A1-ESS-G2 SYSTEM

(A1-BI-200-G2)

Quick Installation Guide

Version 11.0

www.solaxpower.com

SolaXCloud App

Scan the QR code below to download SolaXCloud App.

Installation Guide

Scan the QR code below for more detailed Installation Guide.

CHANGE HISTORY

Version 11 (Aug. 23, 2024)

Modified document style;

Modified cover name;

Adjusted the circuit breaker in the packing list of inverter to an optional accessory;

Added document to the packing list of BI;

Updated the packing list of battery and accessory serial number;

Modified the strip length and torque of BI terminals;

Updated the APP content to version 6.0.4.

Version 10 (Mar. 20, 2024)

Apart from the TROUBLESHOOTING section, changed "E-Stop" to "Emergency stop";

Added a grounding reminder;

Added the specifications and colors of the L1, L2, N, GND wires;

Adjusted the wiring sequence for the Ethernet cable (blue-white and green-white).

Version 10 (Jan. 18, 2024)

Modified the front and back cover, added QR code of instruction manual, and added contents;

Added safety regulations section, system diagram description, installationspace and wall requirements;

Added accessory numbers, updated the presentation of kits, added accessory numbers in the text section, and added kits;

Updated torque for bolts in battery mounting section, modified screwdriver torque spanner pictures;

Modified the format of the installation part; added wiring instructions before locking the cover;

Before the wiring section, added the steps of removing the cover, enlarged the local diagram, and increased the pointing of local points.

Version 09 (Nov. 21, 2023)

Modified the width of inverter

Version 08 (Sep. 14, 2023)

Added the installation information about the solid wood wall and torque

Version 07 (Jun 12, 2023)

Modified battery installation

Version 06 (May 06, 2023)

Modified battery accessory description

Version 05 (Mar. 24, 2023)

Modified the size, added instruction of drilling hole in the back

Version 04 (Dec. 29, 2022)

Added weight and mounting height instructions

Version 03 (Sep. 29, 2022)

Updated torque, breaker information

Version 02 (May 31, 2022)

Updated torque, modified equipment drawings, etc.

Version 01 (May 31, 2022)

Modified the installation method

Version 00(Oct. 22, 2021)

Initial release

Table of Contents

1 Safety

1.1 General Safety Instructions

This manual contains important instructions for A1-HYB-G2 series inverter that should be followed during installation and maintenance for the inverter.
A1-HYB-G2 series inverter is designed and tested to meet all applicable North American and International safety standards. However, like all electrical and electronic equipment, safety precautions must be observed and followed during installation and operation of the A1-HYB-G2 series inverter to reduce the risk of personal injury and to ensure a safe installation.
Installation, commissioning, service, and maintenance of A1-HYB-G2 series inverter must only be performed by authorized personnel that are licensed and / or satisfy state and local jurisdiction regulations.
Before starting installation or commissioning, read the entire manual carefully to ensure correct and safe installation or commissioning. And keep the user manual in a safe place.

All US electrical installations must comply and be in accordance with all the state, local, utility regulations, and National Electrical Code ANSI/NFPA 70.

1.2 Important Safety Instructions

⚠ WARNING!

- This document does not replace and is not intended to replace any local, state, provincial, including without limitation applicable in the jurisdiction of installation. SolaX assumes no responsibility for the compliance or non-compliance with such laws or codes in connection with the installation of the product.

⚠ WARNING!

- Before installing or using the product, read all the instructions, cautions, and warnings in this manual. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury or death, or may damage the product.
- Before connecting the product to the electrical utility grid, contact the local utility company.
- All work must be carried out by a qualified electrician. Children should be supervised to ensure that they do not play with the appliance.

⚠ WARNING!

- Do not install the system in a corrosive environment where it may be exposed to ammonia, corrosive gases, acids, or salts (eg: chemical plant, fertilizer storage areas, tanneries, near volcanic ash eruption).

WARNING!

- Do not disassemble any parts of the product which are not mentioned in the installation guide. It contains no user-serviceable parts. See warranty for instructions on obtaining service. Attempting to service the device by yourself may result in a risk of electric shock or fire and will void your warranty.

WARNING!

- The inverter input and output circuits are isolated from the enclosure. This system does not include an isolation transformer and should be installed with an ungrounded PV array in accordance with the requirements of ANSI / NFPA 70, NEC 690.41.
- Equipment grounding is the responsibility of the installer and must be performed in accordance with all applicable Local and National Codes.

WARNING!

- Before operating the inverter, ensure that the inverter is grounded properly. This product must be connected to a grounded, metal, permanent wiring system, or an equipment-grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal or lead on the product.

WARNING!

- When a ground fault is indicated, normally grounded conductors may be ungrounded and energized or normally ungrounded conductors may be grounded.

WARNING!

- Do not operate the device when the device is running.

CAUTION!

- Only accessories shipped with the product are recommended to use. Using other accessories may result in a fire or injury to the user.

CAUTION!

Possible damage to health as a result of the effects of radiation!

- Do not stay closer than 7.87 in / 20 cm to system for a long time.

CAUTION!

Danger of burn injuries due to hot enclosure parts!

- During operation, the enclosure may become hot.

CAUTION!

Risk of electric shock from energy stored in the capacitor.

- Never operate on the inverter couplers, the Mains cables, battery cables, and PV cables when power is applied. After switching off the PV, battery and Mains, always wait for 5 minutes to fully discharge the intermediate circuit capacitors discharge before unplugging DC, battery and Mains couplers.

CAUTION!

- A1-HYB-G2 series only supports a certain type of lithium-ion battery (Manufacturer certified battery)!

WARNING!

- Do not expose system to ambient temperatures above 140°F (60°C) or below -13°F (-25°C).

WARNING!

- Do not attempt to open, disassemble, repair, tamper with or modify the product. The product and its components are not user serviceable.

Battery safety instructions

A1-HYB-G2 Series inverter should be coupled with a high voltage battery.
The battery must comply with UL 1973 and must be SolaX certified.
As accumulator batteries may contain potential electric shock and short-circuit current dangers, to avoid accidents that might be thus resulted, the following warnings should be observed during battery replacement:

- Risks of explosion:

Do not subject the battery module to heavy impacts.
Do not crush or puncture the battery module.
Do not dispose of the battery module in a fire.

- Risks of fire:

Do not expose the battery module to temperatures in excess of 140°F.
Do not place the battery module near a heat source, such as a fireplace.
Do not expose the battery module 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 module.
Do not touch the battery module with wet hands.
Do not expose the battery module to moisture or liquids.
Keep the battery module away from children and animals.

- Risks of damage to the battery module:

Do not expose the battery module to liquids.
Do not subject the battery module to high pressures.
Do not place any objects on top of the battery module.

A1-HYB-G2 series inverter is transformerless type without galvanic isolation. It is designed and certified to fulfill the directives of ANSI/NFPA 70, NEC 690.41, UL 1741, UL 1741 SA, IEEE 1547 and IEEE 1547.1. The inverter converts the DC power generated by PV strings into AC power and stores the energy into the battery bank or feeds the power into the power grid.

RSD
The RSD provides an automatic disconnect of residential or small commercial PV systems, fully compliant with the rapid shutdown requirements of National Electric Code (NEC), ANSI / NFPA 70 Sections 690.12.

Battery (Optional)
The A1-HYB-G2 series inverter should be coupled a high voltage battery. The battery communicate with inverter via BMS and must comply with the specification of UL 1973.

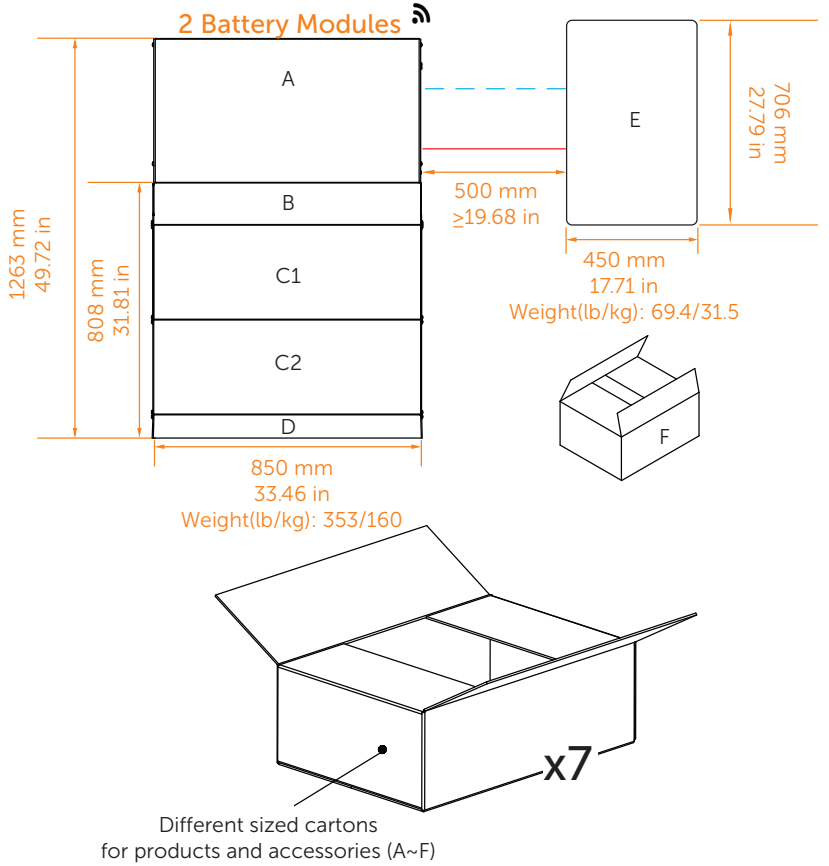
The installation of A1-ESS-G2 system including A1-HYB-G2 inverter, battery and BI must be done in accordance with local codes and the National Electric Code (NEC) ANSI / NFPA 70 or the Canadian Electrical Code CSA C22.1.

The whole system requires adequate clearance for the installation, cabling or conduit and airflow. Do not install anything above each unit that limits access to the unit or that might fall and damage the unit. Do not mount each unit upside down.

The inverter and battery in the system can be wall-mounted or floor-mounted.
The BI in the system must be wall-mounted and installed on the right side of inverter. It needs to be configured for cable entry at the bottom and sides of the enclosure.

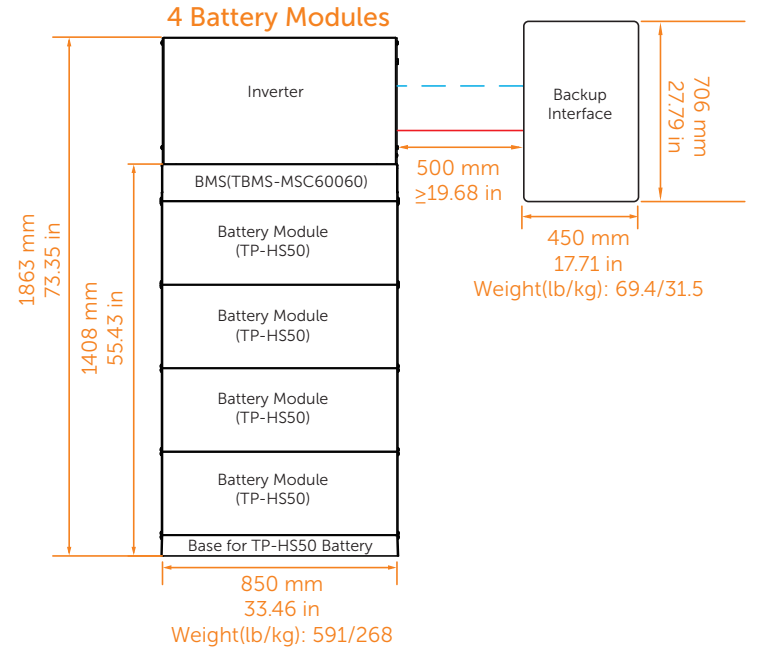
2 Overview of System

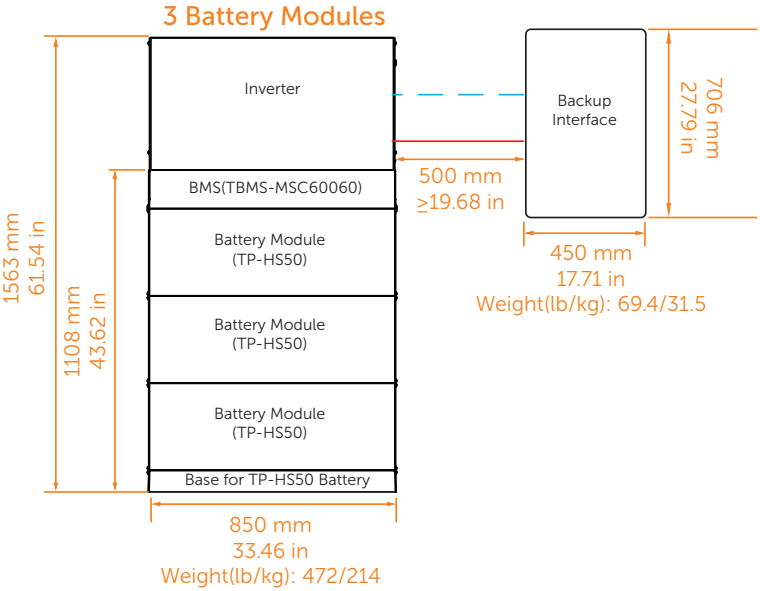
2.1 A1-ESS-G2 System and Corresponding Cartons



A	Inverter
B	TBMS-MSC60060
C1	Rechargeable Li-ion Battery Module TP-HS50/5kWh
C2	Rechargeable Li-ion Battery Module TP-HS50/5kWh
D	Base for TP-HS50 Battery
E	Backup Interface (referred to as BI)
F	All Accessories Required for Two Installation Modes (T50 Battery)

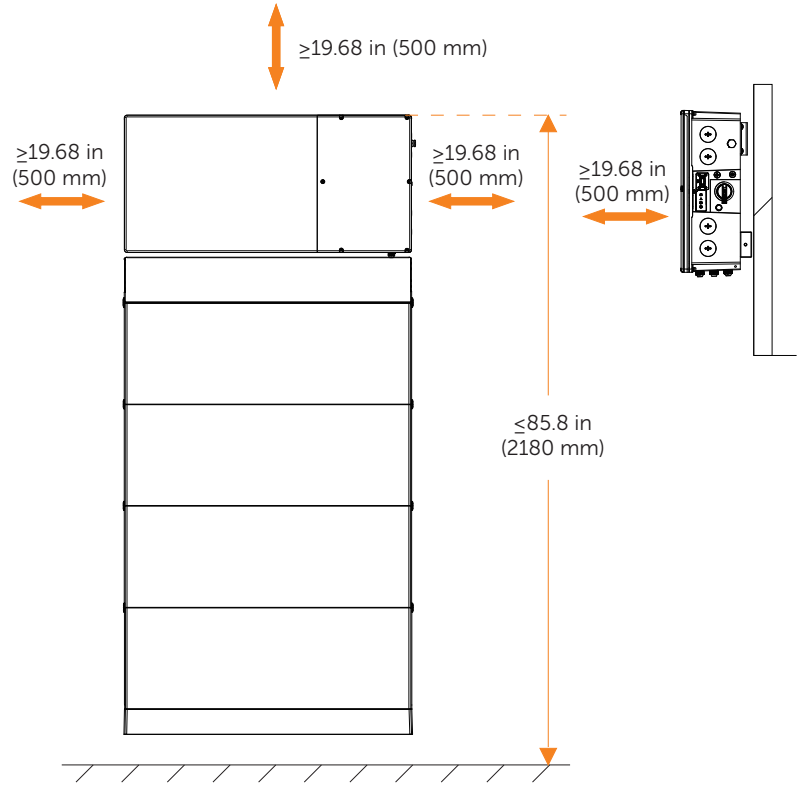
2.2 Weight and Mounting Height Instructions





3 Installation Space Requirement

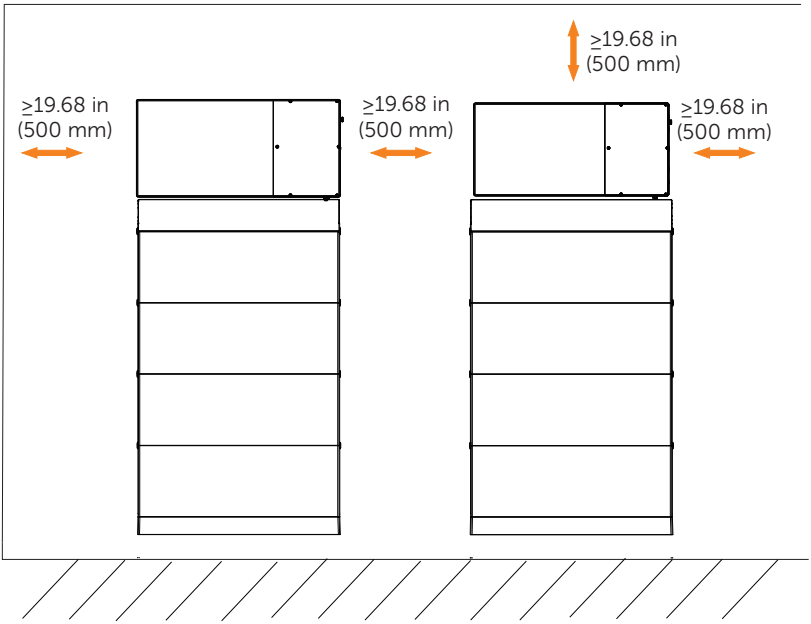
To ensure good heat dissipation and convenient disassembly of the inverter and battery, the minimum clearance around the inverter and battery shall not be less than the following values, as shown below. The height above the ground marked below is recommended assuming that four BATs are installed with floor-mounting.



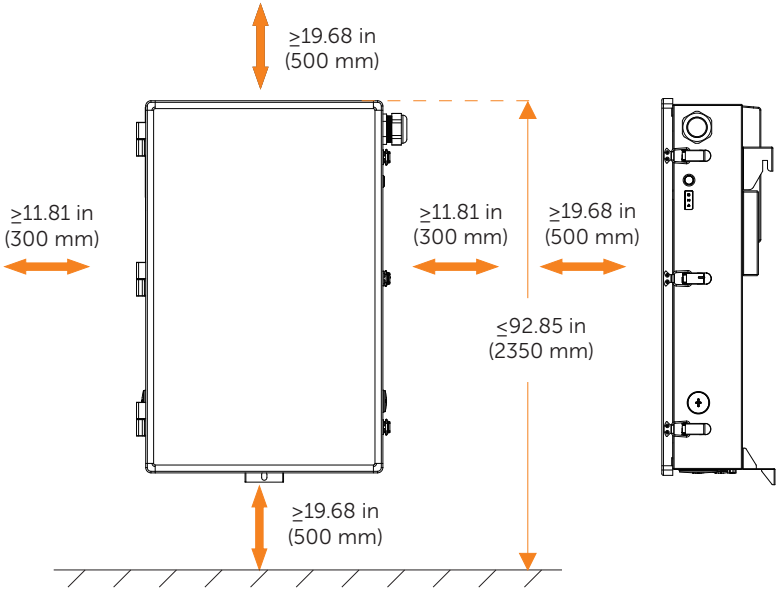
For multi-inverter installation, please reserve the space of 19.68 inch (500 mm) at least between each left and right inverter and at least 19.68 inch (500 mm) distance from the ceiling . If multiple inverter are mounted in areas with high ambient temperatures, increase the clearances between the inverter and batteries and ensure an adequate fresh-air supply if possible.

NOTICE!

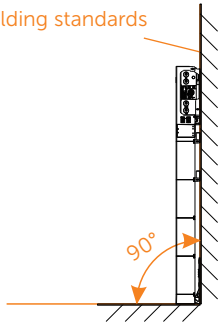
- In case of wall-mounting, the distance from base to ground is decided according to the local regulations.



To ensure good heat dissipation and convenient disassembly of the BI, the minimum clearance around the BI shall not be less than the following values, as shown below.

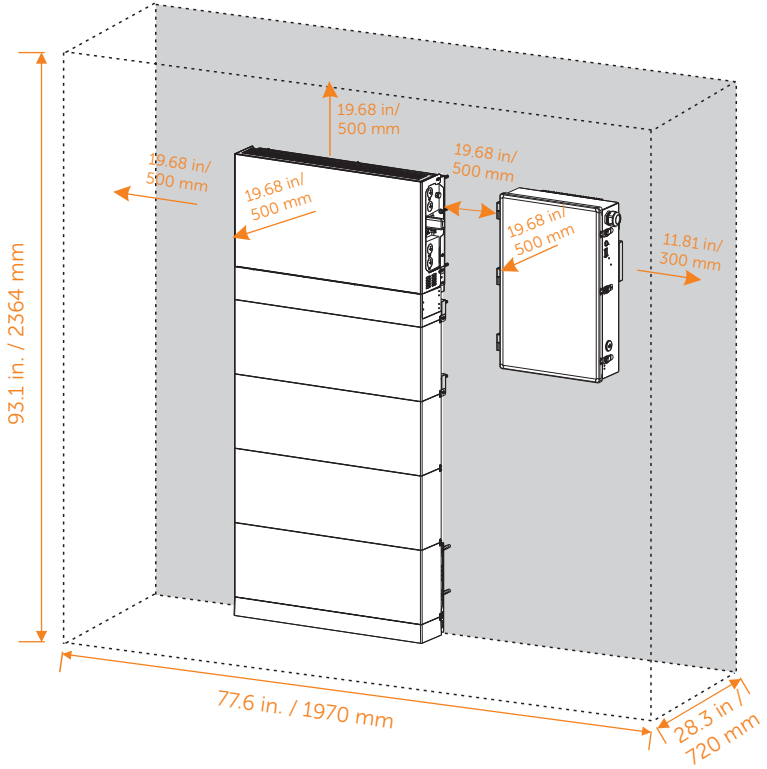


The following are the specification requirements for wall flatness and perpendicularity.



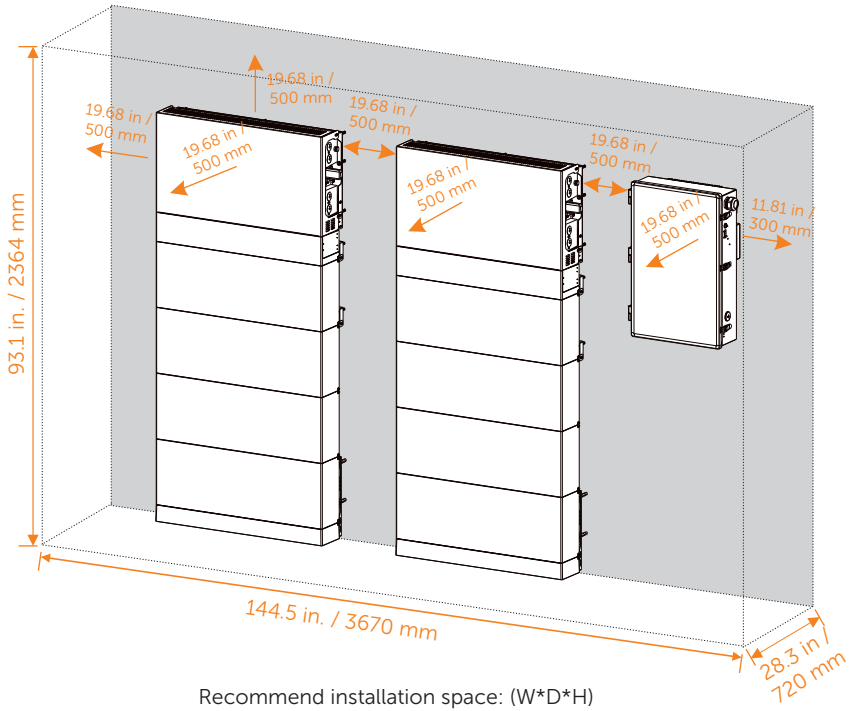
Recommended Installation Space

Example for single inverter installation:



Recommend installation space: (W*D*H)
77.6 in. * 28.3 in. * 93.1 in. /
1970 mm * 720 mm * 2364 mm

Example for multi-inverter installation:



Recommend installation space: (W*D*H)
144.5 in. * 28.3 in. * 93.1 in. /
3670 mm * 720 mm * 2364 mm

4 Packing lists

4.1 Packing list of Inverter

Inverter

Metal cover

Bracket

A

8-pin female terminal block with terminating resistor

B

Grounding terminal

C D

M5 × L10 screw
10 AWG ferrules

E

Fixing plate of cover

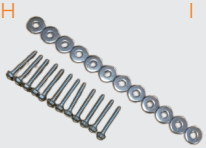
F

Cable protective guard

G

PE cable

H I



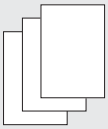
Self-tapping screw
Washer

J

Expansion set

Communication Dongle

K



Document

L M

M4 × L10 screw
8 AWG ferrules

N

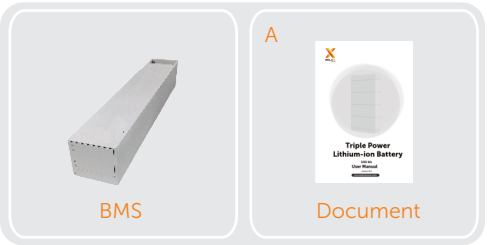
Circuit breaker (optional)

Item	Name	Quantity	Description
/	Inverter	1 pc	Product
/	Metal cover	1 pc	Protect the inverter
/	Bracket	1 pc	Support the inverter
A	8-pin female terminal block with terminating resistor	1 pc	Additional 8-pin female terminal block with terminating resistor
B	Grounding terminal	5 pcs	For grounding
C	M5XL10 screw	10 pcs	Fix the cover, cable protective guard and cover fixing plate
D	10 AWG ferrules	6 pcs	For PV cable
E	Fixing plate of cover	2 pcs	Connect the cover and the bracket
F	Cable protective guard	1 pc	Protect the cable between inverter and BMS
G	PE cable	1 pc	Grounding conductor between inverter and BMS
H	Self-tapping screw	12 pcs	Fix the bracket
I	Washer	12 pcs	Fix the bracket
J	Expansion set	12 pcs	Fix the bracket
/	Communication Dongle	1 pc	For communication
K	Document	/	Guide the installation
L	M4XL10 screw	2 pcs	Fix the fixing plate between inverter bracket and BMS
M	8 AWG ferrules	3 pcs	For AC cable
N	Circuit breaker (optional)	1 pc	Mount it on the BI

4.2 Packing list of Battery

BMS (TBMS-MCS60060)

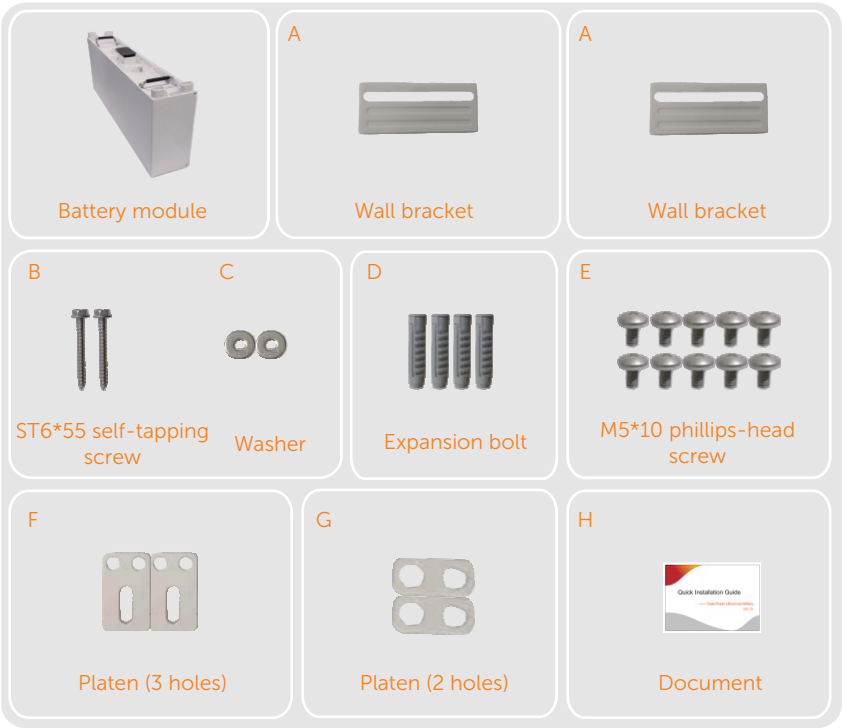
Hereinafter referred to as "MCS60060"



Item	Name	Quantity	Description
/	BMS	1 pc	Product
A	Document	/	User Manual, Guide the installation and maintenance

Battery Module (TP-HS50)

Hereinafter referred to as "TP-HS50"



Item	Name	Quantity	Description
/	Battery module	1 pc	Product
A	Wall bracket	2 pcs	Support battery module to be mounted on the wall
B	ST6*55 self-tapping screw	2 pcs	Fix the bracket
C	Washer	2 pcs	Fix the bracket
D	Expansion bolt	4 pcs	Fix the bracket
E	M5*10 phillips-head screw	10 pcs	Fix the fixing plate
F	Platen (3 holes)	2 pcs	Connect two battery modules with bracket
G	Platen (2 holes)	2 pcs	Connect two battery modules
H	Document	/	Guide the installation

NOTICE!

