X1-Genki

Installation Manual

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Safety

General Notice

1. Contents may be periodically updated or revised. FRONUS 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 and maintenance 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. FRONUS 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.FRONUS.COM of FRONUS for more information.

Descriptions of Labels

	CE mark of conformity		Additional grounding point
	Caution, risk of electric shock		Caution, hot surface
	Read the enclosed documentations		Caution, risk of danger
	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 FRONUS. 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 PV 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.

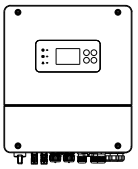
CAUTION!

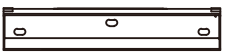
- Keep children away from the inverter.
- Pay attention to the weight of the inverter. Personal injuries may be caused if not handled properly.

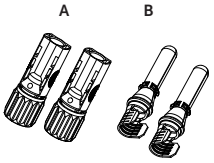
NOTICE!

- If an external RCD is required by local regulations, check which type of RCD is required for relevant electric codes. It is recommended to use a Type-A RCD with the value of 300 mA.
- All the product labels and nameplate on the inverter shall be maintained clearly visible.

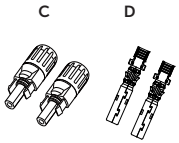
Packing List


Inverter

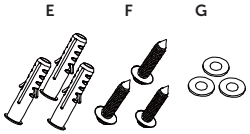

Bracket



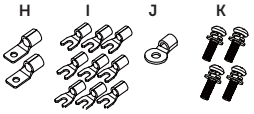
Negative PV connectors
Negative PV pin contacts



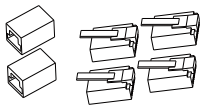
Positive PV connectors
Positive PV pin contacts



Expansion tubes
Self-tapping screws
Washers

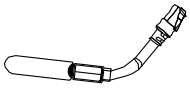


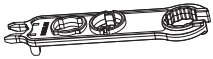
Battery connection terminals
Y terminals
OT terminal
M4*12 Screws

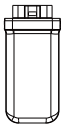


RJ45 connectors
RJ45 terminals

Document


Battery temperature sensor
(Optional)


Disassembling tool for
PV terminal(Optional)

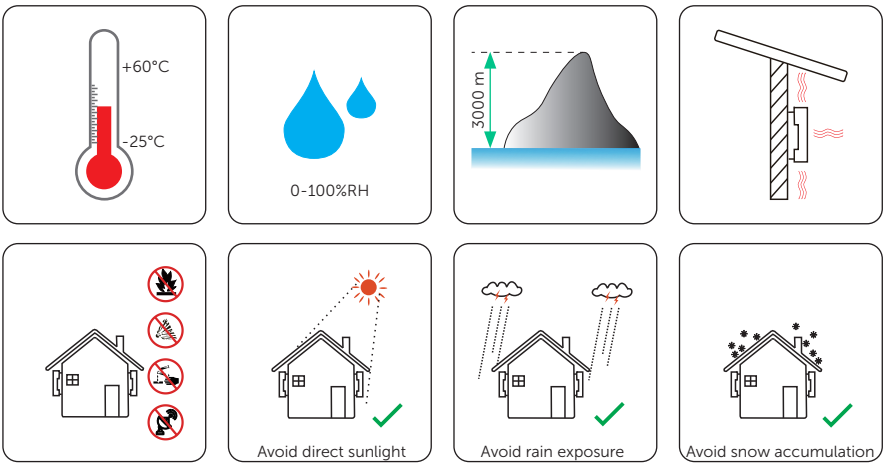

Dongle (Optional)

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
E	Expansion tubes	3 pcs
F	Self-tapping screws	3 pcs

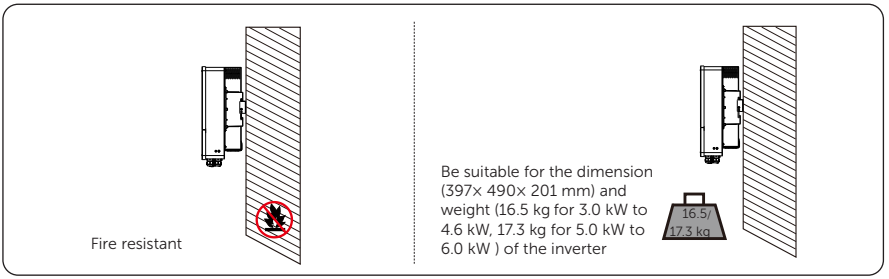
Item	Description	Quantity
G	Washers	3 pcs
H	Battery connection terminals	2 pcs
I	Y terminals	9 pcs
J	OT terminal	1 pc
K	M4*12 Screws	4 pcs
L	RJ45 connectors	2 pcs
M	RJ45 terminals	4 pcs
N	Document	/
/	Battery temperature sensor(Optional)	1 pc
/	Disassembling tool for PV terminal(Optional)	1 pc
/	Dongle (Optional)	1 pc

* Please refer to the actual delivery for the optional accessories.

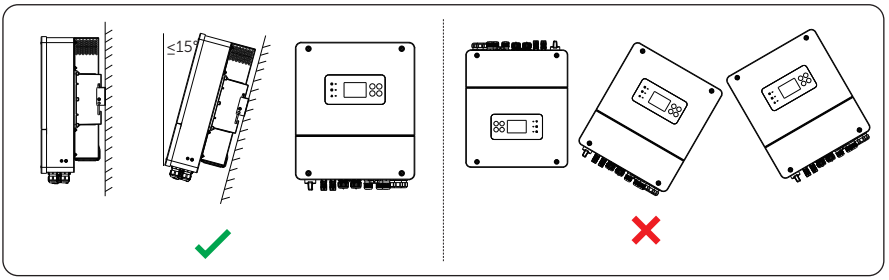
Installation Site



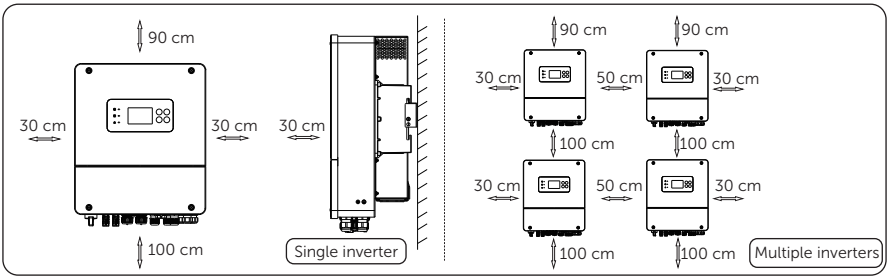
Installation Carrier



Installation Angle



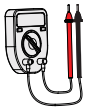
Installation Space

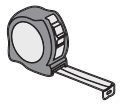


* It is recommended to install the inverter more than 100 cm above the ground. The minimum clearance reserved for the connected terminal at the bottom of inverter should be 10 cm. When planning installation space, it is important to simultaneously consider the bending radius of the wires.

