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.

320101042009



X3-Hybrid G4

5 kW / 5.5 kW / 6 kW / 8 kW
8.3 kW / 10 kW / 12 kW / 15 kW

User Manual

Version 9.0

www.solaxpower.com

eManual in the QR code or at
www.solaxpower.com

Change History

Changes between document versions are cumulative. The latest version contains all updates made in previous versions.

Version 09 (Feb. 10, 2026)

Optimized the document in RCMU, voltage decisive class and ventilation icon.
Deleted QR code on the back cover and modified "master" "slave" into "leader" "follower". Deleted Section Monitoring Connection.

Version 08 (Jan. 20, 2025)

Support battery model HS51.
Added content about free-password time and password time resetting.

Version 07 (Jul. 23, 2024)

Update the company address.
Update 4.3 Installation Precautions (Modified the direct sunlight suggestions).
Update Technical Data (Added a note to the max. PV current and modified the battery voltage range for inverter 5/6/8/10/12/15kW).
Modified the torque in mechanical installation, grounding connection, and grid & EPS (off-grid) connection.
Modified the net weight and gross weight into 30±1 kg and 34±1 kg respectively.
Modified the diameter of PE wire from 4 mm^2 into 4~6 mm^2.
Modified the number and installation order of washers in mechanical installation.

Version 06 (November. 01, 2023)

Update 3 Technical Data (Added parameters of rated output apparent power and Max. output apparent power for AS/NZS 4777.2)

Version 05 (September. 13, 2023)

Update 7.2 LCD Operation (Updated the description of battery heating function) in page116.)

Version 04 (July. 26, 2023)

Update 7.2 LCD Operation (Correct the mistake in 27) in page114.)
Update the whole passage (Add X3-Hybrid-5.5-D-LV and X3-Hybrid-8.3-D-LV.)
Update 7.2 LCD Operation (Add Meter/CT Check under Meter/CT setting interface and Super-Backup under EPS setting interface.)
Update 3.1 DC Input (Add Max. PV array power.)
Update 5.5.3 Parallel Communication (Correct the parallel system.)
Update 2.2 Electrical Block Diagram of the System (Add a notice in page 14.)
Update 1.3.1 Important Safety Instructions (Correct some notices.)
Update 5 Electrical Connection (Explain how to use Australian DC switch of this inverter in page75.)
Update 5.4 Battery Connection (Update compatible battery models and quantity in page46.)

Version 03 (May. 08, 2023)

Update 2.3 Work Modes and 7.3 LCD Operation (Added peak shaving mode under work modes chapter.)
Update 7.3 LCD Operation (Updated the LCD display under most settings.)
Update 3 Technical Data (Changed the data of Max. input current to 28/16 A; and the data of Max. short circuit current to 35/20 A for 8kW+ inverters.)
Update 4.2 Packing List (Deleted the "PE cable" in the packing list of the M version inverter.)
Update 5.1 PV Connection (Deleted the COMM PV module connection method.)
Update 5.5.3 Parallel Connection (Updated the description.)

Version 02 (Dec. 14, 2022)

Update the inverter power (Added 10.0K-D for the certification of Belgium)
Update 2.3 Work Modes (Separated the description of the forced charging period and allowed discharging period)
Update 2.2 Electrical Block Diagram of the System (Changed the place of RCD in the D and M version diagram in Australia)
Update 5.5.3 Parallel Connection (Added a note about "External ATS" setting and corrected the port of the inverter the meter connected to)
Update 7.3 LCD Operation (Changed the "External ATS" setting)
Update 3 Technical Data (Revised the description of some data and added some new parameters.)
Update 1.3.2 Explanation of Symbols (Deleted the icon and description of "UNKI")
Update 5.5.4 COM Communication (A computer is connected to an inverter through a USB-RS485 converter.)

Version 01 (Sept. 15, 2022)

Update 1.3.2 Explanation of Symbols (Deleted the icon of "TUV")
Update 4.2 Packing List (Changed the WiFi Dongle optional)
Update 2.2/5.3/5.5.2/5.8 (Changed all CT figures)
Update the design and cover page (Changed the telephone number and changed the design layout tolerance)
Update 1.3.3 EC Directives (Updated the corresponding standards)
Update 3 Technical Data (Added "Nominal AC Output Current")
Update 5.5.2 Introduction to meter/CT Communication (Added a note about the installation requirements of CTs)

Version 00 (Jun. 20, 2022)

Initial release

Contents

1 Note on this Manual....03
1.1 Scope of Validity....03
1.2 Target Group....03
1.3 Symbols Used....03
1.3.1 Important Safety Instructions.... 04
1.3.2 Explanation of Symbols....09
1.3.3 CE Directives....11

2 Introduction....12
2.1 Basic Features....12
2.2 Electrical Block Diagram of the System....12
2.3 Work Modes....15
2.4 Dimensions....17
2.5 Terminals of Inverter....18

3 Technical Data....19
3.1 DC Input....19
3.2 AC Output/Input....19
3.3 Battery....20
3.4 Efficiency, Safety and Protection....20
3.5 EPS(Off-grid) Output....21
3.6 General Data....21

4 Installation....22
4.1 Check for Transport Damage....22
4.2 Packing List....22
4.3 Installation Precautions....24
4.4 Tool Preparation....25
4.5 Installation Site Conditions....27
4.5.1 Installation Carrier Requirements....27
4.5.2 Installation Requirements....27
4.5.3 Installation Space Requirements....28
4.6 Mounting....29

5 Electrical Connections.....32
5.1 PV Connection.....32
5.2 Grid Port and EPS(Off-grid) Output Connection.....36
5.3 EPS(Off-grid) Block Diagram.....37
5.4 Battery Connection.....46
5.5 Communication Connection.....50
5.5.1 Introduction to COM Communication.....50
5.5.2 Introduction to Meter/CT Communication.....52
5.5.3 Parallel Communication.....55
5.5.4 Introduction to DRM Communication.....62
5.5.5 Introduction to OFF port.....62
5.5.6 Communication Connection Steps.....63
5.6 Grounding Connection(Mandatory).....71
5.7 Check All below Steps before Starting Inverter.....76
5.8 Inverter Operation.....77

6 Firmware upgrading.....80

7 Setting.....84
7.1 Control Panel.....
7.2 Menu Structure.....84
7.3 LCD Operation.....85
86

8 Troubleshooting.....122
8.1 Trouble Shooting.....
8.2 Routine Maintenance.....122
128

9 Decommissioning.....129
9.1 Disassembling the Inverter.....
9.2 Packaging.....129
9.3 Storage and Transportation.....129
9.4 Waste Disposal.....129
129

10 Disclaimer.....130

* WARRANTY REGISTRATION FORM

1 Notes on this Manual

1.1 Scope of Validity

This manual is an integral part of the inverter, it describes the assembly, installation, commissioning, maintenance and failure of the product. **Please read it carefully before operating.**

X3-Hybrid-5.0-D	X3-Hybrid-5.0-M	X3-Hybrid-10.0-D X3-Hybrid-10.0K-D	X3-Hybrid-10.0-M
X3-Hybrid-6.0-D	X3-Hybrid-6.0-M	X3-Hybrid-12.0-D	X3-Hybrid-12.0-M
X3-Hybrid-8.0-D	X3-Hybrid-8.0-M	X3-Hybrid-15.0-D	X3-Hybrid-15.0-M
X3-Hybrid-5.5-D LV		X3-Hybrid-8.3-D LV	

Note: **"X3-Hybrid"** Series refers to the energy storage inverter that supports photovoltaic grid-connected.
"5.0"means 5.0kW.
"10.0K-D" is in compliance with C10/11.
"D" means with "DC switch", **"M"** means externally connected with X3-Matebox.
"LV" means low voltage.
The15.0kw inverter complies with Thailand's PEA/MEA grid-connected regulations.
Keep this manual available at any time.

1.2 Target Group

This manual is for end customers and qualified electricians. The tasks described in this manual only can be performed by qualified electricians.

1.3 Symbols Used

The following types of safety instructions and general information appear in this document as described below:

Danger!
"Danger" refers to a dangerous situation that, if not avoided, will result in a high level of risk such as serious injury or even death.

Warning!
"Warning" indicates a dangerous situation, which, if not avoided, may result in serious injury or death.

Caution!
"Caution" indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Note!
"Note" provides tips that are valuable for the optimal operation of our product.

1.3.1 Important Safety Instructions

Danger!
Danger to life due to high voltages in the inverter!
The personnel responsible for the installation, electrical connection, debugging, maintenance and fault handling operation of this product need to be trained, master the correct operation method, have the corresponding electrician qualification and safety operation knowledge.

Caution!
When the inverter is working, it is strictly forbidden to touch the shell. The temperature of the shell is high and there is a risk of scalding.

Caution!
Radiation may be harmful to health!
Do not stay for a long time and keep at least 20 cm away from the inverter.

Note!
Ground PV system.
Finish PV modules and photovoltaic system grounding in accordance with local requirements to achieve optimal protection of systems and personnel.

Warning!
Ensure that the input DC voltage is below the inverter limit. Excessive DC voltage and current may cause permanent damage or other losses to the inverter, which is not covered by the warranty.

Warning!
Before performing maintenance, cleaning or operation on the circuit connected to the inverter, authorized maintenance personnel must first disconnect the AC and DC power supplies of the inverter.

Warning!
Only operate the inverter when it is technically faultless.

Warning!
Risk of electric shock!

Warning!
You need a multipolar interruption device to disconnect the current conductors.

This inverter can only use the accessories sold and recommended by our company, otherwise it may cause fire, electric shock or casualties. Without the authorization of our company, you may not open the inverter cover or replace the inverter parts, otherwise the warranty promise of the inverter will be invalid.

Strictly follow relevant safety specifications for product installation and testing. During installation, operation or maintenance, please read carefully and follow the instructions and precautions on the inverter or user manual. If the operation is incorrect, it may cause personal and property losses. Please keep the user manual properly after use.

The inverter has an integrated Type-B Residual Current Monitoring Unit (RCMU). The use and operation of the inverter must be carried out in accordance with the instructions in this manual, otherwise this protection will fail and the warranty of the inverter will also fail. During working, the inverter surface temperature may exceed 60°C, please make sure the inverter cools down before touching, and make sure children can not touch.

When exposed to sunlight, photovoltaic arrays generate dangerous high DC voltages. Please follow our instructions, otherwise it will be life-threatening.

All DC and AC power sources must be disconnected from the inverter for at least 5 minutes before any wiring or electrical operation is performed on the inverter to ensure complete isolation of the inverter and avoid electric shock.

A photovoltaic module used on the inverter must have a IEC61730A rating, and the total open circuit voltage of the photovoltaic string / array is lower than the maximum rated DC input voltage of the inverter. Any damage caused by photovoltaic over voltage is not covered by warranty.

Installation position should be away from wet environment and corrosive substances.

After the inverter and power grid cut off the PV power supply, there will be a certain amount of residual current in a short time, be cautious or it may lead to serious personal injury and even high risk of death. Use a multimeter (impedance at least1 MΩ) to measure the voltage between the UDC and the UDC- to ensure that the inverter port is discharged below the safe voltage before starting operation (35 VDC).

➢ **Surge protection devices (SPDs) for PV installation**



Warning!

Over-voltage protection with surge arresters should be provided when the PV power system is installed.
The grid connected inverter is fitted with SPDs in both PV input side and MAINS side.

Direct or indirect lightning strikes can cause failures. Surge is the main cause of lightning damage to most devices. Surge voltage may occur at photovoltaic input or AC output, especially in remote mountain areas where long distance cable is supplied.

Please consult professionals before installing SPDs.

The external lightning protection device can reduce the influence of direct lightning strike, and the lightning protection device can release surge current to the earth.

If the building installed with external light protection device is far away from the inverter location, in order to protect the inverter from electrical and mechanical damage, the inverter should also install an external lightning protection equipment.

In order to protect DC system, two-stage surge protection equipment is needed between DC cable of inverter and photovoltaic equipment module.

In order to protect the AC system, the level 2 surge protection equipment should be installed at the AC output, located between the inverter and the grid. Installation requirements must comply with IEC61643-21 standard.

All DC cables shall be installed in a distance as short as possible, and the positive and negative cables of the same input need to be bundled together to avoid causing loops in the system. Minimum distance installation and binding requirements also apply to auxiliary grounding and shielding grounding conductors.



Warning!

You need an external protection device.

➢ **Anti-Islanding Effect**

The islanding effect means that when the power grid is cut off, the grid-connected power generation system fails to detect the power outage and still supplies power to the power grid. This is very dangerous for the maintenance personnel and the power grid on the transmission line.
The inverter's use active frequency offset method to prevent islanding effect.

➢ **PE Connection and Leakage Current**

• All inverter's incorporate a certified internal Residual Current Monitoring (RCM) in order to protect against possible electrocution and fire hazard in case of a malfunction in the PV array, cables or inverter.
There are 2 trip thresholds for the RCM as required for certification (IEC 62109-2:2011).
The default value for electrocution protection is 30mA, and for slow rising current is 300mA.

• If an external RCD is required by local regulations, it is recommended to choose a Type-A RCD with the rating residual current of 300 mA.



Warning!
High leakage Current!
Earth connection essential before connecting supply.

• A faulty ground connection can result in equipment failure, personal and death injuries, and electromagnetic interference.
• Ensure correct according to grounding to IEC62109 and conductor diameter according to STANDARD specification.
• Do not connect the grounding end of the equipment in series to prevent multi-point grounding.
• Electrical appliances must be installed in accordance with the wiring rules of each country.

For United Kingdom
• The installation that connects the equipment to the supply terminals shall comply with the requirements of BS 7671.
• Electrical installation of PV system shall comply with requirements of BS 7671 and IEC 60364-7-712.
• All protective devices cannot be changed.
• User shall ensure that equipment is so installed, designed and operated to maintain at all times compliance with the requirements of ESQCR22(1)(a).

➢ **Battery Safety Instructions**

The inverter should pair with high voltage battery, for the specific parameters such as battery type, nominal voltage and nominal capacity etc., please refer to section 3.3.

Please refer to the matching battery specification for details.

1.3.2 Explanation of Symbols

This section gives an explanation of all the symbols shown on the inverter and on the type label.

- Symbols on the Inverter

Symbols	Explanation
	Operating Display
	Battery status
	An error has occurred, please inform your installer immediately

- Symbols on the Type Label

Symbols	Explanation
	CE mark. The inverter complies with the requirements of the applicable CE guidelines.
	TUV certified.
	RCM remark.
	Beware of hot surface. The inverter can become hot during operation. Avoid contact during operation.

	Danger of high voltages. Danger to life due to high voltages in the inverter!
	Danger. Risk of electric shock!
	Observe enclosed documentation.
	The inverter can not be disposed together with the household waste. Disposal information can be found in the enclosed documentation.
	Do not operate this inverter until it is isolated from battery, mains and on-site PV generation suppliers.
	Danger to life due to high voltage. There is residual voltage existing in the inverter after powering off, which needs 5 min to discharge. Wait 5 min before you open the upper lid or the DC lid.

1.3.3 CE Directives

This chapter describes the requirements of the European low voltage regulations, including safety instructions and system licensing conditions, the user must comply with these regulations when installing, operating, and maintaining the inverter, otherwise it will cause personal injury or death, and the inverter will cause damage.

Please read the manual carefully when operating the inverter .If you do not understand "danger", "warning", "caution" and the description in the manual, please contact the manufacturer or service agent before installing and operating the inverter.

Grid-connected inverter comply with low voltage directive (LVD) 2014/35/EU and Electromagnetic compatibility directive (EMC) 2014/30/EU.Detection of components is based on:
Standard of 2014/35/EU (LVD)
EN IEC 62109-1; EN IEC 62109-2
EN IEC 62477-1
Standard of 2014/30/EU (EMC)
EN IEC 61000-6-1; EN IEC 61000-6-2;
EN IEC 61000-6-3; EN IEC 61000-6-4;
EN IEC 61000-3-2; EN 61000-3-3;
EN IEC 61000-3-11; EN 61000-3-12;
EN 55011

For installation in photovoltaic module system, it is necessary to make sure that the whole system complies with the requirements of EC(2014/35/EU, 2014/30/EU, etc.) before starting the module (i.e. to start the operation).The assembly shall be installed in accordance with the statutory wiring rules .Install and configure the system in accordance with safety rules, including the use of specified wiring methods. The installation of the system can only be done by professional assemblers who are familiar with safety requirements and EMC. The assembler shall ensure that the system complies with the relevant national laws.

The individual subassembly of the system shall be interconnected by means of the wiring methods outlined in national/international such as the national electric code (NFPA) No. 70 or VDE regulation 4105.

2 Introduction

2.1 Basic Features

This high-quality inverter can convert solar energy into alternating current and store energy into batteries.
The inverter can be used to optimize self-consumption, stored in batteries for future use or fed into the public grid. The way it works depends on user preferences. It can provide emergency power during power outages.

2.2 Electrical Block Diagram of the System

The inverter has two wiring schemes, one is for M series inverter connected to X3-Matebox, and the other is for D series inverter.
There are different ways of wiring in different countries, one is to connect N line with PE line, the other is to separate the line from the PE line wiring, see below;

Diagram A: N line and PE line separate wiring, D series inverter;
(For most countries)

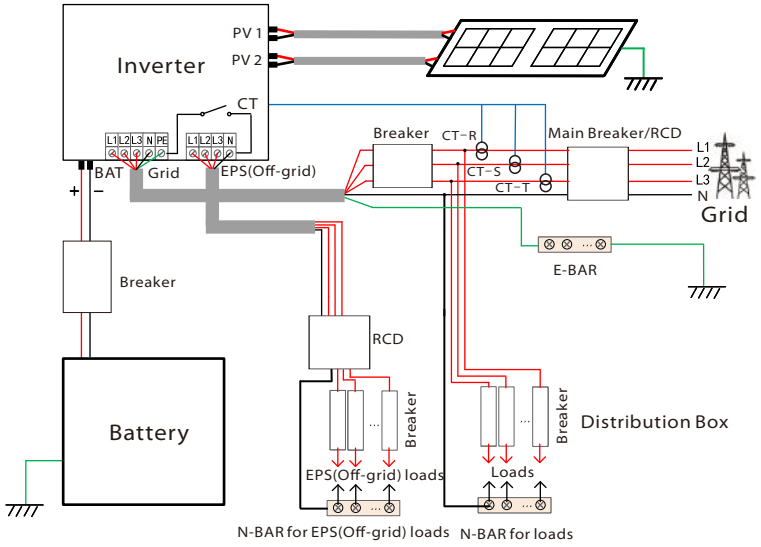


Diagram B: N line and PE line separate wiring, M series inverter;
(For most countries)

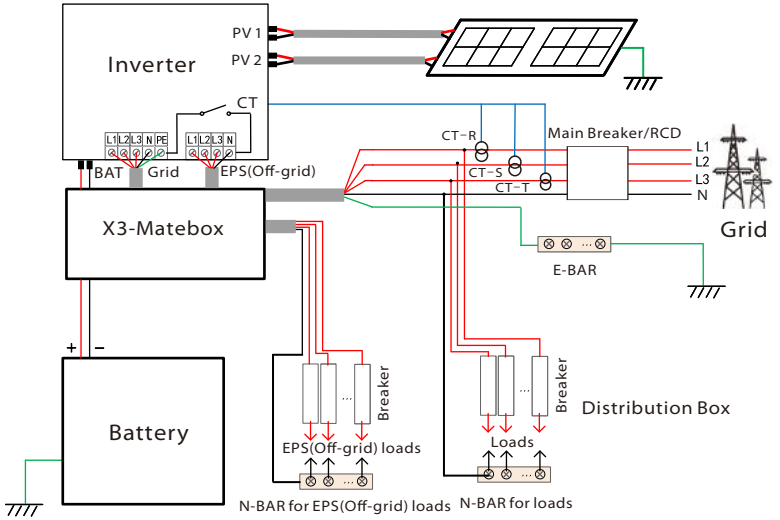


Diagram C: N line and PE line together, D series inverter;
(Applicable to Australia)

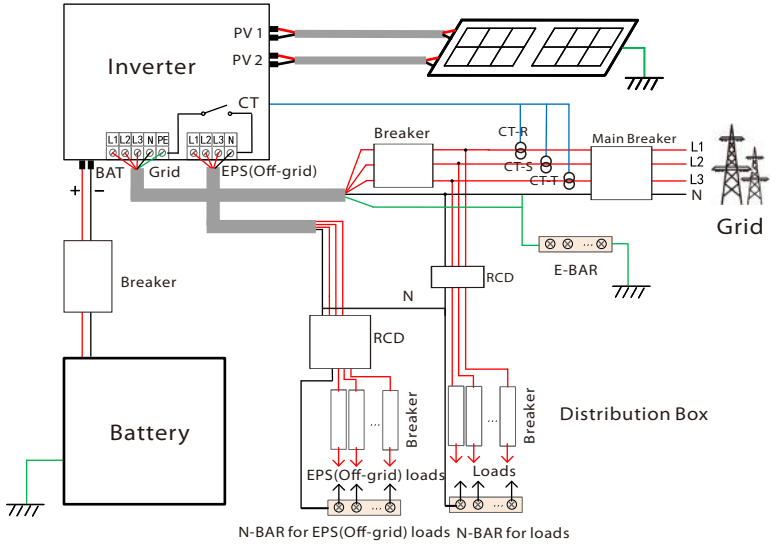
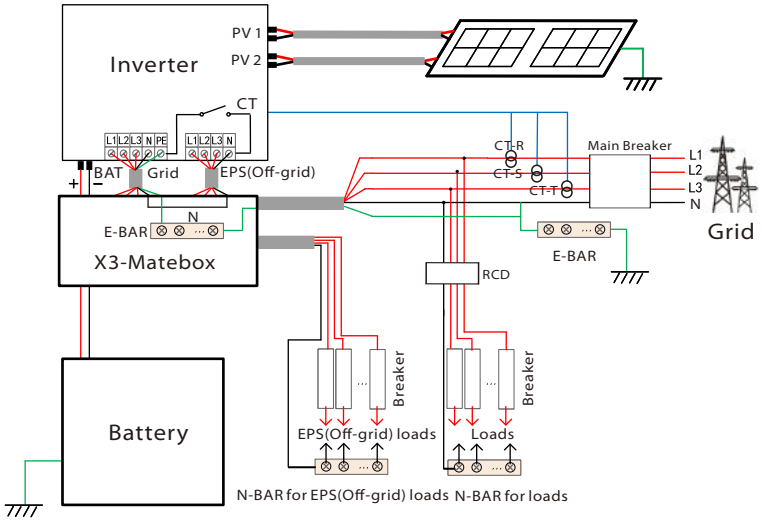


Diagram D: N line and PE line together, M series inverter;
(Applicable to Australia)



Note!
The RCD on the figure represents a leakage protection device with a circuit breaker function.

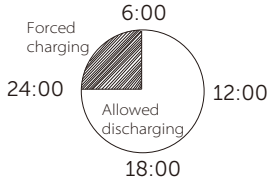
- When power cuts suddenly, the inverter connects the N line of EPS(Off-grid) load with the ground through relay, providing a fixed zero potential for EPS(Off-grid) load and ensuring the safety of electricity use by users.

- Please control the inverter load and make sure it is "output value" in "within " EPS(Off-grid) mode, otherwise the inverter will stop and alarm overload fault".

- Please confirm with the grid operator whether there are special regulations for grid connection.

- If Australian users replace a SolaX X3-Fit G4 inverter with a X3-Hybrid G4 inverter, only a meter can be connected in those diagrams above.

2.3 Work Modes



The inverter has two configurable working periods: allowed discharging period and forced charging period.

For how to set the two working periods, please refer to page 90.

The default value of allowed discharging period is 00:00~23:59, and the default value of forced charging period is 00:00~00:00 (closed in default) . You can configure the two working periods by yourself.

As shown in the example above, the allowed discharging period is 6 am to 24 pm, and the forced charging period is 24 pm to 6 am.

• Forced charging period

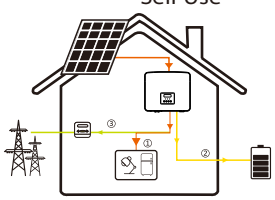
The priority of forced charging period is higher than all work modes. Under the forced charging period, the inverter will charge the battery first untill the battery SOC reaches the value of "charge battery to".

• Allowed discharging period

Under the allowed discharging period, the inverter will allow the battery to discharge (but not force the battery to discharge). The following work modes will take effect under the allowed discharging period.

For **on-grid** status, there are five work modes: Self Use, Feed-in Priority, Backup, Manual and Peak Shaving Mode.

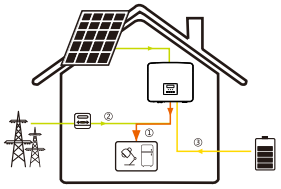
Self Use



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 surplus power will charge the battery, then the remaining power will feed into the grid.

Priority: Loads > Battery > Grid

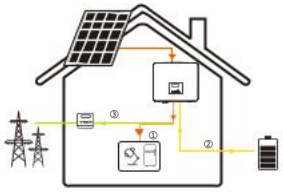
Feed-in priority



The feed-in priority mode is suitable for areas with high feed-in subsidies, but has feed-in power limitation.
The power of PV will supply the loads first, and surplus power will feed into the grid, then the remaining power will charge the battery.

Priority: Loads > Grid > Battery

Backup mode



The back-up 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.

Priority: Loads > Battery > Grid

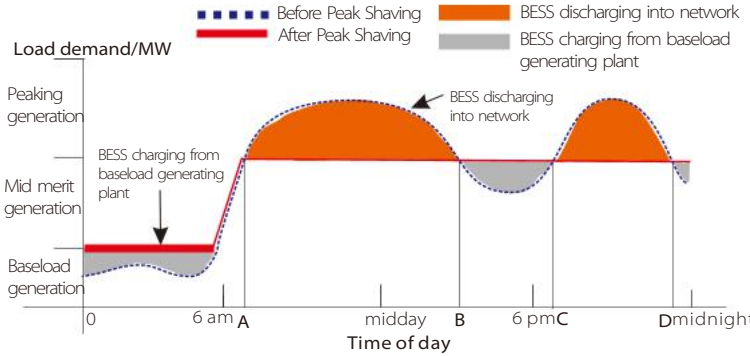
* For the above three work modes, when the power of PV is insufficient to supply the loads, the battery will supply the loads. If the battery is insufficient, then the grid will supply the loads.

Manual

This work mode is for the after-sales team to do after-sales maintenance.

Peak shaving mode

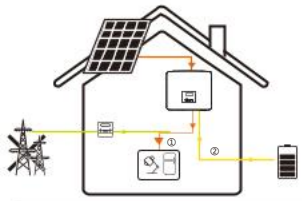
Peak shaving mode is set for leaving out peaks in electricity use.



The D-A period is the battery charging period during which discharging is not allowed and the PV will charge the battery first for peak shaving. The ChargeFromGrid" setting determines whether or not to charge from the grid. When "ChargeFromGrid" is set to "Disable", the battery cannot charge from the grid; when "ChargeFromGrid" is set to "Enable" and the actual battery SOC is less than “Max_SOC”, the battery will charge from the grid at no more than "ChargePowerLimits" power.
In the A-B and C-D periods, if the power of loads does not exceed "PeakLimits", the PV will charge the battery first. When the battery is fully charged, the PV will charge loads, and the surplus power will feed into the grid. If the power of loads exceeds "PeakLimits", the PV and battery will discharge energy for loads and thus reduce the amount of energy purchased from the grid.
In the B-C period, the battery does not discharge. The PV will charge the battery to the "Reserved SOC" first and then supply power for loads, with the surplus power feeding into the grid. Charging the battery first in these periods is storing energy for the peak shaving.
* If there are requirements for zero output from the inverter, the PV output will be limited.

For **off-grid** status, there is only one work mode: EPS (Off-grid).

EPS (Off-grid)



In case of power failure, the system will supply EPS loads through PV and battery.
(The battery must be installed, and EPS loads shall not exceed battery’s max. loads shall not exceed output power.) output power.)
The power of PV will charge the loads first, and surplus power will charge the battery.

