X3-NEO-LV

5 kW / 8 kW / 10 kW / 12 kW / 15 kW / 20 kW

User Manual

Version 1.0

www.solaxpower.com

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

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About This Manual

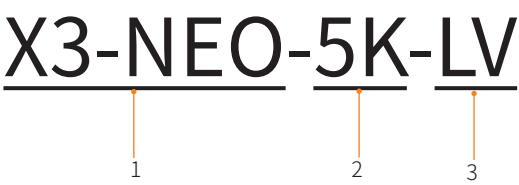
Scope of Validity

This manual is an integral part of X3-NEO-LV 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-NEO-5K-LV
- X3-NEO-8K-LV
- X3-NEO-10K-LV
- X3-NEO-12K-LV
- X3-NEO-15K-LV
- X3-NEO-20K-LV

Model description



Item	Meaning	Description
1	Product family name	"X3-NEO": energy storage series inverter that supports grid connection of photovoltaic system.
2	Power	"5K": rated output power of 5 kW.
3	Voltage	"LV": low voltage battery.

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.
NOTICE!	Provides tips for the optimal operation of the product.

Change History

Version 1.0 (2025-01-08)

DC Switch to PV Switch;

Updated "Upgrade preparation";

Updated "2.6 Working State";

Updated "2.7 Working mode (For Pakistan)";

Added "2.8 Working mode (For countries other than Pakistan)";

Updated "Figure3-1 System diagram";

Added "16 Appendix";

Updated "11 Operation on LCD";

Updated "13.2 Troubleshooting";

Added 20kW model, updated related parameters "15 Technical Data";

Version 1.0 (2024-10-31)

Updated "service@solaxpower.com.au"

Version 0.0 (2024-04-26)

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.
- 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. Overvoltage can cause irreversible damage to the inverter, and such damage is not covered by the warranty.

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 PV switch and LCD panel.
- 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 5 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!

- When handling the battery, carefully follow all safety instructions provided in the battery manual. The battery used with the inverter must meet the specified requirements of the series inverter.

WARNING!

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

WARNING!

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

CAUTION!

- 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!

- If an external Residual Current Device (RCD) is required by local regulations, verify the type of RCD required. It is recommended to use a Type-A RCD with a rating of 300 mA. When required by local regulations, the use of a Type-B RCD is permitted.
- Keep all product labels and the nameplate on the inverter clearly visible and well-maintained.

1.2.3 Safety Instructions of Utility 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

The X3-NEO-LV series is an energy storage PV grid-connected inverter. It supports various intelligent solutions such as load management, wireless metering, dual battery terminals, microgrids, etc. to achieve efficient and economical energy utilization. The X3-NEO-LV series inverter is compatible with both Lithium-ion batteries and lead-acid batteries.

2.2 Appearance

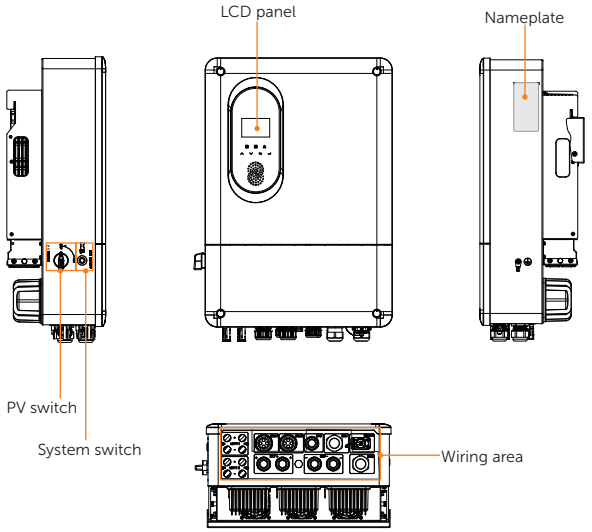


Figure 2-1 Appearance

Table 2-1 Description of appearance

Item	Description
Nameplate	Nameplate clearly identifies the device type, serial number, specific DC / AC parameters, certification, etc.
LCD panel	Including screen, indicators and keys. Screen displays the information; indicators indicate the status of inverter. Keys are used to perform the parameter setting.
PV switch	Disconnect the DC input when necessary.

Item	Description
System switch	Button pressed: ON, the system is allowed to operate; Button released: OFF, the system is not allowed to operate .
Wiring area	Including PV terminals, battery terminals, Grid terminals, GEN terminals, EPS terminals, communication terminals, etc.

2.3 Supported Power Grid

There are different ways of wiring for different grid systems. TT / TN-S / TN-C-S are shown as below:

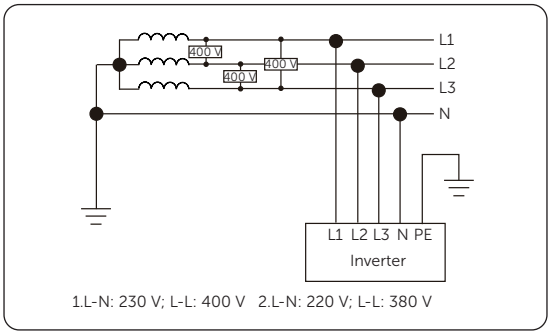


Figure 2-2 Supported power grid-TT

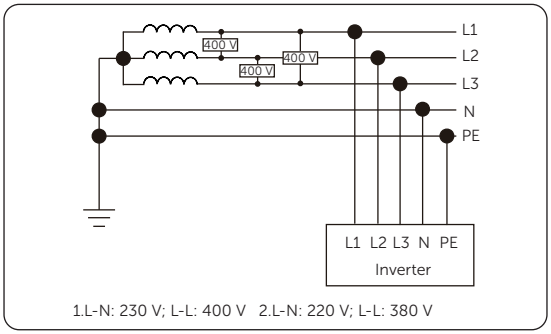


Figure 2-3 Supported power grid-TN-S

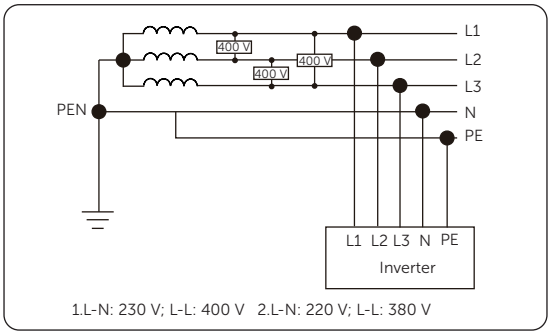


Figure 2-4 Supported power grid-TN-C-S

2.4 Symbols on the Label and Inverter

Table 2-2 Description of symbols

Symbol	Description
CE	CE mark. The inverter complies with the requirements of the applicable CE guidelines.
TÜVRheinland CERTIFIED	TUV certified.
	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 battery, mains and on-site PV generation source.
5min	Danger of high voltage. Do not touch live parts for 5 minutes after disconnection from the power sources.

2.5 Working Principle

2.5.1 Circuit Diagram

The inverter is equipped with multi-channel MPPT for DC input to ensure maximum power even under different photovoltaic input conditions. The inverter unit converts direct current 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:

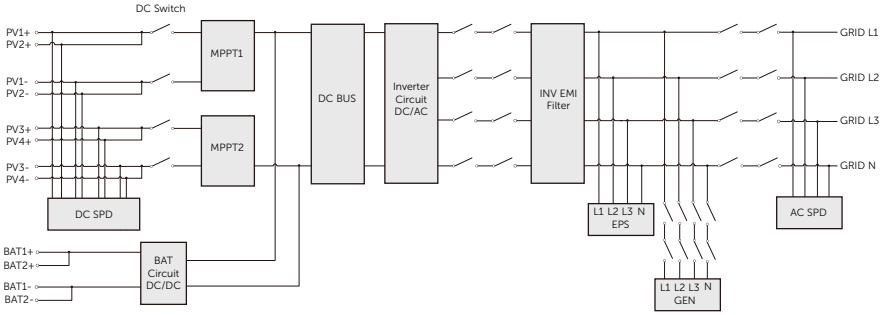


Figure 2-5 Circuit Diagram for X3-NEO-LV series inverter

2.5.2 Application Schemes

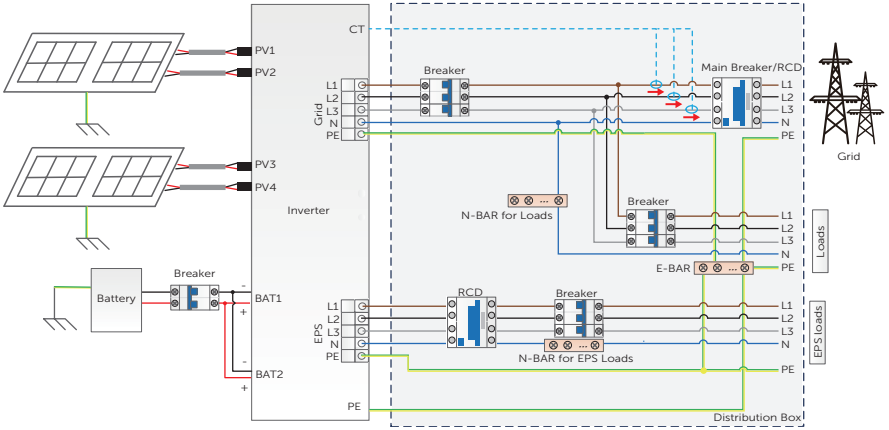


Figure 2-6 Partial home backup for most countries

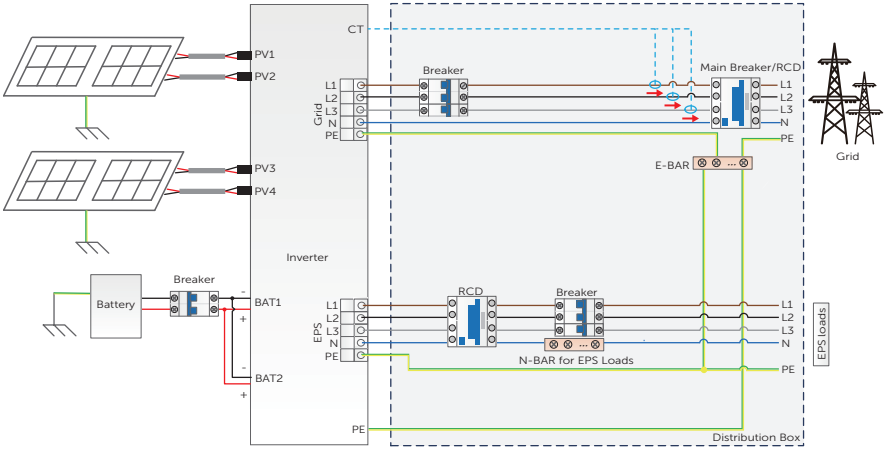


Figure 2-7 Whole home backup for most countries

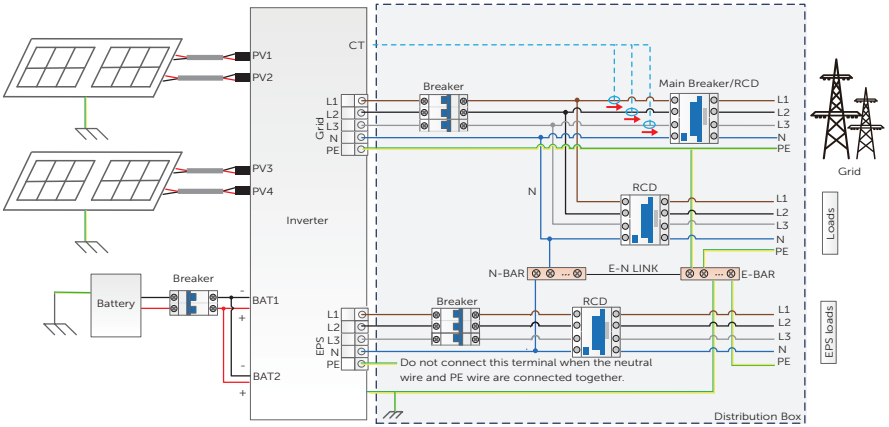


Figure 2-8 Neutral point connected to PE in distribution box

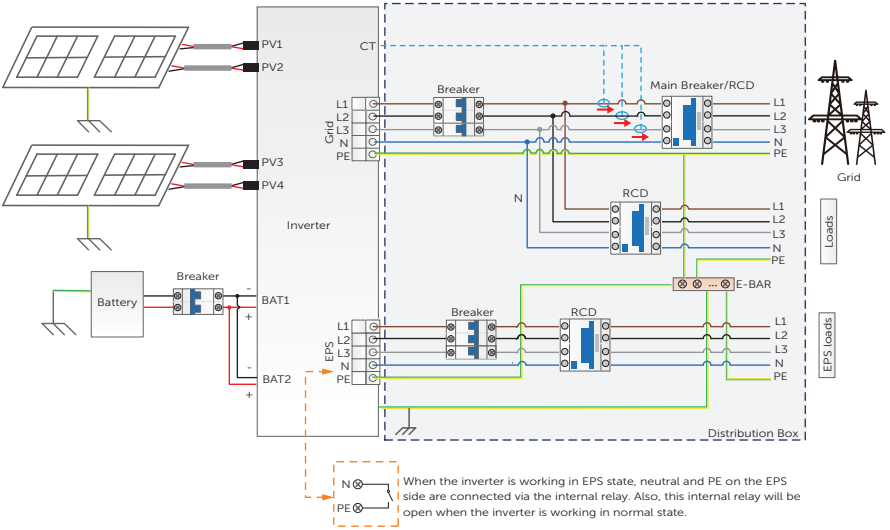


Figure 2-9 Neutral point separate from PE in distribution box

2.6 Working State

The series inverter has Wait, Check, Normal, Fault, Update, EPS Check, EPS Wait, EPS, GEN Check and GEN.

Table 2-3 Description of working state

State	Description
Wait	• The inverter is waiting for the conditions to be met in order to enter Checking state.
Check	• The inverter is checking for conditions to enter Normal state.
Normal	• The inverter is working normally.
Fault	• The inverter detects error and prompts error code.
Update	• The inverter is updating ARM, DSP or BMS, etc.
EPS Check	• The inverter is checking for conditions to enter EPS state.
EPS wait	• Without utility power, the inverter waits to enter the EPS state (Overload or low SOC will cause the inverter to enter the EPS wait).
EPS	• The inverter is working in EPS state.
GEN Check	• The inverter is checking for conditions to enter generator state.
GEN	• The inverter is in the generator operating state.

2.7 Working mode (For Pakistan)

There are different work modes of the inverter based on different needs.

Applicable areas	Work modes
Pakistan	SUB, SBU, MKS, Force Time Use, Manual
Countries other than Pakistan	Back Up, Self Use, Manual

For how to set the working mode, please refer to the section "11.3 Work Mode Setting".

2.7.1 SUB Mode

This mode uses the energy storage system as a backup power source and is suitable for applications with frequent power outages or wish to feed excess electricity generated by solar power into the grid.

Figure 2-10 Description of SUB mode

Battery SOC	Battery Charge Source	Power Supply Situation
The battery is not fully charged	PV Only	PV → load → battery → grid • PV prioritizes supplying power to the load. If the PV output exceeds the load demand, the surplus energy is first used to charge the battery. Once the battery is fully charged, the excess energy is fed into the grid according to the **Grid Control** settings. For specific settings, please refer to "11.4 Grid Control". • In off-grid situation, both PV and the battery supply power to the load.
	PV Then Utility	PV is available: (PV → load → battery → grid) • Consistent with the PV Only charging situation.
		PV is not available: (grid → load+battery) • The grid supplies power to the load and draws electricity from the grid to charge the battery based on the **Max Utility Charge Current**.
	PV And Utility	PV → load → battery → grid • PV is prioritized for the load, with excess used to charge the battery. Simultaneously, power is drawn from the grid to charge the battery based on the **Max Utility Charge Current**. After the battery is fully charged, surplus energy is either fed into the grid or curtailed according to **Grid Control** settings. For specific settings, please refer to "11.4 Grid Control".

2.7.2 SBU Mode

This mode is suitable for applications where electricity prices are high and PV cannot be fed into the grid. PV is prioritized for loads, and excess power is stored in the battery for later use. This mode is ideal for customers with low daytime electricity consumption and higher night time electricity consumption.

Figure 2-11 Description of SBU mode

Battery SOC	Battery Charging And Discharging Situation	Power Supply Situation
BAT<**Return to Utility Voltage/Soc**	PV Only	PV → battery, grid → load • PV charges the battery, and the load is supplied by the grid.
	PV Then Utility	PV is available: (PV → battery → load) • PV prioritizes supplying power to the battery. If the PV output exceeds the battery demand, the surplus energy is first used to charge the load.
		PV is not available: (grid → load+battery) • The grid supplies power to the load and charge the battery based on the **Max Utility Charge Current**. For specific settings, please refer to "11.4 Grid Control".
	PV And Utility	PV+grid → battery, grid → load • All electricity generated by the PV is used to charge the battery, and concurrently, power is drawn from the grid to charge the battery based on the **Max Utility Charge Current**. For specific settings, please refer to "11.4 Grid Control".
BAT>**Return to Battery Voltage/Soc**	Battery Discharge	PV+battery → load • PV is priority to supply power to the load. If the PV is insufficient, the battery supplies power to the load until the battery voltage is less than the **Return to Utility Voltage/Soc**. The grid terminal relay is disconnected, the lcd screen displays normal, and the grid-connected flow line becomes dashed.

2.7.3 MKS/EPS Mode

This mode is suitable for customers who have higher electricity consumption during the day and lower consumption at night.

When PV is available, this mode is basically the same as the SBU mode, the discharge capability of the battery is more extensive than SBU mode. At night when PV is unavailable, this mode is basically the same as the SUB mode, with the battery only charging and not discharging, which prevents the battery from being depleted.

Figure 2-12 Description of MKS mode

PV input	Battery SOC/voltage	Power Supply Situation
With PV input	SOC/voltage≥return to SUB	• When MKS mode is set, the inverter will run in SBU mode logic. The grid terminal relayy is disconnected, the lcd screen displays normal, and the grid-connected flow line becomes dashed.
	SOC/voltage<return to SUB	• The inverter runs in SUB logic until SOC/voltage>**Return to SBU** and the inverter changes to the logic of SBU mode. The grid terminal relay is disconnected, the lcd screen displays normal, and the grid-connected flow line becomes dashed.
No PV input	-	Grid → Load+battery • The grid supplies power to the load and draws electricity from the grid to charge the battery based on the **Max Utility Charge Current**.

2.7.4 Force Time Use Mode

This mode is suitable for application with peak and valley price difference. When the price of electricity is high, the battery is discharged to the load, and when the price of electricity is low, the battery is charged from the solar or the grid to fill the battery.

Figure 2-13 Description of Force Time Use mode

Time Period	Battery Charging And Discharging Situation	Power Supply Situation
Charge period	PV Only	PV → battery, grid → load • PV charges the battery, and the load is supplied by the grid.
	PV Then Utility	PV+grid → battery+load • PV prioritizes charging the battery, if the PV is insufficient, electricity is drawn from the grid to charge the battery. The load is supplied by the grid.
	PV And Utility	PV+grid → battery+load • All electricity generated by the PV is used to charge the battery, and concurrently, power is drawn from the grid to charge the battery based on the **Max Utility Charge Current**. For specific settings, please refer to "11.4 Grid Control".
Home load removed from utility time periods	Battery Discharge	grid+battery → load • The battery discharges to supply the load until the battery voltage is less than the **Battery Stop Discharge Voltage**, after which the load will be supplied by the grid.
Outside of peak-valley scheduled time periods	The battery charges according to the priority settings of the battery charging source mode.	

2.7.5 Manual Mode

This mode allows the user to set the battery charging and discharging power.

- **Battery ChrgDischrg Power** (Range: -15000 W~15000 W. Negative value means the battery is discharged, positive value means the battery is charged.)

2.8 Working mode (For countries other than Pakistan)

2.8.1 Self Use Mode (Priority: Loads > Battery > Grid)

The self use mode is suitable for areas with low feed-in subsidies and high electricity prices. The power of PV will supply the loads first, and the surplus power will charge the battery, then the remaining power will be fed into the power grid.

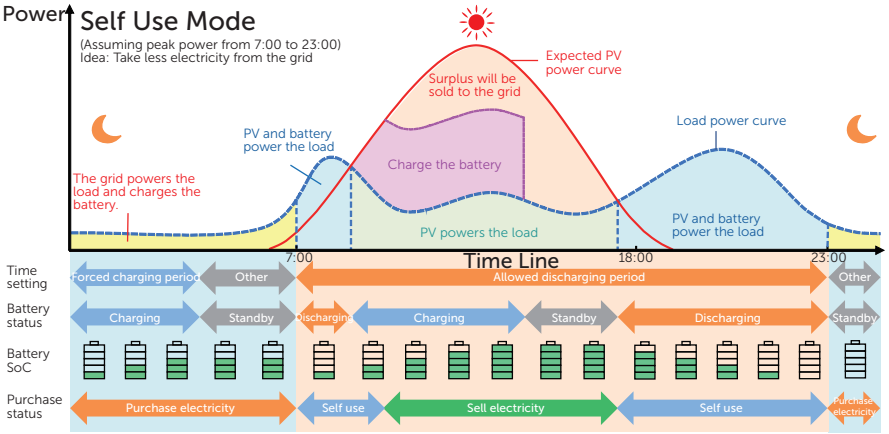


Figure 2-14 Self use mode

Table 2-4 Description of self use mode

Time period	Inverter working state
Forced charging period	• Charge the battery first until the battery SOC/Voltage reaches the specified **Charge battery to** value. You can configure the inverter to either draw power from the grid or not.
Allowed discharging period	PV is sufficient (PV → load → battery → grid) • The power generated from PV prioritizes supplying the load. Any excess power is then directed towards charging the battery, and if there is still surplus electricity, it can be fed into the power grid. In the event that the local utility restricts the sale of electricity to the power grid, the **Grid Control** value can be set on the inverter. Please refer to "11.4 Grid Control".
	PV is insufficient (PV+battery → load) • The battery discharges power to the load. Once its capacity reaches **Min Soc/Voltage**, it automatically ceases discharging.

Note:

Charge battery to: The target battery SOC/Voltage charged from power grid. 10% / 47V by default, the settable range is 10%~100% / 42V~60V.

Min Soc/Voltage: Minimum SOC/Voltage of the battery under grid connection. 10% / 42V by default, the settable range is 10%~100% / 40V~47V.

Charge from grid: Setting whether the inverter draws power from the grid or not.

2.8.2 Backup Mode (Priority: Loads > Battery > Grid)

The backup mode is suitable for areas with frequent power outages.

This mode will maintain the battery capacity at relatively high level to ensure that the emergency loads can be used when the grid is off. Same working logic with self use mode.

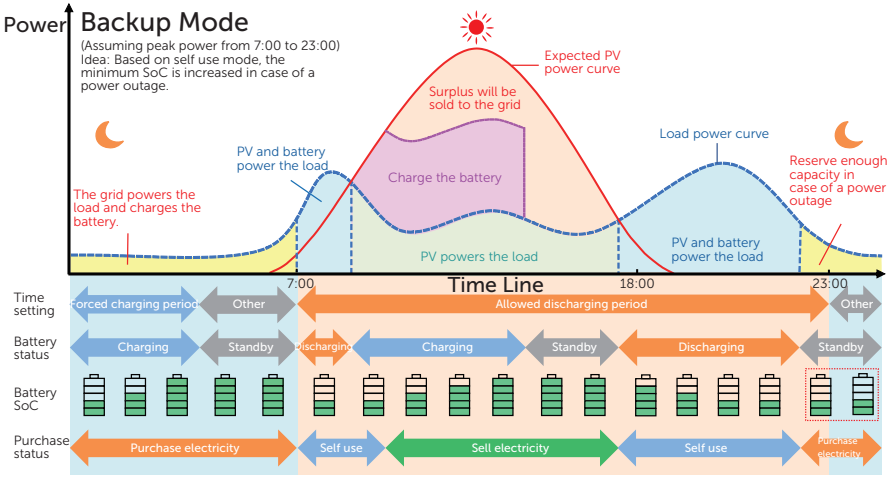


Figure 2-15 Backup mode

Table 2-5 Description of backup mode

Time period	Inverter working state
Forced charging period Allowed discharging period	The working logic remains the same as for self use mode.

Note:

Charge battery to: The target battery SOC/Voltage charged from power grid. 10% / 47V by default, the settable range is 10%~100% / 42V~60V.

Min Soc/Voltage: Minimum SOC/Voltage of the battery under grid connection. 10% / 42V by default, the settable range is 10%~100% / 40V~47V.

NOTICE!

- You can set two configurable working periods: forced charging period and allowed discharging period. Please refer to "Period Set" for details.
- If there is a foreseeable power outage, switch from other working modes to the backup mode in advance.

2.8.3 Manual Mode

The working logic remains the same as for "2.7.5 Manual Mode".

2.8.4 Period Set

You can set two configurable working periods: Forced charging period and Allowed discharging period. The interval not in the charging & discharging period belongs to other time periods.

- **Charge T1/T2** (Default period: 00:00~00:00, closed by default)

In the forced charging period, the inverter will charge the battery first until the battery SOC reaches the specified **Charge battery to** value set in each working mode. You have the option to configure the inverter to either draw power from the grid or not.

- **Discharge T1/T2** (Default period: 00:00~23:59)

In the allowed discharging period, the inverter will allow the battery to discharge and charge power in accordance with the working mode and load conditions.

- Period not set as forced charging or allowed discharging period

In this period, the inverter will allow the battery to charge but can not discharge power.

NOTICE!

- The charging and discharging period is applicable for self-use mode and backup mode. The priority of forced charging period is higher than all working modes.

2.9 Grid Control Function

Solar export control is a limit on the amount of energy your solar system that can export into the grid. You have a set limit on how much energy you can export to the grid.

How Grid Control works

- CT/Meter required
- Correct setting of the limit value of **Grid Control** through inverter. (For parallel system, set on the master inverter)
- **Grid Control** value can be set from 0W to more than the rated output power. For how to set the **Grid Control** function, please refer to "11.4 Grid Control".

