SOLAX



X3-NEO-LV

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

User Manual

Version 4.0

www.solaxpower.com

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

STATEMENT

Copyright

Copyright © SolaX Power Network Technology (Zhejiang) Co., Ltd. All rights reserved.

No part of this manual may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means without the prior written permission of SolaX Power Network Technology (Zhejiang) Co., Ltd.

Trademarks



e demais símbolos ou desenhos (nome da marca, logotipo) que distinguem os produtos ou serviços oferecidos pela SolaX são protegidos por direitos de marca registrada. Qualquer uso não autorizado das referidas marcas poderá constituir violação dos direitos de marca.

Notice

Please note that certain products, features, and services mentioned in this document may not be within the scope of your purchase or usage. Unless otherwise specified in the contract, the contents, information, and recommendations presented in this document are provided "as is" by SolaX. We do not provide any warranties, guarantees, or representations, whether express or implied.

The content of the documents is reviewed and updated as needed. However, occasional discrepancies may occur. SolaX retains the right to make improvements or changes in the product(s) and the program(s) described in this manual at any time without prior notice.

The images included in this document are solely for illustrative purposes and may differ based on the specific product models.

For more detailed information, kindly visit the website of SolaX Power Network Technology (Zhejiang) Co., Ltd. at www.solaxpower.com.

SolaX retains all rights for the final explanation.

About This Manual

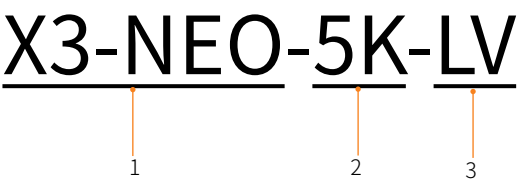
Scope of Validity

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 4.0 (2026-07-27)

Updated the company logo on the front and back covers, the product rendering on the front cover, and the SolaX Cloud on the QR code in Section "12.1 Introduction of SolaXCloud".

Added AFCI Settings to "11.4.2 Advanced Settings".

Version 3.0 (2026-03-05)

Updated "2.7 Work Mode (For Pakistan)", "2.8 Work Mode (Outside Pakistan)" , "2.9 Export Control Function", and "11 Operation on LCD" according to the new software version.

Updated the connection scenario and corresponding diagrams "9.6.2 CT Connection Procedure".

Updated the number of parallel units in "16.2.1 Introduction of Parallel Application".

Version 2.0 (2025-12-01)

Normative updates for the whole documentation.

"2.7 Work Mode (For Pakistan)" and "2.8 Work Mode (Outside Pakistan)".

Added Load First option to SBU Mode, Force Time Use Mode, and MKS/EPS Mode with description.

Updated MKS/EPS Mode table: corrected "SUB" to "SBU" and added notes for Load First.

Enhanced No PV input description with charge source behavior details.

Renamed "Battery Charging And Discharging Situation" to "Battery Charge

Source".

"2.8.1 Self Use Mode"

Updated period names: removed "forced" and "allowed".

"9 Communication Connection"

Restructured communication connection content title, updated the pin assignment description, and added COM description for emergency shutdown, Modbus RS-485, and EV charger.

Updated Meter/CT diagram.

Updated Parallel Connection CAN DIP switch settings.

"10.2 Powering on the System"

Added GRID terminal connection note for "Installation Check"

"11 Operation on LCD"

Added Today/Total energy statistics to PV display

Expanded Setting options with Smart Load

Renamed from Grid Control and added Active Power Limit function

Removed User battery type and added new Li-ion settings

Standardized SOC term and added Generator option

Added Micro Grid, Connection Point and enhanced Meter/CT State parameters

Renamed from History Errors

Added EPS Output load requirements

Updated X3-NEO-20K-LV parameters and Rated output current values

Changed Switch time to 3 ms

Changed Communication Interfaces to RS485, CAN, USB, DI/DO

"16 Appendix"

Enhanced wiring diagrams with Meter1/Meter2 designations

Restructured Application of Generator Micro grid content and added meter application

Updated parallel system requirements and wiring diagrams

Added Smart Load application

Version 1.0 (2025-01-08)

DC Switch to PV Switch;

Updated "Upgrade preparation";

Updated "2.6 Working State";

Updated "2.7 Work Mode (For Pakistan)"

Added "2.8 Work Mode (Outside 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

1.1 General Safety 1
1.2 Safety Instructions of PV, Inverter and Grid 1
1.2.1 Safety Instructions of PV 2
1.2.2 Safety Instructions of Inverter 2
1.2.3 Safety Instructions of Utility Grid 3

2 Product Overview 4

2.1 Product Introduction 4
2.2 Appearance 4
2.3 Supported Power Grid 6
2.4 Symbols on the Label and Inverter 7
2.5 Working Principle 8
2.5.1 Circuit Diagram 8
2.5.2 Application Schemes 9
2.6 Working State 11
2.7 Work Mode (For Pakistan) 12
2.7.1 SUB Mode 12
2.7.2 SBU Mode 12
2.7.3 MKS/EPS Mode 14
2.7.4 Force Time Use Mode 15
2.7.5 Manual Mode 15
2.8 Work Mode (Outside Pakistan) 16
2.8.1 Self Use Mode (Priority: Loads > Battery > Grid) 16
2.8.2 Feed-in Priority Mode (Priority: Loads > Grid) 17
2.8.3 Backup Mode (Priority: Loads > Battery > Grid) 18
2.8.4 Peak Shaving Mode 19
2.8.5 Manual Mode 20
2.9 Export Control Function 21

3 System Overview 22

4 Transportation and Storage 24

5 Preparation before Installation 25

5.1 Selection of Installation Location 25
5.1.1 Environment Requirement 25
5.1.2 Installation Carrier Requirements 27

5.1.3 Clearance Requirements 27
5.2 Tools Requirements 29
5.3 Additionally Required Materials 30
6 Unpacking and Inspection 32
6.1 Unpacking 32
6.2 Scope of Delivery 33
7 Mechanical Installation 35
7.1 Dimensions for Mounting 36
7.2 Installation Procedures 37
8 Electrical Connection 40
8.1 Overview of Electrical Connection 40
8.1.1 Terminals of Inverter 40
8.1.2 Cable Connections of Inverter 41
8.2 PE Connection 44
8.3 Battery Power Cable Connection 46
8.4 AC Connection 49
8.5 PV Connection 54
9 Communication Connection 58
9.1 Pin Assignment of COM Terminal 58
9.2 COM1 Communication Connection 59
9.3 COM2 Communication Connection 59
9.4 COM4 Communication Connection 59
9.4.1 Generator Communication Connection 60
9.5 COM5 Communication Connection 61
9.5.1 Battery Communication Connection 61
9.6 COM6 Communication Connection 64
9.6.1 Meter/CT Connection 64
9.6.2 CT Connection Procedure 67
9.6.3 (Optional) Meter Connection Procedure 70
9.7 COM7/COM8 Communication Connection 70
9.7.1 Pin Assignment of the COM7/COM8 Terminal 71
9.7.2 Parallel Communication Connection 71
9.8 Upper Cover Installation 72
10 System Commissioning 73
10.1 Checking Before Power-on 73
10.2 Powering on the System 74
11 Operation on LCD 76

11.1 Control Panel Introduction 76
11.2 Main Screen Overview 78
11.3 Work Mode Settings 81
11.3.1 Setting Work Modes for Pakistan 81
11.3.2 Setting Work Modes for Countries Outside Pakistan 85
11.4 Basic and Advanced Settings 91
11.4.1 Basic Settings 91
11.4.2 Advanced Settings 92
11.5 Period Settings 100
11.6 Grid Settings 101
11.7 Smart Load Settings 102
11.8 Battery Settings 108
11.9 Wind Turbine Settings 110
11.10 Parallel Settings 111
11.11 About 111
11.12 Logs 111
12 Operation on SolaX App and Web 112
12.1 Introduction of SolaXCloud 112
12.2 Operation Guide on SolaXCloud App 112
12.2.1 Downloading and Installing App 112
12.2.2 Operation on the SolaXCloud App 113
12.3 Operations on SolaXCloud Web Page 113
13 Troubleshooting and Maintenance 114
13.1 Power-off 114
13.2 Troubleshooting 114
13.3 Maintenance 122
13.3.1 Maintenance Routines 122
13.3.2 Replacement of Fans 123
13.3.3 Upgrading Firmware 124
14 Decommissioning 126
14.1 Disassembling the Inverter 126
14.2 Packing the Inverter 127
14.3 Disposing of the Inverter 127
15 Technical Data 128
16 Appendix 134
16.1 Installation Video 134
16.2 Application of Generator 134

16.2.1 Introduction of Generator Application 134
16.2.2 Generator Wiring Connection Diagram 135
16.2.3 Generator Control Mode 137
16.2.4 Cable Connection 138
16.2.5 Inverter settings for Meter1 138
16.3 Application of Parallel Function 138
16.3.1 Introduction of Parallel Application 138
16.3.2 Notice for Parallel Application 139
16.3.3 System Wiring Diagram 140
16.3.4 System Wiring Procedure 141
16.3.5 Settings for Parallel Connection 143
16.3.6 Parallel Display 144
16.4 Application of Micro Grid 145
16.4.1 Introduction of Micro Grid Application 145
16.4.2 System Wiring Diagram 146
16.4.3 Cable Connection 149
16.4.4 Inverter Settings for Meter2 150
16.5 Application of AC Coupling 150
16.5.1 Introduction of AC Coupling 150
16.5.2 System Wiring Diagram 151
16.5.3 Cable Connection 151
16.5.4 Inverter Settings for Meter2 152
16.6 Application of Meter 152
16.6.1 Introduction of Meter Connection 152
16.6.2 System Wiring Diagram 152
16.6.3 Pin Assignment of COM6 155
16.6.4 Inverter Settings for Meter1 155
16.6.5 Inverter Settings for Meter2 155
16.7 Application of Smart Load 156
16.7.1 Introduction of Smart Load 156
16.7.2 System Wiring Diagram 156

1 Safety

1.1 General Safety

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

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

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

1.2 Safety Instructions of PV, Inverter and Grid

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

1.2.1 Safety Instructions of PV

DANGER!

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

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

WARNING!

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

WARNING!

- Make sure that the input DC voltage does not exceed the maximum DC input voltage specified for the inverter. 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 advanced energy storage inverter designed for PV grid-connected applications. It integrates a range of intelligent features—including load management, wireless metering, dual battery terminals, and microgrid support—to enable more efficient and economical energy use. The series offers broad compatibility with both lithium-ion and lead-acid batteries, ensuring flexible adaptation to diverse energy storage needs.

2.2 Appearance

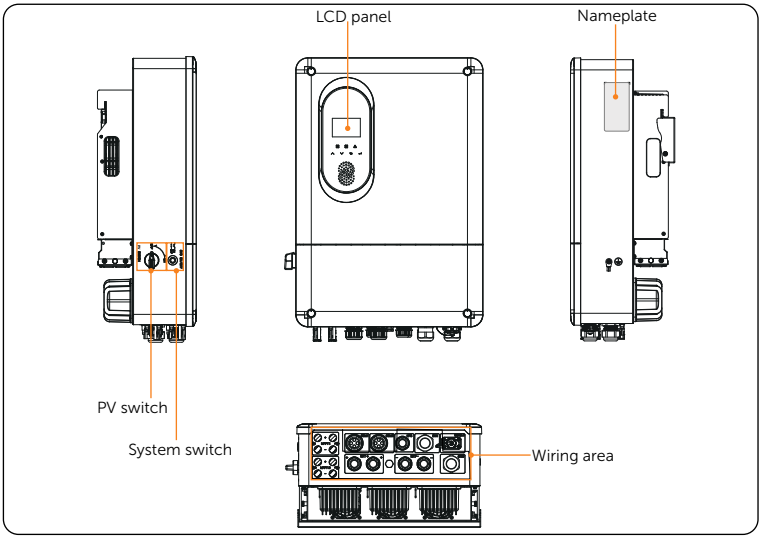


Figure 2-1 Appearance

Table 2-1 Description of appearance

Item	Description
Nameplate	Nameplate clearly identifies the device type, serial number, specific DC/AC parameters, certification, and more.
LCD panel	Including the screen, indicators and buttons. Screen displays the information; indicators indicate the status of inverter. Buttons are used to perform the parameter settings.

Item	Description
PV switch	Disconnect the DC input when necessary.
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, and more.

2.3 Supported Power Grid

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

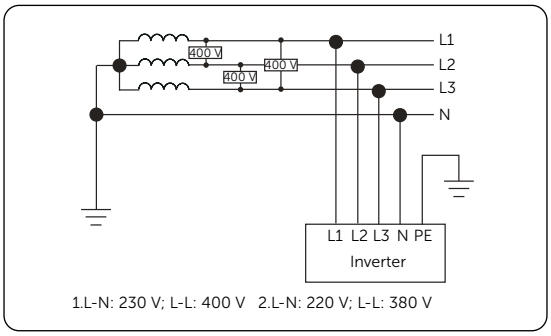


Figure 2-2 Supported power grid-TT

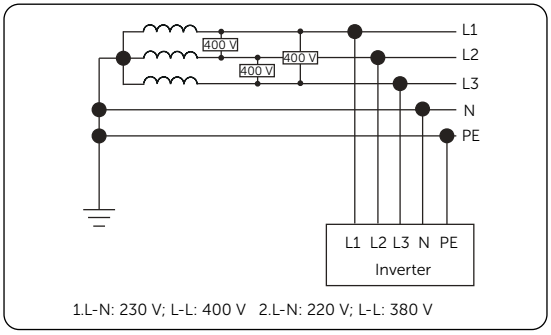


Figure 2-3 Supported power grid-TN-S

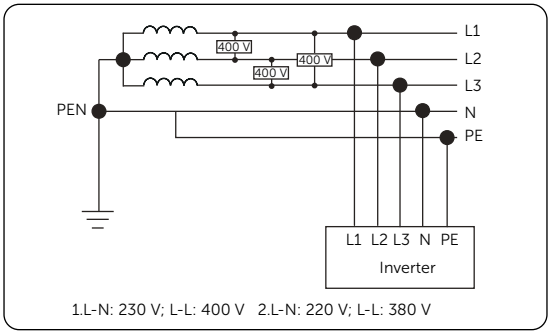


Figure 2-4 Supported power grid-TN-C-S

2.4 Symbols on the Label and Inverter

Table 2-2 Description of symbols

Symbol	Description
	CE mark. The inverter complies with the requirements of the applicable CE guidelines.
	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.
	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:

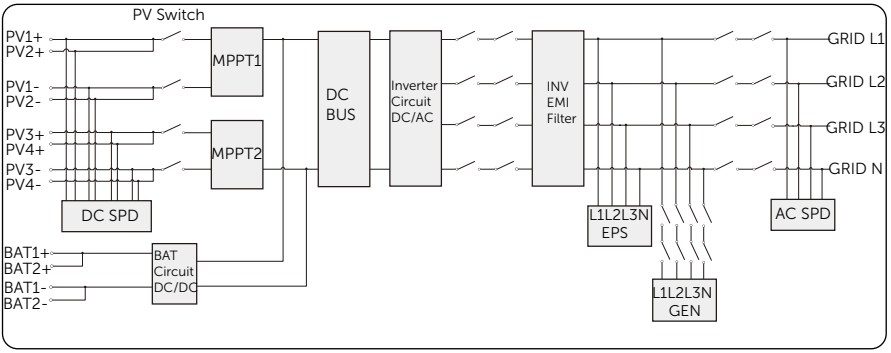


Figure 2-5 Circuit diagram for X3-NEO-LV series inverter

2.5.2 Application Schemes

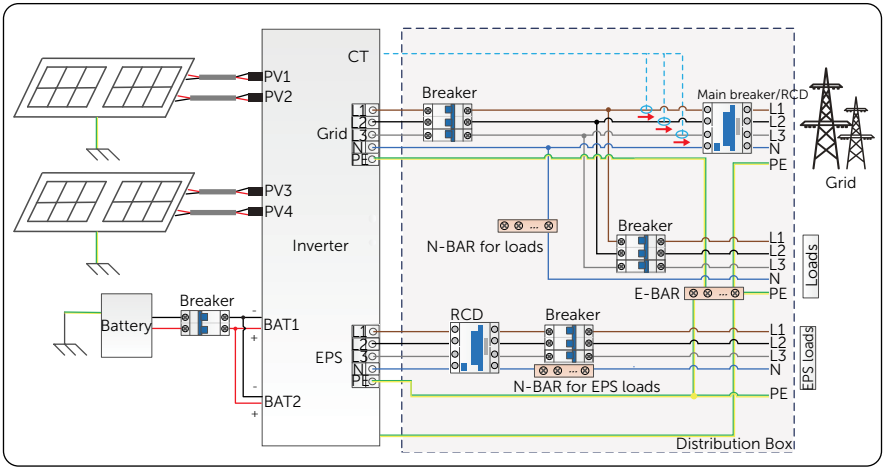


Figure 2-6 Partial home backup for most countries

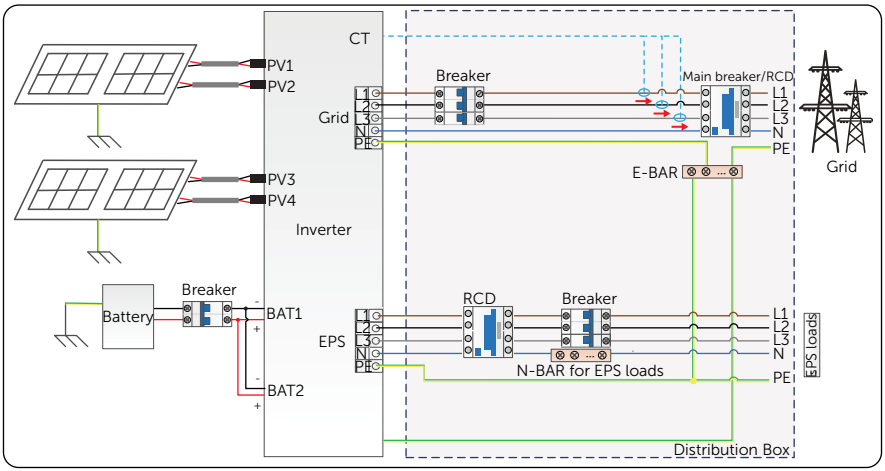


Figure 2-7 Whole home backup for most countries

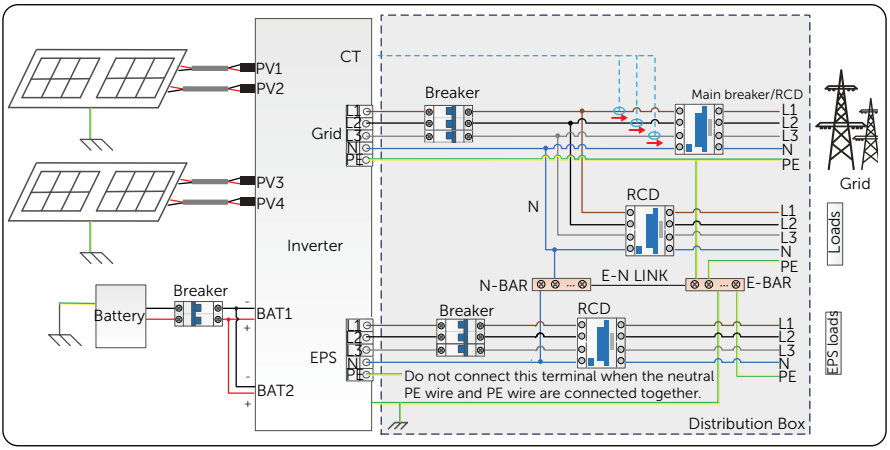


Figure 2-8 Neutral point connected to PE in distribution box

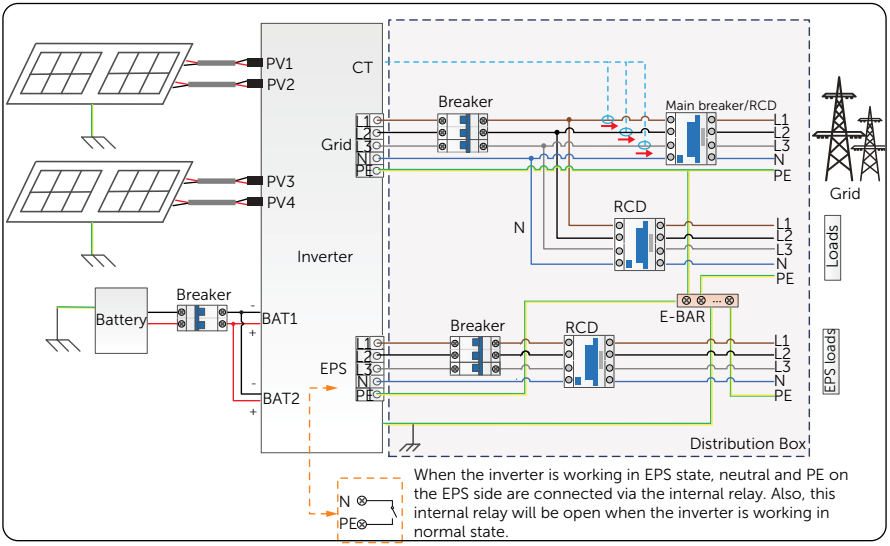


Figure 2-9 Neutral point separate from PE in distribution box

2.6 Working State

The series inverter supports Wait, Check, Normal, Fault, Update, EPS Wait, EPS, and GEN working states.

Table 2-3 Description of working state

State	Description
Wait	• The inverter is waiting for the conditions to be met in order to enter the check state.
Check	• The inverter is checking for conditions to enter the normal state or the EPS state.
Normal	• The inverter is working normally.
Fault	• The inverter detects error and prompts error code.
Update	• The inverter is updating its firmware (ARM, DSP, or BMS).
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 state).
EPS	• The inverter is working in EPS state.
GEN	• The inverter is in the generator operating state.

2.7 Work Mode (For Pakistan)

The work modes vary depending on the country. For how to set the work mode, see "11.3 Work Mode Settings".

2.7.1 SUB Mode

The mode uses the energy storage system as a backup power source and is suitable for applications with frequent power outage or wish to feed excess electricity generated by solar power into the grid. For LCD settings, see "SUB mode".

Figure 2-10 Description of SUB mode

Battery SOC or voltage	Battery charge source	Power supply situation
Battery 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 **Export** value in **Grid Settings**. • In off-grid situation, both PV and the battery supply power to the load.
	PV then grid	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 grid	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 Settings**.

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. For LCD settings, see "SBU mode".

Figure 2-11 Description of SBU mode

Battery SOC or voltage	Battery charge source	Power supply situation
Battery < **Return to Utility Voltage** or **Return to Utility SOC**	PV only	PV → battery, grid → load • PV charges the battery, and the load is supplied by the grid.
	PV then grid	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 and battery) • The grid supplies power to the load and charge the battery based on the **Max Charge Current**.
	PV and grid	PV and 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 Charge Current**.
	Load first (optional)	PV → load → battery → grid • Only some modes sopport load first. PV power prioritizes supplying the load. When the PV output exceeds the load demand, the excess energy is first used to charge the battery and is then supplied to the grid.
Battery > **Return to Utility Voltage** or **Return to Utility SOC**	Battery discharge	PV and 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** or **Return to Utility 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 application with 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.

For LCD settings, see "MKS/EPS mode".

Figure 2-12 Description of MKS mode

PV input	Battery SOC or voltage	Power supply situation
With PV input	SOC or voltage ≥ **Return to SBU**	• When MKS mode is set, the inverter will run in SBU mode logic. The **GRID** terminal relay is disconnected, the LCD screen displays normal, and the grid-connected flow line becomes dashed.
	SOC or 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. • In the **Load First** mode, PV power supplies the load first. Then, any remaining power is used to charge the battery.
No PV input	-	Grid → Load and battery • When you set the **Charge Source** to **PV Then Grid or PV and Grid**, the grid supplies power to the load and draws electricity from the grid to charge the battery based on the **Max Charge Current**. • When you set the **Charge Source** to **PV Only**, the grid can supply energy to the load but will not charge the battery.

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. For LCD settings, see "Force time use mode".

Figure 2-13 Description of Force Time Use Mode

Time period	Battery charge source	Power supply situation
Charge	PV only	PV → battery, grid → load • PV charges the battery, and the load is supplied by the grid.
	PV then grid	PV and grid → battery and 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 grid	PV and grid → battery and 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 Charge Current**.
	Load first (optional)	PV → load → battery → grid • PV power prioritizes supplying the load. When the PV output exceeds the load demand, the excess energy is first used to charge the battery and is then supplied to the grid.
Home load removed from grid	Battery discharge	Grid and battery → PV and grid → battery and 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	The battery charges according to the priority settings of the battery charging source mode.	

2.7.5 Manual Mode

This mode is intended for qualified personnel only, for debugging and maintenance. It allows manual adjustment of the battery charge and discharge power. For LCD settings, see "Manual mode".

2.8 Work Mode (Outside 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. For LCD settings, see "Self use mode".

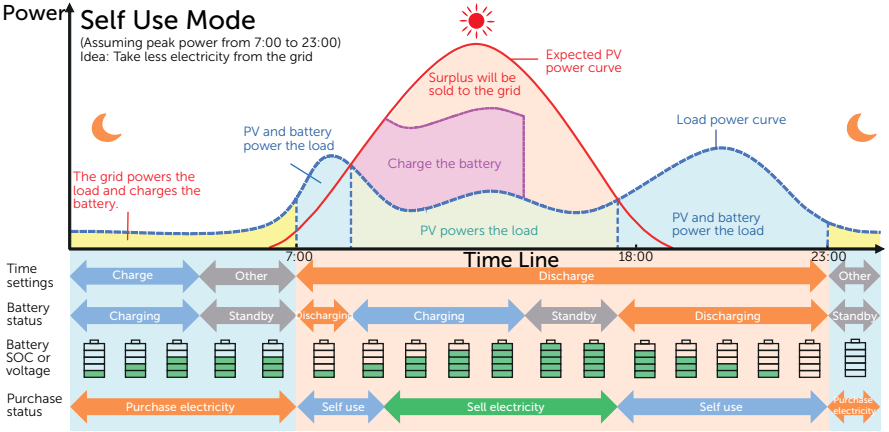


Figure 2-14 Self use mode

Table 2-4 Description of self use mode

Time period	Inverter working state
Charge	During this period, the battery does not discharge. PV → load → battery → grid • If **Charge from grid** is enabled, the system charges the battery from the grid up to (**Charge battery to** + 5% SOC) or (**Charge battery to** + 2 V).
Discharge	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 **Export** value in **Grid Settings** can be set on the inverter.
	PV is insufficient (PV and battery → load) • The battery discharges power to the load. Once its capacity reaches the value of min. SOC or voltage, it automatically stops discharging.

