



User Manual X3-Hybrid

5.0 kW - 10.0 kW



Solino®

Specialized wholesaler of photovoltaic products



EN



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Specialized Photovoltaic
Wholesaler

4
4

Contents

1 Notes on This Manual	03
1.1 Scope of Application	03
1.2 Target Audience	03
1.3 Symbols Used	03
2 Safety	04
2.1 Important Safety Instructions	04
2.2 Explanation of symbols	08
2.3 CE Directive	09
3 Introduction	10
3.1 Basic Functions	10
3.2 Operating Modes	12
3.3 Dimensions	13
3.4 Photovoltaic Inverter Terminals	14
4 Technical Data	15
4.1 DC Input (applies to versions E, C)	15
4.2 AC Output / Input (applies to versions E, C)	15
4.3 Internal charger (applies to versions E, C)	16
4.4 Efficiency, Safety, and Protection (applies to versions E, C)	16
4.5 EPS Output (applies only to version E)	17
4.6 General data	17
5. Installation	18
5.1 Check for physical damage	18
5.2 Package contents list	18
5.3 Installation	19
6 Electrical Connection	22
6.1 Photovoltaic Connection	22
6.2 Grid connection	24
6.3 EPS connection (applies to version E)	26
6.4 Battery connection	30

6.5	Grounding connection (required).....	33
6.6	Electric meter connection.....	34
6.7	LAN connection.....	36
6.7	LAN connection.....	37
6.8	DRM connection.....	38
6.8	DRM Connection.....	39
6.9	WiFi Connection (optional).....	40
6.10	RF Connection (optional).....	40
6.1.1	Handling the converter.	
7.	Firmware Upgrade	42
8.	Settings	
8.1	Control panel	44
8.2	Menu Structure	45
8.3	LCD operation	46
9	Troubleshooting	64
9.1	Troubleshooting	64
9.2	Routine maintenance.....	68
10	Decommissioning	69
10.1	Removing the inverter.....	69
10.2	Packaging.....	69
10.3	Storage and Transport	69

Specialized Wholesale of Photovoltaic Products

1 Notes on this manual

1.1 Scope of Application

This manual is an integral part of the X3-Hybrid and describes the product's assembly, installation, commissioning, maintenance, and troubleshooting. Please read it carefully before use.

X3-Hybrid-5.0-N-E X3-Hybrid-6.0-N-E X3-Hybrid-8.0-N-E X3-Hybrid-10.0-N-E
X3-Hybrid-5.0-D-E X3-Hybrid-6.0-D-E X3-Hybrid-8.0-D-E X3-Hybrid-10.0-D-E
X3-Hybrid-5.0-N-C X3-Hybrid-6.0-N-C X3-Hybrid-8.0-N-C X3-Hybrid-10.0-N-C
X3-Hybrid-5.0-D-C X3-Hybrid-6.0-D-C X3-Hybrid-8.0-D-C X3-Hybrid-10.0-D-C

Note:

"5.0" means 5.0 kW.

"D" means with a "DC switch" "N" means without

"DC switch"

"E" means that the "EPS function" will be available with an installed external switching device installed.

"C" means without the "TPS function"

Keep this manual in a place where it will be readily available.

1.2 Target Audience

This manual is intended for qualified electricians. The tasks described in this manual may only be performed by a qualified electrician.

1.3 Symbols Used

The following types of safety instructions and general information are used in this document:

and



Danger!

"Danger" indicates a hazardous situation that, if not avoided, will result in death or serious injury.



Warning!

"Warning" indicates a hazardous situation that, if not avoided, could result in death or serious injury.



Caution!

"Caution" indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.



Note!

"Note" provides advice that is valuable for the optimal operation of our product.

2 Safety

2.1 Important Safety Instructions



Danger!

Life-threatening danger due to high voltages in the inverter!

- All work must be performed by a qualified electrician.
- The device must not be used by children or persons with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they are supervised or have been properly instructed.
- Care must be taken to ensure that children do not play with the device.



Warning!

Danger of burns from hot parts of the enclosure!

- During operation, the top cover and the enclosure may be hot.
- During operation, touch only the bottom cover of the enclosure.



Warning!

There is a risk of radiation-related health hazards!

- Do not remain within 20 cm of the inverter for any length of time.



Note!

Grounding of the photovoltaic generator.

- Comply with local requirements for grounding photovoltaic modules and the photovoltaic generator. It is recommended to connect the generator frame and other electrically conductive surfaces in a manner that ensures their permanent electrical connection and grounding to provide optimal protection for the system and personnel.



Warning!

- Ensure that the input DC voltage is <maximum> DC voltage. Overvoltage can lead to permanent damage to the inverter or other damage not covered by the warranty!



Warning!

- Authorized service personnel must disconnect both the AC and DC power supplies from the inverter before performing any maintenance, cleaning, or work on any circuits connected to the inverter.



WARNING!
Do not work on the converter while the equipment is in operation.



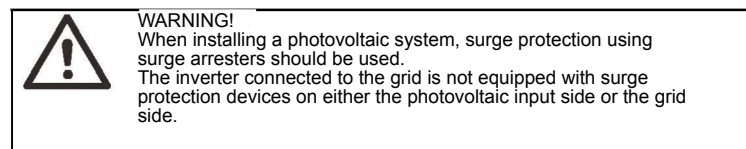
WARNING!
Risk of electric shock.

- Please read this section carefully before use to ensure proper and safe operation. Please keep the user manual in a safe place.
- Only accessories supplied with the inverter are recommended here. Otherwise, there is a risk of fire, electric shock, or personal injury.
- Ensure that the existing wiring is in good condition and that the conductors are not undersized.
- Do not disassemble any parts of the inverter that are not mentioned in the installation manual. It does not contain any user-serviceable parts. For service instructions, see the Warranty section. Attempting to repair the inverter yourself may result in a risk of electric shock or fire and will void the warranty.

Flammable or explosive materials must not be used near the inverter to prevent fire.

- The installation site must not be near damp or corrosive substances.
- Authorized service personnel must use insulated tools when installing or working on this equipment.
- Photovoltaic modules must be rated IEC 61 730 Class A.
- Never touch the positive or negative terminals of the photovoltaic generator's connection device. It is strictly prohibited to touch both at the same time.
- The device contains capacitors that remain charged to a potentially lethal voltage after disconnecting the GRID, battery, and photovoltaic system. Dangerous voltage persists for 5 minutes after disconnecting from the power supply.
- **WARNING - RISK of electric shock due to energy stored in the capacitor.** Never work on components connected to the inverter, MAINS cables, battery cables, photovoltaic cables, or the photovoltaic generator while the power is connected. After turning off the photovoltaic system, battery, and mains power, always wait 5 minutes for the capacitors in the internal circuitry to discharge before disconnecting the DC connection, battery connection, and MAINS connection.
- When accessing the inverter's internal circuitry, it is very important to wait 45 minutes before working on the power circuit or removing the electrolytic capacitors inside the device. Do not open the device before this time has elapsed, as the capacitors require this time to discharge sufficiently!
- Before beginning work inside the device, measure the voltage at the UDC+ and UDC- terminals with a multimeter with an impedance of at least 1 MΩ to ensure that the device is discharged (35 VDC).

- Surge protection devices (SPD) for photovoltaic installations



Lightning causes damage either by a direct strike or by voltage surges near the strike.

Induced current surges are the most likely cause of damage to most installations, especially in rural areas where electricity is typically supplied via long overhead lines. A current surge can occur at the connection of the photovoltaic array as well as in the AC cables leading to the building.

When installing the system for the end user, consultation with a lightning protection specialist should be conducted. By using appropriate internal lightning protection, the impact of a direct lightning strike on the building can be mitigated in a controlled manner, and the lightning current can be safely diverted to ground.

Installation of surge protection devices to protect the inverter from mechanical damage and overload includes a surge arrester in the case of a building with an external lightning protection system (LPS), provided the separation distance is observed.

To protect the DC system, surge protection devices (Type 2 SPDs) must be installed at the end of the DC cable on the inverter side and at the string, located between the inverter and the photovoltaic generator, if the voltage protection (voltage protection - VP) of the lightning arrester is higher than 1100 V and additional Type 3 surge protection devices are required to protect electrical equipment.

To protect the AC system, it is necessary to install surge protection devices (SPD type 2) at the AC power input point (at the user's circuit breaker), located between the inverter and the electricity meter / distribution system; surge protection devices (test impulse D1) for signal lines in accordance with EN 61632-1.

All DC cables must be installed so that they are as short as possible, and the positive and negative cables of the same line or DC power supply must be bundled together. Avoid creating loops in the system. This requirement for the shortest possible lines and bundling includes all associated grounding bundle conductors.

Spark-gap devices are not suitable for use in DC circuits as the sole conductors, as they cease to conduct current when the voltage between their terminals is typically no greater than 30 volts.

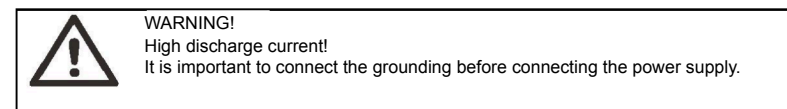
Anti-islanding effect

The islanding effect is a specific phenomenon where a grid-connected photovoltaic system continues to supply electrical current to the connected grid when a voltage loss occurs in the power supply system. This is dangerous for maintenance personnel and the public. The X3-Hybrid series inverters provide an Active Frequency Drift (AFD) function to prevent the islanding effect.

► PE connection and leakage current

- The end device must monitor the protective conductor using a residual current operated protective device (RCD) with a rated fault current $I_{fn} < 240$ mA, which automatically disconnects the device in the event of a fault.
- Direct current differential currents are generated (caused by insulation resistance and capacitances in the photovoltaic generator). To prevent unwanted tripping during operation, the rated residual current of the RCD must be at least 240 mA.

This device is intended for connecting a photovoltaic generator with a maximum capacitance of approximately 700 nF.



- Improper grounding can result in physical injury, death, equipment failure, and increased electromagnetic interference.
- Ensure that the grounding conductor is properly sized in accordance with safety regulations.
- Do not touch the equipment's grounding terminals in series in the case of a multiple installation. This product may produce a current with a DC component, and a residual current-operated protective (RCD) or monitoring (RCM) device is used for protection in the event of direct or indirect contact. Only Type B RCDs or RCMs are permitted on the supply side of this product. For the United Kingdom
- Installations connecting equipment to the supply terminals must comply with the requirements of BS 7671.
- The electrical installation of a photovoltaic system must comply with the requirements of BS 7671 and IEC 60364-7-712.
- No protective settings may be altered.
- The user must ensure that the equipment is installed, designed, and operated in such a way that the requirements of ESQCR22(1)(a) are always met.

For Australia and New Zealand

- Electrical installation and maintenance must be performed by a licensed electrician and must comply with the requirements of the Australia National Wiring Rules.

Photovoltaic
business

2.2 Explanation of Symbols

This section contains explanations of all symbols shown on the drive and on the nameplate.

• Symbols on the drive

Symbol	Explanation
	Control display
	Battery status
	A fault has occurred; please notify the installation company immediately.

Symbol	Explanation
	CE mark. The inverter complies with the requirements of applicable CE directives.
	TÜV certified.
	RCM Note.
	SAA Certification.
	Caution: Hot Surface. The inverter may become hot during operation. Do not touch during operation.
	High voltage hazard. Life-threatening danger due to high voltages in the inverter!
	Danger. Risk of electric shock.
	Follow the enclosed documentation.

	The inverter must not be disposed of with household waste. Disposal information can be found in the accompanying documentation.
	Do not work on this inverter unless it is disconnected from the battery, the grid, and local photovoltaic power supply systems.
	Life-threatening danger due to high voltage. After shutdown, there is residual voltage in the inverter • that takes 5 minutes to dissipate. • Wait 5 minutes before opening the top cover or DC cover.

2.3 EC Directive

This chapter complies with the requirements of the European Low Voltage Directive, which contains important safety instructions and conditions of acceptability for the system of devices that you must follow during installation, operation, and servicing of the equipment. Failure to comply with these instructions may result in injury, including fatalities, or damage to the equipment. Read these instructions before working on the equipment. If you do not understand the hazards, warnings, cautions, or instructions, contact an authorized service dealer before installation. Operation and maintenance of the equipment. The inverter connected to the grid complies with the requirements of the Low Voltage Directive (LVD) 2014/35/EC and the Electromagnetic Compatibility (EMC) Directive 2014/30/EC. The device is based on: EN 62109-1:2010; EN 62109-2:2011; IEC 62109-1 (1st edition); IEC 62109-2 (1st edition); EN 61000-6-3:2007+A:2011; EN 61000-6-1:2007; EN 61000-6-2:2005.

In the case of installation in a photovoltaic system, the device must not be switched on (i.e., put into intended operation) until it has been verified that the system complies with the requirements set forth in EC Regulations (2014/35/EU, 2014/30/EU, etc.)

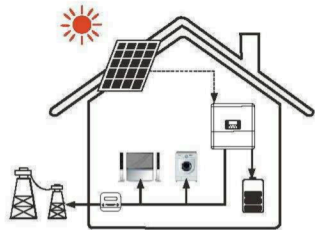
The grid-connected inverter leaves the factory as a fully wired device and ready for connection to the grid and photovoltaic power supply; the device must be installed in accordance with national regulations for electrical wiring. Compliance with safety regulations depends on the proper installation and configuration of the system, including the use of special cables. The system must be installed exclusively by professional installers who are familiar with safety and EMC requirements. The installer is responsible for ensuring that the final system complies with all relevant laws of the country in which it will be used.

The individual subsystems of the system must be interconnected using electrical wiring practices prescribed by national/international regulations, such as the National Electrical Code (NFPA) No. 70 or VDE Regulation 0107.

- Please check the household loads and ensure they are within the "EPS output power" limit in EPS mode; otherwise, the inverter will shut down with an "overload fault" warning.
- Please check with your local grid operator to see if there are any special regulations for grid connection.

3.2 Operating Modes

The X3-Hybrid series inverter offers multiple operating modes based on different requirements.



