battery to operate is from 15°C to 35°C. Frequent exposure to harsh temperatures may deteriorate the performance and lifetime of the battery.

### 3.2. Safety prepare

Installation and maintenance personnel must operate according to applicable federal, state and local regulations as well as the industry standard.

The product installation personnel shall wear safety gears, etc. in order to avoid short circuit and personal injury.



Safety goggles

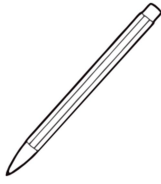


Insulated gloves

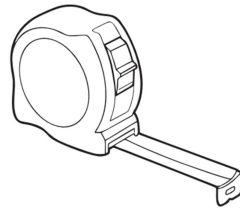


Safety shoes

### 3.3. Required tools



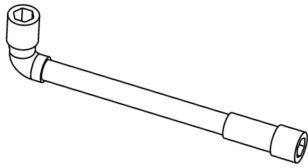
Pencil or Mark



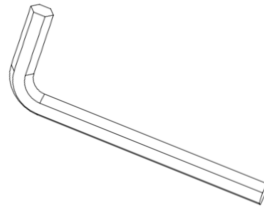
Tape measure



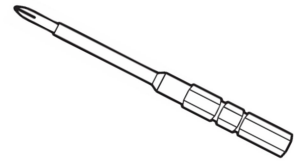
driller



Socket nut wrenchs



Hex wrenchs



Phillips screwdrivers

### 3.4. Packaging inspection

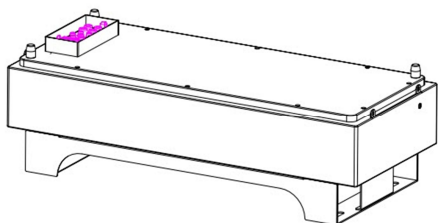
Check the battery packages to find the visible damages, any visible damages, such as cracks, please contact your dealer immediately.

### 3.5. Open Box

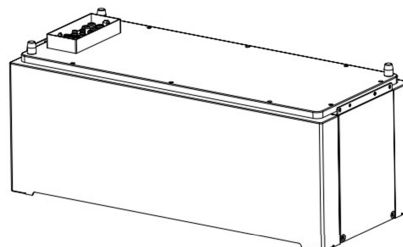
Open the battery package by cutting the packing tape, please check if the battery package and all relevant items are intact.

Check the package items on section 3.6, check the packing list carefully, if there's any item missing, please contact your distributor directly.

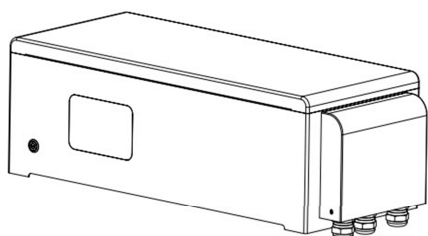
### 3.6. Packing list



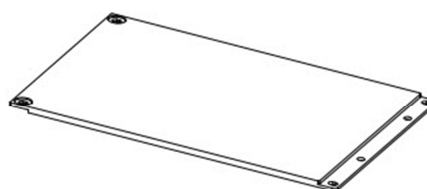
Base Module\*1



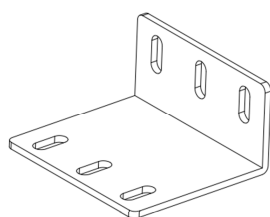
Battery Module\*N ( $N \leq 6$ )



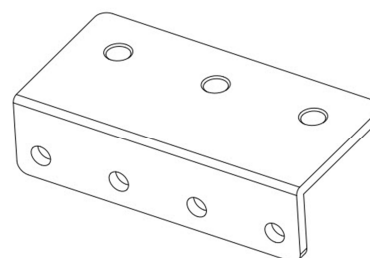
Main Control Module\*1



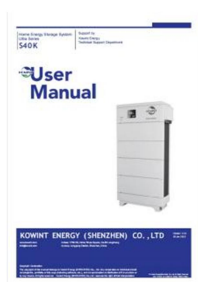
Connection Board\*2N( $N \leq 6$ )