Installation Tools


Hammer drill


Multimeter

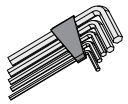

Measuring tape

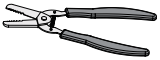

Utility knife


Marker

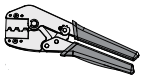

Cross screwdriver

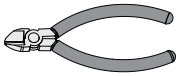

Flat-head screwdriver

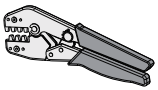

Allen key


Wire stripper

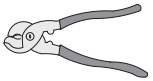

Crimping tool for RJ45

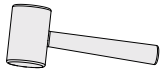

Crimping tool for PV terminals

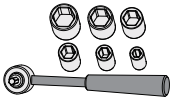

Diagonal pliers


Crimping tool

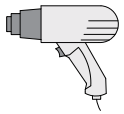

Crimping tool for ferrules


Wire cutter


Rubber mallet


Torque wrench


Spirit level

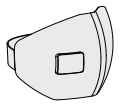

Heat gun


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	16-25mm^2 or 35-50 mm^2

- Micro-breaker recommended:

Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
Micro-Breaker	32 A	40 A	40 A	50 A	50 A	50 A

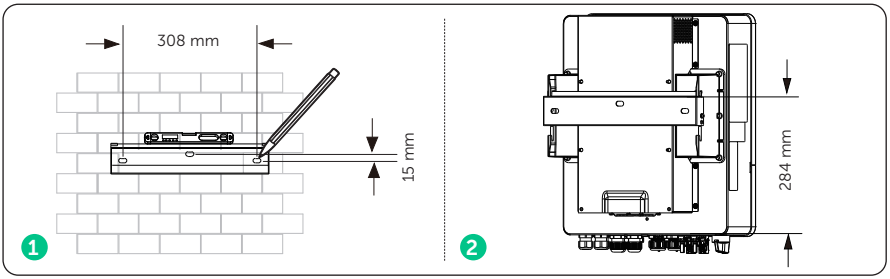
- EPS cable and micro-breaker recommended:

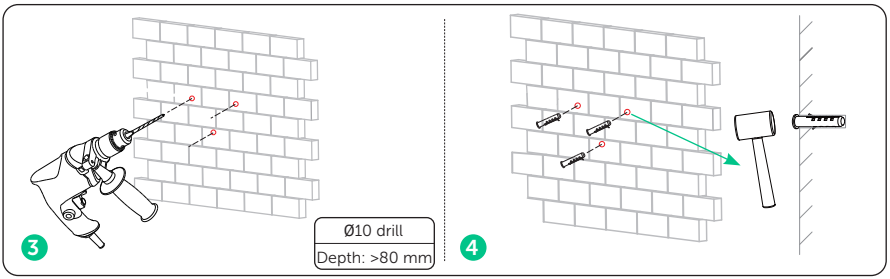
Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
Cable (copper)	3-4 mm^2	3-4 mm^2	3-4 mm^2	4-6 mm^2	4-6 mm^2	6-8 mm^2
Micro-Breaker	25 A	25 A	25 A	32 A	32 A	40 A

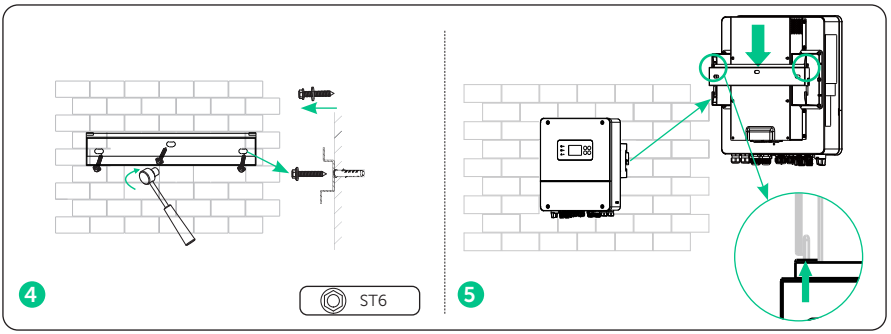
- GEN cable and micro-breaker recommended:

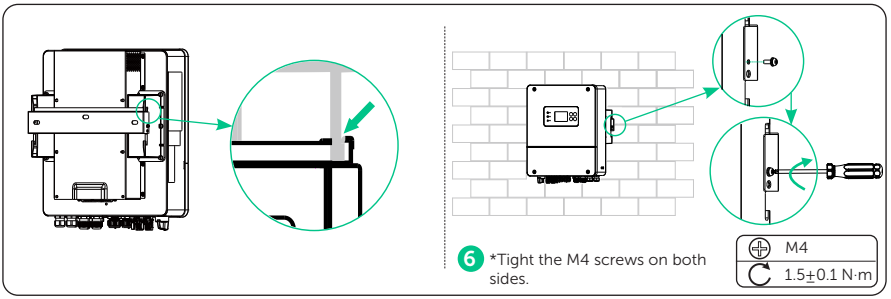
Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
Cable (copper)	3-4 mm^2	3-4 mm^2	3-4 mm^2	4-6 mm^2	4-6 mm^2	6-8 mm^2
Micro-Breaker	25 A	25 A	25 A	32 A	32 A	40 A