Operating modes:
Self-consumption (with photovoltaic energy)

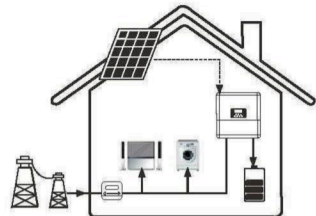
Priority: load > battery > grid

This mode applies to areas with low feed-in tariffs and high energy prices. Photovoltaic-generated power is used primarily to power local loads, then to charge the battery. The remaining energy is exported to the public grid.

Operating modes:

Self-consumption (without photovoltaic power)

If no photovoltaic power is being supplied, the battery is first discharged to power local loads, and the grid supplies power when the battery capacity is insufficient.



Supply modes: use during peak hours

Priority: battery > load > grid (during charging)

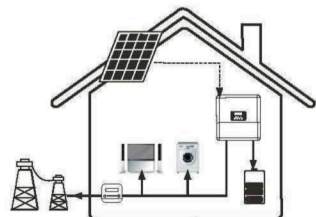
Priority: load > battery > grid

Operating modes: use during peak hours

Priority: battery > load > grid (during charging) Priority: load > battery > grid (during discharging)

This mode applies in areas where electricity prices vary between peak and off-peak hours. The user can use off-peak energy to charge the battery.

The charging time can be set flexibly, and it is also possible to choose whether to charge from the grid or not.



Operating modes:

Mains power supply priority

Priority: load > grid > battery

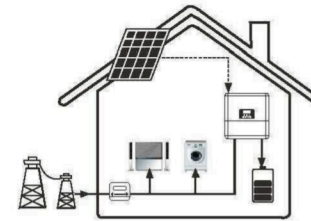
This mode applies to areas with high tariffs for grid power supply and export control.

Photovoltaic-generated power is used primarily to supply local loads, then to feed into the public grid. Residual energy charges the battery.

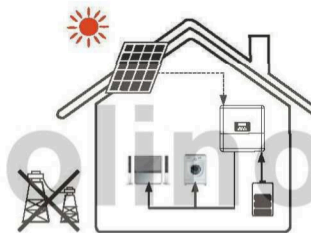
Operating modes: Backup mode

Priority: battery > load > grid

This mode is intended for areas with frequent grid outages. This mode ensures that the battery will have sufficient energy to provide power during a grid outage.



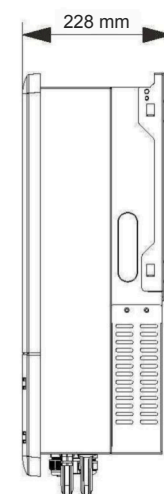
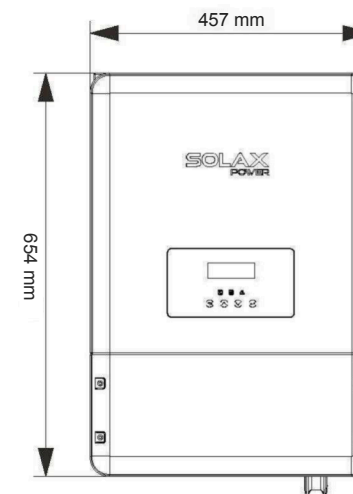
In this mode, the battery charges at an accelerated rate within the set time and will never be discharged while the grid is on; it also allows the option to charge from the grid or not.



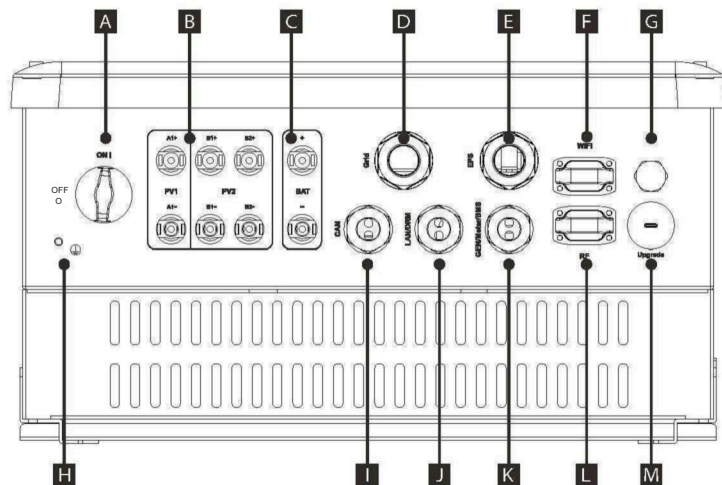
*** EPS Status**

When the grid is off, the system supplies emergency power from the photovoltaic system or the battery to power household loads. (A battery is required in EPS mode.)

3.3 Dimensions



3.4 Photovoltaic inverter connections



Course	Description
A	Photovoltaic Connection Area DC switch (optional)
B	Description DC switch (optional)
C	Photovoltaic connection area Battery connection area
D	Mains output
E	EPS output
F	WiFi port for external Pocket WiFi
G	Waterproof valve
H	Grounding screw
I	CAN communication port for parallel operation
J	Ethernet port / DRM port
K	Generator communication port / external electricity meter / battery communication port
L	External smart outlet port
M	USB port for upgrades



WARNING!
A qualified electrician is required for installation.

4. Technical Data

4.1 DC input

Model	X3-Hybrid-5.0-D	X3-Hybrid-6.0-D	X3-Hybrid-8.0-D	X3-Hybrid-10.0-
	X3-Hybrid-5.0-N	X3-Hybrid-6.0-N	X3-Hybrid-8.0-N	D X3-Hybrid-
Max. recommended DC power [W]	A:3000/B:3000	A4000/B4000	A:5000/B:5000	A:8000/B:5000
Max. DC voltage [V]	1000	1000	1000	1000
Rated DC operating voltage [V]	720	720	720	720
MPPT voltage range [V]	200-950	200-950	200-950	200-950
MPPT voltage range [V] (full load)	230-800	280-800	370-800	330-800
Max. input AC current [A]	11/11	11/11	11/11	20/11
Max. short-circuit current [A]	14/14	14/14	14/14	23/14
Initial input voltage [V]	180	180	180	180
Initial output voltage [V]	300	300	300	300
Number of maximum power point trackers	2	2	2	2
Max. power	A:1/B:1	A:1/B:1	A:1/B:1	A:2/B:1
DC disconnect switch	Elective			

4.2 AC Output / Input

Model X3-Hybrid-5

Model X3-Hybrid	X3-Hybrid-5.0-D	X3-Hybrid-6.0-D	X3-Hybrid-8.0-D	X3-Hybrid-10.0-
	X3-Hybrid-5.0-N	X3-Hybrid-6.0-N	X3-Hybrid-8.0-N	D X3-Hybrid-
AC output				
Rated AC power [VA]	5000	6000	8000	10,000
Max. apparent AC power [VA]	5000	6000	8000	10,000
Rated line voltage (range) [V]	400 V/230 VAC; 380 V/220 VAC			
Rated mains frequency [Hz]	50/60			
Rated AC current [A](@230VAC)	7.2	8.7	11.6	14.5
Max. AC current [A]	8.0	9.6	12.8	16.0
Power factor shift	0.8 lead...0.8 lag			
Total harmonic distortion (THD) harmonic distortion - THDi)	< 2%			
Load control	Under development			
AC input				
Rated AC power [VA]	5000	6000 7000		7000
Rated mains frequency [Hz]	50/60			
Rated AC [Hz]	47...53/57...63			
Rated AC current [A](@230VAC)	7.2	8.7	10.1	10.1
Max. AC current [A]	8.0	9.6	11.2	11.2
Rated mains voltage (range) [V]	400 V/230 VAC; 380 V/220 VAC			
Power factor correction	0.8 leading...0.8 lagging			

4.3 Internal charger

Model	X3-Hybrid-5.0-	X3-Hybrid-6.0-	X3-Hybrid-8.0-	X3-Hybrid-10.0-
	D X3-Hybrid-5.0-N	D X3-Hybrid-6.0-N	D X3-Hybrid-8.0-N	D X3-Hybrid-10.0-N
Battery type	Lithium battery			
Battery voltage range [V]	170–500			
Max. charging/discharging power [W]	6000	8000	10,000	10,000
Max. charging/discharging current [A]	25 A			
Peak charging / discharging current [A]	30 A, 60 s			
Communication interface	CAN/RS485			
Reverse polarity protection	Yes			

4.4 Efficiency, Safety, and Protection

Model	X3-Hybrid-5.0-	X3-Hybrid-6.0-	X3-Hybrid-8.0-	X3-Hybrid-10.0-
	D X3-Hybrid-5.0-N	D X3-Hybrid-6.0-N	D X3-Hybrid-8.0-N	D X3-Hybrid-10.0-N
MPPT efficiency	99.90%	99.90%	99.90%	99.90%
Euro efficiency	97.00%	97.00%	97.00%	97.00%
Max. efficiency	97.80%	97.80%	97.80%	97.80%
Max. charging/discharging efficiency of the battery	97.60% / 96.00 %	97.60% / 96.00 %	97.60% / 96.00 %	97.60% / 96.00 %
Safety and protection				
Overvoltage / Undervoltage Protection	YES			
DC insulation protection	YES			
Earth fault monitoring	YES			
Grid protection	YES			
DC input monitoring input	YES			
Backflow monitoring	YES			
Residual current detection	YES			
Mains failure protection	YES			
Overload protection	YES			
Overheating protection	YES			

4.5 EPS output (applies only to the E version)

Model	X3-Hybrid-5.0-	X3-Hybrid-6.0-	X3-Hybrid-8.0-	X3-Hybrid-10.0-
	D X3-Hybrid-5.0-N	D X3-Hybrid-6.0-N	D X3-Hybrid-8.0-N	D X3-Hybrid-10.0-N
Rated EPS Power [VA]	5000	6000	8000	10,000
Max. EPS power [VA]	5000	6000	8000	10,000
Rated UPS voltage [V]	400 V/230 VAC, 380 V/220 VAC			
Rated EPS current [A] (@230 VAC) VAC)	7.2	8.7	11.6	14.5
EPS Peak Power [W]	10,000, 60 s	12,000, 60 s	14,000, 60 s	14,000, 60 s
Switching time [s]	< 2 s			
Total harmonic distortion (total harmonic distortion - THDv)	< 2%			
Parallel operation	Under development			
Compatible with generator	Under development			

4.6 General Data

Model	X3-Hybrid-5.0-	X3-Hybrid-6.0-	X3-Hybrid-8.0-	X3-Hybrid-10.0-
	D X3-Hybrid-5.0-N	D X3-Hybrid-6.0-N	D X3-Hybrid-8.0-N	D X3-Hybrid-10.0-N
Dimensions (W/H/D) [mm]	654*457*228			
Package dimensions (W/H/D) [mm]	777*567*423			
Net weight [kg]	45			45
Gross weight [kg]	48			48
Installation	Wall mounting			
Operating temperature range [°C]	-20~+60 (derating at 45)			
Storage temperature [°C]	-20~+60			
Storage / operating relative humidity	0% ~ 100%, non-condensing			
Altitude [m]	< 2000			
Ingress protection	IP 65 (for outdoor use)			
Standby power consumption (W)	< 7			
Idle mode	YES			
Overvoltage category	III (GRID), II (photovoltaics, battery)			
Cooling	Natural			
Inverter topology	Transformerless			
Communication interface	Ethernet, electricity meter, Wi-Fi (optional), RF (optional), DRM, USB, ISO Alarm			
LCD display	Backlit 20 x 4 characters			
Standard warranty	Standard 5 years (optional 10 years)			

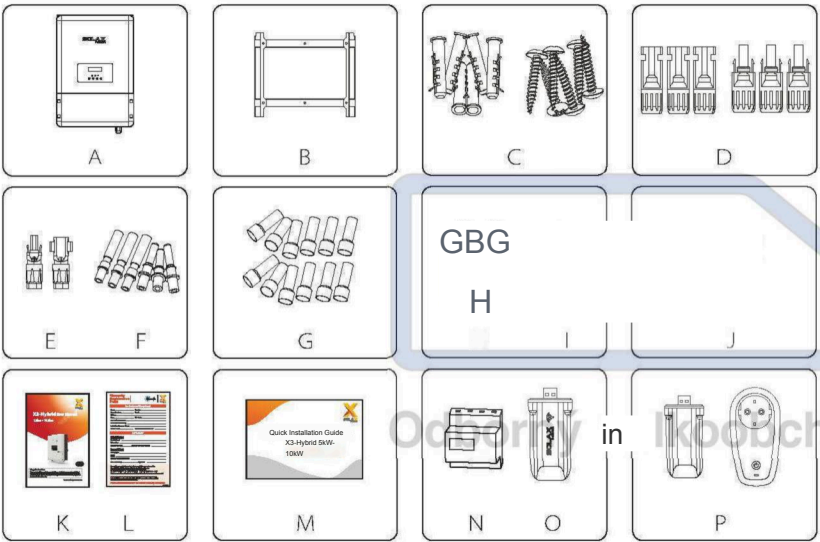
5. Installation

5.1 Check for Physical Damage

Check the inverter for any damage that may have occurred during transport. If you notice any visible damage, such as cracks, please contact your carrier immediately.

5.2 Package Contents

Open the packaging and remove the product. Please check the accessories first. Packing list.