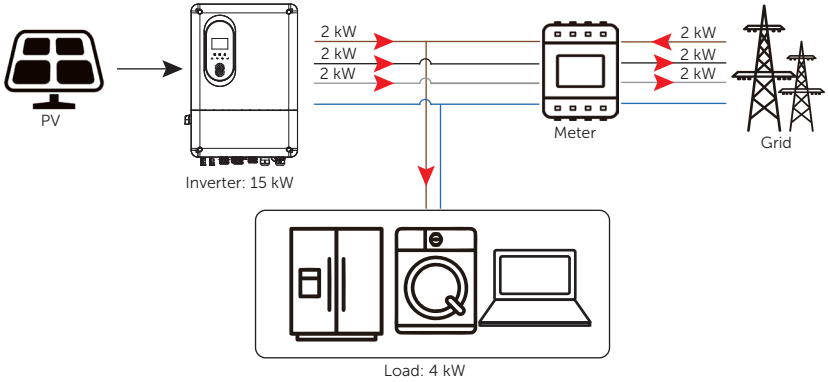


Figure 2-16 Zero grid control with **Phase Unbalance** disabled

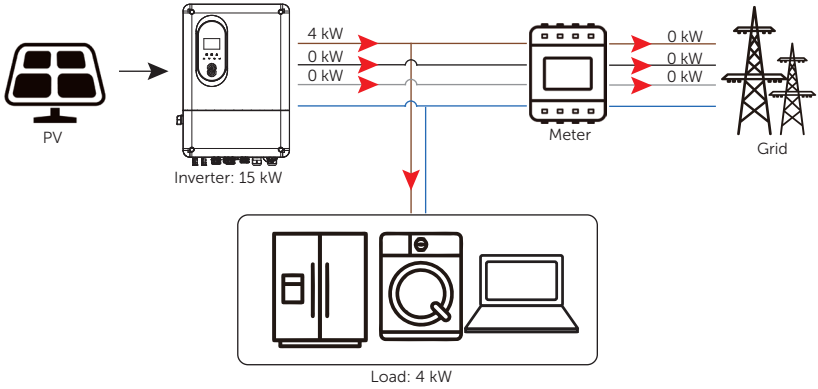


Figure 2-17 Zero grid control with **Phase Unbalance** enabled

3 System Overview

System Overview

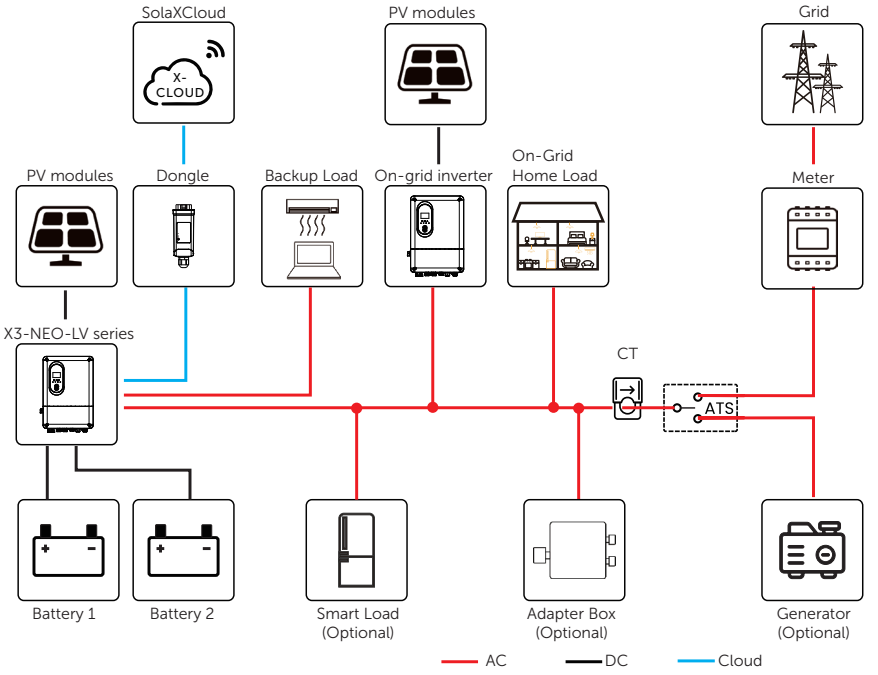


Figure 3-1 System diagram

Table 3-1 System item description

Item	Description
X3-NEO-LV series (the device covered in this manual)	The X3-NEO-LV series is an energy storage inverter that supports grid connection of a photovoltaic system.
PV modules	PV modules work in MPPT mode.
Battery	The series inverter can be connected with lithium-ion batteries or lead-acid batteries. Lithium-ion batteries communicate with the inverter through the BMS.
Meter/CT	The meter/CT is used by the inverter for import / export or consumption readings, and manages the battery charge / discharge accordingly for smart energy management applications.
Additional on-grid inverter (Optional)	The series inverter supports micro-grid function that makes hybrid inverter simulate the grid to active on-grid inverter during off-grid period by connecting on-grid inverter to hybrid inverter's EPS terminal. On-grid inverter and generator are not connected at the same time.
Adapter Box G2 (Optional)	With SolaX Adapter Box G2, you can connect the smart heat pump to the energy storage systems, realizing the control of the heat pump through inverter.
Generator (Optional)	SolaX PV-Genset solution ensures optimum interaction between the photovoltaic and diesel generator, which saves fuel, lowers energy costs and ensures a stable and reliable power supply.
Smart Load (Optional)	This mode utilizes the Gen input connector as an output which only receives power when the battery SOC is above a user programmable threshold.
Grid	400 V / 230 V and 380 V / 220 V grid are supported.
SolaXCloud	SolaXCloud is an intelligent, multifunctional monitoring platform that can be accessed either remotely or through a hard wired connection. With the SolaX Cloud, the operators and installers can always view key and up to date data.

4 Transportation and Storage

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

Transportation

- 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 as specified by local regulations.
- Wear protective gloves when carrying the equipment by hand to prevent injuries.
- When lifting up the inverter, hold the handle position and the bottom position of the carton. Keep the inverter horizontal in case of falling down.

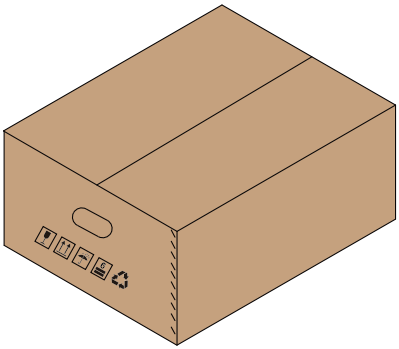


Figure 4-1 Caution signs on the packaging

Storage

- The inverter must be stored indoors.
- 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.

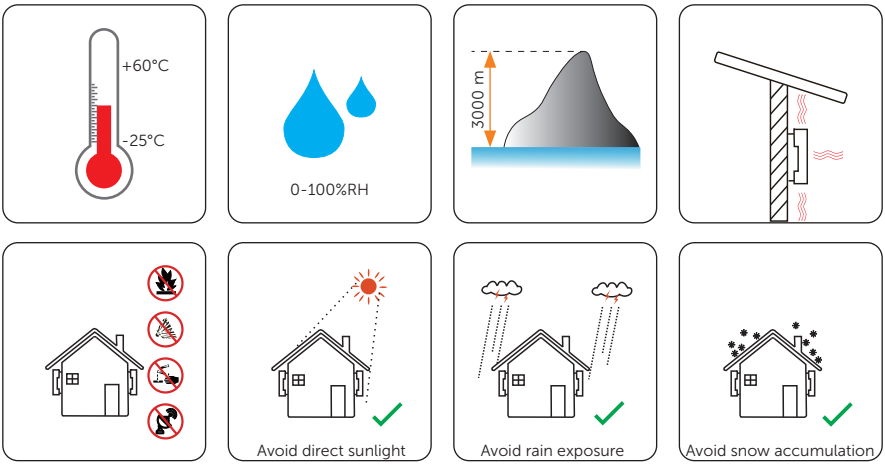
5 Preparation before Installation

5.1 Selection of Installation Location

The installation location selected for the inverter is quite critical in the aspect of the guarantee of machine safety, service life and performance. It has the IP65 ingress protection, which allows it to be installed outdoor. The installation position shall be convenient for wiring connection, operation and maintenance.

5.1.1 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 the areas where the altitude exceeds 3000 m.
- 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.



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.

- Install the inverter at least 500 meters away from the coast and avoid sea breeze directly hit.

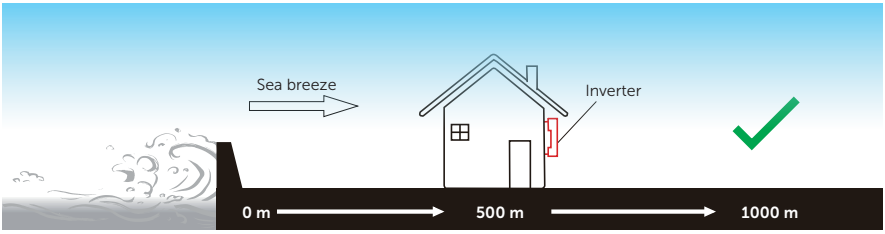


Figure 5-1 Recommended installation position

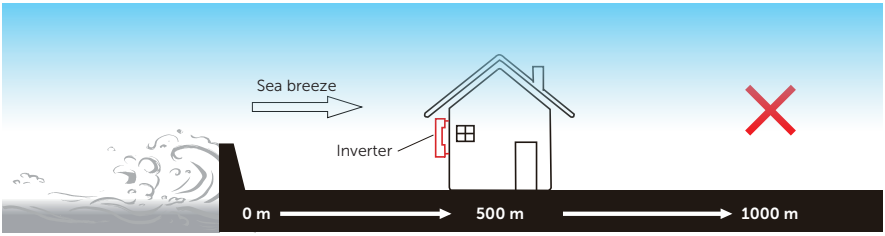


Figure 5-2 Incorrect installation position

NOTICE!

- For the installation of the whole system, please refer to the specific environment requirement of each unit.

5.1.2 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.

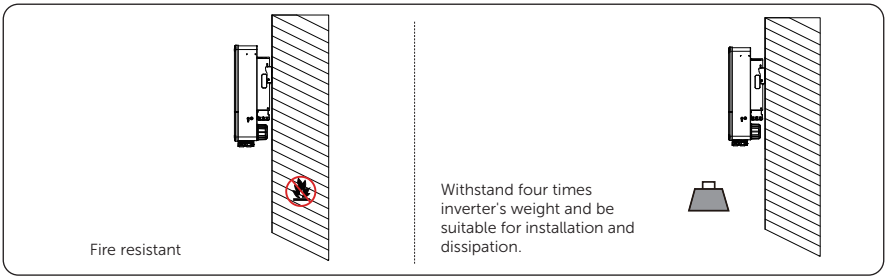


Figure 5-3 Installation carrier requirement

NOTICE!

- Please take the weight of battery into account when wall-mouting the whole system.

5.1.3 Clearance Requirement

When planning installation space, please reserve space in the bottom of the inverter and consider the bend radius of the cables at the same time.

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 600 mm between each inverter laterally and 1000 mm vertically. In areas with high ambient temperatures, increase the clearances between the inverters and provide adequate fresh air ventilation if feasible.

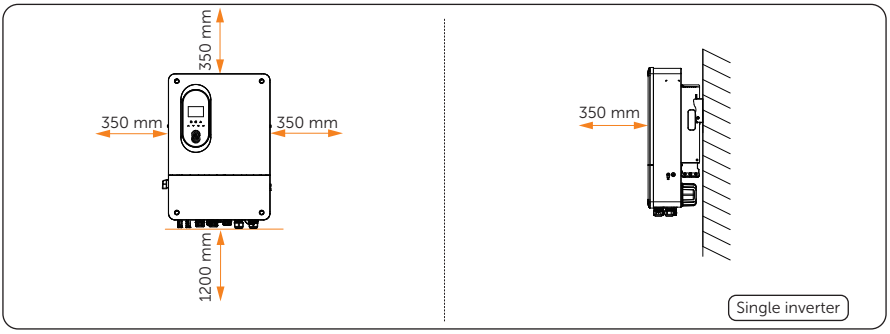


Figure 5-4 Clearance requirement for single inverter

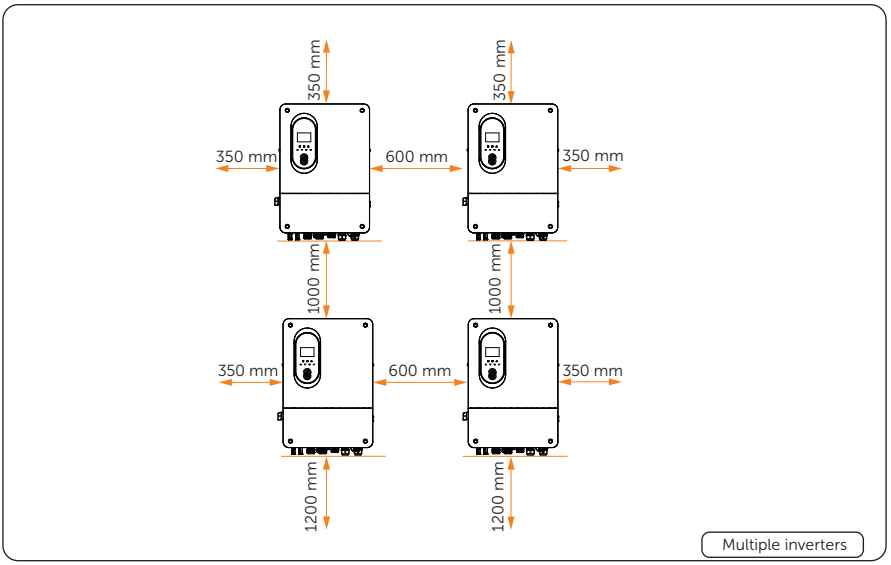
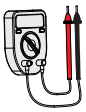


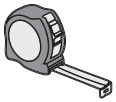
Figure 5-5 Clearance requirement for multiple inverters

5.2 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: Ø10 mm)

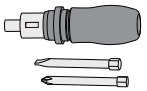

Multimeter
(≥ 1100 V DC)

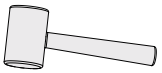

Measuring tape

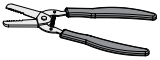

Utility knife

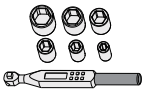

Marker

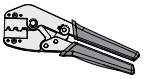

Spirit level

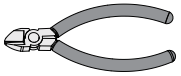

Torque screwdriver
(Flat-head: M2)
(Phillips head: M2.5 / M3 / M5)

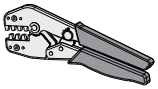

Rubber mallet

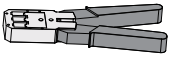

Wire stripper

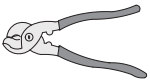

Torque wrench


Crimping tool for
PV terminals

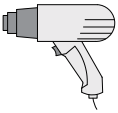

Diagonal pliers

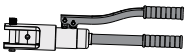

Crimping tool


Crimping tool for RJ45


Wire cutter


Heat shrink tubing
(Ø8 mm)

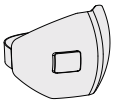

Heat gun


Hydraulic wire crimper
for battery terminal


Safety gloves


Safety boots


Safety goggles


Anti-dust mask

5.3 Additionally Required Materials

Table 5-1 Additionally required wires

No.	Required Material		Type	Conductor Cross-section
1	PV wire		Dedicated PV wire with a voltage rating of 1000 V, a temperature resistance of 105°C, a fire resistance grade of VW-1	4-6 mm^2
2	Communication wire		Network cable CAT5E	/
3	Grid, GEN and EPS wire		Five-core copper cable	6 mm^2 for EPS terminal; 8-10 mm^2 for Grid & GEN terminal
4	Battery power wire (2 sets, length<3 m)		/	40-55 mm^2
5	Additional PE wire		Conventional yellow and green wire	10-16 mm^2

Table 5-2 Circuit breaker recommended

Model	5 kW	8 kW	10 kW	12 kW	15 kW	20 kW
Circuit breaker (For Grid, EPS and GEN terminal)	25 A	32 A	50 A	50 A	63 A	63 A

Table 5-3 Non-polarized DC circuit breaker recommended

Model	5 kW	8 kW	10 kW	12 kW	15 kW	20 kW
Non-polarized DC circuit breaker (For BAT terminal)	200 A	320 A	320 A	400 A	450 A	450 A

Table 5-4 Anti-theft lock recommended

Required Material	Type	Remark
(Optional) Anti-theft lock	< Ø8 mm	Installed on the left side of the inverter for anti-theft purposes.

6 Unpacking and Inspection

6.1 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.

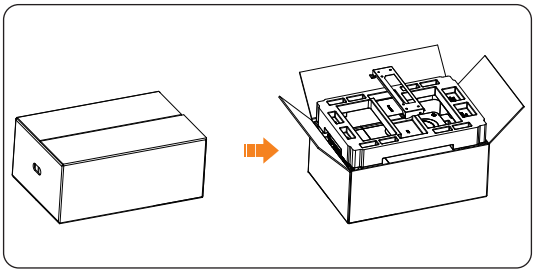


Figure 6-1 Unpacking the inverter

- 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.

6.2 Scope of Delivery

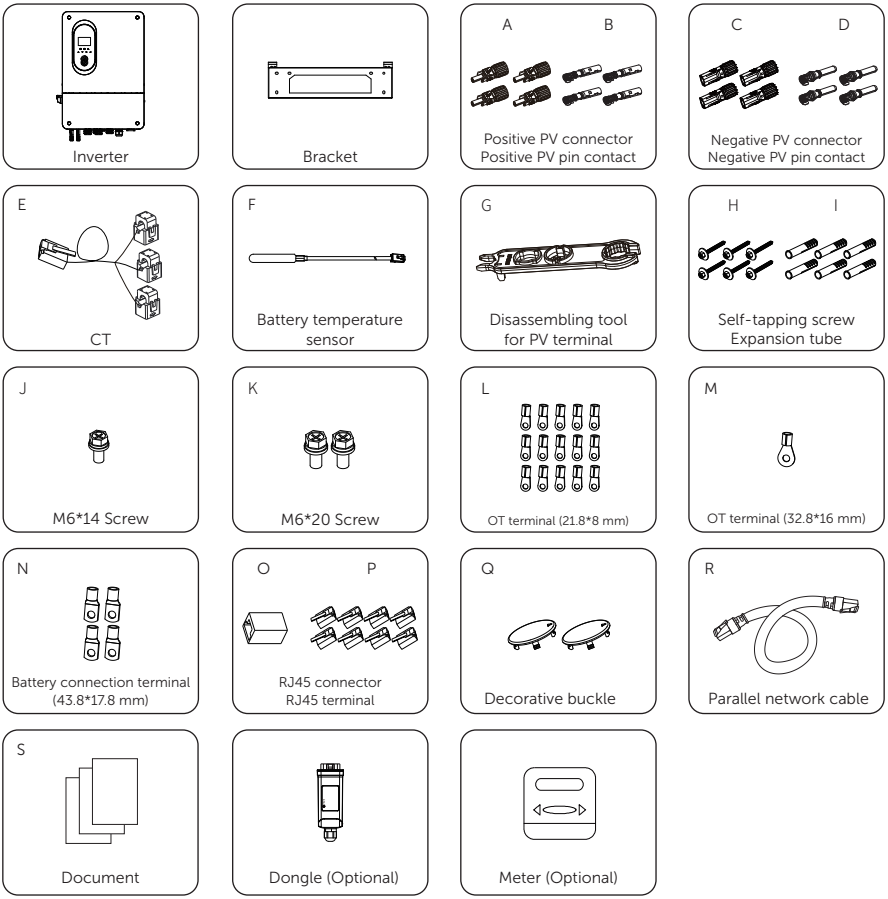


Table 6-1 Packing list

Item	Description	Quantity	Remark
/	Inverter	1 pc	
/	Bracket	1 pc	
A	Positive PV connector	4 pcs	4 pcs for 12kW, 15kW and 20 kW inverter; 3 pcs for 10 kW inverter; 2 pcs for 5kW and 8kW inverter.
B	Positive PV pin contact	4 pcs	
C	Negative PV connector	4 pcs	
D	Negative PV pin contact	4 pcs	

Item	Description	Quantity	Remark
E	CT	1 pc	
F	Battery temperature sensor	1 pc	Temperature sensor for lead-acid batteries
G	Disassembling tool for PV terminal	1 pc	
H	Self-tapping screw	6 pcs	Bracket mounting
I	Expansion tube	6 pcs	
J	M6*14 Screw	1 pc	
K	M6*20 Screw	2 pcs	
L	OT terminal (21.8*8 mm)	15 pcs	5 pcs for Grid terminal 5 pcs for GEN terminal 5 pcs for EPS terminal
M	OT terminal (32.8*16 mm)	1 pc	For grounding the inverter
N	Battery connection terminal (43.8*17.8 mm)	4 pcs	
O	RJ45 connector	1 pc	
P	RJ45 terminal	8 pcs	
Q	Decorative buckle	2 pcs	For the upper cover of inverter
R	Parallel Network cable	1 pc	For parallel connection
S	Document	/	
/	Dongle (Optional)	1 pc	
/	Meter (Optional)	1 pc	

NOTICE!

- Refer to the actual delivery for the optional accessories.
- The figures of packing list takes 15 kW inverter as an example.

7 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.

CAUTION!

- During installation, always be cautious about the weight of the inverter. Improper lifting or dropping of the inverter may result in personal injury.

NOTICE!

- Install the inverter at a maximum back tilt of 5 degrees and avoid it being forward tilted, side tilted, or upside down.

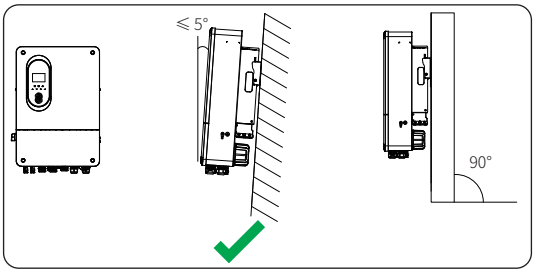


Figure 7-1 Correct installation

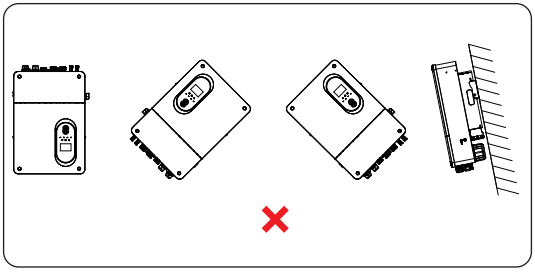


Figure 7-2 Incorrect installation

7.1 Dimensions for mounting

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

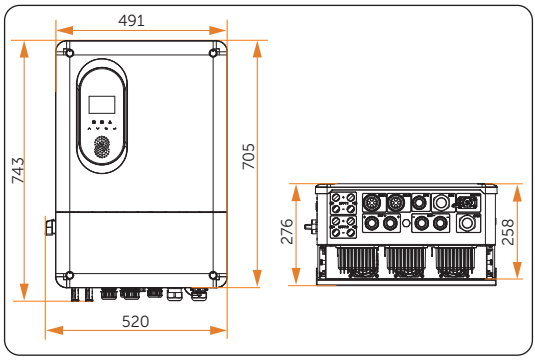


Figure 7-3 Dimensions 1 (Unit: mm)

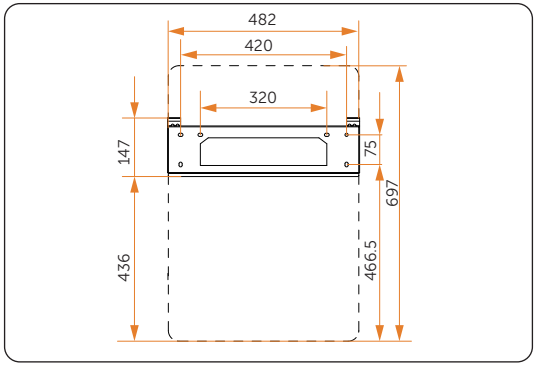


Figure 7-4 Dimensions 2 (Unit: mm)

7.2 Installation procedures

Step 1: Horizontally align the wall mounting bracket with the wall, adjust the position of the bracket with a spirit level until the bubble stays in the middle, and then mark holes. Please note that take the height of the battery into account when determining the position of the wall mounting bracket.

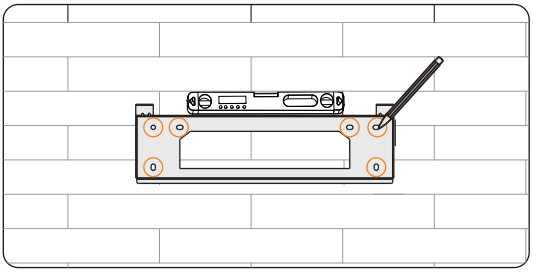


Figure 7-5 Marking the holes

Step 2: Set the wall mounting bracket aside and drill holes with Ø10 drill bit. The depth of the holes should exceed 55 mm.

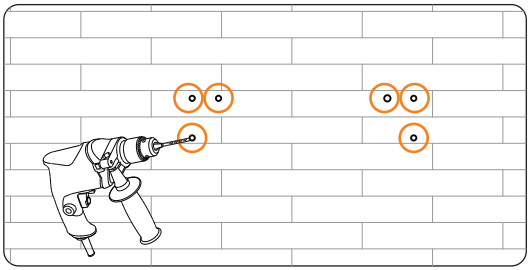


Figure 7-6 Drilling holes

Step 3: Knock the expansion tubes (part I) into the holes.

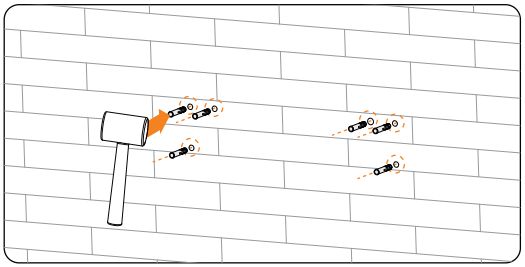


Figure 7-7 Knock the expansion tubes

Step 4: Use expansion screws (part H) to attach the wall mounting bracket on the wall

again and secure them to the wall by torque wrench.

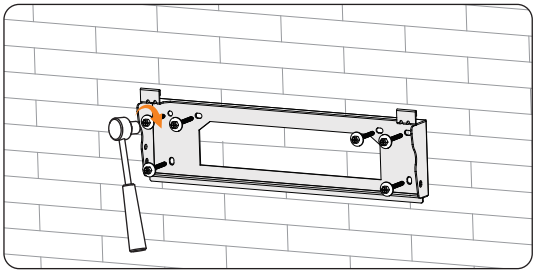


Figure 7-8 Securing the wall mounting bracket

Step 5: Open the anti-static bag, take out the inverter. Lift up the inverter collaboratively by the required number of personnel in accordance with the local regulation and hang it onto the wall mounting bracket. Make sure that the inverter is mounted on the bracket as shown in the diagram.

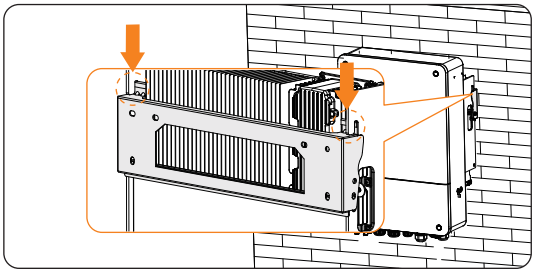


Figure 7-9 Hanging the inverter

Step 6: Use M6*20 screws (part K) to secure the inverter on both sides.