- The above-mentioned accessories are only for one battery module.

All Accessories Required for Two Installation Modes (T50 Battery)

Hereinafter referred to as "Accessories Required"

A

M8*85 expansion screw

B

M5*8 countersunk screw

C

M5*20 countersunk screw

D

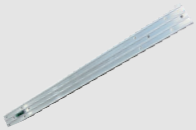
M8*88 self-tapping screw

E

Washer

F

Adjustment screw

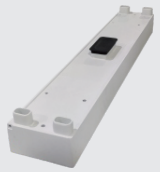


Transverse plate

Base support

Item	Name	Quantity	Description
A	M8*85 expansion screw	6 pcs	Fix the base support in case of concrete wall
B	M5*8 countersunk screw	4 pcs	Fix the transverse plate with base support
C	M5*20 countersunk screw	6 pcs	Fix the two sides of base
D	M8*88 self-tapping screw	6 pcs	Fix the base support in case of wooden wall
E	Washer	6 pcs	Fix the base support in case of wooden wall
F	Adjustment screw	4 pcs	Adjust the base to be leveled
/	Transverse plate	1 pc	Support the base
/	Base support	2 pcs	Support the base

Base for TP-HS50 Battery



Base

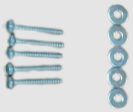
Item	Name	Quantity	Description
/	Base	1 pc	Product

4.3 Packing list of Backup Interface

Backup interface

Bracket

A B



Self-tapping screw
Washer

C

Expansion set

D E

55*13*23.7 mm
copper bar
M5*12 cross screw

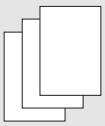
F G

40*13*7.9 mm
copper bar
M4*12 cross screw

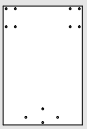
H

Cable tie

I



Document



Perforating paper

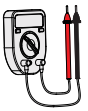
Communication cable

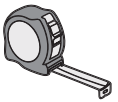
Item	Name	Quantity	Description
/	Backup inteface	1 pc	Product
/	Bracket	1 pc	Support the BI to be mounted on the wall
A	Self-tapping screw	5 pcs	Four for fixing the bracket and one for fixing the BI
B	Washer	5 pcs	Four for fixing the bracket and one for fixing the BI
C	Expansion set	5 pcs	Four for fixing the bracket and one for fixing the BI
D	55*13*23.7 mm copper bar	4 pcs	For parallel connection with inverter
E	M5*12 cross screw	8 pcs	Fix the part when parallel connection with inverter
F	40*13*7.9 mm copper bar	4 pcs	For parallel connection with inverter
G	M4*12 cross screw	1 pc	Fix the circuit breaker
H	Cable tie	12 pcs	Fix the cable
I	Document	/	Quick installation guide of A1-ESS-G2 System
/	Perforating paper	1 pc	For hole location
/	Communication cable	1 pc	Communicate with inverter

4.4 Tools Requirement

Installation tools include but are not limited to the following recommended ones. If necessary, use other auxiliary tools on site. Please note that the tools used must comply with local regulations.


Hammer drill
(drill bit: Ø4 mm / Ø10 mm / Ø12 mm)

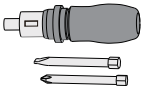

Multimeter
(≥ 1100 V DC)

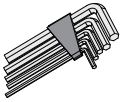

Measuring tape


Utility knife

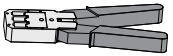

Marker

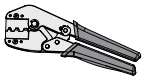

Spirit level

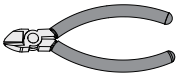

Torque screwdriver
(Flat-head: M2)
(Phillips head: M3/M4/M5)

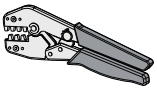

Allen key
(including M5)


Wire stripper

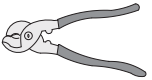

Crimping tool for RJ45

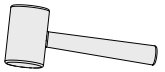

Crimping tool for
PV terminals

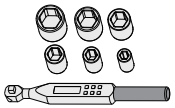

Diagonal pliers

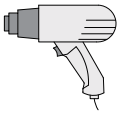

Crimping tool


Crimping tool for ferrules


Wire cutter


Rubber mallet


Torque wrench
(including 16 mm wrench)

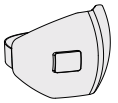

Heat gun


Heat shrink tubing
(Ø6 mm)


Safety gloves

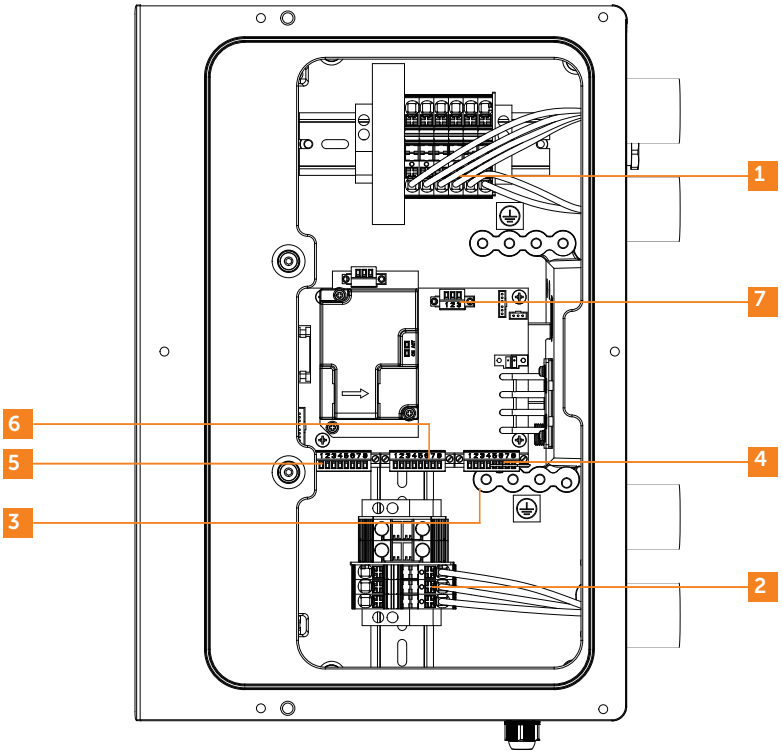

Safety boots


Safety goggles


Anti-dust mask

5 Overview of Terminals

5.1 Terminals and Breaker of Inverter



Inverter power terminal (Purchased by customer)

No.	Terminals	Type	Cross-sectional Area Range	Strip Length
1	PV terminals	90°C(194°F), 600 V, copper	10-8 AWG	0.47 in / 12 mm
2	AC terminals	90°C(194°F), 600 V, copper	12-8 AWG(3.8 kW), 10-8 AWG(5/6/7.6 kW)	0.47 in / 12 mm
3	Ground terminals	90°C(194°F), 600 V, copper	8 AWG	0.47 in / 12 mm

Inverter communication terminal (Purchased by customer)

No.	Terminals	Port Pin	Type	Range	Strip Length	Torque (in-lbs)
4	AUX terminal	Pin 1: RS485_METER_A	CAT5 or better	24-18 AWG	0.24 in / 6 mm	1.8
		Pin 2: RS485_METER_B				
		Pin 3: GND	/			
		Pin 4: +12V_RELAY_OUT				
		Pin 5: DRM0				
		Pin 6: +12V_COM				
		Pin 7: STOP_NO+				
		Pin 8: STOP_NO-				
5	COMM in terminal	Pin 1: SYSR_L	CAT5 or better	24-18 AWG	0.24 in / 6 mm	1.8
		Pin 2: SYSR_H				
		Pin 3: CAN_L				
		Pin 4: CAN_H				
		Pin 5: RS485_BI_A				
		Pin 6: RS485_BI_B				
		Pin 7: +12V	/	18-16 AWG		
		Pin 8: GND				
6	COMM out terminal	Pin 1: SYSR_L	CAT5 or better	24-18 AWG	0.24 in / 6 mm	1.8
		Pin 2: SYSR_H				
		Pin 3: CAN_L				
		Pin 4: CAN_H				
		Pin 5: RS485_BI_A				
		Pin 6: RS485_BI_B				
		Pin 7: +12V	/	18-16 AWG		
		Pin 8: GND				
7	MLPE terminal	Pin 1: GND	CAT5 or better	24-18 AWG	0.24 in / 6 mm	1.8
		Pin 2: RS485_MLPE_A				
		Pin 3: RS485_MLPE_B				

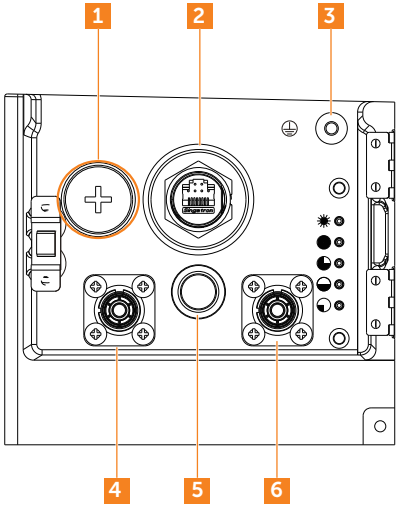
Inverter Breaker

Component	Port Pin	Source
AC Breaker	3.8 kW: Noark # B1N2C20: 20 A Circuit Breaker; 2-Pole, 240 V, 10 kAIC 5 kW: Noark # B1N2C30: 30 A Circuit Breaker; 2-Pole, 240 V, 10 kAIC 6 kW: Noark # B1N2C35: 35 A Circuit Breaker; 2-Pole, 240 V, 10 kAIC 7.6 kW: Noark # B1N2C40: 40 A Circuit Breaker; 2-Pole, 240 V, 10k AIC	Can be purchased from the manufacturer

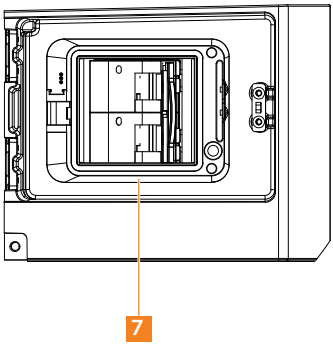
NOTICE!

- The AC breaker was in the accessory box of inverter.

5.2 Terminals and Breaker of Battery



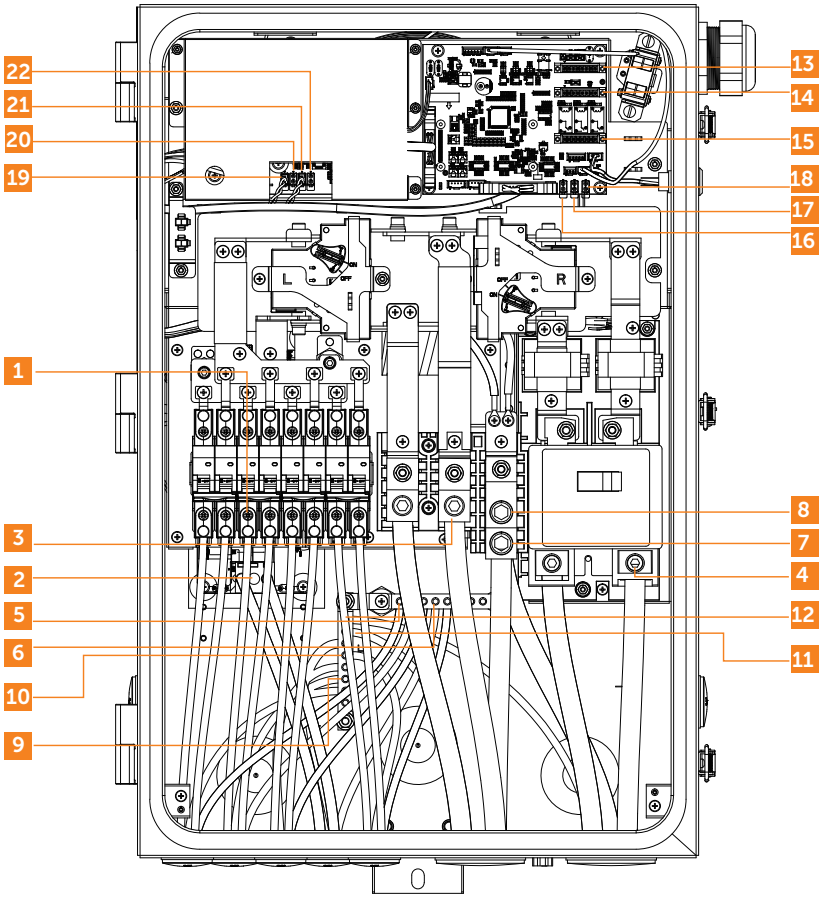
Right side view



Left side view

1 DIP
2 COMM Terminal
3 GND
4 BAT+
5 Power button
6 BAT-
7 Circuit breaker

5.3 Terminals and Breaker of Backup Interface



BI power terminal required wire sizes and torques

No.	Terminals	Cross-sectional Area Range	Strip Length	Torque (in-lbs)
1	INV terminals	12-8 AWG(3.8 kW), 10-8 AWG(5/6/7.6 kW)	0.67 in / 17 mm	30
2	GEN terminals	8-4 AWG	0.67 in / 17 mm	/
3	Load terminals	3 AWG-4/0 AWG	1.25 in / 32 mm	275
4	Grid terminals	3 AWG-4/0 AWG	1.25 in / 32 mm	275
5	INV Neutral terminals	12-8 AWG(3.8 kW), 10-8 AWG(5/6/7.6 kW)	0.79 in / 20 mm	30
6	GEN Neutral terminals	8-4 AWG	0.79 in / 20 mm	30
7	Load Neutral terminals	3 AWG-4/0 AWG	1.77 in / 45 mm	275
8	Main Neutral terminals	3 AWG-4/0 AWG	1.77 in / 45 mm	275
9	INV Ground terminals	8 AWG	0.79 in / 20 mm	30
10	GEN Ground terminals	8-6 AWG	0.79 in / 20 mm	30
11	Load Ground terminals	6-4 AWG	0.79 in / 20 mm	30
12	Main Ground terminals	6-4 AWG	0.79 in / 20 mm	30

BI communication terminal (Purchased by customer)

No.	Terminals	Port Pin	Type	Range	Strip Length	Torque (in-lbs)
13	INV Communication terminal	Pin 1: RESERVE	CAT5 or better	24-18 AWG	0.24 in / 6 mm	1.8
		Pin 2: RESERVE				
		Pin 3: CAN_L				
		Pin 4: CAN_H				
		Pin 5: RS485_BI_A				
		Pin 6: RS485_BI_B				
		Pin 7: +12 V	/	18-16 AWG		
		Pin 8: GND				
14	AUX1 terminal	Pin 1: DRY_GEN	/	24-16 AWG	0.24 in / 6 mm	1.8
		Pin 2: GEND_GEN				
		Pin 3: RS485_RESERVE_A	CAT5 or better	24-18 AWG		
		Pin 4: RS485_RESERVE_B				
		Pin 5: RESERVE	/			
		Pin 6: RESERVE				
		Pin 7: STOP_NO+				
		Pin 8: STOP_NO-				

BI communication terminal (Purchased by customer)

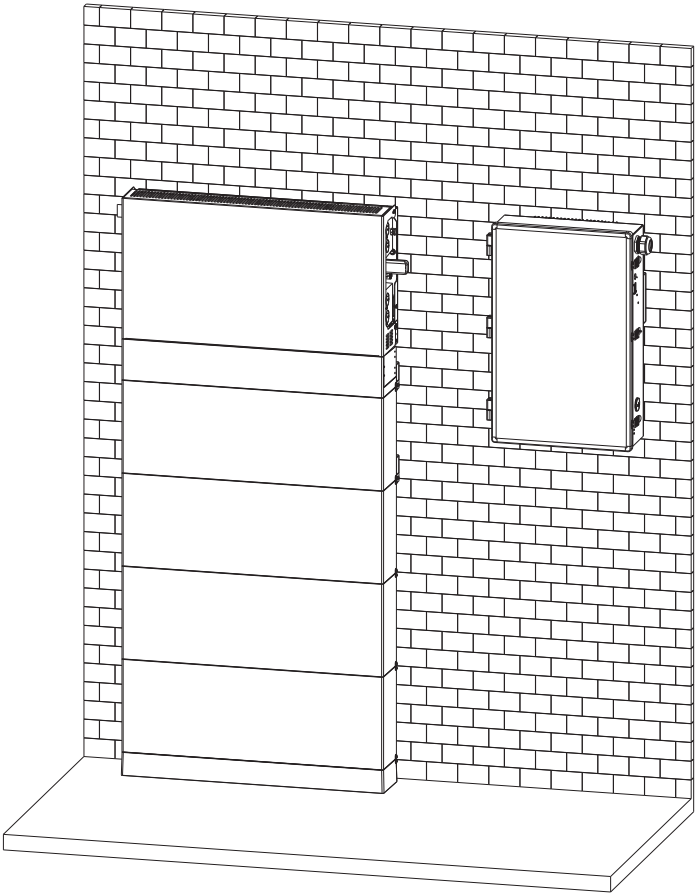
No.	Terminals	Port Pin	Type	Range	Strip Length	Torque (in-lbs)
15	AUX2 terminal	Pin 1: NO_1	/	24-16 AWG	0.24 in / 6 mm	1.8
		Pin 2: COM_1				
		Pin 3: NC_1				
		Pin 4: NO_2				
		Pin 5: CON_2/3				
		Pin 6: NC_2				
		Pin 7: NO_3				
		Pin 8: NC_3				
16	CT1 terminal	Pin 1: CT1+	Shielded, twisted pair	/	/	/
		Pin 2: CT1-				
17	CT2 terminal	Pin 1: CT2+	Shielded, twisted pair	/	/	/
		Pin 2: CT2-				
18	CT3 terminal	Pin 1: CT3+	Shielded, twisted pair	/	/	/
		Pin 2: CT3-				
19	CT L1A terminal	Pin 1: CT L1A+	Shielded, twisted pair	/	/	/
		Pin 2: CT L1A-				
20	CT L1B terminal	Pin 1: CT L1B+	Shielded, twisted pair	/	/	/
		Pin 2: CT L1B-				
21	CT L2A terminal	Pin 1: CT L2A+	Shielded, twisted pair	/	/	/
		Pin 2: CT L2A-				
22	CT L2B terminal	Pin 1: CT L2B+	Shielded, twisted pair	/	/	/
		Pin 2: CT L2B-				

BI breaker and switch (Purchased by customer)

No.	Component	Description		
1	Grid breaker	Amps	Part Number	Description
		100	CSR2100	Eaton # CSR2100: 100 A / 240 V, 25 kAIC, 2-Pole
		125	CSR2125N	Eaton # CSR2125N: 125 A / 240 V, 25 kAIC, 2-Pole
		150	CSR2150N	Eaton # CSR2150N: 150 A / 240 V, 25 kAIC, 2-Pole
		175	CSR2175N	Eaton # CSR2175N: 175 A / 240 V, 25 kAIC, 2-Pole
		200	CSR2200N	Eaton # CSR2200N: 200 A / 240 V, 25 kAIC, 2-Pole
		100	BW2100	Eaton # BW2100: 100 A / 240 V, 10 kAIC, 2-Pole
		125	BW2125	Eaton # BW2125: 125 A / 240 V, 10 kAIC, 2-Pole
		150	BW2150	Eaton # BW2150: 150 A / 240 V, 10 kAIC, 2-Pole
		175	BW2175	Eaton # BW2175: 175 A / 240 V, 10 kAIC, 2-Pole
		200	BW2200	Eaton # BW2200: 200 A / 240 V, 10 kAIC, 2-Pole
		100	BWH2100	Eaton # BWH2100: 100 A / 240 V, 25 kAIC, 2-Pole
		125	BWH2125	Eaton # BWH2125: 125 A / 240 V, 25 kAIC, 2-Pole
		150	BWH2150	Eaton # BWH2150: 150 A / 240 V, 25 kAIC, 2-Pole
		175	BWH2175	Eaton # BWH2175: 175 A / 240 V, 25 kAIC, 2-Pole
		200	BWH2200	Eaton # BWH2200: 200 A / 240 V, 25 kAIC, 2-Pole
2	Emergency stop switch	Normally closed (NC) contact The UL certification is required for the emergency stop switch.		

6 Mechanical Installation

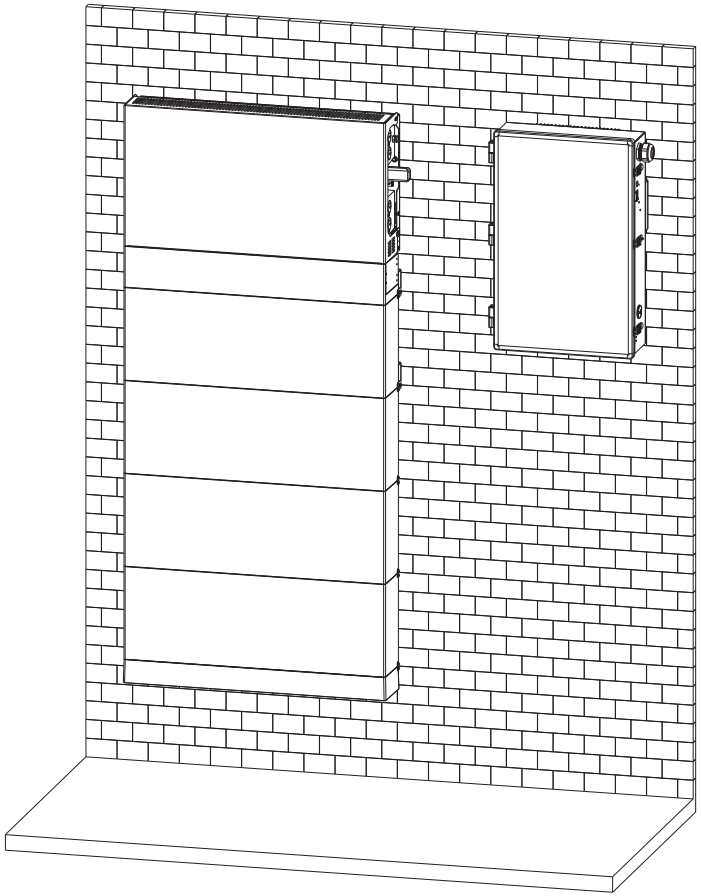
There are two mechanical installation modes: Floor-mounting and Wall-mounting. You can first-view the final look of the installation in the renderings below:



Floor-mounting

NOTICE!