2.8.2 Feed-in Priority Mode (Priority: Loads > Grid)

The feed-in priority mode is suitable for areas with high feed-in subsidies. The power generated from the PV is directed towards supplying the loads. Any excess power beyond the load requirements will be fed into the power grid. For LCD settings, see "Feed-in priority mode".

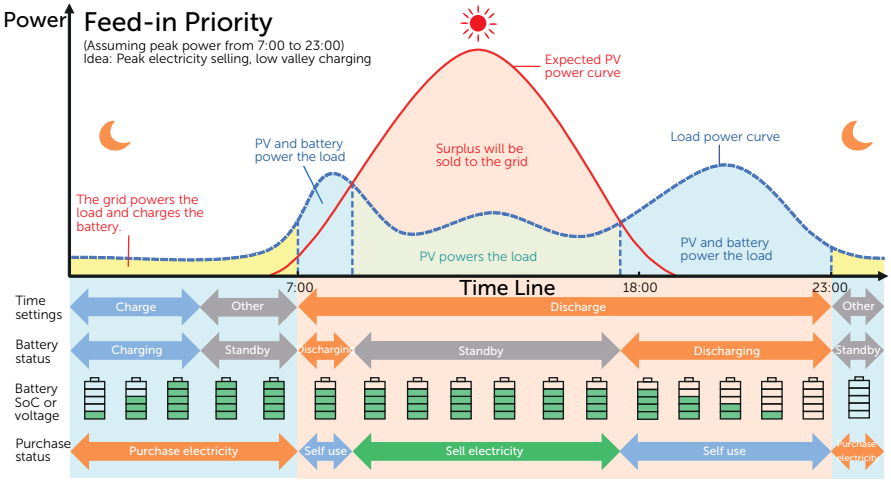


Figure 2-15 Feed-in priority

Table 2-5 Description of feed-in priority

Time period	Inverter working state
Charge	• Charge the battery first until the battery SOC or voltage reaches **MAX Charge SOC** or **MAX Charge Voltage**. Once the threshold is reached, PV power is prioritized for grid feed-in. You can choose whether to allow charging from the grid or not.
Discharge	PV is sufficient. (PV → load → grid) • The power generated from PV is directed towards supplying the loads. Any excess power beyond the load requirements will be fed into the power grid.
	PV is insufficient. (PV and battery → load) • You can choose whether the battery participates in selling power to the grid. The PV and battery supply power to the load at the same time. Once the battery capacity reaches the value of min. SOC or voltage, it automatically stops discharging.

2.8.3 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. For LCD settings, see "Backup mode".

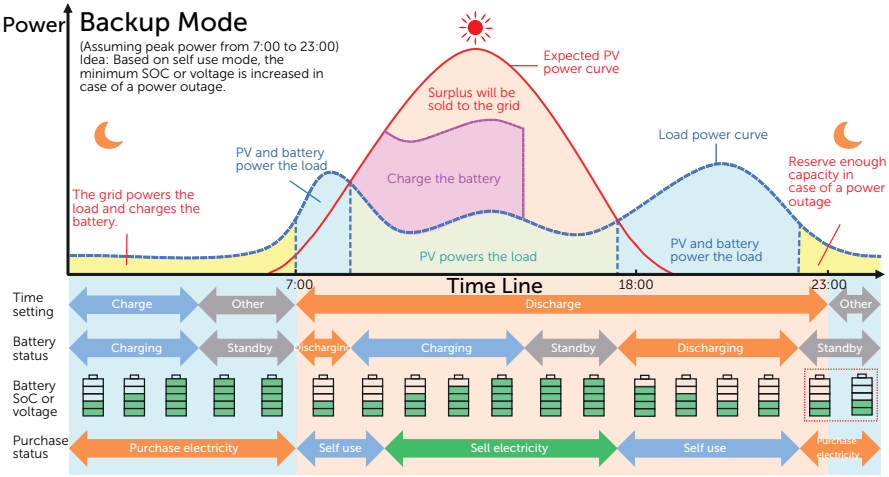


Figure 2-16 Backup mode

Table 2-6 Description of backup mode

Time period	Inverter working state
Charge	The working logic remains the same as for the self use mode. For details, see "2.8.1 Self Use Mode". During the charge period, the system charges the battery from the grid by default to ensure a high battery level.
Discharge	

NOTICE!

- If a power outage is planned, switch to backup mode in advance.

2.8.4 Peak Shaving Mode

Peak shaving mode is set for levelling out peaks in electricity use. The system is intelligently controlled to ensure charging takes place during off-peak hours and discharging occurs during peak hours. For LCD settings, see "Peak shaving mode".

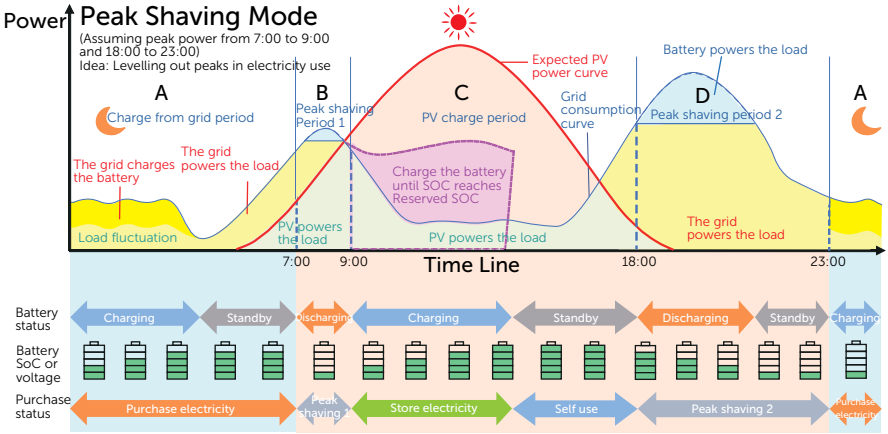


Figure 2-17 Peak shaving mode

Table 2-7 Description of peak shaving mode

Time period	Inverter working state
Period A : charge from grid period (night/early morning)	• You can enable or disable charging from grid. If enabled, the system charges the battery up from the grid to **Max SOC** or **Max Voltage** within the set **Charge Power**. During this period, the battery does not discharge power.
Period B & D : peak shaving periods (morning & evening peaks)	• The system continuously monitors grid consumption power against a pre-set **Peak Limits**. » (PV and grid → load) When charge is enabled and grid consumption < **Peak Limits**: The system draws remaining power from the grid to charge the battery until grid consumption reaches the Peak Limits. Charge is enabled, and grid consumption power > **Peak Limits** » (PV, battery and grid → load) When charge is enabled and grid consumption > **Peak Limits**: The battery discharges power for loads to "shave" the peak, reducing the amount of power purchased from the grid.
Period C : PV charge period (daytime)	(PV → battery → load → grid) • The battery does not discharge power. PV energy is prioritized to charge the battery up to the **Reserved SOC** or **Reserved Voltage**. Loads are powered by surplus PV and the grid.

2.8.5 Manual Mode

This mode is intended for qualified personnel only, for debugging and maintenance. It allows manual adjustment of the battery charge and discharge power. For LCD settings, see "Manual mode".

2.9 Export 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. The **Export** value in **Grid Settings** can be set from 0 W to more than the rated output power. For LCD settings, see "11.6 Grid Settings".

How export control works

- CT or meter required.
- Correct setting of the limit value of **Export** through inverter. For the parallel system, set on the master inverter.

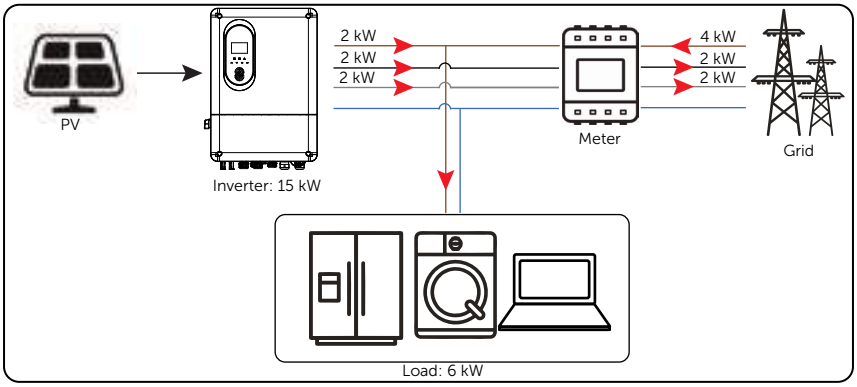


Figure 2-18 Zero **Export** with **Unbalance output** disabled

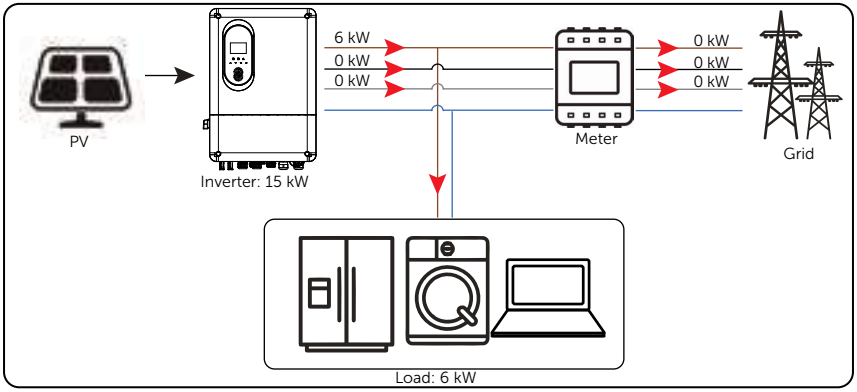


Figure 2-19 Zero **Export** with **Unbalance output** enabled

3 System Overview

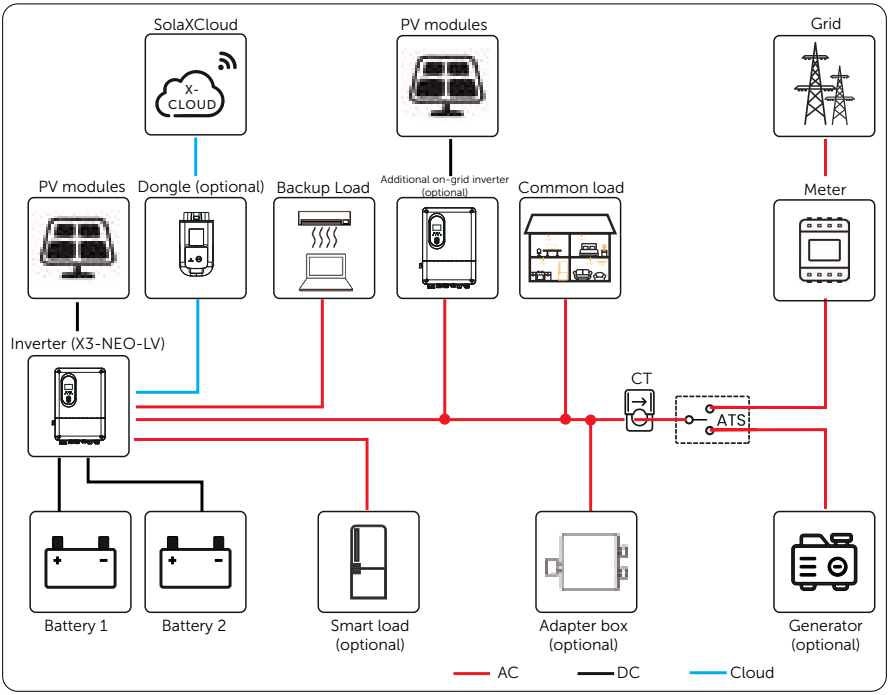


Figure 3-1 System diagram

NOTICE!

- This section uses a specific device model as an example. Please refer to your actual devices.

Table 3-1 System item description

Item	Description
Inverter (X3-NEO-LV series inverter 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 or export or consumption readings, and manages the battery charge and 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 SolaXCloud, 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

- The inverter must be transported in its original packaging. SolaX will not be held responsible for any damage to the inverter caused by improper transportation or by transportation after it has been installed.
- Observe the caution signs on the packaging of inverter before transportation.
- Pay attention to the weight of the inverter. Carry the inverters by the required number of personnel 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.

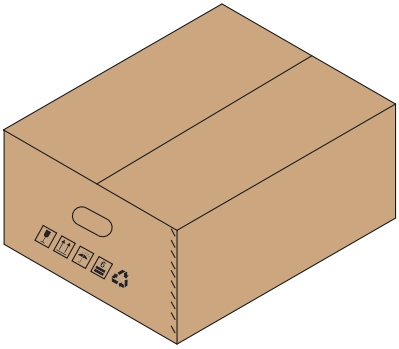


Figure 4-1 Caution signs on the packaging

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.

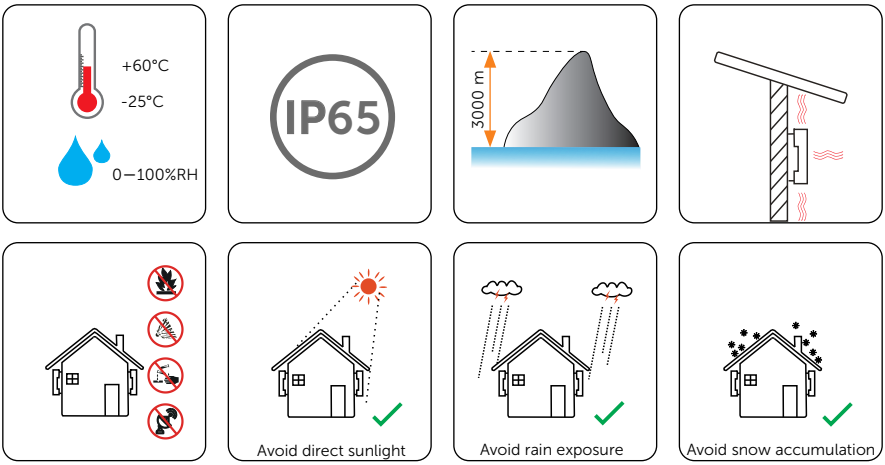
5 Preparation before Installation

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 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.

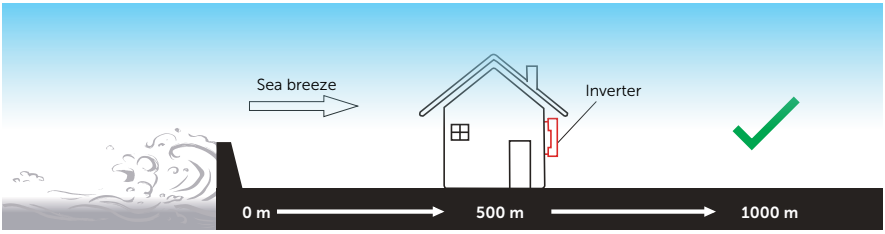


Figure 5-1 Recommended installation position

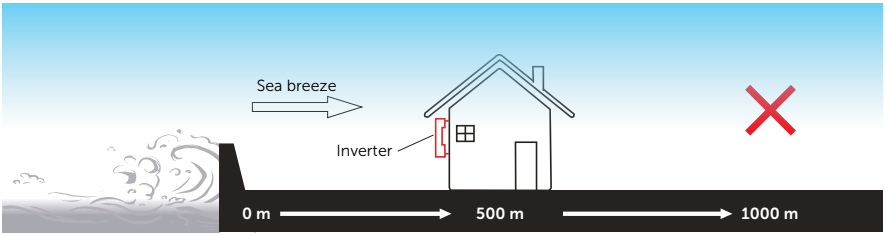


Figure 5-2 Incorrect installation position

NOTICE!

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

5.1.2 Installation Carrier Requirements

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.

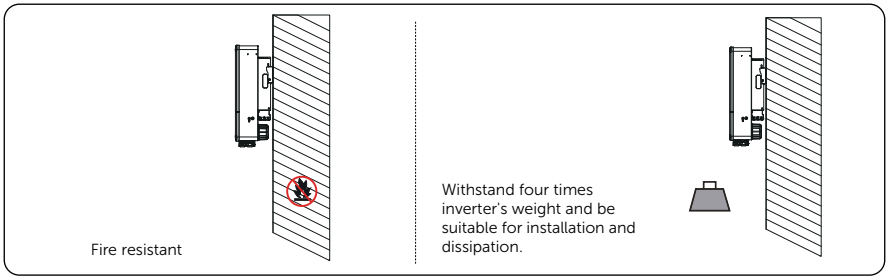


Figure 5-3 Installation carrier requirement

NOTICE!

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

5.1.3 Clearance Requirements

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.

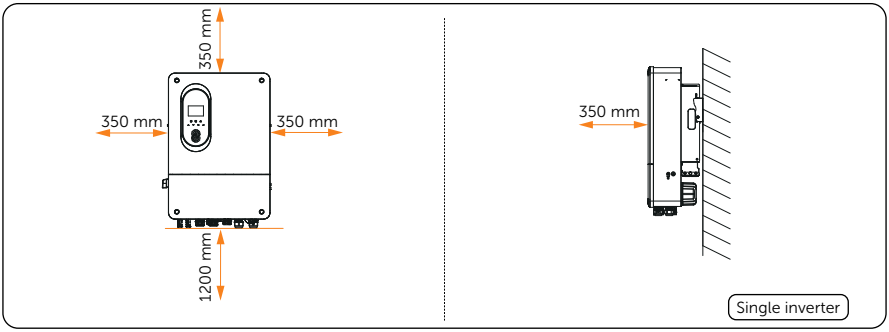


Figure 5-4 Clearance requirement for single inverter

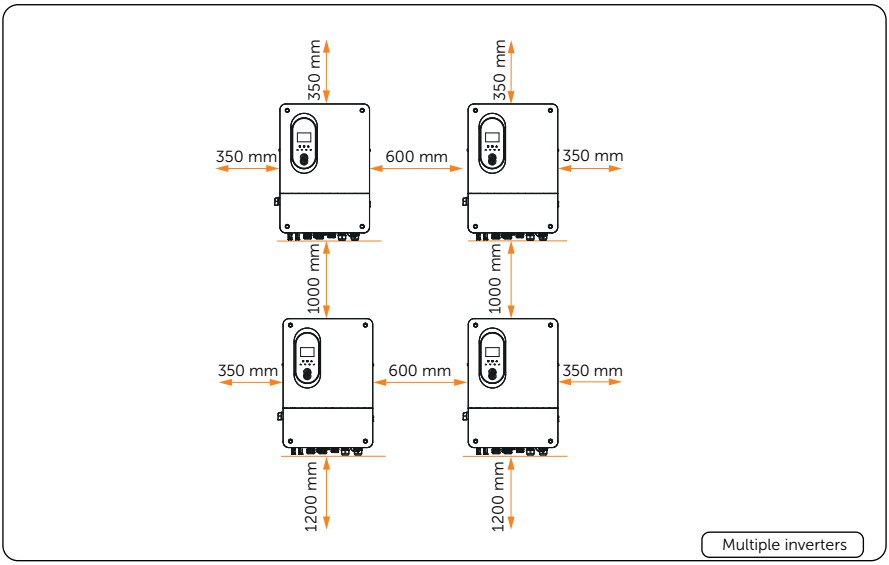


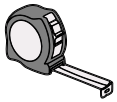
Figure 5-5 Clearance requirement for multiple inverters

5.2 Tools Requirements

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)

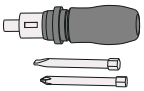

Multimeter
(≥ 1100 V DC)

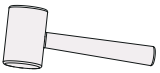

Measuring tape


Utility knife

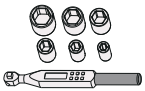

Marker

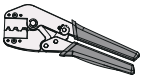

Spirit level

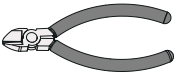

Torque screwdriver
(Flat-head: M2)
(Phillips head: M2.5/M3/M5)

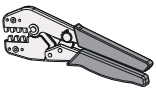

Rubber mallet


Wire stripper

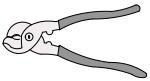

Torque wrench


Crimping tool for
PV terminals


Diagonal pliers

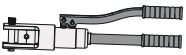

Crimping tool


Crimping tool for RJ45


Wire cutter


Heat shrink tubing
(Ø8 mm)

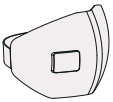

Heat gun


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 Breaker recommended for grid connection (with EPS)

Model	5 kW	8 kW	10 kW	12 kW	15 kW	20 kW
On-grid Breaker	25 A	32 A	50 A	50 A	50 A	63 A

Table 5-3 Breaker recommended for grid connection (without EPS)

Model	5 kW	8 kW	10 kW	12 kW	15 kW	20 kW
On-grid Breaker	25 A	32 A	50 A	50 A	50 A	63 A

Table 5-4 Breaker recommended for off-grid connection (only EPS)

Model	5 kW	8 kW	10 kW	12 kW	15 kW	20 kW
EPS Breaker	25 A	32 A	50 A	50 A	50 A	63 A

Table 5-5 Breaker recommended for battery connection

Model	5 kW	8 kW	10 kW	12 kW	15 kW	20 kW
DC Breaker	200 A	320 A	320 A	400 A	400 A	400 A

Table 5-6 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.

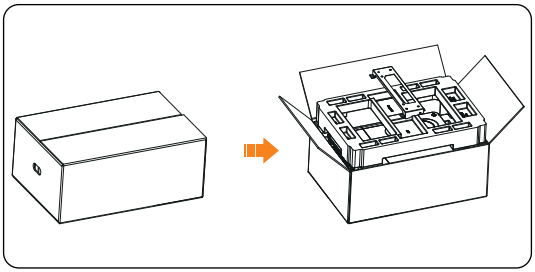
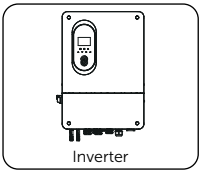
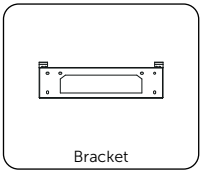


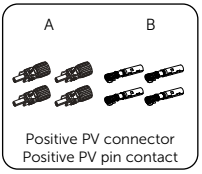
Figure 6-1 Unpacking the inverter

- 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.

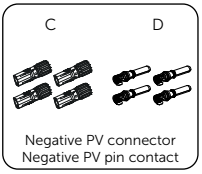
6.2 Scope of Delivery


Inverter

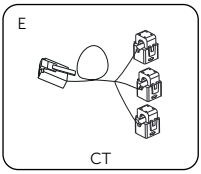

Bracket



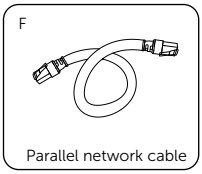
Positive PV connector
Positive PV pin contact



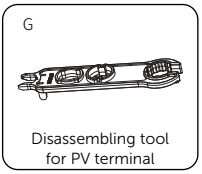
Negative PV connector
Negative PV pin contact



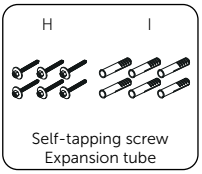
CT



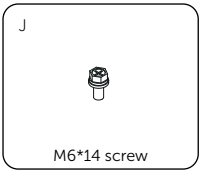
Parallel network cable



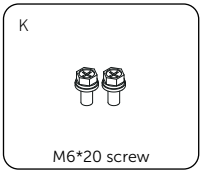
Disassembling tool
for PV terminal



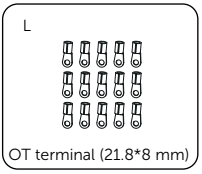
Self-tapping screw
Expansion tube



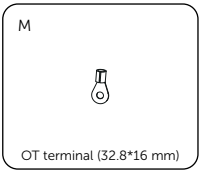
M6*14 screw



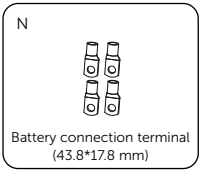
M6*20 screw



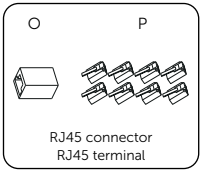
OT terminal (21.8*8 mm)



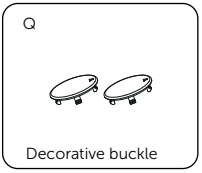
OT terminal (32.8*16 mm)



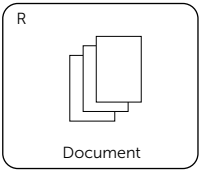
Battery connection terminal
(43.8*17.8 mm)



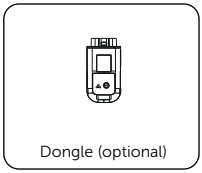
RJ45 connector
RJ45 terminal



Decorative buckle



Document


Dongle (optional)

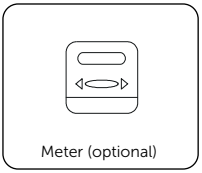

Meter (optional)

Table 6-1 Packing list

Item	Description	Quantity	Remark
/	Inverter	1 pc	
/	Bracket	1 pc	

Item	Description	Quantity	Remark
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	
E	CT	1 pc	
F	Parallel network cable	1 pc	For parallel connection.
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	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
- This section uses a specific dongle model as an example. Please refer to your actual dongle. For dongle installation, see its documentation.

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.

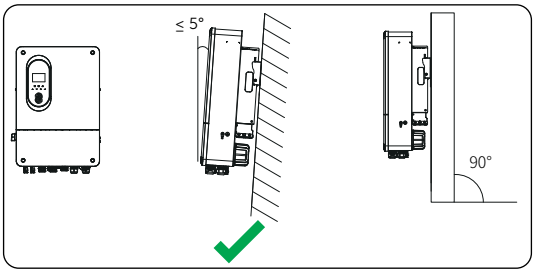


Figure 7-1 Correct installation

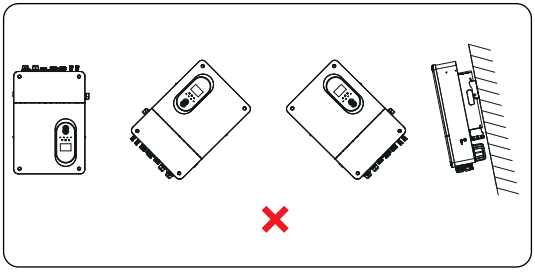


Figure 7-2 Incorrect installation

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.

