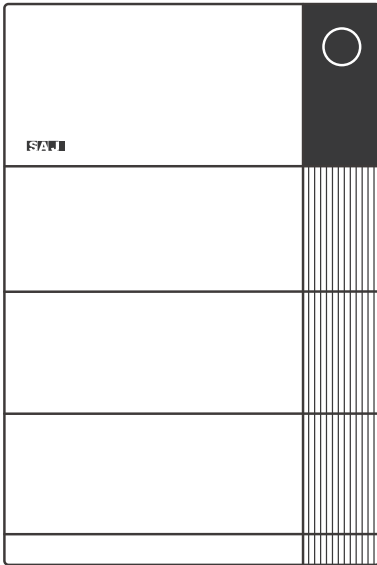


EK70 series

All-in-One Energy Storage System

EK70 HS5-(5K-10K)-(S3,S4)-X

Quick Installation Guide



About this document

This quick installation guide provides the installation and electrical connection instructions of the SAJ product.

Scan the following QR code to obtain the latest eManuals:

Scan for eManuals



Note:

Illustrations in this document show only essential details and may differ from the actual product.



NOTICE

- This document may be updated without notice and is for guidance only. No warranties are implied.
- Read the product *User Manual* before installation for product details and safety instructions.
- Only qualified electrical professionals familiar with grid-connected PV systems and local standards may perform installation or servicing.
- Check the *Packing List* before installation; report any missing or damaged items to your dealer.
- Damage from improper installation or operation not following this document or the *User Manual* is not covered by warranty.



WARNING

Risk of High Voltage and Electric Shock

- This device is directly connected to public grid.
- Before operation, ensure the inverter is completely disconnected from all the power sources.
- During operation, wear appropriate personal protective equipment and use insulated tools.
- Failure to follow these instructions will result in serious injury or death.

Safety symbols

Symbol	Description	Symbol	Description
	Danger: Electrical shock hazard		Caution: No disposal in residential waste
	Danger: Hot surface Do not touch metal plate housing during operating.		CE Mark
	Danger: Do not open the cabinet door until 5 minutes after disconnecting all power sources.		RoHS compliant mark
	Warning: No open flames		Caution: Check the user manual before service

Contents

1. Installation.....	2
1.1. Environment requirements.....	2
1.2. Plan the installation site.....	3
1.3. Installation tools.....	4
1.4. Packing list.....	5
1.5. Dimension.....	10
1.6. Ground mounting.....	11
1.7. Wall mounting.....	18
2. Electrical connection.....	21
2.1. Australia and New Zealand.....	21
2.2. Inverter ports and switches.....	24
2.3. Prepare the cables.....	27
2.4. Connect the grounding cable.....	28
2.5. Connect the AC power cables.....	29
2.6. Connect the manual transfer switch.....	32
2.7. Connect the DC power cables.....	34
2.8. Connect the communication cables to COM port.....	36
2.9. Connect the communication module.....	39
2.10. Connect the LAN and DRMS cables.....	40
2.11. Connect the antenna.....	41
2.12. Install the inverter cover.....	42
3. Start up the system.....	43
4. LED on the inverter.....	46
5. Shut down the system.....	48

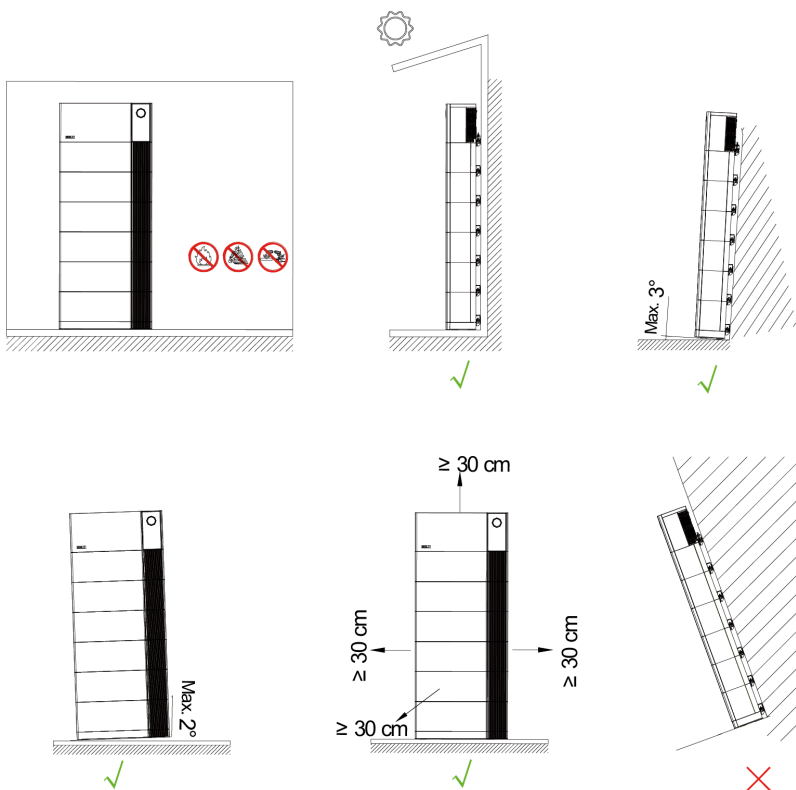
1. Installation

1.1. Environment requirements

- Do not expose the device to direct solar irradiation as this could cause power derating due to overheating.
- The installation environment must be free of inflammable or explosive materials.
- The device must be installed in a place away from any heat source.
- Do not install the device at a place where the temperature changes extremely.
- Keep the device away from children.
- Do not install the device in the bedroom, toilet, or bathroom.
- When installing the device at the garage, keep it away from the driveway.
- Keep the device from water sources such as taps, sewer pipes and sprinklers to prevent water seepage.
- For outdoor installation, keep the device away from direct sunlight, rain and snow.
- Ensure the inverter is installed in a well-observed area where the LED display panel can be easily read for real-time status checks.



1.2. Plan the installation site



1.3. Installation tools

Installation tools include but are not limited to the following recommended ones. Use other auxiliary tools on site if necessary.

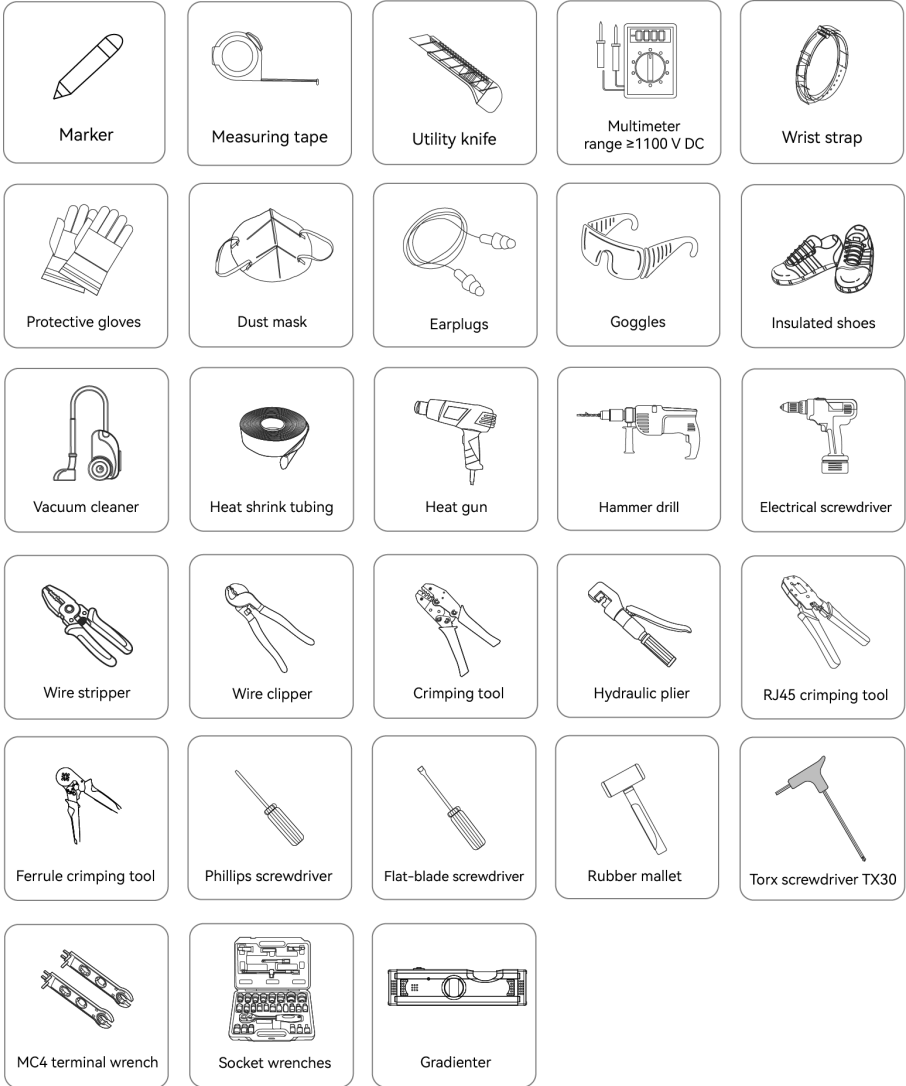
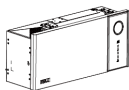


Figure 1.1. Suggested installation tools

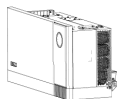
1.4. Packing list

Inverter

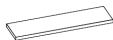
A1*



A2*



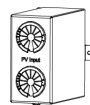
B



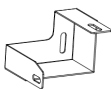
C



D



E



F



Z



Accessory package



G



H



I



J



K



L



M



N



O*



P*



Q

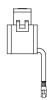


Meter package

R



S



T

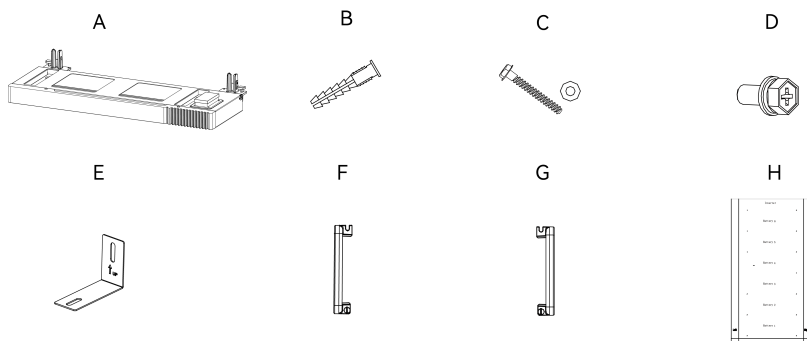


Number	Quantity	Designation
A1*/A2*	1	Depending on different shipments, either A1 or A2 is included in this package. Refer to the actual product you received. • A1: Inverter without battery base. The battery base and its related accessories are delivered in a separate package. • A2: Inverter with battery base. The inverter is pre-secured beneath the inverter with the screws. Before installation, remove the screws to detach the batter base from the inverter.
B	1	Protective cover of inverter
C	1	AC protective cover
D	1	PV protective cover
E	1	Anti-theft bracket
F	1	Communication module
G	1	Manual transfer switch
H	1	Bolts and gaskets for anti-theft bracket
I	1	Hand-tighten screw
J	9	AC cable terminal
K	3 or 4	PV connector. The quantity varies depending on different machine models.
L	1	20-pin connector
M	3	M6*16 screw
N	6 or 4	M4*10 screw. • With grounding plate: 6 • Without grounding plate: 4
O*	1	Grounding plate
P*	1	Wrench for securing the AC cover
Q	1	Antenna to be connected to the inverter.
R	1	Meter
S	1	Current transformer (CT)
T	1	Antenna to be connected to the meter.
Z	1	Documentation

Note: Depending on different shipments, the components marked with * may not be included in this package. Refer to the actual product you received.