Wall Mounting kit\*2



MCM Mounting kit \*2



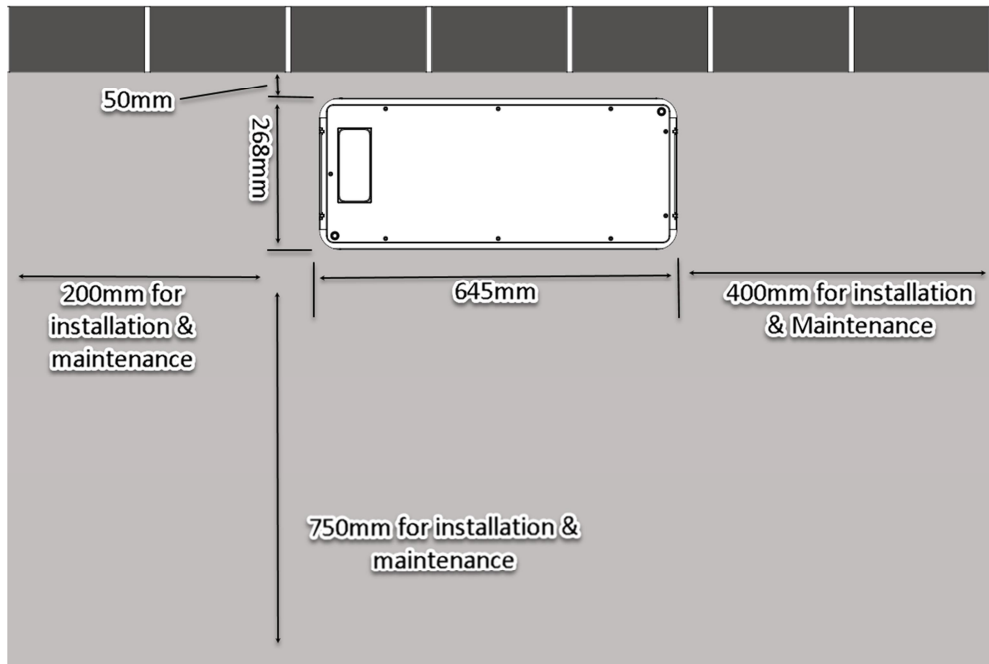
User Manual

### 3.7. Battery installs steps

The battery physical installation including the **floor mounting** and the **wall mounting** (the **wall mounting** is optional, if the **BBM (Battery Base Module)** configure more than **3(include 3)**, the **wall mounting** is highly recommended for safety reason.

**Step 1: Install the Battery on the floor.**

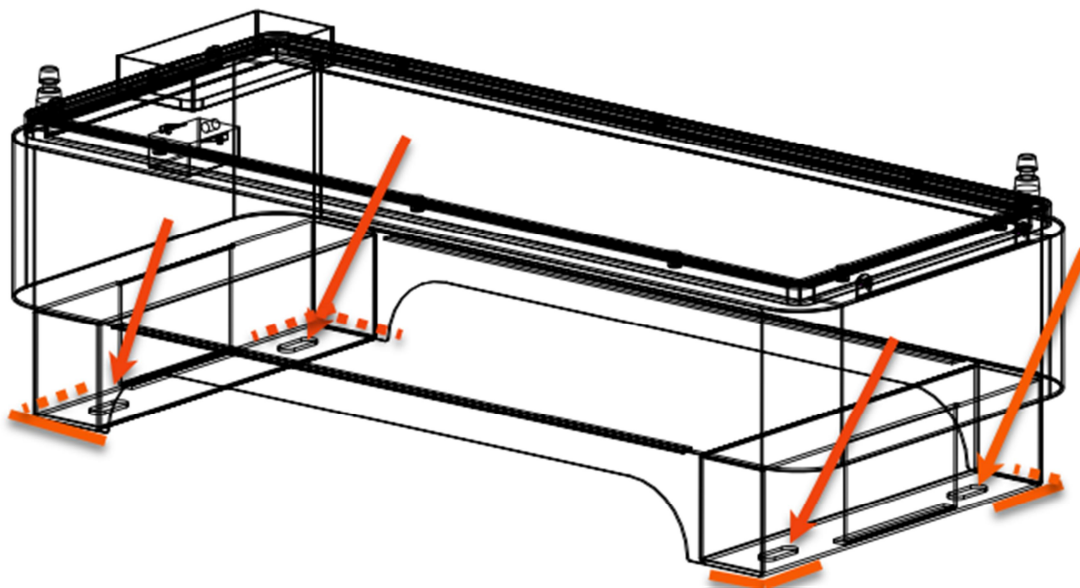
- Put the **Battery Base Module (BBM)** to the install location refer to the following diagram.



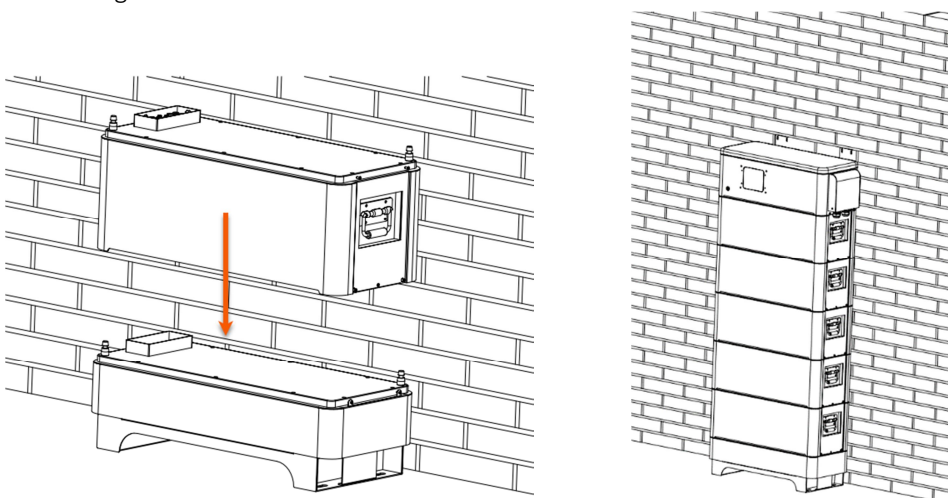
- Use the **BBM (Battery Base Module)** as a template to mark the edge of the **BBM** and 4 hole positions of the **BBM** on the floor as the diagram.