Mechanical Installation

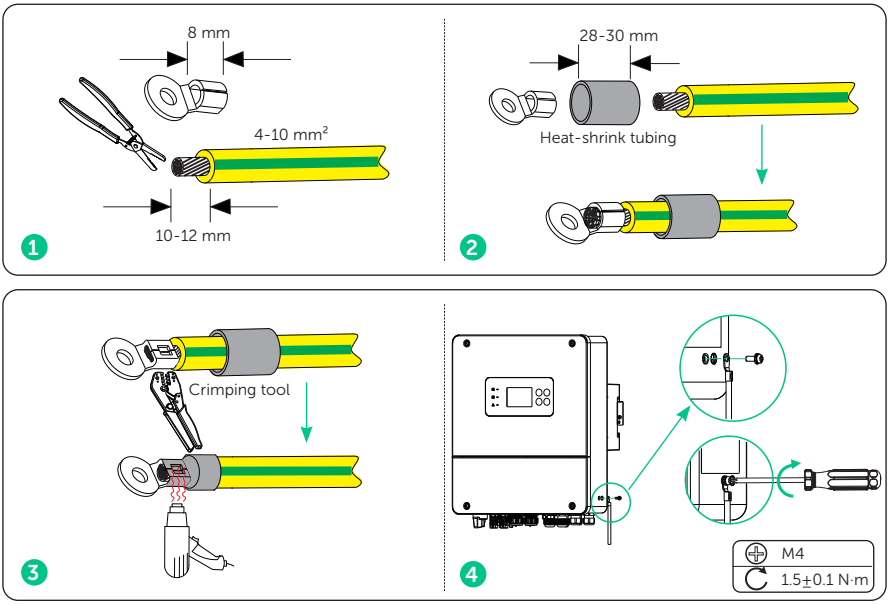








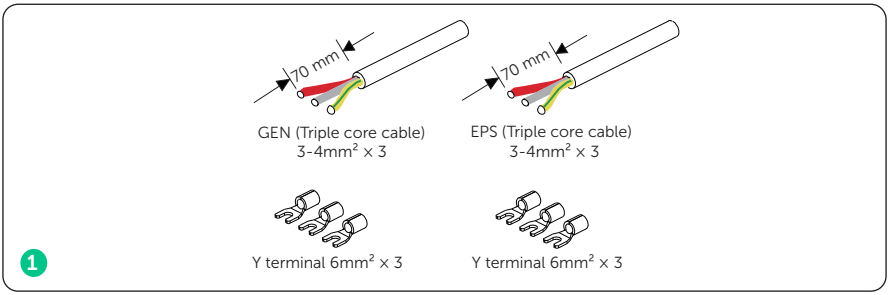
PE Connection



- PE cable recommended:

Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
PE cable	4-6 mm²	6-8 mm²	6-8 mm²	8-10 mm²	8-10 mm²	8-10 mm²

EPS and GEN Connection

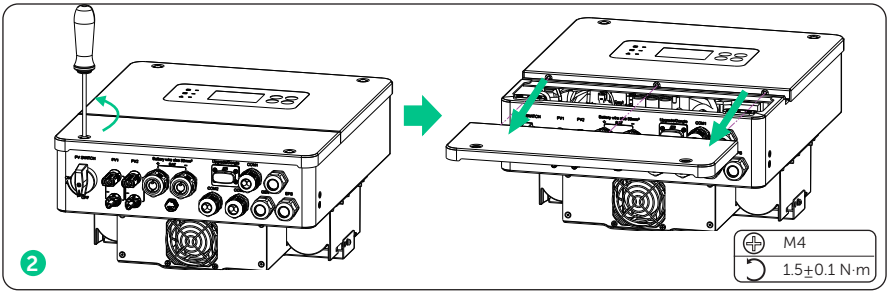


* Please refer to the table in **Additionally Required Materials** to view the recommended wire sizes for EPS, and GEN.

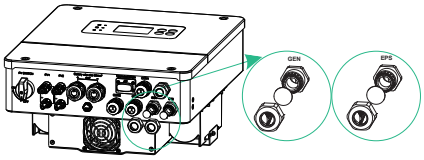
* It is recommended to use copper wire. Non-triple or non-dual core cables shall be sealed with glue or fireproof mud.

* 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.

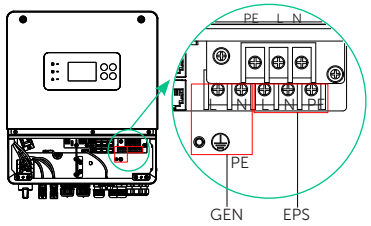
* All connection diagrams provided here are based on the use of a 3-core wire, with X1-Genki-3K serving as an example.



Remove the plug of EPS and GEN ports.



