X1-HYB-LV

3.0 kW / 3.6 kW / 3.7 kW
4.0 kW / 5.0 kW / 6.0 kW

Installation Manual

Version 8.0

www.solaxpower.com

eManual in the QR code or
athttp://kb.solaxpower.com/

Table of Contents

Safety

General Notice

1. Contents may be periodically updated or revised. SolaX reserves the right to make improvements or changes in the product(s) and the program(s) described in this manual without the prior notice.
2. The installation, maintenance and grid-related setting can only be performed by qualified personnel who:
   - Are licensed and/or satisfy state and local jurisdiction regulations;
   - Have good knowledge of this manual and other related documents.
3. Before installing the device, carefully read, fully understand and strictly follow the detailed instruction of the user manual and other related regulations. SolaX shall not be liable for any consequences caused by the violation of the storage, transportation, installation, and operation regulations specified in this document and the user manual.
4. Use insulated tools when installing the device. Individual protective tools must be worn during installation, electrical connection and maintenance.
5. Please visit the website www.solaxpower.com of SolaX for more information.

Descriptions of Labels

	CE mark of conformity		TUV certification
	Additional grounding point		Caution, hot surface
	Caution, risk of electric shock		Caution, risk of danger
	Read the enclosed documentations		Do not dispose of the inverter together with household waste.
	Do not operate this inverter until it is isolated from mains and on-site PV generation suppliers.		
	Danger of high voltage. Do not touch live parts for 5 minutes after disconnection from the power sources.		

DANGER!

Lethal danger from electrical shock due to the inverter

- Only operate the inverter when it is technically faultless. Otherwise, electric shock or fire may occur.
- Do not open the enclosure in any case without authorization from SolaX. Unauthorized opening will void the warranty and cause lethal danger or serious injury due to electric shock.

DANGER!

Lethal danger from electrical shock due to the PV

- When exposed to sunlight, high DC voltage will be generated by PV modules. Death or lethal injuries will occur due to electric shock.
- Never touch the positive or negative pole of PV connecting device. Touching both of them at the same time is prohibited as well.
- Do not ground the positive or negative pole of the PV modules.
- Only qualified personnel can perform the wiring of the PV panels.

WARNING!

Risk of personnel injury or inverter damage

- During operation, do not touch any parts other than DC switch and LCD panel of the inverter.
- Never connect or disconnect the AC and DC connectors when the inverter is running.
- Turn off the AC and DC power and disconnect them from the inverter, wait for 5 minutes to fully discharge the voltage before attempting any maintenance, cleaning or working on any circuits connected.
- Make sure that the input DC voltage ≤ Maximum DC input voltage of the inverter. Overvoltage may cause permanent damage to the inverter, which is NOT covered by the warranty.

WARNING!

- SolaX assumes no responsibility for any problems arising from the use of third-party lithium batteries connected as lead-acid batteries.
- Prohibit the use of SolaX lithium battery in Lead-acid mode. Any consequences arising from the use of lead-acid mode shall be borne by users themselves, and SolaX will not provide warranty!

CAUTION!

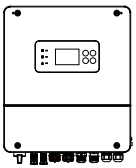
- Keep children away from the inverter.
- Pay attention to the weight of the inverter. Personal injuries may be caused if not handled properly.

NOTICE!

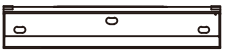
- The inverter has an integrated Type-B Residual Current Monitoring Unit (RCMU). If an external Residual Current Device (RCD) is required by local regulations, verify the type of RCD required. It is recommended to use a Type-A RCD with a rating of 300 mA.
- All the product labels and nameplate on the inverter shall be maintained clearly visible.

Installation

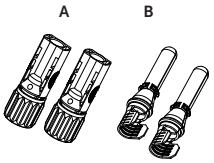
Packing List



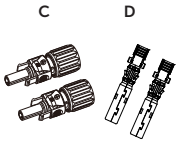
Inverter



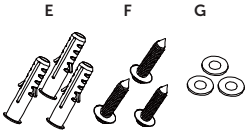
Bracket



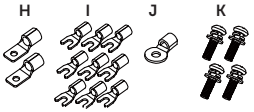
Negative PV connectors
Negative PV pin contacts



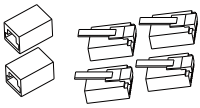
Positive PV connectors
Positive PV pin contacts



Expansion tubes
Self-tapping screws
Washers

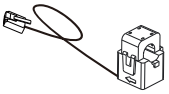


Battery connection terminals
Y terminals
OT terminal
M4*12 Screws

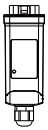


RJ45 connectors
RJ45 terminals

Document



CT



Dongle (Optional)

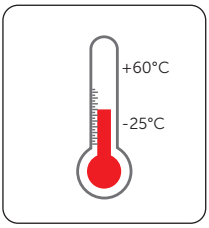
Item	Description	Quantity
/	Inverter	1 pc
/	Wall mounting bracket	1 pc
A	Negative PV connectors	2 pcs
B	Negative PV pin contacts	2 pcs
C	Positive PV connectors	2 pcs
D	Positive PV contacts	2 pcs

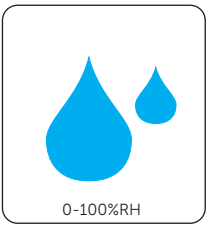
Item	Description	Quantity
E	Expansion tubes	3 pcs
F	Self-tapping screws	3 pcs
G	Washers	3 pcs
H	Battery connection terminals	2 pcs
I	Y terminals	9 pcs
J	OT terminal	1 pc
K	M4*12 Screws	4 pcs
L	RJ45 connectors	2 pcs
M	RJ45 terminals	4 pcs
N	Document	/
O	CT	1 pc
/	Dongle (Optional)	1 pc

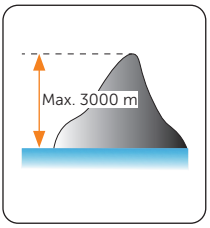
NOTICE!

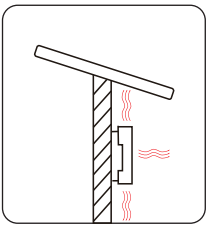
- Please refer to the actual delivery for the optional accessories.
- The figures of packing list take X1-HYB-3.0-LV inverter as an example.

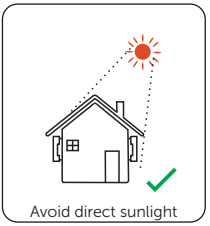
Installation Site

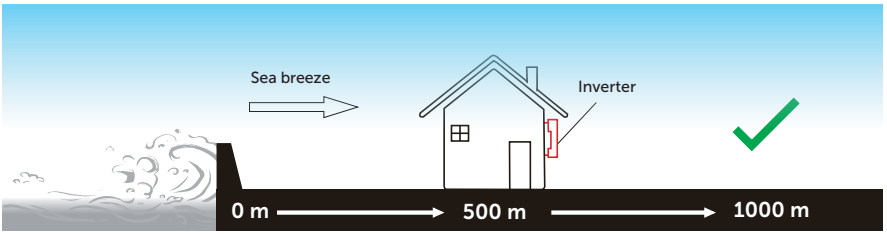


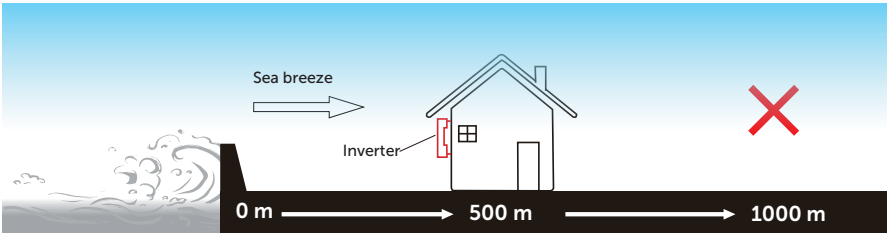








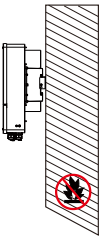




NOTICE!

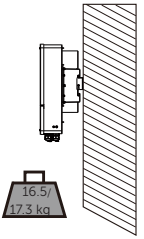
- For outdoor installation, precautions against direct sunlight, rain exposure and snow accumulation are recommended.
- Exposure to direct sunlight raises the temperature inside the device. This temperature rise poses no safety risks, but may impact the device performance.

Installation Carrier

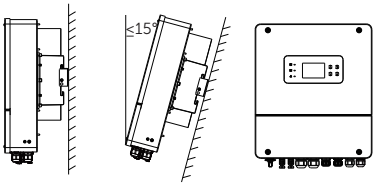


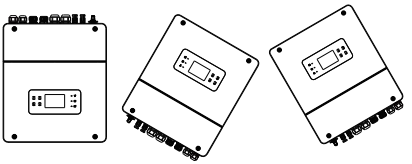
Fire resistant

Be suitable for the dimension (397x 490x 201 mm) and weight (16.5 kg for 3.0 kW to 4.0 kW, 17.3 kg for 5.0 kW to 6.0 kW) of the inverter