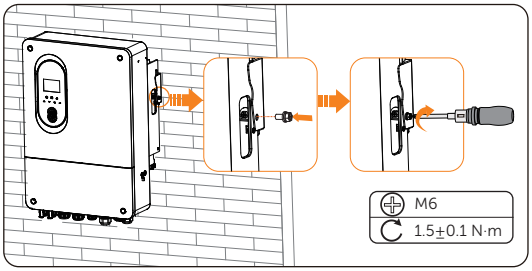


Figure 7-10 Securing the inverter (Right side)

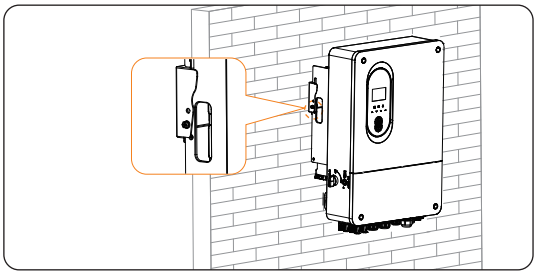


Figure 7-11 Securing the inverter (Left side)

Step 7: (Optional) For safety reason, install an anti-theft lock. The anti-theft lock is not in the scope of delivery. If necessary, prepare a lock with a diameter < Ø8 mm by yourself, and keep the key to the lock in a safe place.

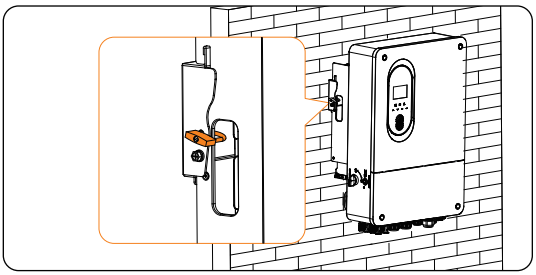


Figure 7-12 Locking the inverter

8 Electrical Connection

DANGER!

- Before electrical connection, make sure the PV switch, System Switch 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.

8.1 Overview of Electrical Connection

8.1.1 Terminals of Inverter

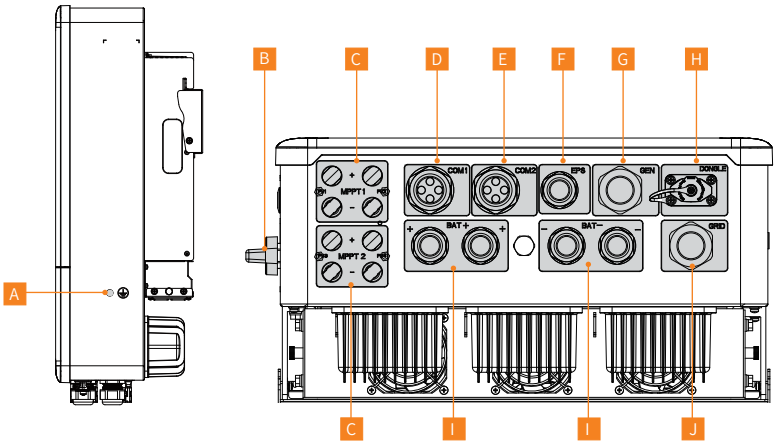


Figure 8-1 Terminals of Inverter

Table 8-1 Description of terminals

Item	Name	Description	Decisive voltage class
A	⏚	Additional grounding point	-
B	PV switch	Disconnect the PV input when necessary	-
C	PV1, PV2, PV3, PV4	PV input terminal connecting to PV module. PV1 and PV3 terminals for 5kW and 8kW inverter; PV1, PV2 and PV3 terminals for 10 kW inverter; PV1, PV2, PV3 and PV4 for 12kW, 15kW and 20 kW inverter.	DVC-C
D	COM 1	COM 1 communication terminal	DVC-A
E	COM 2	COM 2 communication terminal	DVC-A
F	EPS	AC terminal connecting to EPS load	DVC-C
G	GEN	AC terminal connecting to generator	DVC-C
H	DONGLE	Firmware upgrading and dongle connection	DVC-A
I	BAT+, BAT-	Battery terminal connecting battery power cable	DVC-C
J	GRID	AC terminal connecting to power grid	DVC-C

8.1.2 Cable Connections of Inverter

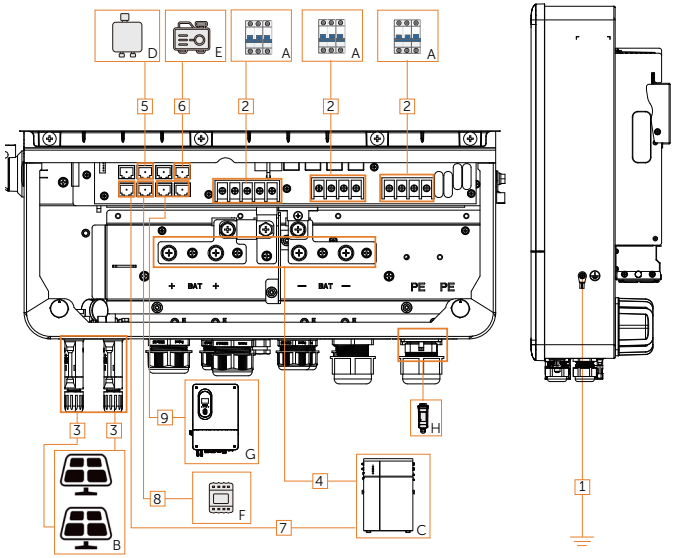


Figure 8-2 Cable connections of inverter

Table 8-2 Descriptions of connected part

Item	Part	Description	Source
A	AC switch	Select an appropriate AC switch according to the local regulations to ensure the inverter can be securely disconnected from the grid when an emergency occurs. Refer to "5.3 Additionally Required Materials" for the recommended specifications of AC switch.	Prepared by user
B	PV module	A PV string is composed of the PV modules connected in series.	Prepared by user
C	Battery	TP-LD53, TP-LD150 and lead-acid battery can be connected with the series inverter. For lithium-ion batteries, batteries from the same brand, model, and version should be connected. For lead-acid batteries, batteries with the same voltage, current, and amp-hour (AH) capacity should be connected.	Prepared by user
D	(Optional) SolaX communication device	SolaX Adapter Box G2, Datahub are supported. Select the device as needed.	Purchased from SolaX
E	(Optional) Generator	For generator, select a generator equipped with an Automatic Transfer Switch (ATS), and the rated output power of the generator should be greater than the sum of the load power and the battery charging power.	Purchased from SolaX
F	Meter	Supported SolaX authorized DTSU666-CT or CT.	Purchased from SolaX
G	(Optional) X3-NEO-LV series inverter	Select a same model of inverter	Purchased from SolaX
H	(Optional) Monitoring dongle	Only SolaX monitoring dongle supported.	Purchased from SolaX

Table 8-3 Descriptions of cables

Item	Cable	Type and specifications	Source
1	PE cable	Refer to "5.3 Additionally Required Materials".	Prepared by user
2	AC output cable		Prepared by user
3	PV DC input power cable		Prepared by user

Item	Cable	Type and specifications	Source
4	Battery power cable for lithium battery	/	In the battery accessory package.
	Battery power cable for lead-acid battery	Refer to "5.3 Additionally Required Materials".	Prepared by user
5	Communication cable	Refer to "5.3 Additionally Required Materials".	Prepared by user
6	Communication cable		Prepared by user
7	Battery communication cable (lithium battery)	/	In the battery accessory package.
	Battery temperature sensor(lead-acid battery)	/	In the inverter accessory package.
8	Communication cable	Refer to "5.3 Additionally Required Materials".	Prepared by user
9	Communication cable		Prepared by user

8.2 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.

PE connection procedures

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

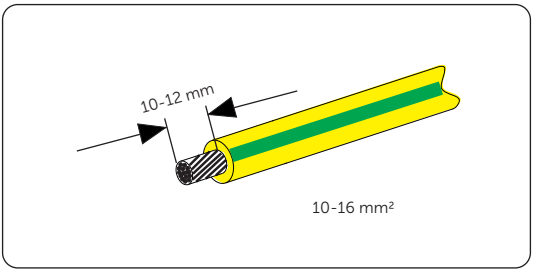


Figure 8-3 Striping the PE cable

Step 2: Insert the stripped section into the OT terminal (part M) .

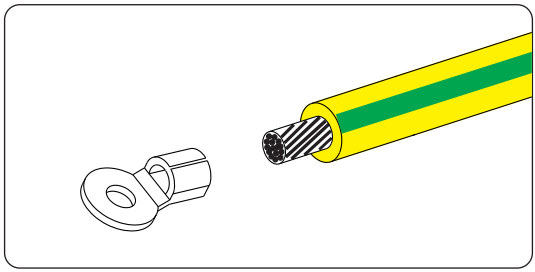


Figure 8-4 Installing the tubing and OT terminal

Step 3: Crimp it with crimping tool.

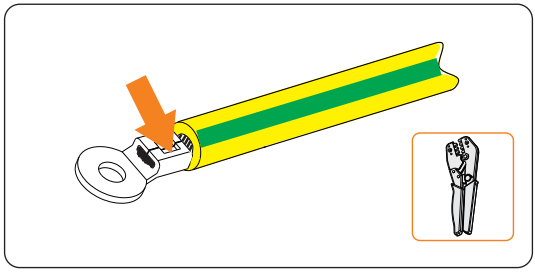


Figure 8-5 Crimping the cable

Step 4: Connect the assembled PE cable to the grounding point of the inverter, and secure it with M6*14 screw (Part J). (Torque: 1.5±0.1 N·m)

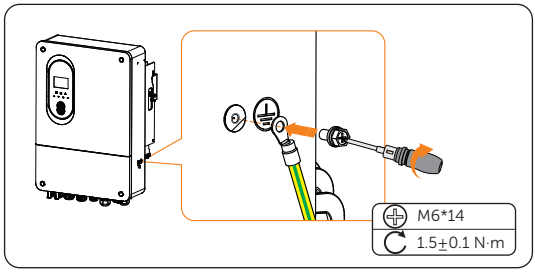


Figure 8-6 Securing the PE cable

8.3 Battery Power Cable Connection

DANGER!

- Before connecting the cables, make sure the breaker, power button (if any) and DC switch (if any) of battery is OFF.
- Always ensure correct polarity. Never reverse the polarity of the battery cables as this will result in inverter damage.

Requirements for battery connection

- Battery
  - » SolaX Lithium-ion battery and lead-acid battery.
  - » The inverter is equipped with two battery terminals. Max charge and discharge current is 300 A.
  - » Make sure the input voltage of each BAT terminal is higher than minimum voltage 40 V and lower than maximum input voltage 60 V.
- Micro circuit breaker (MCB)
  - » If the battery is integrated with a readily accessible internal DC breaker, no additional DC breaker is required. If lead-acid batteries are used, a DC circuit breaker needs to be installed between the battery and the inverter.
  - » The nominal voltage of DC MCB should be larger than maximum voltage of battery.
- Battery configuration information
  - » X3-NEO-LV series inverter matches with SolaX low voltage battery TP-LD53, TP-LD150. A single inverter can match with maximum 16 batteries. Without a minimum.

Wiring procedures

Step 1: Use a Phillips screwdriver to remove the inverter's upper cover as shown in the diagram.

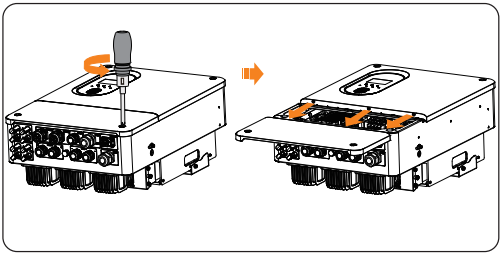


Figure 8-7 Removing the upper cover

Step 2: Use a Phillips screwdriver to remove the protective cover inside the inverter. Please store it properly after removal.

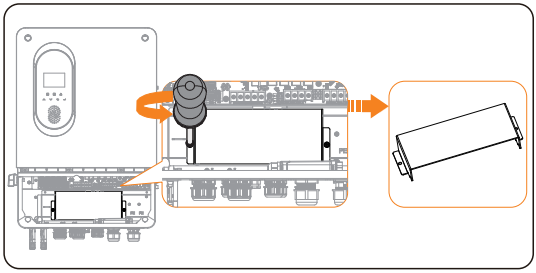


Figure 8-8 Remove the protective cover

Step 3: Strip the insulation of the battery power cable to an appropriate length.

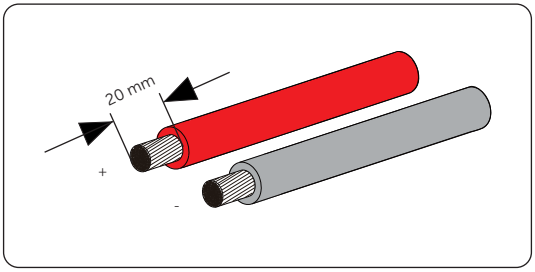


Figure 8-9 Stripping the battery cable

Step 4: Insert the stripped cable into the battery connection terminal (part N). Crimp it with crimping tool.

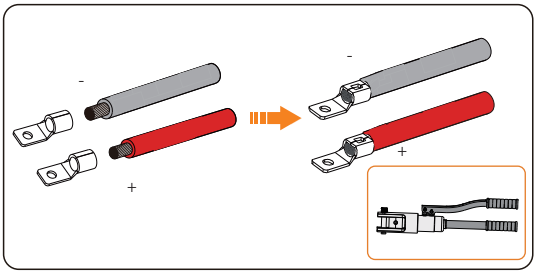


Figure 8-10 Crimping the terminal

Step 5: Loosen the swivel nut of the battery terminals then remove the screws.

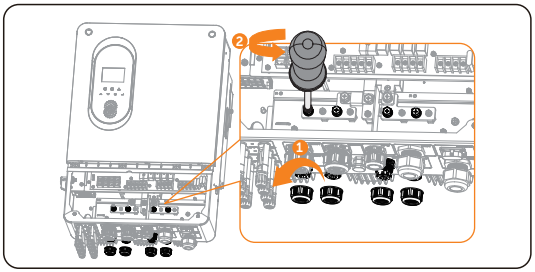


Figure 8-11 Threading the battery cable

Step 6: Thread the cable through the swivel nut, puncture a waterproof seal, then pass through the BAT terminal. Connect the positive and negative cables to their respective positions, screw back the removed screws (Torque: 5.0±0.1 N·m). Gently pull the cable backward to ensure firm connection. Tighten the swivel nut clockwise.

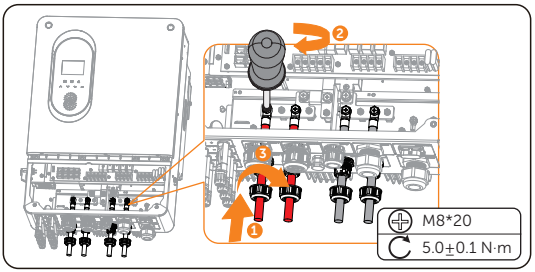


Figure 8-12 Connecting the battery cables

Step 7: Reinstall the protective cover onto the inverter.

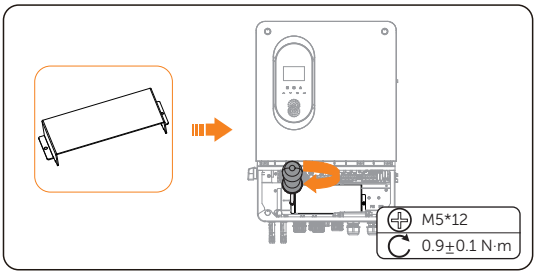


Figure 8-13 Reinstall the protective cover

8.4 AC Connection

NOTICE!

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

The inverter supports the EPS mode. When connected to the grid, the inverter outputs go through the Grid terminal, and when disconnected from the grid, the inverter outputs go through the EPS terminal.

Requirements for AC connection

- Grid voltage requirement
  - » The grid voltage and frequency must be within the allowable range (400 V / 230 V, 380 V / 220V, 50 / 60 Hz) and comply with the requirements of the local power grid.
- Residual Current Device (RCD)
  - » The inverter does not require an external RCD when operating. If an external RCD is required by local regulations, a 300 mA Type-A RCD is recommended. If required by local regulations, a Type-B RCD is also permitted.
- AC breaker
  - » An AC 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 grid. For specific information on the AC breaker for Grid and EPS, see "5.3 Additionally Required Materials".
- EPS load
  - » Make sure that the rated power of the EPS load is within the rated output power range of the inverter. Otherwise, the inverter will report an **EPS Overload Fault** alarm. In this case, turn off some loads to suit the rated EPS output power range of the inverter, and then press the **ESC** key on the LCD screen to clear the fault.
  - » When connecting to the EPS terminal, pay attention to the following points:

Medical equipment	Connection prohibited
Precision instrument	Connection prohibited
Appliances susceptible to malfunctions in the event of power outages during use.	Connection prohibited

  - » For inductive loads such as refrigerators, air conditioner, washing machine, etc., ensure that their start power does not exceed the EPS peak power of the inverter.

Table 8-4 EPS load information

Type of load	Equipment	Start power
Resistive load	Lamp	Rated power
	Fan	Rated power
	Hair dryer	Rated power
Inductive load	Refrigerator	3-5 times rated power
	Air conditioner	3-6 times rated power
	Washing machine	3-5 times rated power
	Microwave oven	3-5 times rated power

* Refer to the nominal start power of the equipment for the actual start power.

Wiring procedures

NOTICE!

- Please refer to "5.3 Additionally Required Materials" to view the recommended wire sizes for GRID, EPS, and GEN.

Step 1: Prepare a Grid cable, a GEN cable (Optional) and an EPS cable, strip the protective layer of L1, L2, L3, N and the grounding conductor according to the recommended length in the table.

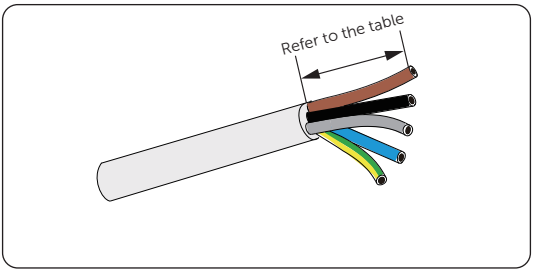


Figure 8-14 Stripping the cable

Table 8-5 Strip length (mm)

Length (mm)	L1	L2	L3	N	PE
Grid	140	140	140	140	55
GEN	120	120	120	120	110
EPS	130	130	135	120	140

Step 2: Strip the insulation layer of L1, L2, L3, N and the grounding conductor to a length of 10±0.5 mm

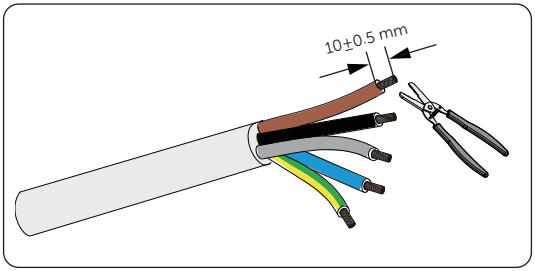


Figure 8-15 Strip the insulation

Step 3: Pull the heat-shrink tubing over the cable and insert the stripped section into the OT terminal (part L).

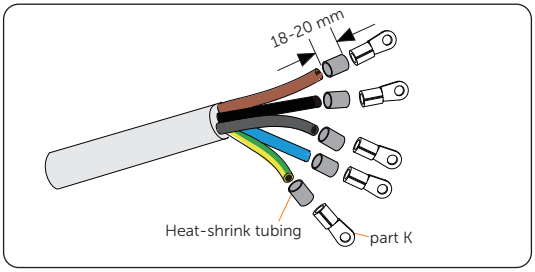


Figure 8-16 Installing the tubing and OT terminal

Step 4: 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.

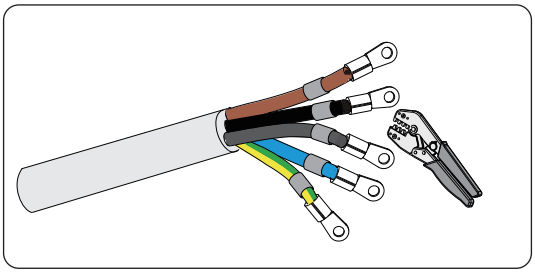


Figure 8-17 Crimping the cable

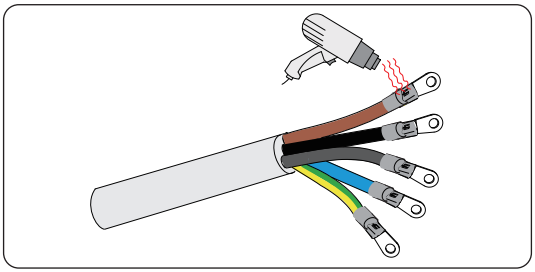


Figure 8-18 Shrinking the tubing

Step 5: Remove the swivel nut of Grid, GEN and EPS terminal. Remove the sealing ring which will be no longer used.

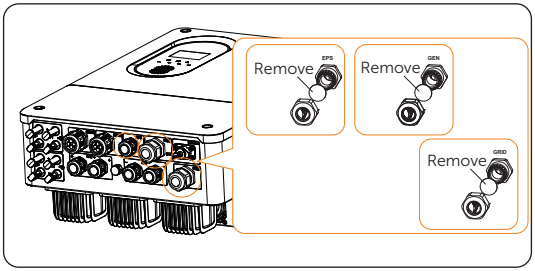


Figure 8-19 Removing the swivel nut

Step 6: Grid terminal connection. Thread the crimped cables through the swivel nut and terminal. Insert the conductors into the terminal block and tighten the terminal block screws (Torque: 0.9 ± 0.1 N·m). Ensure that the conductors are firmly seated in the terminal. After connecting, tighten the swivel nut.

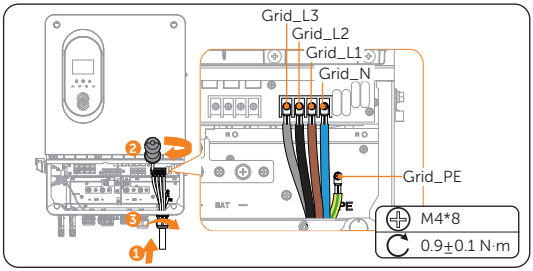


Figure 8-20 Grid terminal connection

Step 7: (Optional) GEN terminal connection. Thread the crimped cables through the swivel nut and terminal. Insert the conductors into the terminal block and tighten the terminal block screws (Torque: 0.9 ± 0.1 N·m). Ensure that the conductors are firmly seated in the terminal. After connecting, tighten the swivel nut.

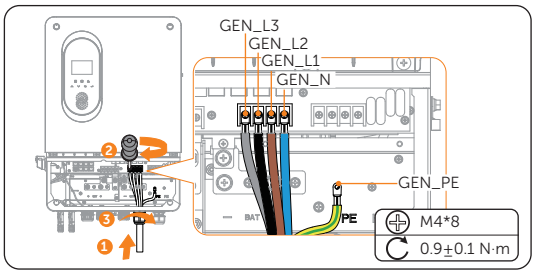


Figure 8-21 GEN terminal connection

Step 8: EPS terminal connection. Thread the crimped cables through the swivel nut and terminal. Insert the conductors into the terminal block and tighten the terminal block screws (Torque: 0.9 ± 0.1 N·m). Ensure that the conductors are firmly seated in the terminal. After connecting, tighten the swivel nut.

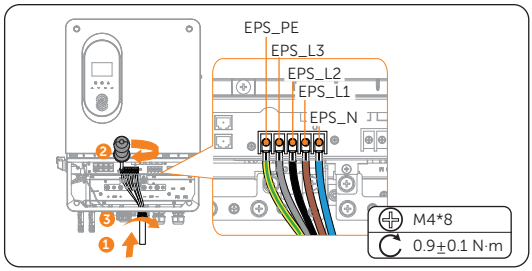


Figure 8-22 EPS terminal connection

DANGER!

- Before powering on the inverter, make sure the AC connector has been installed correctly on the Grid and EPS terminal even if the EPS terminal is not wired. Otherwise, electrical shock may be caused by high voltage, resulting in serious personal injury or death.

WARNING!

- Reinstall AC terminal caps immediately after removing the connectors from the terminals.

8.5 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 PV switch and AC breaker are disconnected, and that the PV module output is securely isolated from the ground.

WARNING!

- To mitigate the risk of fire, it is crucial to utilize a dedicated crimping tool specifically designed for PV installations to ensure secure and reliable connections.

CAUTION!

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

Requirements for PV connection

- Open circuit voltage and operating voltage
  - » The open circuit voltage of each module array cannot exceed the maximum PV input voltage (1000 V) of the inverter. Otherwise, the inverter may be damaged.
  - » The operating voltage of PV modules must be within the MPPT voltage range (160-950 V) of the inverter. Consider the impact of low temperature on the voltage of the photovoltaic panels, as lower temperatures tend to result in higher voltages.
- PV module
  - » The PV modules within the same MPPT channel are of the same brand. Additionally, the strings within the same channel should have identical quantities, and be aligned and tilted identically.
  - » The positive or negative pole of the PV modules should not be grounded.
  - » The positive cables of the PV modules must be connected with positive DC connectors.
  - » The negative cables of the PV modules must be connected with negative DC connectors.

Wiring procedures

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

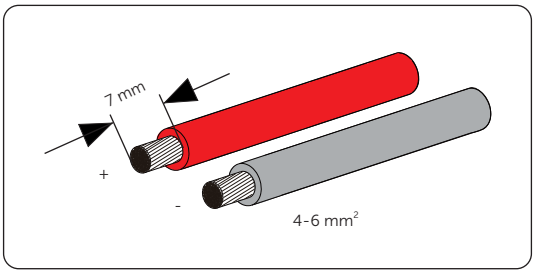


Figure 8-23 Stripping the PV cable

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

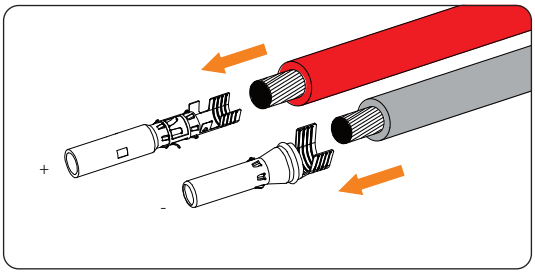


Figure 8-24 Inserting the PV pin contact

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

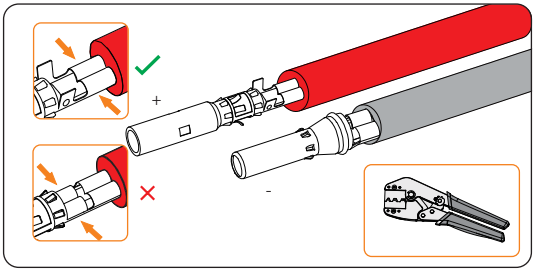


Figure 8-25 Crimping the terminal

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

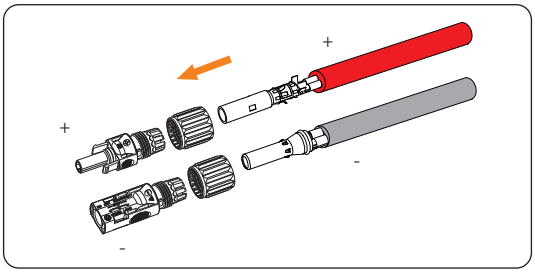


Figure 8-26 Threading the PV cable

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.

