X3-FORTH PLUS

75 kW / 120 kW / 125 kW / 136 kW / 150 kW

User Manual

Version 0.0

www.solaxpower.com

eManual in the QR code or
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About This Manual

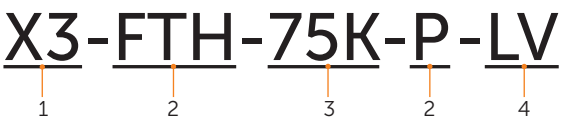
Scope of Validity

This manual is an integral part of X3-FORTH PLUS series inverter. It describes the transportation, storage, installation, electrical connection, commissioning, maintenance and troubleshooting of the product. Please read it carefully before operating.

This manual is valid for the following inverter models:

- X3-FTH-75K-P-LV
- X3-FTH-120K-P
- X3-FTH-125K-P
- X3-FTH-136K-P
- X3-FTH-150K-P

Model description



Item	Meaning	Description
1	Inverter type	"X3": Three-phase PV grid-connected inverter.
2	Product family name	"FTH-P": FORTH PLUS series.
3	Power	"75K": Rated output power of 75 kW.
4	Voltage	"LV": AC Low Voltage. • Model with "LV": AC voltage is 127/220 V. • Model without "LV": AC voltage is 220/380 V, 230/400 V.

Target Group

The installation, maintenance and grid-related setting can only be performed by qualified personnel who:

- Are licensed and / or satisfy state and local regulations.
- Have good knowledge of this manual and other related documents.

Conventions

The symbols that may be found in this manual are defined as follows.

Symbol	Description
DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION!	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury, device damage, power generation loss or unanticipated results.
NOTICE!	Provides tips for the optimal operation of the product.

Change History

Version 0.0 (2025-02-13)

Initial release

Table of Contents

1 Safety

1.1 General Safety

The series inverter has been meticulously designed and thoroughly tested to comply with the relevant state and international safety standards. Nevertheless, like all electrical and electronic equipment, safety precautions must be observed and followed during the installation of the inverter to minimize the risk of personal injury and ensure a safe installation.

Please thoroughly read, comprehend, and strictly adhere to the comprehensive instructions provided in the user manual and any other relevant regulations prior to the installation of the inverter. The safety instructions in this document serve as supplementary guidelines to local laws and regulations.

SolaX shall not be liable for any consequences resulting from the violation of the storage, transportation, installation, and operation regulations outlined in this document. Such consequences include, but are not limited to:

- Inverter damage caused by force majeure events, such as earthquakes, floods, thunderstorms, lightning, fire hazards, volcanic eruptions, and similar events.
- Inverter damage due to human causes.
- Inverter damage caused by strong vibrations from external factors before, during and after installation.
- Usage or operation of the inverter in violation of local policies or regulations.
- Failure to comply with the operation instructions and safety precautions provided with the product and in this document.
- Improper installation or usage of the inverter in unsuitable environmental or electrical conditions.
- Unauthorized modifications to the product or software.
- Inverter damage occurring during transportation by the customer.
- Storage conditions that do not meet the requirements specified in this document.
- Installation and commissioning performed by unauthorized personnel who lack the necessary licenses or do not comply with state and local regulations.

1.2 Safety Instructions of PV, Inverter and Grid

Save these important safety instructions. Failure to follow these safety instructions may result in damage to the inverter and injury or even loss of life.

1.2.1 Safety Instructions of PV

DANGER!

Potential risk of lethal electric shock associated with the photovoltaic (PV) system

- Exposure to sunlight can result in the generation of high DC voltage by PV modules, which can lead to electric shock causing severe injuries or even death.
- Never touch the positive or negative poles of the PV connecting device, and avoid touching both poles simultaneously.
- Do not ground the positive or negative poles of the PV modules.
- Only qualified personnel can perform the wiring of the PV modules.

WARNING!

- Overvoltage protection with surge arresters should be provided when the PV system is installed. The inverter is fitted with SPDs on both PV input side and mains side.
- Please consult professionals before installing SPDs.

WARNING!

- Make sure that the input DC voltage does not exceed the maximum DC input voltage specified for the inverter. Over voltage can cause irreversible damage to the inverter, and such damage is not covered by the warranty.
- PV modules should have an IEC61730 class A rating.

1.2.2 Safety Instructions of Inverter

DANGER!

Potential risk of lethal electric shock associated with the inverter

- Only operate the inverter if it is in a technically faultless condition. Operating a faulty inverter may lead to electric shock or fire.
- Do not attempt to open the enclosure without authorization from SolaX. Unauthorized opening of the enclosure will void the warranty and can result in lethal danger or serious injury due to electric shock.
- Make sure that the inverter is reliably grounded before any operation to prevent the risk of electric shock causing lethal danger or serious injury.
- Only qualified personnel can perform the installation, wiring, maintenance of the inverter by following this document and the related regulations.

WARNING!

- During operation, avoid touching any parts of the inverter other than the DC switch and LCD pannel.
- Never connect or disconnect the AC and DC connector while the inverter is running.
- Prior to conducting any maintenance, turn off the AC and DC power and disconnect them from the inverter. Wait for 15 minutes to fully discharge the energy.

WARNING!

Potential danger of scalding due to the hot enclosure of the inverter

- Avoid touching the inverter while it is running, as it becomes hot during operation and may cause personal injuries.

WARNING!

- Use insulated tools when installing the device, and always wear personal protective equipment (PPE) during installation and maintenance.

CAUTION!

- Make sure that children are supervised to prevent them from playing with the inverter.
- Pay attention to the weight of the inverter and handle it properly to avoid personal injuries.

NOTICE!

- Keep all product labels and the nameplate on the inverter clearly visible and well-maintained.

1.2.3 Safety Instructions of Grid

NOTICE!

- Only connect the inverter to the grid with the permission of the local utility grid company.

2 Product Overview

2.1 Product Introduction

Photovoltaic grid connected system

X3-FORTH PLUS is a three-phase transformerless grid-connected inverter, which is an important component of photovoltaic (PV) power generation systems. The inverter converts the direct current (DC) generated by the PV strings into alternating current (AC) that meets grid requirements and feeds it into the grid.

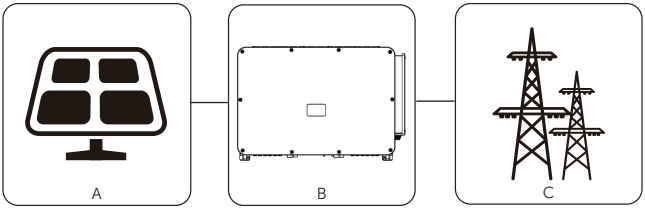
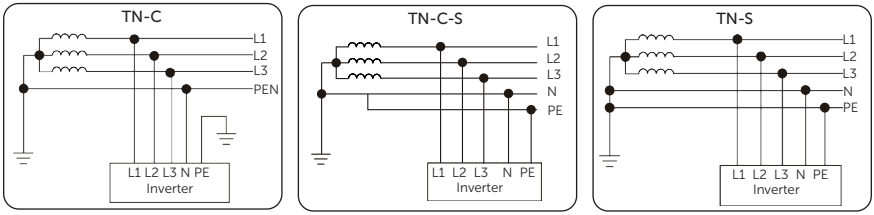


Figure 2-1 Typical application scenario

Number	Item	Description
A	PV strings	The maximum number of input strings per MPPT is 4.
B	Inverter	X3-FORTH PLUS series
C	Grid	See Supported power grids for the power grid supported by the inverter

Supported power grids

There are different ways of wiring for different grid systems. The power grids supported by the inverter are TN-C, TN-C-S, TN-S, TT and IT.



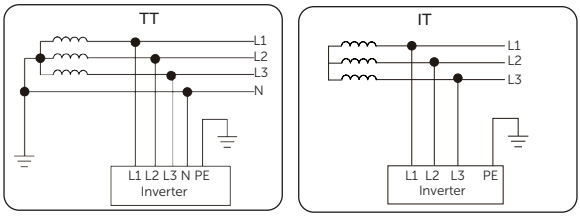


Figure 2-2 Supported power grids

2.2 Appearance

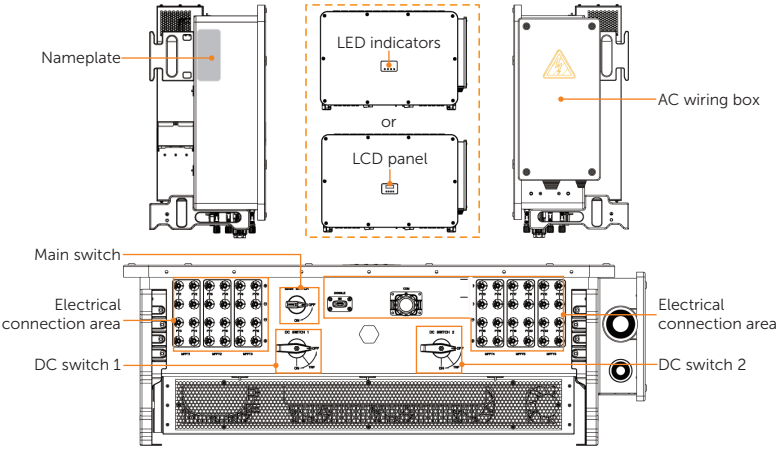


Figure 2-3 Appearance

Table 2-1 Description of appearance

Item	Description
Nameplate	Nameplate clearly identifies the device type, serial number, specific DC / AC parameters, certification, etc.
LED indicators	Indicate the state of the inverter.
LCD panel (Optional)	Including screen and keys: screen displays the information, keys are used to perform the parameter settings.
AC wiring box	Connect AC cables.
Main switch	Turn on the main switch only when the inverter is powered on for the first time, and turn off the main switch after running.

Item	Description
DC switch 1	Disconnect the DC input of MPPT 1, MPPT 2, and MPPT 3 when necessary.
DC switch 2	Disconnect the DC input of MPPT 4, MPPT 5, and MPPT 6 when necessary.
Electrical connection area	Including PV terminals, communication terminal, and Dongle terminal.

2.3 DC Switch

DC switch can safely disconnect the inverter from the PV strings, preventing danger in the event of an abnormal condition such as overcurrent at the PV input. This series of inverters is equipped with two DC switches to control the corresponding PV DC input terminals.

NOTICE!

- The customer shall add a 25 A fuse for each PV input to ensure that the inverter and PV strings are reliably disconnected in the event of an overcurrent or other abnormal conditions.

Status description

Status	Description
ON	The DC switch has automatic breaking capability.
TRIP	The DC switch is in automatic breaking state (Switch is located between "ON" and "OFF").
OFF	The DC switch does not have the automatic breaking capability.

When the inverter detects a PV reverse connection or an internal fault of the inverter, the DC switch automatically disconnects.
For details about the fault, see "11.2 Troubleshooting".

Reset switch

When a fault occurs, the DC switch is automatically in the "TRIP" state. Check the fault type on the monitoring system, rectify the fault, and reset the DC switch. The steps are as follows:

Step 1: Turn the switch to the "OFF" position.

Step 2: Turn the switch to the "ON" position.

2.4 Symbols on the Label and Inverter

Table 2-2 Description of symbols

Symbol	Description
	CE mark. The inverter complies with the requirements of the applicable CE guidelines.
	TUV certified.
	RCM mark. The inverter complies with the requirements of the applicable RCM guidelines.
	Additional grounding point.
	Beware of hot surface. Do not touch a running inverter, as the inverter becomes hot during operation!
	Risk of electric shock. High voltage exists after the inverter is powered on!
	Risk of danger. Potential hazards exist after the inverter is powered on!
	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 source.
	Danger of high voltage. Do not touch live parts for 15 minutes after disconnection from the power sources.

2.5 Working Principle

The inverter is equipped with multi-channel MPPTs for DC input to ensure maximum power even under different photovoltaic input conditions. The inverter converts the direct current generated from PV module into alternating current that meets the requirements of the power grid and feeds it into the power grid. The principle design of inverter is shown in the figure below:

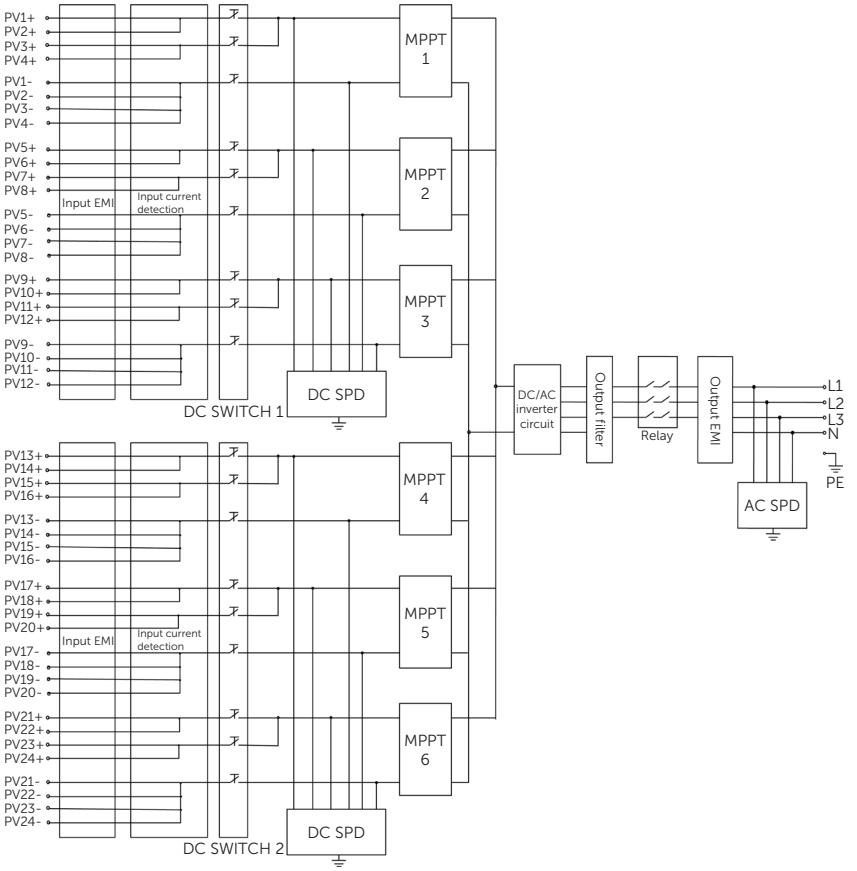


Figure 2-4 Circuit diagram

2.6 Working State

State	Description
Waiting	After powering on, the inverter enters the **Waiting** state. • When the inverter detects sufficient photovoltaic input voltage, it enters the **Checking** state. • If the inverter detects a fault, it enters the **Fault** state. • Upon receiving an upgrade file, the inverter enters the **Upgrading** state to perform the upgrade process.
Checking	The inverter is initializing and synchronizing with the grid in the **Checking** state. • The inverter performs a self-check, and upon passing, it enters the **Running** state. • If the inverter detects a fault, it enters the **Fault** state. • Upon receiving an upgrade file, the inverter enters the **Upgrading** state to perform the upgrade process.
Running	In **Running** state: • The inverter converts the DC power from the photovoltaic strings into AC power and feeds it to the utility grid or load. • The inverter tracks the maximum power point to optimize the output of the PV strings. • If the inverter detects a fault, it enters the **Fault** state. • Upon receiving an upgrade file, the inverter enters the **Upgrading** state to perform the upgrade process. • If the inverter detects insufficient photovoltaic input, it enters the **Waiting** state and stops generating power.
Fault	When the inverter detects a fault, it enters the **Fault** state. In the fault state: • After troubleshooting, it enters the **Waiting** state . • If the inverter receives a shutdown command, it will power off. Upon receiving a startup command, the inverter will return to the **Waiting** state. • Upon confirming the upgrade after receiving an upgrade file, the inverter enters the **Upgrading** state to perform the upgrade process.
Upgrading	When the inverter firmware is being upgraded, it enters the **Upgrading** state. The upgrade process is as follows: • Before the upgrade, the inverter will automatically shut down. It then enters the **Upgrading** state. • After the upgrade is complete, the inverter will automatically powers on and enter the **Waiting** state.

3 Transportation and Storage

If the inverter is not put into use immediately, the transportation and storage requirements need to be met:

Transportation

- The inverter must be transported in its original packaging. SolaX will not be held responsible for any damage to the inverter caused by improper transportation or by transportation after it has been installed.
- Observe the caution signs on the packaging of inverter before transportation.
- Pay attention to the weight of the inverter. Carry the inverters by the required number of personnel or with a forklift as specified by local regulations.
- Wear protective gloves when carrying the device by hand to prevent injuries.
- Hold the handles on the device to move or lift. Keep the inverter horizontal in case of falling down.

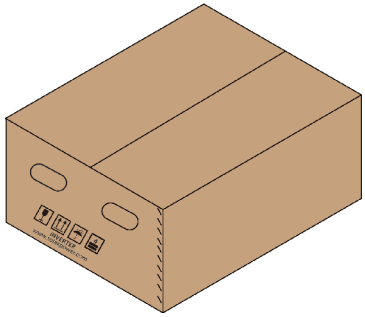


Figure 3-1 Caution signs on the packaging

Storage

- The inverter must be stored in a dry, clean, and ventilated indoor environment that is free from sources of corrosive gases, flammable, explosive material, heat and ignition.
- Do not remove the original packaging material and check the outer packaging material regularly.
- The storage temperature should be between -40°C and +70°C. The relative humidity should be between 5%RH and 65%RH.
- Stack the inverter in accordance with the caution signs on the inverter carton to prevent their falling down and device damage. Do not place it upside down.

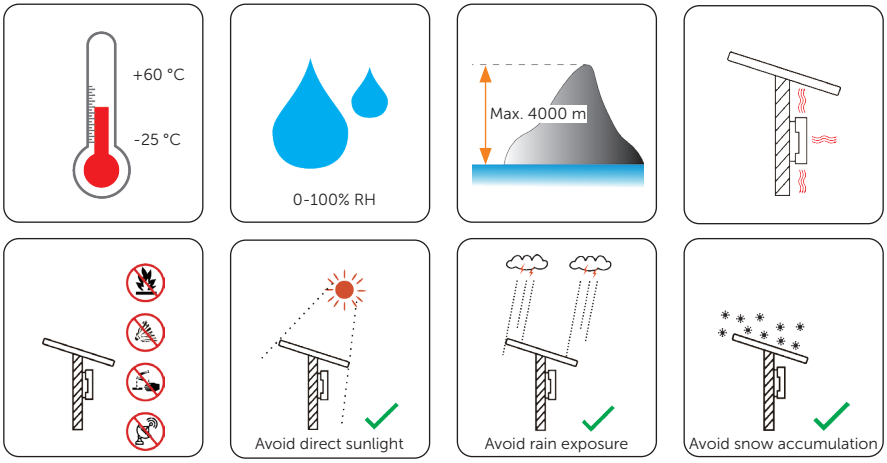
4 Preparation before Installation

4.1 Selection of Installation Location

The installation location selected for the inverter is quite critical in the aspect of the guarantee of device safety, service life and performance. It has the IP66 ingress protection, which allows it to be installed outdoor. The installation position shall be convenient for wiring connection, operation and maintenance.

4.1.1 Environment Requirement

- The ambient temperature: -25 °C to +60 °C.
- The relative humidity shall be between 0-100%RH.
- Do not install the inverter in areas where the altitude exceeds 4000 meters.
- Install the inverter in a well-ventilated environment for heat dissipation. It is recommended to install an awning over the inverter if it is installed on a support outdoor.
- Do not install the inverter in areas with flammable, explosive and corrosive materials or near antennas.
- Avoid direct sunlight, rain exposure and snow accumulation.
- Install the inverter at least 500 meters away from the coast and avoid sea breeze directly hit.



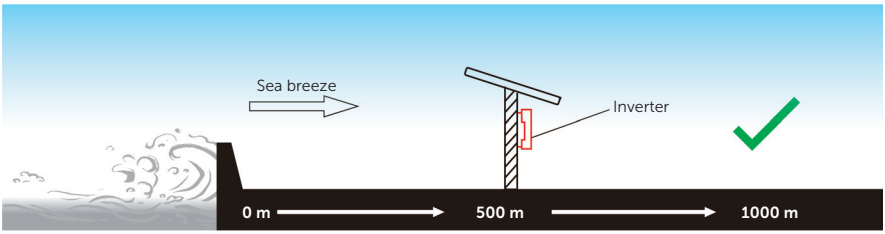


Figure 4-1 Recommended installation position

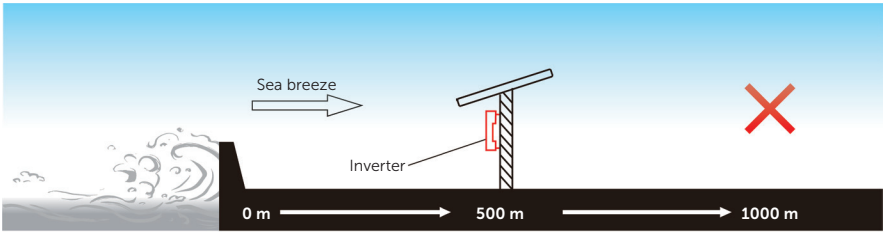


Figure 4-2 Incorrect installation position

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.

4.1.2 Installation Carrier Requirement

The installation carrier must be made of a non-flammable material, such as solid brick, concrete, etc. and be capable of supporting the weight of the inverter and suitable of the dimensions of the inverter. If the wall strength is not enough (such as wooden wall, the wall covered by a thick layer of decoration), it must be strengthened additionally.

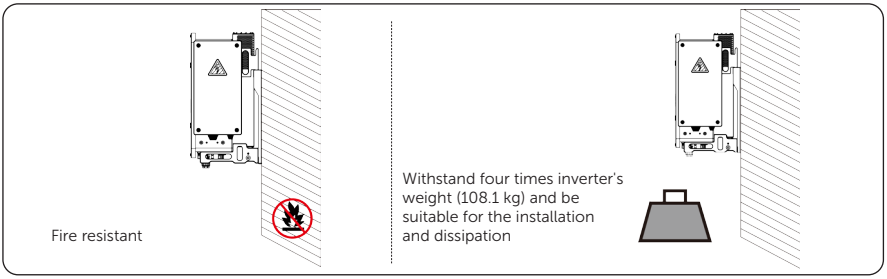


Figure 4-3 Installation carrier requirement

NOTICE!

- When choosing a bracket, you need to consider whether the design of the bracket is conducive to heat dissipation at the back of the inverter.

4.1.3 Clearance Requirement

To guarantee proper heat dissipation and ease of disassembly, the minimum space around the inverter must meet the standards indicated below.