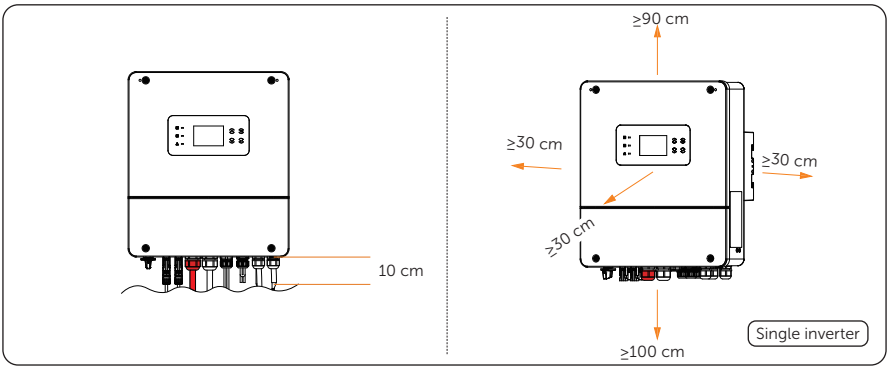


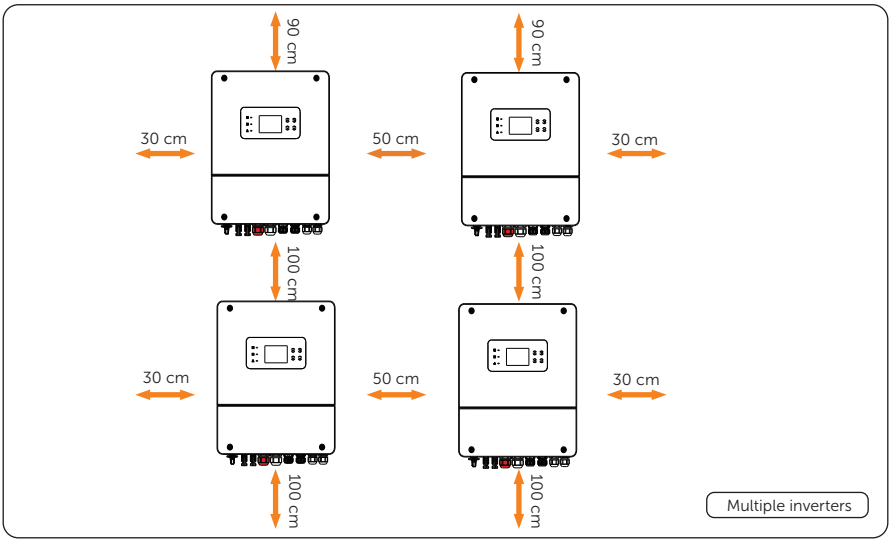
Installation Angle





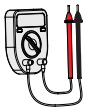
Installation Space

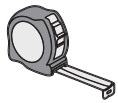




Installation Tools

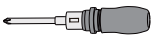

Hammer drill


Multimeter

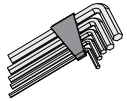

Measuring tape

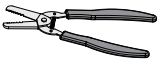

Utility knife


Marker

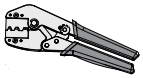

Cross screwdriver

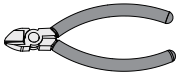

Flat-head screwdriver

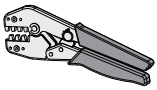

Allen key


Wire stripper

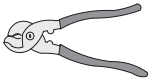

Crimping tool for RJ45

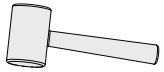

Crimping tool for PV terminals

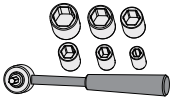

Diagonal pliers


Crimping tool

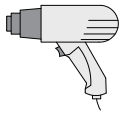

Crimping tool for ferrules


Wire cutter


Rubber mallet


Torque wrench


Spirit level

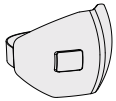

Heat gun


Φ6 mm Hear shrink tubing


Safety gloves


Safety boots


Safety goggles


Anti-dust mask

Additionally Required Materials

No.	Required Material	Type	Conductor Cross-section
1	PV cable	Dedicated PV wire withstand voltage 600 V	4 mm^2
2	Communication cable	Network cable CAT5	0.2 mm^2
3	Additional PE cable	Conventional yellow and green wire	4 mm^2-10 mm^2
4	Battery power cable	Conventional copper wire	16-25 mm^2 or 35-50 mm^2

- Grid cable and micro-breaker recommended:

Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
Cable (copper)	4-6 mm^2	6-8 mm^2	6-8 mm^2	6-8 mm^2	8-10 mm^2	8-10 mm^2
Micro-Breaker	32 A	40 A	40 A	40 A	50 A	50 A

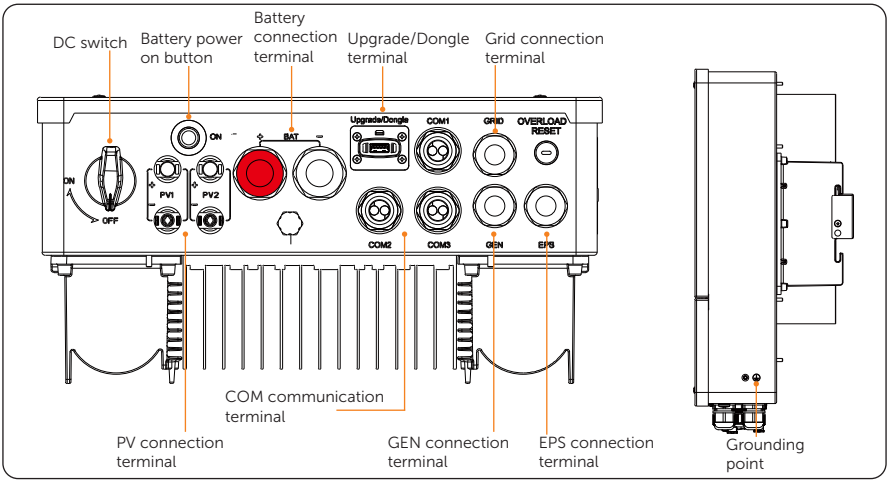
- EPS cable and micro-breaker recommended:

Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
Cable (copper)	3-4 mm^2	3-4 mm^2	3-4 mm^2	3-4 mm^2	4-6 mm^2	6-8 mm^2
Micro-Breaker	25 A	25 A	25 A	25 A	32 A	40 A

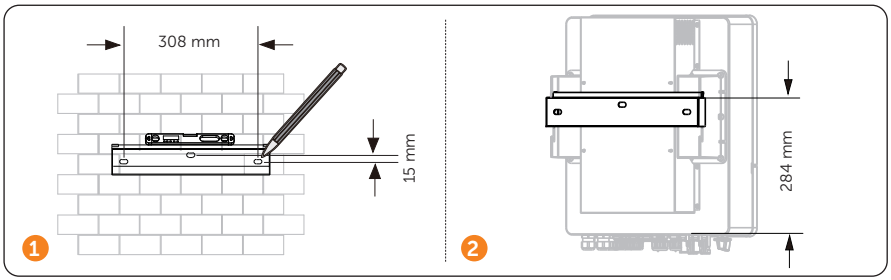
- GEN cable and micro-breaker recommended:

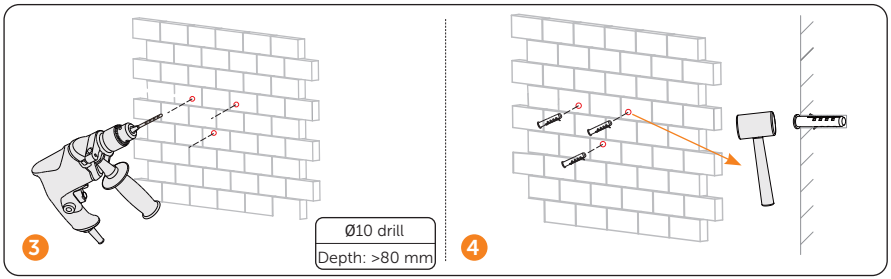
Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
Cable (copper)	3-4 mm^2	3-4 mm^2	3-4 mm^2	3-4 mm^2	4-6 mm^2	6-8 mm^2
Micro-Breaker	25 A	25 A	25 A	25 A	32 A	40 A

