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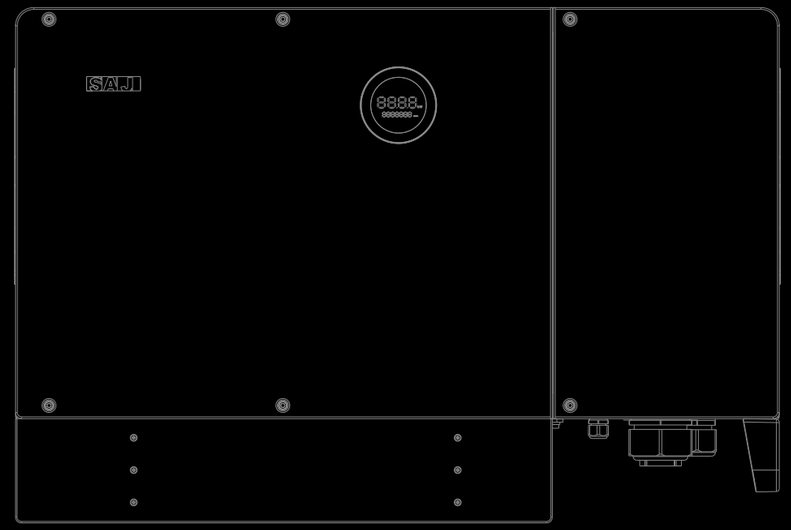
V1.1



C6 Series

COMMERCIAL ON-GRID SOLAR INVERTER

USER MANUAL

C6-(75K-125K)-(T6, T9, T12)-40

Preface

Thank you for choosing SAJ products. We are pleased to provide you first-class products and exceptional service.

This manual provides information about installation, operation, maintenance, troubleshooting and safety. Please follow the instructions of this manual so that we can ensure delivery of our professional guidance and whole-hearted service.

Customer-orientation is our forever commitment. We hope this document proves to be of great assistance in your journey for a cleaner and greener world.

We make constant improvements on the products and their documentation. This manual is subject to change without notice; these changes will be incorporated in new editions of the publication. To access the latest documentation, visit the SAJ website at https://www.saj-electric.com/.

Guangzhou Sanjing Electric Co., Ltd.

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1.

SAFETY PRECAUTIONS

1.1 Scope of Application

This User Manual provides instructions and detailed procedures of installing, operating, maintaining, and troubleshooting of the following SAJ on-grid inverters:

C6-75K-T6-40; C6-99K-T9-40; C6-100K-T9-40; C6-110K-T12-40; C6-125K-T12-40

Keep this manual all time available in case of emergency.

1.2 Safety Instructions

DANGER
· DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
·WARNING indicates a hazardous situation which, if not avoided, can result in death or serious injury or moderate injury.

CAUTION
· CAUTION indicates a hazardous condition which, if not avoided, can result in minor or moderate injury.

NOTICE
· NOTICE indicates a situation that can result in potential damage, if not avoided.

1.3 Target Group

Only qualified electricians who have read and fully understood all safety regulations contained in this manual can install, maintain, and repair the inverter. Operators must be aware of the high-voltage device.

2.

PREPARATION

2.1 Safety Instructions

DANGER

· There is possibility of danger to life due to electrical shock and high voltage.
· Do not touch non-insulated parts or cables.
· Disconnect the inverter from voltage sources and make sure it cannot be reconnected before working on the device.
· Do not disconnect the DC connector under load.
· Do not touch the live parts and cables inside the inverter during operation, it might result in burning or death.
· To prevent risk of electric shock during installation and maintenance, please make sure that all AC and DC terminals are disconnected.
· Do not touch the surface of the inverter while the housing is wet, otherwise, it might cause electrical shock.
· Do not stay close to the inverter while there are severe weather conditions including storm, lighting, etc.
· Before opening the housing, the SAJ inverter must be disconnected from the grid and PV generator; you must wait for at least five minutes to let the energy storage capacitors completely discharged after disconnecting from power source.

WARNING

Danger to life due to fire or explosion
· In the event of fault, do not conduct any direct action on the inverter.
· Disconnect PV array from inverter via an external disconnection device. If there is no external disconnection device present, wait until no more DC power is applied to the inverter.
· Disconnect the AC circuit breaker, or keep it disconnect if it is tripped, and secure it against reconnection.
· Do not touch non-insulated parts or cables.
· Do not touch non-insulated parts or cables.
·The installation, service, recycling and disposal of the inverters must be performed by qualified personnel only in compliance with national and local standards and regulations.
·Any unauthorized actions including modification of product functionality of any form may cause lethal hazard to the operator, third parties, the units or their property. SAJ is not responsible for the loss and these warranty claims.
·The SAJ inverter must only be operated with PV generator. Do not connect any other source of energy to the SAJ inverter.
·Be sure that the PV generator and inverter are well grounded in order to protect properties and persons.

CAUTION

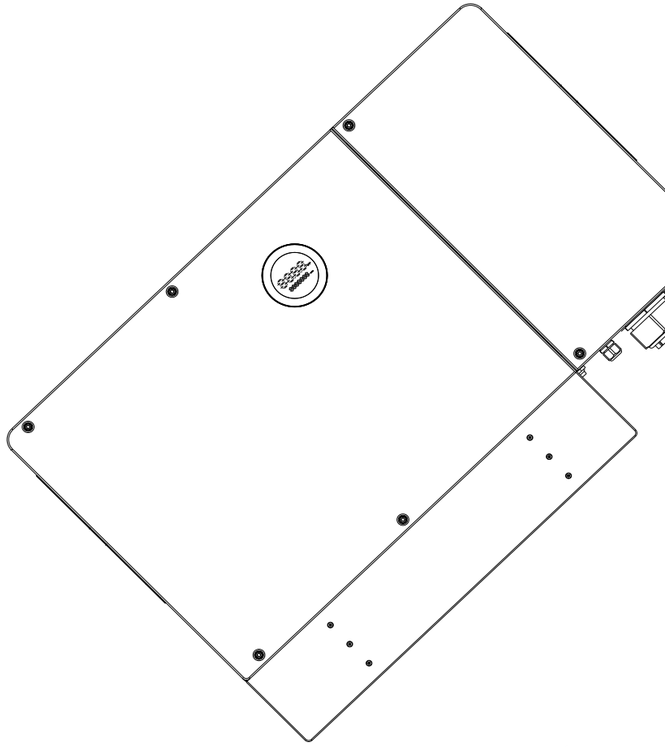
·The solar inverter enclosure will become hot during operation. Please do not touch the heat sink or enclosure during operation.
·Risk of damage due to improper modifications.

NOTICE

·Public utility only.
·The solar inverter is designed to feed AC power directly to the public utility power grid; do not connect AC output of the inverter to any private AC equipment.

2.2 Explanations of Symbols

Symbol	Description
	Dangerous electrical voltage This device is directly connected to public grid, thus all work to the inverter shall only be carried out by qualified personnel.
5min	**Danger to life due to high electrical voltage!** There might be residual currents in inverter because of large capacitors. Wait for 5 minutes before you remove the front lid.
	Notice, danger! This is directly connected with electricity generators and public grid.
	Danger of hot surface The components inside the inverter will release a lot of heat during operation. Do not touch metal plate housing during operating.
	An error has occurred Please go to Chapter 7 “Troubleshooting” to remedy the error.
	This device shall not be disposed of in residential waste Please go to Chapter 8 “Recycling and Disposal” for proper treatments.
CE	**CE Mark** Equipment with the CE mark fulfills the basic requirements of the Guideline Governing Low-Voltage and Electro-magnetic Compatibility.
CQC	**CQC Mark** The inverter complies with the safety instructions from China's Quality Center.



3.

PRODUCT INFORMATION

3.1 Application Scope of Products

C6 series product is grid-tied three phase inverter without transformer. The product converts the DC generated by solar panels into AC that meets the public grid requirements and send the AC into the grid. Figure 3.1 shows the structural diagram of the typical application system of C6 inverter.

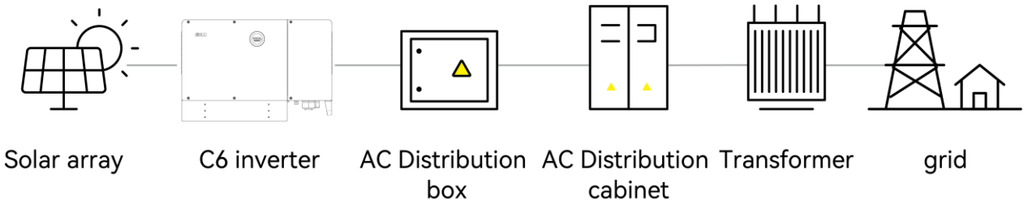


Figure 3.1
C6 series application

3.2 C6 Applicable Grid

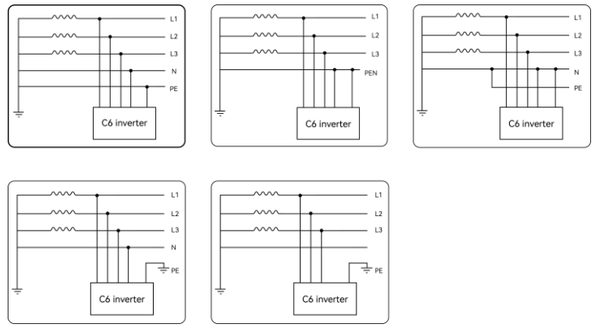


Figure 3.2
C6 applicable grid

3.3 Specification for Product Model

C6 – *X*K – T*X* - 40

① ② ③ ④

① C6 stands for product name.