For installations with multiple inverters, make sure to leave a minimum space of 30 cm on the sides and 60 cm above and below each inverter. In areas with high ambient temperatures, increase the clearances between the inverters and provide adequate fresh air ventilation if feasible.

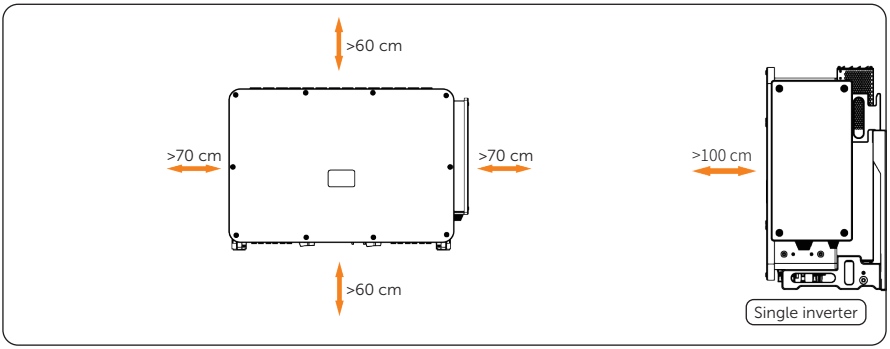


Figure 4-4 Clearance requirement for single inverter

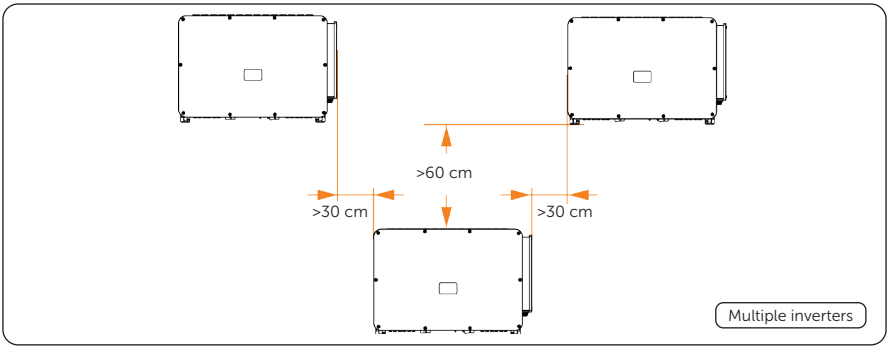
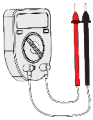


Figure 4-5 Clearance requirement for multiple inverters

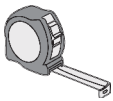
4.2 Tools Requirement

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: Ø12 mm)



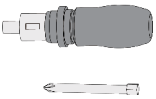
Multimeter
(≥ 1100 V DC)



Measuring tape

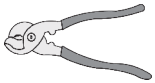
Utility knife

Marker



Torque screwdriver
(Philips head: PH2, 3)

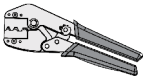
Spirit level



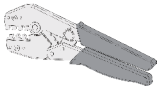
Wire cutter

Wire stripper

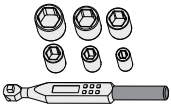
crimping tool for ferrules



Crimping tool for
PV terminals



Crimping tool

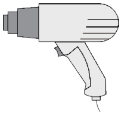


Torque wrench

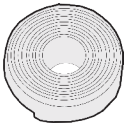
Torque specifications:
including 10, 13, 16, 18 mm
Torque depth: ≥12 mm
Torque range:
12 N·m ~ 37 N·m

Lifting rope
(Bearing capacity
480 kg, 2.5 m)

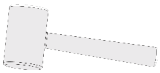
Crane (bearing
capacity 150 kg)



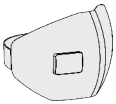
Heat gun



Heat shrink tubing



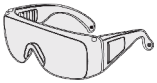
Rubber mallet



Anti-dust mask

Safety gloves

Safety boots



Safety goggles

4.3 Additionally Required Materials

Table 4-1 Additionally required wires

No.	Required material	Type	Conductor cross-section	Outer diameter
1	PV cable	Dedicated PV wire, resistance voltage 1500 V, high temperature 105℃ , fire rating VW-1	4-6 mm^2	/
2	Communication cable 1	Outdoor shielded twisted pair cable	0.5-0.75 mm^2	/
	Communication cable 2	Network cable CAT5E with RJ45 connector		
3	AC cable	If neutral wire is used, please select one of the following options and prepare the corresponding wires accordingly: • A five-core (L1,L2,L3,N,PE) copper/aluminium wire • A four-core (L1,L2,L3,N) copper/aluminum wire + a single core PE wire • Four single-core copper/ aluminum wires + a single core PE wire	• S(copper): 95-240 mm^2 S (PE) ≥ S/2 • S(aluminum): 150-240 mm^2 S (PE) ≥ S/2	• multi-core wire: 24-66 mm • single-core wire: 14-38 mm
		If no neutral wire is used, please select one of the following options and prepare the corresponding wires accordingly: • A four-core (L1,L2,L3,PE) copper/aluminium wire • A three-core (L1,L2,L3) copper/aluminum wire + a single core PE wire • Three single-core copper/aluminum wires + a single core PE wire		
4	PE cable	Conventional yellow and green wire	S (PE) ≥ S/2	/
5	Expansion bolts	For wall mounting (4 pcs)	M10 × L80	/

No.	Required material	Type	Conductor cross-section	Outer diameter
6	OT/DT terminal	M8 OT/DT terminal	For PE cable connection	
		M12 OT/DT terminal	For AC cable connection	
7	Fireproof mud	For plugging the cut pagoda shaped coil		

Note: The value of S (PE) is applicable only when the conductor material of the PE cable is the same as that of the AC cable.

Table 4-2 Recommended AC breakers

Inverter	75 kW	120 kW	125 kW	136 kW	150 kW
AC Breaker	500 V / 315 A				

5 Unpacking and Inspection

5.1 Unpacking

- The inverter undergoes 100% testing and inspection before delivery. However, damages may still occur during transportation. Before unpacking, please carefully check the external packaging for any signs of damage, such as punctures or cracks.
- Unpacking the inverter according to the following figure.

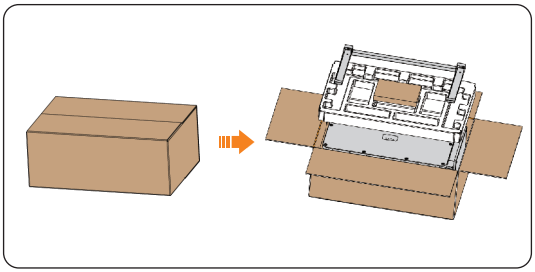
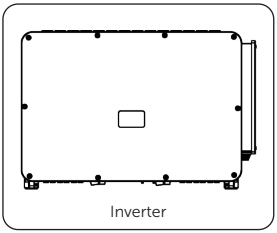
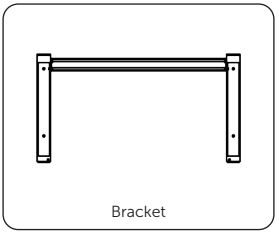


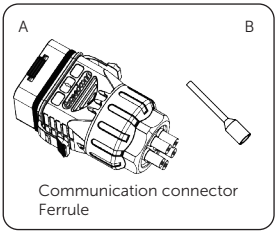
Figure 5-1 Unpacking the inverter

- Properly handle all the packaging materials in case they may be reused for storage and transportation of the inverter in the future.
- Upon opening the package, check whether the inverter is intact and whether all accessories are included. If any damage is found or any parts are missing, contact your dealer immediately.

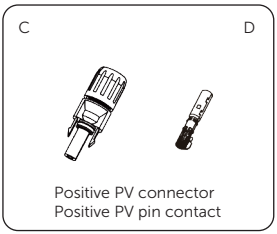
5.2 Scope of Delivery


Inverter

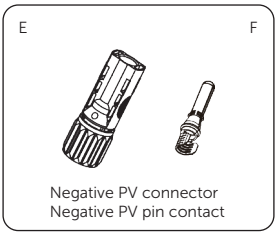

Bracket



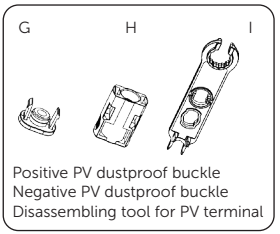
Communication connector
Ferrule



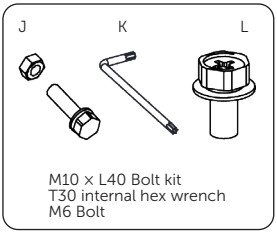
Positive PV connector
Positive PV pin contact



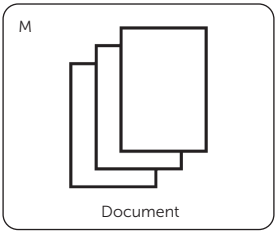
Negative PV connector
Negative PV pin contact



Positive PV dustproof buckle
Negative PV dustproof buckle
Disassembling tool for PV terminal



M10 × L40 Bolt kit
T30 internal hex wrench
M6 Bolt



Document

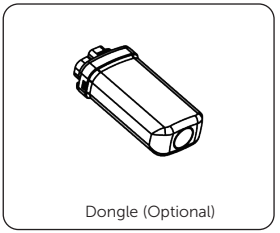

Dongle (Optional)

Table 5-1 Packing list

Item	Description	Quantity	Remark
/	Inverter	1 pc	
/	Bracket	1 pc	
A	Communication connector	1 pc	
B	Ferrule	16 pcs	
C	Positive PV connector	24 pcs	
D	Positive PV pin contact	24 pcs	
E	Negative PV connector	24 pcs	
F	Negative PV pin contact	24 pcs	

Item	Description	Quantity	Remark
G	Positive PV dust proof buckle	12 pcs	Used to install on the positive/negative PV input port when the PV is not connected
H	Negative PV dust proof buckle	12 pcs	
I	Disassembling tool for PV terminal	1 pc	Used to remove the dust proof buckle or PV connector
J	M10 × L40 Bolt combination kit	4 pcs	Used to fix the bracket
K	T30 internal hex wrench	1 pc	Used to open the AC wiring box
L	M8 Bolt	2 pcs	Used to fix the inverter
M	Documents	/	
/	Dongle (Optional)	1 pc	

NOTICE!

- Refer to the actual delivery for the optional accessories.
- Please purchase OT terminals separately.

6 Mechanical Installation

WARNING!

- Only qualified personnel are allowed to perform the mechanical installation in accordance with local laws and regulations.
- Check the existing power cables or other piping in the wall to prevent electric shock or other damage.
- Use insulated tools and wear personal protective equipment throughout the installation and maintenance process.
- Make sure there is no electrical connection before installation.

CAUTION!

If drilling is required during installation:

- Wear personal protective equipment when drilling, such as safety goggles, safety gloves, etc.
- Avoid drilling around pipes, and light switches and sockets, as the electrical wires can go horizontally and vertically around these fixtures.
- Make sure the holes are drilled perpendicular to the wall and avoid tilting up or down.
- Cover the device to protect it from dusts and debris entering when drilling, and clean it at once after finishing drilling.

CAUTION!

If the inverter is mounted high, Crane handling is recommended.
Before lifting:

- Ensure that the crane's load capacity is ≥ 150 kg, the lifting rope's load capacity is ≥ 480 kg, and the length is ≥ 2.5 m.
- Personnel involved in lifting operations must undergo relevant training and may only operate after passing the qualification assessment.
- If the working conditions on site do not meet requirements, professional evaluation is necessary.
- When used outdoors, it is recommended to operate the lifting equipment in clear and calm weather. Work should be suspended during adverse weather conditions such as heavy rain, snow, or strong winds.

During lifting:

- It is strictly forbidden for unauthorized personnel to enter the lifting area, and no one is allowed to stand beneath the boom.
- Ensure that the crane is positioned correctly; long-distance lifting is not permitted.
- The angle between the two lifting ropes must be ≤ 90°.
- Lift and lower the equipment gently; when lowering, it should be smooth and steady to avoid impacting internal components.
- Dragging of steel wire ropes and lifting tools is prohibited, and collisions between equipment must be avoided.

CAUTION!

- During installation, always be cautious of the weight of the inverter. Improper lifting or dropping of the inverter may result in personal injury.
- If the inverter needs to be temporarily placed on the ground, use foam or other protective materials to protect it against potential damages.
- Do not contact the terminals and connectors on the bottom of the inverter with the ground or any other object as this may cause damage.
- Tighten the screws to the torque specified in this document. Otherwise, the inverter may be damaged. This damage is not coved by the warranty.

NOTICE!

- X3-FORTH PLUS series inverters support two mounting methods: Stand-mounting and Wall-mounting. Select an appropriate installation mode based on the actual environment.
- Install the inverter at a maximum back tilt of 5 degrees and avoid it being forward tilted, side tilted, or upside down.
- If the inverter is mounted on a stand, it is necessary to consider whether the design of the stand is conducive to the heat dissipation of the back of the inverter.

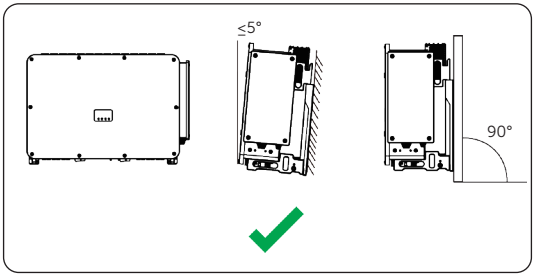


Figure 6-1 Correct installation

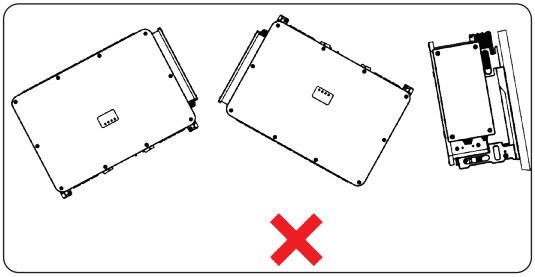


Figure 6-2 Incorrect installation

6.1 Dimensions for Mounting

Before installation, check the dimensions of the bracket and ensure that enough space is reserved for the installation and heat dissipation of the entire system.

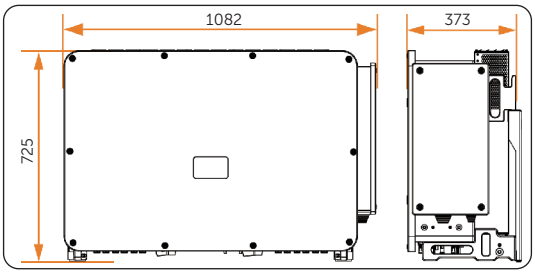


Figure 6-3 Dimensions 1 (Unit: mm)

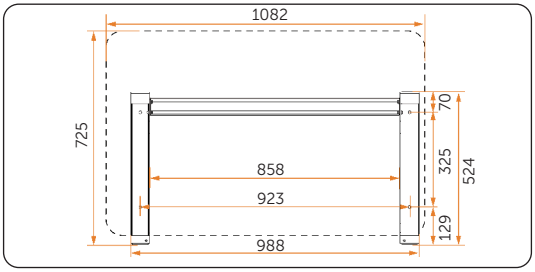


Figure 6-4 Dimensions 2 (Unit: mm)

6.2 Installation Procedures

Stand-mounting

Step 1: Attach the bracket to the stand. Use a spirit level to level the bracket: observe the bubble of the spirit level and adjust the bracket so that the bubble stays in the center position. Then mark the holes (4 holes).

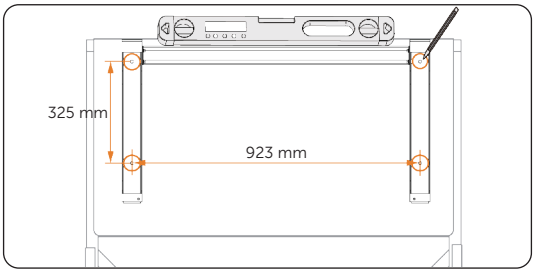


Figure 6-5 Marking the holes

Step 2: Remove the bracket and drill holes with a Ø12 drill bit according to the hole markings

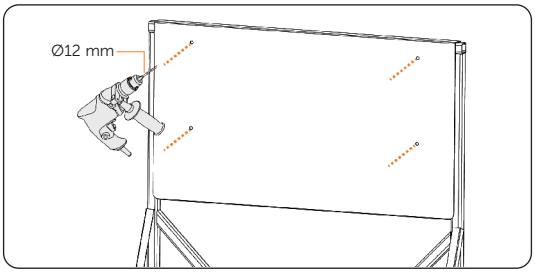


Figure 6-6 Drilling holes

Step 3: Secure the bracket to the stand using the M10 × L40 bolt kits (part J).

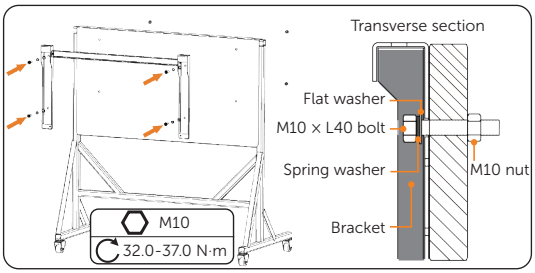


Figure 6-7 Securing the bracket

Step 4: Open the anti-static bag, take out the inverter and move it to the installation site.

- Manual handling: Carry the inverter to the installation site according to the weight of the equipment and the number of personnel required by the regulations.

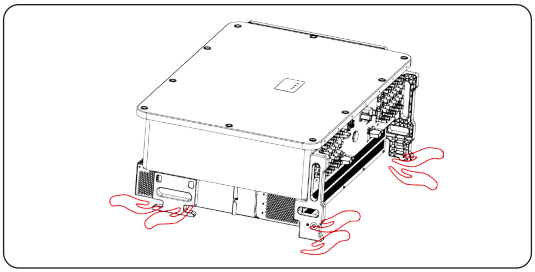


Figure 6-8 Manual handling

- Crane handling: Pass the lifting rope through the lifting holes and tie it tightly. Use the crane to lift the inverter 100 mm above the ground and pause to check the tightness of the rope. After confirming the tightness, lift the inverter to the installation site.

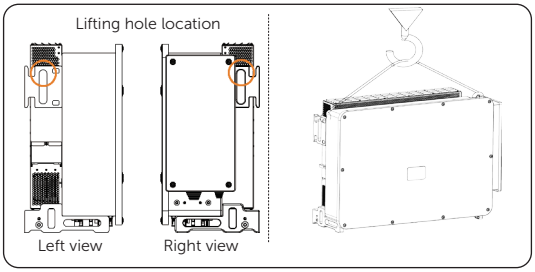


Figure 6-9 Crane handling

Step 5: Hang the inverter on the bracket, making sure that the hooks on the back of the inverter are accurately hooked into the keyways of the bracket.

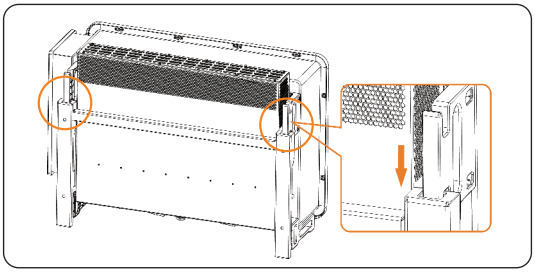


Figure 6-10 Hanging the inverter

Step 6: Secure the inverter on both sides with M6 bolts (part L).

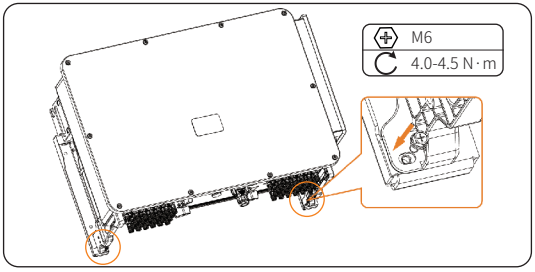


Figure 6-11 Securing the inverter

Wall-mounting

Step 1: Prepare M10 × L80 iron expansion combination in advance. Please kindly note that M10 × L80 screws are not in the accessory box.
Use the bracket as a template for marking the positions of drilling holes on the wall with a spirit level and marker.

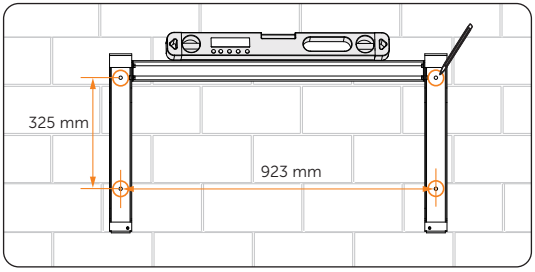


Figure 6-12 Marking the holes

Step 2: Use Ø12 drill to drill holes in accordance with the mark. The depth of the holes shall be at least 65 mm.

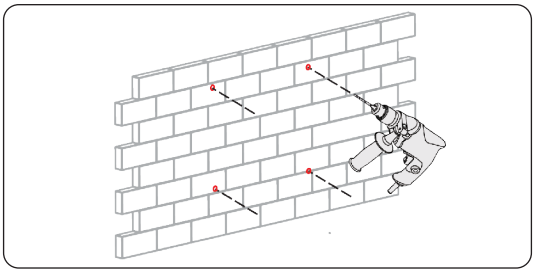


Figure 6-13 Drilling holes

Step 3: Insert the expansion screws into the holes, hang the bracket on the screw and secure it with a nut.

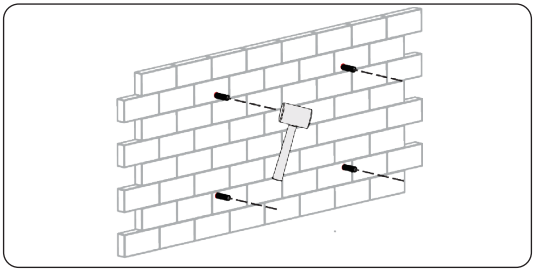


Figure 6-14 Inserting the expansion screws

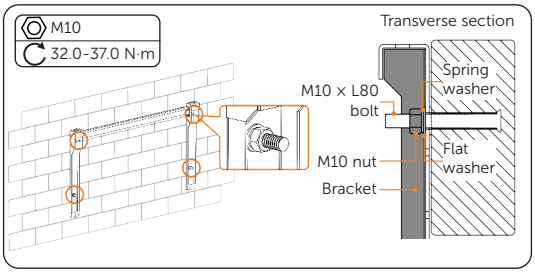


Figure 6-15 Securing the bracket

Step 4: Open the anti-static bag, take out the inverter and move it to the installation site.

