

HS3-(3K-6K)-S2-(W, G)- (B, P)X Quick Guide

This quick guide provides installation operations. For safety precautions and detailed product information, refer to the *User Manual* on the SAJ Website www.saj-electric.com. You can scan the below QR code to access all the product documentation.



NOTICE

- Before installation, operation, and maintenance, read the product documentation carefully.
- ONLY qualified and trained electricians who have read and fully understood all safety regulations contained in this manual can install, maintain, and repair the equipment. The operation personnel should understand the system, its working principles, and relevant national and regional standards.
- During operations, wear protective equipment and use dedicated tools.

1. Check the outer packing

- Check the outer packing package for any damage, such as holes and cracks.
- Check the equipment model.

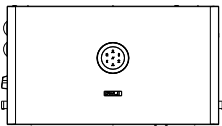
If any serious damage is found or the model is not what you requested, do not unpack the product, and contact your dealer as soon as possible.

2. Check the product packages

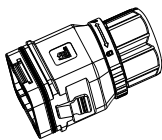
Contents in your shipment are order-dependent. Not all packages listed below may be in your shipment.

Place the connectors separately after unpacking to avoid confusion for connection of cables.

Inverter



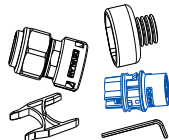
Inverter



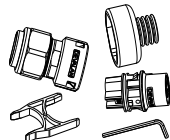
24-pin communication cable connector



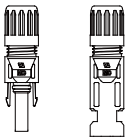
Insulated terminals x22



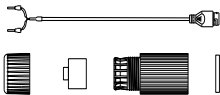
¹ Grid connector kit (blue)



¹ Backup load connector kit (black)



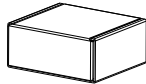
PV connector x4



Communication cable kit



Rubber plug x2



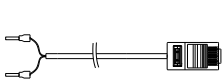
² Meter kit



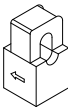
Printed documents

¹ The waterproof cover is only available in some configurations.

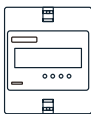
² The meter kit contains the following items:



Communication cable with an RJ45 connector

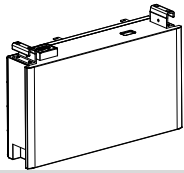


Current transformer



Smart meter

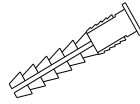
BU3 battery pack



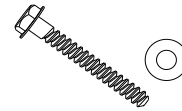
Battery pack



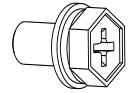
Locking bracket x2



M6*80 expansion bolt x2



M6*50 screw x2
Gasket x2



M5*14 screw x4

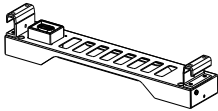


M4*12 screw x2



Grounding plate

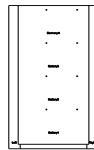
BE3-TV battery base



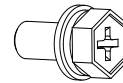
Battery base



Bumper feet x 4



Cardboard



M5*14 screw x2

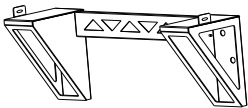


M4*12 screw x2

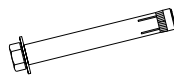


Grounding plate

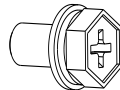
Wall-mounting bracket (optional)



Mounting bracket

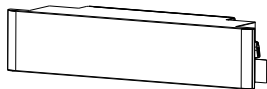


M12*100 expansion bolt x6



M5*14 screw x2

BC3 battery junction box (optional)



Battery junction box

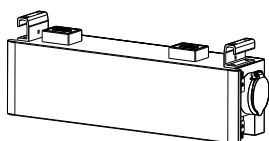


Communication cable



Positive cable
Negative cable

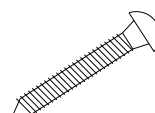
CU2 charger (optional)



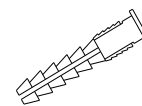
Charger



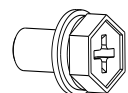
Holster



M4*32 screw x4



Expansion bolt x4



M5*14 screw x2

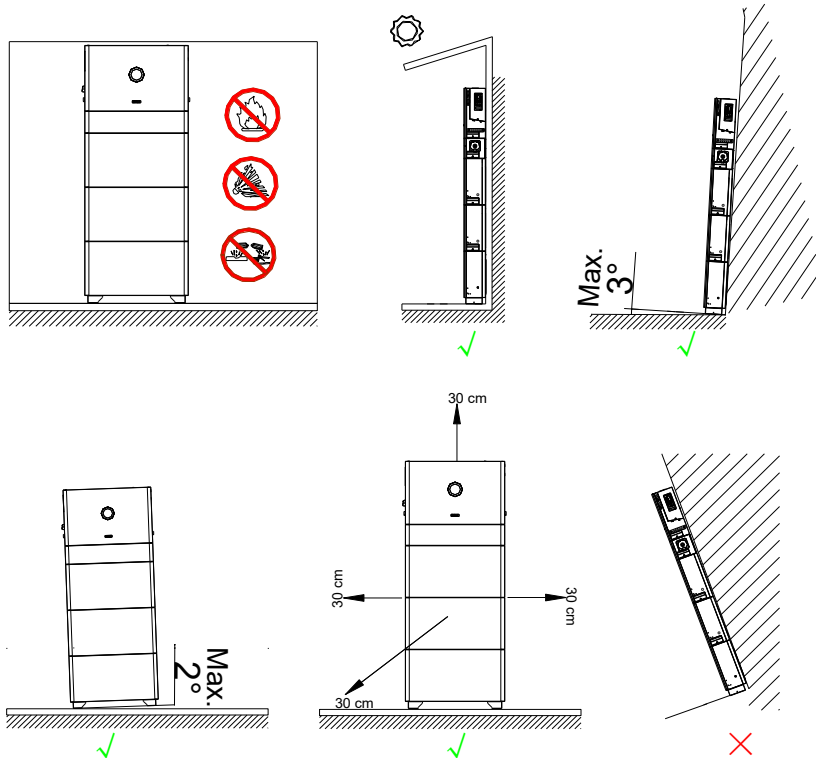


M4*12 screw x2



Grounding plate

3. Check installation ways and gaps



4. Installation overview

1. Plan the battery stack installation. For details, see section 5 "Plan the battery stacks".
2. Choose one of the following options to mount the battery stacks and the inverter:
 - Ground mounting, see section 6 "Install the system on the ground".
 - Wall mounting, see section 7 "Install the system on the wall".
3. Install the junction box when multiple battery stacks are installed. See section 8 "(Optional) Install a battery junction box (BC3-TV)".

5. Plan the battery stacks

Quantity of batteries

One inverter supports up to eight batteries.

- For ground-mounting, a maximum of four batteries can be installed in one stack.
- For wall-mounting, a maximum of three batteries can be installed in one stack.

Besides the four or three batteries installed in the same stack as the inverter, the other batteries in each stack must be installed with a battery junction box (BC3-TV).

Distance between battery stacks

For the installation distance between two battery stacks, make sure that the power and communication cables between two battery stacks are within 5 meters to ensure optimum performance of the system.

The cables delivered in the product package are of 2 meters. When longer cable connections are required, prepare the battery power and communication cables as follows:

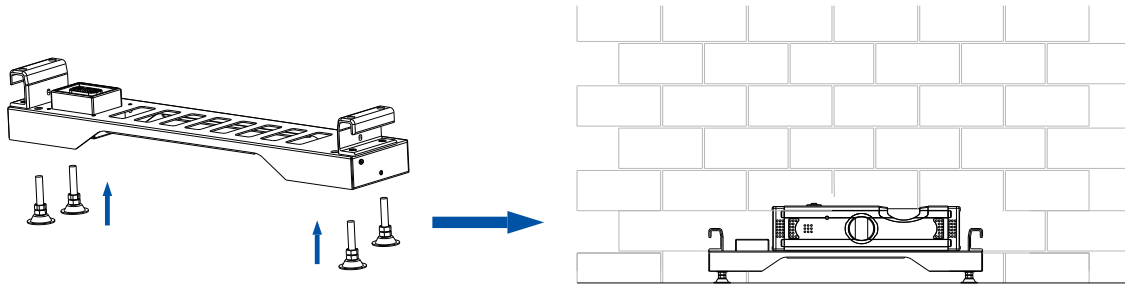
- The power and communication cables are of the same length.
- For the communication cables, use the standard network cables.
- For the power cables, comply with the following specifications:

Conductor cross-sectional area (mm ²)	Outer diameter (mm)	Conductor material	Terminal
6-10	6-8	Copper wire (600VDC, working temperature ≤105 °C)	VP-D4B-CHDM8B

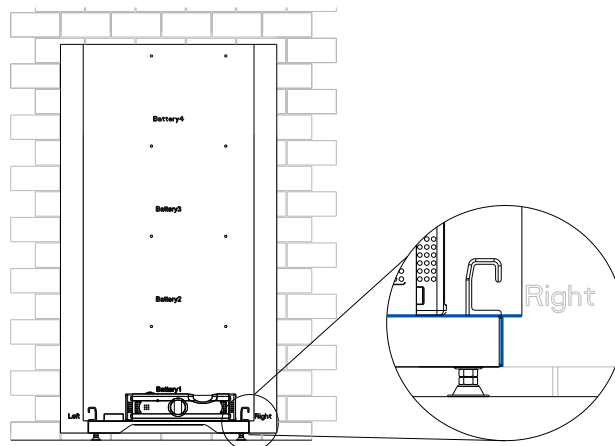
6. Install the system on the ground

6.1 Install the battery base (BE3-TV)

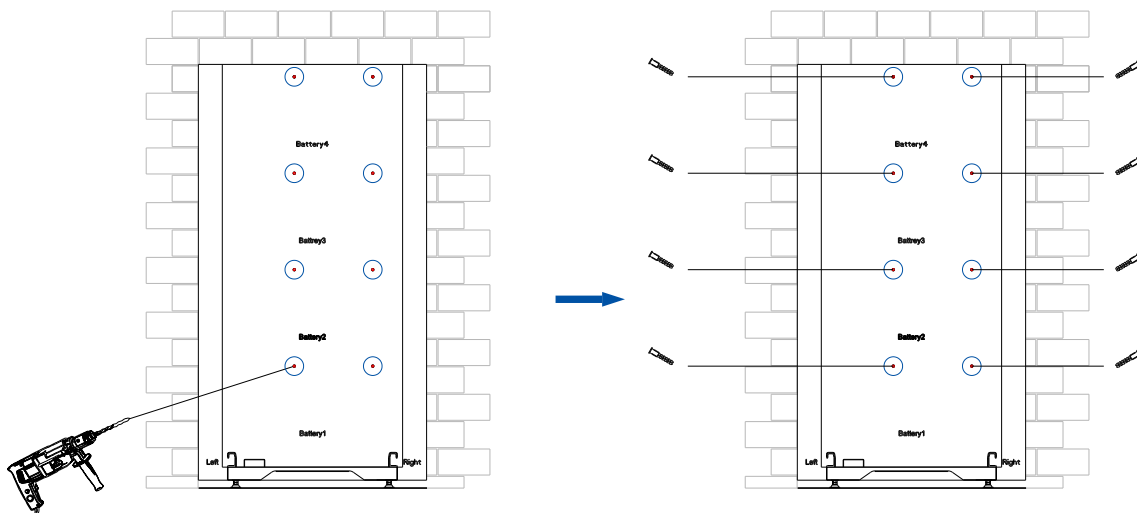
- Place the battery base on the ground horizontally.
 - Recommend using a gradienter.
 - The space between the battery base and the wall surface is 50-65 mm.
- (Optional) Install the bumper feet beneath the battery base to adjust the battery base horizontally.



- Get the cardboard from the battery base package and position it against the wall.
- Align the edges (marked in blue) of the cardboard with the edges of the battery base on both sides.