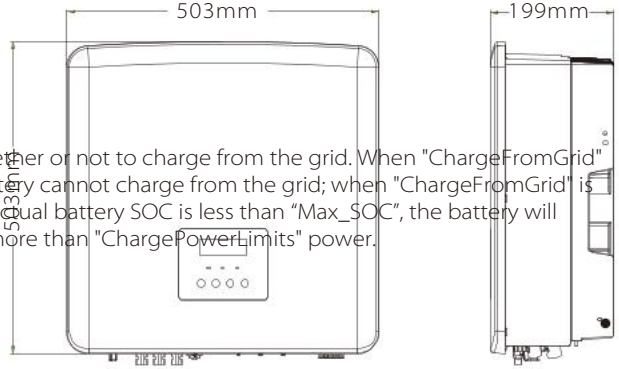
Priority: Loads > Battery

Note:
The battery will stop discharging when SOC=min SOC. But due to battery self consumption, sometimes SOC may < min SOC. battery

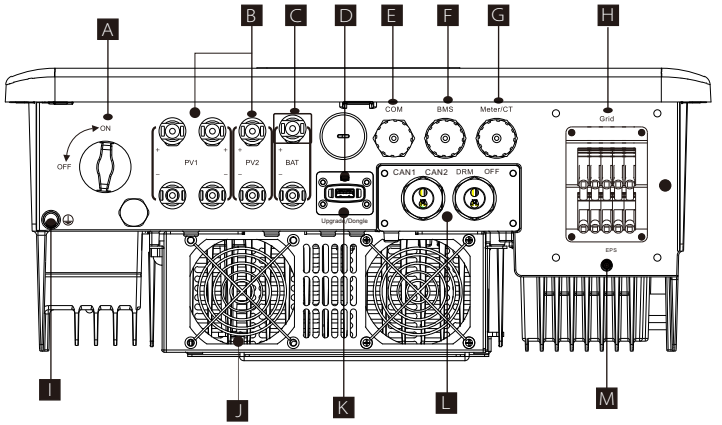
For on-grid status, if the battery SOC ≤ (min SOC-5%), the inverter will take utility energy to charge battery SOC back to (min SOC+1%).

For off-grid status, if the battery SOC ≤min SOC, the inverter will be unable to enter EPS mode (the battery will be unable to discharge unless SOC is back to 31%.)

2.4 Dimensions



2.5 Terminals of Inverter



Object	Description	Decisive voltage class
A	DC switch	-
B	PV connection port	DVC-C
C	Battery connection port	DVC-C
D	USB port for upgrading	DVC-A
E	COM port	DVC-A
F	Battery communication	DVC-A
G	Meter/CT Port	DVC-A
H	Grid connection port	DVC-C
I	Ground connection port	-
J	Fans(only for X3-Hybrid-12.0-D/M and X3-Hybrid-15.0-D/M)	-
K	External monitoring connection port	DVC-A
L	CAN1 and CAN2 are for parallel communication / OFF is for external shutdown/ DRM Port (only for Australia)	DVC-A
M	EPS(Off-grid) Output (main load connection port)	DVC-C

Warning!

Qualified electrician required for the installation.

3 Technical Data

3.1 DC Input(apply to version D/M)

Model	X3-Hybrid-5.0	X3-Hybrid-6.0	X3-Hybrid-8.0	X3-Hybrid-10.0 X3-Hybrid-10.0K-D	X3-Hybrid-12.0	X3-Hybrid-15.0	X3-Hybrid-5.5-D LV	X3-Hybrid-8.3-D LV
Max. Recommended DC power [W]	A:4000/B:4000	A:5000/B:5000	A:8500/B:5000	A:10500/B:6000	A:11000/B:7000	A:11000/B:7000	A:8000/B:5500	A:11000/B:8300
Max. PV array power [Wp]	10000	12000	16000	20000	24000	30000	11000	16600
Max. PV voltage [d.c.V]	1000	1000	1000	1000	1000	1000	800	800
Nominal DC operating voltage [d.c.V]	640	640	640	640	640	640	360	360
MPPT Voltage Range [d.c.V]	180-950	180-950	180-950	180-950	180-950	180-950	160-650	160-650
Max. PV current [d.c.A]	16/16	16/16	28*/16	28*/16	28*/16	28*/16	28*/16	28*/16
Isc PV array Short Circuit Current [d.c.A]	20/20	20/20	35/20	35/20	35/20	35/20	35/20	35/20
Max. inverter backfeed current to the array	0	0	0	0	0	0	0	0
Start output voltage [d.c.V]	200	200	200	200	200	200	200	200
No. of MPPT trackers	2	2	2	2	2	2	2	2
Strings per MPPT tracker	A:1/B:1	A:1/B:1	A:2/B:1	A:2/B:1	A:2/B:1	A:2/B:1	A:2/B:1	A:2/B:1

Note:

"*" The max. current when the PV 1 side connects to two PV strings: When the PV1 side only connects to one PV string, the max. current is 20A.

3.2 AC Output/Input(apply to version D/M)

Model	X3-Hybrid-5.0	X3-Hybrid-6.0	X3-Hybrid-8.0	X3-Hybrid-10.0 X3-Hybrid-10.0K-D	X3-Hybrid-12.0	X3-Hybrid-15.0	X3-Hybrid-5.5-D LV	X3-Hybrid-8.3-D LV
AC Output								
Rated Output Apparent Power [VA]	5000 (4999 for AS /NZS 4777.2)	6000	8000	10000 (10.0K-D 9999) (9999 for AS/ NZS 4777.2)	12000	15000 (PEA 14000) (14999 for AS/ NZS 4777.2)	5500	8300
Max. Output Apparent Power [VA]	5500 (4999 for AS /NZS 4777.2)	6600	8800	11000 (10.0K-D 9999) (9999 for AS/ NZS 4777.2)	13200	15000 (14999 for AS/ NZS 4777.2)	6100	8300
Nominal AC voltage [a.c.V]	415/240; 400/230; 380/220						127	
Nominal AC frequency [Hz]	50/60						50/60	
Max. Output Continuous current [a.c. A]	8.1	9.7	12.9	16.1	19.3	24.1	16.1	21.8
Current (inrush) (at 50 µs) [a.c. A]	30							
Rated Output Current [a.c. A]	7.2	8.7	11.6	14.5	17.5	21.8	14.5	21.8
Power Factor Range	1 (0.8 leading...0.8 lagging)							
Total harmonic distortion(THDi)	< 3%							
Maximum output fault current (at 5ms) [a.c. A]	68							
Maximum output overcurrent protection [a.c. A]	68							
AC Input								
Rated AC power [W]	10000	12000	16000	20000	20000	20000	11000	12100
Max. AC input apparent power [W]	10000	12000	16000	20000	22000	22000	11000	12100
Nominal AC voltage [a.c.V]	415/240; 400/230; 380/220						127	
Nominal AC frequency [Hz]	50/60						50/60	
Max. AC current [a.c. A]	16.1	19.3	25.8	32.0	32.0	32.0	32.0	32.0

3.3 Battery(apply to version D/M)

Model	X3-Hybrid-5.0	X3-Hybrid-6.0	X3-Hybrid-8.0	X3-Hybrid-10.0 X3-Hybrid-10.0K-D	X3-Hybrid-12.0	X3-Hybrid-15.0	X3-Hybrid-5.5-D LV	X3-Hybrid-5.5-D LV
Battery type	Lithium-ion battery / Lead-acid battery							
Battery voltage range [d.c. V]	120-800						180-650	
Max. continuous charge/discharge current [d.c. A]	30A							
Communication interface	CAN/RS485							
Reverse connection protection	YES							

3.4 Efficiency, Safety and Protection(apply to version D/M)

Model	X3-Hybrid-5.0	X3-Hybrid-6.0	X3-Hybrid-8.0	X3-Hybrid-10.0 X3-Hybrid-10.0K-D	X3-Hybrid-12.0	X3-Hybrid-15.0	X3-Hybrid-5.5-D LV	X3-Hybrid-8.3-D LV
MPPT efficiency	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%
European efficiency	97.7%	97.7%	97.7%	97.7%	97.7%	97.7%	97.7%	97.7%
Maximum efficiency	98.0%	98.0%	98.0%	98.0%	98.0%	98.0%	98.0%	98.0%
Max. battery charge efficiency (PV to BAT) (@ full load)	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%
Max. battery discharge efficiency (BAT to AC) (@ full load)	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%
Security & Protection								
Safety	EN / IEC 62109-1 / -2							
Grid Monitoring	VDE4105, G99, G98, AS4777, EN50549, CEI 0-21, IEC61727, PEA / MEA, NRS-097-2-1, RD1699, TOR							
DC SPD Protection	Integrated							
AC SPD Protection	Integrated							
Over/under voltage protection	YES							
Grid protection	YES							
DC injection monitoring	YES							
Back feed current monitoring	YES							
Residual current detection	YES							
Active anti-islanding method	Frequency Shift							
Over load protection	YES							
Over heat protection	YES							
Array insulation resistance detection	YES							

3.5 EPS(Off-grid) Output(apply to version D/M)

Model	X3-Hybrid-5.0	X3-Hybrid-6.0	X3-Hybrid-8.0	X3-Hybrid-10.0 X3-Hybrid-10.0K-D	X3-Hybrid-12.0	X3-Hybrid-15.0	X3-Hybrid-5.5-D LV	X3-Hybrid-8.3-D LV
EPS(Off-grid) rated power [VA]	5000	6000	8000	10000	12000	15000	5500	8300
EPS(Off-grid) rated voltage [a.c. V]	400V/230						220/127	
Frequency [Hz]	50/60						50/60	
EPS(Off-grid) rated current [a.c. A]	7.2	8.7	11.6	14.5	17.5	21.8	14.5	21.8
EPS(Off-grid) Peak Power [VA]	12000, 10s	12000, 10s	18000, 10s	18000, 10s	22500, 10s	22500, 10s	9900, 10s	12400, 10s
Switching time [s]	<10ms							
Total harmonic distortion (THDv)	<3 %							
Parallel operation	YES, 10							

3.6 Generic Data(apply to version D/M)

Model	X3-Hybrid-5.0	X3-Hybrid-6.0	X3-Hybrid-8.0	X3-Hybrid-10.0 X3-Hybrid-10.0K-D	X3-Hybrid-12.0	X3-Hybrid-15.0	X3-Hybrid-5.5-D LV	X3-Hybrid-8.3-D LV
Dimensions (W/H/D)[mm]	503*503*199							
Dimensions of Packing (W/H/D)[mm]	560*625*322							
Net weight [kg]	30±1	30±1	30±1	30±1	30±1	30±1	30±1	30±1
Gross weight * [kg]	34±1	34±1	34±1	34±1	34±1	34±1	34±1	34±1
Heat dissipation treatment	Natural Cooling				Smart Cooling		Natural Cooling	Smart Cooling
Noise emission(typical) [dB]	<35				<45		<40	<45
Storage temperature range [℃]	-40~+70							
Operating Ambient Temperature Range [℃]	-35~+60 (derating at 45)							
Humidity [%]	0%~100%							
Altitude [m]	<3000							
Ingress Protection	IP65							
Protective Class	I							
Cold standby consumption	<5W							
Overvoltage Category	III(MAINS), II(PV, Battery)							
Pollution Degree	III							
Installation mode	Wall mounted							
Inverter Topology	Non-isolated							
Communication interface	Meter/CT (optional), external control RS485, Dongle interface, DRM,USB Upgrade, NTC (optional)							

* The specific gross weight is subject to the actual situations of the whole machine.

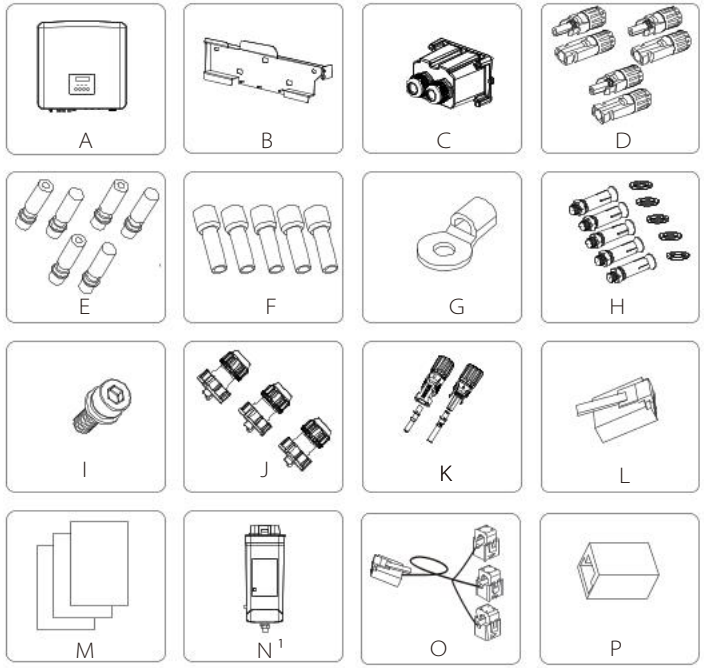
4 Installation

4.1 Check for Transport Damage

Ensure that the inverter is in good condition via transportation. If there is any visible damage such as cracks, please contact the dealer immediately.

4.2 Packing List

Open the package and check the materials and accessories according to the following list.



Number	Quantity	Description (for M series)
A	1	Inverter
B	1	Bracket
H	5	(Expansion tubes, expansion bolts, screws, washers)
I	1	M5 inner hexagon screw
J	3	Waterproof connectors with RJ45
L	6	RJ 45 terminals
M		Documents
N	1	Wifi Dongle (optional)
P	1	RJ45 connector

Number	Quantity	Description (for D series)
A	1	Inverter
B	1	Bracket
C	1	AC protective cover
D	6	Positive & negative PV connectors (for 5-6kW inverter, positive*2, negative*2; for 8-15kW inverter, positive*3, negative*3)
E	6	Positive & negative PV pin contacts (for 5-6kW inverter, positive*2, negative*2; for 8-15kW inverter, positive*3, negative*3)
F	12	6 mm^2 ferrules
G	1	OT terminal
H	5	(Expansion tubes, expansion bolts, screws, washers)
I	1	M5 inner hexagon screw
J	3	Waterproof connectors with RJ45
K	2	Positive & negative battery connectors & pin contacts
L	6	RJ 45 terminals
M		Documents
N	1	Dongle (optional)
O	1	CT
P	1	RJ45 connector

Note:
* Refer to the actual delivery for the optional accessories.
* [1] This section uses a specific dongle model as an example. Please refer to your actual dongle. For dongle installation, see its documentation.

4.3 Installation Precautions

The protection level of the inverter is IP 65, so that the inverter can be installed outdoors.

Check the installation environment and pay attention to the following conditions when installing:

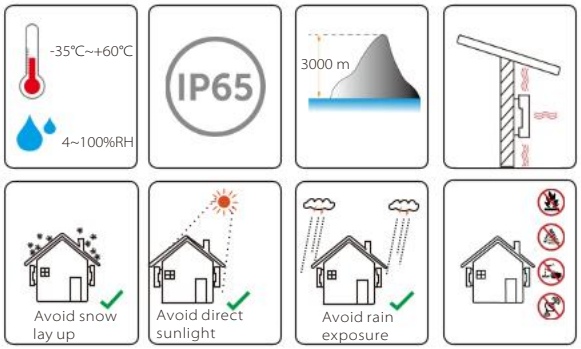
- Do not expose to strong light.
- Do not touch flammable building materials.
- Do not approach flammable and explosive gases or liquids (e.g. where chemicals are stored).
- Do not touch cold air directly.
- Do not approach TV antenna or cable.
- Do not place in areas above 3000 meters above sea level.
- Do not install in precipitation or high humidity, which may cause corrosion or damage Internal devices.
- Keep the system out of reach of children.

If the inverter is installed in a narrow area, be sure to reserve appropriate space for heat dissipation.

The ambient temperature of the installation site is -35℃~60℃.

The maximum angle range of wall tilt ±5°.

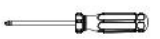
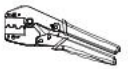
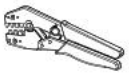
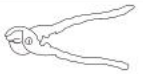
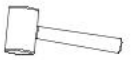
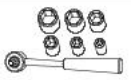
Avoid direct sunlight, rain and snow weather.



Note!

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

4.4 Tool preparation

Tool equipment				
Type	Name	Image	Name	Image
Machine Installation Tools	Hammer drill (Bit Φ8)		Multimeter DC Voltage Range ≥1100 V DC	
	Measuring tape		Utility knife	
	Marker		Cross screwdriver	
	Flat-head screwdriver		Allen key	
	Wire stripper		Crimping tool for RJ45	
	MC4 Crimping tool		Diagonal pliers	
	Crimping tool		Crimping tool for ferrules	
	Wire cutter		Rubber mallet	
	Torque wrench		Spirit level	
	Heat gun		Φ6 mm Heat shrink tubing	
Individual Protection Tools	Safety gloves		Safety boots	
	Safety goggles		Anti-dust mask	

Type	Name	Image	Requirement
Equipment Preparation	Breaker		Grid port and EPS(Off-grid) port wiring section (4.5.2)
Cable Preparation	PV end wire		Dedicated PV wire, line number #4 mm^2 withstand voltage 1000V, temperature resistance 105℃ fire resistance grade VW-1
	EPS (Off-grid) end wire		Five-core cable
	Grid end wire		Five-core cable
	Communi-cation lines		Twisted pair with shield
	Battery Cable		Conventional wire
	PE Cable		Conventional wire

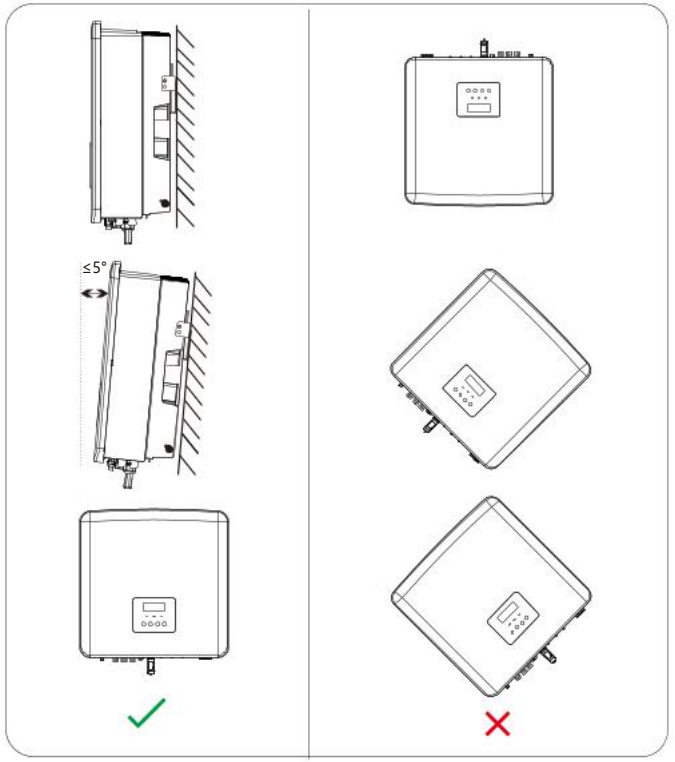
4.5 Installation Site Conditions

4.5.1 Installation Carrier Requirements

Do not install the inverter near flammable materials.
Please install the inverter on a solid object that can withstand the weight requirements of the inverter and energy storage system.
Please be careful not to install the inverter in the plasterboard wall or similar to the residential places with poor sound insulation, so as not to work with noise and interfere with the residents' life in the morning.

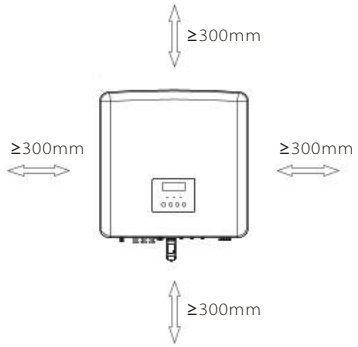
4.5.2 Installation Requirements

Install the inverter at a maximum back tilt of 5 degrees, the inverter can not be tilted forward, inverted, excessive back tilted or side tilted.



4.5.3 Installation Space Requirements

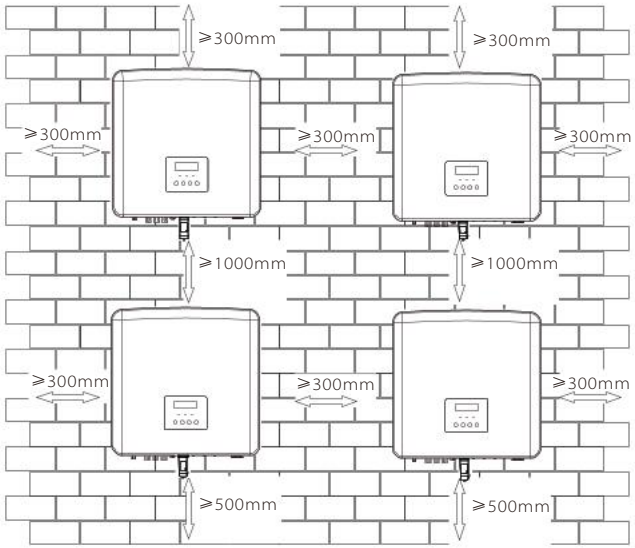
Reserve enough space when installing inverter (at least 300mm) for heat dissipation.



Reserved space dimensions of installation

Position	Min Distance
Left	300mm
Right	300mm
Up	300mm
Down	500mm

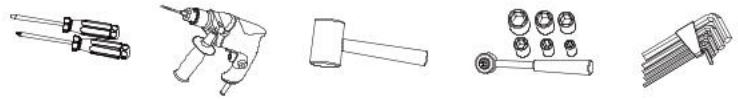
For multi-inverter installation scenarios, the inline installation method is recommended; when the space is insufficient, the recommended method of installation in the form of "products"; it is not recommended to install multiple inverters in stacks. If you choose stack installation, please refer to the installation separation distance below.



4.6 Mounting

➢ **Preparation**

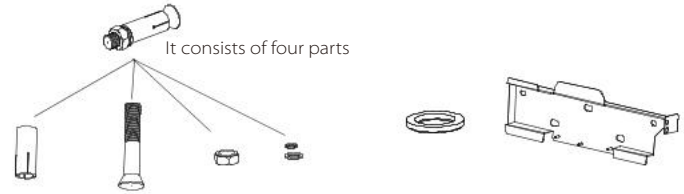
Please prepare the following tools before installation.



Installation tools: screwdriver, wrench, Φ8 drill, rubber hammer, socket wrench set and Hexagon keys.

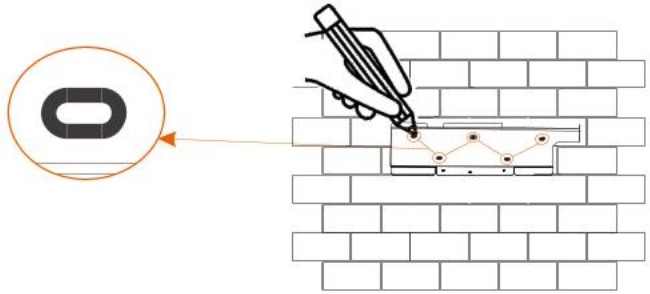
➢ **Step 1: Fix the wall bracket to the wall**

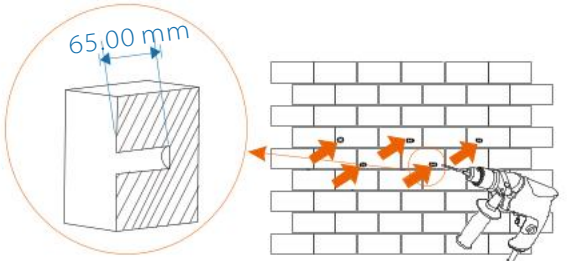
First find the expansion screw and the bracket in the accessory bag, as shown below:



Expansion screw, Expansion bolt, Screw, Washers Washer Bracket

a) Use a spirit level and a marker to mark drilling holes of the bracket on the wall.
b) Drill holes at marked spots with depth of 65 mm.

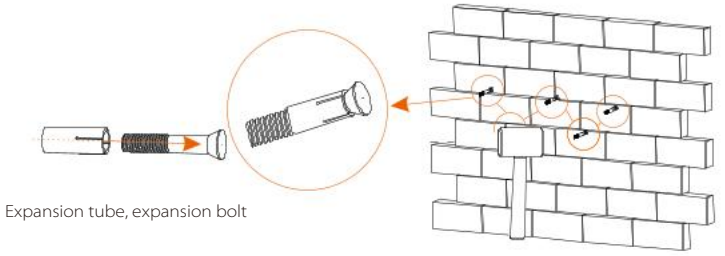




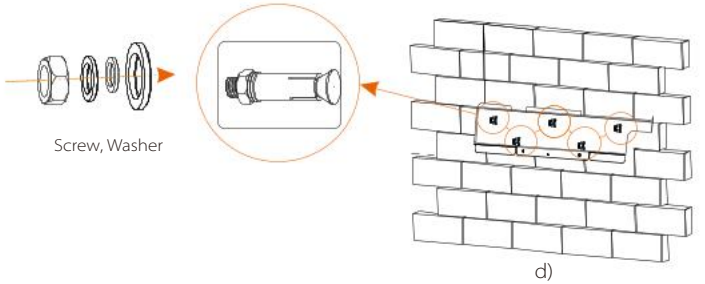
b)

➢ **Step 2: hang the inverter on the bracket**

c) Insert an expansion bolt into an expansion tube and then insert them into the hole, use rubber hammer to knock them into the wall;
d) Hang the bracket on the expansion bolts on the wall, put different types of washers into the bolts and then use the inner hexagonal wrench to screw the screw until a "bang" is heard.



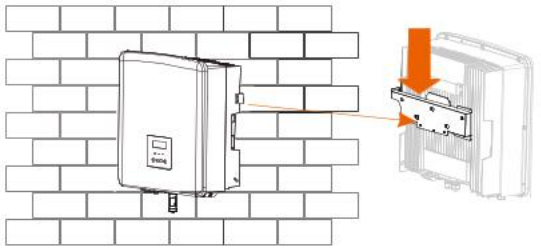
c)



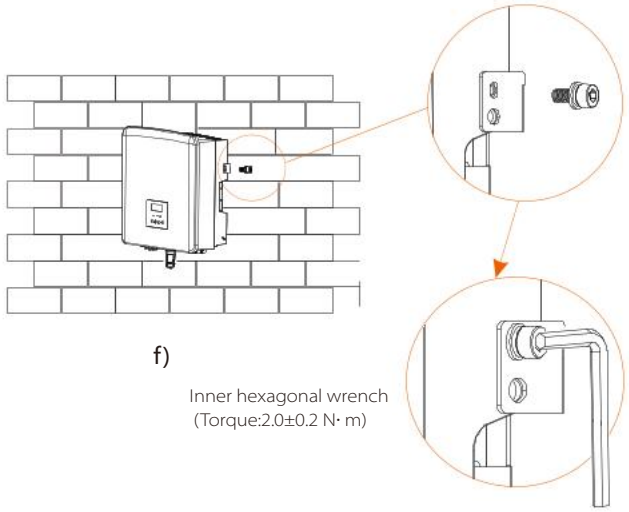
d)

➢ **Step 3: Tighten the inverter and bracket**

e) Hang the buckle on the inverter to the corresponding position of the backplane;
f) Use the inner hexagonal wrench to tighten the inner hexagonal screw on the right side of the inverter.



e)



f)

5 Electrical Connections

5.1 PV Connection

The inverter have two PV inputs. Please select photovoltaic modules with good performance and quality assurance. The open circuit voltage of the module array should be less than the maximum PV input voltage specified by the inverter, and the working voltage should be within the MPPT voltage range.

Table 1: Maximum input voltage limit(apply to version D/M)

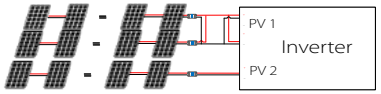
Model	X3-Hybrid-5.0	X3-Hybrid-6.0	X3-Hybrid-8.0	X3-Hybrid-10.0 X3-Hybrid-10.0K-D	X3-Hybrid-12.0	X3-Hybrid-15.0	X3-Hybrid-5.5-D LV	X3-Hybrid-8.3-D LV
Max. DC input voltage	1000V							

Warning!
The voltage of photovoltaic modules is very high, and is dangerous voltage. When wiring, please follow the safe electricity regulations.

Note!
Please do not make PV positive or negative ground!

Note!
The following PV module requirements need to be applied to each input range:
1. Same model
2. Same quantity
3. The same array
4. The same angle

Notice!
The series inverters support the Multi PV connection method.

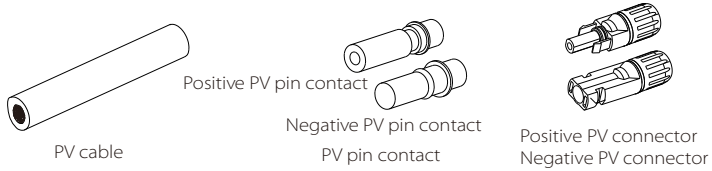


PV Inverter

➢ Connection step

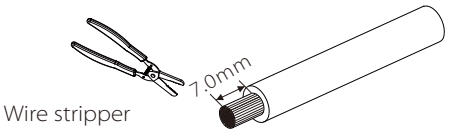
The PV port wiring of the M series inverter has been completed. For specific installation details, please refer to the X3-Matebox Quick Installation Guide, the D series needs to be wired according to the following steps.