- For detailed steps of floor-mounting, please refer to "6.1 Mechanical Installation (Floor-mounting)" (Page 28-46).



Wall-mounting

NOTICE!

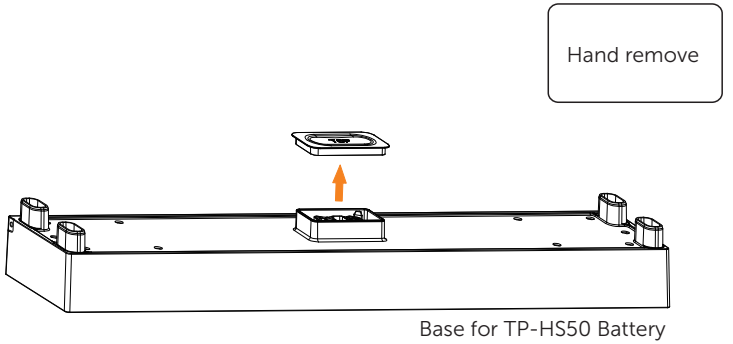
- For detailed steps of wall-mounting, please refer to "6.2 Mechanical Installation (Wall-mounting)" (Page 47-67).

6.1 Mechanical Installation (Floor-mounting)

6.1.1 Mount the Battery

Step 1 Mount the base

1



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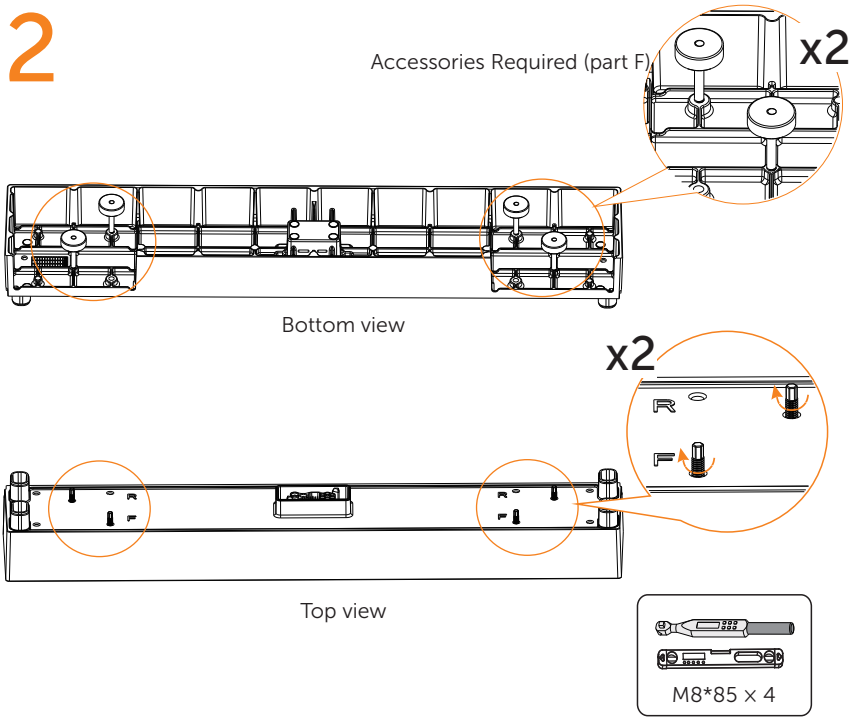

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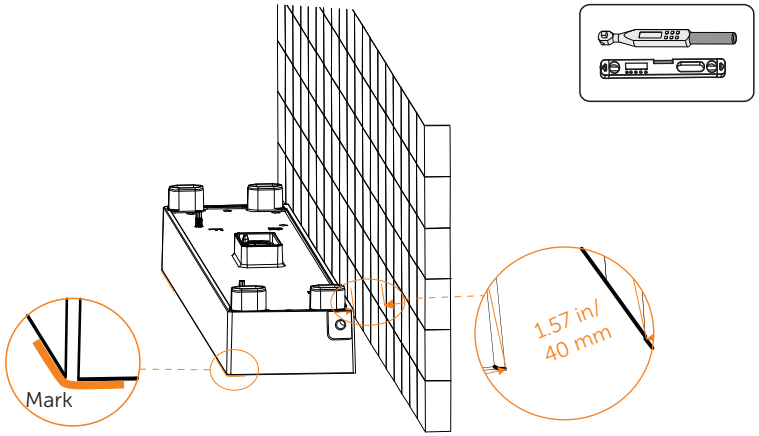
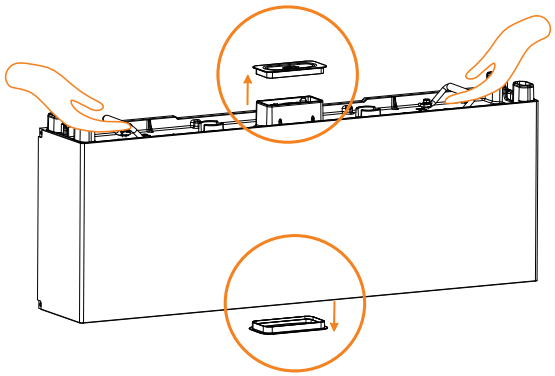


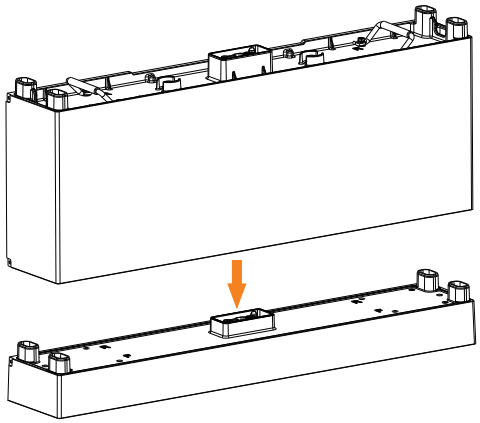
Step 2 Mount the battery module

1



Hand remove

2



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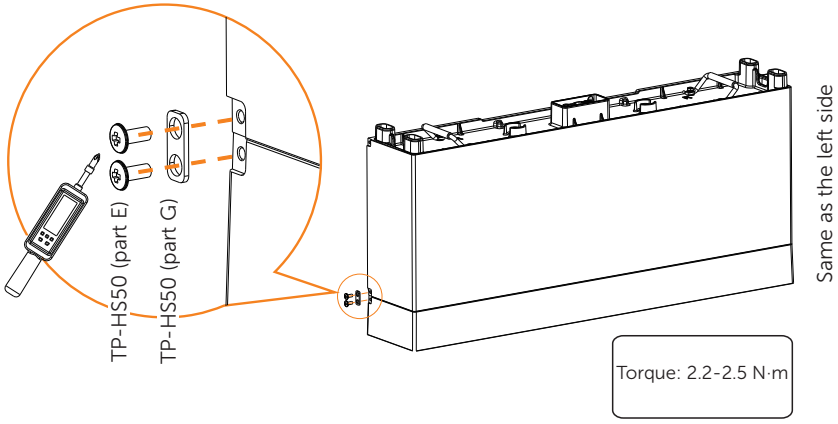
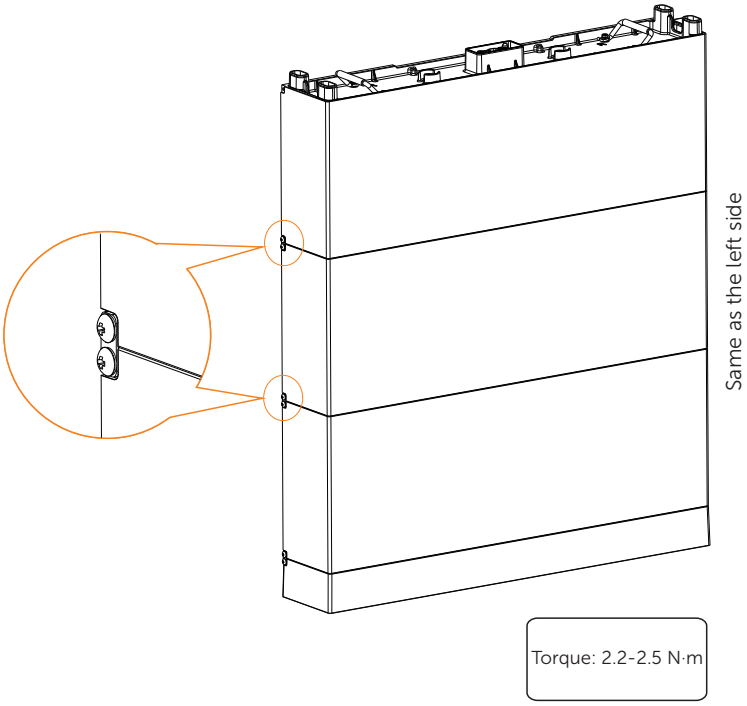
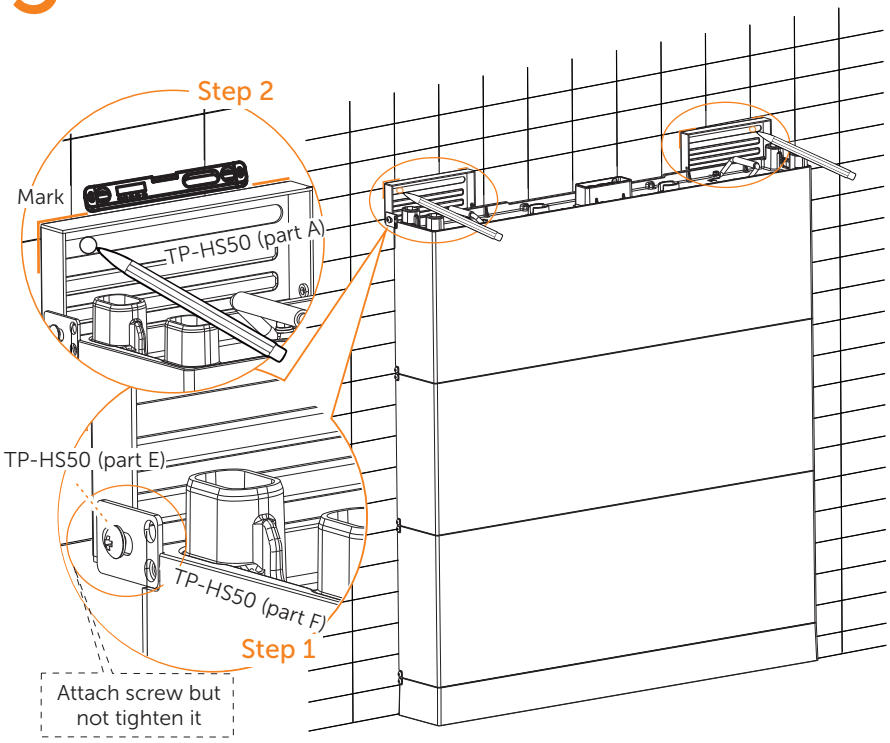
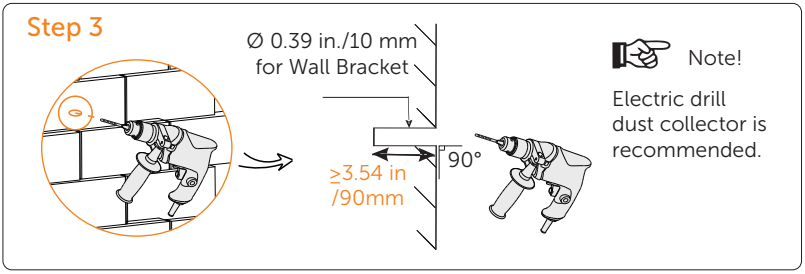

TP-HS50 (part E)
TP-HS50 (part G)
Same as the left side
Torque: 2.2-2.5 N·m

4


Same as the left side
Torque: 2.2-2.5 N·m

5

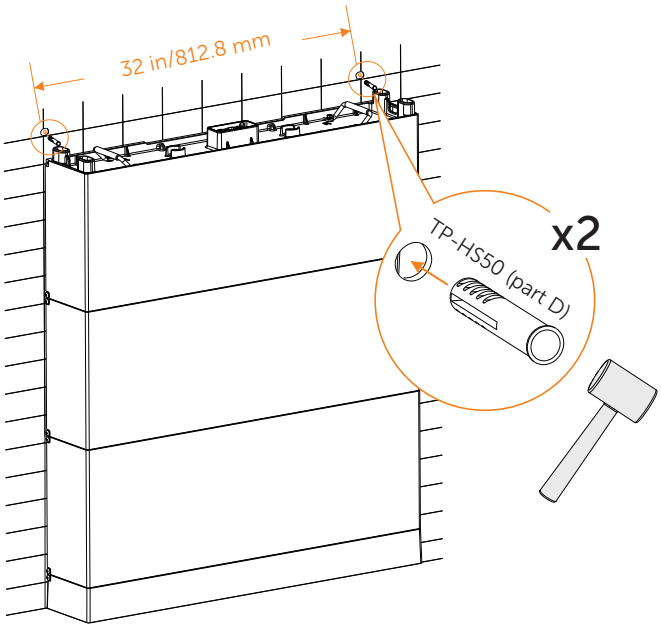




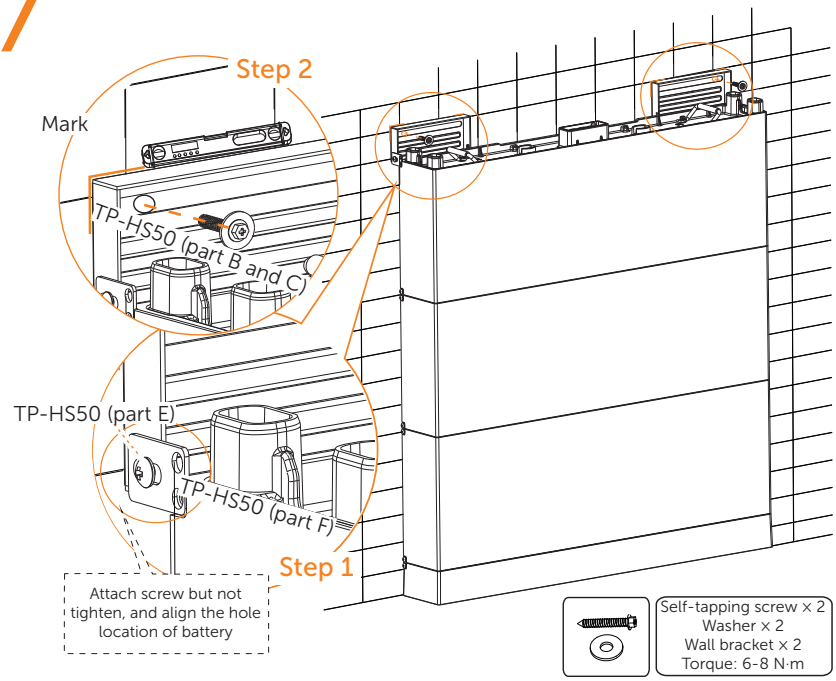
CAUTION!

- Please re-mount the dust cover to the battery module before drilling holes to avoid dust falling into the interface and do remember to remove the dust cover again after the installation wall bracket completed.

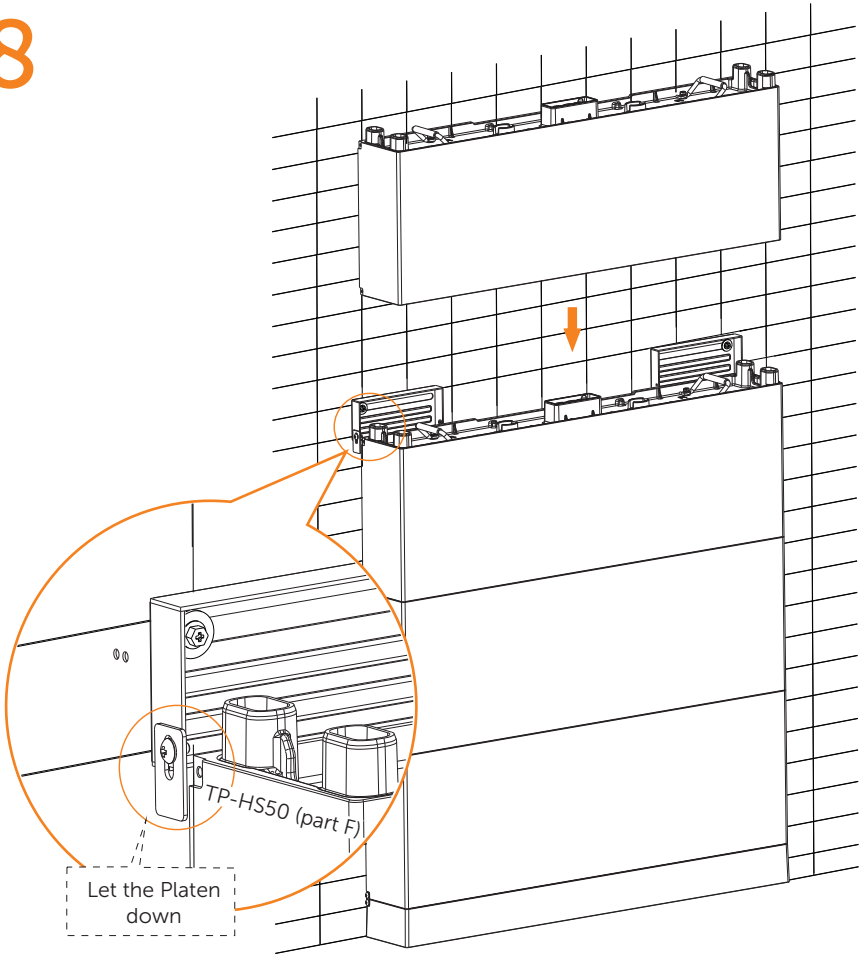
6


32 in/812.8 mm
TP-HS50 (part D)
x2

7

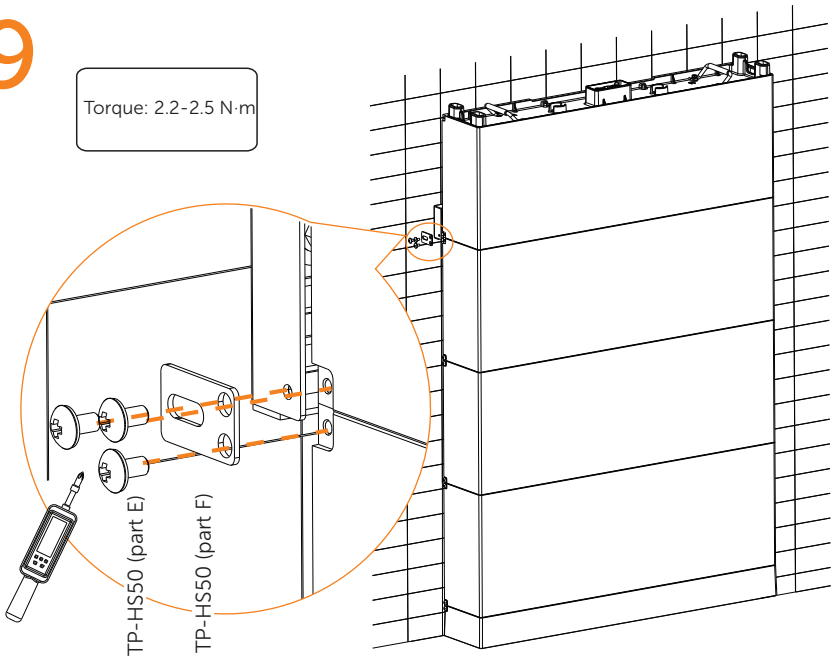

Step 2
Mark
TP-HS50 (part B and C)
TP-HS50 (part E)
TP-HS50 (part F)
Step 1
Attach screw but not tighten, and align the hole location of battery
Self-tapping screw x 2
Washer x 2
Wall bracket x 2
Torque: 6-8 N·m