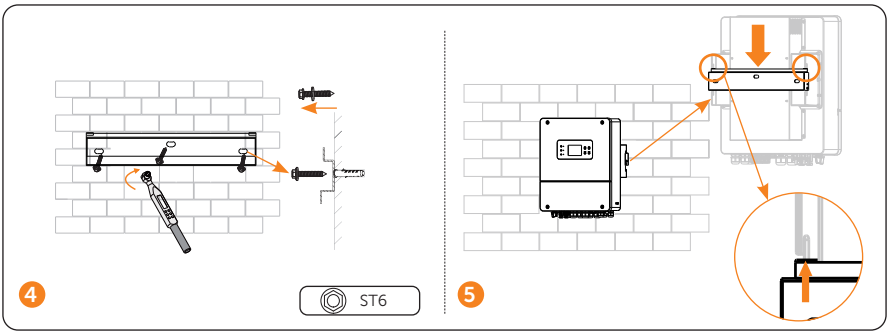
Terminals and Parts of Inverter

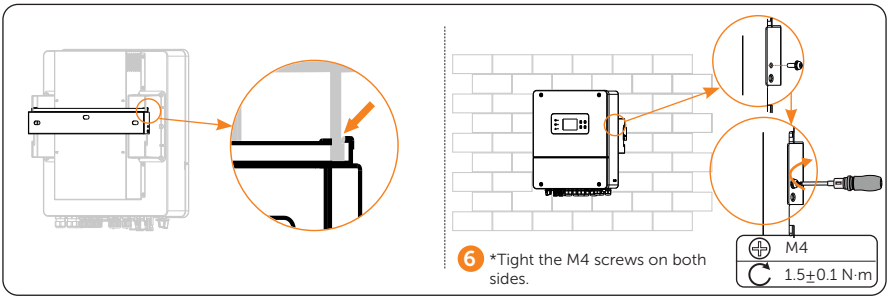


Mechanical Installation

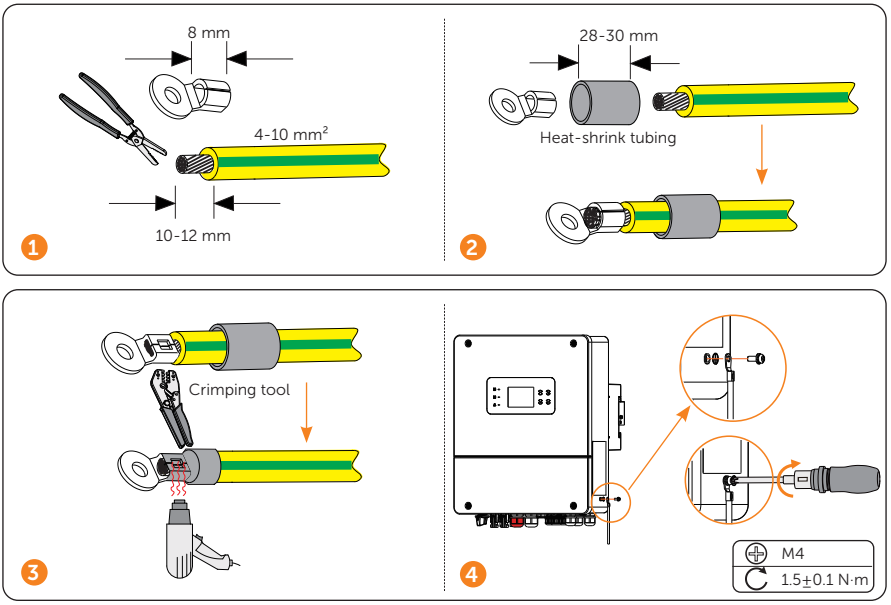








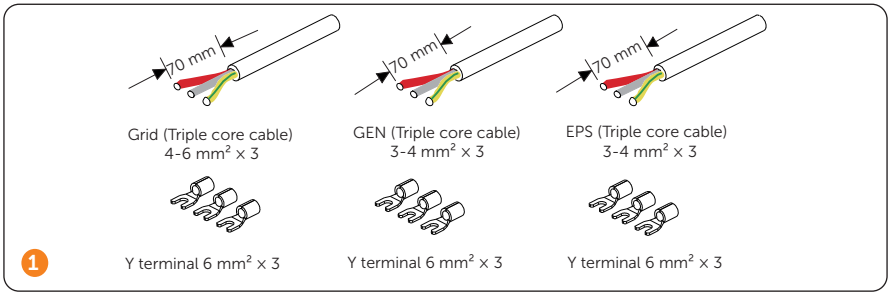
PE Connection



- PE cable recommended:

Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
PE cable	4-6 mm²	6-8 mm²	6-8 mm²	6-8 mm²	8-10 mm²	8-10 mm²

GRID, EPS and GEN Connection

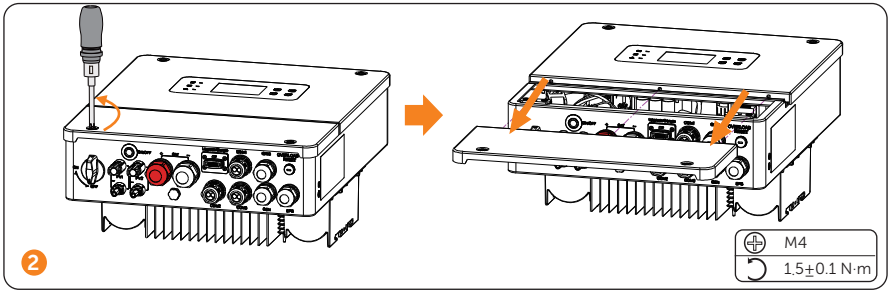


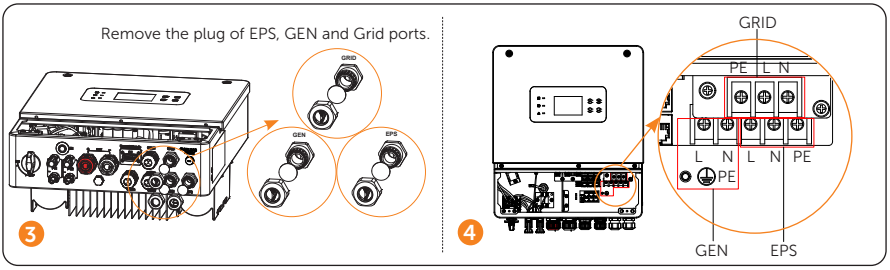
* Please refer to the table in **Additionally Required Materials** to view the recommended wire sizes for GRID, EPS, and GEN.

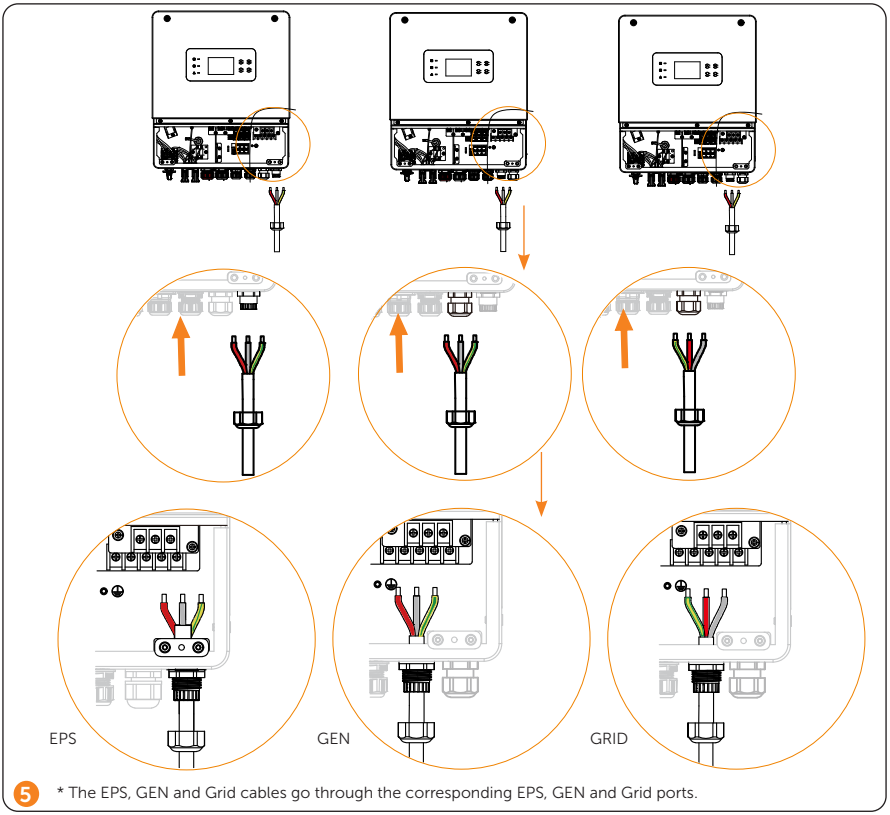
* It is recommended to use copper wire. Non-triple or non-dual core cables shall be sealed with glue or fireproof mud.

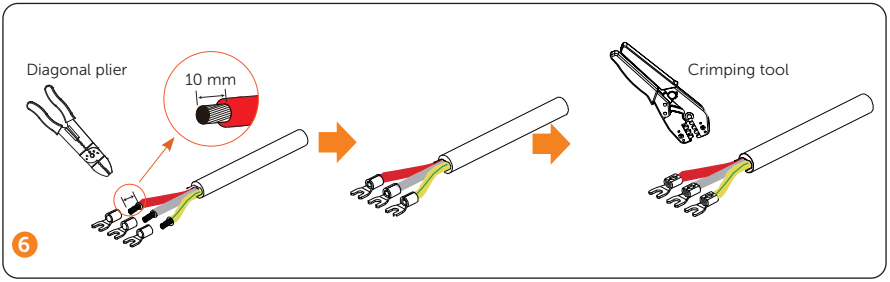
* When using wire sizes of 6 mm² and above, only 2-core wires can be used because the 3-core wire cannot pass through the waterproof terminal. In the case of using 2-core wire, the PE wire should only be connected to the inverter shell and does not need to be connected to the internal terminals.

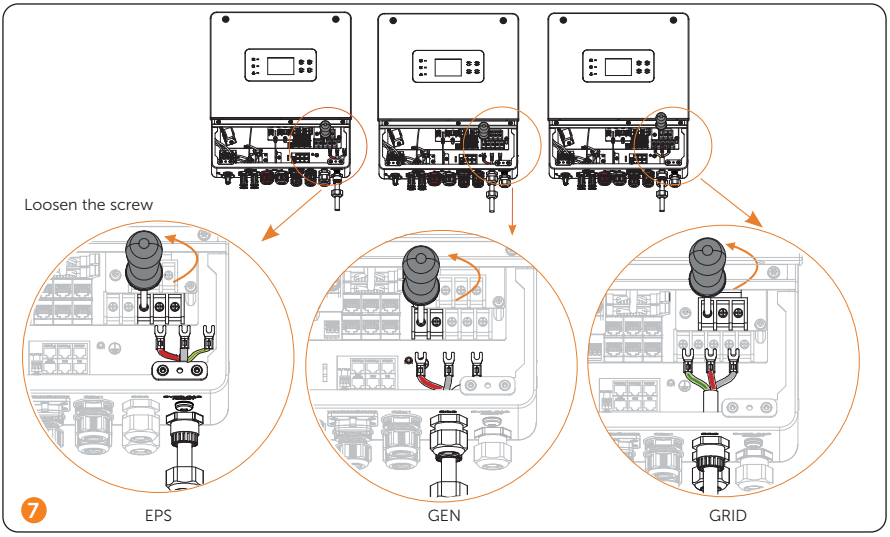
* All connection diagrams provided here are based on the use of a 3-core wire, with X1-HYB-3.0-LV serving as an example.