② *X*K stands for rated power *X*kW of inverter, for example, 125K stands for 125 kW.

③ T stands for three phases; *X* stands for the number of MPPT of inverter.

④ 40 indicates that the maximum DC input current of each MPP tracker is 40 A.

3.4 Dimensions

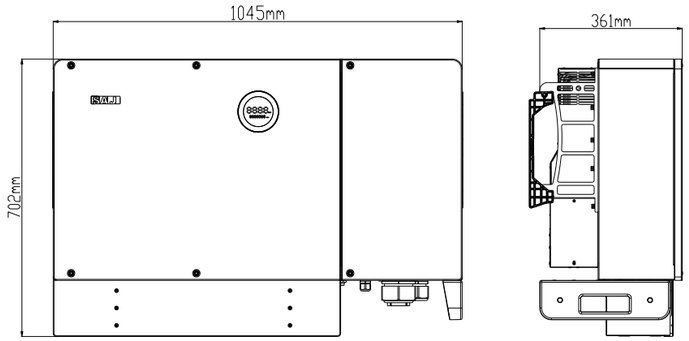


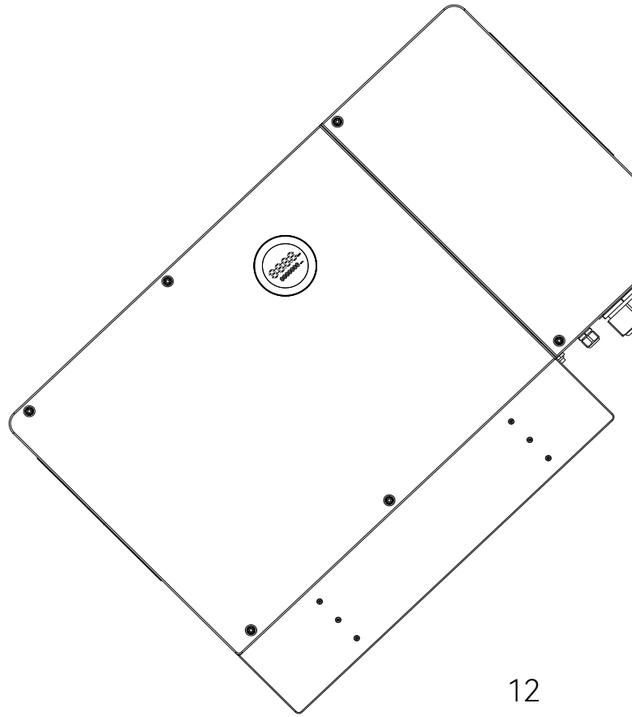
Figure 3.3 Dimensions of
C6-(75K-125K)-(T6,T9,T12)-40

3.5 Datasheet

Model	C6-75K-T6-40	C6-99K-T9-40	C6-100K-T9-40	C6-110K-T12-40	C6-125K-T12-40
DC Input					
Max. PV Array Power [KWp]@STC	144	198	200	220	250
Max. Input Voltage [V]	1100 *1				
MPPT Voltage Range [V]	180–1000 *2				
Nominal Input Voltage [V]	600				
Startup Voltage [V]	200				
Min. Input Voltage [V]	180				
Max. Input Current [A]	6*40	9*40		12*40	
Max. Short-Circuit Current [A]	6*50	9*50		12*50	
Number of Strings per MPP Tracker	2				
Number of MPP Trackers	6	9		12	
DC Switch	Integrated				
Overvoltage Category	II				
AC Output [On-grid]					
Rated AC Output Power [KW]	75	99.999	100	110	125
Rated Apparent Power [KVA]	75	99.999	100	110	125
Max. Apparent Power [KVA]	75	99.999	100	110	125
Rated AC Output Current [A]	108.3	144.3	144.3	158.8	180.4
Max. AC Output Current [A]	108.3	144.3	144.3	158.8	180.4
Current Inrush [A]	320			360	
Max. AC Fault Current [A]	280			320	
Max. AC Over Current Protection [A]	280			320	
Backfeed Current [A]	0				
Nominal AC Voltage/ Range [V]	3+N+PE, 230/400				
Nominal AC Grid Frequency/ Range [Hz]	50 Hz: 45–55 60 Hz: 55–65				
Total Distortion Harmonic [THDi]	< 3%				
Power Factor	0.8 leading – 0.8 lagging				
Feed-in Phases/AC Connection Phases	3/3				
Overvoltage Category	III				
Residual Current Monitoring Unit	Type A				
Efficiency					
Max. Efficiency	98.8%				
Euro Efficiency	98.5%				

*1 Make sure the maximum input voltage of each string does not exceed 1100 V.
*2 When the input voltage varies within the range of 1000 V to 1100 V, the inverter will enter the standby mode. When the input voltage decreases to a value within the MPPT operating voltage range of 180 V to 1000 V, the inverter will enter the normal mode.

Model	C6-75K-T6-40	C6-99K-T9-40	C6-100K-T9-40	C6-110K-T12-40	C6-125K-T12-40
Protection					
DCI Monitoring	Integrated				
GFCI Monitoring	Integrated				
Grid Monitoring	Integrated				
Internal Overvoltage Protection	Integrated				
DC Insulation Resistance Detection	Integrated				
AC Short Circuit Current Protection	Integrated				
AC Grounding Detection	Integrated				
DC Surge Protection	Type II				
AC Surge Protection	Type II				
Active Anti-islanding Protection	Frequency shift				
AFCI Protection	Optional				
Interface					
AC Connection	OT/DT Terminal (Max. 240mm²)				
DC Connection	MC4/D4				
Display	LED+App				
Communication Port	RS232 (USB) + RS485 (RJ45) + DRM				
Communication Mode	Wi-Fi/Ethernet/4G/PLC (optional)				
General Data					
Topology	Non-isolated				
Protective Class	Class I				
Consumption at Night [W]	<2				
Operating Temperature Range	-30℃ to +60℃ (45℃ to 60℃ with derating)				
Cooling Method	Intelligent fan cooling				
Ambient Humidity	0%–100% non-condensing				
Max. Operating Altitude [m]	4000 m (>3000 m power derating)				
Ingress Protection	IP66				
Mounting	Wall Mounting / Frame Mounting				
Dimensions [H x W x D] [mm]	702*1045*361				
Weight [kg]	93			98	
Warranty [Year]	10/15/20 (Optional)				
Certifications	EN 62109-1/2, EN 61000-6-2/4, EN 50438, EN 50549, C10/11, IEC 62116, IEC 61727, RD 1699, RD 413, UNE 206006, UNE 206007, NTS, CEI 0-16, AS 4777.2, NBR 16149, NBR 16150 VDE-AR-N 4105, VDE 0126-1-1				
Country of Manufacturer	China				



4.

INSTRUCTIONS FOR INSTALLATION

4.1 Safety Instructions

DANGER

- Dangerous to life due to potential fire or electricity shock.
- Do not install the inverter near any inflammable or explosive items.
- This inverter will be directly connected with HIGH VOLTAGE power generation device; the installation must be performed by qualified personnel only in compliance with national and local standards and regulations.

NOTICE

- This equipment meets the pollution degree II.
- Inappropriate installation environment may jeopardize the life span of the inverter.
- Installation directly exposed under intensive sunlight is not recommended.
- The installation site must be well ventilated.

4.2 Pre-installation Check

4.2.1 Check the Package

Although SAJ's inverters have thoroughly tested and checked before delivery, it is uncertain that the inverters may suffer damages during transportation. Please check the package for any obvious signs of damage, and if such evidence is present, do not open the package and contact your dealer as soon as possible.

4.2.2 Scope of Delivery

Refer to the packing list inside the package container.

4.3 Installation Method and Position

4.3.1 Mounting Methods

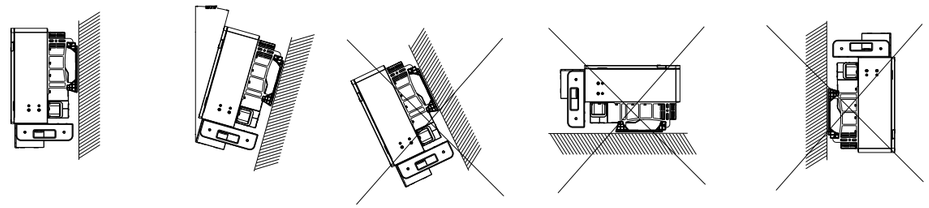


Figure 4.1 Mounting method

- The equipment employs natural convection cooling, and it can be installed indoor or outdoor.
- Vertical installation on eye level is recommended. Mount vertically or tilted backwards by max.15°. Never install the inverter tilted forwards, sideways, horizontally or upside down.
- Considering convenience for maintenance, please install the equipment at eye level.
- Choose a solid and smooth wall to ensure that the inverter can be installed securely on the wall. Make sure that the wall can bear the weight of the inverter and accessories.
- DO NOT expose the inverter to direct solar irradiation as this could cause power derating due to overheating.
- The ambient temperature should be between -30°C to +60°C (-22°F to +140°F) to ensure optimum operation.
- Choose locations with sufficient air exchange. Ensure additional ventilation, if necessary.
- DO NOT install the inverter near any inflammable and explosive items.
- The inverter generates noise during operation. It is not recommended to install the inverter in living areas.

Note: When installing outdoors, the height of the device from the ground should be considered to prevent the device from soaking in water. The specific height is determined by the site environment.

To make sure the installation spot is suitably ventilated, if multiple SAJ on-grid solar inverters are installed at the same area, the safety clearance should be followed for proper ventilation condition.