3



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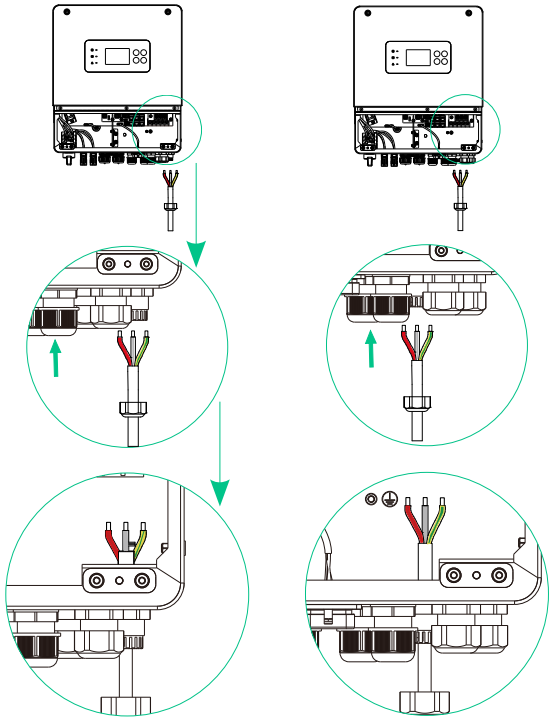
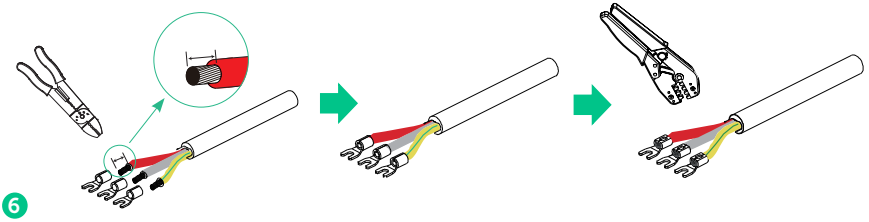
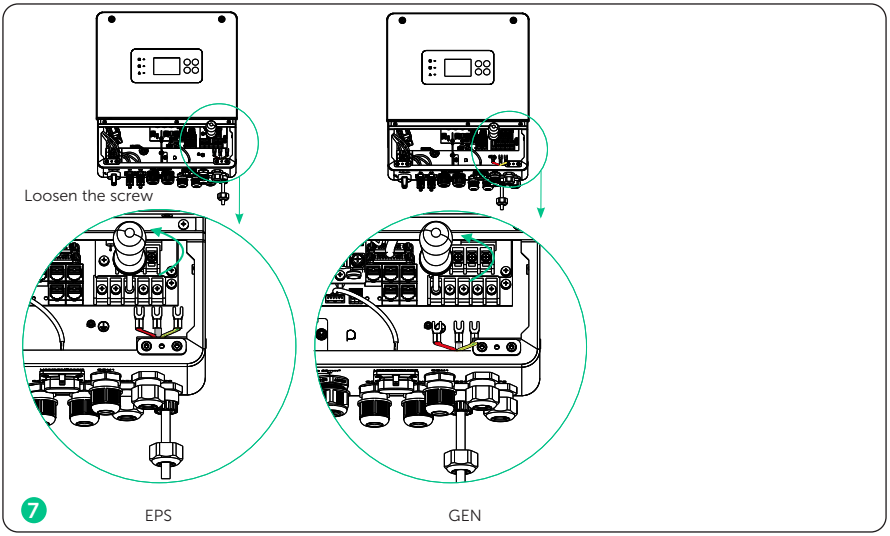
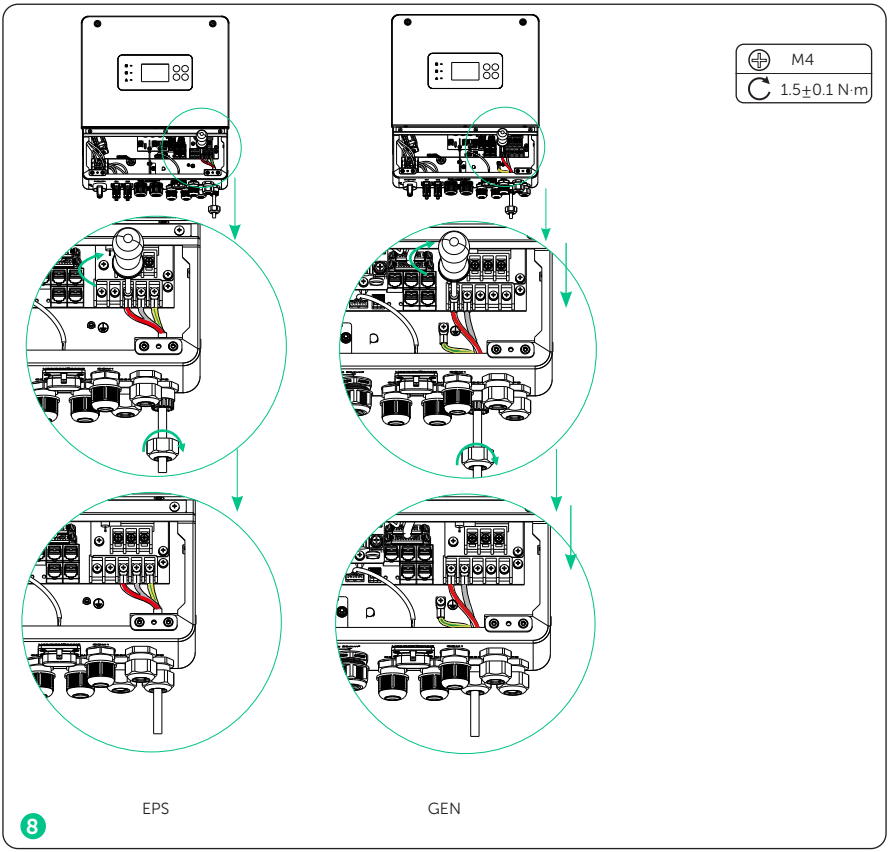


5 * The EPS and GEN cables go through the corresponding EPS and GEN ports.

