CSI-350K-T8001A-E

CSI-350K-T8001B-E

CSI-333K-T8001A-E

CSI-333K-T8001B-E

CSI-250K-T8001A-E

PV Grid-Connected Inverter User Manual

(Part No: 91000911; Release Date: March, 2025)

Contents

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This manual provides important safety instructions for the installation, maintenance and use of the grid-connected inverter (hereinafter referred to as inverter) produced by the CSI Solar Co., Ltd. (hereinafter referred to as CSI). Both users and professional installers must read these guidelines carefully and strictly follow these instructions. Failure to follow these instructions may result in death, serious injury or property damage.

Installation and operation of the inverter require professional skills, and only professionals can engage in this work. The installer must inform the end customer (or consumer) of the above matters.

This manual is only valid for the inverter type: CSI-250K-T8001A-E、CSI-333K-T8001A-E、CSI-333K-T8001B-E、CSI-350K-T8001A-E、CSI-350K-T8001B-E.

About this Manual

Due to product version upgrades or other reasons, the content of this manual will be updated regularly. Unless otherwise agreed, this manual is for guidance only. CSI gives no warranty of any kind whatsoever, either explicitly or implicitly, with respect to the information contained herein.

If there is any inconsistency among different language versions of this document, the English version shall prevail. Please refer to our product lists and documents published on our website at: http://www.csisolar.com as these lists are updated on a regular basis.

Limitation of Liability

CSI is not responsible for any form of damage or injury, including but not limited to the operation of the inverter, system installation, physical harm or injury, and property damage resulting from failure to follow the instructions in this manual.

Target Group

This manual is for professional and technical personnel who need to install, operate and maintain the inverter, as well as users who need to view the parameters of the inverter.

Symbol Conventions

To ensure the personal and property safety of users when using the product and to optimize its use, this manual provides relevant information and emphasizes it using the following symbols. The following lists the symbols that may be used in this manual. Please read them carefully to better use this manual.

Symbol	Description
DANGER	Indicates a highly risky hazard that, if not avoided, will lead to fatality or severe bodily harm.
WARNING	Indicates a moderately risky hazard that, if not prevented, could result in fatality or severe bodily harm.
CAUTION	Indicates a low-risk hazard that, if not mitigated, could cause minor to moderate bodily harm.
NOTICE	Indicates a situation that, if not addressed, could result in damage to equipment or property.
Information	Indicates additional information, emphasized contents or tips that may be helpful, e.g. to help you solve problems or save time.

1 Safety Instructions

In the process of product installation, commissioning, operation and maintenance, relevant safety regulations must be observed.

Improper use or misoperation may lead to:

• Risk to the life and personal safety of the operator or third parties.

• Damage to the product or other property belonging to the operator or third parties.

To avoid the above hazards, please strictly follow the safety precautions in this manual.

WARNING	It is strictly prohibited to operate the product under adverse weather conditions such as lightning, rain, snow, strong winds of more than level 6, etc. (including but not limited to handling, installation, electrical connection, power-on, maintenance, and high-altitude operations). In case of fire, evacuate the building or product area and call the fire department. Under no circumstances should you re-enter the burning area. When using tools to fasten products or terminals, please tighten them according to the specified torque, otherwise it may cause product damage. The resulting damage will not be covered by the warranty. Before using tools, please master the correct use of tools to avoid injury and equipment damage.
NOTICE	Please operate the equipment under the conditions of familiarity with this manual and having appropriate tools.
	The safety precautions in this manual do not cover all the norms that should be followed but only serve as a supplement to all safety precautions. It should be combined with the actual situation on site for each work. CSI shall not be responsible for any losses caused by violating general safety operation requirements, safety standards, and safety precautions in this manual. When installing, operating, and maintaining equipment, you should comply with local laws, regulations, and norms. The safety precautions in this manual only serve as a supplement to local laws, regulations, and norms.

1.1 Unpacking Inspection

WARNING	Check all safety markings, warning labels, and nameplates on the product. Before the product is scrapped, its safety markings, warning labels, and nameplates must be clearly visible and cannot be removed or covered.
NOTICE	After receiving the product, check the product's appearance and structural components for damage and verify that the received product matches the actual ordered product. If any issues are found during these checks, do not install it and contact CSI promptly.

1.2 Installation Safety

DANGER	Before installation, please ensure that the product is not electrically connected in any way. If installation requires drilling holes in the wall, please ensure that you have avoided any electrical wiring and plumbing within the wall.
CAUTION	Improper installation may cause personal injury. If the product supports lifting and transportation methods and needs to be lifted by lifting tools, personnel are not allowed to pass or stay under the product. When moving the product, please consider its weight, keep it balanced, and prevent it from tipping or falling.
NOTICE	Before operating the product, please ensure that the tools used have been regularly maintained.

1.3 Electrical Connection Safety

DANGER	Before making electrical connections, please ensure that the inverter is not damaged, as this may pose a danger. Before making electrical connections, please ensure that the inverter and all connected switches are in the "OFF" position to avoid electrical shock hazards.
DANGER	Solar strings exposed to sunlight can generate dangerous voltages. When making electrical connection operations, the operator must wear personal protective equipment. Before touching DC cables, please use a measuring device to ensure that they are voltage free. Follow the safety precautions listed in this manual and related documents. The inverter cannot be connected to solar strings that require positive grounding or negative grounding.

DANGER	There may be lethal high voltages inside the product. When making wiring connections, please use dedicated insulated tools. Pay attention to warning labels on the product and operate according to their safety instructions.
WARNING	Incorrect wiring may cause product damage, and any resulting damage will not be covered by the warranty. Electrical connection operations must be performed by professionals. The cables used in PV power systems must be properly sized, securely connected, and well insulated.
WARNING	Before connecting a DC connector to the inverter, check the positive and negative polarities of the solar strings to ensure they are correct before inserting the DC connector into the corresponding DC terminals. During inverter installation and operation, please ensure that there is no short-circuit between the positive or negative terminals of the solar strings and ground. Otherwise, it may cause AC/DC short-circuiting of the inverter, leading to product damage, which will not be covered by the warranty.
NOTICE	The wiring process must follow the relevant rules of the local power grid and the relevant safety instructions for the solar strings.

1.4 Operation Safety

DANGER	Using cables in high-temperature environments may cause insulation ageing and damage. The cables should be kept at least 30mm away from the heating devices or heat source areas. When the product is operating, please pay attention to the following: • Do not touch the outer casing of the product. • Do not insert or remove any connectors on the inverter. • Do not touch any wiring terminals on the inverter, as there is a risk of electric shock. • Do not disassemble any parts on the inverter, as there is a risk of electric shock. • Do not touch the hot parts of the inverter (such as heat sinks), as there is a risk of burns. • Do not connect or disconnect any strings or components in a string, as this may cause electric shock.

1.5 Maintenance Safety

DANGER	Improper maintenance operations may cause personal injury or product damage. Before performing maintenance operations, first disconnect the AC disconnectors on the grid side, then disconnect the DC switch. If faults that may cause personal injury or equipment damage are found before maintenance operations, please first disconnect the AC disconnectors, wait until nighttime, and then operate the DC switch. Otherwise, it may cause internal fires or explosions in the inverter, leading to personal injury. After the inverter has been powered off for 25 minutes, use testing equipment to check and ensure there is no voltage or current. Wear protective equipment to maintain the inverter. After the product has been shut down, there is still a risk of burns. After the product has cooled down, protective gloves should be worn before operating on it.
DANGER	There is a risk of electric shock when touching the grid or connected contacts and terminals inside the product. The grid side may generate voltage, so use a standard voltmeter to confirm that there is no voltage before touching it.
CAUTION	To prevent misoperation or accidents by unauthorized personnel near the product, please place prominent warning signs or safety barriers around the product.
NOTICE	If paint chips or rust appear on the outer casing of the inverter, please repair them promptly to avoid affecting the use of the inverter. When cleaning the inverter, avoid using cleaning agents that may damage the inverter. Any damage caused by this will not be covered by the warranty. The inverter does not contain any maintenance-related components. Unauthorized persons should not open the inverter cabinet (excluding the wiring box) or replace internal components of the inverter. Any damage caused by this will not be covered by the warranty. To reduce the risk of electric shock, do not perform any other maintenance operations beyond what is described in this manual. If necessary, contact CSI for repairs. Any damage caused by this will not be covered by the warranty.

1.6 Disposal safety

WARNING	Please dispose of products according to local regulations and standards to avoid property damage or personal injury.

2 Product Introduction

2.1 System Introduction

This inverter is a three-phase transformerless grid-connected inverter and is an important component of the PV power generation system.

The inverter converts the DC power generated by the PV string into AC power that meets the grid requirements and feeds it into the grid.

WARNING	The inverter cannot be connected to PV strings that require positive grounding or negative grounding. During the installation and operation of the inverter, please ensure that the positive or negative terminals of the PV string are not short-circuited to the ground. If there is a short circuit, it may cause AC/DC short-circuiting of the inverter, leading to equipment damage. Damage caused by this will not be covered under warranty. Do not connect any local loads except for tracking shafts between the inverter and the AC side circuit breaker. The inverter is only suitable for the scenarios described in this manual and cannot be used for other purposes.
NOTICE	When designing the system, please ensure that all equipment connected to the inverter meets the specifications required by the inverter. The photovoltaic modules used in the system must comply with 61730-1 (2016) Class II.

The typical application scenarios of the inverter are as follows:

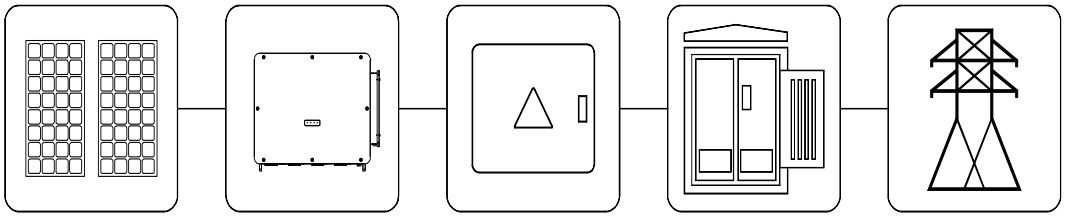
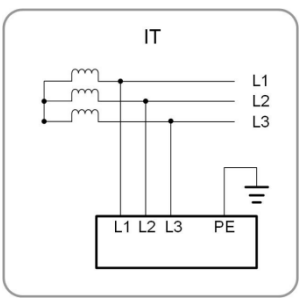


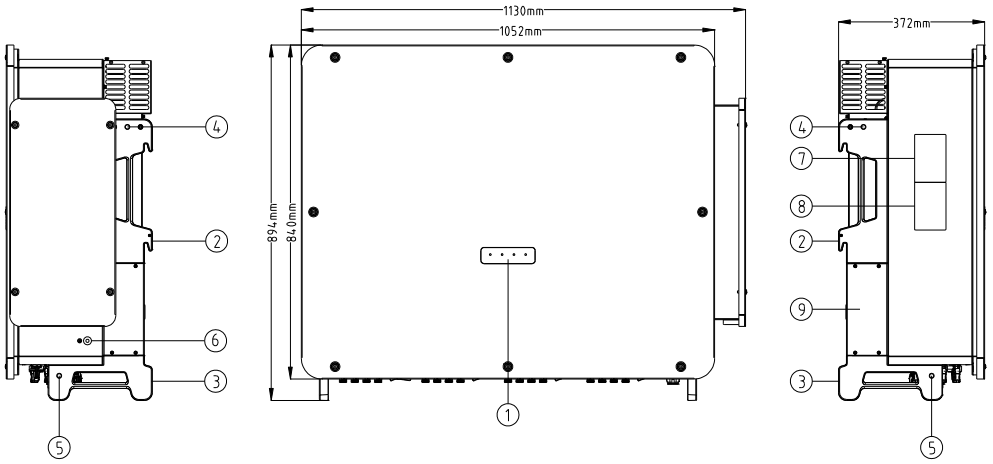
FIG 2-1 Application of PV Grid-Connected Inverters in PV Power Generation Systems

Name	Description	Notes
A	PV string	Monocrystalline silicon, polycrystalline silicon
B	Inverter	CSI-350K-T8001B-E
C	AC distribution box/cabinet	Raises the output voltage of the inverter to a level that meets grid requirements.
D	Substation	
E	Grid	The form of grid supported by the inverter is shown below. 

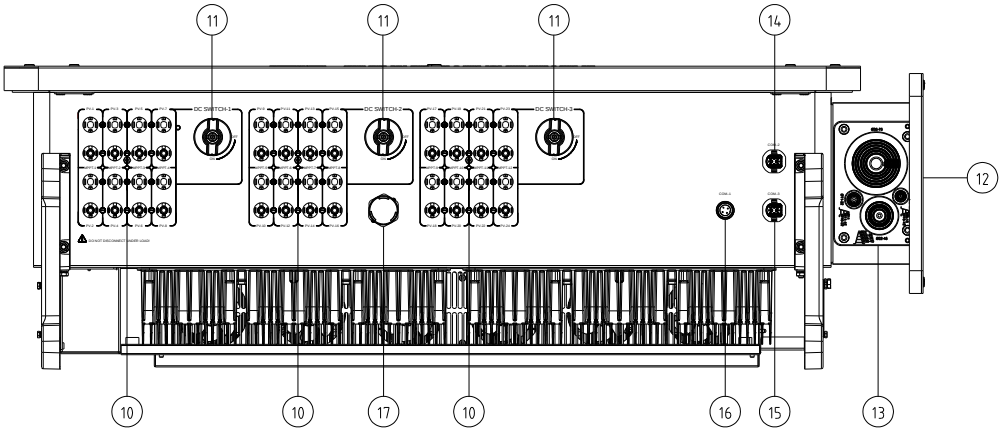
2.2 Product Introduction

2.2.1 Product Appearance

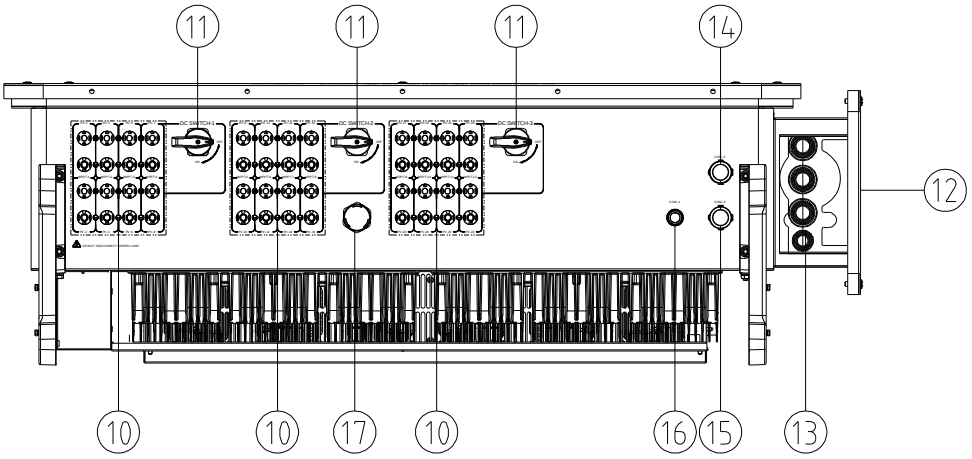
The appearance of the inverter is as follows:



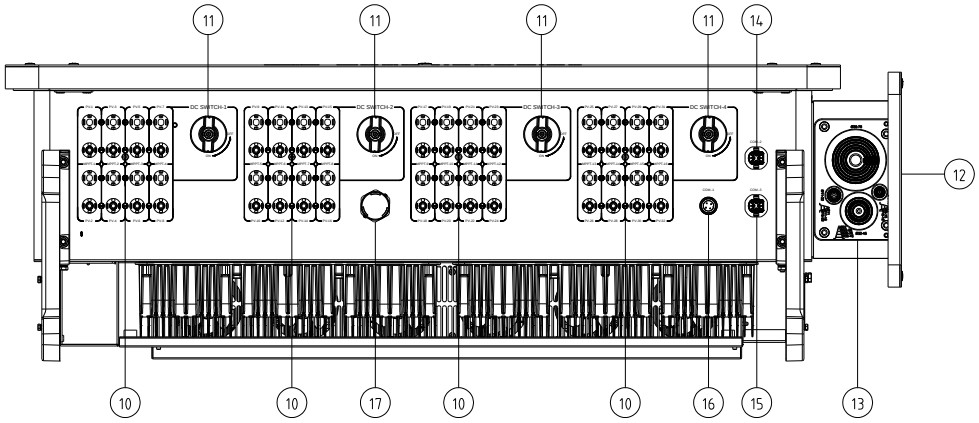
CSI-250K-T8001A-E, CSI-333K-T8001A-E, CSI-350K-T8001A-E (with intelligent switches)



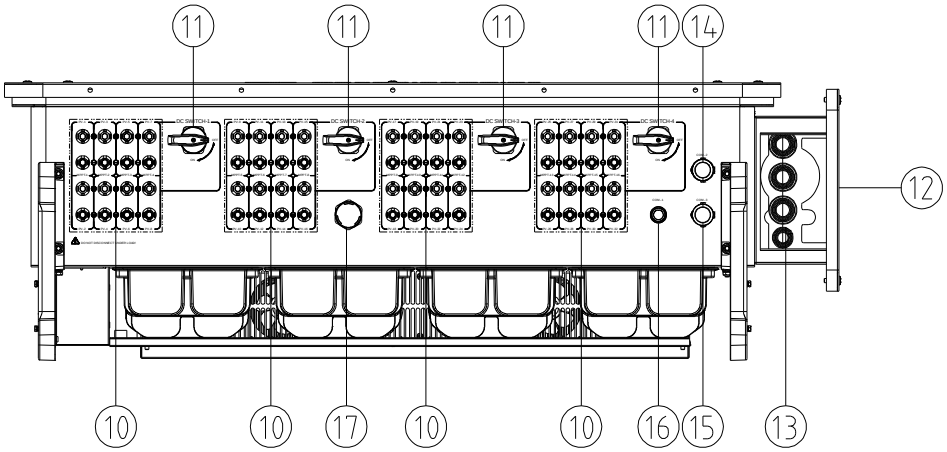
CSI-250K-T8001A-E, CSI-333K-T8001A-E, CSI-350K-T8001A-E (without intelligent switches)



CSI-333K-T8001B-E, CSI-350K-T8001B-E (with intelligent switches)



CSI-333K-T8001B-E, CSI-350K-T8001B-E (without intelligent switches)



1. LED indicator panel
2. Side handles and mounting supports
3. Lower mounting supports
4. M12 holes for lifting eyes or shanks
5. M12 holes for lifting shanks
6. Additional grounding points
7. Nameplate
8. Warning label
9. The cover of the outer fan module
10. DC input connector (24 or 32 pairs)
11. DC switch (3 or 4 pieces)
12. AC wiring box
13. AC output cable gland
14. Dry contact interface
15. RS485 communication interface
16. Communication connector for data logger
17. Breather valve

FIG 2-2 Product Appearance (The picture is for reference only)

2.3 Symbol Description on the Machine Body

Symbol	Description
	Hot surface. Be careful of burns. It may exceed 60℃.
	Before performing maintenance operations on the inverter, all external power connections must be disconnected.
	High voltage danger. This is a dangerous area of electric shock, which may pose a danger to the user's safety. Do not touch it casually.
	After the power is turned off, wait for 25 minutes to ensure that the machine is fully discharged.
	Protective Earthing connection point
	DC (Direct Current)
	AC (Alternating Current)

2.4 DC Switches

The DC switches can safely disconnect the connection between the inverter and the PV string. The inverter, depending on the model, is equipped with either three or four intelligent switches or DC switches, each controlling the corresponding DC terminals, as shown in FIG 2-3.