Item	Description
A	Converter
B	Bracket
C	Anchors and anchor screws (6/6)
D	Photovoltaic connectors (3 positive, 3 negative)
E	Battery connectors (1 positive, 1 negative)
F	Photovoltaic pin connectors (3 positive, 3 negative)
G	AC connections / EPs connections (optional) / grounding connections (12)

Item	Description
H	Ring terminal (for grounding) (2)
1	Grounding nut
J	Adjusting screw (2)
K	Instructions for use
L	Warranty card
M	Quick Installation Guide
N	Three-phase electricity meter
O	WiFi module (optional)
P	Smart Plug (optional)

5.3 Installation

> Precautions before installation

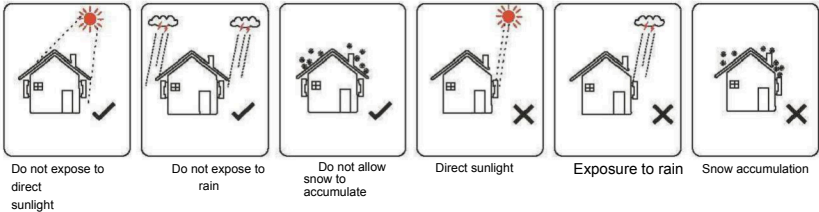
The X3-Hybrid series inverter is designed for outdoor installation (IP 65). Ensure that the installation site meets the following conditions:

Ensure that the installation switches

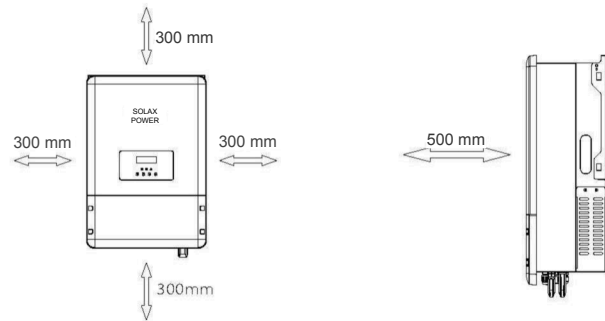
- Not in direct sunlight.
- Do not install the inverter in areas where highly flammable materials are stored.
- Not in explosive areas.
- Not directly exposed to cold air.
- Not near a TV antenna or antenna cable.

- Not at altitudes above 2000 m.
- Not in environments with condensation or high humidity (> 95%).
- In a well-ventilated area.
- In an environment with an ambient temperature of -20 °C to +60 °C.
- The wall must have a slope of $\pm 5^\circ$.
- The wall mount for the inverter must meet the following conditions:
 1. A solid brick, concrete, or other mounting surface with equivalent strength;
 2. The inverter must be supported or reinforced if the wall strength is insufficient (wooden wall, wall covered with a thick layer of decorative material)

Please AVOID direct sunlight and snowfall during installation and operation.



> Space requirements



> Installation Instructions

Tools required for installation.

Installation tools: crimping pliers for connecting terminals, RJ45 screwdriver, wrench, and drill diameter < P 10.



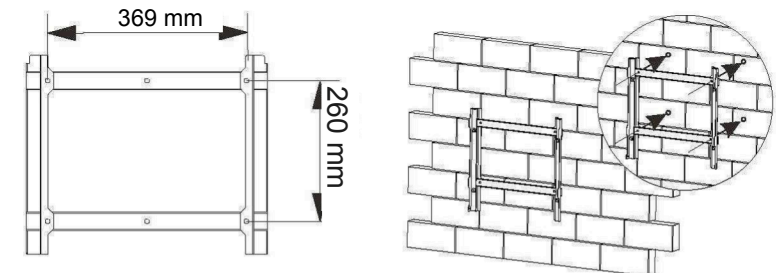
Step 1: Screw the wall mount to the wall

- 1.1 Place the bracket against the wall and mark the positions of the 6 holes.
- 1.2 Drill the holes using a drill, ensuring sufficient depth (at least 60 mm) for installing the inverter.
- 1.3 Insert the wall plugs into the holes and tighten them. Then use the wall plug screws to mount the wall bracket.

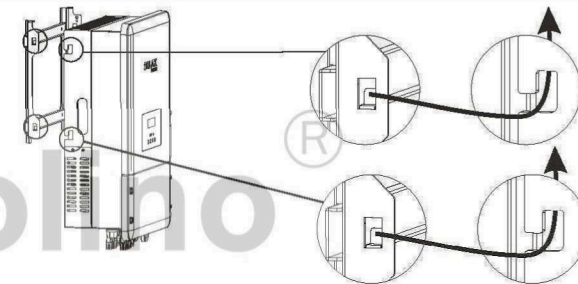
Step 2: Place the inverter on the mounted bracket, holding it by the side handle.

Step 3: Tighten the adjustment screw at the top right of the inverter.

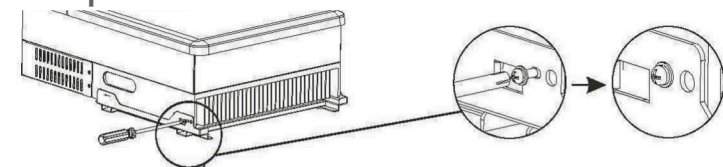
Step 4: If desired, the user can install the anti-theft lock on the top right of the converter.



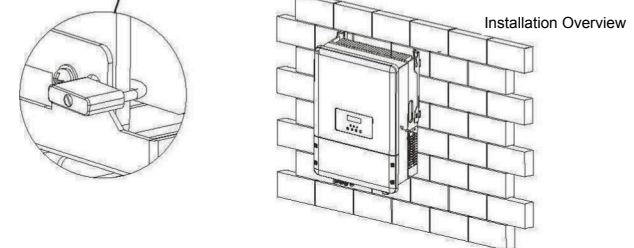
Step 1



Step 2



Step 3



Installation Overview

Step 4

Specialized wholesaler of photovoltaic products

6. Electrical Connection

6.1 Photovoltaic Connection

The X3-Hybrid can be connected to photovoltaic modules with 2 MPPT channels for 5.0 kW, 6.0 kW, 8.0 kW, and 10.0 kW. Please select photovoltaic modules with excellent performance and reliable quality. The open-circuit voltage of the module panels connected in series must be < the maximum DC input voltage; the operating voltage must correspond to the MPPT voltage range.

Max. DC voltage limiter				
Model	X3-Hybrid-5.0-D	X3-Hybrid-6.0-D	X3-Hybrid-8.0-D	X3-Hybrid-10.0-D
	X3-Hybrid-5.0-N	X3-Hybrid-6.0-N	X3-Hybrid-8.0-N	X3-Hybrid-10.0-N
Max. DC voltage (V)	1000			
MPPT voltage range (V)	200-950			

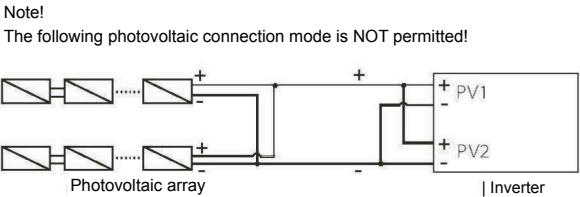


Warning!

- The voltage of the photovoltaic module is very high and reaches dangerous levels; please observe electrical safety regulations when connecting.
- Do not ground the positive or negative terminals of the photovoltaic system!



- Note!**
- Specialized photovoltaic wholesaler**
- Step 3.**
- When purchasing a model (X3-Hybrid-5.0-II, X3-Hybrid-6.0-N, X3-Hybrid-8.0-N, X3-Hybrid-10.0-N), please select an external DC disconnect switch.
 - The following requirements for PV modules must be met for each input area
 - Same type - Same number - Same location - Same tilt angle
 - Please do not perform positive or negative grounding of the photovoltaic system!
 - To save on cable and reduce DC losses, we recommend installing the inverter near the photovoltaic modules.

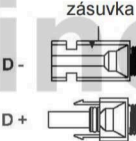


Connection procedure:

- Step 1: Check the photovoltaic module.
1. 1 Use a multimeter to measure the voltage of the panel array.
 1. 2 Check the PV+ and PV- terminals on the photovoltaic junction box.
 1. 3 Ensure that the impedance between the positive and negative terminals of the photovoltaic system and ground is at the MQ level.
- Step 2: Disconnect the DC connector.
- Step 3: Electrical connection.
3. 1 Select a 12 AWG wire for connection with a cold-crimped terminal.
 3. 2 Strip 10 mm of insulation from the end of the wire.
 3. 3 Insert the insulation into the pin connector and crimp it using crimping pliers.
- Step 4: Insert the pin connector through the cable gland on the back of the plug or socket. When you hear or feel a click, the pin connector is properly connected.
- Step 5: Connect the photovoltaic connector to the corresponding photovoltaic connector on the inverter.

Step 2.
Socket
D-

Krok 2.

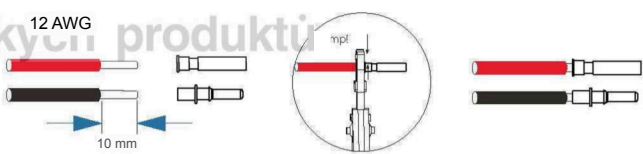


zásuvka

contact pin

cable nut

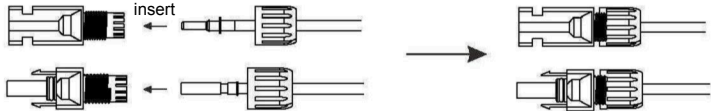
Krok 3.



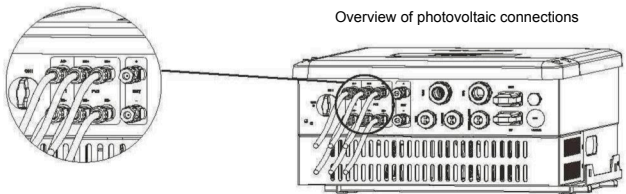
12 AWG

10 mm

Step 4.



Step 5.



Overview of photovoltaic connections

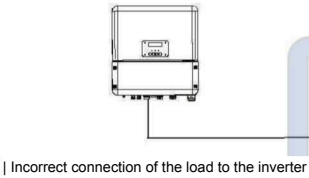
6.2 Grid connection

The X3-hybrid series inverters are designed for a three-phase grid. The voltage is 380/400 V, the frequency is 50/60 Hz. Other technical parameters must meet the requirements of the local power grid.

Table 4 Recommended Cable and Circuit Breaker

Model	X3-Hybrid-5.0-D	X3-Hybrid-6.0-D	X3-Hybrid-8.0-D	X3-Hybrid-10.0-D
	X3-Hybrid-5.0-N	X3-Hybrid-6.0-N	X3-Hybrid-8.0-N	X3-Hybrid-10.0-N
Cable	4-5 mm²	4-5 mm²	4-5 mm²	5-6 mm²
Microcircuit breaker	20 A	20 A	25 A	32 A

The miniature circuit breaker must be installed between the inverter and the grid; no load may be connected directly to the inverter.



Connection procedure:

Step 1. Check the mains voltage.

- 1. 1 Check the mains voltage and compare it with the permitted voltage range (see technical data).
- 1. 2 Disconnect the circuit breaker from all phases and secure it against reconnection.

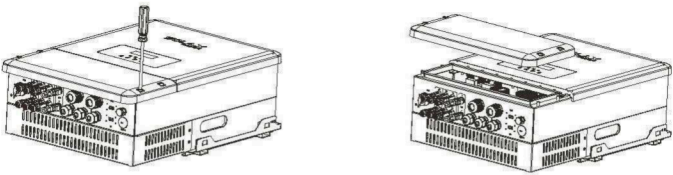
Step 2. Remove the cover from the inverter.

Step 3. Prepare the AC cables.

- 3. 1 Select the appropriate wire (cable size: see Table 4).
- 3. 2 Set aside approximately 60 mm of wire.
- 3. 3 Strip 12 mm of insulation from the end of the wire.
- 3. 4 Insert the stripped wires into the AC terminals so that all wire strands are secured in the AC terminal.
- 3. 5 Squeeze the head of the AC terminal with crimping pliers and securely tighten the screw cap.

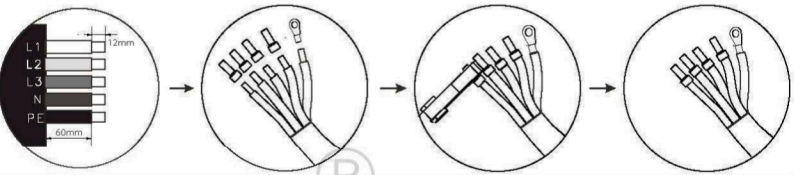
Step 4. Insert the AC cable into the power connection through the screw cap, then tighten the screw cap. Insert the L1, L2, L3, and N conductors into the corresponding AC terminals. Crimp the PE conductor to the grounding terminal, then screw it to the grounding pin.

Step 2.



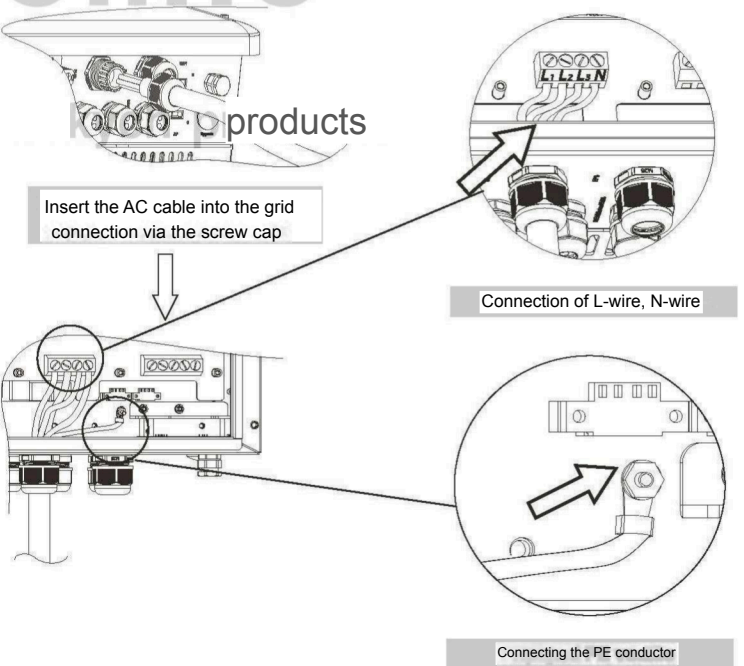
Step 3.

Cable size: According to Table 4 (page 24)



Step 4:
Solino

Krok 4:



6.3 EPS connection (applies to version E)

The X3-hybrid inverter is equipped with a mains on/off function. When the mains are on, the inverter outputs power through the mains connection, and when the mains are off, it outputs power through the EPS output.

This function can be activated manually or automatically, depending on the user's preference. If the user wishes to use the grid function manually, an external switch must be installed. Please follow the electrical wiring diagram below or the instructions in the quick installation guide. For an automatic solution, please contact our sales department.

EPS Wiring Diagram.

The following diagram is for informational purposes only, given the various local regulations regarding electrical wiring. Please perform the external wiring in accordance with local regulations.