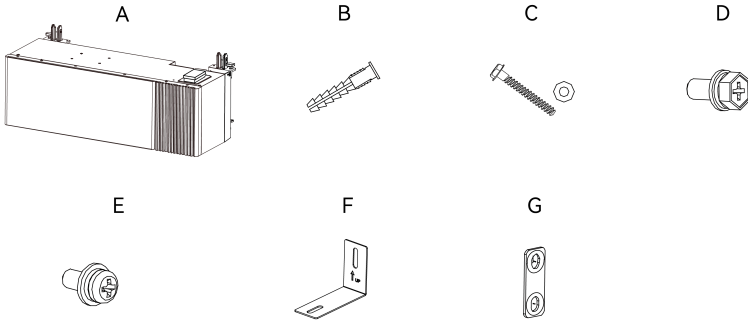
The following figure and table show the components for installing the battery base.

Depending on different shipments, these components are either included in the inverter's package or delivered in a separate package. Refer to the actual product you received.



Number	Quantity	Designation
A	1	Battery base. Depending on different shipments, the battery base can be pre-secured beneath the inverter with the screws.
B	2	M6*80 expansion bolt
C	2	ST6*50 screw and gasket set
D	2	M6*16 screw
E	2	Locking bracket
F	1	Left handle
G	1	Right handle
H	1	Positioning cardboard

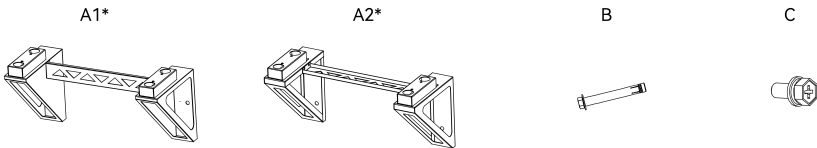
Battery pack



Number	Quantity	Designation
A	1	Battery pack
B	2	M6*80 expansion bolt
C	2	ST6*50 screw and gasket set
D	4	M6*16 screw
E*	2	M4*10 screw
F	2	Locking bracket
G*	1	Grounding plate

Note: Depending on different shipments, the components marked with * may be not included in the package. Refer to the actual product you received.

Wall bracket



Number	Quantity	Designation
A1/A2	1	Wall bracket. Depending on different shipments, either A1 or A2 is included in this package. Refer to the actual product you received. - A1: 3 installation holes are equipped. - A2: 2 installation holes are equipped.

Number	Quantity	Designation
B	4 or 6	M12*100 expansion bolt. • For the wall bracket with 3 installation holes, 6 bolts are provided. • For the wall bracket with 2 installation holes, 4 bolts are provided.
C	2	M6*16 screw

1.5. Dimension

Use one stack with six battery modules as an example:

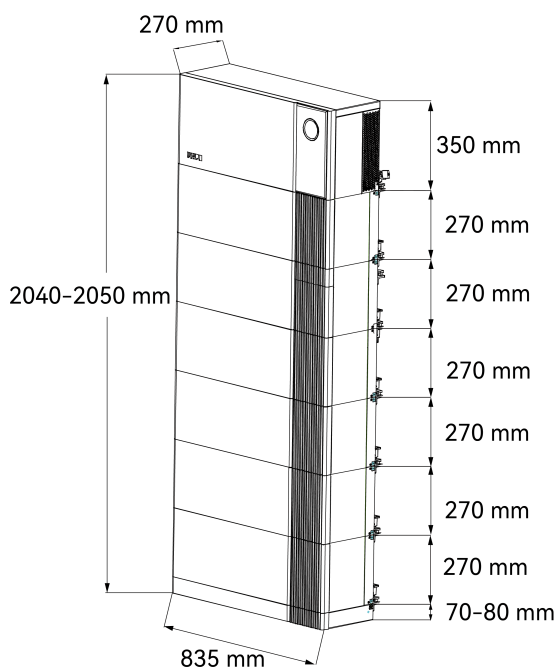


Figure 1.2. Dimensions

Note: The presence of grounding plates on the right side is subject to the actual product you received.

1.6. Ground mounting

Note:

- For ground mounting, a maximum of 6 batteries is supported.
- Depending on the shipments, some packages do not include the grounding plates and its screws. In this case, skip the related steps for installing them in this procedure.

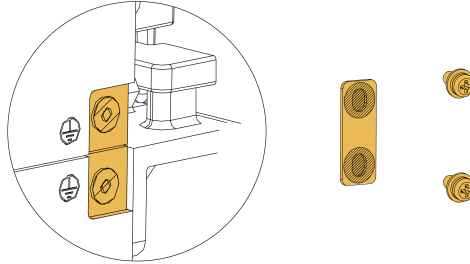
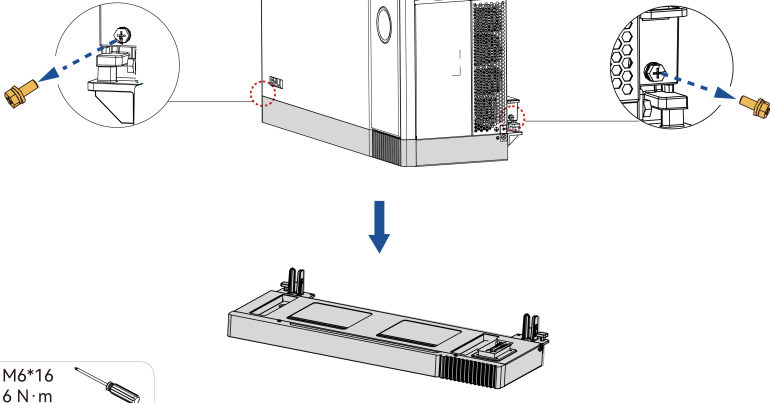


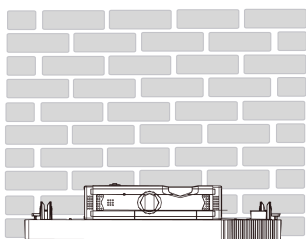
Figure 1.3. Grounding plate and its screws (optional)

(Optional) Step 1: Detach the battery base from the inverter. If the battery base you received is not included in the inverter package and is instead included in a separate package, skip step 1.

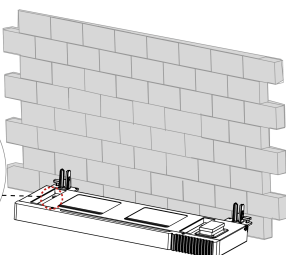
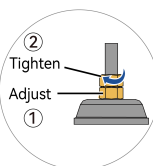
① Optional



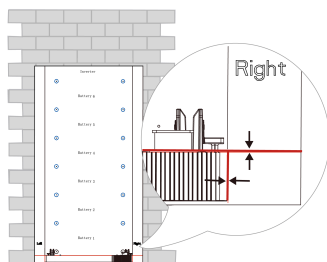
2



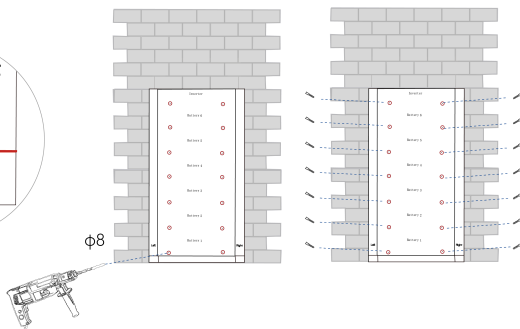
3



4

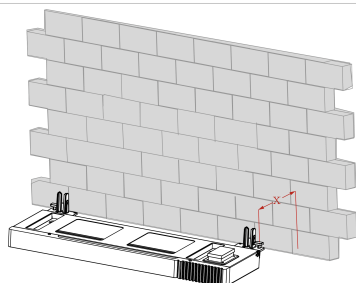


5



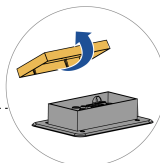
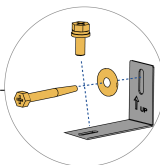
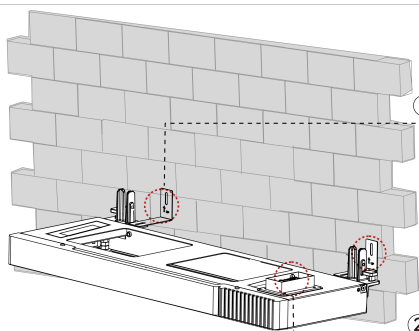
Note: Before drilling, put the battery base aside to keep the blind-mate ports dust-free.

6



Recommended spacing
 $X = 110 \text{ mm}$

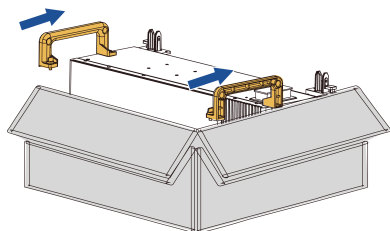
7



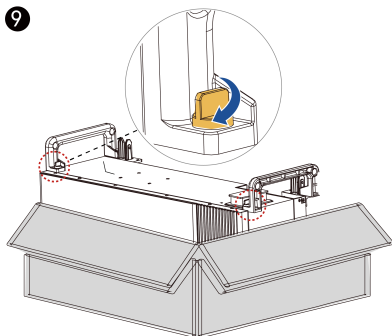
Skip removing the cover if not equipped.