- Manual handling: Carry the inverter to the installation site according to the weight of the equipment and the number of personnel required by the regulations.

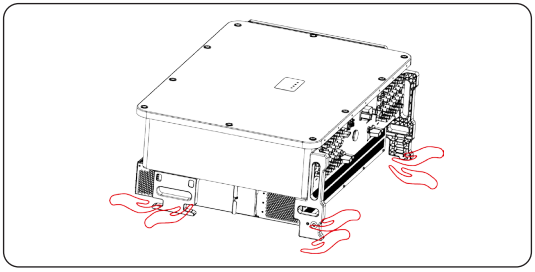


Figure 6-16 Manual handling

- Crane handling: Pass the lifting rope through the lifting holes and tie it tightly. Use the crane to lift the inverter 100 mm above the ground and pause to check the tightness of the rope. After confirming the tightness, lift the inverter to the installation site.

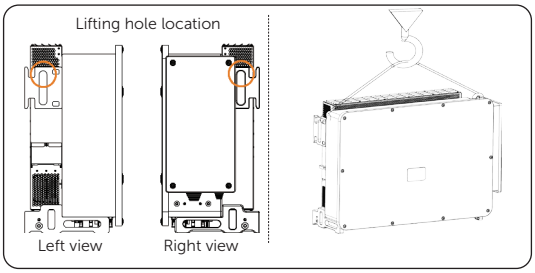


Figure 6-17 Crane handling

Step 5: Hang the inverter on the bracket, making sure that the hooks on the back of the inverter are accurately hooked into the keyways of the bracket.

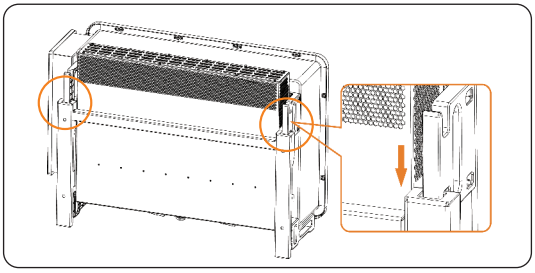


Figure 6-18 Hanging the inverter

Step 6: Secure the inverter on both sides with M6 bolts (part L).

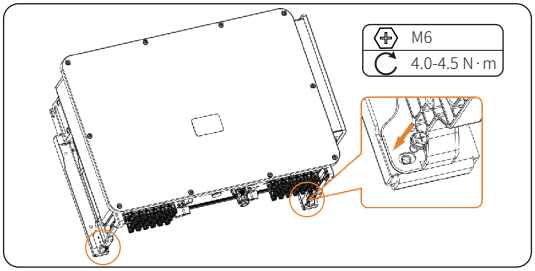


Figure 6-19 Securing the inverter

7 Electrical Connection

DANGER!

- Before electrical connection, make sure all switches and AC breaker are disconnected. Otherwise, the high voltage may cause electric shock, resulting in severe personal injuries or even death.

WARNING!

- Only qualified personnel are allowed to perform the electrical connection following local laws and regulations.
- Strictly follow the instructions of this manual or other related documentation for electrical connection. Inverter damages caused by incorrect wiring are not covered by the warranty.
- Use insulated tools and wear personal protective equipment throughout the electrical connection process.

7.1 Overview of Electrical Connection

7.1.1 Terminals of Inverter

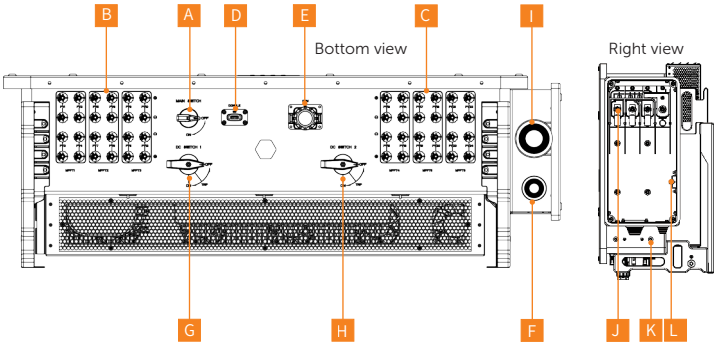


Figure 7-1 Terminals of inverter

Table 7-1 Description of terminals

Item	Name	Description	Decisive voltage class
A	MAIN SWITCH	/	/
B	PV input 1	Includes MPPT1, MPPT2, MPPT3	DVC-C
C	PV input 2	Includes MPPT4, MPPT5, MPPT6	DVC-C
D	DONGLE	Firmware upgrading and dongle connection	DVC-A
E	COM	RS485 / Meter / DRM connection	DVC-A
F	PE terminal	to be used only when connecting with a single-core cable for AC, thus requiring a separate PE cable for grounding	/
G	DC SWITCH 1	Disconnect the PV input 1 when necessary	/
H	DC SWITCH 2	Disconnect the PV input 2 when necessary	/
I	AC terminal	/	/
J	GRID	AC terminal connecting to power grid	DVC-C
K		Additional grounding point	/
L	Grounding point in AC wiring box	/	/

7.1.2 Cable Connections of Inverter

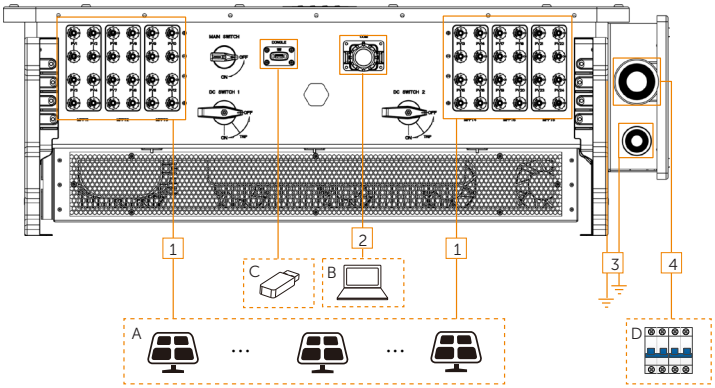


Figure 7-2 Cable connections of inverter

Table 7-2 Descriptions of connected part

Item	Part	Description	Source
A	PV module	A PV string is composed of the PV modules connected in series. This series of inverters supports up to 24 strings of PV string inputs.	Prepared by user
B	X3-FORTH PLUS series inverters	Select X3-FORTH PLUS series inverters.	Purchased from SolaX
	Monitoring equipment	Select a computer that can install SolaX monitoring software.	Prepared by user
C	USB drive	USB 2.0/3.0, ≤32 GB, FAT 16/32	Prepared by user
	Monitoring dongle	Only SolaX monitoring dongle supported.	Purchased from SolaX
D	AC breaker	Select an appropriate AC breaker according to the local regulations to ensure the inverter can be securely disconnected from the grid when an emergency occurs. Recommended breaker is 500 V / 315 A.	Prepared by user

Table 7-3 Descriptions of cables

Item	Cable	Type and specifications	Source
1	PV cable	Refer to "4.3 Additionally Required Materials" .	Prepared by user
2	RS485 communication cable		
3	PE cable		
4	AC cable		

7.2 PE Connection

The inverter must be reliably grounded. The PE connection point has been marked with ⏚. It is recommended to connect the inverter to a nearby grounding point.

NOTICE!

- X3-FORTH PLUS series supports the earthing detection function. Before start-up, the inverter will detect whether it has been properly grounded. If not (Neither the additional grounding point nor the grounding point in AC wiring box is connected.), the inverter will turn on the red light and report fault on **SolaXCloud**.

Terminal size requirements

- Use M8 OT/DT terminals for PE wires (Prepared by user). The following is an example of the OT terminal.

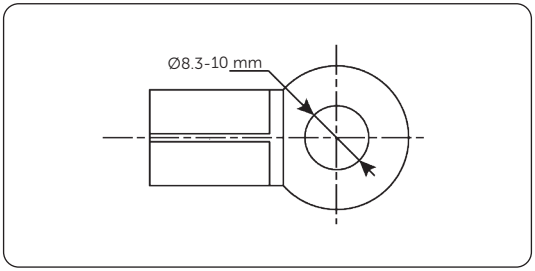


Figure 7-3 Terminal size

Terminal material and crimping requirements

- When copper wires are used, use copper terminals.
- When aluminum wires are used, use aluminum terminals with copper and aluminum transition spacers or use copper and aluminum transition terminals.

- It is strictly prohibited to connect aluminum terminals directly to the equipment housing, as this will lead to chemical corrosion and affect the reliability of the electrical connection.
- When using copper-aluminum transition spacers, make sure that the aluminum side of the copper-aluminum transition spacer is in contact with the aluminum terminals and the copper side is in contact with the equipment housing.

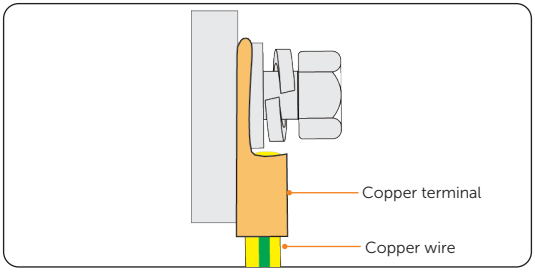


Figure 7-4 Copper terminal crimping

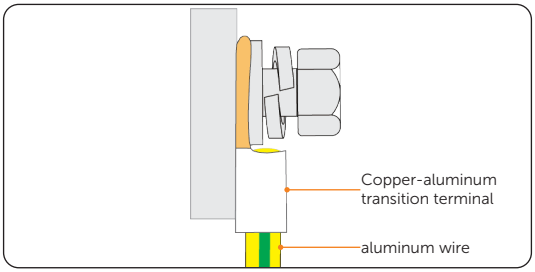


Figure 7-5 Aluminum-copper transition terminal crimping

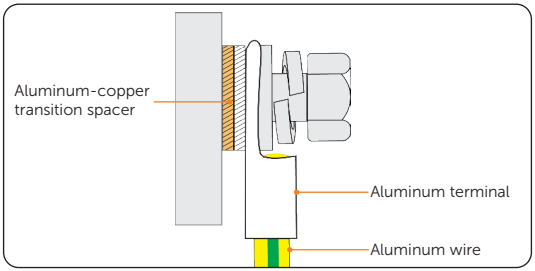


Figure 7-6 Aluminum terminal crimping

PE connection procedures

Step 1: Strip off the insulation of the PE cable to an appropriate length.

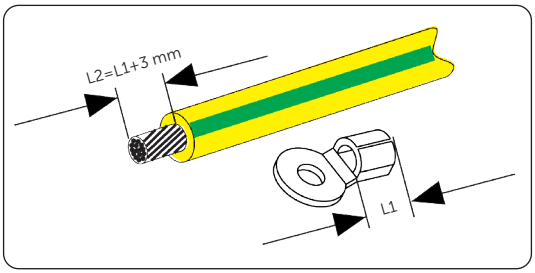


Figure 7-7 Stripping the PE cable

Step 2: Pull the heat-shrink tubing over the PE cable and insert the stripped section into the OT terminal.

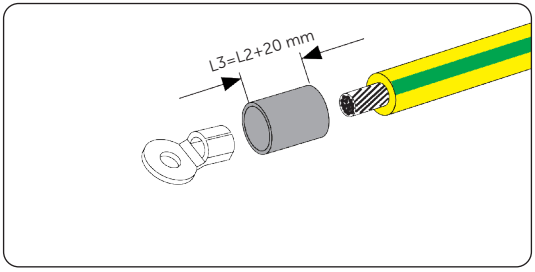


Figure 7-8 Installing the tubing and OT terminal

Step 3: Crimp it with crimping tool, pull the heat-shrink tubing over the stripped section of the OT terminal and use a heat gun to shrink it so that it can be firmly contacted with the terminal.

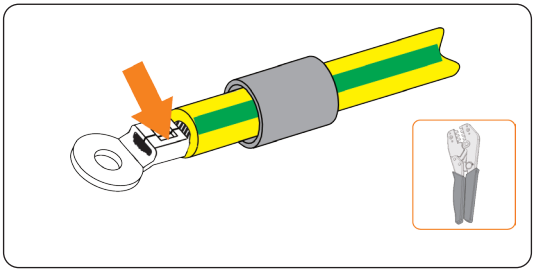


Figure 7-9 Crimping the cable

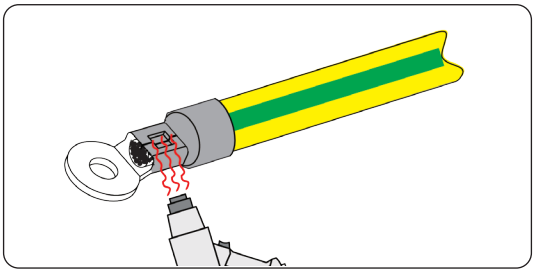


Figure 7-10 Shrinking the tubing

Step 4: Remove the M8 screws on the inverter with a Philips screwdriver.

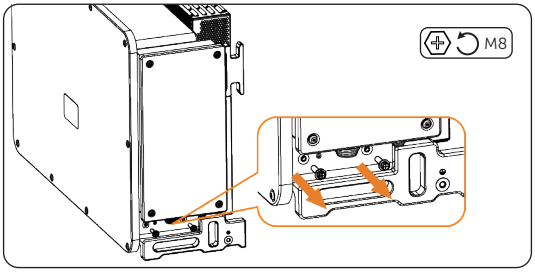


Figure 7-11 Removing the M8 screws

Step 5: Connect the assembled PE cables to the grounding point of the inverter, and secure it with the original screws.

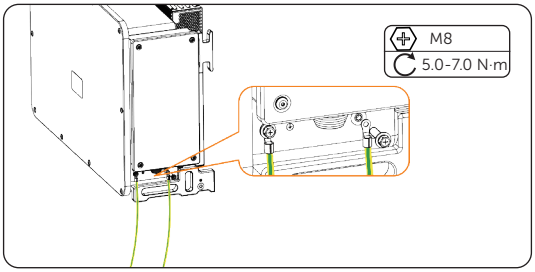


Figure 7-12 Securing the PE cable

7.3 AC Connection

NOTICE!

- Before connecting the inverter to the grid, approval must be received by local utility as required by national and state regulations.

Requirements for AC connection

- Grid voltage requirement
  - » The grid voltage and frequency must be within the allowable range and comply with the requirements of the local power grid.
    - » 120-150 kW: 220/380 V, 230/400 V, 50/60 Hz
    - » 75 kW: 127/220 V, 50/60 Hz
- Residual Current Device (RCD)
  - » If an external RCD is required by local regulations, verify the type of RCD required. It is recommended to use a Type-B RCD with a rating of 1.5 A.
- Circuit breaker
  - » A circuit breaker that matches the power of the inverter must be used between the inverter output and the power grid. Each inverter must be equipped with an independent breaker or other load disconnection unit to ensure the safe disconnection from the power grid. Recommended breaker is 500 V / 315 A.

Terminal size requirements

- Use M12 OT/DT terminals for phase wires in the AC wiring box.

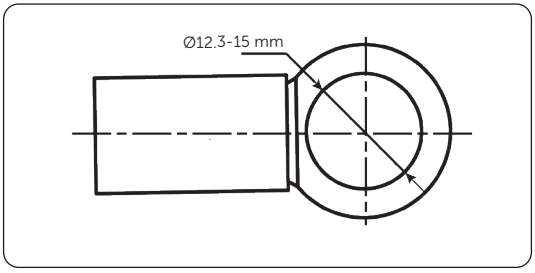


Figure 7-13 Terminal size

- Use M8 terminals for PE wires in the AC wiring box.

Terminal material and crimping requirements

- When copper wires are used, use copper terminals.
- When aluminum wires are used, use aluminum terminals with copper and aluminum transition spacers or use copper and aluminum transition terminals.
- It is strictly prohibited to connect aluminum terminals directly to the equipment housing, as this will lead to chemical corrosion and affect the reliability of the electrical connection.
- When using copper-aluminum transition spacers, make sure that the aluminum side of the copper-aluminum transition spacer is in contact with the aluminum terminals and the copper side is in contact with the equipment housing.

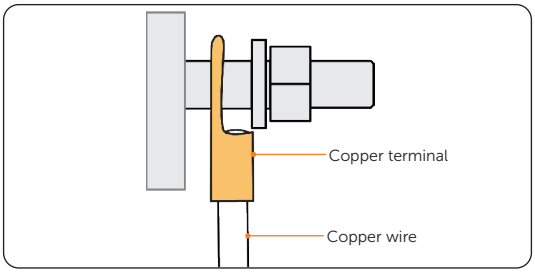


Figure 7-14 Copper terminal crimping

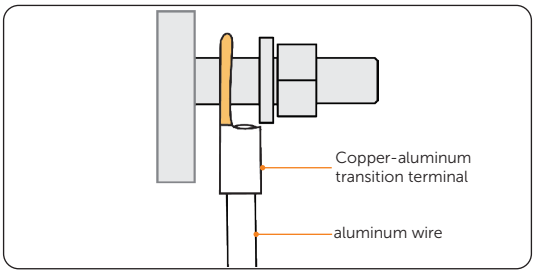


Figure 7-15 Aluminum-copper transition terminal crimping

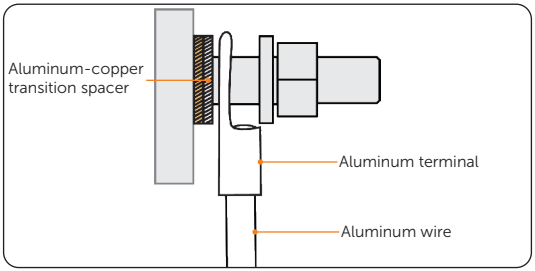


Figure 7-16 Aluminum terminal crimping

Wiring procedures

NOTICE!

- The AC side wiring supports single-core wire wiring scheme and multi-core wire wiring scheme.
- The following describes the wiring procedure using copper wires and OT terminals as an example. Refer to "4.3 Additionally Required Materials" for wire requirements for aluminum wires.
- The OT and DT terminals are crimped in the same way.

Step 1: Use a T30 internal hex wrench (part K) to open the AC wiring box cover.

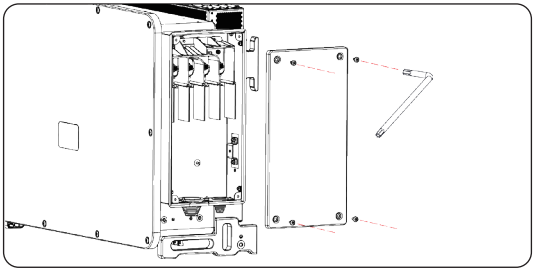


Figure 7-17 Opening the AC wiring box cover

Step 2: Remove the nuts and bolts as shown below.

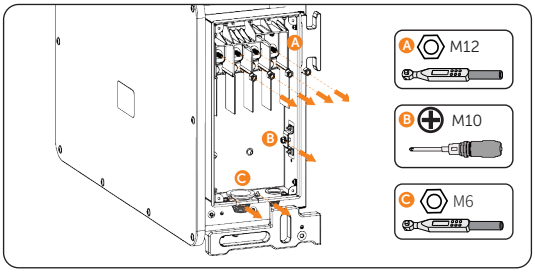


Figure 7-18 Removing the nuts and bolts

Step 3: Remove the baffle.

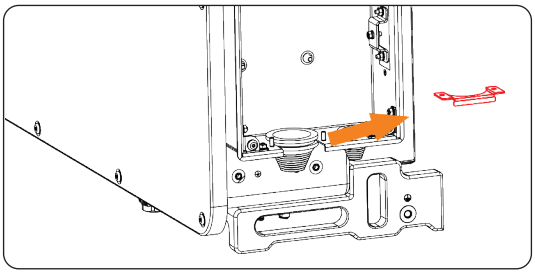


Figure 7-19 Crimping the OT terminals

NOTICE!

- If it is inconvenient to thread the cable through the pagoda-shaped coil, remove the pagoda-shaped coil from the inverter before threading.
- When wiring is complete, please return the pagoda-shaped coil to its original position and install the baffle in place.

Step 4: Connect the AC cable to the inverter.