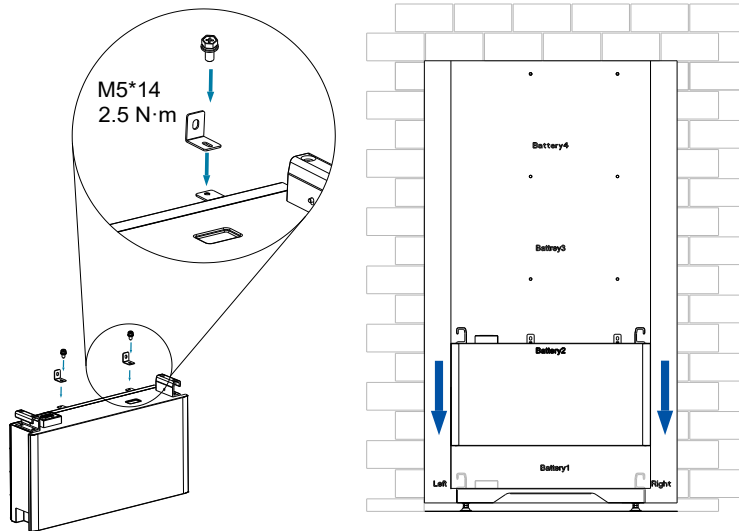


- Drill six holes (8mm in diameter and 55mm in depth) on the marked positions on the cardboard. Install the expansion tubes into the drilled holes.



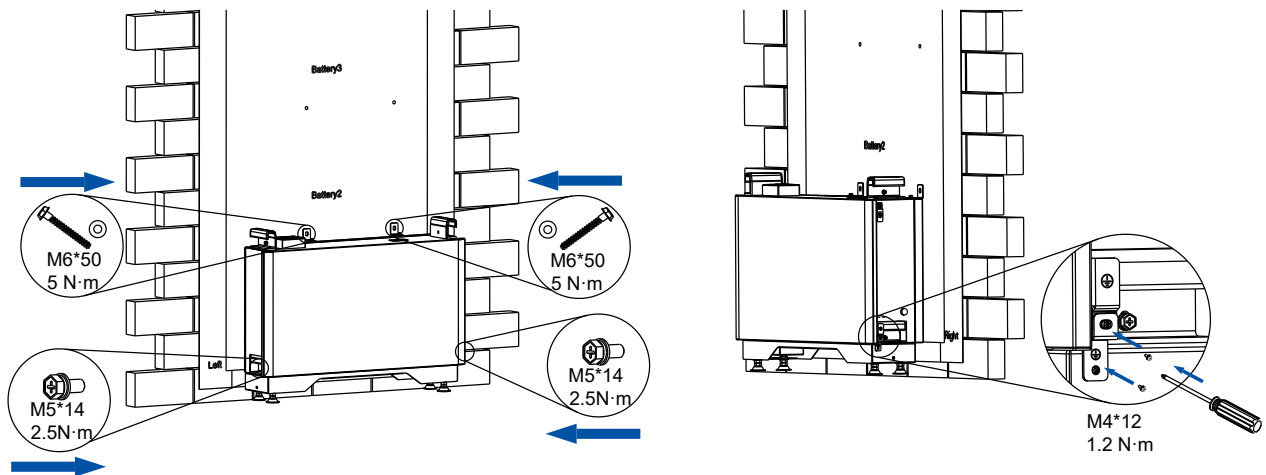
6.2 Install the batteries (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO)

1. On the top of the first battery, use two M5*14 screws to install two locking brackets to the mounting ears. Then place the battery onto the battery base and push it downwards.

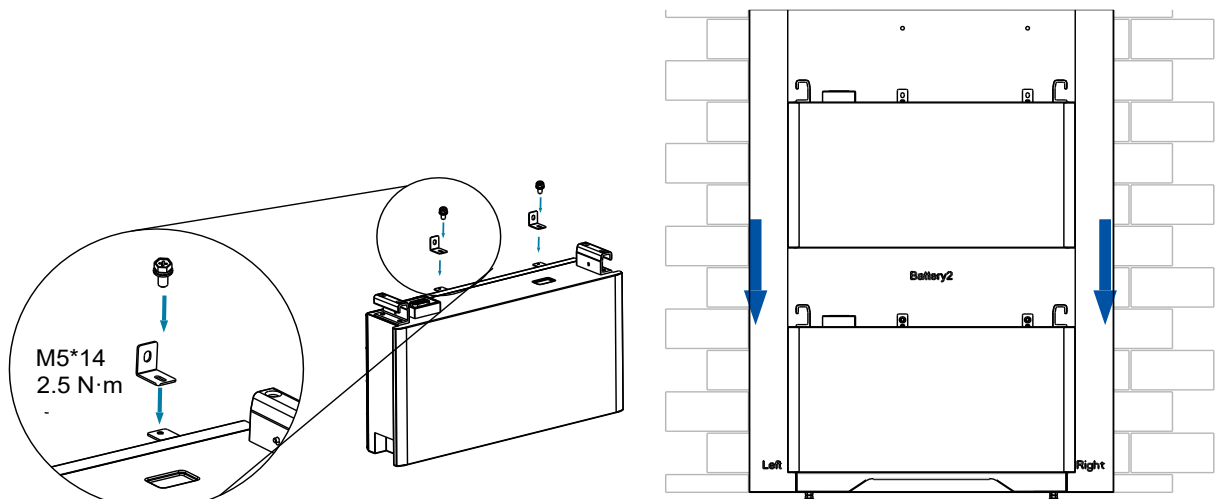


2. On the top of the first battery, align the locking brackets to the drilled holes and install M6*50 screws to secure the locking brackets to the wall. Then install M5*14 screws to secure the battery to the battery base.
3. On the right side of the battery base, secure the metal grounding plate with M4*12 screws.

Note: When the battery is installed outdoors, it is suggested to remove the cardboard which is not waterproof.



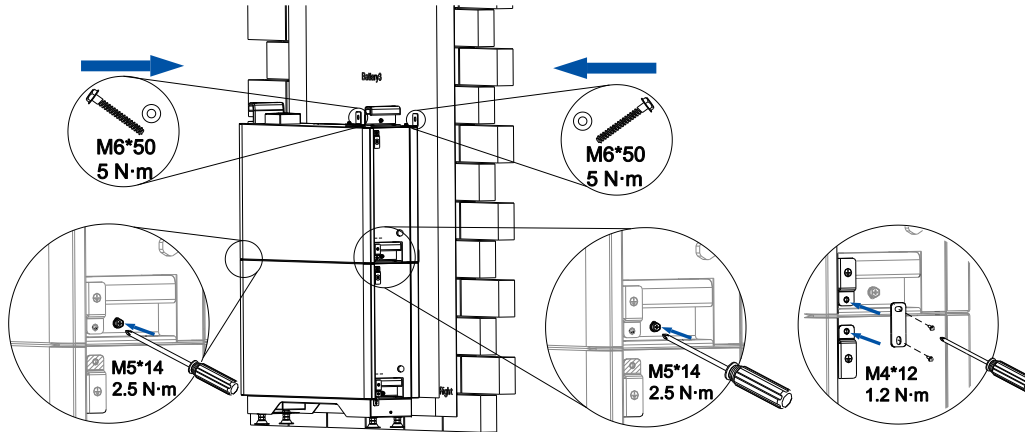
4. (Optional) On the top of the second battery, use two M5*14 screws to install two locking brackets to the mounting ears. Place this battery onto the first battery and push it downwards.



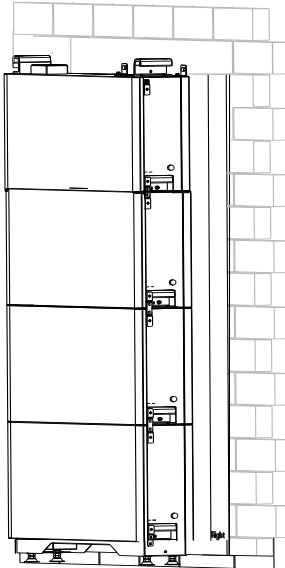
5. (Optional) On the top of the second battery, align the locking brackets to the drilled holes. Install the gaskets and M6*50 screws to secure the battery to the wall.

On the left and right bottom sides of the battery, secure two batteries with an M5*14 screw.

On the right bottom side of the battery, secure the metal grounding plate with M4*12 screws.

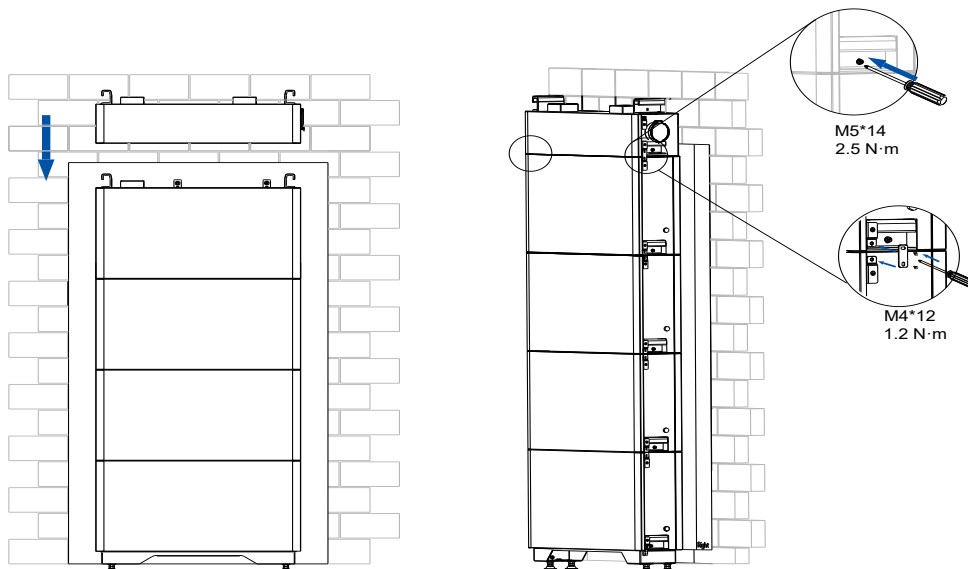


6. (Optional) Install the third and fourth battery by taking the same steps as the second battery. The following figure takes 4 batteries as an example.

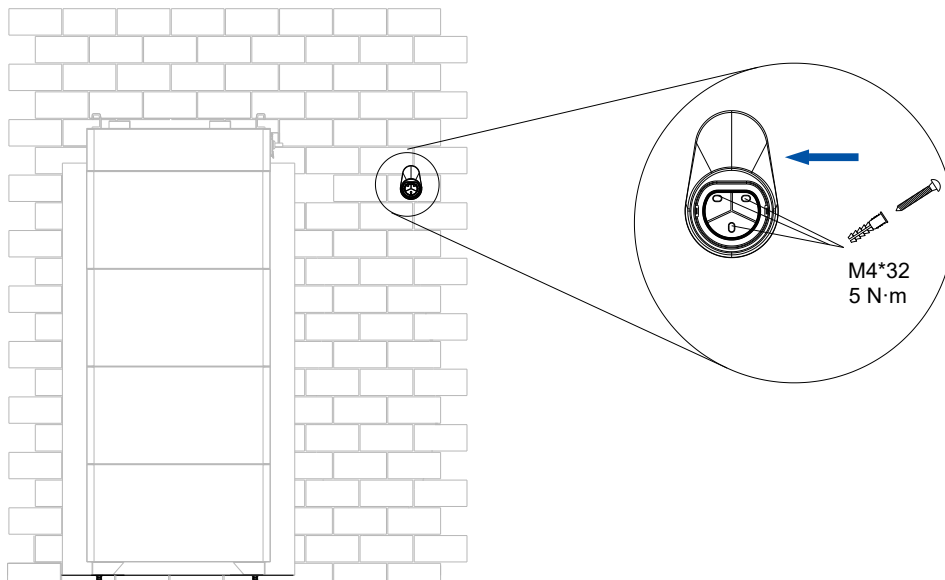


6.3 (Optional) Install the EV charger (CU2-7.4K-S(-I))

1. Get the holster from the EV charger package. Install the holster onto the right side of the charger.
2. Place the charger onto the battery. Push it downwards.
3. On the left and right bottom sides, secure the charger to the battery with screws.
On the right bottom side, secure the metal grounding plate with screws.