Step 1. Turn off the DC switch, connect the PV module, prepare a 4 mm^2 PV cable, and find the PV (+) terminal and PV (-) terminal in the package.



PV cable

Step 2. Use a wire stripper to strip the 7mm insulation layer of the wire end.



Wire stripper

Step 3. Tighten the cable with the insulation layer stripped and insert it into the PV pin contacts (see Figure 1), make sure all wires are well connected (see Figure 2).

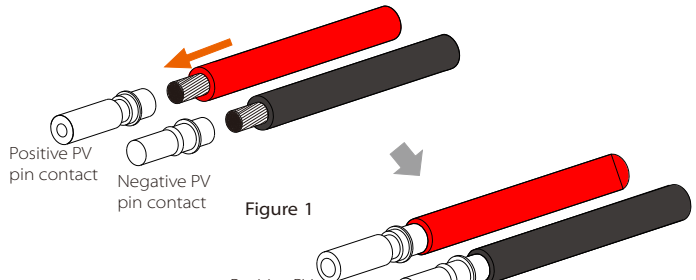
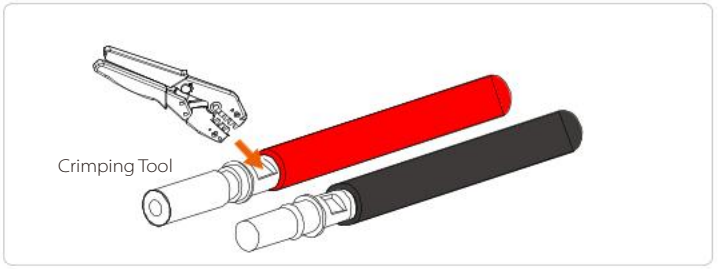


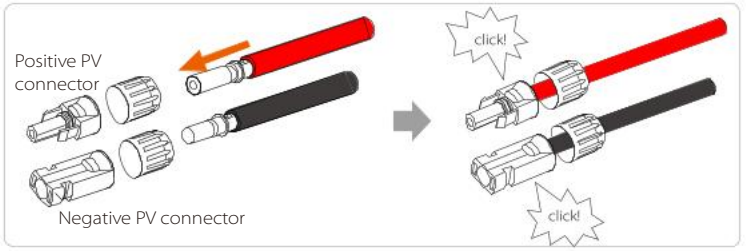
Figure 1

Figure 2

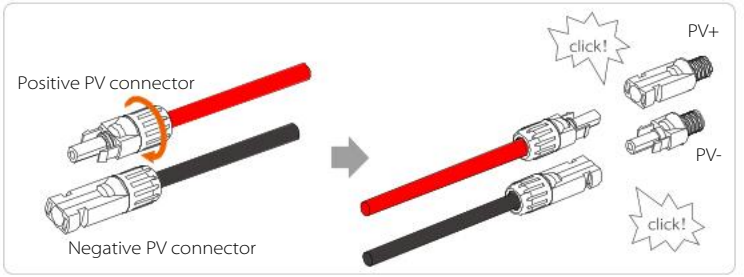
Step 4. Tighten the PV pin needle and the wiring harness to make the connection tight without looseness.



Step 5. The PV connectors are divided into 2 parts - the plug and the fastening head. Insert the cable through the fastening head and the opposite plug. Note that the red and black lines correspond to different of plugs. Finally, force the cable pair into the plug, will a "click" sound ,which indicates that the connection is complete.

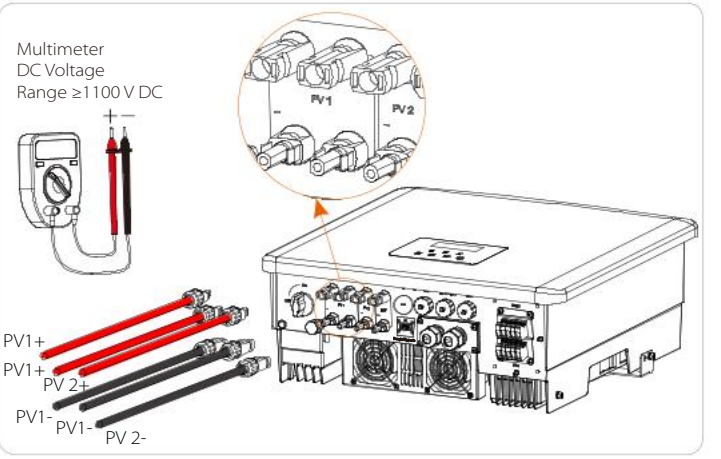


Step 6. Tighten the fastening head and into insert the corresponding positive and negative (PV-/PV+) ports of the inverter.

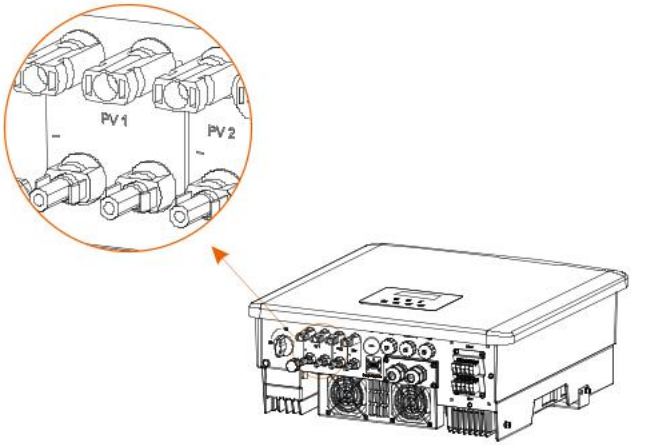


The following is the location of the inverter's positive and negative (PV-/PV+) ports.

Note: Before inserting the PV connectors, please turn on the switch of the PV module and use a multi-meter to measure the positive and negative poles of the PV connectors to prevent reverse connection.



Schematic diagram of the inverter PV connected.



5.2 Grid Port and EPS(Off-grid) Output Connection

The inverter is three-phase inverter. Suitable for rated voltage 380/400/415V, frequency 50/60Hz. Other technical requests should comply with the requirement of the local public grid.

➢ Grid port connection

Grid Cable and Micro-breaker recommended (apply to version D/M)

Model	X3-Hybrid-5.0	X3-Hybrid-6.0	X3-Hybrid-8.0	X3-Hybrid-10.0 X3-Hybrid-10.0K-D	X3-Hybrid-12.0	X3-Hybrid-15.0	X3-Hybrid-5.5-D LV	X3-Hybrid-8.3-D LV
Cable (copper)	4~6mm²	4~6mm²	4~6mm²	5~6mm²	5~6mm²	5~6mm²	5~6mm²	5~6mm²
Micro-Breaker	20A	20A	32A	40A	40A	40A	40A	40A

EPS(Off-grid) Cable and Micro-breaker recommended (apply to version D/M)

Model	X3-Hybrid-5.0	X3-Hybrid-6.0	X3-Hybrid-8.0	X3-Hybrid-10.0 X3-Hybrid-10.0K-D	X3-Hybrid-12.0	X3-Hybrid-15.0	X3-Hybrid-5.5-D LV	X3-Hybrid-8.3-D LV
Cable (copper)	4~6mm²	4~6mm²	4~6mm²	4~6mm²	4~6mm²	4~6mm²	4~6mm²	4~6mm²
Micro-Breaker	16A	16A	20A	25A	32A	32A	25A	32A

The load should not be directly connected to the inverter.

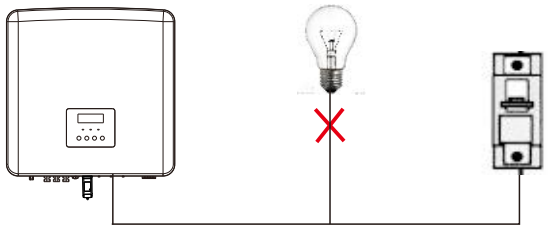


Figure: Wrong connection of load and inverter

5.3 EPS(Off-grid) Block Diagram

The inverter has an EPS(Off-grid) function. When the grid is connected, the inverter outputs go through the Grid port, and when the grid is disconnected, the inverter outputs go through the EPS(Off-grid) port. The EPS(Off-grid) function can be connected to part of the load, Please refer to the following diagram for the wiring.
If you want to save installation time, you will need an accessory. If you need a solution, please contact our sales staff.

➢ EPS(Off-grid) wiring diagram

Diagram A: N line and PE line separate wiring, D series inverters; (For most countries)

For to different local wiring rules, please refer to the diagram below Please select the appropriate wiring method according to local wiring rules.

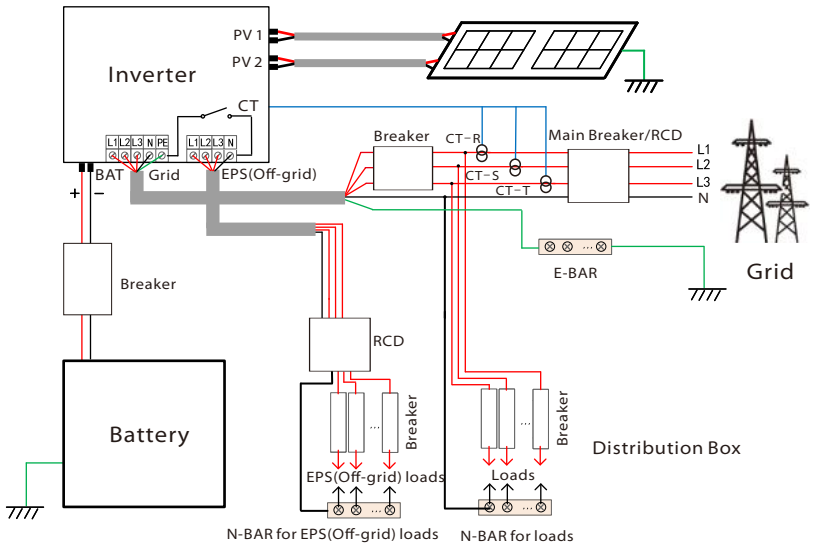


Diagram B: N line and PE line separate wiring, M series inverters; (For most countries)

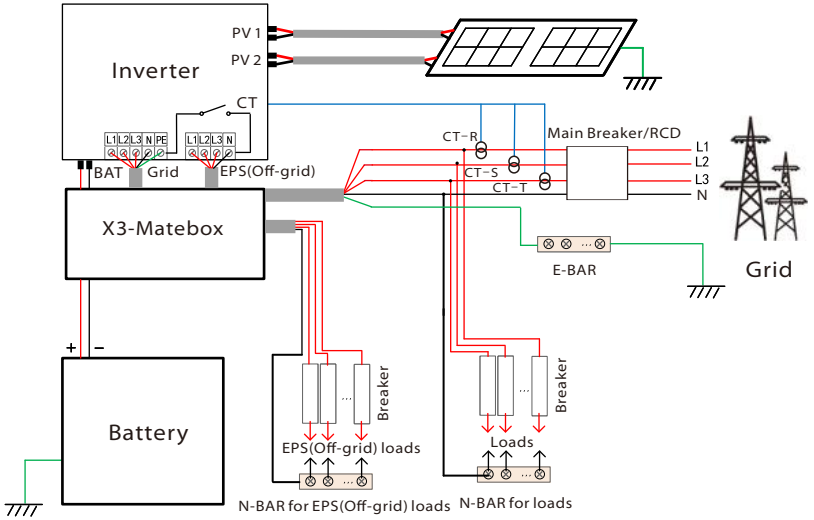


Diagram C: N line and PE line together, D series inverters; (Applicable to Australia)

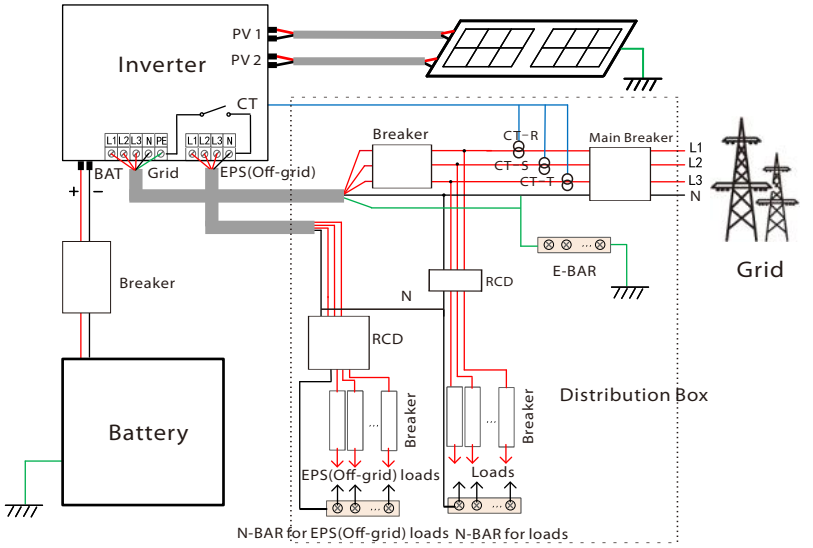
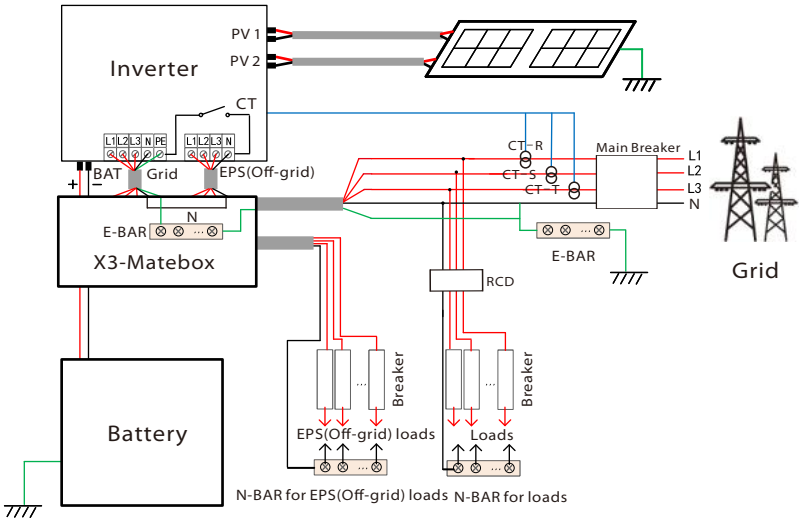


Diagram D: N line and PE line together, all load connection EPS(Off-grid) scheme;(Applicable to Australia)



X3-Matebox is a convenient wiring accessory. Please refer to X3-Matebox for details. If you need to purchase X3-Matebox, please contact us.

The RCD on the figure represents a leakage protection device with a circuit breaker function.
To use X3-Matebox's **Diagram B** and **Diagram D**, you need to set "X3-Matebox" to "Enable" in "Settings";
The Australian customer must shorten the N lines of the Grid and the EPS(Off-grid) in the X3-Matebox.
If your local wiring method does not follow the above operation guide, especially the neutral wire, ground wire, RCD wire, please contact our company before operation.

➢ EPS(Off-grid) load requirements

Warning!

Ensure that the EPS(Off-grid) load rated power is within the EPS(Off-grid) rated output power range, otherwise, the inverter will report an "overload" warning.

When "overload" occurs, adjust the load power to make sure it is within the EPS(Off-grid) rated output power range, and the inverter will automatically return to normal.

For non-linear loads, ensure that the inrush current power is within the EPS(Off-grid) rated output power range.
When the configuration current is less than the maximum DC input current, the capacity and voltage of lithium and lead acid will decrease linearly.

The following table shows some common loads for your reference.

Note: Please check with the manufacturer for high-power inductive loads.

Content	Power		Common equipment	Instance		
	Start	Rated		Equipment	Start	Rated
Resistive load	X 1	X 1	Incandescent lamp	100W Incandescent lamp	100VA (W)	100VA (W)
Inductive load	X 3~5	X 2	Fan Fridge	150W Fridge	450-750VA (W)	300VA (W)

Note: The EPS load of the inverter does not support a half-wave load, and the half-wave load cannot be used here.

➢ Grid and EPS(Off-grid) connection steps

• Connection requirements

Note: Check the grid voltage and compare the voltage range (see technical data).
Disconnect the circuit board from all power sources to prevent electric shock.

The Grid and the EPS(Off-grid) ports of the M series inverter have been connected, for specific installation details, please refer to the X3-Matebox Quick Installation Guide. And the D series needs to be wired according to the following steps.

Step 1. Prepare a Grid cable (five-core wire) and an EPS(Off-grid) cable (four-core wire), and then find the ferrules and AC protective cover in the accessory bag.



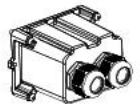
6 mm² Grid(Five-Core Cable)



6 mm² EPS(Off-grid)(Four-Core Cable)

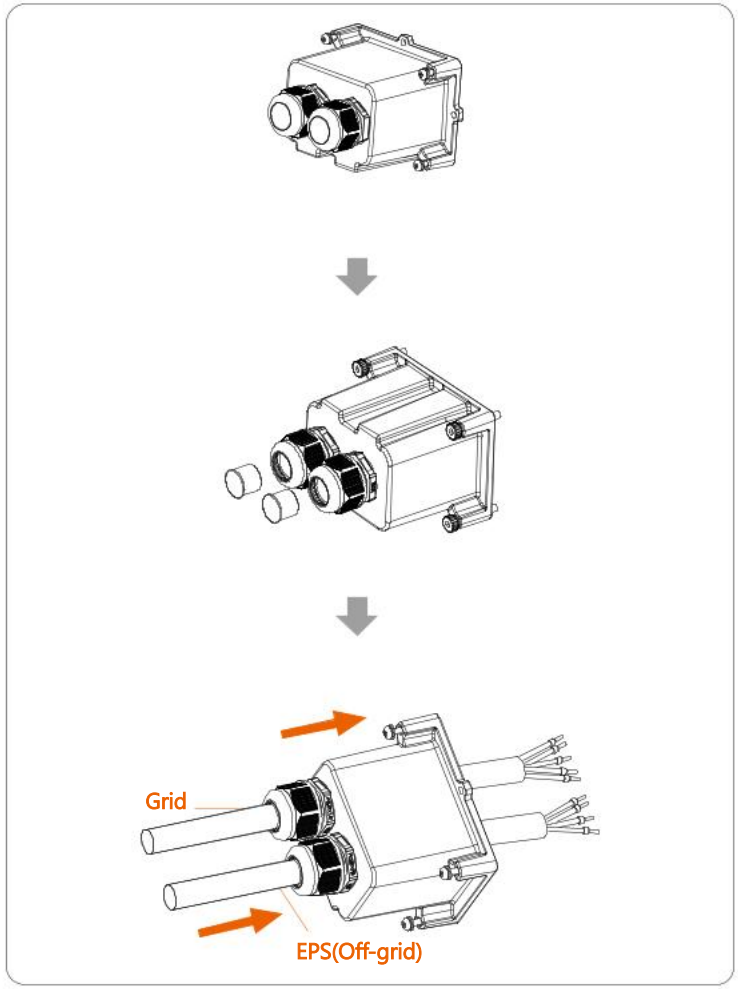


6 mm² ferrules*10

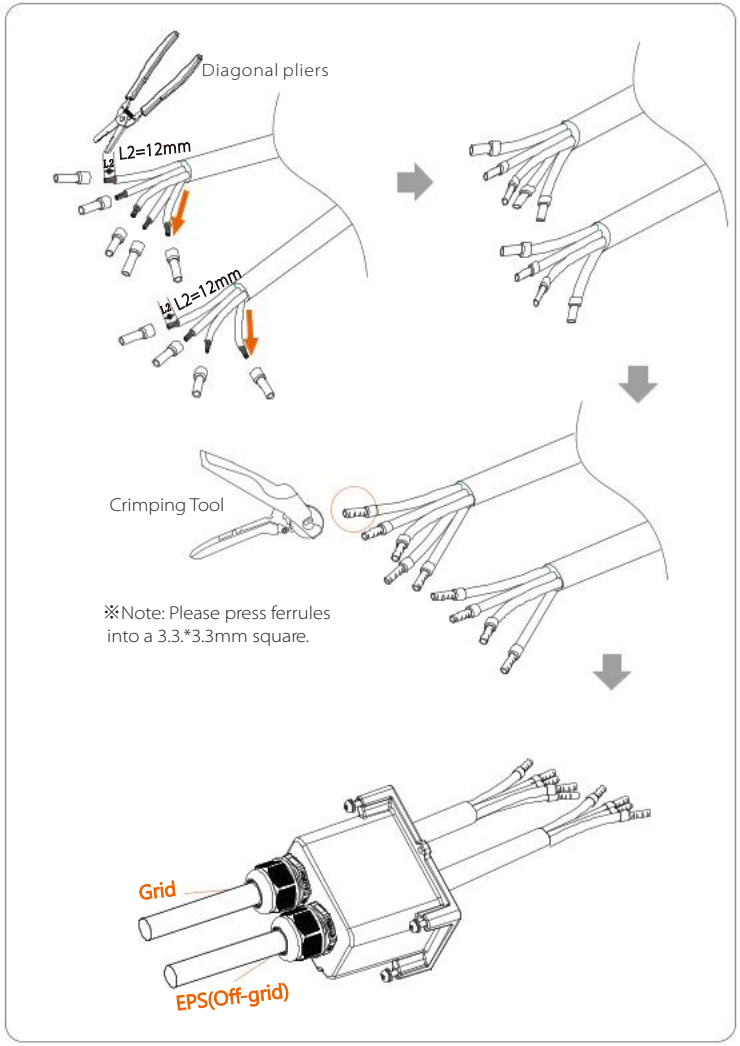


AC protective cover

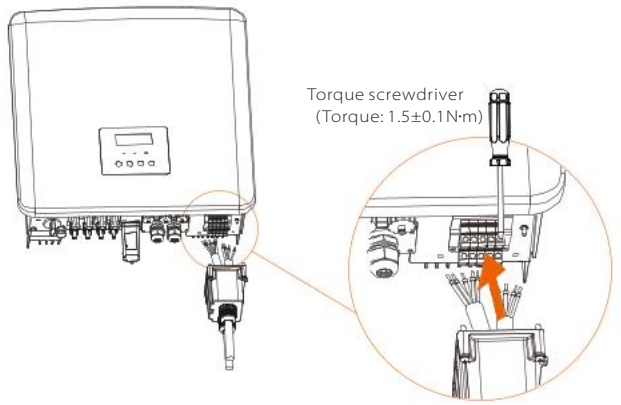
Step 2. First remove the waterproof housing plug, and then the Grid and EPS(Off-grid) cables through the waterproof housing corresponding to the Grid and EPS(Off-grid) ports.



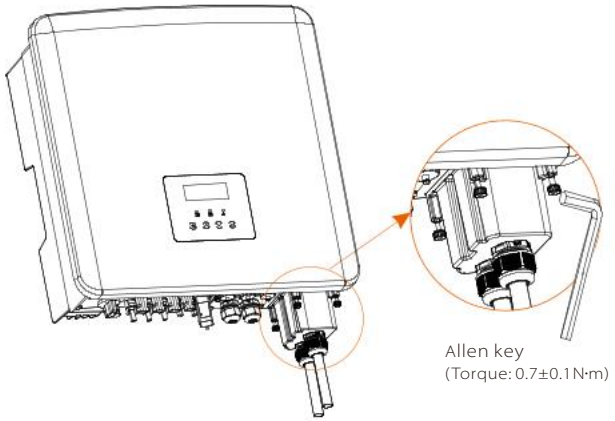
Step 3. Remove the 12mm insulation layer at the end of the cable. Insert the ferrules respectively, and make sure that the stripped ends are inserted into the ferrules, and finally use crimping pliers to press tightly.



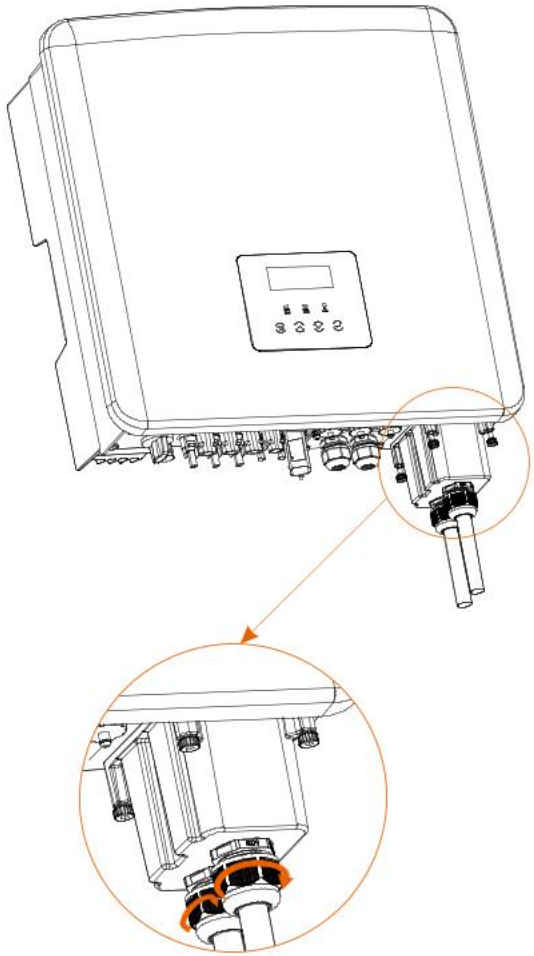
Step 4. Find the location of the AC interface on the inverter, insert the crimped terminals into the UW10 terminals L1, L2,L3,N, and PE according to the wire sequence, and use a flat-blade screwdriver to tighten the screws. (Torque: 1.5±0.1N·m)



Step 5. Install the AC protective cover, and tighten the screws on the four sides of the cover with an Hexagon keys.
(Torque: 0.4±0.1N.m)



Step 6. Tighten the waterproof fastening head.



5.4 Battery Connection

➢ Connection requirements

The inverter charge and discharge system can be equipped with high voltage lithium battery .
Please note that the maximum voltage of the battery should not exceed 650 V, battery communication should be compatible with the inverter.

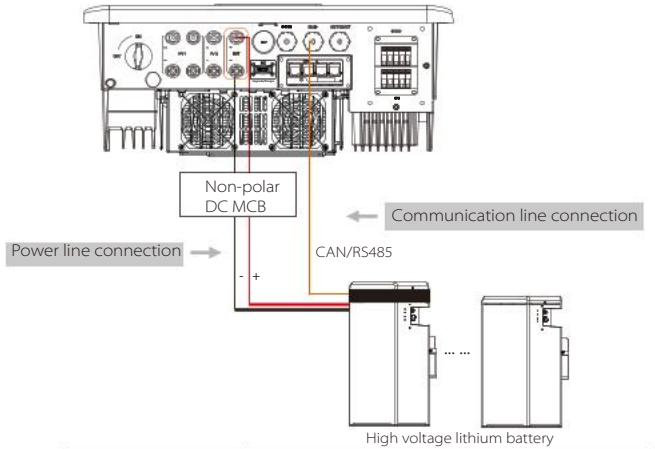
➢ Battery Breaker

Before connecting the battery, a non-polar DC MCB must be installed to ensure safety.
Before maintenance, the inverter need to be safely disconnected.

Model	X3-Hybrid-5.0	X3-Hybrid-6.0	X3-Hybrid-8.0	X3-Hybrid-10.0 X3-Hybrid-10.0K-D	X3-Hybrid-12.0	X3-Hybrid-15.0	X3-Hybrid-5.5-D LV	X3-Hybrid-8.3-D LV
Voltage	Nominal voltage of DC breaker should be larger than maximum voltage of battery.							
Current[A]	32A							

Note: The above situation applies to the D/M version.

➢ Battery connection diagram



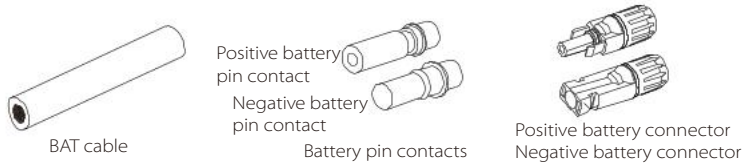
	Battery Control	Battery Modules
Battery & Quantity	T-BAT 5.8 (1 pc)	HV11550 (1-3 pcs)
Battery & Quantity	MC0600 (1 pc)	HV10230 (2-4 pcs)
Battery & Quantity	TBMS-MCR0800 (1 pc)	TP-HR25 (4~13 pcs)*
Battery & Quantity	TBMS-MCR0800 (1 pc)	TP-HR36 (4~13 pcs)*
Battery & Quantity	TBMS-MCS0800 (1 pc)	TP-HS25 (4~13 pcs)*
Battery & Quantity	TBMS-MCS0800 (1 pc)	TP-HS36 (4~13 pcs)*
Battery & Quantity	TBMS-S51-8 (1 pc)	TB-HS51 (3~13 pcs)

Note:
* For X3-Hybrid-5.5-D LV and X3-Hybrid-8.3-D LV inverters, only 4~12 pieces of battery modules (TP-HR25/ TP-HR36/ TP-HS25/ TP-HS36) and one piece of TBMS-MCS0800 can be installed together with an inverter.
HV11550 battery modules have V1 and V2 versions, V1 and V2 with the same number of inverters, the specific collocation can refer to the relevant part of the battery manual.