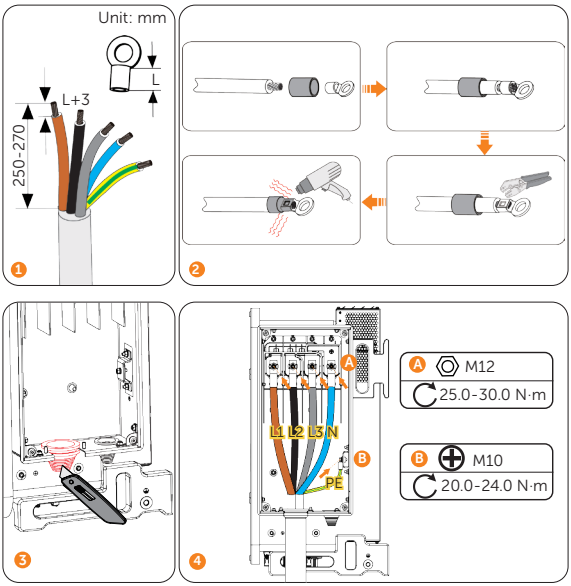


Figure 7-20 Multi-core wiring with N wire solution - Not separate PE wiring

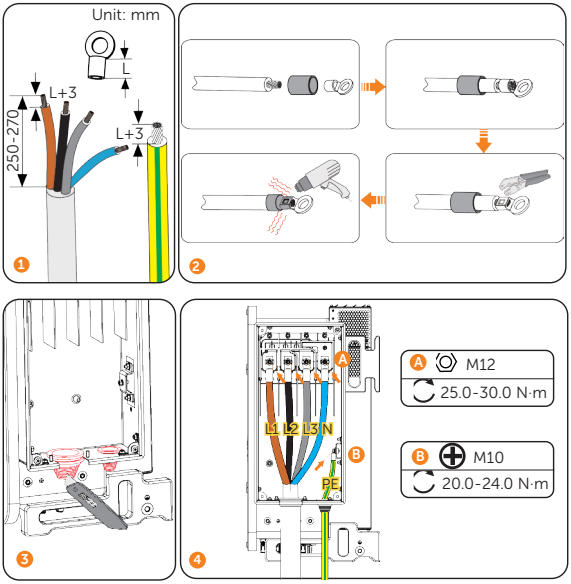


Figure 7-21 Multi-core wiring with N wire solution - Separate PE wiring

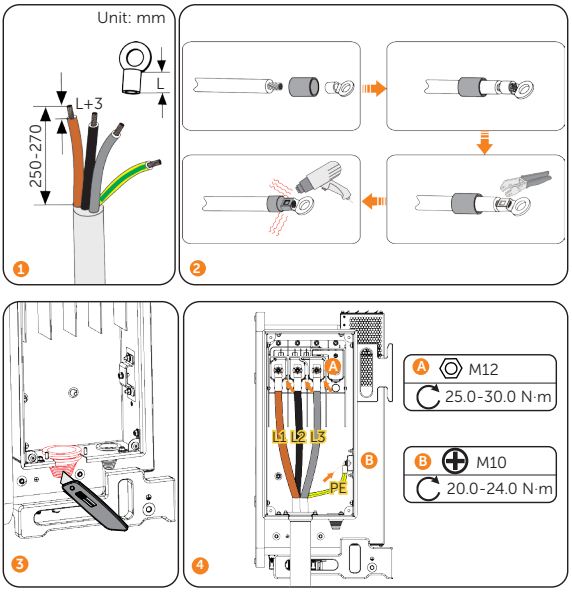


Figure 7-22 Multi-core wiring without N wire solution - Not separate PE wiring

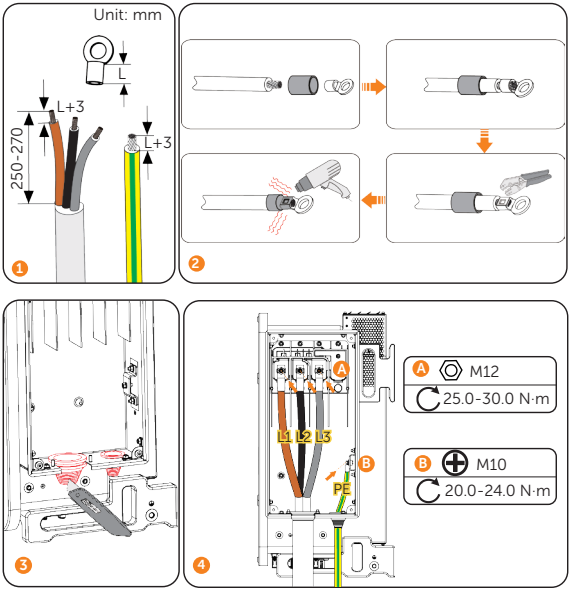


Figure 7-23 Multi-core wiring without N wire solution - Separate PE wiring

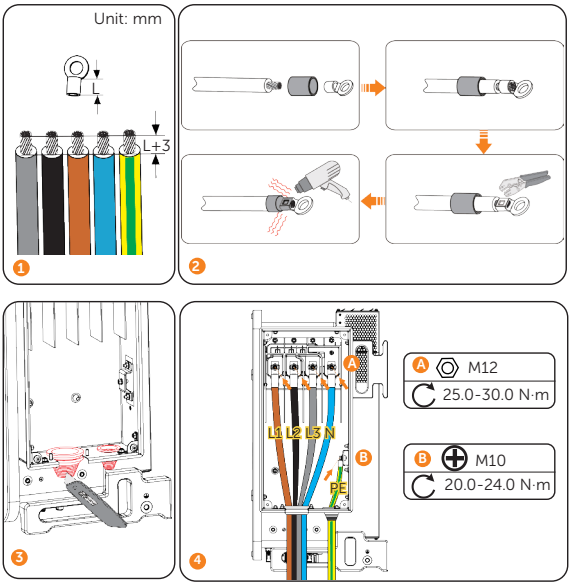


Figure 7-24 Single core wiring solution

NOTICE!

- Plug the cut pagoda-shaped coil with fireproof mud before closing AC wiring box.
- Prepare fireproof mud that meets local environmental standards.

Step 5: Close the AC wiring box. The following diagram is an example of single-core wiring scheme.

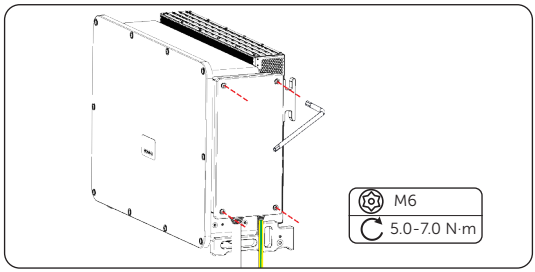


Figure 7-25 Closing the AC wiring box

7.4 PV Connection

DANGER!

- When exposed to the sunlight, PV modules will generate lethal high voltage. Please take precautions.
- Before connecting the PV modules, make sure that both DC switches and AC breaker are disconnected, and the PV module output is securely isolated from the ground.

WARNING!

- Utilize a dedicated crimping tool specifically designed for PV installations to ensure secure and reliable connections. Otherwise, electrical shock or fire may be caused.

CAUTION!

- Power is fed from more than one source and more than one live circuit.

The inverter is equipped with two DC switches: DC SWITCH 1 controls the DC terminals PV1 to PV12, DC SWITCH 2 controls the DC terminals PV13 to PV24.

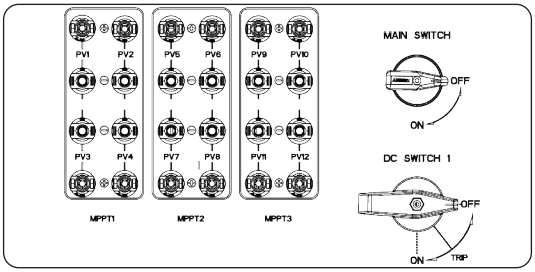


Figure 7-26 DC SWITCH 1 controls the DC terminals PV1 ~ PV12

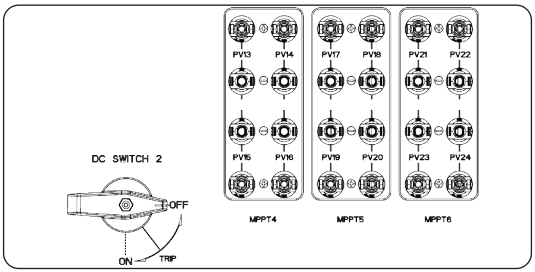


Figure 7-27 DC SWITCH 2 controls the DC terminals PV13 ~ PV24

Requirements for PV connection

- Voltage and current requirements
  - » The open circuit voltage of each module cannot exceed the maximum PV input voltage (1100 V) of the inverter. Otherwise, the inverter may be damaged.
  - » The operating voltage of PV modules must be within the operating voltage range (180~1000 V) of the inverter. Otherwise, the inverter will not work properly. Consider the impact of low temperature on the voltage of the photovoltaic panels, as lower temperatures tend to result in higher voltages.
  - » The maximum allowable operating current is 25 A per PV string.
  - » The voltage difference between different MPPTs should be less than 200 V.
- PV module installation and cable connection requirements
  - » Use the same brand of PV modules for the same MPPT. Different PV strings of the same MPPT should have the same structure, including: the same model, the same number, the same tilt angle, and the same azimuth.
  - » Ensure that the PV module output is well insulated to ground
  - » The positive and negative terminals of a PV string must be connected to corresponding positive and negative DC input terminals of the inverter.
  - » This series of inverters does not support full parallel connection for PV strings (full parallel connection: PV strings connect to one another in parallel outside the inverter and then connect to it separately)

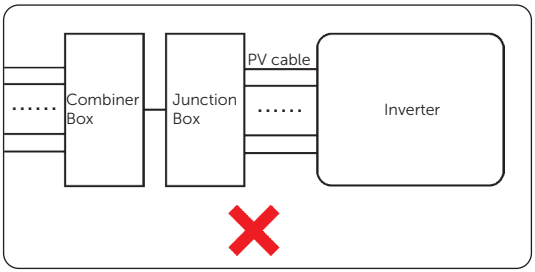
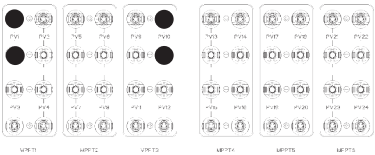
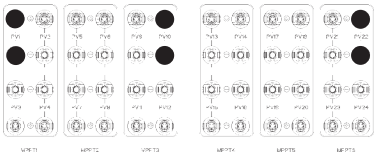
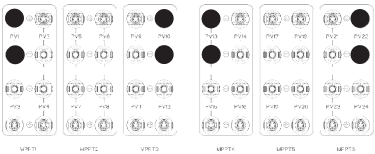
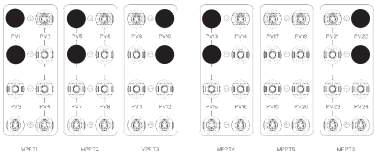
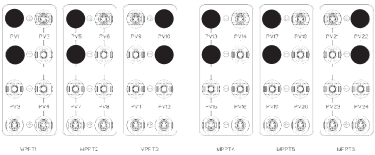
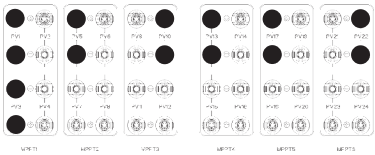
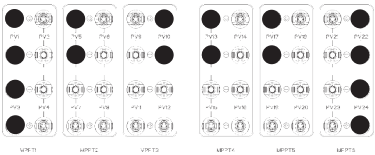
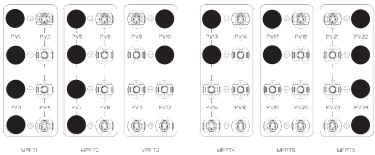
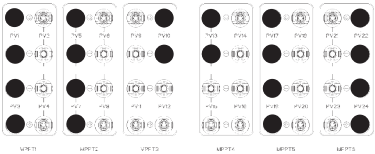
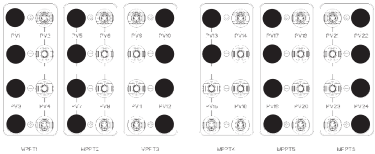
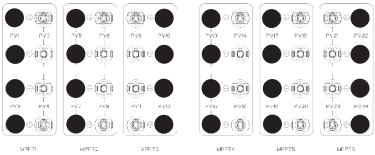
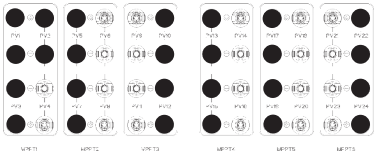
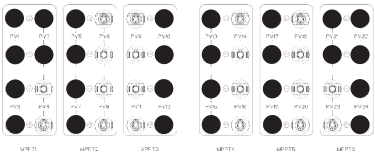
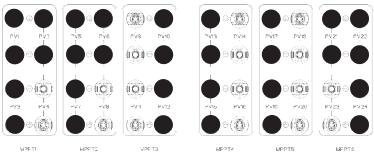
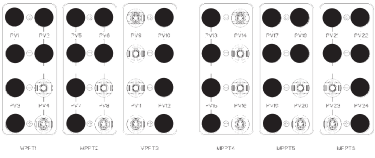
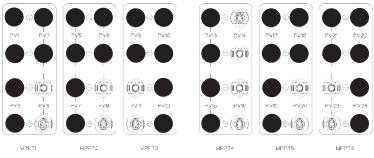
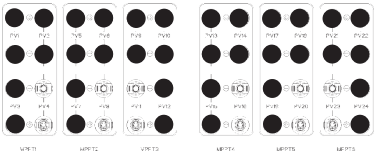
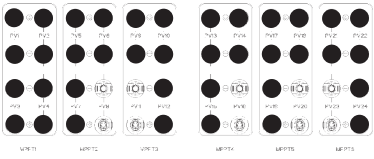
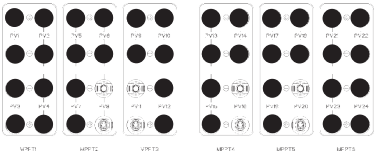
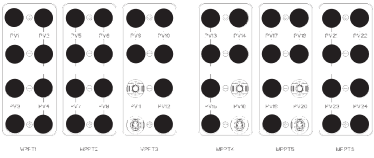
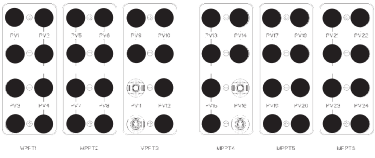
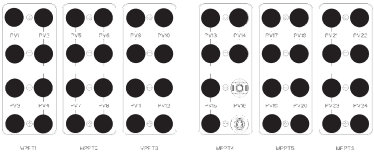


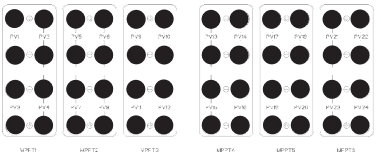
Figure 7-28 Full parallel connection

PV terminal configuration

- DC input terminal PV9 / PV10 must be connected to a PV string.
- Ensure that PV strings are evenly distributed on each MPPT.
- Please refer to the following table for the selection of terminals with different input string numbers:

Numbers	Terminal Selection	Numbers	Terminal Selection
2	PV1/10 	3	PV1/10/22 
4	PV1/10/13/22 	5	PV1/5/10/13/22 
6	PV1/5/10/13/17/22 	7	PV1/3/5/10/13/17/22 
8	PV1/3/5/10/13/17/22/24 	9	PV1/3/5/7/10/13/17/22/24 
10	PV1/3/5/7/10/13/17/19/22/24 	11	PV1/3/5/7/10/12/13/17/19/22/24 
12	PV1/3/5/7/10/12/13/15/17/19/22/24 	13	PV1/2/3/5/7/10/12/13/15/17/19/22/24 

Numbers	Terminal Selection	Numbers	Terminal Selection
14	PV1/2/3/5/7/10/12/13/15/17/19/21/22/24 	15	PV1/2/3/5/6/7/10/12/13/15/17/19/21/22/24 
16	PV1/2/3/5/6/7/10/12/13/15/17/18/19/21/22/24 	17	PV1/2/3/5/6/7/9/10/12/13/15/17/18/19/21/22/24 
18	PV1/2/3/5/6/7/9/10/12/13/14/15/17/18/19/21/22/24 	19	PV1/2/3/4/5/6/7/9/10/12/13/14/15/17/18/19/21/22/24 
20	PV1/2/3/4/5/6/7/9/10/12/13/14/15/17/18/19/21/22/23/24 	21	PV1/2/3/4/5/6/7/8/9/10/12/13/14/15/17/18/19/21/22/23/24 
22	PV1/2/3/4/5/6/7/8/9/10/12/13/14/15/17/18/19/20/21/22/23/24 	23	PV1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/17/18/19/20/21/22/23/24 

Numbers	Terminal Selection	Numbers	Terminal Selection
24	All 	/	/

Wiring procedures

Step 1: Strip off the insulation of the PV cables to an appropriate length.

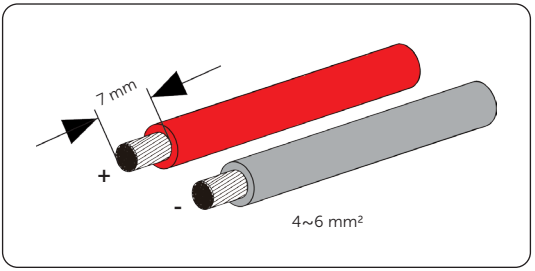


Figure 7-29 Stripping the PV cable

Step 2: Insert the stripped cable into the PV pin contact (part D and part F), make sure the PV cable and PV pin contact are of the same polarity.

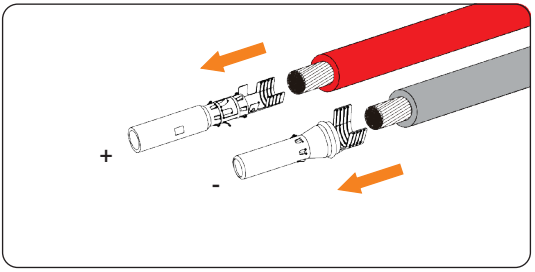


Figure 7-30 Inserting the PV pin contact

Step 3: Crimp it with crimping tool for PV terminal. Pay attention to the crimping position.

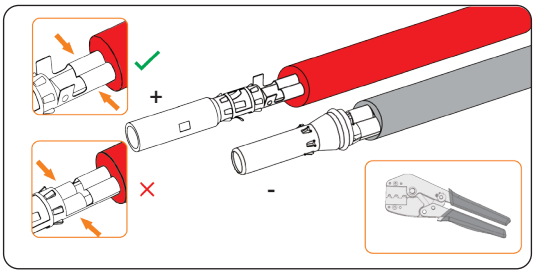


Figure 7-31 Crimping the terminal

Step 4: Thread the PV cable through swivel nut and insert the cable into the PV connector (part C and part E).

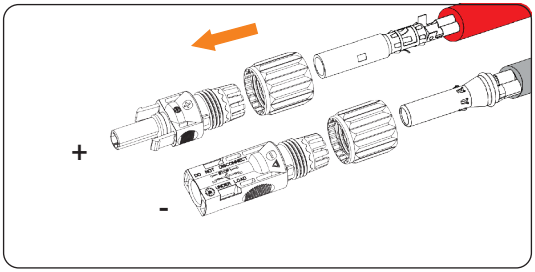


Figure 7-32 Threading the PV cable

Step 5: A "Click" will be heard if it is connected correctly. Gently pull the cable backward to ensure firm connection. Tighten the swivel nut clockwise. Verify that the PV connectors have the correct polarity before connection.

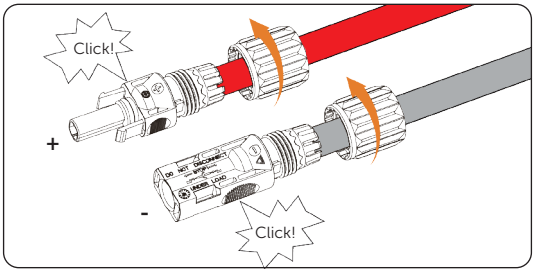


Figure 7-33 Securing the PV cable

Step 6: Use a multimeter which complies with the local regulation to measure the positive and negative voltage of the assembled PV connectors. Make sure the open circuit voltage does not exceed the input limit of 1100 V.

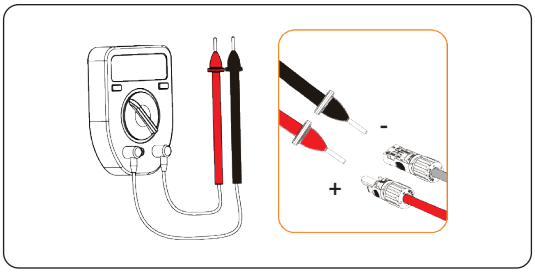


Figure 7-34 Measuring the voltage of PV connectors

NOTICE!

- If the voltage reading is negative, it indicates an incorrect DC input polarity. Please check if the wiring connections on the multimeter are correct or PV connectors are correctly assembled.

Step 7: Remove the PV terminal caps and connect the assembled PV connectors to the corresponding terminals until there is an audible "Click". The PV+ on the string side must be connected to the PV+ on the inverter side, and the PV– on the string side must be connected to the PV– on the inverter side.

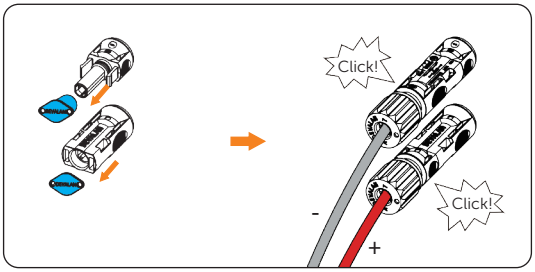


Figure 7-35 Connecting the PV cable

Step 8: Seal the unused PV terminal with positive and negative dustproof buckle. (Part G and H).

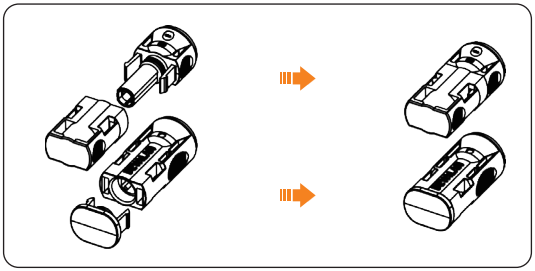


Figure 7-36 Installing the dustproof buckles

WARNING!

- Seal the unused PV terminals with the dustproof buckle. If all PV terminals are connected, keep the dustproof buckles in a safe place. Reinstall them immediately after removing the connectors from the terminals.

Disassembling the dustproof buckles with the Disassembling tool for PV terminal (part I).

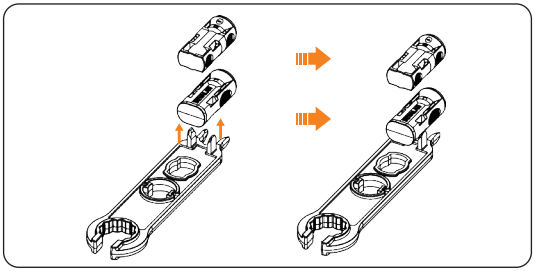


Figure 7-37 Disassembling the dustproof buckles

7.5 Communication Connection

7.5.1 Communication Signal Definition

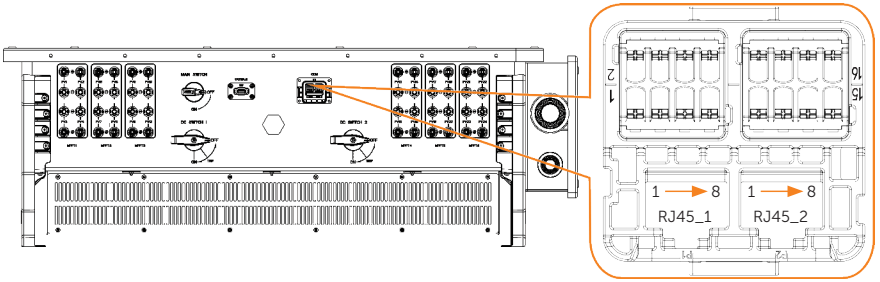


Figure 7-38 Communication port pin number

Table 7-4 Communication port pin definition

Pin	Function	Definition	Remark
1	RJ45_1	RS485A IN	For inverter RS485 networking or connecting the data collector
2		RS485B IN	
3		GND	
4		RS485A METER	For connecting RS485 meter or other devices
5		RS485B METER	
6		GND	
7		/	Reserved
8		/	
1	RJ45_2	RS485A OUT	For inverter RS485 networking or connecting the data collector
2		RS485B OUT	
3		GND	
4		/	Reserved
5		/	
6		/	
7		/	
8		/	

Pin	Function	Definition	Remark
1	DRM	DRM1/5	Reserved for DRM
2		DRM2/6	
3		DRM3/7	
4		DRM4/8	
5		RefGen	
6		DRM0	
7		GND	
8		GND	
9	Dry contact	Digital IN+	Dry contact
10		Digital IN-	
11		Digital OUT+	
12		Digital OUT-	
13		Digital IN+	
14		Digital IN-	
15	Selection of terminating resistor for shorting	120Ω_IN	Selection of terminating resistor for shorting
16		120Ω_OUT	

7.5.2 RS485 Communication Connection Diagram

Single inverter communication system

In case of a single inverter, communication cable connection requires only one RS485 cable.