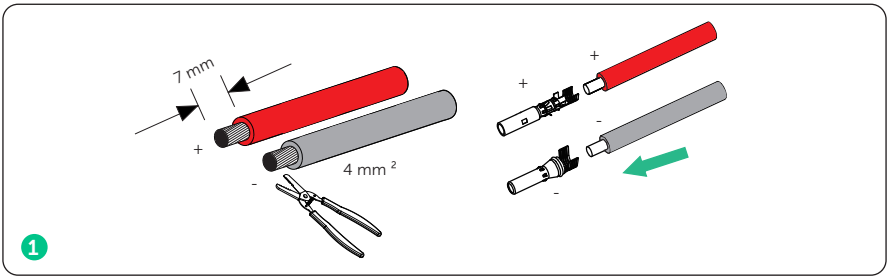


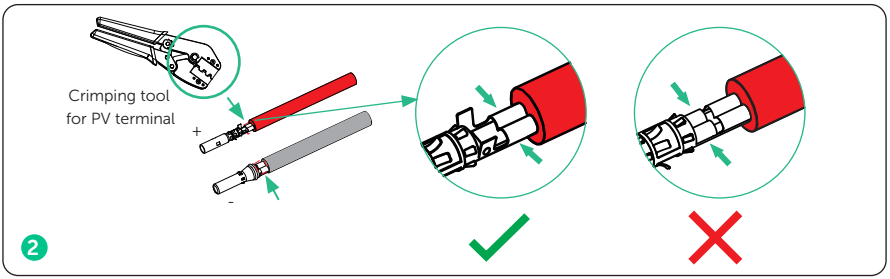
6

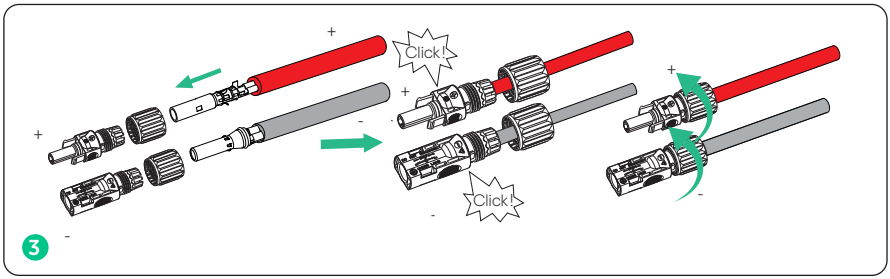

Loosen the screw
7
EPS
GEN

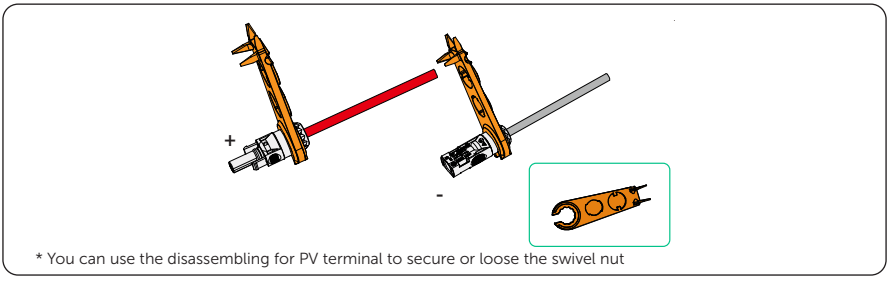

M4
1.5±0.1 N·m
8
EPS
GEN

PV Connection

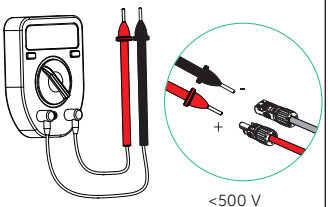




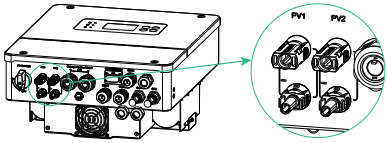




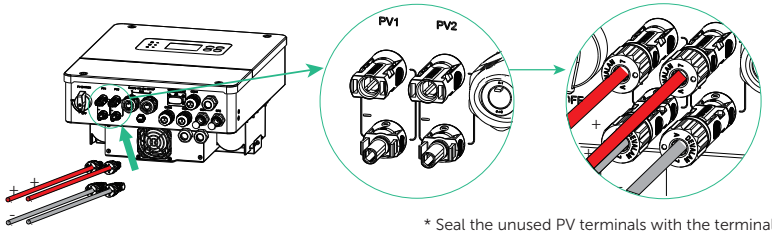
* You can use the disassembling for PV terminal to secure or loose the swivel nut



3



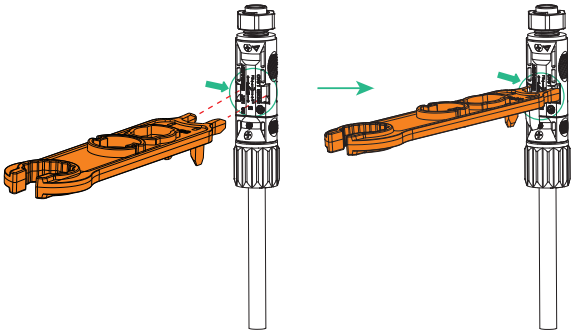
4 Remove the PV terminal caps.



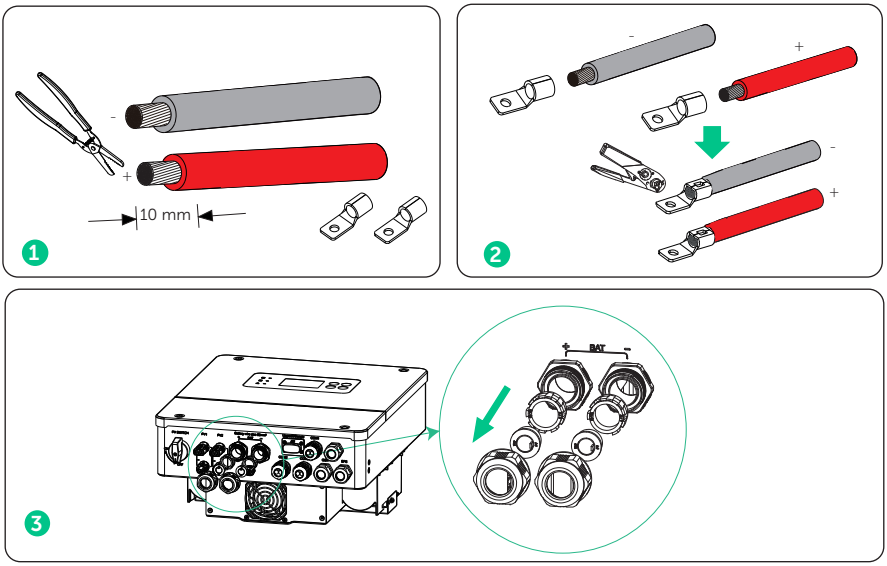
5

* Seal the unused PV terminals with the terminal caps.