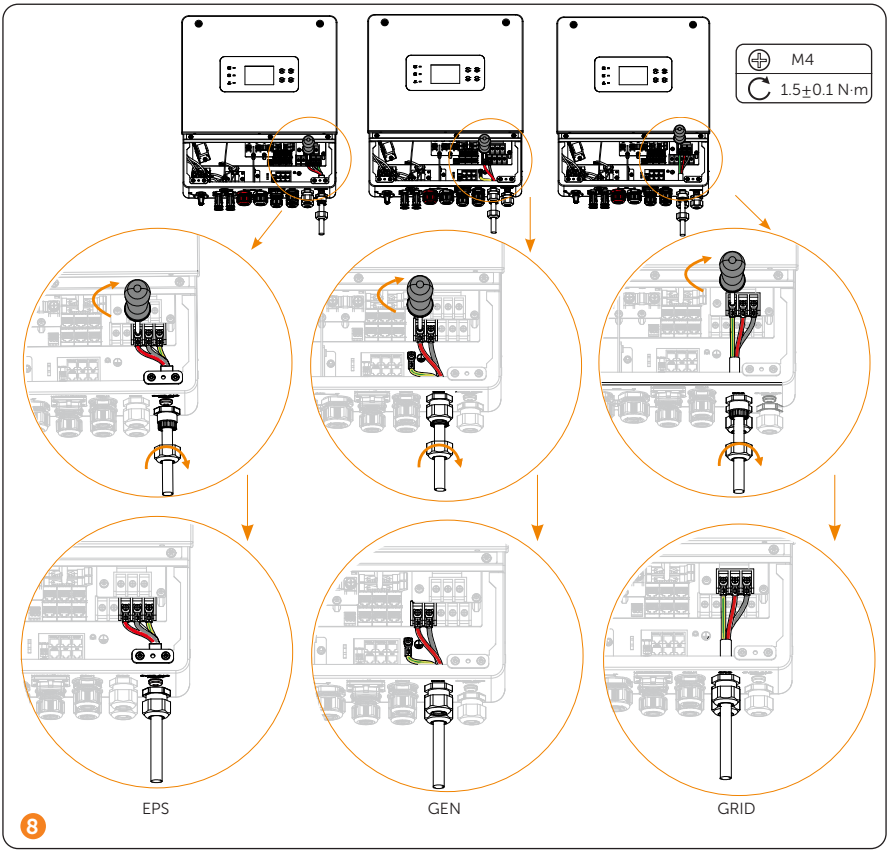



Remove the plug of EPS, GEN and Grid ports.
GRID
GEN
EPS
3
4
GRID
PE L N
L N L N PE
PE
GEN
EPS

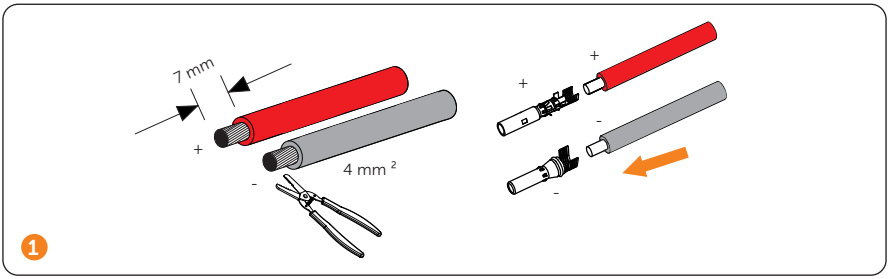

EPS
GEN
GRID
5
* The EPS, GEN and Grid cables go through the corresponding EPS, GEN and Grid ports.

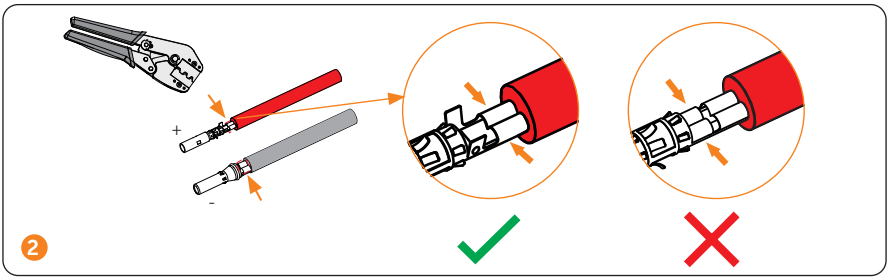

Diagonal plier
10 mm
Crimping tool
6

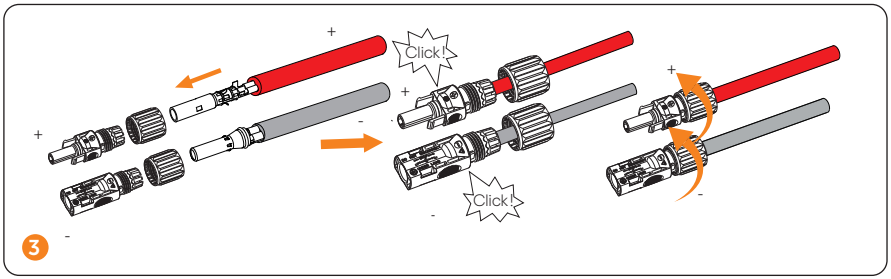

Loosen the screw
7
EPS
GEN
GRID

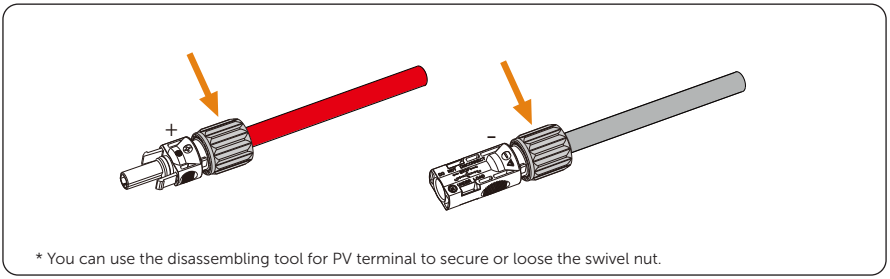

M4
1.5±0.1 N·m
8
EPS
GEN
GRID

PV Connection

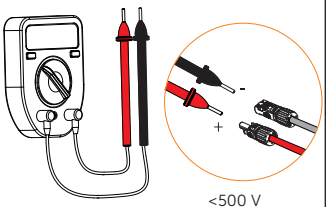




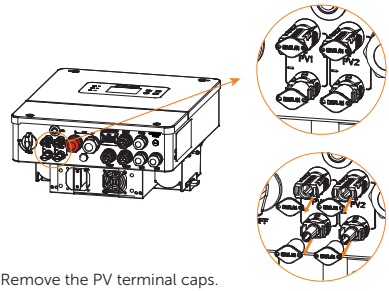




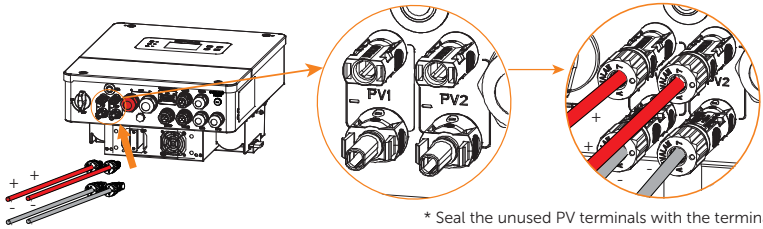
* You can use the disassembling tool for PV terminal to secure or loose the swivel nut.



3



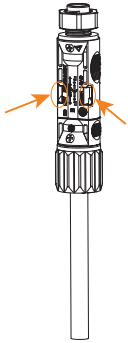
4 Remove the PV terminal caps.



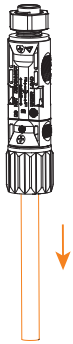
5

* Seal the unused PV terminals with the terminal caps.