8

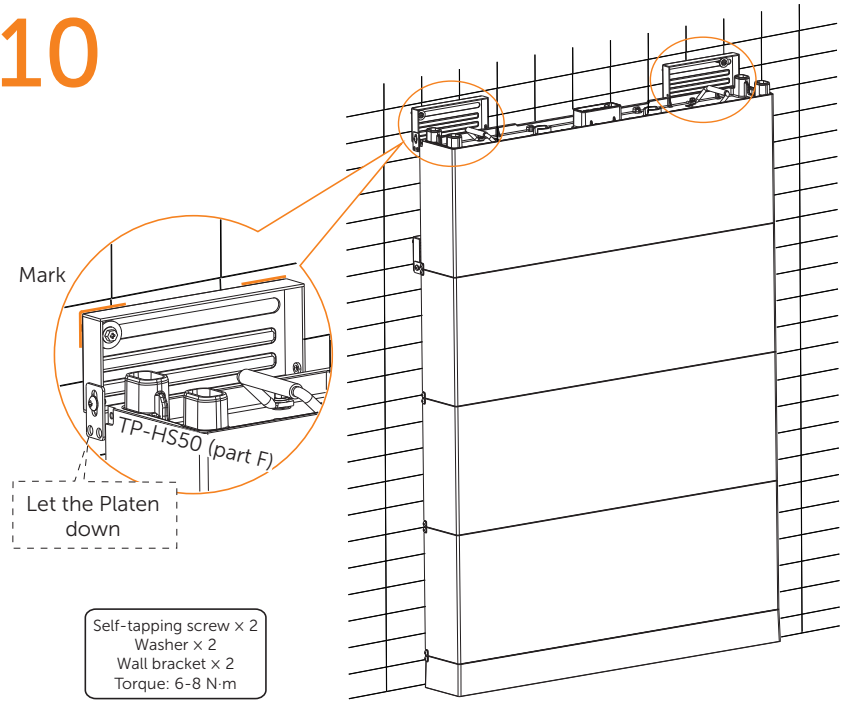


9

Torque: 2.2-2.5 N·m



10

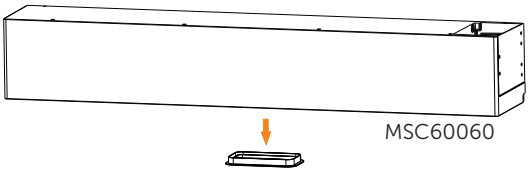


Self-tapping screw x 2
Washer x 2
Wall bracket x 2
Torque: 6-8 N·m

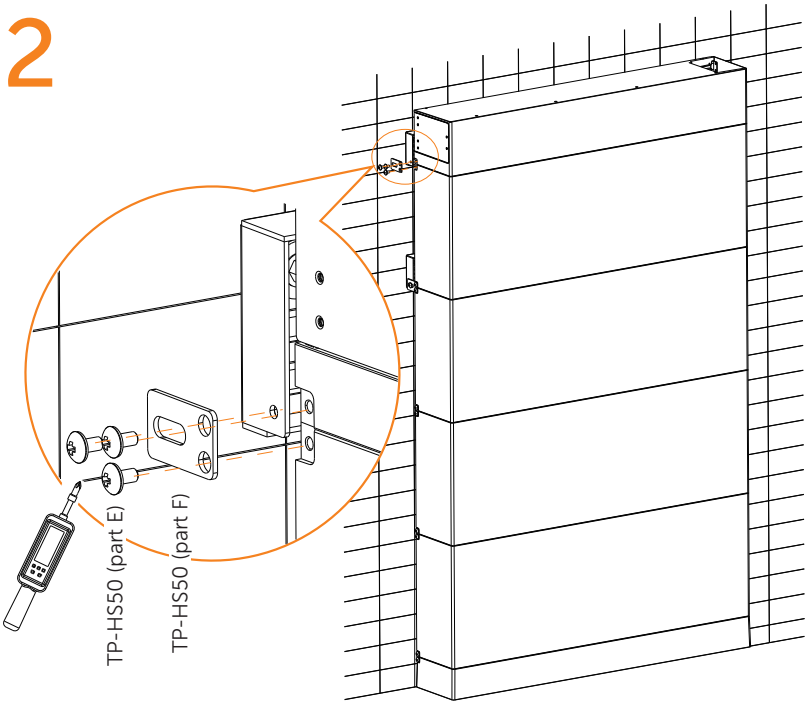
Step 3 Mount the BMS

1

Hand remove



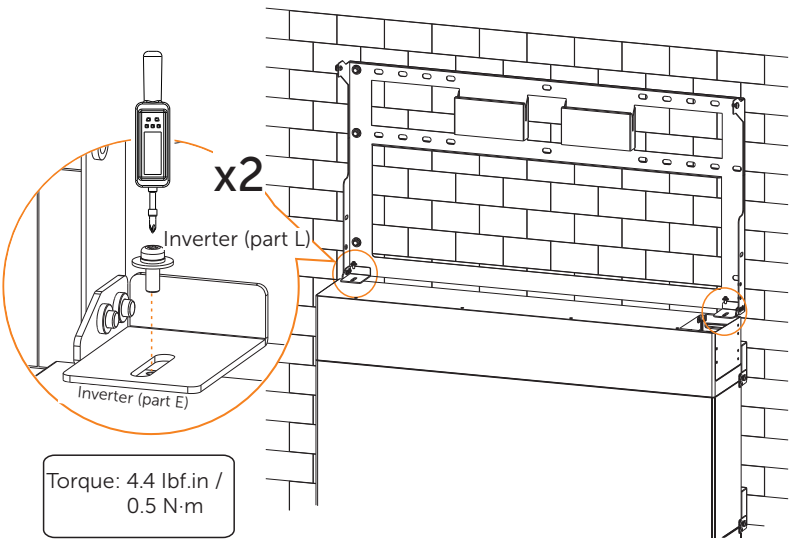
2



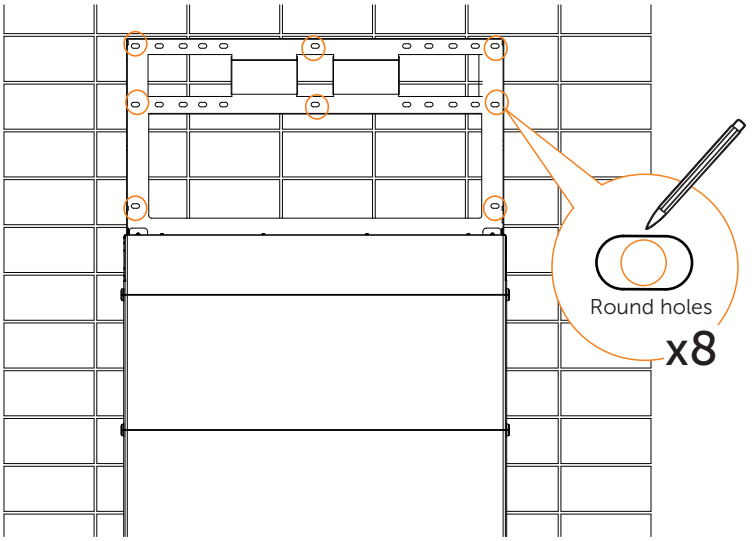
Torque: 2.2-2.5 N·m

6.1.2 Mount the Inverter

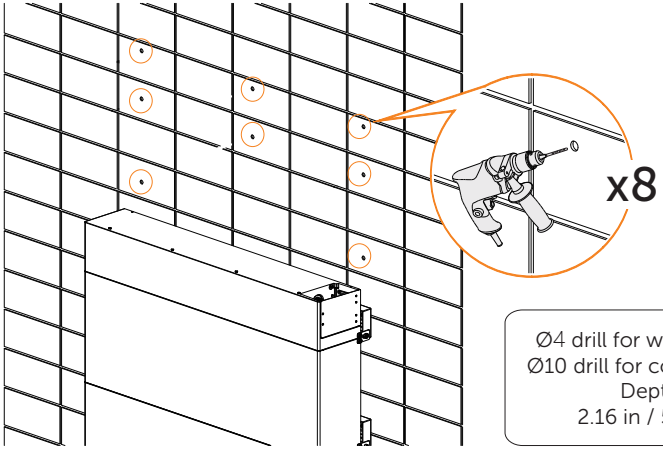
1



2



3

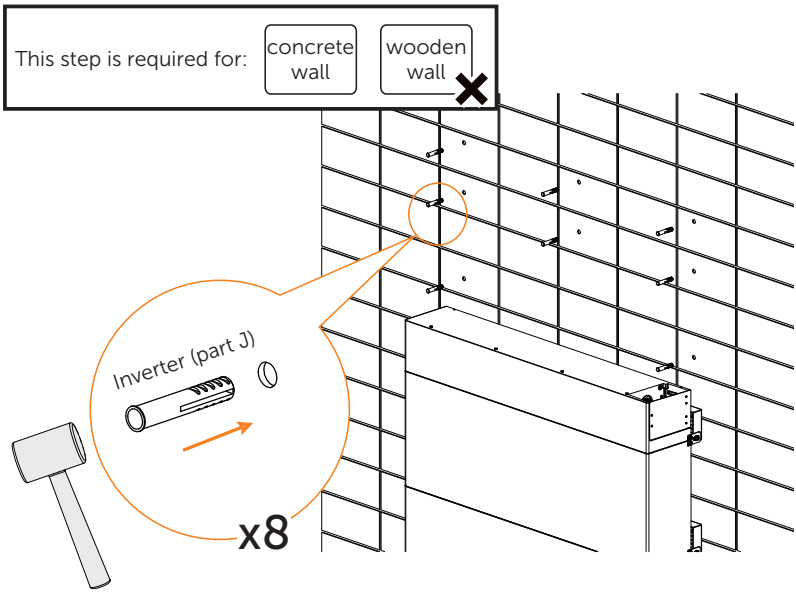


Ø4 drill for wooden wall
Ø10 drill for concrete wall
Depth:
2.16 in / 55 mm

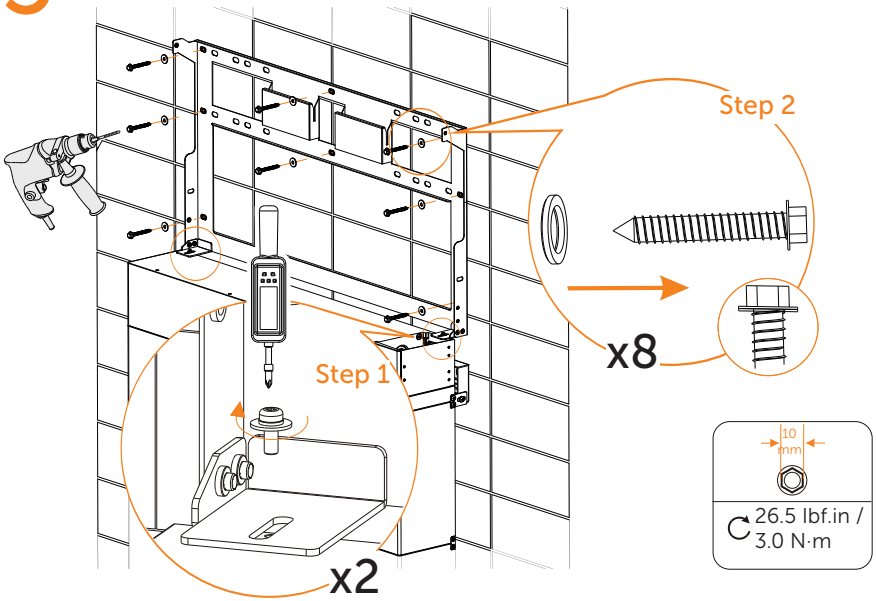
CAUTION!

- Remove the screws on the bracket and disassemble the bracket before drill holes.

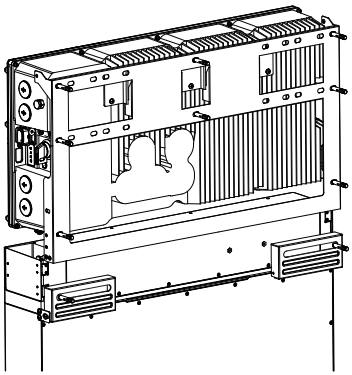
4



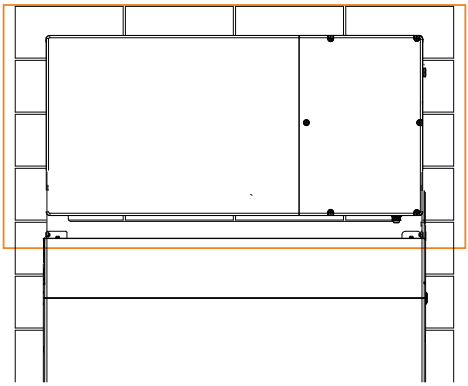
5



6

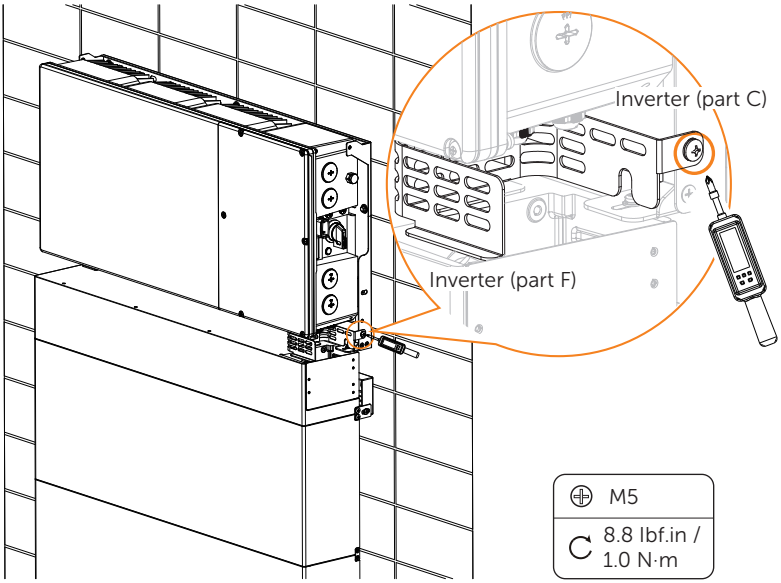


Back view



Front view

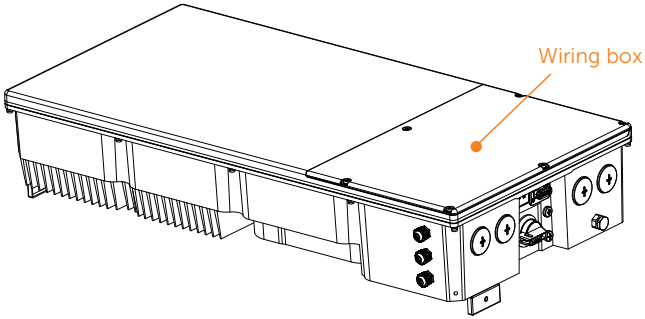
7



8

68

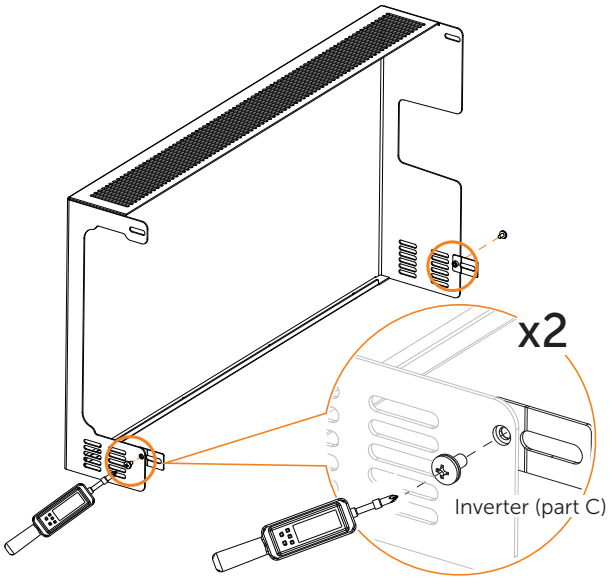
Open the wiring box cover to complete all the wiring connection.



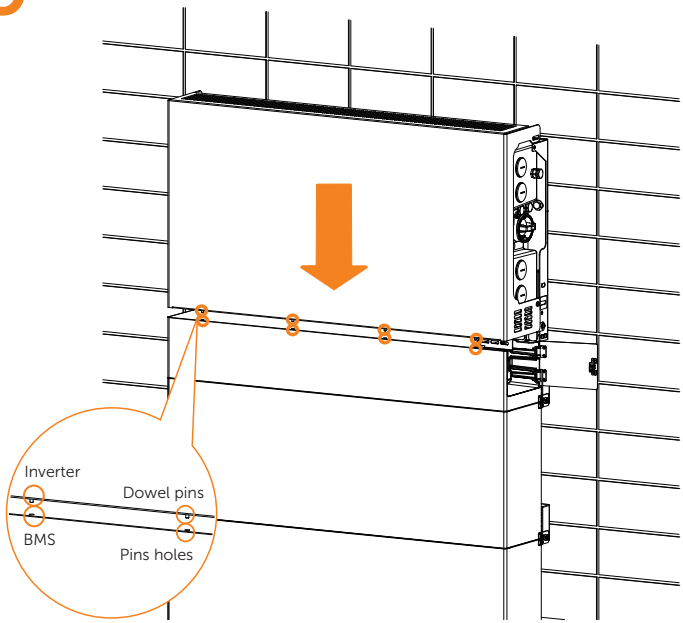
NOTICE!

- For detailed wiring connection, please refer to "7.1 Wiring Connection on the Inverter" and "7.2 Wiring Connection Between Inverter and Battery" (Page 68-78).

9



10



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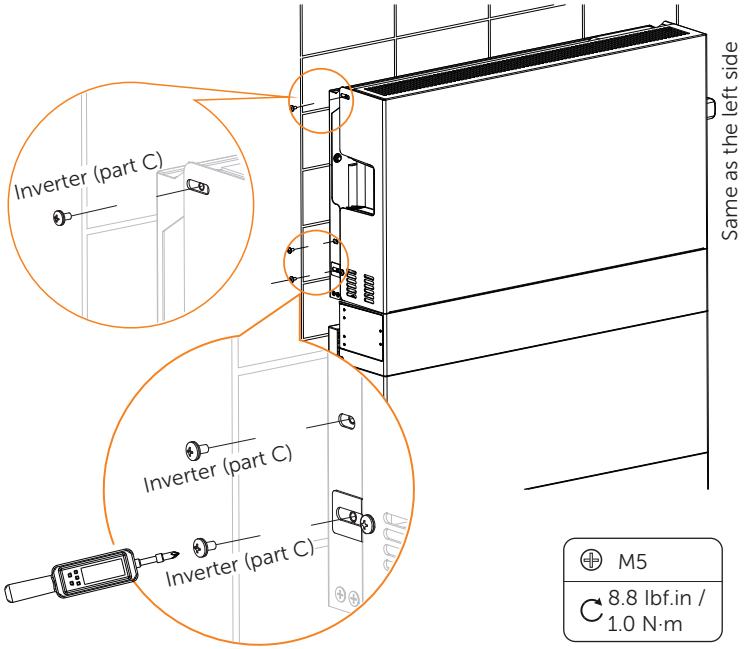
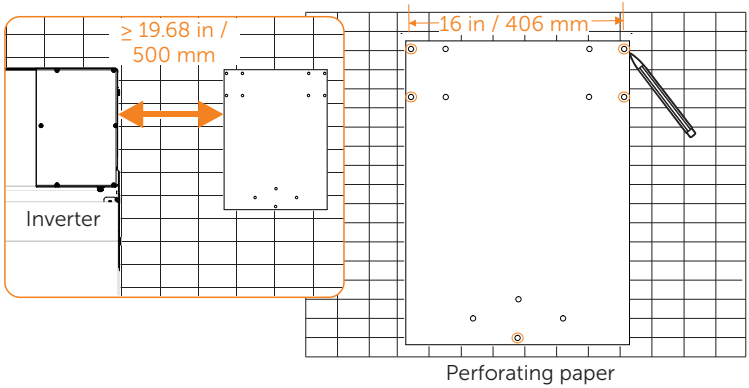
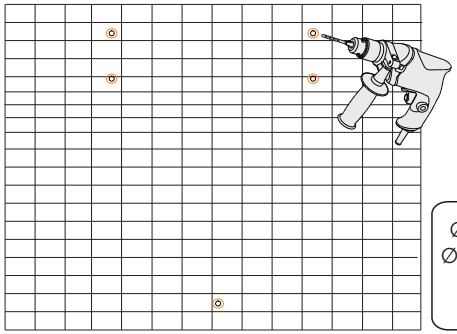

Inverter (part C)
Inverter (part C)
Inverter (part C)
Same as the left side
M5
8.8 lbf.in /
1.0 N·m

6.1.3 Mount the BI

1

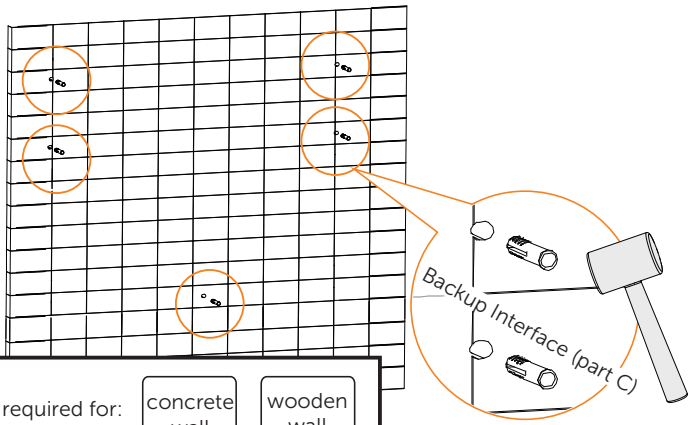


2



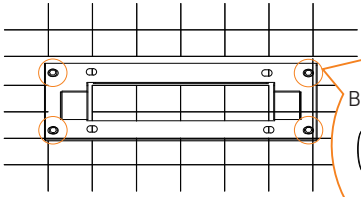
Ø4 drill for wooden wall
Ø10 drill for concrete wall
Depth:
2.16 in / 55 mm

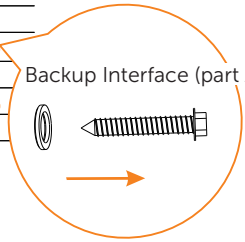
3

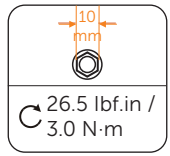


This step is required for: concrete wall | wooden wall ✗

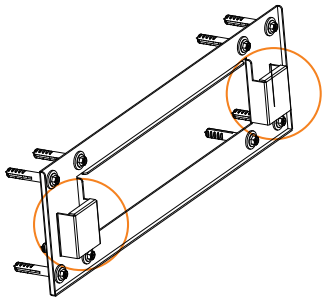
4

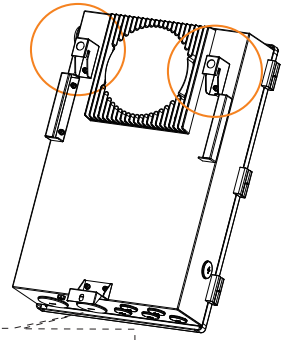






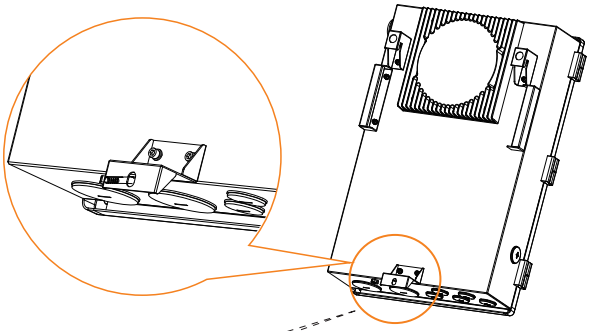
5



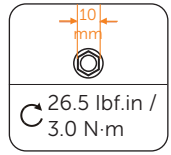


Hang the BI
on the bracket

6

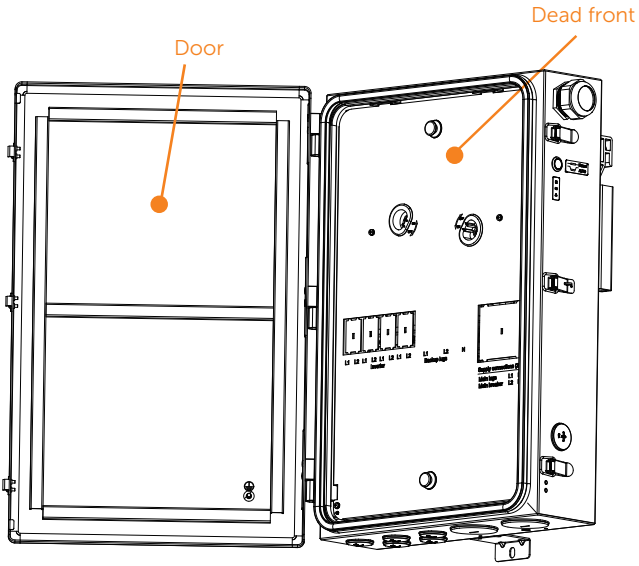


Secure the BI
on the wall



7

Open the door of Backup Interface and remove the dead front to complete all the wiring connection.

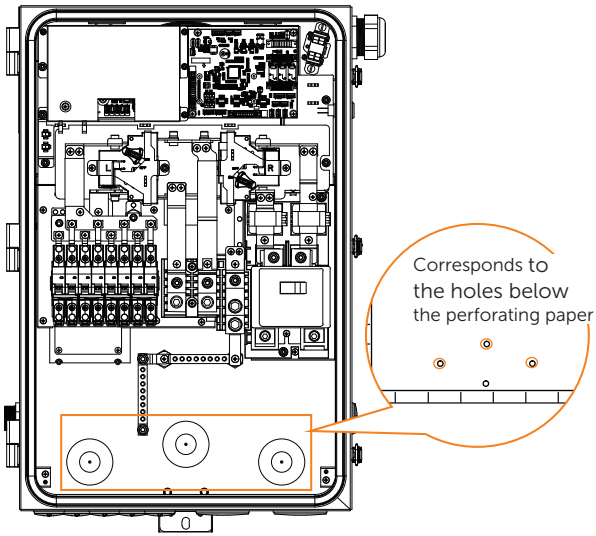


NOTICE!

- For detailed wiring connection, please refer to "7.3 Wiring Connection on the Backup Interface" (Page 79-88).

Drill a hole in the back (Not recommended)
Before drill the hole, please remove the cover first by loosening the screws.

1



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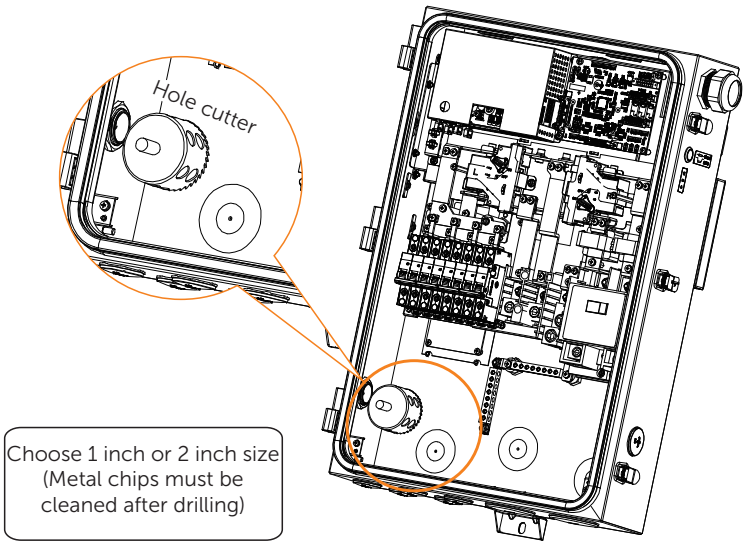

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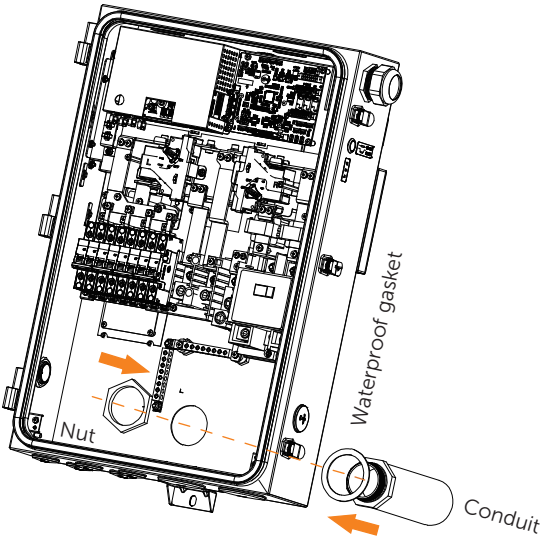
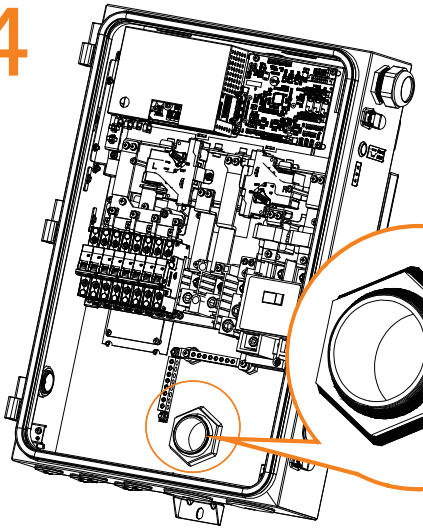


NOTICE!

- Prohibit the flow of water inside the tubing water into the machine!

4



The top of the nut and contact surface of the threads must be cleaned after locking the nut, as well as the contact surface between the nut and the box.

TSE-382 waterproof adhesive or a similar performance glue.

NOTICE!

- Drilling a hole in the wall is required before cutting a hole in the rear. To guarantee easy installation of the conduit and sealing with the chassis, the hole's size must be greater than the conduit's outside diameter.

6.2 Mechanical Installation (Wall-mounting)

NOTICE!

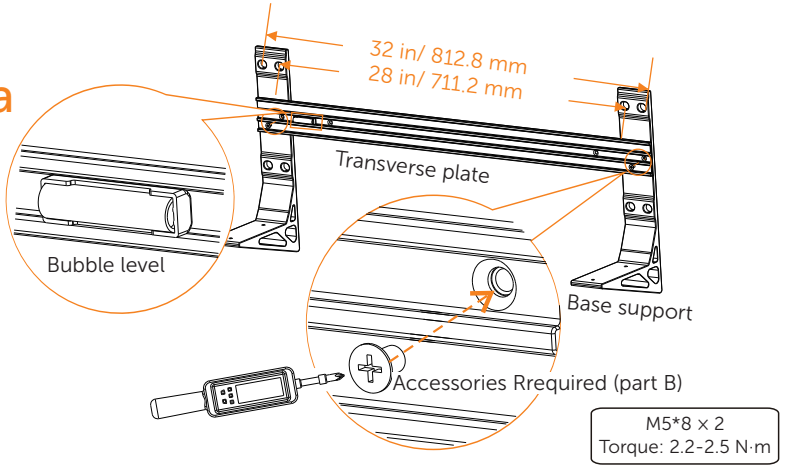
- For wall mounting, make sure the BMS breaker is no more than 6.56 ft/2 m above the ground so that you can easily shut down the system in emergencies.