Diagram A: The neutral wire of the AC power supply must not be disconnected or turned off.

Diagram B: The neutral wire of the AC power supply may be disconnected or turned off.

Scheme A

• Version E for Australia and New Zealand

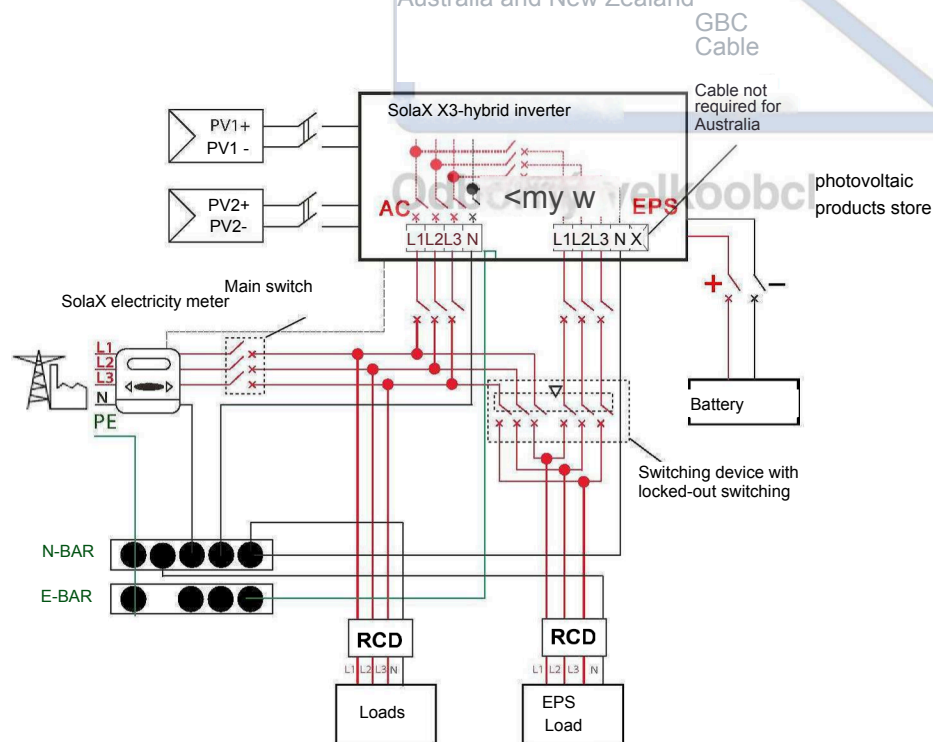
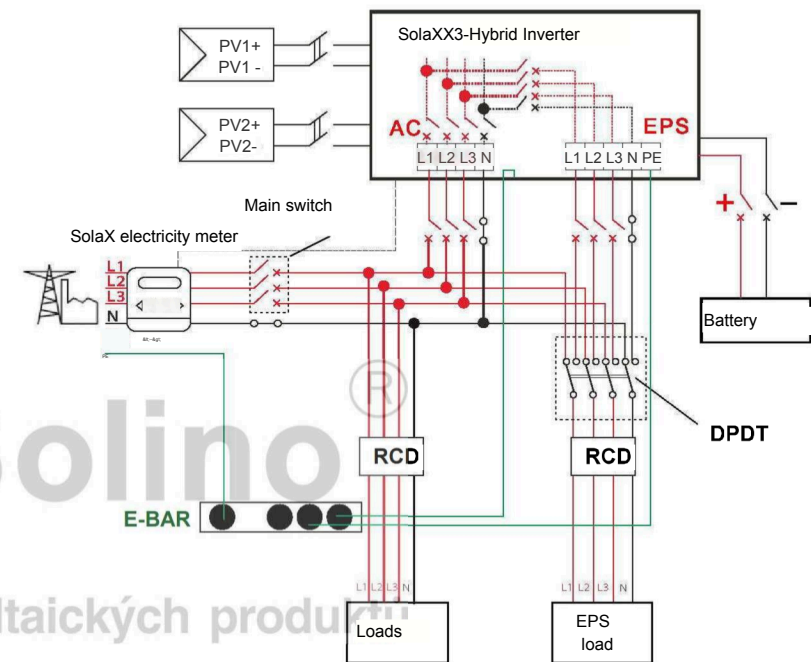


Diagram B

•Version E •

For other countries



To purchase a compatible contactor, please contact our sales department.

Note!



In case of discrepancies between the wiring according to local regulations and the instructions above, particularly regarding the neutral wire, grounding, and RCD, please contact us before commissioning the system.

Step 1. Prepare the EPS wires.

- 1 Select the appropriate wire (cable size: see the following figure).
- 2 Set aside approximately 60 mm of wire.
- 3 Strip 12 mm of insulation from the end of the wire.
- 4 Insert the stripped wires into the terminal blocks so that all strands of the wire are secured in the terminal block.
- 5 Squeeze the head of the terminal block with crimping pliers and securely tighten the screw cap.

Step 2. Insert the EPS cable into the EPS connection through the screw cap, then tighten the screw cap. Insert the L1, L2, L3, N, and PE conductors (the PE conductor does not apply to Australia) into the corresponding terminals on the EPS terminal block and screw them tight.

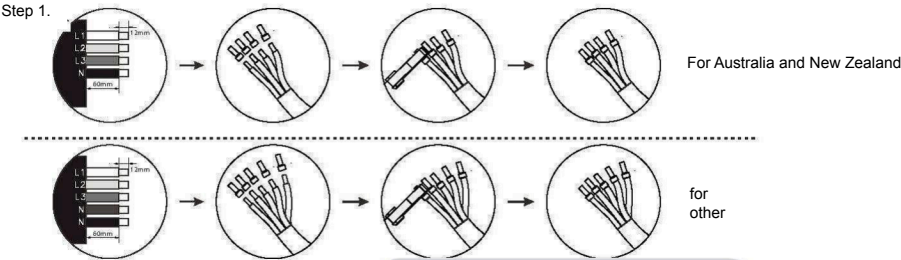
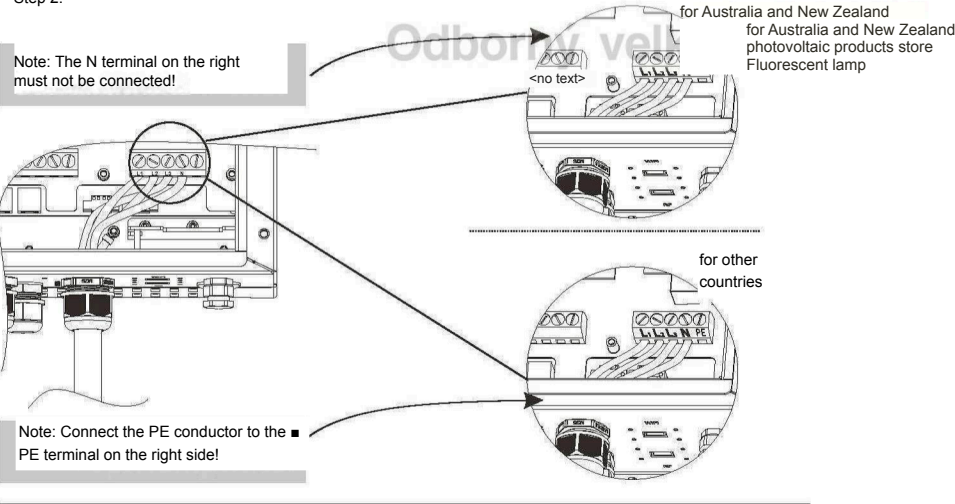


Table 5 Recommended cable and circuit breaker				
Model	X3-Hybrid-5.0-D X3-Hybrid-5.0-N	X3-Hybrid-6.0-N	X3-Hybrid-8.0-D X3-Hybrid-8.0-N	X3-Hybrid-10.0-D X3-Hybrid-10.0-N
EPS cable	≥ 5 mm ²	≥ 5 mm ²	≥ 5 mm ²	≥ 5 mm ²
EPS circuit breaker	25 A	25 A	32 A	32 A

Step 2.



WARNING!

Ensure that the EPS load power is within the EPS output power range; otherwise, the inverter will shut down and display an "overload" warning.

If the "overload" warning appears, adjust the load power to match the EPS power and restart the inverter.

For non-linear loads, please ensure that the starting power is within the EPS power range.

The following table shows some common load scenarios for your reference.

Type	Power		Common equipment	Example		
	Start Names			Equipment	Start	Rated
Resistive load	X 1	X 1	 Light bulb	 TV	 100W	100VA (W) 100VA (W)
Capacitive load	X 2	X 1.5	 Fluorescent lamp	 40W	80VA (W)	60VA (W)
Induction load	X 3-5	X 2	 Fan	 Refrigerator	 150W	450-750VA (W) 300VA (M)

6.4 Battery connection

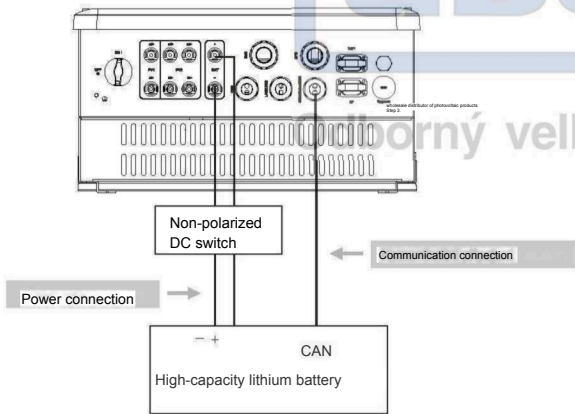
The charging and discharging system of the X3-Hybrid series inverter is designed for a high-voltage lithium battery.
Before selecting a battery, please note that the maximum battery voltage must not exceed 500 V and the nominal battery voltage must not exceed 400 V, and the battery communication must be compatible with the X3-Hybrid inverter.

> Battery Disconnect Switch

Before connecting to the battery, please install a non-polarized DC switch to ensure the inverter can be safely disconnected during maintenance.

Model	X3-Hybrid-5.0-D	X3-Hybrid-6.0-D	X3-Hybrid-8.0-D	X3-Hybrid-10.0-D
	X3-Hybrid-5.0-N	X3-Hybrid-6.0-N	X3-Hybrid-8.0-N	X3-Hybrid-10.0-N
Voltage	The rated voltage of the DC switch must be higher than the maximum battery voltage.			
Current [A]	32 A			

> Battery connection diagram



> BMS PIN definition

The communication interface between the inverter and the battery is CAN with an RJ45 connector.

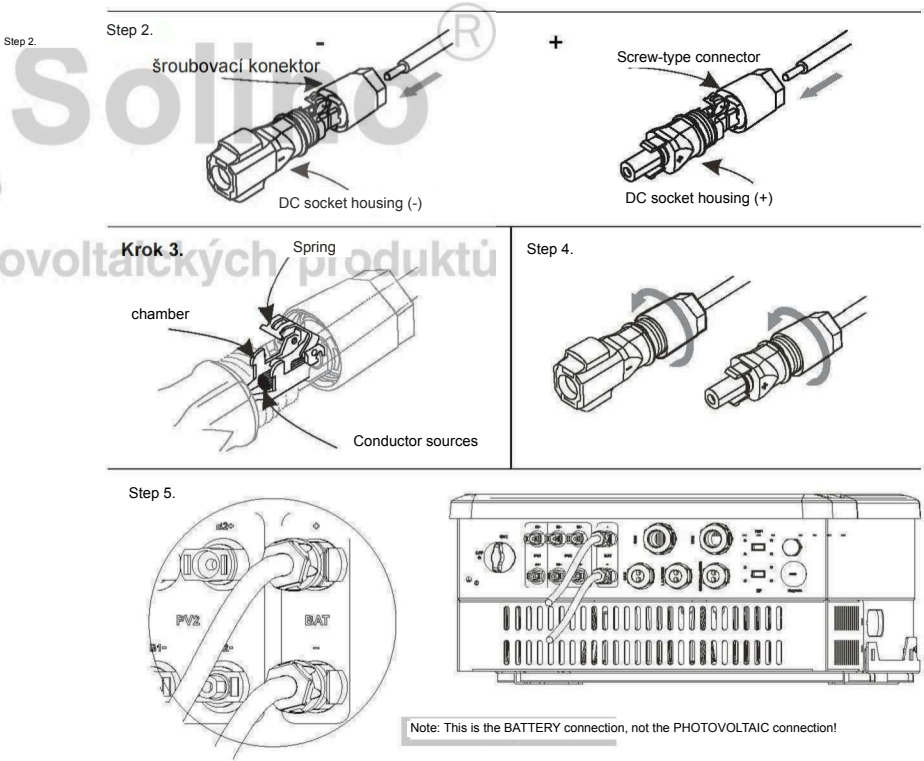
PIN	1	2	3	4	5	6	7	8
Definition	X	GND	X	BMS_CANH	BMS_CANL	GND	BMS_485A	BMS_485B



Note!
Communication with the battery can only function if the battery's BMS is compatible with the inverter.

> Power connection procedure:

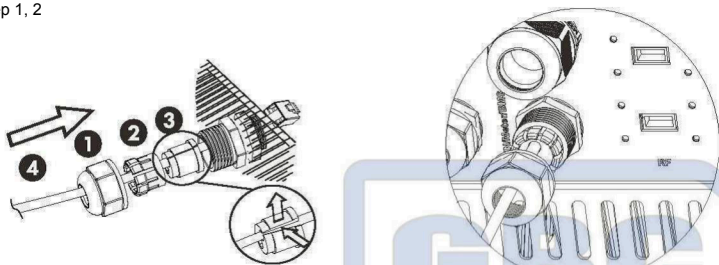
- Step 1. Select a 9 AWG wire and strip 15 mm of insulation from the end.
- Step 2. Insert the stripped wire all the way in (the negative cable for the DC socket (-) and the positive cable for the DC socket (+) are live). Hold the housing by the screw connection.
- Step 3. Press the spring until it audibly clicks into place (fine wire strands must be visible in the chamber).
- Step 4. Tighten the screw connection (torque: 2.0 Nm)
- Step 5. Connect the PV connector to the corresponding PV connector on the inverter.