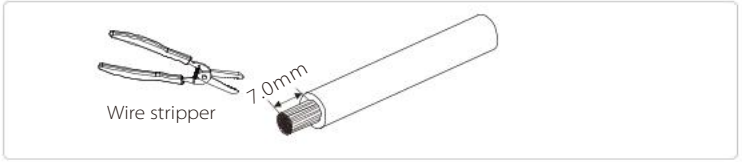
➢ Battery connection steps

Battery port connection line of the M series inverter is on the X3-Matebox, for specific installation details, please refer to the X3-Matebox Quick Installation Guide It is necessary to wire the D series according to the following steps.

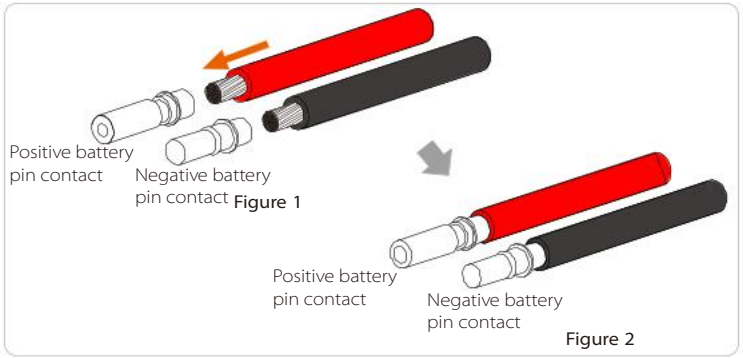
Step 1. Turn off the DC switch, connect the BAT module, prepare a 6 mm^2 BAT cable, and find the BAT (+) terminal and BAT (-) terminal in the package.



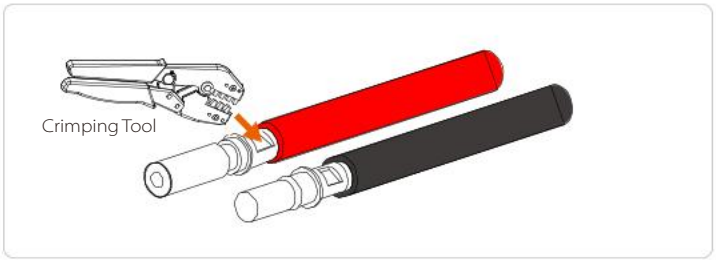
Step 2. Use a wire stripper to strip the 7mm insulation layer of the wire end.



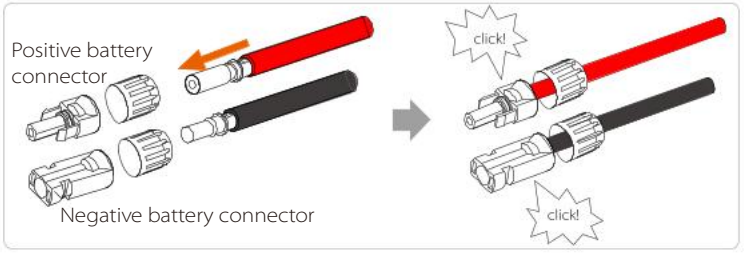
Step 3. Tighten the cable with the insulation layer stripped and insert it into the battery pin contacts (see Figure 1), make sure all wires are well connected (see Figure 2).



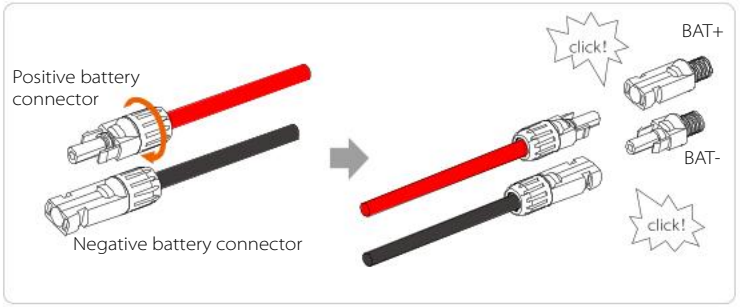
Step 4. Tighten the BAT pin needle and the wiring harness to make the connection tight without looseness.



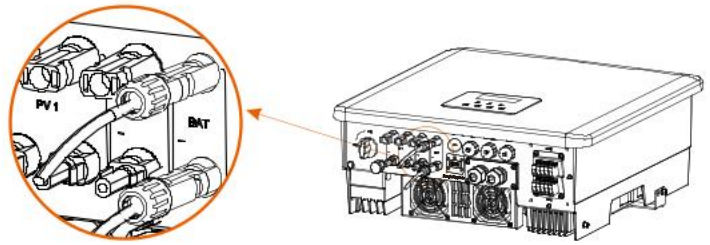
Step 5. The battery connectors are divided into 2 parts - the plug and the fastening head. Insert the cable through the fastening head and the opposite plug.
Note that the red and black lines correspond to different of plugs. Finally, force the cable pair into the plug, will a "click" sound ,which indicates that the connection is complete.



Step 6. Tighten the fastening head and into insert the corresponding positive and negative (BAT-/BAT+) ports of the inverter.



Step 7. Insert the battery power lines into the corresponding BAT port (+), (-) of the inverter.



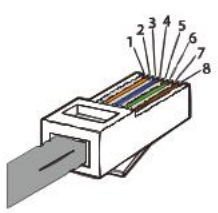
Note: BAT port, not PV port!

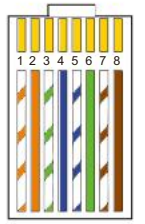
Note: The positive and negative wires of the battery are not allowed to be reversed!

➢ Communication connection

BMS port definition

The communication interface between the inverter and the battery uses the waterproof connector with RJ 45.





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

1	2	3	4	5	6	7	8
X	X	X	BMS_CANH	BMS_CANL	X	BMS_485A	BMS_485B

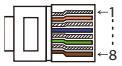
Note!
After the BMS communication between the battery and the inverter is finished, the battery will work normally.

5.5 Communication Connection (COM/ Meter/ CT/ CAN1/ CAN2/ DRM/ OFF port)

5.5.1 Introduction to COM Communication

COM communication interface is mainly provided for customization the second step of development use. The inverter supports the control of external equipment or external equipment control through communication. For example, the inverter adjusts the working mode of the heat pump and so on.

➢ COM PIN Definition



1	2	3	4	5	6	7	8
Drycontact_A(in)	Drycontact_B(in)	+13V	485A	485B	GND	Drycontact_A(out)	Drycontact_B(out)

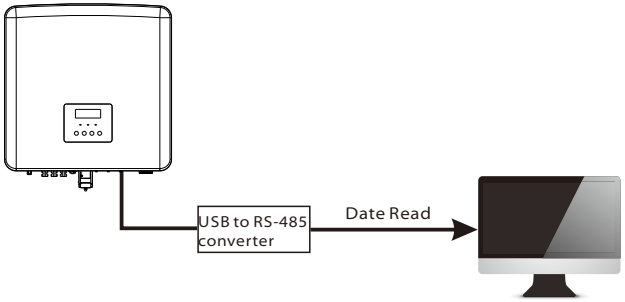
Note!

Customers can communicate or control the inverter and external devices through the COM interface. Professional users can use pins 4 and 5 to realize data acquisition and external control functions. The communication protocol is Modbus RTU. For details, please contact us. If the user wants to use the inverter dry contact to control external equipment (such as a heat pump), it can be used with our's Adapter Box. For details, please refer to the Quick Installation Manual of the Adapter Box.

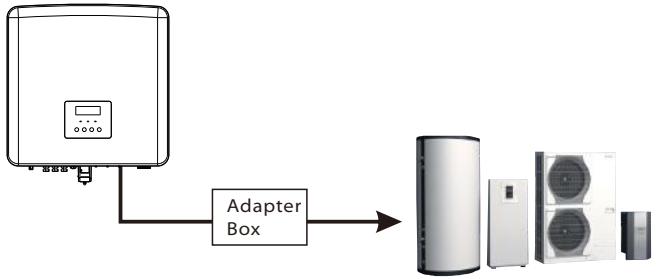
➢ Application occasion

COM is a standard communication interface, through which the monitoring data of the inverter can be directly obtained. Also, external communication devices can be connected to carry out the secondary development of the inverter. For specific technical docking, please contact us.

External communication equipment controls the inverter:



Inverter communication control external equipment:



5.5.2 Introduction to meter/CT Communication

The inverter should work with an electric meter or current sensor (CT for short) to monitor household electricity usage. The electricity meter or CT can transmit the relevant electricity data to the inverter or platform, which is convenient for users to read at anytime.

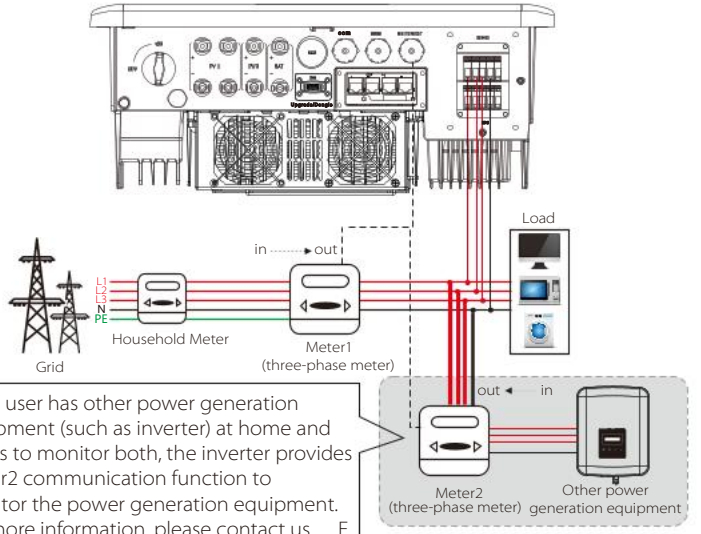
Users can choose to use electric meters or CTs according to their needs.

Please note that the meter/CT brand required by our company must be used.

Note!
The meter or CT must be connected to the inverter, otherwise the inverter will shut down and alarm "meter failure"alarm. Smart meters must be authorized by our company, third party or other companies, Unauthorized meter may be incompatible with the inverter.

Our company will not be responsible for the impact caused by the use of other appliances.

➢ **Electric meter connection diagram**



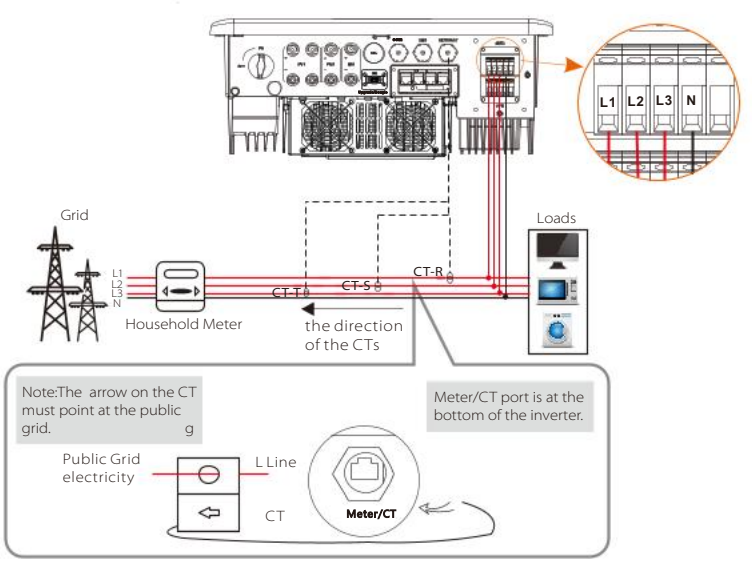
If the user has other power generation equipment (such as inverter) at home and wants to monitor both, the inverter provides Meter2 communication function to monitor the power generation equipment. For more information, please contact us. F

Note: If you want to connect the meter, please ground the GND terminal of the Meter1.

➢ **CT Connection**

The current sensor measures the current on the live wire between the inverter and the public grid.

- **CT connection diagram**



Note: CT-R must be connected to L1, CT-S connected to L2 and CT-T connected to L3 in accordance with the L1, L2 and L3 of the inverter's grid port. The household meter should be installed on the power lines.

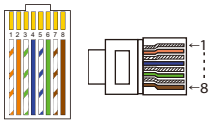
- **LCD settings**

To select CT, you need to enter Use setting, then enter CT/Meter Setting.

CT/Meter Setting
> Select
CT

- Note for CT connection:

Note!
- Do not place the CT on the N wire or ground wire.
- Do not put CT on the N line and L line 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.
- After CT is connected, prevent the CT clip from falling off. It is recommended to wrap the CT clip around in circles with insulating tape.



1	2	3	4	5	6	7	8
CT-R-1	CT-S-1	CT-T-1	485A	485B	CT-T-2	CT-S-2	CT-R-2

Note!
Only one of the Meter and CT connections can be selected. Meter cable goes to pin terminal 4 and 5; CT-R cable to PIN Terminal 1 and 8; CT-S cable to PIN Terminal 2 and 7; CT-T cable is connected to terminals 3 and 6.

5.5.3 Parallel Communication (CAN1/CAN2 port)

The inverter provides a parallel function. 10 inverters can be maximally connected in diagram 1. And diagram 2 allows up to three inverters to be connected. In these two systems, one inverter will be set as the "leader inverter" which controls every other "follower inverter" in the system. In diagram 1, an X3-PBOX-150kW-G2 should be equipped and connected to the “leader inverter," “follower inverter 1" should be connected to the “leader inverter," and all other “follower inverters" are connected via network cable in a numbered sequence. An X3-PBOX-60kW-G2 can be selected when no more than six inveters are paralleled in diagram 1 system.

➢ System Diagram

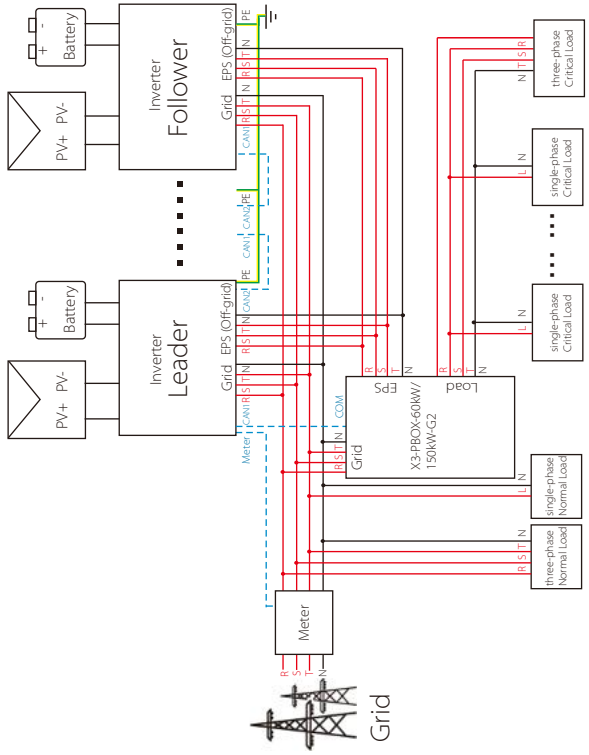


Diagram 1

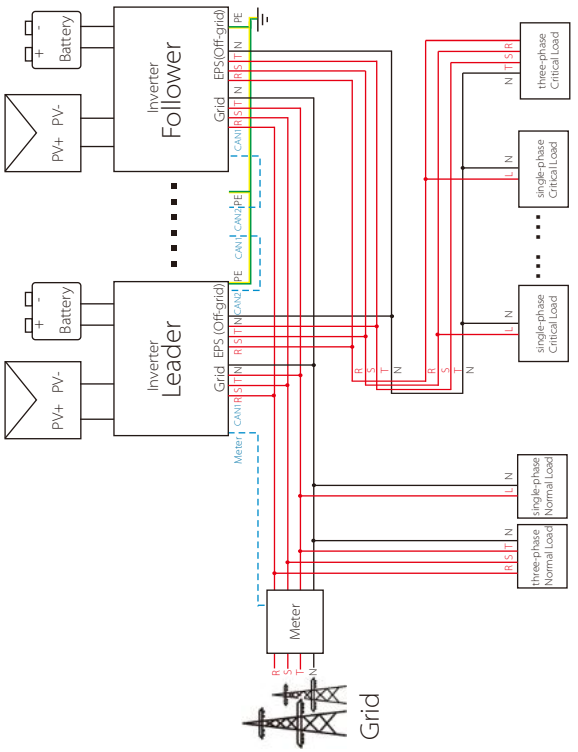


Diagram 2

Important Warning!

- The hybrid parallel system is extremely complex and a large amount cables need to be connected, therefore it is strongly required that **every cable must be connected according to correct line sequence (R-R, S-S, T-T, N-N)**, otherwise any small misoperation may cause the system running failed.
- In diagram 2, INCORRECT line sequence (R-R, S-S, T-T, N-N) will damage the inverter. To avoid the damage, the default "Disable" has been set to "Enable" in "External ATS" under "Advance Settings". **Please set the default "Enable" in "External ATS" back to "Disable".**

➢ Work Modes in Parallel System

There are three work modes in parallel system, and your acknowledge of different inverter's work modes will help you understand parallel system better, therefore please read it carefully before operating.

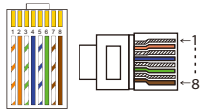
Free mode	Only if no one inverter is set as a "Leader", all inverters are in free mode in the system.
Leader mode	When one inverter is set as a "Leader", this inverter enters leader mode. Follower mode can be changed to free mode.
Follower mode	Once one inverter is set as a "Leader", all other inverters will enter follower mode automatically. Follower mode can not be changed from other modes by LCD setting.

➢ Wiring Operation and LCD Setting

Note: Before operation, please make sure that the inverter meets the following three conditions,
1. The software version of all inverters is the same;
2. The power range of all inverter models is the same;
3. The type and quantity of batteries connected to all inverters are the same;
Otherwise, this function cannot be used.

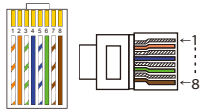
Note: There are two CAN ports on the inverter. The CAN port of the inverter set as the "host" is connected. The CAN port on the left mus be connected to the COM port of the X3-PBOX-60kW/150kW-G2, and the CAN port on the right is connected "Follower".

➢ CAN1 PIN Definition



1	2	3	4	5	6	7	8
485A	485B	VCC	CANH	CANL	GND	SYN1	SYN2

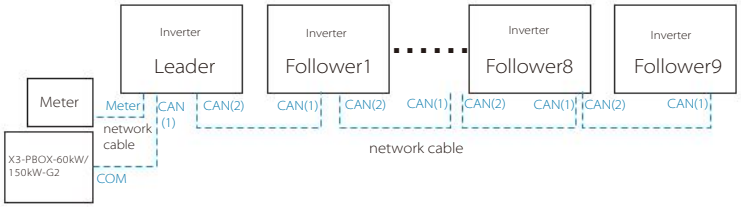
➢ CAN2 PIN Definition



1	2	3	4	5	6	7	8
485A	485B	X	CANH	CANL	GND	SYN1	SYN2

For diagram 1

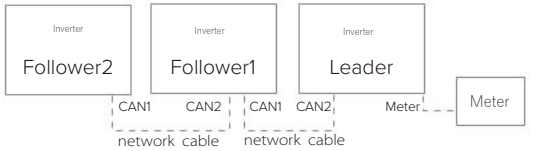
Step1: Connect all inverters' communication together by connecting network cables between CAN ports.
– Use standard network cables for CAN-CAN connection and insert one end of the cable into CAN1 of the leader inverter and the other end into the COM port of X3-PBOX-60kW/150kW-G2.
– Insert one end of network cable into the first inverter's CAN2 port and the other end into the next inverter's CAN1 port and other inverters are connected in such way .
– Insert one end of network cable into the meter, and the other end into the meter port the leader inverter.



Note: A CT can be used in the parallel connection of the hybrid series inverters only when the leader inverter are with PV panels or only the meter can be used. In the parallel connection of the Fit series inverters, only the meter can be used.

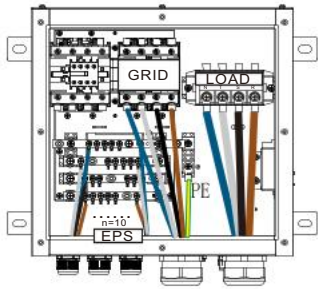
For diagram 2

Step1: Connect all inverters' communication together by connecting network cables between CAN ports.
- Use standard network cables for CAN-CAN connection.
- Use network cable to connect leader inverter CAN2 port and follower1 inverter CAN1 port, and connect follower1 inverter CAN2 port and follower2 inverter CAN1 port.
- Use network cable to connect leader inverter meter port and meter.



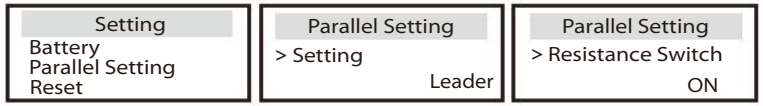
Step 2: Connect the power cable between X3-PBOX-60kW/150kW-G2 and inverter (R/S/T/N/PE) in diagram 1.
-If the user purchased the X3-PBOX-60kW/150kW-G2 product, please refer to the X3-PBOX-60kW/150kW-G2 user manual for installation and connection.

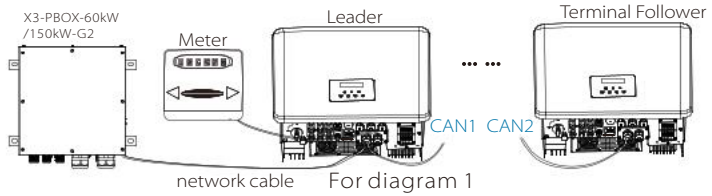
For example, the wiring diagram of the X3-PBOX-150kW-G2 power line.

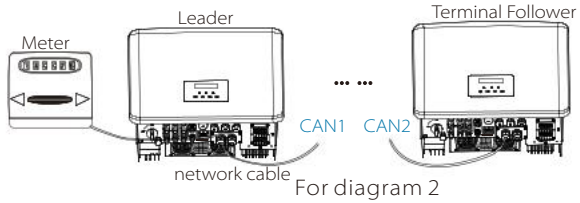


X3-PBOX-150kW-G2

Step 3: Turn on the power of the entire system, find the inverter connected to the meter, enter the setting page of the inverter LCD screen, click on the parallel settings, and select "follower control"; then enter the "resistance switch" and set it to " ON";
Finally, find the last follower in the parallel system and enter the setting page of the inverter LCD screen and set the "resistance switch" to "ON".







➢ How to Remove parallel system

If one inverter wants to exit from this parallel system, please do the steps as below:

–Step1: Enter the setting page and click parallel setting, and choose "Free".

–Step2: Disconnect all the network cables on the CAN port.

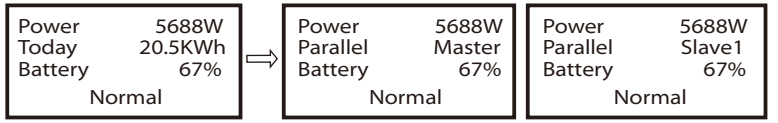
Note!

- If a follower inverter is set to "Free" mode but not disconnect the network cable, this inverter will return to "slave" mode automatically.
- If a follower inverter is disconnected with other inverter but not be set to "Free" mode, this inverter will stop working and maintain "waiting" status.

➢ LCD display

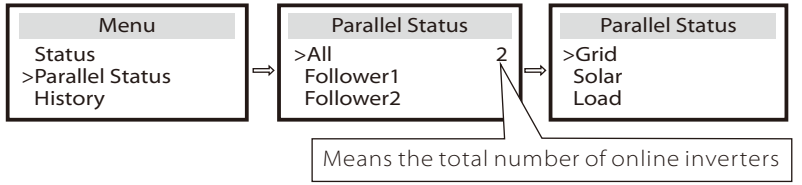
Main display:

Once inverter enters parallel system, the "today yield" will be replaced by " Inverter Class", and parallel relevant fault has a higher priority than other faults and will be showed firstly on main display.



Status display:

User can obtain all the status data from leader inverter. System power and individual follower inverter power can be obtain in status display of leader inverter.



➢ Parallel Control Function

Leader inverter has an absolute lead in the parallel system to control all follower inverter's energy management and dispatch control. Once leader inverter has some error and stop working, all follower inverter will stop simultaneously. But leader inverter is independent of all follower inverters to work and will not be affected by follower inverter's fault.

Overall system will be running according to leader inverter's setting parameters, and most setting parameters of follower inverter will be kept but not be cancelled.

Once follower inverter exit from system and be running as an independent unit, its all setting will be re-excuted.

The rest of this section covers several important parallel control functions, and the next page table shows which LCD options are controlled by leader inverter and which can work independently.

Off mode setting:

Off mode can only be set by leader inverter (long press ESC button on LCD).

Safety setting:

System safety protection is cancelled by leader inverter's safety. Follower inverter protection mechanism will only be triggered by leader inverter's instructions.

Self-use setting:

If system is running as self-use mode, please note the Feedin Power Limit set of leader inverter is for the overall system and the corresponding set of follower inverter is invalid.

Power Factor setting:

All sets about power factor are all for the overall system and the corresponding sets of follower inverter are invalid.

Remote control setting:

The remote demand instructions received by leader inverter will be interpreted as the demand instructions to overall system.

External ATS setting:

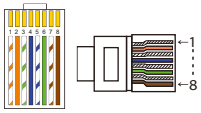
INCORRECT line sequence (R-R, S-S, T-T, N-N) will damage the inverter. To avoid the damage, the default "Disable" has been set to "Enable" in "External ATS" under "Advance Settings". Users should set the default setting back to "Disable". Because only when a matebox advanced is connected, External ATS needs to be set to "Enable".

5.5.4 Introduction to DRM communication (AS4777 regulatory requirements)

DRM requirements:

Mode	Requirement
DRM0	Operation disconnect device
DRM1	Do not consume power
DRM2	Do not consume more than 50% of rated power
DRM3	Do not consume more than 75% of rated power AND Source reactive power if capable
DRM4	Increase power consumption (subject to constraints from other active DRMs)
DRM5	Do not generate power
DRM6	Do not generate more than 50% of rated power
DRM7	Do not generate more than 75% of rated power AND Sink reactive power if capable
DRM8	Increase power generation (subject to constraints from other active DRMs)

➢ DRM PIN Definition

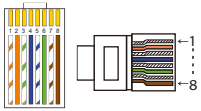


1	2	3	4	5	6	7	8
DRM1/5	DRM2/6	DRM3/7	DRM4/8	+3.3V	DRM0	GND	GND

Note!
Currently, only PIN6 (DRM0) and PIN1 (DRM1/5) are available, other PIN functions are under development.

5.5.5 Introduction to OFF port

➢ OFF PIN Definition



1	2	3	4	5	6	7	8
X	X	X	shutdown	X	+3.3V	X	X

Note: if pin4 and pin6 are connected together, the inverter will be off.

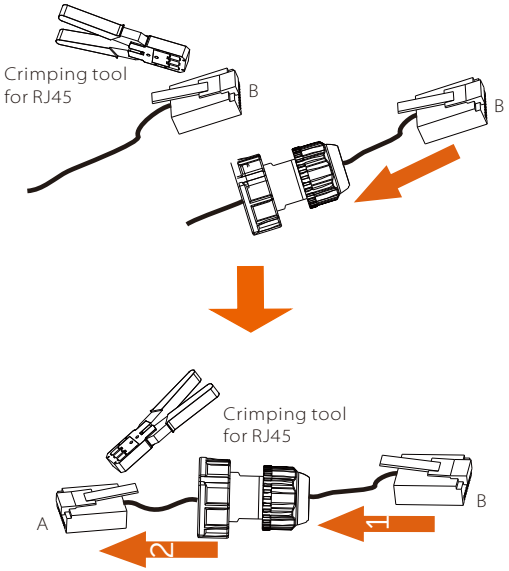
5.5.6 Communication Connection Steps

Meter/CT connection steps:

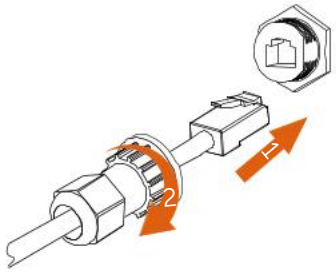
Step1: Prepare a waterproof connector with RJ45, a RJ45 terminal and a communication cable. An additional RJ45 terminal is not needed in meter connection. Disassemble the waterproof connector and the RJ45 terminal inside the connector.