6.2.1 Mount the Battery

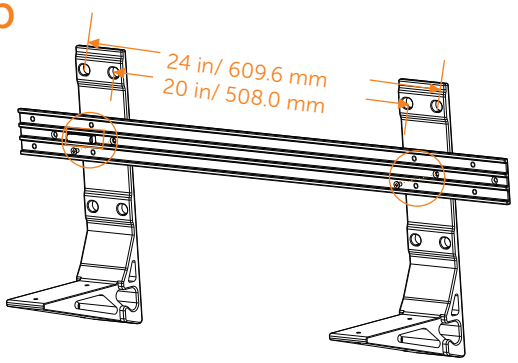
Step 1 Install the Transverse plate

1 Two ways to instal the Transverse plate (a and b)

a

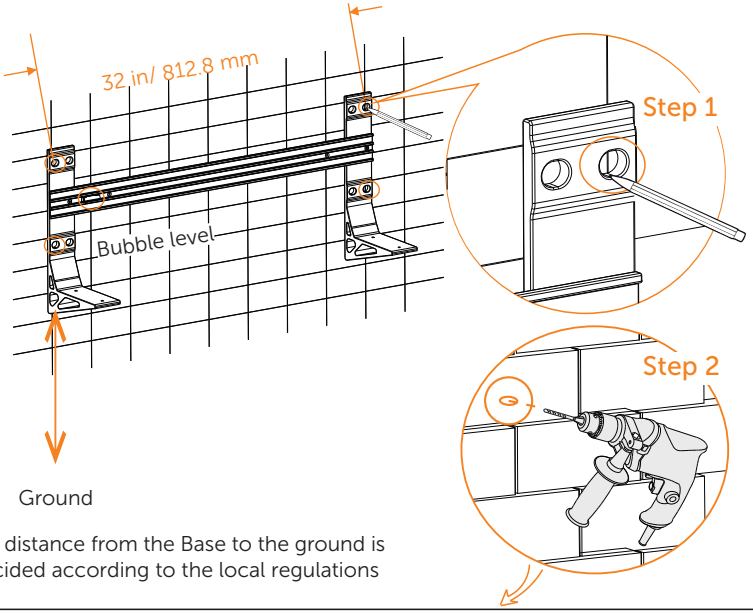


b

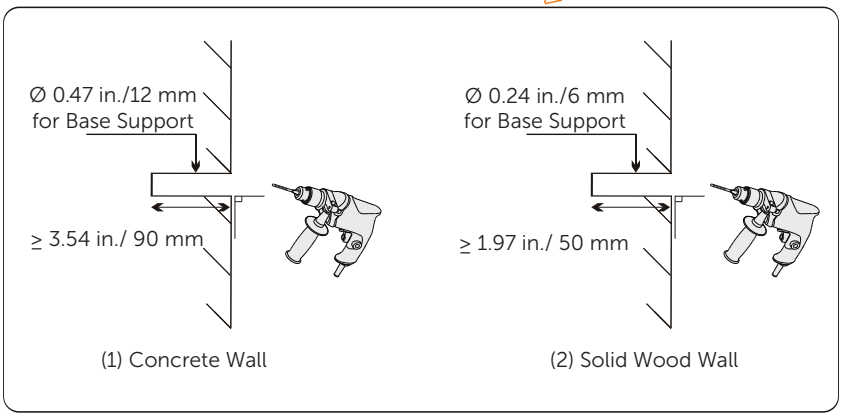


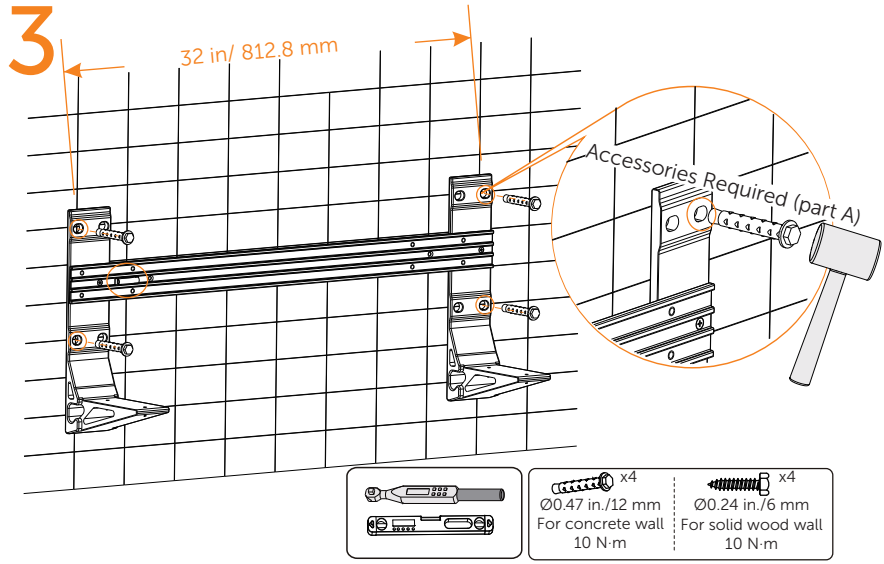
Same as Way a to secure the plate.

2

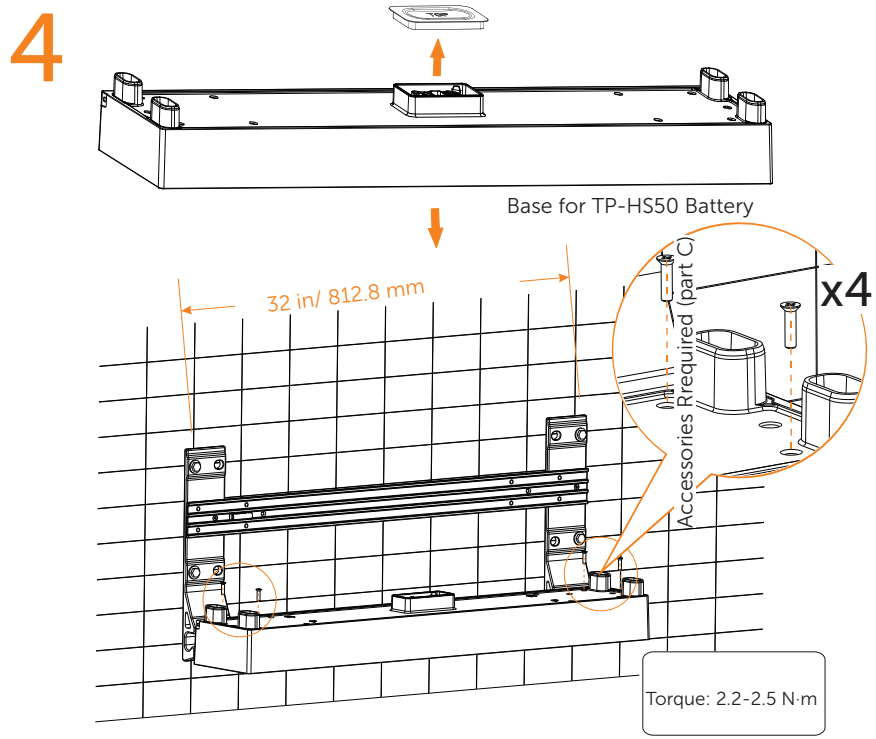


The distance from the Base to the ground is decided according to the local regulations



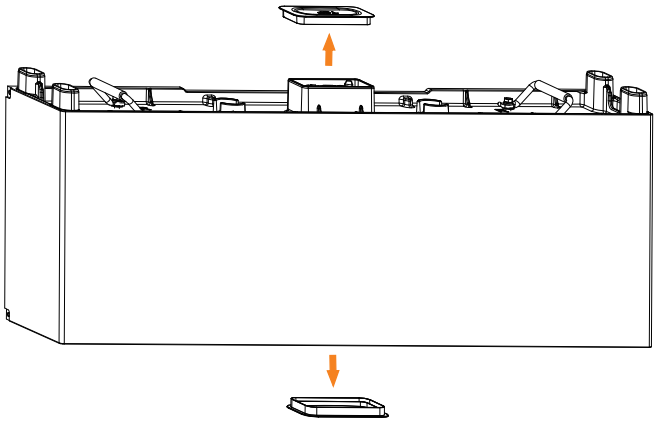


Step 2 Mount the base

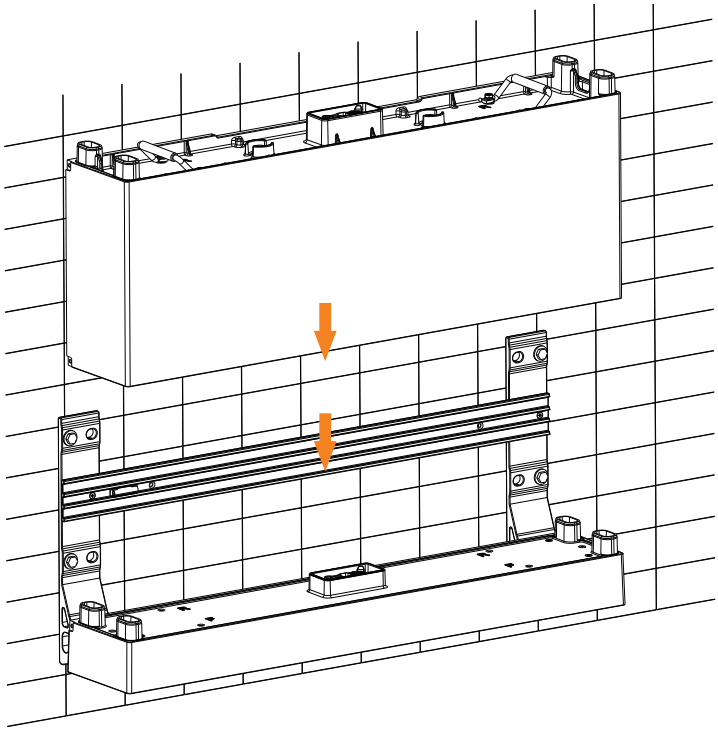


Step 3 Mount the battery module

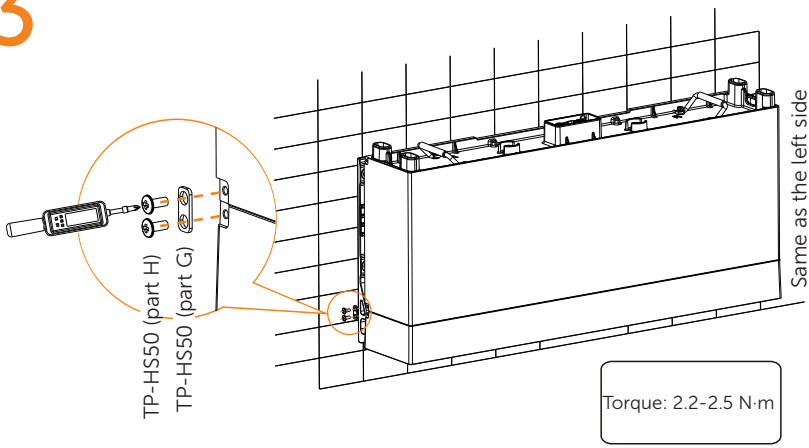
1



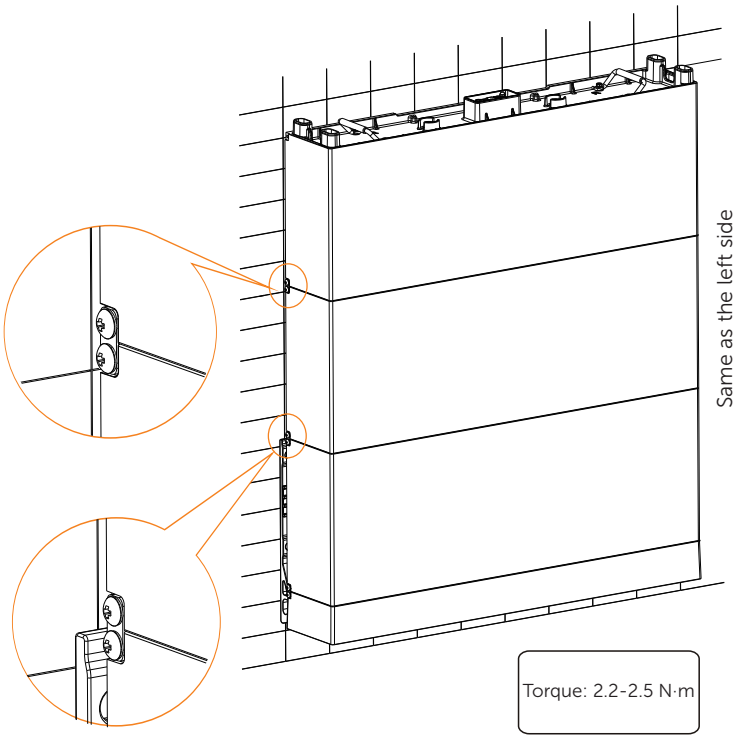
2



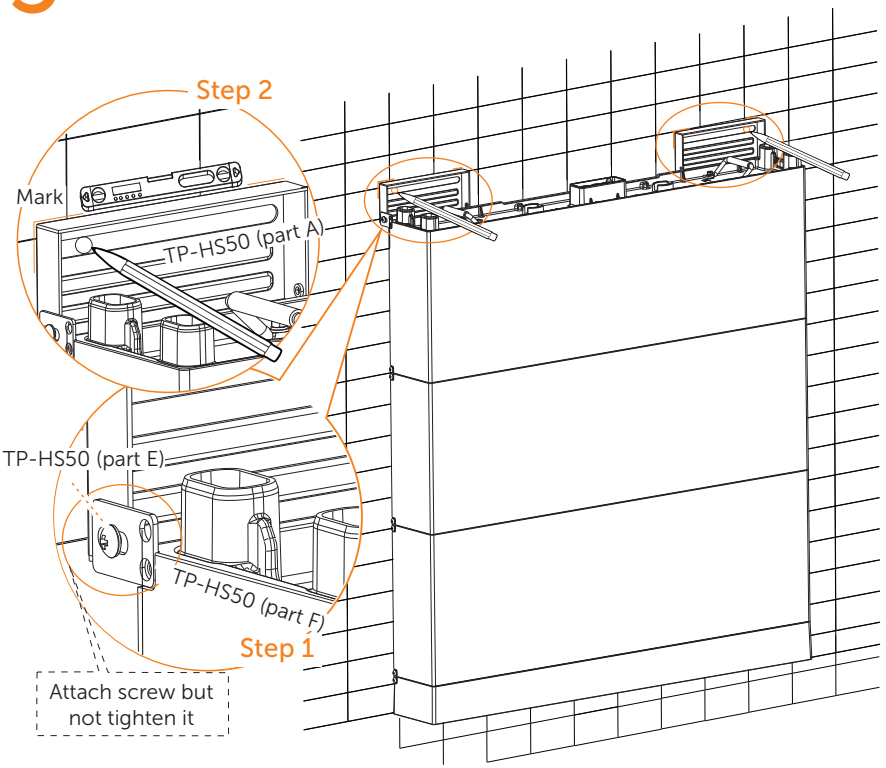
3

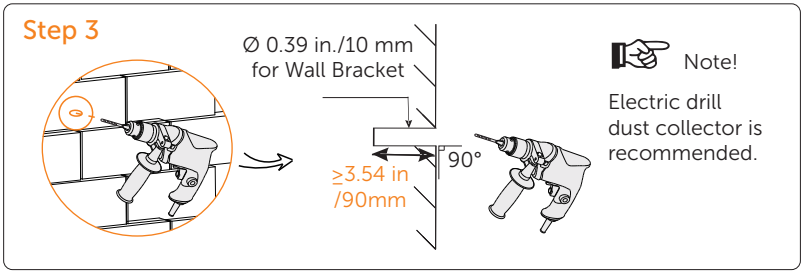

TP-HS50 (part H)
TP-HS50 (part G)
Same as the left side
Torque: 2.2-2.5 N·m

4


Same as the left side
Torque: 2.2-2.5 N·m

5

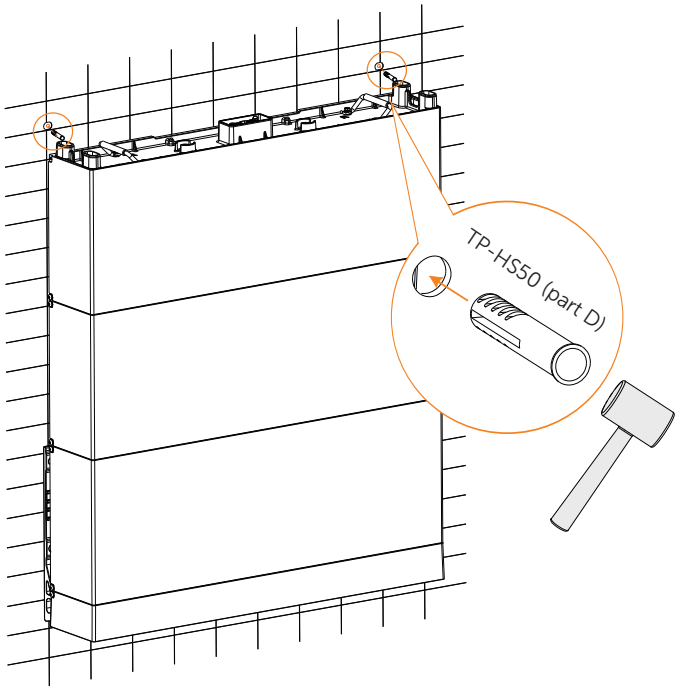




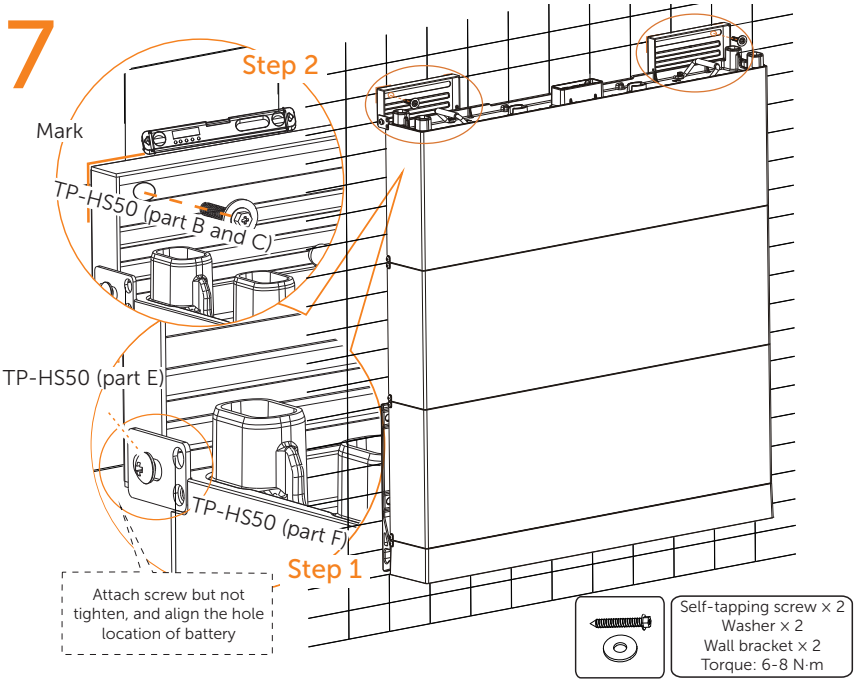
CAUTION!

- Please re-mount the dust cover to the battery module before drilling holes to avoid dust falling into the interface and do remember to remove the dust cover again after the installation wall bracket completed.

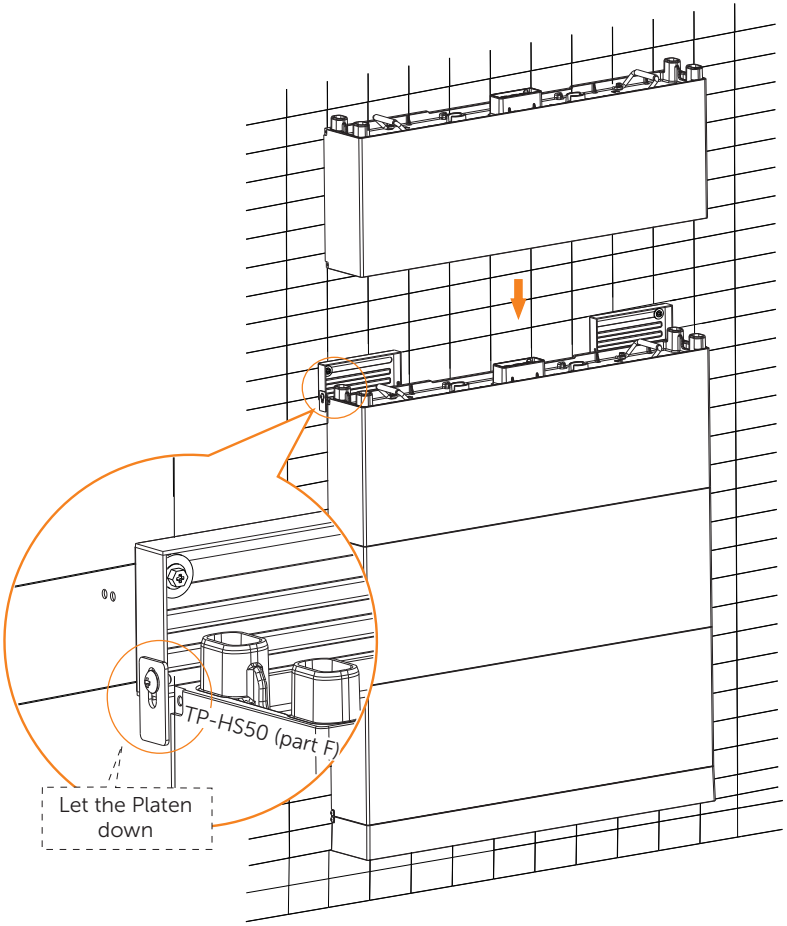
6


TP-HS50 (part D)

7

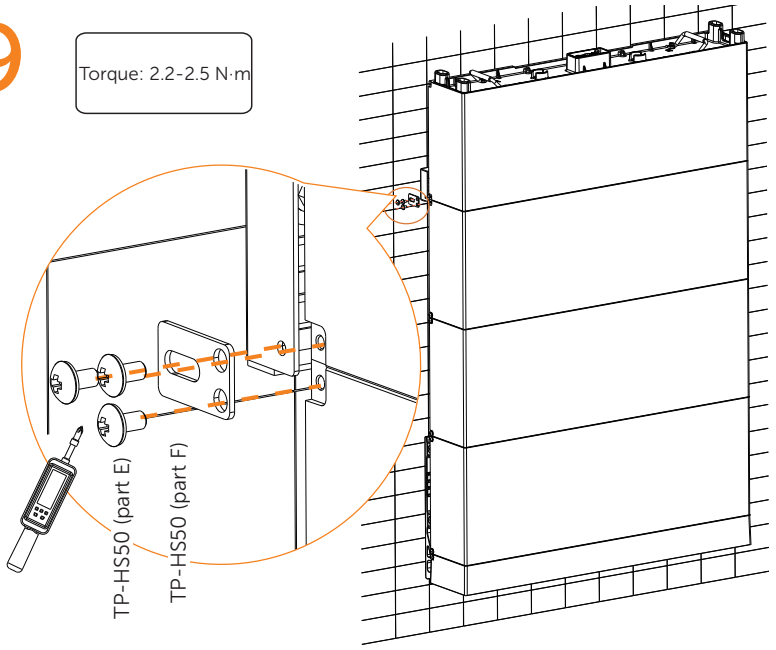

Step 2
Mark
TP-HS50 (part B and C)
TP-HS50 (part E)
TP-HS50 (part F)
Step 1
Attach screw but not tighten, and align the hole location of battery
Self-tapping screw × 2
Washer × 2
Wall bracket × 2
Torque: 6-8 N·m