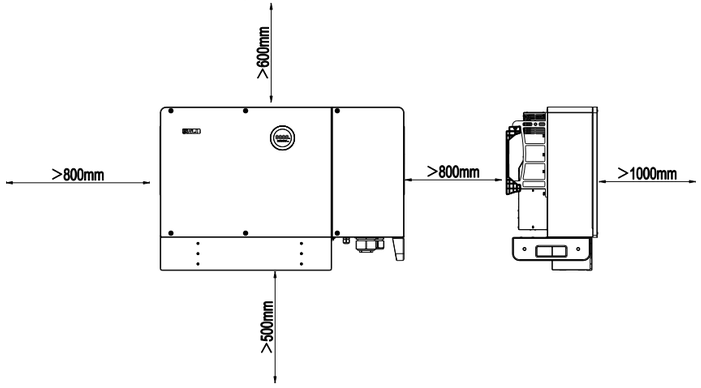


Figure 4.2 Installation clearance

4.4 Mounting Procedure

4.4.1 Installation Tools

Installation tools include but are not limited to the following recommended ones. Please use other auxiliary tools on site if necessary.


Marker


Measuring tape


Utility knife


Multimeter
Measurement range: ≥ 1100Vdc


Wrist strap


Protective gloves


Dust mask


Earplugs


Goggles


Insulated shoes


Vacuum cleaner


Heat shrink tubing


Heat gun


Hammer drill Drill bit: Φ10

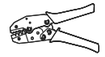

Rubber mallet


Electric screwdriver tool bit: M4

Phillips screwdriver Specification: M4

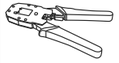

Wire stripper


Hydraulic plier


Crimping tool crimping range: 2.5-6mm²


Wrenchfor MC4 terminal


Wire clipper


RJ45 crimping tool

Flat-blades crewdriver M2


Torx screwdriver TX30


Socket wrench open end:
8mm (forM5 bolts)
10mm (forM6 bolts)
13mm (forM8bolts)
16mm (forM10bolts)

4.4.2 Mounting the Inverter

Select one of the following options to mount the inverter:

- Mount the inverter on the wall.
- Mount the inverter on a frame. With this option, the installer needs to prepare the frame. Four M10*45 screws are provided in the delivery for securing the mounting bracket to the frame.

To install the inverter on the wall:

Step 1. Place the mounting bracket onto the wall and mark the drilling positions of the holes.

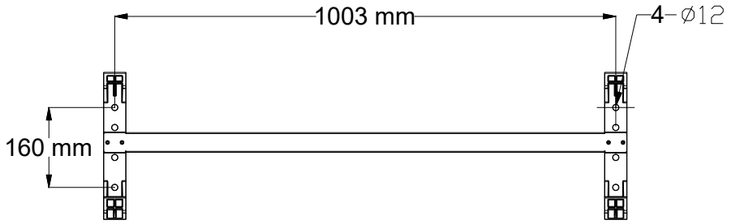


Figure 4.3 Marking drilling holes

Step 2. Drill four holes in the wall according to the markings, and insert the four M10*100 expansion tubes in the holes using a rubber mallet.

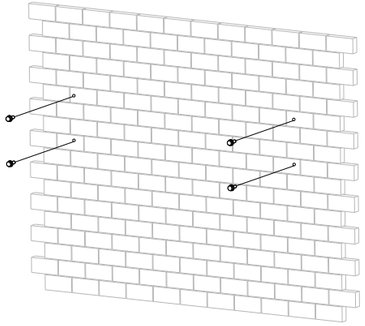


Figure 4.4 Drilling holes

Step 3. Install the mounting bracket onto the wall and secure it with the four M10*100 screws.

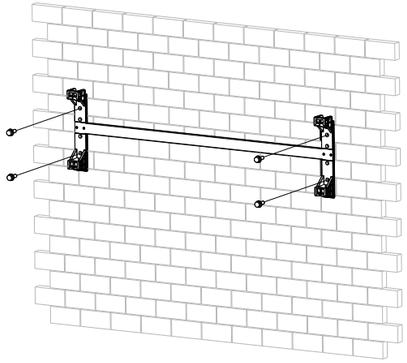


Figure 4.5 Installing mounting bracket

Step 4. Carefully mount the inverter to the mounting bracket. Make sure that the rear part of the inverter is closely mounted to the mounting bracket. Secure the inverter to the mounting bracket with a screw.

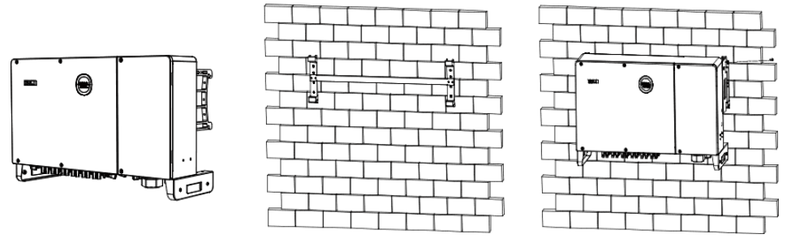


Figure 4.6 Mounting inverter

To install the inverter on a frame:

Step 1. Place the mounting bracket onto the frame and mark the drilling positions of the holes.

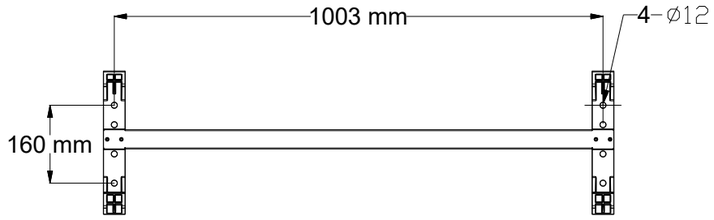


Figure 4.7 Marking drilling holes

Step 2. Drill four holes on the frame according to the markings.

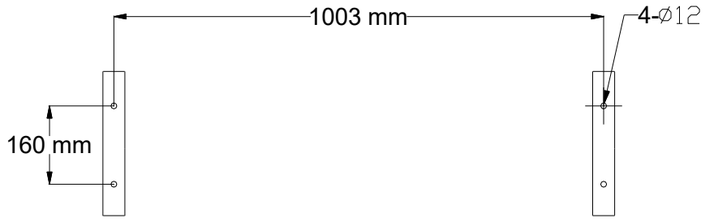


Figure 4.8 Drilling holes

Step 3. Secure the mounting bracket to the frame with the four M10*45 screws.

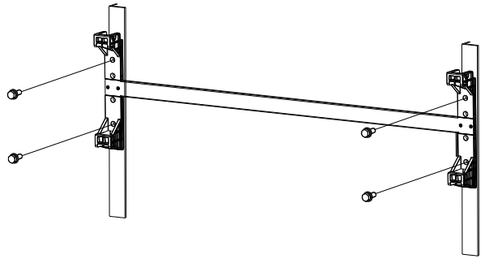


Figure 4.9 Installing mounting bracket and frame

Step 4. Carefully mount the inverter to the mounting bracket. Make sure that the rear part of the inverter is closely mounted to the mounting bracket. Secure the inverter to the mounting bracket with a screw.

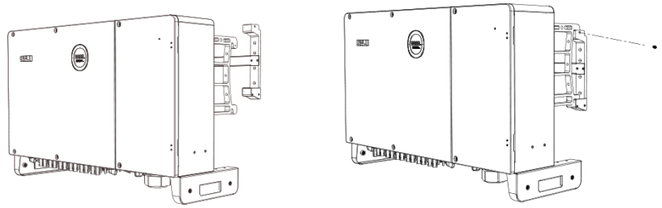


Figure 4.10 Mounting inverter

5.

ELECTRICAL CONNECTION

5.1. Safety Instructions

Electrical connection must only be operated by professional technicians. Please keep in mind that the inverter is a bi-power supply equipment. Before connection, necessary protective equipment must be employed by technicians, including insulating gloves, insulating shoes and safety helmet.

DANGER

- Dangerous to life due to potential fire or electricity shock.
- The PV panel string will produce lethal high voltage when exposed to sunlight.
- Disconnect DC and AC circuit breakers before starting electrical connections.
- Ensure all the cables have no voltage before conducting cable connection.

WARNING

- Any improper operations during cable connection can cause device damage or personal injury.
- All cables must be undamaged, firmly attached, properly insulated, and adequately dimensioned.

NOTICE

- When power-on, the equipment should be in conformity with national rules and regulations.
- The direct connection between the inverter and high voltage power systems must be operated by qualified technicians in accordance with local and national power grid standards and regulations.