For CT connection, strip 15 mm insulation jacket off the cable, crimp terminal B with the cable. Thread the unstripped end of the cable through the waterproof connector. Strip 15 mm insulation jacket off and crimp the end with terminal A in accordance with the pin definition of CT.

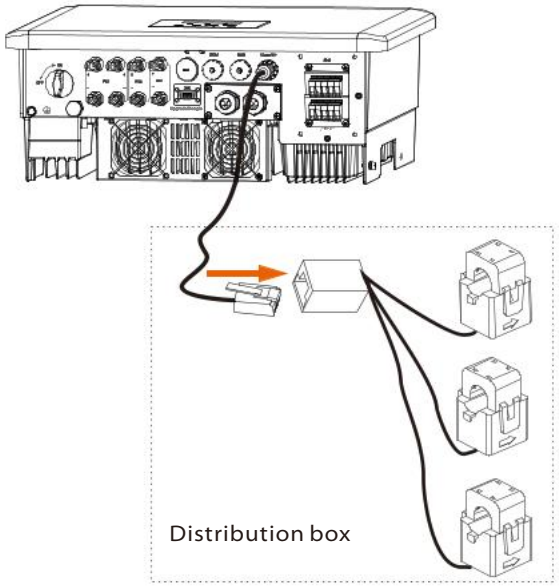
For meter connection, strip the cable with the requirement of the Meter Quick Installation Guide. Thread the unstripped end through the waterproof connector. Strip 15 mm insulation jacket off and crimp the end with terminal A in accordance with the pin definition of meter.



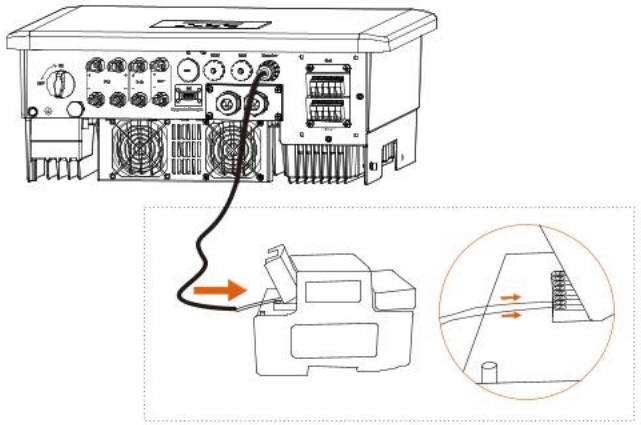
Step2: Remove the dustproof cover from the Meter/CT port. Insert the communication cable into the Meter/CT port. An audiable "Click" will be heard if it is successfully connected.



Step3: For a CT connection, plug the terminal B to RJ45 connector. For a meter connection, connect pin 4 and pin 5 of the stripped end directly to the pin 24 and pin 25 of a meter. Please refer to a meter manual for a specific connection method.

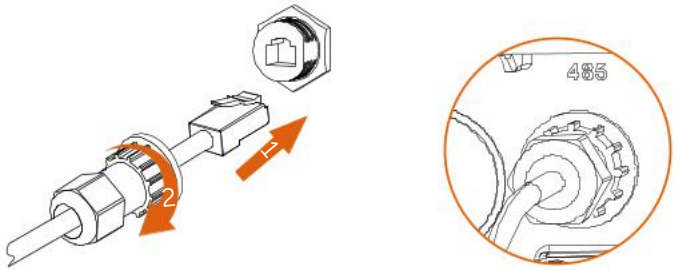


Note!
When installing, pay attention to water resistance. All the connected parts of CT must be put into the distribution cabinet.



COM port connection steps:

Please refer to 5.5.1 Introduction to COM communication and wire the COM cable in accordance with the COM pin definition.
Insert the well crimped cable into the COM port and tighten the swivel nut.



CAN1/ CAN2/ DRM/ OFF port connection steps:

Step 1. Prepare a communication cable, and then take out RJ 45 terminals in the accessory bag.

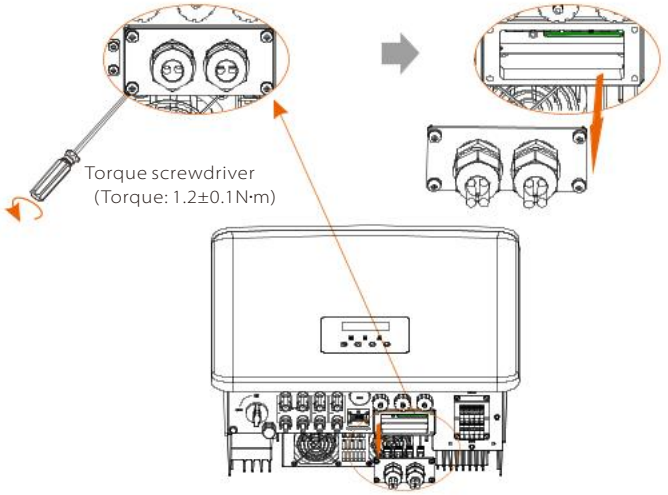


Communication cable

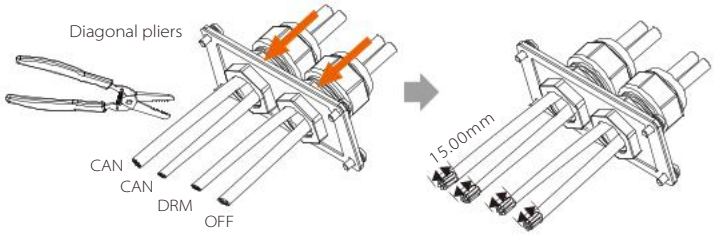


RJ 45 terminal

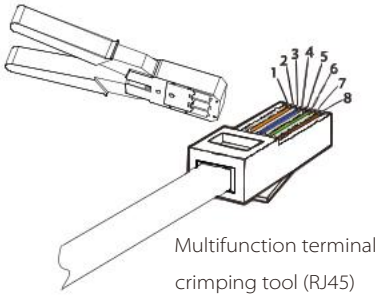
Step 2 . Loosen the screws and remove the cover on the inverter.



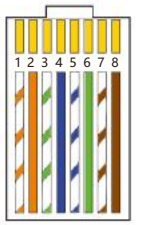
Step 3. Thread communication cables through CAN1/ CAN2/ DRM/ OFF port of the cover. And then strip off 15 mm insulation layer.



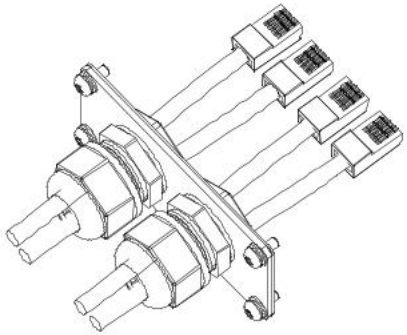
Step 4. Crimp each stripped cables with a RJ45 terminal in accordance with CAN1/ CAN2/ DRM/ OFF pin definition.



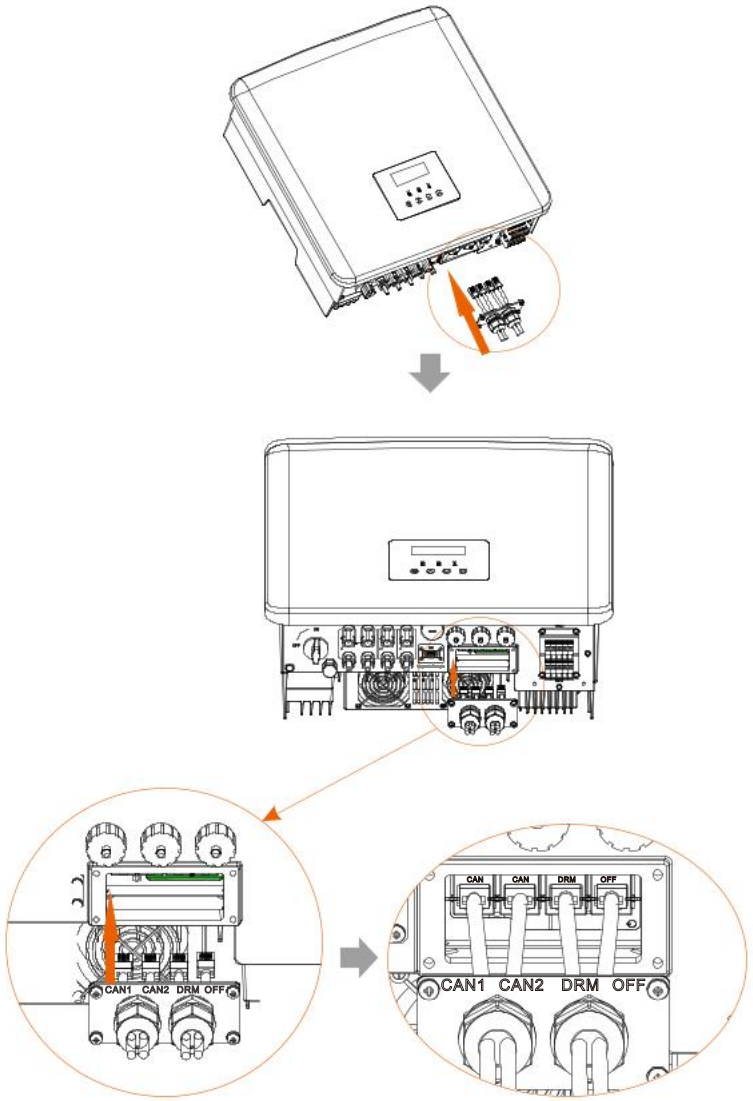
Multifunction terminal crimping tool (RJ45)



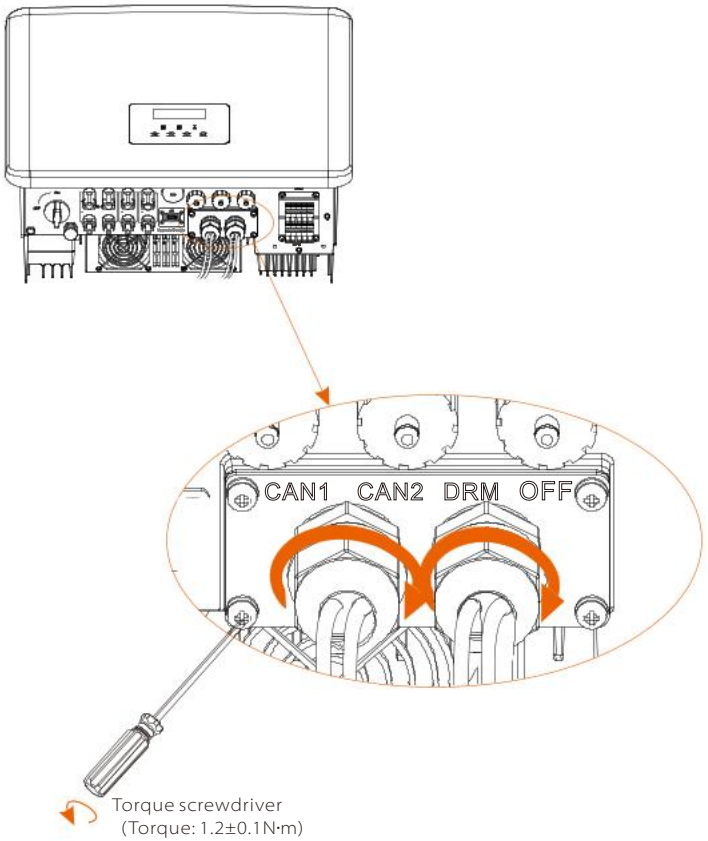
1) White with orange stripes
2) Orange
3) White with green stripes
4) Blue
5) White with blue stripes
6) Green
7) White with brown stripes
8) Brown



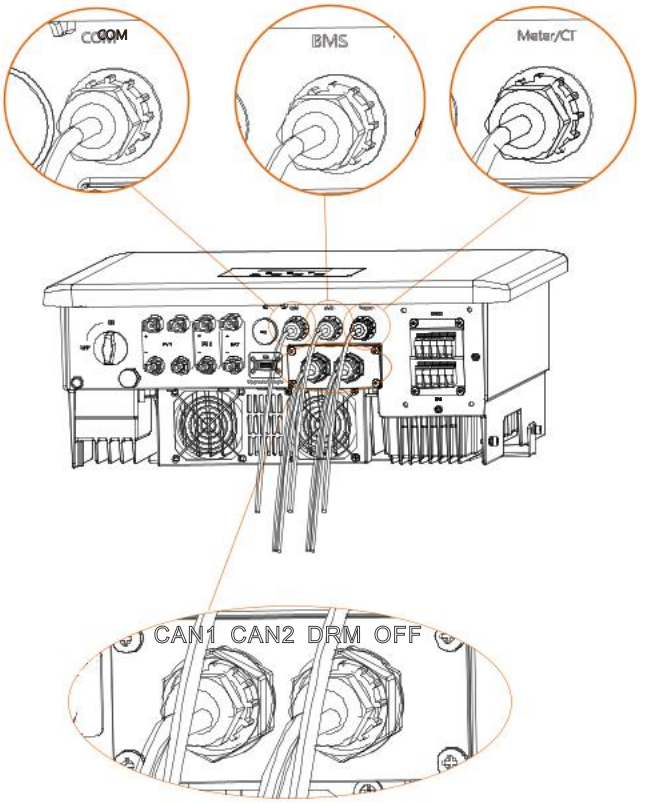
Step 5. Insert well crimped CAN1/ CAN2/ DRM/ OFF cables into the corresponding port of the inverter.



Step 6. Tighten the screws and lock the cover on the inverter. And then tighten the swivel nuts.



Step 7: Here below are the well connected communication cables.



5.6 Grounding Connection (Mandatory)

The user must make two ground connections: one shell grounding, and one equipotential grounding. This prevents electric shock.

Note: If the PV end of the inverter is not connected with earth, the inverter will turn on a red light Inspect and report ISO Fault. This inverter complies with IEC 62109-2 clause 13.9 for earth fault alarm monitoring.

Ground wire port of the M series inverter has been connected, and the D series needs to be wired according to the following steps.

➢ **Ground connection steps**

Step 1. Prepare a one-core cable (4~6 mm^2), and then find the ground terminal in the accessories.



One-core cable (4~6 mm^2)

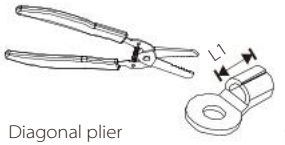


OT terminal

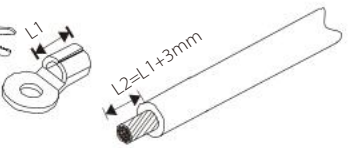


Hexagon socket screws

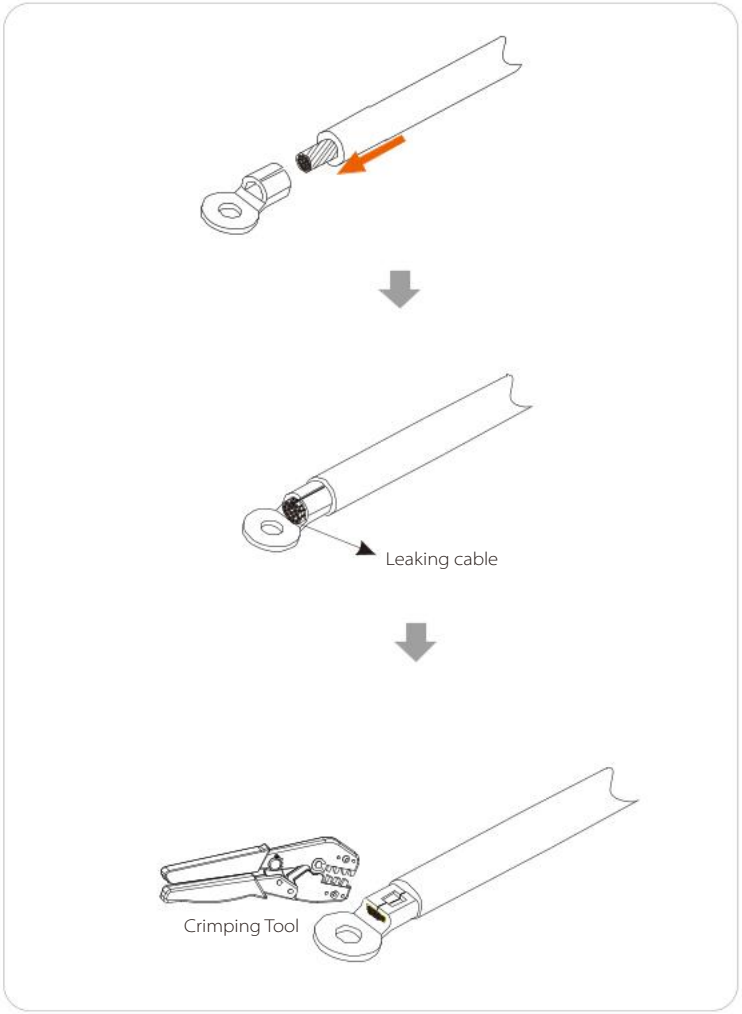
Step 2. Strip the grounding cable insulation(length"L2), insert the striped cable into the ring terminal, and then clamp it.



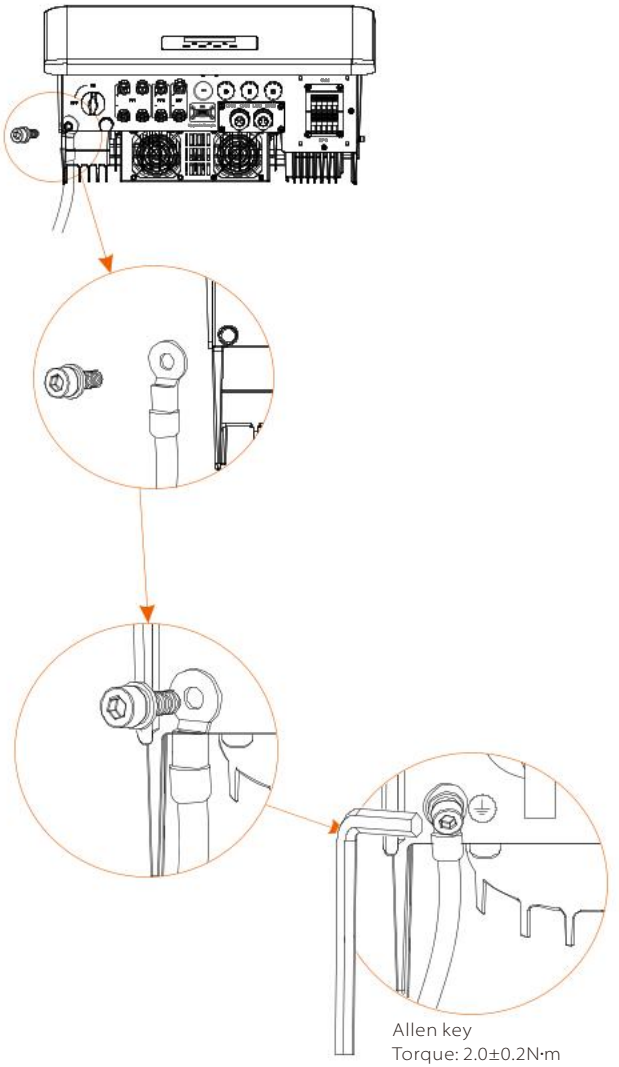
Diagonal plier



Step 3. Insert the striped cable into OT terminal and tighten the terminal with a terminal crimping tool.

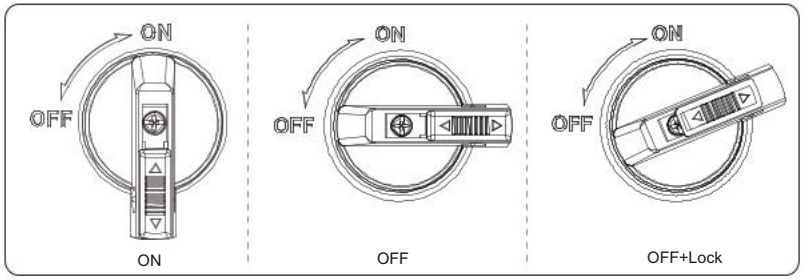


Step 4. Find the ground connection port on the inverter, and screw the ground wire on the inverter with an M5 Hexagon keys.

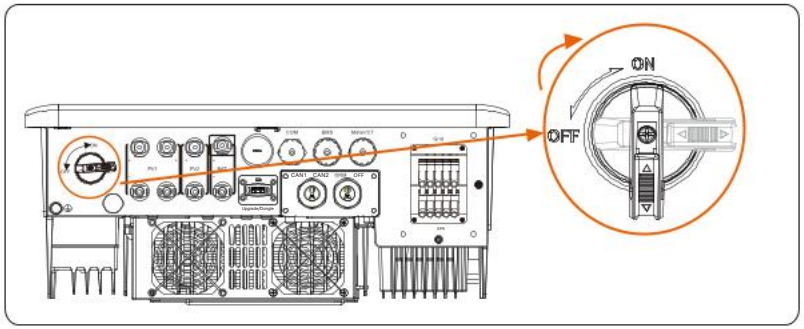


➢ DC Switch for Australia

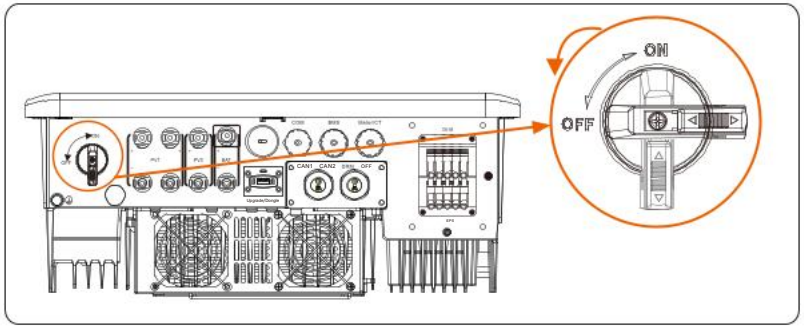
The Australian version includes 3 states: ON, OFF, and OFF+Lock. The DC switch is in the OFF state by default.



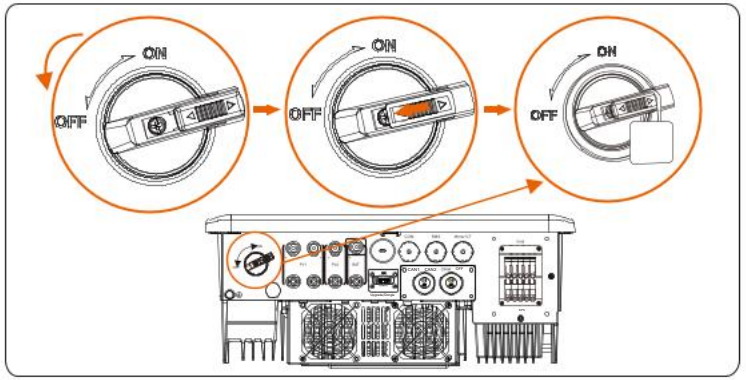
- To turn on the DC switch
  i) Turn on the DC switch from OFF state to ON state.



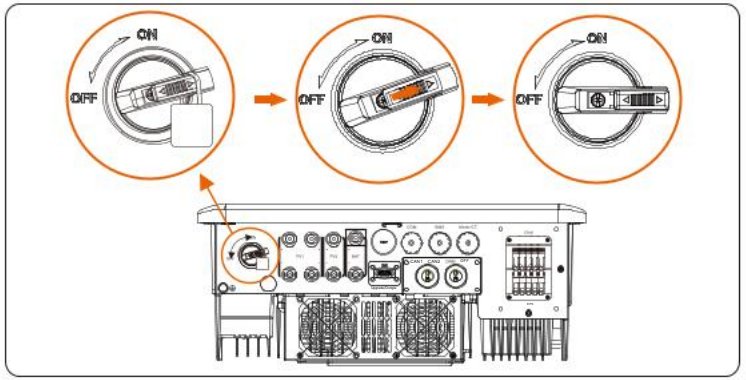
- To turn off the DC switch
  i) Rotate the DC switch from ON state to OFF state.



- To lock the DC switch
  i) Rotate the lock to the left side.
  ii) Push the lock upward (as shown in the diagram below).
  iii) Secure the DC switch with a lock (Please prepare a lock in advance).



- To unlock the DC switch
  I) Remove the lock.
  ii) Push the lock down (as shown in the diagram below).
  iii) Wait for it to return to OFF state.



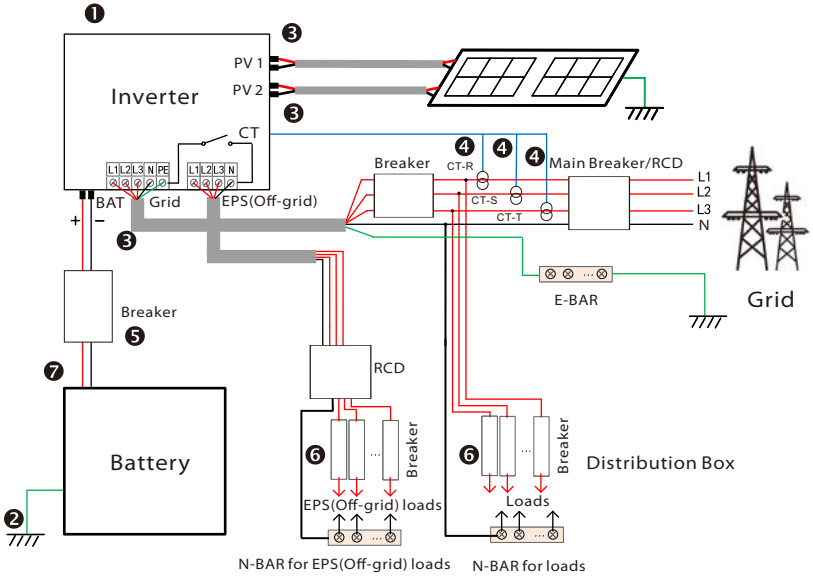
WARNING!
Only authorized personnel are allowed to set the connection.

5.7 Check All below Steps before Starting Inverter

➢ After the inverter is checked, then conduct the following steps

❶ Make sure that the inverter is fixed on the wall.
❷ Ensure that all ground wires are grounded.
❸ Confirm that all DC lines and AC lines are connected.
❹ Make sure the CT are connected.
❺ Make sure the battery is well connected.
❻ Turn on the Load breaker and EPS(Off-grid) breaker.
❼ Turn on the battery breaker.
❽ Turn on the DC switch.

Long press the "Enter "key for 5 seconds to exit the Off mode.
(The mode is factory defaulted as Off Mode)



Note: The RCD on the figure represents a leakage protection device with a circuit breaker function.

5.8 Inverter Operation

➢ Before operation, check the inverter according to the following steps

a) Check that the inverter is well fixed on the wall.
b) Ensure that all ground wires are well tightened.
c) Ensure that all DC and AC circuit breakers are disconnected.
d) Ensure that all ground wires are well tightened.
e) The AC output terminal is correctly connected to the mains.
f) Ensure that all photovoltaic panels and inverters are properly connected. Unused DC connectors should be blocked with caps.

➢ Start the inverter

- Steps to start the inverter
  - Turn on the AC switch between the inverter and the power grid.
  - (Optional) Remove the locking screw from the DC switch.
  - Turn on the DC switch between the PV string and the inverter if there is any.
  - Turn on the DC switch at the bottom of the inverter .
- When the photovoltaic panel generates enough power, the inverter will start automatically.
  - If the battery port of the inverter is connected to a battery, turn on the auxiliary power switch of the battery and then the battery switch.
- Check the status of the LED and LCD screen, the LED is blue, and the LCD displays the main interface.
  If the LED is not blue, please check the following:
  - All connections are correct.
  - All external disconnect switches are closed.
  - The DC switch of the inverter is set to the "ON" position.

The following are 3 different states of inverter operation, which means that the inverter starts successfully.

Waiting: When the DC output voltage of the photovoltaic panel is higher than 160V (lowest starting voltage) and lower than 180V (lowest working voltage), the inverter waits for checking.

Checking: The inverter will automatically detect the DC input. When the DC input voltage of the photovoltaic panel is higher than 200V and the photovoltaic panel has enough energy to start the inverter, the inverter will enter the checking state.