The DC switch types of this inverter include manual DC switches and intelligent disconnectors. The following diagram is for reference only, and the type and quantity of DC switches should be based on the actual received product.

Manual DC switch:

If the switch is a manual DC switch, you can turn the switch to the "OFF" position to disconnect the DC input.

Intelligent Disconnector:

If the DC switch is an intelligent disconnector, it will automatically trip the disconnection protection of the intelligent disconnector and disconnect the DC input when the equipment detects a reverse connection or an internal inverter fault.

When the inverter trips the automatic disconnection protection of the intelligent disconnector, please refer to "8.2.6 DC Switch Maintenance" for proper handling.

The bottom view of this type of switch is as follows:

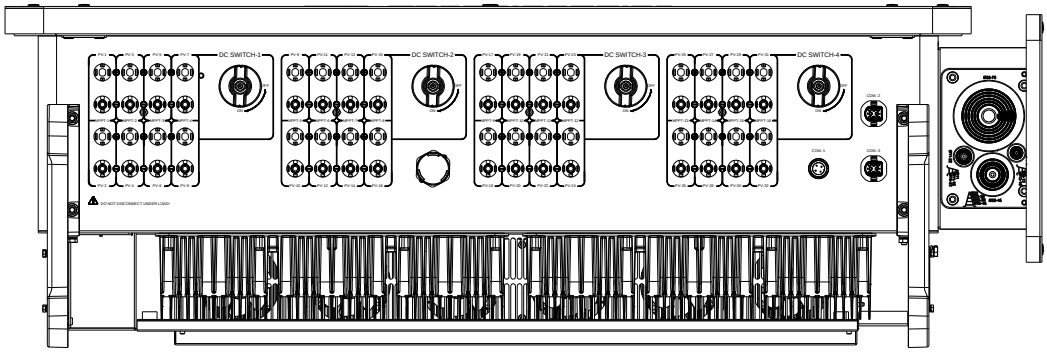


FIG 2-3 DC Input

2.5 Principle Description

The schematic design of the inverter is shown in the figure below:

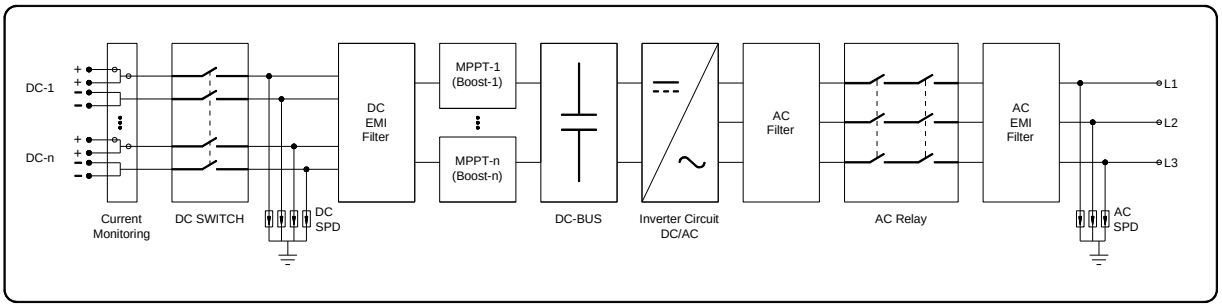


FIG 2-4 Product Topology Diagram

- The DC switch is used to safely cut off the DC current when necessary, ensuring the safe operation of the inverter and personnel safety.
- Through the EMI filter, electromagnetic interference inside the inverter is filtered out, ensuring that the inverter can meet the requirements of electromagnetic compatibility standards.
- The inverter is equipped with multiple MPPTs for DC input, ensuring maximum power even under different PV input conditions.
- The inverter unit converts DC power into AC power that meets grid requirements and feeds it into the grid.
- The AC filter removes high-frequency components of the inverter's output current, ensuring that the output current meets grid requirements.
- The output relay isolates the inverter's AC output from the grid, safely disconnecting the inverter from the grid in the event of an inverter or grid fault.
- Through the AC surge protector (lightning protector), a discharge circuit is provided for the AC side overvoltage energy, preventing damage to the internal circuit of the inverter caused by AC side overvoltage surges.

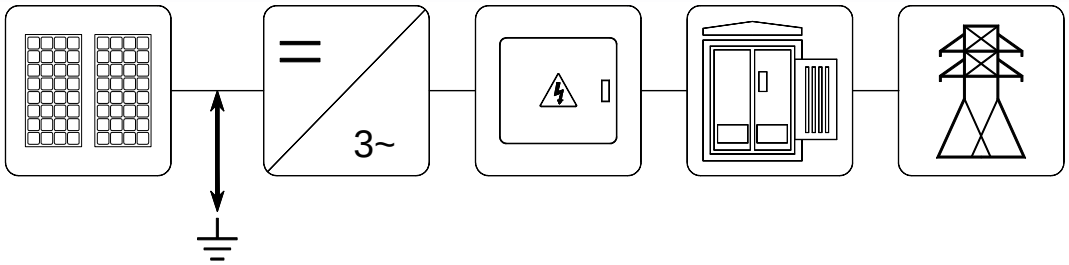
2.6 Functional Description

DANGER	If the surge energy exceeds the protection level of the product, it may cause surge protection, overvoltage protection, etc. to fail, resulting in electric shock and causing fatal injury.

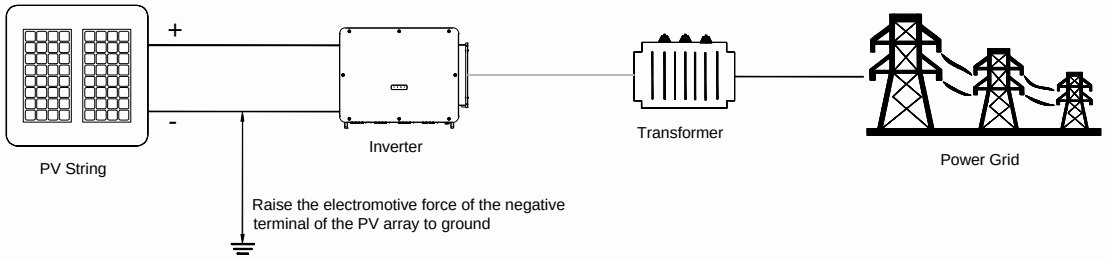
The functions of the inverter can be summarized as follows:
1. Inversion Function
The inverter converts DC power into AC power that meets grid requirements and feeds it into the grid.
2. Data Storage and Display Function
The inverter stores system information, such as operating information and fault records.
3. Parameter Configuration
The inverter provides a variety of parameter configurations, allowing users to configure parameters through a mobile APP to meet various needs or optimize its operating performance.
4. Communication Interface
The inverter provides a standard RS485 communication interface.
The standard RS485 communication interface is used to establish communication with power station monitoring equipment, uploading monitoring data to the monitoring backend through communication cables. After the inverter successfully establishes communication with the communication equipment through the communication interface, users can view relevant information of the inverter or set operating and protection parameters of the inverter through the CSI Smart Energy Platform.
5. Protection Function
The inverter has protection functions such as islanding protection, low voltage ride-through, DC reverse connection protection, AC short circuit protection, leakage current protection, and surge protection.
6. PID (Optional)
The PID phenomenon of PV modules can lead to severe power generation losses. The PID recovery function can repair the adverse effects caused by the PID phenomenon when enabled, and it is applied in scenarios where there is no DC power to the inverter.

The strategies for applying PID recovery function to P-type and N-type solar panels are different.

P-type Solar Panel

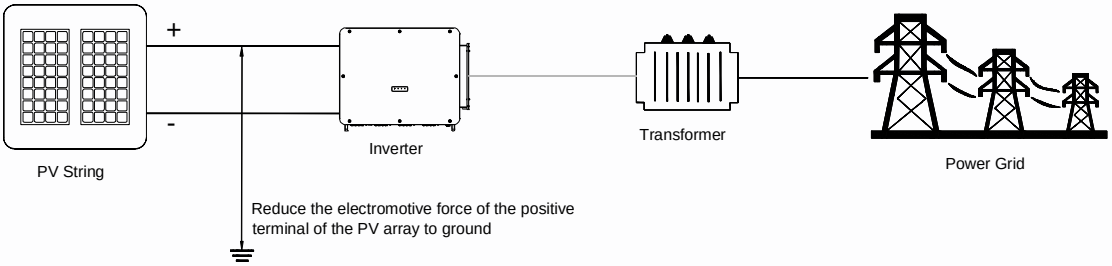


When the PID recovery function is enabled, the potential between the negative pole of the P-type solar panel array and the ground is lifted to 500Vdc through the PID module for PID recovery.



N-type Solar Panel

When designing a power station, power design institutes and users should confirm the compensation voltage direction of the PID recovery of the purchased solar panel with the solar panel manufacturer.



	PID recovery and night SVG functions can be enabled simultaneously but cannot work simultaneously. In an IT system, PID recovery and night SVG functions can work simultaneously. The PID recovery function only works when there is no DC power to the inverter and the PID recovery function is enabled. When the PID recovery function is enabled, the voltage of the PV string components to the ground is defaulted to 500Vdc.
NOTICE	Before enabling the PID recovery function, please note the requirements for the polarity of the voltage to ground for different types of PV modules. If in doubt, please contact the PV module manufacturer or read the module user manual. When the module type does not match the voltage scheme of the PID recovery function, the PID recovery function may not achieve the desired effect and may even have an adverse effect on the solar panel. When the inverter is in PID recovery mode (the communication/maintenance indicator light is flashing slowly in red), the PID recovery function needs to be disabled before manual power-on and maintenance operations can be performed on the inverter.

3 Unpacking and Storage

3.1 Unpacking and Inspection

The equipment has been fully tested and strictly inspected before leaving the factory, but there may still be damage during transportation. Please conduct a detailed inspection before signing for the product.

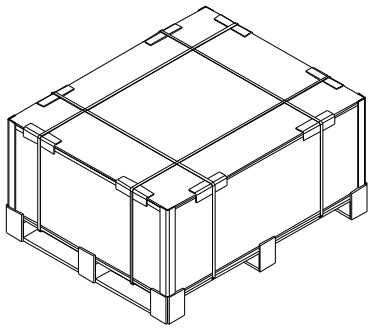
• Check if the outer box is damaged.
• Check if the goods are complete and match the order according to the packing list.
• Open the box and check if all internal equipment are intact.

If there is any damage or incomplete goods, please contact the transportation company or directly contact CSI, and provide pictures of the damaged areas or the names and quantities of missing accessories to facilitate service.
Please do not discard the original packaging of the equipment. It is best to store the equipment in its original packaging after it is shut down and dismantled.

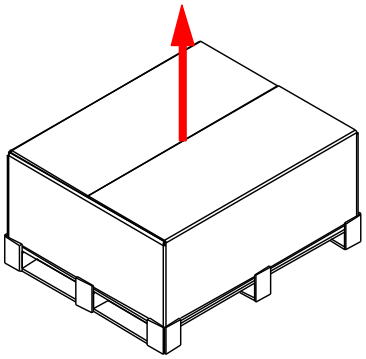
NOTICE	After receiving the product, check if the appearance and structural parts are damaged, and check if the packing list matches the actual ordered product. If there are problems with the above inspection items, please do not install them and contact CSI in a timely manner. If using tools to unpack, be careful with the tools and do not damage the product.

3.2 Unpacking steps:

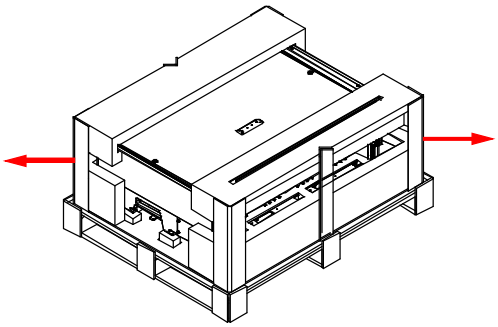
Step 1: Use a craft knife to cut the packing tape. Remove the horizontal and vertical paper corner guards.



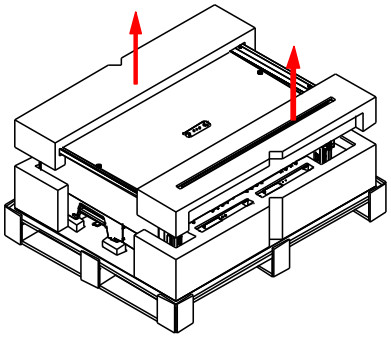
Step 2: Lift off the outer box.



Step 3: Remove the paper corner guards around it.



Step 4: Remove the top cushioning pad.



3.3 Inverter storage

If the inverter is not put into operation immediately, it needs to be stored under specific environmental conditions.

- Use the original packaging box to repackage and keep the desiccant.
- Storage temperature range: -40℃~70℃, relative humidity range: 0~95%, no condensation.
- The number of stacked inverters must not exceed the "stacking limit" marked on the outer box.
- The packaging box cannot be tilted or inverted.
- If the product needs to be transported again, please pack it strictly before loading it onto the vehicle.
- Do not store the product in direct sunlight, places where rain can reach, strong electrical fields, etc.
- Do not place this product with items that may affect or damage it.
- The inverter needs to be stored in a clean and dry place, and protected from dust and moisture.
- Do not store the inverter in places with chemical corrosive substances or infested by insects or rodents.
- Regular inspection: at least once every six months. If any signs of insect or rodent infestation are found, the packaging materials need to be replaced in a timely manner.
- If the storage time of the inverter is more than one year, it needs to be inspected and tested by professionals before it can be put into operation.

⚠ NOTICE	Please store the product according to the storage requirements. Any product damage caused by storage conditions not meeting the requirements will not be covered by the warranty.

3.4 Product Nameplate

The inverter can be identified by the nameplate on its left side. The nameplate contains information about the model, important technical parameters, and relevant certification marks of the inverter.

CanadianSolar

Product Name:	Grid-connected PV Inverter
Model Number:	CSI-350K-T8001B-E
Vmax. PV (absolute max.):	DC 1500V
MPPT Voltage Range:	DC 500-1500V
Max. Input Current:	DC 16 x 32A
Isc PV (absolute max.):	DC 16 x 60A
Rated Output Power:	350kW
Max. Output apparent Power:	352kVA
AC Nominal Voltage:	3/PE ~ 800V
AC Nominal Frequency:	50/60Hz
Max. Output Current:	AC 254A
Power Factor:	0.8 leading...0.8 lagging
Protection Class:	I
Overvoltage Category:	II(DC), III(AC)
Degree of Protection:	IP66
Operating Temperature Range:	-30℃...+60℃

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CSI Solar Co., Ltd.
No.199 Lushan Road, SND, Suzhou, Jiangsu, China

WARNING: Electric Shock Hazard!
DC conductors of the photovoltaic system are generally ungrounded and may carry lethal voltage. They will be intermittently grounded without indication when the inverter measures the PV insulation resistance.

CAUTION: Risk of Electric Shock!
Do not remove the cover.
No user serviceable components inside.
Maintained by qualified personnel only.
(a) Both AC and DC wiring terminals are inside the device.Disconnect each circuit before maintenance.
(b) Once exposed to sunlight, the PV array will generate voltage.

25min

CAUTION: Risk of electric shock from energy stored in the capacitors. Do not service the device until 25 minutes after disconnecting all supply sources.

CAUTION: Beware of Burning!
Hot surface. Do not touch the running device.

CAUTION:
Read the manual before operation and maintenance.

3.5 Supply Range

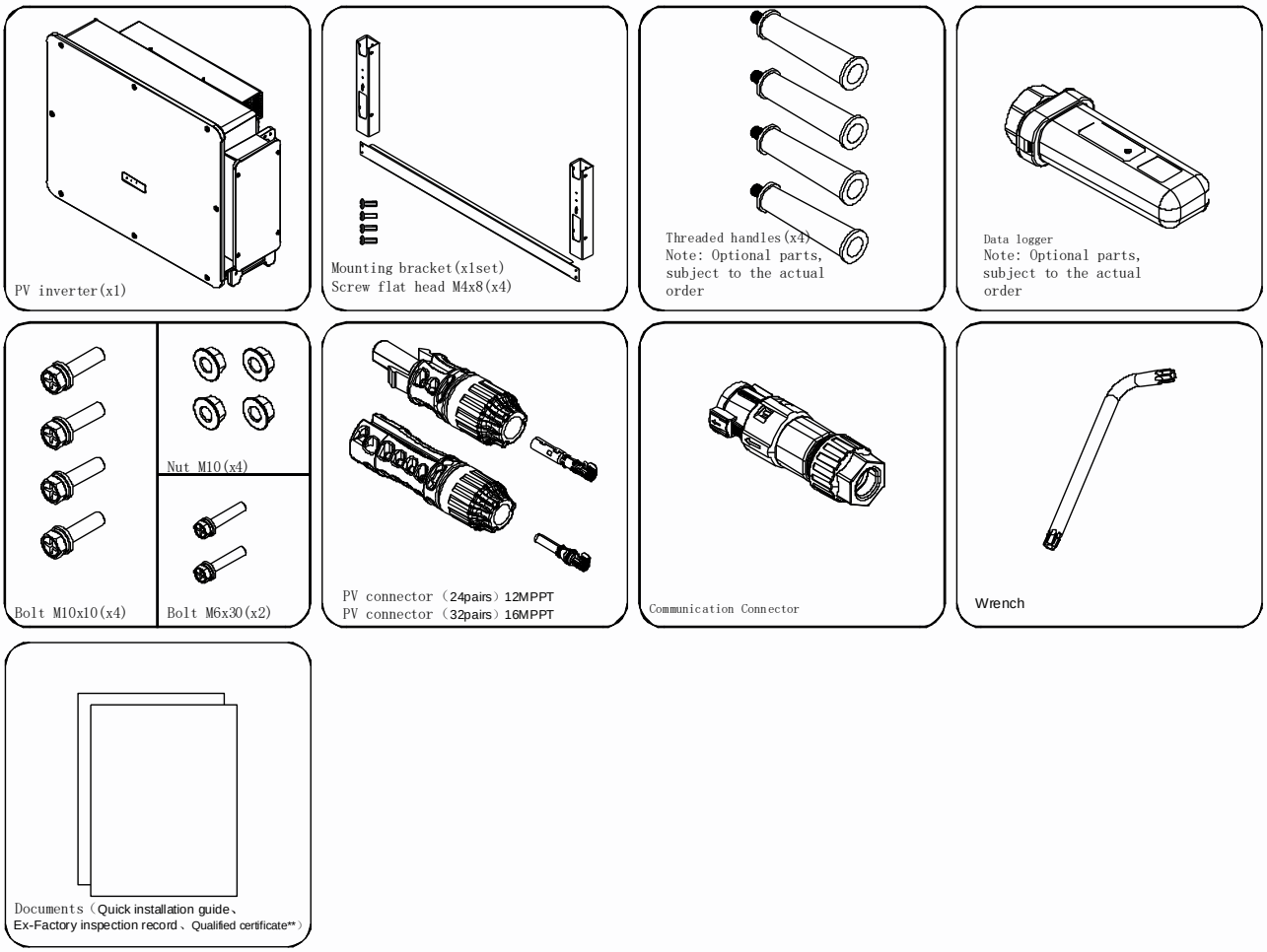


FIG 3-1 Supply Range Diagram (Actual configuration shall be subject to the packing list.)