- Disassembling the PV cables

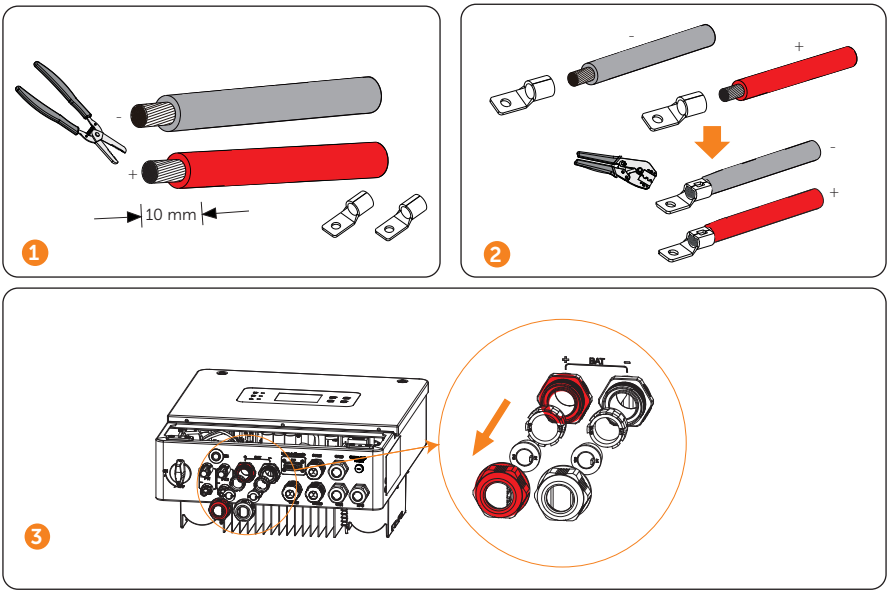


1 Use the disassembling tool to snap the two tabs inside the PV terminal to disassemble it.



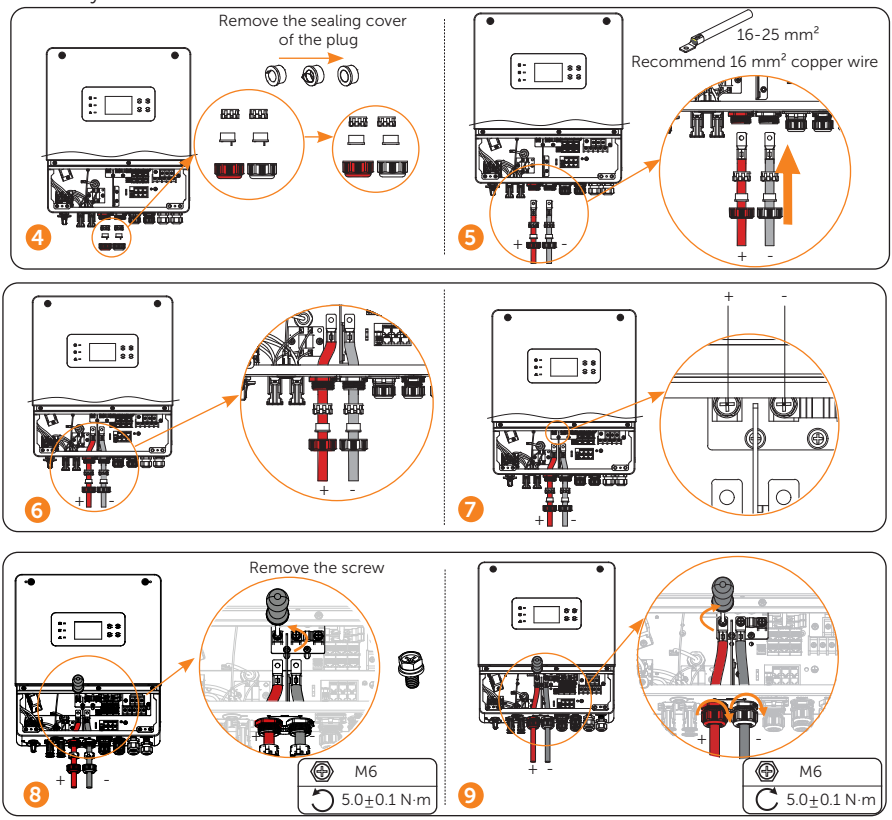
2 Remove the PV cable, and slightly pull it out.

Battery Connection

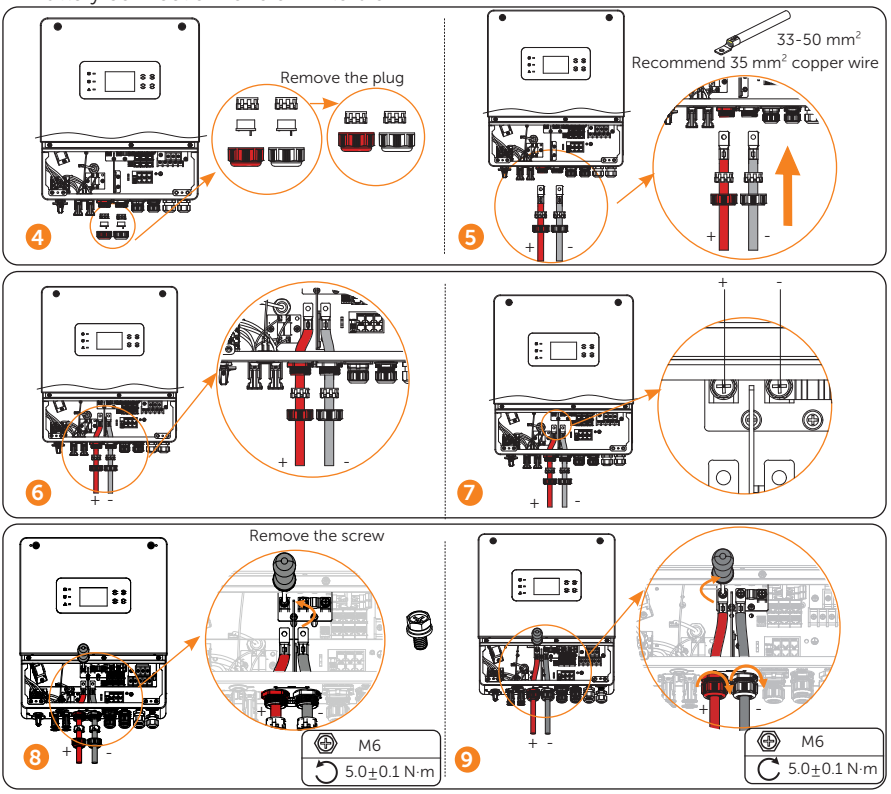


* If only the battery is connected and the PV, GRID, and GEN are not connected, press and hold the battery power button until the screen turns on to start the inverter.

- Battery connection for 3.0 kW to 4.0 kW

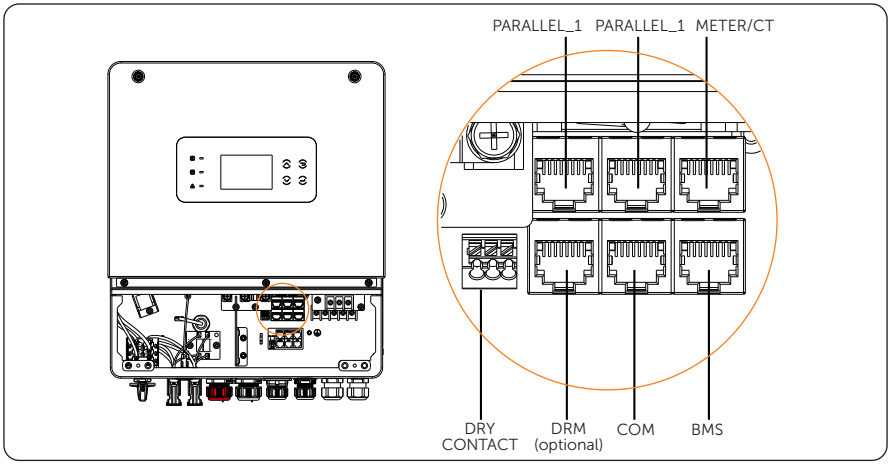


- Battery connection for 5.0 kW to 6.0 kW



Communication Connection

Communication ports diagram



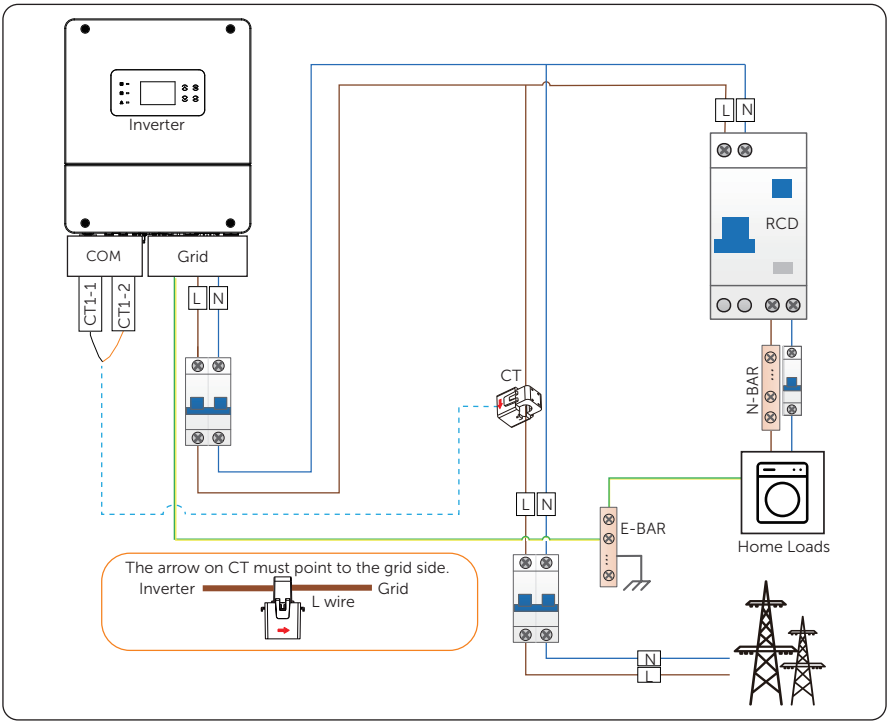
COM port assignment

Port	PIN	PIN Definition	Port	PIN	PIN Definition
PARALLEL_1	1	/	PARALLEL_2	1	/
	2	/		2	/
	3	/		3	/
	4	CAN_H		4	CAN_H
	5	CAN_L		5	CAN_L
	6	GND		6	GND
	7	SYNC_1		7	SYNC_1
	8	SYNC_2		8	SYNC_2
Meter/CT	1	CT1-1	DRY CONTACT	1	DO_1
	2	/		2	/
	3	/		3	DO_2
	4	RS485_A		/	/
	5	RS485_B		/	/
	6	/		/	/
	7	/		/	/
	8	CT1-2		/	/
DRM (optional)	1	DRM1/5	COM	1	DI_1
	2	DRM2/6		2	DI_2
	3	DRM3/7		3	/
	4	DRM4/8		4	RS485_A
	5	RG/0		5	RS485_B
	6	CL/0		6	GND
	7	/		7	/
	8	/		8	/