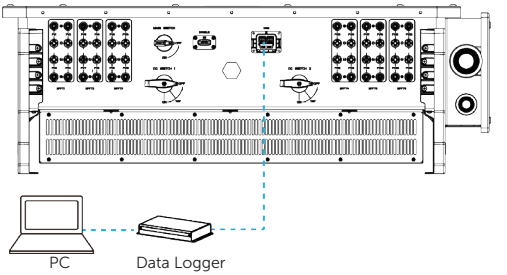


Figure 7-39 Single inverter communication diagram

Multi-inverter communication system

In case of multiple inverters, all the inverters can be connected via RS485 cables in the daisy chain manner.

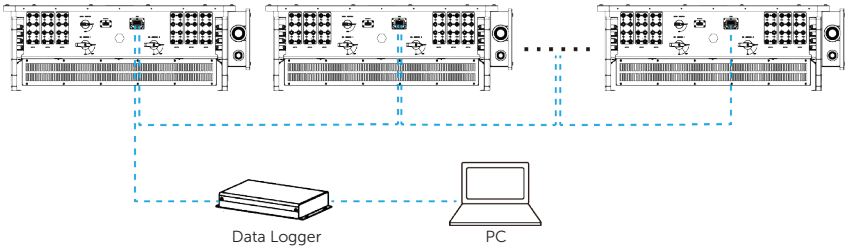


Figure 7-40 Multi-inverter communication diagram

7.5.3 Wiring Procedures

Step 1: Prepare standard network cable with RJ45 connector and 0.5-0.75 mm² outdoor shielded twisted pair, and crimp the twisted pair to the ferrule (part B).

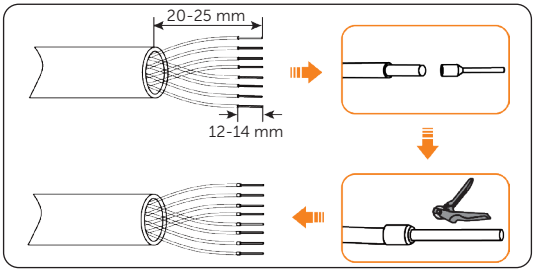


Figure 7-41 Stripping and crimping

Step 2: Find the communication connector (part A) from the accessory box and disassemble it into the following parts.

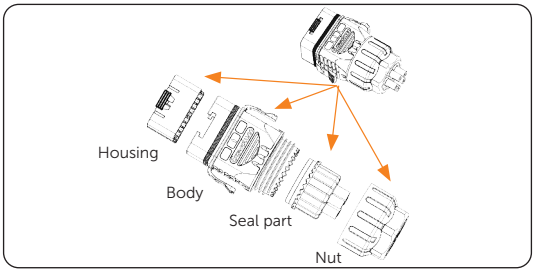


Figure 7-42 Disassembling the connector

Step 3: Remove the waterproof plug based on actual needs.

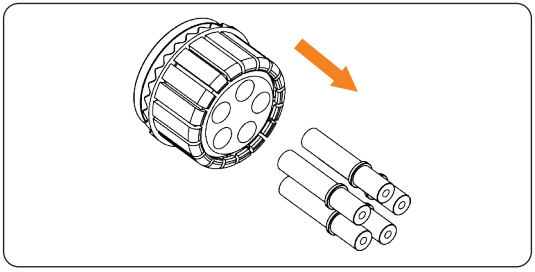


Figure 7-43 Removing the waterproof plug

Step 4: Route the crimped cable through the nut, seal part and body in sequence.

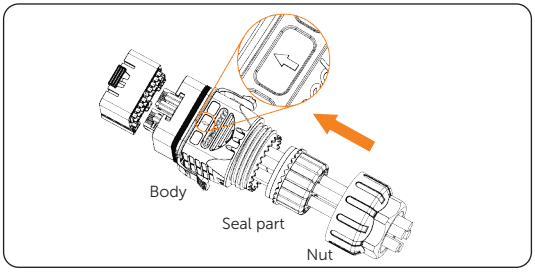


Figure 7-44 Running a cable through

Step 5: Insert the crimped cable into the housing according to the number identification on the housing. And follow the steps below to finish assembling the communication connector.

a. Push the housing into the body until you hear a slight "click".

b. Push the cable support sleeve into the body.

c. Tighten the nut clockwise.

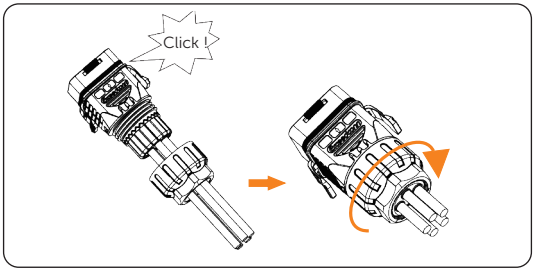


Figure 7-45 Assembly connector

Step 6: Keep the buttons on both sides pressed and connect it to the COM port of the inverter. There will be a slight sound of "Click" if it is correctly connected.

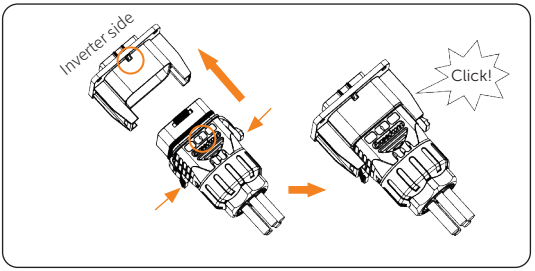


Figure 7-46 Connect to inverter

7.6 Monitoring Connection

This series of inverters support Wi-Fi/LAN/4G mode connection. The inverter provides a **DONGLE** terminal, which can transmit data of the inverter to the monitoring website via dongle (Optional). Purchase dongle from SolaX if needed.

Monitoring connection diagram

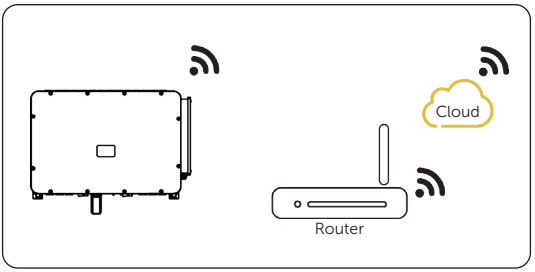


Figure 7-47 Wi-Fi mode connection diagram

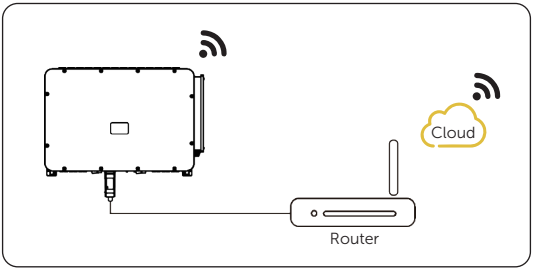


Figure 7-48 LAN mode connection diagram

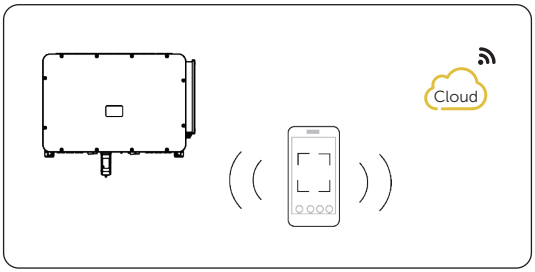


Figure 7-49 4G mode connection diagram

Monitoring connection procedure

a. Remove the dust cap from the Dongle terminal.

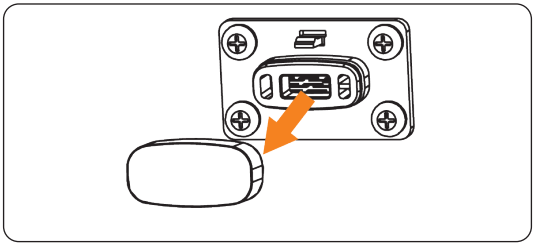


Figure 7-50 Removing the dust cap

b. Plug the dongle to the inverter.

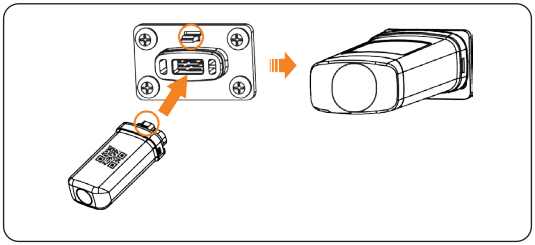


Figure 7-51 Plugging to the inverter

CAUTION!

- Taking the WiFi 3.0 connection as an example, please refer to the corresponding installation manual for the specific connection procedure and precautions regarding the dongle.
- The buckles on the inverter and dongle must be on the same side. Otherwise, the dongle may be damaged.

8 System Commissioning

8.1 Checking before Power-on

Table 8-1 Start-up Inspection Rules

No.	Item	Inspection rules
1	Mounting	• The inverter is mounted correctly and securely
2	Wiring	• All DC and AC cables are properly and securely connected • All communication cables are connected correctly and securely • All Grounding cables are connected correctly and securely
3	Breaker	• All the DC breakers and AC breakers are OFF
4	Unused terminal	• Unused terminals are sealed with caps and unused PV terminals are sealed with dustproof buckles
5	Bolts	• AC wiring box closed and all bolts tightened, no bolts left in box

8.2 Powering on the System

Step 1: Use a multimeter to check whether the AC voltage is within the allowable range.

Step 2: Turn on the AC switch between the inverter and the power grid.

Step 3: Use a multimeter in DC voltage mode to check whether the PV voltage is within the allowable range.

Step 4: Turn on the main switch, and observe the LED indicator after hearing a slight "click" sound.

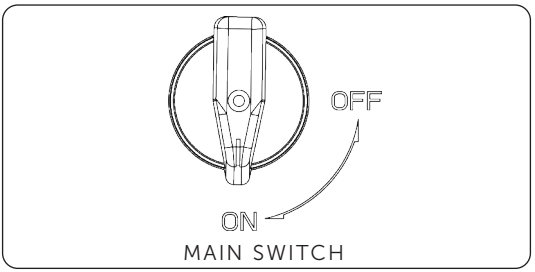


Figure 8-1 Turning on the main switch

Step 5: When the DC connection indicator and the grid connection indicator are flashing at the same time and the alarm indicator does not stay on, turn on the DC switch 1 and DC switch 2, and continue to observe the LED lights to check the operation status of the inverter.

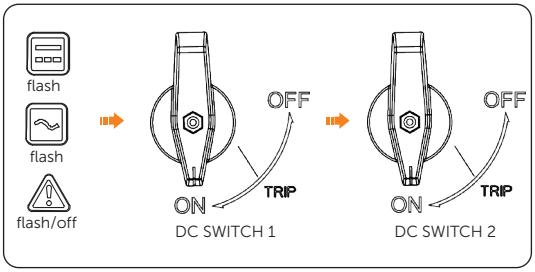


Figure 8-2 Turning on DC switches

NOTICE!

- If the DC connection indicator does not light up or the alarm indicator stay on after 1 minute of turning on the main switch, do not turn on the DC switch. At the same time, immediately turn off the main switch and check that the input cable is not reversed or that the input voltage meets the starting voltage requirement. After correction, start again from step 4.
- After the correction, If the DC Connection Indicator and Grid Connection Indicator do not light up and the Alarm Indicator is always on, turn off the main switch and contact a technical support engineer.

Step 6: After normal operation of the inverter (DC connection indicator and grid connection indicator are always on), turn off the main switch.

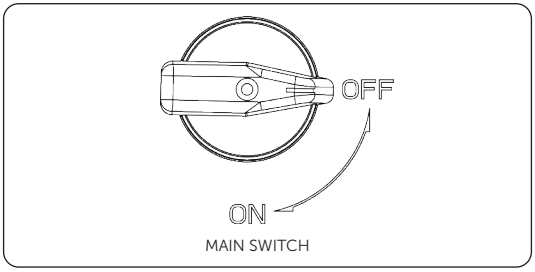


Figure 8-3 Turning off the main switch

9 Operation on LCD

9.1 Introduction of Control Panel

LCD panel

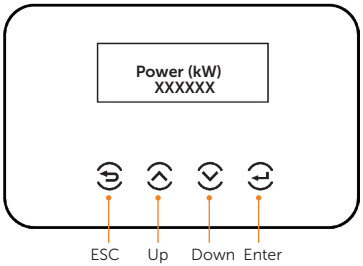


Figure 9-1 Control panel

- In normal state, the **Power**, **TodayEnergy**, **TotalEnergy** and **Status** information will be displayed. You can press the keys to switch information.
- In error state, the fault message and error code will be displayed, please refer to "11.2 Troubleshooting" for the related solution.

Table 9-1 Definition of indicators

Key	Definition
ESC key	Exit from the current interface or cancel the setting
Up key	Move the cursor to the previous option or increase the value
Down key	Move the cursor to the next option or decrease the value
Enter key	Enter the selected option or confirm the selection

LED indicators

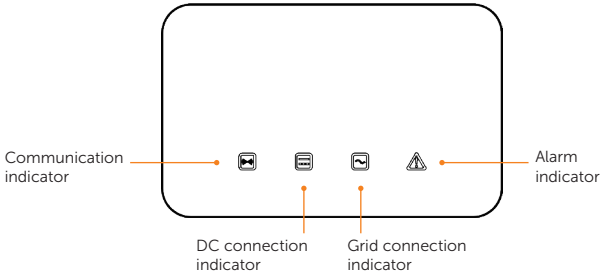


Figure 9-2 Control panel

- During normal operation, the communication indicator, DC connection indicator, and grid connection indicator are always on.
- When a fault occurs, the alarm indicator is on. Use the monitoring system to view the fault code and fault name. See "11.2 Troubleshooting" for the related solution.

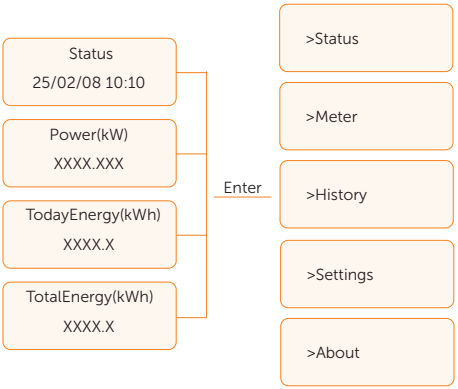
Table 9-2 Definition of indicators

LED	Status		Definition
Communication indicator (Blue)		On	The inverter communication is normal.
		Flash	No communication data is sent or received for a long time.
DC connection indicator (Green)		On	The inverter is in grid-connected state.
		Flash	Alarm indicator on: Errors occur on the inverter DC side. Alarm indicator off: No errors occur on the inverter DC side and at least one channel of MPPT input voltage is higher than start-up voltage.
		Off	The input voltage of all channels of MPPT is less than 200 V or DC switch is not turned on.
Grid connection indicator (Green)		On	The inverter is in grid-connected state.
		Flash	Alarm indicator on: Errors occur on the AC side. Alarm indicator off: AC grid is connected and the inverter is not in grid-connected state.
		Off	The inverter is not connected to the grid.
Alarm indicator (Red)		On	Errors occur on the inverter.
		Off	No errors occur on the inverter.

*** Note:**

- During software upgrading, all indicators blink in a chasing light pattern.
- If the software upgrade fails, the communication indicator light (blue) goes off, the alarm indicator light (red) remains on, and the DC connection indicator light (green) and grid connection indicator light (green) remain off.
- After a successful inverter upgrade, the communication indicator light (blue) goes off, the alarm indicator light (red), DC side indicator light (green), and grid connection indicator light (green) remain on.

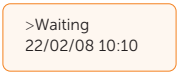
9.2 Main interface



The main interface (Level 1) is the default interface, the inverter will automatically jump to this interface when the system started up successfully or not operated for a period of time.

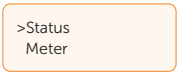
Status shows the time and the current status "Waiting", "Checking","Running", "Fault" and "Upgrading"; **Power** means the timely output power; **TodayEnergy** means the power generated within the day; **TotalEnergy** means the power generated until now.

Press **Up** and **Down** to review the information.

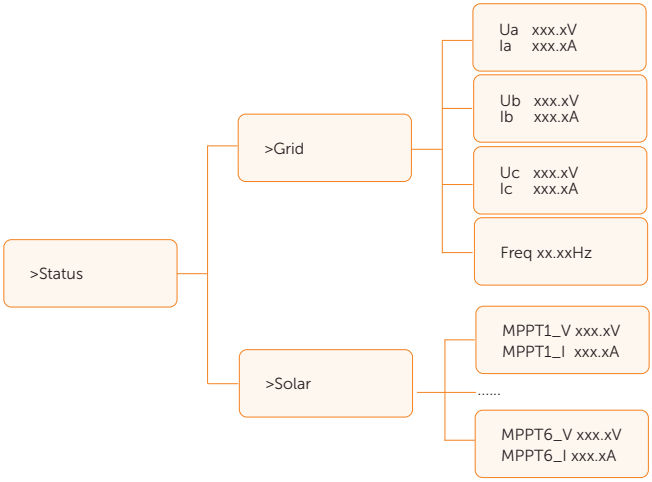


The menu interface (Level 2) is a transfer interface for the user to get into other interface to change the setting or obtain the information. User can get into this interface by pressing **Enter** key when LCD displays the main interface.

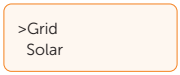
User can select **Up** and **Down** key, and press **Enter** to confirm the selection.



9.3 Status



The status function contains **Grid** and **Solar**. Press **Up** and **Down** to select and press **Enter** to confirm the selection. Press **ESC** to return to menu.



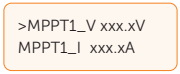
9.3.1 Grid Setting

This status shows the current grid condition such as voltage, current, output power, etc.

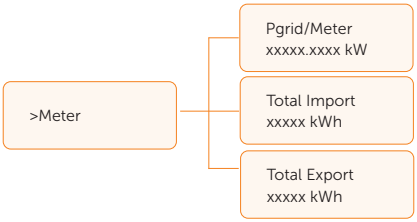
Press **Up** and **Down** button to review the parameter, press **ESC** to return to Status.

9.3.2 Solar Setting

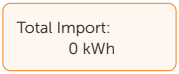
This interface shows the input current and voltage of PV. Totally up to 6 channels of MPPT current and voltage can be checked for the inverter.



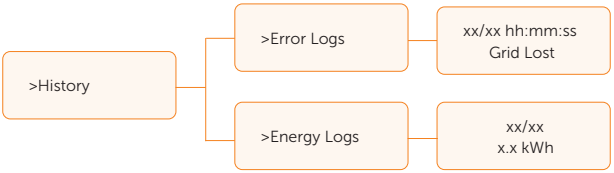
9.4 Meter



The user can check the active power received from the meter and import/export energy by this function. There are three parameters: **Pgrid/Meter**, **Total Import** and **Total Export**. Press **Up** and **Down** to review the values. If no meter is connected, the parameters here will display 0.



9.5 History



The user can check the error logs and energy logs by this function.

9.6 Settings

NOTICE!

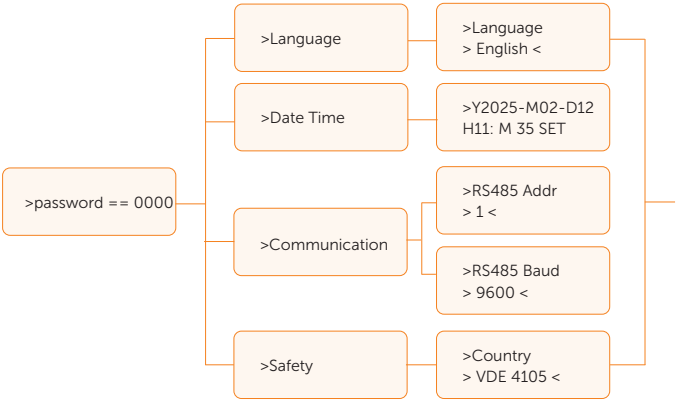
- The setting is displayed under the corresponding safety regulations.

Setting function is used for setting the inverter for safety, system on/off, PV connection mode, etc. To set the parameter, please input the password.

Use **0000** as the password for end-users. For installers, Use **2014** as the password to review and modify necessary settings complying to the local rules and regulations. Please change the password promptly for security purposes.

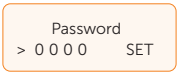
If further advanced setting is required, please contact us or the distributor for assistance.

9.6.1 Using Users' Password



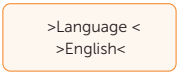
The sections in this diagram are the same whether accessed with the end-user password or the installer password.

For users, the default password is **0000**, which allows the user to review and modify **Language**, **Date Time**, **Communication** and **Safety**.



Language

Users can set the language here, currently available in English.



Date time

This interface is for the user to set the system date and time. Increase or decrease the word by pressing **Up** and **Down** key. Press **Enter** to confirm and alternate to next word.

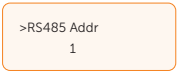
Communication

RS485 Addr: the modbus address of the external communication protocol.

RS485 Baud: The baud rate of the external communication protocol.

At present,4800, 9600 and 19200 are supported, and the default is 9600. With this function, the inverter can communicate with the computer, through which the operating status of the inverter can be monitored.