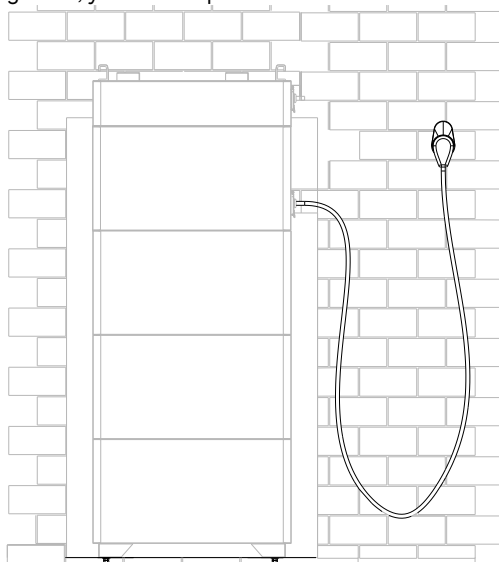
4. Install the holster on the wall with M4*32 screws.



5. Connect the charger cable.

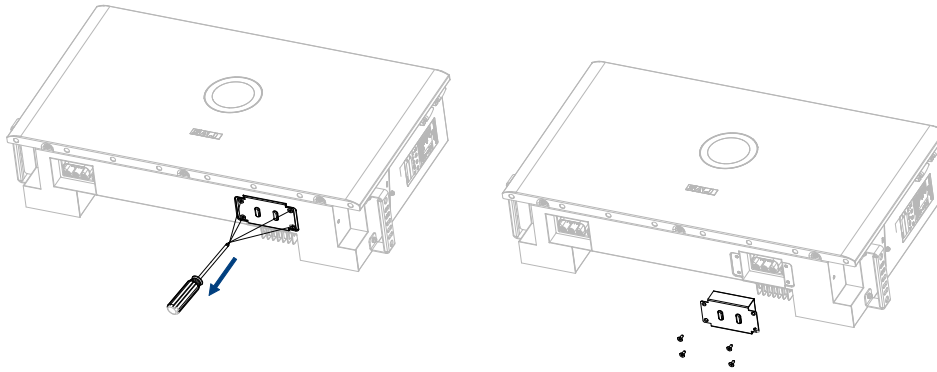
Notes:

- It is recommended that you connect the cable after all device installation is completed.
- It is recommended that you purchase the cable from SAJ.
- For a long cable, you can wrap the cable on the holster.



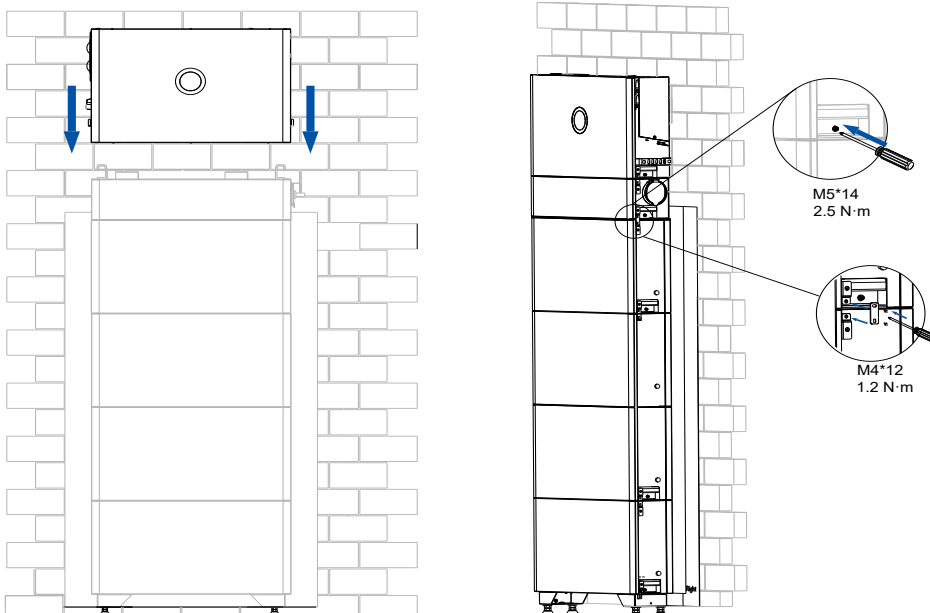
6.4 Install the inverter (HS3-xk-S2-(W, 4G)-(B, P) or HS3-xK-S2-(W, 4G)-(B, P)-(BE, IE))

1. (Optional) If you have installed a charger, loosen the screws on the inverter, and remove the port cover, as shown below:



2. Place the inverter onto the battery or charger (if available) and push it downwards.
3. On the left and right bottom sides of the battery pack, install M5*14 screws to secure the inverter to the beneath device (battery or charger; here takes a charger as an example).

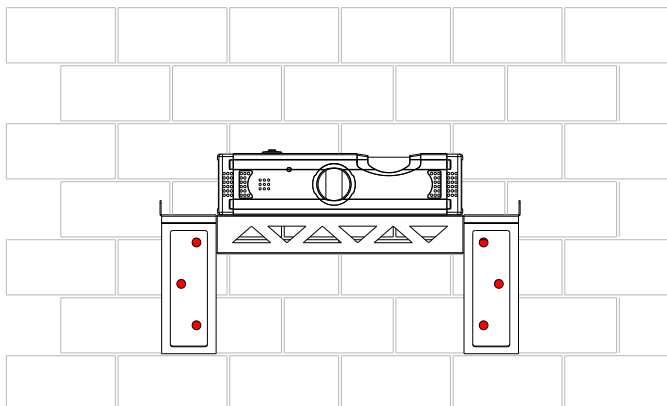
Install M4*12 screws to secure the metal grounding plate.



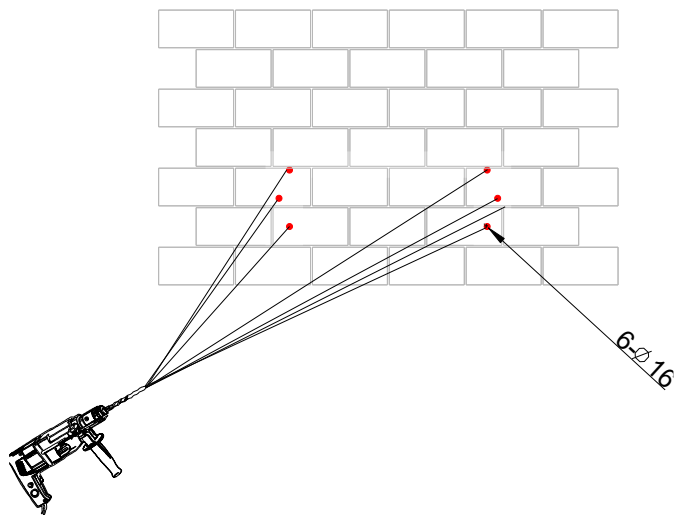
7. Install the system on the wall

7.1 Install the wall-mounting bracket (BT3-TV)

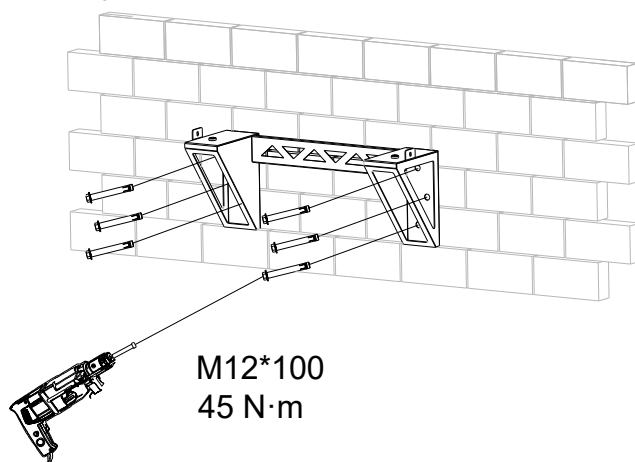
1. Place the mounting bracket onto the wall. Mark six holes. Remove the bracket.



2. Drill six holes according to the marked positions on the wall.

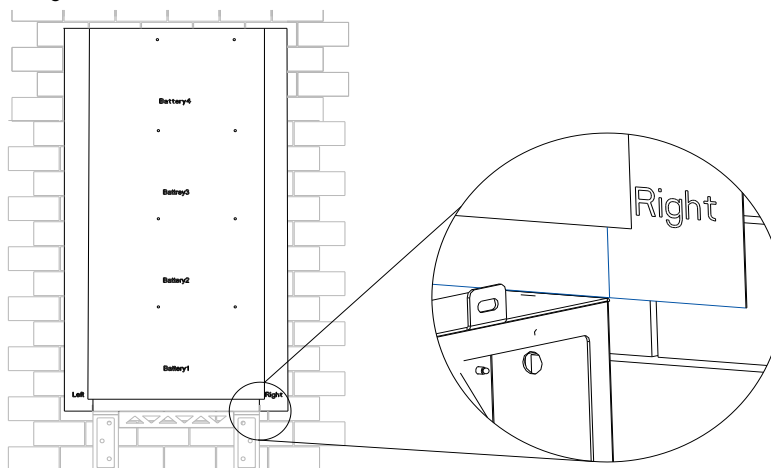


3. Install the mounting bracket on to the wall.

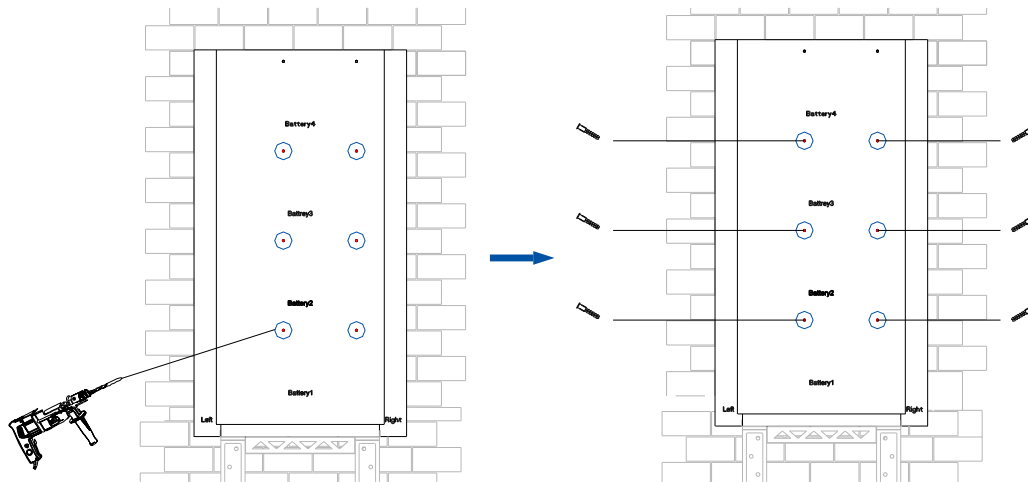


7.2 Install the battery base (BE3-TV)

1. Get the cardboard from the base battery package. Place the cardboard onto the wall and align the vertical lines on the cardboard with the bracket edges.