Disassembling the PV cables

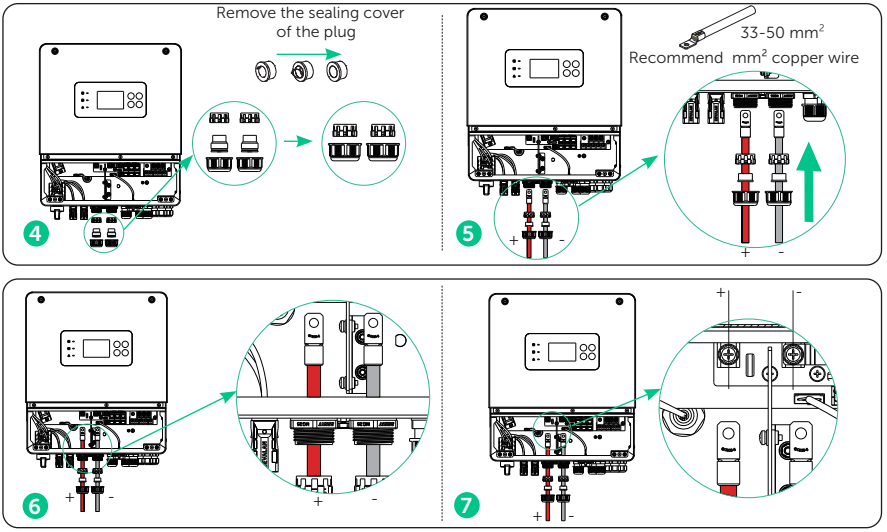


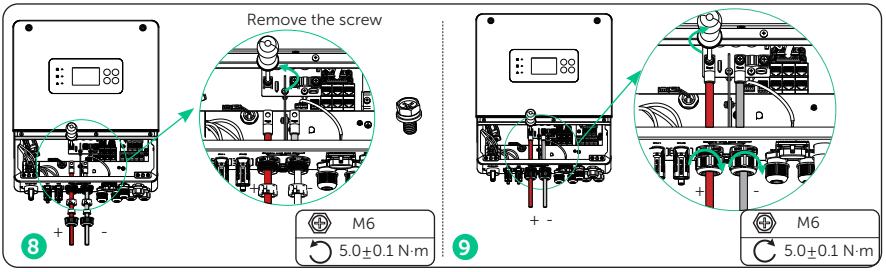
Battery Connection



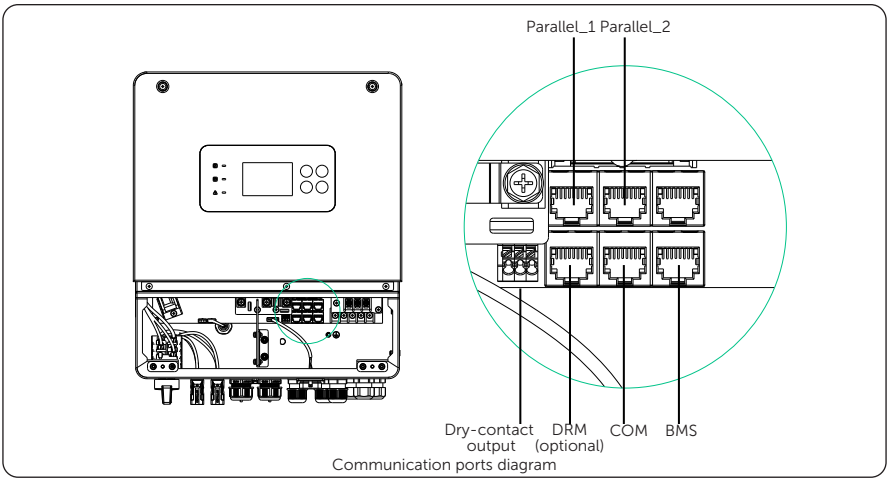
* If only the battery is connected but the PV and GEN are not connected, to start the inverter, press and hold the battery power on button until the screen is on.

- Battery connection





Communication Connection



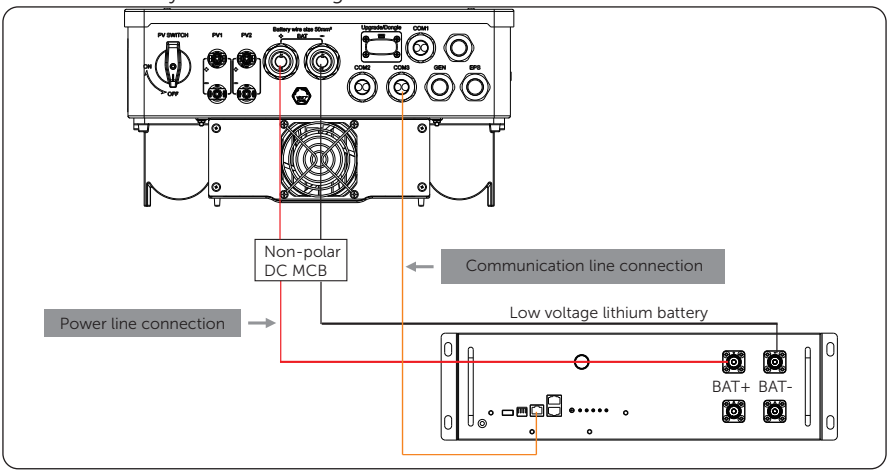
Communication ports diagram

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

- BMS/DRM/COM port connection

1. BMS

1.1 Lithium battery connection diagram



1.2 Pin definition for BMS

Pin	1	2	3	4	5	6	7	8
Pin Definition	BMS_ 485B	BMS_ 485A	GND	BMS_ CANH	BMS_ CANL	X	GND	BAT_ TEMP

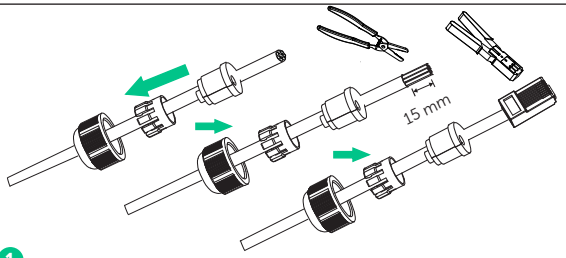
2. Pin definition for DRM (0)

Pin	1	2	3	4	5	6	7	8
Pin Definition	DRM1/5	DRM2/6	DRM3/7	DRM4/8	RG/0	CL/0	X	X

3. Pin definition for COM

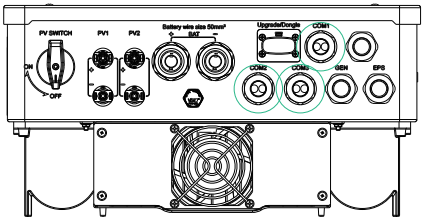
Pin	1	2	3	4	5	6	7	8
Pin Definition	Dry-contact_ in1	Dry-contact_ in2	X	RS485_A	RS485_B	GND	X	X

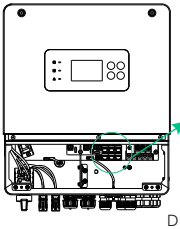
4. BMS/DRM/COM connection steps

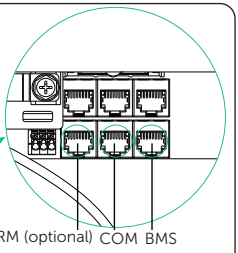


1) White with orange stripes
2) Orange
3) White with green stripes
4) Blue
5) White with blue stripes
6) Green
7) White with brown stripes
8) Brown