4 Mechanical installation

4.1 Installation Precautions

DANGER	Before installation, please make sure that the product is disconnected from any electrical connections.
WARNING	Poor installation environment may affect the performance of the inverter system! • Please install the product in a well-ventilated environment. • Make sure that the product's heat dissipation system or ventilation ports are not blocked. • Ensure that the power and water lines inside the wall have been avoided at the drilling site. • Do not install the product in a flammable, explosive, or smoke-filled environment.
CAUTION	Improper installation operations may cause personal injury! • When handling the inverter, please consider its weight, maintain balance to prevent it from tipping over or falling. • When operating on the inverter, please wear appropriate protective equipment. • The bottom terminals and interfaces of the inverter cannot be directly touched by the ground or other supporting objects, and the inverter cannot be placed directly on the ground.
NOTICE	During installation, it should be ensured that the installation of each device in the system will not affect the operation of DC switches and AC circuit breakers, and the operation of maintenance personnel. During installation, if drilling is required: • Please wear safety glasses and protective gloves. • Please cover the product to prevent debris or dust from falling into the product.

4.2 Selecting an Installation Location

Choosing the best installation location for the inverter plays a very important role in ensuring its safe operation, longevity, and performance.

• The inverter has an IP66 protection rating and can be installed indoors or outdoors.

• The installation height of the inverter should facilitate observation of the LED indicator panel and electrical connections, operation and maintenance.

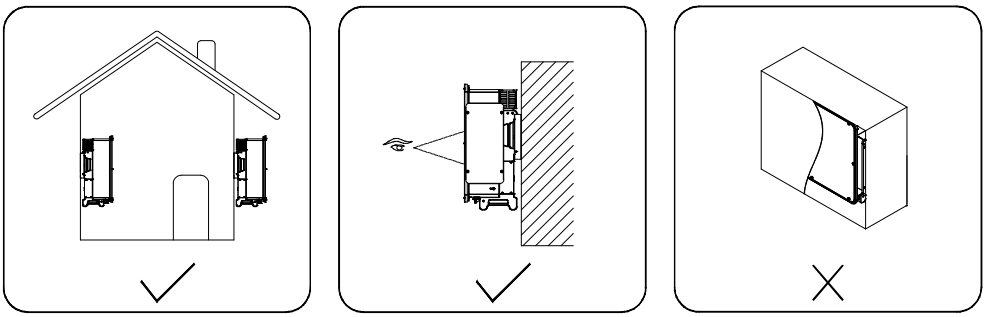


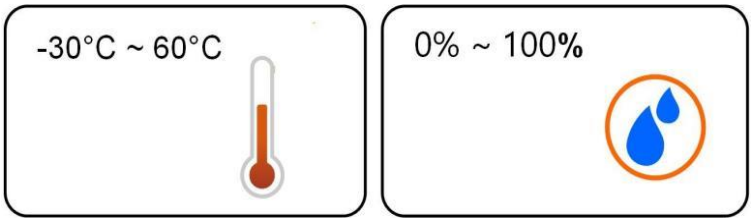
FIG 4-1 Installation site

4.2.1 Environmental Requirements for Installation

• The installation environment must be free of flammable or explosive materials.

• It cannot be installed where children can reach it.

• The temperature and humidity should meet the following requirements:



• If the inverter is installed outdoors in a salt-affected area, please consult with CSI. Salt-affected areas mainly refer to coastal areas within 500m of the coast. The amount of salt spray deposition is related to the characteristics of adjacent sea water, sea winds, precipitation, air humidity, terrain, and forest coverage, and there are significant differences.

• If the inverter is installed in a place with dense vegetation, please conduct regular weeding. Additionally, modifications need to be made to the ground below the inverter, such as laying concrete or stones (with a recommended area of 3m×2.5m).

• The inverter should be installed in a sheltered place to avoid direct sunlight or severe weather (such as snow, rain, lightning, etc.). If the inverter is installed in a place with direct sunlight, the inverter has self-protection and power reduction functions in high-temperature environments. As the temperature increases, power may be reduced.

• The inverter is strictly prohibited from being installed in environments with strong vibrations or strong electromagnetic fields.

• It is very important to ensure good ventilation and heat dissipation for the inverter. Please install the inverter in a well-ventilated environment.

• The inverter will produce some noise during operation, so it is not recommended for installation in living areas.

• The inverter should be installed at a distance of more than 10m from third-party wireless communication facilities and residential areas.

4.2.2 Structural Requirements

The installation carrier should meet the following requirements:

- Made of non-inflammable materials;
- Load bearing capacity > 4 times of inverter weight.

4.2.3 Installation Angle Requirements

It is recommended to install the inverter vertically or at a slight backward tilt. It should not be installed with a forward tilt, inverted, horizontal, excessively backward tilt, or sideways installation.

The installation with a backward tilt is not suitable for floating power stations.

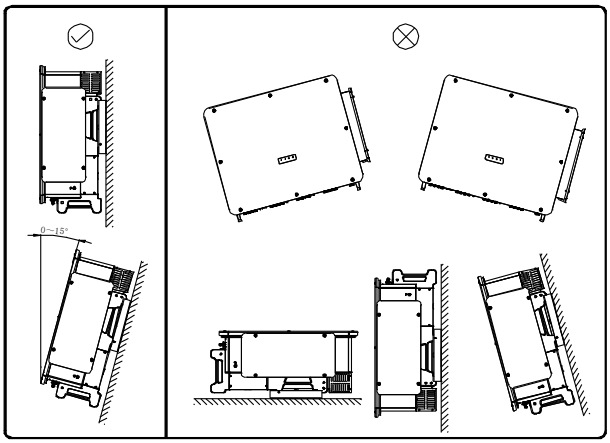


FIG 4-2 Installation Angle

4.2.4 Installation Space Requirements

Ensure that there is sufficient space around the inverter to ensure proper ventilation. The installation space required for a single inverter is as shown below.

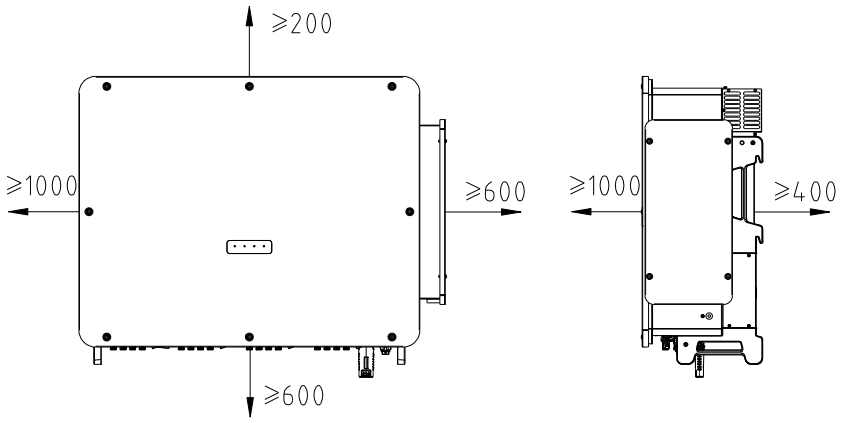


FIG 4-3 Single inverter clearance

* Fan maintenance is on the left side of the inverter, requiring a larger gap. If the side gap is less than 800mm, please first remove the inverter from the installation bracket or wall before conducting fan maintenance.

When installing multiple inverters, it is necessary to leave a certain spacing between them, and it is recommended to install them in a straight line.

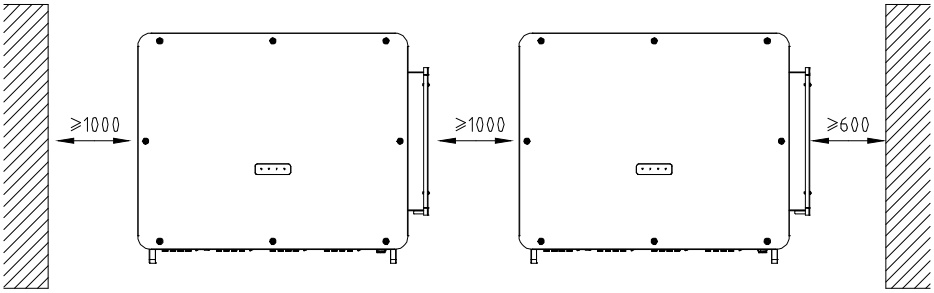


FIG 4-4 Multiple inverters clearance

4.2.5 Back-to-back installation

When installing two inverters back-to-back, the spacing between them should be at least 500mm. A barrier plate needs to be added between the two devices to form a heat dissipation channel. The barrier plate should be placed horizontally between the two inverters and should not block the air intake and exhaust ports of the inverters.

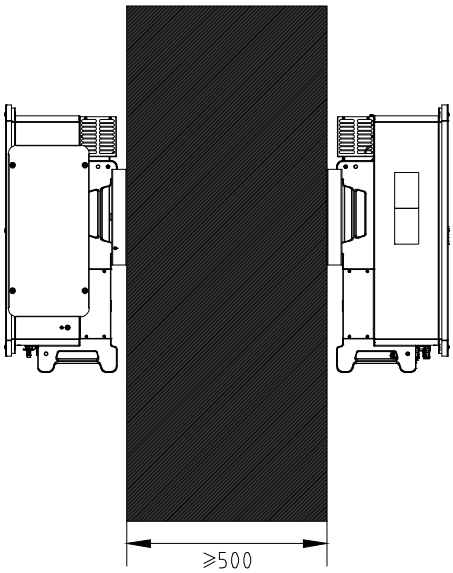
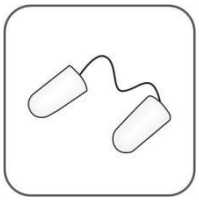


FIG 4-5 Back-to-back installation

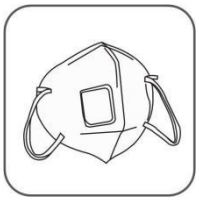
4.3 Installation Tools

The installation tools include but are not limited to the following recommended tools. If necessary, other auxiliary tools can be used on site.

Protective glasses



Noise-canceling earplugs



Dust masks

Safety gloves

Safety shoes

Tool knives

Pliers

Impact drills (φ12)

Cross screwdriver (PH2 PH00)

Marker pen

Open-end wrenches (16mm, 35mm)

Electric drill (φ12)

Rubber hammer

Socket sets (#7, #10, #13, #16, #19)

Spirit level

Anti-static wrist strap

Wire cutter

Wire stripper

Hydraulic plier

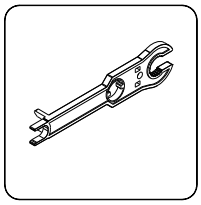
Heat gun

Wire crimper (4~6mm^2)

Multimeter (≥1500 Vdc)

Vacuum cleaner

Scissor



Spanner

Hex wrench (T30)

4.4 Transporting Inverters

When transporting inverters, you can choose manual or lifting methods based on the site conditions.

⚠ CAUTION	The improper handling operation may cause personal injury! • When handling the inverter, please arrange appropriate number of installation personnel according to the weight of the inverter, and the installation personnel need to wear protective equipment such as protective boots and gloves. • During the handling process of the inverter, please always pay attention to the center of gravity of the inverter to avoid it from being tilted. • If the inverter is directly placed on a hard ground, it will cause damage to the metal shell. It is necessary to lay a pad of sponge or foam and other protective materials under it. • When handling the inverter, please use the handle on the product, and do not use the terminals of the product as a grab.

4.4.1 Manual handling

Fix the four threaded handles (optional) on the ears and base of the inverter. Lift and move the inverter to the destination by using the bottom handle and the four installed handles.

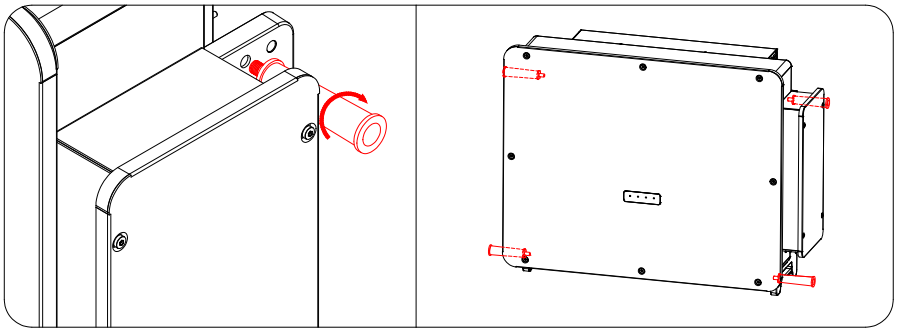


FIG 4-6 Handling Hole Positions

⚠ NOTICE	When handling the inverter, do not remove the buffer pad to avoid damage to the outer casing or bottom terminals. It is recommended that at least two installation personnel lift and move the inverter together, and wear protective equipment such as protective boots and gloves.

4.4.2 Lifting and handling

Tools required:

Name of parts	Requirements	Source
Crane	lifting capacity ≥180 kg	provided by user
Hoist rings	2 M12 hoist rings, lifting capacity ≥260 kg	provided by user
Hoisting rope	1, length ≥2.5 m, lifting capacity ≥600 kg	provided by user

Step 1: Securely fasten two M12 threaded hoist rings to the back panel of the inverter.
Step 2: Thread the rope through both hoist rings and securely tie them.
Step 3: Use the lifting equipment to lift the inverter approximately 100mm off the ground, then pause to check the tightness of the hoist rings and rope. After confirming that the connection is secure, lift the inverter to the destination.
Step 4: Remove the hoist rings.

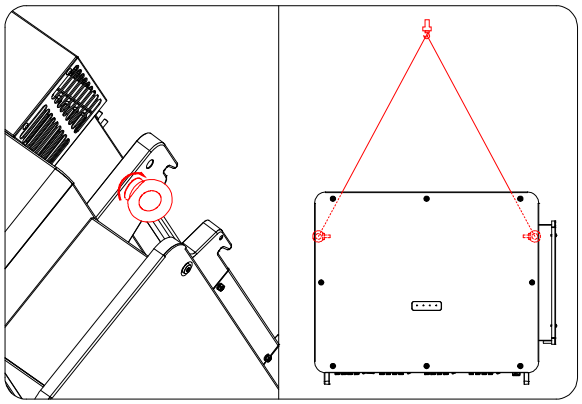


FIG 4-7 Lifting and Handling Schematic

CAUTION	Always maintain balance when lifting the inverter to avoid collisions with walls or other obstacles. If severe weather conditions such as heavy rain, fog, strong winds, etc., are encountered, lifting work should be stopped.
	Hoist rings and hoisting rope are not included in the scope of supply.

4.5 Installation of mounting brackets

Use mounting brackets to install the inverter on brackets, walls, and pillars. Dimensions of the assembled mounting bracket are as follows.

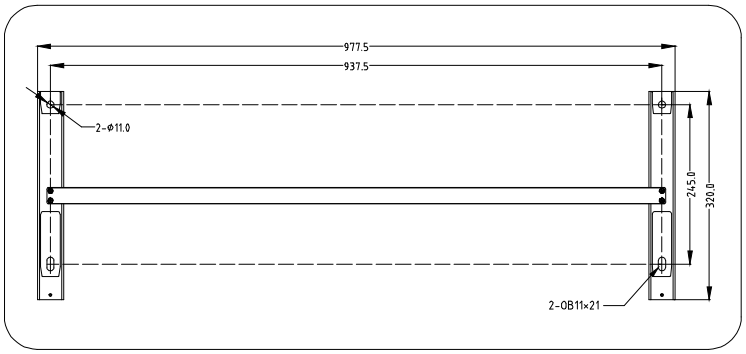


FIG 4-8 Dimensions of the Mounting Bracket

4.5.1 Standard C or U Steel Installation

Installation steps:
Step 1: Select the installation hole position for the C-shaped steel or U-shaped steel.
Step 2: Use the M10 bolts and nuts provided in the packaging box to fix the mounting bracket.

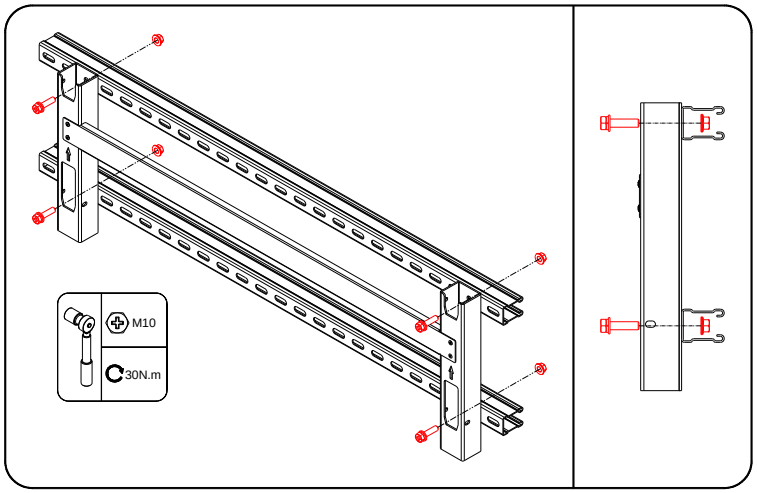


FIG 4-9 Locate the Mounting Hole

4.5.2 Installation on steel frames

Installation steps:

Step 1: Place the assembled mounting bracket on the steel frame, adjust the angle using a level, and mark the drilling position. Drill the holes using an electric drill. Recommended hole diameter is 12mm.

Step 2: Use the M10 bolts and nuts provided in the packaging box to fix the mounting bracket.

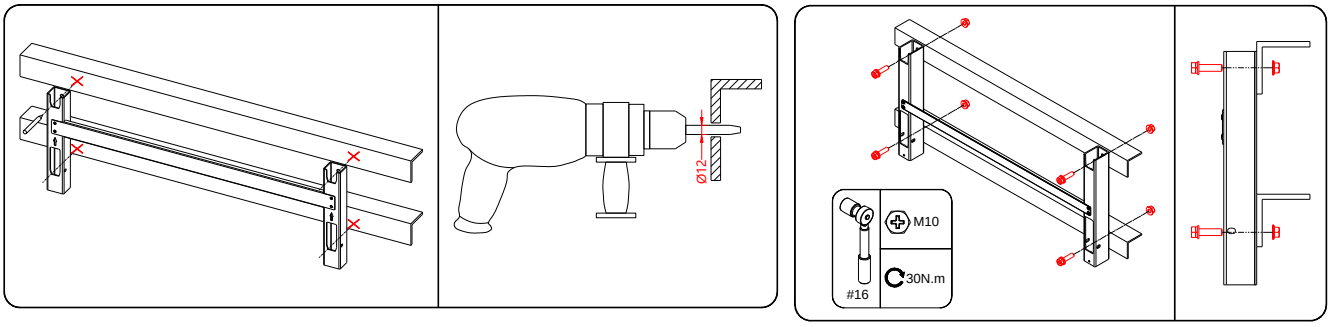


FIG 4-10 Install the Wall Bracket

4.5.3 Installation on walls

Installation steps:

Step 1: Place the assembled mounting bracket at the installation point, adjust the angle using a level, and mark the drilling position.

Step 2: Drill the hole using an impact drill, clean out the hole, insert an expansion bolt into the hole, and secure it using a rubber hammer. Use a wrench to tighten the nut to secure the bolt tail, remove the nut, spring washers, and flat washers for backup.

Step 3: Secure the mounting bracket using expansion bolts. (Note: Expansion bolts are not provided.)