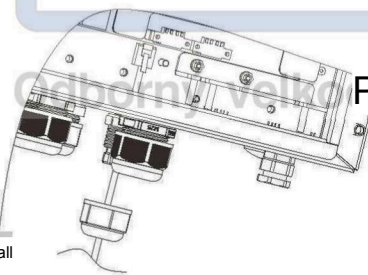
Note: The positive and negative leads must not touch the shielding.

- Procedure for establishing the communication connection:
- Step 1. Disconnect the GEN / electricity meter / BMS cable gland.
- Step 2. Prepare the communication cable (unshielded) and thread it through the cable gland.
- Step 3. Reassemble the cable gland and screw on the cable nut.
- Step 4. Insert one end of the RJ45 cable into the BMS connector on the inverter and the other into the RS485 or CAN connector on the battery.

Step 1, 2

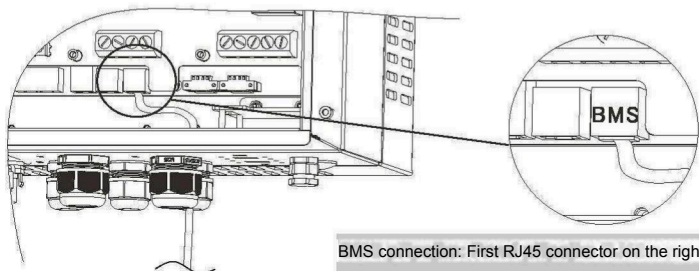


Step 3



A gasket is used for sealing. Remember to reinstall it.

Step 4



BMS connection: First RJ45 connector on the right side

6.5 Grounding Connection (Mandatory)

The user may additionally ground the inverter to a second grounding point or an equipotential bonding system if required by local safety regulations. This prevents electric shock in the event of damage to the original protective conductor.

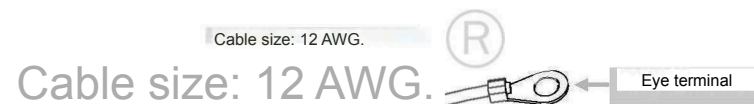
> Grounding connection procedure:

Step 1. Strip the insulation from the grounding cable and insert the stripped cable into the eye terminal, then crimp it.

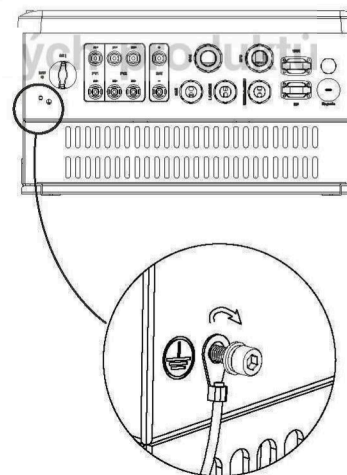
Step 2. Place the eye terminal into the grounding rod and securely screw the grounding rod in place.

Step 1

Cable size: 12 AWG.



Step 2



6.6 Connecting the electricity meter

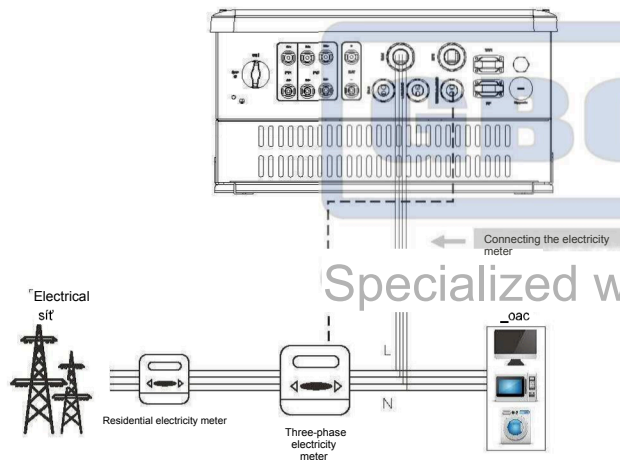
The electricity meter is used to monitor power consumption throughout the house; in addition, the inverter also requires data from the electricity meter to perform the grid feed-in control function.



Note!

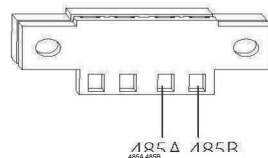
It is necessary to connect the electricity meter to the inverter; otherwise, the inverter will shut down with the message “Electricity meter fault.” The electricity meter communication only works if the meter is compatible with the inverter.

Electric meter connection diagram



Electric meter interface

The communication interface between the inverter and the electricity meter is a two-wire RS485.

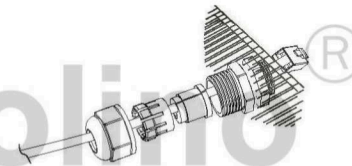


> Procedure for connecting the electricity meter:

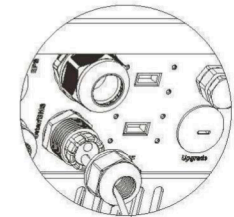
Please note the pin definition and connector orientation.

- Step 1. Prepare the connector and two communication wires.
- Step 2. Unscrew the nut on the electricity meter connector and thread the two communication wires through it.
- Step 3. Strip the insulation from the ends of the communication wires, then insert one end of the communication wires into the connector terminals.
- Step 4. Insert the connector into the electricity meter socket inside the inverter. Insert the other end of the wires into the corresponding terminals on the electricity meter.

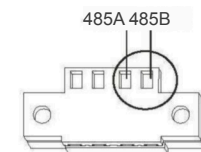
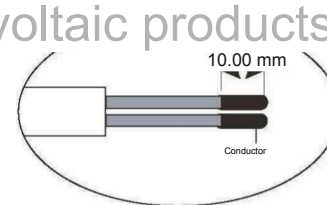
Step 1



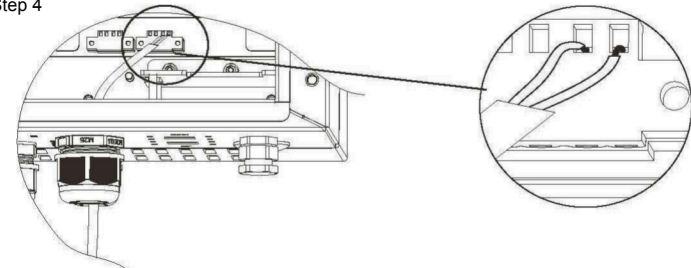
Step 2



Step 3



Step 4



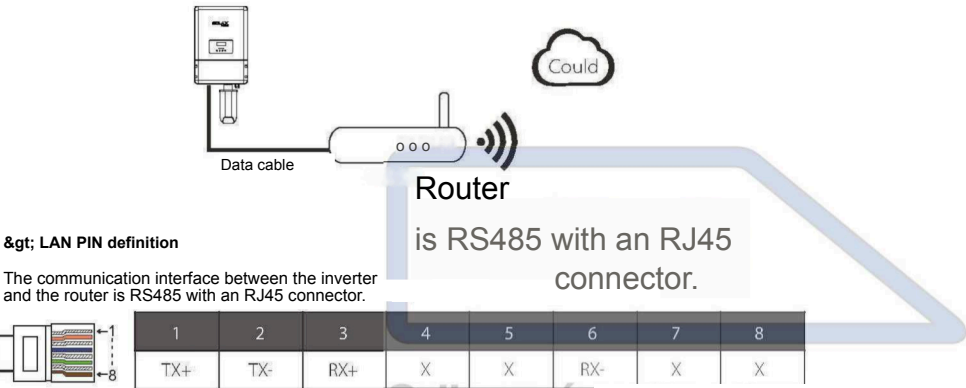
6.7 LAN Connection

LAN communication is a standard communication interface. It can transfer data between the router and the inverter over a local network.

> Application Possibility

This feature is applicable in the following situation:
When the Wi-Fi signal is too weak for data transmission, the user can use the LAN port for monitoring via a data cable.

Note: The Wi-Fi module can remain connected while using the LAN connection.

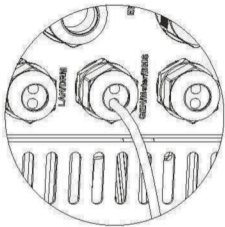


> LAN PIN definition

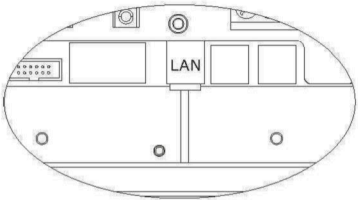
The communication interface between the inverter and the router is RS485 with an RJ45 connector.

> LAN connection procedure:

To connect the LAN, please follow the BMS connection procedure (page 32). Please note that the pin definitions and connector positions differ slightly.



LAN/DRM port

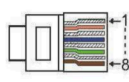


LAN connection: third RJ45 port from the right

6.8 DRM Connection

DRM is used to support various on-demand response modes by transmitting control signals, as described below.

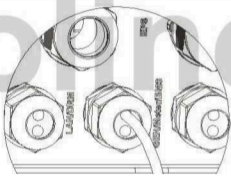
Note: Currently, only PIN6 (DRM0) is operational; other PIN functions are under development.



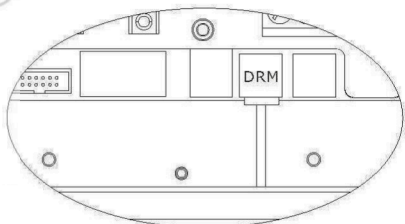
1	2	3	4	5	6	7	8
DRM1/5	DRM2/6	DRM3/7	DRM4/8	+3.3V	DRM0	GND	GND

> DRM connection procedure:

To connect the DRM, please follow the BMS connection procedure (page 32). Please note that the pin definitions and connector positions differ slightly.



LAN/DRM port

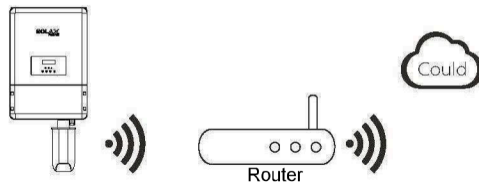


DRM connection: Second RJ45 port from the right

6.9 WiFi connection (optional)

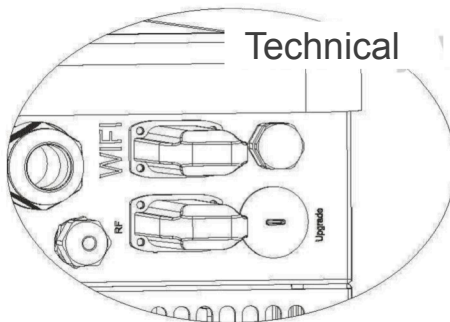
The inverter is equipped with a WiFi port that can collect data from the inverter and transmit it to the monitoring website using Pocket WiFi. (Purchase the product from your supplier as needed.)

➤ Diagram



> WiFi connection procedure:

- Step 1. Connect the Pocket WiFi to the "WiFi" port on the bottom of the converter.
- Step 2. Establish a connection between the converter and the router.
- Step 3. Create an online user account. (For more details, see Pocket WiFi user manual.)



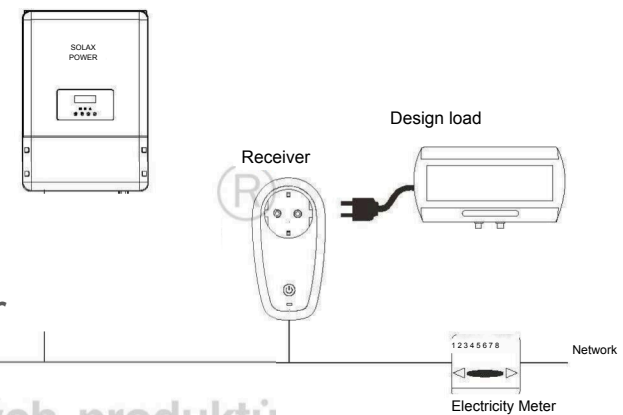
Technical

Wholesale of photovoltaic products

6.10 RF Connection (Optional)

The X3-Hybrid inverter provides an RF (radio frequency) interface that controls the switching time of the connected load via an external Smart Plug (purchase the product from a supplier as needed), so that the load is powered primarily by photovoltaic energy, ensuring the lowest possible energy costs during operation.

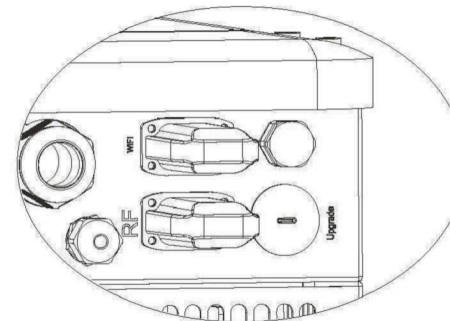
➤ Diagram



Solox
AC
transmitter

> RF connection procedure:

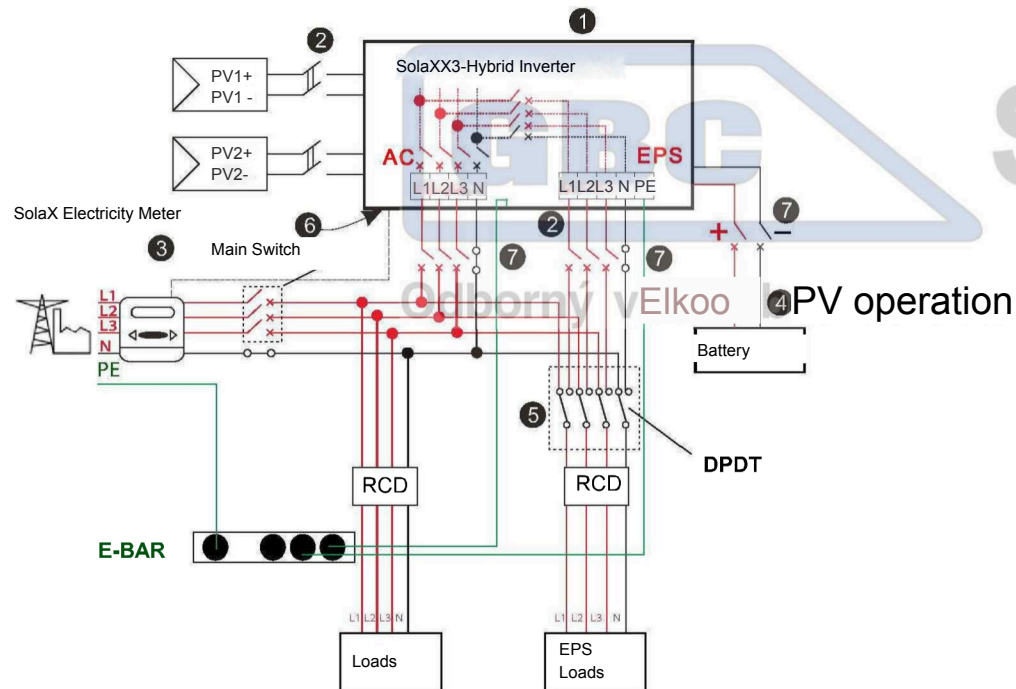
For detailed connection instructions, please refer to the Smart Plug user manual.