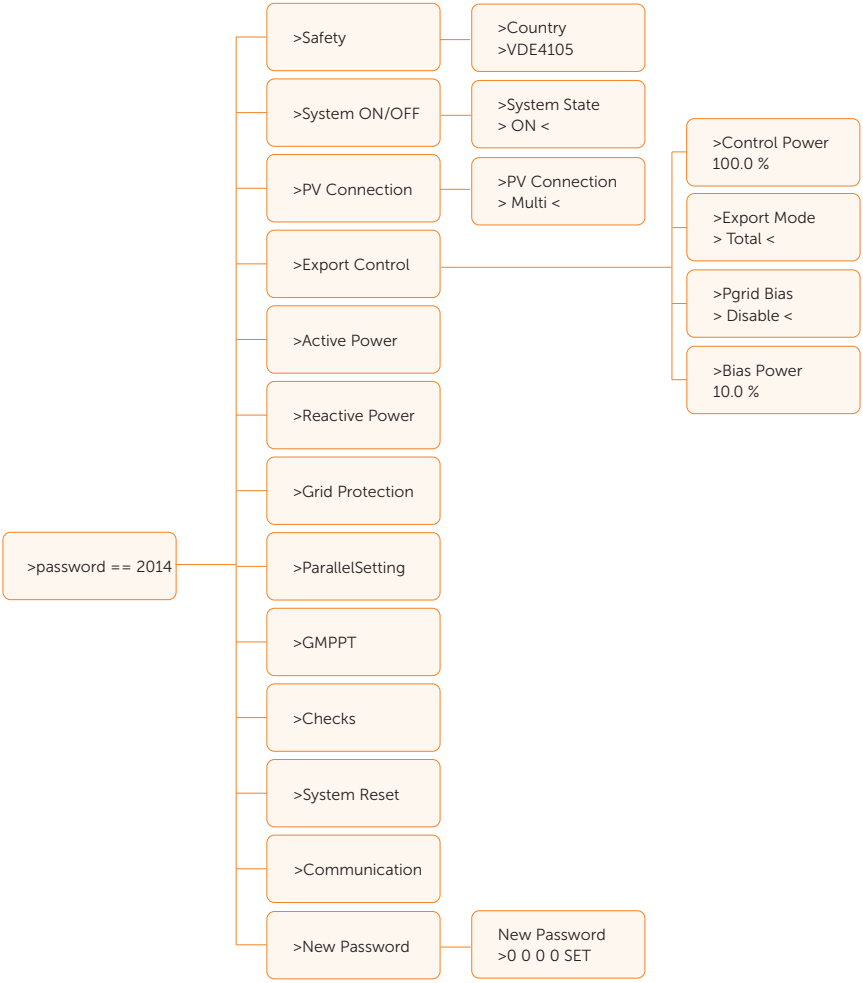
When multiple inverters are monitored by one computer, RS485 communication addresses of different inverters need to be set.



Safety

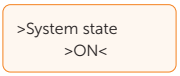
The user can set the safety standard here according to different countries and grid tied standards. There are several standards for choice.

9.6.2 Using Installer password



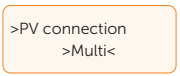
System ON/OFF

ON means the inverter is in running state which is the default state. **OFF** means that the inverter stops running and only the LCD screen is on.



PV connection

The user can select the PV connection type by this function.



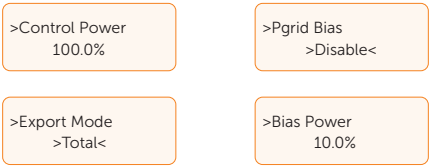
Export control

With this power control function, the **Control Power**, **Export Mode**, **Pgrid Bias** and **Bias Power** can be set by the installer.

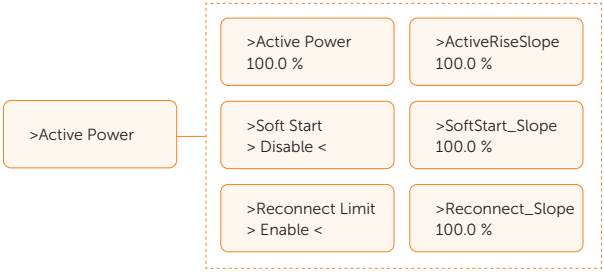
When you set 100% for **Control Power**, it means the energy can be exported to grid with full power. When you set 0%, exporting to grid is limited. Please set the percentage according to the actual need.

Users can set the bias power enable through **Pgrid Bias**. The **ExportMode** parameter allows the selection of the inverter output mode, the default setting is **Total**, which transmits the average value of the three-phase circuit. **Bias Power** represents the feed-in redundancy, with a default value of 0%.

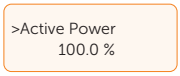
Press **Up** and **Down** button to select and press **Enter** to confirm it.



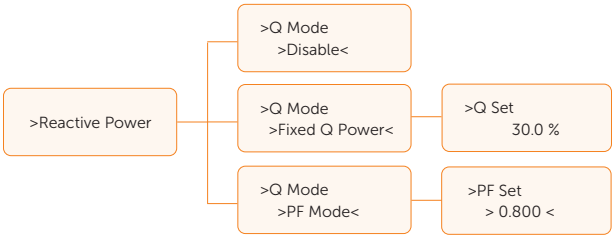
Active power



This interface is used to set the active power according to the requirement of grid.

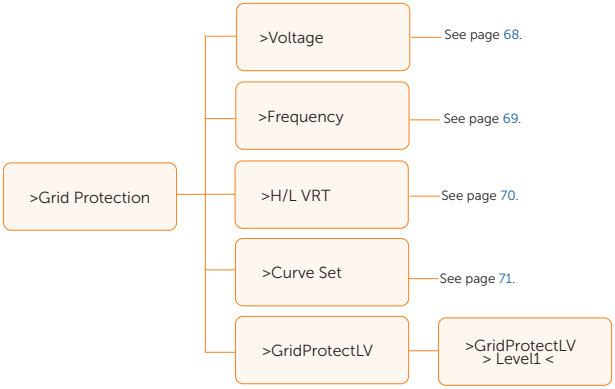


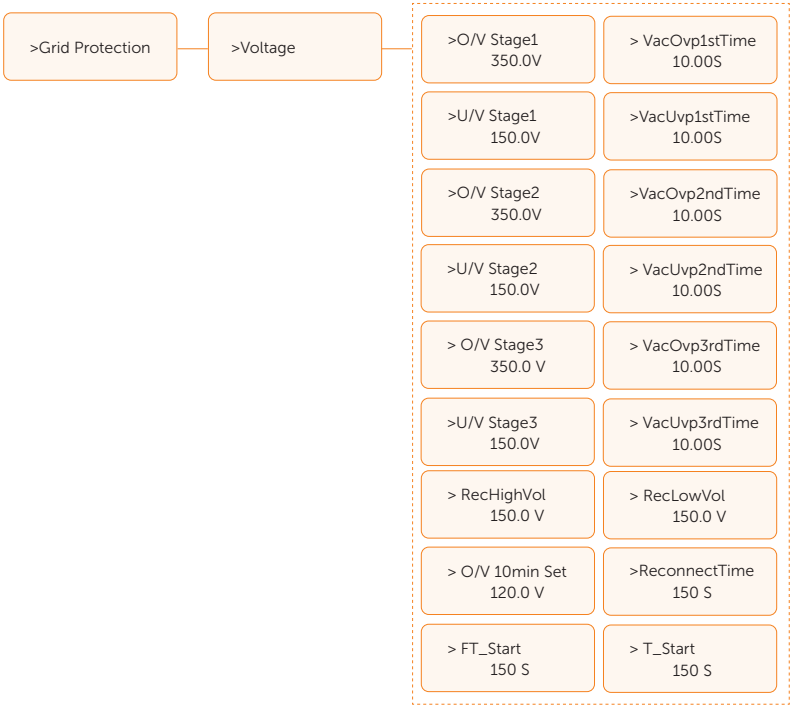
Reactive power

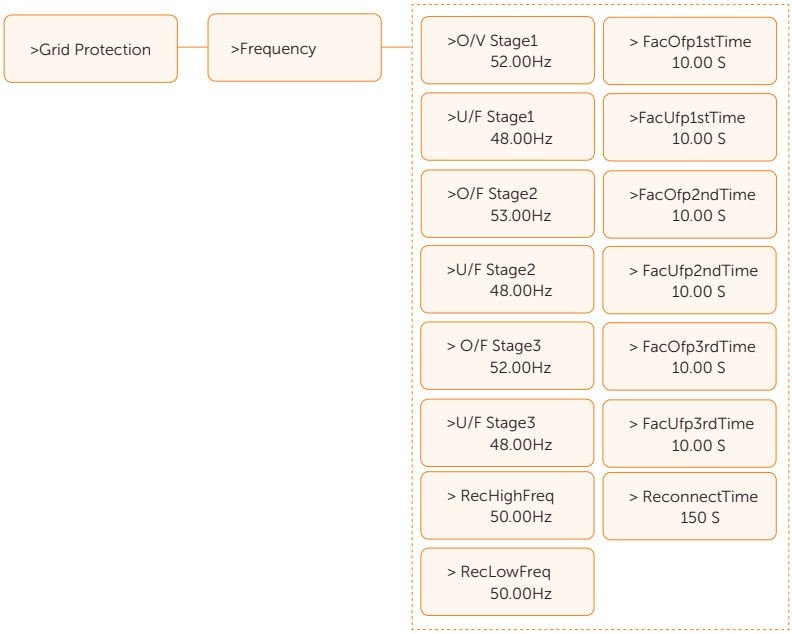


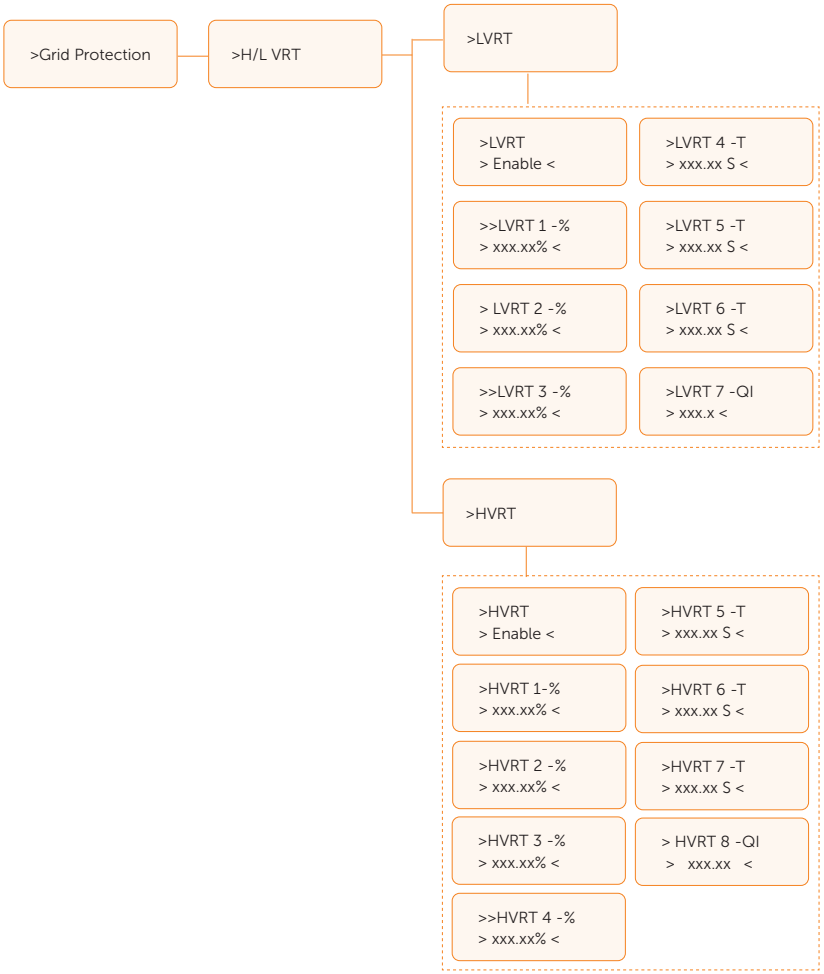
This interface is used to set the reactive power. Please set the value according to the requirement of utility grid.

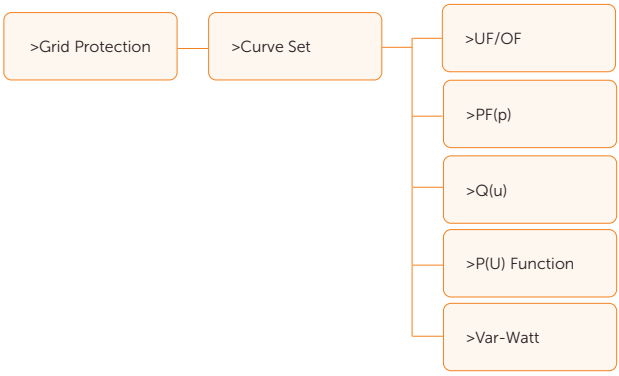
Grid protection

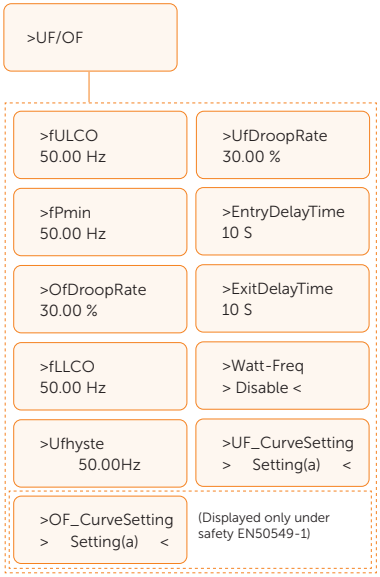


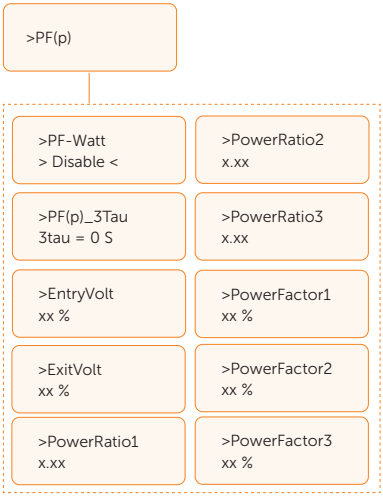



>Grid Protection
>Frequency
>O/V Stage1
52.00Hz
> FacOfp1stTime
10.00 S
>U/F Stage1
48.00Hz
>FacUfp1stTime
10.00 S
>O/F Stage2
53.00Hz
>FacOfp2ndTime
10.00 S
>U/F Stage2
48.00Hz
> FacUfp2ndTime
10.00 S
> O/F Stage3
52.00Hz
> FacOfp3rdTime
10.00 S
>U/F Stage3
48.00Hz
> FacUfp3rdTime
10.00 S
> RecHighFreq
50.00Hz
> ReconnectTime
150 S
> RecLowFreq
50.00Hz


>Grid Protection
>H/L VRT
>LVRT
>LVRT
> Enable <
>LVRT 4 -T
> xxx.xx S <
>>LVRT 1 -%
> xxx.xx% <
>LVRT 5 -T
> xxx.xx S <
> LVRT 2 -%
> xxx.xx% <
>LVRT 6 -T
> xxx.xx S <
>>LVRT 3 -%
> xxx.xx% <
>LVRT 7 -QI
> xxx.x <
>HVRT
>HVRT
> Enable <
>HVRT 5 -T
> xxx.xx S <
>HVRT 1-%
> xxx.xx% <
>HVRT 6 -T
> xxx.xx S <
>HVRT 2 -%
> xxx.xx% <
>HVRT 7 -T
> xxx.xx S <
>HVRT 3 -%
> xxx.xx% <
> HVRT 8 -QI
> xxx.xx <
>>HVRT 4 -%
> xxx.xx% <

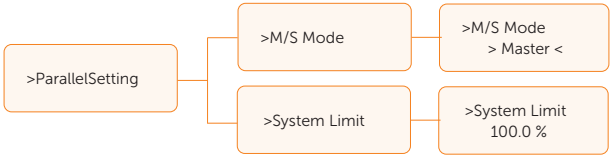

>Grid Protection
>Curve Set
>UF/OF
>PF(p)
>Q(u)
>P(U) Function
>Var-Watt


>UF/OF
>fULCO
50.00 Hz
>UfDroopRate
30.00 %
>fPmin
50.00 Hz
>EntryDelayTime
10 S
>OfDroopRate
30.00 %
>ExitDelayTime
10 S
>fLLCO
50.00 Hz
>Watt-Freq
> Disable <
>Ufhyste
50.00Hz
>UF_CurveSetting
> Setting(a) <
>OF_CurveSetting
> Setting(a) <
(Displayed only under safety EN50549-1)


>PF(p)
>PF-Watt
> Disable <
>PowerRatio2
x.xx
>PF(p)_3Tau
3tau = 0 S
>PowerRatio3
x.xx
>EntryVolt
xx %
>PowerFactor1
xx %
>ExitVolt
xx %
>PowerFactor2
xx %
>PowerRatio1
x.xx
>PowerFactor3
xx %

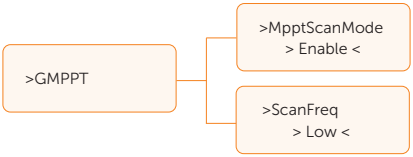
Usually end user do not need to set the grid protection. All default value have been set before leaving factory according to safety rules. If reset is needed, any changes should be made according to the requirements of local grid.

Parallel setting



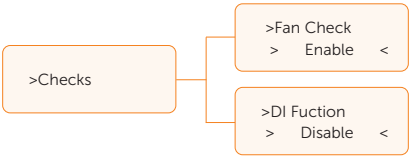
M/S Mode can choose **Master** or **Slave**. **System Limit** can set whether to allow the reverse flow power from inverter to power grid, and the default value is 0%.

GMPPT



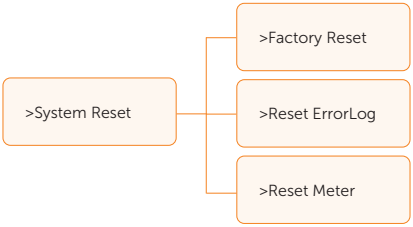
This interface is used to configure GMPPT settings, including MPPT scan mode and scan frequency.

Checks



This interface is used to activate the needed functions. Users configure the enable settings for each branch, including Fan check, DI fuction, etc.

System reset



Here you can reset error logs, and meter. In addition, restoring factory default setting is allowed.

Take **Reset Meter** as an example:The user can clear the meter energy by this function. Press **Up** and **Down** button to select and press **Enter** to confirm it.
(If you have purchased a SolaX meter, you can reset by selecting the **Start** option.)

Communication

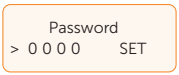
RS485 Addr and **RS485 Baud** are the primary communication settings for RS485 which can be configured to 1 and 9600.

Comlostshutdown and **Combackshutdown** detect meter loss. Meter loss can result from communication disconnection. If **Comlostshutdown** is enabled, the machine will report an error if the meter is lost. If **Combackshutdown** is enabled and the meter is reconnected, the machine will resume operation.

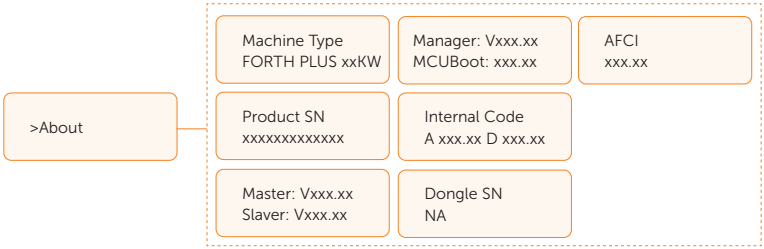
New password

Press **Enter** to enter the password setting interface, press **Up** and **Down** when it is flashing, then press **Enter** to confirm the set value. Finally, select **SET** and press **Enter** to confirm the password.

The user can set the new password here. Users need to increase or decrease the word by pressing **Up** or **Down** button. Press **Enter** to confirm and alternate to next word. After word is confirmed, Press **SET** and **Enter** to reset the password.



9.7 About



This interface shows information of the inverter, include model, SN, software version of master DSP, slaver and ARM board and internal code.

10 Operation on SolaX App and Web

10.1 Introduction of SolaXCloud

SolaXCloud is an intelligent management platform for home energy, which integrates energy efficiency monitoring, device management, data security communication and other integrated capabilities. While managing your home energy device, it helps you optimize the efficiency of electricity consumption and improve the revenue of power generation.

10.2 Operation Guide on SolaXCloud App

10.2.1 Downloading and Installing App

Method 1: Scan the QR code below to download the app.

The QR codes are also available on the login page of our official website (www.solaxcloud.com), and the installation guide of the dongle.

Figure 10-1 QR code

Method 2: Search for SolaXCloud in Apple Store App or Google Play, and then download the App.

10.2.2 Operation on the SolaXCloud App

For instructions on the related operations, see the online documents on the SolaXCloud App.

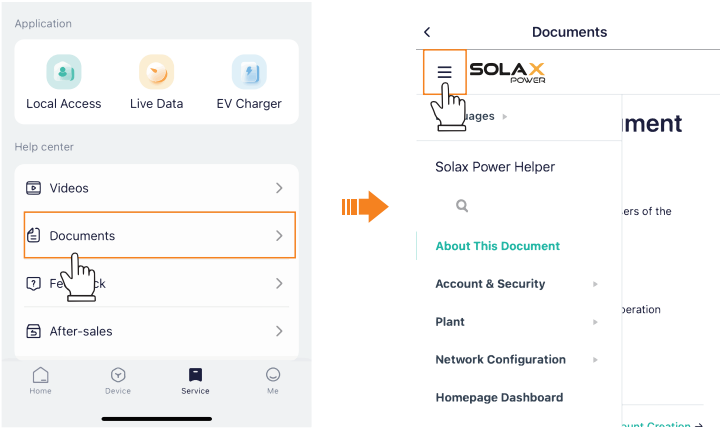


Figure 10-2 Online help on SolaXCloud

NOTICE!

- The screen shots in this chapter correspond to the SolaXCloud App V6.2.0, which might change with version update and should be subject to the actual situations.

10.3 Operations on SolaXCloud Web Page

Open a browser and enter www.solaxcloud.com to complete registration, login, add site and other related operations according to the guide.

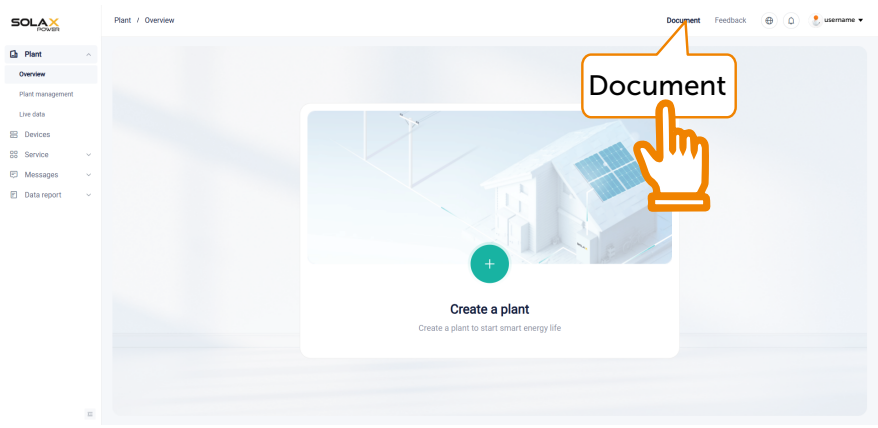


Figure 10-3 Guide on web page

11 Troubleshooting and Maintenance

11.1 Power off

a. Turn off the system by **System ON/OFF** on LCD screen.

b. Switch off the DC and AC switch/breaker and disconnect the inverter from DC Input and AC output.

c. Wait for 15 minutes for de-energizing.