5.2. Specification of Electrical Interfaces

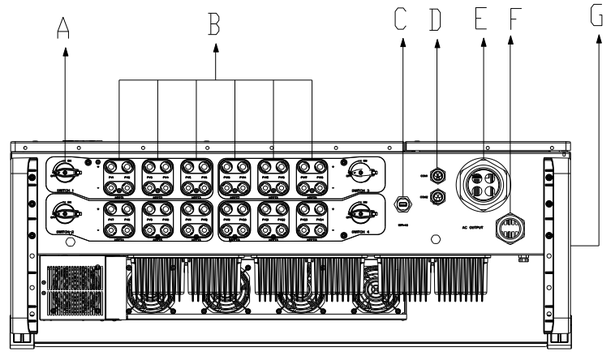


Figure 5.1 Electrical terminals

Item	Name
A	DC Switch
B	DC Input
C	RS232 Communication
D	RS485 Communication
E	AC Output
F	Ground Connection
G	Ground Connection

Table 5.1. Interfaces specification

5.3. AC-side Connection

5.3.1. Electrical Connection Overview

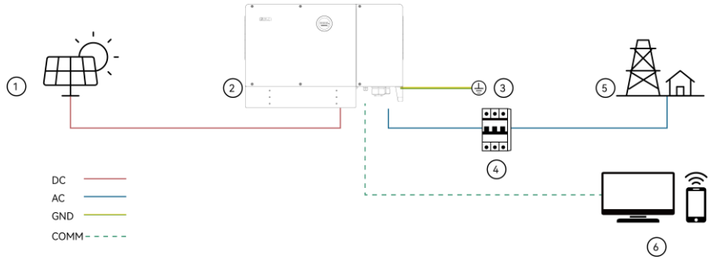


Figure 5.2 Electrical connection overview

Item	Name
1	PV array
2	C6 inverter
3	Inverter enclosure grounding connection
4	Circuit Breaker
5	Grid
6	Monitoring Platform

Table 5.2. Electrical connection overview

5.3.2. Cable Specification

Cross-sectional area of cables (mm²)			External diameter (mm)
Cable type	**Scope (S)**	**Recommended grounding cable (Spe)**	
Three-core, four-core, five-core cables	95-240	Spe ≥ S/2	38-66
Four single-core cables			14-32

Table 5.3. Recommended power grid connecting cable specification

5.3.3. Circuit Breaker Specification

Model	Rated Voltage of Recommended Circuit Breaker	Rated Current of Recommended Circuit Breaker
C6-75K-T6-40	≥400 V	160 A
C6-99K-T9-40 C6-100K-T9-40		200 A
C6-110K-T12-40		225 A
C6-125K-T12-40		250 A

Table 5.4. Recommended circuit breaker specification

5.3.4. Residual Current Device

The inverter is integrated with a RCMU that can detect the real time external current leakage. When the detected current exceeds the limitation, the inverter will be disconnected from the grid quickly.

An external type A RCD can be connected with the inverter to protect the system from tripping when needed. The recommended action current of the external RCD is as follows:

Model	Recommended rated current of external RDC
C6-75K-T6-40	750 mA
C6-99K-T9-40 C6-100K-T9-40 C6-110K-T12-40 C6-125K-T12-40	1000 mA

Table 5.5. Recommended RCD specification

5.3.5. OT/DT Terminal Specification

Figure 5.3 OT/OD terminal

L1/L2/L3/N cable terminal PE cable terminal

L1/L2/L3/N cable terminal	M12 size	a≤46mm, 13mm≤b≤15.5mm
PE cable terminal	M8 size	c≤30mm, 8mm≤d≤11mm

Table 5.6. Specification of cables

Note: Do not connect Aluminum OT/DT terminal with AC output terminal, as it will have electrochemical reaction with AC output terminal and affect the reliability of connection. Please choose the OT/OD terminal material according to the cable conductor material as below.

Cable conductor material	Recommended OT/OD terminal material
Copper	Copper
Copper clad aluminum	Copper
Aluminum	Copper to aluminum adapter terminal

Table 5.7. Cable conductor specification

5.3.6. Connection of Additional Grounding

⚠ WARNING

- The ground connection of this additional grounding connection cannot replace the AC cable PE terminal connection.
- Make sure that all the grounding points on the enclosures are equipotential connected when there are multiple inverters.
- Connect this additional grounding cable before AC cable connection, DC cable connection and communication cable connection.

Note: The additional cable and OT/DT terminal should be prepared by the users themselves.

Note: The inverter cannot be used with functionally earthed PV arrays.

Remove the screw of grounding terminal and secure the additional grounding cable by insert a screw into the screw hole in the OT/DT terminal. Two grounding terminals are available for redundancy purpose. The user can choose either terminal for connection or connect two grounding cables if needed.

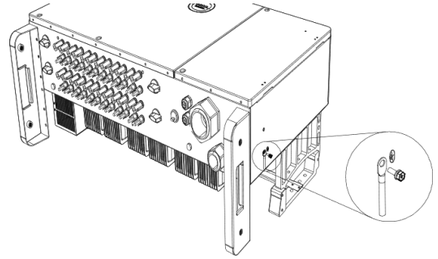


Figure 5.4 Installing additional grounding cable

M6*30 mm

5-7 N·m

5.3.7. AC Side Electrical Connection

To connect AC-side cables:

Step 1. Strip off the wire insulation skin and AC cable insulation skin at proper length.

Step 2. Crimp the AC cable with OT/DT terminals.

Step 3. Disconnect the AC circuit breaker, and open the wiring cabinet cover.

Step 4. Insert the cable through the waterproof cable gland and housing.

Step 5. Insert the conductors into the corresponding ports and fix them with screws.

Step 6. Secure the cable gland by fastening the sealing nut.

Step 7. Plug the AC connector into the AC connector port of the inverter.

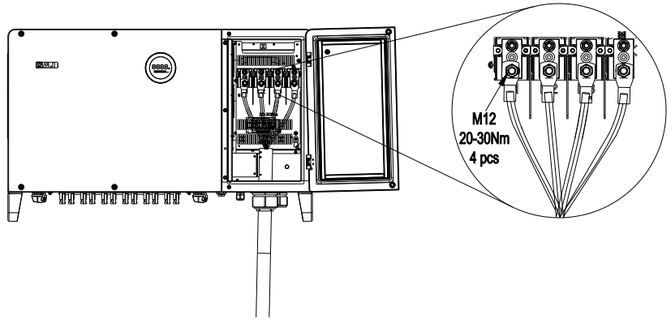


Figure 5.4 AC side electrical connection

5.4. DC-side Connection

5.4.1 DC Cable Specification

Cross-sectional area of cables (mm^2)	External diameter of the cables (mm)
Scope	6-9
4 ≤ S ≤ 6	

Table 5.8. Recommended specifications of DC cables

5.4.2 PV Connector Assembly

DANGER

- Dangerous to life due to electric shock when live components or DC cables are touched.
- The PV panel string will produce lethal high voltage when exposed to sunlight. Touching live DC cables results in death or lethal injures.
- DO NOT touch non-insulated parts or cables.
- Disconnect inverter from voltage sources.
- DO NOT disconnect DC connectors under load.
- Wear suitable personal protective equipment for all work.

WARNING

- Make sure the PV array is well insulated to ground before connecting it to the inverter.
- Make sure the maximum input voltage of each string does not exceed 1100V.
- When the input voltage varies within the range of 1000V to 1100V, the inverter will enter standby mode. When the input voltage decreases to a value within the MPPT operating voltage range of 180V to 1000V, the inverter will enter normal mode.
- Make sure the maximum short-circuit current of DC side is within the permissible range.
- When the photovoltaic array is exposed to light, it supplies a d.c. voltage to the PCE.

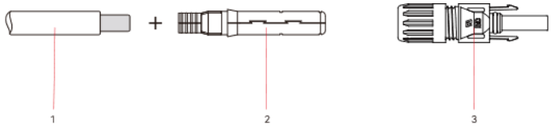


Figure 5.6 Positive connector

1. Insulated enclosure 2. Lock screw 3. Positive connector

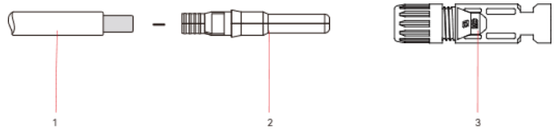


Figure 5.7 Negative connector

1. Insulated enclosure 2. Lock screw 3. Negative connector

Procedure

1. Pass the prepared DC cables through the PV cover one by one.

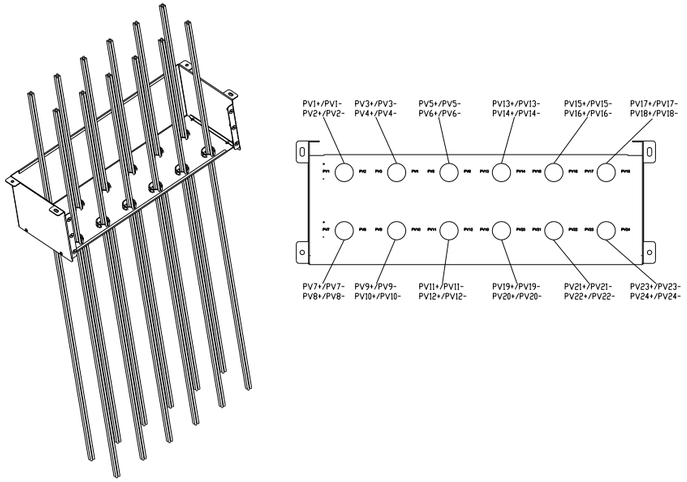


Figure 5.8 Cable preparation

2. Loosen the lock screws on positive and negative connectors.

3. Use a 3-mm wide-bladed screwdriver to strip the insulation layer around 8 to 10 mm length from one end of each cable.

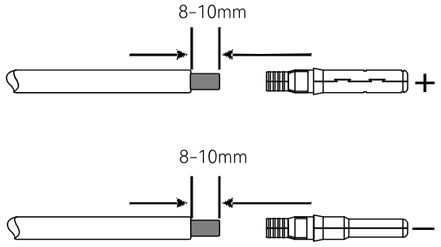


Figure 5.9 Striping off the insulation skin of cables

4. Insert the cable ends to the sleeves. Use a crimping plier to assembly the cable ends.

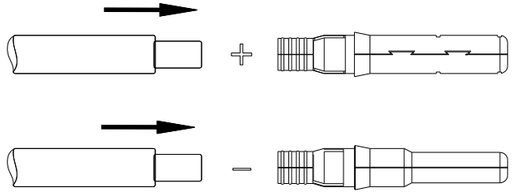


Figure 5.10
Inserting cables to lock screws

5. Insert the assembled cable ends into the blue positive and negative connectors. Gently pull the cables backwards to ensure firm connection.