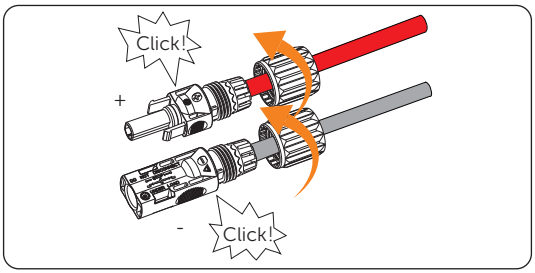


Figure 8-27 Securing the PV cable

Step 6: Use a voltage measuring device 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 1000 V.

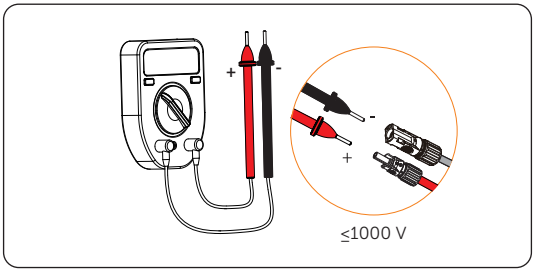


Figure 8-28 Measuring the voltage of PV connectors

NOTICE!

- If the voltage reading is negative, it indicates an incorrect DC input polarity. Please check if the wiring connections on the measuring device are correct or PV connectors are not mistakenly connected.

Step 7: Use the PV removal tool (part G) to 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.

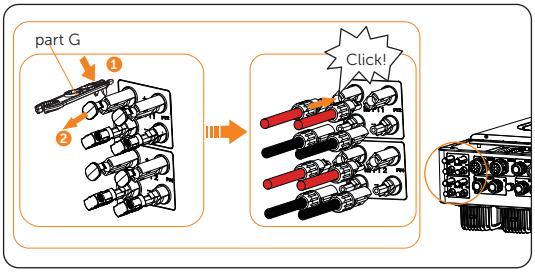


Figure 8-29 Connecting the PV cable

WARNING!

- Seal the unused PV terminals with the original terminal caps. If all PV terminals are connected, keep the waterproof caps in a safe place. Reinstall them immediately after removing the connectors from the terminals.

9 Communication Connection

9.1 Pin Assignment of COM Terminal

The COM terminal is used for DIO function via I/O terminal, battery communication or battery temperature sensor connection via BMS terminal, CT/Meter connection via CT/METER terminal, parallel connection via PAR terminal.

NOTICE!

- When using the Lithium battery, refer to "9.2 Battery Communication Connection" for wiring procedure; when using lead-acid batteries, refer to "9.3 Battery Temperature Sensor Connection".

9.2 Battery Communication Connection

Connection diagram

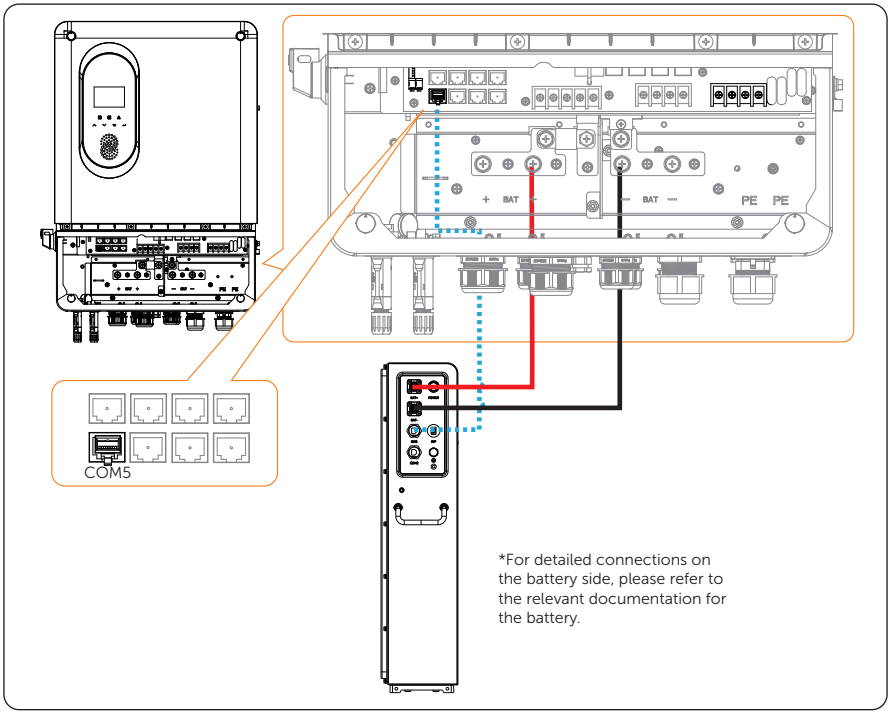


Figure 9-30 BMS connection diagram

Wiring procedure

Step 1: Loosen the COM1 swivel nut on the enclosure, and then remove the sealing plugs from the cable support sleeve as needed. Do not remove the sealing plugs from holes if you choose not to connect the cable.

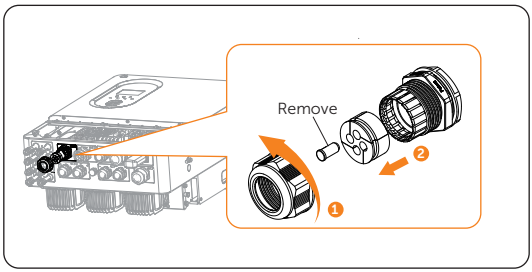


Figure 9-31 Disassembling the connector

Step 2: Find the battery communication cable in the battery accessory package. Directly thread the cable through the swivel nut, cable support sleeve and connector enclosure in sequence.

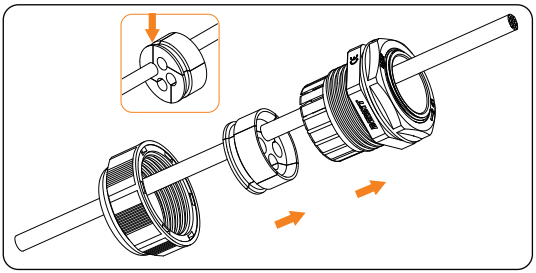


Figure 9-32 Threading the cable

Step 3: Strip the insulation to an appropriate length.

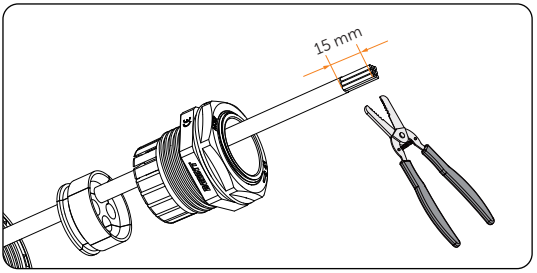


Figure 9-33 Stripping the insulation

Step 4: Insert the stripped section into the RJ45 terminals (part P). Crimp it tightly with a crimping tool for RJ45. Pay attention to the pin order of RJ45 terminals. Use a network cable tester to check if the cable has been correctly and properly crimped before connecting to inverter.

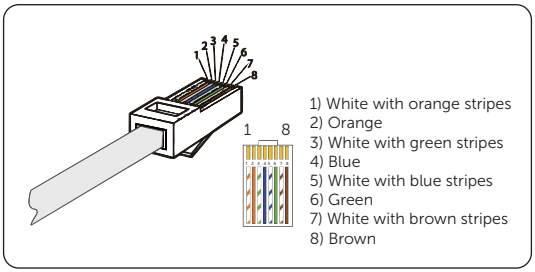


Figure 9-34 Crimping the communication cable

Step 5: Insert the RJ45 connector into the COM 5 located inside the inverter. You will hear an audible "Click". Tighten the swivel nut.

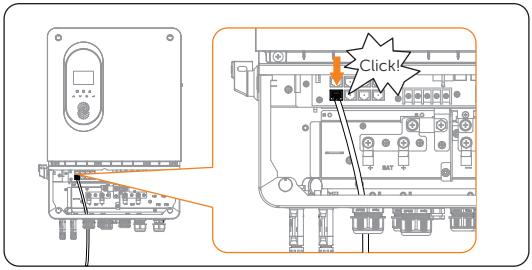


Figure 9-35 Inserting the connector to COM 1

Step 6: Set the dip switch to ON.

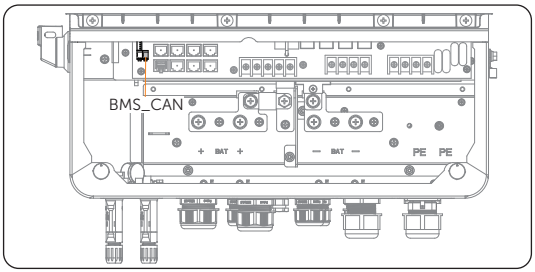


Figure 9-36 Switch on the dip switch

NOTICE!

- The dip switches of the Master and the last unit of the parallel unit should be set to ON.

9.3 (Optional) Battery Temperature Sensor Connection

NOTICE!

- Battery temperature sensor connection is optional, if you connect it, you need to set it in the path: **Setting**>**Advanced**<**Detect Control**>**NTC** to enable it. Default is disabled.

Connection diagram

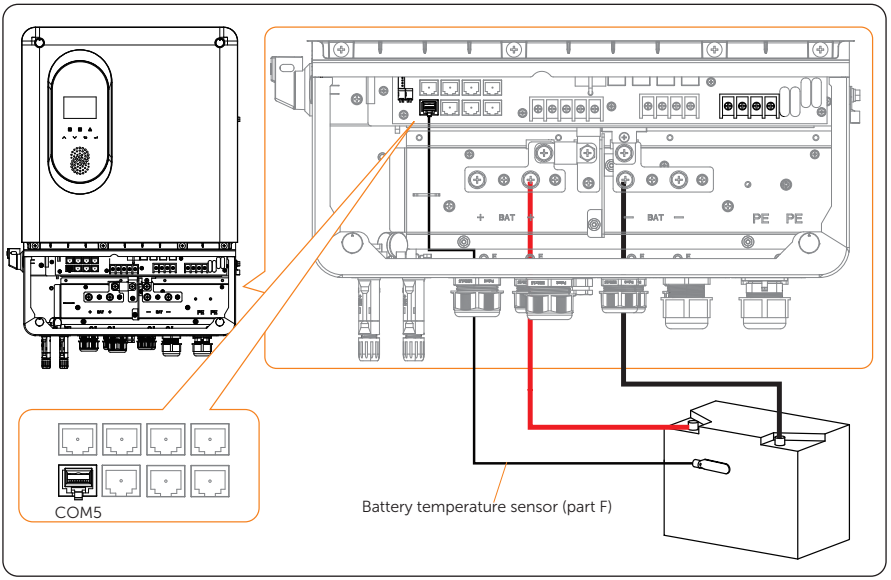


Figure 9-37 Battery temperature sensor connection diagram

Wiring procedure

Step 1: Loosen the COM1 swivel nut, and then remove the sealing plugs from the cable support sleeve as needed. Do not remove the sealing plugs from holes if you choose not to connect the cable.

Step 2: Thread the NTC (part F) through the swivel nut, cable support sleeve and connector enclosure in sequence.

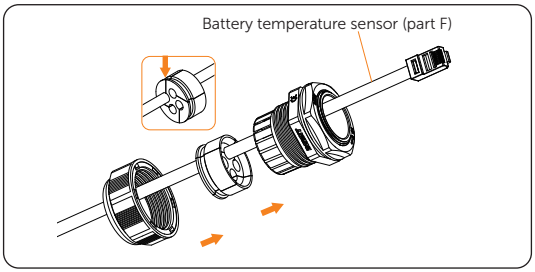


Figure 9-38 Threading the NTC

Step 3: Insert the RJ45 connector into the COM 5 located inside the inverter. You will hear an audible "Click". Tighten the swivel nut.

Step 4: Connect the other end to the lead-acid battery, ensuring that the battery temperature is measured.

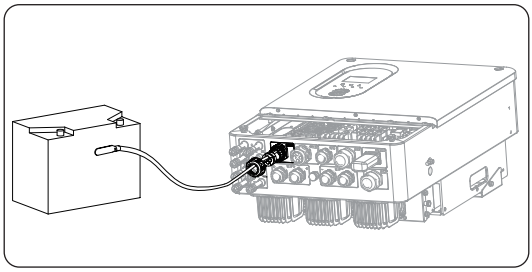


Figure 9-39 Connecting the NTC

Step 5: Set the dip switch to ON.

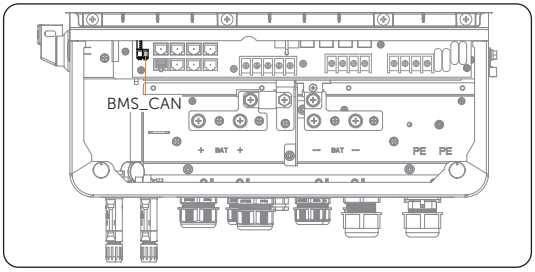


Figure 9-40 Switch on the dip switch

9.4 Meter/CT Connection

The inverter should work with an electric meter or current transformer (CT for short) to monitor household electricity usage. The electricity meter or CT can transmit the relevant electricity data to the inverter or platform.

CAUTION!

- The inverter will prompt a **CT/Meter Check Fault** alarm if a meter or CT is set up in **CT/Meter State** but not connected properly. Smart meters must be authorized by our company. Unauthorized meter may be incompatible with the inverter, thereby resulting in inverter damage and working mode malfunction. SolaX will not be responsible for the impact caused by the use of other appliances.

NOTICE!

- Do not place the CT on the N wire or ground wire.
- Do not put CT on the N wire and L wire at the same time.
- Do not place the CT on the side where the arrow points to the inverter.
- Do not place the CT on non-insulated wires.
- The cable length between CT and inverter should not exceed 100 meters.
- It is recommended to wrap the CT clip around in circles with insulating tape.
- Before proceeding with the CT connection, please evaluate the distance between the inverter and the CT. If the length of the CT cables provided in the accessory package is insufficient, use Case 2 connection method; otherwise, Case 1.

9.4.1 Meter/CT connection diagram

NOTICE!

- Please make PE connection for Meter if the meter has ground terminal.
- CT-R must be connected to L1, CT-S connected to L2, and CT-T connected to L3 in accordance with the L1, L2 and L3 of the inverter's Grid port.

CT connection diagram

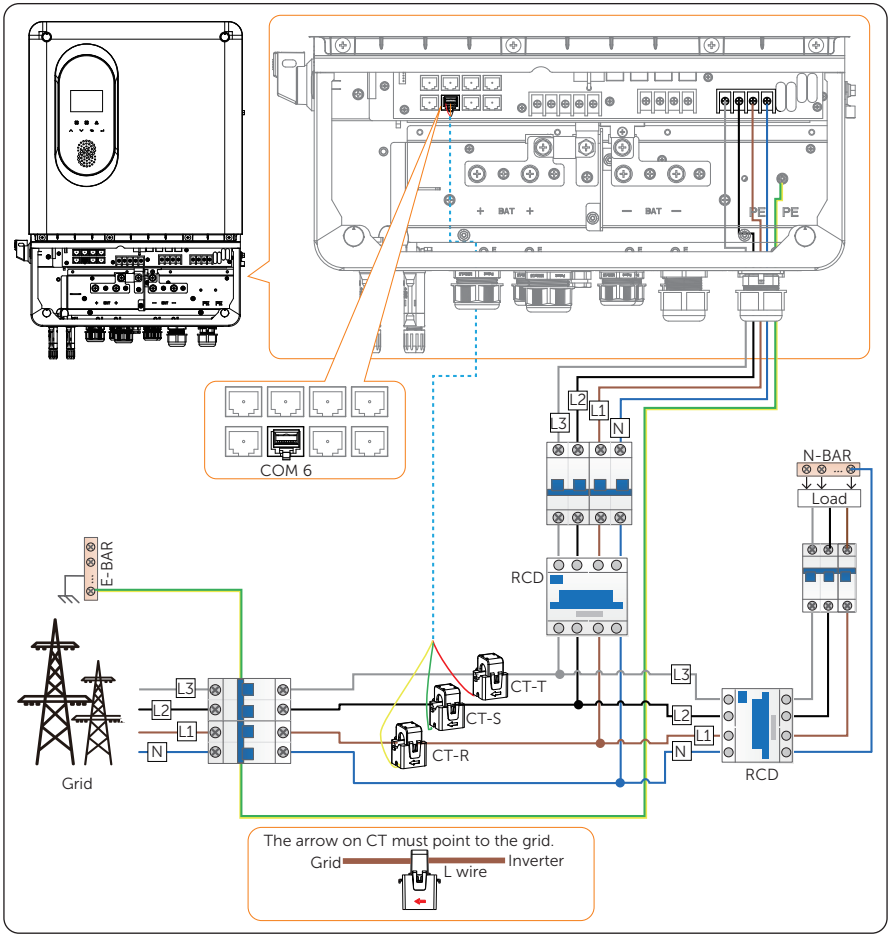


Figure 9-41 CT connection diagram

Meter connection diagram

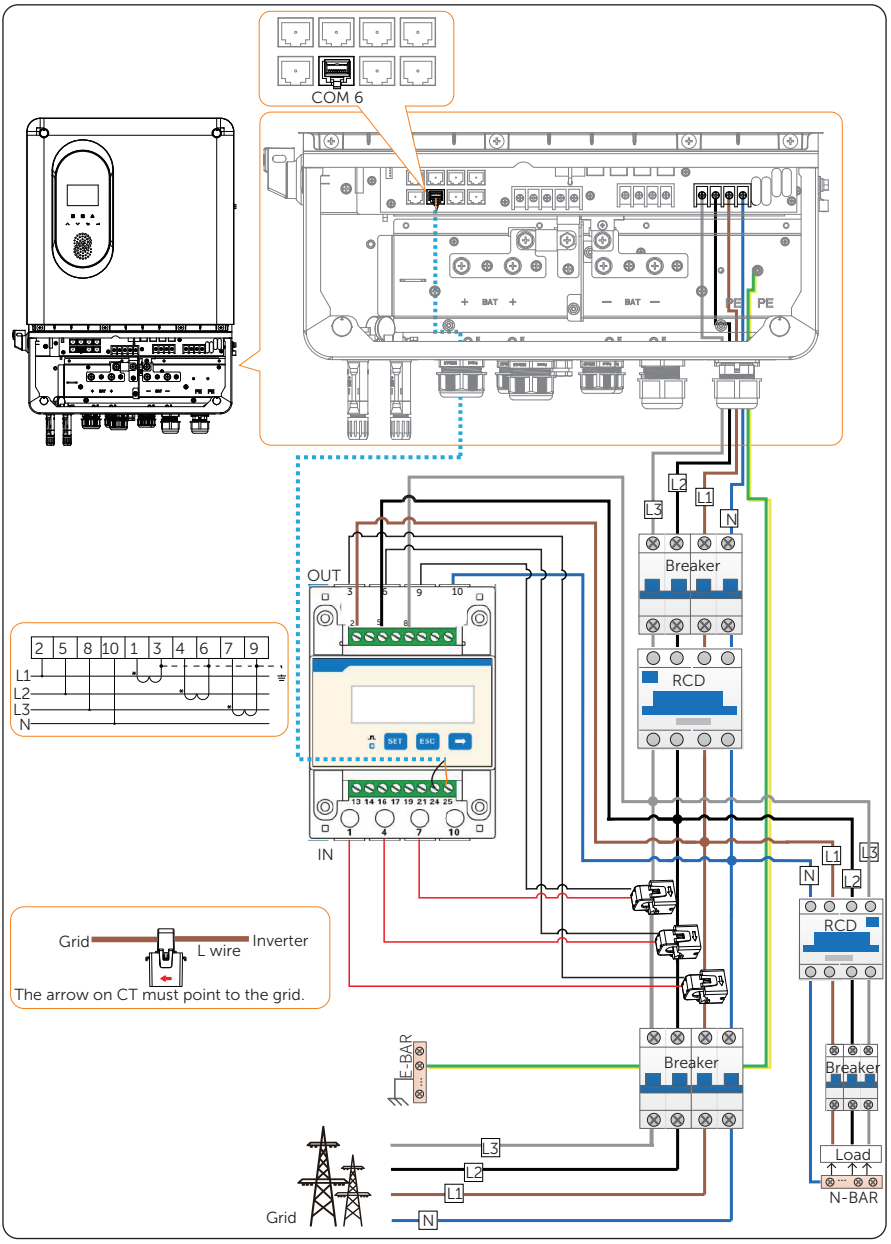


Figure 9-42 Meter connection diagram

9.4.2 CT connection (Case 1)

Step 1: Insert the RJ45 terminal of the CT (part E) into the COM6 located inside the inverter, make sure that the connection is tight until you hear "Click", the CT side towards the grid is clamped on the L3, L2 and L1 cables of the Grid terminal.

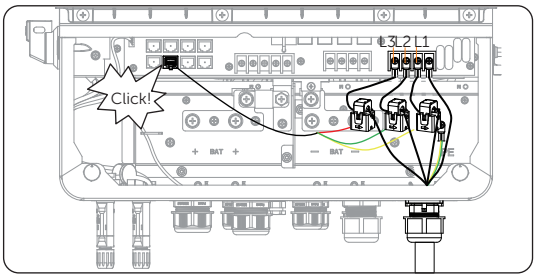


Figure 9-43 Connecting the CT

9.4.3 CT connection (Case 2)

Step 1: Loosen the COM1 terminal swivel nut, and then remove the sealing plugs from the cable support sleeve as needed. Do not remove the sealing plugs from holes if you choose not to connect the cable.

Step 2: Crimp the RJ45 terminal (part O) onto both ends of the prepared Network cable. Thread the cable through the swivel nut, cable support sleeve and connector enclosure in sequence.

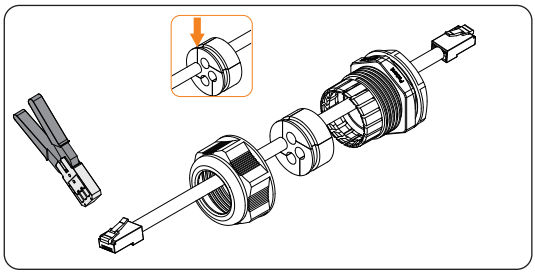


Figure 9-44 Crimping the RJ45

Step 3: Insert the cable into the COM6 located inside the inverter, ensuring a secure connection until you hear a 'Click'. Tighten the swivel nut.

Step 4: Insert the RJ45 terminal on the other end of the Network cable and the RJ45 terminal on the CT (part E) into the RJ45 connector (part N).

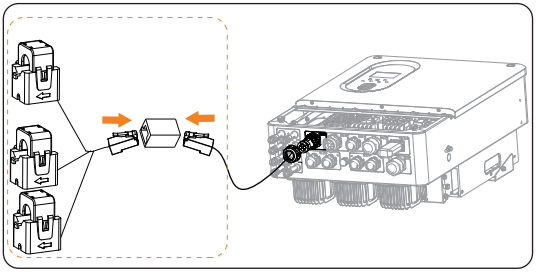


Figure 9-45 CT connection diagram

9.4.4 (Optional) Meter connection

Step 1: Loosen the COM1 terminal swivel nut, and then remove the sealing plugs from the cable support sleeve as needed. Do not remove the sealing plugs from holes if you choose not to connect the cable.

Step 2: Crimp the RJ45 terminal (part O) onto one end of the prepared Ethernet cable. Thread the cable through the swivel nut, cable support sleeve and connector enclosure in sequence.

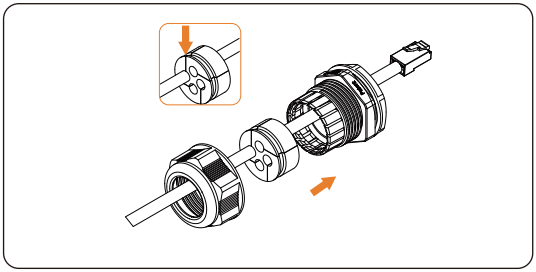


Figure 9-46 Threading the cable

Step 3: Insert the cable into the COM6 terminal located inside the inverter, ensuring a secure connection until you hear a 'Click'. Tighten the swivel nut

Step 4: Connect the stripped end of the Network cable to the meter.

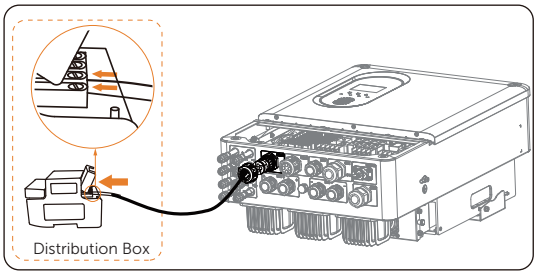


Figure 9-47 Meter connection diagram

9.5 I/O Communication Connection

The I/O terminal can be used to connect a generator.

For generator, please refer to "16.1 Application of Parallel Function" for specific application.

I/O pin assignment

Table 9-6 I/O pin assignment

Pin	Pin assignment	Description
1	1DI-1	Reserved
2	1DI-2	
3	2DI-1	Reserved
4	2DI-2	
5	DO-1	For generator dry contact output
6	DO-2	
7	GND-COM	
8	GND-COM	

Wiring procedure

Step 1: Loosen the COM2 terminal swivel nut, and then remove the sealing plugs from the cable support sleeve as needed. Do not remove the sealing plugs from holes if you choose not to connect the cable.

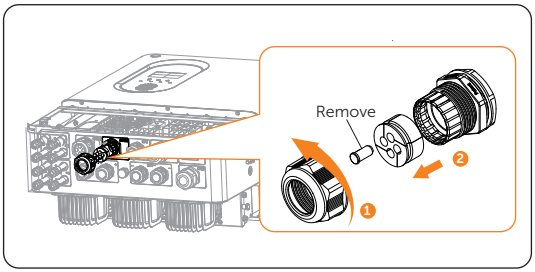


Figure 9-48 Removing the swivel nut

Step 2: Thread the network cable through the swivel nut, cable support sleeve and connector enclosure in sequence. Strip off the 15 mm insulation of the cable.

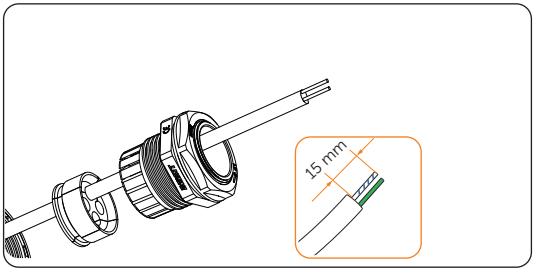


Figure 9-49 Threading the cable

Step 3: Insert the stripped section into the RJ45 terminal (part P). Crimp it tightly with a crimping tool for RJ45. Pay attention to the pin order of RJ45 terminal. Use a network cable tester to check if the cable has been correctly and properly crimped before connecting to inverter.