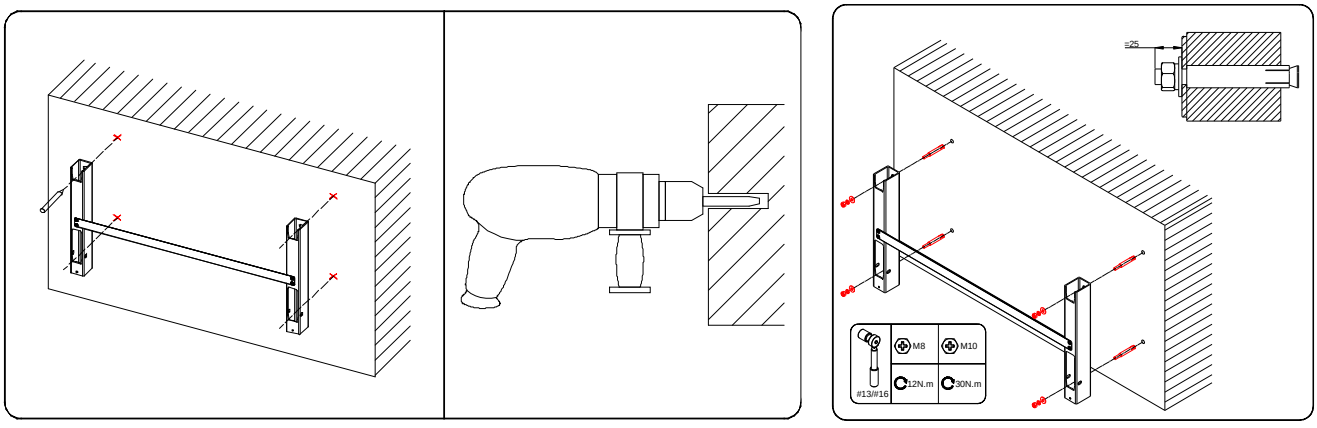
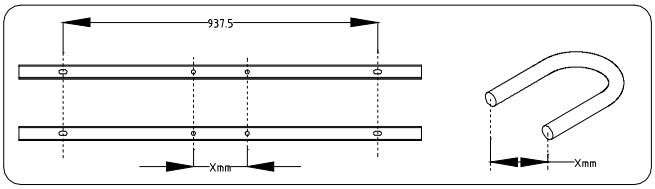


FIG 4-11 Installing the Mounting Bracket

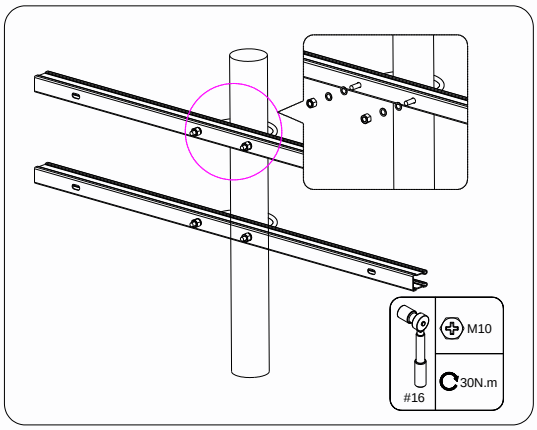
4.5.4 Installation on pillars

Step 1: Bury the pillar at the installation location. (If it is necessary to install the inverter on a cement column, a PV bracket etc., skip this step.)

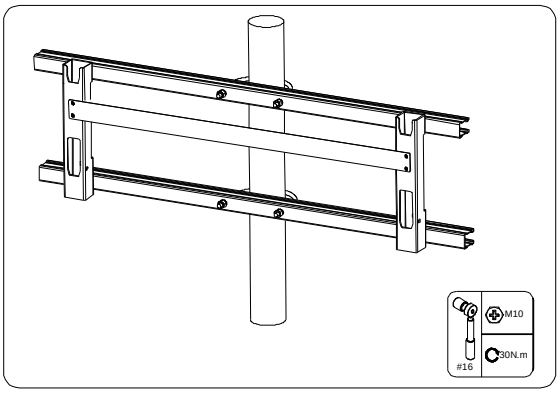
Step 2: Place the assembled mounting bracket on the U-shaped steel or C-shaped steel, adjust the angle using a level, mark the drilling position and drill the hole.



Step 3: Use bolts and clamps to fix the U-shaped steel or C-shaped steel to the pillar.



Step 4: Use bolts and nuts to fix the mounting bracket to the U-shaped steel or C-shaped steel.



4.6 Installing the Inverter

Step 1: Remove the inverter from its packaging.
Step 2: If the installation location is high, you need to lift the inverter onto the mounting bracket (see the "Lifting and handling" section in the user manual for details). Otherwise, skip this step.
Step 3: Lift the inverter onto the mounting bracket and make sure the lugs fit well into the groove of the bracket.
Step 4: Secure the mounting bracket with two M6x30 screws. (Note: The screws are not locked in place. They are simply screwed in all the way.)

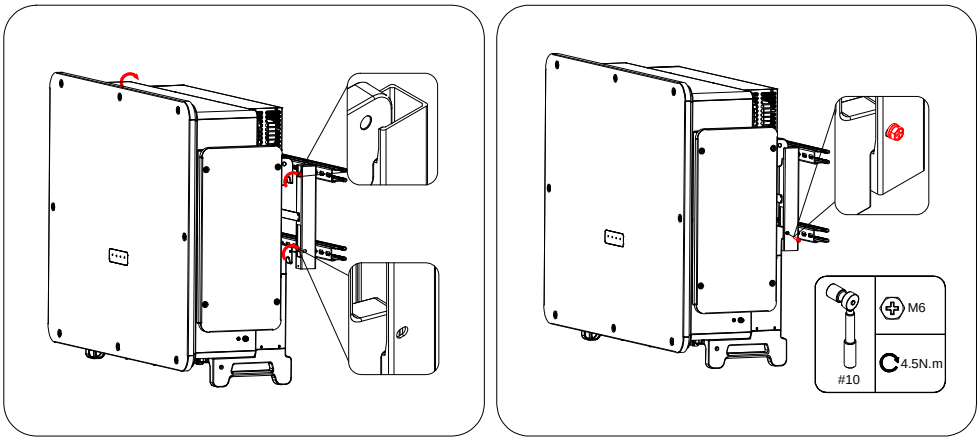


FIG 4-12 Installing the Inverter

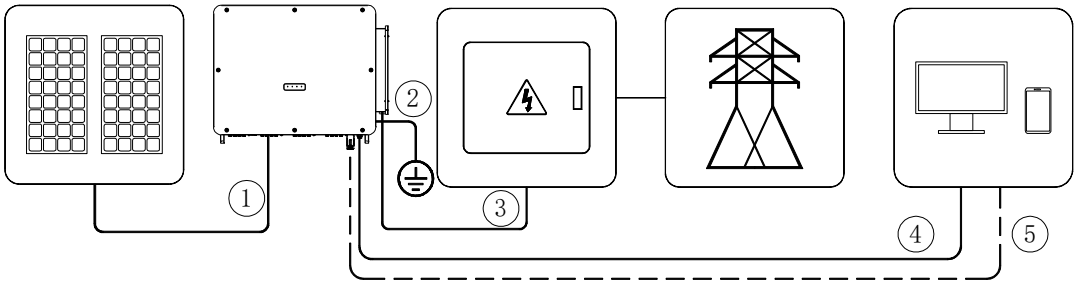
5 Electrical Connection

5.1 Safety Precautions

DANGER	PV strings exposed to sunlight can generate dangerous voltages! • When performing electrical connection operations, the operator must wear personal protective equipment. • Before touching DC cables, please use measuring equipment to ensure that the cables are voltage free. • Follow the safety precautions listed in this manual and related documents.
DANGER	Before making any electrical connections, make sure that the inverter and all the connected switches are in the "OFF" position, otherwise it may lead to electric shock hazards! Before starting electrical work, please ensure that the inverter is undamaged and all cables are voltage free. During the electrical connection work, ensure that the AC circuit breaker cannot be closed.
WARNING	The grounding conductor cannot be damaged, and the product cannot be operated before installing the grounding conductor, otherwise it may cause personal injury or product damage. Please choose a measuring device with a suitable range. Overvoltage can cause damage to the measuring device, leading to personal injury!
WARNING	Incorrect wiring may cause product damage, and any damage caused by this will not be covered under warranty. • Electrical connection operations must be performed by professionals. • When performing electrical connection operations, the operator must wear personal protective equipment. • The cables selected for photovoltaic power systems must have appropriate specifications, be well-connected and well-insulated. • Factors that affect cable selection include: rated current, cable type, installation method, ambient temperature, and maximum expected line loss.
NOTICE	All electrical connections must meet local and national/regional electrical standards. • The cables selected by users should comply with local legal and regulatory requirements. • The inverter can only be connected to the grid after obtaining approval from the power department of the host country/region.
NOTICE	When making electrical connections, priority should be given to connecting the protective ground wire. When removing the inverter, the protective ground wire should be removed last. The wiring process must follow the relevant rules of the local grid and the relevant safety instructions for PV strings.
NOTICE	The conductor pressure piece of the cold-pressed terminal should completely cover the wire core after pressure connection, and the wire core should be tightly and securely attached to the cold-pressed terminal without any loosening. Please be careful when using a heat gun to prevent burns on equipment. Before connecting power lines (such as AC cables, DC cables, etc.), please confirm that the power line labels are correctly labeled before making the connection. When laying communication cables, please separate the communication cables from the power cables and avoid large interference sources to prevent signal interference that may affect communication. All unused terminals must be covered with waterproof caps to prevent affecting the product's protective rating. Please ensure that the AC output line is securely connected, otherwise it may cause problems such as abnormal operation of the inverter or damage to the AC connector after operation. After completing the wiring, please use fire-resistant mud or other fire-resistant/waterproof materials to seal the gaps around the inverter's input and output holes to prevent foreign objects or moisture from entering and affecting the long-term normal operation of the inverter.
	The cable colors in this manual are for reference only. Please select cables according to local cable standards.

5.2 General Electrical Connection

Connecting the inverter to the PV system, which includes: external protective ground connection, grid connection, and PV string connection.



①PV Cable ②Secondary Ground Cable ③AC Cable ④Tracking System Power Cord ⑤Communication Cable

FIG 5-1 General Electrical Connection

Table 5-1 Cable Requirements

(S is the cross-sectional area of the AC cable conductor, Sp is the cross-sectional area of the grounding cable conductor)

Serial number	Name	Type	Cross-sectional area of the conductor	Outer diameter
1	PV Cable	PV cable meeting 1500V standard	4~6mm² (10mm² optional)	6~9mm
2	Secondary Grounding Cable	Outdoor single-core copper wire	Same as the ground wire of the AC cable, reference also to local requirements	/
3	AC Cable	Recommended outdoor single-core copper wire or aluminum wire*Note (1)	①Copper wire S: 150mm~400mm²; Sp≥S/2 ②Aluminum alloy wire or copper clad aluminum wire： S: 150mm²~400mm²; Sp≥S/2	20mm~38mm
		Outdoor multi-core copper wire or aluminum wire*Note (1)	①Copper wire： S: 150mm²~400mm²; Sp≥S/2 ②Aluminum alloy wire or copper clad aluminum wire： S: 150mm²~400mm²; Sp≥S/2	35mm~75mm
4	Tracking System Power Cord	Double-layer protected three-core outdoor copper wire cable and M4 OT terminal	10mm²	15mm~18mm
5	Communication Cable	485 Communication Cable	0.2~1.0mm²	4.5mm~6.5mm* Note（2）
6	Wireless Communication	/	/	/

Note:

(1) When using aluminum wire, copper-aluminum transition terminals are required. Please refer to "Requirements for Aluminum Conductors".

(2) If a thicker communication cable is required, please contact your local dealer or CSI.

Table 5-2 PE Wire Requirements

Cross-sectional area requirements for the phase conductor	Cross-sectional area requirements for the PE wire	Notes
S＞35mm²	S/2	Only applies when the ground and phase conductors have the same material. If the materials are different, the equivalent conductivity of the PE wire must be consistent with the requirements in the table.

Table 5-3 Tracking System Power Cable Requirements

Name	Type	Cross-sectional area of the conductor	Outer diameter	Voltage rating
Tracking system power cord	Outdoor double-core or three-core copper wire	2 or 3×4~10mm²	15~18mm	Consistent with AC cables

5.3 Aluminum Conductor Requirements

If aluminum wire is selected, copper-aluminum transition terminals must be used to avoid direct contact between copper busbars and aluminum wire.

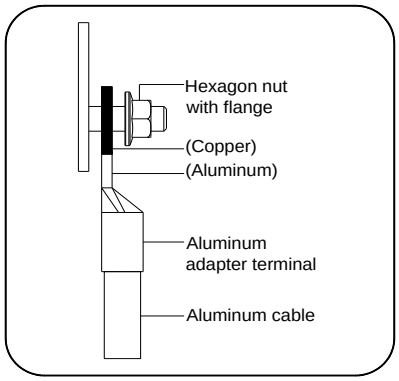


FIG 5-2 Order of Connection of Aluminum Conductor Terminal

NOTICE	Please ensure that the selected terminals can be directly connected to the copper busbars. If in doubt, contact the terminal manufacturer. Please ensure that there is no direct contact between the copper busbars and aluminum wire, as it may cause chemical corrosion and affect the reliability of the electrical connection.

5.4 External Protective Ground Connection

DANGER	Danger of electric shock! • Please confirm that the ground wire is connected securely to avoid the danger of electric shock.
WARNING	As the inverter is transformerless, the positive and negative terminals of the PV string cannot be grounded. Otherwise, it may cause the inverter to malfunction. Perform the external protective ground connection before making AC connections, PV string connections, and communication connections. The external grounding protection point provides a guarantee of reliable grounding. Do not use inappropriate grounding conductors, as it may cause product damage or personal injury.
WARNING	The external protective ground terminal must meet at least one of the following requirements: • When the ground wire cross-sectional area is greater than or equal to 10 mm^2 (copper) or 16 mm^2 (aluminum), it is recommended to ground both the external protective ground terminal and the AC ground terminal. • When the ground wire cross-sectional area is less than 10 mm^2 (copper) or 16 mm^2 (aluminum), please ensure that both the external protective ground terminal and the AC ground terminal are grounded. If other grounding methods can meet local standards and relevant safety regulations, they can be used according to local standards and regulations. In case of any consequences, CSI assumes no responsibility.

5.4.1 External Grounding Requirements

In the PV power generation system, all non-current-carrying metal components and equipment housings should be grounded (e.g., PV brackets, inverter housings, etc.).
The external protective ground terminal of a single inverter requires near-end grounding.
When multiple inverters are used, connect all inverters' external protective ground terminals and PV brackets' grounding points to the equipotential line (specific operation depends on site conditions) to ensure an equipotential connection.

5.4.2 Wiring Steps

Step 1 Prepare cables and crimp OT/DT terminals.
Step 2 Remove the bolt on the external grounding point (i.e., the secondary grounding point) and use a torque wrench to secure the cable terminal.
Step 3 Apply paint to the grounding terminal to ensure corrosion resistance.

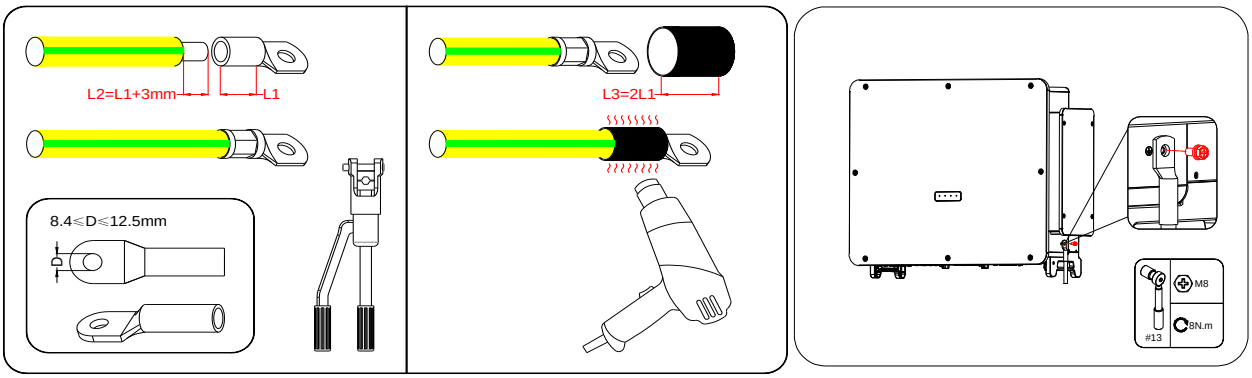


FIG 5-3 PE Cable Installation

	There are two external protective ground terminals. Choose one for grounding.

5.5 AC Side Connection

5.5.1 AC Side Requirements

	Only when obtaining the grid connection permission from the local power company can the inverter be connected to the grid.

Before connecting to the grid, ensure that the grid voltage and frequency meet the requirements of the inverter. Otherwise, contact the power company for assistance. Detailed parameters are provided in "Technical Data".

AC Circuit Breaker

WARNING	Please install overcurrent protection devices (such as AC circuit breakers, fuses, etc.) on both the AC side and grid side of the inverter to ensure safe disconnection of the inverter and grid. • Do not connect local loads except for tracking axes between the inverter and AC circuit breaker. • Multiple inverters cannot share a common AC circuit breaker.

Table 5-4 Recommended AC Circuit Breaker Specifications

Inverter	Recommended Rated Voltage	Recommended Rated Current
CSI-350K-T8001A-E	800 V	400 A
CSI-350K-T8001B-E	800 V	400 A
CSI-333K-T8001A-E	800 V	320 A
CSI-333K-T8001B-E	800 V	320 A
CSI-250K-T8001A-E	800 V	250 A

Multiple Inverters Parallel Requirements

When multiple inverters are connected in parallel to the grid, it should be ensured that the maximum parallel connection of individual windings on the transformer substation is 15 inverters. Otherwise, please contact CSI for technical confirmation.

5.5.2 Wiring Steps (inverters with intelligent switches)

Step 1: Turn off the AC side circuit breaker and prevent it from being connected accidentally.
Step 2: Remove the upper cover of the junction box as shown in FIG 5-4.
Step 3: If necessary, remove the sealing plate from the junction box for wiring.
Step 4: Cut the corresponding tower-shaped sealing ring on the sealing plate according to the cable specifications, referring to FIG 5-5.
Step 5: Pass the unstripped AC cable through the sealing plate, as shown in FIG 5-6.

Step 6: Peel off a certain length of cable insulation sheath and core wire insulation layer according to the distance between the terminal and the sealing plate in FIG 5-6.
Step 7: Process the cable cores: select suitable terminal blocks (recommended types DT or DTM) -> crimp terminals -> use heat shrink tubings, as FIG 5-6.
Step 8: Remove the nuts from the AC terminal block and the internal grounding point. Install the AC cable in the corresponding position, ensuring a tight connection, as shown in FIG 5-6.
(Note: Connect the internal grounding wire first, followed by the phase wire.)
Step 9: Reinstall the sealing plate and the upper cover of the junction box, as shown in FIG 5-7.