### 3. Installation



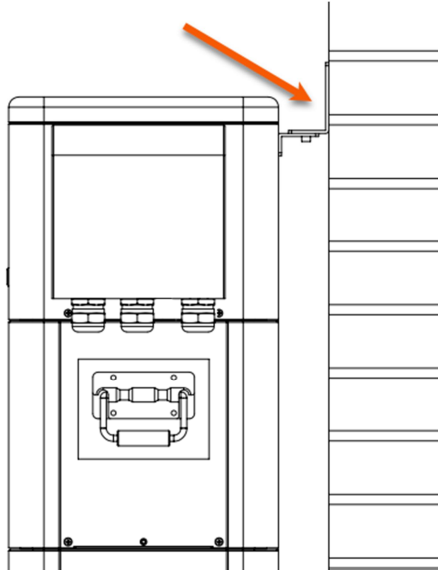
- Remove the BBM, and Drill holes with  $\phi 10$  driller, make sure the holes are deep enough (at least 50mm for installing and tightening the expansion bolts).
- Install the expansion bolts into the floor, then put back the BBM as the marked edge, and tighten the screws.
- Install the BM (Battery Module) onto the BBM one by one and the MCM(Main Control Module) as the diagram.



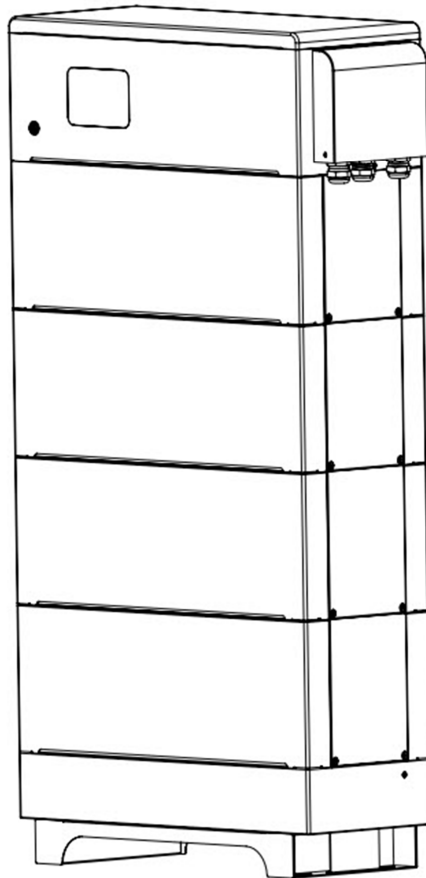
- Adjust the hanging board as it's appropriate location as the following diagram.
- Use the current hanging boards as the templates to mark the hole position, then remove the MCM and use the paper or cloth to cover the BM, and drill holes with  $\phi 6$  driller, make sure the holes are deep enough (at least 50mm for installing and tightening the expansion bolts).

### 3. Installation

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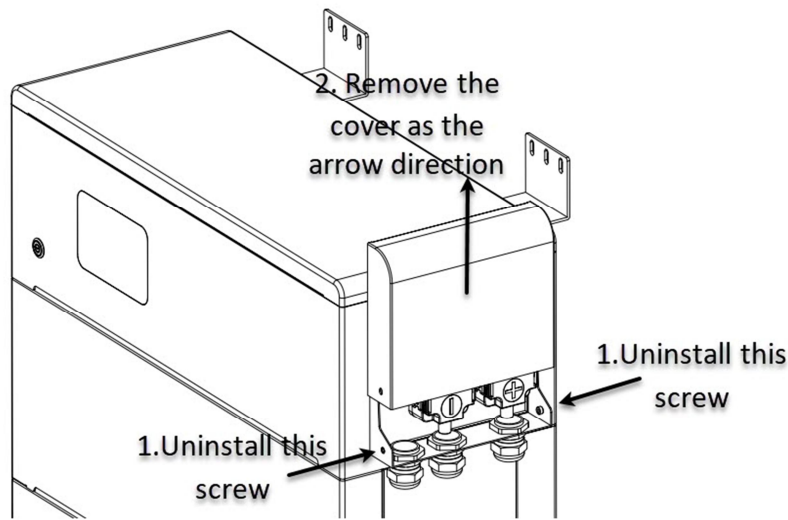
- install the expansion bolts into the wall, reinstall the MCM back to its position and tighten the screw to fix the S40k with the wall.
- Install the connection board between the BBM and the BM and install all the connection board one by one as following diagram.