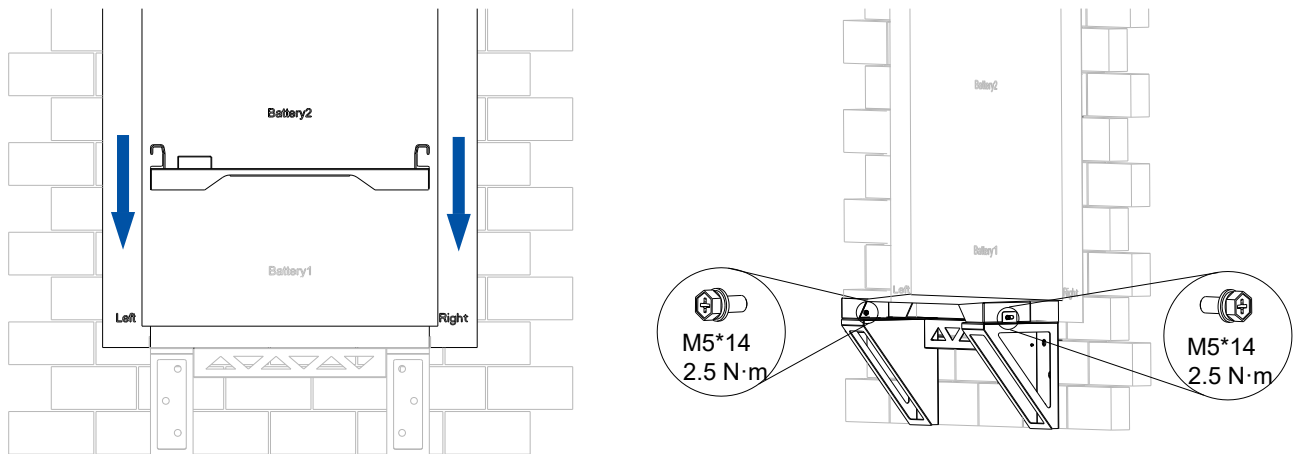


2. Drill six holes (8mm in diameter and 55mm in depth) on the marked positions on the cardboard. Install the provided expansion tubes into the drilled holes.



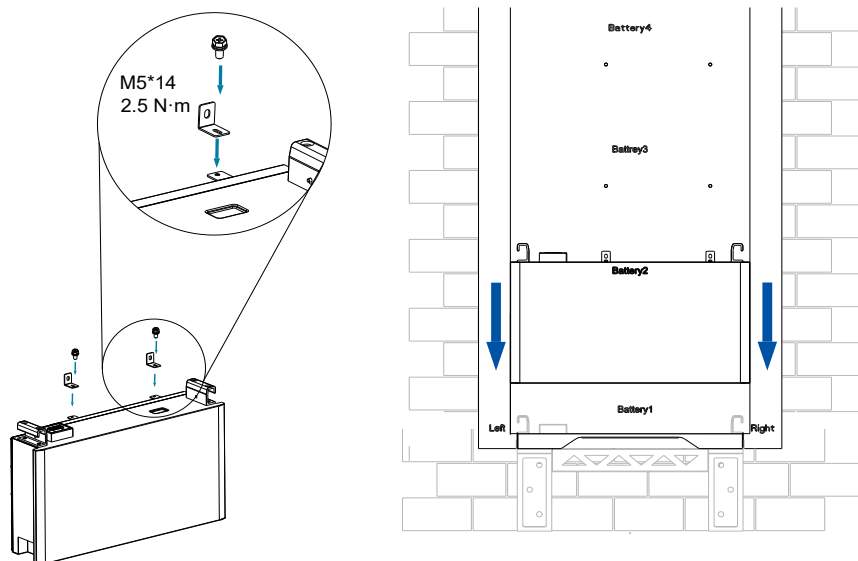
3. Place and secure the battery base onto the bracket. Make sure that:

- The left and right of the battery base are aligned with the vertical black lines on the cardboard.
- The battery pack is placed horizontally. (It is recommended that a gradienter be used.)
- The space between the battery back and the wall surface is 50–65 mm.



7.3 Install the batteries (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO)

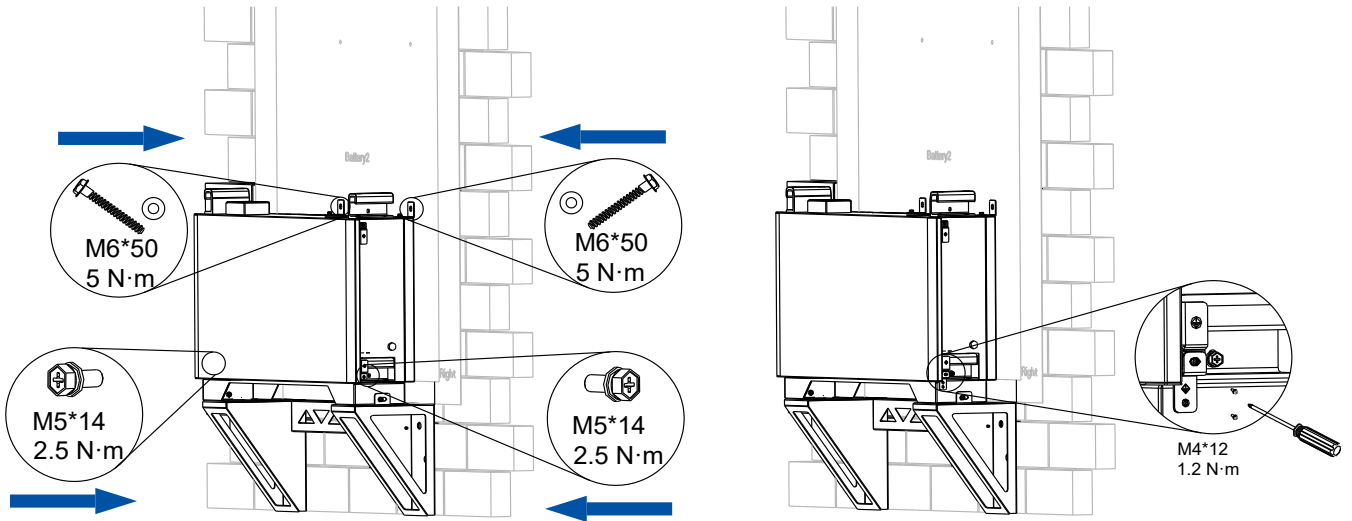
1. Use two M5*14 screws to install two locking brackets to the mounting ears on the top of the first battery. Then place the battery onto the battery base and push it downwards.



2. On the top of the battery, align the locking brackets to the drilled holes and install M6*50 screws to secure the locking brackets to the wall. Then install M5*14 screws to secure the battery to the battery base.

- On the right side of the battery base, secure the metal grounding plate with M4*12 screws.

Note: When the battery is installed outdoors, it is suggested to remove the cardboard which is not waterproof.



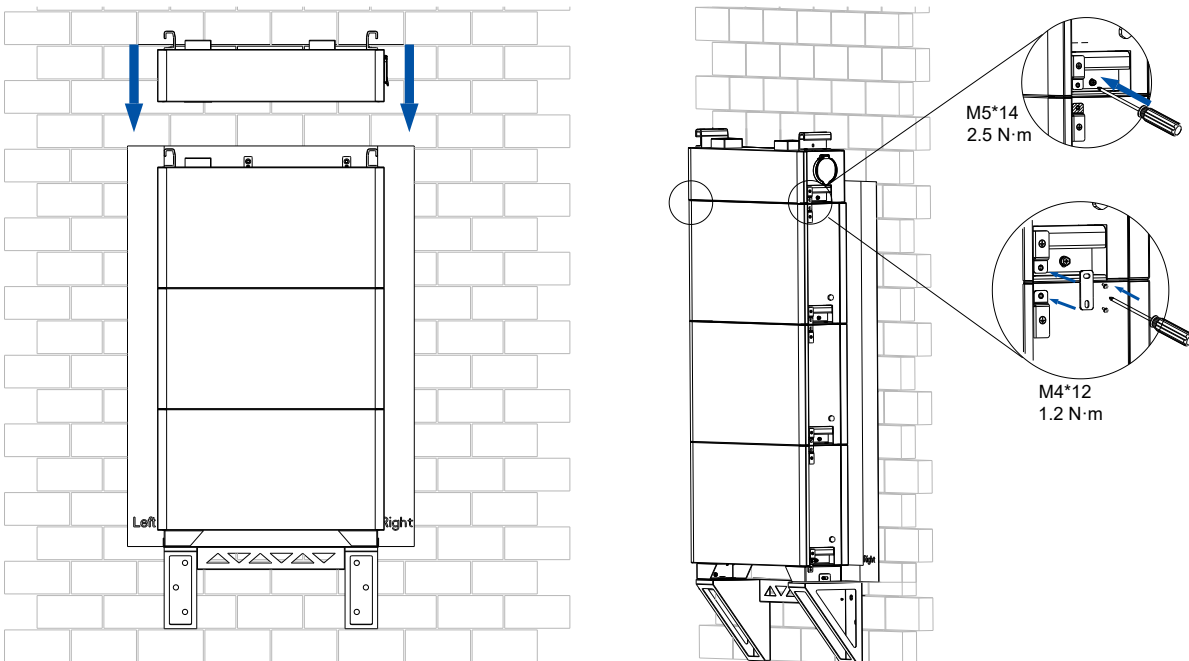
7.4 Install other required devices

For details, refer to the same procedure in the ground mounting manner.

- (Optional) Batteries: Step 6.2 Install the batteries (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO).
- (Optional) Charger: Step 6.3 (Optional) Install the EV charger (CU2-7.4K-S(-I)).
- Inverter: Step 6.4 Install the inverter (HS3-xk-S2-(W, 4G)-(B, P) or HS3-xK-S2-(W, 4G)-(B, P)-(BE, IE)).

□ 8. (Optional) Install a battery junction box (BC3-TV)

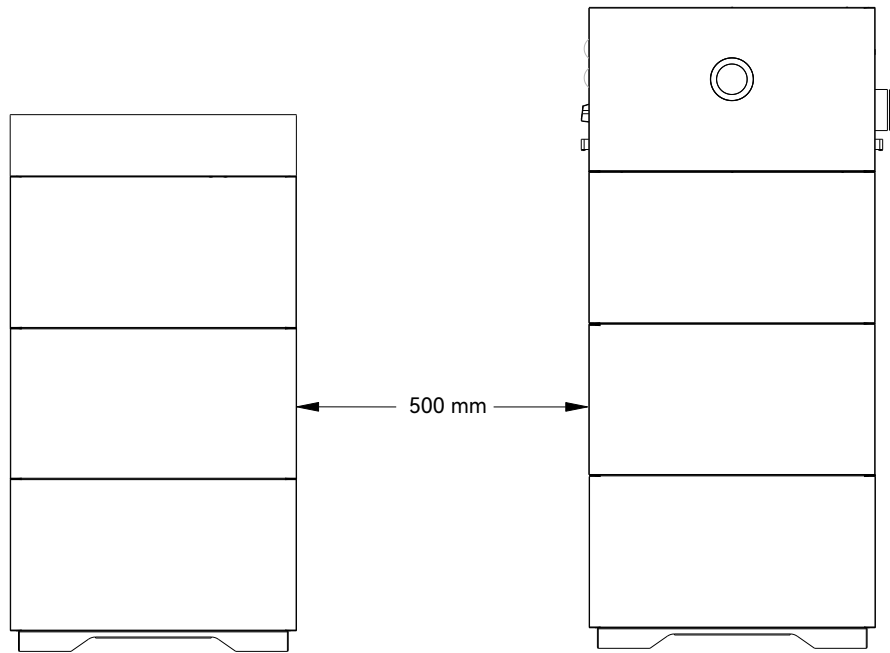
- Place the junction box onto the battery. Push it downwards.
- Install screws on both lower sides of the junction box to secure the junction box to the last battery. Install and secure the metal grounding plate.