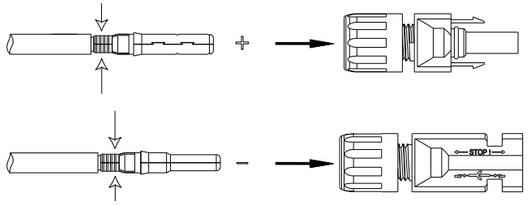


Figure 5.11
Inserting crimped cables to connectors

6. Tighten the lock screws on the positive and negative cable connectors.

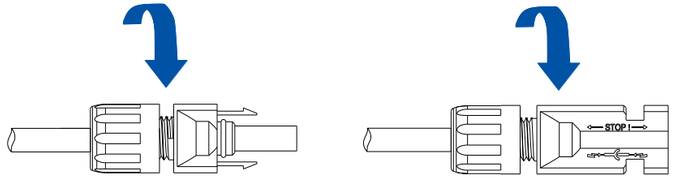


Figure 5.12 Securing the connectors

7. Make sure all the DC switches are at OFF position. For further safety consideration, recommend using a reliable tool (such as a lock with a key) to lock the switch and make sure that others cannot unlock it easily.

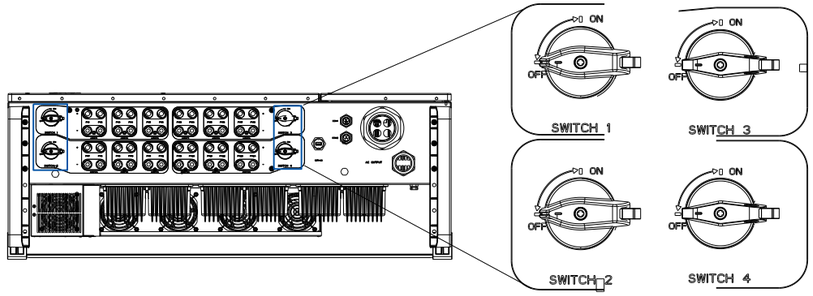


Figure 5.13 DC switch

8. Insert the positive and negative cable connectors into the positive and negative PV ports on the inverter until you hear a “click” sound to ensure firm connection.

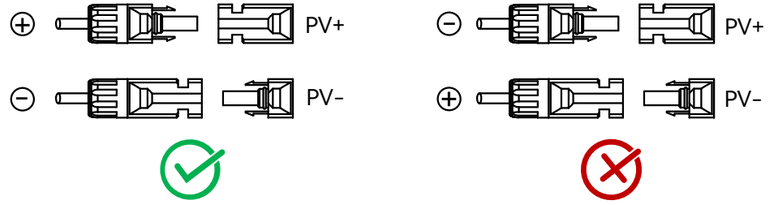


Figure 5.14 Plug in connectors

9. Secure the PV cover to the inverter.

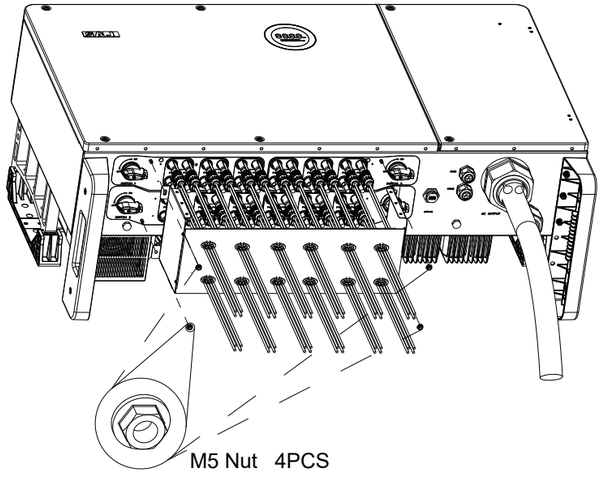


Figure 5.15 Installing the PV cover

10. Install the PV upper cover to the PV cover with screws.

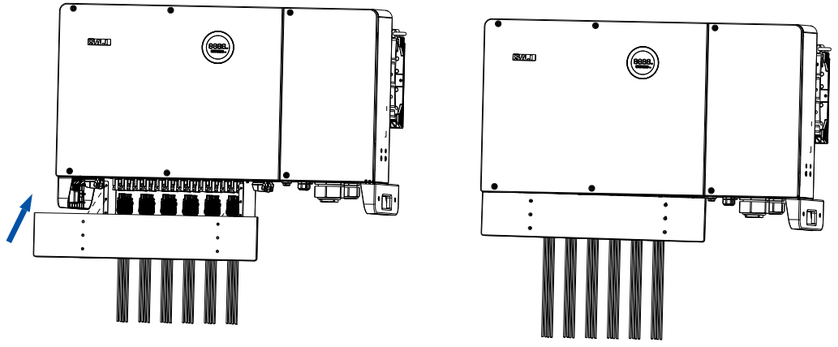


Figure 5.16 Installing the upper cover

5.5. Communication Connection

5.5.1 Communication Terminal Overview

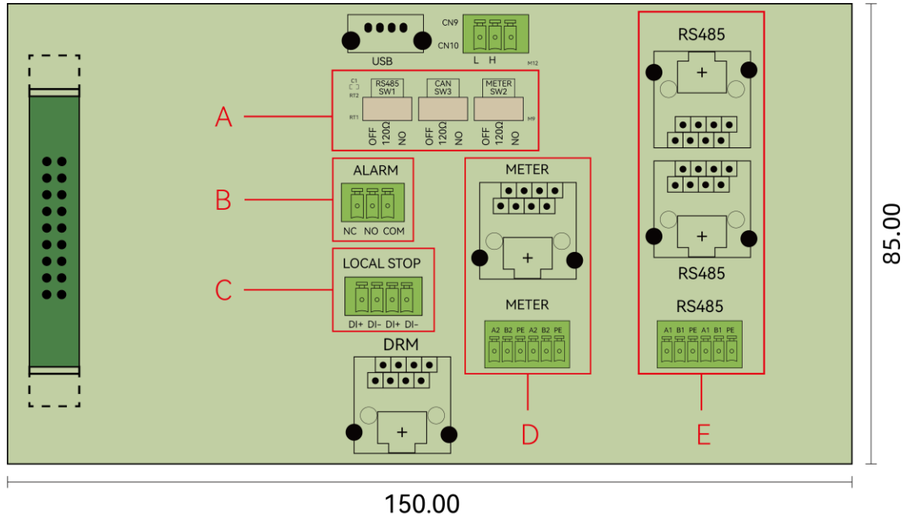


Figure 5.17
Communication terminal overview

Position	Description
A	DIP Switch
B	Alarm Output Dry Contact
C	Emergency Stop Dry Contact
D	Meter Output
E	RS485 Communication Port

Table 5.9.
Terminal description

5.5.2 Dry Contact Connection

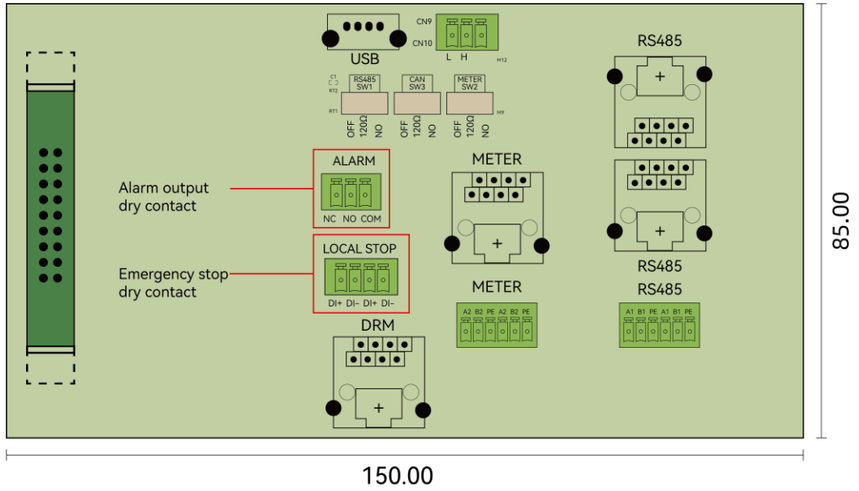


Figure 5.18 Dry contact overview

The inverter is integrated with alarm output dry contact and emergency stop dry contact.

Alarm output dry contact:

The relay can be set to normal open contact (COM&NO) or normal close contact (COM&NC). When the inverter is in alarm/fault state, the fault status can be indicated by LED indicator or other external display device.

1. The LED indicator works as the alarm/fault indicator. When the relay is in normal close contact (NC) and no alarm/fault occurs, the LED indicator is on; When a fault occurs, the relay is in normal open contact (NO), and the LED indicator is off.

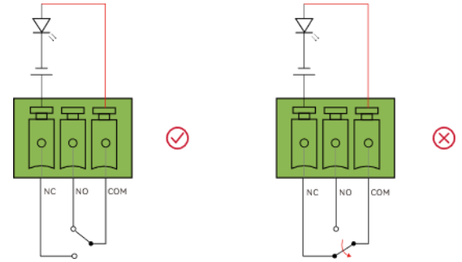


Figure 5.19 Relay is in normal close contact

2. When the relay is on normal open contact (NO) and no alarm/fault occurs, the LED indicator is off; When a fault occurs, the relay is on normal close contact (NC), and the LED is on.

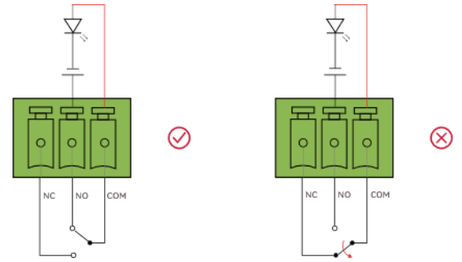


Figure 5.20 Relay is in normal open contact

Emergency stop dry contact:

When the DI+ and DI- contacts are shorted by external controlled switch, the inverter stops immediately.