⚠ WARNING!

- After the inverter is powered off, there may still be residual electricity and heat which may cause electric shocks and body burns. Please wear personal protective equipment (PPE) and start maintaining the inverter at least 15 minutes after power off.

11.2 Troubleshooting

This section lists problems that may occur during operation of the inverter and provides information and procedures for recognizing and resolving problems. In the event of an inverter malfunction, check for warning or malfunction messages on the monitoring system or LCD panel and follow the prompted messages in the table below for troubleshooting.

For further assistance, contact SolaX Customer Service. Please provide the model and SN of the inverter, and be prepared to describe the system installation details.

Table 11-1 Troubleshooting list

Error Code	Name	Diagnosis and Solutions
1	METER_OPPSITE	Incorrect meter direction 1. Confirm whether the current direction of the meter is correct; 2. Contact the installer.
2	REMOTE_TURN_OFF	The inverter receives the shutdown command and is in the shutdown state 1. Send the startup command through app or web to re-run the inverter; 2. Contact the installer.
3	FREQ_CFG_UNMATCH	Grid rated frequency setting error 1. In accordance with local safety regulations, reset the parameters; 2. Contact the installer.

Error Code	Name	Diagnosis and Solutions
4	GND_CONN_FAIL	Inverter grounding fault 1. Check whether the Neutral line of the power grid is correctly connected; 2. Check whether the inverter ground wire is correctly connected; 3. Try to re-run the inverter; 4. Contact the installer.
5	ISO_FAIL	PV insulation impedance below safety value 1. Check the PV string impedance to ground, if there is a short circuit or insufficient insulation please rectify the short circuit point; 2. Check whether the protective earth wire of the inverter is correctly connected; 3. If there is no abnormality in the above two points, and the device fault still exists, contact the installer.
11	PV01_REVERSE	PV string 1 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
12	PV02_REVERSE	PV string 2 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
13	PV03_REVERSE	PV string 3 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.

Error Code	Name	Diagnosis and Solutions
14	PV04_REVERSE	PV string 4 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
15	PV05_REVERSE	PV string 5 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
16	PV06_REVERSE	PV string 6 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
17	PV07_REVERSE	PV string 7 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
18	PV08_REVERSE	PV string 8 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.

Error Code	Name	Diagnosis and Solutions
19	PV09_REVERSE	PV string 9 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
20	PV10_REVERSE	PV string 10 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
21	PV11_REVERSE	PV string 11 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
22	PV12_REVERSE	PV string 12 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
30	PV13_REVERSE	PV string 13 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.

Error Code	Name	Diagnosis and Solutions
31	PV14_REVERSE	PV string 14 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
32	PV15_REVERSE	PV string 15 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
33	PV16_REVERSE	PV string 16 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
34	PV17_REVERSE	PV string 17 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
35	PV18_REVERSE	PV string 18 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.

Error Code	Name	Diagnosis and Solutions
36	PV19_REVERSE	PV string 19 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
37	PV20_REVERSE	PV string 20 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
38	PV21_REVERSE	PV string 21 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
39	PV22_REVERSE	PV string 22 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
40	PV23_REVERSE	PV string 23 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.

Error Code	Name	Diagnosis and Solutions
41	PV24_REVERSE	PV string 24 is of reverse polarity. 1. Check whether the positive and negative polarity of the string is reversed, if so, wait until the current of the PV string is reduced to below 0.5A, then put the "DC SWITCH" in the "OFF" position and adjust the polarity of the string; 2. If there is no abnormality in the string check, and the fault still exists, contact the installer.
42	HBUS_SHORT	Half BUS short circuit 1. Try restarting the inverter; 2. Contact the installer.
43	MPPT_OCP	MPPT overcurrent 1. Try restarting the inverter; 2. Contact the installer.
44	PV_BRANCH_ FAULT	PV branch fault: 1. Try restarting the inverter; 2. Contact the installer.
50	PV_VOLT_HIGH	PV input voltage is higher than the allowable value 1. If the DC switch is "ON", check whether the highest open-circuit voltage of the corresponding PV string is higher than the maximum input voltage; if yes, please contact the installer; if no, the device alarm will disappear automatically after the PV array is configured correctly. 2. If the DC switch is "OFF", contact the installer.
51	PV01_VOLT_ HIGH	MPPT1 voltage is higher than the allowable value 1. If the DC switch is "ON", check whether the highest open-circuit voltage of the corresponding PV string is higher than the maximum input voltage; if yes, please contact the installer; if no, the device alarm will disappear automatically after the PV array is configured correctly. 2. If the DC switch is "OFF", contact the installer.
52	PV02_VOLT_ HIGH	MPPT2 voltage is higher than the allowable value 1. If the DC switch is "ON", check whether the highest open-circuit voltage of the corresponding PV string is higher than the maximum input voltage; if yes, please contact the installer; if no, the device alarm will disappear automatically after the PV array is configured correctly. 2. If the DC switch is "OFF", contact the installer.

Error Code	Name	Diagnosis and Solutions
53	PV03_VOLT_HIGH	MPPT3 voltage is higher than the allowable value 1. If the DC switch is "ON", check whether the highest open-circuit voltage of the corresponding PV string is higher than the maximum input voltage; if yes, please contact the installer; if no, the device alarm will disappear automatically after the PV array is configured correctly. 2. If the DC switch is "OFF", contact the installer.
54	PV04_VOLT_HIGH	MPPT4 voltage is higher than the allowable value 1. If the DC switch is "ON", check whether the highest open-circuit voltage of the corresponding PV string is higher than the maximum input voltage; if yes, please contact the installer; if no, the device alarm will disappear automatically after the PV array is configured correctly. 2. If the DC switch is "OFF", contact the installer.
55	PV05_VOLT_HIGH	MPPT5 voltage is higher than the allowable value 1. If the DC switch is "ON", check whether the highest open-circuit voltage of the corresponding PV string is higher than the maximum input voltage; if yes, please contact the installer; if no, the device alarm will disappear automatically after the PV array is configured correctly. 2. If the DC switch is "OFF", contact the installer.
56	PV06_VOLT_HIGH	MPPT6 voltage is higher than the allowable value 1. If the DC switch is "ON", check whether the highest open-circuit voltage of the corresponding PV string is higher than the maximum input voltage; if yes, please contact the installer; if no, the device alarm will disappear automatically after the PV array is configured correctly. 2. If the DC switch is "OFF", contact the installer.
58	BST01_SW_OCP	BOOST1 software overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.
59	BST02_SW_OCP	BOOST2 software overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.
60	BST03_SW_OCP	BOOST3 software overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.

Error Code	Name	Diagnosis and Solutions
61	BST04_SW_OCP	BOOST4 software overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.
62	BST05_SW_OCP	BOOST5 software overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.
63	BST06_SW_OCP	BOOST6 software overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.
71	BST01_HW_OCP	BOOST1 hardware overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.
72	BST02_HW_OCP	BOOST2 hardware overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.
73	BST03_HW_OCP	BOOST3 hardware overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.
74	BST04_HW_OCP	BOOST4 hardware overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.
75	BST05_HW_OCP	BOOST5 hardware overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.
76	BST06_HW_OCP	BOOST6 hardware overcurrent: 1. Check PV input for short circuit; 2. Try to re-run the inverter; 3. Contact the installer.
90	GRID_LOSS	Power failure of power grid / disconnection of AC line or AC switch. 1. Check whether the grid voltage is normal; 2. Check the power grid electrical connection AC switch; 3. Try to re-run the inverter.

Error Code	Name	Diagnosis and Solutions
91	GRID_OVP1	Grid overvoltage (level 1) 1. Check whether the voltage at the grid point is too high, if so, please contact the local power operator; 2. If it is confirmed that the voltage at the grid point is higher than the permitted range and with the consent of the local power operator, modify the over-voltage protection point through the mobile phone APP or monitoring website; 3. Please check if the grid voltage peak is too high.
92	GRID_OVP2	Grid overvoltage (level 2) 1. Check whether the voltage at the grid point is too high, if so, please contact the local power operator; 2. If it is confirmed that the voltage at the grid point is higher than the permitted range and with the consent of the local power operator, modify the over-voltage protection point through the mobile phone APP or monitoring website; 3. Please check if the grid voltage peak is too high.
93	GRID_UVP1	Grid undervoltage (level 1) 1. If it occurs occasionally, it may be a short time abnormality of the power grid, the inverter will return to normal operation after detecting the power grid is normal, no manual intervention is required; 2. If it occurs frequently, please check whether the grid voltage is within the permitted range, if not, please contact the local power operator. If yes, you also need to get the consent of the local power operator and then modify the grid voltage on the mobile phone APP or monitoring website to modify the grid undervoltage protection point; 3. If recovery is not possible for a long time, check that the AC side circuit breaker is properly connected to the output cable.

Error Code	Name	Diagnosis and Solutions
94	GRID_UVP2	Grid undervoltage (level 2) 1. If it occurs occasionally, it may be a short time abnormality of the power grid, the inverter will return to normal operation after detecting the power grid is normal, no manual intervention is required; 2. If it occurs frequently, please check whether the grid voltage is within the allowable range, if not, please contact the local power operator. If yes, you also need to get the consent of the local power operator and then modify the grid voltage on the mobile phone APP or monitoring website to modify the grid undervoltage protection point; 3. If recovery is not possible for a long time, check that the AC side circuit breaker is properly connected to the output cable.
95	GRID_10MIN_ OVP	The average grid voltage in 10 minutes exceeds the allowable value 1. Check whether the grid voltage is within the allowable range; 2. Try to re-run the inverter.
96	GRID_INST_OVP	Instantaneous high voltage of power grid 1. Check whether the grid voltage is within the allowable range; 2. Try to re-run the inverter.
97	GRID_OFP1	Grid overfrequency (level 1) 1. If it occurs occasionally, it may be a short time abnormality of the power grid, the inverter will return to normal operation after detecting the power grid is normal, no manual intervention is required; 2. If it appears frequently, please check whether the grid frequency is within the permitted range, if not, please contact the local power operator. If yes, you also need to modify the grid over-frequency protection point via mobile phone APP or monitoring website after getting the consent of local power operator; 3. Contact the installer.

Error Code	Name	Diagnosis and Solutions
98	GRID_OFP2	Grid overfrequency (level 2) 1. If it occurs occasionally, it may be a short time abnormality of the power grid, the inverter will return to normal operation after detecting the power grid is normal, no manual intervention is required; 2. If it appears frequently, please check whether the grid frequency is within the permitted range, if not, please contact the local power operator. If yes, you also need to modify the grid over-frequency protection point via mobile phone APP or monitoring website after getting the consent of local power operator; 3. Contact the installer.
99	GRID_UFP1	Grid underfrequency (level 1) 1. If it occurs occasionally, it may be a short time abnormality of the power grid, the inverter will return to normal operation after detecting the power grid is normal, no manual intervention is required; 2. If it appears frequently, please check whether the grid frequency is within the permitted range, if not, please contact the local power operator. If yes, you also need to modify the grid over-frequency protection point via mobile phone APP or monitoring website after getting the consent of local power operator; 3. Contact the installer.
100	GRID_UFP2	Grid underfrequency (level 2) 1. If it occurs occasionally, it may be a short time abnormality of the power grid, the inverter will return to normal operation after detecting the power grid is normal, no manual intervention is required; 2. If it appears frequently, please check whether the grid frequency is within the permitted range, if not, please contact the local power operator. If yes, you also need to modify the grid over-frequency protection point via mobile phone APP or monitoring website after getting the consent of local power operator; 3. Contact the installer.
101	GRID_PHS_LOSS	Loss of grid phase voltage 1. Check the grid voltage; 2. Check the power grid electrical connection AC switch; 3. Try to re-run the inverter.
102	GRID_UNBLC	Grid voltage imbalance 1. Check whether the grid voltage is within the allowable range; 2. Try to re-run the inverter.

Error Code	Name	Diagnosis and Solutions
103	GRID_FRT	Grid fault 1. Check whether the grid voltage is within the allowable range; 2. Try to re-run the inverter;
104	GRID_SMCU_ VOLT	SMCU voltage fault 1. Try to re-run the inverter; 2. Contact the installer.
105	GRID_SMCU_ FREQ	SMCU frequency fault 1. Try to re-run the inverter; 2. Contact the installer.
106	GRID_OVP3	Grid overvoltage (level 3) 1. Check whether the voltage at the grid point is too high, if so, please contact the local power operator; 2. If it is confirmed that the voltage at the grid point is higher than the permitted range and with the consent of the local power operator, modify the over-voltage protection point through the mobile phone APP or monitoring website; 3. Please check if the grid voltage peak is too high.
107	GRID_UVP3	Grid undervoltage (level 3) 1. If it occurs occasionally, it may be a short time abnormality of the power grid, the inverter will return to normal operation after detecting the power grid is normal, no manual intervention is required; 2. If it occurs frequently, please check whether the grid voltage is within the permitted range, if not, please contact the local power operator. If yes, you also need to get the consent of the local power operator and then modify the grid voltage on the mobile phone APP or monitoring website to modify the grid undervoltage protection point; 3. If recovery is not possible for a long time, check that the AC side circuit breaker is properly connected to the output cable.
110	DCBUS_HW_OVP	BUS hardware overvoltage 1. check whether the PV input voltage is within the allowable range. 2. Try to re-run the inverter; 3. Contact the installer.
111	PBUS_FSW_OVP	Positive BUS software overvoltage: 1. Try to re-run the inverter; 2. Contact the installer.

Error Code	Name	Diagnosis and Solutions
112	NBUS_FSW_OVP	Negative BUS software overvoltage 1. Try to re-run the inverter; 2. Contact the installer.
113	DCBUS_SW_OVP	BUS software overvoltage 1. Check whether the PV input voltage is within the allowable range; 2. Try to re-run the inverter; 3. Contact the installer.
114	DCBUS_SW_UVP	BUS software undervoltage 1. Check whether the PV input voltage is within the allowable range; 2. Try to re-run the inverter; 3. Contact the installer.
115	DCBUS_UNBLC	BUS voltage unbalance 1. Check whether the PV input voltage is within the allowable range; 2. Try to re-run the inverter; 3. Contact the installer.
116	PV_ABOVE_BUS	The PV voltage is higher than the BUS voltage 1. Try to re-run the inverter; 2. Contact the installer.
117	DCBUS_SS_FAIL	Bus soft start failure 1. Try to re-run the inverter; 2. Contact the installer.
118	SUNPWR_WEAK	Low PV power 1. Try to re-run the inverter; 2. Contact the installer.
119	GRID_START_OVP	Power grid overvoltage during start-up 1. Try to re-run the inverter; 2. Contact the installer.
120	GRID_START_UVP	Power grid undervoltage during start-up 1. Try to re-run the inverter; 2. Contact the installer.
121	GRID_START_OFP	Power grid overfrequency during start-up 1. Try to re-run the inverter; 2. Contact the installer.
122	GRID_START_UFP	Power grid underfrequency during start-up 1. Try to re-run the inverter; 2. Contact the installer.

Error Code	Name	Diagnosis and Solutions
123	AUX_HW_UVP	Auxiliary source undervoltage 1. Try to re-run the inverter; 2. Contact the installer.
125	INV_RLY_FLT	Relay fault 1. Try to re-run the inverter; 2. Contact the installer.
126	RLY_ON_FAIL	Relay pull in fault 1. Try to re-run the inverter; 2. Contact the installer.
127	INV_SW_OCP	Inverter software over current 1. Try to re-run the inverter; 2. Contact the installer.
128	INV_PEAKCURR_LMT	Inverter peak over current fault 1. Try to re-run the inverter; 2. Contact the installer.
129	INV_HW_OCP	Inverter hardware over current 1. Try to re-run the inverter; 2. Contact the installer.
130	INV_DCI_PROT	Inverter DCI protection 1. If the abnormality is introduced by an external fault, the inverter automatically resumes normal operation after the fault disappears without manual intervention; 2. If this alarm occurs frequently, please contact the installer.
131	INV_SC	Output short circuit 1. Try to re-run the inverter; 2. Contact the installer.
132	GFCI_CT_FAIL	GFCI sensor failure 1. Try to re-run the inverter; 2. Contact the installer.
133	GFCI_PROT	GFCI failure 1. Check whether the PE cable is connected correctly; 2. Try to re-run the inverter; 3. Contact the installer.
134	INV_HW_FAIL	Inverter hardware failure 1. Try to re-run the inverter; 2. Contact the installer.
136	INV_HW_OCP_A	Inverter phase A hardware overcurrent 1. Try to re-run the inverter; 2. Contact the installer.

Error Code	Name	Diagnosis and Solutions
137	INV_HW_OCP_B	Inverter phase B hardware overcurrent 1. Try to re-run the inverter; 2. Contact the installer.
138	INV_HW_OCP_C	Inverter phase C hardware overcurrent 1. Try to re-run the inverter; 2. Contact the installer.
140	SCI_FAIL	Internal SCI failure: 1. Try to re-run the inverter; 2. Contact the installer.
141	SPI_FAIL	Internal SPI failure: 1. Try to re-run the inverter; 2. Contact the installer.
142	CAN_FAIL	Internal CAN failure: 1. Try to re-run the inverter; 2. Contact the installer.
143	EPRM_RW_FAIL	EEPROM fault 1. Try to re-run the inverter; 2. Contact the installer.
144	MOV_AC_FAIL	AC lightning protection module failure 1. Try to re-run the inverter; 2. Contact the installer.
145	MOV_DC_FAIL	DC lightning protection module failure 1. Try to re-run the inverter; 2. Contact the installer.
146	FAN1_FAIL	Internal fan 1 fault 1. Try to re-run the inverter; 2. Contact the installer.
147	FAN2_FAIL	Internal fan 2 fault 1. Try to re-run the inverter; 2. Contact the installer.
150	BST_IGBT_NTC_OTP	Boost module temperature above allowable value 1. Check if the inverter installation location is well ventilated and the ambient temperature is not beyond the maximum permissible ambient temperature range; 2. Contact the installer.
151	INV_IGBT_NTC_OTP	The temperature of inverter module is higher than the allowable value 1. Check if the inverter installation location is well ventilated and the ambient temperature is not beyond the maximum permissible ambient temperature range; 2. Contact the installer.

Error Code	Name	Diagnosis and Solutions
152	AC_TB_NTC_OTP	The AC terminal temperature is higher than the allowable value 1. Check if the inverter installation location is well ventilated and the ambient temperature is not beyond the maximum permissible ambient temperature range; 2. Contact the installer.
153	INV_TB_NTC_ OTP	The inverter heat sink temperature is higher than the allowable value 1. Check if the inverter installation location is well ventilated and the ambient temperature is not beyond the maximum permissible ambient temperature range; 2. Contact the installer.
154	ENVIR_TMP_LOW	The internal temperature is lower than the allowable value 1. Check if the inverter installation location is well ventilated and the ambient temperature is not beyond the maximum permissible ambient temperature range; 2. Contact the installer.
155	ENVIR_TMP_ HIGH	The internal temperature is higher than the allowable value 1. Check if the inverter installation location is well ventilated and the ambient temperature is not beyond the maximum permissible ambient temperature range; 2. Contact the installer.
157	ARC_TESET_FAIL	Arc self-test failure 1. Try to re-run the inverter; 2. Contact the installer.
158	ARC_FAULT	ARC failure 1. Verify that the PV module wiring is not broken; 1. Try to re-run the inverter; 2. Contact the installer.
159	AC_CAP_TMP_ HIGH	The AC capacitor temperature is higher than the allowable value 1. Check if the inverter installation location is well ventilated and the ambient temperature is not beyond the maximum permissible ambient temperature range; 2. Try to re-run the inverter; 3. Contact the installer.

Error Code	Name	Diagnosis and Solutions
160	BUS_ELECAP_TMP_HIGH	The bus electrolytic capacitor temperature is higher than the allowable value: 1. Check if the inverter installation location is well ventilated and the ambient temperature is not beyond the maximum permissible ambient temperature range; 2. Try to re-run the inverter; 3. Contact the installer.
198	TYPE_MODEL_ERR	Model setting error 1. Try to re-run the inverter; 2. Contact the installer.
199	SW_VER_UNMATCH	Software version unmatch 1. Try to re-run the inverter; 2. Contact the installer.
200	METER_LOST	Meter lost 1. Check the communication wires of the meter and the meter CT for clamping; 2. check the wiring of the communication terminals of the Datahub or third party Hub.
201	PID_OUT_SC	PID output short circuit fault 1. Try to re-run the inverter; 2. Contact the installer.
202	PID_PV_IN_FAIL	PID output open or not connected to PV module 1. Check whether PV module and X-PID BOX is connected correctly and securely; 2. Check whether the resistance of PV- to X-PID BOX PV- $\leq 4\,\Omega$; 2. Contact the installer.
203	PID_OCP	PID overcurrent fault 1. Check whether the impedance of PV- to the ground $< 50\,k\Omega$; 2. Contact the installer.
204	PID_COMM_LOST	PID communication lost 1. Check whether the wiring sequence of the communication cable is correct; 2. Contact the installer.
205	EX_FAN1_FAULT	External fan 1 fault Check the condition of the fan and replace it if it is damaged.
206	EX_FAN2_FAULT	External fan 2 fault Check the condition of the fan and replace it if it is damaged.

Error Code	Name	Diagnosis and Solutions
207	EX_FAN3_FAULT	External fan 3 fault Check the condition of the fan and replace it if it is damaged.
208	EX_FAN4_FAULT	External fan 4 fault Check the condition of the fan and replace it if it is damaged.
209	EX_FAN5_FAULT	External fan 5 fault Check the condition of the fan and replace it if it is damaged.

11.3 Maintenance

Regular maintenance is required for the inverter. Please check and maintain the following items based on the instructions below to ensure the optimal performance of the inverter. For inverters working in inferior conditions, more frequent maintenance is required. Please keep maintenance records.

WARNING!

- Only qualified person can perform the maintenance for the inverter.
- Only spare parts and accessories authorized by SolaX can be used for maintenance.