Completion view

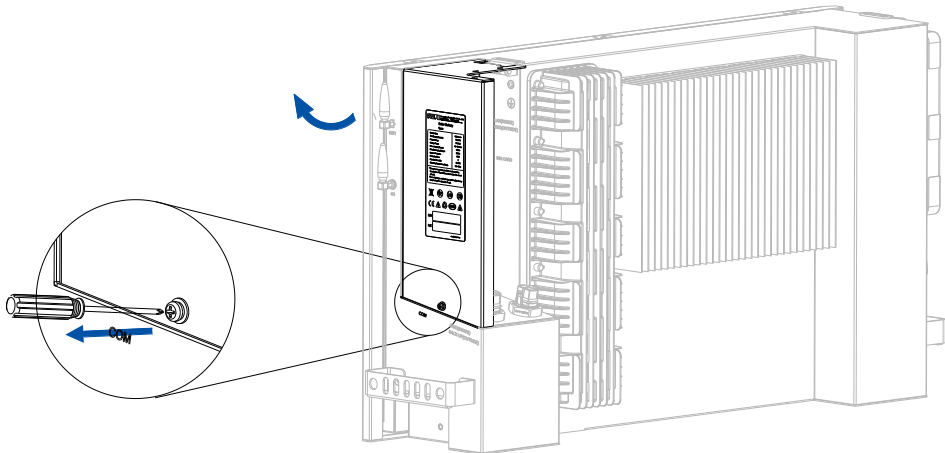
Multiple battery stacks: supporting 1 to 8 batteries

Take 6 batteries as an example:

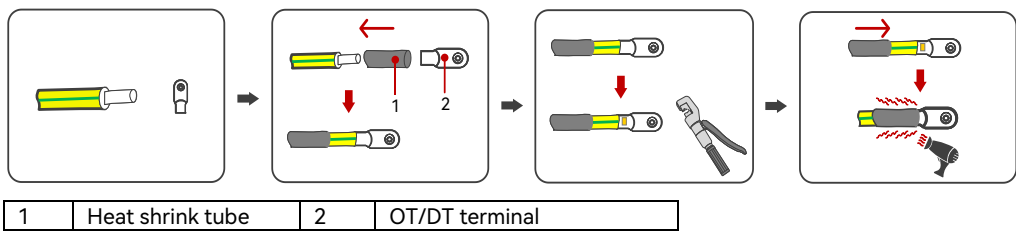


9. Assemble the AC-side connection

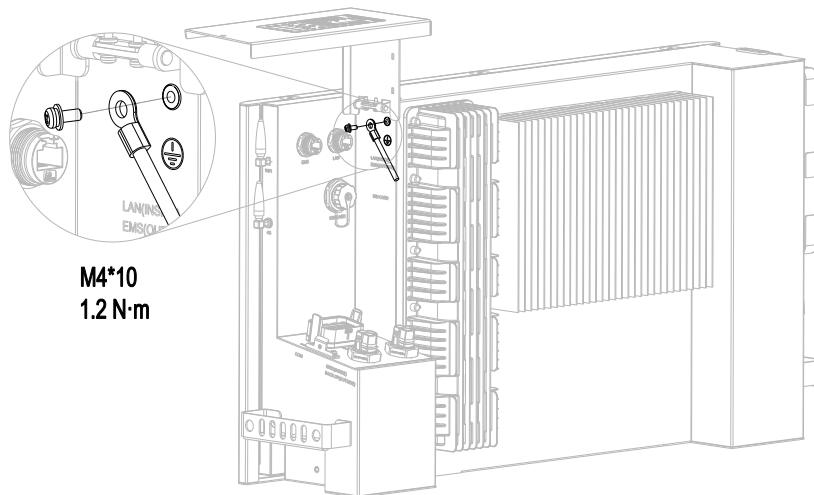
1. Open the AC-side Cover.



2. Connect the grounding cable, by taking AC-side grounding as an example.
The cable needs to be prepared by the user. It is recommended that a 6-mm² conductor cross-sectional area of cable be used.
a. Assemble the cable and OT/DT terminal.

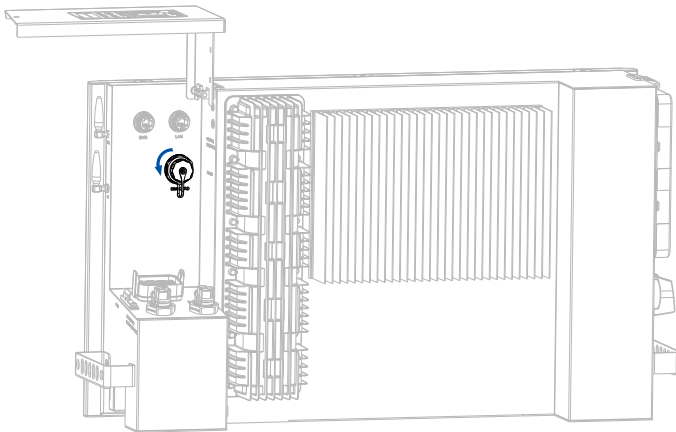


- b. Remove the M4*10 screw from the grounding port. Connect and secure the grounding cable, as shown below:

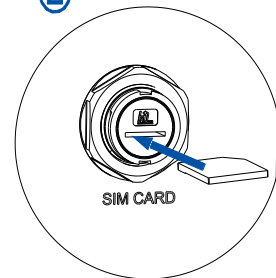


3. (4G model only) Install the SIM card.
 - a. Loosen the cover of the SIM card slot.
 - b. Insert the SIM card into the slot.

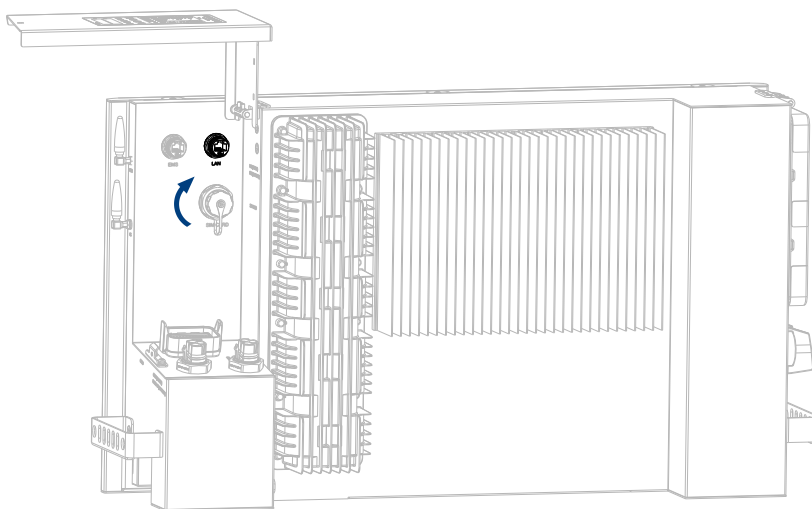
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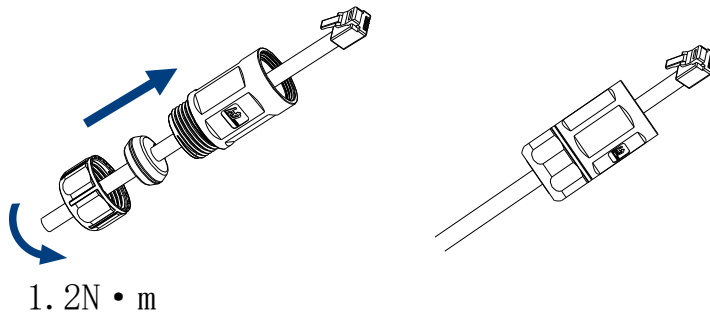
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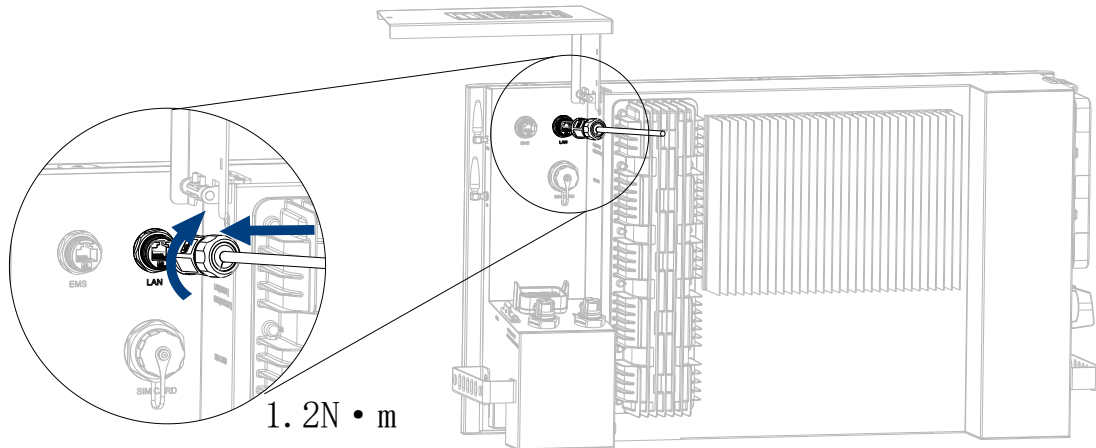
- c. Rotate the cover 90° clockwise until it stops at the limit.



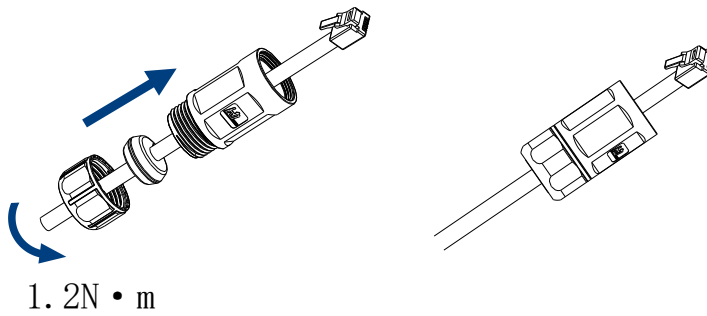
4. (W model only) Install the LAN cable, if you choose to use the Ethernet connection manner.
 - a. Remove the RJ45 cable fastener from the LAN port.
 - b. Use a standard RJ45 cable. Insert the cable through the cable fastener as shown below. Assemble the cable fastener.



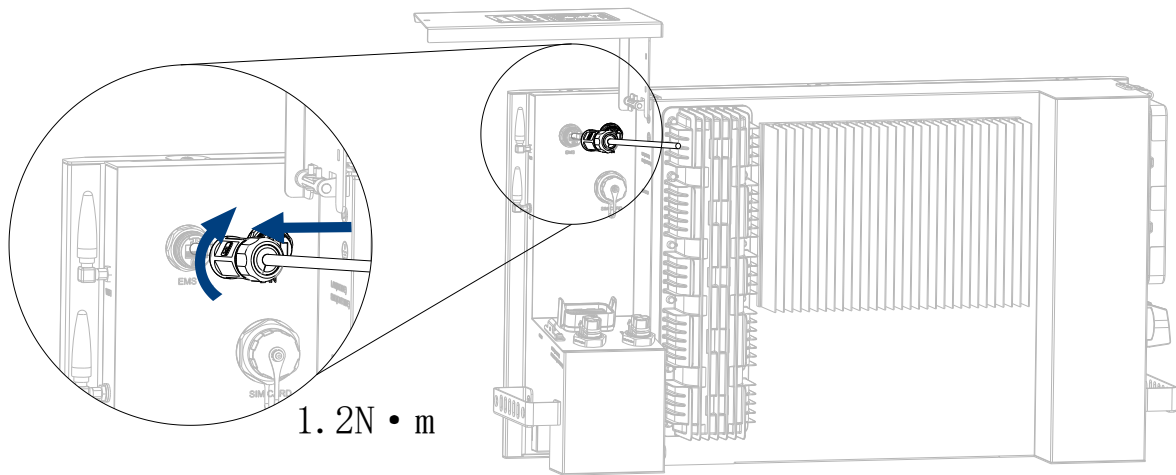
- c. Connect the LAN cable from the LAN port on the inverter to the router.