### 3. Installation

#### Step 2: Uninstall the interface cover

After the Step 1 finished, the S40k battery was installed at its location, uninstall the interface panel cover before start next step



#### Step 3: S40k Dial Switch setting

Set the Dial switch according to the role of the battery pack (The Dial switch is on the interface panel which at the bottom of the battery pack) first.

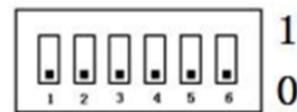
##### A. Set the Function Set refer to the Function SET reference table.

Table 7: Function SET reference table

The Role of the Device	#1	#2	#3	#4	#5	#6
Signal Mode	1	0	0	0	0	0
Parallel Mode Master pack	1	1	0	0	0	0
Parallel middle Slave Battery	1	0	0	0	0	0
Parallel Mode Last Slave Battery	1	1	0	0	0	0

##### B. Set the Addr SET switch refer to the ADDR SET Reference table.

The Address Dial Switch used for Hardware address configure.  
 ADD Switch: 6 ADD switches, "0" and "1", refer to picture right.



The settings will be active only after restart the battery. When the battery communicates with the inverter, the address of the battery pack must be set to 1, and the address of the parallel slave should be greater than 1.

When the battery Pack is connected in parallel, cascading communication is required. Hardware address configuration is required for both the master PACK and the slave PACK, and the hardware address can be set by the dial switch on the board. The definition of the switch refers to the table below.

Table8: Addr SET Dial Switch reference table.

Address	Dial Code Switch Position
---------	---------------------------

### 3. Installation

Coding	#1	#2	#3	#4	#5	#6	
1	1	0	0	0	0	0	Set the master Battery, and the inverter communicates with the battery at that address
2	0	1	0	0	0	0	Set to the slave Battery1
3	1	1	0	0	0	0	Set to the slave Battery 2
4	0	0	1	0	0	0	Set to the slave Battery 3
5	1	0	1	0	0	0	Set to the slave Battery 4
6	0	1	1	0	0	0	Set to the slave Battery 5
7	1	1	1	0	0	0	Set to the slave Battery 6
8	0	0	0	1	0	0	Set to the slave Battery 7
9	1	0	0	1	0	0	Set to the slave Battery 8
10	0	1	0	1	0	0	Set to the slave Battery 9
11	1	1	0	1	0	0	Set to the slave Battery10
12	0	0	1	1	0	0	Set to the slave Battery 11
13	1	0	1	1	0	0	Set to the slave Battery 12
14	0	1	1	1	0	0	Set to the slave Battery13
15	1	1	1	1	0	0	Set to the slave Battery 14
16	0	0	0	0	1	0	Set to the slave Battery 15
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
29	1	0	1	1	1	0	Set to the slave Battery 28
30	0	1	1	1	1	0	Set to the slave Battery 29

#### C. Set the INV.set switch refer to the INV.set Reference table.

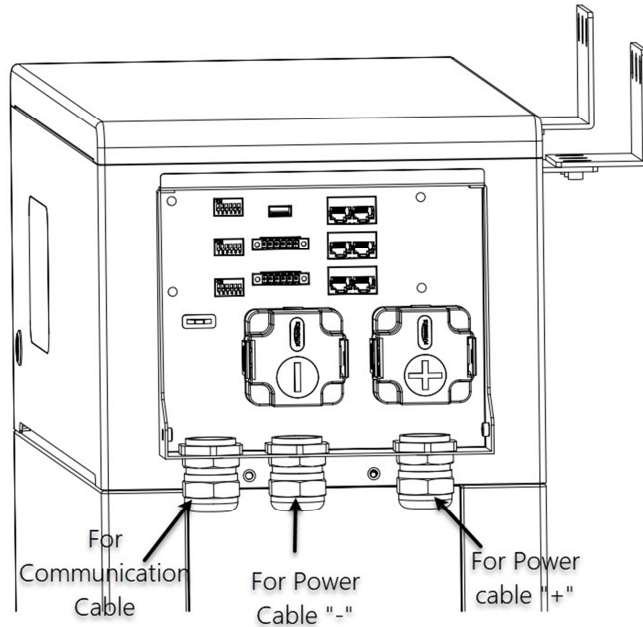
Table9: INV.set Dial Switch reference table