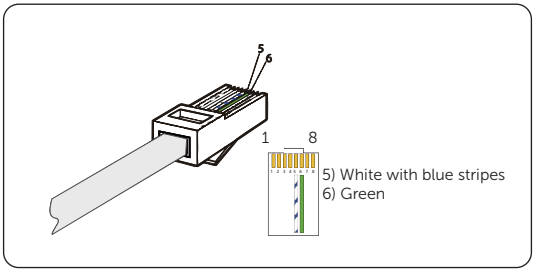


Figure 9-50 Crimping the communication cable

Step 4: Insert the RJ45 connector into the COM 4 located inside the inverter. You will hear an audible "Click". Tighten the swivel nut

9.6 Parallel Connection

The inverter provides the parallel connection function. One inverter will be set as the master inverter to control the other slave inverters in the system. For details, please refer to "16.2 Application of Parallel Function".

Parallel connection wiring procedure

Step 1: Loosen the COM2 terminal swivel nut, and then remove the sealing plugs from the cable support sleeve as needed. Do not remove the sealing plugs from holes if you choose not to connect the cable.

Step 2: Thread the Parallel network cable (part R) through the swivel nut, cable support sleeve and connector enclosure in sequence.

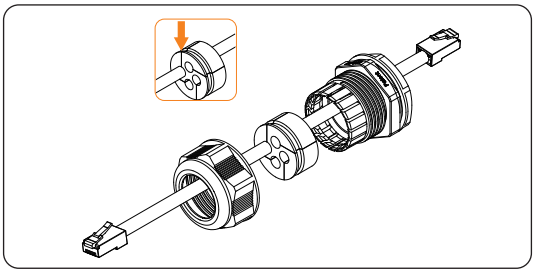


Figure 9-51 Threading the parallel network cable

Step 3: Insert the cable into the COM7/COM8 located inside the inverter. You will hear an audible "Click". Tighten the swivel nut

Step 4: Set the dip switch to ON.

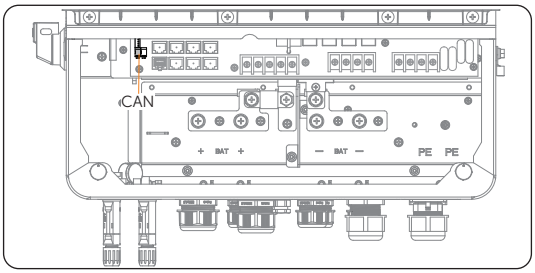


Figure 9-52 Switch on the dip switch

9.7 Upper Cover Installation

Step 1: After the connection is completed, replace the upper cover as follows (Torque: 2.8±0.1 N·m).

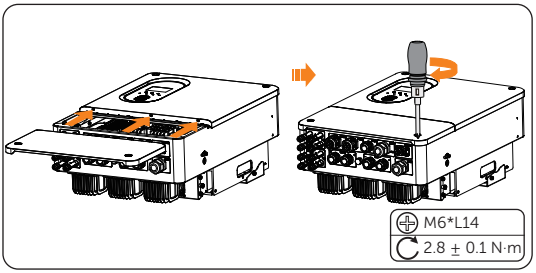


Figure 9-53 Install the upper cover

Step 2: Install the screw cover (part Q) into the hole position on the upper cover.

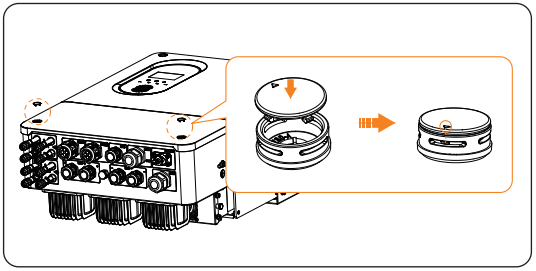


Figure 9-54 Install the upper cover

9.8 Monitoring Connection

The inverter provides a **DONGLE** terminal, which can transmit data of the inverter to the monitoring website via WiFi+LAN dongle (Optional). The WiFi+LAN dongle is equipped with two kinds of communication modes (Wi-Fi mode or LAN mode). Users can choose based on actual needs. (If needed, purchase products from us.)

Monitoring connection diagram

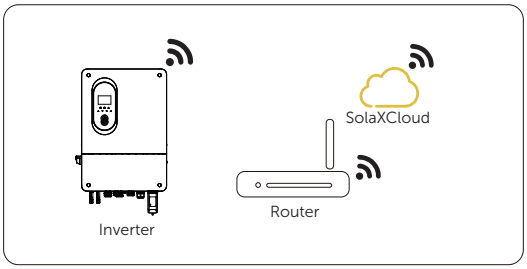


Figure 9-55 Wi-Fi mode connection diagram

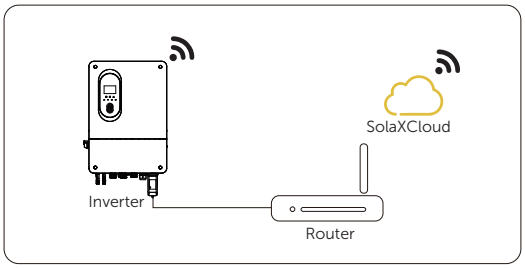


Figure 9-56 LAN mode connection diagram

Monitoring wiring procedure

Wi-Fi mode:

a. Assemble the dongle.

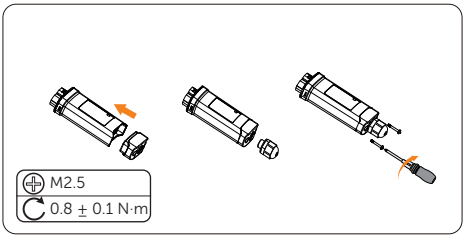


Figure 9-57 Assembling the dongle

b. Plug the dongle to the inverter.

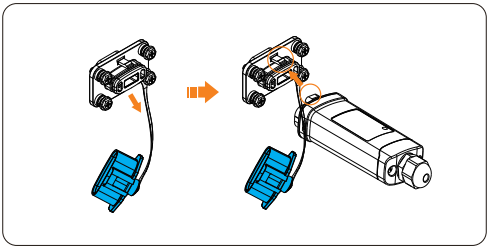


Figure 9-58 Dongle connection procedure

CAUTION!

- The buckles on the inverter and dongle must be on the same side. Otherwise, the dongle may be damaged.

NOTICE!

- The distance between the router and the inverter must be no more than 100 meters. If there are walls in between, the distance must be no more than 20 meters.
- For locations where Wi-Fi signals are weak, install a Wi-Fi signal booster.

NOTICE!

- For details on Wi-Fi configuration, see *Pocket WiFi + LAN Installation Manual*. You can configure Wi-Fi only after the inverter is powered on.

LAN mode:

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

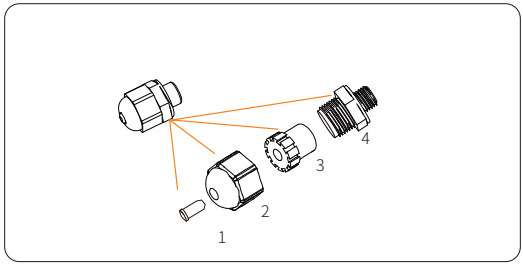


Figure 9-59 Disassembling the waterproof connector

b. Assemble the dongle.

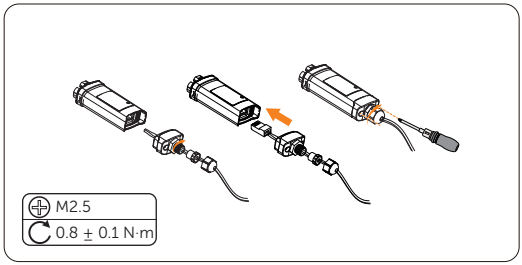
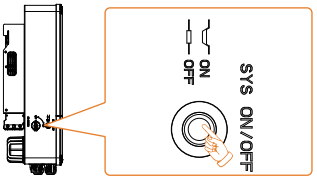


Figure 9-60 Assembling the dongle

c. Plug the dongle to the inverter.

10 System Commissioning

10.1 Checking before Power-on

No.	Item	Checking details
1	Installation	The inverter is installed correctly and securely. The battery is installed correctly and securely. Other device (if any) is installed correctly and securely.
2	Wiring	All DC, AC cables and communication cables are connected correctly and securely; The meter/CT is connected correctly and securely. The ground cable is connected correctly and securely;
3	Breaker	All the DC breakers and AC breakers are OFF;
4	Connector	The external AC and DC connectors are connected; The connectors on the **Grid** and **EPS** terminal are connected correctly and securely.
5	Unused terminal	Unused terminals and ports are locked by waterproof caps.
6	Screw	All the screws are tightened.
7	System switch	The system switch on the left side of the inverter is in the OFF (pop-up) state. 

10.2 Powering on the System

Step 1: Turn on the PV switch and check the LCD screen.

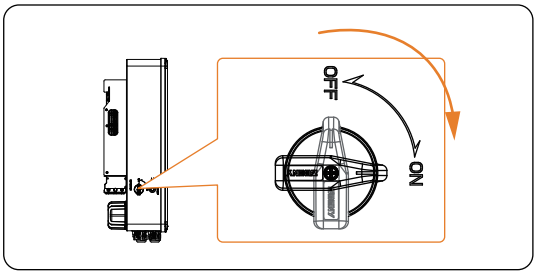
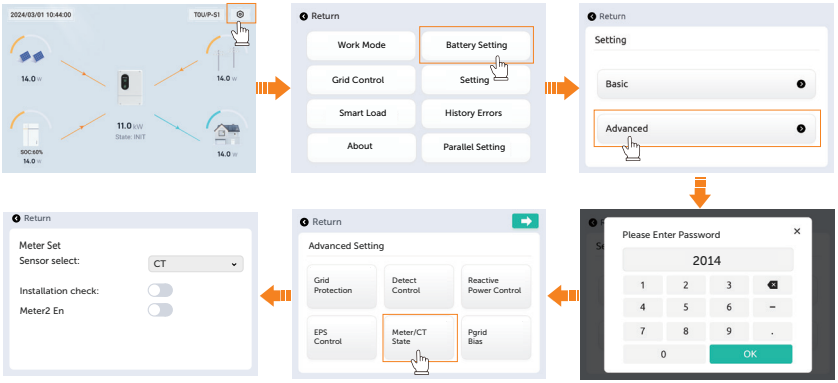


Figure 10-61 Turn on the PV switch

» If the LCD screen is not on, turn off the PV switch and check whether the PV polarity is connected correctly.

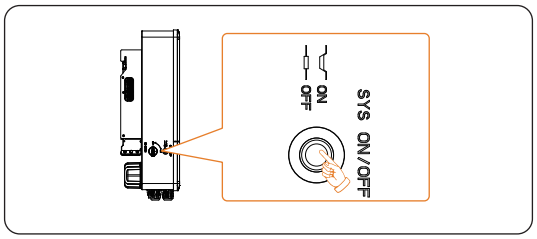
» If the error of any channel of PV is displayed on LCD, turn off the PV switch and check the corresponding channel of PV connection.

Step 2: Select **Meter/CT/None** based on actual usage, with CT as the default.

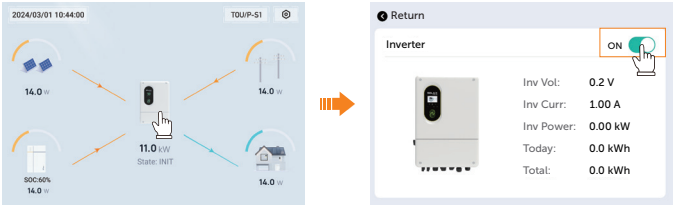


Step 3: Switch on the battery or the battery (see documentation of the battery).

Step 4: Press the system switch down to the ON.

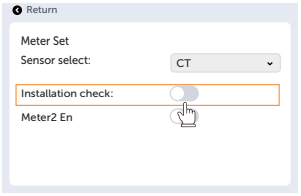


Step 5: Switch on the system switch on the LCD.



Step 6: Wait for the inverter to start up.

Step 7: Upon the initial power up, it is required to initiate the Installation check to perform a CT check. The setup path matches **Step 2**.



11 Operation on LCD

11.1 Introduction of Control Panel

The default menu is shown as below. In this interface, you can tap on the four icons of PV, battery, grid and load to check the basic information of each part. .

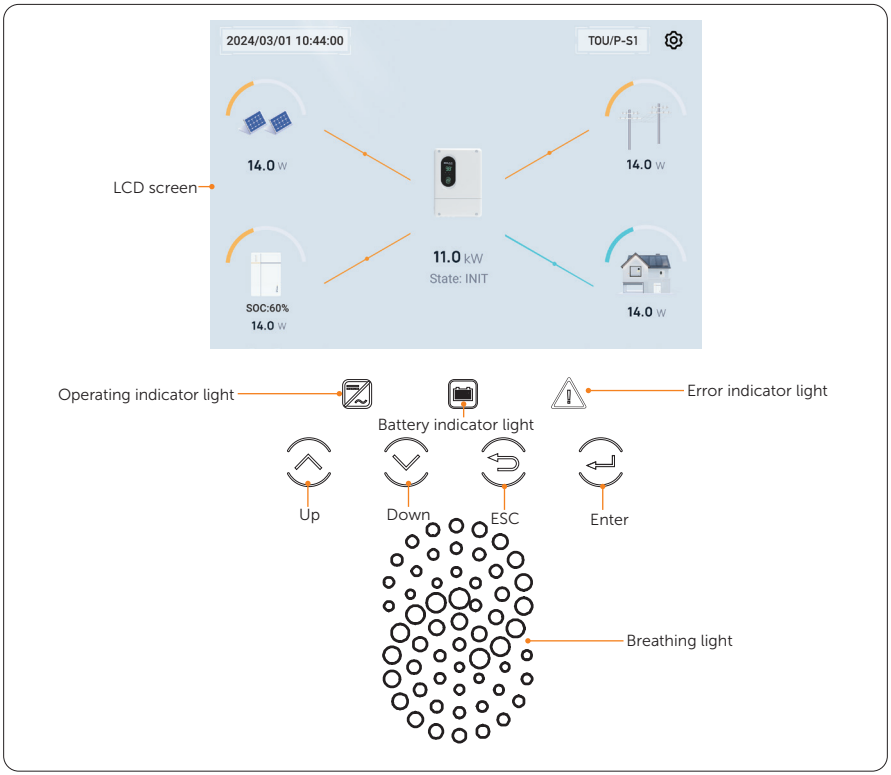


Figure 11-1 Control Panel

- The semi-circular arcs on each icon represent the ratio of current power to the full-load power.
- The position of the dots on the connecting lines between the inverter icon and the other icons indicates the current status of inputs or outputs.

Table 11-1 Definition of indicators

LED indicator	Status		Definition
Operating		Light on	The inverter is in a normal state.
		Blinking	The inverter is in the process of connecting to Grid or EPS.
	/	OFF	The inverter is in fault or manual shutdown state.
Battery		Light on	The battery is online and the voltage is normal.
	/	OFF	Low battery voltage or no battery.
Error		Light on	The inverter is in a fault state, stop running.
		Blinking	The inverter has an alarm message.
	/	OFF	The inverter has no faults or alarms.

Table 11-2 Definition of keys

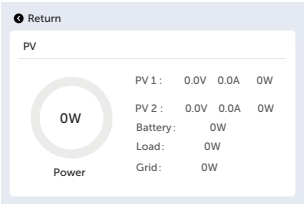
Key		Definition
	ESC key	Exit from the current interface or function.
	Up key	Move the cursor to the upper part or increase the value.
	Down key	Move the cursor to the lower part or decrease the value.
	Enter key	Confirm the selection.

Table 11-3 Definition of breathing light

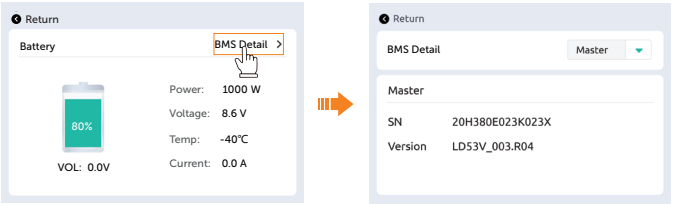
Key	Status		Definition
Breathing light		Green blinking	Both inverter and battery are in normal status.
		Red blinking	The inverter has alarm information.
		Blue blinking	The battery is in normal status, but the battery SOC is lower than the set min SOC.
		Green, blue and red lights flash in turns	The upgrade is in progress. After successfully upgraded, the light turns green and the buzzer sounds for one second.

11.2 Introduction of Menu Interface

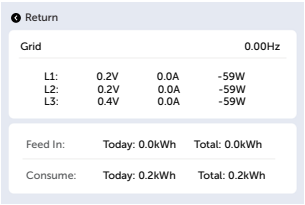
- **PV**: Display the information about **PV1**, **PV2**. Information contains input voltage, current and power of each PV.



- **Battery**: Display the information about **Battery**. Information contains the power voltage, current, temperature and SOC/Voltage status. Positive value means charging; Negative value means discharging. Select the **BMS detail**, you can see the battery's SN number and Version.



- **Grid:** Information contains the voltage, current, frequency, and output power of Grid terminal. And a record of the output and input electric energy of the inverter today and the total (through Grid terminal). Positive value with power means power output; Negative value means power input.

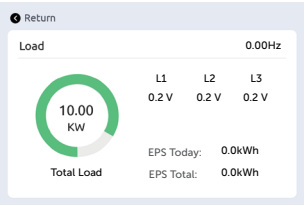


  - » **Feed In Today**: The electric energy fed into the grid by the inverter today.
  - » **Feed In Total**: The electric energy fed into the grid by the inverter since the inverter activated for the first time.
  - » **Consume Today**: The electric energy consumed by the inverter today.
  - » **Consume Total**: The electric energy consumed by the inverter since the inverter activated for the first time.

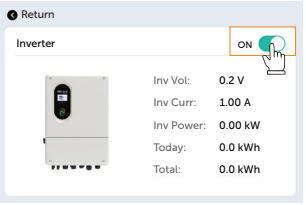
- **Load:** Information contains the total load, Load three-phase voltage, current, power

» **EPS Today**: A record of the output electric energy of the inverter today when it is disconnected from grid. (Through EPS terminal)

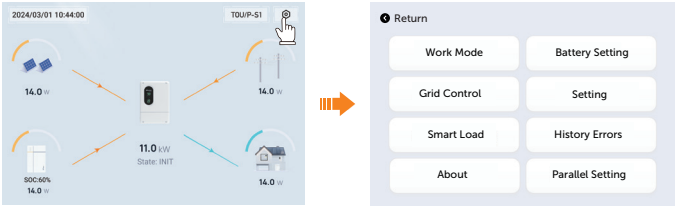
» **EPS Total**: A record of the output electric energy of the inverter total when it is disconnected from grid. (Through EPS terminal)



- **Inverter:** You can **Power ON/OFF** the inverter after tapping the icon of the inverter. Information contains the inverter voltage, inverter current, inverter power, Input/export electric energy of the inverter today and Total input/export electric energy since the inverter activated for the first time. Positive value with power means power output; Negative value means power input.



- **Setting:** Here you can set or choose the **Work Mode**, **Grid Control**, **About, Setting**, **Battery Setting**, **History Errors**.



11.3 Work Mode Setting

Selecting path: >**Work Mode**

The working mode is related to your setting in the setting country, when you select Pakistan, the working mode can be selected: SUB / SBU / MKS / Force Time Use.

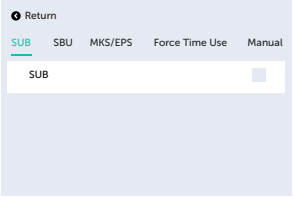
The working mode in other countries can be selected: Back Up / Self Use / Manual.

Please refer to "2.7 Working mode" for introduction of the modes.

11.3.1 Work mode for Pakistan

SUB

Please refer to "2.7.1 SUB Mode" for working logic of this mode.



SBU

Please refer to "2.7.2 SBU Mode" for working logic of this mode.

There are two types of Battery: Lead-acid (Voltage type) and Lithium-ion (SOC type).

- For lead-acid battery:
  - » **Return To Utility Voltage:** When the voltage is lower than the setted value, the battery stars to charge.

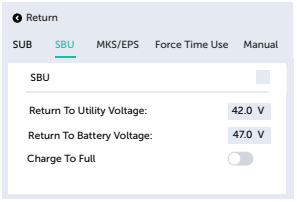
    Default: 42 V, range:40-60 V;
  - » **Return To Battery Voltage:** When the voltag is higher than the setted value, the battery stars to discharge.

    Default: 47 V, range:40-60 V;
  - » **Charge To Full:** Default: OFF.

    If set OFF: when the battery voltage reaches Return To Battery Voltage, the grid terminal relay disconnects, LCD screen displays normal, and the grid side flow line becomes a dotted line;

    If set ON: through the charging source, continue to charge the battery, charging to the float voltage, wait for 2 min after grid terminal relay disconnect, LCD screen display is normal, grid side flow line becomes a

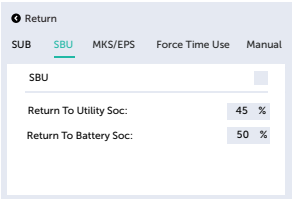
dotted line.



- For Lithium-ion battery:
  - » **Return To Utility Soc:** When the voltage is lower than the setted value, the battery stars to charge.

    Default: 20%, range:10~40%.
  - » **Return To Battery Soc:** When the voltage/SOC is higher than the setted value, the battery stars to discharge.

    Default: 80%, range: 50-90%

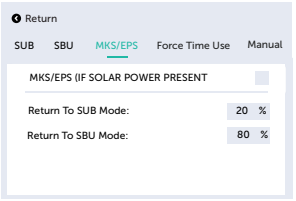


NOTICE!

- The priority of **Alarm Voltage/Soc** is higher than **Return To Utility Voltage/Soc**.

MKS/EPS

The operating mode depends on the setting value of **Return to SUB Mode** and **Return to SBU Mode**, please refer to "2.7.3 MKS/EPS Mode" for details.



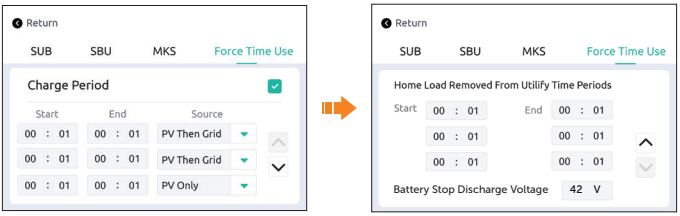
Force Time Use

Please refer to "2.7.4 Force Time Use Mode" for working logic of this mode.

- **Charge Period**: You can set the charge time according to your own needs.
  - » **Start Time**: Time to start charging. Default: 00:00, range: 00:00~23:59
  - » **End Time**: Time to end charging. Default: 00:00, range: 00:00~23:59
  - » **Charge Period Source**: The three options to choose from are PV Only, PV Then Grid and PV + Grid.
- **Home Load Removed From Utility Time Periods**: You can set the discharge time according to your own needs.
  - » **Start Time**: Time to start discharging. Default: 00:00, range: 00:00~23:59
  - » **End Time**: Time to end discharging. Default: 00:00, range: 00:00~23:59
  - » **Battery Stop Discharge Voltage**: When the voltage/SOC is lower than the setted value, the battery stops to discharge.

    (For lead-acid battery) Default: 42 V, range: 40-60 V;

    (For Lithium-ion battery) Default: 20%, range: 5-100%.



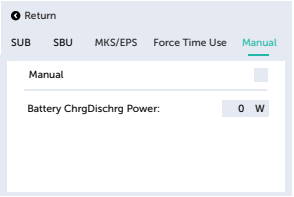
NOTICE!

- The priority of **Alarm Voltage/Soc** is higher than **Battery Stop Discharge Voltage**.

Manual

Please refer to "2.7.5 Manual Mode" for working logic of this mode.

- **Battery ChrgDischrg power**: Set the battery charge/discharge power, negative value for discharge.

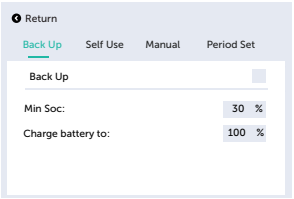


11.3.2 Work mode for other countries

Setting backup mode

Please refer to "2.8.2 Backup Mode" for working logic of this mode.

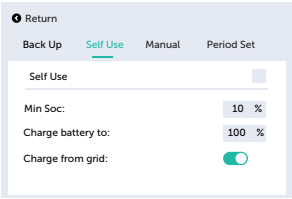
- **Min Soc/Voltage**: Default: 30% / 42V; range: 30%~100% / 40V~47V
  - » The minimum SOC/Voltage of the battery. The battery will not discharge power when the SOC/Voltage of the battery reaches this value.
- **Charge battery to**: Default: 50% / 47V; range: 30%~100% / 42V~60V
  - » In this mode, charging from grid function is turned on by default, and you can set the target value by yourselves, that is, during the forced charging period, the inverter will use both PV & grid power to charge the battery to the target value. If the PV power is still sufficient (enough for load and there is excess power), the inverter will continue to charge the battery.



Setting self use mode

Please refer to "2.7.6 Self Use Mode" for working logic of this mode.

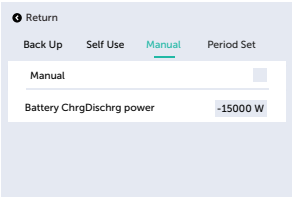
- **Min Soc**: Default: 30% / 42V; range: 30%~100% / 40V~47V
  - » The minimum SOC / Voltage of the battery. The battery will not discharge power when the SOC / Voltage of the battery reaches this value.
- **Charge battery to**: Default: 50% / 47V; range: 30%~100% / 42V~60V
  - » Set the target SOC / Voltage to charge the battery from power grid in the forced charging period (applicable only when the **Charge from grid** is enabled).
  - » You can set your own target value, i.e. during the forced charging period, the inverter will use both PV & grid power to charge the battery to the target value. If the PV power is still sufficient (enough for load and there is excess power), the inverter will continue to charge the battery.
- **Charge from grid**:
  - » You can set whether the power can be taken from the power grid to charge the battery in the forced charging period. When **Charge from grid** is set to **Enable**, the grid power is allowed to charge the battery; when it is set to **Disable**, the grid power is not allowed to charge the battery.



Setting Manual mode

Please refer to "2.7.5 Manual Mode" for working logic of this mode.

- **Battery ChrgDischrg power**: Set the battery charge/discharge power, negative value for discharge.

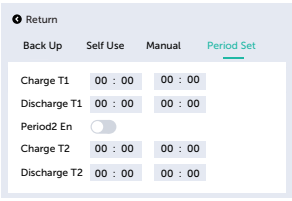


Period Set

Here you can set the Charge and Discharge period.