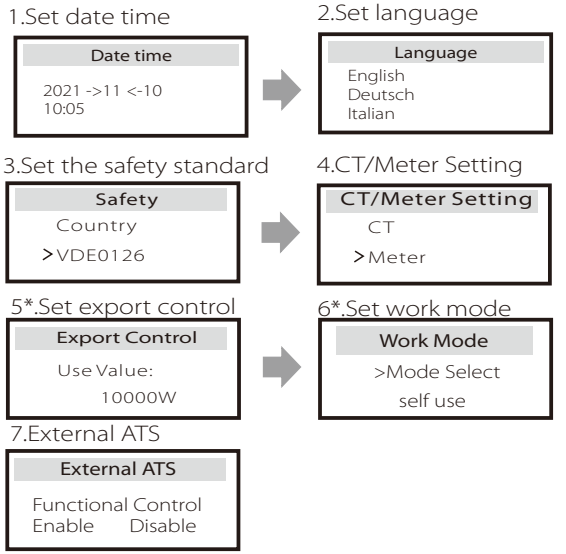
Normal: When the inverter is working normally, the green light is always on. At the same time, the power is fed back to the grid, and the LCD displays the output power.

If it is the first time to boot, please follow the prompts to enter the setting interface.

Warning!
The input terminal of the inverter can be opened only when all the installation work of the inverter has been completed. All electrical connections must be performed by professionals in accordance with local regulations.

Note!
If it is the first time to operate the inverter, the system will automatically display setup guide. Please follow the setup guide to complete the basic inverter settings.

Please follow the setup guide to complete the basic inverter settings.



5*.Export Control

This function allows the inverter able to control energy exported to the grid. There are user value and factory value. The factory value is default which can not be charged by user. The user value set by installer must be less than the factory value.

6 Firmware Upgrade

➢ Upgrade notes

Please read the following precautions before upgrading.

Warning!

- In order to upgrade the firmware smoothly, if the DSP and ARM firmware need to be upgraded, please note that ARM firmware must be upgraded first, then DSP firmware!
- Please make sure that the category format is correct, do not modify the firmware file name, Otherwise, the inverter may not work!

Warning!

- For the inverter, ensure that the PV input voltage is greater than 180V (upgrade on sunny days). please ensure that the battery SOC is greater than 20% or the battery input voltage is greater than 180V. Otherwise, it may cause serious failure during the upgrade process!

Caution!

- If the ARM firmware upgrade fails or stops, please do not unplug the U disk power off the inverter and restart it. Then repeat the upgrade steps.

Caution!

- If the DSP firmware upgrade fails or stops, please check whether the power is off. If it is normal, plug in the U disk again and repeat the upgrade.

➢ Upgrade preparation

1) Please check the inverter version and prepare a U disk (USB 2.0/3.0) and personal computer before upgrading.

Caution!

- Please make sure that the size of the U disk is smaller than 32G, and the format is FAT 16 or FAT 32.

2) Please contact our service support to obtain the firmware, and store the firmware in the U disk according to the following path.

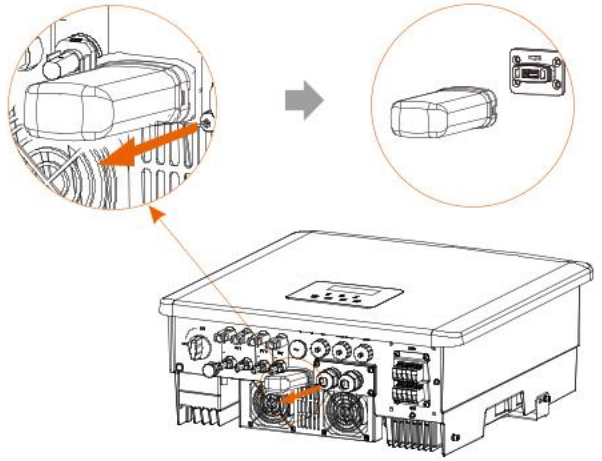
Update:
For ARM file: "update \ARM\618.00406.00_HYB_3P_ARM_V1.13_1220.usb";
For DSP file: "update\DSP\618.00405.00_HYB_3P_DSP_V1.14_1215.usb";

➢ Upgrade steps

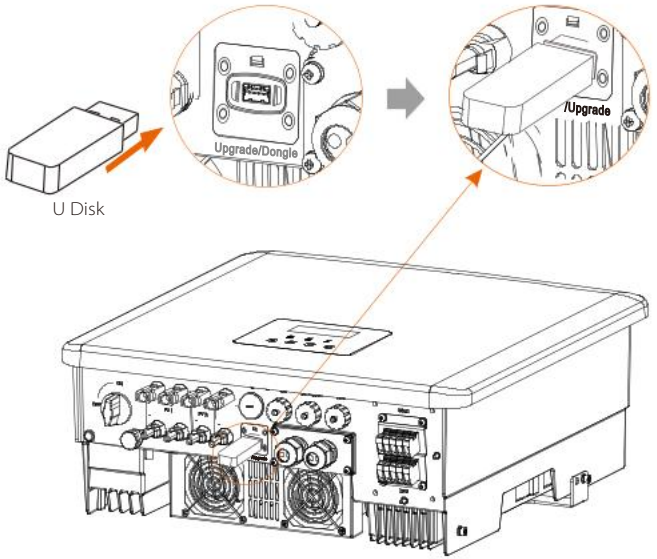
Step 1. Please save the "Upgrade" firmware in your U disk first, and press the "Enter" button on the inverter screen for 5 seconds to enter the OFF mode.



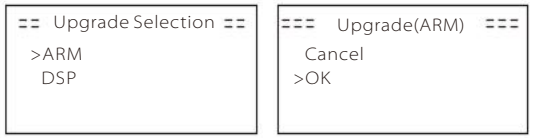
Step 2. Find the "Upgrade" port of the inverter, unplug the monitoring module (dongle) by hand, and insert the USB flash drive.



Note: The dongle in this figure is indicative only. The actual dongle might differ. The unplugging method shall be subject to the actual situations.



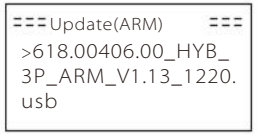
Step 3. LCD operation, enter the upgrade interface "update", as shown below (a): Please press the up and down keys to select ARM, then press down to set "OK", press the enter key to enter the software version interface;



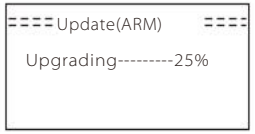
(a)

(b)

Step 4. Please confirm the new firmware version again and select the firmware to upgrade. The upgrade takes about 20 seconds.
(d) When it is completed, the LCD screen returns to the "Update" page.



(c)

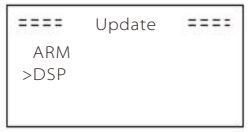


(d)

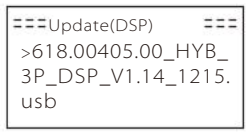


(e)

Step 5. For DSP: Please wait for 10 seconds. When "Update" page shown as below, press down to select "DSP" and then press Enter. Please confirm the firmware version again and press Enter to upgrade. The upgrade takes about 2 minutes.



(f)



(g)



(h)

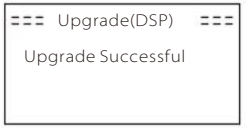


(i)



(j)

Step 6. After the upgrade is completed, the LCD screen displays" Upgrade Successful" .



(k)

Step 7. Plug off the U disk, press "Esc" to return to the main interface, and long press the enter key to exit the mode.

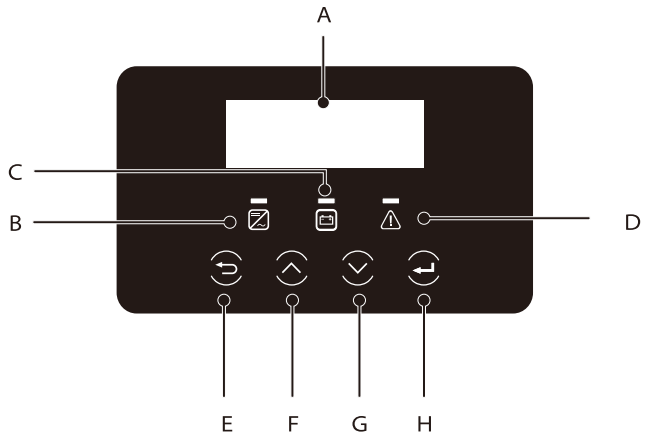
Caution!

- Please strictly follow each step from step 1-6, don't miss it.
- Please confirm the ARM/DSP firmware version on the USB flash drive.

Tip: If the display screen is stuck on "X3-Hybrid G4" after the upgrade, please turn off the photovoltaic power supply and restart, and the inverter will restart and return to normal. If not,
please contact us for help.

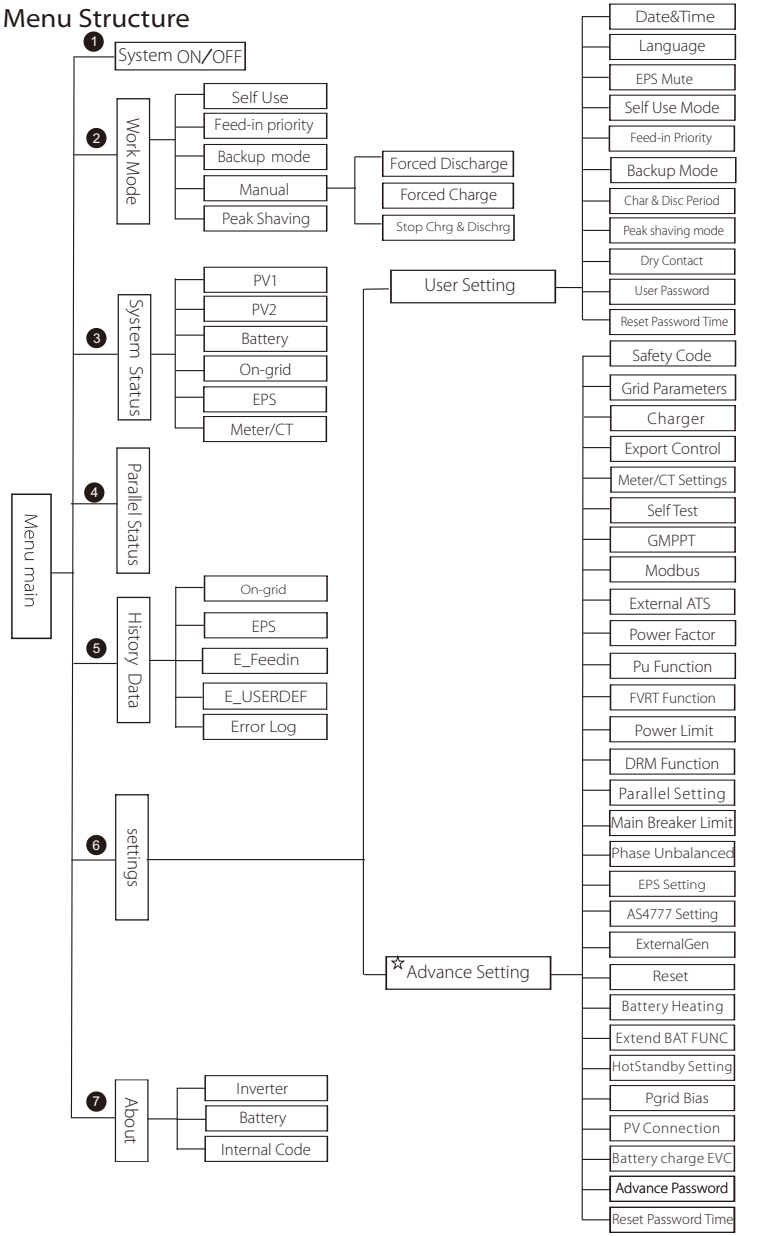
7 Setting

7.1 Control Panel



Object	Name	Description
A	LCD Screen	Display inverter information on the LCD display.
B	LED Indicator light	Blue light: The inverter is in normal state or EPS(Off-grid) mode. Blue flashing: The inverter is in the waiting, checking state or the system switch is off. Off: The inverter is in a fault state.
C		Green: The battery communication is normal but the battery MCB is disconnected, and the battery communication is normal and working normally. Green flashing: The battery communication is normal and in an idle state. Off: The battery does not communicate with the inverter.
D		Red light on: The inverter is in a fault state. Off: The inverter has no error.
E	Key Function	ESC button: Return from the current interface or function.
F		Up button: Move the cursor to the upper part or increase the value.
G		Down button: Move the cursor down or decrease the value.
H		Enter button: Confirm selection.

7.2 Menu Structure

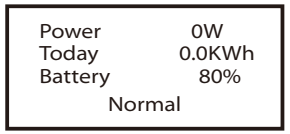


Note:"☆"This part of the content cannot be set by the end user. Please contact the installer or our company if necessary.

7.3 LCD Operation

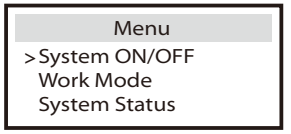
The main interface is the default interface, the inverter will automatically return to this interface when the system started up successfully or not operated for a period of time.

The information of the interface is as below. “Power” means the instant output power; “Today” means the power generated within the day. “Battery” means the left capacity of battery energy.

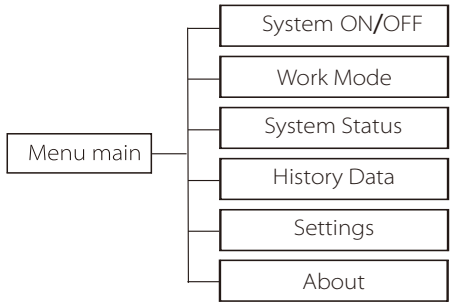


➢ Menu interface

The menu interface is another interface for users to change settings or obtain information.
- When the LCD displays the main interface, click "OK" to enter this interface.
- The user can select up and down the menu, and press the "OK" key to confirm.



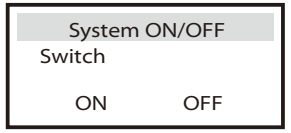
➢ Menu main



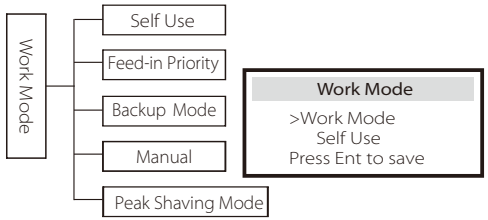
➢ System ON/OFF

“ON" means the inverter is in working state, and the inverter is in the default state.

"OFF" means that the inverter stops running and only the LCD screen is on.

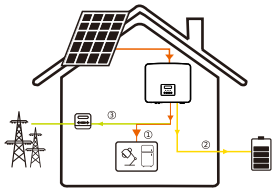


➢ Work Mode



For **on-grid** status, there are four work modes: Self Use, Feed-in Priority, Backup and Manual and Peak Shaving Mode.

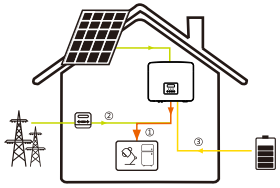
Self Use



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 surplus power will charge the battery, then the remaining power will feed into the grid.

Priority: Loads > Battery > Grid

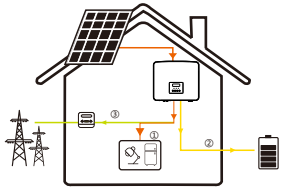
Feed-in priority



The feed-in priority mode is suitable for areas with high feed-in subsidies, but has feed-in power limitation.
The power of PV will supply the loads first, and surplus power will feed into the grid, then the remaining power will charge the battery.

Priority: Loads > Grid > Battery

Backup mode



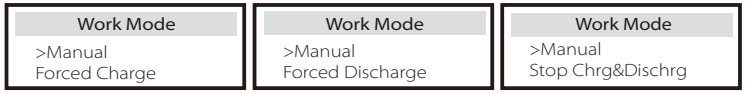
The backup mode is suitable for areas with frequent power outages.
This mode will maintain the battery capacity at relatively high level, to ensure that the emergency loads can be used when the grid is off.
Same working logic with "self use" mode.

Priority: Loads > Battery > Grid

Manual

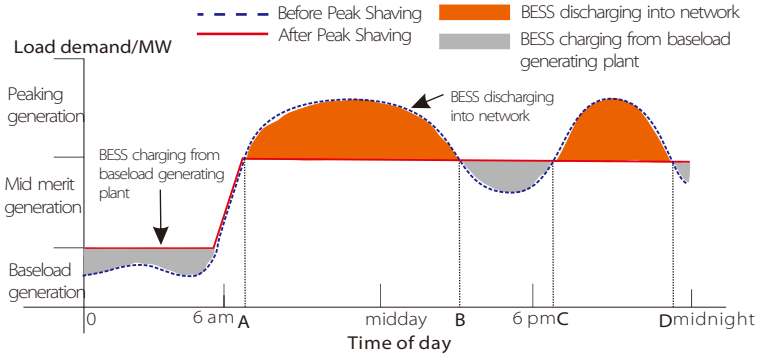
This work mode is for the after-sales team to do after-sales maintenance.

Manual mode, there are three options to choose from: forced charging, forced discharge, stop charging and discharging (grid-connected power).



Peak Shaving Mode

Peak shaving mode is set for leaving out peaks in electricity use.



The D-A period is the battery charging period during which discharging is not allowed and the PV will charge the battery first for peak shaving. The ChargeFromGrid" setting determines whether or not to charge from the grid. When "ChargeFromGrid" is set to "Disable", the battery cannot charge from the grid; when "ChargeFromGrid" is set to "Enable" and the actual battery SOC is less than "Max_SOC", the battery will charge from the grid at no more than "ChargePowerLimits" power.

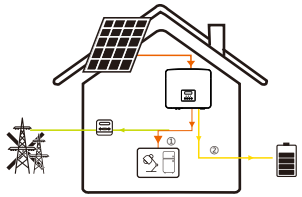
In the A-B and C-D periods, if the power of loads does not exceed "PeakLimits", the PV will charge the battery first. When the battery is fully charged, the PV will charge loads, and the surplus power will feed into the grid. If the power of loads exceeds "PeakLimits", the PV and battery will discharge energy for loads and thus reduce the amount of energy purchased from the grid.

In the B-C period, the battery does not discharge. The PV will charge the battery to the "Reserved SOC" first and then supply power for loads, with the surplus power feeding into the grid. Charging the battery first in these periods is storing energy for the peak shaving.

* If there are requirements for zero output from the inverter, the PV output will be limited.

For **off-grid** status, there is only one work mode: EPS (Off-grid).

EPS (Off-grid)



In case of power failure, the system will supply EPS loads through PV and battery. (The battery must be installed, and EPS loads shall not exceed battery's max. output power.)
The power of PV will charge the loads first, and surplus power will charge the battery.

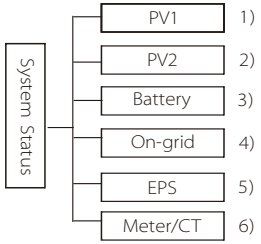
Priority: Loads > Battery

Note:
The battery will stop discharging when SOC=min SOC. But due to battery self consumption, sometimes SOC may < min SOC.

For on-grid status, if the battery SOC ≤ (min SOC-5%), the inverter will take utility energy to charge battery SOC back to (min SOC+1%).

For off-grid status, if the battery SOC ≤min SOC, the inverter will be unable to enter EPS mode (the battery will be unable to discharge unless SOC is back to 31%.)

➢ System Status



System status contains six content: PV1/PV2/Battery/On-grid (energy feed into or buy from the grid)and EPS(Off-grid) and so on. Press up and down to select, press "Enter" to confirm the selection, and press "ESC" to return to the menu.

1/2) PV1, PV2
Here you can see the voltage, current and power of the pv1 and Pv2. Photovoltaic panels respectively;

PV1	
>U	0.0V
I	0.0A
P	0 W

PV2	
>U	0.0V
I	0.0A
P	0 W

3) Battery
This status shows the battery condition of the system. Including battery voltage and battery current, Battery power, battery capacity, battery temperature, BMS connection status. The meaning of the sign of battery current and power: "+" means charging; "-" means discharging.

Battery	
U	400.0V
I	-1.0A
P	-400W
SoC	0%
Cell Temp	20℃
BMS Connected	
BMS Disconnected	

Battery	
U	400.0V
I	-1.0A
P	-400W
NTC Temp	

4) On-grid
Here you can see the voltage, current, frequency, and power of the grid.

On-grid A	
Ua	0.0V
Ia	0.0A
PaOut	0 W

On-grid B	
Ub	0.0V
Ib	0.0A
PbOut	0 W

On-grid C	
Uc	0.0V
Ic	0.0A
PcOut	0 W

Grid Frenquency	
Fa	0.00Hz
Fb	0.00Hz
Fc	0.00Hz

5) EPS
Here you can see the inverter of voltage, current, frequency and power.

EPS_Spower	
PaS	0VA
PbS	0VA
PcS	0VA

EPS A	
Ua	0.0V
Ia	0.0A
PaActive	0W

Frequency	
Freq	
	0.00Hz

EPS B	
Ub	0.0V
Ib	0.0A
PbActive	0W

EPS C	
Uc	0.0V
Ic	0.0A
PcActive	0W

6) Meter/CT
Here you can see the data showing the meter or the CT.

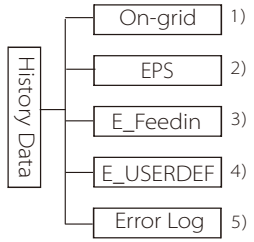
Meter/CT
Pfeedin A
Pfeedin B
Pfeedin C
P_USERDEF A
P_USERDEF B
P_USERDEF C

➢ **Parallel Status**

Status shows on the screen when paralleling.

Parallel Status	
All	3
Slaver1	O
Slaver2	X
Slaver3	O
Slaver4	X
Slaver5	X
Slaver6	X
Slaver7	X
Slaver8	X
Slaver9	X

➢ **History Data**



The history data contains five pieces of information: on-grid power of the inverter, EPS power generation, power of the meter /CT and error Error logs.

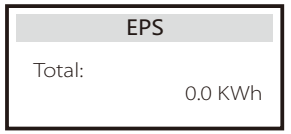
Press up and down to select, press Enter to confirm selection, and press ESC to return to the menu.

1) On-grid
Here is a record of the power capacity of the inverter connected to the grid today and the total.

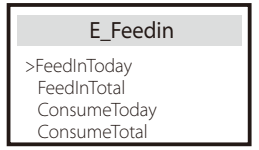
On-grid	
Output Today	0.0 KWh
Output Total	0.0 KWh
Input Today	0.0 KWh
Input Total	0.0 KWh

2) EPS
Here you can see the EPS output of the inverter today and the total output.

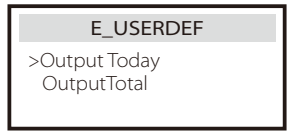




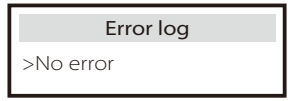
3) E_Feedin
Here you can see the inverter's electricity sold, total electricity sold, electricity bought from the grid and total electricity bought on that day.



4) E_USERDEF
Here you can see the total power output of the inverter for the day.



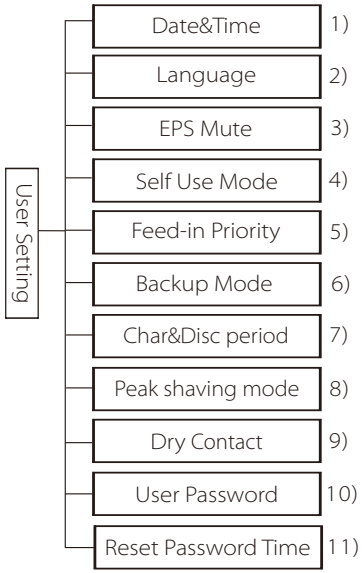
5) Error Log
Here you can see the most recent six error messages.



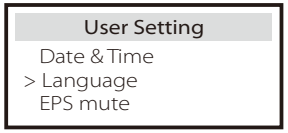
➢ **Settings**

Settings includes **User Setting** and **Advanced Setting**. You need to enter the corresponding passwords for different settings. After you enter the settings, a passwordfree time (15 minutes) is available to you. That is, you can exit from and re-enter the settings without a password during the time.

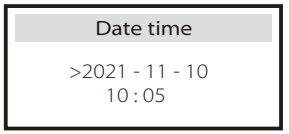
➢ **User Setting**



Here you can set the inverter time, language, working mode SOC, charging and discharging time period and user password.



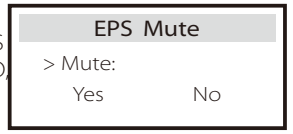
1) Date time
This interface is for users to set the system date and time.



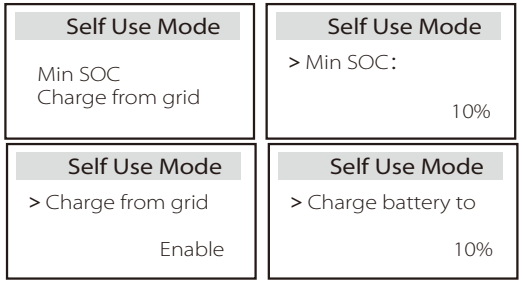
2) Language
This inverter provides multiple languages for customers to choose, such as English, Deutsch, francais, Polskie, Espanol, Português.



3) EPS Mute
Here you can choose whether the buzzer is turned on when the inverter is running in EPS mode. Select Yes, the buzzer mutes, select NO, EPS mode, the buzzer will sound once every 4s when the battery is fully charged, the closer the battery is to the empty state, the higher the buzzer will sound, to remind users to avoid battery loss.

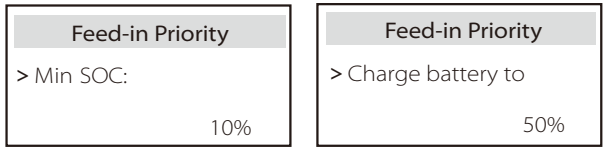


4) Self-use mode
In this mode, you can set the power reserve percentage of the minimum battery state, set whether the power can be taken from the mains side to charge the battery, and set the amount of power to charge the battery.
For example: set the reserved minimum SOC of the battery capacity to "10%", which means that when the battery has been discharged to 10% of the battery capacity, the battery is not allowed to continue to discharge;
When Charge from grid is set to "Enable", the utility power is allowed to charge the battery; when set to “Disable”, the utility power is not allowed to charge the battery;
Charge battery to is set to 10%, indicating that the mains is allowed to charge the battery at 10%.

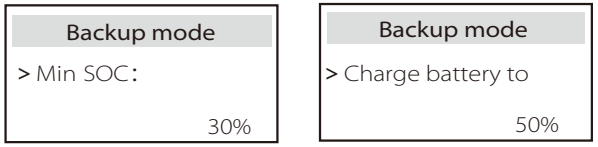


5) Feed-in Priority
In this mode, you can set the power reserve percentage of the minimum battery state, set whether the power can be taken from the mains side to charge the battery, and set the amount of power to charge the battery.
For example: set the reserved minimum SOC of the battery capacity to "10%", which means that when the battery has been discharged to 10% of the battery capacity, the battery is not allowed to continue to discharge;

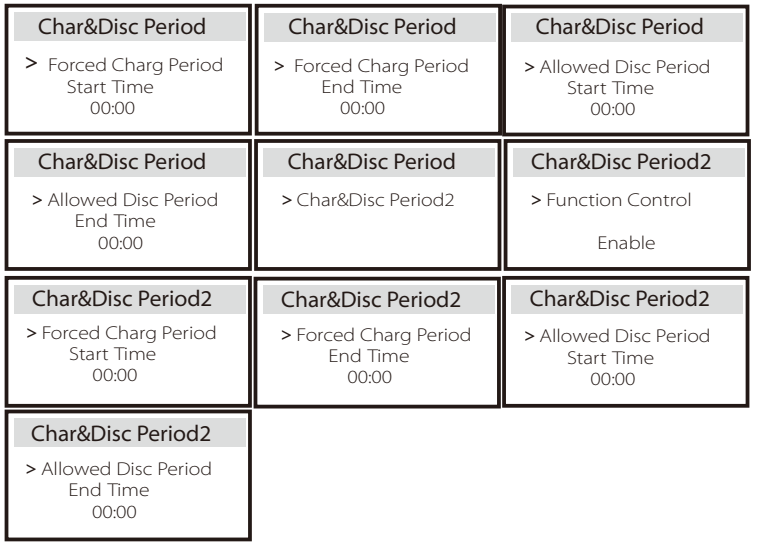
Charge battery to is set to 50%, indicating that the mains is allowed to charge the battery at 50%.



6) Backup mode
In this mode, you can set the power reserve percentage of the minimum battery state, set whether the power can be taken from the mains side to charge the battery, and set the amount of power to charge the battery.
For example: set the reserved minimum SOC of the battery capacity to "30%", which means that when the battery has been discharged to 30% of the battery capacity, the battery is not allowed to continue to discharge;
Charge battery to is set to 50%, indicating that the mains is allowed to charge the battery at 50%.