8

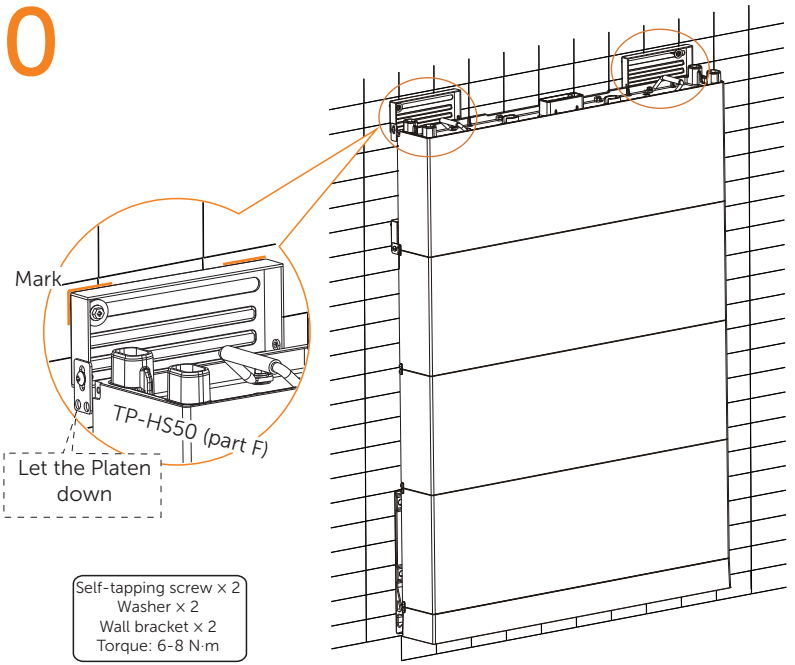


9

Torque: 2.2-2.5 N·m



10

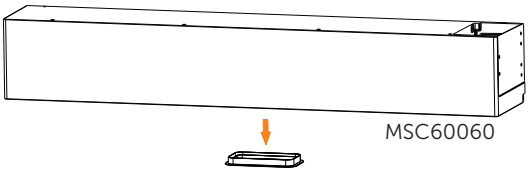


Self-tapping screw x 2
Washer x 2
Wall bracket x 2
Torque: 6-8 N·m

Step 4 Mount the BMS

1

Hand remove



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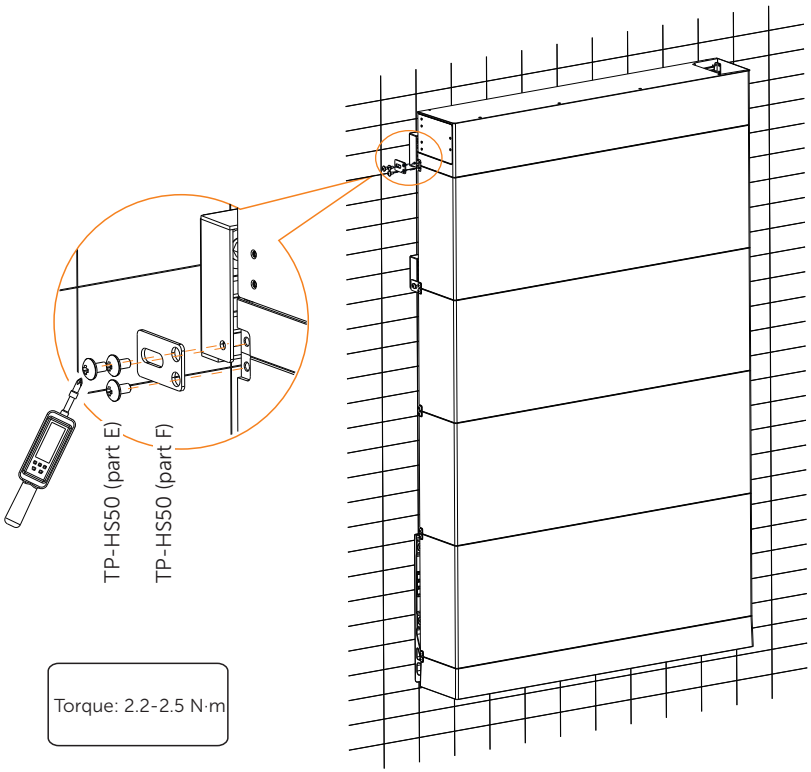
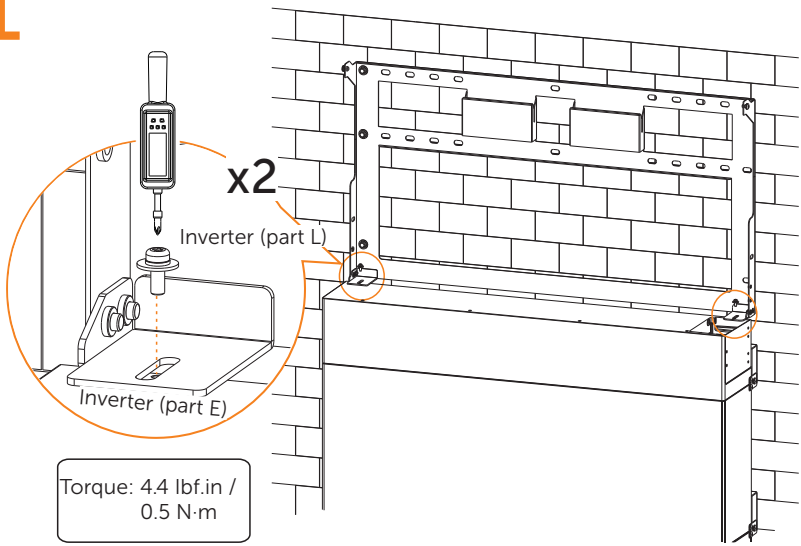
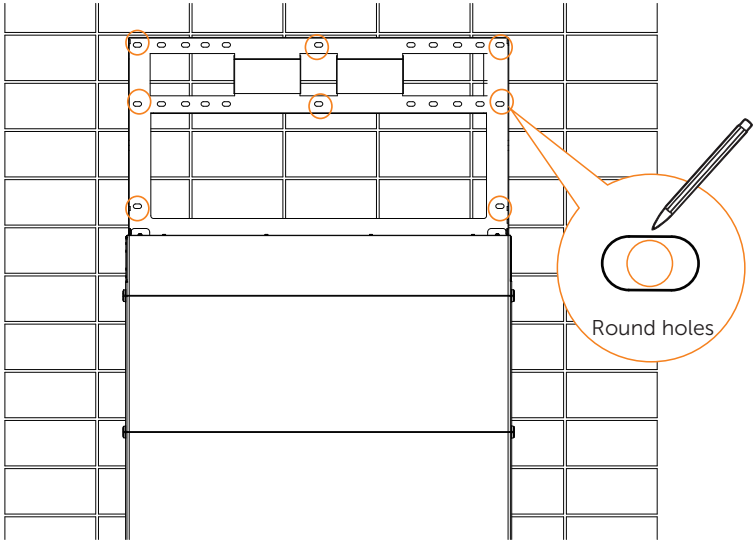


6.2.2 Mount the Inverter

1



2



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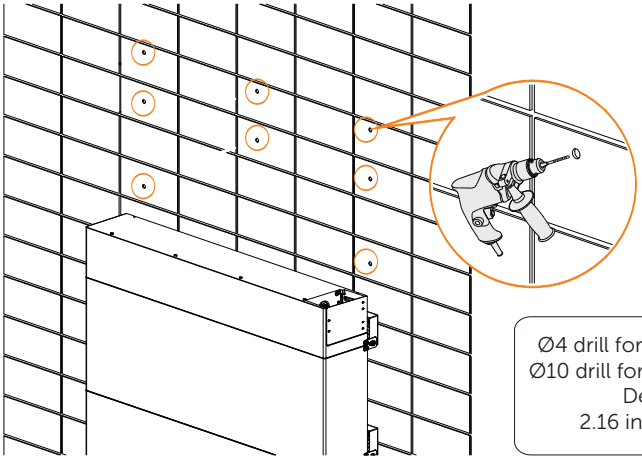


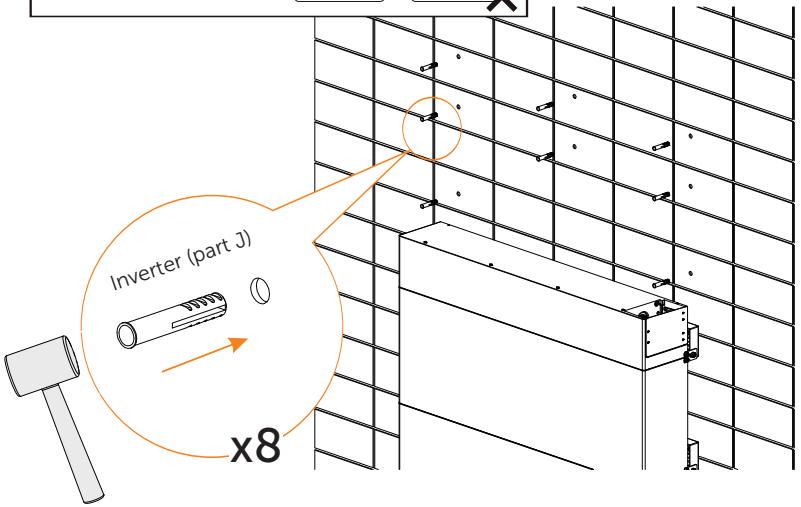
Ø4 drill for wooden wall
Ø10 drill for concrete wall
Depth:
2.16 in / 55 mm

CAUTION!

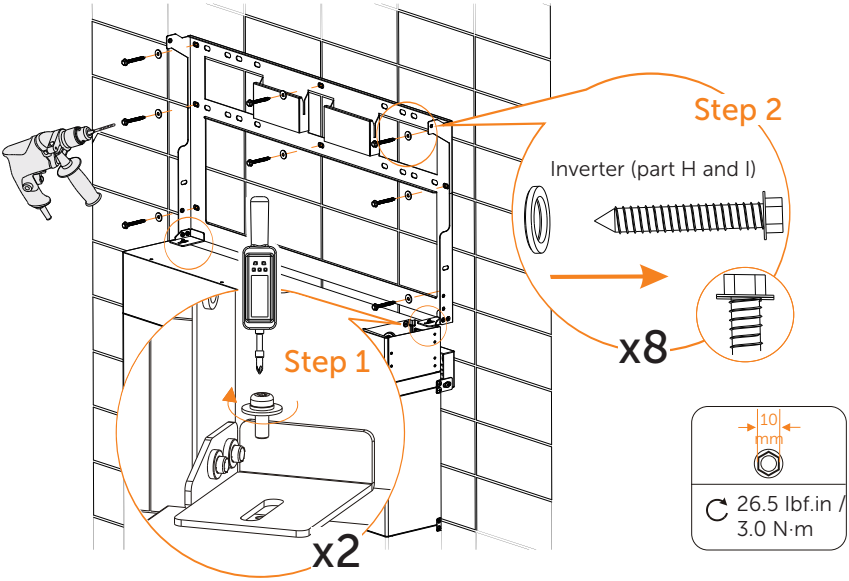
- Remove the screws on the bracket and disassemble the bracket before drill holes.

4

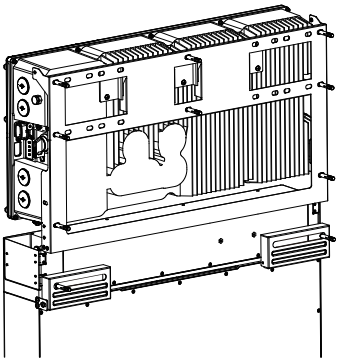
This step is required for: concrete wall ✓ wooden wall ✗



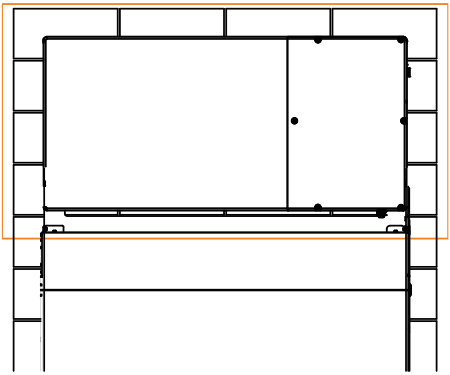
5



6

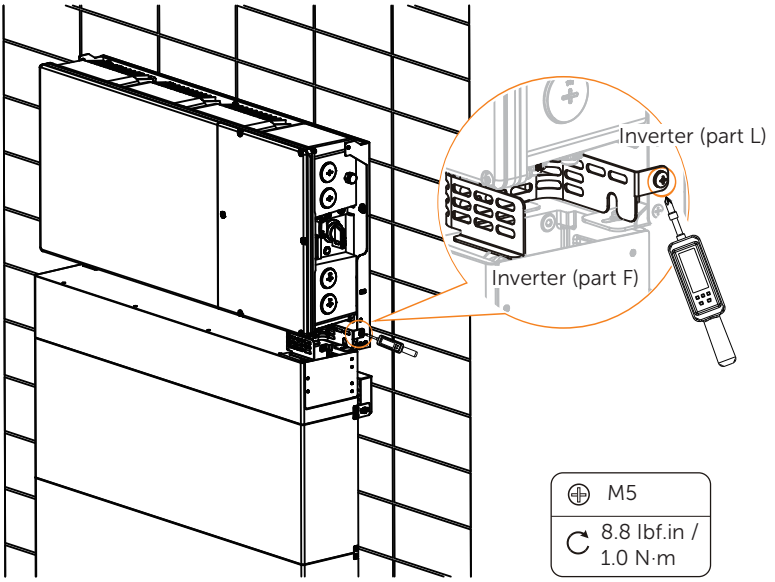


Back view



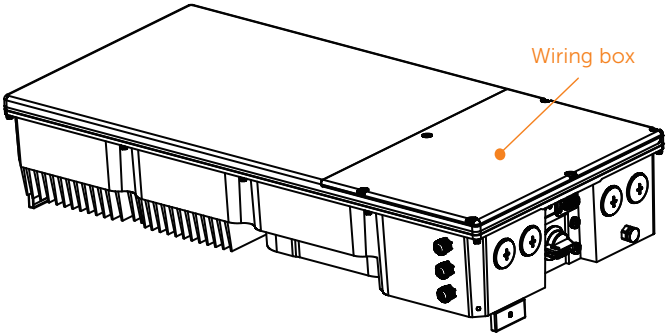
Front view

7



8

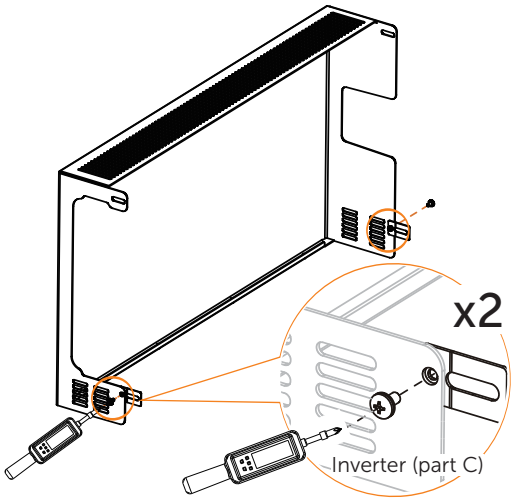
Open the wiring box cover to complete all the wiring connection.



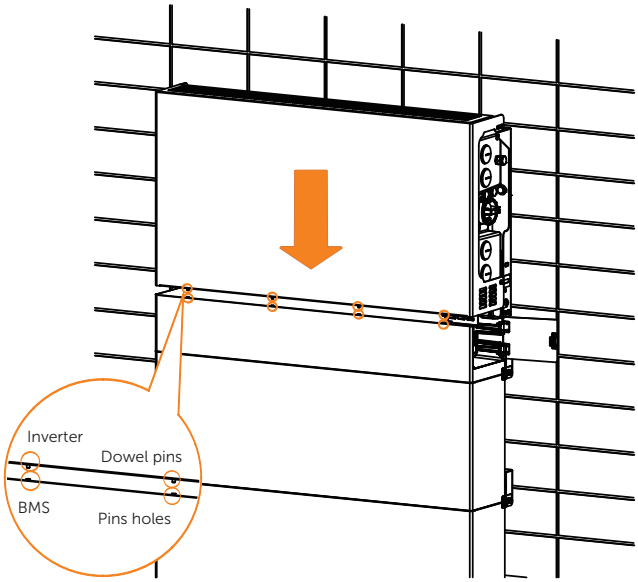
NOTICE!

- For detailed wiring connection, please refer to "7.1 Wiring Connection on the Inverter" and "7.2 Wiring Connection Between Inverter and Battery" (Page 68-78).

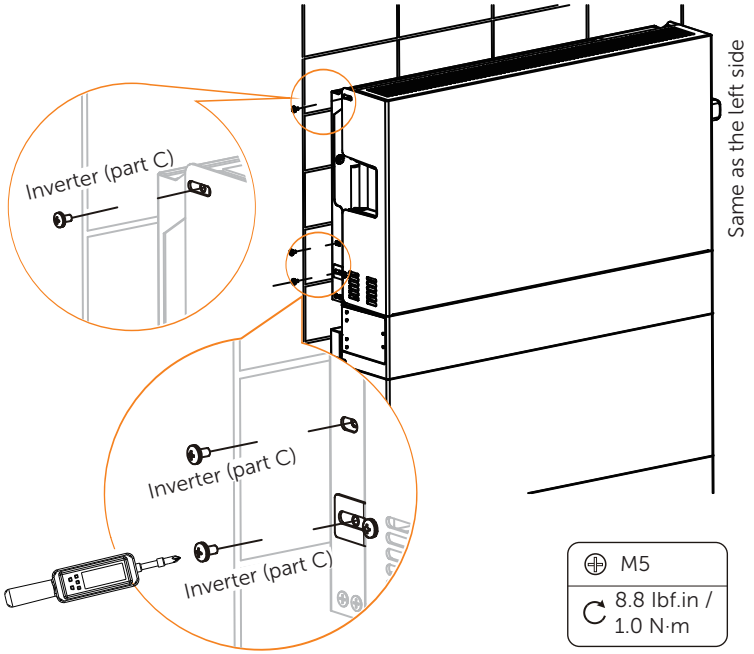
9



10

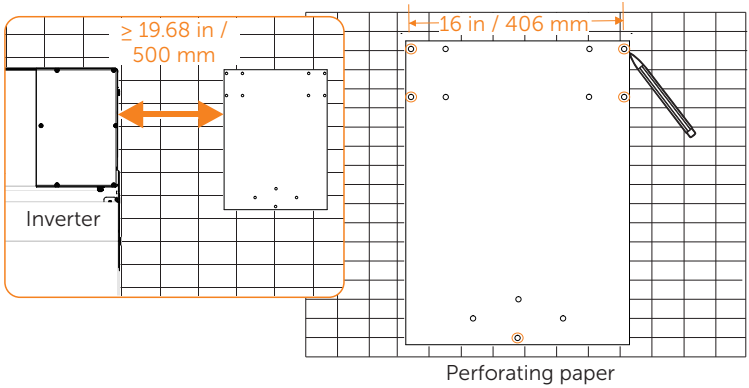


11

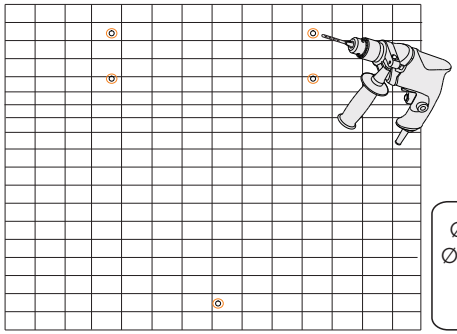

Inverter (part C)
Inverter (part C)
Inverter (part C)
Same as the left side
M5
8.8 lbf.in /
1.0 N·m

6.2.3 Mount the BI

1

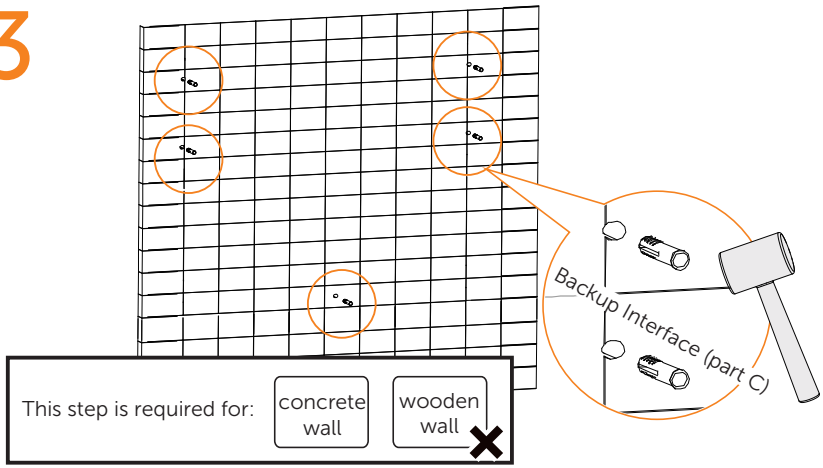


2

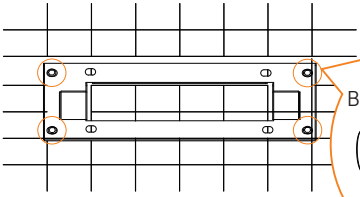


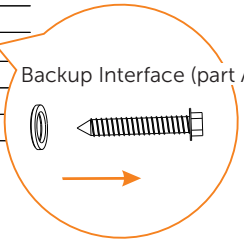
Ø4 drill for wooden wall
Ø10 drill for concrete wall
Depth:
2.16 in / 55 mm

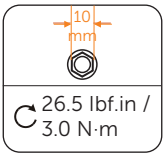
3



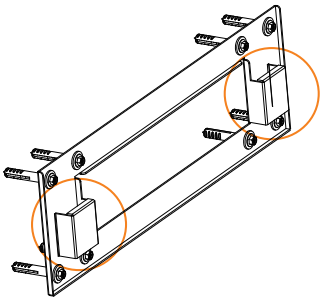
4

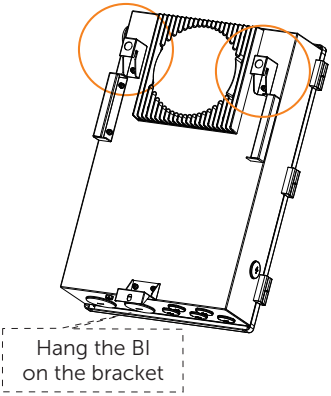



Backup Interface (part A and B)

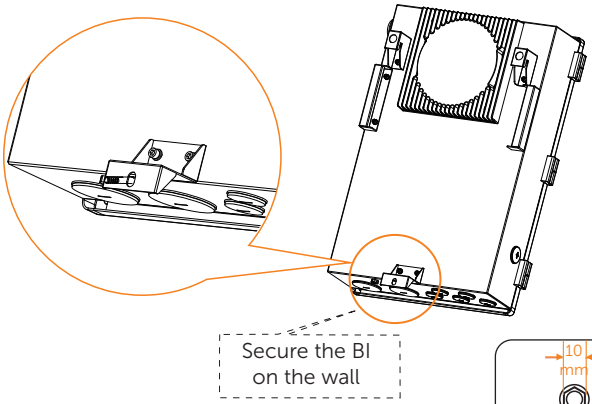

10
mm
26.5 lbf.in /
3.0 N·m

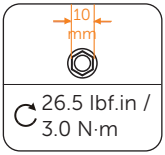
5




Hang the BI
on the bracket

6

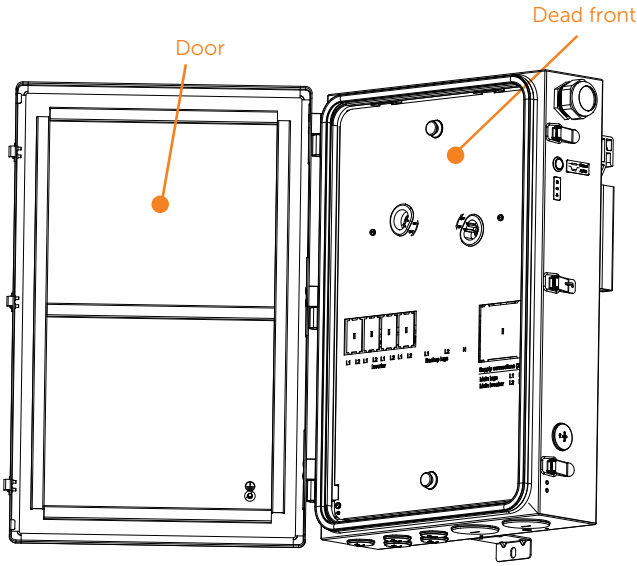

Secure the BI
on the wall


10
mm
26.5 lbf.in /
3.0 N·m

7

79

Open the door of Backup Interface and remove the dead front to complete all the wiring connection.

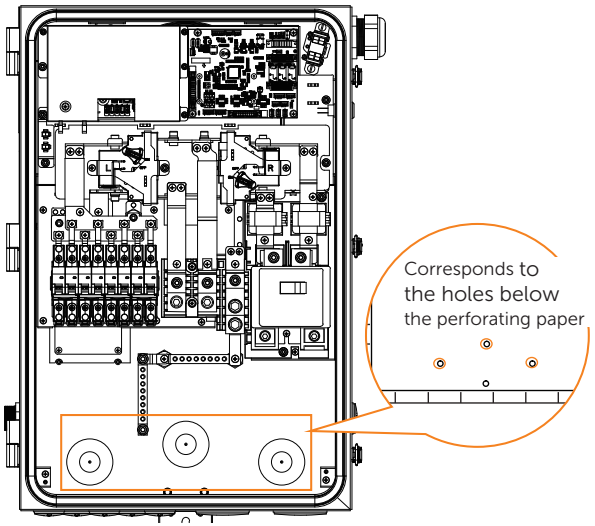


NOTICE!

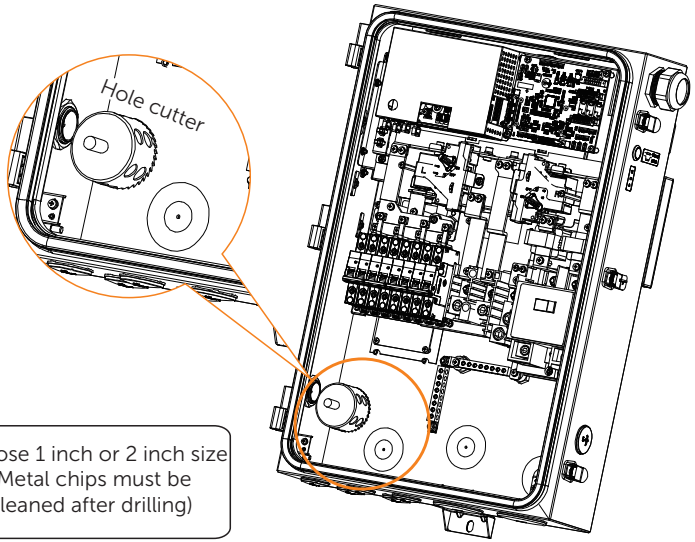
- For detailed wiring connection, please refer to "7.3 Wiring Connection on the Backup Interface" (Page 79-88).