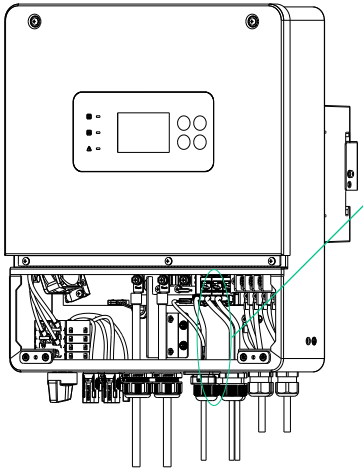
1

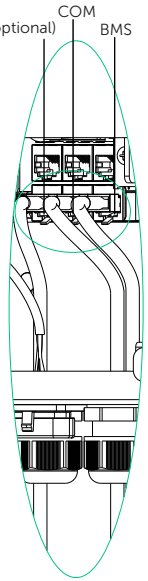






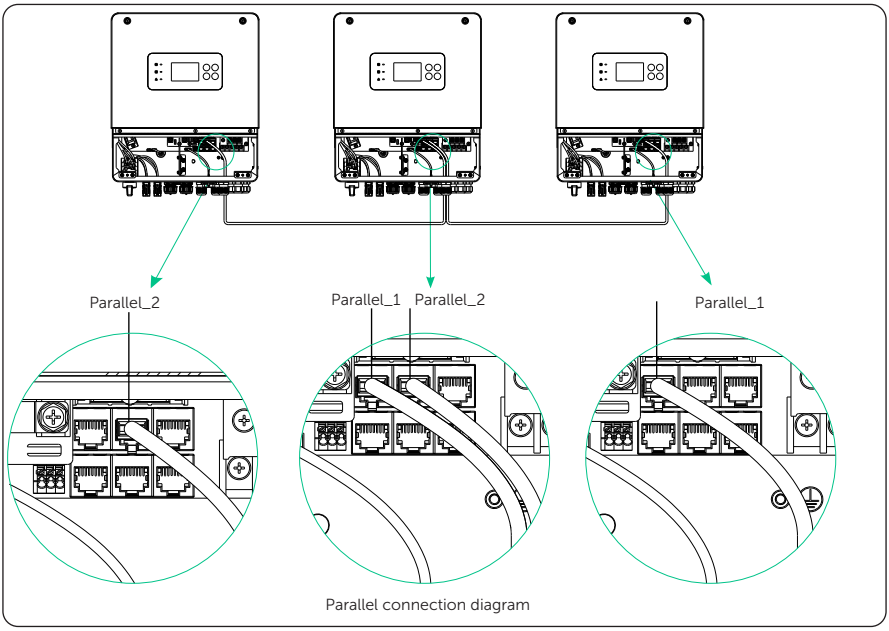
2 * For Communication connection, you can select any port from COM 1, COM 2 and COM3.





3

- Parallel connection connection



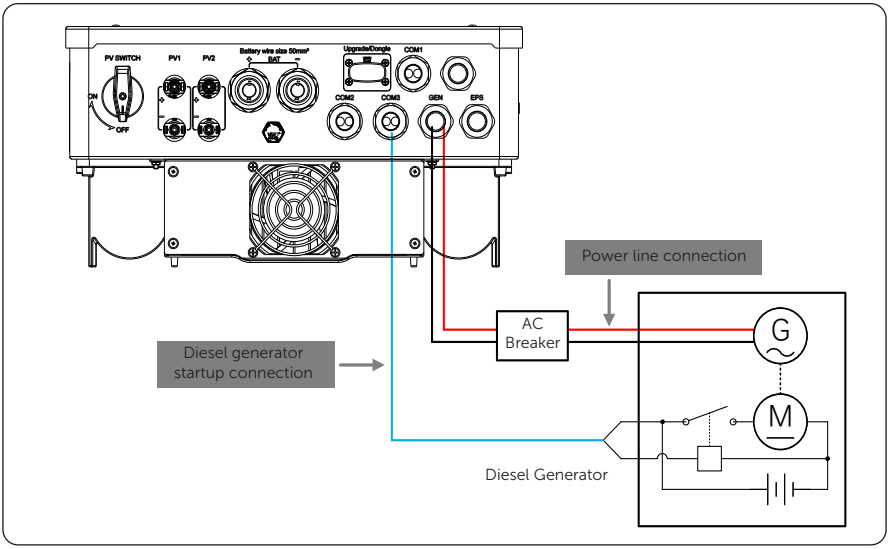
Parallel connection diagram

* Parallel cable making method is the same as BMS/DRM/COM.

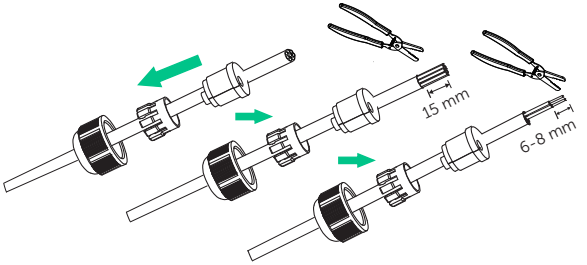
* In parallel operation, if there are PV modules, the master inverter must be connected to the py modules.

- Dry-contact output connection

1. Dry-contact output connection diagram

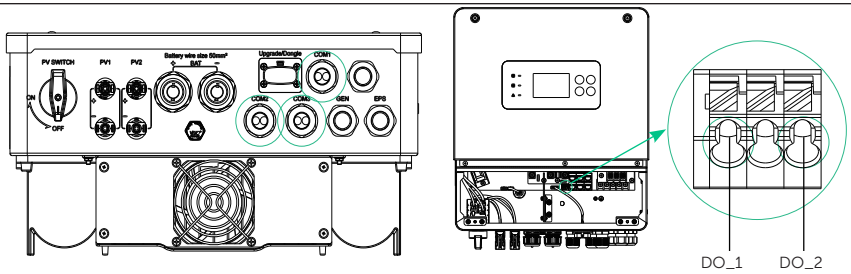


2. Dry-contact output connection steps

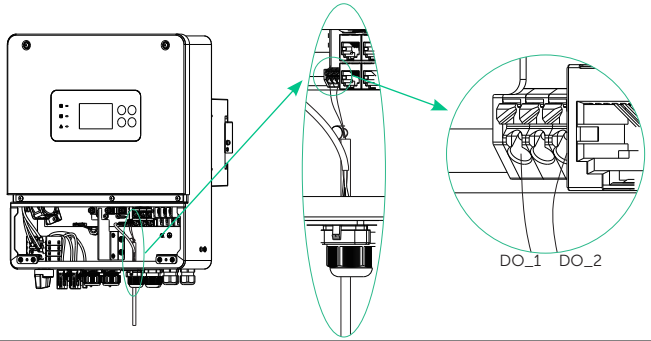


1) White with orange stripes
2) Orange
3) White with green stripes
4) Blue
5) White with blue stripes
6) Green
7) White with brown stripes
8) Brown

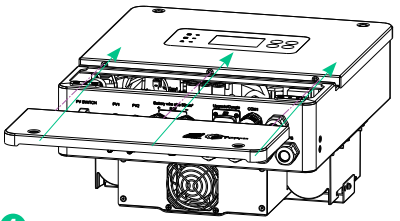
1 * It is recommended to use CAT5 network cable.
* For dry-contact output connection, you can select any two cables from the following four groups: white with orange stripes, Orange; white with green stripes, blue; white with blue stripes, green; white with brown stripes, brown.