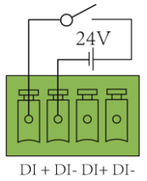


Figure 5.21 Emergency stop dry contact

Multiple-inverters dry contact connection

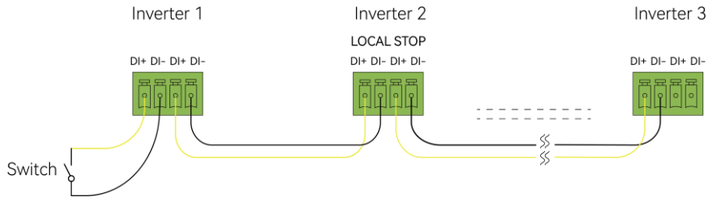


Figure 5.22
Multiple-inverters dry contact

5.6. RS485 Communication Connection

The inverter is integrated with an RS485 communication terminal and a meter communication terminal. RS485 communication terminal is mainly for multiple inverters communication which can be connected in a daisy chain manner. Meter communication terminal is mainly for data interaction between the monitoring device and the inverter.

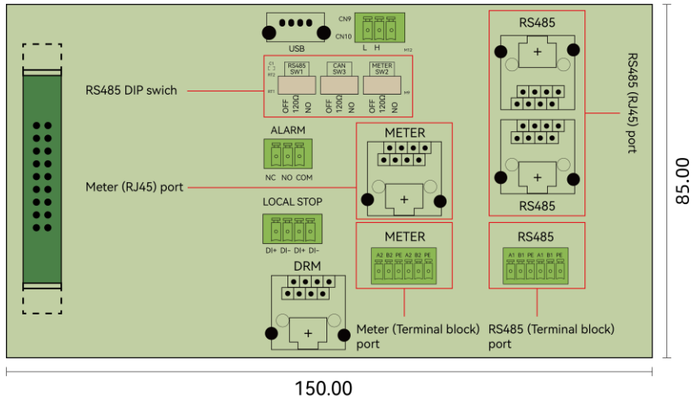
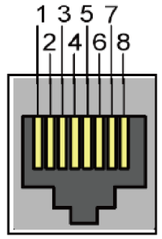


Figure 5.23 RS485 communication

Note: Meter and RS485 communication have two kinds of interfaces: the RJ45 terminal and the terminal block. The two ports provide the same function with different wiring. Choose either interface for cable connection.



RS485		
1	NC	8 7 6 5 4 3 2 1
2	NC	
3	NC	
4	NC	
5	NC	
6	NC	
7	RS485-A+	
8	RS485-B-	

DRM		
1	DRM 1/5	8 7 6 5 4 3 2 1
2	DRM 2/6	
3	DRM 3/7	
4	DRM 4/8	
5	RefGen	
6	Com/DRM 0	
7	0	
8	0	

Figure 5.24 RS485 pin
Table 5.10. RJ45 pin port description

To comply with Australian and New Zealand safety requirements, the DRMs terminals should be connected where required. A RJ45 plug is provided as the DRED connection to the inverter. Only DRM 0 is supported for this inverter.

Mode	Corresponding Pins	Function
DRM 0	5 and 6	Operate the disconnection device.

Table 5.11. DRM description

Terminal block:

Pin	Name	Function
A1	RS485-A+	RS485 in, RS485A differential signal +
B1	RS485-B	RS485 in, RS485B differential signal -
PE	PE	GND, shielded earthing point
A1	RS485-A+	RS485 in, RS485A differential signal +
B1	RS485-B	RS485 in, RS485B differential signal -
PE	PE	GND, shielded earthing point

Figure 5.25 RS485 terminal block
Table 5.12. Terminal block description

Note: When there are multiple inverters connected, connect a terminating resistor between A1 and B1 by switching the RS485 DIP switch to ensure the communication quality.

Single-inverter terminal block connection:

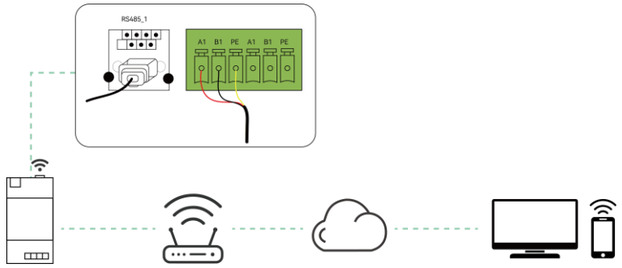


Figure 5.26 Single-inverter terminal block

Multiple-inverters terminal block connection:

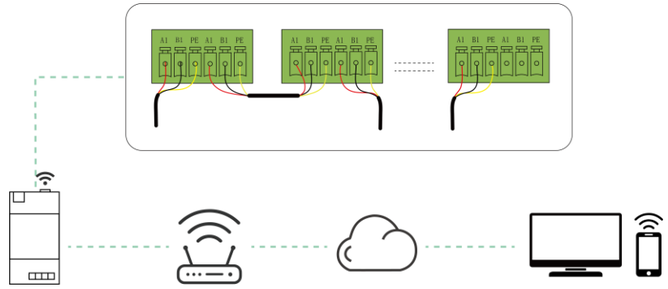


Figure 5.27 Multiple-inverters terminal block

5.7. RS232/USB Connection

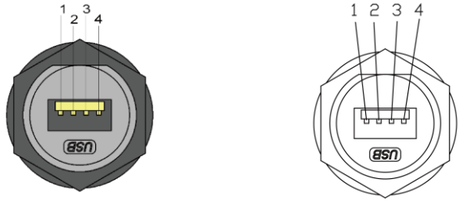


Figure 5.28 RS232 pin

Pin Number	Description	Function
1	+5V	Power supply
2	RS-232 TX	Send data
3	RS-232 RX	Receive data
4	GND	Ground wire

Table 5.13. USB pin port definition

This USB port is used to connect an eSolar Wi-Fi/4G/AIO3 communication module. For details, refer to the Quick Installation Guide of the communication module at https://www.saj-electric.com/.

5.8. Multiple Converters Combination

The inverters are not tested according to Section 5 of AS/NZS 4777.2:2020 for multiple inverters combination, so the combinations should not be used, or external devices should be used in accordance with the requirement of AS/NZS 4777.1.

5.9. Starting Up and Shutting Down

5.8.1. Starting Up the Inverter

Step 1. Make sure that the photovoltaic panels and AC power grid are connected to the inverter following the installation instructions from previous chapters.

Step 2. Use a multimeter to check whether the AC side and DC side voltage meet the inverter start voltage.

Step 3. Turn ON the DC switch (if applicable). The LED indicators will be lit up.

Step 4. Select the count grid code through the App. Contact the local grid operator about which region to select if needed.

The inverter will be in self-testing mode. When the inverter meets all the grid connecting standards, the inverter will connect to the grid and generate power automatically.

5.8.2. Shutting Down the Inverter

When the solar light intensity is not strong enough or the output voltage of the photovoltaic system is less than the minimum input power of the inverter, the inverter will shut down automatically.

To shut down the inverter manually, disconnect the AC side circuit breaker first. When multiple inverters are connected, disconnect the minor circuit breaker first, and then disconnect the main circuit breaker. Disconnect the DC switch after the inverter reports the grid connection lost alarm.

6.

COMMISSIONING

6.1 LED Indicators

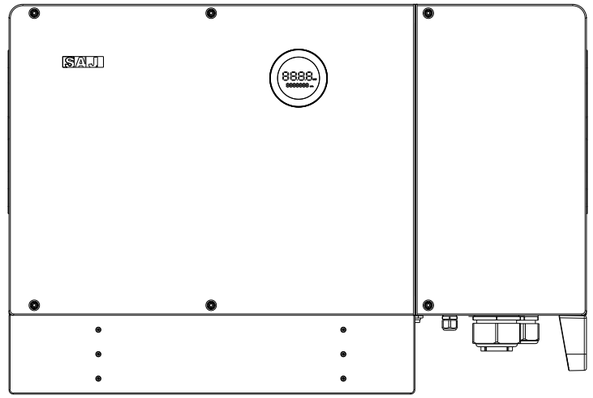


Figure 6.1 Human-computer interface

Display	Status		Description
Ring Light		Solid Green	The inverter is in normal on-grid state
		Breathing Mode	The inverter is in the initialization or standby state
		Solid Red	An error occurs
		Breathing Mode	Software is upgrading in the inverter
		OFF	The inverter is powered off.
LED Panel 1	8.8.8.8kW / E036		Current power (kW) / Error code
LED Panel 2	88888888 kWh		Total yield (kWh)

Table 6.1 Interface description

6.2 Commissioning Procedures

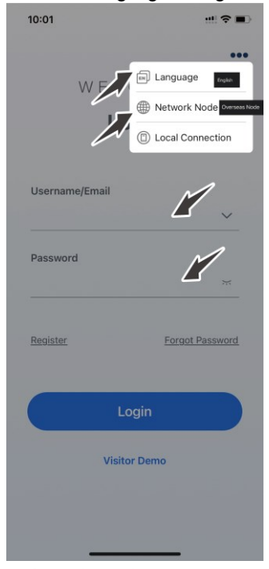
6.2.1. Downloading the App

1. The Elekeeper (used to be called eSAJ Home) App can be used for both nearby and remote monitoring. It supports AIO3, 4G and Wi-Fi module to communicate with the device.
2. On your mobile phone, search for “Elekeeper” in the App store and download the App.