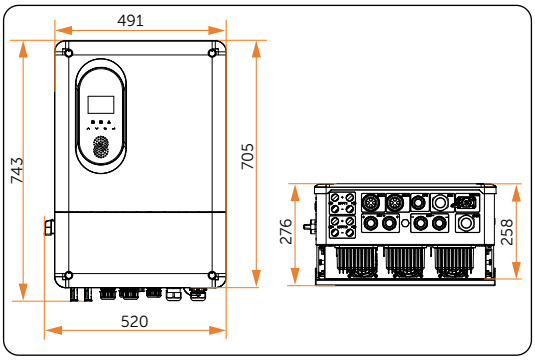


Figure 7-3 Dimensions 1 (unit: mm)

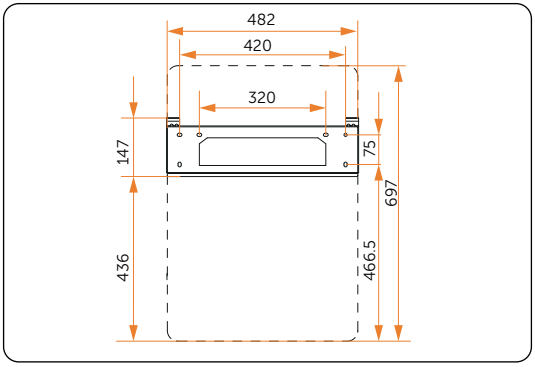


Figure 7-4 Dimensions 2 (unit: mm)

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.

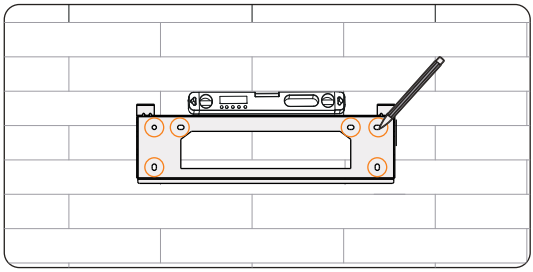


Figure 7-5 Marking the holes

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

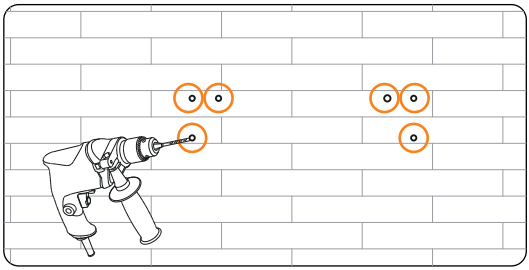


Figure 7-6 Drilling holes

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

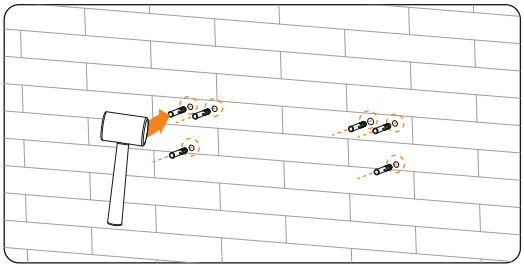


Figure 7-7 Knock the expansion tubes

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.

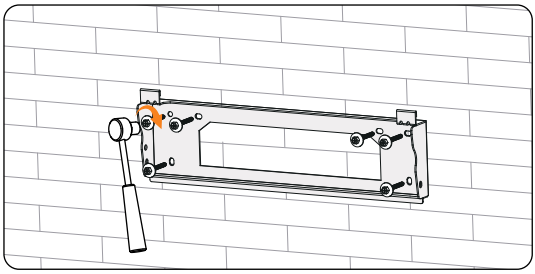


Figure 7-8 Securing the wall mounting bracket

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.

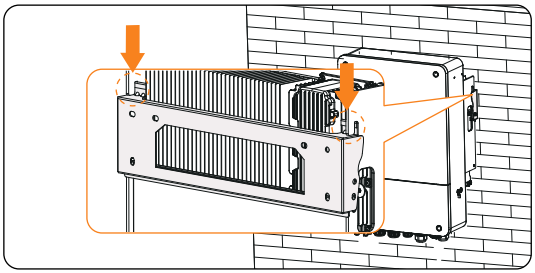


Figure 7-9 Hanging the inverter

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

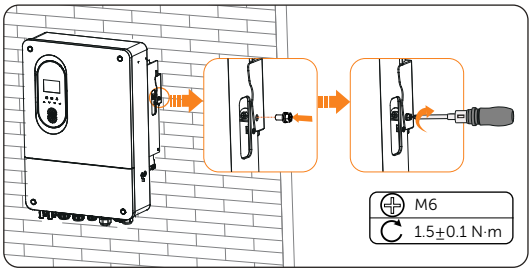


Figure 7-10 Securing the inverter (right side)

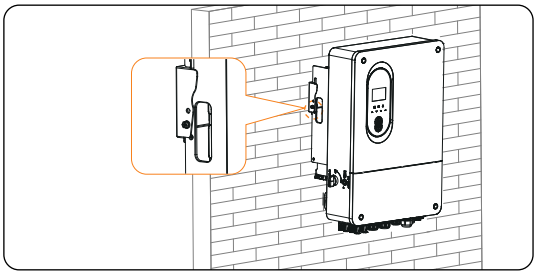


Figure 7-11 Securing the inverter (left side)

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.

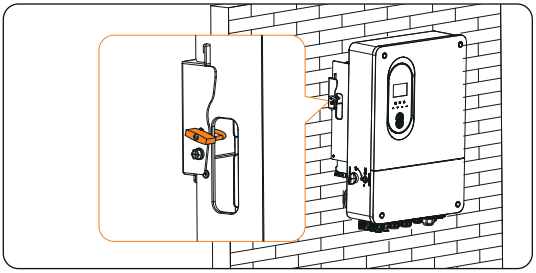


Figure 7-12 Locking the inverter

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

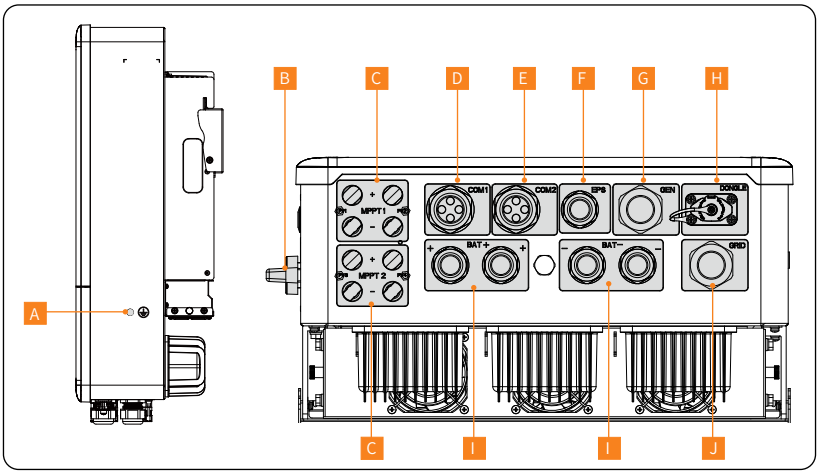


Figure 8-1 Terminals of inverter

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 the EPS load.	DVC-C
G	**GEN**	AC terminal connecting to the generator.	DVC-C
H	**Dongle**	Firmware upgrading and dongle connection	DVC-A
I	**BAT+**, **BAT-**	Battery terminal connecting to the battery power cable.	DVC-C
J	**GRID**	AC terminal connecting to the power grid.	DVC-C

8.1.2 Cable Connections of Inverter

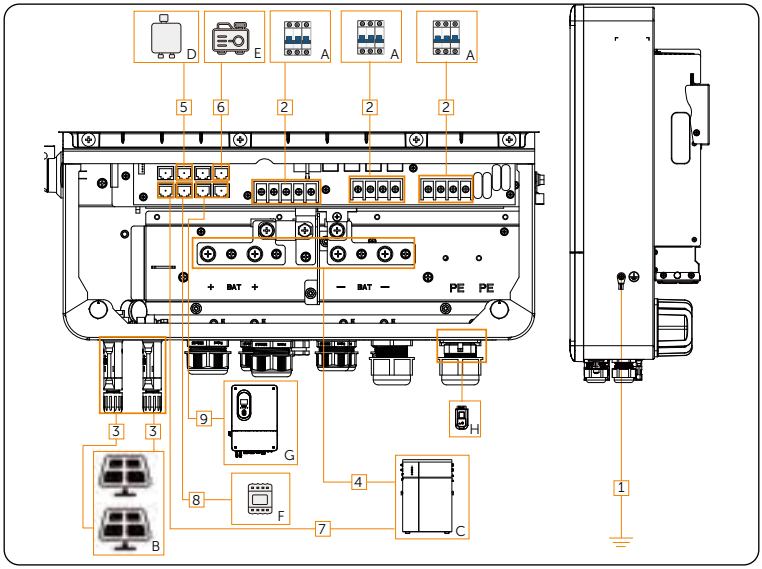


Figure 8-2 Cable connections of inverter

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 from the same brand, model, and version should be connected. For lead-acid 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 is supported. This section uses a specific dongle model as an example. Please refer to your actual dongle.	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
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 wire to an appropriate length.

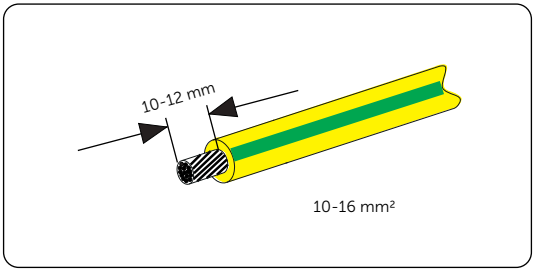


Figure 8-3 Stripping the PE wire

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

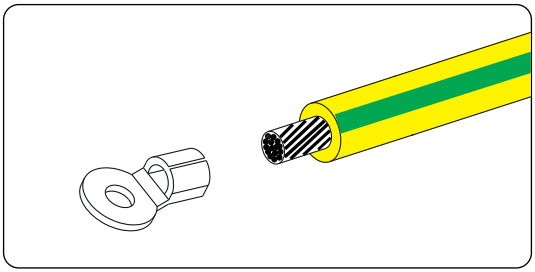


Figure 8-4 Installing the tubing and OT terminal

Step 3: Crimp it with crimping tool.

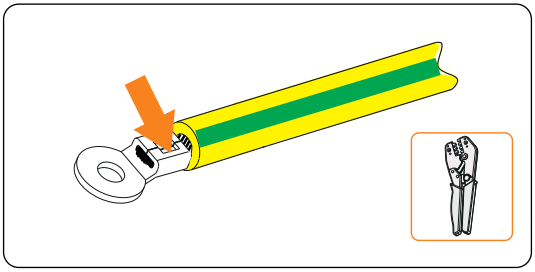


Figure 8-5 Crimping the cable

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

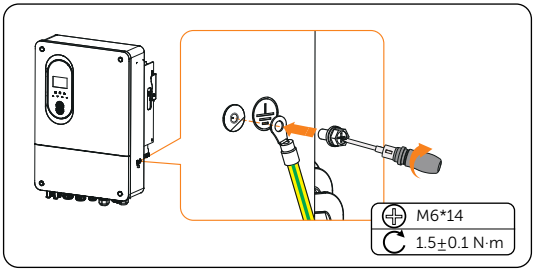


Figure 8-6 Securing the PE wire

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 350 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
  - » The X3-NEO-LV series inverter is compatible with SolaX low-voltage batteries (TP-LD53, TP-LD150). A single inverter supports up to 16 batteries, with no minimum requirement.

Wiring procedures

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

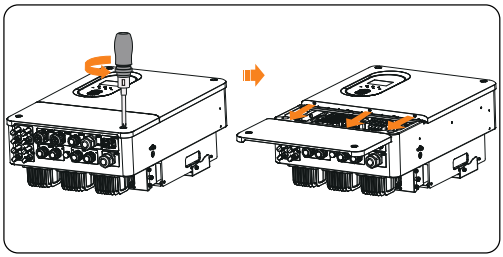


Figure 8-7 Removing the upper cover

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

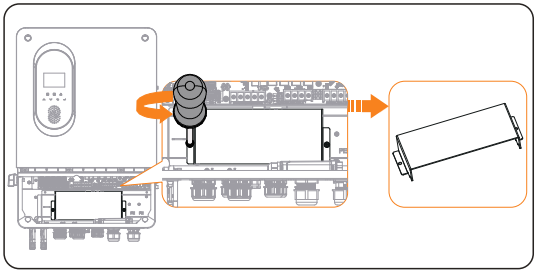


Figure 8-8 Remove the protective cover

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

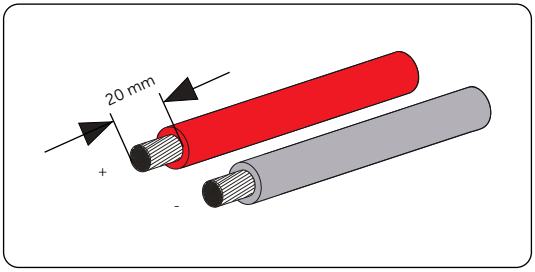


Figure 8-9 Stripping the battery cable

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

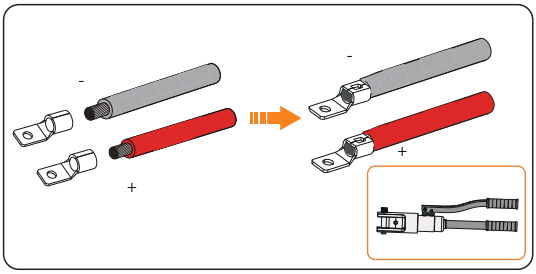


Figure 8-10 Crimping the terminal

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

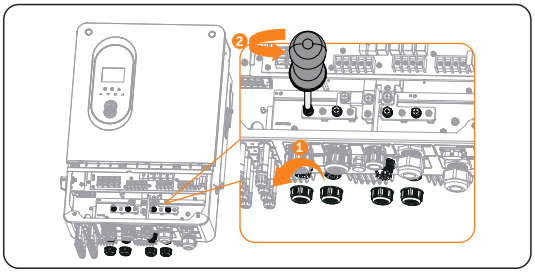


Figure 8-11 Threading the battery cable

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. Gently pull the cable backward to ensure firm connection. Tighten the swivel nut clockwise.

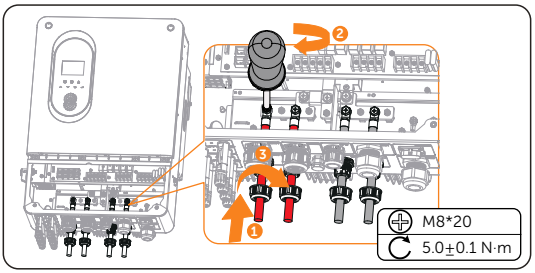


Figure 8-12 Connecting the battery cables

Step 7: Reinstall the protective cover onto the inverter.

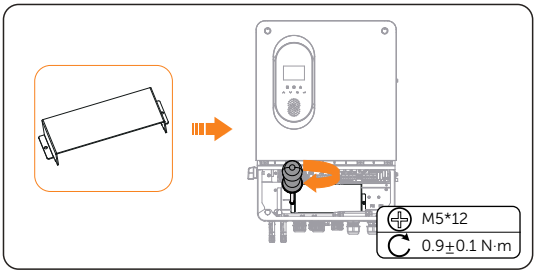


Figure 8-13 Reinstall the protective cover

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/220 V, 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 **Reset** 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.

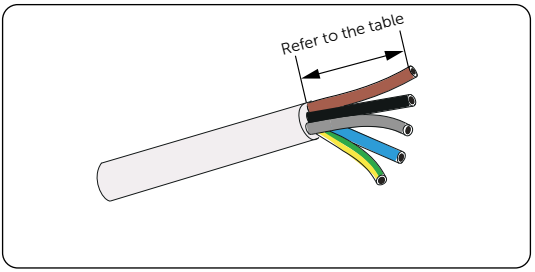


Figure 8-14 Stripping the cable

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.

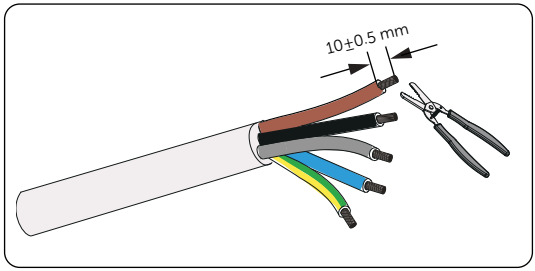


Figure 8-15 Strip the insulation

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

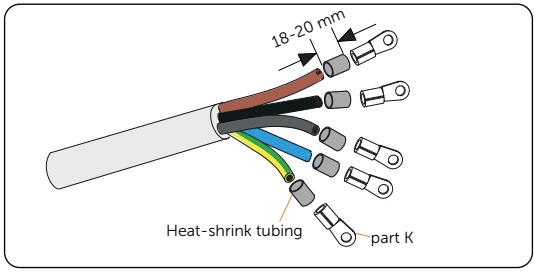


Figure 8-16 Installing the tubing and OT terminal

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.

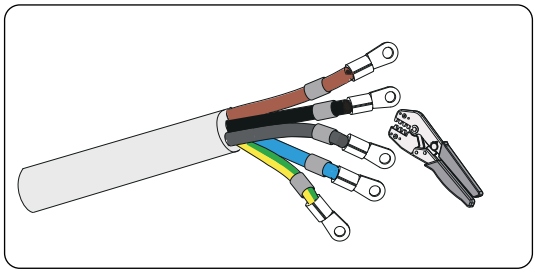


Figure 8-17 Crimping the cable

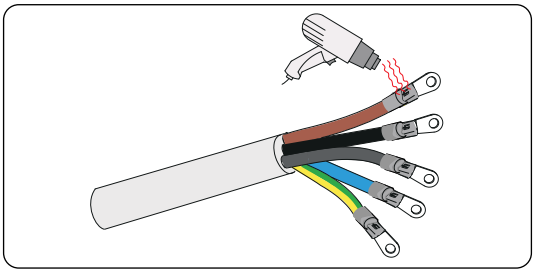


Figure 8-18 Shrinking the tubing

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

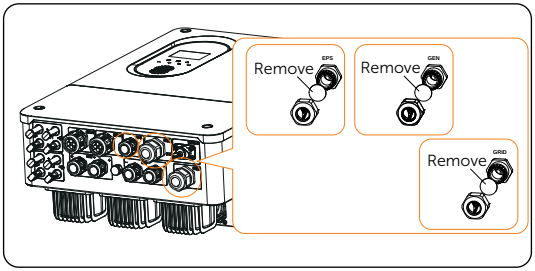


Figure 8-19 Removing the swivel nut

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.

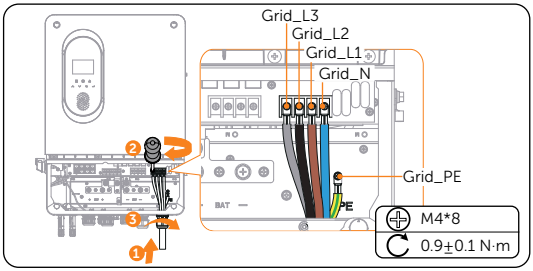


Figure 8-20 GRID terminal connection

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.

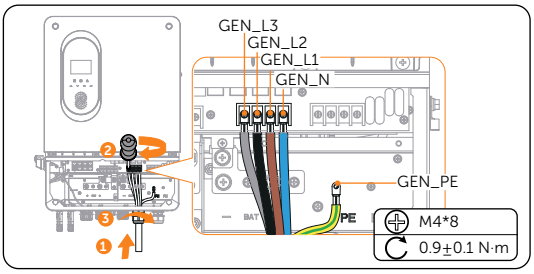


Figure 8-21 GEN terminal connection

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.

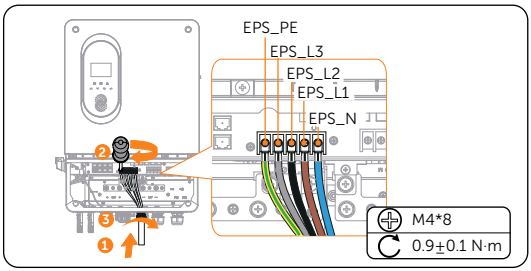


Figure 8-22 EPS terminal connection

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.

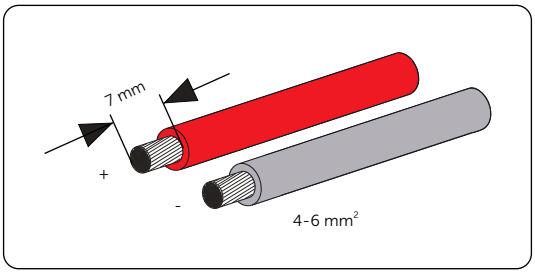


Figure 8-23 Stripping the PV cable

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

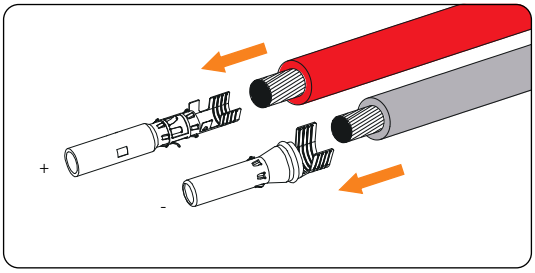


Figure 8-24 Inserting the PV pin contact

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

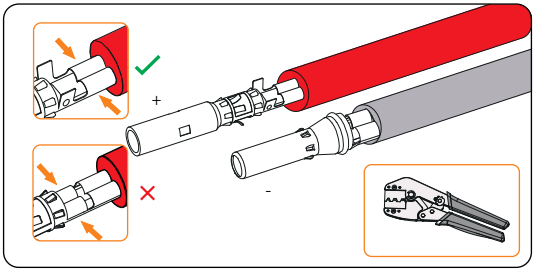


Figure 8-25 Crimping the terminal

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

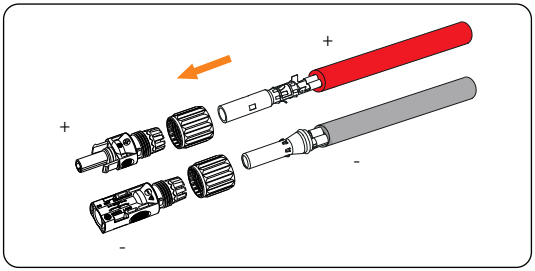


Figure 8-26 Threading the PV cable

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.

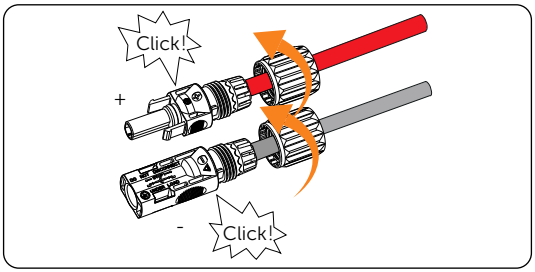


Figure 8-27 Securing the PV cable

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.

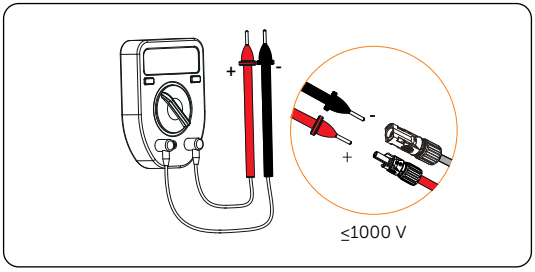


Figure 8-28 Measuring the voltage of PV connectors

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.

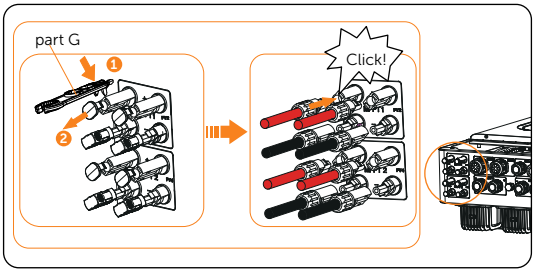


Figure 8-29 Connecting the PV cable

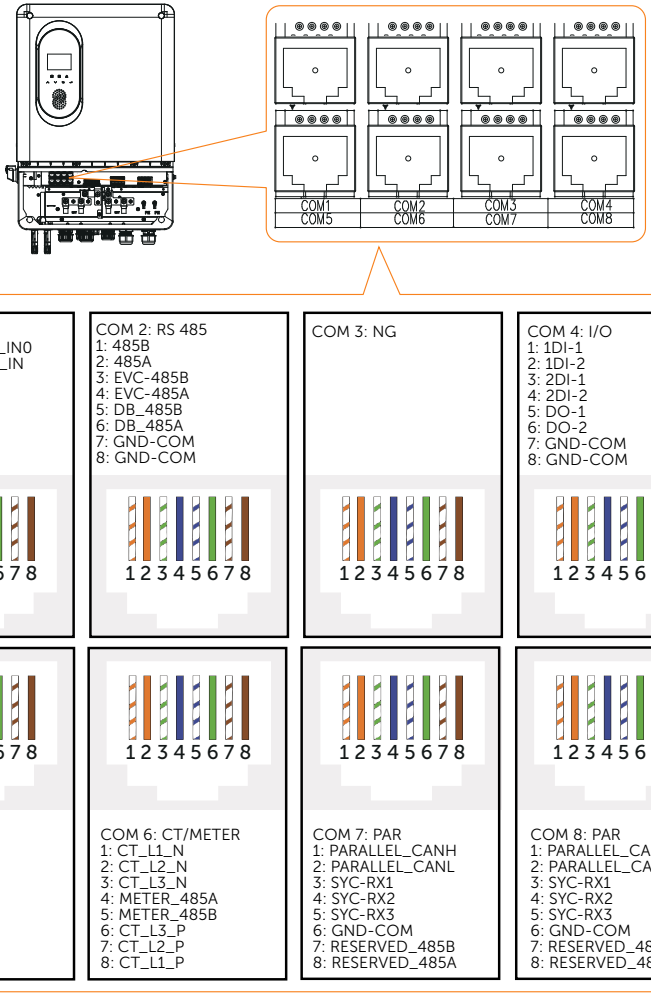
WARNING!

- 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 generator connection via I/O terminal, battery communication via BMS terminal, CT/Meter connection via **CT/METER** terminal, parallel connection via PAR terminal.



NOTICE!

- When using the lithium battery, refer to "9.5.1 Battery Communication Connection" for wiring procedure.

9.2 COM1 Communication Connection

Table 9-6 Pin assignment of the COM1 terminal

Pin Number	Pin assignment	Description
1	SHUTDOWN1_IN0	Emergency shutdown for the entire inverter system.
2	SHUTDOWN1_IN	
4	RED-485A	Differential the data for Modbus RS-485 communication
5	RED-485B	

9.3 COM2 Communication Connection

Table 9-7 Pin assignment of the COM2 terminal

Pin	Pin assignment	Description
3	EVC-485B	Connect to the EV charger's RS-485 terminal.
4	EVC-485A	

9.4 COM4 Communication Connection

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

For generator connection, please refer to "16.2 Application of Generator" for specific application.

Table 9-8 COM4 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	Grounding
8	GND-COM	

9.4.1 Generator Communication Connection

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.