Proposal of Maintenance

Table 11-2 Proposal of Maintenance

Item	Check notes	Maintenance interval
Fans (external)	• Check if the fan makes noise or is covered by dust. • Clean the fan with a soft and dry cloth or brush, or replace the fan if necessary.	Every 12 months
Electrical connection	• Ensure that all cables are firmly connected. • Check the integrity of the cables, ensuring that there are no scratches on the parts touching the metallic surface. • Verify that the unused PV sealing caps on idle terminals are not falling off. • Check that if the input and output wires are damaged or aged.	Every 12 months

Item	Check notes	Maintenance interval
Grounding reliability	• Check if the grounding cables are firmly connected to the grounding terminals as well as all terminals and ports are properly sealed. Use a ground resistance tester to test the grounding resistance from the inverter enclosure to the PE bar in the power distribution box.	Every 6 months
Heat sink	• Check if there are foreign objects in the heat sink.	Every 12 months
General status of inverter	• Check if there is any damage on the inverter. • Check if there is any abnormal sound when the inverter is running.	Every 6 months
Cooling fans (internal)	• Check that if the cooling fans on the rear of inverter are covered by dirts, and the device should be cleaned and absorbed dust when necessary.	Every time as-needed
Indicators	• Check that if the indicators of the inverter are in normal state, check if the display of the inverter (if it has screen) is normal. • Get the inverter panels cleaned and their safety checked	Every 6 months

11.4 Replacement of Fans

WARNING!

- Turn off the inverter before replacing the fan.
- Fan replacement must be performed by a professional.

Step 1: Use a Phillips screwdriver to remove the screws from the fan bracket.

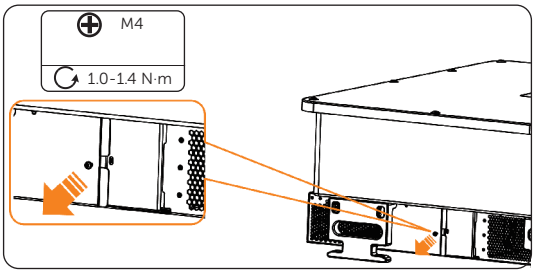


Figure 11-1 Removing the screws

Step 2: Gently pull the fan bracket until the fan bezel is flush with the inverter chassis. And unplug the connector to disconnect the cables.

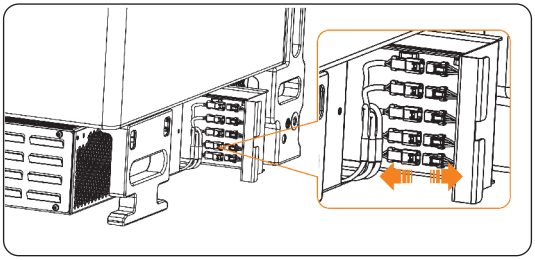


Figure 11-2 Disconnecting the cable

Step 3: Pull out the fan bracket completely.

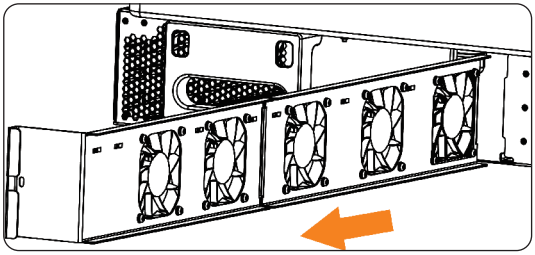


Figure 11-3 Pulling out the fan bracket completely

Step 4: Replace the fan bracket with a new one and lock the screws.

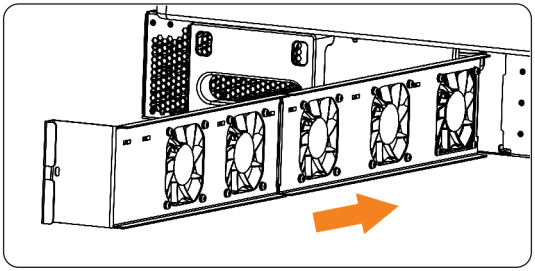


Figure 11-4 Replacing the fan bracket

11.5 Upgrading Firmware

WARNING!

- Make sure that the type and format of the firmware file are correct. Do not modify the file name. Otherwise, the inverter may not work properly.
- Do not modify the folder name and file path where the firmware files are located, as this may cause the upgrade to fail.

WARNING!

- Before upgrading, ensure that the PV input voltage is higher than 180 V (preferably on sunny day), or that the battery SoC is higher than 20%, or the battery input voltage is higher than 180 V. Failure to meet one of these conditions may result in upgrade failure.

Upgrade preparation

- Prepare a USB drive (USB 2.0/3.0, ≤32 GB, FAT 16 / 32).
- Check for the current firmware version of the inverter.
- Contact our service support for the update firmware file, and save it to the USB drive.
  - » X3FORTHPLUS_Vxxx.xx.bin
  - » X3FORTHPLUS_IAP.txt

Upgrade steps

a. Use the monitoring system to perform a shutdown command on the inverter.

b. Remove the dongle from the DONGLE terminal of the inverter by hand, and then insert the USB drive. The inverter will automatically upgrade (For the exact location of the port, see "7.1.1 Terminals of inverter".)

NOTICE!

- When the USB flash drive is inserted, the four indicators will blink in blue, green, green, and red in a running light pattern.

c. Wait for about 30 seconds for the buzzer to beep, indicating a successful ARM upgrade.

d. When the beeping sound disappears and the indicator light continues to blink in the running light mode, it indicates that the inverter has begun upgrading the software for MCU models other than ARM. The upgrade process takes about one and a half minutes (the exact upgrade time depends on the file).

» If the software is successfully upgraded, the communication indicator (blue) is off, and other indicators are steady on.

» If the software upgrade fails, only the alarm indicator (red) is steady on.

e. After the upgrade is complete, the inverter automatically starts after the current indicator status is maintained for one minute.

CAUTION!

- If the ARM firmware upgrade fails or stops, do not unplug the USB drive. Power off the inverter, restart it, and then repeat the above upgrade steps.
- If the DSP firmware upgrade fails or stops, unplug the USB flash disk and check whether the DC switch is on. If it is turned on, check whether the PV meets the upgrade requirements according to the LED status, and then reinsert the USB flash disk after meeting the upgrade requirements; if the DC switch is not turned on, please turn on the DC switch first, and then repeat the above steps.

12 Decommissioning

12.1 Disassembling the Inverter

WARNING!

- Strictly follow the steps below to disassemble the inverter.
- Only use the dedicated removal tool delivered with the inverter to disassemble the PV connector.
- Before dismantling the inverter, please be sure to turn off the DC switch and AC breaker, and then unplug the PV and AC cables, otherwise it will lead to an electric shock hazard.

Step 1: Use the monitoring system to perform a shutdown command on the inverter.

Step 2: Disconnect the inverter's external AC circuit breaker.

Step 3: Turn off the DC switch 1 and DC switch 2.

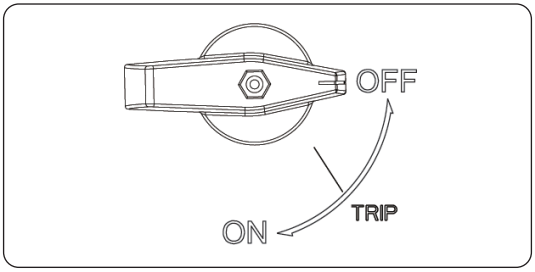


Figure 12-1 Turning off the DC switches

Step 4: Verify that the main switch on the inverter is in the "OFF" position.

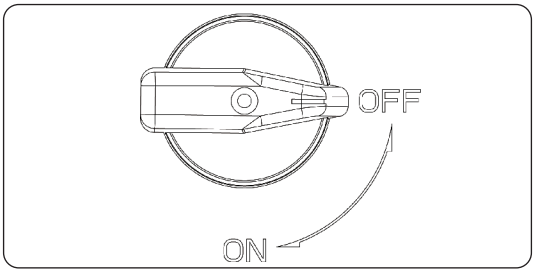


Figure 12-2 Checking the main switch

Step 5: Disconnect the PV connectors.

a. After confirming that all switches are turned off, use a current clamp to measure the DC current of each input string of the inverter. Make sure the current is less than 0.5 A.

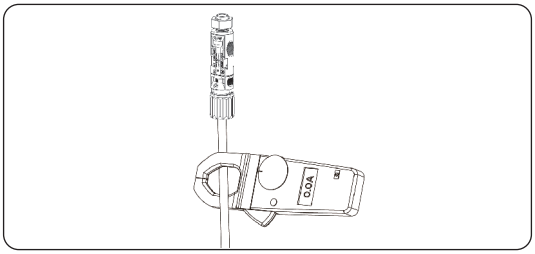


Figure 12-3 Measuring DC current

b. Insert the disassembling tool into the notch of PV connectors and slightly pull out the connectors.

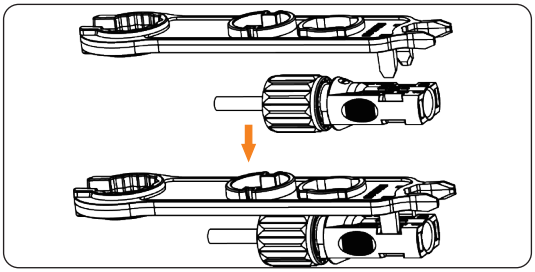


Figure 12-4 Disconnecting the PV connector

c. Put the original terminal caps on the terminals.

Step 6: Disconnect AC wiring.

a. Remove the screws and open the AC wiring box.

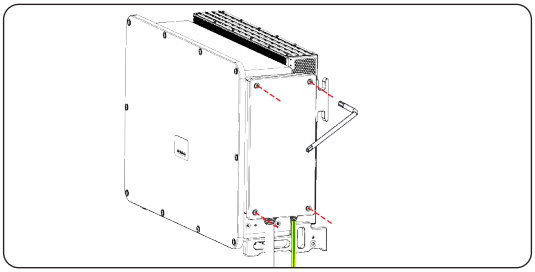


Figure 12-5 Opening the AC wiring box

b. Disconnect the AC cables and PE cable.

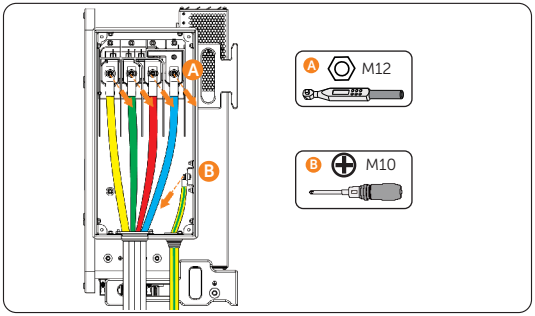


Figure 12-6 Disconnecting cables

c. Close the AC wiring box.

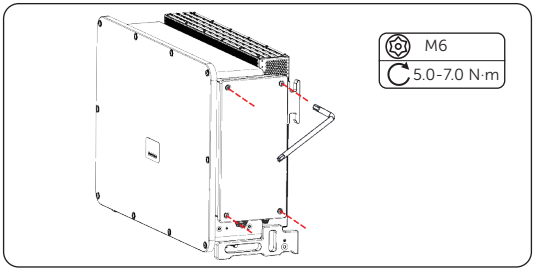


Figure 12-7 Closing the AC wiring box

Step 7: Disconnect the communication connector: Simultaneously press down on the tabs on both sides of the AC connector and gently pull the connector outward.

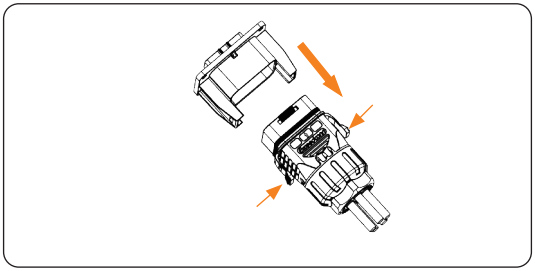


Figure 12-8 Disconnecting the communication connector

Step 8: Pull out the Dongle (if any).

Step 9: Put the original terminal caps on the terminals.

Step 10: Unscrew the grounding screws by Phillips screwdriver and remove the grounding cables.

Step 11: Unscrew the screws for securing the inverter and remove the inverter from the bracket.

Step 12: Unscrew the screws for fastening the bracket and remove the bracket if needed.

12.2 Packing the Inverter

- Use the original packaging materials if available.

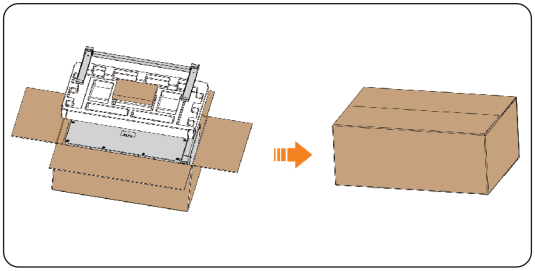


Figure 12-9 Packing the inverter

- If the original packing material is not available, use the packing material which meets the following requirements:
  - » Suitable for the weight and dimension of product
  - » Convenient for transportation
  - » Can be sealed with adhesive tape

12.3 Disposing of the Inverter

Properly dispose of the inverter and accessories in accordance with local regulations on the disposal of electronic waste.

13 Technical Data

- DC input

Model	X3-FTH-75K-P-LV	X3-FTH-120K-P	X3-FTH-125K-P	X3-FTH-136K-P	X3-FTH-150K-P
Max. PV array input power [kWp]	112.5	180	187.5	204	225
Max. PV input voltage [d.c. V][1]	750	1100	1100	1100	1100
Nominal input voltage [d.c. V]	360	580 / 600	580 / 600	580 / 600	580 / 600
MPPT voltage range (full load) [d.c. V][4]	300-550	500-800			
Start-up voltage [d.c. V]	160	200	200	200	200
Operating voltage range [d.c. V][2]	160-750	180-1000	180-1000	180-1000	180-1000
Max. PV input current per MPPT [d.c. A]	65	65	65	65	65
Max. input short circuit current Isc per MPPT [d.c. A]	82	82	82	82	82
No. of MPP trackers	6	6	6	6	6
Strings per MPP tracker	4	4	4	4	4
Max. inverter backfeed current to the array [d.c. A]	0	0	0	0	0

- AC output

Model	X3-FTH-75K-P-LV	X3-FTH-120K-P	X3-FTH-125K-P	X3-FTH-136K-P	X3-FTH-150K-P
Nominal AC output power [kW]	75	120	125	136	150
Nominal AC output current [a.c A]	196.9	181.8 / 174	189.4 / 181.2	206.6 / 196.3	227.3 / 217.4
Max. AC output apparent power [kVA]	75	132	137.5	150	165
Max. AC output current [a.c A]	196.9@ 220V	200.6@380V	209@380V	228@380V	250.7@380V
Max. short circuit current [a.c A]	500				
Current (inrush) [a.c A]	500				
Nominal AC voltage [a.c V][3]	3W/(N)/PE, 127/220,	3W/(N)/PE, 220/380, 230/400			
Nominal AC frequency [Hz][3]	50 / 60				
AC frequency range [Hz]	±5				
Power factor range	0.8 leading - 0.8 lagging				

Model	X3-FTH-75K-P-LV	X3-FTH-120K-P	X3-FTH-125K-P	X3-FTH-136K-P	X3-FTH-150K-P
THDi (Rated power)			<3%		
Max. output fault current [a.c A]			450		
Max. output overcurrent protection [a.c A]			450		

- Efficiency

Model	X3-FTH-75K-P-LV	X3-FTH-120K-P	X3-FTH-125K-P	X3-FTH-136K-P	X3-FTH-150K-P
Maximum efficiency			98.6%		
European efficiency			98.2%		

- General

Model	X3-FTH-75K-P-LV	X3-FTH-120K-P	X3-FTH-125K-P	X3-FTH-136K-P	X3-FTH-150K-P
Dimensions (W×H×D) [mm]			1082 × 724 × 373		
Net weight [kg]			108.1		
Topology			Non-isolated		
Power consumption (night) [W]			<10		
Operating ambient temperature range [°C]			-25 to +60 (Derating above 45°C)		
Relative humidity			0-100%		
Storage Temperature [°C]			-40 to +70		
Noise [dB]			<75		
Ingress protection			IP66 / C5-M		
Cooling concept			Smart fan-cooling		
Max. operation altitude without derating [m]			4000		
Pollution degree			PD 2		
Certificates and approvals			NB/T 32004, IEC 61727, IEC 62116, VDE4110, VDE4105, EN50549, NRS097, G99, RD1699, PPDS2020, CEI0-21, CEI0-16, VFR 2019		
Display			LED, LCD(Optional), APP(Optional)		
Communication			RS485, Optional: PLC, Pocket WiFi / LAN / 4G		

- Protection

Model	X3-FTH-75K-P-LV	X3-FTH-120K-P	X3-FTH-125K-P	X3-FTH-136K-P	X3-FTH-150K-P
DC trip switch	Yes				
DC reverse-polarity protection	Yes				
DC isolation protection	Yes				
Residual current detection	Yes				
Over current protection	Yes				
Over load protection	Yes				
Over/under voltage protection	Yes				
Active anti-islanding method	Frequency Shift				
SPD (DC/AC)	DC: Type II (Optional: Type I+II) / AC: Type II				
Arc-fault circuit interrupter(AFCI)	Optional				
AC auxiliary power supply (APS)	Built-in				
Grid monitoring	Yes				
DC injection monitoring	Yes				
Over temperature detection	Yes				
Anti-PID	Optional				
Monitoring ground fault protection	Yes				

* Note:

(1) The Max. PV input voltage is the upper limit of the DC voltage, any higher DC input voltage may damage the inverter. Input voltage outside the operating voltage range may trigger inverter protection.

(2) If the input voltage is not within the operating voltage range, the inverter will not work properly.

(3) The AC voltage and the frequency range may vary from different country codes.

(4) The voltage difference between different MPPTs should be less than 200 V.

14 Appendix

Datahub Parallel Connection

The series inverter provides the parallel connection function when connected with Datahub, which could support at most 60 inverters to parallel in one system and can control zero injection to the grid with a meter installed in the main circuit. In this parallel system, the Datahub will be the master of the system, and all the inverters are the slaves. The Datahub can communicate with all the slave inverters.

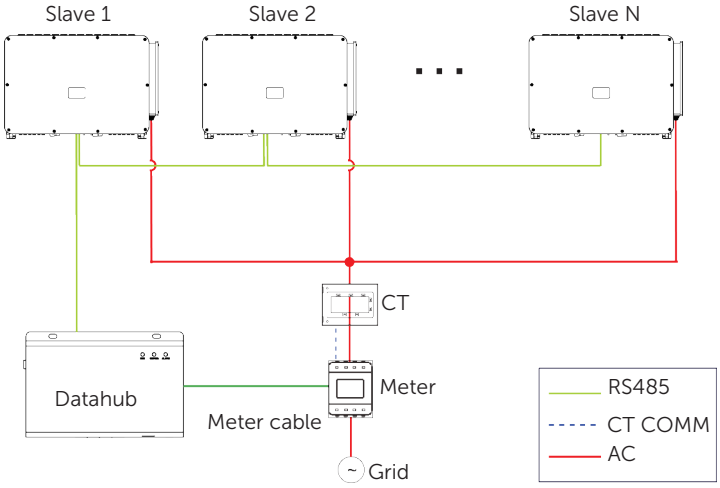


Figure 14-1 Parallel system diagram with Datahub

NOTICE!

- Before operation, please make sure that the inverters meet the following conditions:
  1. All the inverters are recommended to be the same series;
  2. The firmware version of all inverters shall be the same. Otherwise, the parallel function cannot be used.
  3. Ensure the RS485 cable length is less than 200 m.

Wiring operation

Step 1: Connect one end of an RS485 communication cable with Datahub, and the other end with one of the slave inverters.

Step 2: Connect all the slave inverters with each other with RS485 cables.

Step 3: Connect the meter with the Datahub and the mains.

NOTICE!
• For details on the wiring operation of Datahub, see *Datahub Installation Guide*.

Modbus Parallel Connection

The device offers master-slave parallel connection for up to 10 devices, with one serving as the master and the others as slaves. A 485 communication wire must be attached directly to the inverter.

The devices are connected in a daisy chain type connection mode. The RJ45-1 port on the master device are connected to the meter. The RJ45-2 port on the master device are connected to the slave device.

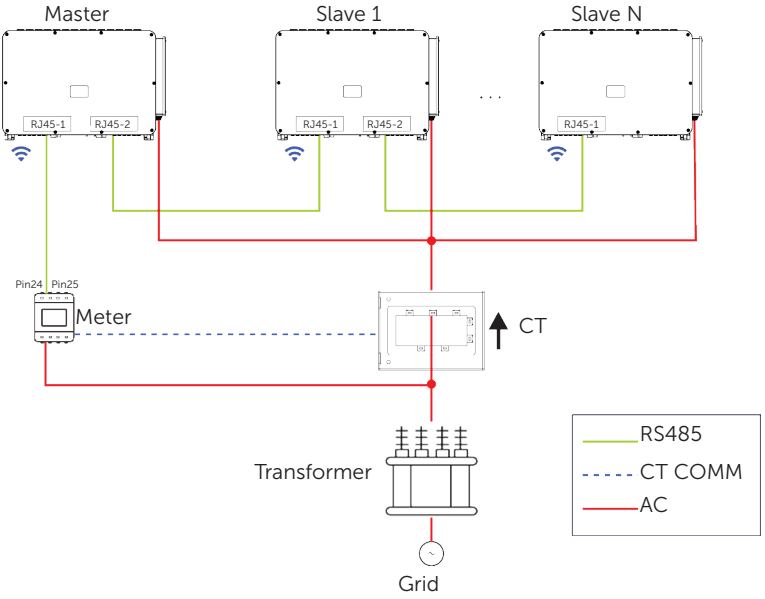
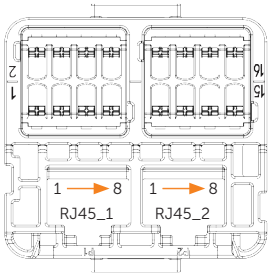


Figure 14-2 Parallel system diagram with Modbus

The interconnection between the host and slave is made by the Pins in the table below, which are connected to the electricity meter.

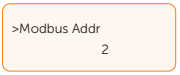


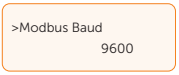
Port	Pin	Definition
RJ45-1	1	RS485A IN+
	2	RS485B IN-
	4	RS485A METER
	5	RS485B METER
RJ45-2	1	RS485A OUT+
	2	RS485B OUT-

Setting procedure

- Slave setup:

  The slave device needs to set its Modbus address and baud rate. Set the Modbus address of the slave device on the power station to 2 ~ 11 (up to 10 devices are supported at present) and the baud rate to 9600.





- Meter setup:

  Set the Modbus address of the meter to 1 and the baud rate to 9600.

- Master setup:

  The equipment connected to the meter is selected as the Master, and the Master mode and anti-reflux function of the Master equipment on the power station are enabled by APP / web page / screen, among which System Limit are set to 100%.

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