6.2.2. Logging in to the App

Procedure

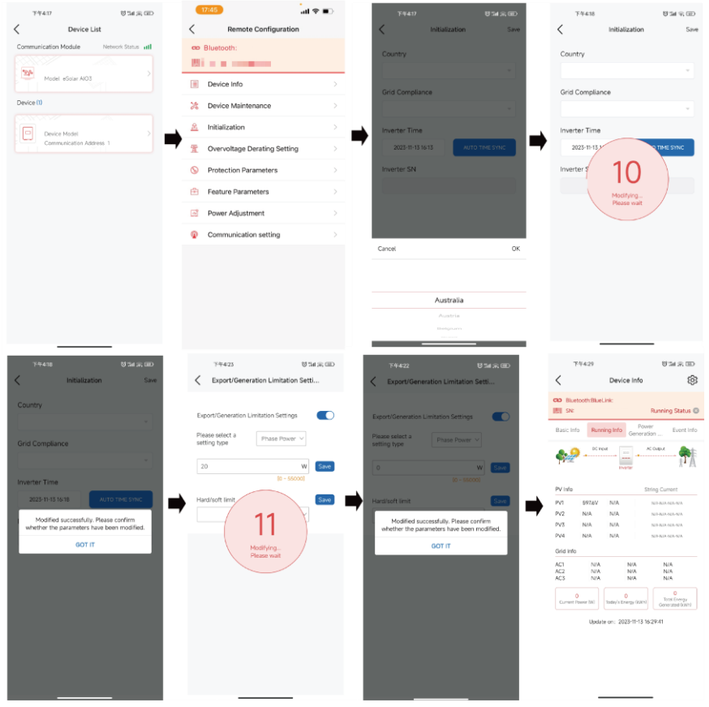
1. Open the App and tap the three-dot icon on the top right corner.
2. Set the **Language** to **English** and **Network Node** to **European Node** or **International Node**.



3. If you do not have an account, register first.
   a. tap **Register.** Choose whether you are an owner or an installer or distributor.
   b. Follow the instructions on the screen to complete the registration.
4. Use the account and password to log in to the App.
5. Go to the **Tool** interface and select **Remote Configuration**. Tap **Bluetooth** and enable the Bluetooth function on your mobile phone. Then, tap **Next.**

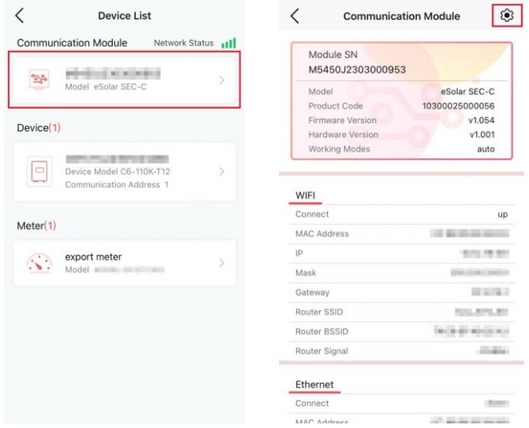
6.2.3. Completing the Initialization Settings

Follow the instructions on the screen.

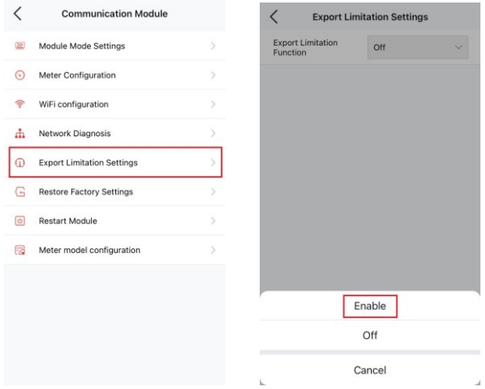


6.2.4. Setting Export Limit

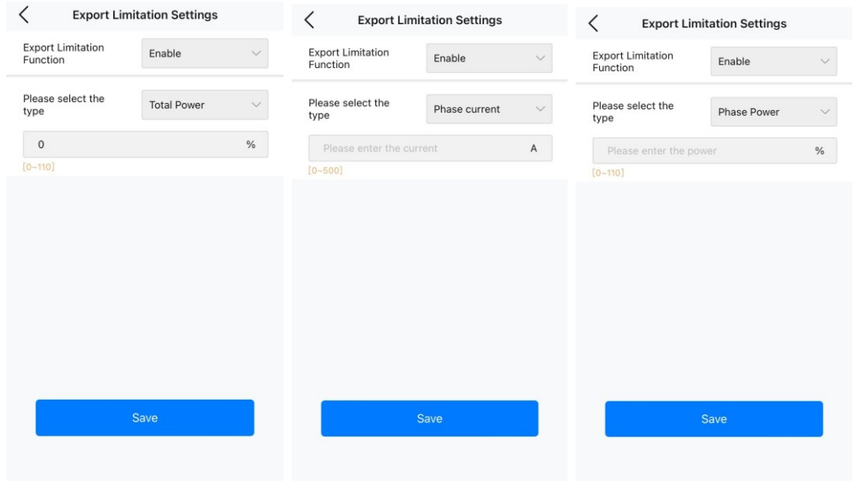
1. Log in to the App and connect to the inverter through Bluetooth connection.
2. Select the communication module from the **Device List**, and tap the settings icon on the upper right corner.



3. Select **Export Limitation Settings**, and select **Enable** from the drop-down list to enable the function.



4. Select one of the export limitation types as follows and set the corresponding value in the text box:



- **Total Power**: The inverter controls the maximum power that is exported to the grid.

  Set the value to the percentage of the rated power of the current inverter. For example, value 10% of inverter C6-100K-T9-40 indicates that the overall export power limit is 10 KW from the inverter.

  Note: Set the value within the range of 0-100 %.

- **Phase Current**: The inverter controls the maximum current that is exported from each phase to the grid. For example, value 20 (A) of inverter C6-100K-T9-40 indicates that the export current limit is 20 A from each phase.

- **Phase Power**: The inverter controls the maximum power that is exported from each phase to the grid.

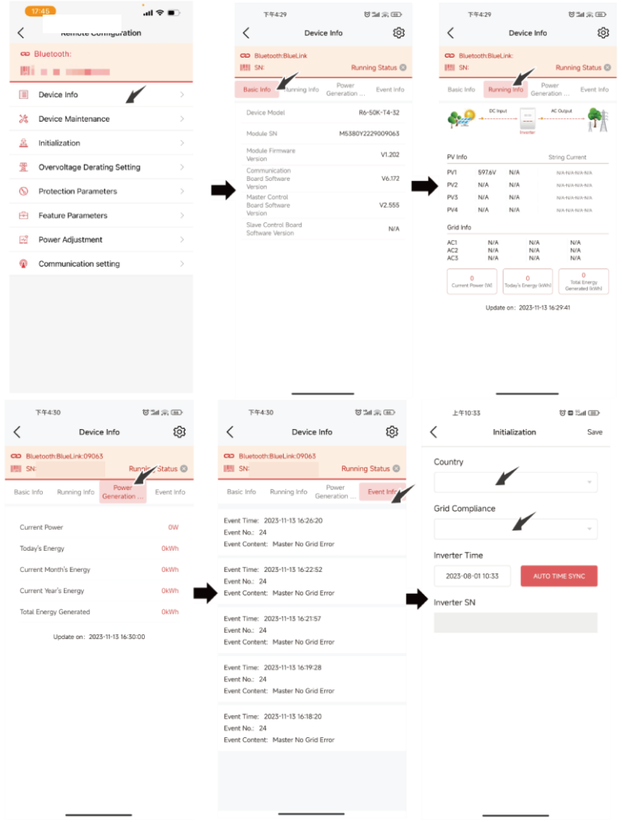
  Set the value to the percentage of the rated power of the current inverter. For example, value 10% of inverter C6-100K-T9-40 indicates that the export power limit is 10 KW from the whole inverter and 3.3 KW from each phase.

  Note: Set the value within the range of 0-100 %.

5. Tap **Save** to finish the setting.

6.2.5. Reviewing Inverter Settings

On **Device Info**, view the setting details, such as **Basic Info**, **Running Info**, **Power Generation**, and **Event Info**; on **Initialization**, view Country and **Grid Compliance**.



6.2.6. Remote Monitoring

Connect to the internet by using the eSolar AIO3 communication module that is delivered with the inverter and upload the inverter data onto the server. The customers could monitor the inverter operation status remotely on the eSolar Web Portal or App on the mobile phone.

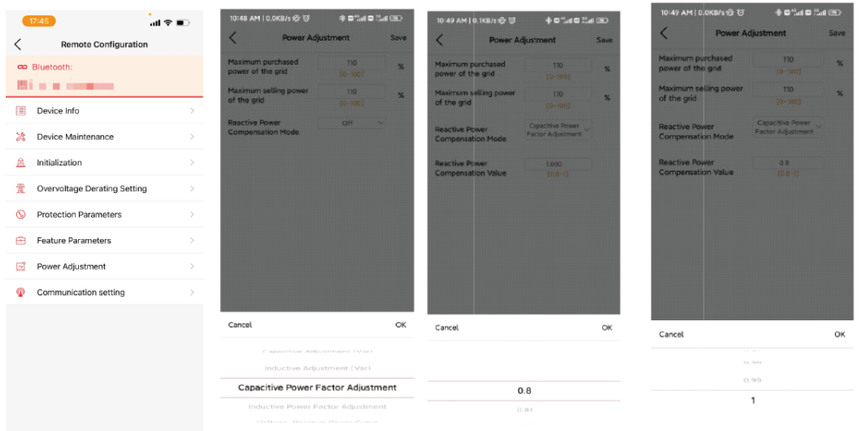
For details, refer to the user manual of the communication module.