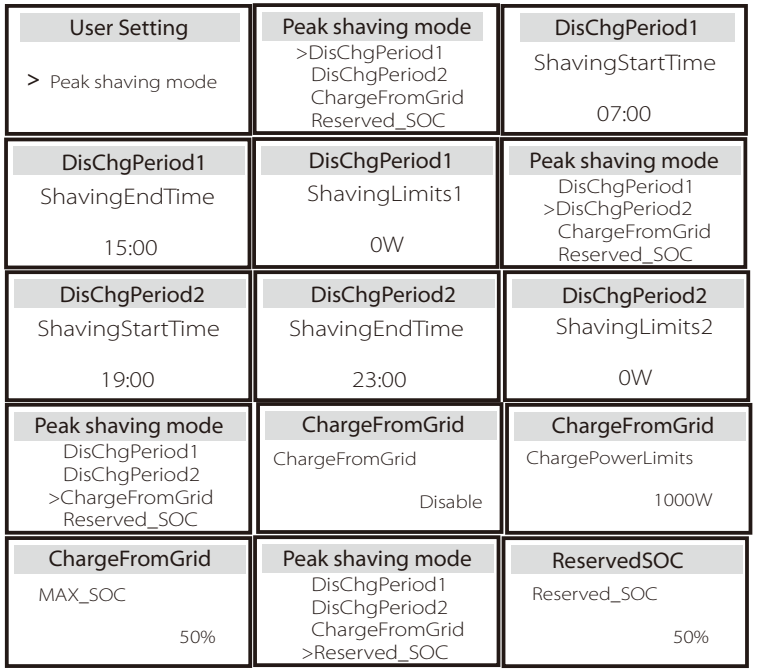


7) Charge and discharge time
Here you can set the charge and discharge time period.
If two charging and discharging periods are needed, turn on the charging and discharging period 2 and set the period.



8) Peak shaving mode

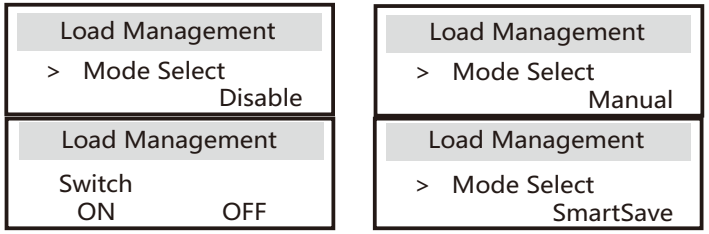
This setting is for enabling peak shaving mode.
"DisChgPeriod1" or "DisChgPeriod2" are two discharging periods you can set.
Set "ShavingStartTime1" (default value: 7:00) and "ShavingEndTime1 (default value: 15:00) under "DisChgPeriod1" and "ShavingStartTime2 (default value: 19:00) and "ShavingEndTime2" (default value: 23:00) under "DisChgPeriod2" to define the peak hours of electricity.
Set "PeakLimits1/2" to limit the power that loads get from the grid. Once the power of loads exceeds "peak limits" during the peak hours, the PV and battery will discharge energy for loads and thus reduce the amount of energy purchased from the grid. In non-peak hours, discharging of the battery is not allowed. If you want to get electricity from the grid, set "ChargeFromGrid" to "Enable". "Disable" is the default setting. When you select "Enable and the actual battery SOC is less than "MAX_SOC (settable)", the battery can be charged from the grid at no more than "ChargePowerLimits" (settable) power.
Range of "ChargePowerLimits": 0 W~rated power (W)
The range of "MAX_SOC" is 10%–100%; the default value is 50%.
Range of "Reserved_SOC": 10%–100%; the default value is 50%.
“Reserved_SOC" is the battery capacity saved for the next peak shaving in the non-peak shaving period.

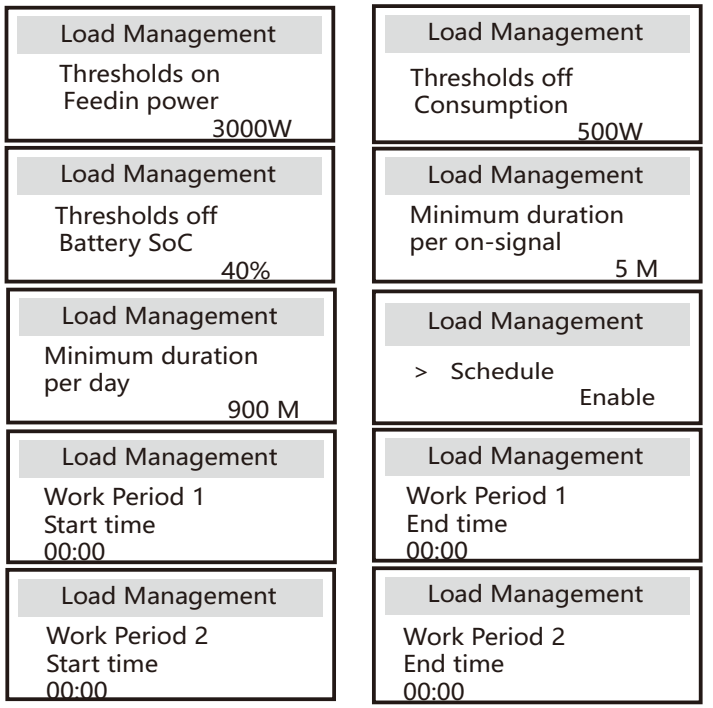


9) Dry Contact

When the user uses the inverter communication control external device function, you can enter here to set the parameters of the external response control. For the setting method, please refer to the user manual of the compatible external device.

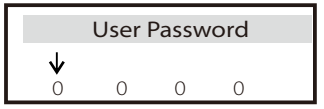
If the user uses the inverter dry contacts to control external devices (such as heat pumps) through the Adapter box, please refer to the Adapter box quick installation manual to set the parameters here.





10) User Password

The default password for the end user is "0000", where you can reset the new password and press the up/down key to increase or decrease the value. Press "Enter" to confirm the value and jump to the next digit. When all passwords have been entered and confirmed, press "OK" to set the password successfully.

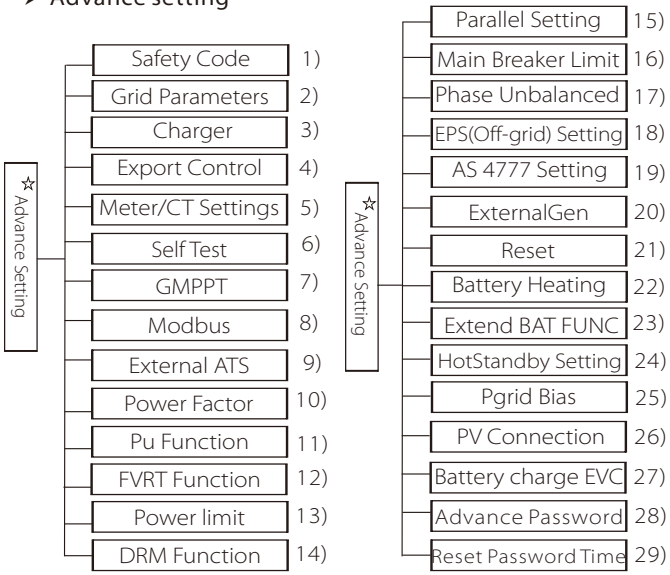


11) Reset Password Time

During the password-free time of setting, selecting **Reset Password Time** to return to the **Setting** interface can end the password-free time in advance. If you want to re-enter the settings, you need to enter the password again, to start another password-free time.



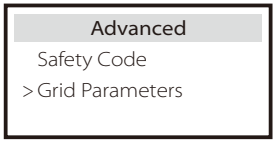
➢ Advance setting



All advanced settings can be set here, such as battery, grid, EPS(Off-grid), etc.

"Advanced" setting is generally customization and resetting for battery and grid. Each part has lower level parts.

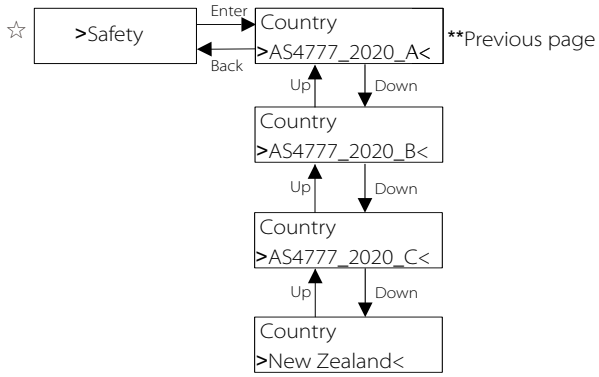
Please contact your installer or factory and enter the installer password.



1) Safety Code

User can set safety standard according to different countries and grid tied stanndards.There are 8 standards to select. (**May be changed or added without notice**)

Item	Standard	Country
1	VDE 0126	German
2	ARN 4015	German
3	AS 4777	Australia
4	EN 50549_EU	Netherland
5	G98/G99	UK
6	EN 50438_NL	Netherland
7	CEI 0-21	Italy
8	IEC61727_In	India



Region	Australia A	Australia B	Australia C	New Zealand	
Standarad Code Name	AS4777_2020_A	AS4777_2020_B	AS4777_2020_C	New Zealand	Setting Range
OV-G-V	265V	265V	265V	265V	230-300V
OV-G-V2	275V	275V	275V	275V	1-2S
OV-GV2-T	0.1S	0.1S	0.1S	0.1S	230-300V
UN-G-V1	180V	180V	180V	180V	0-0.2S
UNGV1-T	10S	10S	10S	10S	40-230V
UN-G-V2	70V	70V	70V	70V	10-11S
UNGV2-T	1.5S	1.5S	1.5S	1.5S	40-230V
OV-G-F1	52HZ	52HZ	55HZ	55HZ	1-2S
OVGF1-T	0.1S	0.1S	0.1S	0.1S	50-55HZ
OV-G-F2	52HZ	52HZ	55HZ	55HZ	0-0.2S
OVGF2-T	0.1S	0.1S	0.1S	0.1S	50-55HZ
OV-GV1-T	1.5S	1.5S	1.5S	1.5S	0-0.2S
UN-G-F1	47HZ	47HZ	45HZ	45HZ	45-50HZ
UNGF1-T	1.5S	1.5S	5S	1.5S	1-6S
UN-G-F2	47HZ	47HZ	45HZ	45HZ	45-50HZ
UNGF2-T	1.5S	1.5S	5S	1.5S	1-6S
Startup-T	60S	60S	60S	60S	15-1000S
Restore-T	60S	60S	60S	60S	15-600S
Recover-VH	253V	253V	253V	253V	
Recover-VL	205V	205V	205V	198V	
Recover-FH	50.15Hz	50.15Hz	50.15Hz	50.15Hz	
Recover-FL	47.5Hz	47.5Hz	47.5Hz	47.5Hz	
Start-VH	253V	253V	253V	253V	
Start-VL	205V	205V	205V	198V	
Start-FH	50.15Hz	50.15Hz	50.15Hz	50.15Hz	
Start-FL	47.5Hz	47.5Hz	47.5Hz	47.5Hz	

2) Grid Parameters

Setting path: Main -> Setting -> Advance Setting -> Grid Parameters.

Here you can set the protection value of grid voltage and frequency. The default value is the specified value under the current safety regulations, and the user cannot change it.

The display content will be displayed according to the requirements of local laws and regulations, which are constantly increasing. Please refer to the contents displayed on the inverter screen.

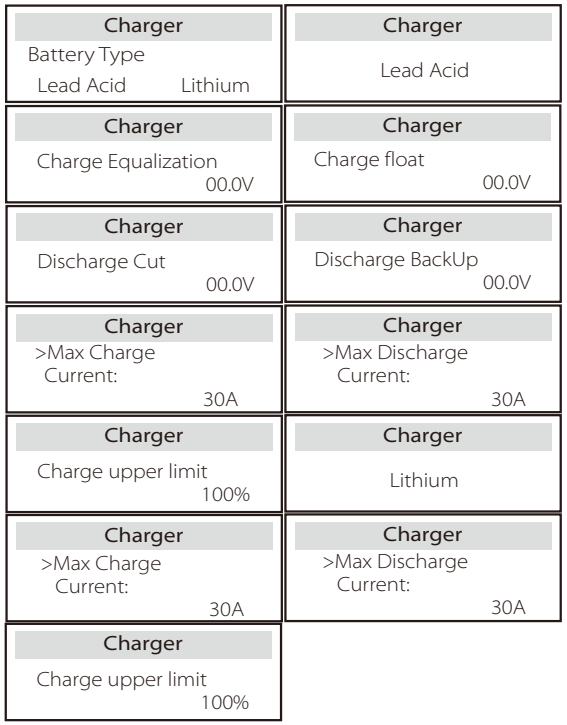
Grid Parameters >OverVoltage_L1 0.0V	Grid Parameters >UnderVoltage_L1 0.0V	Grid Parameters >OverFreq_L1 0.00Hz
Grid Parameters >UnderFreq_L1 0.00Hz	Grid Parameters >Vac 10min Avg 0.0V	Grid Parameters >OverVoltage_L2 0.0V
Grid Parameters >UnderVoltage_L2 0.0V	Grid Parameters >OverFreq_L2 0.00Hz	Grid Parameters >UnderFreq_L2 0.00Hz
Grid Parameters >Tovp_L1 0ms	Grid Parameters >Tuvp_L1 0ms	Grid Parameters >Tofp_L1 0ms
Grid Parameters >Tufp_L1 0ms	Grid Parameters >Tovp_L2 0ms	Grid Parameters >Tuvp_L2 0ms
Grid Parameters >Tofp_L2 0ms	Grid Parameters >Tufp_L2 0ms	Grid Parameters >Reconnection Time 0.0s
Grid Parameters >Checking Time 0.0s	Grid Parameters > OFPL_Setting	OFPL_Setting OFPL_Curve Symmetric
OFPL_Setting OFPL_Curve Asymmetry	OFPL_Setting OFPL_RemovePoint(Aus.) 50.10Hz	OFPL_Setting OFPL_OverFreqfhyste(Aus.) 50.15Hz
OFPL_Setting OFPL_StartPoint 50.25Hz	OFPL_Setting OFPL_DropRate 5%	OFPL_Setting OFPL_DelayTime 0.0S

OFPL_Setting W(Gra) 0%	OFPL_Setting Tstop 0.0S	OFPL_Setting fstop-disch 00.00Hz
OFPL_Setting fP min 00.00Hz	Grid Parameters > UFPL_Setting	UFPL_Setting UFPL_RemovePoint(Aus.) 00.00Hz
UFPL_Setting UFPL_UnderFreqfhyste(Aus.) 00.00 Hz	UFPL_Setting UFPL_StartPoint 00.00Hz	UFPL_Setting UFPL_DropRate 0%
UFPL_Setting UFPL_DelayTime 0.0S	OFPL_Setting fstop-ch 00.00Hz	OFPL_Setting fP max 00.00Hz
Grid Parameters Local Command 0 1	Grid Parameters Connect Slope 0%	Grid Parameters Reconnect Slope 0%
Grid Parameters Vac 10min Time 0.0 s	Grid Parameters > Connection	Connection Low frequency 00.00Hz
Connection High frequency 00.00Hz	Connection Low voltage 00.0V	Connection High voltage 00.0V
Connection Observation time 0.0S	Connection Gradient Select Disable Enable	Connection Gradient 0%
Grid Parameters > Reconnection	Reconnection Low frequency 00.00Hz	Reconnection High frequency 00.00Hz
Reconnection Low voltage 00.0V	Reconnection High voltage 00.0V	Reconnection Observation time 0.0S
Reconnection Gradient Select Disable Enable	Reconnection Gradient 0%	Grid Parameters > Pf Function
Pf Function Disable Enable		

3) Charger

Here the user can set the parameters of charger on this page, the inverter is compatible with both lithium battery. Users can set the charge & discharge parameters.

For the detailed parameters, please refer to below table.



4) Export Control

This feature allows the inverter to control the amount of electricity output to the grid.

The factory value is the default and can be changed by the user. The user value set by setup must be less than the maximum. If the user does not want to supply power to the grid, set it to 0.



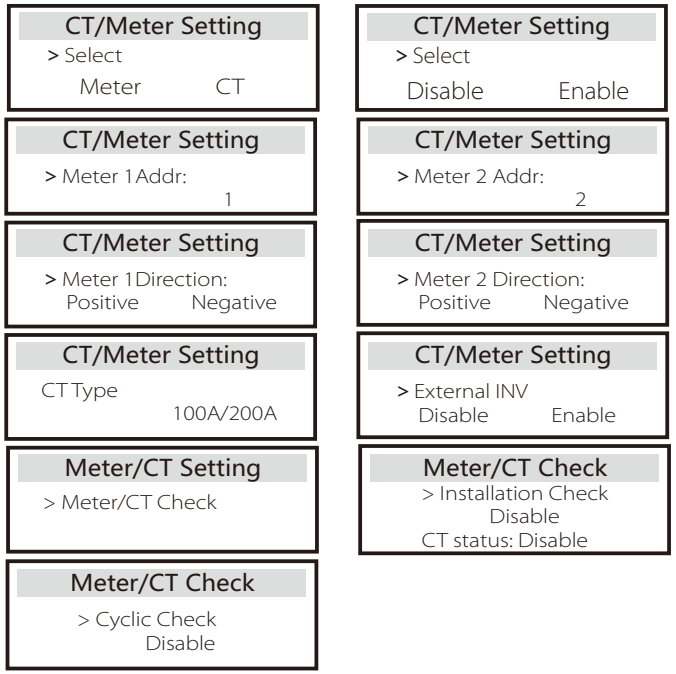
5) Meter/CT Settings

The user needs to select the CT or electricity meter to connect the inverter here. CT is a default, when users choose CT, there is only Meter 2 Addr setting. All will show on the inverter screen when users choose Meter.

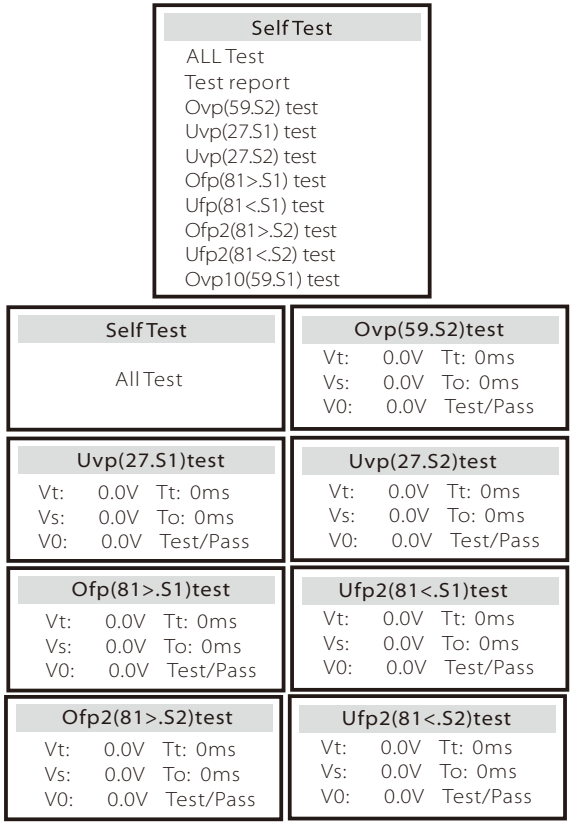
"Installation Check" is for checking whether the meter/CT is properly connected when the inverter is well installed. "Cyclic Check" is for periodically checking whether the meter/CT is in good condition when the inverter is running.

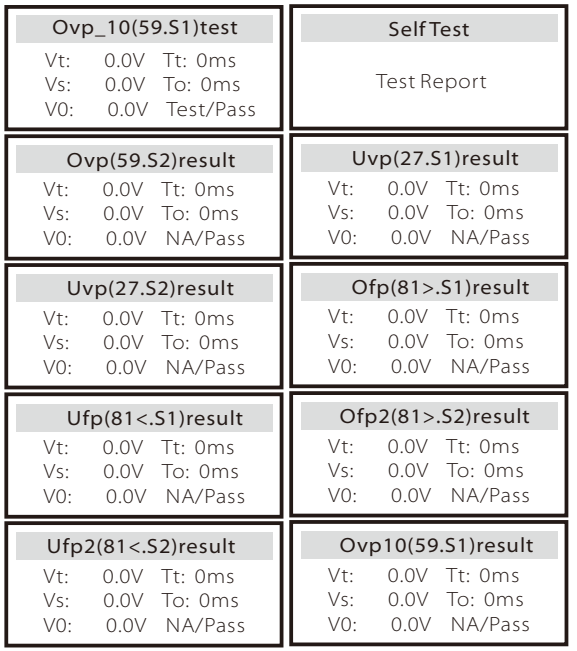
Users can set "Enable" under the "Installation Check" setting to check the connection status of the meter/CT and automatically correct "Meter/CT status: Disable" due to the wrong connection of the meter/CT. A reverse connection of a meter/CT cannot be corrected through this setting.

Users set "Enable" under the "Cyclic Check" for periodically checking the condition of the meter/CT.

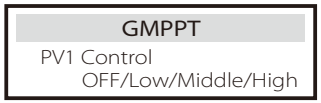


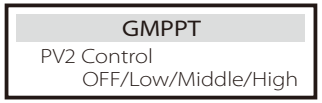
6) Self Test (only for CEI 0-21)
The self test function allows users to test the following items. "Full test", "Ovp(59.S2) test"27. "Uvp (s1) test", "Uvp (27. s2) test", "Ofp (81> .S1) test", "Ufp (81 <.S1) test", "Ufp (81> .S2) test", "Ufp (81 <.S2) test", "Ovp10 (59. s1) test".
In the self-test interface, the user can select "all tests" or a single test item for testing.
Before testing, make sure that the inverter is connected to the grid.
All tests take about 6 minutes. And it will display "Success" and then "Delivery".
For a single test item, it takes about a few seconds or minutes.
Click "Test Report" to view the test results of all items.



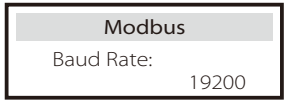


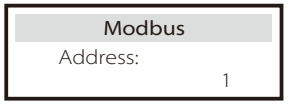
7) GMPPT
Here, you can set the shadow tracking with four options, which are off, low, middle, and high.





8) Modbus
Here you select the baud rate of the external communication protocol.

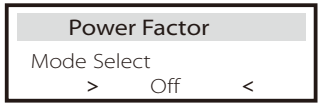


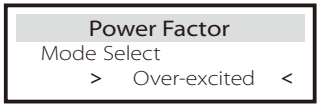


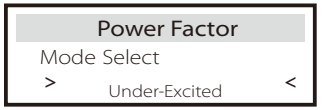
9) External ATS
INCORRECT line sequence (R-R, S-S, T-T, N-N) will damage the inverter. To avoid the damage, the default "Disable" has been set to "Enable" in "External ATS" under "Advance Settings". Users should set the default setting back to "Disable". External ATS needs to be set to "Enable" only when a matebox advanced is connected.

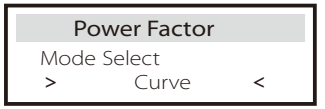


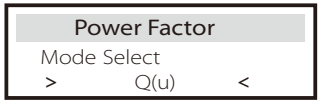
10) Power Factor (applicable to specific countries, please refer to local grid requirements)

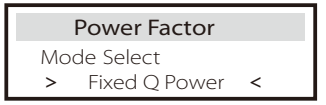




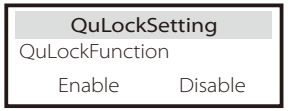




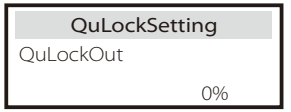




Mode	Comment
Off	–
Over-Excited	PF value
Under-Excited	PF value
Curve	P1_PF
	P2_PF
	P3_PF
	P4_PF
	Power 1
	Power 2
	Power 3
	Power 4
	PfLockInPoint (EU50549 only)
	PfLockOutPoint (EU50549 only)
	3Tau
Q(u)	SetQuPower1
	SetQuPower2
	SetQuPower3
	SetQuPower4
	QuRespondV1(AS4777.2 only)
	QuRespondV2(AS4777.2 only)
	QuRespondV3(AS4777.2 only)
	QuRespondV4(AS4777.2 only)
	K
	3Tau
	QuDelayTimer
	QuLockEn
Fixed Q Power	Q Power







11) PU Function (applicable to specific countries, please refer to local grid requirements)
The PU function is a volt-watt response mode required by certain national standards such as AS4777.2. This function can control the active power of the inverter according to the grid voltage.
Selecting "Enable" means that this function is turned on and is the default value.
Select "Disable" to deactivate the function.

PU Function >PuFunction Enable	PU Function Response V1 0.0V	PU Function Response V2 0.0V
PU Function Response V3 0.0V	PU Function Response V4 0.0V	PU Function 3Tau 0S
PU Function SetPuPower 1 0%	PU Function SetPuPower 2 0%	PU Function SetPuPower 3 0%
PU Function SetPuPower 4 0%	PU Function 3Tau_Charge 0 S	PU Function Pu Type Static Dynamics

12) FVRT Function(apply to50549)
Here you can set the high and low enable or disable.

FVRT Function Function Control Disable Enable	FVRT Function VacUpper 00.0V	FVRT Function VacLower 00.0V

13) Power limit
Power limit function, the maximum power of the AC port can be set by percentage.

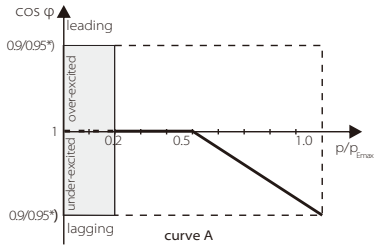
Power Limit >Proportion 1.00

- Reactive power control, reactive power standard curve cos φ = f(P)

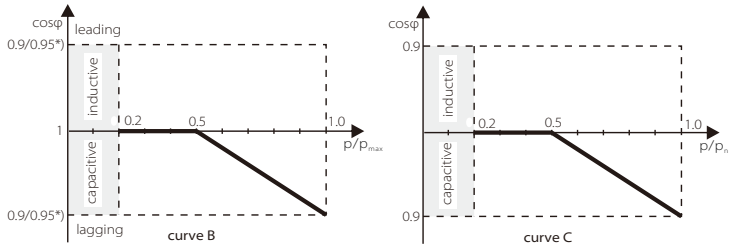
For VDE ARN 4105, the curve cos φ = f(P) should refer to curve A. The set default value is shown in curve A.

For TOR, the curve cos φ = f(P) should be curve B. The set default value is shown in curve B.

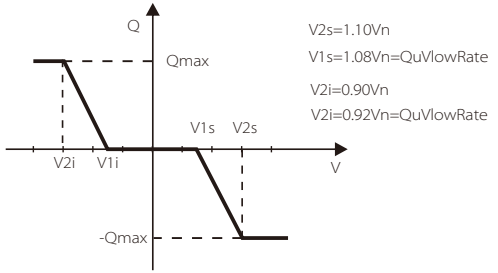
For CEI 0-21, the default value of PFLockInPoint is 1.05. When Vac> 1.05Vn, Pac> 0.2 Pn, curve cos φ = f(P) corresponds to curve C.



*) If the grid-connected power of the inverter ⩽4.6kW, the Power Factor is 0.95 at 1.0 power; if the grid-connected power of the inverter > 4.6kW, the Power Factor is 0.90 at 1.0 power.



- Reactive power control, reactive power standard curve Q= f(V).



14) DRM function (applied to NZS4777.2)

The DRM function is a demand response method required by the NZS4777.2 standard and is only applicable to NZS4777.2.

The default value is "enable". Select "Disable" to disable this function.

DRM Function
>Function Control
Enable Disable

15) Parallel Setting

If a parallel operation is required, the user may set it with Parallel Setting.

Parallel Setting
> Status Free/Leader /Follower_1 Setting
Free Leader

Parallel Setting
resistance switch
OFF ON

Parallel Setting
ARM Comm Check
Yes No

16) Main Breaker Limit

For power limit of smart meter or CT, the current must be set in line with the utility's contract requirements. In case of failure to set, it may cause a circuit breaker fault of main switchboard, adversely affecting the charging or discharging of battery. Click Main Breaker Limit to enter the setting interface, and then choose the corresponding amperage according to the utility's requirements.

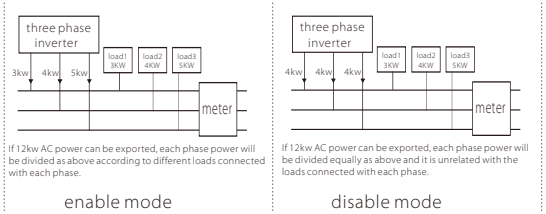
Main Breaker Limit
>Current
100 A

17) Phase Unbalanced

This function controls the distribution of AC output power.