5. Install the EMS cable.
 - a. Connect the cable from the EMS port on the inverter to the LAN port on SAJ eManager (EMS). Remove the RJ45 cable fastener from the EMS port.
 - b. Use a standard RJ45 cable. Insert the cable through the cable fastener as shown below. Assemble the cable fastener.



- c. Connect the cable from the EMS port on the inverter to the LAN port on SAJ eManager (EMS).



6. Install a circuit breaker.

For safety operation and regulation compliance, install a 63 A or higher air circuit breaker between the grid and the inverter.

7. (Optional) Install an RCD.

If the external RCD must be installed according to the local regulations, either type A or type B RCD can be installed with the action current 300 mA or higher.

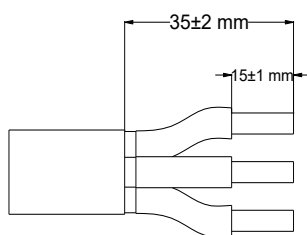
8. Connect the grid and backup loads.

Recommended cable specification:

Cable type	Conductor cross-sectional area of cables		Conductor material	Cable diameter range (with insulation)
	Range	Recommended value		
Three-wire cable	10–13.3 mm ² or 7–6 AWG	10 mm ² or 6 AWG	Copper	15–19 mm
Three cables	/	10 mm ²		6.5–8.5 mm Double-layer insulation

The following takes a three-wire cable as an example. However, if you choose to use three separated cables for grid or backup load connection, to ensure sealing safety, use the three-hole rubber plug provided in the accessory bag, instead of the original one-hole rubber plug in the connector.

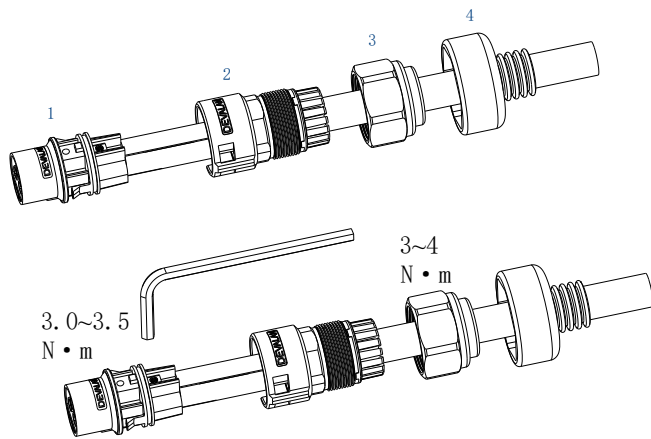
- a. On the cable end, strip off the external protective layer around 35 mm and then strip off the wire insulation around 15 mm.



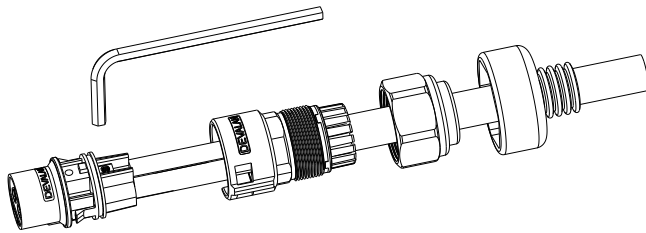
- b. Insert the cable through the dustproof cover, nut, and connector body of the connector and secure the wires to the terminal block with a spanner.

- c. Connect the cable to the grid or backup load connector.

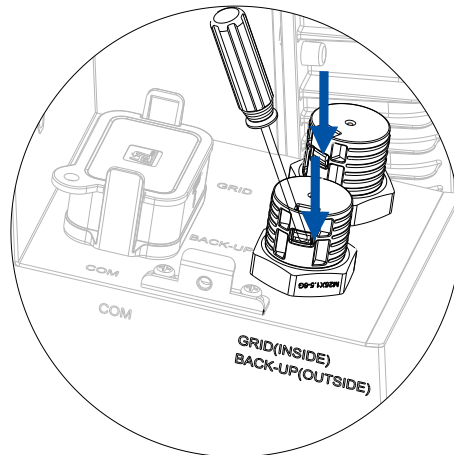
Note: Depending on the configurations, the waterproof gland nut (callout 4 in the following illustration) may not be provided.



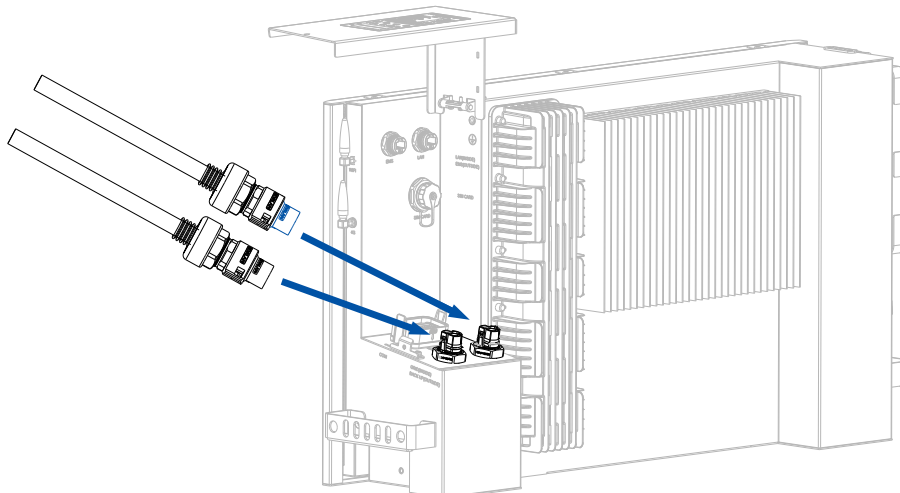
- d. Secure the cable to the connector. Then, assemble the connector.



- e. Remove the dustproof covers from the GRID and BACK-UP ports.
Use a flathead screwdriver to press down the tab in the cover.
Rotate the cover anti-clockwise and pull it upwards.



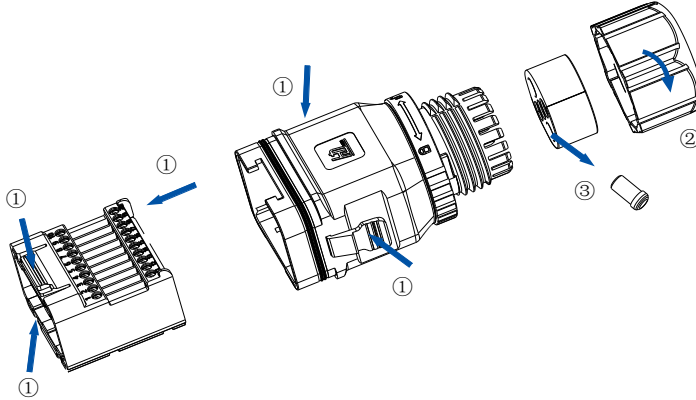
- f. Connect the cables to the GRID and BACKUP ports on the inverter.



9. Assemble the communication connection.

a. Disassemble the communication cable connector.

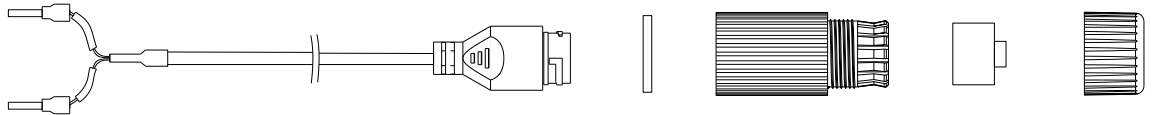
- ① Press the tabs on two sides of the connector by one hand and press the front ends of the terminal by another hand. Pull the connection terminal block outwards.
- ② Rotate the nut anti-clockwise and remove it from the connector body.
- ③ Remove the rubber plugs out of the seals.



b. Connect all communication cables to the communication cable connector.

① Prepare cables.

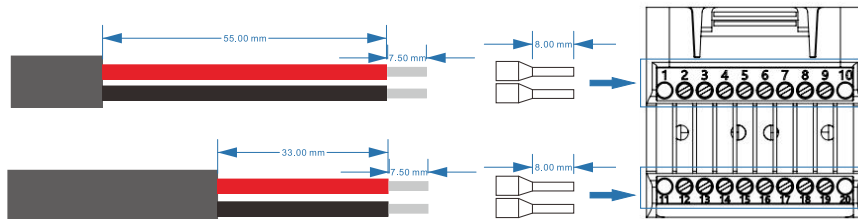
- Meter communication: Use the provided communication cable kit. It contains a communication cable with an RJ45 port and two assembled terminals and cable fastener parts.



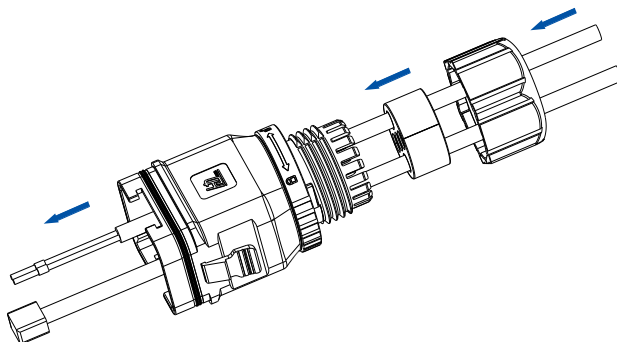
- Other terminal connection:

Prepare cables according to the following suggested specifications

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



② Insert all communication cables through the nut, seals, and body of the connector.



- ③ Locate the ports and terminals on the connection terminal block according to their silkscreens.

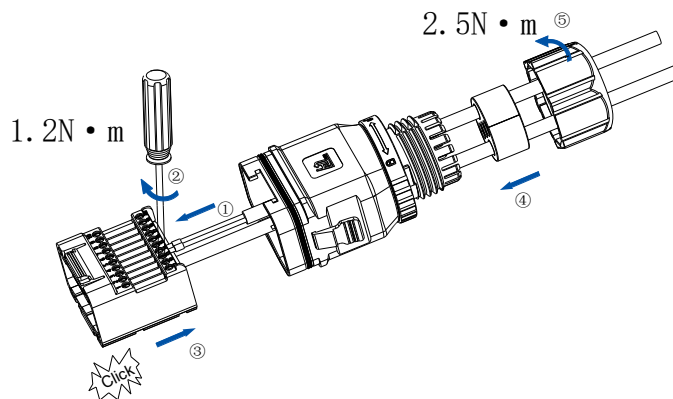
Name	Number	Pin definition	Description
PORT (RJ45 port)	/	1: CAN-H (with a 120 Ω resistor)	For parallelling connection scenario
		2: CAN-L	
		3: GND_W	
		4: SYN	
		5: GND_W	
		6: HOST	
		7: GND_W	
		8: TRF	
DRMs (RJ45 port)	/	1: DRM1/5	For RCR
		2: DRM2/6	For RCR
		3: DRM3/7	For RCR
		4: DRM4/8	For RCR
		5: REF D/0	/
		6: COM D/0	/
		7: NC	/
		8: NC	/
Terminals	4	DO1+	Dry contact output 1
	5	DO1-	Dry contact output 1
	6	DO2+	Dry contact output 2
	7	DO2-	Dry contact output 2
	11	RS485-A (with a 120 Ω resistor)	For external RS485 communication
	12	RS485-B	
	13	MET-A (with a 120 Ω resistor)	For meter communication
	14	MET-B	
	15	DI1+	Dry contact input 1
	16	DI1-	Dry contact input 1
	17	DI2+	Dry contact input 2
	18	DI2-	Dry contact input 2
	19	CAN_H (with a 120 Ω resistor)	For external CAN communication
	20	CAN_L	

- c. Connect and secure the cables to the connection terminal block. Then, assemble the communication cable connector.