Brand	Type	Version	ID	CommMode
KWT	All	V1.0	1	CAN/RS485
Studer	Xtender	V1.0.3	2	CAN
Sofar	Low Voltage	V6	3	CAN
Solis	Low Voltage	V1.0	4	CAN
Goodwe	Low Voltage	V1.5	5	CAN
Victron	Color Control	20190402	6	CAN
SMA	Low Voltage	V1.1	7	CAN
Sermatec	Low Voltage	V1.2	8	CAN
LuxPower	All	Can-V01	9	CAN
Growatt	SPF	V1.22	10	RS485
Li_PLUS	Low Voltage	V1.2	11	CAN
Schneider	Gateway	V2	12	CAN
SOL-ARK	Low Voltage	V1.0	13	CAN
AnyGrid	PSW-H	2021/11/4	14	RS485
Deye	Low Voltage	V1.0	17	CAN
Growatt	SPH&SPA	V1.3	18	CAN
GreenCell	PV1800 VHM	V1.04.04	27	CAN
Must	PV1800 VHM	V1.04.04	29	CAN

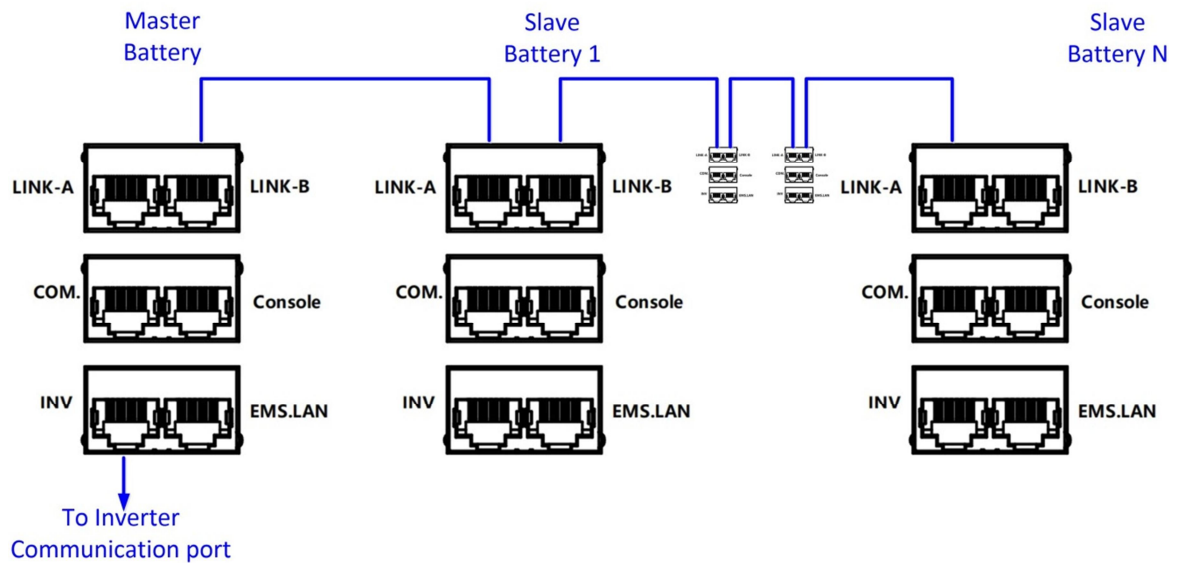
### 3.8. Cable connection

#### 3.8.1. Communication cable connection

- There are three holes on the MCB for the cable go through



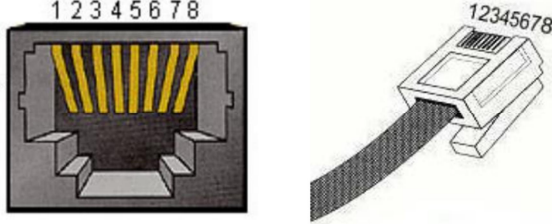
- In single Mode, just need to connect the communication cable from the **Invert.COM** port to the Inverter's Communication port.
- In parallel Mode, also need connect the communication cable from the Master battery's "LINK-B" port to the next battery's "LINK-A" port one by one to create the communication chain, the following diagram show the connection.



### 3. Installation

#### 3.8.1.1. LINK-A & LINK-B Interface

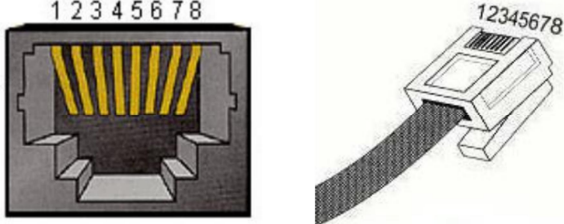
Multi-device parallel connection: The same RJ45 port, two RJ45 parallel. Comply with CAN protocol (baud rate: 500Kbps), used for parallel communication between batteries.

Port Definition	PIN number	PIN Definition
	1	CAN_L
	2	CAN_H
	3	CAN-GND
	4	CAN-GND
	5	CAN-GND
	6	CAN-GND
	7	CAN_H
	8	CAN_L

#### 3.8.1.2. Invert COMM ---Communication with Inverter (RS485 & CAN) Interface

Device supply Inverter communication connection: RS485 & CAN Interface.