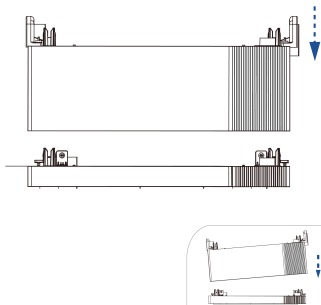
8



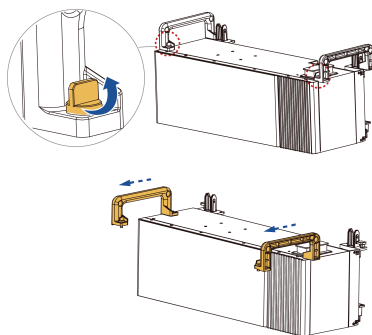
9

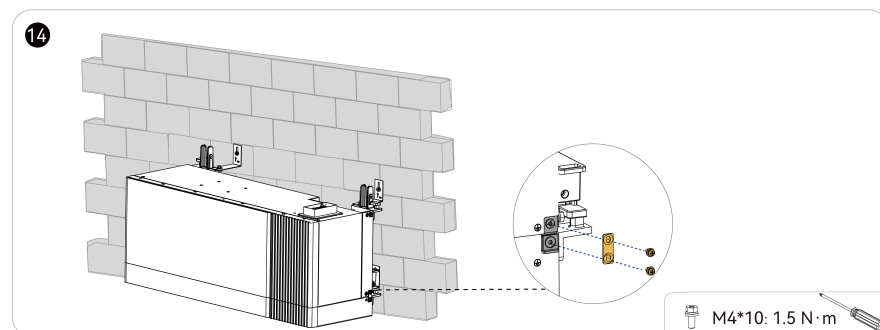
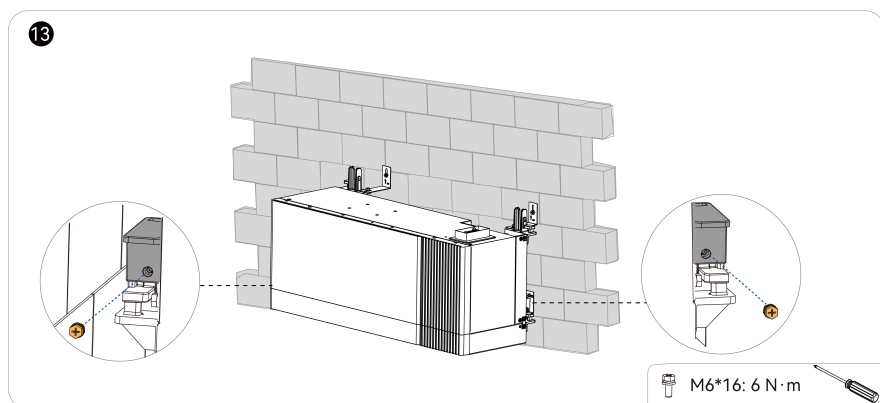
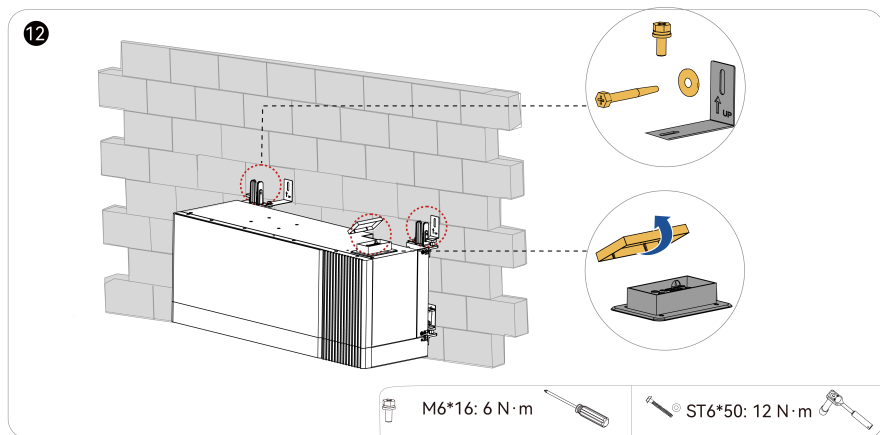


10



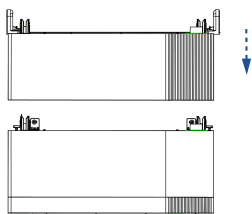
11





Note: If the product package you received does not include the grounding plate and corresponding screws, skip the above step.

15

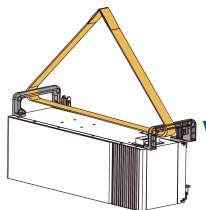


16

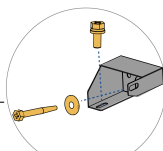
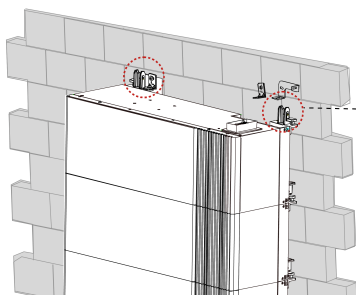
Install more batteries by taking the same steps as the first one.

17

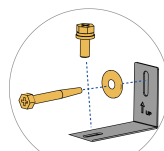
≥4 batteries: recommend
using a lifting device.



18



With lock



Without lock



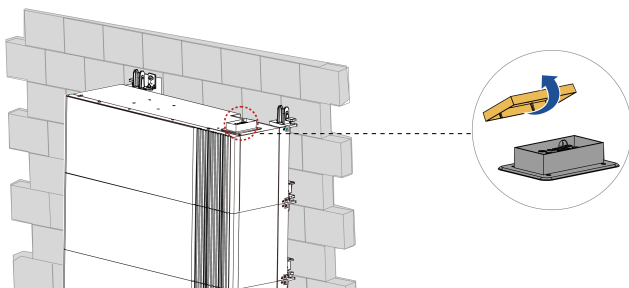
M6*16: 6 N·m



ST6*50: 12 N·m

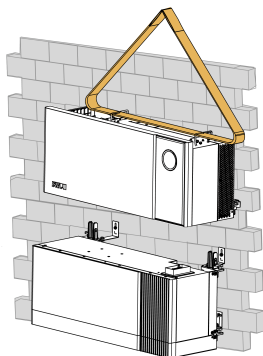


19

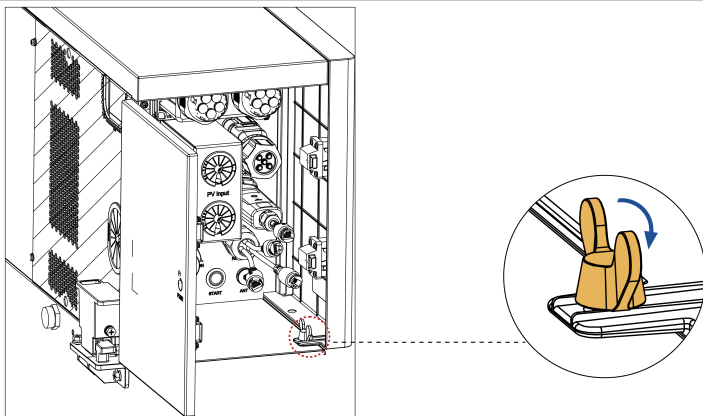


20

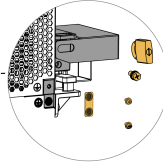
≥4 batteries: recommend using a lifting device.



21



A diagram showing a power supply unit (PSU) mounted in a rack. A power cable is connected to the PSU. A blue dashed line indicates the correct connection point on the PSU. A yellow circle with a plus sign is shown next to the cable, indicating the correct polarity.



 M6*16: 6 N·m
 M4*10 1.5 N·m
 Prepared by the customer

Note: If the product package you received does not include the grounding plate and corresponding screws, skip installing them.

A technical diagram showing a cable being connected to a terminal block mounted on a brick wall. The cable is shown entering the terminal block from the bottom. The terminal block has a circular opening on its side. The diagram illustrates the correct way to connect the cable to the terminal block.

[illegible]

X =	6	7	9	12	14	15	16
	18	21	24	25	27	28	30
	35	36	40	42	45	50	54



1.7. Wall mounting

Note:

- For wall mounting, a maximum of 2 batteries is supported.
- Depending on the shipments, some packages do not include the grounding plates and its screws. In this case, skip the related steps for installing them in this procedure.

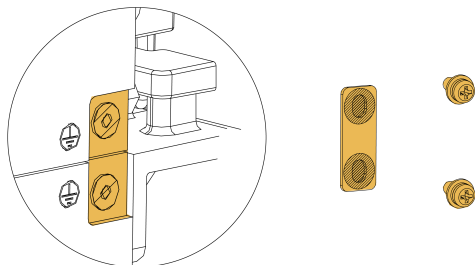
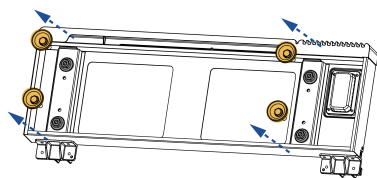
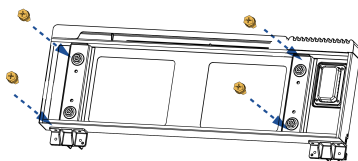


Figure 1.4. Grounding plate and its screws (optional)

1 Remove the bumper feet.



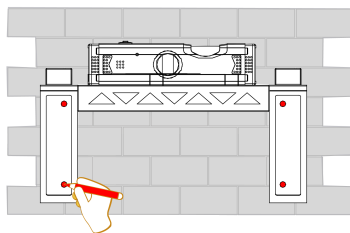
2



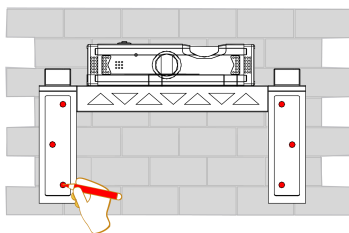
M6*16 6 N·m



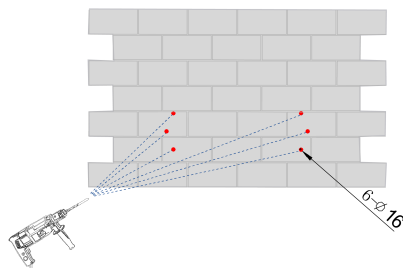
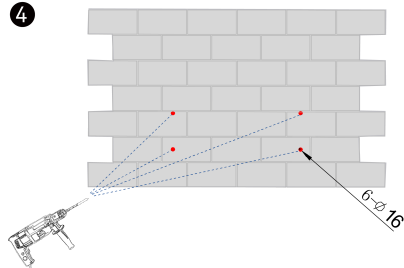
3 For wall bracket with 2 installation holes