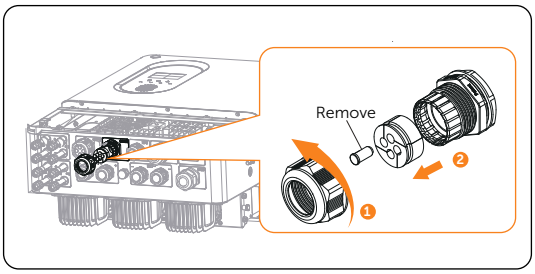


Figure 9-30 Removing the swivel nut

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.

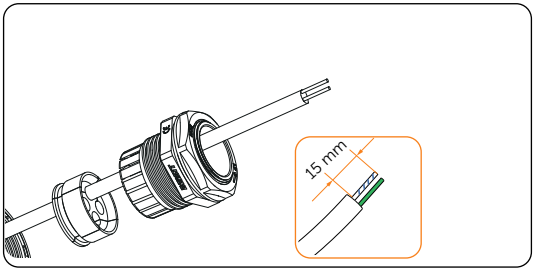


Figure 9-31 Threading the cable

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.

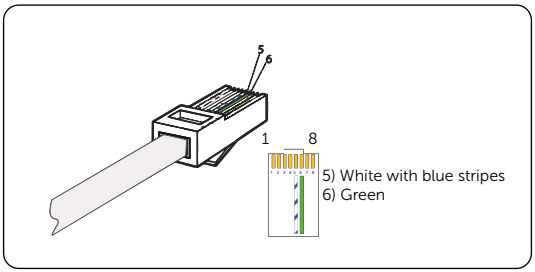


Figure 9-32 Crimping the communication cable

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

9.5 COM5 Communication Connection

9.5.1 Battery Communication Connection

Connection diagram

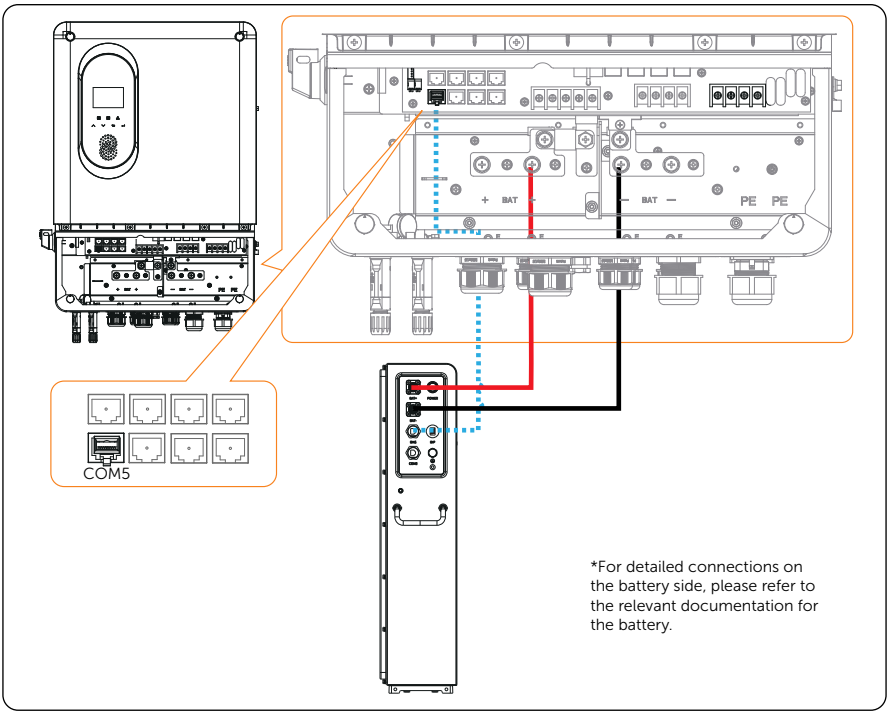


Figure 9-33 BMS connection diagram

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.

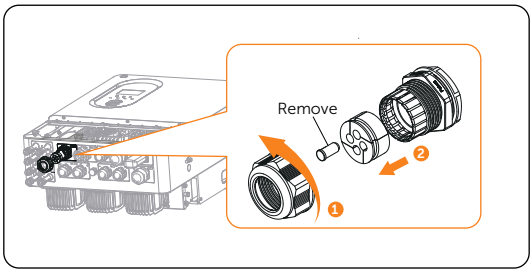


Figure 9-34 Disassembling the connector

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.

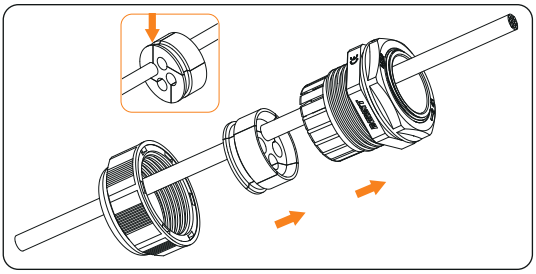


Figure 9-35 Threading the cable

Step 3: Strip the insulation to an appropriate length.

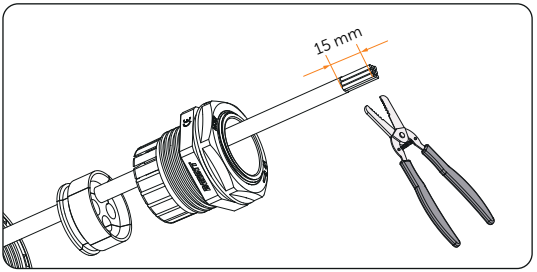


Figure 9-36 Stripping the insulation

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.

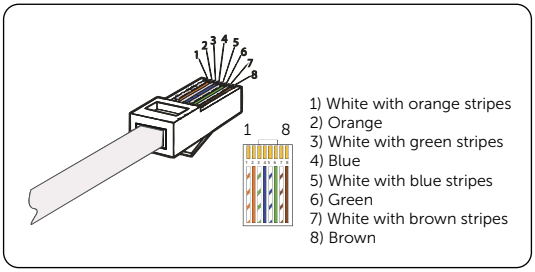


Figure 9-37 Crimping the communication cable

Step 5: Insert the RJ45 connector into the **COM5** located inside the inverter. You will hear an audible "click". Tighten the swivel nut.

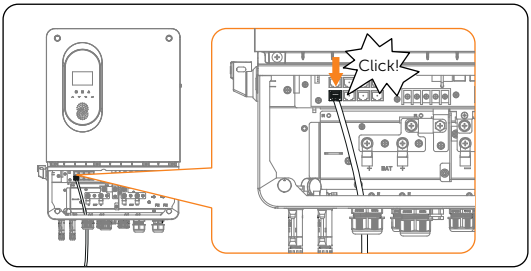


Figure 9-38 Inserting the connector to COM 1

Step 6: Set the DIP switch to **ON**.

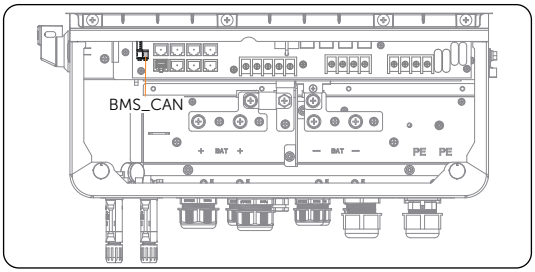


Figure 9-39 Switch on the DIP switch

9.6 COM6 Communication Connection

9.6.1 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, follow "CT connection with common loads on GRID terminal"; otherwise, follow "CT connection without common loads on GRID terminal".

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** terminal.

- CT connection diagram

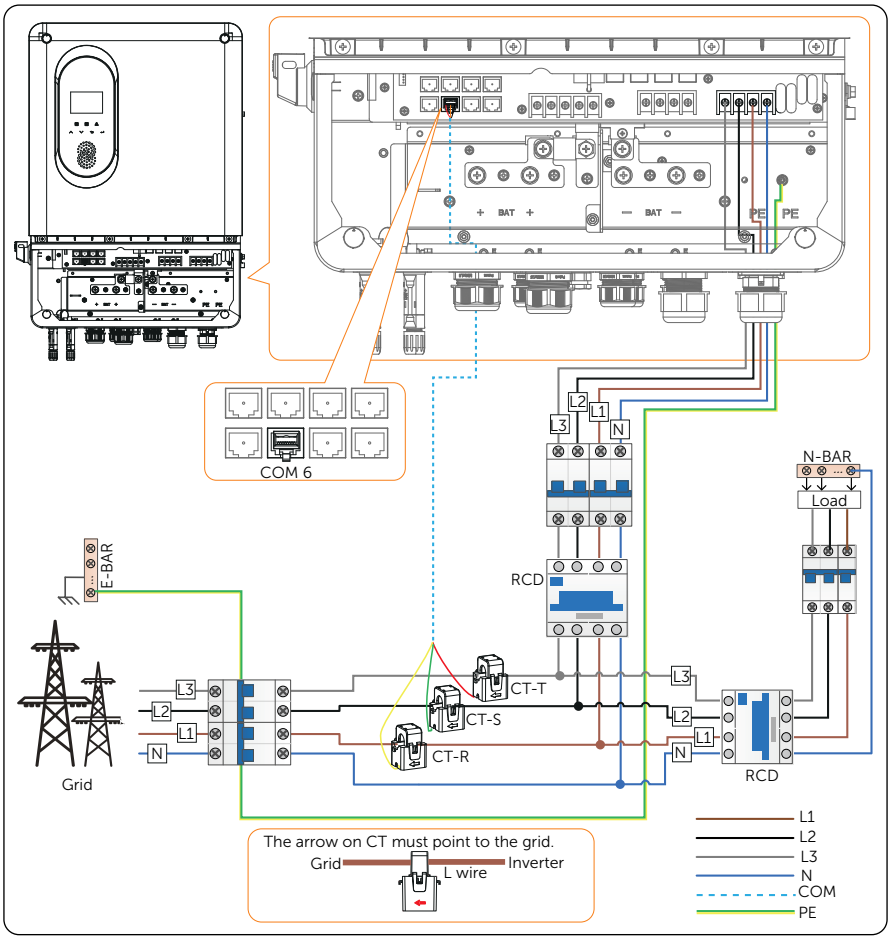


Figure 9-40 CT connection diagram

- Meter connection diagram

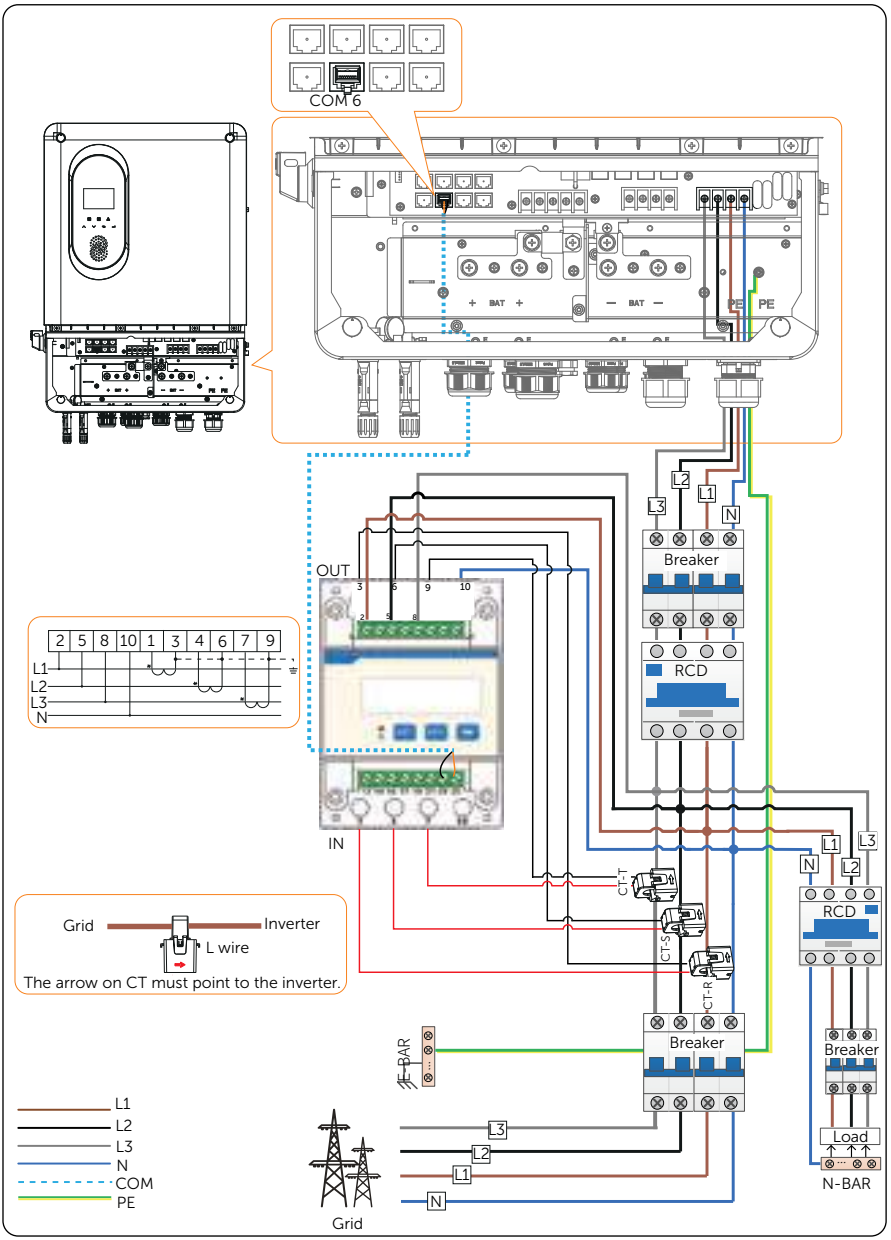


Figure 9-41 Meter connection diagram

9.6.2 CT Connection Procedure

CT connection without common loads on GRID terminal

When all loads are connected to the **EPS** terminal and none are connected to the **GRID** terminal, connect the CT as follows:

Step 1: Insert the RJ45 connector of the CT module (Part E) into the **COM6** port inside the inverter. Push firmly until you hear a "click" to ensure a secure connection.

Step 2: Ensure the arrow on the CT points toward the grid, then clamp the CT module onto the L1, L2, and L3 wires of the GRID terminal.

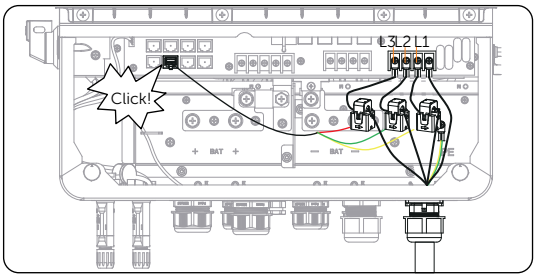


Figure 9-42 Connecting the CT with no load on the GRID terminal

CT connection with common loads on GRID terminal

When any load is directly connected to the **GRID** terminal, connect the CT as follows:

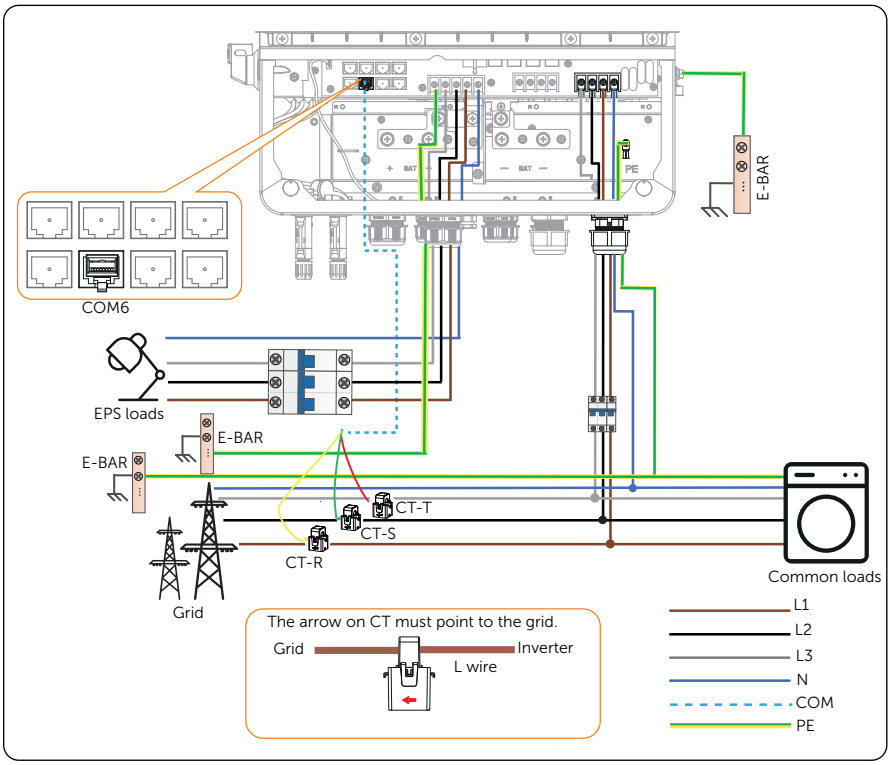


Figure 9-43 Connecting the CT with common loads on the GRID terminal

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.

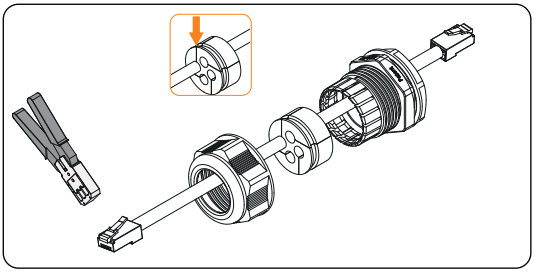


Figure 9-44 Crimping the RJ45

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).

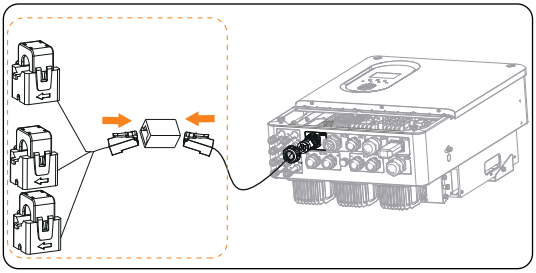


Figure 9-45 CT connection diagram

9.6.3 (Optional) Meter Connection Procedure

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.

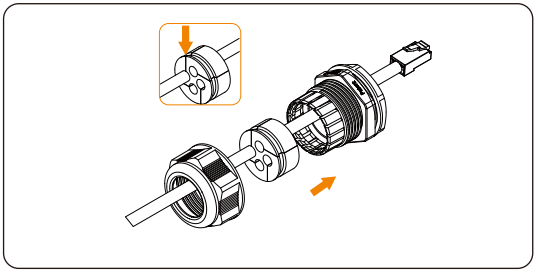


Figure 9-46 Threading the cable

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.

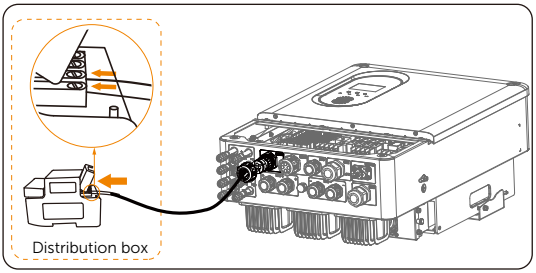


Figure 9-47 Meter connection diagram

9.7 COM7/COM8 Communication 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, refer to "16.2 Application of Parallel Function".

9.7.1 Pin Assignment of the COM7/COM8 Terminal

Pin	Description
1 to 6	For parallel communication
7 and 8	Differential the data for Modbus RS-485 communication

9.7.2 Parallel Communication Connection

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 F) through the swivel nut, cable support sleeve and connector enclosure in sequence.

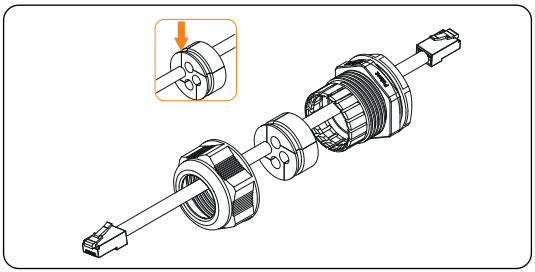


Figure 9-48 Threading the parallel network cable

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 switches of the master and the last of the parallel units to **ON**.

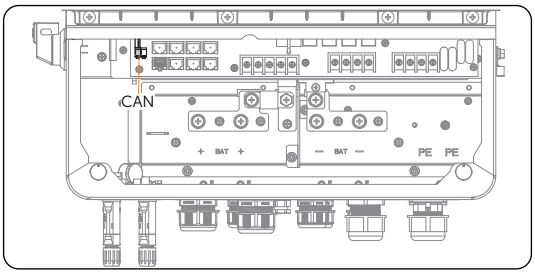


Figure 9-49 Switch on the DIP switch

NOTICE!

- For all slave units between the master unit and the final slave unit, the DIP switch must be in the **OFF** position.

9.8 Upper Cover Installation

Step 1: After the connection is completed, replace the upper cover as follows.

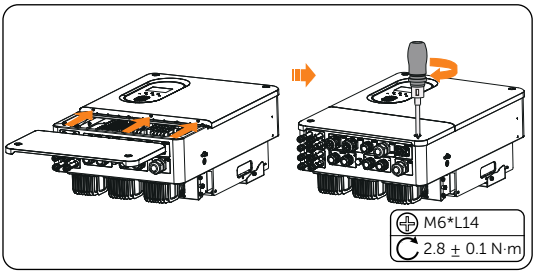


Figure 9-50 Install the upper cover

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

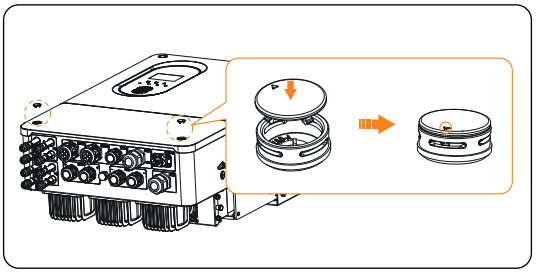
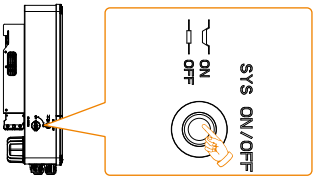


Figure 9-51 Install the upper cover

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

NOTICE!

- The user interface shown is for reference only and may vary based on your selected settings. Refer to the actual interface.
- Due to product updates, the actual interface may differ. Refer to the actual interface.

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

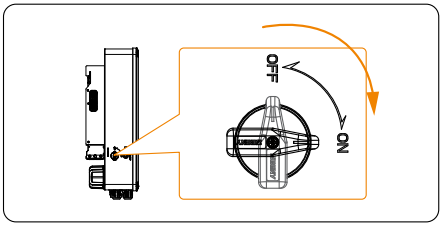
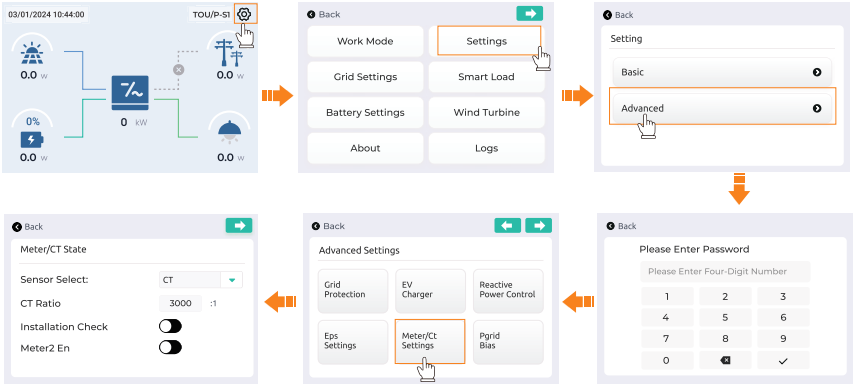


Figure 10-52 Turning on the PV switch

» If the LCD screen is off, turn off the PV switch and check whether the PV polarity is connected correctly.

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

Step 2: On the main screen, go to ⚙ > **Settings** > **Advanced**, enter the password (default: **2 0 1 4**), and select **Meter/Ct Settings** to set the sensor (default sensor: **CT**).



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

Step 4: Press the system switch to turn it **ON**.

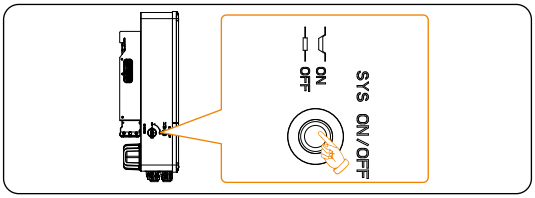
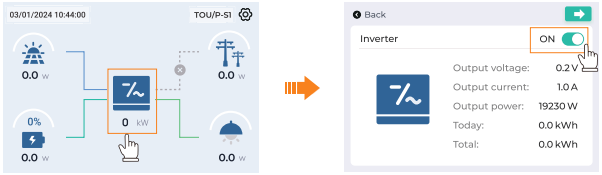


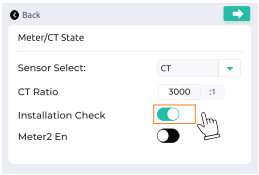
Figure 10-53 Turning the system switch to **ON**

Step 5: On the LCD screen, enable the system switch.



Step 6: Wait for the inverter to start up.

Step 7: After initial power-up, return to the main screen, go to ⚙ > **Settings** > **Advanced**, enter the password (default: **2 0 1 4**), select **Meter/Ct Settings**, and enable **Installation Check** to verify the CT sensor setup.



NOTICE!

- **Installation Check** is available when the CT is connected to the **GRID** terminal. If you connect a meter to the **GRID** terminal, this setting is unavailable, and you must check the meter wiring manually.

11 Operation on LCD

NOTICE!

- The user interface shown is for reference only and may vary based on your selected settings. Refer to the actual interface.
- Due to product updates, the actual interface may differ. Refer to the actual interface.