CAN/RS485 communication port: (RJ45 port) follow CAN protocol and RS485 protocol, for output batteries information, the battery uses this interface to communicate with external inverters, PCS, and other devices.

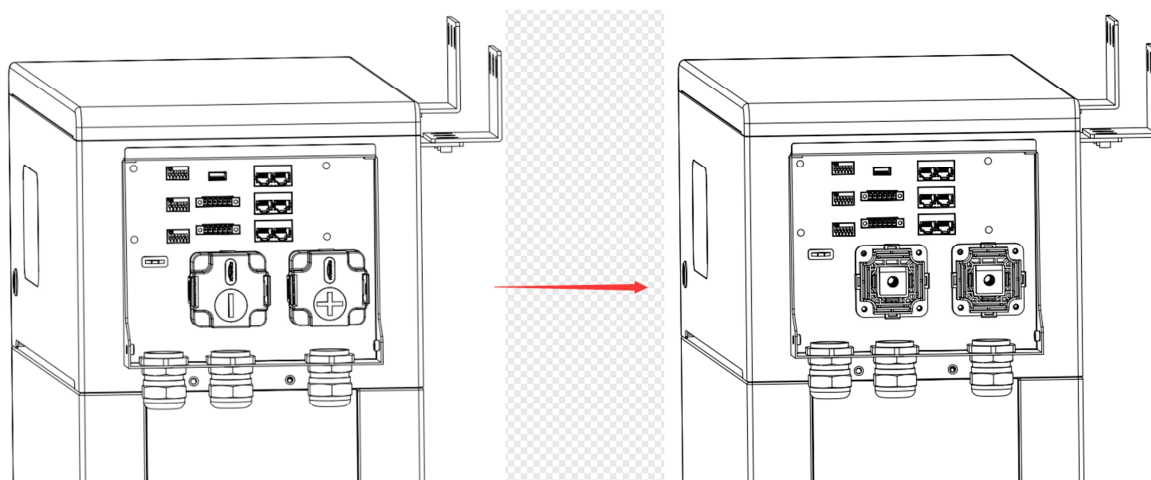
Port Definition	PIN number	PIN Definition
	1	RS485_B
	2	RS485_A
	3	RS485-GND
	4	CAN-GND
	5	CAN-GND
	6	RS485-GND
	7	CAN_H
	8	CAN_L

#### 3.8.2. Power connection

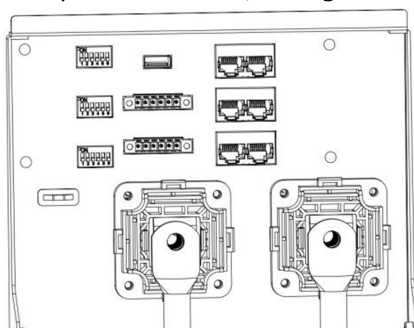
Before connecting the power cable, make sure the inverter and all of the batteries in Power OFF status.

1: Remove the Power connector's cover

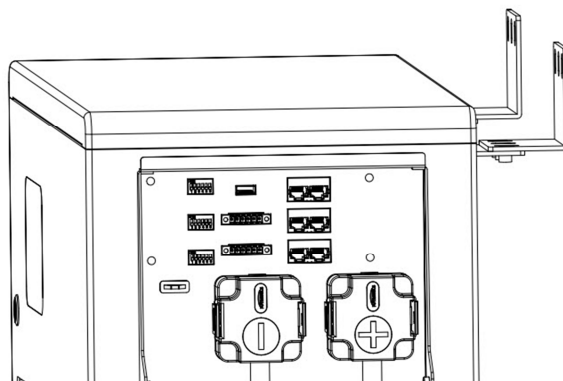
### 3. Installation



**2: Connect the cable terminals to the power connector, and tight the screw.**



**3: Recover the cable connector cover.**



**4: Connect the power cables to the Inverter or the Combiner Box.**

The default length of power cables are 1.5 meters, if the actual installation environment needs longer power cable, the customer can use the power connector's in the packing list to made the longer power cables.