For wall bracket with 3 installation holes

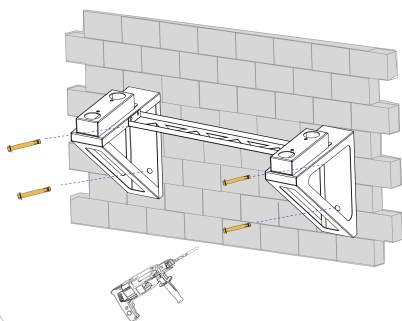


4

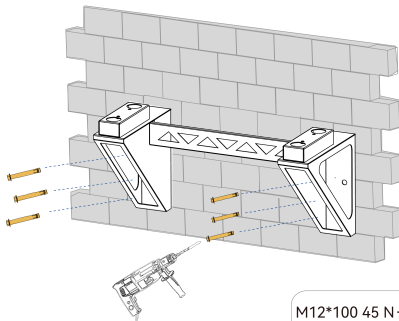


5

For wall bracket with 2 installation holes

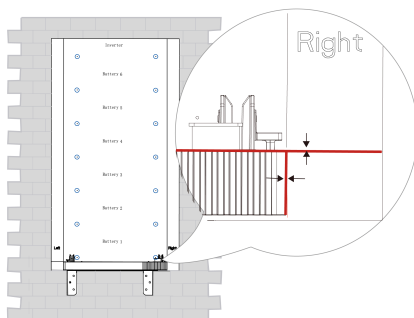


For wall bracket with 3 installation holes

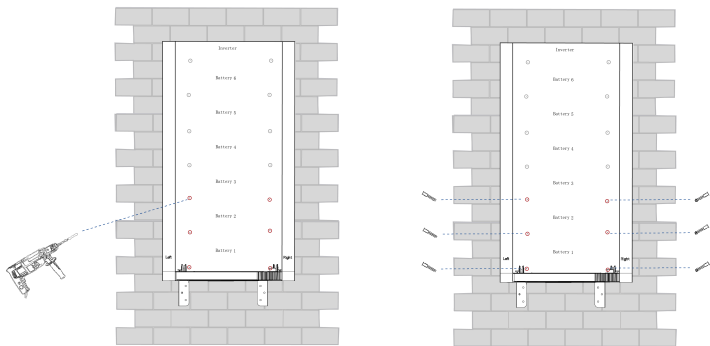


M12*100 45 N·m

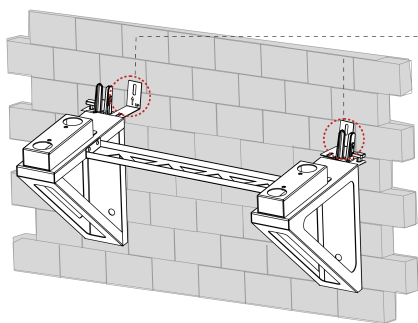
6



7



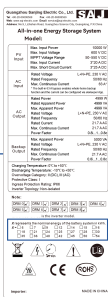
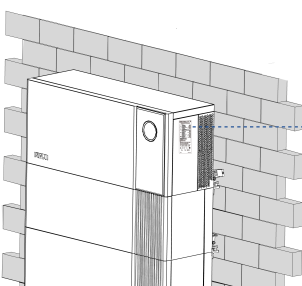
8



9

Install the batteries and inverter by taking the same steps as the ground mounting.

10



X represents the nominal energy of the battery system in kWh

X =	6	7	9	12	14	15	16
	18	21	24	25	27	28	30
	35	36	40	42	45	50	54



Example

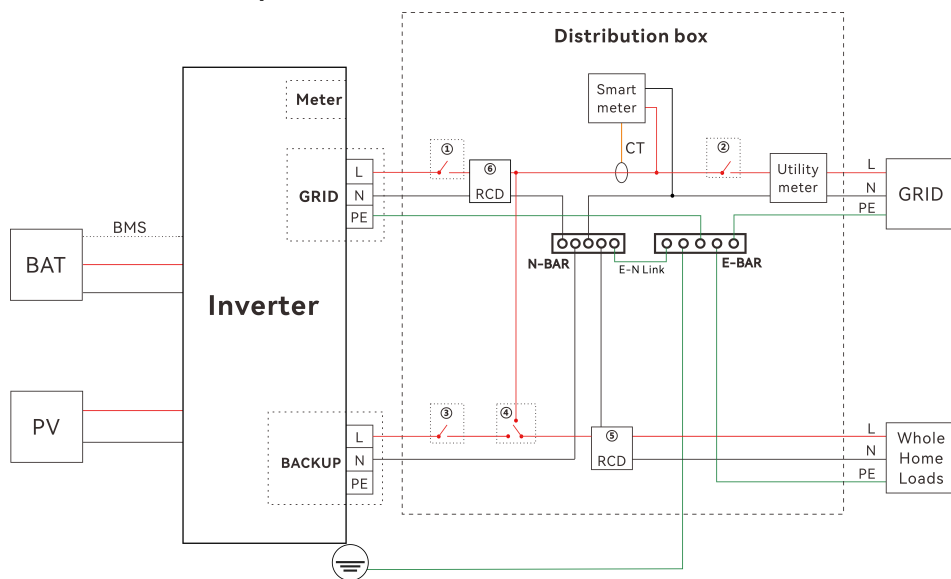
2. Electrical connection

2.1. Australia and New Zealand

This section shows the system connection diagrams applicable to Australia and New Zealand.

- To comply with AS/NZS3000, the neutral (N) cables of the grid and backup-load sides (where applicable) must be connected together.
- Do not connect the PE terminal of the **BACKUP** port.
- The E-BAR and the N-BAR must be connected as illustrated.

Whole home backup solution



Product model	① AC breaker (grid)	③ AC breaker (backup loads)	② AC breaker (utility meter)	④ Manual transfer switch	⑤⑥ RCD (on-grid/backup loads) ¹
EK70 HS5-5K-S3-X	63 A/230 V	63 A/230 V	Main breaker	63 A/230 V	30 mA
EK70 HS5-6K-S3-X (-IE)	63 A/230 V	63 A/230 V	Main breaker	63 A/230 V	30 mA

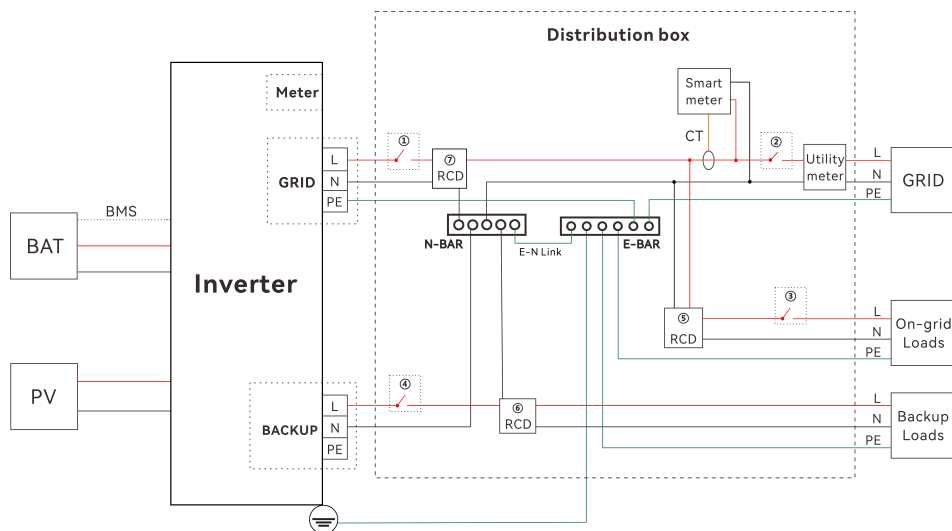
Product model	① AC breaker (grid)	③ AC breaker (backup loads)	② AC breaker (utility meter)	④ Manual transfer switch	⑤⑥ RCD (on-grid/ backup loads) ¹
EK70 HS5-8K-S3-X	63 A/230 V	63 A/230 V	Main breaker	63 A/230 V	30 mA
EK70 HS5-10K-S4-X	63 A/230 V	63 A/230 V	Main breaker	63 A/230 V	30 mA

Table 2.1. Recommended AC breaker and RCD specifications

1. The on-grid RCD is optional since the inverter is integrated with a residential current monitoring unit (RCMU). However, if the external RCD must be installed according to the local regulations, install a type A RCD of action current 30 mA or higher.

Note: The values in the above table are recommendations only and can be set to other values based on the actual conditions.

Partial backup solution



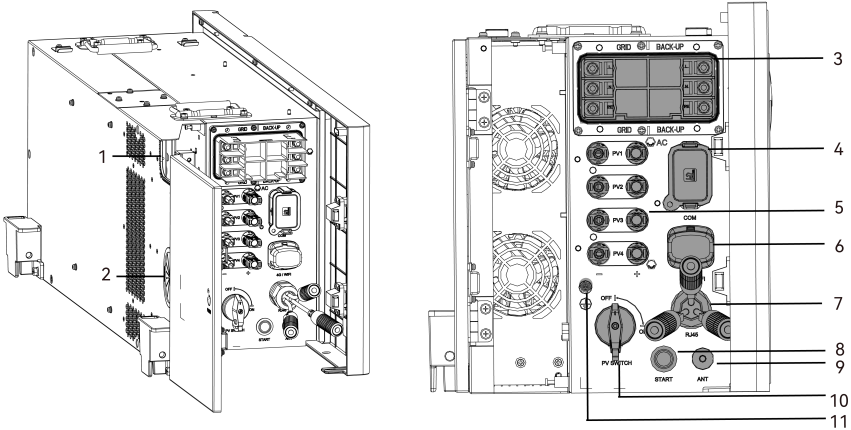
Product model	① AC breaker (grid)	④ AC breaker (backup loads)	② AC breaker (utility meter)	③ AC breaker (on-grid loads)	⑤⑥ RCD (on-grid/backup loads) ¹
EK70 HS5-5K-S3-X	32 A/230 V	Depend on loads	Main breaker	Depend on loads	30 mA
EK70 HS5-6K-S3-X (-IE)	40 A/230 V	Depend on loads	Main breaker	Depend on loads	30 mA
EK70 HS5-8K-S3-X	50 A/230 V	Depend on loads	Main breaker	Depend on loads	30 mA
EK70 HS5-10K-S4-X	63 A/230 V	Depend on loads	Main breaker	Depend on loads	30 mA

Table 2.2. Recommended AC breaker and RCD specifications

1. The on-grid RCD is optional since the inverter is integrated with a residential current monitoring unit (RCMU). However, if the external RCD must be installed according to the local regulations, install a type A RCD of action current 30 mA or higher.