11.1 Control Panel Introduction

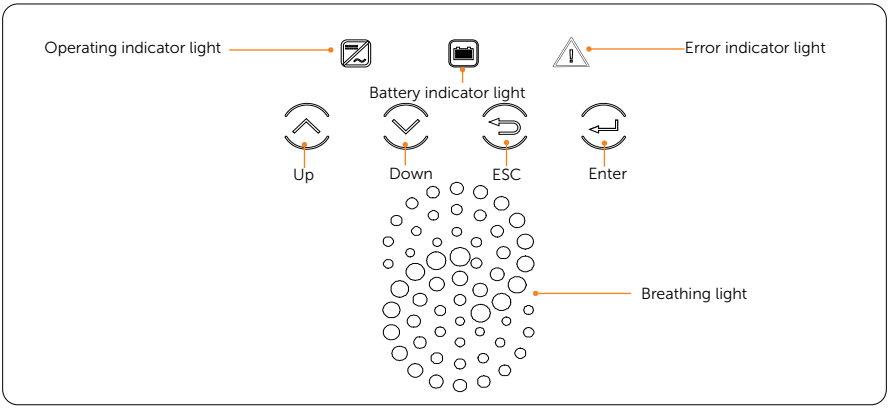


Figure 11-1 Control Panel

LED indicator

Table 11-1 Definition of indicators

LED indicator	Status		Definition
Operating		Light on	The inverter is in grid-connected operation state or off-grid operation state..
		Blinking	The inverter is in the process of grid connection or off-grid.
	/	OFF	The inverter is in fault or manual shutdown state.
Battery		Light on	The battery is online and the voltage is normal.
	/	OFF	Low battery voltage or no battery.

LED indicator	Status		Definition
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.

Operation button

Table 11-2 Definition of buttons

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

Breathing light

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.

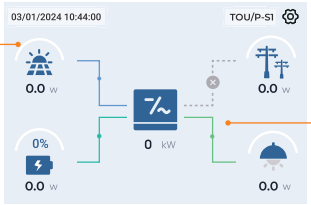
11.2 Main Screen Overview

NOTICE!

- Due to product updates, the user interface may differ. Please refer to your actual product.

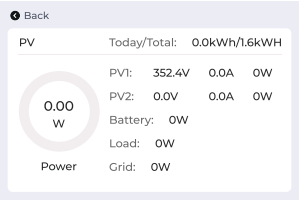
Tap the PV, battery, grid, inverter, load, and settings icons to access the detailed settings.

Arcs: Shows current load as a percentage of the device's total capacity.

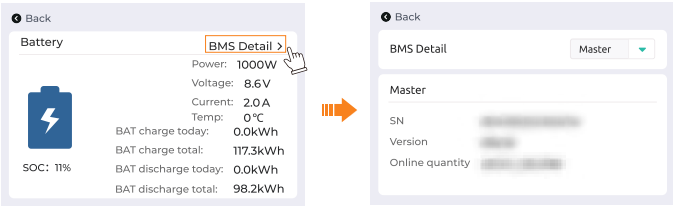


Moving dots on the connection lines: The live direction of energy flow along each connection. The position on the connecting lines between the inverter icon and the other icons indicates the current status of inputs or outputs.

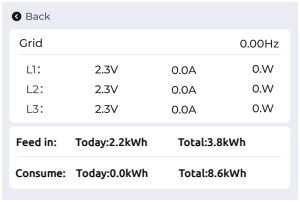
- **PV**: Displays the system power flow and key metrics including PV **Today/Total** energy yield, real-time voltage, current, and power of **PV1** and **PV2**, and the current power status of the **Battery**, **Load**, and **Grid**.



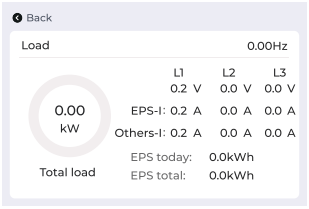
- **Battery:** Displays detailed battery operational data including real-time power, voltage, current, and temperature, as well as daily, total charge, and discharge energy statistics. When you connect a battery, tap **BMS Detail** to see the information of the battery.

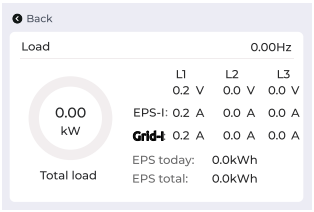


- **Grid:** Displays the system's interaction with the utility power grid, showing real-time electrical parameters and energy exchange totals.



- **Load**: Displays the real-time monitoring of the load-side electrical parameters, displaying the three-phase voltage, current values for both EPS, grid, and other circuits and the cumulative energy output from the EPS or the grid.

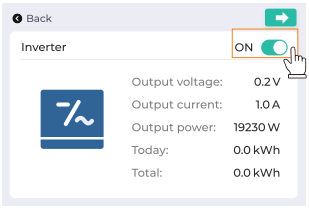




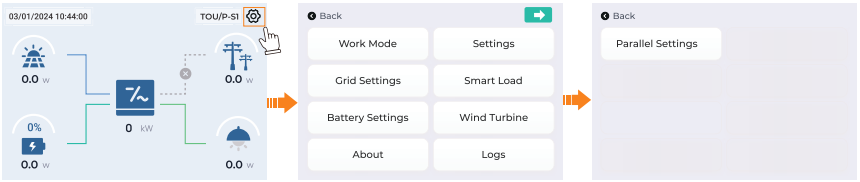
NOTICE!

- The displayed items may vary depending on the inverter model or firmware version. Some models show both smart load and grid-side bypass load, while others display only the grid-side bypass load.

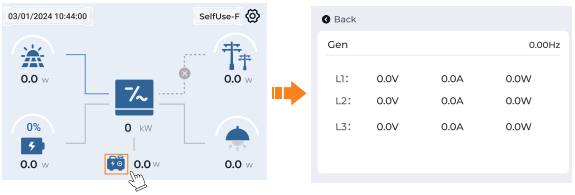
- **Inverter**: Displays the inverter's real-time operating status and energy production data, including its **ON** and **OFF** state, output voltage, current, power, and today's and total energy yield. Positive value with power indicates power output; a negative value indicates power input.



- **Settings**: Tap ⚙ on the top-right corner to set the **Work Mode**, **Settings**, **Grid Settings**, **Smart Load**, **Battery Settings**, **Wind Turbine, About**, **Logs**, and **Parallel Settings**.



- (Optional) **Generator**: When a generator is connected to the inverter, you can see a generator icon. It displays the real-time monitoring of the generator electrical parameters, including the three-phase voltage, current values, and power output.

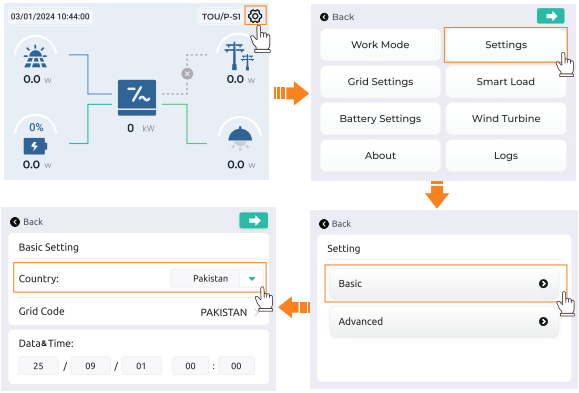


11.3 Work Mode Settings

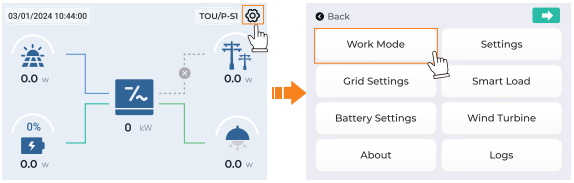
On the main screen, go to ⚙ > **Work Mode** to set the work mode. The mode and settings vary depending on the country. For detailed functional logic and working principles of all modes , see "2.7 Work Mode (For Pakistan)" and "2.8 Work Mode (Outside Pakistan)".

11.3.1 Setting Work Modes for Pakistan

Step 1: On the main screen, go to ⚙ > **Settings** > **Basic** to set the country as **Pakistan**.

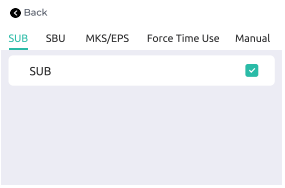


Step 2: Return to the main screen, go to ⚙ > **Work Mode** and enable your desired work mode. For detailed functional logic and working principles of all modes , see "2.7 Work Mode (For Pakistan)".



SUB mode

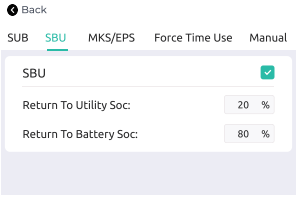
On the main screen, go to ⚙ > **Work Mode** > **SUB**. You can enable **SUB**. For detailed functional logic and working principles of this mode, see "2.7.1 SUB Mode".



SBU mode

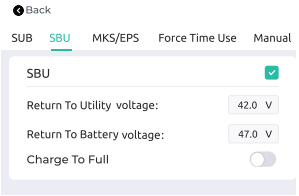
On the main screen, go to ⚙ > **Work Mode** > **SBU**. For detailed functional logic and working principles of this mode, see "2.7.2 SBU Mode".

Lithium-ion battery



- **Return To Utility Soc:** When the SOC drops below the set value, the battery starts charging. The value can be set within the range of 20% SOC to (**Return to Battery Soc** - 5 %), with a default of 20% SOC.
- **Return To Battery Soc:** When the SOC is higher than the set value, the battery starts discharging. The value can be set within the range of 50% to 100%, with a default of 80% SOC.

Lead-acid battery



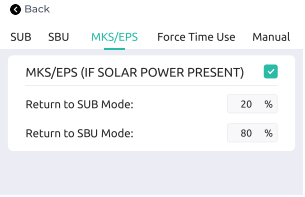
- **Return To Utility Voltage:** When the voltage drops below the set value, the battery starts charging. The value can be set within the range of 42 V to (**Return to Battery Voltage** - 2 V), with a default of 42 V.
- **Return To Battery Voltage:** When the voltage is higher than the set value, the battery starts discharging. The value can be set within the range of (**Return to Utility Voltage** + 2 V) to 60 V, with a default of 47 V.
- **Charge To Full:** Determines how the system acts when the lead-acid battery voltage reaches **Return to Battery Voltage**.
  - » **OFF**: The grid relay disconnects immediately. The grid relay disconnects after 2 minutes, and the system is off grid. LCD shows normal status, grid-side power flow line becomes dashed.
  - » **ON**: The system continues charging the battery using available charge sources. After 2 minutes, the grid relay disconnects and the system is off grid. LCD shows normal status, grid-side power flow line becomes dashed.

NOTICE!

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

MKS/EPS mode

On the main screen, go to ⚙ > **Work Mode** > **MKS/EPS**. You can enable **MKS/EPS (IF SOLAR POWER PRESENT)** and set the battery level for returning to the SUB and SBU mode. For detailed functional logic and working principles of this mode, see "2.7.3 MKS/EPS Mode".



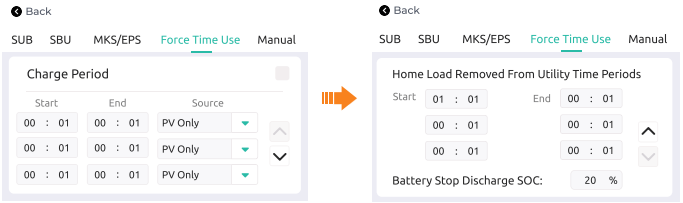
- **Return to SUB Mode**
  - » Settable range: 20%–75% or 24–45 V.
  - » Default: 20% SOC or 42 V.
- **Return to SBU Mode**
  - » Settable range: 25%–100% or 44–58 V.
  - » Default: 80% SOC or 47 V.

NOTICE!

- This user interface illustrated using a li-ion battery as an example. Li-ion battery settings are based on SOC while lead-acid battery settings are based on voltage.

Force time use mode

On the main screen, go to ⚙ > **Work Mode** > **Force Time Use**. You can enable **Charge Period** and set the start and end time for charge and discharge. For detailed functional logic and working principles of this mode, see "2.7.4 Force Time Use Mode".



- **Charge Period**: You can set the desired charge time.
  - » **Start** and **End**: Time to start charging and end charging.
  - » **Source**: **PV Only**, **PV Then Grid**, **PV And Grid,** and **Load First** are available.

- **Home Load Removed From Utility Time Periods**: Set the desired discharge time.
  - » **Start** and **End**: Time to start discharge and end discharge.
  - » **Battery Stop Discharge SOC** or **Battery Stop Discharge Voltage**: When the battery level (SOC or voltage) is lower than the set value, the battery stops discharge.

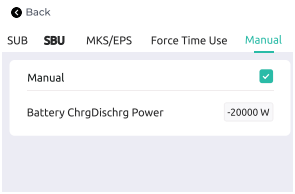
    Settable range: 20%–100% SOC or 42– 55.9 V.

    Default: 20% SOC or 42 V.

NOTICE!
• This user interface illustrated using a li-ion battery as an example. Li-ion battery settings are based on SOC while lead-acid battery settings are based on voltage. • The priority of **Alarm Voltage** or **Alarm SOC** is higher than **Battery Stop Discharge Voltage**.

Manual mode

On the main screen, go to > **Work Mode** > **Manual**. You can enable **Manual** and set the battery charge and discharge power. For detailed functional logic and working principles of this mode, see "2.7.5 Manual Mode".

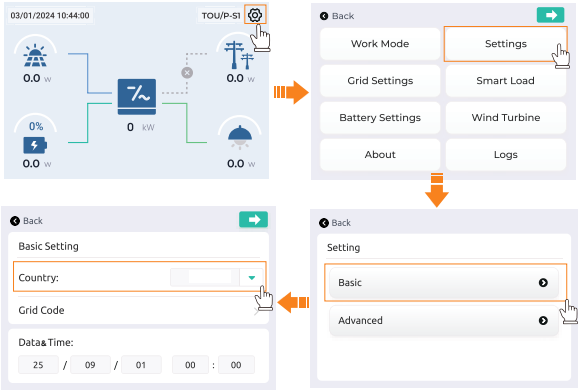


- **Battery ChrgDischrg Power**: Battery charge and discharge power.
  - » Settable range: -30,000 to 3,0000 W.
  - » Default: 0 W.

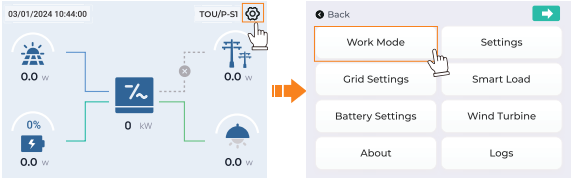
NOTICE!
A negative value means the inverter draws power from the grid (at the set value) to charge the battery. A positive value means the inverter supplies power (at the set value) to the grid or to the loads.

11.3.2 Setting Work Modes for Countries Outside Pakistan

Step 1: On the main screen, go to ⚙ > **Settings** > **Basic** to set the country except Pakistan.



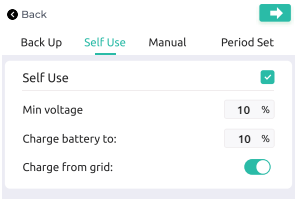
Step 2: Return to the main screen, and go to ⚙ > **Work Mode** and enable your desired work mode. For detailed functional logic and working principles of all modes , see "2.8 Work Mode (Outside Pakistan)".



Self use mode

On the main screen, go to ⚙ > **Work Mode** > **Self Use**. You can enable **Self Use**. For detailed functional logic and working principles of this mode, see "2.8.1 Self Use Mode (Priority: Loads > Battery > Grid)".

- **Min voltage** or **Min SOC**: The minimum battery level (SOC or voltage) allowed when grid-connected. When this threshold is reached, the system stops discharging to protect the battery.
  - » Settable range: 3% SOC to **Charge battery to** or 40 V to **Charge battery to**.
  - » Default: 10% SOC or 42 V.
- **Charge battery to**: You can set a target battery level (SOC or voltage) for the forced charging period (only active when **Charge from grid** is enabled). During this period, the inverter will prioritize charging the battery to your set target, using both grid and PV power. Any surplus PV energy—after meeting the load demand—will also be directed to charging the battery.
  - » Settable range: 10%–100% SOC or 42–60 V.
  - » Default: 10% or 47 V.
- **Charge from grid**: This setting determines whether grid power can be used to charge the battery during the charge period. If enabled, the grid will supply power for charging. If disabled, charging will rely only on other available sources such as the PV.
  - » Default: Enabled.



NOTICE!

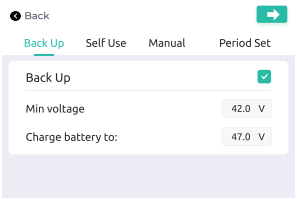
- This user interface illustrated using a lead-acid battery as an example. Li-ion battery settings are based on SOC while lead-acid battery settings are based on voltage.
- Period settings are supported in the self-use mode. For details, see "11.5 Period Settings".

Backup mode

On the main screen, go to ⚙ > **Work Mode** > **Back UP**. You can enable **Back UP** and set the battery level (SOC or voltage).

During the charge period, the system charges the battery from the grid by default to ensure a high battery level, charging up (**Charge battery to** + 5% SOC) or (**Charge battery to** + 2 V). For detailed functional logic and working principles of this mode, see "2.8.3 Backup Mode".

- **Min Voltage** or **Min SOC**: The min. allowable battery SOC or voltage when grid-connected.
  - » Settable range: 40–47 V or 30% SOC to **Charge Battery to**.
  - » Default: 42 V or 30% SOC.
- **Charge battery to**: In this mode, grid charging is enabled by default. You can set a target battery level (SOC or voltage). The inverter uses PV and grid power to charge until the target, with surplus PV continuing after loads are met.
  - » Settable range: 42–60 V or **Min SOC** to 100%.
  - » Default: 47 V or 50% SOC.

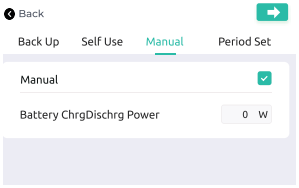


NOTICE!

- This user interface illustrated using a lead-acid battery as an example. Li-ion battery settings are based on SOC while lead-acid battery settings are based on voltage.
- Period settings are supported in the self-use mode. For details, see "11.5 Period Settings".

Manual mode

On the main screen, go to ⚙ > **Work Mode** > **Manual**. You can enable **Manual** and set the battery charge and discharge power. For detailed functional logic and working principles of this mode, see "2.8.5 Manual Mode".



- **Battery ChrgDischrg Power**: Battery charge and discharge power.
  - » Settable range: -30,000 to 3,0000 W.
  - » Default: 0 W.

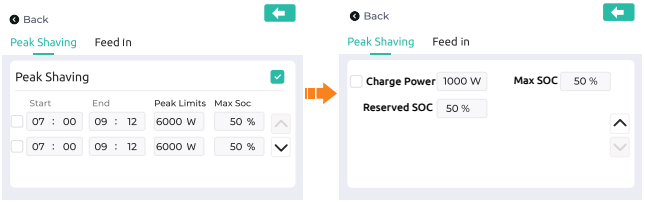
NOTICE!

A negative value means the inverter draws power from the grid (at the set value) to charge the battery. A positive value means the inverter supplies power (at the set value) to the grid or to the loads.

Peak shaving mode

On the main screen, go to ⚙ > **Work Mode** > **Peak Shaving**. For detailed functional logic and working principles of this mode, see "2.8.4 Peak Shaving Mode".

- **Peak Shaving:**
  - » Enabled: During the configured peak period, grid import power is limited by **Peak Limits**. If load demand exceeds this value, the battery discharges to supply the difference.
  - » Disabled: The grid supplies power to the loads without peak limitation control. The battery does not charge from the grid for peak shaving purposes.



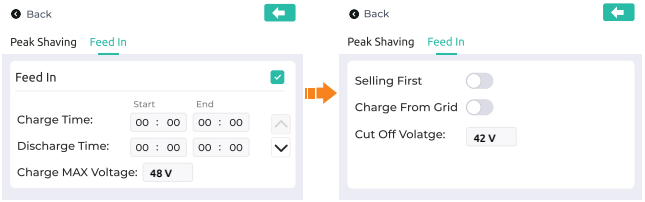
- ☐: Check to enable charging from grid. The first is for the peak shaving period 1 (period B in "2.8.4 Peak Shaving Mode"), the second is for the peak shaving period 2 (period D in "2.8.4 Peak Shaving Mode").
- **Peak Limits**: The max. grid import power allowed during the peak period. If the load demand exceeds this value, the battery will discharge to reduce grid power purchase.
  - » Settable range: 0–60000 W
  - » Default: 1000 W.
- (Optional) **Charge Power**: The max. grid charging power drawn from the grid. When enabled, the battery can charge from the grid during the configured period. Charging stops when **Max SOC** or **Max Voltage** is reached.
  - » Settable range: 0–60000 W
  - » Default: 1000 W.
- **Max SOC** or **Max Voltage**: The upper battery SOC or voltage limit for grid charging in the charge from grid period (period A in "2.8.4 Peak Shaving Mode").
  - » Settable range: 0%–100% SOC or 40–60 V.
  - » Default: 50% SOC or 48 V.
- **Reserved SOC** or **Reserved Voltage**: The battery SOC or voltage reserved for peak shaving operations in the PV charge period (period C in "2.8.4 Peak Shaving Mode"). During the PV charge period, the battery does not discharge.
  - » Settable range: 0%–100% SOC or 40–60 V.
  - » Default: 50% SOC or 48 V.

NOTICE!

- This user interface illustrated using a li-ion battery as an example. Li-ion battery settings are based on SOC while lead-acid battery settings are based on voltage.

Feed-in priority mode

On the main screen, go to ⚙ > **Work Mode** > **Feed in**. You can enable **Feed in** and set the charge and discharge time. For detailed functional logic and working principles of this mode, see "2.8.2 Feed-in Priority Mode (Priority: Loads > Grid)".



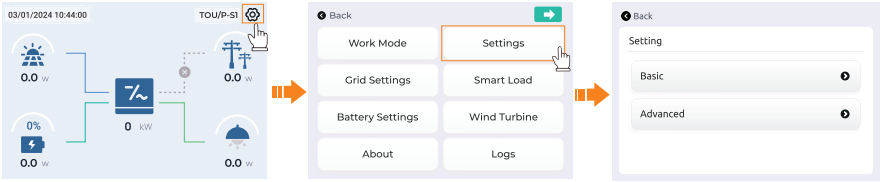
- **Charge Time**: The start and end time for battery charging.
- **Discharge Time**: The start and end time for battery discharging.
- **Charge MAX SOC** or **Charge MAX Voltage**: The max. battery level during charging.
  - » Settable range: 0–100% SOC or 40–60 V.
  - » Default: 50% SOC or 48 V.
- **Selling first**: When enabled, the system prioritizes selling excess PV power to the grid before charging the battery. When the battery level is higher than **Cut off SOC** or **Cut off Voltage**, the battery will discharge to the grid.
  - » Default: Disabled.
- **Charge from grid**: When enabled, the battery is allowed to be charged from the utility grid during the charge time period.
  - » Default: Disabled.
- **Cut off SOC** or **Cut off Voltage**: The min. battery level (SOC or voltage) at which the system stops discharging to protect the battery.
  - » Settable range: 11%–100% SOC or 40.1–60 V.
  - » Default: 11% SOC or 42 V.

NOTICE!

- This user interface illustrated using a lead-acid battery as an example. Li-ion battery settings are based on SOC while lead-acid battery settings are based on voltage.
- In feed in mode, you can set two configurable time periods for charge and discharge.
- If the battery cannot be charged during the day, it is recommended to set the charge period during off-peak hours.

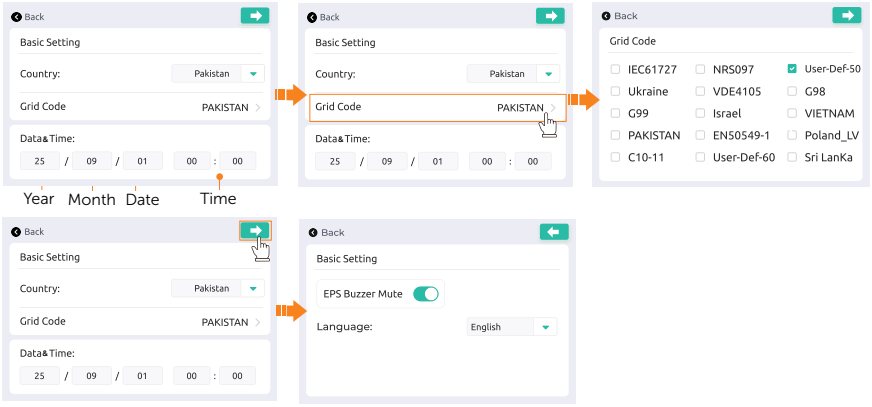
11.4 Basic and Advanced Settings

On the main screen, go to ⚙ > **Settings**. You can set basic and advanced parameters.



11.4.1 Basic Settings

On the main screen, go to ⚙ > **Settings** > **Basic**. You can set the basic parameters for the inverter including the country, grid code, time, language and set EPS buzzer to mute or not.

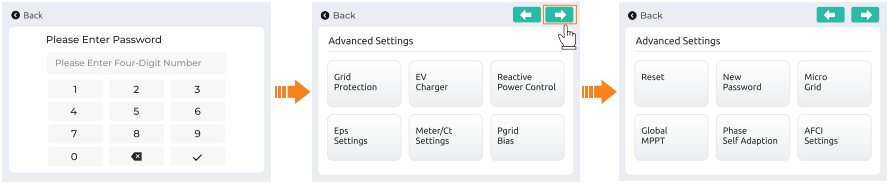


NOTICE!

- The grid code must be set correctly, or the inverter cannont connect to the grid. Consult your dealer or SolaX service for details if you need help.
- Grid code settings varies depending on the country.

11.4.2 Advanced Settings

On the main screen, go to ⚙ > **Settings** > **Advanced**. Enter the password (default: **2 0 1 4**) to access the settings.

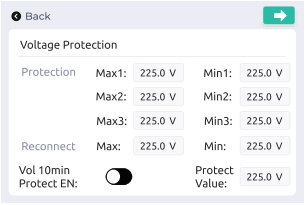


NOTICE!

- To prevent incorrect settings that could reduce energy yield or violate local regulations, keep the installer password strictly confidential. Obtain it only from your authorized dealer and never share it with unauthorized individuals.

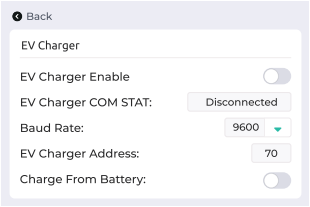
Grid protection

In **Advanced Settings**, select **Grid Protection**. When you select the grid code in ⚙ > **Settings** > **Basic** > **Grid Code**, the corresponding grid protection parameters are automatically configured.



EV charger

In **Advanced Settings**, select **EV Charger.** When you connect an EV charger to the inverter, you can enable the EV charger function and set the related communication parameters.



- **EV Charger Enable**: Enable to activate the communication and control interface with the EV charger.
- **EV Charger COM STAT**: Indicates the communication status between the inverter and the connected EV charger. When communication is established successfully, this status shows **Connected**.
- **Baud Rate**: The address must match the EV charger communication setting
  - » Default: 9600.
- **EV Charger Address**: The communication address must match the preset charger address.
  - » Default: 70.
- **Charge From Battery**: If enabled, the battery is allowed to discharge to supply power to the EV charger during battery discharge periods.