6.11 Handling the Inverter

> Turn on the inverter after completing all of the following steps:

- 1 Check that the inverter is properly mounted on the wall.
- 2 Check that all DC and AC electrical connections are correct.
- ③ Ensure the electricity meter is properly connected.
- ① Ensure the battery is connected correctly.
- 5 Ensure the external EPS contactor is connected correctly (if required).
- 6 Turn the DC switch on the bottom of the inverter to the "ON" position.
- 7 Turn on the external DC switch and AC switch.



> Turn on the inverter after checking the following steps:

- Step 1. The inverter turns on automatically as soon as the solar panels generate enough energy or the battery is discharged.
- Step 2. Check the status of the indicator lights and the LCD display. First, the left indicator light must turn blue, and then the display must show the main screen.



Note!

If the left indicator light is not blue, please check the following:

- All connections are secure.
- All external switches are turned on.
- The inverter's DC switch is in the "ON" position.

Step 3. The LCD display shows a setup wizard; if this is the first time you are turning on the unit, please follow the instructions. For specific settings, please refer to Chapter 8 (Settings).

Step 4. Configure the WiFi according to the WiFi user manual.

Step 5. Perform an "Autotest" (as needed).

Solino

> Self-test according to CEI 0-21 (applies only to Italy)

The self-test is required only for inverters put into service in Italy. The Italian standard requires that all inverters feeding into the public grid be equipped with a self-test function in accordance with CEI 0-21. During the self-test, the inverter sequentially checks the response times of the protection functions and the values for overvoltage, undervoltage, overfrequency, and underfrequency.

The self-test function is available at any time. The test report is displayed to the end user on the LCD screen.

7. Firmware Upgrade

The user can upgrade the firmware using a USB drive.

> Preparation

Please ensure that the inverter has a continuous power supply.

The inverter must remain connected to the solar panels, and the battery must remain connected throughout the entire upgrade process. Please have a PC and a USB flash drive ready.

Warning!
Ensure that the input photovoltaic voltage is higher than 180 V (perform the upgrade on a sunny day); otherwise, serious malfunctions may occur during the upgrade.

> Upgrade procedure:

Step 1. To obtain the upgrade files, please contact our technical support and extract the files to a USB drive as follows:

"update\ARM\618.00098.00_Hybrid_X3G3_Manager_VX.XX_XX-XX.usb";

"update\DSP\Hybrid_GSX3_Master.hex";

(Vx.xx is the version number, xxxxxxxx is the file compilation date)

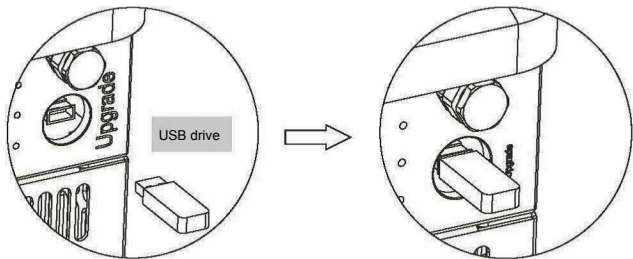
Warning!
Ensure that the folder name exactly matches the format specified above!
Do not modify the program file name, otherwise the inverter upgrade will fail!

Step 2. Turn off the DC switch, AC switch, EPS switch, and battery. Then unscrew the waterproof cover and insert the USB drive into the "upgrade" port on the bottom of the inverter.

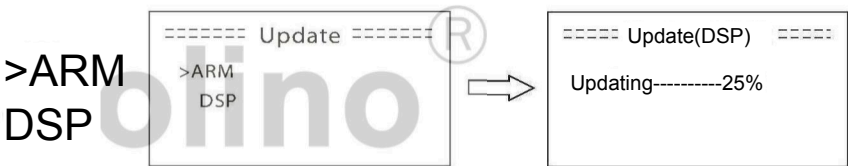
Step 3. Turn on the DC switch and the battery; the LCD will then display the screen shown in Fig. 3-1. Then use the up and down buttons to select what you want to upgrade and press "OK" to confirm.

Step 4. After the upgrade is complete, please turn off the DC switch and the battery, then remove the USB flash drive and screw the waterproof cover back on. After each upgrade, the inverter is in "off mode." Please turn on the system.

Step 2



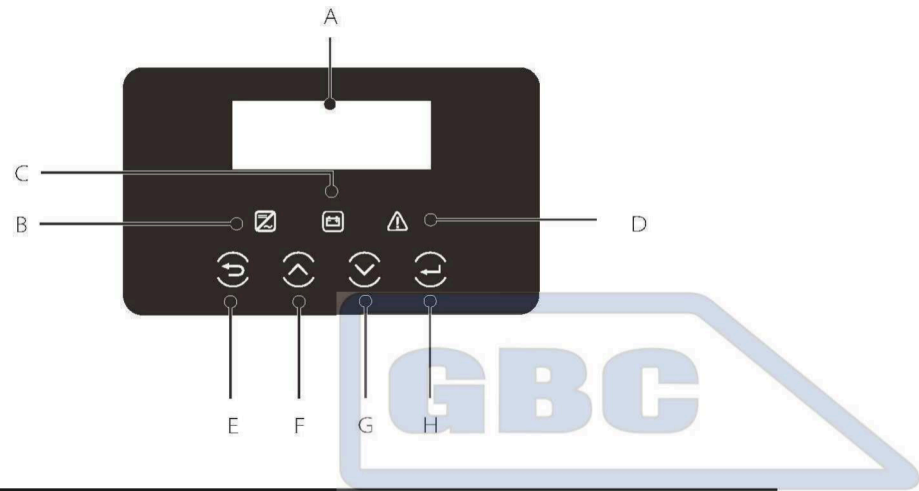
Step 3



Warning!
If the upgrade is interrupted during operation, ensure that the inverter remains powered and reinsert the USB drive.

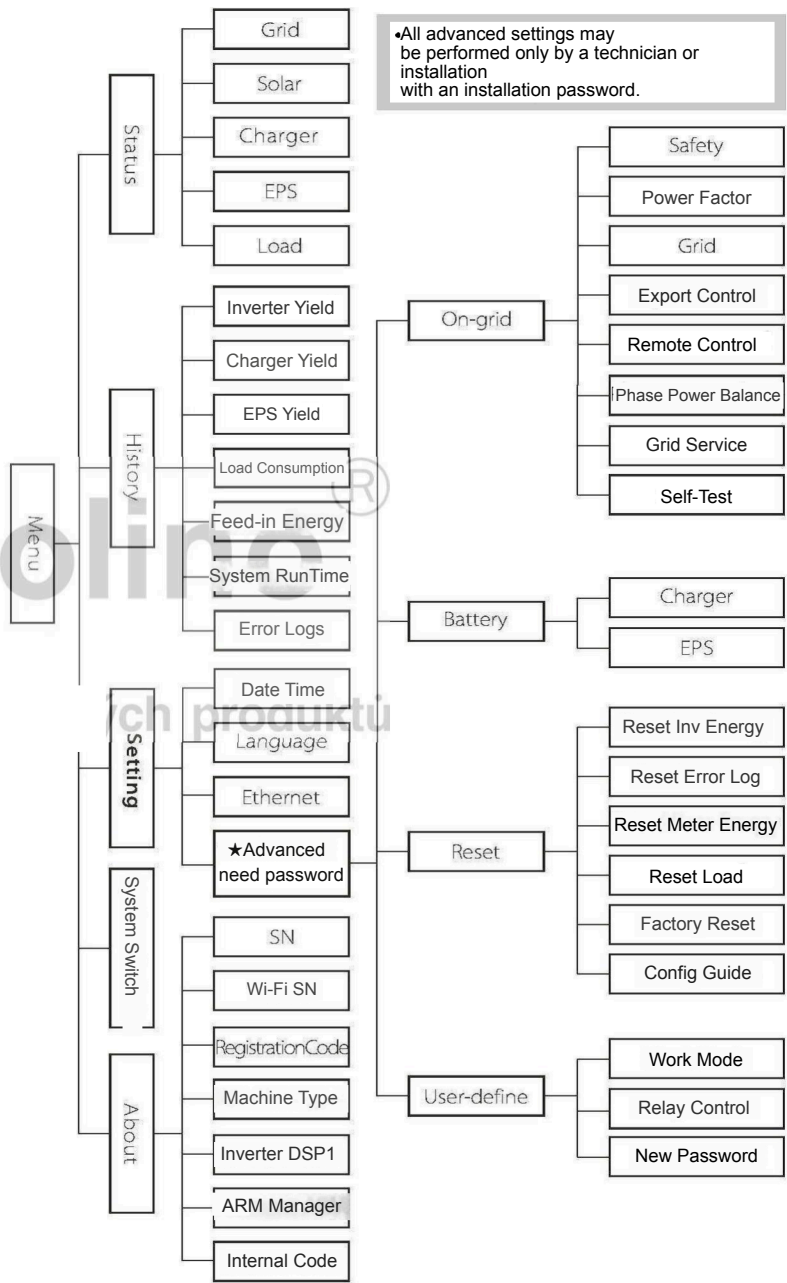
8. Settings

8.1 Control Panel



Subject	Name	Description
A	LCD display	
B	Indicator LED	Blue light: The inverter is in normal mode or EPS mode Flashing blue: The inverter is in standby or diagnostic mode. Off: The inverter is in fault status.
C		Green light: battery communication is normal and functioning Flashing green: battery communication is normal and in idle mode. Off: the battery is not communicating with the inverter.
D		Red light: The inverter is in fault mode. Off: The inverter has no faults.
E		
F	Function button	ESC button: return from the current screen or function.
G		Up button: move the cursor up or increase the value.
H		Down button: moves the cursor down or decreases the value.
I		OK button: confirms selection.

8.2 Menu Structure



8.3 LCD Operation

LCD Digital Display

The main screen is the standard screen, and the inverter automatically opens it after a successful system startup or after a certain period of inactivity.

The information on the screen is as follows. "Power" indicates the current output power; "Today" indicates the power generated during the day. "Battery" indicates the remaining battery capacity.

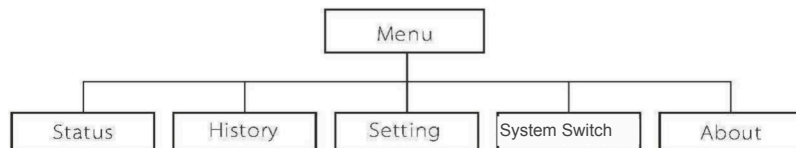
Power 0W
Today 0.0 kWh
Battery %
Normal

Menu Screen

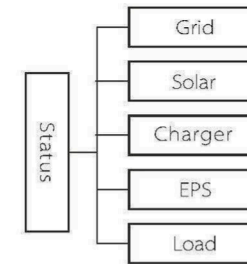
The menu screen is a transition screen that allows the user to open other screens to configure settings or obtain information.

- The user can access this screen by pressing the "OK" button when the main screen is displayed.
- The user can select screens by moving the cursor with the function buttons and then confirming by pressing "OK".

Technical
Menu
Status
History
Settings



Status



• Status

The Status function includes five inverter items (grid, solar, charger, EPS, and load).

Select an item using the up and down buttons and confirm your selection by pressing "OK"; to return to the Menu, press "ESC".

Status
Grid
Solar
Charge

a) Grid

This status displays real-time grid conditions such as voltage, current, output power, local power consumption, and frequency.

Pout indicates the inverter's output power;

Pgrid indicates power supplied to the grid or power drawn from the grid.

A positive value indicates energy supplied to the grid; a negative value indicates energy being drawn from the grid.

Grid
Ua 0.0V
Ia 0.0A
PaOut 0W

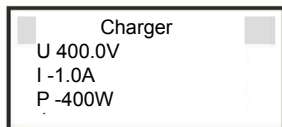
b) Solar

This section displays the real-time status of the photovoltaic system, such as the input voltage, current, and power of each photovoltaic input.

Solar
U1 600.0V
I1 7.0A
P1 4200W

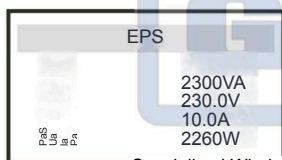
C) Charger

This section displays the status of the system charger. It includes battery voltage, charging or discharging current, charging or discharging power, battery capacity, battery temperature, BMS status, and charging and discharging limits. "+" indicates charging; "-" indicates discharging.



d) EPS

EPS displays data only when the inverter is operating in EPS mode; it then shows real-time EPS in real time, such as voltage, current, and power.

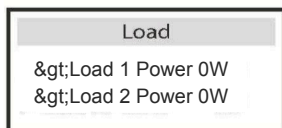


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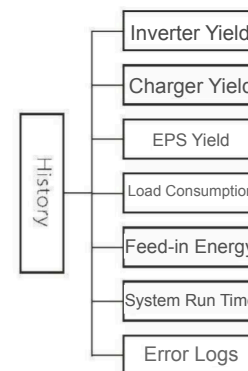
a) Inverter Yield

e) Load

If the inverter is connected via a small socket, this section displays the load power in real time, including Load Power 1 and Load Power 2.