If two charging and discharging periods are needed, enable the **Period2 En** to activate the **Charge T2 & Discharge T2**.

- **Charge T1**: Time to charging. Default: 00:00; range: 00:00~23:59
- **Discharge T1**: Time to discharging. Default: 00:00; range: 00:00~23:59
- **Charge T2**: The second time axis is closed by default. If two charging and discharging periods are needed, turn on the **Period2 En**. This period will hold the same working logic as **Charge T1 & Discharge T1**.



NOTICE!

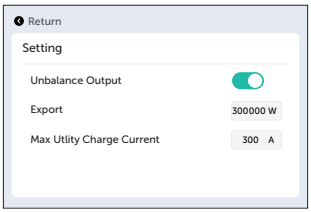
- The charging and discharging period is only applicable for self use mode and backup mode.
- In the period not set as forced charging period and allowed discharging period, the battery can charge but not discharge power.
- In the period simultaneously set as forced charging period and allowed discharging period, the battery will be charged.

11.4 Grid Control

Displaying path: ⚙ >**Grid Control**

This function allows the inverter to control the output power to the grid. If the user does not want to feed power to the grid, set the **Export** to "0".

- **Unbalance Output**: Enable Unbalanced Three-Phase Output. How to achieve unbalanced output, refer to "2.9 Grid Control Function".
- **Export**: Default: 300000 W, range: 0-300000 W
- **Max Utility Charge Current:** Setting the current that can be taken from the power grid when the battery is charged. Default: 0 A, range: 0-300 A



11.5 Battery Setting

Displaying path: ⚙ >**Battery Setting**

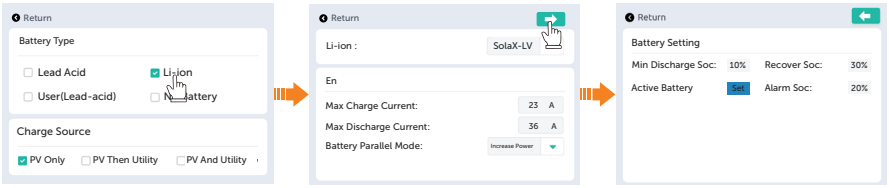
- **Battery type**: Select the battery type according to the actual battery used.
- **Charge Source**: Select the source to charge the battery.

NOTICE!

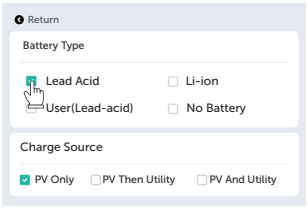
- The settings must be: **Min Discharge Voltage/Soc** < **Alarm Voltage/Soc**, otherwise, the settings will not be successful.
- The priority of **Alarm Voltage/Soc** is higher than all working modes.

11.5.1 Li-ion battery setting

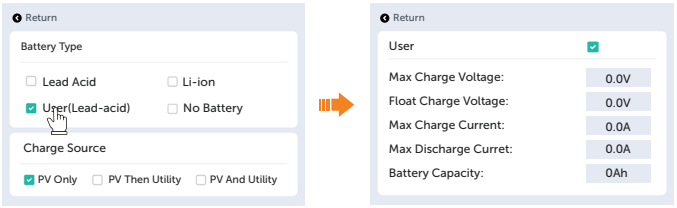
- **Max Charge Current**: Default: 160 A, range: 0-300 A
- **Max DisCharge Current**: Default: 160 A, range: 0-300A
- **Battery Parallel Mode**: Set up the battery parallel mode
- **Min Discharge Soc**: If the battery SOC falls below this value, the inverter will disconnect from the grid and shutdown. Default: 10%, range: 5-100%
- **Recover Soc**: When the battery SOC drops below the **Min Discharge Soc**, the battery must recover to above the **recovery Soc** before it can resume discharging and supply power. Default: 30%, range: 5-100%
- **Alarm Soc**: If the battery SOC falls below this value, it will no longer supply power to the grid or the load. Default: 20%, range: 10-100%



11.5.2 Lead battery setting



11.5.3 User

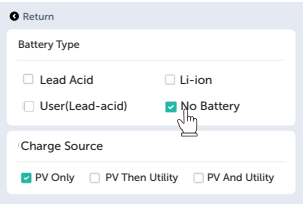


NOTICE!

- If the type of lead-acid battery connected is not available in the **Lead Acid** option, set it to **User(Lead-acid)**.

11.5.4 No Battery

No battery is connected.

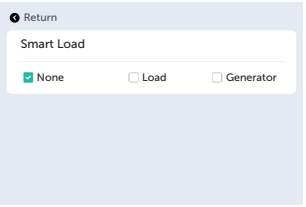


11.6 Smart Load

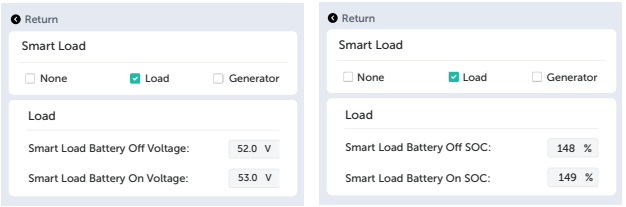
Displaying path: >**Smart Load**

The generator port has three options:

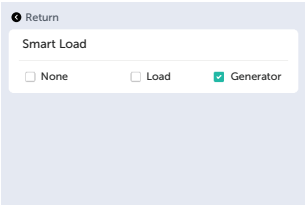
- **None:** No device is connected to the generator port.



- **Load:** The generator port is connected to a load
  - » **Smart Load Battery On/Off Voltage**: when the voltage is below the **Smart Load Battery Off Voltage**, the lead battery will no longer supply power to the load, until the voltage returns to the **Smart Load Battery On Voltage**.
  - » **Smart Load Battery On/Off SOC**: when the voltage is below the **Smart Load Battery Off SOC**, the Li-ion battery will no longer supply power to the load, until the voltage returns to the **Smart Load Battery On SOC**.



- **Generator:** When the generator port is connected to the generator.



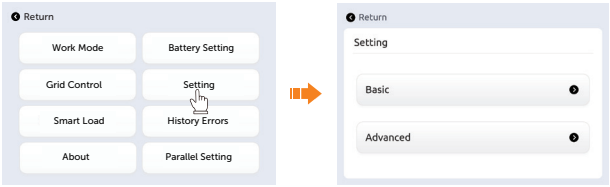
11.7 Parallel Setting

Displaying path: >**Parallel Setting**

The inverter provides the parallel connection function. One inverter will be set as the master inverter to control the other slave inverters in the system. For details, please refer to "16.2 Application of Parallel Function".

11.8 Setting

Settings includes Basic Settings and Advanced Settings.

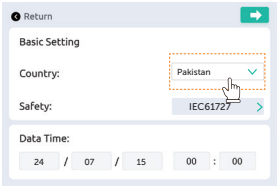


11.8.1 Basic Setting

Setting path: >**Setting**>**Basic Setting**

You can set the **Country**, **Safety**, **Data&Time**, **Phase Self Adaption** and **Unbalance Output** in Basic setting.

Setting Country

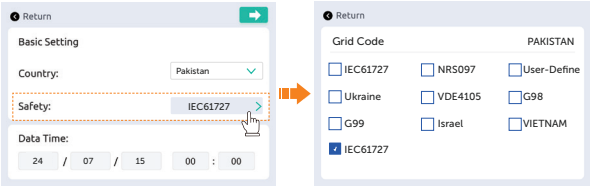


Setting Safety Code

NOTICE!

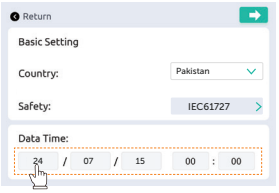
- The inverter cannot be connected to the grid before the safety code is correctly set. If there is any doubt about your safety code where the inverter installed, please consult your dealer or SolaX service for details.
- The setup will vary from different safety codes.

Here you can set safety code according to different countries and grid-tied standards. In addition, the inverter has an **User Defined** option which allows you to customize relevant parameters with a wider range.



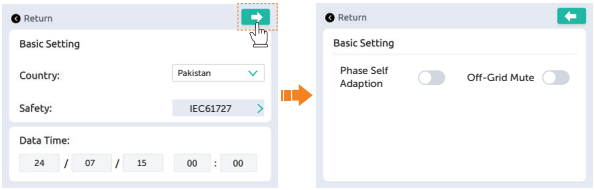
Setting Data Time

The display format is "24-07-15 00:00", in which the first two numbers represent the year (e.g. 2000~2099); the third and fourth numbers represent the month (e.g. 01~12); the fifth and sixth numbers represent the date (e.g. 01~31). The remaining numbers represent the time.



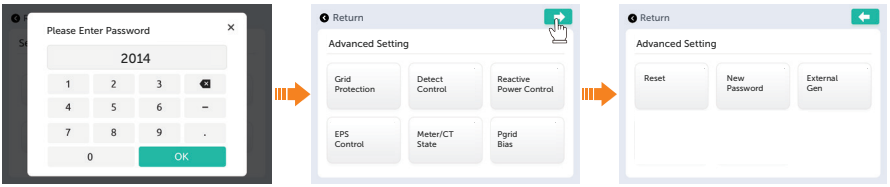
Setting Phase Self Adaption and Unbalance Output

- **Phase Self Adaption:** When the phase sequence of the three-phase power at the Grid terminal is different from the default, enabling the **Phase Self Adaption** allows the inverter to continue operating; otherwise, it will report a **Reversed Grid Phase** error.
- **Off-Grid Mute:** Default ON, the inverter is muted when off the grid. If you want to hear a sound when the inverter is off the grid, you can turn off this setting.



11.8.2 Advanced Setting

Setting path: ⚙>**Setting**>**Advance Setting.** The default password is **"2 0 1 4".**



NOTICE!

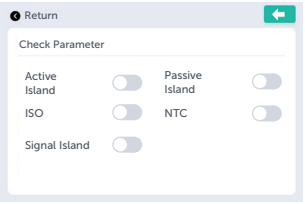
- Unauthorized use of the installer password by unauthorized persons can lead to incorrect parameters being input, resulting in power generation loss or violation of local regulation. Get the installer password from the dealer and never open the password to unauthorized person.

Grid Protection

When the Safety is selected, the parameters of Grid Protection corresponding to the selected safety code will be automatically matched. The default value is the specified value under the current safety regulations. The contents will be displayed according to the requirements of local laws and regulations. Please refer to the actual contents displayed on the LCD screen on the inverter.

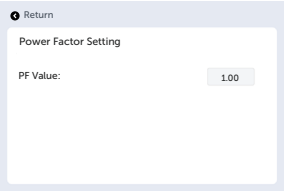
Detect Control

- **Active Island**: You can set whether the active island is turned on or not.
- **ISO**: Default ON, Detect the inverter insulation impedance is normal.
- **Signal Island**: If signal island is enabled and the inverter is in EPS mode of operation, the relay between PE and N lines of the EPS load port will be closed.
- **Passive Island**: You can set whether the passive island is turned on or not.
- **NTC**: Sets whether the NTC connection is enabled or not.



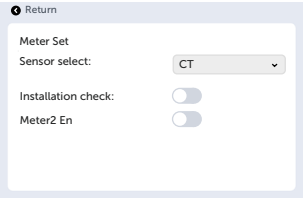
Reactive Power Control

The default value is the specified value under the current safety regulations. The contents will be displayed according to the requirements of local laws and regulations. Please refer to local grid requirements.



Meter/CT State

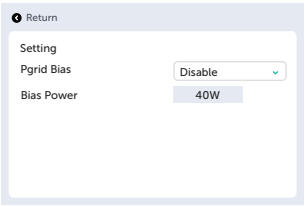
Here you can set **Meter/CT/None** based on the actual connected. CT is set by default.



Pgrid Bias

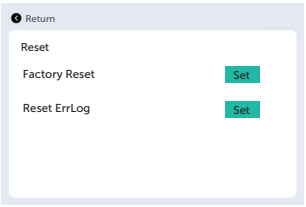
This function is disabled by default.

- **Disable**: Disable this function
- **Grid**: The inverter will discharge more power to the power grid.
- **INV**: The inverter will be biased to charge power from the power grid.



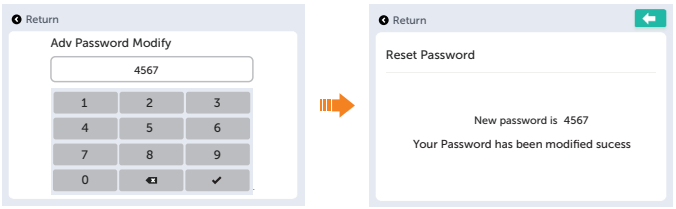
Reset

Here you can reset value of History Record and restore to the factory reset.



New Password

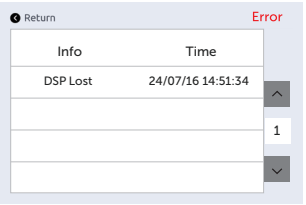
You can reset the advanced password here.



11.9 History Errors

Displaying path: ⚙ > **About**

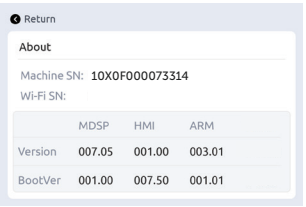
Display the recent error messages. Information contains date and time error happened and error description.



11.10 About

Displaying path: ⚙ > **About**

Here shows the basic information of the inverter and internal code. After entering the **About** interface, you can check those information.



12 Operation on SolaX App and Web

12.1 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.

12.2 Operation Guide on SolaXCloud App

12.2.1 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 12-1 QR code

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

12.2.2 Operation on the SolaXCloud App

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

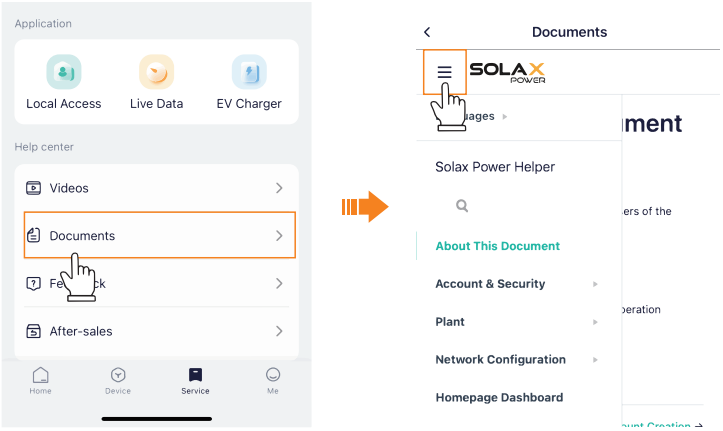


Figure 12-2 Online help on SolaXCloud

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.

12.3 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.

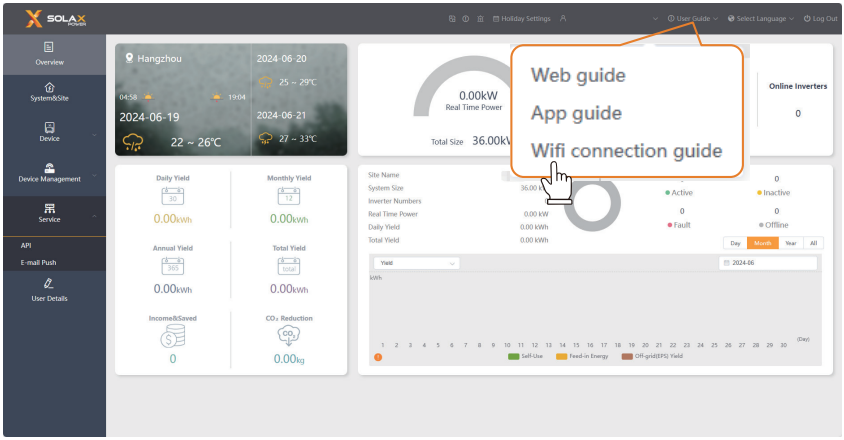


Figure 12-3 Guide on web page

13 Troubleshooting and Maintenance

13.1 Power OFF

a. Release the **System switch** on the left side of the inverter to turn it off, or turn off the system by **System ON/OFF** on LCD screen.

b. Turn off the AC switch between the inverter and the power grid.

c. Turn **OFF** the PV switch.

d. Switch off the battery or the breaker, button, DC switch of the battery (see documentation of the battery manufacturer).

⚠ 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 five minutes after power off.

13.2 Troubleshooting

This section lists the possible problems with the inverter, and provides information and procedures for identifying and resolving them. In case of any errors, check for the warnings or error messages on the system control panel or App, and then refer to the suggestions below. 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 13-1 Troubleshooting list

Faults	Diagnosis and solution
HW Protect Fault	Internal hardware anomaly • Contact SolaX for help.
Grid Lost Fault	• Check grid input voltage if it's within normal range. • Or ask the installer for help.
Grid Volt Fault	Power grid voltage overrun • Wait a moment, if the utility returns to normal, the system will reconnect. • Please check if the grid voltage is within normal range. • Or ask the installer for help.
Grid Freq Fault	Electricity frequency beyond range • If the utility returns to normal, the system reconnects. • Or ask the installer for help.

Faults	Diagnosis and solution
PV Volt Fault	PV voltage out of range • Check the output voltage of the PV panel. • Or ask the installer for help.
Bus Volt Fault	• Press the **ESC** key to restart the inverter. • Check that the PV input open circuit voltage is in the normal range. • Or ask the installer for help.
Bat Volt Fault	Battery voltage fault • Check battery input voltage if it's within normal range. • Or ask the installer for help.
AC10M Volt Fault	• The grid voltage was out of range in the last 10 minutes. • The system will return to normal if the grid returns to normal. • Or ask the installer for help.
DCI OCP Fault	DCI overcurrent protection fault • Wait for a while to check if it's back to normal. • Or ask the installer for help.
DCV OVP Fault	DCV EPS(Off-grid) overvoltage protection failure • Wait for a while to check if it's back to normal. • Or ask the installer for help.
SW OCP Fault	Software Detection of Overcurrent Fault. • Wait for a while to check if it's back to normal. • Shut down photovoltaic, battery and grid connections. • Or ask the installer for help.
RC OCP Fault	Overcurrent protection fault. • Check the impedance of DC input and AC output. • Wait for a while to check if it's back to normal. • Or ask the installer for help.
IsolationFault	Insulation Fault • Please check the wire insulation for damage. • Wait for a while to check if it's back to normal. • Or ask the installer for help.
Temperature Over Fault	Temperature beyond limit • Check if ambient temperature exceeds the limit. • Or ask the installer for help.
EPS Overload Fault	EPS(Off-grid) over load fault. • Shutdown the high-power device and press the **ESC** key to restart the inverter. • Or ask for help from the installer if it can not return to normal.

Faults	Diagnosis and solution
Bat Power Low	• Close the high-power device and press the **ESC** key to restart the inverter. • Please charge the battery to a level higher than the protection capacity or protection voltage.
BMS Lost	Battery communication loss • Check that the communication lines between the battery and the inverter are properly connected. • Or ask for help from the installer if it can not return to normal.
Fan Fault	Fan Fault • Ask for help from the installer if it can not return to normal.
Parallel Fault	Parallel Fault • Check the communication and earth cable connection and matching resistor settings. • Or contact SolaX for help if it can not return to normal.
Hard Limit Fault	HardLimitFault • Check the power value set in the HardLimit setting, increase the value larger if needed. • Or contact SolaX for help if it can not return to normal.
CT/Meter Check Fault	• Check if the CT or meter is well connected. • Or contact SolaX for help if it can not return to normal.
Inter_Com_Fault	Mgr InterCom Fault • Shut down photovoltaic, battery and grid, reconnect. • Or ask for help from the installer if it can not return to normal . • Internal communication errors. • Shut down photovoltaic, battery and grid connections. • Or ask for help from the installer if it can not return to normal.
RCD Fault	Fault of Residual Current Device • Check the impedance of DC input and AC output. • Disconnect PV + PV - and batteries, reconnect. • Or ask for help from the installer if it can not return to normal.
Grid Relay Fault	Electrical relay failure • Disconnect PV+ PV- grid and batteries and reconnect. • Or ask for help from the installer if it can not return to normal.
EPS Relay Fault	EPS(Off-grid) relay failure • Disconnect PV+ ,PV-, grid and batteries and reconnect. • Or ask for help from the installer if it can not return to normal.
PV ConnDirFault	PV direction fault • Check if the PV input lines are connected in the opposite direction. • Or ask for help from the installer if it can not return to normal.

Faults	Diagnosis and solution
Earth Raley Fault	EPS(Off-grid) earth relay fault • Press the ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal.
Power Unmatched	Power type fault • Upgrade the software and press the ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal.
EPS Port Overcurrent	EPS(Off-grid) port over current fault • Check that the EPS(Off-grid) load does not exceed the system requirements. • and press the ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal.
Low Bat Temp	• Shutdown the high-power device and press the ESC key to restart the inverter. • Please charge the battery to a level higher than the protection capacity or protection voltage.
High Bat Temp	• Check if the battery temperature is too high or the battery temperature sampling wire is not connected or disconnected.
Meter Comm Fault	• Check if the meter is working properly. • Or contact SolaX for help if it can not return to normal.
Other AC Fault	• Check the AC power condition (may be missing phase), • Try to update the processing. • Or contact SolaX for help.
Other DC Fault	• Shut down and re-power on (check battery wiring). • Try to update the processing. • Or contact SolaX for help.
Other PV Fault	• General PV energy is weak, confirm the PV energy is normal, if it still exists. • Try to update the processing. • Or contact SolaX for help.
Reversed Grid Phase	• Reverse phase sequence L2, L3 can be switched arbitrarily, also can be licensed on the screen to run in reverse phase sequence.
EPO Fault	• Check the EPO wiring (loose or disconnected).
Bat Overcurrent	Battery overcurrent • Shut down and re-power (check the battery wiring) • Try to update the processing. • Or contact SolaX for help.

Faults	Diagnosis and solution
PV Overcurrent	PV overcurrent • Shut down and re-power (check the battery wiring) • Try to update the processing. • Or contact SolaX for help.
NTC1 Sample Invalid	Battery temperature sampling wire is not connected or disconnected • Check or contact SolaX for help.
ExFAN1Fault	• Check if the foreign objects stuck in the fan. • Or contact SolaX for help.
ExFAN2Fault	• Check if the foreign objects stuck in the fan. • Or contact SolaX for help.
ExFAN3Fault	• Check if the foreign objects stuck in the fan. • Or contact SolaX for help.
BMS Lost	BMS communication loss fault • Check the power supply, try to update the process. • Or contact SolaX for help.
DSP Lost	DSP communication loss fault • Check the power supply, try to update the process. • Or contact SolaX for help.
Bat Disconnect	• Check battery power cable access • Or contact SolaX for help.
Cell Overvoltage	Over-voltage faults in the battery cells • Wait for fault recovery. • Restart the battery. • Or contact SolaX for help.
Cell Undervoltage	Cell undervoltage fault • Charge the battery.
High Cell Vol Diff	Excessive cell pressure difference • Contact SolaX for help.
HVB Overvoltage	Overvoltage faults on the main voltage • Wait for fault recovery. • Restart the battery. • Or contact SolaX for help.
HVB Undervoltage	Mains undervoltage fault • Charge the battery.
Overtemp Fault	Over Temperature Fault • Stop using the battery and wait for the temperature to recover.
Self-check Fault	Self-checking faults • Check what's happening to the battery and contact SolaX for help.

Faults	Diagnosis and solution
Main Relay Stuck (+)	Main Positive Relay Sticky Fault • Contact SolaX for help.
Main Relay Open (+)	Main positive relay open circuit fault • Contact SolaX for help.
Main Relay Stuck (-)	Main negative Relay Sticky Fault • Contact SolaX for help.
Main Relay Open (-)	Main negative relay open circuit fault • Contact SolaX for help.
Precharge Fail	Precharge Failure Fault • Restart the battery. • If this failure occurs several times please contact solax for help.
CellSampleFault	Single-unit sampling fault • Contact SolaX for help.
TempSampleFault	Temperature Sampling Fault • Contact SolaX for help.
System Fault	System fault • Contact SolaX for help.
Dischrg Overcurrent	Discharge overcurrent fault • Stop using the battery and wait for fault recovery. • Restart the battery. • Or contact SolaX for help.
Chrg Overcurrent	Charge overcurrent fault • Stop using the battery and wait for fault recovery. • Restart the battery. • Or contact SolaX for help.
AFE Comm Fault	AFE communications failure • Contact SolaX for help.
Inv Comm Fault	Extract communication failure • Check the communication cable between the battery and the inverter, after re-plugging, it still appears to contact SolaX for help.
Mid Comm Fault	Intermediate network communications failure • Check the communication cable between the batteries, after re-plugging still appears to contact SolaX for help.
Voltage Sensor Fault	Voltage Sensor Fault • Contact SolaX for help.
ID Duplicate	ID Repeat Fault • Check if the system is connected correctly, follow the initial installation steps again for power-on operation, contact SolaX for help.

Faults	Diagnosis and solution
Low Temp Fault	Low temperature fault • Wait for fault recovery, restart the battery, contact SolaX for help.
Current Sensor Fault	Current Sensor Failure • Contact SolaX for help.
Power Line Open	Power line open circuit fault • Check that the power cables are connected, restart the battery.
Flash Fault	Flash Fault • Contact SolaX for help.
AFE Self-Protect Fault	APE self-protection fault • Contact SolaX for help.
Charge Request Fault	Charge Request Fault • Check that the inverter is properly recharging the batteries.
Insulation Fault	Insulation faults • Contact SolaX for help.
MCB Fault	• Contact SolaX for help.
High Linker Temp	• Contact SolaX for help.
Bat Linker Exception	• Contact SolaX for help.

Table 13-1 Other faults

Faults	Diagnosis and solution
Screen not on	• Check if the inverter correctly and normally connected to PV, battery or grid. • Contact SolaX for help if the inverter is connected correctly.
Abnormal sound on fan	• Check if there is foreign objects stuck in the fan. • Contact SolaX for help.
Screen on but no content display	• Contact SolaX for help.
No readings after CT connection	• Check if CT is correctly clipped on the L wire • Check if the arrow on the CT points at Grid. • Contact SolaX for help if it can not return to normal.
No readings on Load (on App or Web)	• Check if the load is connected correctly. • Check if the power of load on the LCD screen displays normally. • Check if the monitoring module works normally. • Contact SolaX for help if it can not return to normal.