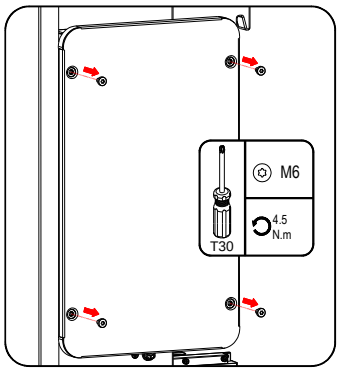


FIG 5-4 Remove the Upper Cover of the Junction Box

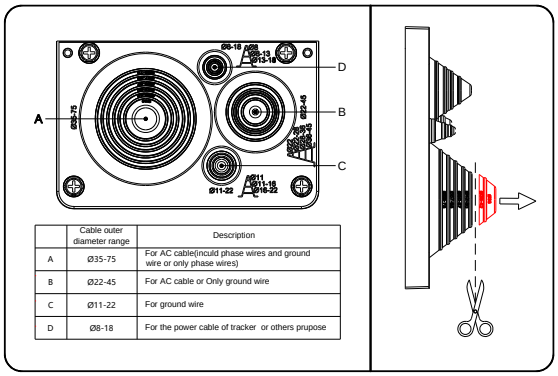


FIG 5-5 Functional Zones of the Sealing Plate and Sealing Ring Cutting

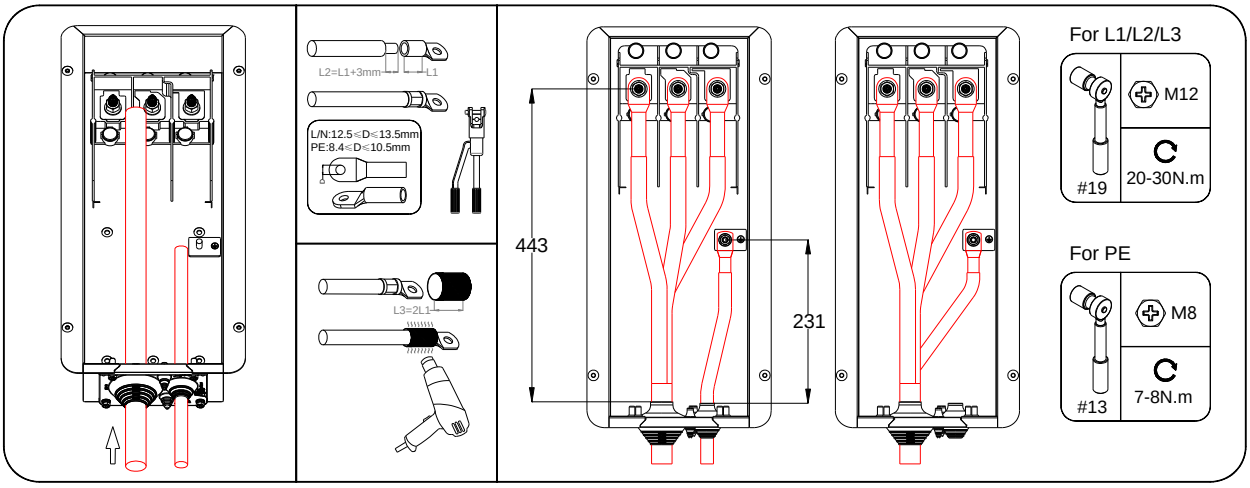


FIG 5-6 Install the AC Cable

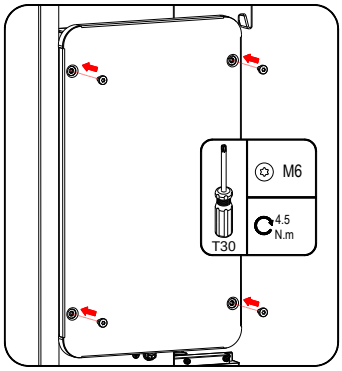


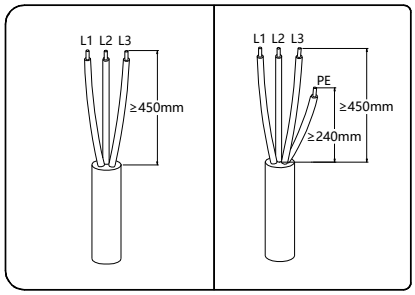
FIG 5-7 Reinstall the Upper Cover of the Junction Box

5.5.3 Wiring Steps (inverters with DC switches)

	The wiring steps for four-core wires are introduced here. The wiring methods for three-core wires are the same.

Step 1: The same as in section 5.5.2
Step 2: The same as in section 5.5.2
Step 3: Peel off a certain length of cable insulation sheath and core wire insulation layer according to FIG 5-8 (Take multi-core wires as an example.).

Step 4: If you need to perform power supply wiring for the tracking bracket system, please refer to the user manual. Otherwise, ignore this step.
Step 5: Process the cable cores: select suitable terminal blocks (recommended types DT or DTM) -> crimp terminals -> use heat shrink tubings, as FIG 5-9.
Step 6: Remove the nuts on the AC terminal blocks and bolts on the internal ground points, and install the AC cables in the corresponding positions.
Step 7: Cut the sealing rings according to cable specifications, as shown in FIG 5-10.
Step 8: Open the terminal protection cover, connect the AC cables to the corresponding terminals, and ensure that the cables are securely connected.
Step 9: Adjust the length of the cables left inside the cabinet and the position of the cores, and tighten the nuts clockwise.



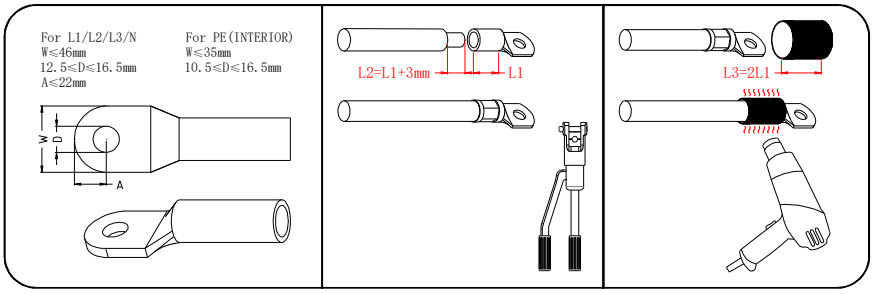


FIG 5-8 Peel off the cable insulation sheath and core wire insulation layer FIG 5-9 Process the cable cores

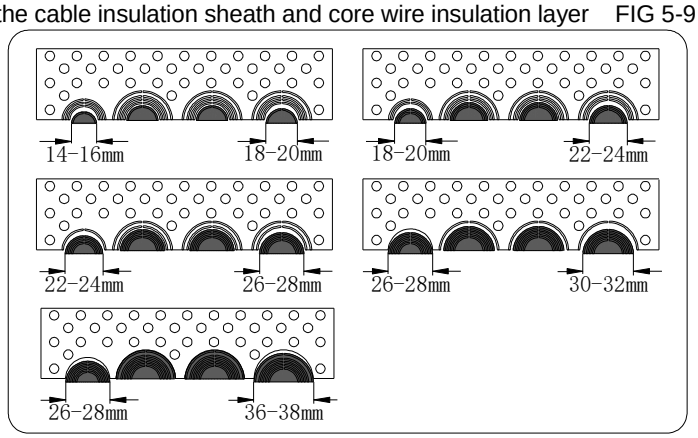


FIG 5-10 Cut sealing rings for single-core cables

Single-core cables:
Refer to FIG 5-9 for processing cable cores and FIG 5-10 for cutting sealing rings for single-core cables. Connection of single-core cables is shown in FIG 5-11.

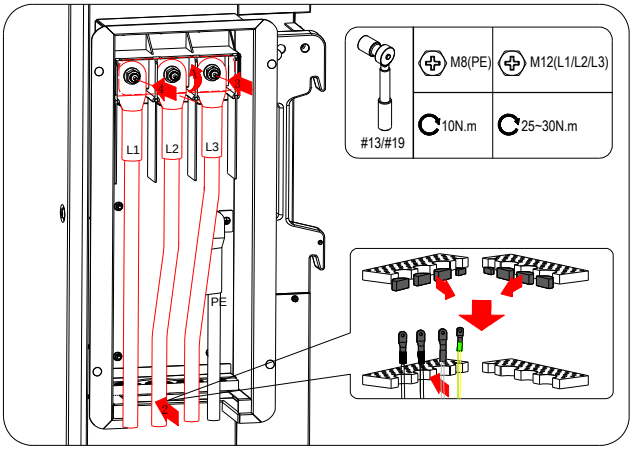


FIG 5-11 Connection of single-core cables

Multi-core cables:
1. Refer to FIG 5-8 for peeling off the cable insulation sheath and core wire insulation layer, FIG 5-9 for processing cable cores, and FIG 5-10 for cutting sealing rings for single-core cables. The connection of multi-core cables using a single-core gasket is shown in FIG 5-12.

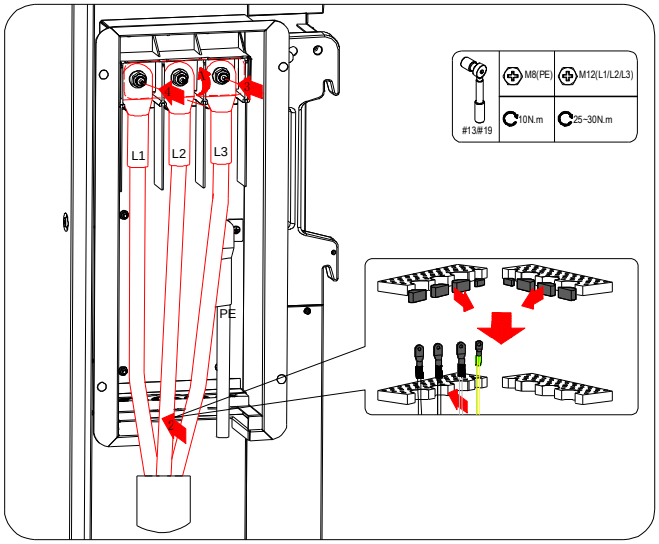


FIG 5-12 Connection of multi-core cables using single-core sealing gasket

2. Refer to FIG 5-8 for peeling off the cable insulation sheath and core wire insulation layer, FIG 5-9 for processing cable cores, and FIG 5-10 for cutting sealing rings for multi-core cables. Connection of multi-core cables is shown in FIG 5-13.

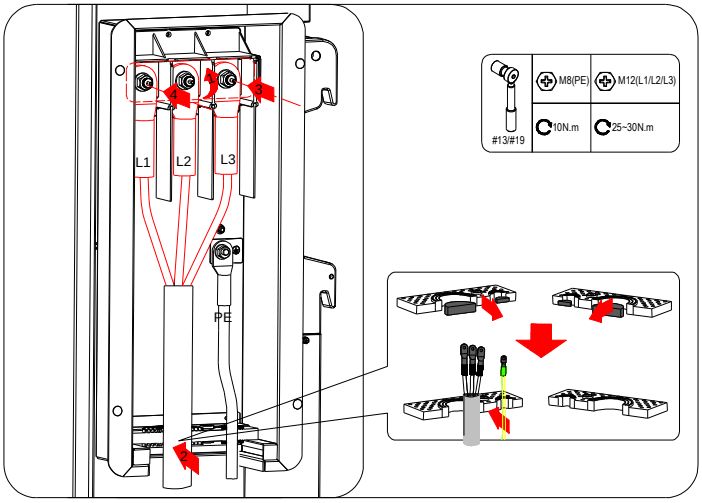


FIG 5-13 Connection of multi-core cables

Note: Multi-core sealing gasket is an optional component. If you need to purchase it, please contact your local distributor or CSI.
Step 10: Close the wiring box cover.

5.5.4 Tracking System Power Wiring (Optional)

Step 1: Remove the upper cover of the junction box in the cabinet. Refer to Section 5.5.2 for wiring and handling the sealing plate.
Step 2: Pass the unstripped cable through hole C or D of the sealing plate.
Step 3: Peel off a certain length of cable insulation sheath and core wire insulation layer according to the distance between the terminal and the sealing plate in FIG 5-8.
Step 4: Process the cable cores: select suitable terminal blocks (recommended types DT or DTM) -> crimp terminals -> use heat shrink tubings, as FIG 5-14.
Step 5: Fix the cable L/N terminals to L3 and N phases on the AC terminal block, and connect the cable grounding wire to the internal grounding point of the machine, as shown in FIG 5-15.
Refer to FIG 5-16 for the positional relationship between the tracking system power supply terminal and the AC terminal of the inverter.
Step 4: Reinstall the upper cover of the junction box, as shown in FIG 5-7.

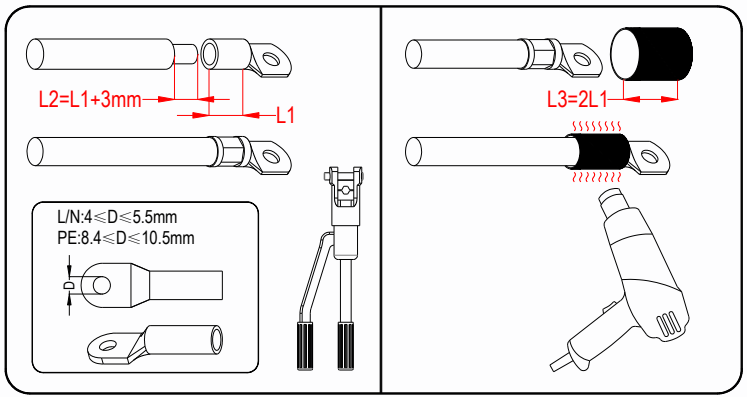


FIG 5-14 Crimp DT/DTM Terminals

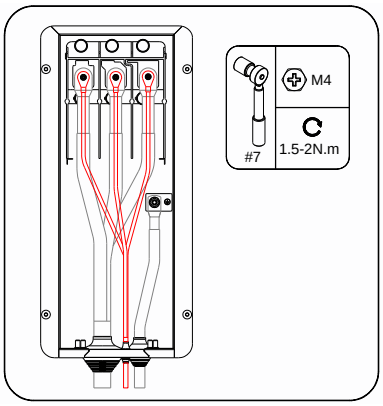


FIG 5-15 Tracking System Wiring

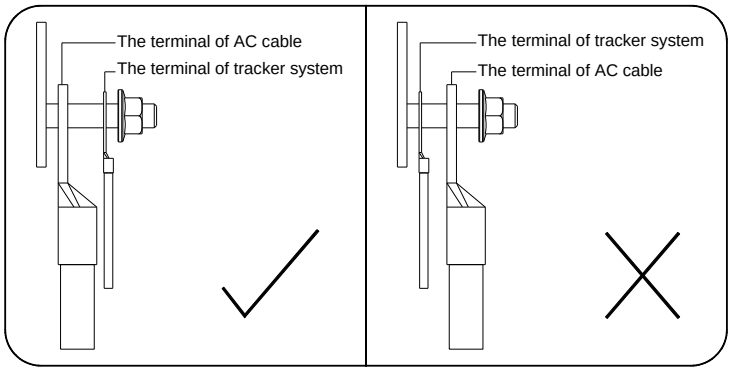


FIG 5-16 Positional Relationship of Wiring Terminals

5.6 DC-side connection

DANGER	PV strings exposed to sunlight pose a danger of voltage! • Follow the safety precautions listed in this manual and related documents.
WARNING	Ensure good insulation of the PV array to ground before connecting it to the inverter. Ensure that the voltage and maximum short-circuit current of each PV string are within the allowable range of the inverter. Please refer to "Technical Data". Before connecting the DC connector to the inverter, check the positive and negative polarities of the PV strings and insert the DC connector into the corresponding DC terminals only after confirming the polarities. During installation and operation of the inverter, ensure that the positive or negative terminals of the PV strings are not short-circuited to the ground. If a short-circuit occurs, it may cause an AC/DC short-circuit in the inverter, leading to product damage. Damage caused by this will not be covered under warranty. Securely assemble the DC connector to prevent arcing or overheating of the connector. Losses caused by this will not be covered under warranty. If the DC input wires are connected reversely or if a ground short-circuit occurs simultaneously on both positive and negative terminals of different MPPTs, and if the DC switch has been turned on, do not operate immediately. This may cause product damage otherwise. Turn off the DC switch and remove the DC connector to adjust the polarities of the strings when the current of the strings has decreased to below 0.5A. The inverter does not support connecting strings in full parallel mode (where all strings are connected in parallel outside the inverter and then connected separately to the inverter). Do not connect the same PV string to multiple inverters, as this may cause damage to the inverters.
NOTICE	When connecting PV strings, the following requirements must be met to avoid causing irreversible damage to the inverter, which will not be covered under warranty. Using different brands or models of PV components in the same MPPT or connecting PV components with different azimuths or tilt angles in the same PV string may not damage the inverter but may result in decreased system performance!

5.6.1 PV input configuration

1) The inverter is equipped with multiple MPPTs and each MPPT has inputs for two strings. Each MPPT operates separately, thus different string configurations may be used, including different PV module types, number of PV modules, angle of tilt, and installation orientation.
2) Each MPPT includes two DC input strings.
The two input PV strings should be the same in PV string structure, including the type, number, tilt, and orientation of the PV modules.
3) The solar inverter is not compatible with full parallel connections of PV strings, which involves connecting the PV strings in parallel externally before connecting them individually to the solar inverter.

Before connecting the PV input to the inverter, ensure that each PV string meets the following requirements.

Maximum open-circuit voltage per input	Maximum allowable current at input terminals
1500V	32A

Terminal configuration instructions

If the number of PV array strings designed is less than the number of input strings required by the inverter, ensure that at least one string is connected to each MPPT on each channel.