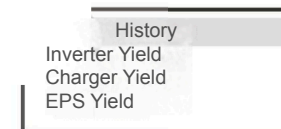
• History



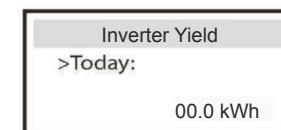
• History

The History function contains seven items for reference: inverter output, charger output, EPS output, load consumption, energy supplied, system runtime, and error logs. Select an item using the up and down buttons and confirm your selection by pressing "OK"; to return to the Menu, press "ESC".

"OK"; to return to the Menu, press
Solino
Invest
Chang

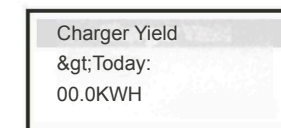


This feature displays the inverter's output for today, yesterday, this month, last month, and total.



b) Charger Yield

The charger efficiency feature displays the charger yield for today, yesterday, this month, last month, and the total.



c) EPS Yield
The EPS efficiency function displays the EPS yield for today, yesterday, this month, last month, and the total.

EPS Yield

>Today:

00.0 kWh

d) Load Consumption
Load consumption shows the energy consumption of a specific load today, this month, and in total.

Load consumption

>Load 1 consume

Load 2 consume

e) Energy supplied
Energy supplied includes energy supplied to the grid today, this month, and in total.

Feed-in Energy

>Today:

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00.0 kWh

f) System operating time
This function includes operating time in grid mode and operating time in EPS mode.

System Runtime

>GridModeRunTime

80.3H

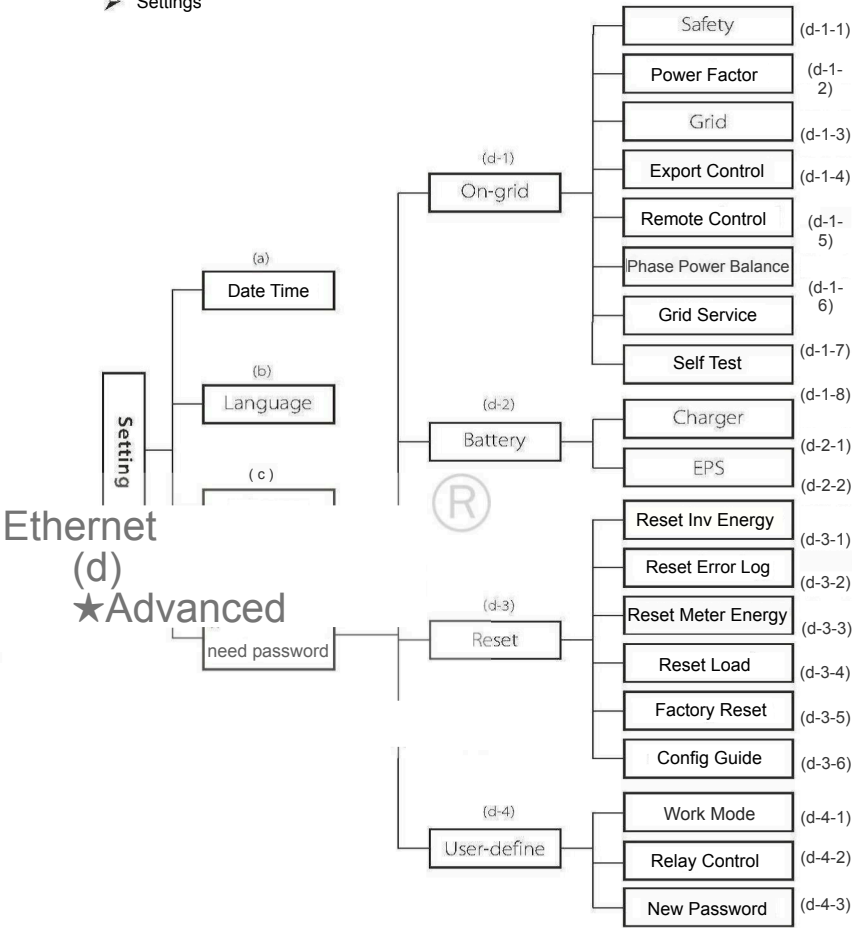
g) Fault Logs
Fault logs record the last six displayed error messages.

Error log

>No error

fed into the grid today,
this month, and in total.

➤ Settings



• Settings
This function is used to configure the inverter time, connection, battery, network, etc. The end user can directly set the date, time, language, and Ethernet. However, for advanced settings, the installation technician needs a password to access for more professional settings.

Settings

Date and Time

Language

Ethernet

a) Date and Time

This screen allows the user to set the date and time.

Date and time

2013-06-06
10:19

b) Language

On this inverter, the user can choose from several languages.

Language

English
Deutsch

c) Ethernet

There are two modes for obtaining an IP address: static and DHCP. Here, the user can configure Ethernet settings, such as the IP address. Here, the user can configure information about the network device, such as the IP address, subnet mask, default gateway, and MAC address.

Ethernet

> IP Method
static

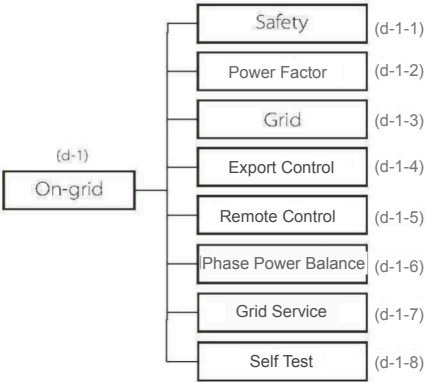
Ethernet, such as IP address, subnet mask and MAC address.

d) Advanced

Here you can configure all advanced settings, such as battery, grid, EPS, etc. "Advanced" is divided into four sections: Mains, Battery, Reset, and User-defined, and each section has subsections.

Advanced

On-grid
Battery
Reset



d-1-1) Security

The user can set security standards according to different countries and standards related to the network. You can choose from 8 standards. (Subject to change without notice)

Item	Standard	Ground
1	VDE0126	Germany
2	ARN4105	Germany
3	AS 4777	Australia
4	G83/2	United Kingdom
5	G59/3	United Kingdom
6	EN50438_NL	Netherlands
7	CEI 0-21	Italy
8	EC61727 In	India

With

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d-1-2) Power Factor (For specific countries where required)

d-1-2) Power Factor (For specific countries where required by local regulations) Five modes are available: Off, Under-Excited, Over-Excited, Curve, Q(u).

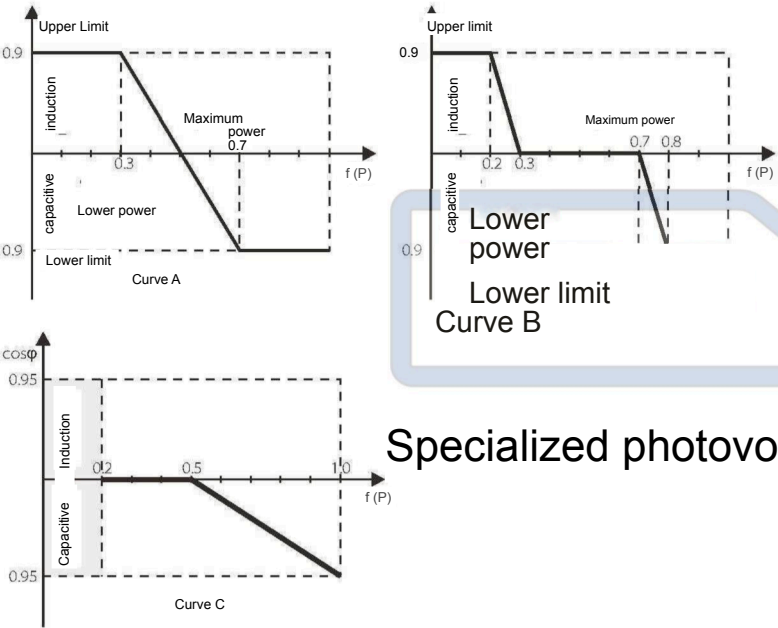
Mode	Note
Off	
Overdrive	PF value
Underexcited	PF value
Curve	Upper limit
	Lower limit
	Upper power
	Lower Power
	PFLockInPoint (CEI 0-21 only)
	PFLockOutPoint (CEI 0-21 only)
Q(u)	QuVupRate (EN50438_NL only)
	QuVlowRate (EN50438_NL only)
Fixed Q power	Q Power

Reactive power control, standard reactive curve $\cos \phi = f(P)$

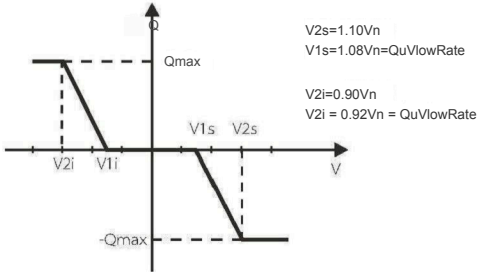
For VDE ARN 4105, the $\cos \phi = f(P)$ curve must correspond to curve A. The standard setting values are shown in curve A.

For E 8001, the $\cos \phi = f(P)$ curve must correspond to curve B. The standard setting values are shown in curve B.

For CEI 0-21, the standard value of PFLockInPoint is 1.05; if $V_{ac} > 1.05 V_n$ and $P_{ac} \geq 0.2 P_n$, the $\cos \phi = f(P)$ curve must correspond to curve C. The standard value of PFLockOutPoint is 0.98; if $V_{ac} < 0.98 V_n$, $\cos \phi = f(P)$ exceeds curve C.



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



d-1-3) Network

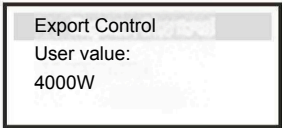
The end user does not need to set network parameters. All default values have been set at the factory in accordance with safety guidelines.

If changes are necessary, all changes must be made in accordance with local network requirements.

Parameter	Note
Normal	
Vac upper	Overvoltage protection
Vac lower	Undervoltage protection
Vac upper slow	Slow overvoltage protection
Vac upper slow	Slow undervoltage protection
Fac upper	High-frequency protection
Fac lower	Low-frequency protection
Fac upper slow	Slow high-frequency protection
Fac lower slow	Slow low-frequency protection
Vac 10 m avg	Protection against 10-minute high voltage
Applies only to Italy (CEI0-21).	
Tuwp_Fast	Fast-rising surge protection
Tovp_Fast	Fast-rising undervoltage protection
Tufp_Fast	High-frequency protection with fast response
Tofp_Fast	Low-frequency protection with fast rise time
Tuwp_Slow	Overvoltage protection with slow rise time
Tovp_Slow	Undervoltage protection with slow rise time
Tufp_Slow	High-frequency protection with slow rise time
Tofp_Slow	Low-frequency protection with slow rise time
FreDrpDlyTime	Frequency drop delay time
Applies only to ENS0438_NL.	
FreqSetPoint	Set frequency value
FreqDropRate	Frequency drop rate

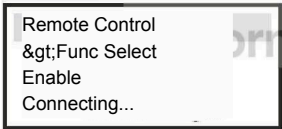
d-1-4) Supply Control

This function allows the inverter to control the energy supplied to the grid. There are user-defined values and factory-set values. The factory-set value is standard and cannot be changed by the user. The user-defined value, set by the installation technician, must be less than the factory-set value.



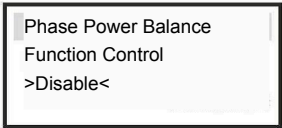
d-1-5) Remote Control

This function allows for remote cluster control of the inverters via the LAN port on the inverter using an external control device. This makes it possible to control both the active and reactive power output of the inverter. The default setting is "Enable." Upon successful connection, "Connecting" is displayed. If not, "Connecting" is displayed. Selecting "Disable" means the function is turned off.



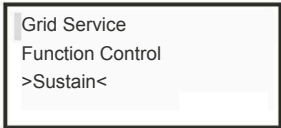
d-1-6) Phase Power Generation

This function controls the generation of power supplied to the grid. "Enable" means that the three phases supply power depending on the load, and power supplied to the grid is generated. "Disable" means that the output power from the inverter is generated and is the default value.



d-1-7) Grid Operation

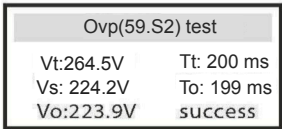
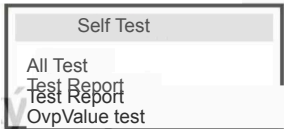
Grid operation can be set to "Sustain" or "Stop." The default setting is "Sustain." Each country's safety requirements or regulations regarding battery storage inverters vary; some may conflict with the user's rights. If permitted by law, the user may select "Stop" to disable these functions.



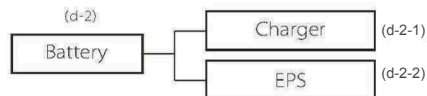
d-1-8) Self-Test

The user can test the inverter's operating status by selecting "All Test." This automatically switches to the OvpValue test screen; a few seconds later, "success" will appear (see below), indicating that the self-test was successful. To proceed to the next test, press "OK." After all

Completed successfully. To proceed to tests, the display returns to the screen specific parameters. tests are complete, the display returns to the "Test Report" screen and shows specific parameters.



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d-2-1) Charger

Here, the user can set the charger parameters; the inverter is compatible only with lithium batteries. The user can set the charging and discharging parameters and the active mode.

See the table below for detailed parameters.

Charger	Charger	Charger
>Min Capacity 10%	Charge Max Current 25A	Max Discharge Current 25A

Parameter	Note
Min capacity *	Remaining minimum battery capacity.
Max Charge Current	The charging current can be set to 0–25 A. The charging current can be set to 0–25 A.
Discharge Max Current	The discharge current can be set to 0–25 A.



NOTE!

Please check whether the inverter is set to maximum charging /discharge current is within the range of the battery's rated charge /discharge current of the battery.

d-2-2) EPS system (E version only)

The X3-Hybrid inverter with the E version can operate in EPS mode.

EPS parameters can be set as follows.

"Mute" means you can set an alert for the system when it switches to EPS mode.

- "No" means that a buzzer will sound, which is the default setting.