**Step 2: Connect the power cable between the batteries.**

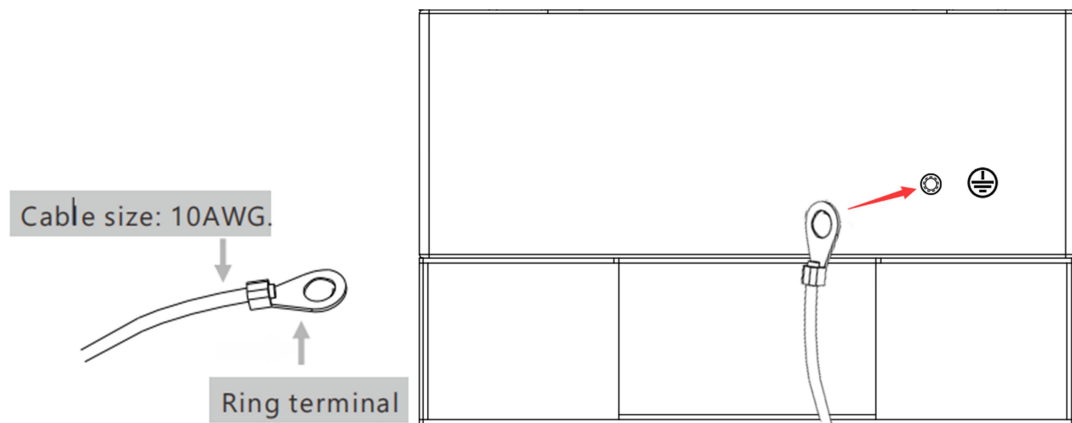
- In single mode, connect the Positive cable & Negative cables to the inverter's Positive Pole & Negative Pole.
- In Parallel mode, connect the Battery power cable's the Combiner Box.

#### 3.8.3. Ground Wire connection

The terminal point for GND connection is on the side of grooves as shown below:

Cable size: 10AWG.

Connect the ground wire to the Ground terminal on the Base module right side, and tight the Nut with the Socket Nut wrenches. Connect the other side to the grounding.



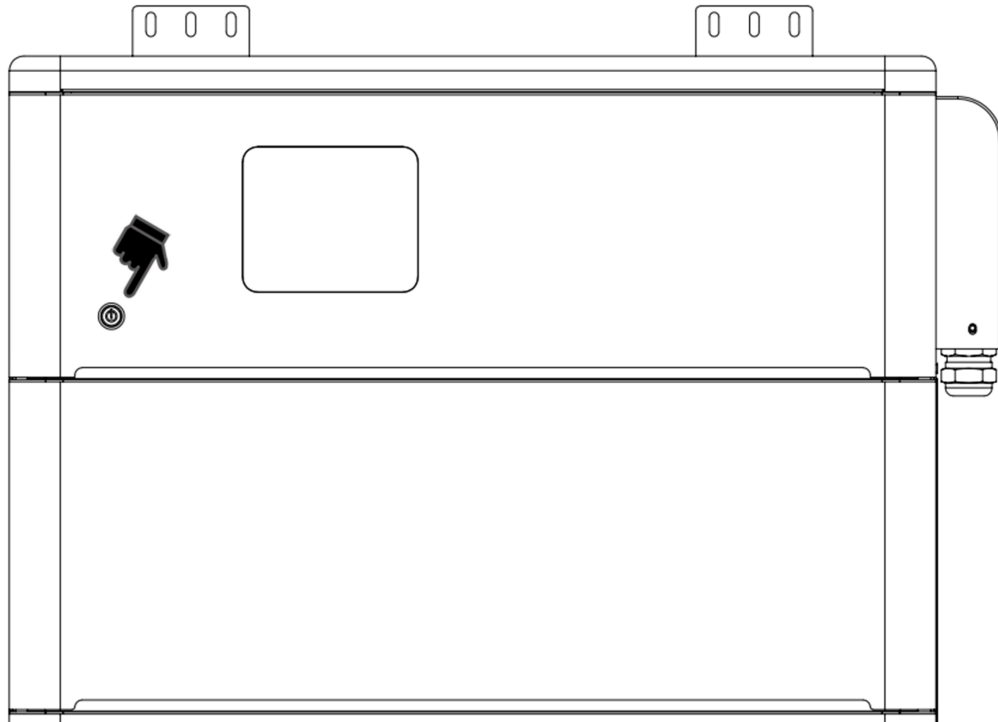


## 4. Commissioning

### 4.1. Commissioning Steps

After all the battery packs are installed, follow these steps to put it into operation.


- Verify the batteries communication cable connection is correct.
- Verify the batteries power connection is correct.
- Verify the batteries Dial switch setting is correct (can use the mobile take a picture for the interface panel and check the Dial switch on the mobile);
- Press the POWER button on the master battery to turn on all of the batteries.
- Check the Battery's screen to confirm the batteries working normal.
- Power on the Inverter.



## 5. APPENDEX


### 5.1. COM interface

The COM communication port: (RJ45 port) combined with CAN protocol, for manufacturers or professional engineers debugging or service.