Drill a hole in the back (Not recommended)
Before drill the hole, please remove the cover first by loosening the screws.

1

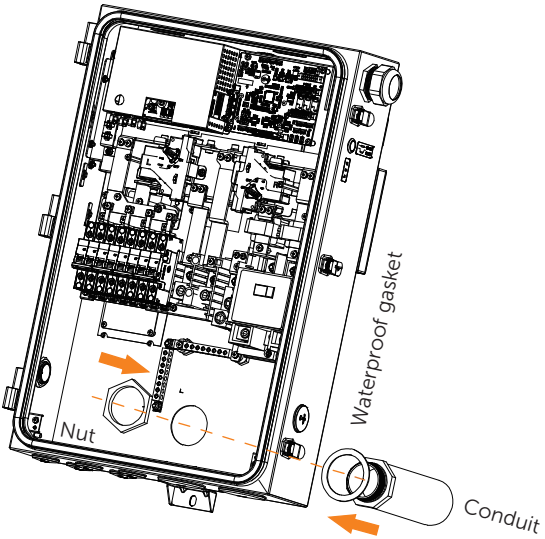


2



Choose 1 inch or 2 inch size
(Metal chips must be
cleaned after drilling)

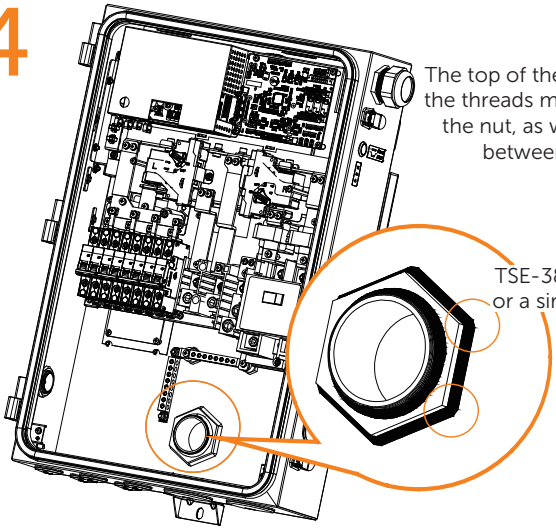
3



NOTICE!

- Prohibit the flow of water inside the tubing water into the machine!

4



The top of the nut and contact surface of the threads must be cleaned after locking the nut, as well as the contact surface between the nut and the box.

TSE-382 waterproof adhesive or a similar performance glue.

NOTICE!

- Drilling a hole in the wall is required before cutting a hole in the rear. To guarantee easy installation of the conduit and sealing with the chassis, the hole's size must be greater than the conduit's outside diameter.

7 Wiring Connection

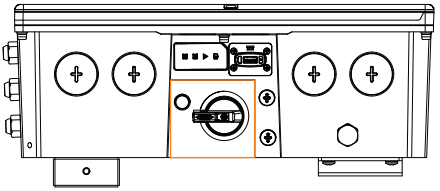
7.1 Wiring Connection on the Inverter

Open the wiring box cover

WARNING!

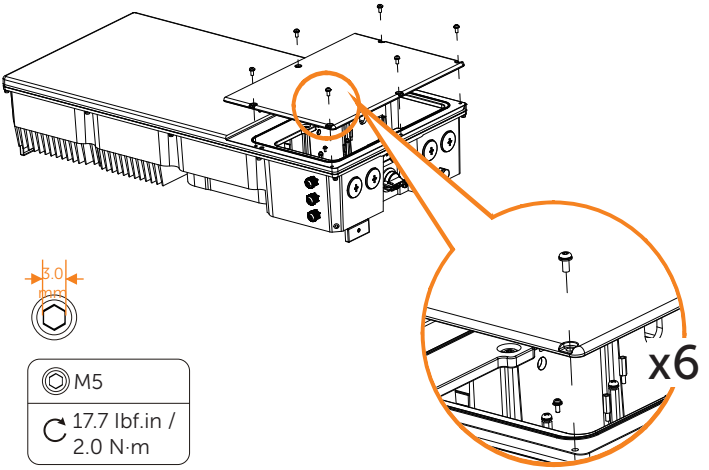
- Before inverter wiring connection, Make sure no live voltages are present on PV input and AC output circuits, and make sure that the DC switch is in "OFF" position, meanwhile, the breaker of battery is in OFF position.

Step 1: Turn DC switch to "OFF" position. Note that the cover cannot be removed when the DC switch is in "ON" position.



Step 2: Make sure the breaker of battery is in OFF position.

Step 3: Remove the 6 cover screws using Allen key, then disassemble the cover.

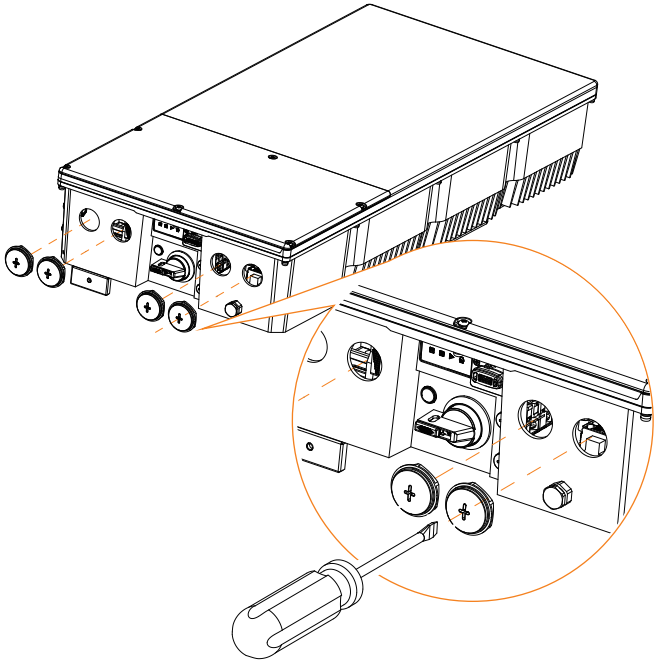


Remove the wiring box waterproof plugs

A1-HYB-G2 series inverter is equipped with four 1 inch conduit fittings which are used for electrical wiring access. Four waterproof plugs have been installed on the inverter at the factory. Before wiring connection, these waterproof plugs should be removed by the operator.

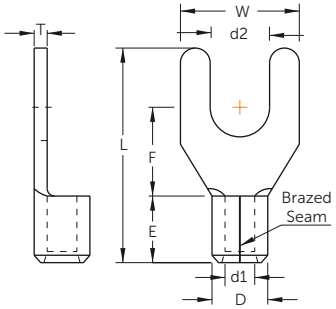
Step 1: Remove the waterproof plugs by placing a flat blade screwdriver in the slot on the waterproof plug face and turning while gripping the nut on the inside of the enclosure to ensure it does not slip.

Step 2: Unscrew the nut from the waterproof plug and slip the conduit plug out of the waterproof opening.

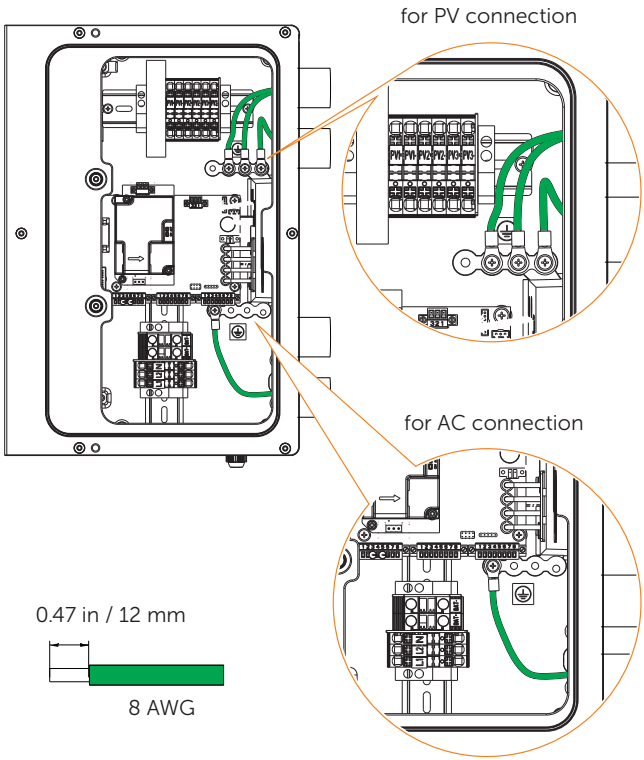


- **GND cable**

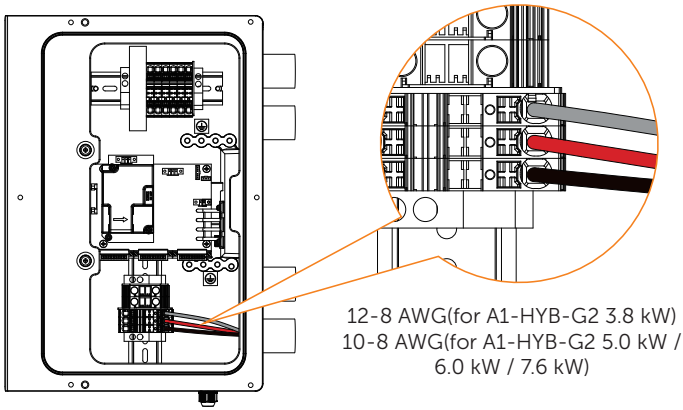
Grounding terminals are provided in the accessory package, If using a Spade terminal additionally, select according to the following model.



Wire Range (AWG / mm^2)	Brazed Seam	Stud Size (in. / mm)	Dimension (in. / mm)						
		d2	W	F	L	E	D	d1	T
8 / 8	SNB8-5	0.209 / 5.3	0.413 / 10.5	0.319 / 8.1	0.819 / 20.8	0.335 / 8.5	0.283 / 7.2	0.177 / 4.5	0.047 / 1.2



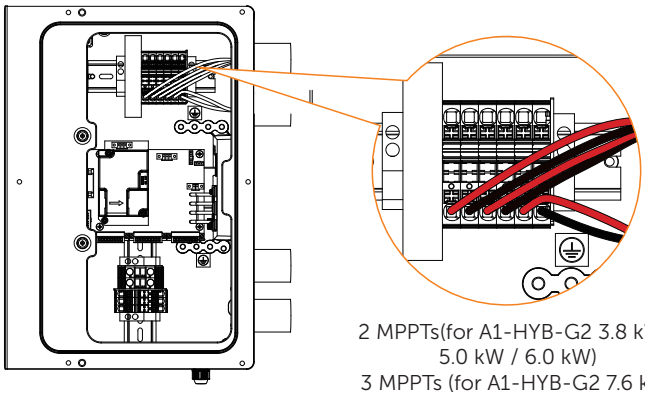
- AC cable



12-8 AWG(for A1-HYB-G2 3.8 kW)
10-8 AWG(for A1-HYB-G2 5.0 kW / 6.0 kW / 7.6 kW)

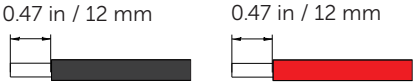
A: L1 cable B: L2 cable C: N cable

- PV cable



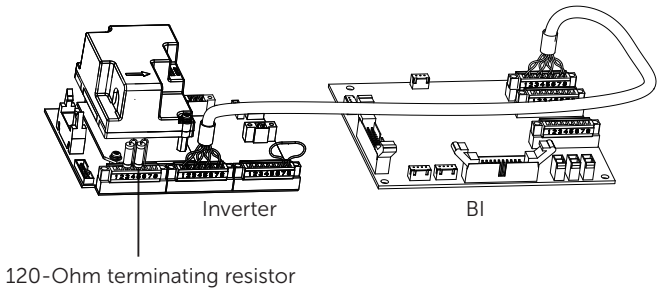
2 MPPTs(for A1-HYB-G2 3.8 kW / 5.0 kW / 6.0 kW)
3 MPPTs (for A1-HYB-G2 7.6 kW)

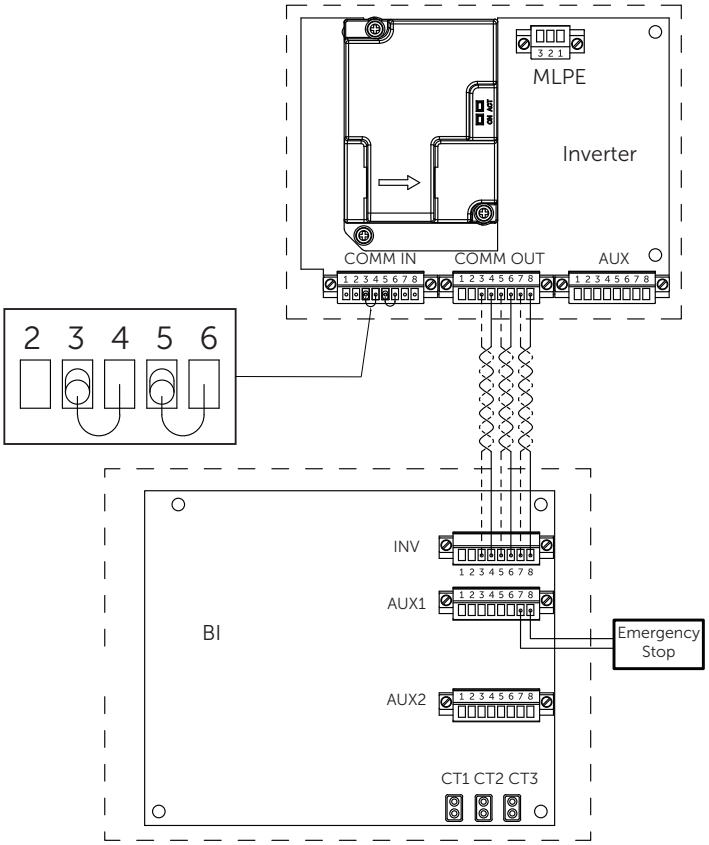
A: PV1+ terminal
B: PV1- terminal
C: PV2+ terminal
D: PV2- terminal
E: PV3+ terminal
F: PV3- terminal



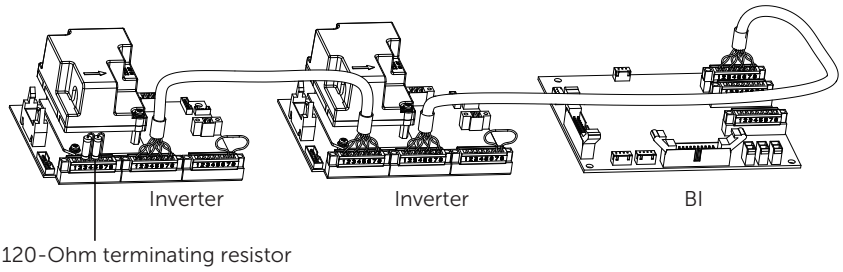
- **Communication cable**

Single inverter





Multi-inverter



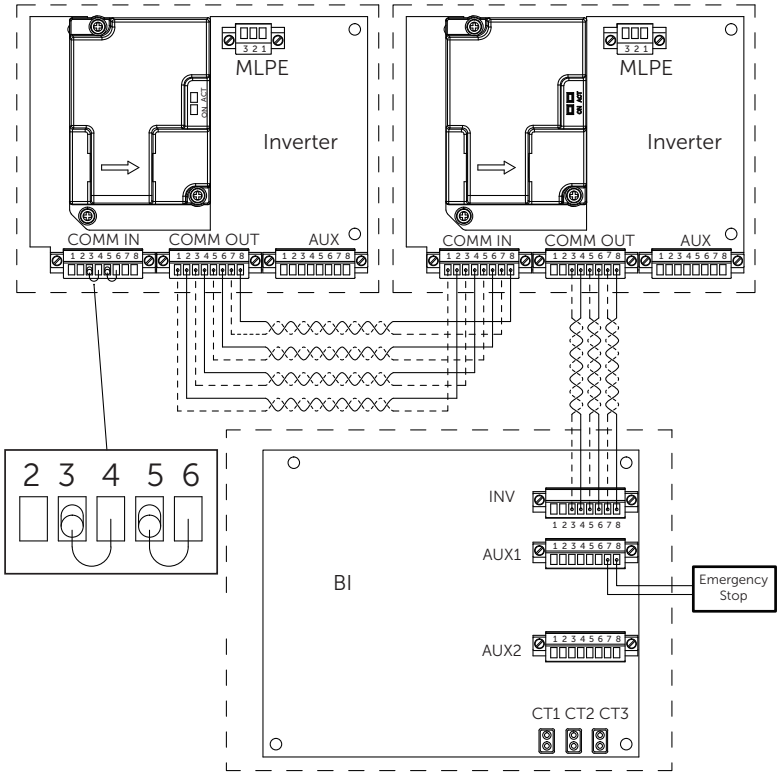
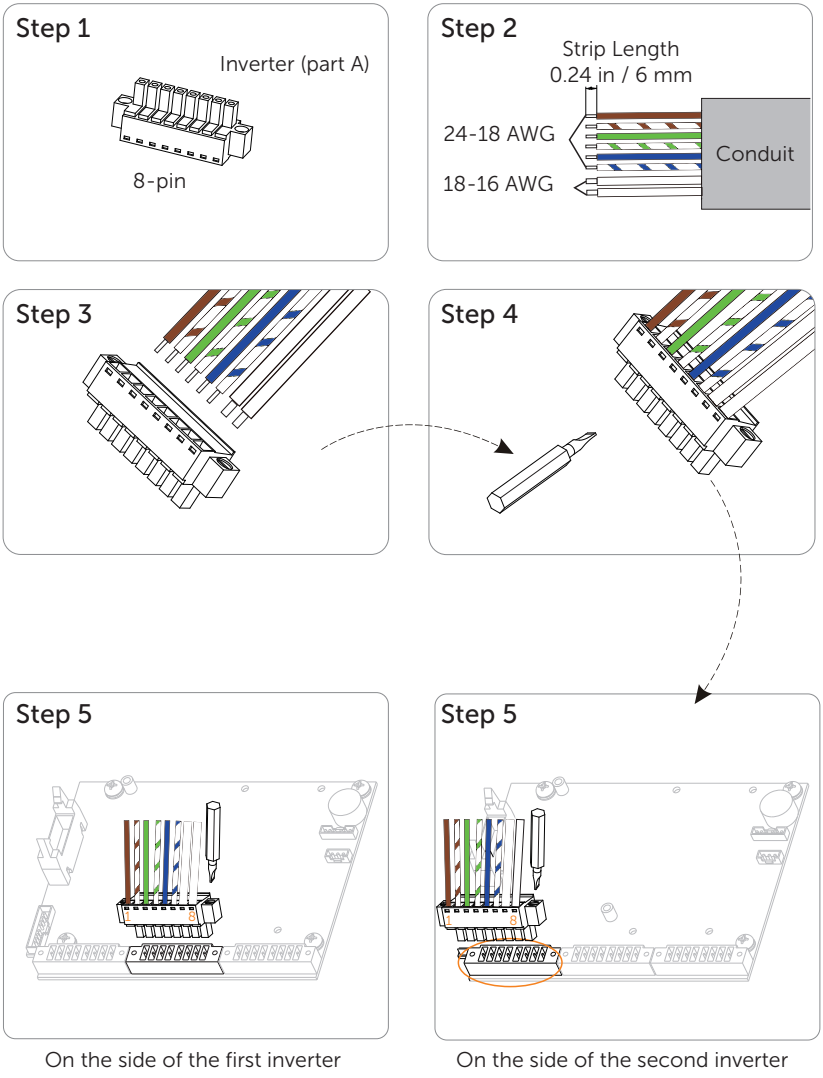


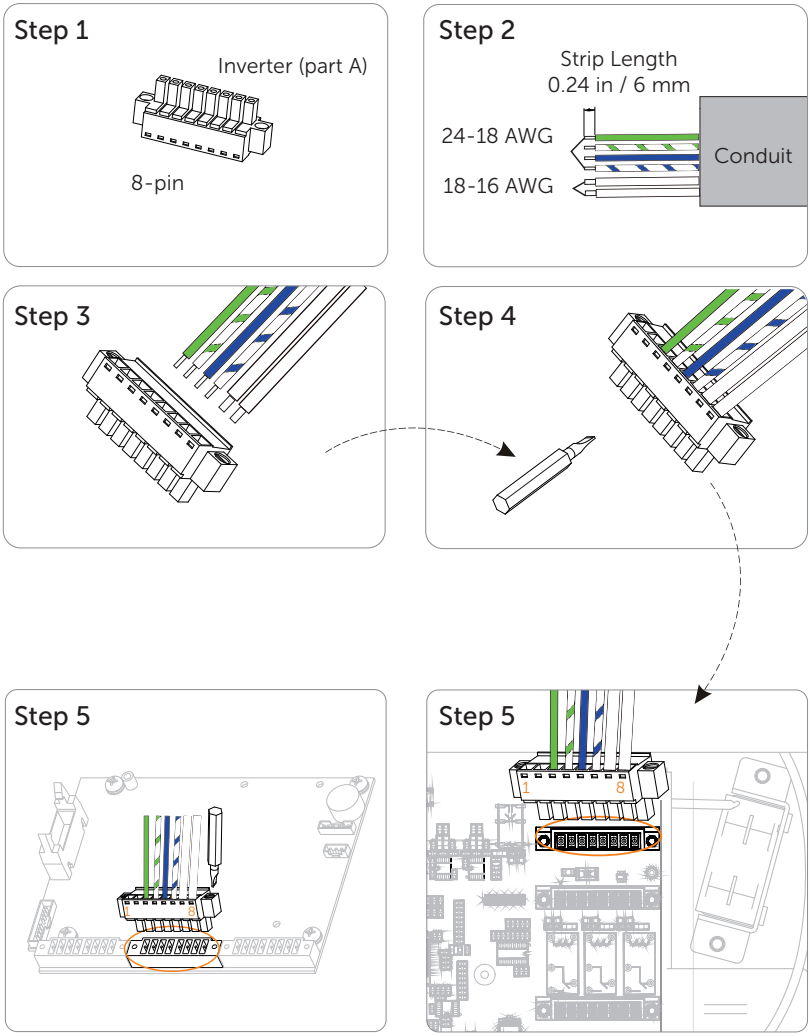
Diagram for communication connection steps between inverters



On the side of the first inverter

On the side of the second inverter

Diagram for communication connection steps between inverter and BI

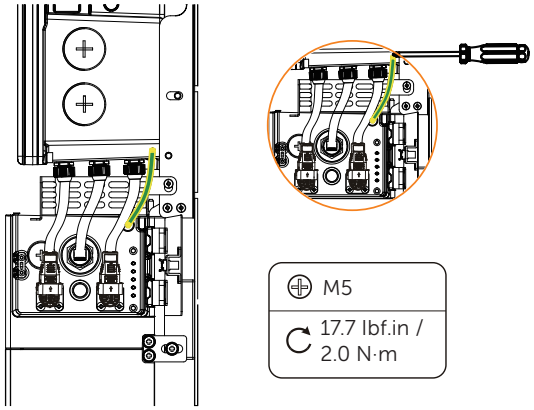


On the side of inverter

On the side of BI

7.2 Wiring Connection Between Inverter and Battery

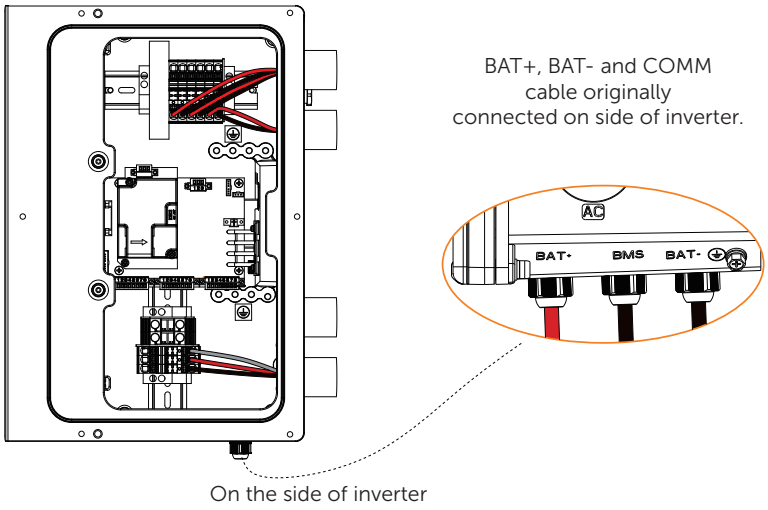
- GND conductor

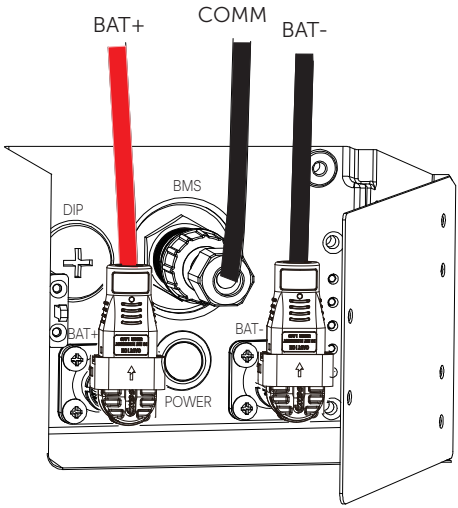


For easier connection, please connect the grounding conductor on the BMS first.

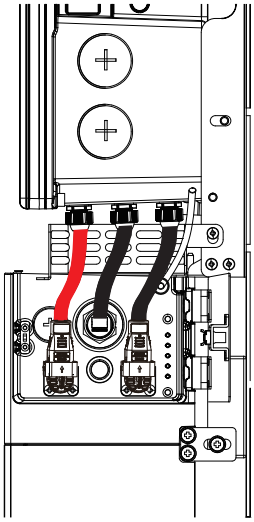
NOTICE!
• Ensure to connect the ground conductor.