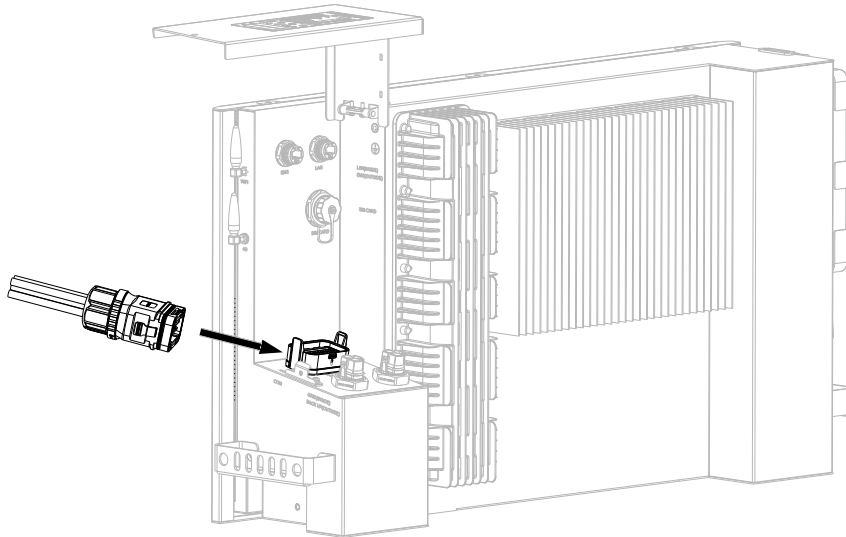
- ① Connect cables to corresponding terminals and RJ45 ports based on your needs.
- ② Use a screwdriver to secure the cables connected to the terminals.

Note: If any terminal that has been equipped with a 120 Ω resistor, such as METER-A, needs to be connected by a cable with the length longer than 20 meters, switch the resistor to ON status.

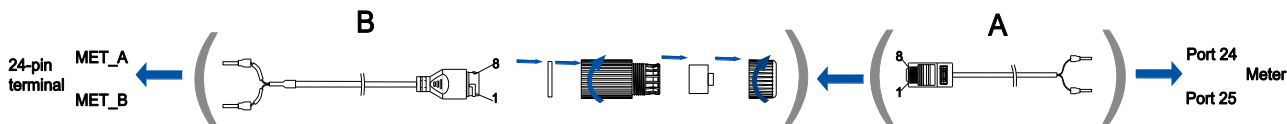
- ③ Insert the connection terminal block back to the connector body until you hear a click sound.
- ④ Insert the seals and nut back to the connector body.
- ⑤ Rotate the nut clockwise until it is secured to the connector body.



- d. Connect the assembled communication terminal connector to the COMM port on the inverter.

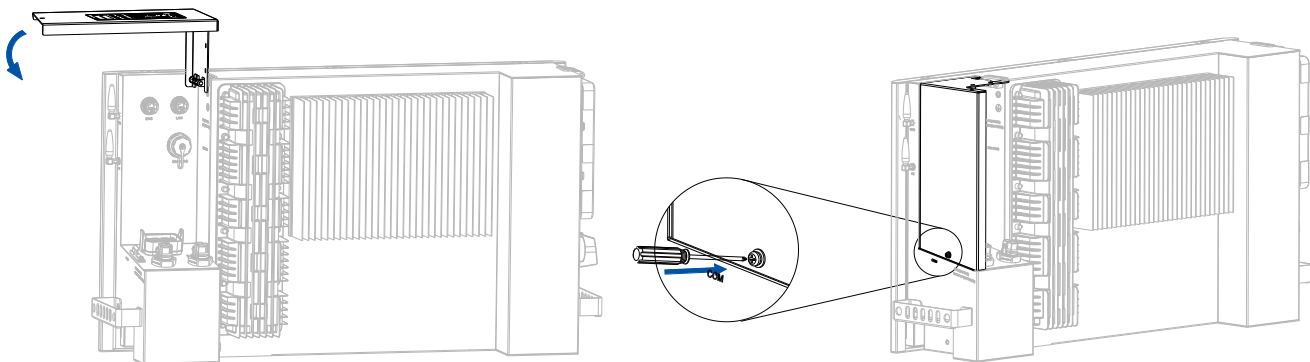


- e. Connect the other end of the cables to external devices, such as the meter.
- Meter connection:
- a. Take the communication cable (A) and smart meter out of the meter kit. For details, refer to the inverter package in step 2 "Check the product packages".
 - b. Connect the RJ45 connector of the cable to the RJ45 port of the meter communication cable (B).
 - c. Connect the two crimped cable ends of the cable to ports 24 and 25 on the meter.



Callout	Description	RJ45 pin definition
A	Communication cable with an RJ45 connector	<ul style="list-style-type: none">● Pin 1: A1● Pin 2: B1● Pins 3 to 8: NC
B	Communication cable kit	<ul style="list-style-type: none">● Pin 1: For MET-A● Pin 2: For MET-B● Pins 3 to 8: NC

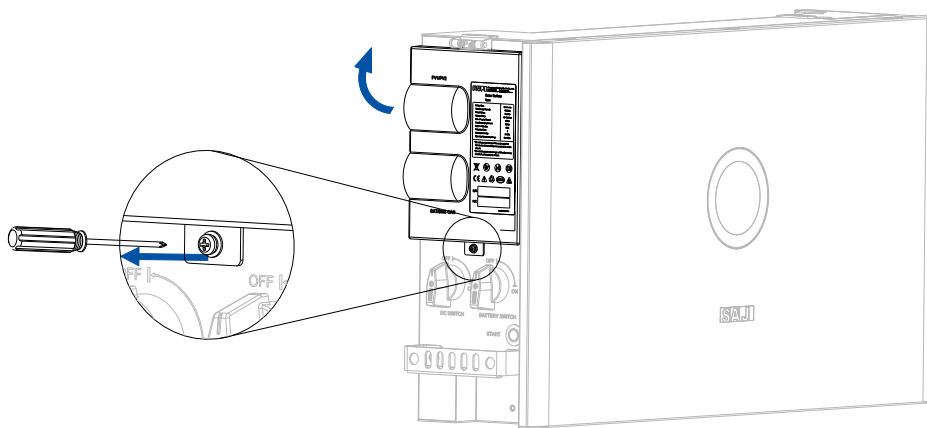
10. Close the AC-side cover.




☐ 10. Assemble the DC-side connection

10.1 Open the DC-side cover


Loosen the screw that locks the cover. Then, lift the cover upwards.



10.2 Connect the PV cables

 **DANGER**

- Dangerous to life due to electric shock when live components or DC cables are touched.
- The PV panel string will produce lethal high voltage when exposed to sunlight. Touching live DC cables results in death or lethal injuries.
- DO NOT touch non-insulated parts or cables.

 **WARNING**

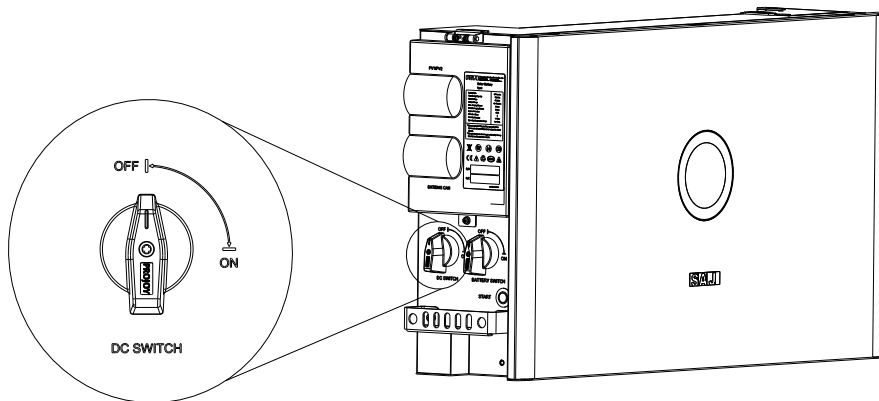
- Disconnect the inverter from voltage sources.
- DO NOT disconnect DC connectors under load.
- Wear suitable personal protective equipment for all work.

Recommended cable specification:

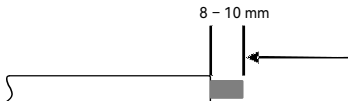
Conductor cross-sectional area of cables (mm ²)		Conductor material
Scope	Recommended value	Outdoor copper wire cable, complying with 600 V DC
4.0–6.0	4.0	

Before you start, make sure that:

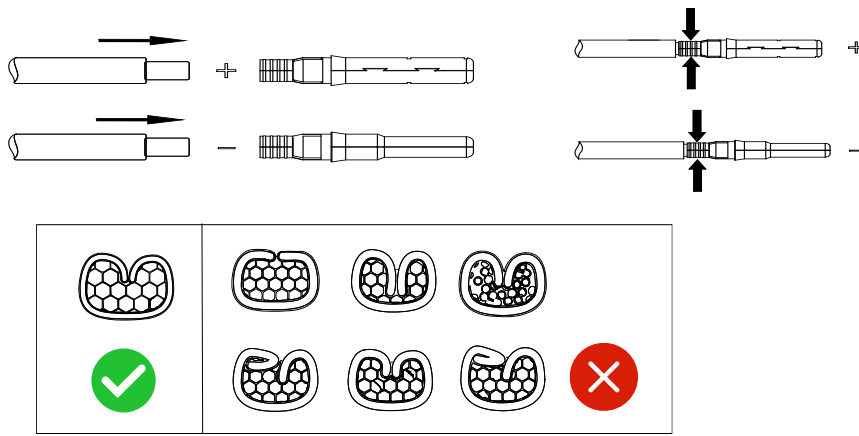
- The PV array is properly insulated to ground before it is connected to the inverter. The inverter cannot be used with functionally earthed PV arrays.
- The DC switch on the inverter is in OFF position to avoid short circuit caused by maloperations.



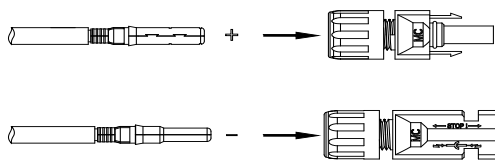
1. Use a 3-mm wide-bladed screwdriver to strip the insulation layer around 8 to 10 mm length from one end of each cable.



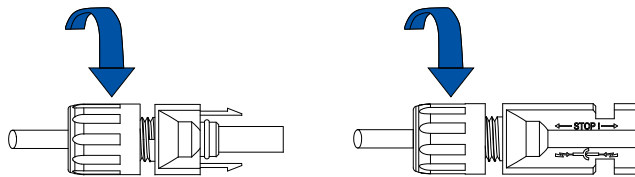
2. Insert the cable ends to the sleeves. Use a crimping plier to assembly the cable ends.



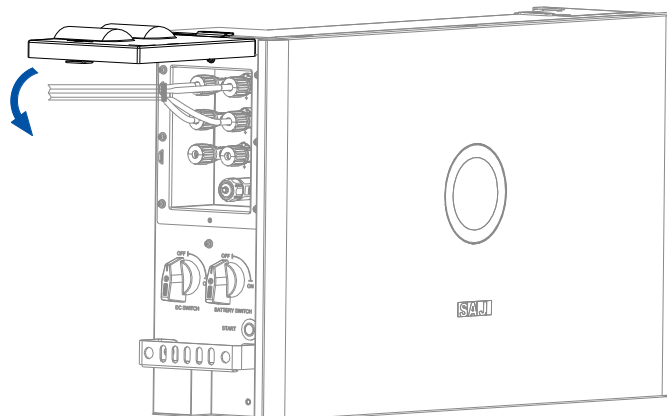
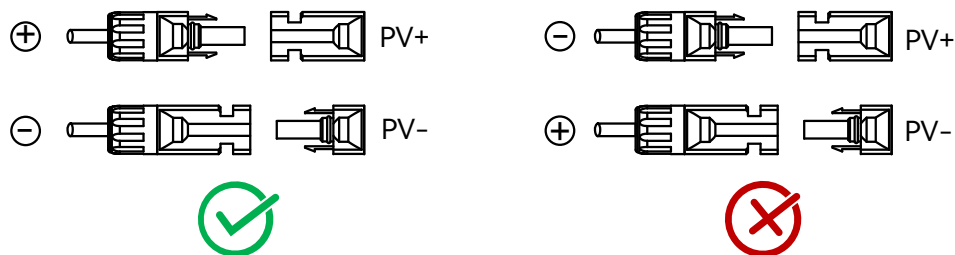
3. Insert the assembled cable ends into the blue positive and negative PV connectors. Gently pull the cables backwards to ensure firm connection.