Note: The values in the above table are recommendations only and can be set to other values based on the actual conditions.

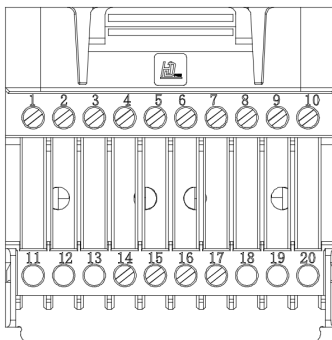
2.2. Inverter ports and switches



Callout	Silkscreen	Description
1	/	The cable entry hole 1 for routing AC power cables.
2	/	The cable entry hole 2 for routing the following cables: • The grounding cable • The DC power cables • The communication cables
3	AC • GRID • BACK-UP	The connection ports for AC power cables. • GRID: for connecting to the public grid. • BACK-UP: for connecting to the home backup load.
4	COM	The connection port for communication cables from external devices like DI/DO devices.
5	PV1, PV2, PV3, PV4	The negative and positive PV input connection ports. Note: Depending on different models, some ports may be disabled with plugs. Only connect the cables to the available ports.
6	4G/WIFI	The connection port of the eSolar AIO3 Pro and 4G Pro communication modules.
7	RJ45	The RJ45 connection ports for LAN1, LAN2, and DRMS connections. LAN1 and LAN2 are reserved for future use.

Callout	Silkscreen	Description
8	START	For starting up the energy storage system.
9	ANT	The LoRa antenna connection port.
10	PV SWITCH	The PV switch that controls the connection to the PV array.
11		The grounding cable connection port.

Table 2.3. Inverter electrical ports



Number	Silkscreen	Description
1-6	/	Reserved for future use.
7	DO1+	Output connection for dry contact device 1.
8	DO1-	Output connection for dry contact device 1.
9	DO2+	Output connection for dry contact device 2.
10	DO2-	Output connection for dry contact device 2.
11	PC 485A	Reserved RS485 connection ports.
12	PC 485B	The RS485 communication can be adjusted with the provided 120 Ω resistor controlled by SW2 DIP switch.
13	Meter 485A	For RS485 connections with the meter.
14	Meter 485B	The RS485 communication can be adjusted with the provided 120 Ω resistor controlled by SW3 DIP switch.
15	DI1+	Input connection for dry contact device 1.
16	DI1-	Input connection for dry contact device 1.
17	DI2+	Input connection for dry contact device 2.
18	DI2-	Input connection for dry contact device 2.

Number	Silkscreen	Description
19	12V	Port for providing 12V DC power supply to the external device.
20	GND	Port for grounding connection.

Table 2.4. 20-pin definition for COM port

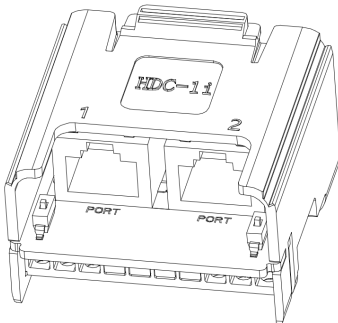


Figure 2.1. RJ45 ports for communication connector

Number	Silkscreen	Description
1	PORT CAN	Reserved port.
2	DSP CAN	Reserved port.

2.3. Prepare the cables

Cable type	Recommended cross-sectional area range (mm ²)
Grounding cable	6

Table 2.5. Grounding cable specification

Solution	Cable type	Cross-sectional area range (mm ²)		Recommended conductor material
		Range	Recommended	
Whole home backup	One three-wire cable	10-16	16	Copper
	Three separated cables	/	16	Copper
Partial backup	One three-wire cable	6-8	8	Copper
	Three separated cables	/	8	Copper

Table 2.6. AC grid and backup cable specification

Cross-sectional area range (mm ²)		Recommended conductor material
Range	Recommended value	
5.0-6.0	6.0	Outdoor copper wire cable, complying with 600 V DC

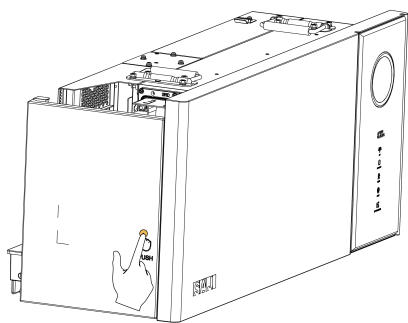
Table 2.7. PV cable specification

Terminals	Cable cross-sectional area(mm ²)	Cable outer diameter (mm)	Insulation off (mm)	
			External protective layer	Wire insulation
1 - 10	0.5 - 0.75	4.5 - 6.5	55	7.5
11 - 20	0.2 - 0.5		33	7.5

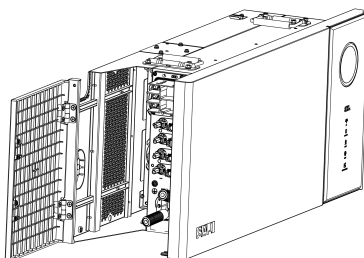
Table 2.8. Communication cable specification

2.4. Connect the grounding cable

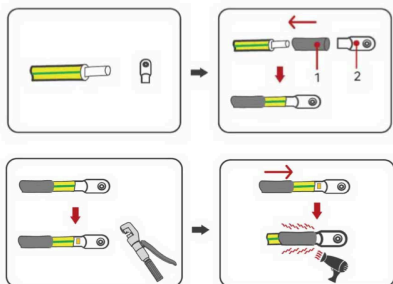
1



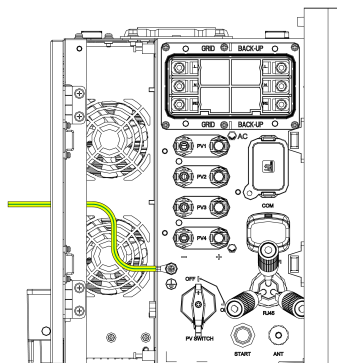
2



3



4



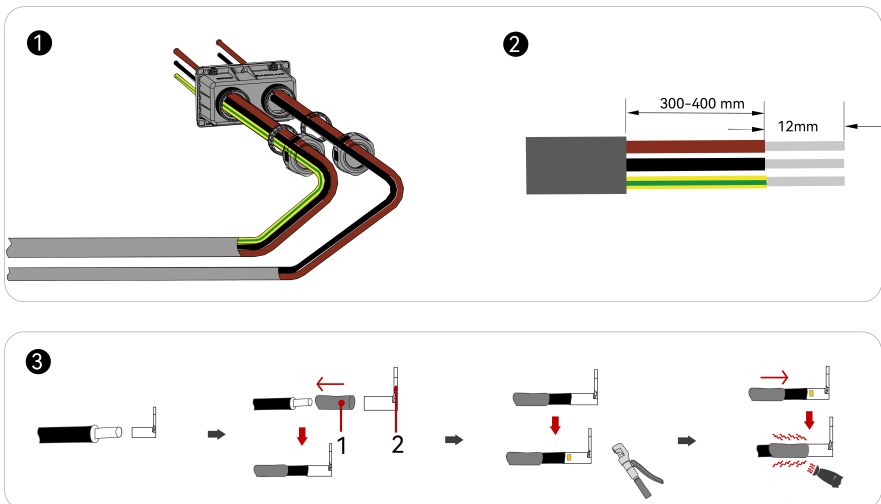
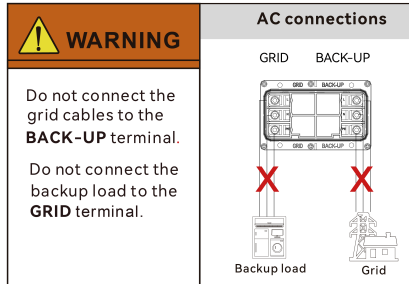
M4X10: 1.5 N·m



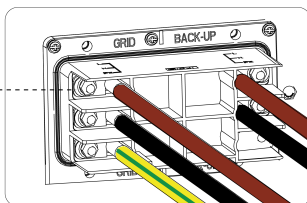
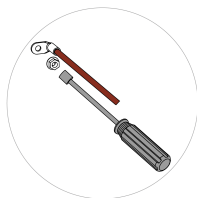
2.5. Connect the AC power cables

Note:

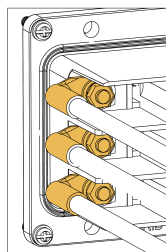
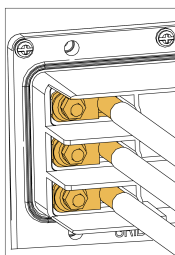
- Secure the corrugated pipe on the wall after finishing all wiring connections.
- When fixing the corrugated pipe at the upper left of the machine on the wall, leave an extra cable length of 300 to 400 mm. If it is fixed in other directions, reserve a longer length as needed.