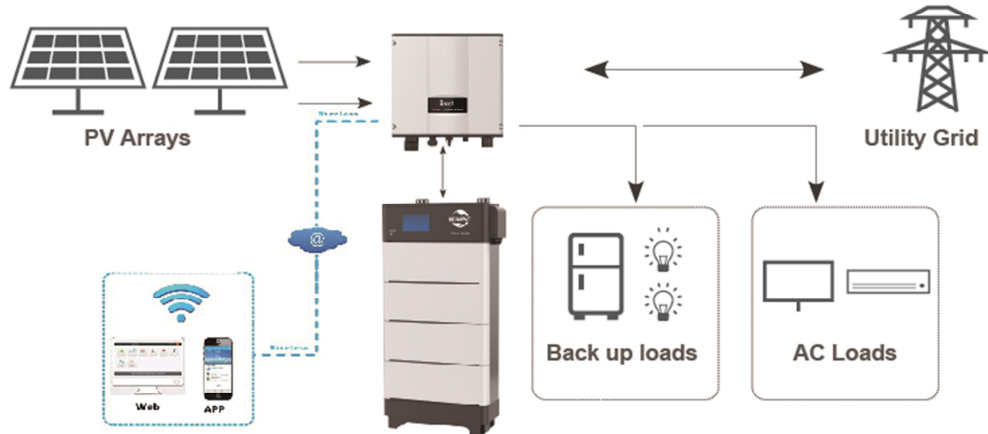
Port Definition	PIN number	PIN Definition
	1	CAN_L
	2	CAN_H
	3	CAN-GND
	4	CAN-GND(LCD)
	5	CAN-GND(LCD)
	6	CAN-GND
	7	CAN_H(LCD)
	8	CAN_L(LCD)

### 5.2. Console Interface

The Console interface comply with RS485 and CAN protocol for manufactures or professional engineers debugging or service.

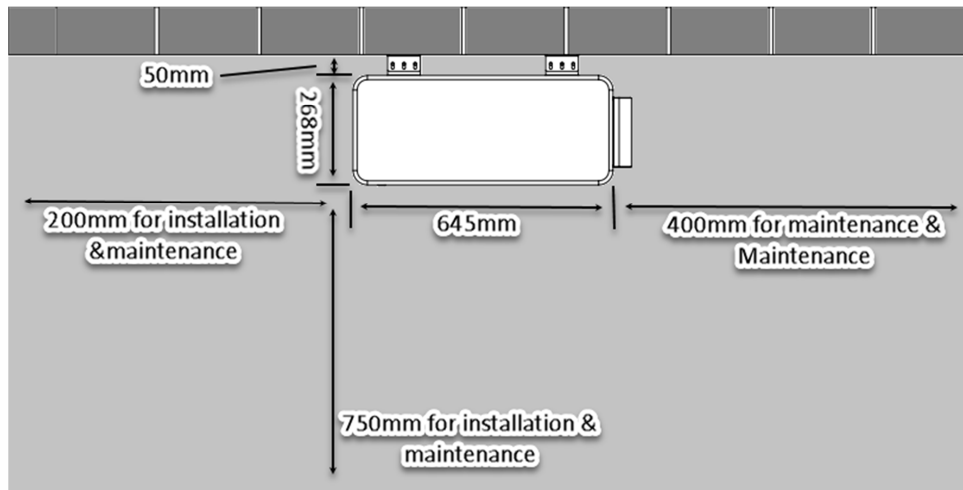
Port Definition	PIN number	PIN Definition
	1	RS485-B
	2	RS485-A
	3	RS485-GND
	4	CAN-GND
	5	CAN-GND
	6	RS485-GND
	7	CAN_H
	8	CAN_L

### 5.3. Product Application



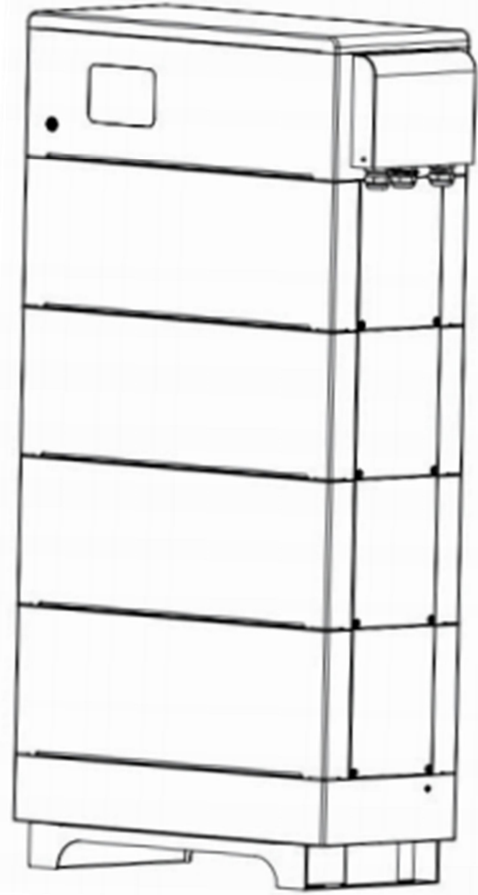
### 5.4. Space requirement & Office layout

The S40k series product is floor mounted installed, and wall mounted optional, it requires the following minimum site footprint:



**KOWI**

# Your Green Energy Coagent



**KOWINT ENERGY (SHENZHEN) CO., LTD**

Version: V1.0  
03 Jan 2023

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