For a 16-channel MPPT 350 machine, at least one PV string should be connected to each MPPT from MPPT1 to MPPT16. The number of input strings and DC terminal configurations are as follows:

Table 5-5 PV string connection position

PV Input String No.	DC Switch-1								DC Switch-2							
20	PV1	X	PV3	X	PV5	X	PV7	X	PV9	X	PV11	X	PV13	X	PV15	X
21	PV1	PV2	PV3	X	PV5	X	PV7	X	PV9	X	PV11	X	PV13	X	PV15	X
22	PV1	PV2	PV3	PV4	PV5	X	PV7	X	PV9	X	PV11	X	PV13	X	PV15	X
23	PV1	PV2	PV3	PV4	PV5	PV6	PV7	X	PV9	X	PV11	X	PV13	X	PV15	X
24	PV1	PV2	PV3	PV4	PV5	PV6	PV7	PV8	PV9	X	PV11	X	PV13	X	PV15	X
25	PV1	PV2	PV3	PV4	PV5	PV6	PV7	PV8	PV9	PV10	PV11	X	PV13	X	PV15	X
26	PV1	PV2	PV3	PV4	PV5	PV6	PV7	PV8	PV9	PV10	PV11	PV12	PV13	X	PV15	X
27	PV1	PV2	PV3	PV4	PV5	PV6	PV7	PV8	PV9	PV10	PV11	PV12	PV13	PV14	PV15	X
28	PV1	PV2	PV3	PV4	PV5	PV6	PV7	PV8	PV9	PV10	PV11	PV12	PV13	PV14	PV15	PV16
29	PV1	PV2	PV3	PV4	PV5	PV6	PV7	PV8	PV9	PV10	PV11	PV12	PV13	PV14	PV15	PV16
30	PV1	PV2	PV3	PV4	PV5	PV6	PV7	PV8	PV9	PV10	PV11	PV12	PV13	PV14	PV15	PV16
31	PV1	PV2	PV3	PV4	PV5	PV6	PV7	PV8	PV9	PV10	PV11	PV12	PV13	PV14	PV15	PV16
32	PV1	PV2	PV3	PV4	PV5	PV6	PV7	PV8	PV9	PV10	PV11	PV12	PV13	PV14	PV15	PV16

PV Input String No.	DC Switch-3								DC Switch-4							
20	PV17	X	PV19	X	PV21	X	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
21	PV17	X	PV19	X	PV21	X	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
22	PV17	X	PV19	X	PV21	X	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
23	PV17	X	PV19	X	PV21	X	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
24	PV17	X	PV19	X	PV21	X	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
25	PV17	X	PV19	X	PV21	X	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
26	PV17	X	PV19	X	PV21	X	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
27	PV17	X	PV19	X	PV21	X	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
28	PV17	X	PV19	X	PV21	X	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
29	PV17	PV18	PV19	X	PV21	X	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
30	PV17	PV18	PV19	PV20	PV21	X	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
31	PV17	PV18	PV19	PV20	PV21	PV22	PV23	X	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32
32	PV17	PV18	PV19	PV20	PV21	PV22	PV23	PV24	PV25	PV26	PV27	PV28	PV29	PV30	PV31	PV32

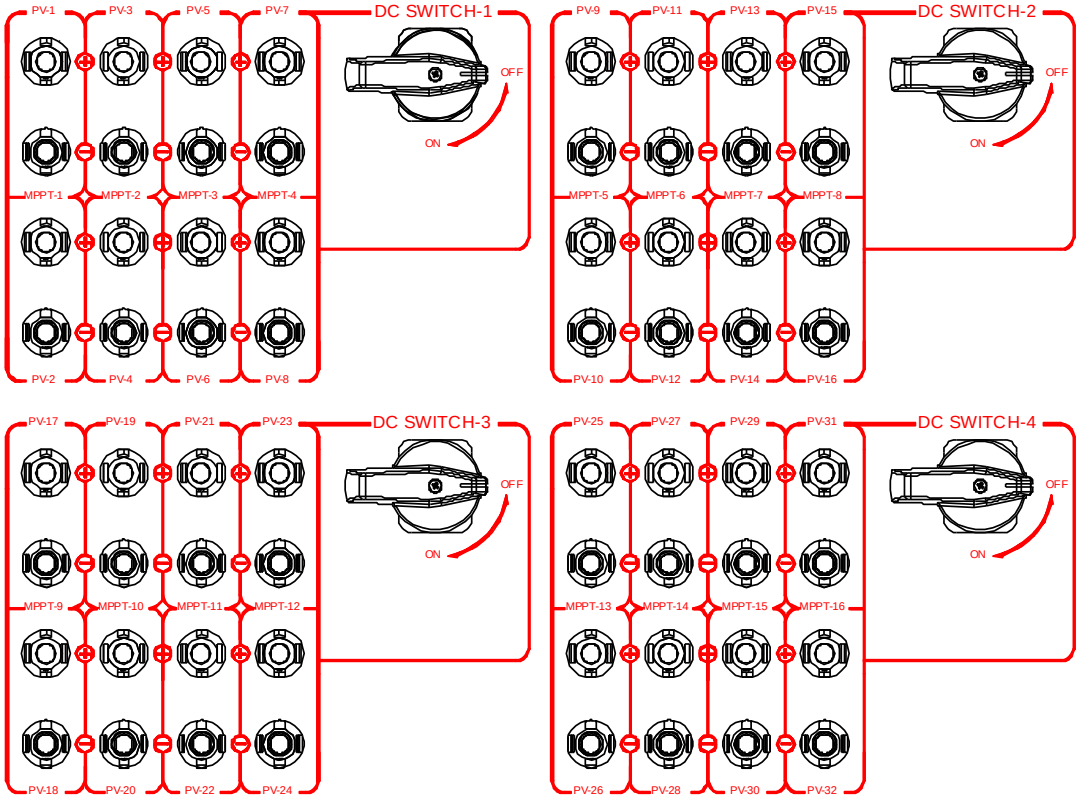


FIG 5-17 DC input terminal of inverter

5.6.2 Connect DC connectors

⚠ CAUTION	Please use the PV connectors provided in the delivery accessories. If any of them are missing or damaged, you need to purchase the same type of PV connectors. The equipment damage caused by using different types of PV connectors is not covered by the warranty.
⚠ DANGER	Danger of electric shock! Safety should be noted before electrical connections. PV modules exposed to sunlight will generate dangerous voltage! Before electrical operations, make sure all cables are voltage free. Before completing the electrical connection of the inverter, do not turn off the AC circuit breaker. Make sure all DC switches are in the "OFF" position before wiring.
⚠ CAUTION	Before connecting PV strings to the inverter, ensure that the PV strings are well insulated against ground. During the installation of PV strings and inverters, if the installation or routing of power distribution cables does not meet the requirements, leading to a short circuit of the positive or negative poles of the PV strings to the ground, it may cause AC/DC short circuits during the operation of the inverter, resulting in equipment damage. The equipment damage caused hereby is not covered by the equipment warranty. If the DC connector is not properly assembled, it may cause arcing or overheating of the connector, and the losses caused hereby are not covered by the warranty.
⚠ CAUTION	The following requirements must be met when connecting PV strings, otherwise it may cause irreparable damage to the inverter, and the damage caused hereby is not covered by the warranty. Ensure that the voltage of each PV string does not exceed 1500V under any circumstances. Ensure that the maximum short-circuit current of the PV string side is within the allowable range of the inverter.

Step 1: Strip the insulation layer of the PV cable for about 7mm.
Step 2: Use the crimping tool to crimp the terminal.
Step 3: After threading the crimped cable through the locking nut and the sealing ring at the tail of the connector housing, insert the cable into the connector housing. When the terminal is inserted into position, there will be a "click" sound indicating proper engagement. Lightly pull the cable to ensure that the terminal is securely in place, and then tighten the locking nut (please use a special wrench for PV connectors, which is not included in the supply scope).

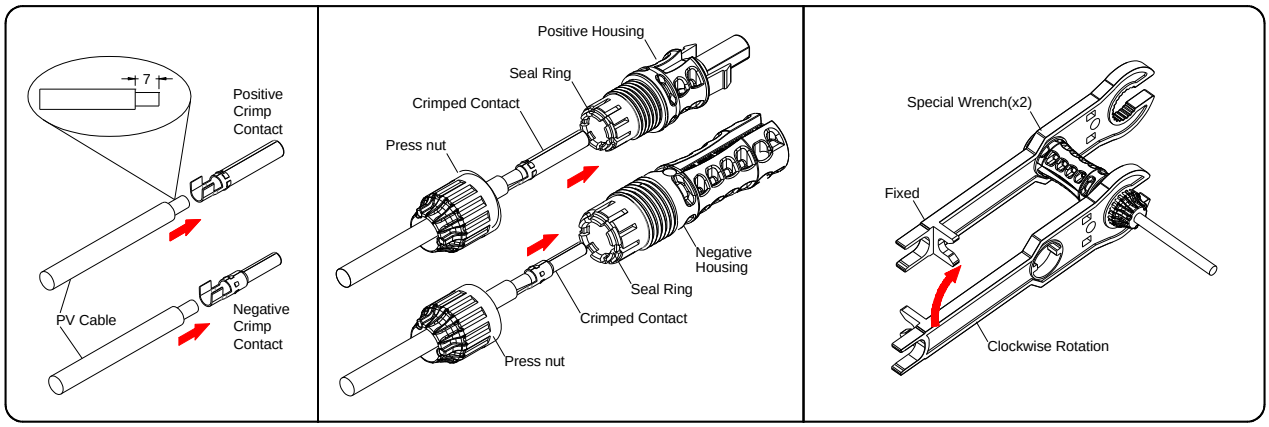


FIG 5-18 Assembling DC side connectors

NOTICE	If the DC input polarity is reversed, the inverter will be in a fault or alarm state and cannot operate normally.

5.6.3 Install the PV connectors

Step 1: Rotate all DC switches to the "OFF" position.
Step 2: Check if the polarity of the connection cables and connectors for the PV strings is correct, as shown in FIG 5-20. (Note: If the DC input polarity is reversed, the inverter will not operate properly.)
Ensure that the open-circuit voltage does not exceed the inverter's maximum input limit of 1500V in any case.
Step 3: Remove the protective covers of the DC connectors on the inverter that need to be connected to the PV strings. (Note: Please keep the protective covers of the connectors that do not need to be wired.)
Step 4: Insert the connector of the PV string into the corresponding DC terminal of the inverter until you hear a "click" sound.

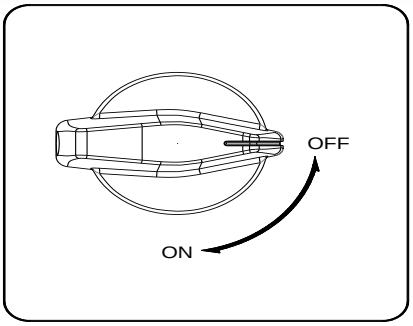


FIG 5-19 DC switch

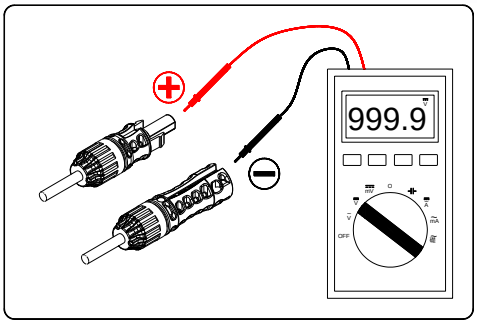


FIG 5-20 Check the polarity of PV string

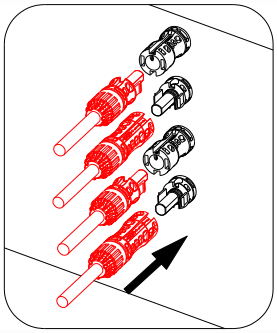


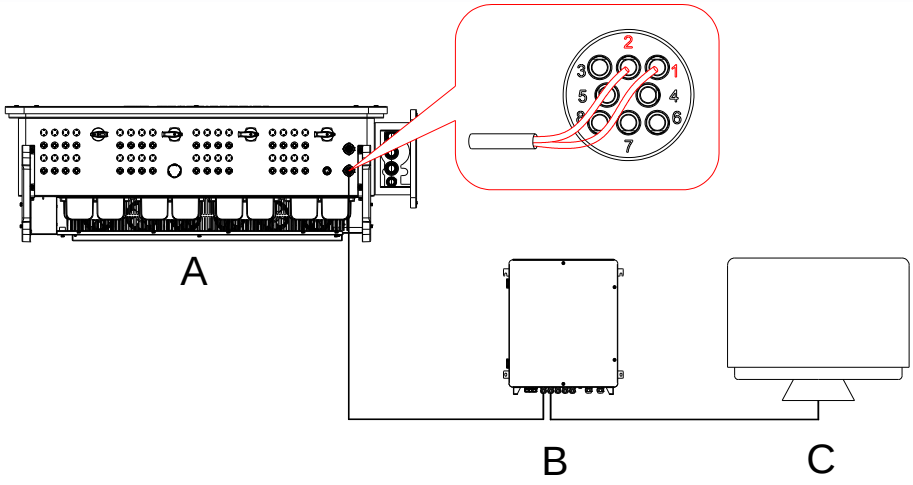
FIG 5-21
Connect the PV connectors to the inverter

5.7 Communication Connection

5.7.1 RS485 Communication System

Single Inverter Communication System

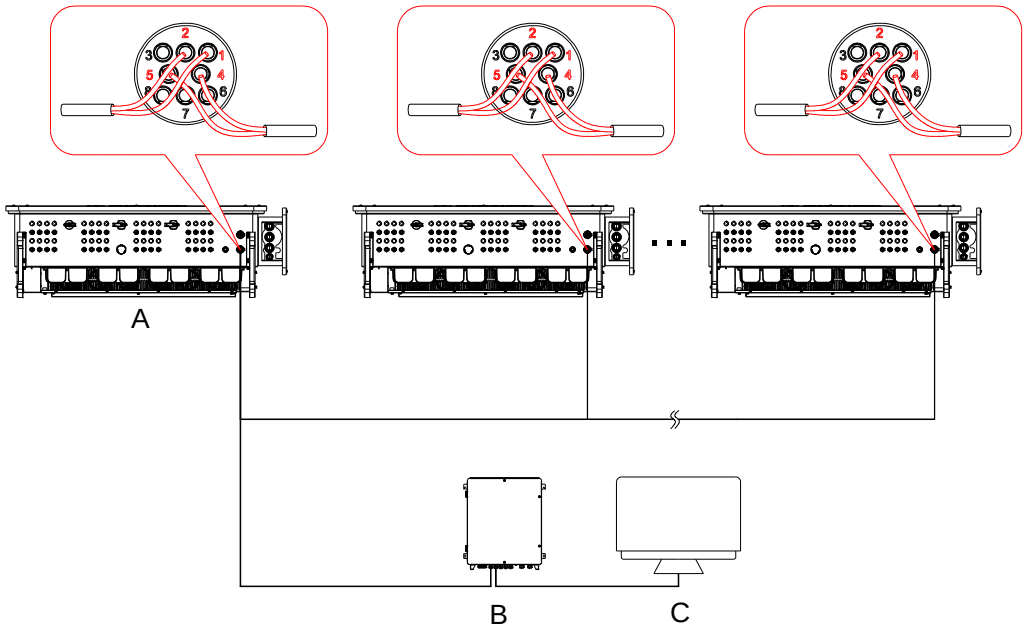
For the application scenario of a single inverter, a single RS485 communication cable can be used to establish a communication connection.



(A) Inverter (B) Smart Array Controller (C) Host Computer

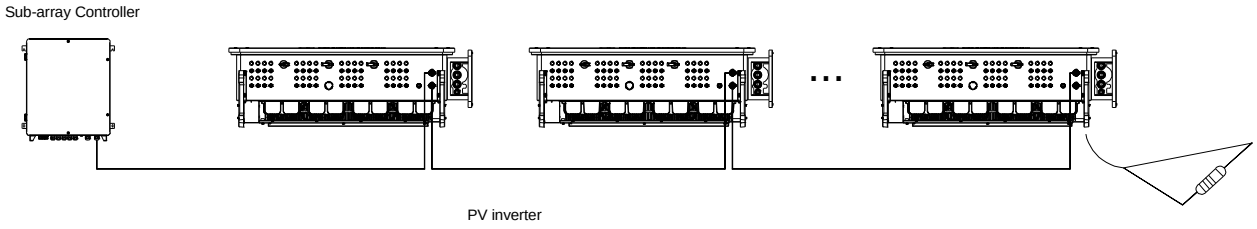
Multiple Inverters Communication System

For the application scenario of multiple inverters, all inverters can be connected in the form of a daisy chain using RS485 communication cables.



(A) Inverter (B) Smart Array Controller (C) Host Computer

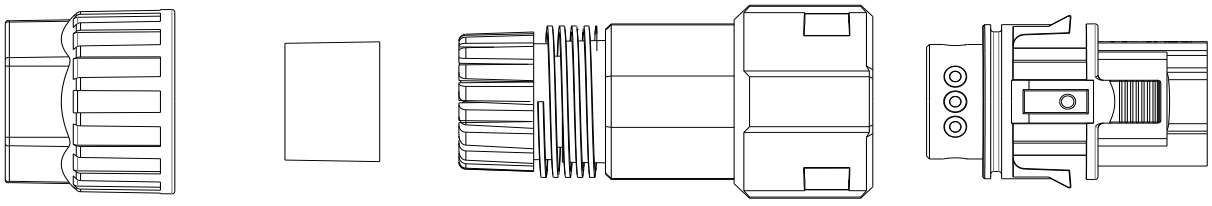
When multiple inverters are connected in parallel (more than 15 inverters), a 120R matching resistor should be added to the first and last inverters.



	The length of the RS485 communication cable cannot exceed 1000m.

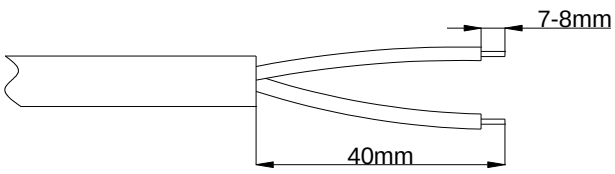
5.7.2 RS485 Wiring Steps

Connector schematic diagram, as shown below.

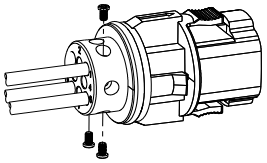


Gland nut Sealing ring threaded sleeve Plug（metal pins and outer casing）

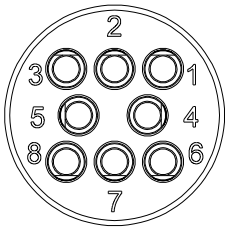
Step 1: Prepare the signal cable (remove about 40mm of the signal cable sheath, then strip about 8mm of the insulation layer).



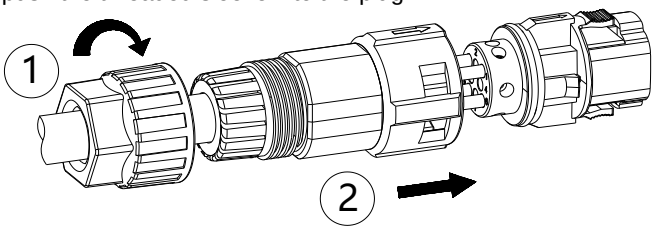
Step 2: Insert the wire into the corresponding pin of the plug and secure it with a screw (Tool: #1cross screwdriver. Torque: 0.6~0.8N.m).



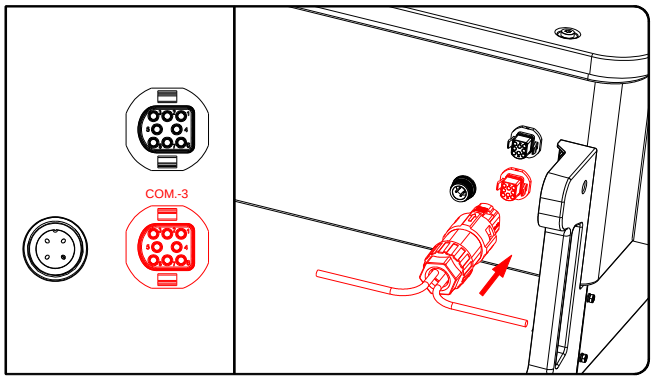
Port	Pin Number	Function Description	
RS485-2	PIN1	RS485A2+	Used for inverter cascade or connecting equipment such as sub-array controllers
	PIN2	RS485B2-	
	PIN3	PE	
	PIN4	RS485A2+	Used for inverter cascade or connecting equipment such as sub-array controllers
	PIN5	RS485B2-	
	PIN6	PE	
RS485-1	PIN7	RS485A1+	Used for connecting communication devices of the tracking system
	PIN8	RS485B1-	



Step 3: Tighten the gland nut and push the threaded sleeve into the plug.



Step 4: Finally, insert the assembled connector into the RS485 socket (COM.-3) on the inverter.



5.8 Communication Module Connection

Connect the communication module through the communication port. After successful connection, you can view information such as the power generation capacity and operating status of the inverter through a mobile phone app.