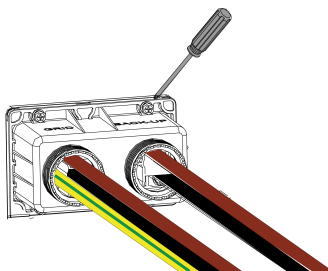
4



M5: 2-3 N·m

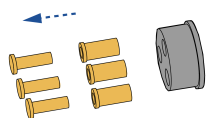
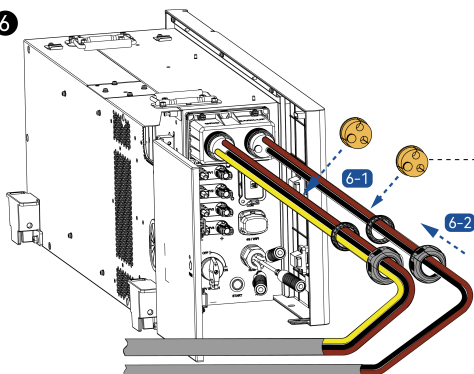


5

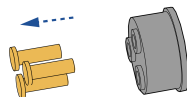


M5: 2-3 N·m

6

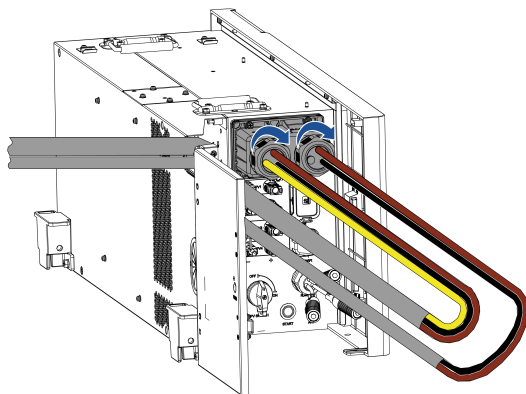


Large-diameter cable

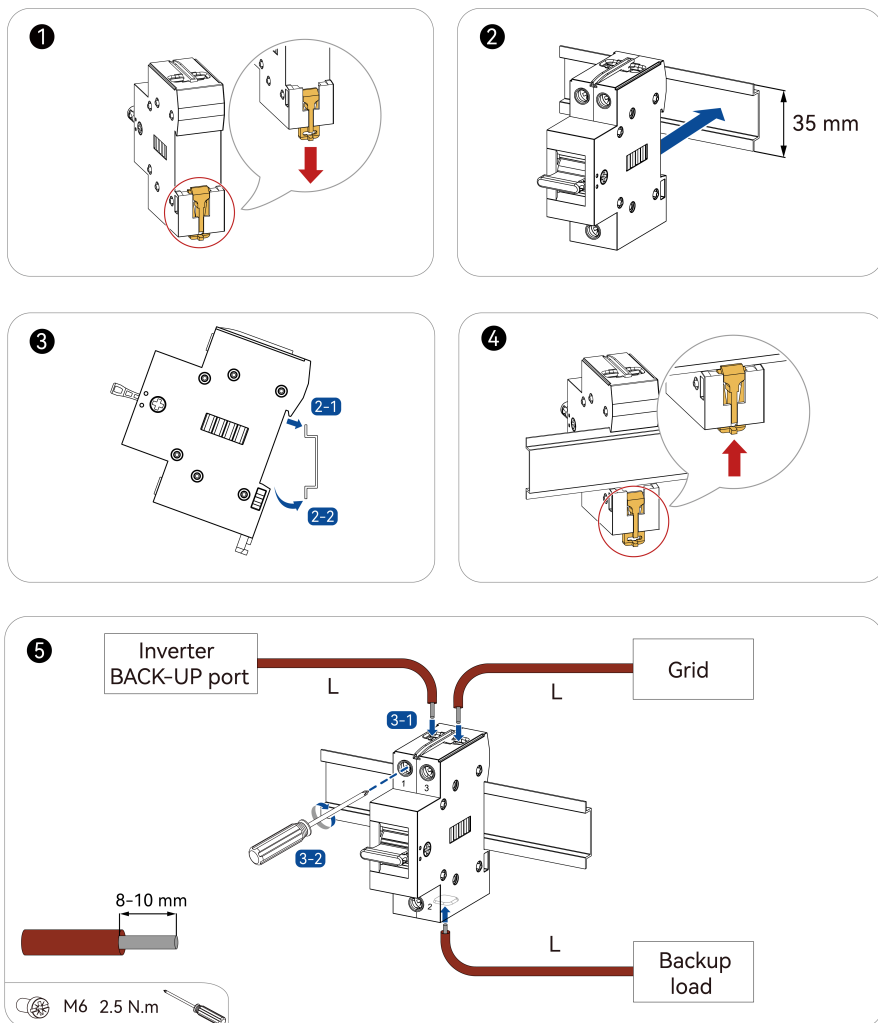


Small-diameter cable

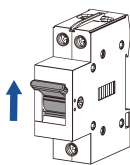
7



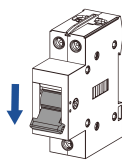
2.6. Connect the manual transfer switch



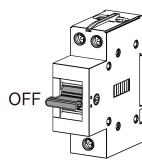
6



Connect to inverter
BACK-UP port



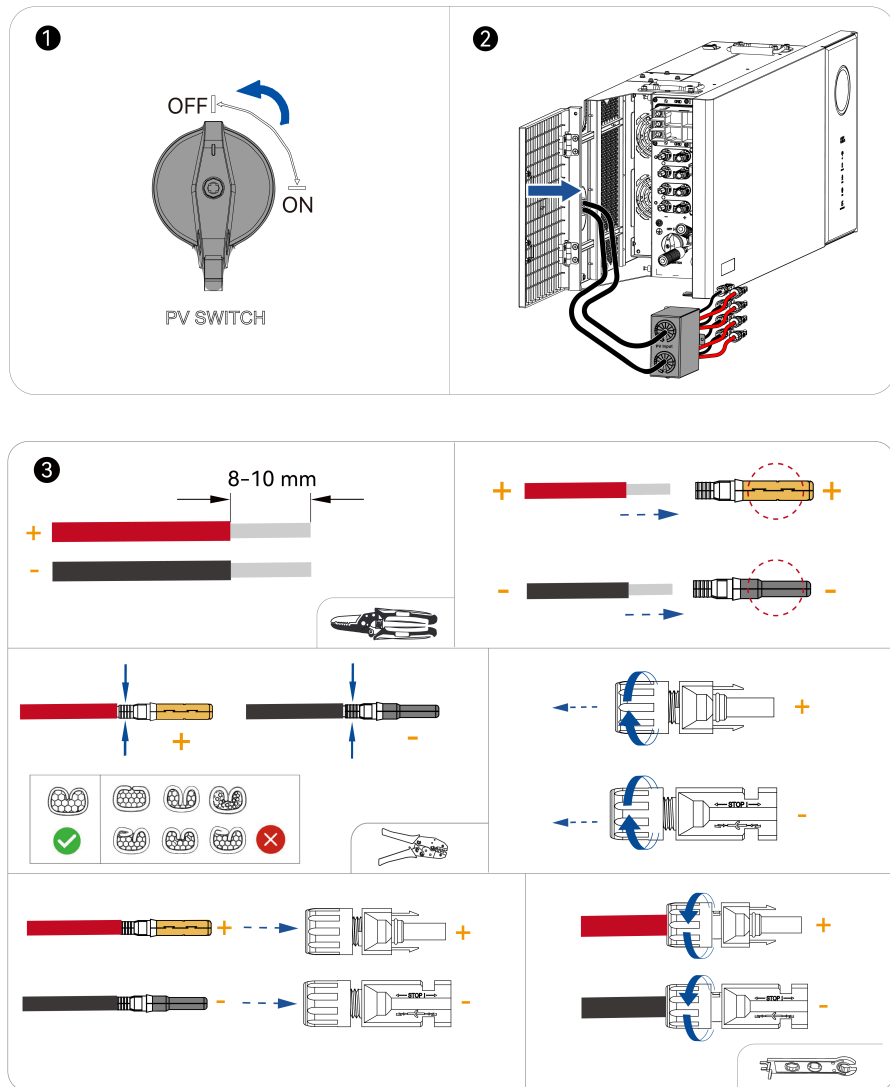
Connect to grid



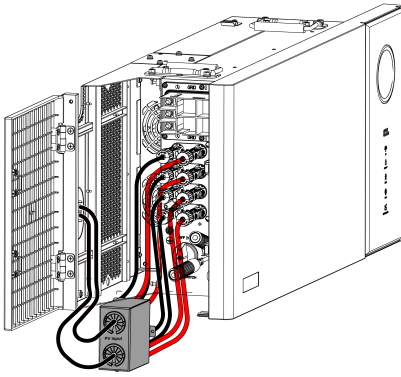
Disconnect from inverter
BACK-UP port and grid

2.7. Connect the DC power cables

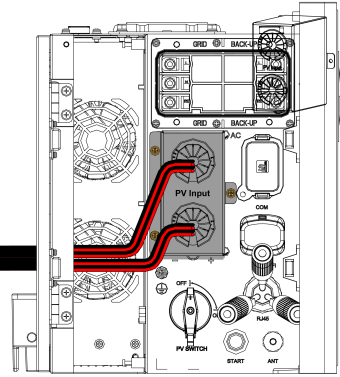
Note: For the machine models with 3 MPPTs, only connect the DC power cables to the PV1, PV2, and PV3 ports. This section takes the machine model with 4 MPPTs as an example.



4



5

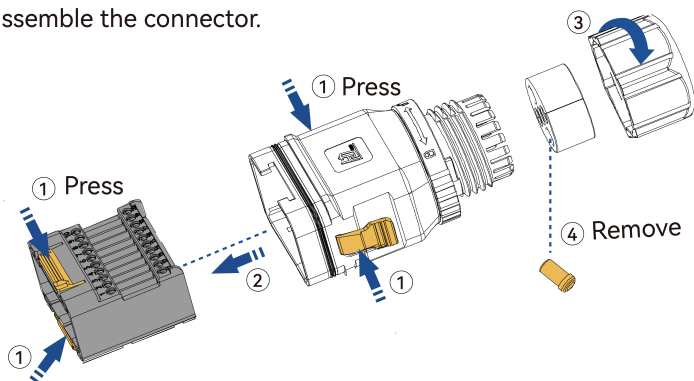


M4: 1.5 N·m

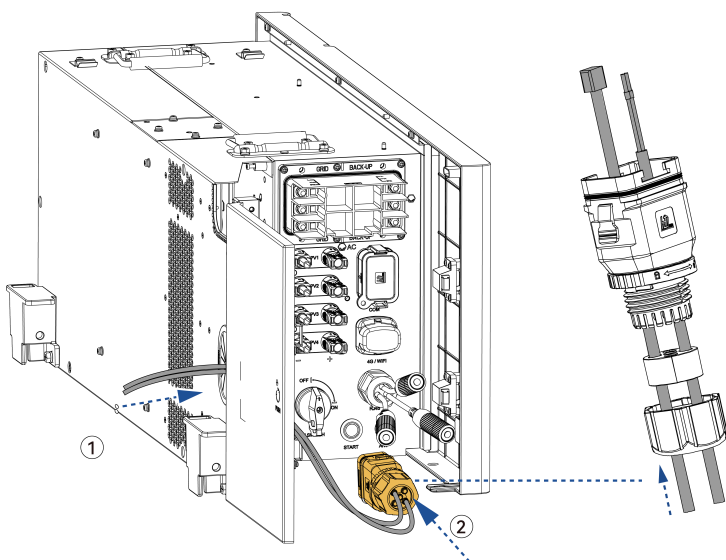


2.8. Connect the communication cables to COM port

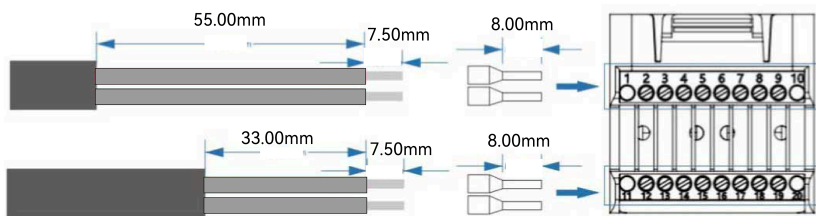
- ① Disassemble the connector.