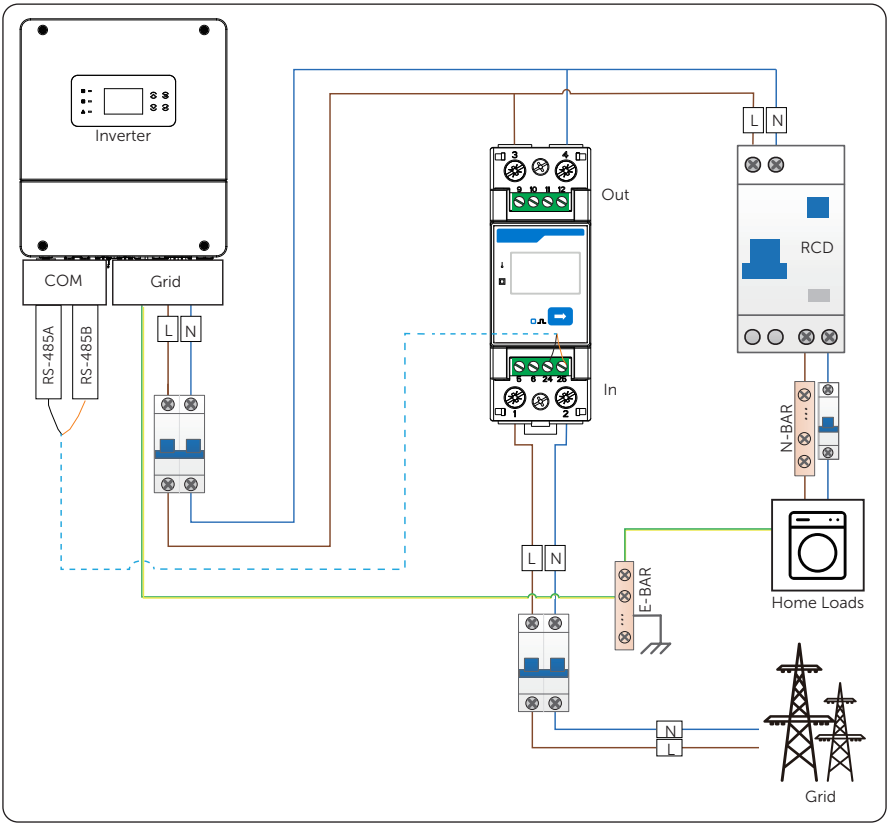
Port	PIN	PIN Definition	Port	PIN	PIN Definition
BMS	1	BMS_485B			
	2	BMS_485A			
	3	GND			
	4	BMS_CANH			
	5	BMS_CANL			
	6	/			
	7	WAKEUP			
	8	BAT_TEMP			

1. CT/Meter connection

- CT connection diagram

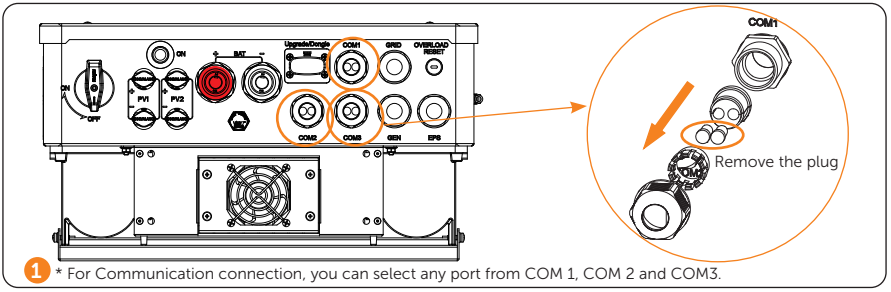


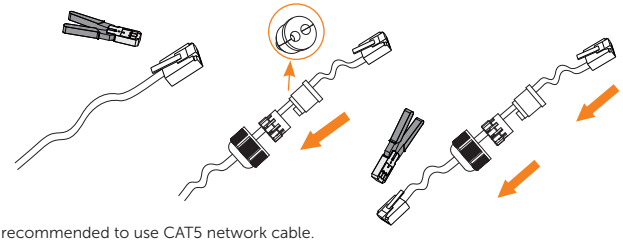
- Meter connection diagram



* If two meters were to be connected in the system,the communication cables of the meters should be connected in parallel, i.e. 485A & 485A, 485B & 485B.
* Only one of the Meter and CT connections can be selected. Meter cable goes to pin terminal 4 and 5; CT cable goes to pin terminal 1 and 8; reserve CT cable goes to pin terminal 3 and 6.

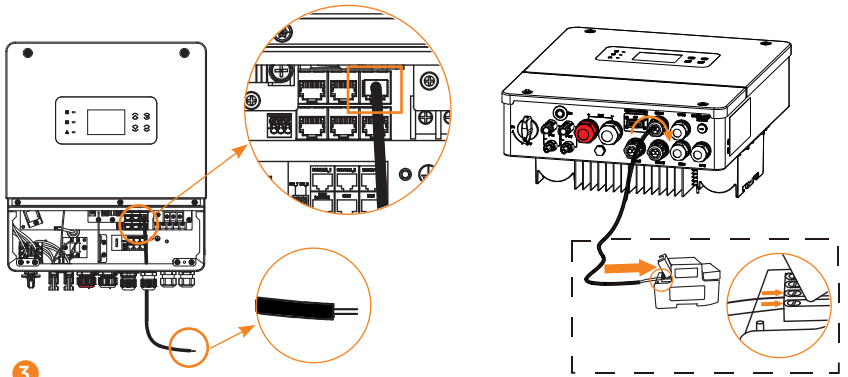
- CT/Meter connection steps





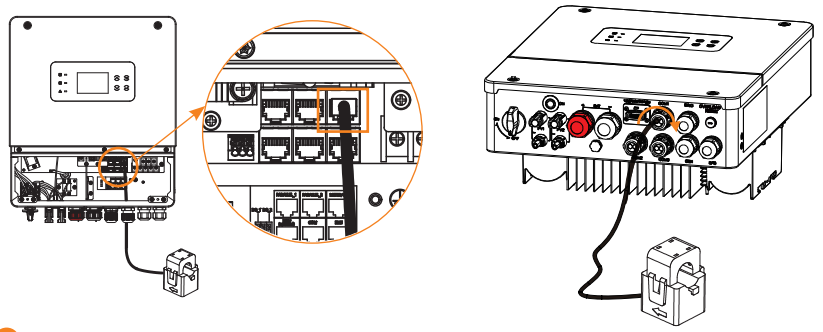
* It is recommended to use CAT5 network cable.
* For Meter connection, crimp only one RJ45 terminal.
* For CT connection without RJ45 connector, there is no need to crimp another RJ45 terminal.
* For CT connection with RJ45 connector, crimp two RJ45 terminals.

- Meter connection

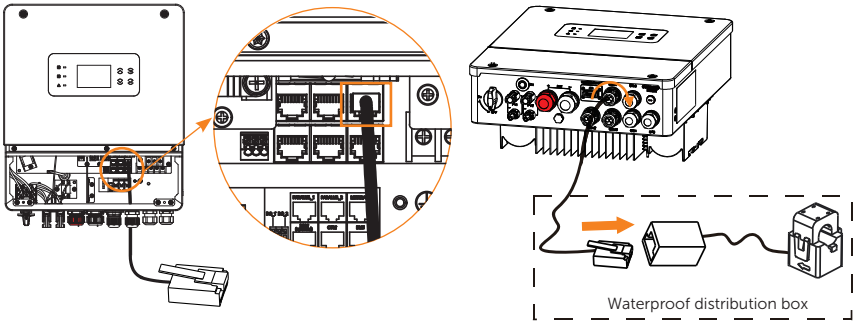


Waterproof distribution box

- CT connection

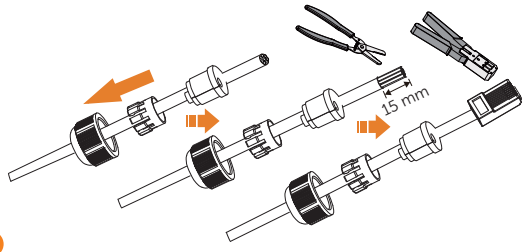


CT connection without RJ45 connector

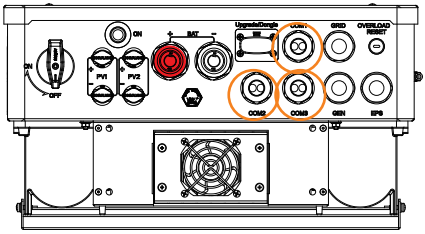


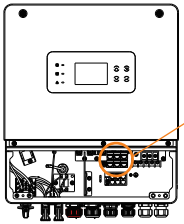
3 CT connection with RJ45 connector

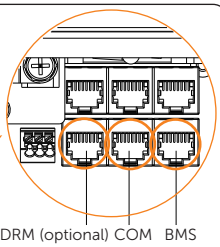
2. BMS/DRM/COM/Parallel port connection



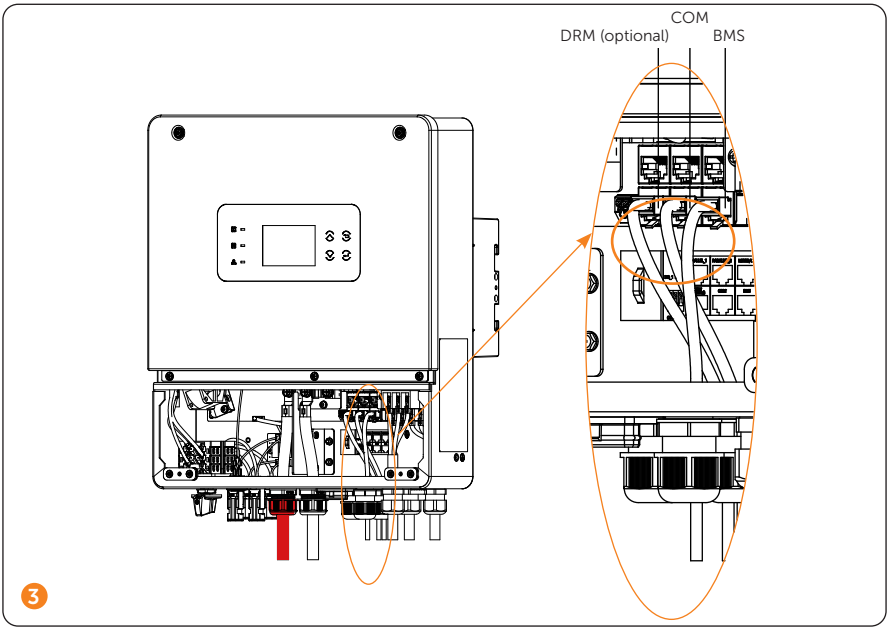
1) White with orange stripes
2) Orange
3) White with green stripes
4) Blue
5) White with blue stripes
6) Green
7) White with brown stripes
8) Brown