4. Tighten the lock screws on the positive and negative cable connectors.
Tightening torque: 2.9N·m



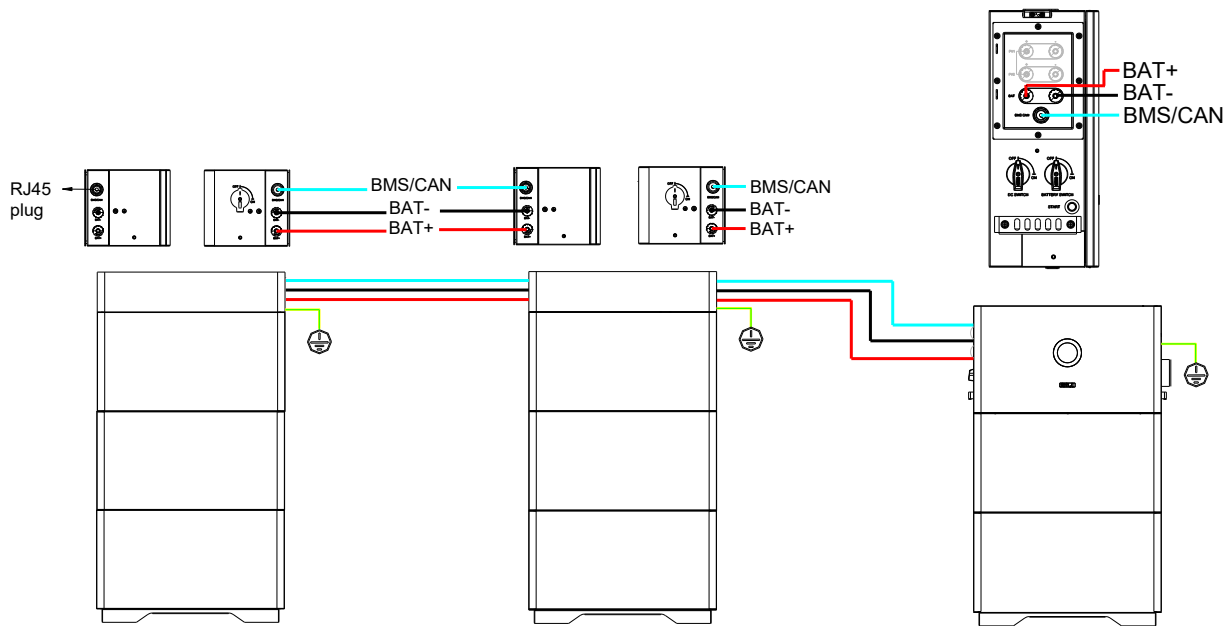
5. Insert the positive and negative cable connectors into the positive and negative PV ports on the inverter until you hear a “click” sound to ensure firm connection.



10.3 (Optional) Connecting the battery cables between multiple stacks

Follow this procedure to connect multiple battery stacks to one inverter.

The following figure shows the cable connection of two battery stacks connecting to the inverter:

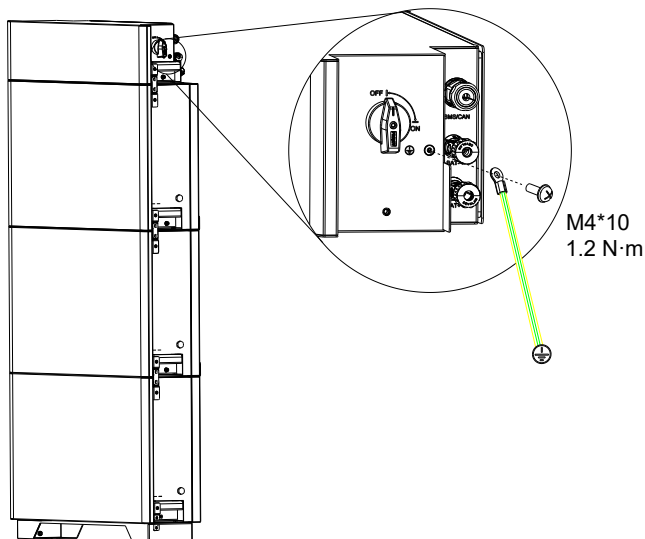


Prerequisite

On top of the first stack, an inverter is installed; while on top of other stacks, a battery junction box has been installed.

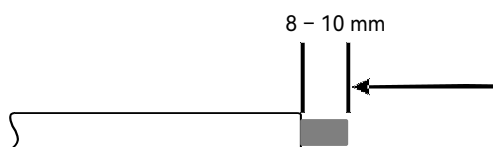
Procedure

1. Prepare and connect the grounding cable to either side of the battery junction box.

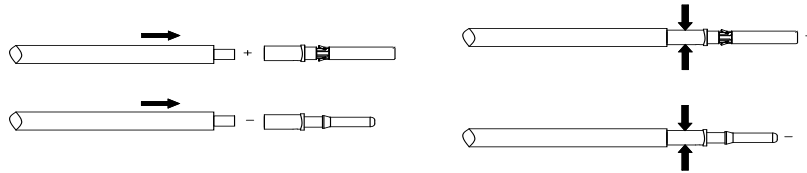


2. Assemble the battery power cable ends.

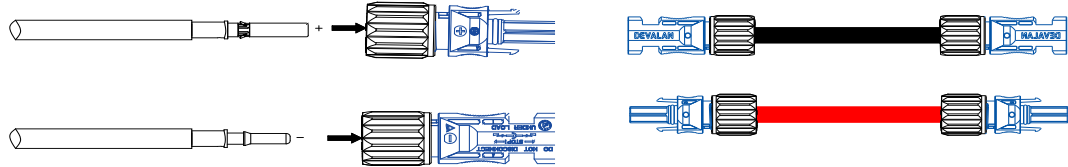
- a) Strip off the insulation of the power cable end by 8-10 mm.



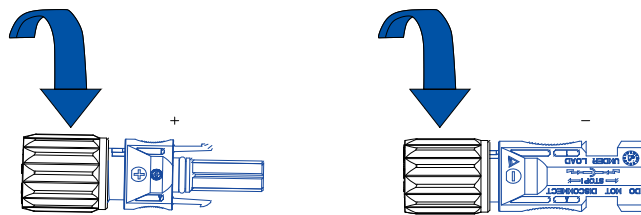
- b) Insert the cable ends to the corresponding sleeves. Use a crimping plier to assemble the cable ends.



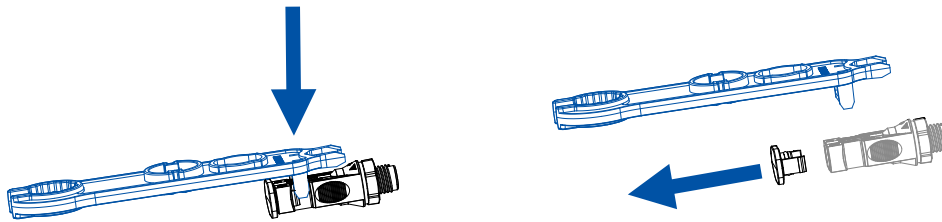
- c) Insert the assembled cable ends into the positive and negative battery connectors. Then, gently pull the cables backwards to ensure that they are firmly connected.



- d) Tighten the nuts on the positive and negative cable connectors.
Tightening torque: $2.9\text{N}\cdot\text{m}$



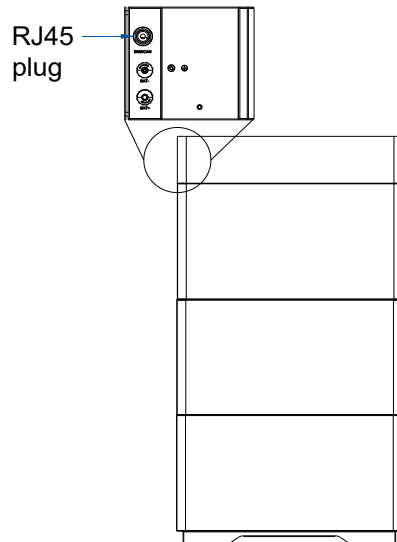
3. Remove the waterproof covers on the **BAT+** and **BAT-** ports on the inverter and battery junction box.



4. Connect the positive and negative power cables from the junction box to the inverter or the junction box of the other B3 battery stack.

Cable	From the junction box	To the inverter
Positive power cable	BAT+	BAT+
Negative power cable	BAT-	BAT-

5. Remove the RJ45 connector plug that is installed on the **BMS CAN** port on the HS3 inverter. Insert the plug into the **BMS/CAN** port on the battery junction box on the furthest left stack.

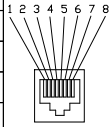


- Connect the communication cable from the junction box to the inverter or the junction box of the other B3 battery stack.

Cable	From the junction box	To the inverter
Communication cable	BMS/CAN	BMS CAN

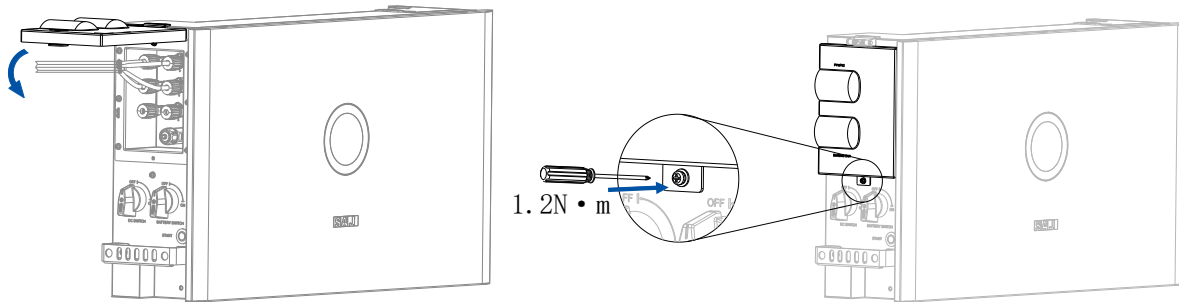
Pin definitions of the BMS CAN port are as follows:

BMS CAN	
1	NC
2	NC
3	NC
4	CANH
5	CANL
6	NC
7	NC
8	NC




10.4 Close the DC-side cover

Push the cover downwards. Use a screwdriver to tighten the screw to lock the cover securely.



11. Start the system

- Open the AC distribution box. Turn on the circuit breakers of the backup loads and grid.
- (Optional) If there are multiple battery stacks, turn on the battery switch on the right side of the battery junction box.
- On the left side of the inverter, perform as follows:
 - Turn on DC SWITCH.
 - Turn on BATTERY SWITCH.
 - Press and hold the START button for five seconds until the LED indicator on the front panel is on .
- Check the LED indicator status on the inverter panel to ensure that the inverter is running properly.

Note: The LED indicator status label is on the left side of the inverter.
- Configure the system on the SAJ App named Elekeeper. For details, refer to the section “System Commissioning” in the *SAJ Configuration Instructions*.
- If any error occurs, check the error code displayed on the App. For detailed error messages, refer to the section “Troubleshooting” in the *User Manual*.

---End

Installer: _____