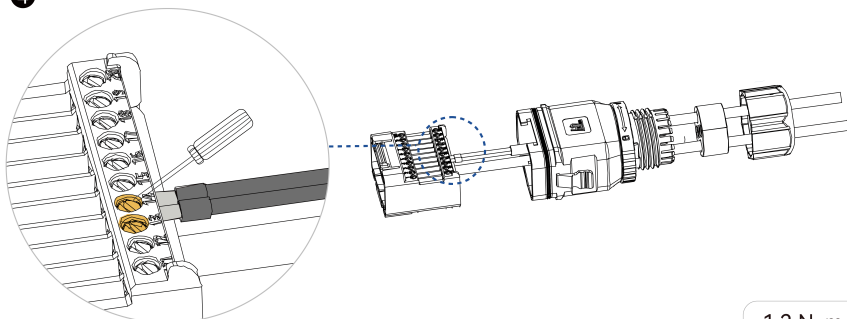
- ②



3

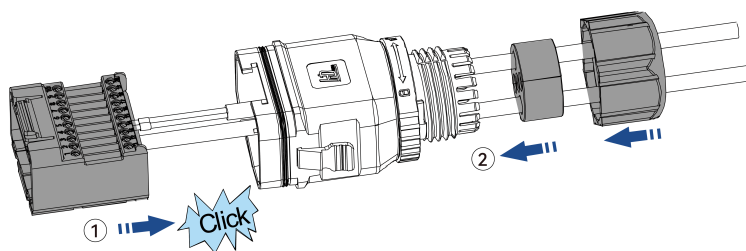


4

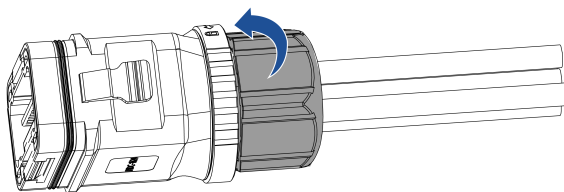


1.2 N·m

5

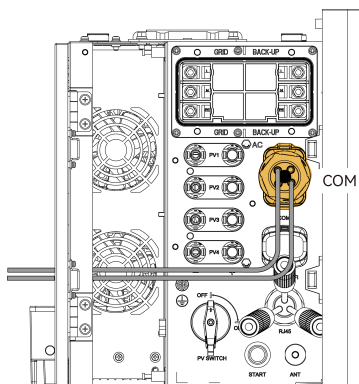


6



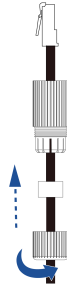
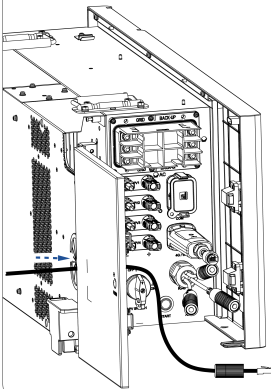
2.5 N·m

7

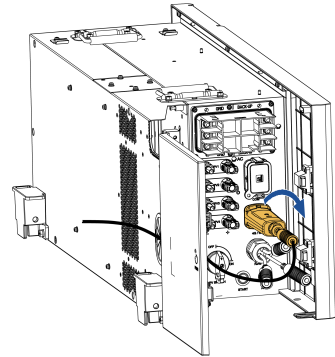


2.9. Connect the communication module

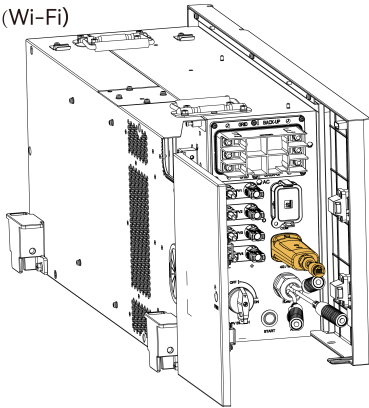
eSolar AIO3 Pro module (Ethernet)



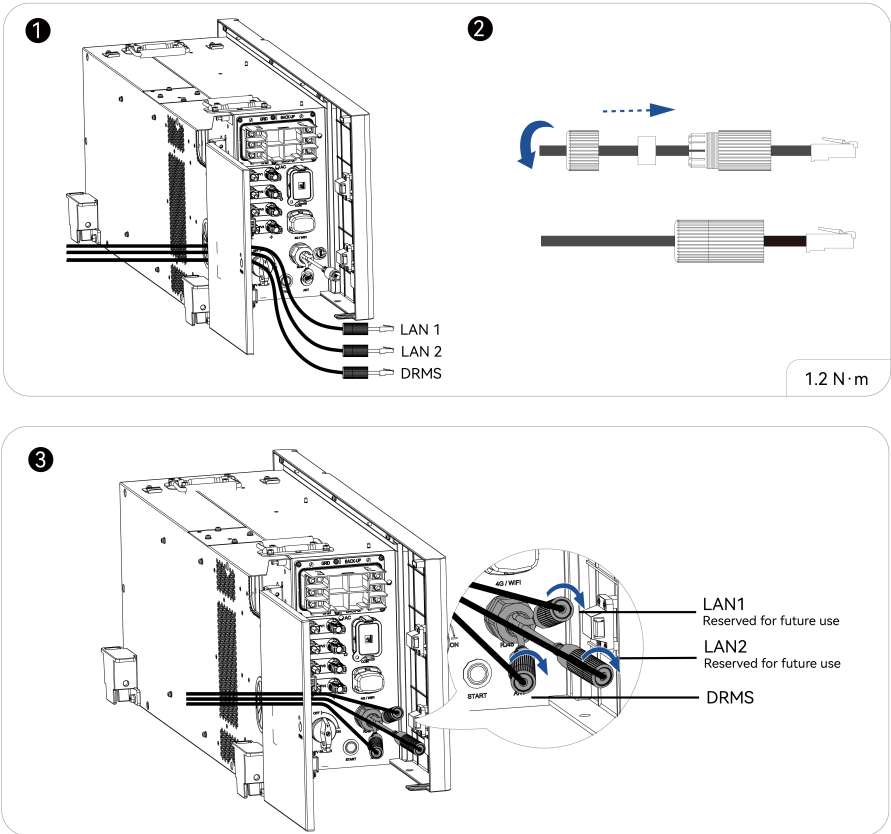
1.2 N·m



eSolar AIO3 Pro module (Wi-Fi)