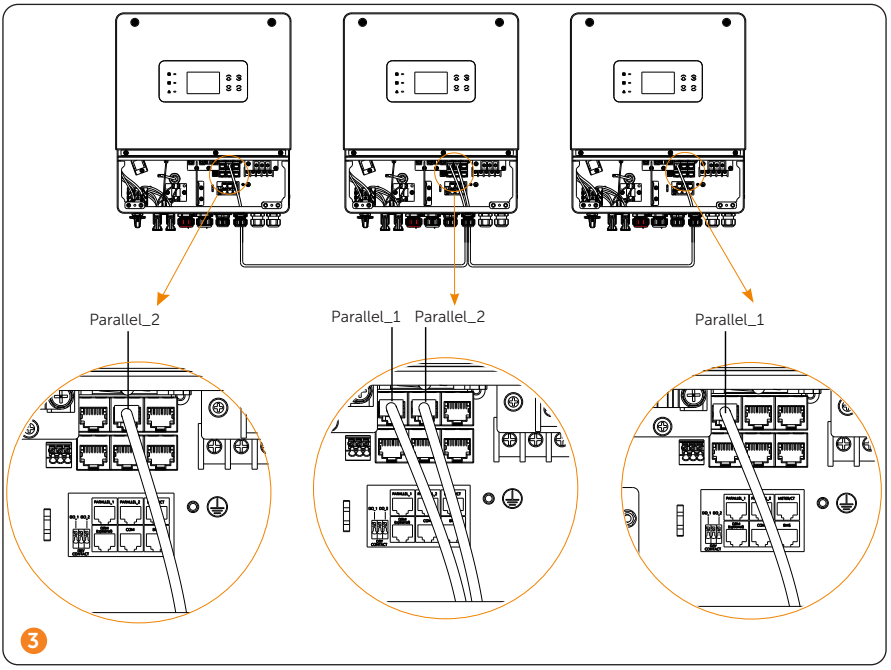






2 * For Communication connection, you can select any port from COM 1, COM 2 and COM3.

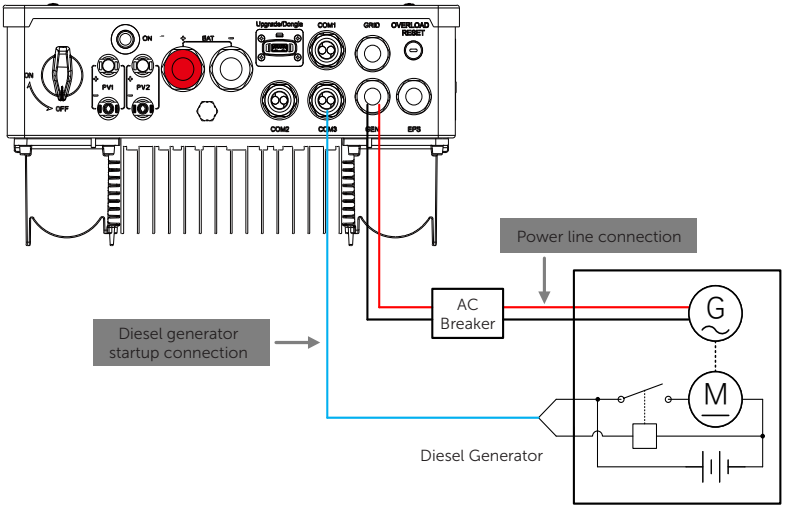




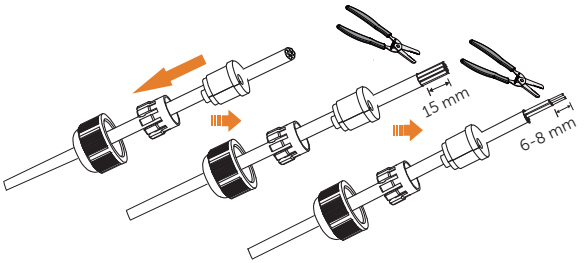
* In parallel operation, if there are PV modules, the master inverter must be connected to the PV modules.

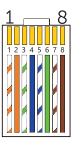
3. Dry-contact output connection

- Dry-contact output connection diagram



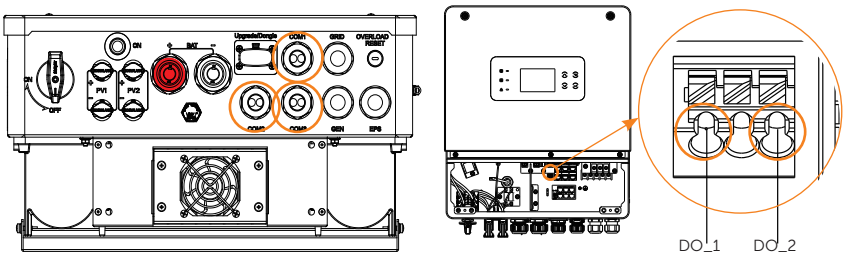
- Dry-contact output connection steps



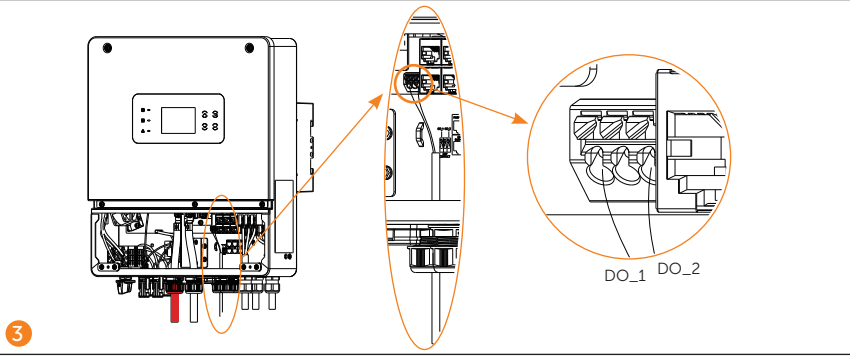


1) White with orange stripes
2) Orange
3) White with green stripes
4) Blue
5) White with blue stripes
6) Green
7) White with brown stripes
8) Brown

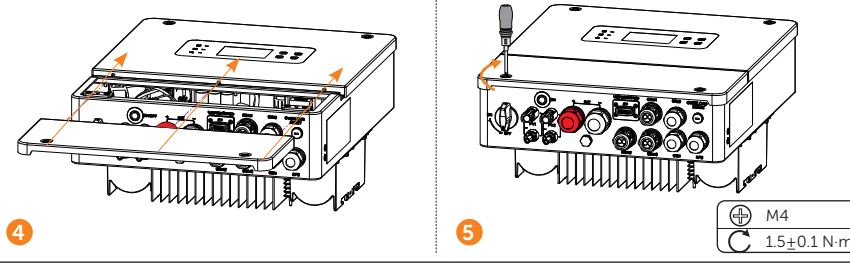
* It is recommended to use CAT5 network cable.
* For dry-contact output connection, you can select any two cables from the following four groups: white with orange stripes, Orange; white with green stripes, blue; white with blue stripes, green; white with brown stripes, brown.



2 * For Communication connection, you can select any port from COM 1, COM 2 and COM3.



3

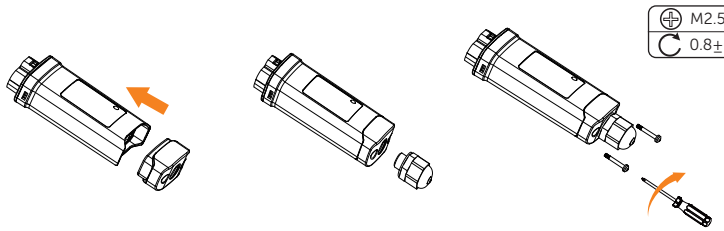


4

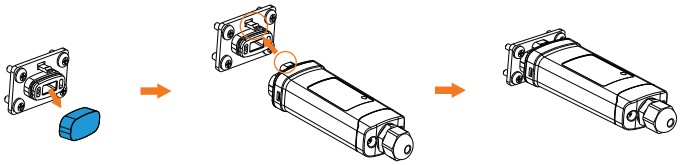
5

Monitoring Connection

WiFi Mode:

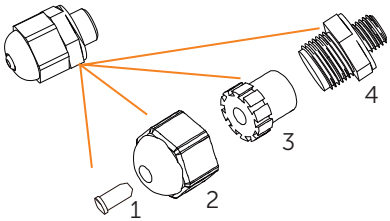


1

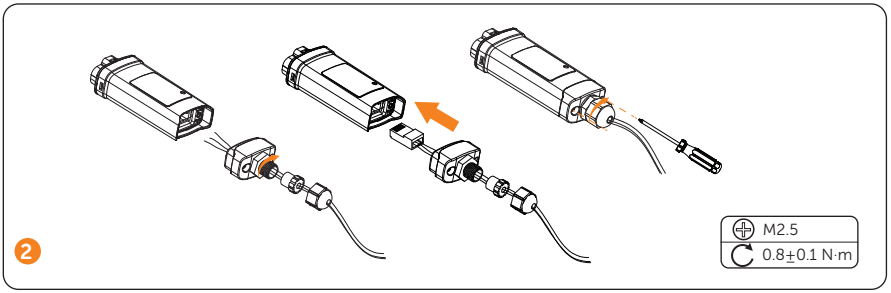


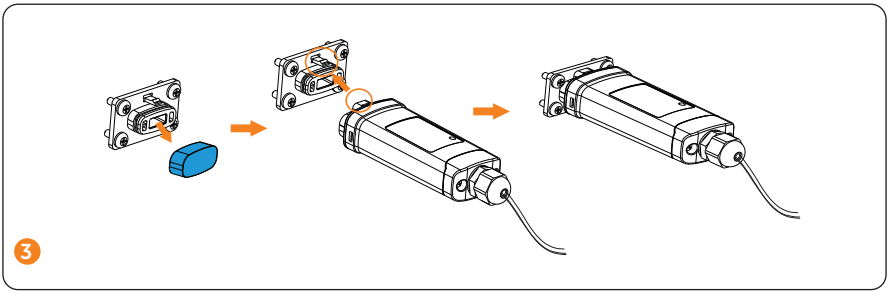
2

LAN Mode:

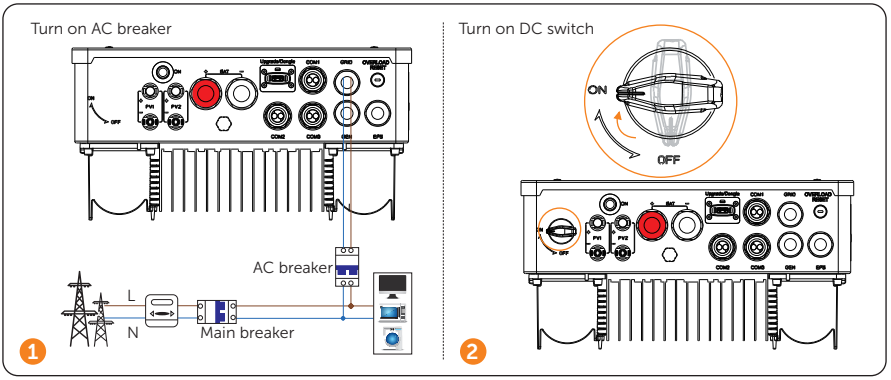


1 Disassemble the waterproof connector into components 1, 2 , 3 and 4; Component 1 is not used, keep it in a safe place.

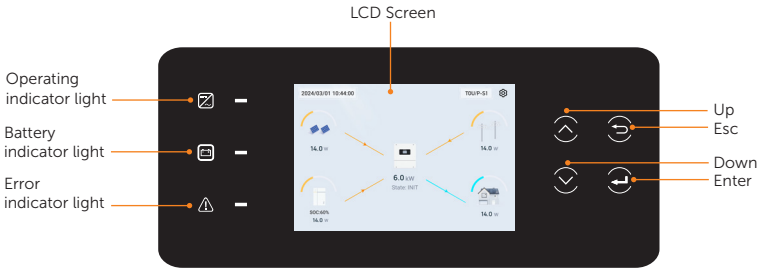




Power on the System



LCD Panel



- In a normal state, the **PV**, **Inverter**, **Load**, **Grid** and **Battery** information will be displayed. You can touch the screen to check information.
- In an error state, the error message will be displayed, please refer to corresponding solutions in the user manual.

LED indicator	Status		Definition
Operating		Light on	The inverter is in grid-connected operation state or off-grid operation state.
		Blinking	The inverter is in the process of grid connection or off-grid.
		OFF	The inverter is in a fault or manual shutdown state.
Battery		Light on	The battery is online and the voltage is normal.
		OFF	Low battery voltage or no battery.
Error		Light on	The inverter is in a fault state, stop running.
		Blinking	The inverter has an alarm massage.
		OFF	The inverter has no faults or alarms.

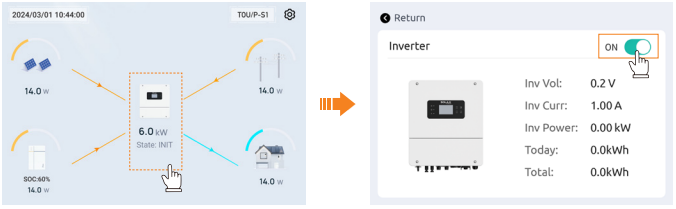
NOTICE!

- While upgrading, the green, blue and red indicator lights will flash in turns, indicating that the upgrade is in progress.

General Setting

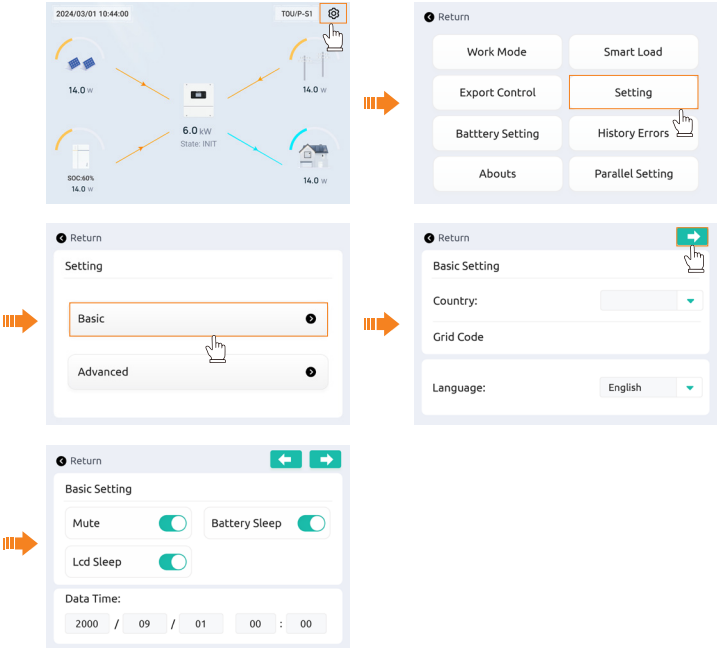
1 System ON/OFF

Set the Power ON/OFF. Tap the icon of inverter, then enable or disable the button to power on/off the inverter.



2 Set the basic settings including country, grid code, language and system date&time.

When Country is set to Pakistan, Workmode is different from other countries.



* The default password for Advanced Setting is "2 0 1 4" which should be changed for the consideration of account security.

SolaXCloud Download

Scan the QR code to download SolaXCloud App. Follow the tutorial on the SolaXCloud APP or the App guide at https://www.solaxcloud.com/ to set the WiFi configuration.

Technical Data

- DC input

Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
Max. PV array power [Wp]	4500	5400	5500	6000	7500	9000
Max. recommended PV array power [Wp]	6000	7200	7360	8000	10000	12000
Max. PV Voltage [d.c.V]	550					
Start output voltage [V]	110					
Nominal input voltage [V]	360					
MPPT voltage range [d.c.V]	80 ~ 520					
No. of MPPT/Strings per MPPT	2 / (1/1)					
Max. input current per MPPT(MPPT1/2) [d.c.A]	16/16					
Max. input short circuit current per MPPT(MPPT1/2) [d.c.A]	20/20					
Max. inverter backfeed current to the array [d.c. A]	0					

- AC output/ input

Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
Nominal AC Output Current [A]	13	15.7	16	17.4	21.7	26.1
Rated AC Output Power [VA]	3000	3600	3680	4000	5000	6000
Max. AC Output Apparent Power [VA]	3300	3600	3680	4400	5000	6000
Max. AC Output Continuous Current [a.c.A]	15	16	16	20	22.7	27.3
Current (inrush) [a.c. A]	30					
Maximum output fault current [a.c. A]	73.5					
Maximum output overcurrent protection [a.c. A]	94					
Max. AC Input Apparent Power [VA]	6000	7200	7360	8000	9200	9200
Max. AC Input Current [A]	26.1	31.3	32	34.8	40	40
Nominal AC voltage [a.c.V], frequency [Hz]	220/230/240, 50/60					
Displacement power factor	0.8 leading ~ 0.8 lagging					
THDi (rated power) [%]	<3					
AC Connection	L/N/PE					

- EPS output

Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
Nominal output power [W]	3000	3600	3680	4000	5000	6000
Peak apparent power [VA]	2 times the rated power, 10s					
Nominal Output Current [A]	13	15.7	16	17.4	21.7	26.1
Nominal EPS Voltage [a.c.V], frequency [Hz]	230, 50/60					
Switch Time [ms]	<4					

- Battery data

Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
Battery type	Lithium/Lead-Acid					
Battery voltage range [d.c.V]	40-60					
Nominal Battery Voltage [V]	48					
Max. Charging Voltage [V]	≤60 (Adjustable)					
Max. Charging/Discharging Current [d.c.A]	75	75	75	75	120	120
Charging Strategy for Li-Ion Battery	Self-adaption to BMS					
Charging Strategy for Lead-Acid Battery	3 stages curve					
Temperature Sensor	Yes					

- System data

Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
MPPT Efficiency	>99.9%					
Max. efficiency [%]	97.6					
Euro. efficiency [%]	97.0					

- Protection device

Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
Anti-Islanding Protection	Yes					
PV String Input Reverse Polarity Protection	Yes					
Insulation Resistor Detection	Yes					
Residual Current Monitoring Unit	Yes					
Output Over Current Protection	Yes					
Output Short Protection	Yes					
Output Over Voltage Protection	Yes					
Surge Protection	AC Type II/DC Type II					
Battery Terminal Temp Protection	Yes					

- Power consumption & Environment limit

Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
Self Consumption(night) [W]	Standby < 40, Shutdown < 10					
Ingress Protection	IP65					
Operating Ambient Temperature Range [°C]	-25 ~ +60 (derating above +45)					
Relative humidity [%]	0 ~ 100 (condensing)					
Max. operation altitude [m]	<3000					
Storage Temperature [%]	-25 ~ +70					
Noise Emission(typical) [dB]	<39	<39	<39	<39	<50	<50

- General data

Model	X1-HYB-3.0-LV	X1-HYB-3.6-LV	X1-HYB-3.7-LV	X1-HYB-4.0-LV	X1-HYB-5.0-LV	X1-HYB-6.0-LV
Dimensions(WxHxD) [mm]	397x490x201 (with connectors) 397x457x201 (without connectors)					
Net weight [kg]	16.5	16.5	16.5	16.5	17.3	17.3
Cooling concept	Natural cooling				Smart cooling	
Topology	Transformerless for PV Side/HF for battery Side					
HMI Interface	LED+LCD					
Active anti-islanding method	Frequency Shift					
Pollution degree	II(Inside), III(Outside)					
Communication interfaces	CAN, RS485, CT, Meter, USB, NTC, Dongle Interface					

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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