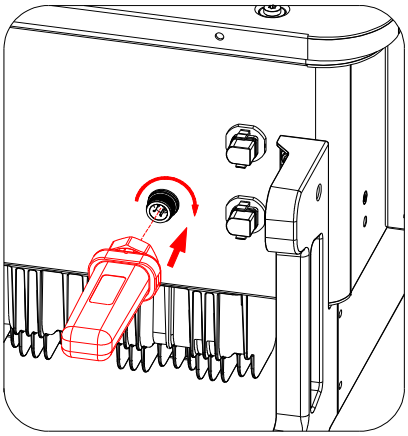


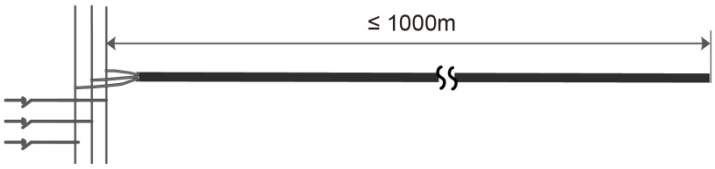
FIG 5-22 Communication Module Connection

5.9 PLC Communication Connection

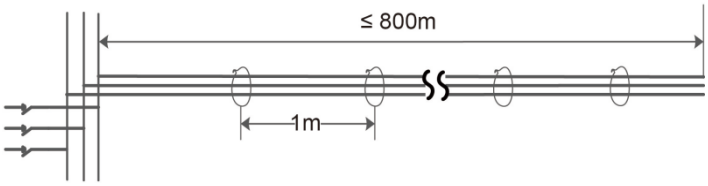
The inverter has an embedded PLC communication module that can be adapted to work with the sub-array controller provided by CSI to enable data communication. Please refer to the user manual of the sub-array controller for specific connection instructions.

Maximum PLC communication distance from the transformer substation to the inverter:

• AC cables with multi-core wires can achieve a maximum communication distance of 1000m.



• AC cables with single-core wires can achieve a maximum communication distance of 800m. Use cable ties to bind three-phase cables every 1 m.



	The sub-array controller is an optional component and can be ordered from CSI. The sub-array controller can directly use the AC output cables of the inverter for data communication, eliminating the need for laying and maintaining dedicated communication cables. The sub-array controller also supports RS485 interfaces and has conventional RS485 wiring options.

6 Commissioning

6.1 Pre-commissioning inspection

Before the inverter is first turned on, the following inspection work needs to be done.

• Check and confirm that all equipment has been installed securely in place.
• Check that the DC switch and AC circuit breaker are in the "OFF" position.
• Check that the grounding wire is connected correctly and securely.
• Check that the AC cables are connected correctly and securely.
• Check that the DC cables are connected correctly and securely.
• Check that the communication cables are connected correctly and securely.
• Check that the empty terminals have been sealed properly.
• Ensure that there are no construction tools left on top of the machine or inside the connection box (if the machine has a connection box).
• The AC circuit breaker selected complies with the requirements of this manual and local standards.
• All safety signs and warning labels are attached securely and clearly visible.

6.2 Commissioning steps

If all items mentioned above meet the requirements, please follow the following steps to start the inverter for the first time.

Step 1: Turn one of the DC switches on the inverter to "ON". Wait until the DC indicator of the inverter is steady green, then turn the remaining DC switches to "ON".

NOTICE	Please follow the order strictly, otherwise it may cause damage to the product, and any losses caused will not be covered under warranty. When DC is powered on and AC is not, the indicator of the inverter may turn red, and the inverter will report a "power grid power off" fault (which can be viewed through the CSI Smart Energy App). After the AC circuit breaker between the inverter and the power grid is closed, the fault will be automatically cleared. Before closing the AC circuit breaker between the inverter and the grid, please use a multimeter to measure the AC voltage to ensure it is within the allowable range of the inverter, otherwise it may cause damage to the inverter.

Step 2: Close the AC circuit breaker between the inverter and the grid.

Step 3: Use the CSI Smart Energy App to perform initial parameter settings. Under normal solar irradiance and grid conditions, the inverter will operate normally.

Step 4: Observe the status of the LED indicators.

LED Indicator	LED Status	Description
DC Indicator 	Steady green	At least one PV string is connected, and the string voltage is above 500V.
	Off	No PV string is connected, or all connected strings have voltages below 500V.
Grid Connection Indicator 	Steady green	The inverter is connected to the grid and operating.
	Blinking green	The inverter is in self-check mode or waiting mode.
	Off	The inverter is not connected to the grid.
Communication Indicator 	Steady green	The inverter is in maintenance mode.
	Blinking green	Communication is normal.
	Off	No communication data has been received by the inverter within 10 seconds.
Fault Indicator 	Steady red	Fault mode
	Blinking red	Minor alarm or prompt alarm
	Off	No alarm
All LEDs	Take turns flashing	The solar inverter is waiting for grid code setting.

6.3 Disclaimer of liability for prompt message

Note：
The voltage range of operation of an inverter can be adjusted, but high grid voltage may affect normal operation and service life of grid-connected home appliances, and any related consequences resulting from voltage adjustment afterward are not related to our company.

7 CSI Smart Energy APP

7.1 Introduction to APP

CSI Smart Energy APP establishes a communication connection with a CSI communication dongle (WIFI stick, LAN stick) via Bluetooth to achieve local access to the inverter. Users can use the APP to view real-time data, check for faults, set parameters, and perform other operations on the inverter.

7.2 Download and installation

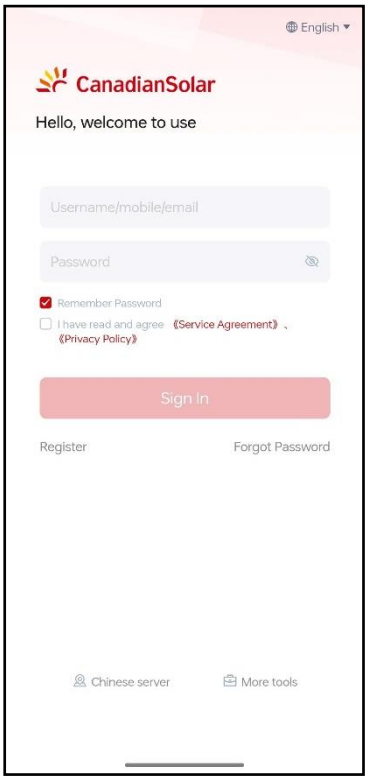
Please scan the QR code below with your phone to download it.

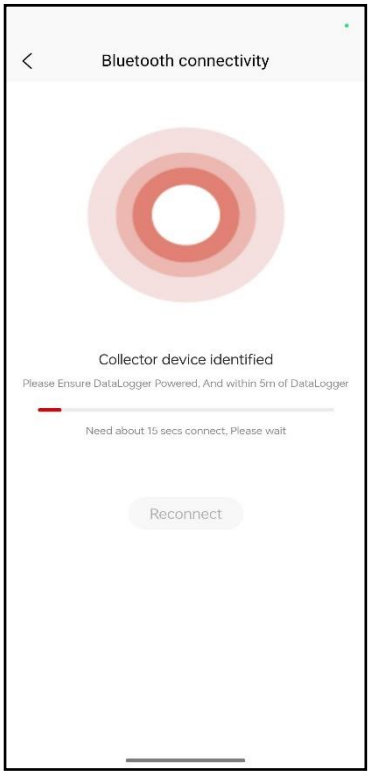
You can also log on to the web version (https://smartenergy.csisolar.com) to use it.

7.3 Using APP's local mode for connection

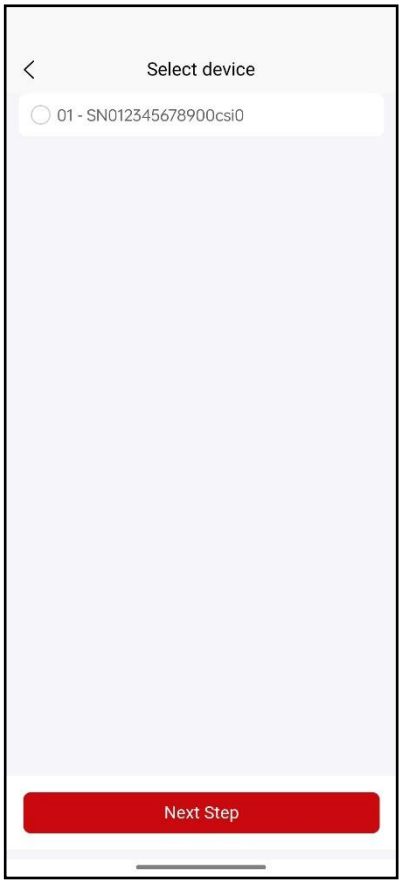
Note: To use the local mode of the APP, the following conditions must be met:
(1) Communication dongle, like WIFI stick or LAN stick, is connected to the inverter.
(2) The phone's Bluetooth is turned on and is within 5 meters of distance without any obstructions from the inverter.

Step 1: After installation, open the CSI Smart Energy App;
Step 2: Click "More tools", select "Local Debug"; scan the QR code on the data collector stick, and the phone will automatically connect to the data collector stick;

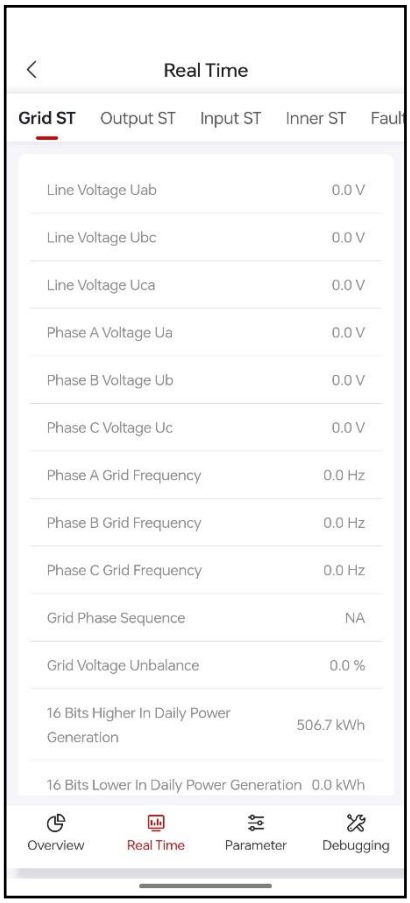


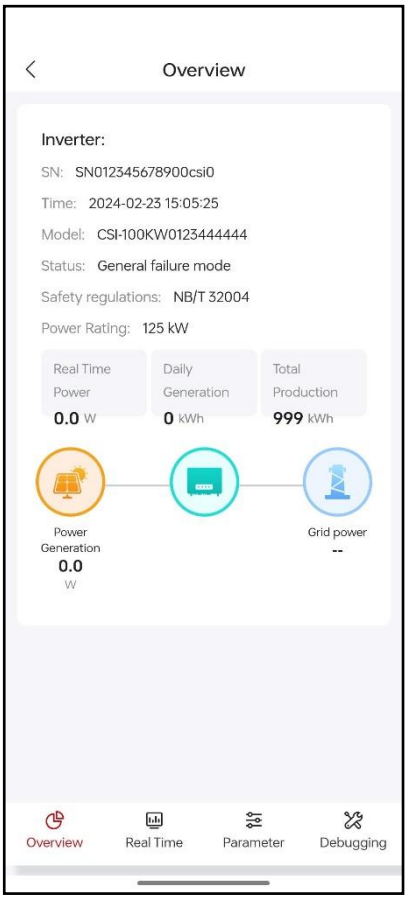


Step 3: Select the inverter SN you want to connect; click "Next";

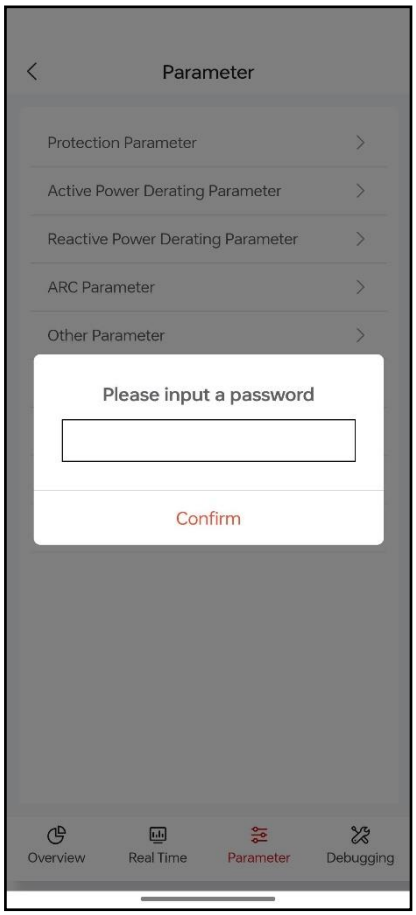


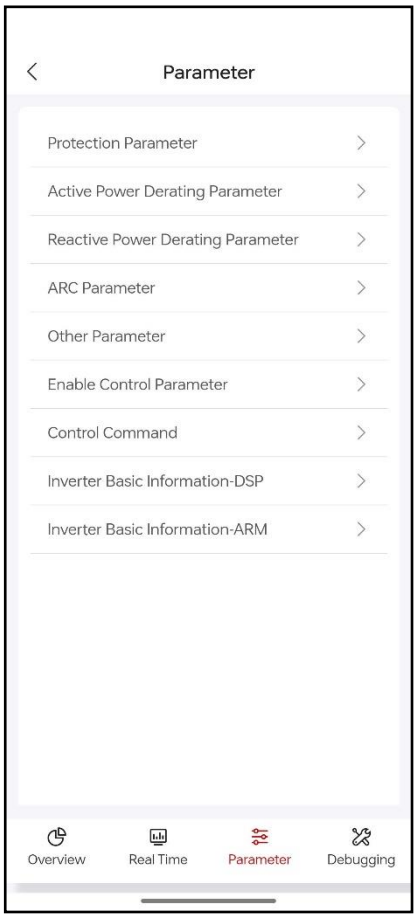
Step 4: After successful connection, you can view the real-time operation data of the inverter;





Step 5: Click "Parameters", enter the password 8888, and you can view and modify the parameters.
* The APP screenshot is for reference only. Please refer to the actual interface.





8 Troubleshooting and Maintenance

8.1 Troubleshooting

Once the inverter malfunctions, the fault information will be displayed on the mobile app or Smart Energy Platform interface, and you can view the fault information there.

All the fault codes and troubleshooting methods of PV inverters are listed in the following table. The models you purchased may only include some of the fault information. When the inverter malfunctions, you can refer to corresponding information through the fault code on the mobile app.

Fault codes are used to identify possible equipment failures or incorrect settings/configurations. All fault handling must be performed by professional technicians. The fault codes are as follows:

Fault code	Fault name	Troubleshooting methods
F-207	Grid overvoltage	In general, after the grid recovers, the inverter will reconnect. If the fault repeatedly occurs: 1. Measure the actual grid voltage. If the grid voltage is indeed higher than the set value, contact the local power company for help; 2. Check the protection parameter settings through the APP, and modify the overvoltage protection value after obtaining consent from the local power operator; 3. If none of above reasons applies and fault still exists, please contact CSI customer service center for help.
F-210	Grid overfrequency	1. In general, after the grid recovers, the inverter will reconnect. If the fault repeatedly occurs: 2. Measure the actual grid frequency. If the grid frequency is indeed beyond the set range, contact the local power company for help; 3. Check whether the protection parameter settings are in accordance with requirements through the APP; 4. If none of above reasons applies and fault still exists, please contact CSI customer service center for help.
F-211	Grid underfrequency	
F-212	Grid power outage	In general, after the grid recovers, the inverter will reconnect. If the fault repeatedly occurs: 1. Check whether the grid provides reliable power supply; 2. Check whether the AC wiring is securely fastened; 3. Check whether the AC cables are connected to the correct terminals; 4. Check whether the AC circuit breaker is closed; 5. If none of above reasons applies and fault still exists, please contact CSI customer service center for help.
F-220、F-265	Leakage current exceeds standard	1. The failure may be caused by damp or poor light conditions on the PV modules. In general, after the environment is improved, the inverter will reconnect; 2. If the environment is normal, check whether the DC and AC cables have normal insulation; 3. If none of above reasons applies and fault still exists, please contact CSI customer service center for help.
F-225	Grid voltage imbalance	In general, after the grid recovers, the inverter will reconnect. If the fault repeatedly occurs: 1. Measure the actual grid voltage. If there is a large difference in phase voltage among each phase of the grid, contact the local power company for help; 2. If the phase voltage gap of each phase is within the allowable range of the local power company, modify the imbalanced grid voltage parameters through APP; 3. If none of above reasons applies and fault still exists, please contact CSI customer service center for help.
F-235、F-241、F-243、F-255、F-257、F-259、F-261、F-263、F-271、F-295、F-297、F-299、F-301、F-303、F-305、F-307	PV reverse connection fault	1. Please check whether the positive and negative terminals of the corresponding strings on the inverter are connected reversely. If they are connected reversely, wait for PV string current to drop below 0.5A and then disconnect DC switch to adjust corresponding string polarity; 2. If none of above reasons applies and fault still exists, please contact CSI customer service center for help.
F-237、F-242、F-244、F-254、F-256、F-258、F-260、F-262、F-270、F-294、F-296、F-298、F-300、F-302、F-304、F-306	High PV voltage	1. Confirm whether this PV channel needs to be connected. If not, ignore this alarm information; 2. If none of above reasons applies and fault still exists, please contact CSI customer service center for help.

F-219	Low system insulation impedance	Wait for the inverter to return to normal operation. If the fault repeatedly occurs: 1. Check whether ISO impedance protection value is too high through APP, and confirm it is in line with local regulations; 2. Check strings and DC cable impedance to ground. If there is short-circuit or damage to insulation layer of cables, please take rectification measures; 3. If cables are normal and the fault occurs on rainy days, wait for better weather and confirm again; 4. If none of above reasons applies and fault still exists, please contact CSI customer service center for help.
F-329、F-330	DIP fault	1. Wait for the system to return to normal; 2. If the fault persists after rebooting the system, please contact the dealer or CSI customer service center for help.
F-200、F-201、F-202、F-230	BUS voltage fault	Disconnect the AC and DC side switches; if there is a battery, disconnect the battery side switch. Wait for 15 minutes, then turn off the AC and DC switches one by one, and reboot the system. If the fault persists, please contact CSI customer service center for help.
A-200	External fan alarm	1. Disconnect the AC side switch, check if the fan blade is damaged and remove foreign objects around the fan. 2. Replace the fan, turn off the AC and DC side switches, and run the equipment for 15 minutes. If the fault persists, please contact CSI customer service center to replace the external fan.
A-201	Internal fan alarm	Disconnect the AC and DC side switches, and wait for 5 minutes, then turn them off again. Run the equipment for 5 minutes. If the fault persists, please contact the dealer or CSI customer service center to replace the equipment.
F-308~311	High system temperature fault	1. Wait for the system temperature to return to normal; 2. Disconnect the AC and DC side switches. If there is a battery, disconnect the battery side switch. Wait for 15 minutes, then turn off the AC and DC switches one by one, and reboot the system. If the fault persists, please contact CSI customer service center for help.
F-203、F-204、F-206、F-209、F-213、F-215、F-217、F-218、F-224、F-227、F-231、F-232、F-236、F-240、F-245、F-246、F-248~250、F-268、F-269、F-280~286、F-288~293、F-339、F-340	System fault	1. Wait for the system to return to normal; 2. Disconnect the AC and DC side switches. If there is a battery, disconnect the battery side switch. Wait for 15 minutes, then turn off the AC and DC switches one by one, and reboot the system. If the fault persists, please contact CSI customer service center for help.
A-203~207、A-209、F-203、F-204、F-328、F-333~336、F-338	System alarm	1. The machine can continue to run; 2. Check for abnormalities in wiring and terminals related to the alarm, inspect for environmental foreign objects, and make corresponding repairs; 3. If the alarm repeatedly appears, please contact CSI customer service center for help.
F-312~320、F-326	Permanent system failure	1. Wait for the system to return to normal; 2. Disconnect the AC and DC side switches. If there is a battery, disconnect the battery side switch. Wait until the next day and restart the system again. If the fault persists, please contact CSI customer service center for help.

	If none of the methods recommended in "Troubleshooting" can help you, please contact CSI.