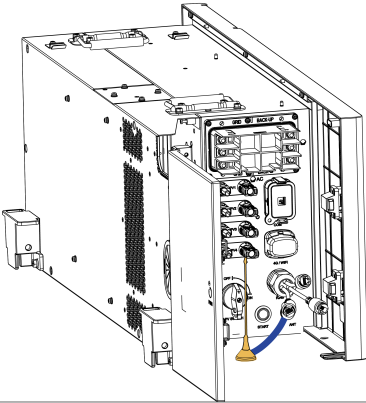


2.10. Connect the LAN and DRMS cables

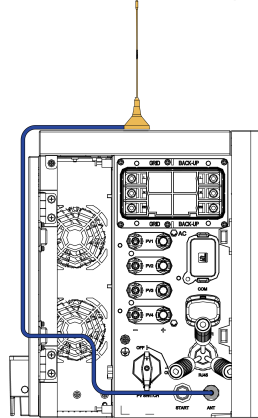


2.11. Connect the antenna

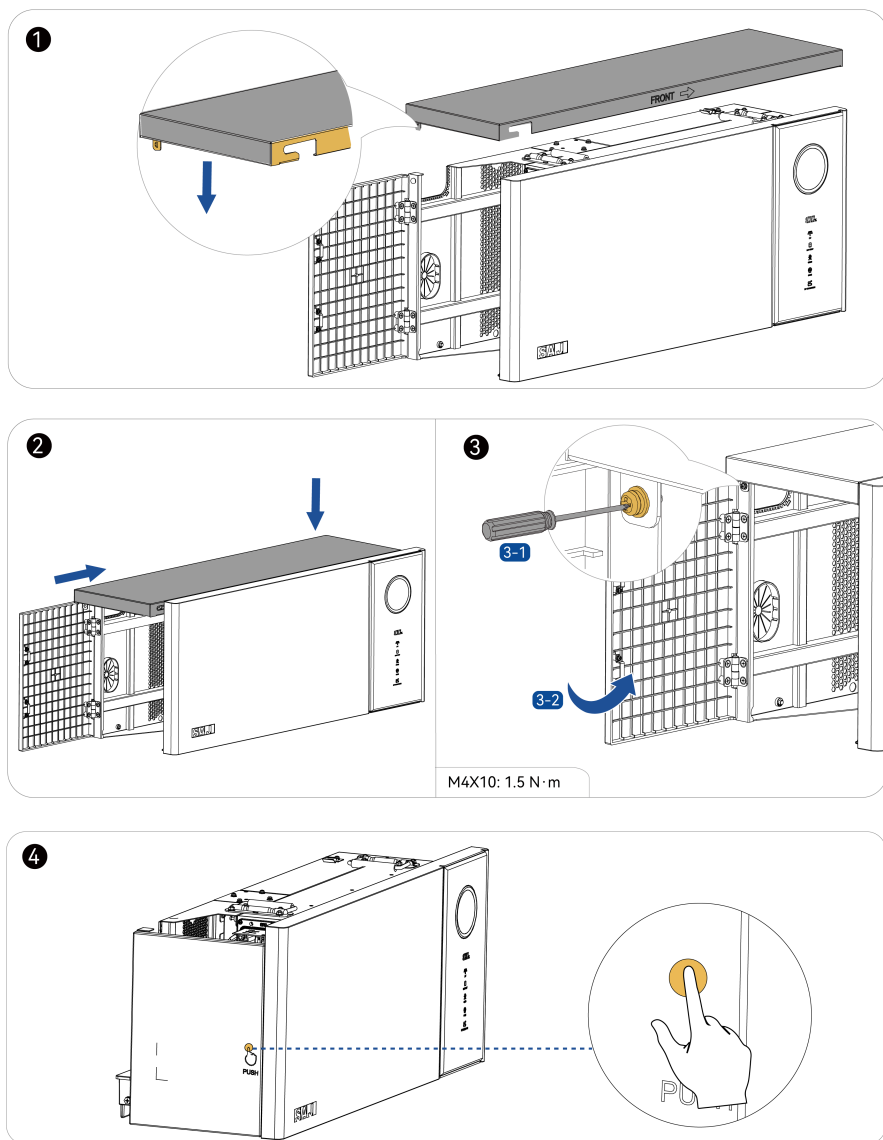
For areas with strong signal



For areas with weak signal



2.12. Install the inverter cover



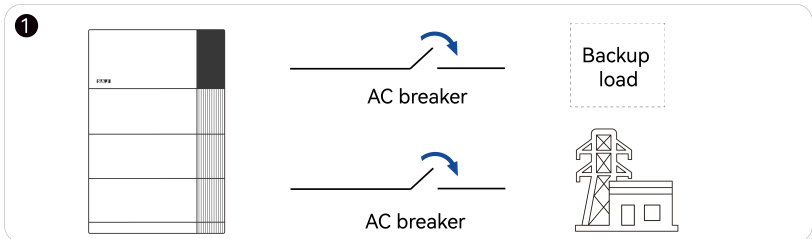
3. Start up the system

Before you begin

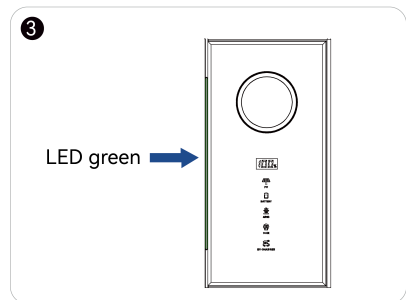
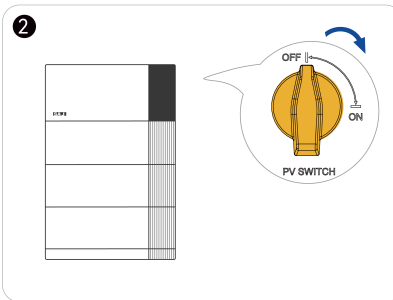
Verify that all the electrical connections are properly wired and secured before starting up the system.

• Method 1 for starting up the system

1. Open the AC distribution box, turn on the following circuit breakers in sequence.
 - a. The backup loads
 - b. The grid



2. On the inverter, turn on the **PV SWITCH** to enable the connection to the PV arrays.
3. Check the LED indicator status on the inverter panel to ensure that the inverter is running properly.

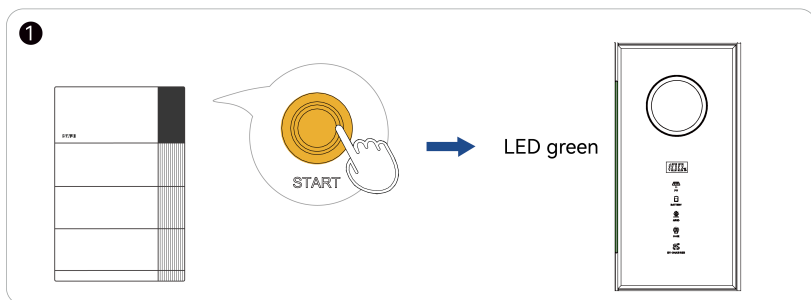


4. Download the elekeeper App and perform the system commissioning.

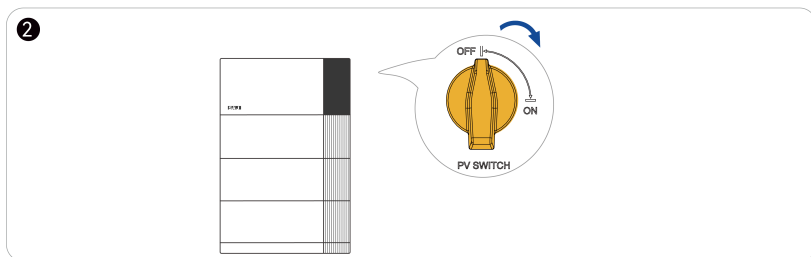


• Method 2 for starting up the system

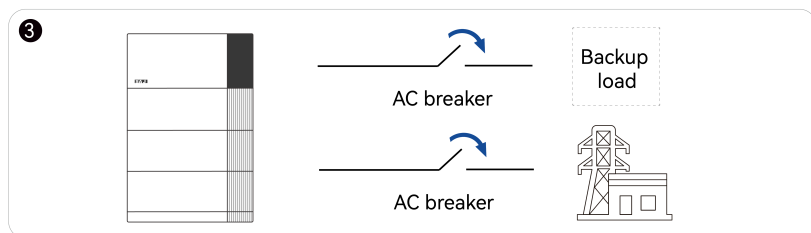
1. On the left side of the inverter, press and hold the **START** button for 5 seconds until the LED indicator on the front panel is on.



2. On the inverter, turn on the **PV SWITCH** to enable the connection to the PV arrays.



3. Open the AC distribution box, turn on the following circuit breakers in sequence.
 - a. The backup loads
 - b. The grid



4. Download and elekeeper App and perform the system commissioning.



4. LED on the inverter



Figure 4.1. Inverter LED panel

Display	Color	Status	Description
	Green	Solid on	The inverter is working properly with grid connection.
		Breath, on 1.5s, off 1.5s	The inverter is in initialization or standby state.
		Breath, on 3s, off 3s	The inverter is working properly off-grid.
		Breath, on 0.5s, off 0.5s	The inverter is working off-grid with SOC lower than 20%.
	Red	Solid on	The inverter is faulty.
	Yellow	Breath, on 3.5s, off 3.5s	The inverter is upgrading.
	Gray	Off	The inverter is powered off.

Table 4.1. LED light

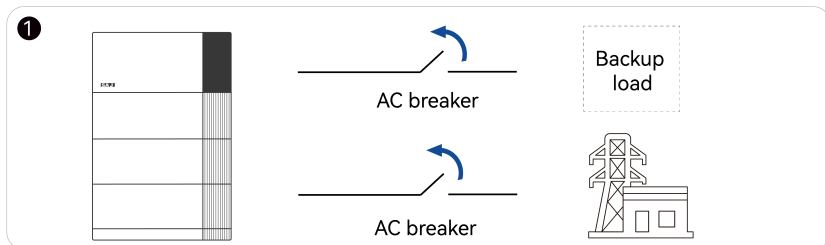
Display	Color	Status	Description
	White	Integer (example, 50)	Battery state of charge (SOC). For example, 50%.
		--	The battery communication is lost.

Display	Color	Status	Description
 PV	White	Solid on	The PV array is working.
		Off	The PV array is not connected.
	Red	Solid on	The PV array is faulty.
 BATTERY	White	Solid on	The battery is charging.
		Breath, on 1s, off 1s	The battery is discharging.
		Off	The battery is disconnected or inactive.
 GRID	White	Solid on	The inverter is working with grid connection.
		Breath, on 3s, off 3s	The inverter is working off-grid.
		Off	No grid is detected.
 COM	White	Solid on	In good communication with the meter, BMS, and cloud.
		Breath, on 1s, off 1s	Lost communication with the meter, BMS, or cloud.
	Red	Off	Lost communication with all the meter, the BMS, and cloud.

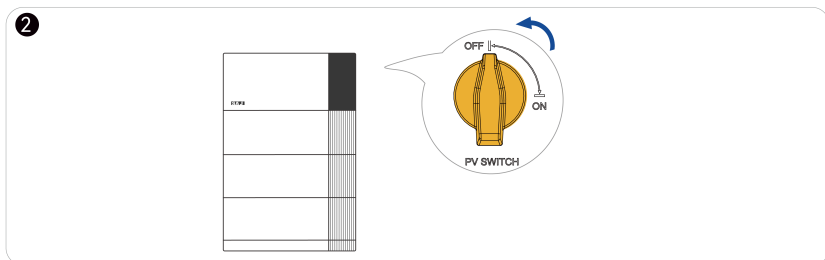
Table 4.2. LED indicators

5. Shut down the system

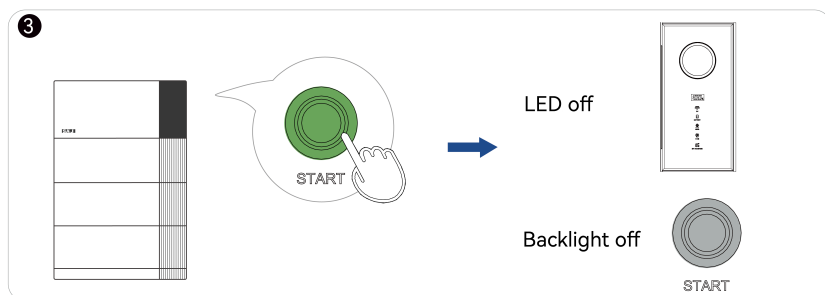
1. Open the AC distribution box, turn off the following circuit breakers:
 - a. The backup loads
 - b. The grid



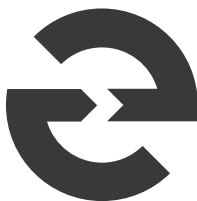
2. On the left side of the inverter, turn off the DC switch to disconnect from the PV arrays.



3. On the inverter, press and hold the **START** button for 5 seconds, and then release the button. Wait until both the button backlight and the LED indicator turn off.



Note: Once the system is shut down, there is no voltage output at the positive and negative terminals. Do not forcibly activate the system to output voltage by other means.



GUANGZHOU SANJING ELECTRIC CO., LTD

Tel: (86) 20 66608588 **Fax:** (86) 20 66608589 **Web:** www.saj-electric.com

Add: No.9, Lizhishan Road, Science City, Guangzhou High-tech Zone, Guangdong, P.R.China