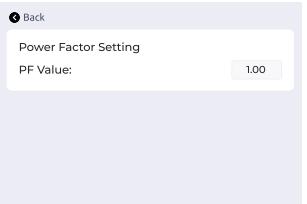
NOTICE!

- To allow the EV charger to be powered by the battery, the following conditions must be met:
  - » Battery discharge time period must be set in **Battery Settings**.
  - » Battery discharge threshold must be set. Set the min. battery limit: **Min SOC** (for lithium battery) or **Min Voltage** (for lead-acid battery). The battery will only discharge to the EV charger when the battery level is above the set threshold.
  - » Work mode must allow battery discharge. The selected work mode must support battery discharge during the configured time period.

Reactive power control

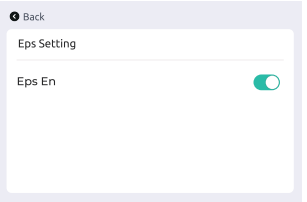
In **Advanced Settings,** select **Reactive Power Control**. You can set the **PF Value**.

- **PF Value**: The power factor of the inverter output to the grid under grid-connected condition.
  - » Settable range: 0.8–1.00.
  - » Default: 1.00.



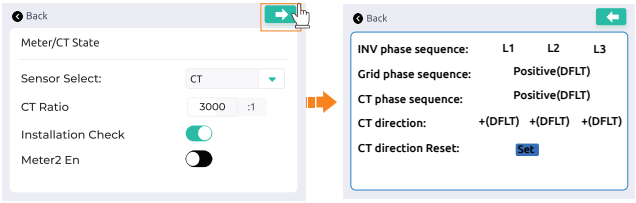
EPS settings

In **Advanced Settings,** select **EPS Settings**. **EPS En** is enabled by default. When enabled, the inverter can operate in the off-grid status.



Meter/CT settings

In **Advanced Settings**, select **Meter/Ct Settings**. You can select the sensor and set the parameters.



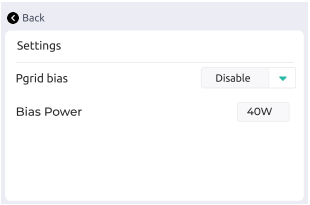
- **Sensor Select**: **CT**, **Meter**, **Meter-WiBr**, **Meter-Dual**, and **Meter-Dual-WiBr** are available.
  - » Default: **CT**.
- **CT Ratio**: You can set the CT ratio (settable value : 1).
  - » Settable range: 100–20000.
  - » Default: 3000.
- **Installation Check**: After initial power-up, tap **Installation Check** to verify the CT sensor setup.

  NOTICE!

  - **Installation Check** is available when the CT is connected to the **GRID** terminal. If you connect a meter to the **GRID** terminal, this setting is unavailable, and you must check the meter wiring manually.
- **INV phase sequence**: Displays the inverter phase sequence.
- **Grid phase sequence**: Displays the grid phase sequence.
- **CT phase sequence**: Displays the CT phase sequence.
- **CT direction**: Displays the CT direction.
- **CT DIR Reset**: Clear the stored phase sequence and direction parameters for the CTs. The CTs are oriented to measure power flow towards the grid.

Pgrid bias

In **Advanced Settings**, select **Pgrid bias**. You can set the inverter's tendency to exchange power with the grid. It is disabled by default.



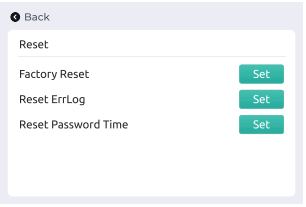
- **Pgrid Bias**:
  - » **Grid**: The system is programmed to constantly import the set amount of power from the grid to ensure a zero-export safety margin.
  - » **INV**: The system is programmed to constantly export the set amount of power to the grid.
- **Bias Power**: Defines the target power buffer between the inverter and the grid.
  - » Settable range: 1–500 W.
  - » Default: 40 W.

NOTICE!

- When the **Pgrid bias** function is enabled, zero export control is activated, even if the **Export** value is not set as 0 W in **Grid Settings**.

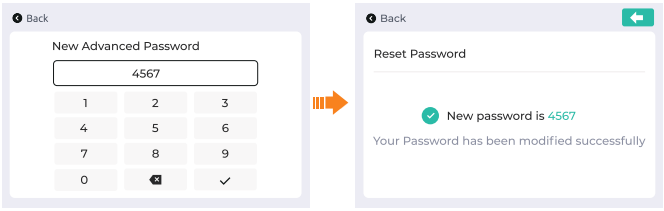
Reset

In **Advanced Settings**, select **Reset**. Three types of resets are available: restore factory settings, clear error logs, and reset the password-entry time limit for specific settings.



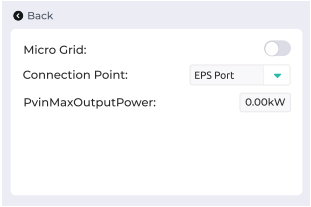
New password

In **Advanced Settings**, select **New Password**. You can reset the password for accessing specific settings.



Micro grid

In **Advanced Settings**, select **Micro Grid**. You can enable **Micro Grid**, select the connection port, and set the max. output power.

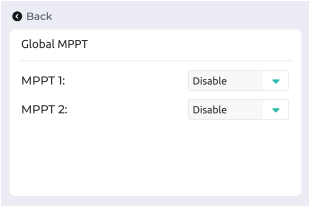


- **Micro Grid**: Enable or disable the function. Default: Disabled.
- **Connection Point**: **EPS Port** and **Grid Port** are available.
- **PVinMaxOutputPower**: The maximum power that the PV inverter can feed into the Micro grid.
  - » Settable range: 0.00–200.00 kW.
  - » Default: 0.00 kW.

Global MPPT

In **Advanced Settings**, select **Global MPPT**. You can enable **MPPT 1** or **MPPT 2**. Default: Disabled.

This function allows scanning the entire voltage range to locate and lock onto the highest power peak, ensuring maximum energy harvest even when the PV curve has multiple local peaks.



Phase self adaption

In **Advanced Settings**, select **Phase Self Adaptation**. **Phase Self Adaption** is enabled by default.

When enabled, the inverter can automatically adapt to a reversed grid phase sequence and operate normally. If disabled, a reversed phase sequence will trigger a **Reversed Grid Phase** error and stop operation.

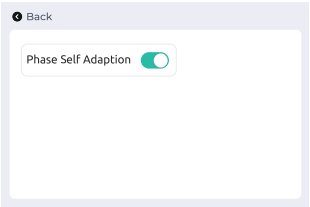
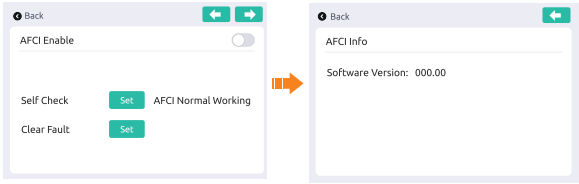


Figure 11-2

AFCI settings

The AFCI (Arc Fault Circuit Interrupter) function detects DC arc faults in the PV system and automatically shuts down the inverter to prevent fire hazards. **AFCI settings** is disabled by default.



In **AFCI Settings**, you can configure the following parameters as needed and view the software version in **AFCI Info**:

Table 11-1 AFCI settings parameters

Parameter	Description	Options/range
AFCI Enable	Enable or disable the AFCI function. When disabled, all AFCI-related operations are locked and cannot be accessed.	Option:Enable/Disable Default: Disabled
Self Check	Initiate a self-test of the AFCI circuit. Available only when AFCI is enabled.	/
Clear Fault	Manually clear an AFCI fault after the root cause has been resolved.	/

- **Running the self check**: After enabling **AFCI Enable**, you can run a self-check to verify the AFCI circuit integrity.
  a. If no issues are detected, the system displays "**AFCI Normal Working**".
  b. If an issue is detected, the system displays "**Self Check Error**". If this occurs:
     » Power off the inverter completely.
     » Check whether the CT is disconnected or not properly connected.
     » After resolving the issue, power on the inverter and run the self-check again.
- **Handling an AFCI fault:** When the inverter detects a DC arc fault, the system displays "**AFCI Fault**". The inverter handles AFCI faults as follows:
  » Faults 1–4 within 24 hours: The inverter automatically clears the fault and reconnects after waiting at least 5 minutes following each fault.
  » 5th fault within 24 hours: The inverter locks and does not automatically reconnect. You must manually clear the fault using **Clear Fault** after resolving the root cause.
  » 24-hour count reset: The fault count resets 24 hours after the first fault occurred. The count is stored in non-volatile memory and persists across power cycles.

- **Manually clearing an AFCI fault**: To manually clear an AFCI fault after the 5th occurrence:

  (1) Identify and resolve the root cause of the arc fault (such as loose DC connections or damaged cables).

  (2) On the **AFCI Settings** page, tap **Set** next to **Clear Fault**.

  (3) The inverter reconnects to the grid and resumes normal operation.

  NOTICE!

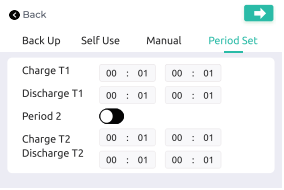
  - If the fault persists after manual clearing, contact your installer or service provider for further inspection.

11.5 Period Settings

On the main screen, go to ⚙ > **Work Mode** > **Period Set**.

You can set two configurable working periods: Charge period and discharge period. If you want to set two periods, enable **Period 2** to set the periods.

- **Charge T1** and **Charge T2**: In the charge period, the inverter will charge the battery first until the battery SOC reaches the specified **Charge Battery to** value set in each work mode. You can configure the inverter to either draw power from the grid or not.
- **Discharge T1** and **Discharge T2**: In the discharge period, the inverter will allow the battery to discharge and charge power in accordance with the work mode and load conditions.



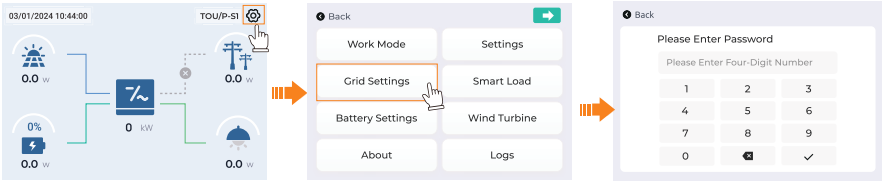
NOTICE!

- Only the self use mode and backup mode support period settings. For how to set the work mode, see "2.8.1 Self Use Mode" and "2.8.3 Backup Mode".
- If a period is not set as a charge or discharge period, the battery can be charged but will not discharge.
- If a period is set as both a charge and discharge period, charge takes priority and the battery will be charged.

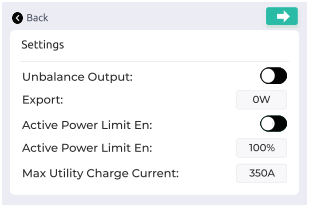
11.6 Grid Settings

This function allows the inverter to control the output power to the grid.

Step 1: On the main screen, go to ⚙ > **Grid Settings**. Enter the password (default: **2 0 1 4**) to access the settings.



Step 2: Set the parameters for the grid.



- **Unbalance Output**: Enable it to achieve unbalance output. For the description of the function, see "2.9 Export Control Function".

  » Default: Disabled.

- **Export**: You can set the output power to the grid.

  NOTICE!

  - If you do not want to feed power to the grid, set **Export** to **0W**.

- **Active Power Limit En**: When enabled, the max. output can exceed the rated value.

  » Default: Disabled.

- **Active Power Limit**: Set the upper limit for active power output (as a percentage of the rated power). It is configurable only when **Active Power Limit En** is enabled.

  » Settable range: 0%–110%.

  » Default: 110%.

- (Optional) **Max Utility Charge Current:** Set the max. current that can be drawn from the grid to charge the battery. The value can be set within the range of 0 to 350 A, with a default of 40 A.

  » Settable range: 0–350 A.

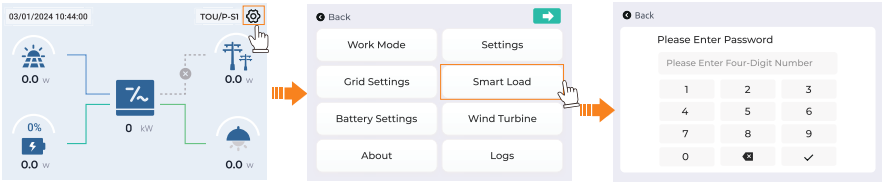
  » Default: 40 A.

NOTICE!

- **Max Utility Charge Current** is only supported when you select the country as Pakistan. For changing the country, return to the main screen, go to ⚙ > **Settings** > **Basic** to set the country as **Pakistan.**

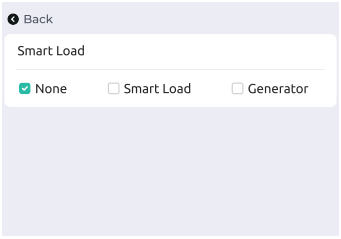
11.7 Smart Load Settings

On the main screen, go to ⚙ > **Smart Load**. Enter the password (default: **2 0 1 4**) to access the settings. You can select the load and set parameters for it.



None

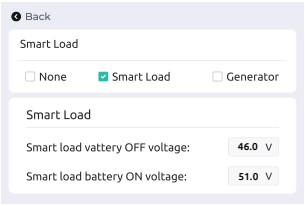
When no load is connected to the generator port, select **None**.



Smart load

When the generator port is connected to a smart load, select **Smart Load** and set the battery level.

When the voltage is below the **Smart load battery OFF SOC** or **Smart load battery OFF voltage**, the battery will no longer supply power to the load, until the voltage returns to the **Smart load battery ON SOC** or **Smart load battery ON voltage**.



- **Smart load battery OFF SOC** or **Smart load battery OFF voltage**:
  - » Settable range: (15% SOC to **Smart load battery ON SOC** - 2%) or 42 V to (**Smart load battery ON voltage** - 1.1 V).
  - » Default: 15% SOC or 46 V.
- **Smart load battery ON SOC** or **Smart load battery ON voltage**:
  - » Settable range: 30%–85% SOC or 48–53 V.
  - » Default:40% SOC or 51 V.

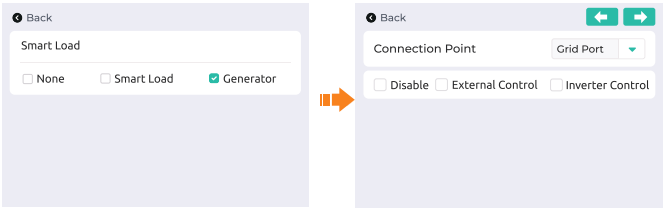
NOTICE!

- This user interface illustrated using a lead-acid battery as an example. Li-ion battery settings are based on SOC while lead-acid battery settings are based on voltage.

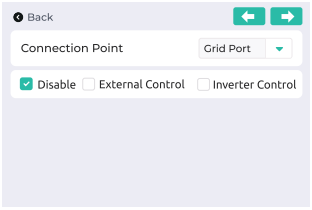
Generator

When the inverter is connected to a generator, select **Generator**, and set the connection port and parameters for the generator.

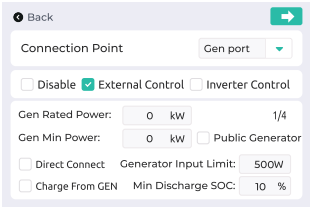
- **Connection Point**: **Grid Port** and **Gen Port** are available. Ensure the selected connection point matches the actual wiring.



- **Disable**: Disable generator control. The system will not start or use the generator.



- **External Control**: The generator is started or stopped by an external signal.



  - » **Gen Rated Power**: The rated output power of the generator. The value must satisfy **Gen Rated Power** ≥ **Max Charge Power** ≥ **Gen Min Power**.

    Settable range: 0–200 kW.

    Default: 0 kW.

  - » **Gen Min Power**: The min. operational power at which the generator can run stably. The value must not exceed **MaxCharge power** set in each **Period**. When multiple periods are configured, the max. power is limited by the lowest charge power among the periods.

    Default: 0 kW.

» **Public Generator**: Enable the function when multiple households share one generator. When enabled, **Generator Input Limit** is effective. The generator max. input power is limited (sum of three phases).

Settable range: 500–65535 W.

Default: 500 W.

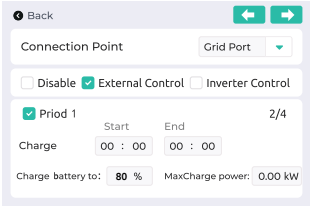
» **Direct Connect**: Enable this only when the generator is connected to the grid port and there is no ATS between the generator and the utility grid.

» **Charge From GEN**: Allows the battery to be charged from the generator. Battery charging will occur only during configured charge periods.

» **Min Discharge SOC** or **Min Discharge Voltage**: You can set the min. battery level required to allow generator charge or discharge. This parameter is only effective when **Public Generator** is enabled.

Settable range: 10%–100% or 46–52 V.

Default: 10% SOC or 46 V.

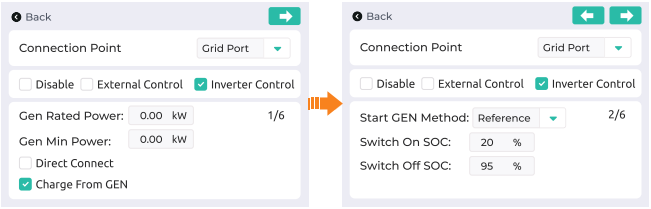


» **Period 1**, **Period 2**, or **Period 3**: Enable the period to set up to three periods during which the system is allowed to use the generator to charge the batteries. You can set the **Charge battery to** and **MaxCharge power**.

Settable range: **Charge battery to** can be set from 0% up to 100% SOC or 40 to 60 V; **MaxCharge power** 0 kW to **Gen Rated Power**.

Default: **Charge battery to** 80% or 53 V; **MaxCharge power** 0 kW.

- **Inverter Control**: When enabled, the inverter sends a start or stop signal to the generator via the **COM4** terminal (pins 5 & 6). For wiring and setup details, see "16.2 Application of Generator".



  - » **Gen Rated Power**: The rated output power of the generator. The value must satisfy **Gen Rated Power** ≥ **Max Charge Power** ≥ **Gen Min Power**.

    Settable range: 0–200 kW.

    Default: 0 kW.

  - » **Gen Min Power**: The minimum operational power at which the generator can run stably.

    The value must not exceed **MaxCharge power** set in each **Period**. When multiple periods are configured, the max. power is limited by the lowest charge power among the periods.

    Default: 0 kW.

  - » **Direct Connect**: Enable this only when the generator is connected to the grid port and there is no ATS between the generator and the utility grid.

  - » **Charge From GEN**: Allows the battery to be charged from the generator. Battery charging will occur only during configured charge periods.

  - » **Start GEN Method:** Indicates how the generator start signal is triggered.

    Reference: The generator starts automatically when the battery reaches the set **Switch On SOC** or **Switch On Voltage**. The generator stops automatically when the battery reaches the set **Switch Off SOC** or **Switch Off Voltage**.

    Immediately: The inverter starts immediately once a valid start signal is received, regardless of battery SOC or voltage.

  - » **Switch On SOC** or **Switch On Voltage**: The battery threshold to trigger generator start.

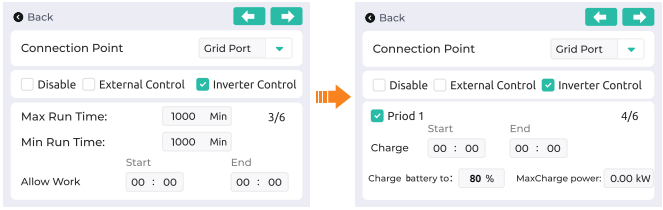
    Settable range: 10%–100% or 40–60 V.

    Default: 20% SOC or 43 V.

  - » **Switch Off SOC** or **Switch Off Voltage**: The battery threshold to stop the generator.

    Settable range: 10%–100% or 40–60 V.

    Default: 95% SOC or 56 V.



» **Max Run Time**: The max. continuous running time of the generator. If the running time exceeds this value, the generator will be forced to stop.

  Settable range: 1–60,000 min.

  Default: 1000 min.

» **Min Run Time**: The min. continuous running time after the generator startup. The generator will not stop until this time is reached even if stop conditions are met.

  Settable range: 1–60,000 min.

  Default: 60 min.

» **Period 1**, **Period 2**, or **Period 3**: Enable the period to set up to three periods during which the system is allowed to use the generator to charge the batteries. You can set the **Charge battery to** and **MaxCharge power** for the time periods.

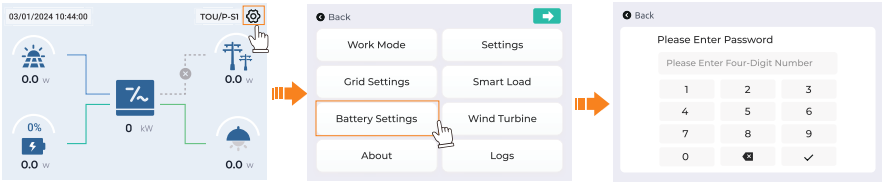
  Settable range: **Charge battery to** can be set from 0% up to 100% SOC or 40 to 60 V; **MaxCharge power** 0 kW to **Gen Rated Power**.

  Default: **Charge battery to** 80% or 53 V; **MaxCharge power** 0 kW.

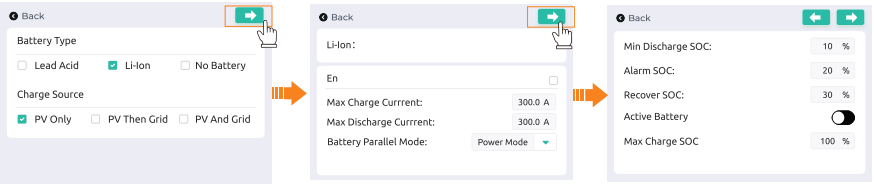
11.8 Battery Settings

You can select the battery type, charge source, charge and discharge current, and manage the battery level (SOC or voltage).

Step 1: On the main screen, go to ⚙ > **Battery Settings**. Enter the password (default: **2 0 1 4**) to access the settings.



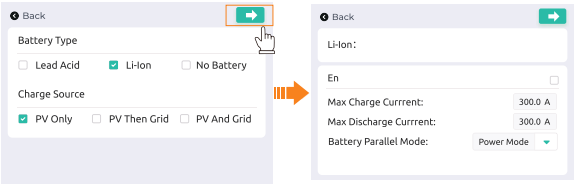
Step 2: Select no battery or select the battery type and set the parameters for the battery.



NOTICE!

- This user interface illustrated using a li-ion battery as an example. Li-ion battery settings are based on SOC while lead-acid battery settings are based on voltage.

Battery type and charge parameters



- **Battery Type**: Select the battery type or no battery.
- **Charge Source**: Select the charge source.

NOTICE!

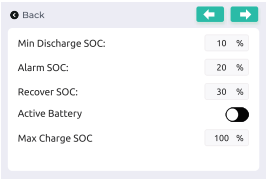
- **Charge Source** is only supported when you select the country as Pakistan. For changing the country, return to the main screen, go to ⚙ > **Settings** > **Basic** to set the country as **Pakistan.**

- **En:** Enable the selected battery type for related settings.
- **Max Charge Current**: The max. charge current for the battery. The value varies by model. For example, for 15 kW models, the value can be set within the range of 0–300 A, with a default of 150 A.
- **Max DisCharge Current**: The max. discharge current for the battery. The value varies by model. For example, for 15 kW models, the value can be set within the range of 0–300 A, with a default of 150 A.
- **Battery Parallel Mode**: **Capacity Mode** and **Power Mode** are available.
  - » Default: **Capacity Mode**.

NOTICE!

- For battery parallel mode wiring, see the documentation of the specific battery.
- When setting the battery parallel mode, make sure that on-site battery parallel wiring and the cable gauge of the battery power lines match the required specifications.

SOC or voltage parameters



- **Min Discharge SOC** or **Min Discharge Voltage**: If the battery level (SOC or voltage) falls below this value, the inverter will disconnect from the grid and shutdown.
  - » Settable range: 5% to **Alarm SOC** or 40 V to **Alarm Voltage.**
  - » Default: 10% SOC or 40 V.
- **Alarm SOC** or **Alarm Voltage**:If the battery level (SOC or voltage) falls below this value, it will no longer supply power to the grid or the load.
  - » Settable range: 10% SOC to (**Recover SOC** - 1%) or **Min Discharge Voltage** to **(Recover Voltage** - 0.1 V).
  - » Default: 20% SOC or 40 V.
- **Recover SOC** or **Recover Voltage**: When the battery level (SOC or voltage) drops below the **Min Discharge SOC** or **Min Discharge Voltage**, the battery must recover the value above the **Recovery SOC** before it can resume discharging and supply power.
  - » Settable range: (**Alarm SOC** + 1%) to 99% SOC or (**Alarm Voltage** + 0.1 V) to 56 V.
  - » Default: 30% SOC or 44 V.

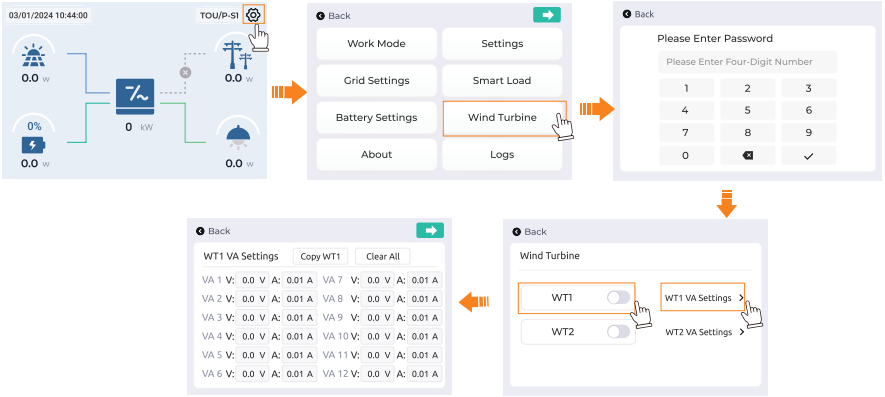
- **Active Battery**: When the battery is in a low-voltage protection state and cannot be charged normally, enable this function to allow the system to use available AC or PV power to apply a small wake-up current and reactivate the battery.
  - » Default: Disabled.
- **Max Charge SOC**: Set the max. battery level (SOC).
  - » Settable range: 80%–110%.
  - » Default: 100%.

NOTICE!

- The value of the **Min Discharge SOC** or **Min Discharge Voltage** must be smaller than the **Alarm SOC** or **Alarm Voltage**.