8.2 Maintenance

8.2.1 Precautions

DANGER	When maintaining the product, if there is any odor, smoke, or obvious abnormality in appearance, do not open the product. If there is no odor, smoke, or obvious abnormality in appearance, please inspect or restart the inverter according to the alarm handling suggestions. Please note that during maintenance, avoid standing directly in front of the inverter. Improper maintenance operations may cause personnel injury or equipment damage! • When performing high-voltage operations, be sure to use dedicated insulated tools. • Before performing maintenance operations, disconnect the AC circuit breaker on the grid side first, then disconnect the DC switch. If any faults that may cause personal injury or equipment damage are discovered before maintenance operations, please disconnect the AC circuit breaker and wait until nighttime to operate the DC switch. Otherwise, it may cause a fire or explosion inside the inverter, leading to personnel injury! • After the inverter has been powered off for 25 minutes, use testing equipment to ensure there is no voltage or current, and wear protective equipment to operate and maintain the inverter. • After the product is stopped, there is still a risk of burns. Wait for the product to cool down, and wear protective gloves before operating the product.
CAUTION	In order to prevent irrelevant personnel from approaching the product and causing misoperation or accidents, conspicuous warning signs or safety warning tapes shall be placed around the product to prevent accidents caused by misoperation.
NOTICE	If the inverter malfunctions, please restart the inverter after troubleshooting any issues that affect its safety performance. The inverter interior does not contain any components that require maintenance. Please do not open the inverter cabinet or replace internal components. To reduce the risk of electrical shock, please do not perform any maintenance operations beyond what is described in this manual. If necessary, contact CSI for repairs. Otherwise, any losses incurred will not be covered under the warranty.
NOTICE	Touching printed circuit boards or other electrostatic-sensitive components may cause damage to the components. • Avoid unnecessary contact with circuit boards. • Follow electrostatic protection guidelines and wear anti-static wristbands.
CAUTION	Danger of burns! After the inverter is stopped, there is still a risk of burns. Wait for the inverter to cool down, and wear protective gloves before operating the inverter.

8.2.2 Shut down the Inverter

Under normal conditions, there is no need to shut down the inverter. However, if maintenance or repair work is required, the inverter needs to be shut down. Please follow the following steps to disconnect the inverter from the AC and DC power supplies, otherwise it may cause personal injury or equipment damage.

Step 1: Disconnect the external AC circuit breaker and prevent it from being reconnected due to misoperation.
Step 2: Disconnect the external DC circuit breaker and turn the inverter's DC switch to "OFF".
Step 3: Wait for at least 25 minutes for the internal capacitors to fully discharge.
Step 4: Use a current clamp to verify that no current is flowing in the DC cables.

8.2.3 Routine Maintenance

Please refer to the table below for the routine maintenance items and cycles of the equipment.

Maintenance Item	Maintenance Method	Maintenance Cycle
Equipment Cleaning	Check if there is dust or other blockages at the air intake and heat sink. If necessary, clean the air intake and heat sink.	Once every 6 months to 1 year
Fan	Check if the fan makes abnormal noises during operation. Check if the fan blades have cracks. If necessary, replace the fan.	Once a year

Maintenance Item	Maintenance Method	Maintenance Cycle
Equipment Wiring Hole	Check if the equipment wiring hole is not completely sealed or has large gaps. If so, perform additional sealing.	Once a year
Electrical Connections	Check if the cable connections are loose or disconnected. Check if the cables are damaged, especially for cuts at the contact points with the metal housing.	Once every 6 months to 1 year
Surrounding Vegetation Clearance	Actively inspect and remove weeds before vegetation withers. Please clear up in time after weeding to avoid accumulation around the inverter.	Based on local vegetation growth conditions.

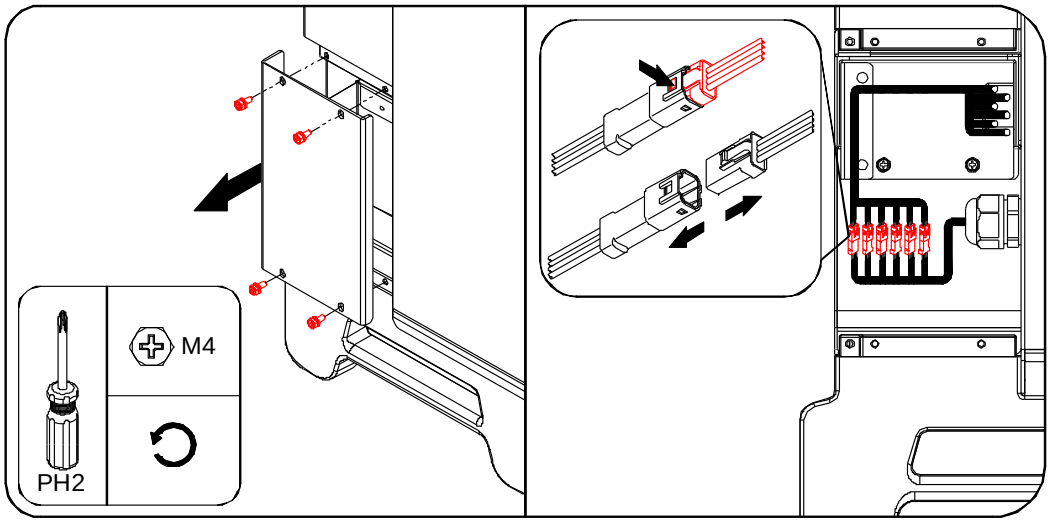
8.2.4 Clean the Air Intake and Outlet

The inverter generates a large amount of heat during operation, so it adopts forced air cooling. To ensure good ventilation of the inverter, it is necessary to regularly inspect the air intake and outlet and confirm that they are unobstructed. If necessary, use a soft brush to clean the air intake and outlet of the inverter.

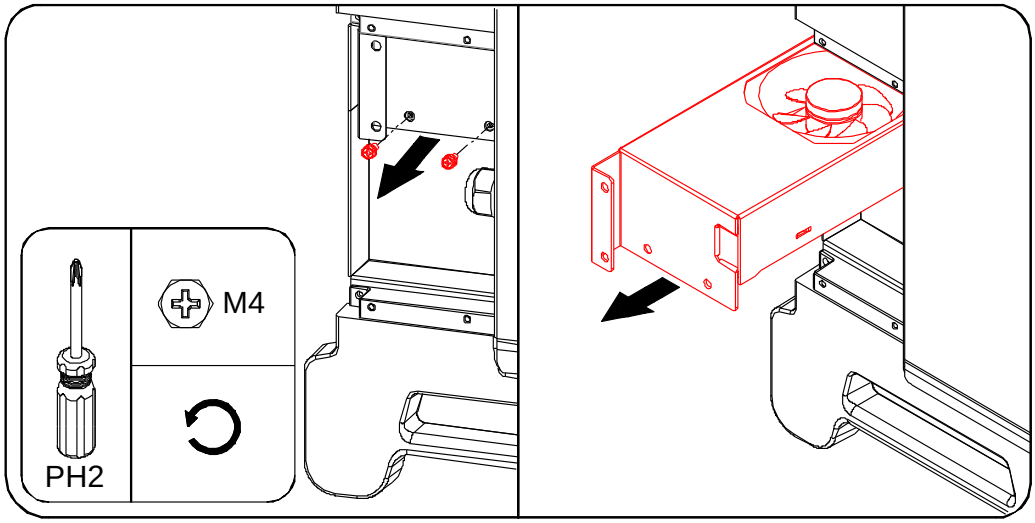
8.2.5 Fan Maintenance

⚠ DANGER	• Before starting fan maintenance, make sure to power off the inverter and disconnect all power inputs to the inverter. • After the inverter has been powered off for 25 minutes, use testing equipment to ensure there is no voltage or current. Wear protective equipment before performing maintenance on the inverter. • Fan maintenance must be completed by professional personnel.

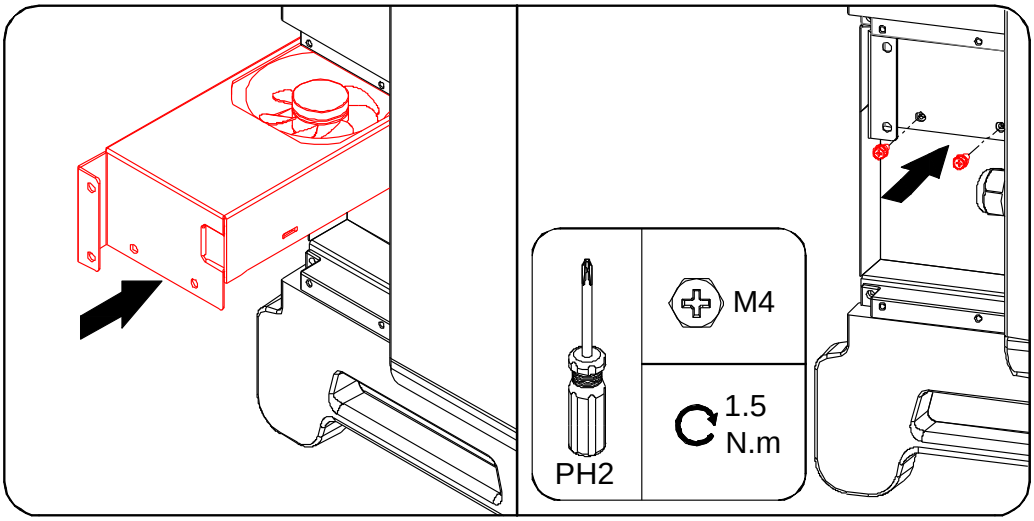
The built-in fan of the inverter is responsible for cooling during operation. If the fan cannot operate normally, the inverter will not cool effectively, which will affect its efficiency or cause derated operation. Therefore, it is necessary to keep the fan clean and replace damaged fans in a timely manner.
Fan cleaning and replacement steps are as follows:
Step 1: Shut down the inverter (see "8.2.2 Shut down the Inverter" for details).
Step 2: Loosen the screws on the fan cover plate, press the protrusion on the fan power plug and pull it outward, then loosen the screws on the fan bracket.



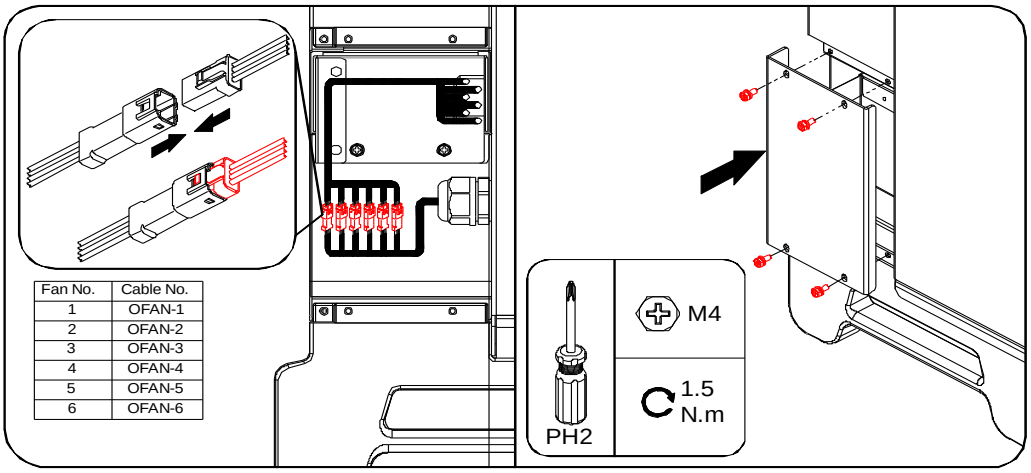
Step 3: Loosen the screws on the side of the fan, pull the fan bracket outward, and use a soft brush or vacuum cleaner to clean the fan or replace the damaged fan.



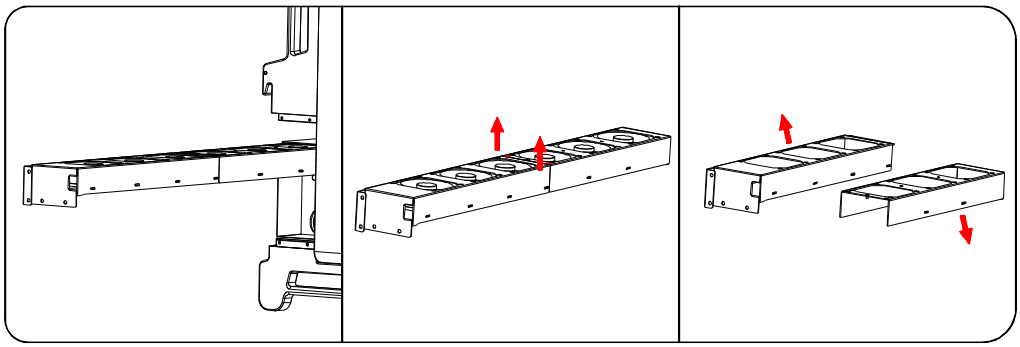
Step 4: After replacing the fan, insert the fan bracket back into the heat sink and lock the screws on the side of the fan.



Step 5: Reinsert the fan power plug and tighten the screws on the fan cover plate.



Note: If the distance for removing the fan bracket is not sufficient, the connecting bolt in the middle of the fan bracket can be removed before operation.

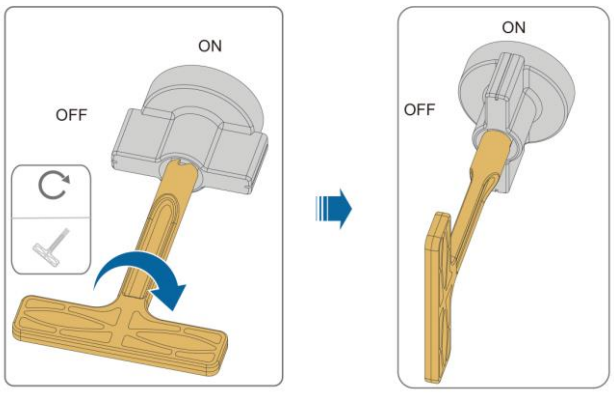


8.2.6 DC Switch Maintenance

NOTICE	Obstacles that hinder the rotation of the handle are strictly prohibited within the rotation distance of the intelligent isolation switch. Otherwise, the intelligent isolation switch may not be automatically disconnected, and the resulting problems will not be covered by the warranty.
	The intelligent isolation switch has the automatic disconnection function. When the device detects a reverse connection or an internal fault of the inverter, the intelligent isolation switch automatically disconnects for protection.

The intelligent isolation switch in the automatic disconnection state cannot be reset by manually rotating it. You can insert and rotate the intelligent isolation switch handle in the delivery accessories to reset it. If you hear the "click" sound twice, the switch is fully closed.

When observing through the App interface or remote monitoring system that there is a reverse connection or an internal fault within the inverter, and the intelligent isolation switch is in the "OFF" position, it can be determined that the inverter's intelligent isolation switch is in an automatic disconnection state. At this point, fault troubleshooting should be conducted based on the alarm information. If the fault is a reverse connection, after resolving the issue, the intelligent isolation switch can be reset. Otherwise, please contact CSI to confirm the technical solution. Equipment damage caused by forcibly resetting the intelligent isolation switch after it has automatically disconnected is not covered by the warranty.



8.3 Inverter Disposal

8.3.1 Remove the Inverter

CAUTION	Danger of burns and electric shock! After the inverter has been powered off for 25 minutes, use testing equipment to ensure there is no voltage or current. Wear protective equipment before performing maintenance on the inverter.
	Both AC and DC power must be disconnected before removing the inverter. If the inverter has more than two layers of DC terminals, the outer layer of DC connectors must be removed before removing the inner layer. If you still have the original packaging of the inverter, put it into the original packaging and securely wrap it up with tape. If you can no longer find the original packaging of the inverter, securely wrap it in a rigid cardboard box suitable for the weight and size of the inverter.

Step 1: Refer to "5 Electrical Connection" and disconnect all electrical connections to the inverter in the reverse order. To remove a DC connector, use a wrench to loosen the locking parts of the DC connector and install a waterproof plug.
Step 2: Refer to "4 Mechanical Installation" and remove the inverter in the reverse order.
Step 3: If necessary, remove the wall-mounted bracket.
Step 4: If the inverter will be used again in the future, please refer to "3.3 Inverter Storage" for proper storage of the inverter.

8.3.2 Dispose of the Inverter

The user is responsible for ensuring that the inverter is disposed of in accordance with national regulations.

WARNING	Please follow local regulations and standards for product disposal to avoid property damage or personal injury.
NOTICE	Some components of the inverter may cause environmental pollution, so please dispose of them according to the applicable electrical waste disposal regulations at the installation site.

9 Appendix: Technical Data

Model	CSI-250K-T8001A-E	CSI-333K-T8001A-E	CSI-333K-T8001B-E	CSI-350K-T8001A-E	CSI-350K-T8001B-E
INPUT(DC）					
Max. Input Voltage	1500Vdc				
Start-up DC Input Voltage	500V				
Rated Input Voltage	1200Vdc				
Max. String Input No.	24	24	32	24	32
MPPT No.	12	12	16	12	16
Max. Current per MPPT	40A	40A	32A	40A	32A
Max. DC Short-Circuit Current	60A				
OUTPUT(AC)					
Max. AC Output Power (Apparent)	250KVA@50℃	333KVA@40℃/320KVA@45℃ /295KVA@50℃		352KVA@35℃/320KVA@45℃ /295KVA@50℃	
Rated Output Voltage	800V				
Grid Connection Type	3φ/PE				
Max. Output Current	180.4A	240A		254A	
Rated Output Frequency	50/60Hz				
THDi	＜2%（rated power）				
Power Factor	＞0.99(rated power) 0.8 leading … 0.8 lagging				
Efficiency					
Max. Efficiency	99.01%				
EU Efficiency	98.8%				
Environment					
Protection Degree	IP66, C5 (Optional)				
Cooling	Intelligent Fan Cooling				
Operating Temperature Range	-30°C - 60°C				
Operating Humidity （non-condensing）	0 - 100%				
Operating Altitude	4000m（>3000m derating）				
Protection & Function					
DC Switch	Yes				
Anti-Islanding Protection	Yes				
DC Reverse-Polarity Protection	Yes				
DC Insulation Resistance Detection	Yes				
Residual Current Monitoring	Yes				
String Monitoring	Yes				
AC Output Over Current Protection	Yes				
AC Short Circuit Protection	Yes				
Grid Monitoring	Yes				
PID Recovery Module	Optional				
Overvoltage Class	II (DC), III(AC)				
DC / AC SPD	DC SPD Type II / AC SPD Type II				
Smart IV Curve Diagnosis	Yes				
SVG	Yes				
Aluminum Cable	Yes				
Intelligent DC Switch	Optional				
SCR 1.2	Yes				
Display & Communication					
Display	LED+ APP (Optional)				
Communication	RS485 / PLC / WiFi-Lan(Optional)				
Mechanical Data					
Dimensions (W / H / D)	1130mm×894mm×372 mm				
Weight	120kg				
DC Inputs Type	MC4-EVO2				

AC Outputs Type	OT/DT Terminals support 400mm^2
Certification	
Safety	IEC62109-1/2
EMC Standard	IEC 61000-6-2/4
Grid Code	IEC 61727/IEC 62116 EN 50530, IEC 61683 NTS2.1, CEI0-16

China – Global Headquarters

CSI Solar Co., Ltd.
199 Lushan Road, SND, Suzhou, Jiangsu, China, 215129

Sales Inquiries Email: inquire.inverter@csisolar.com

Customer Support Email: service.inverter@csisolar.com