Faults	Diagnosis and solution
No readings on Grid (on App or Web)	• Check if the grid connection is normal. • Check if the grid parameter on the LCD screen displays normally. • Check if the monitoring module works normally. • Contact SolaX for help if it can not return to normal.
No readings on battery (on App or Web)	• Check if the battery is connected correctly. • Check if the battery parameter on the LCD screen displays normally. • Check if the monitoring module works normally. • Contact SolaX for help if it can not return to normal.
No Feedin data (on App or Web)	• Check if the meter/CT is connected correctly. • Check if the meter/CT parameter on the LCD screen displays normally. • Check if the monitoring module works normally. • Contact SolaX for help if it can not return to normal.
No data on App or Web	• Check if the monitoring module works normally. • Contact SolaX for help.
No display on meter after power on	• If the meter connection is abnormal, reconnect them according to the wiring diagrams. • Wait for the grid voltage to restore. • Contact SolaX for help if it can not return to normal.
Abnormal electrical data on meter	• If the wiring is incorrect, reconnect them based on the wiring diagrams. • Set the voltage and current ratio according to the setting steps of meter user manual. • Contact SolaX for help if it can not return to normal.

13.3 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.

13.3.1 Maintenance routines

Table 13-3 Proposal of Maintenance

Item	Check notes	Maintenance interval
Fans	• 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 sealing caps on idle terminals are not falling off.	Every 12 months
Grounding reliability	• Check if the grounding cables are firmly connected to the grounding terminals. Use a ground resistance tester to test the grounding resistance from the inverter enclosure to the PE bar in the power distribution box.	Every 12 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

13.3.2 Replacement of Fans

When the fan is not rotating and the feedback speed of the fan is 0, the LCD screen will display **ExFAN1Faul** / **ExFAN2Faul** / **ExFAN3Faul** error. Refer to the following steps for replacement.

Step 1: Loosen the screw on the inverter with cross screwdriver.

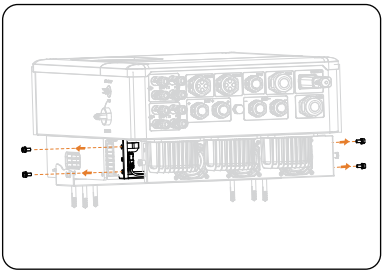


Figure 13-1 Loosening the screws

Step 2: Remove the spring pin, remove the outer casing of the inverter, proceed to disconnect the terminals that are connected to the fans.

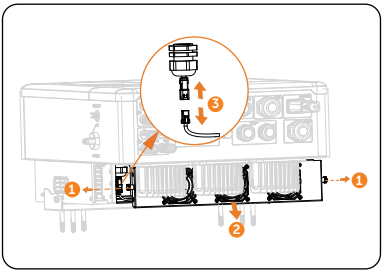


Figure 13-2 Disconnecting the fan

Step 3: Loosen the screws on the fan assembly and after disassembling it, replace the fans. After the replacement is complete, please check if the fan can operate normally.

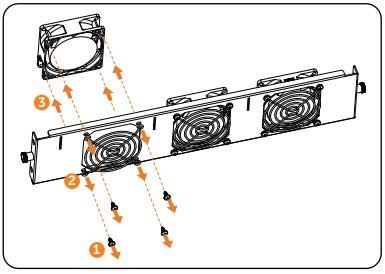


Figure 13-3 Replacing the fan

13.3.3 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 150 V (preferably on sunny day), or that the battery SOC is higher than 20%, or the battery input voltage is higher than 150 V. Failure to meet one of these conditions may result in upgrade process failure.

Upgrade preparation

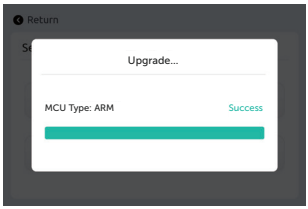
- Prepare a USB drive (USB 2.0/3.0, ≤32 GB, FAT 16/32).
- Check for the current firmware version of the inverter.
- Contact our service support for the update firmware file, and save it to the USB drive.
- Find out if the directory "\update\combin" exists on the USB drive.
  - » If it exists, find xxx_X3-NEO-LV_ALL_Vxxx_xxx.bin
  - » If not, check for xxx_X3-NEO-LV_ALL_Vxxx_xxx.bin in the root directory of the USB drive.

Upgrade steps

a. Insert the U disk into the dongle terminal. If the Dongle is connected to the terminal, please remove the dongle first. For the position of Dongle terminal, refer to "8.1.1 Terminals of Inverter".

b. The inverter will automatically enters the upgrade process and displays the current upgrade progress.

c. After the upgrade is completed, the LCD screen displays **Success**. If the upgrades fail, the LCD screen displays **Fail**.



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.

CAUTION!

If the DSP firmware upgrade fails or stops, perform operations below to troubleshoot:

- Check if the PV switch is turned off. If it is off, turn it on.
- (Recommended) If the PV switch is already on, check if the battery and PV parameters meets the upgrade requirements (The PV or battery input voltage should be larger than 150 V, or the battery SOC be higher than 20%).

NOTICE!

- If the LCD screen lags or freezes after the upgrade, turn off the PV switch, and then restart the inverter. Check if the inverter returns to normal. If not, contact us.

14 Decommissioning

14.1 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.

Step 1: Follow the "13.1 Power OFF" and wait for the inverter to power off.

Step 2: Disconnect the PV connectors: Insert the removal tool into the notch of PV connectors and slightly pull out the connectors.

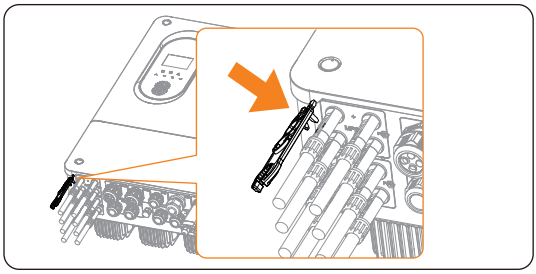


Figure 14-4 Releasing the PV connector

Step 3: Slightly pull out the dongle module.

Step 4: Open the upper cover of the inverter.

Step 5: Remove the internal cables (battery cable, Grid, GEN and EPS cable, communication cable) and the CT.

Step 6: Put the original terminal caps on the terminals.

Step 7: Reinstall the upper cover.

Step 8: Unscrew the grounding screw by crosshead screw and remove the grounding cable.

Step 9: (Optional) Unlock the anti-theft lock.

Step 10: Unscrew the M6 screw on the both sides of inverter and vertically lift up the inverter to dismantle the inverter.

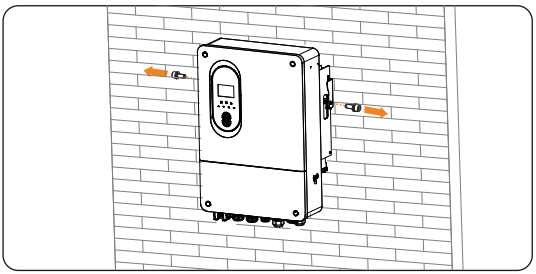


Figure 14-5 Unscrewing the M6 screws

Step 11: Unscrew the screws for fastening the wall mounting bracket and remove the wall mounting bracket if needed.

14.2 Packing the Inverter

- Use the original packaging materials if available.

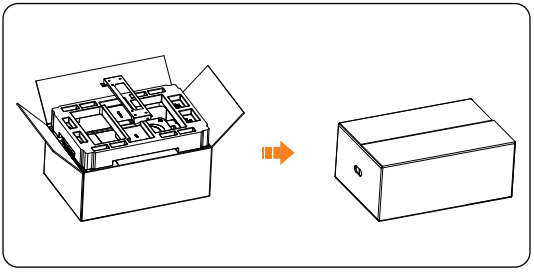


Figure 14-6 Packing the inverter

- 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

14.3 Disposing of the Inverter

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

15 Technical Data

- PV Input

Model	X3-NEO-5K-LV	X3-NEO-8K-LV	X3-NEO-10K-LV	X3-NEO-12K-LV	X3-NEO-15K-LV	X3-NEO-20K-LV
Max. PV array input power [Wp]	10000	16000	20000	24000	30000	30000
Max. PV input power [W] (derating above +45℃)	10000	16000	20000	24000	30000	30000
Max. PV input voltage[1] [V]	1000					
Start output voltage [V]	150					
Nominal input voltage [V]	640					
MPPT operating voltage range[2] [V]	160 - 950					
No. of MPPT/Strings per MPPT	2(1/1)	2(1/1)	2(2/1)	2(2/2)	2(2/2)	2(2/2)
Max. input current[3][A]	18/18	18/18	36/18	36/36	36/36	36/36
Max. short circuit current [A]	25/25	25/25	50/25	50/50	50/50	50/50
Max. inverter backfeed current to the array [A]	0					

Note:

[1] The maximum input voltage is the upper limit of the DC voltage. Any higher input DC voltage would probably damage inverter.

[2] Input voltage exceeding the operating voltage range may triggers inverter protection.

[3] When both strings are connected to a single MPPT, the Max. output current for a single string is 18 A; When a single string is connected to one MPPT, the Max output current for a single string is 20 A.

- AC Input/Output

Model	X3-NEO-5K-LV	X3-NEO-8K-LV	X3-NEO-10K-LV	X3-NEO-12K-LV	X3-NEO-15K-LV	X3-NEO-20K-LV
Nominal AC output power [W]	5000	8000	10000	12000	15000	20000
Max. AC output apparent power [VA]	5500	8800	11000	13200	16500	22000
Max. AC output current [A] @220V/380V	8.4	13.4	16.8	20.0	25.0	33.4
Max. AC output current [A] @230V/400V	8.1	12.9	16.0	19.2	24.0	31.9
Max. AC input apparent power [VA]	10000	16000	20000	24000	30000	30000
Max. AC input current [A] @220V/380V	15.15	24.24	30.30	36.4	45.5	45.5
Max. AC input current [A] @230V/400V	14.5	23.2	29.0	34.8	43.5	43.5
Nominal AC voltage (AC voltage range)[V]	220/380, 230/400					
Nominal grid frequency [Hz]	50/60					
Displacement power factor	0.8 leading - 0.8 lagging					
THDi (rated power)[%]	<3					
AC Connection	3L/N/PE					
DC Disconnection Switch	Yes					
Maximum fault current [A]	50					
Maximum output overcurrent protection [A]	72					
Inrush current [A]	65					

- EPS Output

Model	X3-NEO-5K-LV	X3-NEO-8K-LV	X3-NEO-10K-LV	X3-NEO-12K-LV	X3-NEO-15K-LV	X3-NEO-20K-LV
Nominal output power [W]	5000	8000	10000	12000	15000	20000
Peak apparent power [VA]	2 times of rated power, 10 s					
Nominal AC Output Frequency [Hz]	50/60					
Nominal AC Output Current [A]	7.2	11.6	14.5	17.4	21.7	29.0
Nominal AC voltage [V]	220/380, 230/400					
Switch Time [ms]	< 6					
THDv (@Linear load)	< 2%					

- Battery Data

Model	X3-NEO-5K-LV	X3-NEO-8K-LV	X3-NEO-10K-LV	X3-NEO-12K-LV	X3-NEO-15K-LV	X3-NEO-20K-LV
Battery type	Lithium / Lead-Acid					
Battery voltage range [V]	40 - 60					
Nominal battery voltage [V]	48					
Max. Charging/ Discharging Current [A]	125	200	250	280	300	350
Charging Strategy for Lead-Acid Battery	3 stages curves					
Temperature Sensor	Yes					

- Protection Device

Model	X3-NEO-5K-LV	X3-NEO-8K-LV	X3-NEO-10K-LV	X3-NEO-12K-LV	X3-NEO-15K-LV	X3-NEO-20K-LV
Active anti-islanding method	Yes					
PV String Input Reverse Polarity Protection	Yes					
Insulation Resistor Detection	Yes					
Residual Current Monitoring Unit	Yes					
Output Over Current Protection	Yes					

Model	X3-NEO-5K-LV	X3-NEO-8K-LV	X3-NEO-10K-LV	X3-NEO-12K-LV	X3-NEO-15K-LV	X3-NEO-20K-LV
Output Short Protection	Yes					
Output Over Voltage Protection	Yes					
Surge Protection	AC Type II/DC Type II					
Battery Terminal Temp Protection	Yes					

- Environment Limit

Model	X3-NEO-5K-LV	X3-NEO-8K-LV	X3-NEO-10K-LV	X3-NEO-12K-LV	X3-NEO-15K-LV	X3-NEO-20K-LV
Degree of protection	IP65					
Operating temperature range[℃]	-25 ~ +60 (derating above +45)					
Pollution level	III					
Relative humidity [%]	0 ~ 100 (condensing)					
Max. operation altitude [m]	<3000					
Storage Temperature[℃]	-40 ~ +70					
Noise Emission(typical)[dB]	<55					

- General

Model	X3-NEO-5K-LV	X3-NEO-8K-LV	X3-NEO-10K-LV	X3-NEO-12K-LV	X3-NEO-15K-LV	X3-NEO-20K-LV
Dimension (W*H*D) [mm]	520 * 705 * 258					
Net Weight [kg][1]	44.6					
Cooling concept	/	/	FAN	FAN	FAN	FAN
Topology	Non-isolated					
HMI Interface	LED+LCD					
Communication Interfaces	CAN / RS485 / WiFi / LAN / 4G (optional) / NTC					

- System Data

Model	X3-NEO-5K-LV	X3-NEO-8K-LV	X3-NEO-10K-LV	X3-NEO-12K-LV	X3-NEO-15K-LV	X3-NEO-20K-LV
MPPT Efficiency	> 99.9%					
Max. efficiency	97.6%					
Euro. efficiency	97.0%					

- Standard

Model	X3-NEO-5K-LV	X3-NEO-8K-LV	X3-NEO-10K-LV	X3-NEO-12K-LV	X3-NEO-15K-LV	X3-NEO-20K-LV
Safety	IEC 62109-1 / -2					
EMC	EN61000-6 / 1 / 2 / 3 / 4					
Certification	IEC 61727, IEC 62116, IEC 61683, IEC 60068, EN 50530					

Note:

[1] The specific weight is subject to the actual situation of the whole machine.

16 Appendix

16.1 Application of Generator

16.1.1 Introduction of Generator Application

When utility power supply is unavailable, the system can seamlessly switch to the generator for power supply and collaborate with the energy storage system to ensure the uninterrupted use of the load.

In this case, the generator functions as the power grid to supply power for the load, and the hybrid inverter converts the solar energy to electricity.

16.1.2 Notice for Generator Application

- Note 1: The generator should be equipped with an Automatic Transfer Switch (ATS), enabling it to start automatically in the event of a power outage.
- Note 2: If the rated output power of the generator is small and cannot meet the requirements of Note 1, the setting value of **MaxChargePower** can be changed in the >**Setting**>**Advance Setting**>**ExternalGen** to ensure that the generator power can meet the load and battery charging use at the same time.
- Note 3: The EPS load power cannot be greater than the battery discharge power to prevent the battery power from being unable to meet the EPS load after the generator shuts down and the inverter will report an **EPS Overload Fault** alarm. If two inverters are paralleled, the EPS load power shall be doubled.

16.1.3 Dry Contact Mode

In this operating mode, users can intelligently control the system by establishing a dry contact connection between the inverter and the generator. It allows for adjustments to multiple parameters so that the system can meet the requirements of different scenarios

Wiring connection diagram

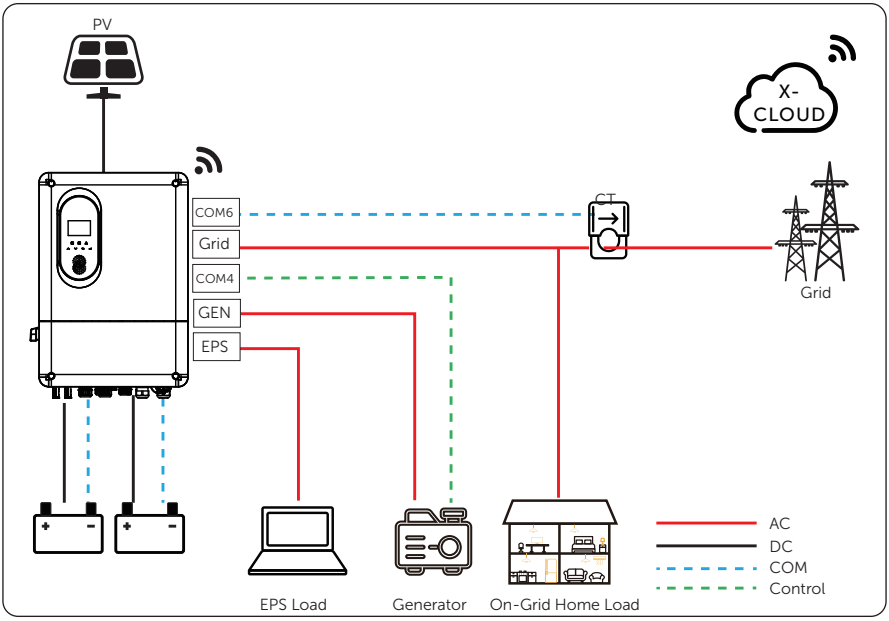


Figure 16-1 Dry contact wiring diagram

Inverter connection for dry contact mode

- Connection terminal-DO terminal

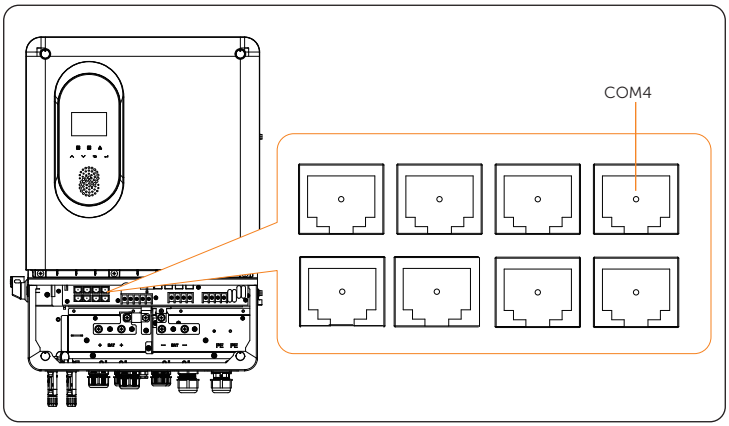


Figure 16-2 Connection terminal for generator

- Connection pins

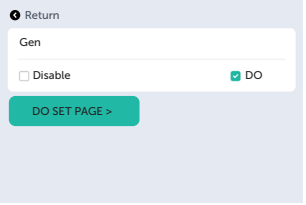
Table 16-1 Connection pins for generator

Pin	Assignment	Description
5	DO_1	For generator connection
6	DO_2	

- Connection steps: Please refer to "9.5 I/O Communication Connection" for specific wire making and connection.

Inverter settings for dry contact mode

a. Select >**Setting>Advance Setting**>**ExternalGen**>**Dry Contact.**



b. Set the relative parameters in accordance with actual needs.

» **Max Charge Power**: Maximum battery charging power from generator. Default: 1000 W, range: 1-60000 W;

» **Min Run Power**: Minimum operating power of the generator. Default：0 W, range: 0-999 W;

» Start Gen Method: **Reference**, **Immediately** and **Manual** can be selected.

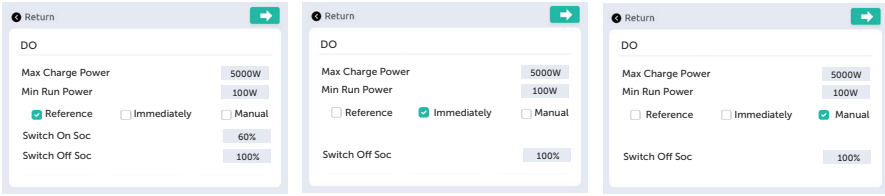
Reference: Turn on / off generator according to the set **Switch on/off Soc**.

Immediately: Turn on / off the generator when the power grid status changed.

Manual: Manual setting.

» **Switch On Soc/Voltage**: The inverter will turn on the generator when the battery level reaches the set **Switch On Soc/Voltage**. Default: 20% / 42 V, range: 20%-79% / 40V-52V;

» **Switch Off Soc/Voltage**: The inverter will turn on the generator when the battery level reaches the set **Switch Off Soc/Voltage**. Default: 80% / 53V; range：21%-100% / 43V-60V

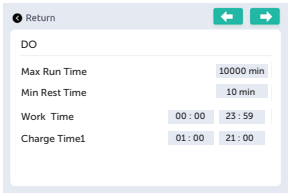


» **Max Run Time**: Maximum operating time of generator. Default: 1000min, range:2-60000min

» **Min Rest Time**: Minimum time interval for two consecutive starts to avoid frequent generator on and off. Default: 60min, range:1-60000min

» **Work Time**: Allowed time period for generator operating. You can set the start time and end time.

» **Charge Time1**: Generator charging time period. Range:00:00-23:59

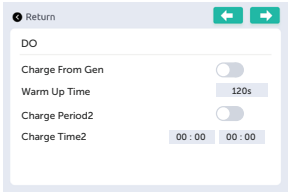


» **Charge From Gen**:The battery SOC which allows the system charging from generator.

» **Warm Up Time**: Generator warm-up time. Default: 120s, range: 120-600s

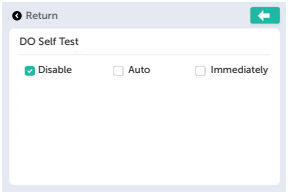
» **Charge Period2**: If you need two periods of generator charging time, enable the **Charge Period2** enable, you can set **Charge Time2.**

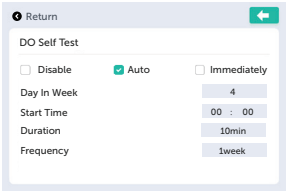
» **Charge Time2**: Generator charging time period2

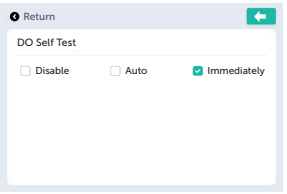


» DO Self Test: Generator self-test enable control. **Disable**, **Auto**, **Immediately** can be selected.

When selecting Auto, you can set: self-test date (**Day In Week**), self-test start time (**Start Time**), self-test duration (**Duration**), and self-test frequency (**Frequency**).


Return
DO Self Test
Disable
Auto
Immediately


Return
DO Self Test
Disable
Auto
Immediately
Day In Week
4
Start Time
00 : 00
Duration
10min
Frequency
1week


Return
DO Self Test
Disable
Auto
Immediately

16.2 Application of Parallel Function

16.2.1 Introduction of Parallel Application

The series inverters supports parallel operation in both Grid and EPS modes. It supports up to 10 units

16.2.2 Notice for Parallel Application

- All inverters should be of the same software version.
- For optimal efficiency, it is recommended that all inverters have the same model.
- In parallel system, there are three states: **Free**, **Slave** and **Master**.

Table 16-2 Three states

Free	Only if no one inverter is set as **Master**, all inverters are in **Free** state in the system.
Slave	Once one inverter is set as **Master**, all other inverters will enter **Slave** state automatically. **Slave** mode can not be changed from other states by LCD setting.
Master	When one inverter is set as **Master**, this inverter enters **Master** state. **Master** mode can be changed to **Free** state.

- Master inverter has an absolute lead in the parallel system to control all slave inverter's energy management and dispatch control. Once master inverter has some error and stop working, all slave inverters will be stopped simultaneously. But master inverter is independent of all slave inverters to work and will not be affected by slave inverter's fault.
- Once the slave inverter has exited the parallel system and is operating as a stand-alone unit, it needs to be rewired and **Free** set.
- The parallel system is extremely complex and requires a large number of cables to be connected. Therefore, the cables must be connected in the correct wire sequence. Otherwise, any small mistake can lead to system failure.
- The communication cable between two inverters should not exceed 1.5 m.
- When connecting batteries, it supports the same type of batteries to be paralleled together and output to the inverter, only the Master communicates with the batteries; it also supports each inverter to communicate with the batteries individually.

16.2.3 Parallel System Wiring Diagram

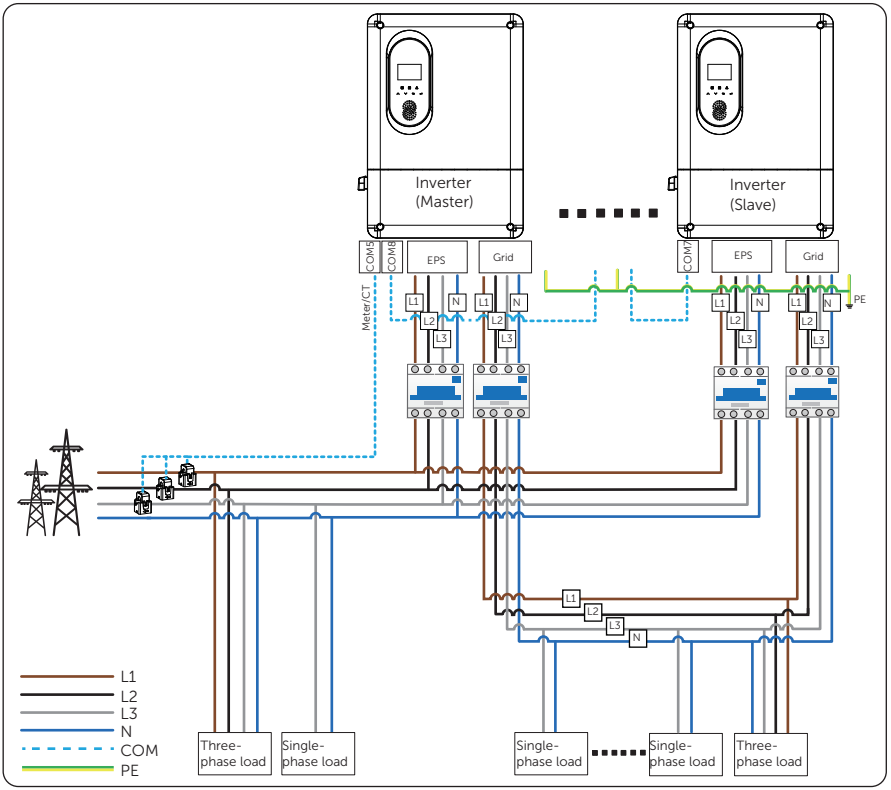


Figure 16-3 Parallel system wiring diagram

16.2.4 Parallel System Wiring Procedure

- Power cable wiring procedure:

a. Use five-core copper cable to connect master-slave inverter.

b. **Grid** terminal of master and slave inverter: L1 connects to L1, L2 connects to L2, L3 connects to L3 and N connects to N,

c. **EPS** termial of master and slave inverter: L1 connects to L1, L2 connects to L2, L3 connects to L3 and N connects to N,

d. All PE cables connect to the E-BAR nearby.