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



3



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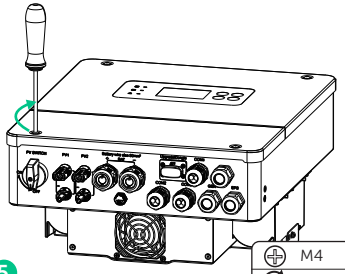
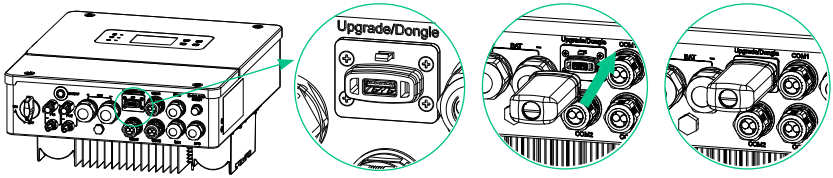


5

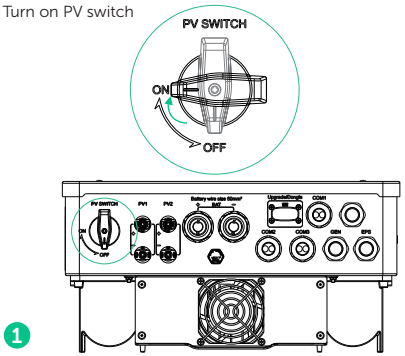
Monitoring Connection



Keep "QR Code" upwards

Power on the System

Turn on PV switch



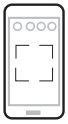
LCD Panel

- While upgrading, the green, blue and red indicator lights will flash in turns, indicating that the upgrade is in progress.
- In error state, the fault message and error code will be displayed at the bottom of the LCD screen, please refer to corresponding solutions in the user manual.

LED indicator	Status		Definition
Operating		Green blinking	The inverter is in the process of powering on.
		Light off	The inverter is in a fault or manual shutdown state.
Battery		Solid blue	One battery is connected in a normal state at least.
		Light off	Low battery voltage or no battery.
Error		Solid red	The inverter is in a fault state.
		Light off	The inverter has no faults or alarms.

Key	Definition
Esc key	Exit from the current interface or function
Up key	Move the cursor to the upper part or increase the value
Down key	Move the cursor to the lower part or decrease the value
Enter key	Confirm the selection

SolaXCloud Download



App Store / Google play

SolaXCloud

Scan the QR code to download SolaXCloud App. Follow the tutorial or online documents on the SolaXCloud App to complete the configuration.

Technical Data

- DC input

Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
Max. PV array power [Wp]	4500	5500	6000	6900	7500	9000
Max. PV input voltage [V]	550					
Start output voltage[V]	110					
Nominal input voltage [V]	360					
MPPT voltage range[V]	80 ~ 520					
No. of MPPT/Strings per MPPT	2 (1/1)					
Max. input current[A]	16/16					
Max. short circuit current[A]	20/20					

- AC input(GEN)

Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
Max. AC input apparent power [VA]	6000	7360	8000	9200	9200	9200
Max. AC input current [A]	26.1	32	34.8	40	40	40
Nominal voltage [V], frequency [Hz]	220 / 230 / 240, 50 / 60					

- EPS output

Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
Nominal output power [W]	3000	3680	4000	4600	5000	6000
Peak apparent power[VA][1]	2 times of nominal, 10s					
Nominal Output Current[A]	13	16	17.4	20	21.7	26.1
Nominal voltage [V], frequency [Hz]	230, 50/60					
Switch Time[ms]	<10					

* "1" Depend on PV and battery capacity.

- Battery data

Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
Battery type	Lithium/Lead-Acid					
Battery voltage range [V]	40~60					
Nominal Battery Voltage[V]	48					
Max. Charging Voltage[V]	<=60 (Adjustable)					
Max. Charging/Discharging Current[A]	75			120		
Charging Strategy for Li-Ion Battery	Self-adaption to BMS					
Charging Strategy for Lead-Acid Battery	3 stages curve					
Temperature Sensor	Optional					

- System data

Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
MPPT Efficiency	>99.9%					
Max. efficiency [%]	97.6					
Euro. efficiency [%]	97.0					
Battery charge/discharge effciency [%][2]	96.0/95.0					

* "[2]" PV to BAT Max. efficiency 96.0%, AC to BAT Max. efficiency 95.0%.

- Protection device

Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
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 III/DC Type III					
Battery Terminal Temp Protection	Yes					

- Power consumption & Environment limit

Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
Self Consumption(night) [W]	Standby < 40, Shutdown < 10					
Degree of protection	IP65					
Operating temperature range[°C]	-25 ~ +60 (derating above +45)					
Relative humidity [%]	0 ~ 100 (condensing)					
Max. operation altitude [m]	<3000					
Storage Temperature[°C]	-25 ~ +70					
Noise Emission(typical)[dB]	<39				<50	

- General data

Model	X1-Genki-3K	X1-Genki-3.7K	X1-Genki-4K	X1-Genki-4.6K	X1-Genki-5K	X1-Genki-6K
Dimensions(WxHxD) [mm]	397x490x201					
Net weight [kg]	16.5				17.3	
Cooling concept	Natural				Smart cooling	
Topology	Transformerless for PV Side/HF for battery Side					
HMI Interface	LED+LCD					
Communication interfaces	CAN, RS485, WiFi, LAN, 4G (Optional), USB , NTC, wifi+lan, wifi+4G					

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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_____

FRONUS SOLAR ENERGY (WASIQ TRADERS).

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