"Enable" means each phase will be divided according to the loads connected with each phase. "Disable" means each phase power will be divided equally and "disable" is the default setting value.

Phase Unbalanced
Function Control
Enable Disable



18) EPS Setting

Users can set the "Frequency", "Mini SoC", "Min ESC SoC" and "Super-Backup" under the "EPS Setting" interface to solve the energy supply to loads under EPS mode.

The default frequency is 50Hz. Users set "Min SoC" to limit the energy battery discharging to EPS loads. When the actual battery SOC is lower than the "Min SOC", the inverter displays "Bat Power Low" and the batteries stop discharging energy to EPS loads. If there is PV, PV will charge the battery. When the actual battery SoC reaches the "Min ESC SoC", the battery will restart to charge EPS loads and the inverter will automatically enter EPS mode. The default value of "Min SoC" is 10% and it can be set between 10% ~ 25%. The default value of "Min ESC SoC" is 30% and it can be set between 15% ~ 100%.

When no battery is connected and the PV can generate power, users can set "Enable" under the "Super-Backup" setting, which means the PV energy is used as backup power to allow the inverter to enter EPS mode and supply power for emergency loads.

EPS Setting
> Frequency
50Hz

EPS Setting
>Frequency
60Hz

EPS Setting
> Min SoC
10%

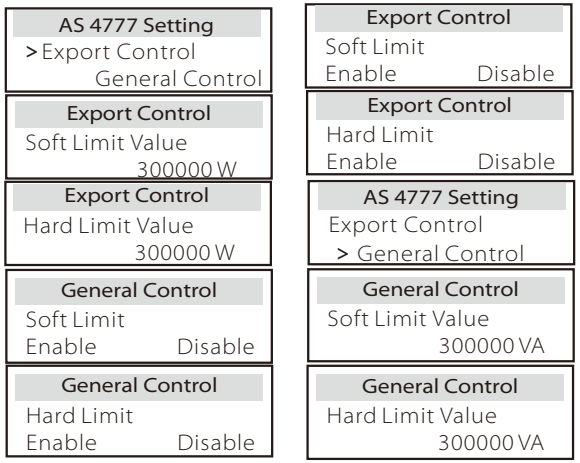
EPS auto restart
Min ESC SOC
15%

for lithium battery

EPS Setting
> Super-Backup
Disable

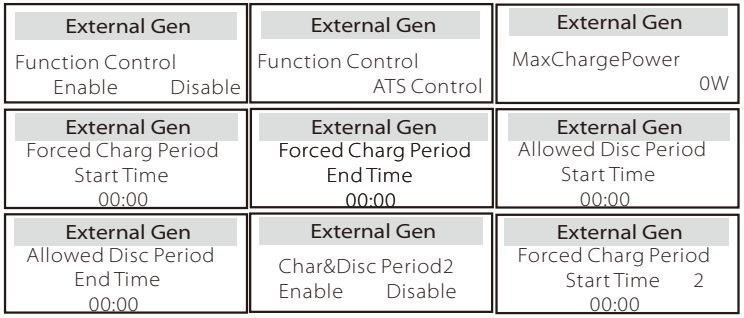
19) AS 4777 Setting

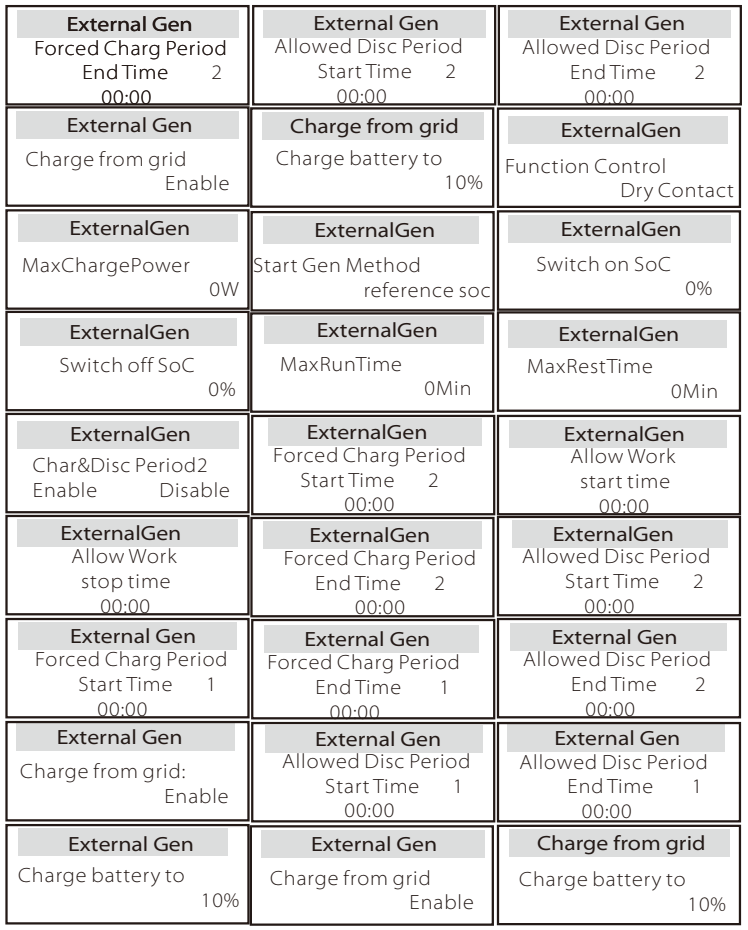
It is the same as the function of Export Control, but it's only applicable to Australia and New Zealand.



20)ExternalGen
Setting path: Advance Setting->ExternalGen->Function Control: Enable/Disable; Max Charge Power: ***W.

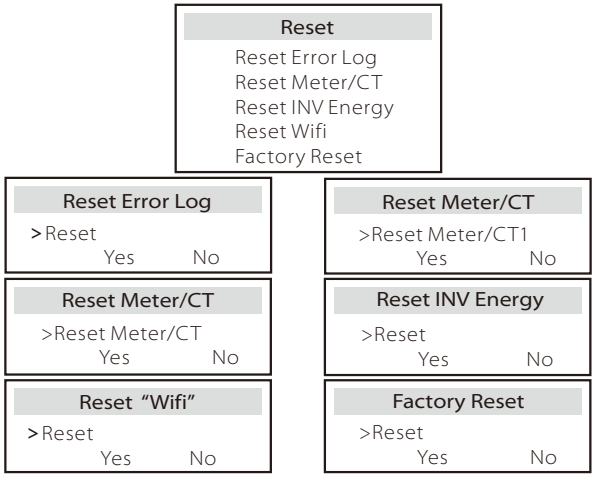
The set value of power must meet the following two conditions when the maximum charging power of batteries is to be set.
1) The value of Max Charge Power is less than that of rated power of the generator minus total load power.
2) The value of Max Charge Power is less than or equals that of rated power of the inverter.





21) Reset

Users can reset the reset error log, meter power ,inverter power, and restore factory settings here.



22) Battery Heating

If the battery heating function is needed, you can enable it here. After you enable this function, as long as PV is available, the battery system will be heated.

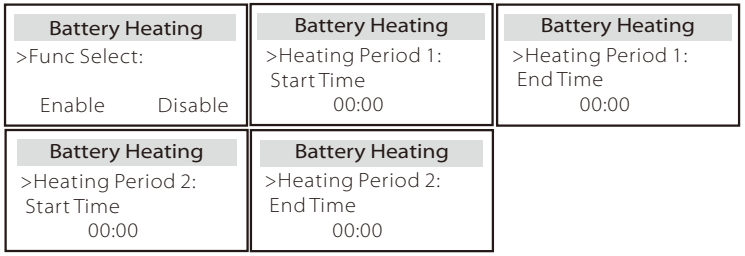
Once the battery system temperature is lower than 0 ℃, the battery will be heated to 10 ℃. Then you need to set the heating periods during which the battery system needs to be heated. There are two periods that can be set.

During the heating periods, if BAT actual SOC > 35%*, the priority of heating energy source will be in the sequence of PV > BAT > grid.

During heating periods, if the BAT actual SOC < 35%*, PV will take precedence over grid.

Out of the heating periods, the heating energy source is PV merely.

* The inverter will synchronize to consider the battery cell voltage.



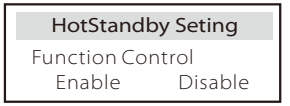
23) Extend BAT FUNC

This function is for extending new batteries. This setting shall be invalid under the EPS mode. When it is on-grid, enabling this setting shall make the inverter charge or discharge the battery SOC to about 40%, which is convenient for adding new batteries.



24) HotStandby Setting

It is "Enable" by default. Setting "Disable" will make the inverter annot enter standby status.



25) Pgrid Bias

Here you can set whether to discharge more to the grid or prefer to take power from the grid. If disable is selected , means no preference. If Grid is selected, the inverter will be biased to discharge the mains; if INV is selected, the inverter will be biased to take power from the mains.



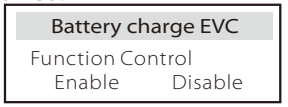
26) PV Connetion

This setting depends on the actual connection ways of PV panels.



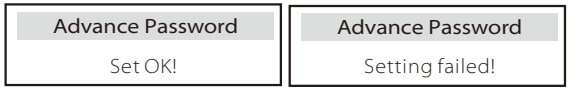
27) Battery charge EVC

Here you can set "Enable" to allow the battery to discharge energy to an EV Charger. When you set "Disable", battery discharging energy to an EV Charger is not allowed.

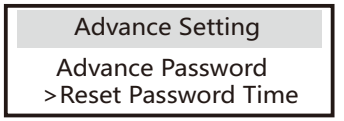


28)Advance password

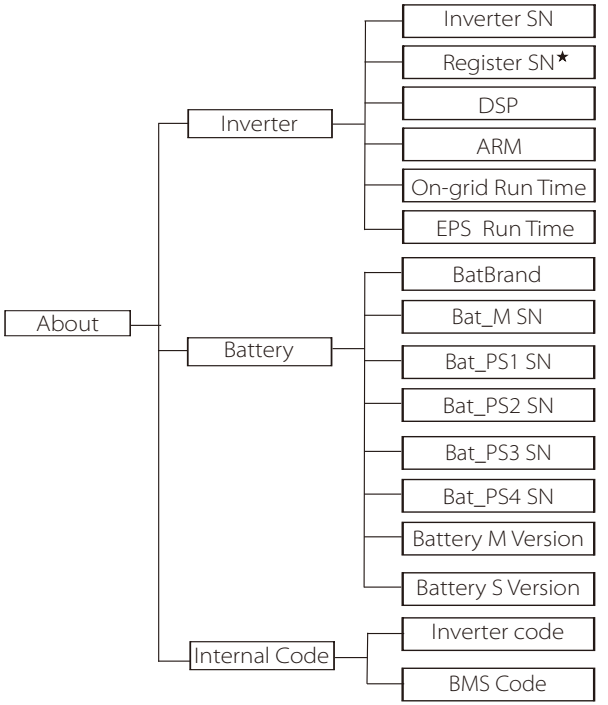
Here you can reset the advanced password. "Set OK!" is displayed on success, and "Setup Failed!" Will also displayed on failure.



29)Reset Password Time
During the password-free time of setting, selecting **Reset Password Time** to return to the **Setting** interface can end the password-free time in advance. If you want to re-enter the settings, you need to enter the password again, to start another password-free time.

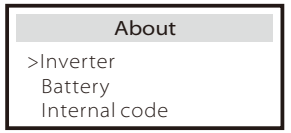


➢ About

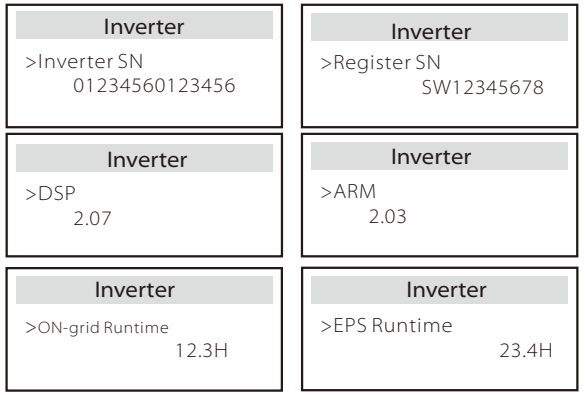


★ Register1 SN: Represents the serial number of external monitoring equipment, such as Wifi Dongle, LAN Dongle.

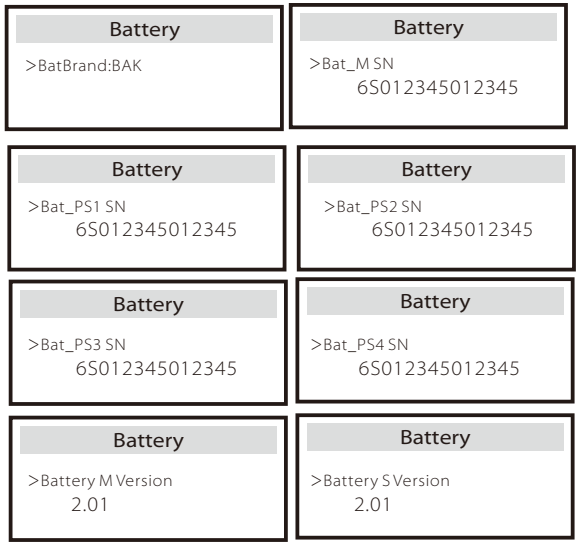
a) About
Here you can see some basic information of the inverter and battery. such as the inverter and battery SN number, software version number, and system run time.



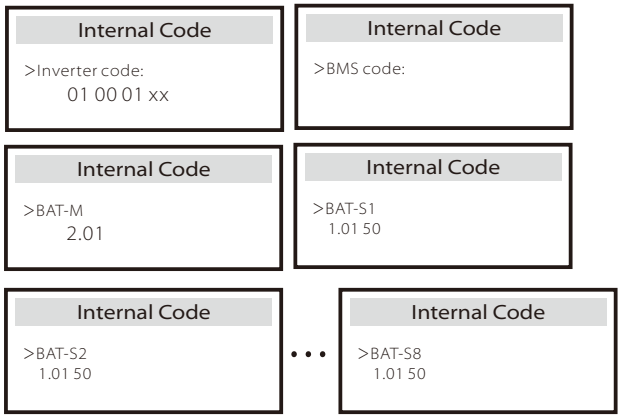
Inverter



Battery

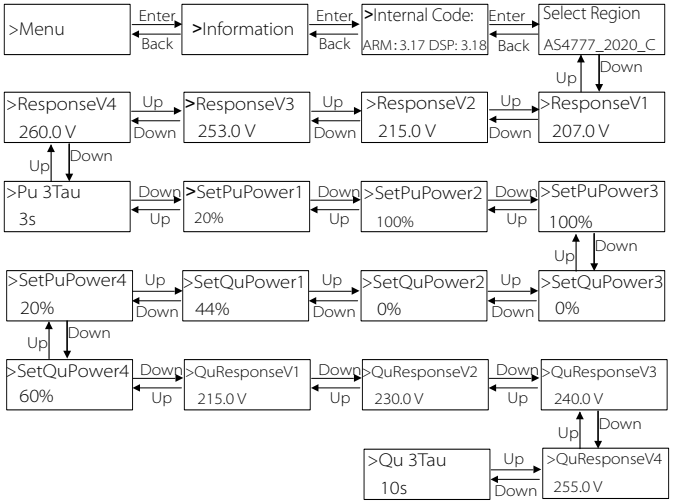


Internal Code



➢ Information

☆



Note!

● Once settings are selected at commissioning they are locked to view only.

● In case of a Path Diagram with the mark of "☆", it indicates that such a Path Diagram is only applicable to Australia and New Zealand.

8 Troubleshooting

8.1 Troubleshooting

This section contains information and procedures for resolving possible problems with the inverter, and provides you with troubleshooting tips to identify and solve most problems that may occur in the inverter. This section will help you narrow down the source of any problems you may encounter. Please read the troubleshooting steps below.
Check the warning or fault information on the system control panel or the fault code on the inverter information panel. If a message is displayed, log it before doing anything further.
Try the solutions indicated in the table below.

Number	Faults	Diagnosis and solution
IE 01	TZ Protect Fault	Overcurrent fault. • Wait for a while to check if you're back to normal. • Disconnect PV+ PV- and batteries, reconnect. • Or ask for help from the installer if it can not return to normal.
IE 02	Grid Lost Fult	• Check battery input voltage if it's within normal range • Or ask the installer for help.
IE 03	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.
IE 04	Grid Freq Fault	Electricity frequency beyond range • If the utility returns to normal, the system reconnects. • Or ask the installer for help.
IE 05	PV Volt Fault	PV voltage out of range • Check the output voltage of the PV panel • Or ask the installer for help.
IE 06	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.
IE 07	Bat Volt Fault	Battery voltage fault • Check battery input voltage if it's within normal range • Or ask the installer for help.
IE 08	AC10mins Volt	• 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.

Number	Faults	Diagnosis and solution
IE 09	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.
IE 10	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.
IE 11	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.
IE 12	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.
IE 13	Isolation Fault	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.
IE 14	Temp Over Fault	Temperature beyond limit • Check if ambient temperature exceeds the limit. • Or ask the installer for help.
IE 15	Bat Con Dir Fault	EPS(Off-grid) mode current is too strong. • Ensure that the load power is within the EPS(Off-grid) power range. • Check for any non-linear load connections on the EPS(Off-grid). • Move this load to check for recovery. • Or ask for help from the installer if it can not return to normal.
IE 16	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.
IE 17	Overload Fault	On-grid mode over load • 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.
IE 18	BatPowerLow	•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
IE 19	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.
IE 20	Fan Fault	Fan Fault • Check for any foreign matter that may have caused the fan not to function properly. • Or ask for help from the installer if it can not return to normal.
IE 21	Low TempFault	Low temperature fault. • Check if the ambient temperature is too low. • Or ask for help from the installer if it can not return to normal.

Number	Faults	Diagnosis and solution
IE 25	InterComFault	Mgr InterCom Fault • Shut down photovoltaic, battery and grid, reconnect. • Or ask for help from the installer if it can not return to normal.
IE 26	INV EEPROM	Inverter EEPROM Fault. • Shut down photovoltaic, battery and grid, reconnect. • Or ask for help from the installer if it can not return to normal.
IE 27	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.
IE 28	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.
IE 29	EPS(Off-grid) 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.
IE 30	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.
IE 31	Battery Relay	Charge relay fault • Press the ESC" key to restart the inverter. . • Or ask for help from the installer if it can not return to normal.
IE 32	Earth Raley	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.
IE 33	ParallelFault	Parallel Fault • Check the communication and earth cable connection and matching resistor settings. • Or ask for help from the installer if it can not return to normal.
IE 36	HardLimitFault	HardLimitFault • Check the power value set in the HardLimit setting, increase the value larger if the value. • Or ask for help from the installer if it can not return to normal.
IE 37	CtMeterConFault	CT Meter ConFault • Check whether the cable connection of the CT or meter is proper or not. • Or ask for help from the installer if it can not return to normal.
IE 101	PowerTypeFault	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.
IE 102	Port OC Warning	EPS(Off-grid) port over current fault • Check that the EPS(Off-grid) load does not exceed the system requirements, and press the ESC" key to restart the inverter. . • Or ask for help from the installer if it can not return to normal.
IE 103	Mgr EEPROM Fault	Manager EEEPROM Fault. • Shut down photovoltaic ,battery and grid ,reconnect. • Or seek help from the installer if it can not return to normal.

Number	Faults	Diagnosis and solution
IE 105	NTC Sample Invalid	NTC invalid • Make sure the NTC is properly connected and the NTC is in good condition. • Please confirm that the installation environment is normal • Or ask for help from the installer, if it can not return to normal.
IE 106	Bat Temp Low	Battery temp low • Check the battery installation environment to ensure good heat dissipation. • Or ask for help from the installer, if it can not return to normal.
IE 107	Bat Temp High	Battery temp high • Check the battery installation environment to ensure good heat dissipation. • Or ask for help from the installer, if it can not return to normal.
IE 109	Meter Fault	Meter Fault •Please check that the instrument is working properly • Or seek help from the installer if it can not return to normal.
IE 110	BypassRaleyFIt	Bypass relay fault • Press the ESC" key to restart the inverter. • Or ask for help from the installer if it can not return to normal.
IE 111	ARMParaComFIt	ARMParaComFIt •Please check that the communication cables of inverters are well connected and the baud rate of COMM setting of inverters are the same. • Or seek help from the installer if it can not return to normal.
IE 112	FAN1 Fault	FAN1 Fault • Please change the fan. • Or seek help from the installer if it can not return to normal.
IE113	FAN2 Fault	FAN2 Fault • Please change the fan. • Or seek help from the installer if it can not return to normal.
BE 01	BMS_Exter_Err	Battery Error - External Communication Fault • Please contact the battery supplier.
BE 02	BMS_InterErr	Battery Error - Internal Communication Fault • Please contact the battery supplier.
BE 03	BMS_OverVolt	Over voltage in battery system • Please contact the battery supplier.
BE 04	BMS_LowerVolt	Low voltage in battery system • Please contact the battery supplier.
BE 05	BMS_ChargeOCP	Battery fault - over charge fault • Please contact the battery supplier.
BE 06	DischargeOCP	Battery fault-discharge over current fault • Please contact the battery supplier.
BE 07	BMS_TemHigh	Over temperature in battery system • Please contact the battery supplier.
BE 08	BMS_TempLow	Battery temperature sensor malfunction • Please contact the battery supplier.

Number	Faults	Diagnosis and solution
BE 09	CellImblance	Battery Unbalanced Failure • Please contact the battery supplier.
BE 10	BMS_Hardware	Battery hardware protection failure • Please contact the battery supplier.
BE 11	BMS_Circuit	Battery circuit failure • Restart the battery . • Please contact the battery supplier.
BE 12	BMS_ISO_Fault	Battery insulation failure • Check that the battery is properly grounded and restart the battery. • Please contact the battery supplier.
BE 13	BMS_VolSen	Battery voltage sensor fault • Please contact the battery supplier.
BE 14	BMS_TempSen	Temperature sensor failure • Restart the battery . • Please contact the battery supplier.
BE 15	BMS_CurSen	Battery current sensor fault • Please contact the battery supplier.
BE 16	BMS_Relay	Battery relay failure • Please contact the battery supplier.
BE 17	TypeUnmatch	Battery type failure • Upgrade the battery BMS software. • Please contact the battery supplier.
BE 18	Ver Unmatch	Battery version mismatch failure • Upgrade the battery BMS software. • Please contact the battery supplier.
BE 19	MFR Unmatch	Battery manufacturer did not match the fault • Upgrade the battery BMS software. • Please contact the battery supplier.
BE 20	SW Unmatch	Battery hardware and software mismatch failure • Upgrade the battery BMS software. • Please contact the battery supplier.
BE 21	M&S Unmatch	Battery leader follower control mismatches • Upgrade the battery BMS software. • Please contact the battery supplier.
BE 22	CR NORespond	Battery charging request does not respond to a fault • Upgrade the battery BMS software. • Please contact the battery supplier.
BE 23	SW Protect	Battery follower software protection failure • Upgrade the battery BMS software. • Please contact the battery supplier.
BE 24	536 Fault	Battery fault-discharge over current fault • Please contact the battery supplier.
BE 25	BMS SelfCheck	Over temperature in battery system • Please contact the battery supplier.

Number	Faults	Diagnosis and solution
BE 26	BMS Tempdiff	Battery temperature sensor malfunction • Please contact the battery supplier.
BE 27	BMS_BreakFault	Battery Unbalanced Failure • Please contact the battery supplier.
BE 28	BMS_FlashFault	Battery hardware protection failure • Please contact the battery supplier.
BE 29	BMS_Precharge	Battery precharge failure • Please contact the battery supplier.
BE 30	AirSwitchBreaker	Battery air switch failure • Check that the battery breaker is off. • Please contact the battery supplier.

• If the information panel of your inverter does not show the fault light, check the following list to ensure the current installation status, correct operation.

------ Is the inverter located in a clean, dry and well-ventilated place?
------ Is the DC input circuit breaker open?
------ Is the specification and length of the cable adequate?
------ Are the input and output connections and wiring in good condition?
------ Is the configuration set correct for your particular installation?

Please contact customer service for further assistance. Please be prepared to describe the details of your system installation and provide the inverter serial number.

8.2 Routine Maintenance

Inverter do not require any maintenance or correction in most cases, but if the inverter often loses power due to overheating, this can be attributed to the following reason:

• heat sink behind the inverter is covered with dirt.
If necessary, clean the cooling heat sink with a soft dry cloth or brush.
Only trained and authorized professionals familiar with safety requirements can perform maintenance and maintenance work.

➢ Safety inspections

Safety checks should be conducted at least every 12 months, please contact the manufacturer to arrange for appropriate training, expertise, and practical experience in performing these tests. (Please note that this action is not covered by warranty). These data should be recorded in the device log. If the equipment is not running properly or any test fails, the equipment must be repaired for details of safety inspections, refer to section 2 of this manual for safety instructions and europe commission instructions.

➢ Regular maintenance

Only qualified people can do the following work.
In the process of using frequency converter, the manager should check and maintain the machine regularly. The specific operation is as follows.

1. Check whether the heat sink is covered with dirt, clean the machine and absorb dust if necessary. This work should be performed from time to time.

2. Check whether the frequency converter indicator is normal, check whether the frequency converter button is normal, check whether the frequency converter display is normal. This inspection should be conducted at least every 6 months.

3. Check the input and output lines for damage or aging. This inspection should be conducted at least every 6 months.

4. Cleaning and safety inspection of PV modules should be carried out at least once every 6 months.

9 Decommissioning

9.1 Disassembling the Inverter

- Remove DC input line and AC output line of inverter.
- Wait for at least 5 minutes to power off.
- Remove all cable connections from the inverter.
- Remove inverter from finger support the bracket.
- Remove the bracket if necessary.

9.2 Packaging

Load the inverter into the original package if possible.

- If the original package can not be found, you can also use the following requirements of the carton packaging:
  Bearing capacity of more than 30 kg.
  Easy to carry.
  Can completely seal the cover.

9.3 Storage and Transportation

Store the inverter in a dry, temperature -40°C~70°C environment.
Pay attention to less than four machines on each stack board during storage and transportation.

9.4 Waste Disposal

If it is necessary to scrap the inverter or other related parts, be sure to send the waste inverter and packaging materials to the designated location for recycling by the relevant department.

10 Disclaimer

The hybrid inverters are transported, used and operated under limited condition, such as environmental, electrical etc. Our company shall not be liable to provide the service, technical support or compensation under conditions listed below, including but not limited to :

- Inverter is damaged or broken by force majeure (such as earthquake, flooding, thunderstorm, lighting, fire hazard, volcanic eruption etc).
- Inverter's warranty is expired and doesn't buy extended warranty.
- Can't provide the inverter's SN, warranty card or invoice.
- Inverter is damaged by man-made cause. Inverter is used or operated against any items in local policy.
- Inverter's installation, configuration, commissioning doesn't follow the requirements mentioned in this manual.
- Inverter is installed, refitted or operated in improper ways mentioned in this manual without authority from us.
- Inverter is installed, operated under improper environment or electrical condition mentioned in this manual without authority from us.
- Inverter is changed, updated or disassembled on hardware or software without authority from us.
- Obtain the communication protocol from other illegal channels.
- Build monitoring, control system without authority from us.
- Connect to other brands batteries without authority from us.
- Our company will keep right to explain all the contents in this user manual.

Warranty Registration Form

SOLAX POWER

For Customer (Compulsory)

Name _____ Country _____

Phone Number _____ Email _____

Address _____

State _____ Zip Code _____

Product Serial Number _____

Date of Commissioning _____

Installation Company Name _____

Installer Name _____ Electrician License No. _____

For Installer

Module (If Any)

Module Brand _____

Module Size(W) _____

Number of String _____ Number of Panel Per String _____

Battery (If Any)

Battery Type _____

Brand _____

Number of Battery Attached _____

Date of Delivery _____ Signature _____

Please visit our warranty website: https://www.solaxcloud.com/#/warranty to complete the online warranty registration or use your mobile phone to scan the QR code to register.

For more detailed warranty terms, please visit SolaX official website: www.solaxpower.com to check it.

614.00002.07

PLEASE REGISTER THE WARRANTY IMMEDIATELY AFTER INSTALLATION!
GET YOUR WARRANTY CERTIFICATE FROM DURACELL!
KEEP YOUR INVERTER ONLINE & WIN DURACELL POINTS!

1

Open your camera app and point your device at the QR code



2

Wait for the camera to recognize the QR code



3

Click banner or notification when it appears on the screen



4

Warranty registration page will be loaded automatically