11.9 Wind Turbine Settings

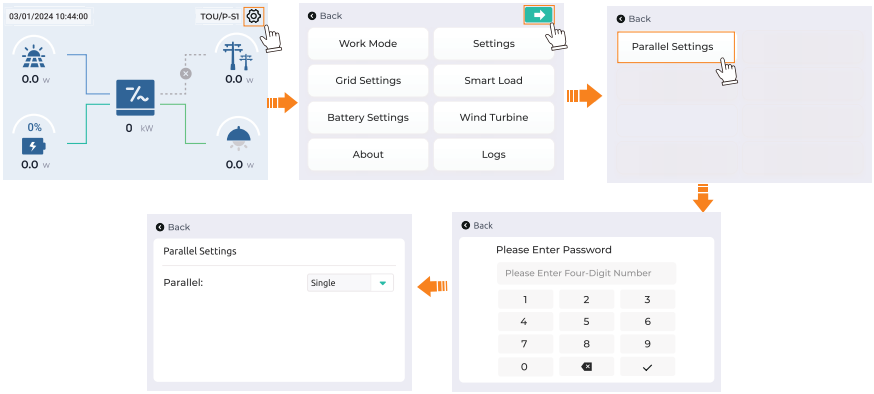
The **Wind Turbine** function allows the inverter to integrate and manage wind turbine inputs. The inverter supports up to 2 wind turbine channels (WT1 and WT2). On the main screen, go to ⚙ > **Wine Turbine**. Enter the password (default: **2 0 1 4**) to access the settings.



- **WT1** or **WT2**: Enable the wind turbine 1 or wind turbine 2.
- **WT1 VA Settings** or **WT2 VA Settings**: Defines the voltage and corresponding current values for wind charging control. You can set the voltage-current (VA) parameters.
- **Copy WT1**: You can copy WT1 VA parameters to other wind turbine channels.
- **Clear All**: Clear all configured VA parameters.

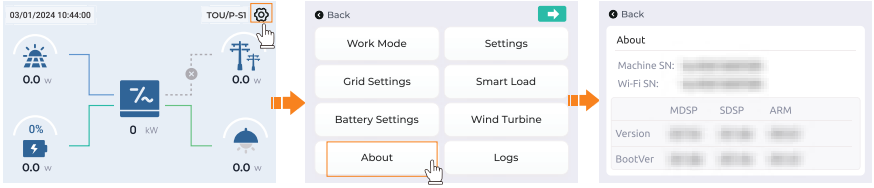
11.10 Parallel Settings

The inverter provides the parallel connection function. On the main screen, go to ⚙ > **Parallel Settings** to set the inverter as **Master** or **Single**. Enter the password (default: **2 0 1 4**) to access the settings. For details, see "16.2 Application of Parallel Function".



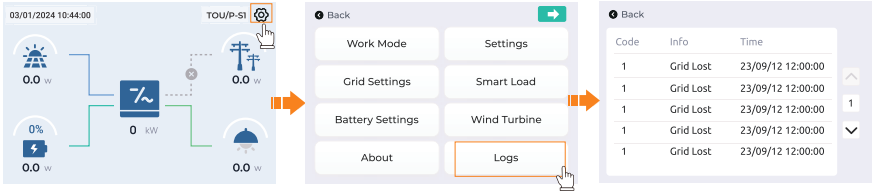
11.11 About

On the main screen, go to ⚙ > **About** to view the basic information of the inverter including the SN and version.



11.12 Logs

On the main screen, go to ⚙ > **Logs** to view the inverter logs.



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

Download and install the SolaXCloud app. You can download the app by the following methods.

- Scan the QR code below.
- Find and scan the QR codes at the button right of the login page of www.solaxcloud.com.
- Search with the key word SolaXCloud on the App Store or Google Play.

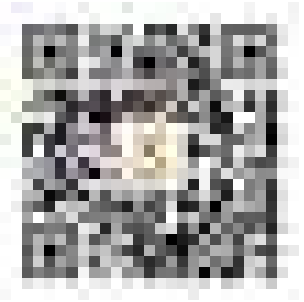


Figure 12-1 QR code

12.2.2 Operation on the SolaXCloud App

For instructions on operations, see the online documents on the SolaXCloud app.

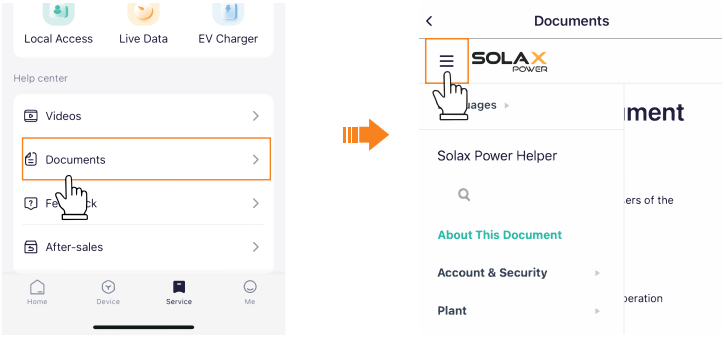


Figure 12-2 Online help on SolaXCloud

NOTICE!

- The user interface might change with version updates 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, log in to your account, add site and other related operations according to the guide.



Figure 12-3 Guide on web page

NOTICE!

- The user interface might change with version updates and should be subject to the actual situations.

13 Troubleshooting and Maintenance

13.1 Power-off

Step 1: To turn off the inverter, release the physical system switch on its left side. Alternatively, you can tap the inverter icon on the LCD screen and disable the system switch.

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

Step 3: Turn **off** the PV switch.

Step 4: Switch off the battery or the breaker, button, DC switch of the battery (see documentation of the battery).

⚠ 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 5 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 Relay 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. • 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.
PV Overcurrent	PV overcurrent • Shut down and re-power (check the battery wiring) • Try to update the processing. • Or contact SolaX for help.

Faults	Diagnosis and solution
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.
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.

Faults	Diagnosis and solution
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.
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.

Faults	Diagnosis and solution
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.
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.

Faults	Diagnosis and solution
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 13-2 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**, and **ExFAN3Faul** error. Refer to the following steps for replacement.

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

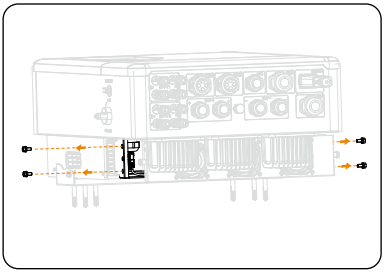


Figure 13-1 Loosening the screws

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

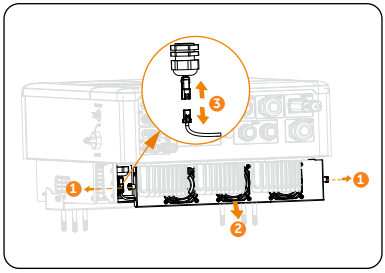


Figure 13-2 Disconnecting the fan

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.

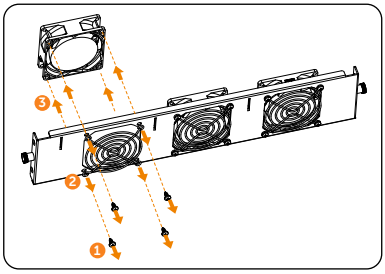


Figure 13-3 Replacing the fan

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

Step 1: 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".

Step 2: The inverter will automatically enter the upgrade process and displays the current upgrade progress.

Step 3: After the upgrade is completed, the LCD screen shows success. If the upgrade fails, it shows failure.

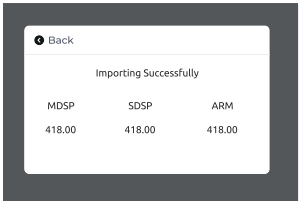


Figure 13-4 Firmware upgrading

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 meet the upgrade requirements. The PV or battery input voltage should be higher than 150 V, or the battery SOC should be higher than 20%.

NOTICE!

- If the LCD screen lags or freezes after the upgrade, turn off the PV switch and restart the inverter. If the issue persists, 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.

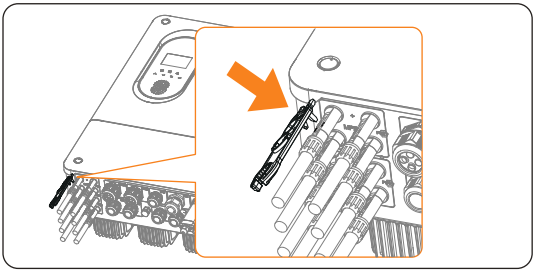


Figure 14-5 Releasing the PV connector

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 cross head 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.

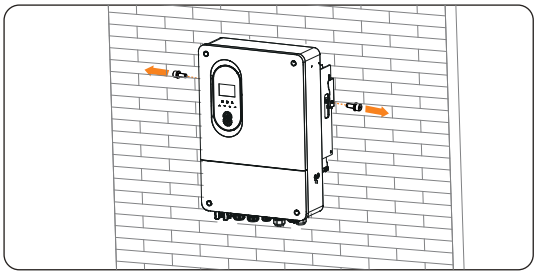


Figure 14-6 Unscrewing the M6 screws

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.

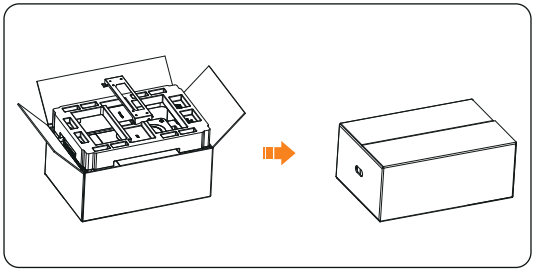


Figure 14-7 Packing the inverter

- 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	40000
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
Rated Output Current [A] (230V)	7.3	11.6	14.5	17.4	21.8	29
Max. Output continuous 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					
Rated EPS Output Current [A]	7.3	11.6	14.5	17.4	21.8	29.0
Nominal AC Voltage [V]	220/380, 230/400					
Switch Time [ms]	< 3					
THDv (@Linear load)	< 2%					

- Load requirements:
  - » The instantaneous peak current (baseline current + inrush current) during load switching shall not exceed 1.1 times the PCS rated current.
  - » Direct-on-line or star-delta starting motors: shall not exceed 10% of the PCS rated power.
  - » Variable-frequency drive or soft-start motors: shall not exceed 2/3 of the PCS rated power.
  - » If the PCS is already under load, the switching capability for motor loads shall be reduced proportionally.
  - » The isolation transformer associated with the PCS must be started simultaneously with the PCS.
  - » Load-side transformers with a power rating not exceeding 50% of the PCS rated power may be switched at no-load. For load-side transformers exceeding this power rating, simultaneous startup with the PCS is recommended.

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					

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					
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[°C]	-25 to +60 (derating above +45)					
Pollution level	III					
Relative humidity [%]	0–100 (condensing)					
Max. operation altitude [m]	< 3000					
Storage Temperature[°C]	-40 to +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	RS485, CAN, USB, DI/DO					

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 Installation Video

A QR code for the installation video is on the front of the inverter. Simply scan it with your phone (iOS or Android) to watch the video.

NOTICE!

The installation video is provided for reference only, and might be updated as needed. Please install the inverter following the installation manual and local regulations.



Figure 16-1 Scanning to view the installation video

16.2 Application of Generator

16.2.1 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.

You can connect the generator to both a single-inverter system and a parallel-inverter system.

NOTICE!

- For generator settings, see "Generator".

16.2.2 Generator Wiring Connection Diagram

You can connect a generator to the inverter's **GEN** or **GRID** terminal.

Generator at GEN terminal

This diagram shows dry-contact control (inverter control) wiring on the **GEN** terminal using a single inverter as an example.

NOTICE!

- If the dry-contact DO control is wired between the **COM4** terminal and the generator, set the inverter to **Inverter Control** mode. Otherwise, select **External Control** mode. For details, see "Generator".

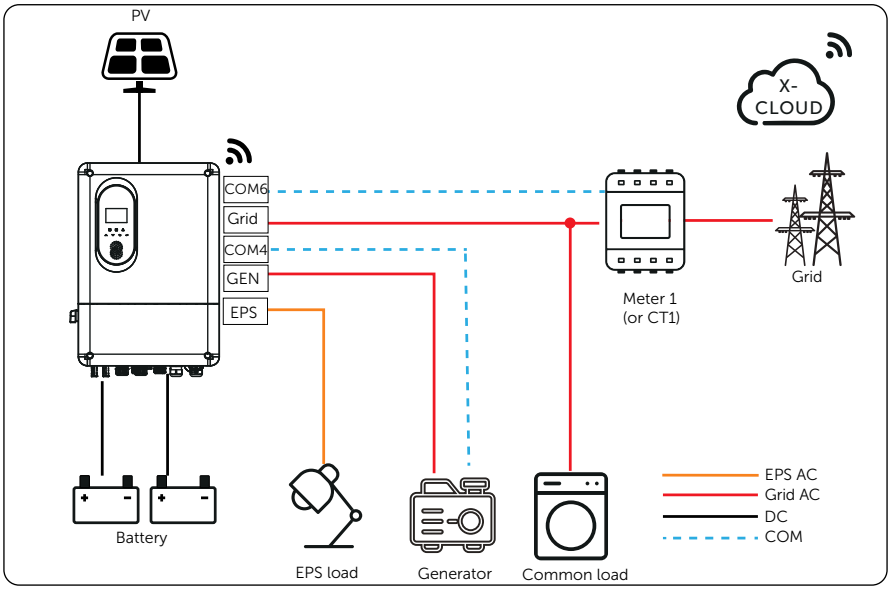


Figure 16-1 Diagram for generator connecting to the GEN terminal (single inverter)

Generator at GRID terminal

This diagram shows dry-contact control (inverter control) wiring on the **GRID** terminal using a single inverter and parallel inverters as an example.

NOTICE!

- In ⚙ > **Smart Load** > **Inverter**, if the dry-contact DO control is wired between the **COM4** terminal and the generator, set the inverter to **Inverter Control**. Otherwise, select **External Control**.
- When the generator is connected to the inverter's **GRID** terminal, an ATS is required to switch between the utility grid and the generator. An external ATS is not required for a off-grid scenario.
- When a generator is connected to the **GRID** terminal, it is normal for the inverter to report **Meter Comm Fault** after a grid failure.

- Single inverter

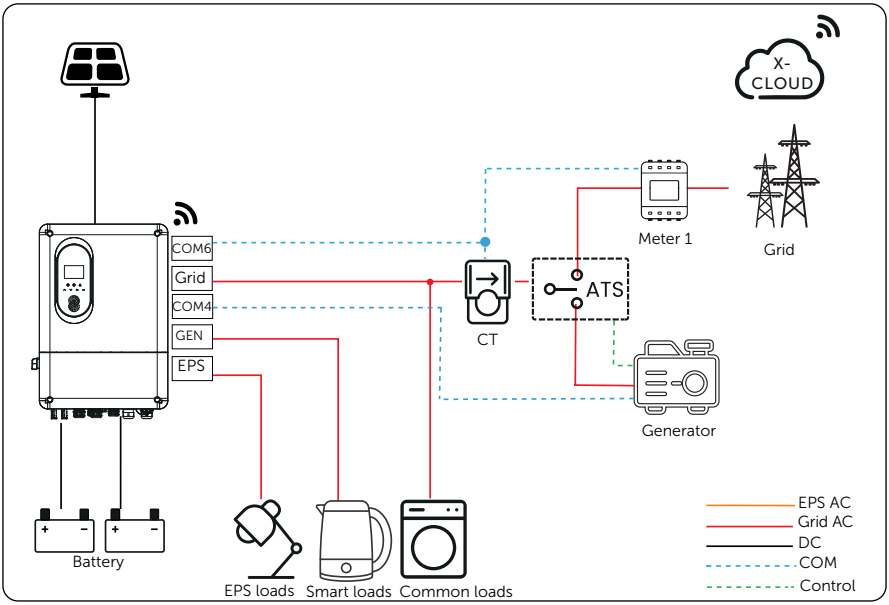


Figure 16-2 Diagram for generator connecting to the GRID terminal (single inverter)

- Parallel inverters

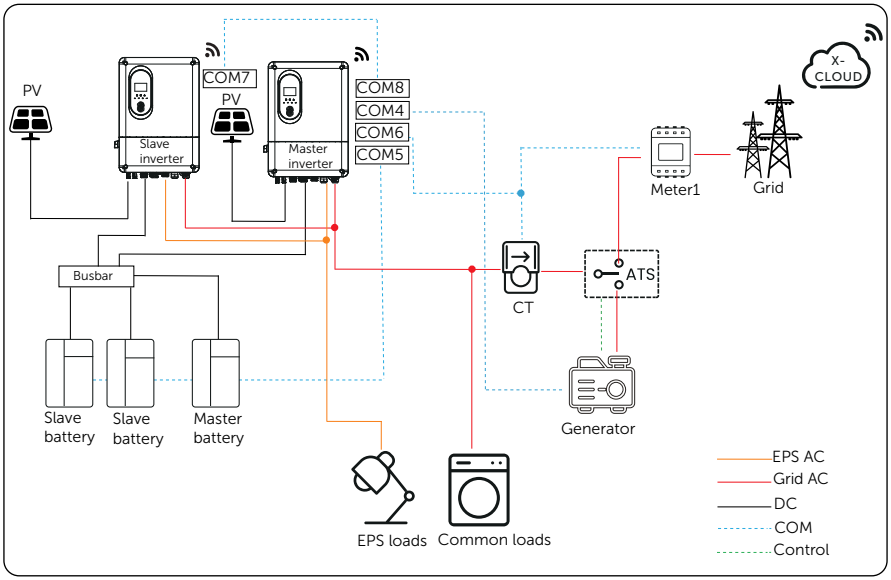


Figure 16-3 Diagram for generator connecting to the **GRID** terminal (parallel inverters)

16.2.3 Generator Control Mode

The generator control mode depends on whether dry-contact control via the COM4 DO port is used.

Inverter control

This mode utilizes the inverter's internal Digital Output (DO) to trigger the generator's Digital Input (DI) for automatic startup. You can connect the generator to the inverter's **GEN** or **GRID** terminals.

External control

When you connect the generator to the inverter's **GEN** terminal, you must start it manually to activate the generator mode. When connected to the **GRID** terminal, automatic startup is supported via an ATS.

NOTICE!
• An ATS is required for automatic switching between the grid and a generator connected to the **GRID** terminal. However, if the inverter is operating in the off-grid scenario, an external ATS is not required.

16.2.4 Cable Connection

- Connection terminal-DO terminal

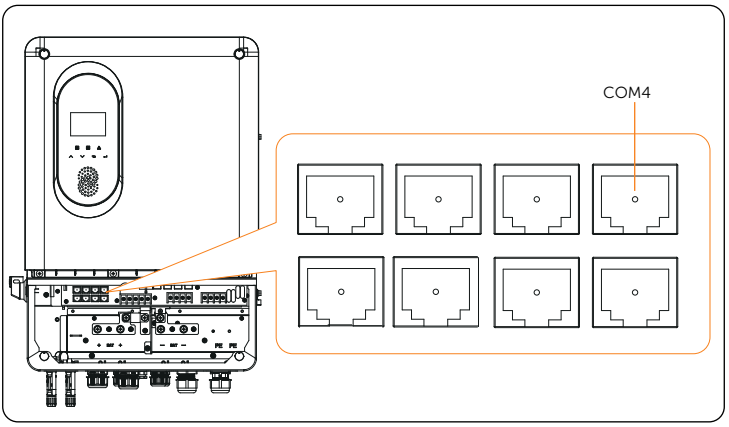


Figure 16-4 Connection terminal for generator

- 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 "9.4.1 Generator Communication Connection" for specific wire making and connection.

16.2.5 Inverter settings for Meter1

Set the meter communication address to **1**. For details, see the user manual of the meter.

16.3 Application of Parallel Function

16.3.1 Introduction of Parallel Application

The series inverters supports parallel operation in both grid and EPS modes. For the number of parallel units, contact the official technical support team in your relevant region.

16.3.2 Notice for Parallel Application

- All inverters should be of the same software version.
- All inverters must be the same model.
- In parallel system, there are three states: **Single**, **Slave** and **Master**.

Table 16-2 Three states

Single	The inverter is operating as an independent, single-unit 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 **Single** state when **System Switch** is set to **Off**.

- 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 the 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 set to **Single**.
- 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.

16.3.3 System Wiring Diagram

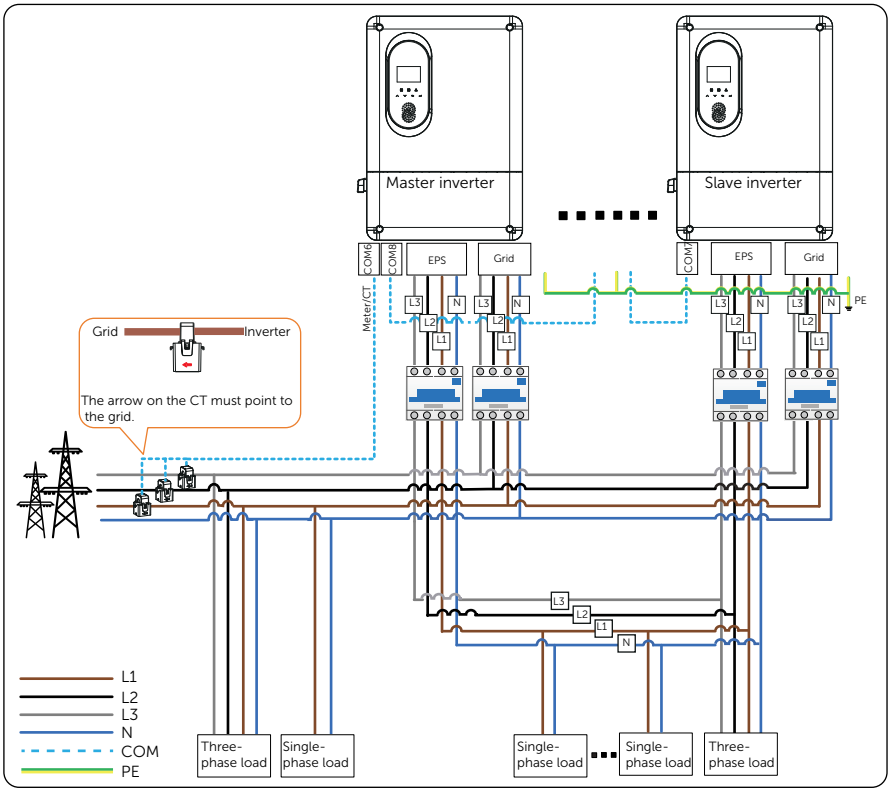


Figure 16-5 Parallel system wiring diagram

16.3.4 System Wiring Procedure

Power cable wiring–Grid and EPS terminal

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 wires connect to the E-BAR nearby.

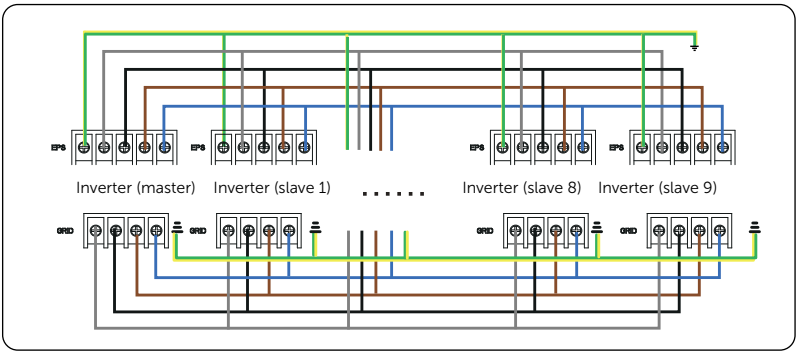


Figure 16-6 Power cable wiring

Communication cable wiring–COM7 terminal and COM8 terminal

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 "9.6.1 Meter/CT Connection".

e. Set the DIP switches of the master and the last of the parallel units to **ON**.

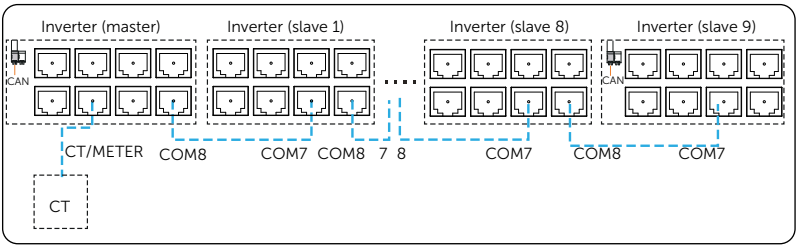


Figure 16-7 Communication cable wiring

NOTICE!

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

Battery wiring diagram

NOTICE!

- When using a lithium battery in a parallel system, a battery communication cable is required between the master inverter and the master battery unit. For details, see "9.5.1 Generator Communication Connection".
- The following diagram illustrates the wiring method for the battery power expansion mode. If connected as shown below, the inverter settings must be configured as follows: Go to ⚙ > **Battery Settings** > **Li-ion**, set the **Battery Parallel Mode** to **Power Mode**. For details, see "11.8 Battery Settings".

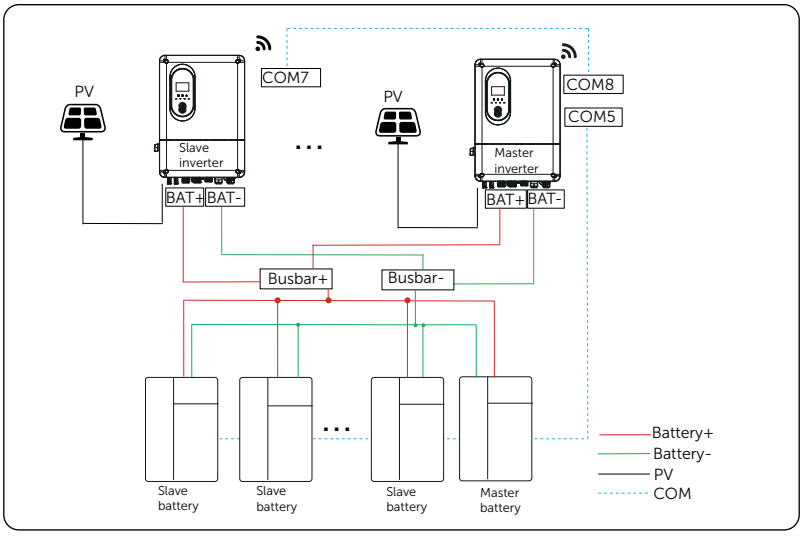


Figure 16-8 Diagram for battery wiring

16.3.5 Settings for Parallel Connection

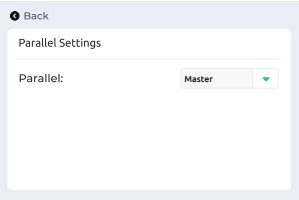
Parallel settings

On the main screen, go to ⚙ > **Parallel Settings** to set the inverter as **Master** or **Single**. Enter the password (default: **2 0 1 4**) to access the settings.