- BAT+, BAT- and COMM cable





On the side of battery



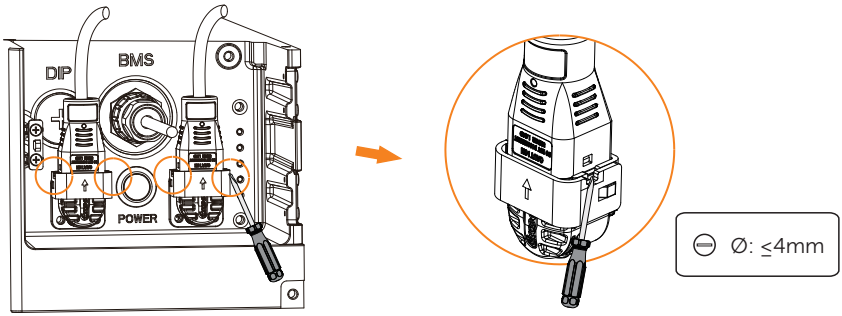
Connection between inverter and battery

- Dismantling the battery

NOTICE!
• Before dismantling the battery, make sure you have shut down the battery system. • If the BAT cables will be reused after disconnecting, please reinstall and secure the buckles back onto these cables first before reconnecting them. For details, see step 2. • The arrow direction on the buckle indicates the vertical direction of the groove.

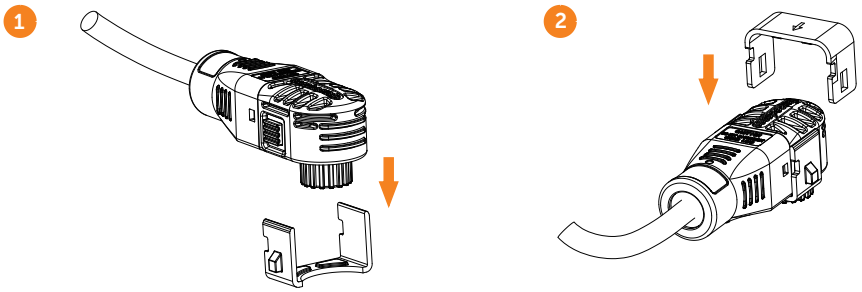
Step 1: Disconnect the cables between BMS and the inverter.

(1) Unscrew the communication cable from the BMS port.
(2) Find the overall position of the groove according to the buckle arrow, place a flat-head screwdriver on the groove at either left or right side of the buckle, and then pry open the buckles fastened on BAT+ and BAT- cables.



Step 2: (Optional) Reinstall and secure the buckles to the BAT cables.

(1) Align the curve of the cable head to that of the buckle, and then stick the cable head into the buckle base.
(2) Align the buckle cover to the buckle base, and then press the cover down to lock it until a "click" sound is heard.



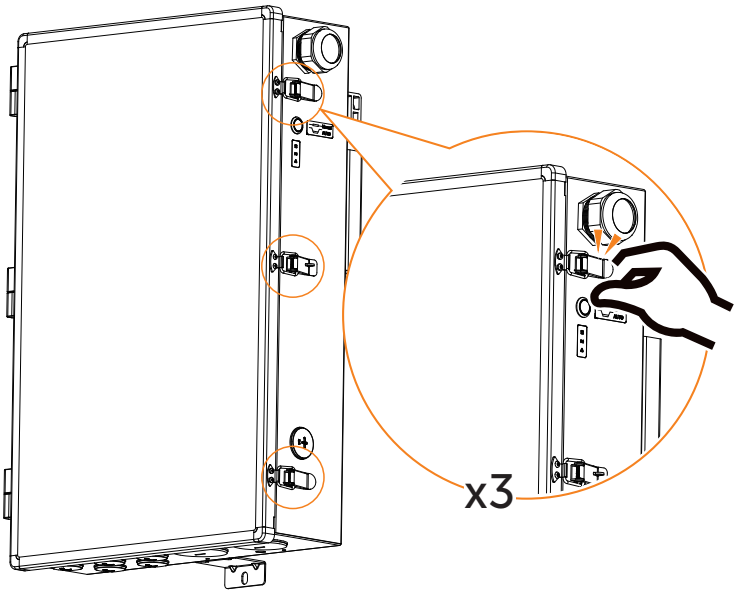
Step 3: Disconnect the series wiring terminal on the battery.

Step 4: Disconnect the rest cables.

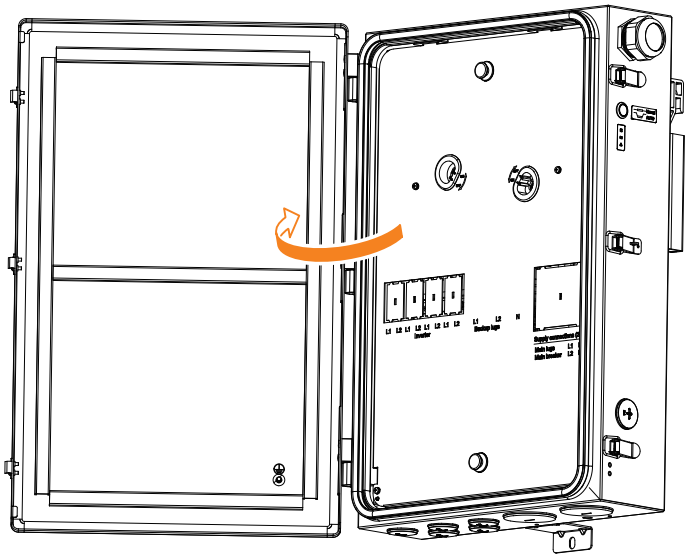
7.3 Wiring Connection on the Backup Interface

Please open the door and remove dead front first.

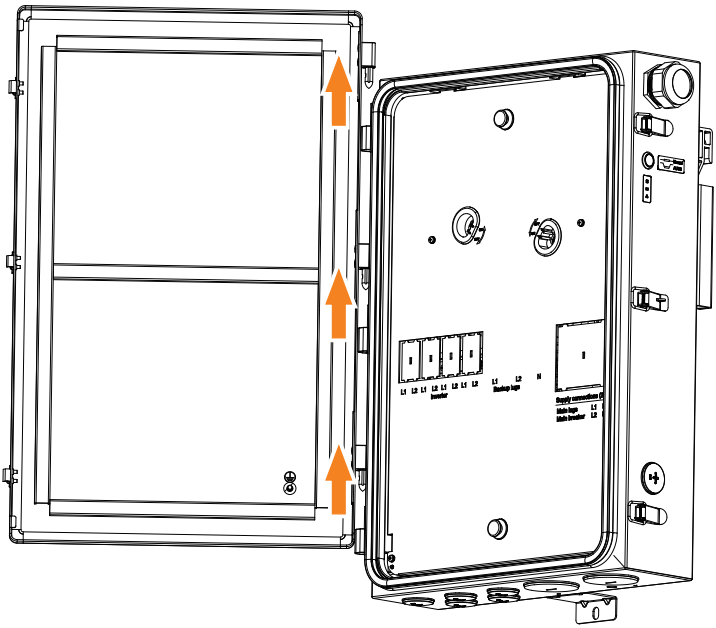
1



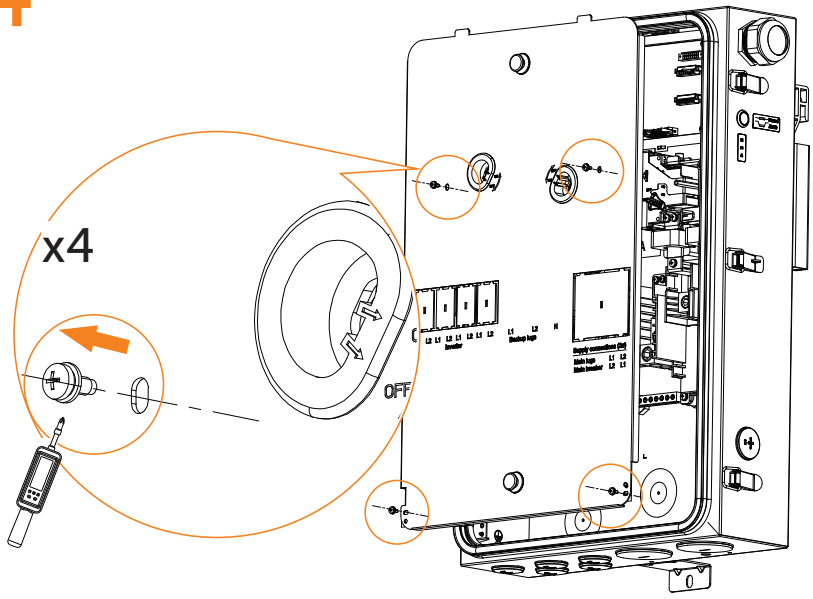
2



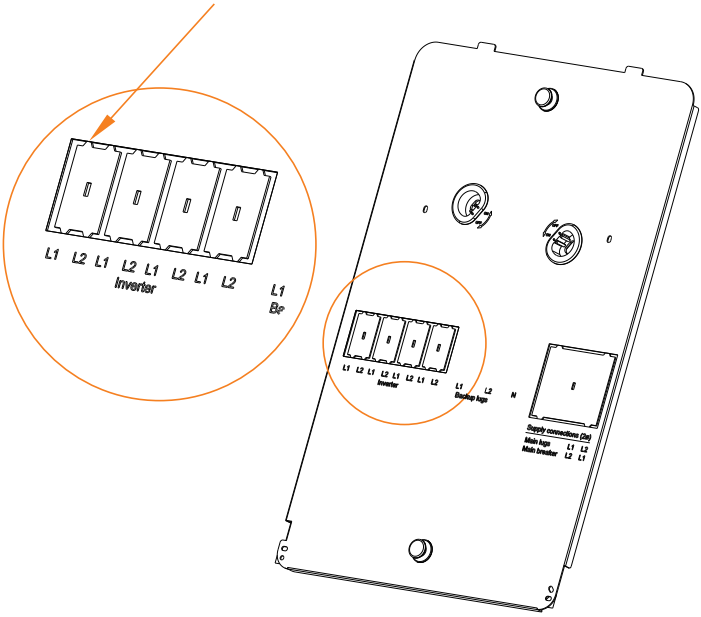
3



4



Knock down holes with diagonal pliers or mallet.



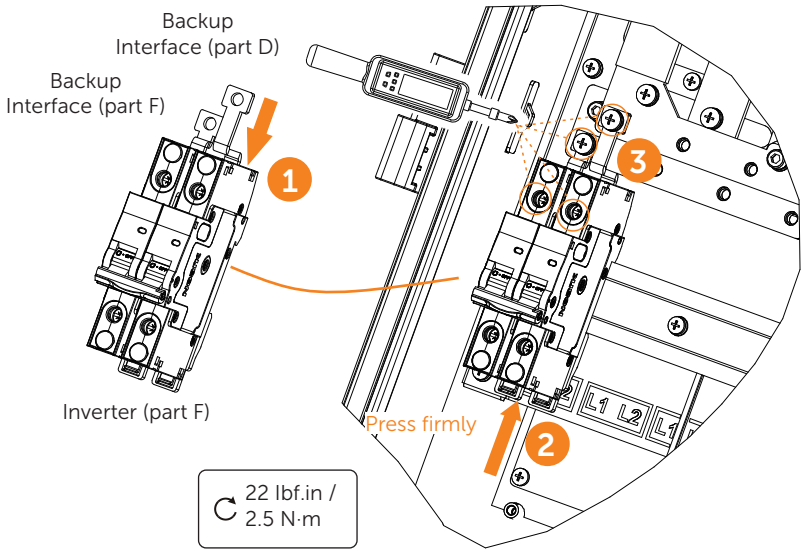
7.3.1 Install the Circuit Breaker

NOTICE!
• The circuit breaker is included in the inverter accessory package.

Step 1: Insert the copper bars at the circuit breaker, pre-tighten them.

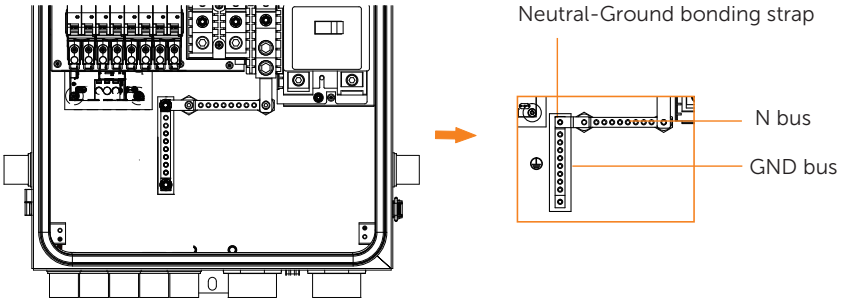
Step 2: Place the circuit breaker and copper bar into the rail and align the screw holes.

Step 3: Press the circuit breaker slot firmly against the rail and then lock the screws.



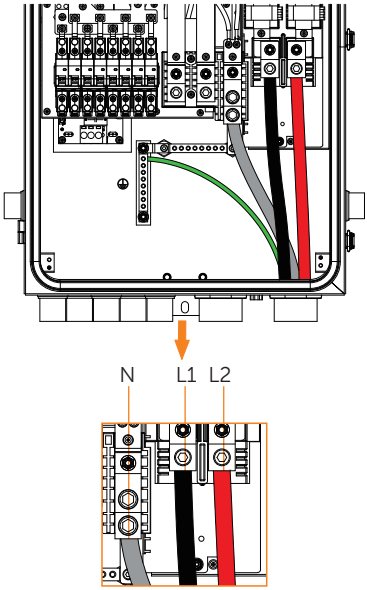
7.3.2 Neutral-Ground Bonding Strap-factory installed

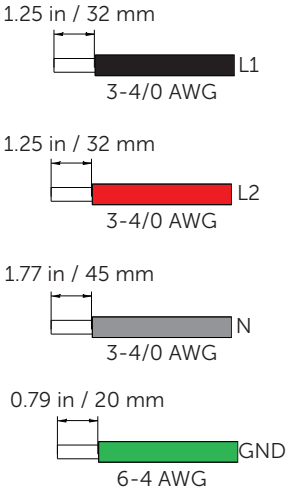
Remove Neutral-Ground bonding strap from BI if not installed as service equipment. Proper earth connection and Neutral-Ground bonding strap is required for safe operation of the system and for compliance with local code requirements.



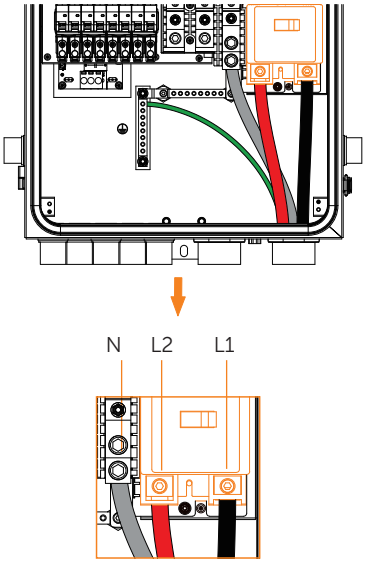
7.3.3 Connect the Grid Conductors to BI

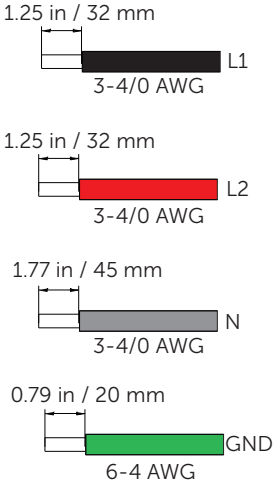
A main breaker not installed





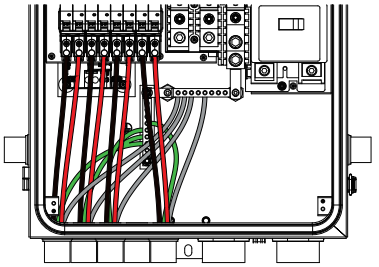
A main breaker installed

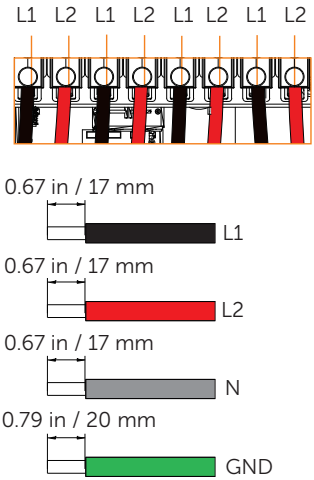




7.3.4 Connect Inverter Conductors to BI

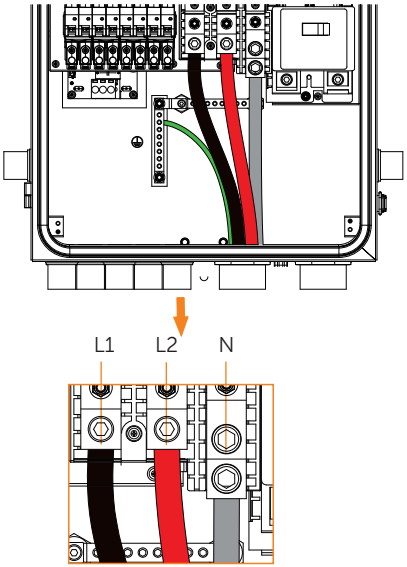
- AC cable

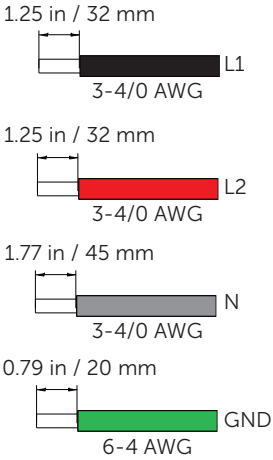




12–8 AWG(for A1-HYB-G2 3.8 kW)
10–8 AWG(for A1-HYB-G2 5.0 kW / 6.0 kW / 7.6 kW)

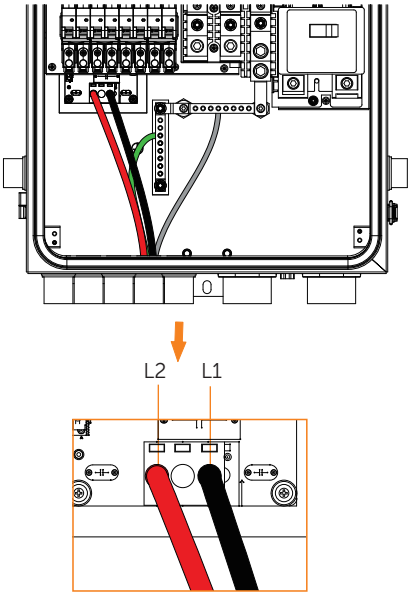
7.3.5 Connect Load Conductors to BI

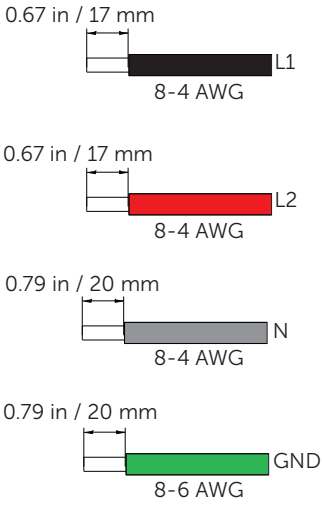




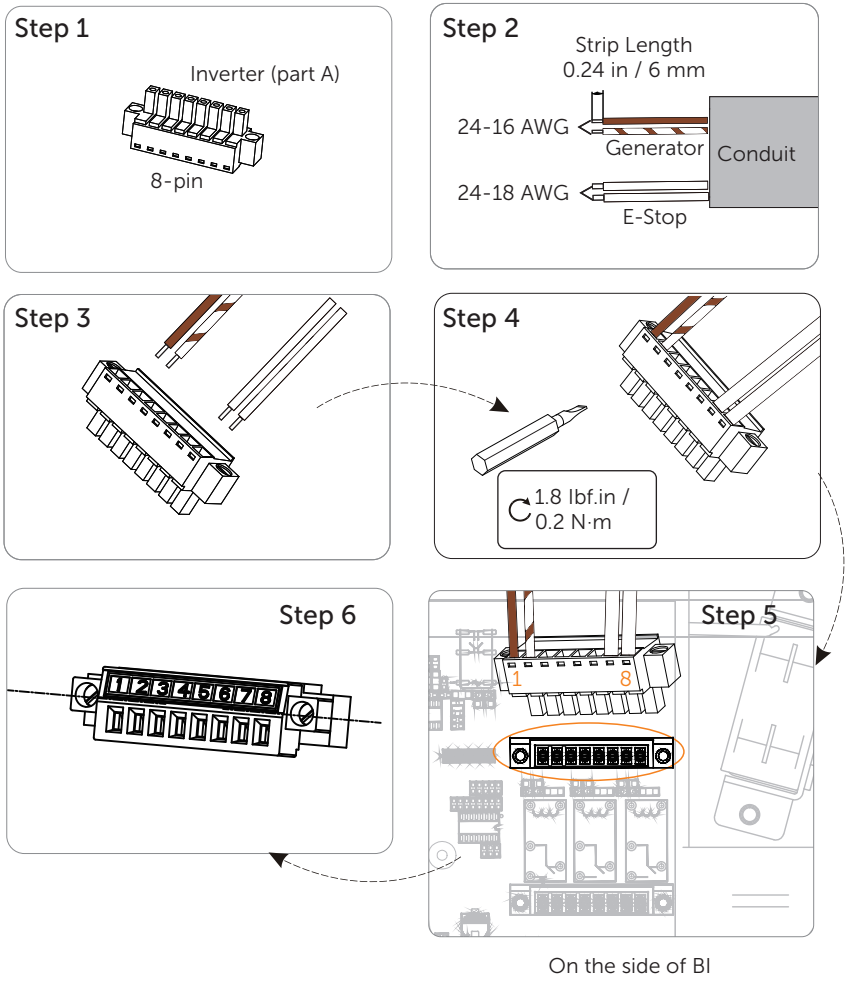
7.3.6 Connect Generator and Emergency Stop Conductors to BI

- AC cable of generator





- Communication cable of generator and Emergency stop



On the side of BI

7.3.7 Connect CT to BI

A set of CTs (CT L1A, CT L2A, 200A) has been built in the BI. In some application scenarios, it can measure both load and generation and there is no need to connect external CTs. But in some application scenarios, such as Partial-Home Backup solution, connecting external CTs (CT L1B, CT L2B) to measure total current both load and generation is needed. In addition, if the site includes solar equipment, a solar CT is placed after the solar inverter to measure the solar output.

CT L1A terminal and CT L1B terminal have been connected in parallel on PCB. CT L1A and CT L1B are used to measure total current both load and generation of the same phase L1.

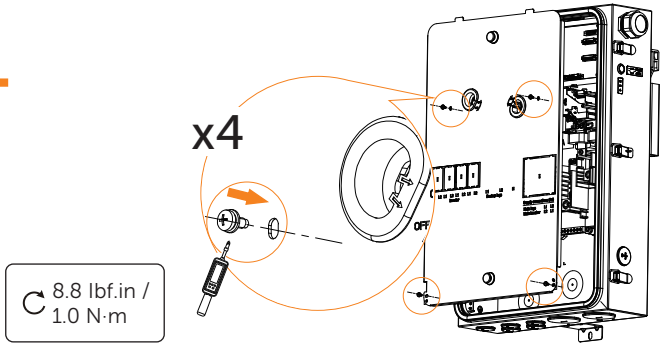
CT L2A terminal and CT L2B terminal have been connected in parallel on PCB. CT L2A and CT L2B are used to measure total current both load and generation of the same phase L2.

NOTICE!

- For detailed information about how to configure external CT, please refer to "BI CT configuration for A1-ESS-G2".

Lock the dead front and close the door.

1



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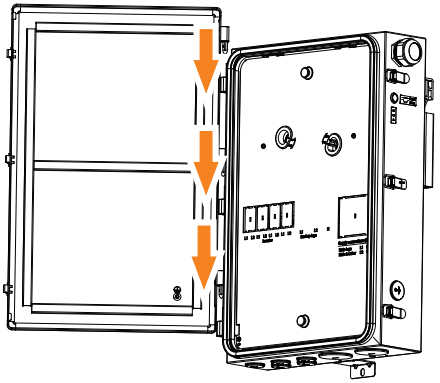
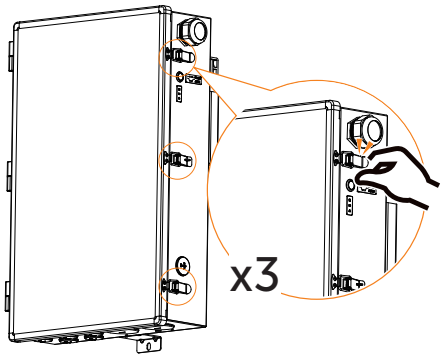


3



Warranty Registration Form

For Customer (Compulsory)

Name _____ Country _____

Phone Number _____ Email _____

Address _____

State _____ Zip Code _____

Product Serial Number _____

Date of Commissioning _____

Installation Company Name _____

Installer Name _____ Electrician License No. _____

For Installer

Module (If Any)

Module Brand _____

Module Size(W) _____

Number of String _____ Number of Panel Per String _____

Battery (If Any)

Battery Type _____

Brand _____

Number of Battery Attached _____

Date of Delivery _____ Signature_____

Please visit our warranty website: https://www.solaxcloud.com/#/warranty or use your mobile phone to scan the QR code to complete the online warranty registration.

For more detailed warranty terms, please visit SolaX official website: www.solaxpower.com to check it.

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