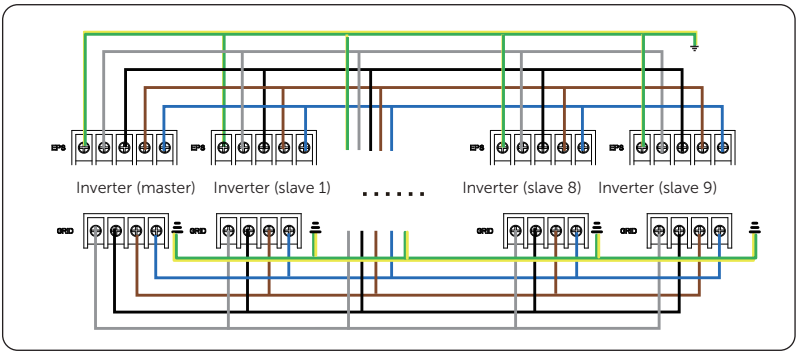


Figure 16-4 Power cable wiring

- Communication cable wiring procedure:

a. Use standard network cables for master-slave inverter connection.

b. Master inverter COM8 connects to slave 1 inverter COM7.

c. Slave 1 inverter COM8 connects to slave 2 inverter COM7. And so on.

d. Meter connects to Meter/CT terminal of the master inverter. Please refer to "9.4 Meter/CT Connection".

e. Set the dip switches of the Master and the last of the parallel units to ON.

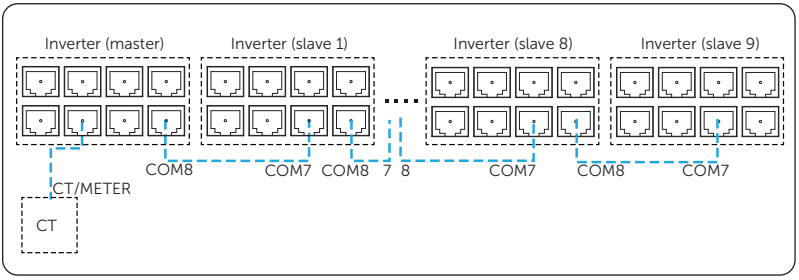


Figure 16-5 Communication cable wiring

NOTICE!

- For details on the specific wiring of the inverter, see "8.4 AC Connection" and "9.6 Parallel Connection".

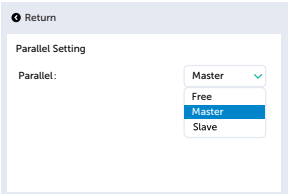
16.2.5 Settings for Parallel Connection

Parallel setting

Setting path: Select ⚙>**Parallel Setting.**

How to build the parallel connection

a. Turn on the power of the entire system; find the inverter which needs to be set as master inverter; enter the setting interface of the master inverter LCD screen; select the **Parallel Setting**, and select **Master**.



How to remove the parallel connection

a. Find the inverter which needs to be set as free inverter. Select the **Parallel Settings** and select **Free** for the inverter.

b. Disconnect all the network cables on the COM7 and COM8 terminal.

c. Disconnect Grid and EPS from parallel connection.

d. Disconnect the parallel CT connection. If necessary, connect as a single CT connection, and then perform the **Installation Check** in the "Meter/CT State" function.

NOTICE!

- If the network cable of a slave inverter is disconnected with master inverter but not be set to **Free**, this slave inverter will stop working, automatically defaults to **Slave** mode and prompt **ParallelFault**.

Meter/CT setting

Setting path: ⚙>**Setting**>**Advance Setting**>**Meter/CT Setting**. For details, see "Meter/CT State".

NOTICE!

- If the output power does not meet the expectation, you can check whether the **Grid Control** value is set reasonably through the setting path: ⚙>**Setting**>**Advance Setting**>**Grid Control**.

16.2.6 Parallel display

NOTICE!
• The exact display is based on what is on the actual inverter.

- The working mode in the main interface will show this inverter as Master or Slave.

  Master displays mode-M;

  Slave 1 displays mode-S1;

  Slave 2 displays mode-S2, and so on.
- Grid display: Inputs and outputs are displayed on the Master inverter and 0 on the slaves;
- PV display: Each inverter displays PV power generation individually;
- Battery display:
  - » If the batteries are connected together in parallel and output to the Master inverter, the Master will display power and SOC, and the slaves will not display SOC;
  - » If connecting and communicating with each inverter individually, each inverter will display battery voltage and power.

16.3 Application of Micro-grid

Micro-grid is the function that making hybrid inverter simulate the power grid to activate on-grid inverter during off-grid by connecting on-grid inverter to hybrid inverter's **EPS** or **GEN** terminal.

16.3.1 AC Couple

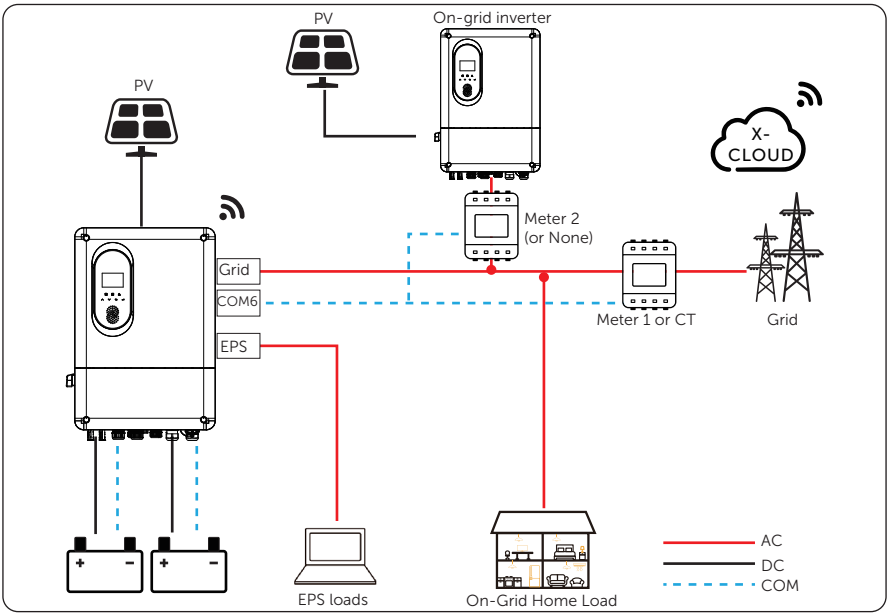


Figure 16-6 AC Couple wiring connection diagram

Cable Connection (Hybrid Inverter)

Please refer to "8.4 AC Connection" for Grid, EPS and GEN connection on X3-NEO-LV series inverter.

Cable Connection (On-grid Inverter)

Please connect the AC cable of on-grid inverter to the **EPS** or **GEN** terminal of X3-NEO-LV series inverter. Please refer to the user manual of specific on-grid inverter.

Cable Connection (Meter2)

To detect and monitor the power data generated from the on-grid inverter, install a meter on the on-grid inverter side. Otherwise, the relevant power data of on-grid inverter can not be monitored. Meter 2 needs to be set to enable. A detailed program for dual meters can be found in "16.4 Connection of Two Meters".

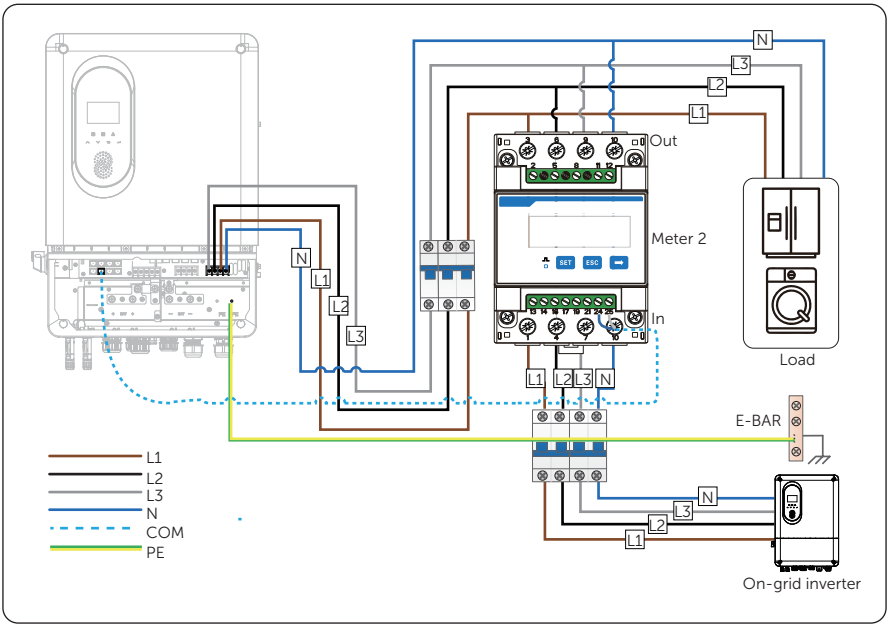


Figure 16-7 Connection diagram of Meter 2 on **Grid** terminal

- Pin assignment

Table 16-3 Pin assignment for meter

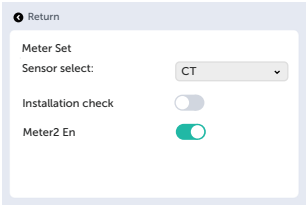
Pin	Assignment	Description
4	METER_485A	For meter connection
5	METER_485B	

- Meter / CT connection steps-Please refer to "9.4 Meter/CT Connection" and meter / CT user manual for specific connection steps.
- Inverter settings for meter 2

a. See the instructions for the meter to set the meter communication address to **2**.

b. Select >**Setting**>**Advance Setting**>**Meter/CT State**

c. Set Meter2 enable.



16.3.2 Micro-grid (On-EPS Port)

- When the grid is disconnected, this series of inverters replaces the grid, maintains the operation of the on-grid inverter, and together with the on-grid inverter, supplies power to the off-grid loads. If there is surplus power, charge the battery.
- Any brand of on-grid inverter that supports "frequency adaptation"
- On-grid inverter output power ≤ Max. hybrid inverter EPS output power
- On-grid inverter output power ≤ Max. battery charging power

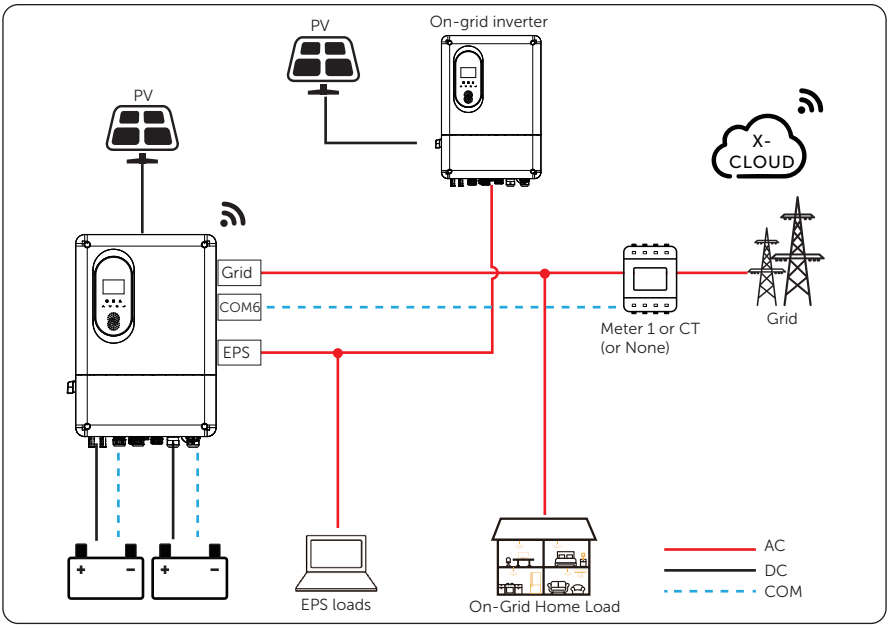


Figure 16-8 Micro-grid (On-EPS terminal)

NOTICE!

- In EPS mode, due to limited battery charging power, the hybrid inverter will increase the EPS output frequency to restrict and shut down the on-grid inverter, ensuring the stable operation of the entire system. In this period, the on-grid inverter may report a **Grid Freq Fault** which is a normal phenomenon.

Cable Connection (Hybrid Inverter)

Please refer to "8.4 AC Connection" for Grid, EPS and GEN connection on X3-NEO-LV series inverter.

Cable Connection (On-grid Inverter)

Please connect the AC cable of on-grid inverter to the **EPS** terminal of X3-NEO-LV series inverter. Please refer to the user manual of specific on-grid inverter.

16.3.3 Micro-grid (On-GEN Port)

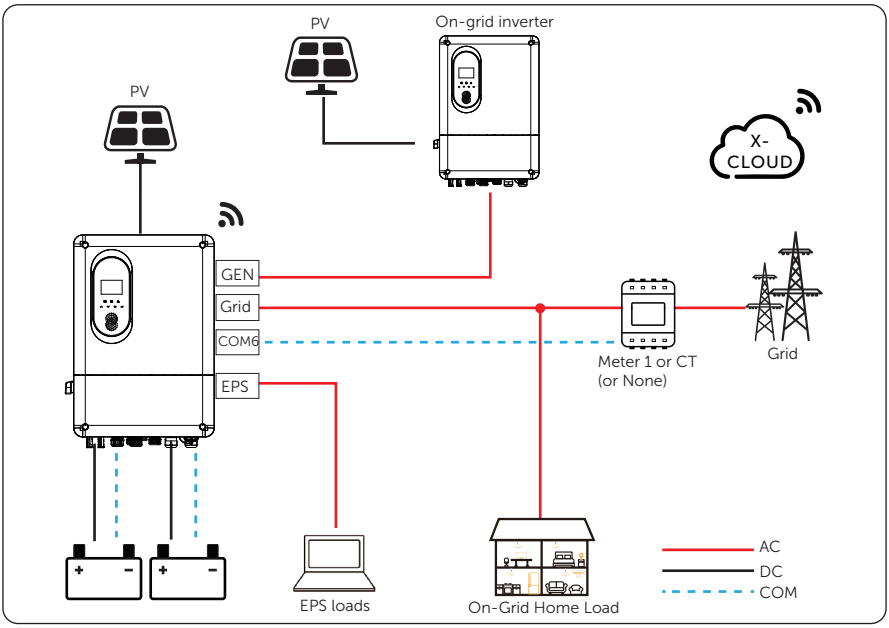


Figure 16-9 Micro-grid (On-GEN terminal)

Cable Connection (Hybrid Inverter)

Please refer to "8.4 AC Connection" for Grid, EPS and GEN connection on X3-NEO-LV series inverter.

Cable Connection (On-grid Inverter)

Please connect the AC cable of on-grid inverter to the **GEN** terminal of X3-NEO-LV series inverter. Please refer to the user manual of specific on-grid inverter.

16.4 Connection of Two Meters

If you have another power generation device (such as an inverter) at home and wants to monitor both devices, our inverter provides a Meter 2 communication function to monitor the other power generation device.

提示!

- For connecting CT and meter, or connecting two meters, prepare an RJ45 splitter adapter and a proper waterproof enclosure for it in advance.
- The device for monitoring the system (device at Meter 1 position) can be CT, direct connected meter and CT-connected meter, but the device for monitoring the other power generation device (device at Meter 2 position) can only be meters, either direct-connected meter or CT-connected meter. The following diagrams use the connection of two direct-connected metes and CT&direct-connected meter for example.

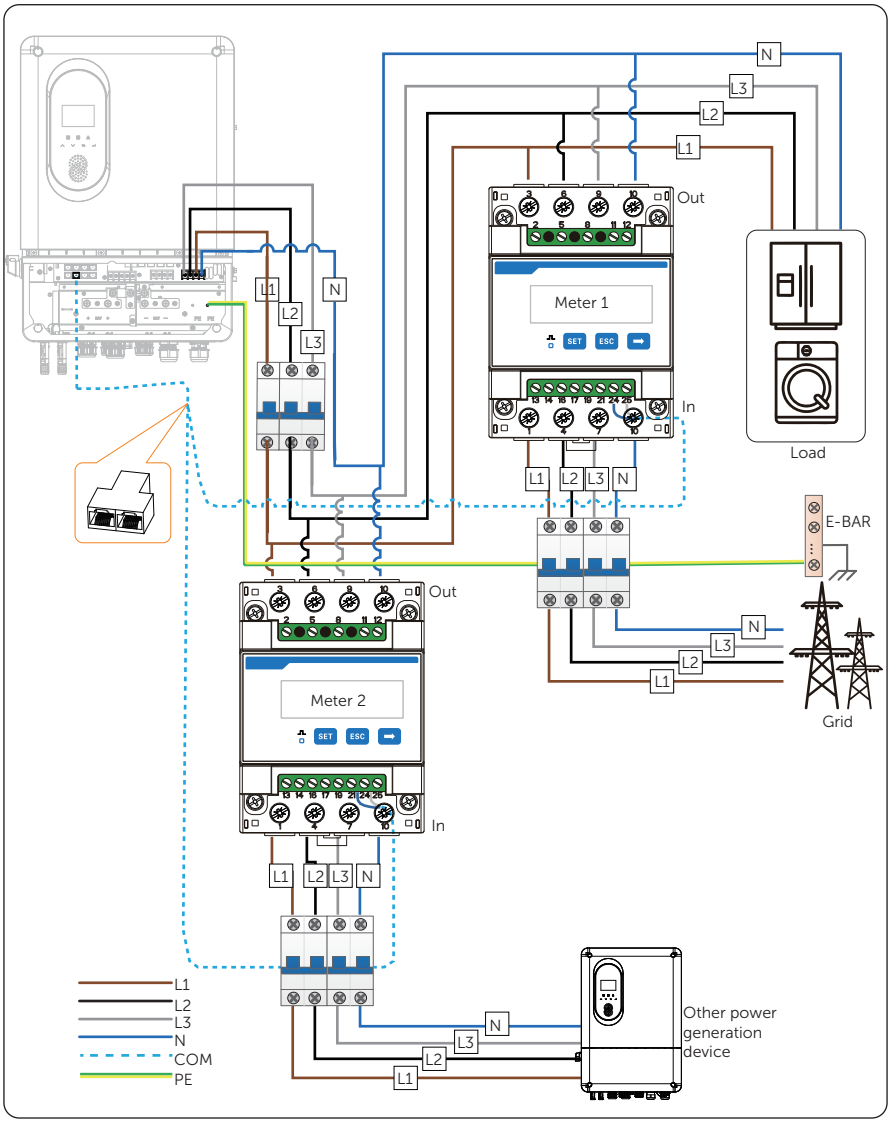


Figure 16-10 Connection diagram of two direct-connected meters

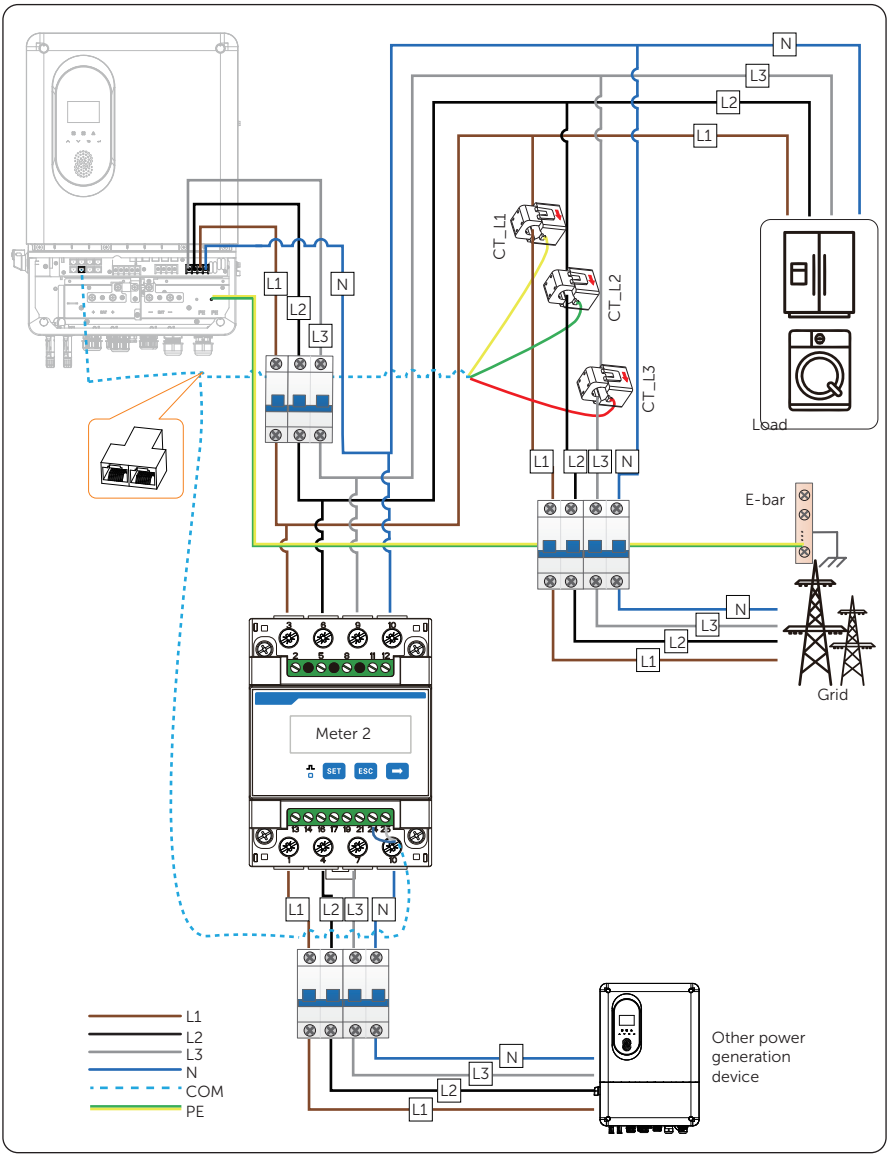


Figure 16-11 Connection diagram of CT and direct-connected meter

Wiring procedures for two direct-connected meters

a. Connect the meter and inverter. For detailed steps, see "9.4 Meter/CT Connection". Please note that the RJ45 splitter adapter should be placed in a proper waterproof enclosure.

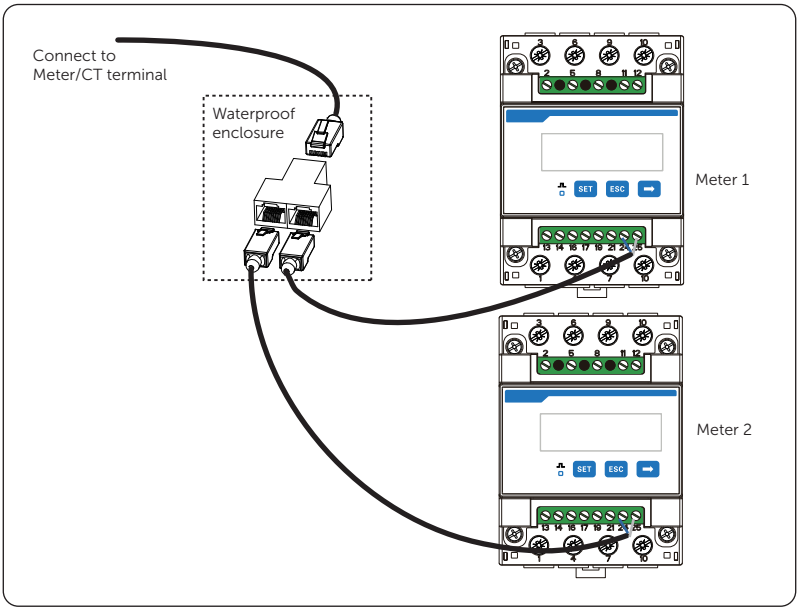


Figure 16-12 Connecting to RJ45 splitter adapter

Setting procedures for two direct-connected meters

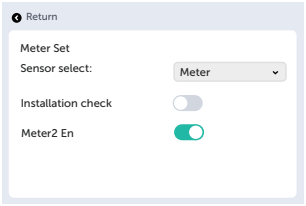
How to set the parameters of meter 1 and meter 2

a. Select >**Setting**>**Advance Setting**>**Meter/CT State**

b. Select the meter.

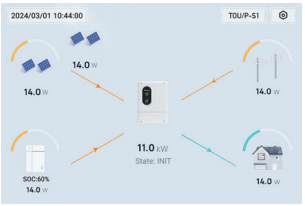
c. Set Meter2 enable.

d. See the instructions for the meter to set the meter communication address to **2**.



How to check the power detected by Meter 1 and Meter 2

e. If the inverter detects meter 2, an additional PV icon will be displayed next to the PV icon on the home page, and you can view the data detected by meter 2.



Wiring procedures for CT and direct-connected meter

a. Connect the meter, CT and inverter. For detailed steps, see "9.4 Meter/CT Connection". Please note that the RJ45 splitter adapter should be placed in a proper waterproof enclosure.

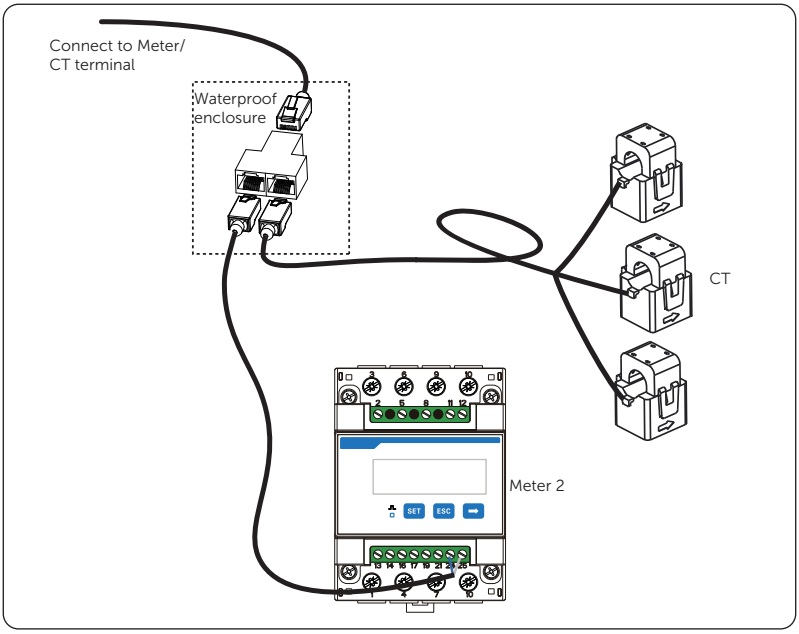


Figure 16-13 Connecting to RJ45 splitter adapter

Setting procedures for CT and direct-connected meter

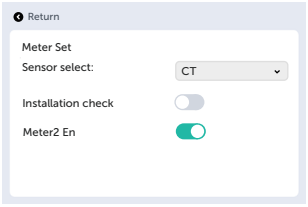
How to set the parameters of CT and Meter 2

a. Select >**Setting**>**Advance Setting**>**Meter/CT Setting.**

b. CT is set by default. Choose the supported CT type. You can check the connection status in **Meter/CT Check**.

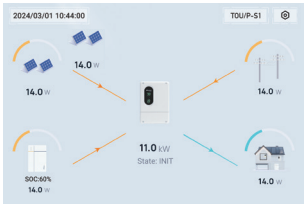
c. Set Meter2 enable.

d. See the instructions for the meter to set the meter communication address to **2**.



How to check the power detected by CT and Meter 2

e. If the inverter detects meter 2, an additional PV icon will be displayed next to the PV icon on the home page, and you can view the data detected by meter 2.



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