How to build the parallel connection

Step 1: Turn on the power of the entire system and find the inverter which needs to be set as the master inverter.

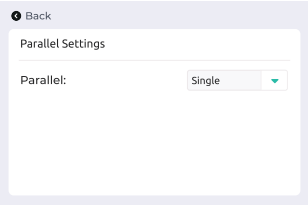
Step 2: In **Parallel Settings**, set **Parallel** as **Master**.



(Optional) Remove the parallel connection

Step 1: Disconnect all the network cables on the **COM7** and **COM8** terminal.

Step 2: Find the inverter which needs to be set as a single inverter. **In Parallel Settings**, set **Parallel** as **Single**.



Step 3: Disconnect Grid and EPS loads from parallel connection.

Step 4: Disconnect the parallel CT connection. If necessary, connect as a single CT connection, and then perform the **Installation Check** according to "Meter/CT settings".

NOTICE!

- If the network cable of a slave inverter is disconnected with master inverter but not be set to **Single**, this slave inverter will stop working.

Meter/CT settings

On the main screen, go to ⚙ > **Settings** > **Advanced** > **Meter/CT Settings**. For details, see "Meter/CT settings".

NOTICE!

- If the output power does not meet the expectation, you can check whether the **Export** value is set reasonably. On the main screen, go to ⚙ > **Grid Settings**.
- To use a higher-range CT in a parallel system, go to the **Meter/CT State Settings** and set **CT Ratio** accordingly.
- In a parallel system, you may need to use a CT with a larger measurement range. Adjust the **CT Ratio** accordingly to support it.

16.3.6 Parallel Display

NOTICE!

- The exact display is based on what is on the actual inverter.

- The work mode on the main screen 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, all inverters will display power and SOC.

16.4 Application of Micro Grid

NOTICE!

- For micro grid settings, see "Micro grid".

16.4.1 Introduction of Micro Grid Application

Due to islanding effect, on-grid inverter is unable to work during off-grid. This characteristic makes user losing the on-grid inverter PV energy when off-grid. Micro grid is the function that making hybrid inverter simulate the grid to active on-grid inverter during off-grid by connecting on-grid inverter to hybrid inverter's **EPS** or **GEN** terminal.

- 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 Protection**.
- On-grid inverter output power ≤ Max. hybrid inverter EPS output power.
- On-grid inverter output power ≤ Max. battery charging power.

16.4.2 System Wiring Diagram

Micro grid at EPS terminal

- Single inverter

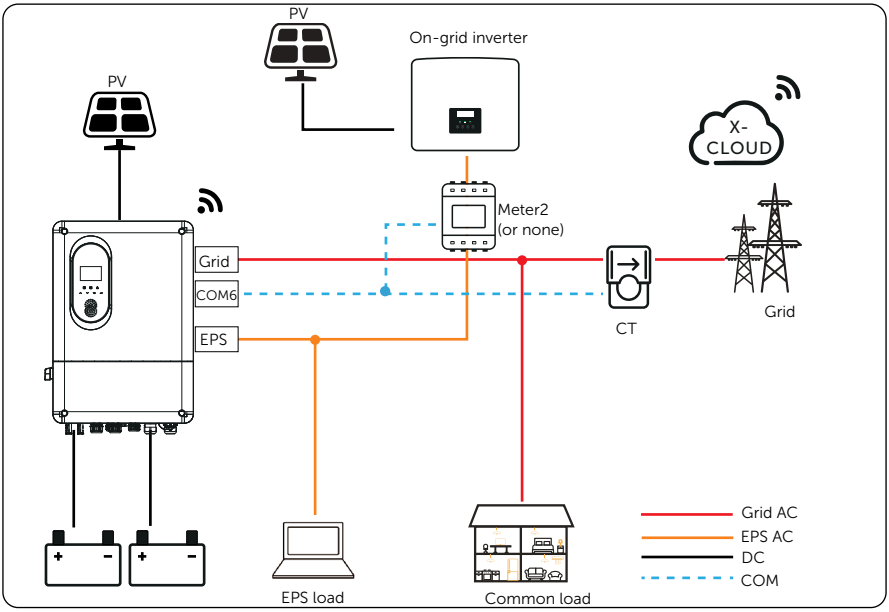


Figure 16-9 Micro grid for a single inverter at EPS terminal

- Parallel inverters

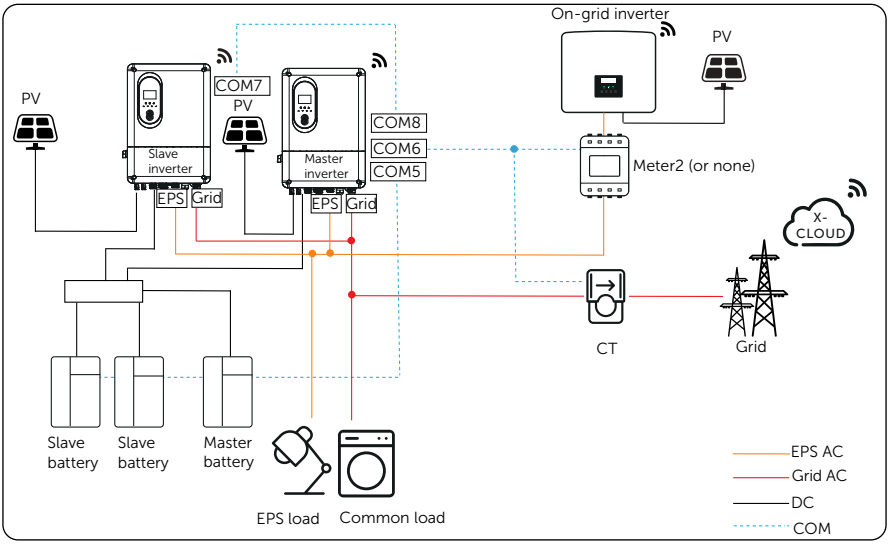


Figure 16-10 Micro grid for parallel inverters at EPS terminal

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.

Micro grid at GEN terminal

- Single inverter

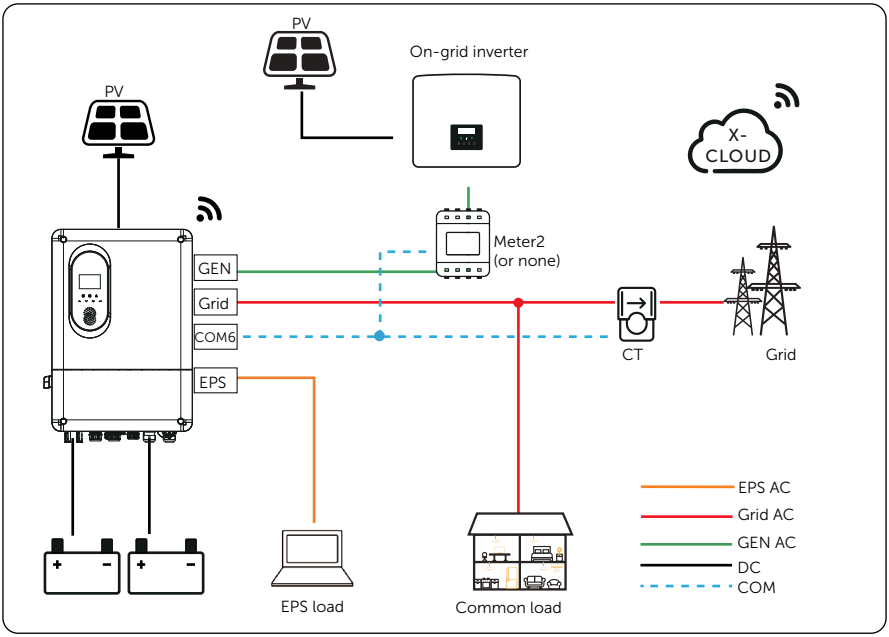


Figure 16-11 Micro grid for a single inverter at GEN terminal

- Parallel inverters

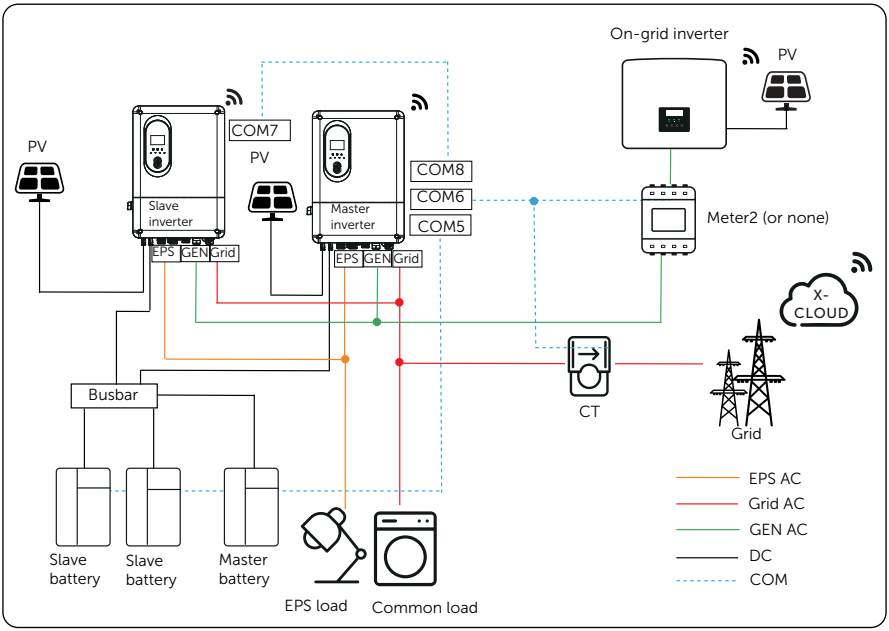


Figure 16-12 Micro grid for parallel inverters at GEN terminal

16.4.3 Cable Connection

Hybrid inverter

For details about cable connection for the X3-NEO-LV series inverter, see "8.4 AC Connection" for Grid, EPS, and GEN connection.

On-grid inverter

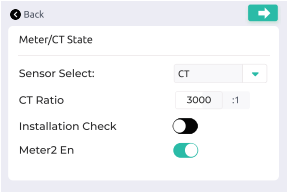
Connect the AC cable of the on-grid inverter to the **GEN** terminal of the hybrid inverter. For details about cable connection for the on-grid inverter, see its user manual.

16.4.4 Inverter Settings for Meter2

Step 1: Set the meter communication address to **2**. For details, see the user manual of the meter.

Step 2: On the main screen of the inverter, go to ⚙ > **Settings** > **Advanced**. Enter the password (default: **2 0 1 4**) to access the settings.

Step 3: Enable **Meter2 En**.



NOTICE!

- Except for **Meter2 En**, all other settings shown are for reference only. Configure them according to the actual needs.

16.5 Application of AC Coupling

16.5.1 Introduction of AC Coupling

AC coupling integrates storage with existing PV systems via parallel AC connection. It stores excess solar energy, enables backup power during grid outages, and increases self-consumption. This retrofit solution requires no modification to the original PV system and maintains compatibility with most on-grid inverters.

NOTICE!

- The AC-coupled system does not support a zero-power output mode.

16.5.2 System Wiring Diagram

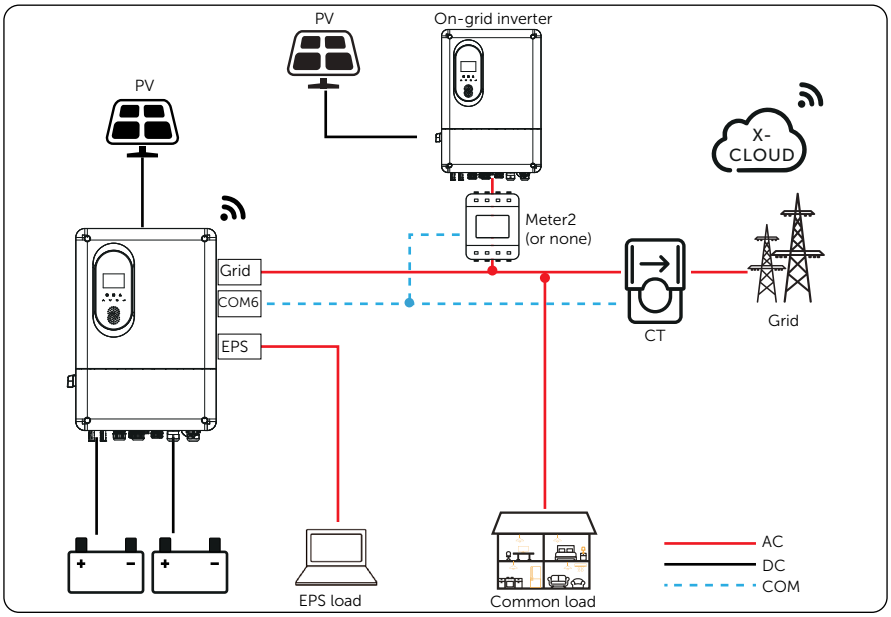


Figure 16-13 AC Coupling wiring diagram

16.5.3 Cable Connection

Hybrid inverter

For details about cable connection for the X3-NEO-LV series inverter, see "8.4 AC Connection" for Grid, EPS, and GEN connection.

On-grid inverter

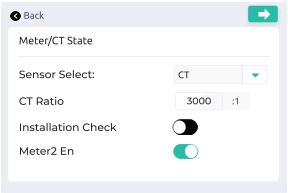
Connect the AC cable of the on-grid inverter to the **GEN** terminal of the hybrid inverter. For details about cable connection for the on-grid inverter, see its user manual.

16.5.4 Inverter Settings for Meter2

Step 1: Set the meter communication address to **2**. For details, see the user manual of the meter.

Step 2: On the main screen of the inverter, go to ⚙ > **Settings** > **Advanced**. Enter the password (default: **2 0 1 4**) to access the settings.

Step 3: Enable **Meter2 En**.



NOTICE!

- Except for **Meter2 En**, all other settings shown are for reference only. Configure them according to the actual needs.

16.6 Application of Meter

16.6.1 Introduction of Meter Connection

To detect and monitor the power data generated from the on-grid inverter or the grid status when a generator is connected to the **GRID** terminal of the X3-NEO-LV series inverter, the meter is required.

16.6.2 System Wiring Diagram

Meter1 connection with generator at GRID terminal

Monitor the grid status when a generator is connected to the **GRID** terminal of the X3-NEO-LV series inverter.

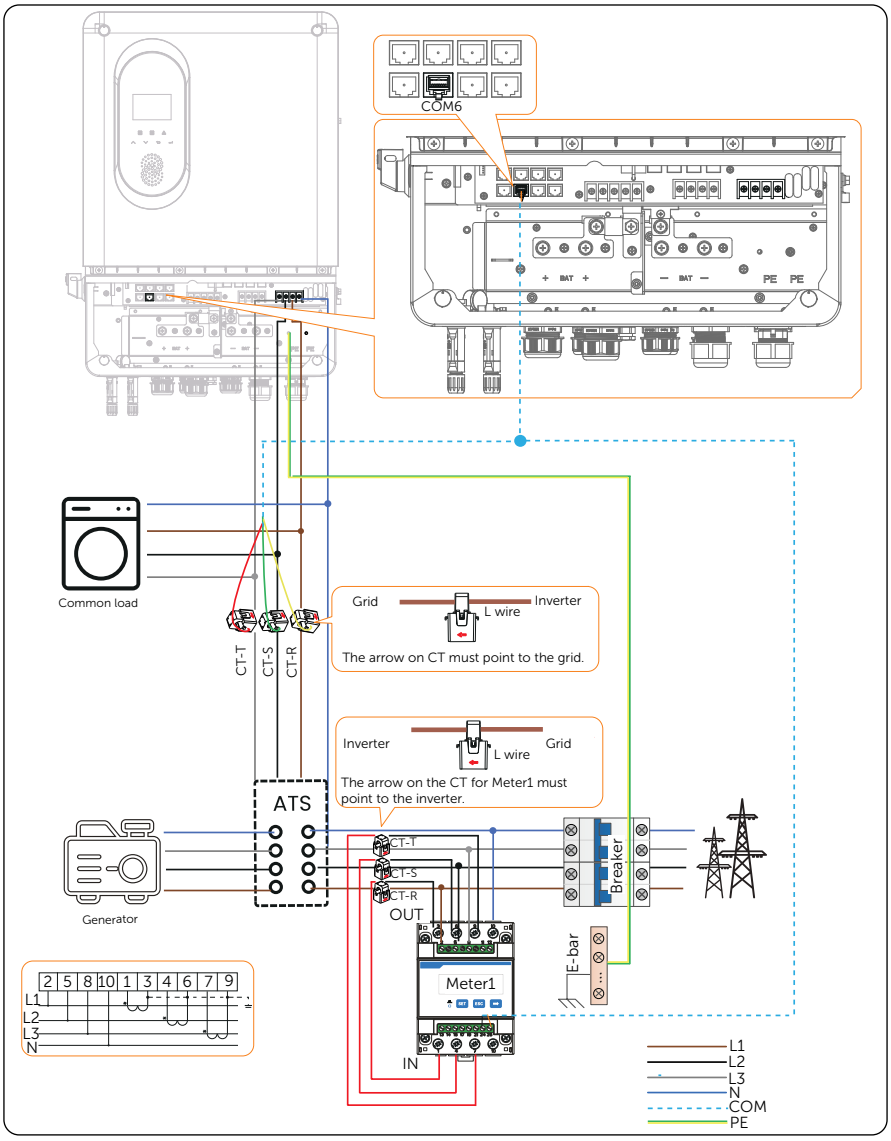


Figure 16-15 Connection diagram for Meter1 with generator at GRID terminal

Meter2 connection in AC coupling

In AC coupling, **Meter2** is installed on the on-grid inverter side to measure net power flow, allowing the inverter to dynamically control energy import and export.

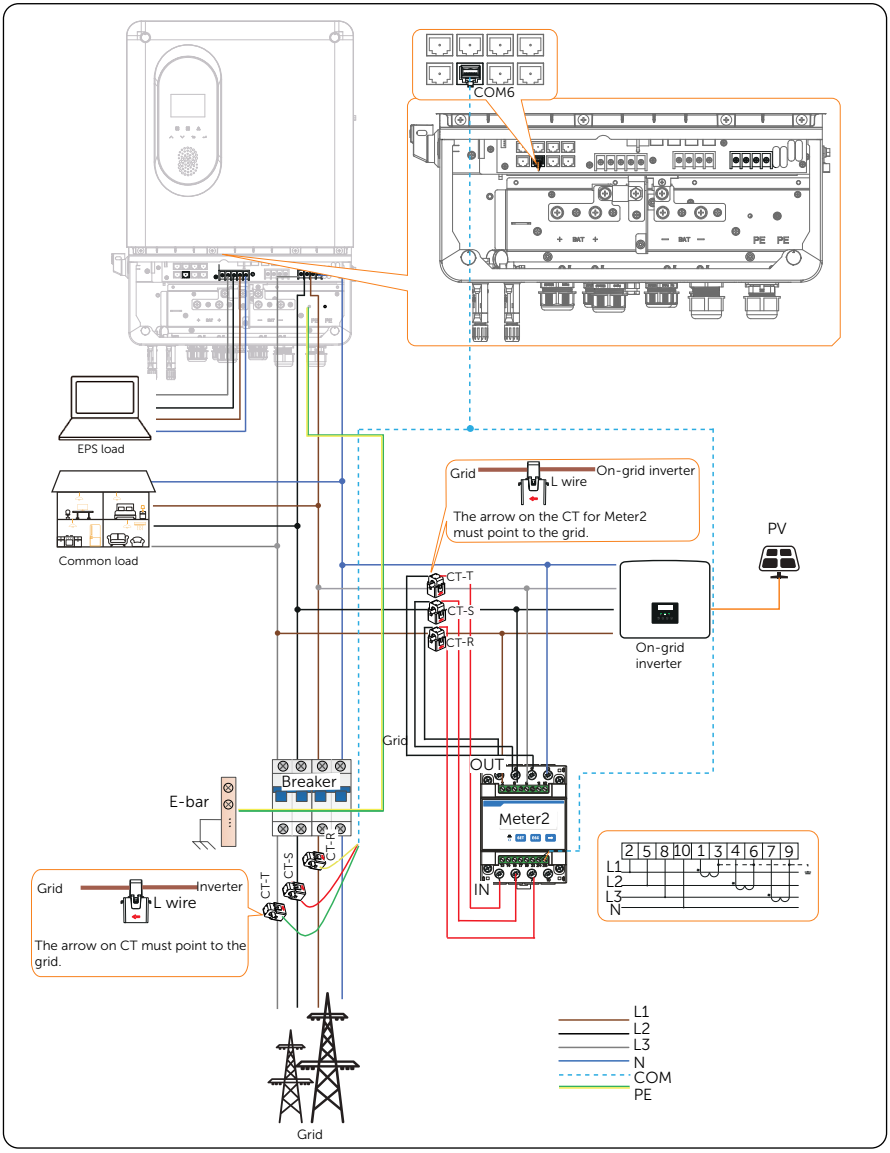


Figure 16-16 Connection diagram for Meter2 in AC coupling

NOTICE!

- For Meter/CT connection steps, refer to "9.6.1 Meter/CT Connection" and meter /CT user manual for specific connection steps.

16.6.3 Pin Assignment of COM6

Table 16-3 Pin assignment of COM6 for meter

Pin	Assignment	Description
4	METER_485A	For meter connection
5	METER_485B	

16.6.4 Inverter Settings for Meter1

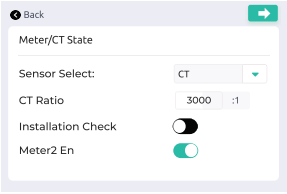
Set the meter communication address to **1**. For details, see the user manual of the meter.

16.6.5 Inverter Settings for Meter2

Step 1: Set the meter communication address to **2**. For details, see the user manual of the meter.

Step 2: On the main screen of the inverter, go to > **Settings** > **Advanced**. Enter the password (default: **2 0 1 4**) to access the settings.

Step 3: Enable **Meter2 En**.



NOTICE!

- Except for **Meter2 En**, all other settings shown are for reference only. Configure them according to the actual needs.

16.7 Application of Smart Load

16.7.1 Introduction of Smart Load

The smart load function is an advanced operational mode that utilizes the **GEN** terminal of an inverter as a controllable load. In this configuration, the inverter actively draws power from an available AC source to supply specific, non-critical loads. This enables critical applications such as generator testing, burner-in cycles, and strategic power diversion, turning excess energy into a usable resource rather than wasting it.

NOTICE!

- For smart load settings, see "11.7 Smart Load Settings".

16.7.2 System Wiring Diagram

Smart load for a single inverter

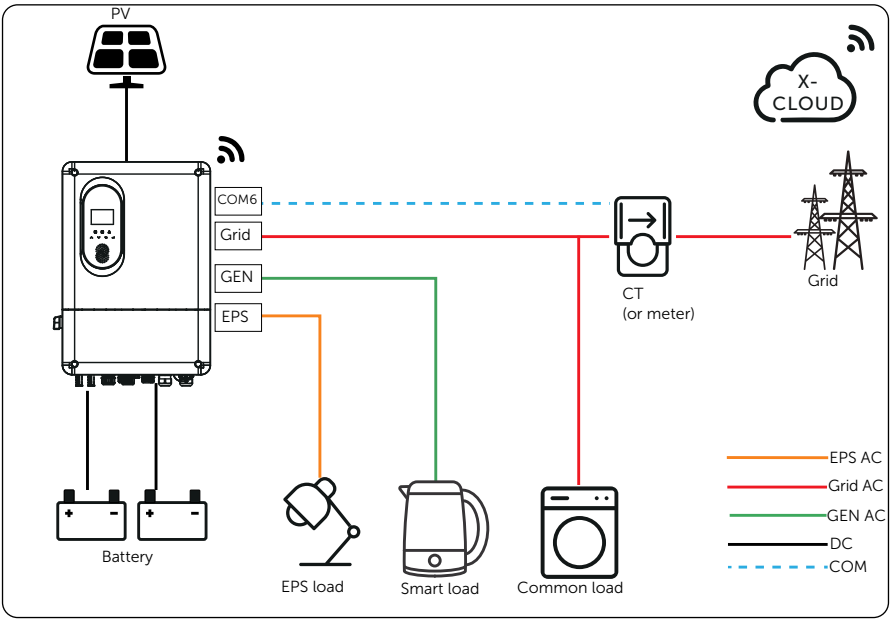


Figure 16-18 Diagram for smart load for a single inverter

Smart load for parallel inverters

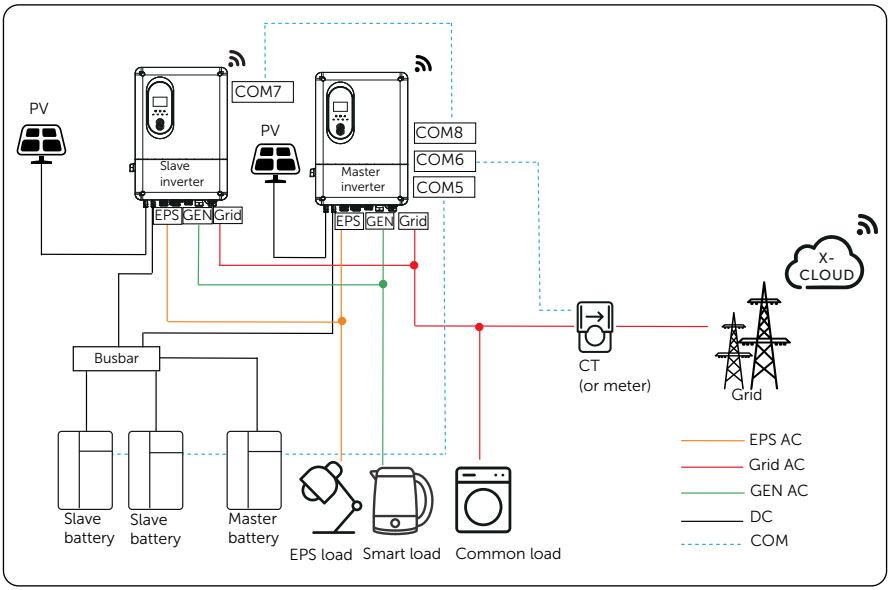


Figure 16-19 Diagram for smart load for parallel inverters

SolaX Power Network Technology (Zhejiang) Co., Ltd.

ADD.: No. 278, Shizhu Road, Chengnan Sub district, Tonglu County,
Hangzhou, Zhejiang, China
E-mail: info@solaxpower.com

Copyright © SolaX Power Network Technology (Zhejiang) Co., Ltd. All rights reserved.

320101105504