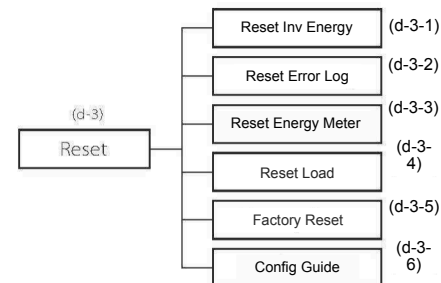
∴ "Yes" means that the warning function is disabled.

Furthermore, if the buzzer sound is sharp, it means that the EPS output is "overloaded."

Frequency - here you can set 50 Hz or 60 Hz, depending on the relevant

loads.

EPS system	
> Mute:	No
Frequency:	50Hz



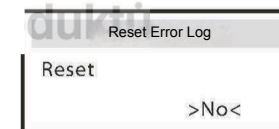
d-3-1) Reset Inv Energy - reset inverter energy

Here you can reset the inverter energy record.



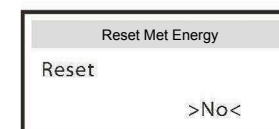
d-3-2) Fault Log Reset

Here you can reset the inverter fault log.



d-3-3) Resetting the electricity meter

Here you can reset the energy record



d-3-4) Load Reset

The user can reset the energy of specific loads if the inverter is installed with a smart plug.

Reset Load Consumption

Reset Load1

>No<

d-3-5) Reset to Factory Settings

Here, the user can reset the inverter administrator parameter settings.

Factory Reset

Reset EE Normal

>No<
GBC

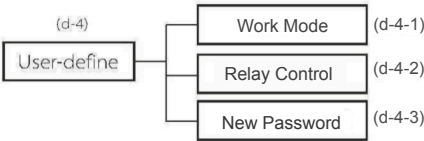
d-3-6) Setup Wizard

This screen repeatedly launches the initial setup

Config guide

>Start

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d-4-1) Operating Mode

There are four operating modes available.

Parameter	Note
Self Use - own use (standard)	The power generated by the photovoltaic system is used primarily to supply local loads, then to charge the battery. Residual power is fed into the public grid. If no photovoltaic power is supplied, the battery is first discharged to supply local loads, and the grid supplies power when the battery capacity is insufficient.
Backup Mode	The battery charges at an accelerated rate during a set time, and you can choose whether it charges from the grid or not. When the grid is on, the battery stops discharging to maintain a higher capacity. Only if the grid is off and there is insufficient photovoltaic energy does the battery begin to discharge to maintain normal operation of emergency loads. This operating mode applies to areas with regular grid outages.
Grid Power Supply Priority	The inverter output priority is: powering loads → grid feed-in → battery charging. This operating mode applies to areas with high tariffs for grid feed-in.
Operating time settings	In this operating mode, the charging and discharging times can be set flexibly, and you can also choose whether to charge from the grid or not.

•For the "Usage Time Setting" mode, 2 parameters must be set.

Work Mode

>Mode Select

Force time use

Work Mode

>Charger period 1

From Grid

Enable

Work Mode

>Charge

Start time 1

08:00

d-4-2) Relay Control

Relay control is an optional feature that can intelligently control a selected appliance based on excess energy consumption when the input power reaches a certain value.

This feature is available only with the Solax "Smart Plug" product. Specific operation is described in the "Smart Plug User Manual".

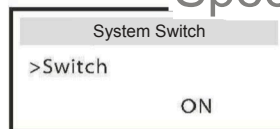


d-4-3) New Password

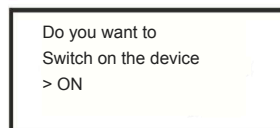
Here, the user can set a new password.

➤ System Switch

- For the system switch, you can select "ON" - on or "OFF" - off.
- "ON" means that the inverter is in operating mode, which is the standard state of the inverter.
- "OFF" means that the inverter stops supplying all power, but the LCD remains on.

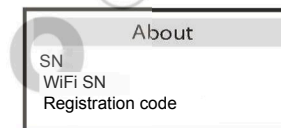
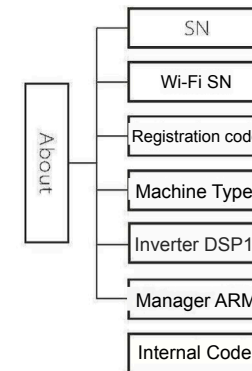


You can also "TURN ON" or "TURN OFF" the system switch by pressing and holding the "Enter" button.



➤ About this Inverter

- This screen displays information about the inverter, including the serial number, WiFi serial number, registration code, machine type, DSP1 master, ARM manager, and interval code.



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9. Troubleshooting

9.1 Troubleshooting

This section contains information on procedures for resolving potential issues with X3-hybrid series inverters and provides troubleshooting advice to identify and resolve most problems that may occur with X3-hybrid series inverters. This section will help you identify the source of any fault that may occur. Please read the following troubleshooting procedures. Check for warning or fault messages on the system control panel or fault codes on the drive's information panel. If a message is displayed, make a note of it before taking any further action. Try the solutions listed in the following table.

Faults	Diagnosis and Solutions
TZ Protect Fault	Overcurrent fault. • Wait a moment to see if the device returns to normal operation. • Disconnect PV+, PV-, and the battery, then reconnect them. - Or contact us for assistance if the system does not return to normal operation.
Grid Lost Fault	• Please wait a moment; the system will restart once the grid returns to normal. • Please check that the cable connection on the AC side is secure. • Or contact us for assistance.
Grid Volt Fault	Grid voltage out of range • Please wait a moment; the system will restart when the grid returns to normal. • Please check that the grid voltage is within the normal range. • Or contact us for assistance.
Grid Freq Fault	Grid frequency out of range • The system will restart when the grid returns to normal. • Or contact us for assistance.
PV Volt Fault	PV voltage out of range • Check the output voltage of the PV panels. • Or contact us for assistance.
Bus Volt Fault	Bus voltage outside normal range • Disconnect PV+, PV-, and the battery, then reconnect them. • Check that the PV input is within the inverter's range. • Or contact us for assistance if the system does not return to normal.
Battery Voltage Fault	Battery voltage fault • Check that the battery input voltage is within the normal range • Or contact us for assistance.

Faults	Diagnostics and troubleshooting
AC10M Volt Fault	The mains voltage has been out of range for the last 10 minutes. • The system will return to normal when the mains voltage returns to the normal range. • Or contact us for assistance.
DCI OCP Fault	DCI overcurrent protection fault. • Wait a moment to see if the device returns to normal. • Or contact us for assistance.
DCVOC P Fault	DCV EPS overvoltage protection fault. • Wait a moment to see if the device returns to normal. • Or contact us for assistance.
SWOCP Fault	Overcurrent fault detected by software. • Wait a moment to see if the device returns to normal operation. • Turn off the PV system, battery, and grid, then reconnect them. • Or contact us for assistance.
RC OCP Fault	DCI overcurrent protection fault. • Please check that the insulation of the electrical wires is not damaged. • Wait a moment to see if the device returns to normal operation. • Or contact us for assistance.
Insulation Fault	Insulation fault • Please check that the insulation of the electrical wires is not damaged. • Wait a moment to see if the device returns to normal. • Or contact us for assistance.
Temp Over Fault	Temperature Limit Exceeded • Check that the ambient temperature does not exceed the specified limit. • Or contact us for assistance.
BatConDir Fault	Battery reverse connection fault • Check that the positive and negative terminals of the battery are not reversed • Or contact us for assistance.
Sample Fault	Detection circuit fault • Disconnect PV+, PV-, and the battery, then reconnect them. • Or contact us for assistance.
Overload Fault	Overload in EPS mode • Turn off the high-power device, press "ESC" to restart the inverter. • Or contact us for assistance if the system does not return to normal.
EPSOCP Fault	Overcurrent in EPS mode • Check that the load power is within the EPS power range. • Check that no non-linear loads are connected to the EPS. Disconnect this load to see if this helps. • Or contact us for assistance if the system does not return to normal.
Cnf input fault	Incorrect photovoltaic panel connection • Check that two MPPTs are not connected in parallel. Please connect both MPPTs independently. • Or contact us for assistance if the system does not return to normal operation.

Faults	Diagnosis and Solutions
-Wunmatchec	Incorrect firmware version • Check that the ARM version matches. • Or contact us for assistance if the system does not return to normal operation.
BatPowerLow	Low EPS battery power • Charge the battery. • Turn off high-power devices, press "ESC" to restart the inverter. • Or contact us for assistance if the system does not return to normal.
PhaseAngleFault	Phase Angle Fault • Please check the correctness of the AC connection. • The system will return to normal when the mains voltage returns to normal. • Or contact us for assistance if the system does not return to normal.
PLL_OverTime Fault	PLL_Timeout Fault • Please check the correctness of the AC wiring. • The system will return to normal when the mains voltage returns to normal. • Or contact us for assistance if the system does not return to normal.
Parallel Fault	Parallel System Fault • The parallel system has two or more main machines. • The DSP1 version is different. • Or contact us for assistance if the system does not return to normal.
Inter Com Fault	Internal communication fault • Turn off the PV, battery, and grid, then reconnect them. • Or contact us for assistance if the system does not return to normal.
DSP System Fault	System Fault • Contact us for assistance if the system does not return to normal operation.
ACHCT Fault	AC sensor fault • Turn off the PV system, battery, and grid, then reconnect them. • Or contact us for assistance if the system does not return to normal.
InvEEPROM Fault	Inverter EEPROM fault • Turn off the PV system, battery, and grid, then reconnect them. • Or contact us for assistance if the system does not return to normal operation.
RCD Fault	• Check the impedance of the DC input and AC output. • Disconnect PV+, PV-, and the battery, then reconnect them. • Or contact us for assistance if the system does not return to normal operation.
EPS Relay Fault	EPS Relay Fault • Disconnect PV+, PV-, the grid, and the battery, then reconnect them. • Or contact us for assistance if the system does not return to normal operation.
Grid Relay Fault	EPS Relay Fault • Disconnect PV+, PV-, the grid, and the battery, then reconnect them. • Or contact us for assistance if the system does not return to normal.
BatRelayFault	Other Device Fault • Disconnect PV+, PV-, the grid, and the battery, then reconnect them. • Or contact us for assistance if the system does not return to normal operation.

Faults	Diagnosis and Solutions
BMS_External_Err	Battery fault - external fault • Please contact the battery supplier.
BMS_Internal_Err	Battery fault - internal fault • Please contact the battery supplier.
BMS_OverVoltage	Battery fault - overvoltage fault • Please contact the battery supplier.
BMS_LowerVoltage	Battery fault - undervoltage fault • Please contact the battery supplier.
BMS_ChargeOCP	Battery charging fault - overcurrent fault • Please contact the battery supplier.
BMS_DischargeOCP	Battery discharge fault - overcurrent fault • Please contact the battery supplier.
BMS_TemHigh	Battery fault - over-temperature fault • Please contact the battery supplier.
BMS_TemLow	Battery fault - low temperature • Please contact the battery supplier.
BMS_CellImbalance	Battery cell fault - imbalance fault • Please contact the battery supplier.
MgrEEPROM Fault	Control EEPROM fault • Turn off the PV system, battery, and grid, then reconnect them. • Or contact us for assistance if the system does not return to normal operation.
DSPunmatchec	DSP version error • Check that the DSP1 version matches. • Or contact us for assistance if the system does not return to normal operation.
Meter Fault	Meter Fault • Please check if the meter is functioning normally. • Or contact us for assistance if the system does not return to normal.

- If your drive's information panel does not display a fault indicator, check the following list to ensure that the current installation conditions allow for proper operation of the equipment.
 - Is the inverter located in a clean, dry, adequately ventilated area?
 - Have the DC input circuit breakers been turned off?
 - Are the cables properly sized and short enough?
 - Are the input and output connections and cables in good condition?
 - Are the configuration settings correct for your specific installation?
 - Is the display panel and communication cable properly connected and undamaged?

For further assistance, contact SolaX Customer Service. Please be prepared to describe the details of your system installation and have the device model and serial number handy.

9.2 Routine Maintenance

In most situations, inverters require no maintenance or repairs; however, if the inverter frequently loses power due to overheating, this may be caused by the following: The cooling fins on the back of the enclosure are covered with dirt.

Clean the cooling fins with a soft, damp cloth or brush them as needed. Service and maintenance work may only be performed by trained and authorized professional personnel who are familiar with safety requirements.

> Safety Inspections

Safety inspections must be performed at least every 12 months; please contact the manufacturer to arrange for a qualified person who has the appropriate education, knowledge, and practical experience to perform these tests. (Please note that this service is not covered by the warranty.) The data must be recorded in the equipment logbook. Details of the safety inspection are provided in this manual in Chapter 2, Safety Instructions and EU Directives.

> Regular Maintenance

The following work may only be performed by a qualified person. During the use of the converter, the operator must regularly inspect and maintain the equipment. The specific procedures are as follows.

1: Check that the cooling fins on the back of the cabinet are not dirty, and clean the unit and remove dust as needed. This should be done periodically.

2: Check that the inverter indicator lights are functioning normally. Check that the inverter buttons are functioning normally. Check that the inverter display is functioning normally.

This check must be performed at least every 6 months.

3: Check that the input and output cables are not damaged or deteriorated. This check must be performed at least every 6 months.

4: You should keep the inverter panels clean and check their safety at least every 6 months.

qualified person.
The operator must regularly inspect
and maintain

10. Decommissioning

10.1 Remove the inverter.

- Disconnect the inverter from the DC input and AC output.
- Wait 5 minutes for the capacitors to discharge.
- Disconnect the communication and optional connection cables.
- Remove the inverter from the mounting bracket.
- Remove the bracket if necessary.

10.2 Packaging

Please pack the inverter in its original packaging.

If the original packaging is no longer available, you may also use a suitable cardboard box that meets the following requirements.

- Suitable for loads over 30 kg.

Dimensions.

Suitable for loads over 30 kg.
With a handle.
With the option of complete
closure.

10.3 Storage and Transport

Store the inverter in a dry place with an ambient temperature range of -20 °C to +60 °C.

Handle the inverter with care during storage and transport; stack a maximum of 4 boxes on top of each other.

If the inverter or related parts must be disposed of, do so in accordance with local waste management regulations. Hand over discarded inverters and packaging material to a specialized company for disposal and recycling.