6.3 Setting Reactive Power Control **(For Australia)**

6.3.1 Setting up Fixed Power Factor Mode and Fixed Reactive Power Mode

1. Select **Power Adjustment** and enter the password.

2. Select **Capacitive Power Factor Adjustment** or **Inductive Power Factor Adjustment** according to your local grid regulation. The power factor range is from 0.8 leading to 0.8 lagging.



6.3.2 Setting up V-Watt and Volt-Var Mode

This inverter complies with AS/NZS 4777.2:2020 for power quality response modes. The inverter satisfies different regions of DNSPs' grid connection rules requirements for volt-watt and volt-var Settings. e.g.: AS4777 series setting as below Fig 6.2&6.3.

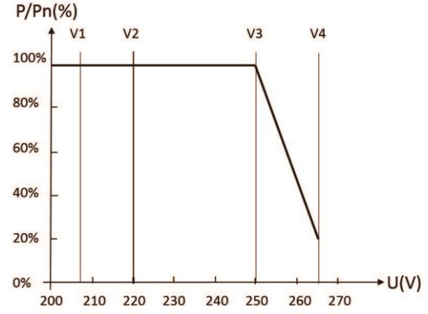


Figure 6.2
Curve for a Volt-Watt response mode (AS4777 Series)

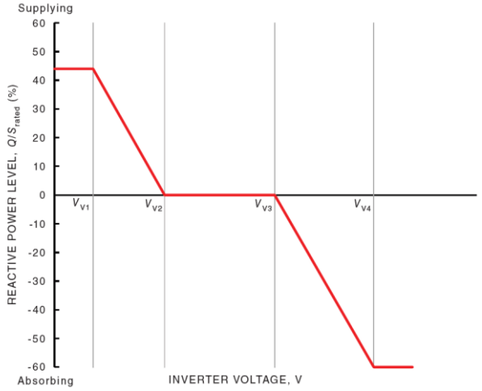


Figure 6.3
Curve for a Volt-Var control mode (AS4777 Series)

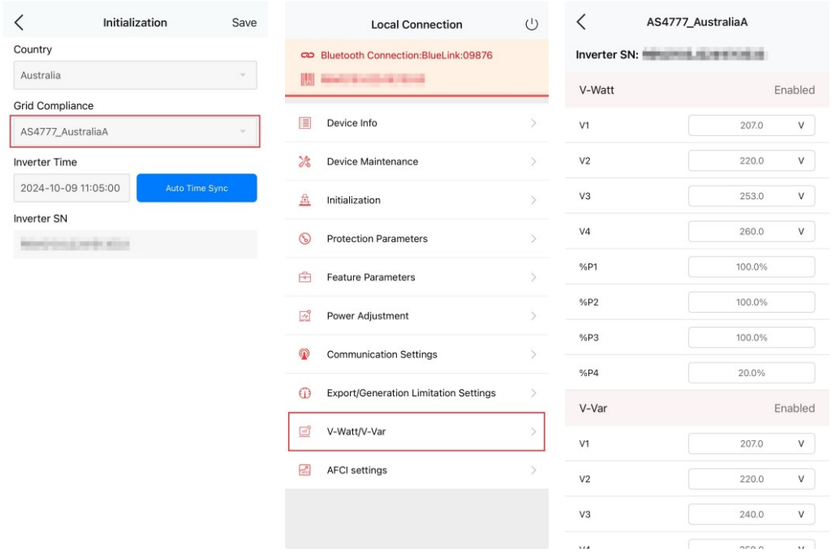
Procedure

1. Log in to Elekeeper App and connect to the inverter through Bluetooth connection.

2. On the **Device List** page, select the inverter under **Device**, and tap **Initialization**.

3. Make sure that the corresponding AS4777 grid compliance is selected.

4. On the **Device List** page, tap **V-Watt/V-Var** to enter the DNSP settings, and set the corresponding values as required.



Note: For the power rate limit mode, SAJ sets the product WGra to 16.67%Pn by default in the following cases according to the requirements of 3.3.5.2 as 4777.2: 2020.:

1. Soft ramp up after connection.
2. Reconnect or soft ramp up/down following a response to frequency disturbance.

7.

TROUBLESHOOTING

7.1 Error Code

Code	Fault Information
1	Master Relay Error
2	Master EEPROM Error
3	Master Temperature High Error
4	Master Temperature Low Error
5	Lost Communication M<->S
6	GFCI Device Error
7	DCI Device Error
8	Current Sensor Error
9	Master Phase1 Voltage High
10	Master Phase1 Voltage Low
11	Master Phase2 Voltage High
12	Master Phase2 Voltage Low
13	Master Phase3 Voltage High
14	Master Phase3 Voltage Low
15	Grid Voltage 10Min High
18	Master Grid Frequency High
19	Master Grid Frequency Low
21	Phase1 DCV High
22	Phase2 DCV High
23	Phase3 DCV High
24	Master No Grid Error
27	GFCI Error
28	Phase1 DCI High
29	Phase2 DCI High
30	Phase3 DCI High
31	ISO Error
32	Bus Voltage Imbalance
33	Master Bus Voltage High
34	Master Bus Voltage Low
35	Master Grid Phase Error
36	Master PV Voltage High
37	Master Islanding Error
38	Master HW Bus Voltage High
39	Master HW PV Current High

Code	Fault Information
40	Master Self-Test Failed
41	Master HW Inv Current High
42	Master AC SPD Error
43	Master DC SPD Error
44	Master Grid NE Voltage Error
45	Master Fan1 Error
46	Master Fan2 Error
47	Master Fan3 Error
48	Master Fan4 Error
49	Lost Communication between Master and Meter
50	Lost Communication between M<->S
51	Lost Communication between inverter and Grid Meter
52	HMI EEPROM Error
53	HMI RTC Error
56	CT Device Err
57	AFCI Lost Com.Err
58	Lost Com. H<->S Err
61	Slave Phase1 Voltage High
62	Slave Phase1 Voltage Low
63	Slave Phase2 Voltage High
64	Slave Phase2 Voltage Low
65	Slave Phase3 Voltage High
66	Slave Phase3 Voltage Low
67	Slave Frequency High
68	Slave Frequency Low
73	Slave No Grid Error
74	Slave PV Input Mode Error
75	Slave HW PV Curr High
76	Slave PV Voltage High
77	Slave HW Bus Volt High
81	Lost Communication D<->C
83	Master Arc Device Error

Code	Fault Information
84	Master PV Mode Error
85	Authority expires
86	DRM0 Error
87	Master Arc Error
88	Master SW PV Current High

Table 7.1 Error Code

7.2 Troubleshooting

Error Message	Troubleshooting
Relay Error	If this error occurs frequently, contact your distributor or call SAJ technical support.
Storage Error	If this error occurs frequently, contact your distributor or call SAJ technical support.
High Temperature Error	Check whether the radiator is blocked, whether the inverter is in too high or too low temperature, if the above mentioned is in normal, contact your distributor or call SAJ technical support.
GFCI Device Error	If this error occurs frequently, contact your distributor or call SAJ technical support.
DCI Device Error	If this error occurs frequently, contact your distributor or call SAJ technical support.
GFCI Devices Error	If this error occurs frequently, contact your distributor or call SAJ technical support.
DCI Devices Error Master	If this error occurs frequently, contact your distributor or call SAJ technical support.
DCI Devices Error Master	If this error occurs frequently, contact your distributor or call SAJ technical support.
AC Voltage Error	• Check the voltage of the grid. • Check the connection between the inverter and the grid. • Check the settings of the on-grid standards of the inverter. • If the grid voltage exceeds the level regulated by the local utility, consult with local grid personnel to determine if they can adjust the voltage at the point of connection or modify the regulated voltage value. • If the grid voltage is within the permitted regulated range and the LCD continues to display this error, contact your distributor or reach out to SAJ technical support for further assistance.
Frequency Error	Check the settings of country and the frequency of the local grid. If the settings are normal, contact your distributor or call SAJ technical support.
Grid Lost Error	Check the connection status between the AC side of the inverter and the grid. If the connection is normal, contact your distributor or call SAJ technical support
GFCI Error	Check the insulation resistance of the positive and negative sides of the solar panel; check whether the inverter is in wet environment; check the grounding of the inverter. If the above mentioned are normal, contact your distributor or call SAJ technical support.

Error Message	Troubleshooting
DCI Error	If this error persists, contact your distributor or call SAJ technical support.
ISO Error	Check the insulation resistance of the positive and negative sides of the solar panel; check whether the inverter is in wet environment; check whether the grounding of the inverter is loose or not. If the above mentioned are normal, contact your distributor or call SAJ technical support.
Overcurrent	Check the connection status between the inverter and the grid and test whether the voltage of the grid is stable or not. If the above mentioned are normal, contact your distributor or call SAJ technical support.
Over Bus Voltage	Check the settings of the solar panel. If the settings are normal, contact your distributor or call SAJ technical support.
PV Overcurrent	If this error persists, contact your distributor or call SAJ technical support.
PV Voltage Fault	Check the settings of the solar panel. If the settings are normal, contact your distributor or call SAJ technical support.
Lost Communication	Check the connection of communication cables between the control board and the display board. If the connection is normal, contact your distributor or call SAJ technical support.
Null line-to-earth voltage fault	Check if the connection of the AC output grounding terminal is stable and reliable. If the connection is normal, contact your distributor or call SAJ technical support.

Table 7.2 Troubleshooting

8.

ROUTINE MAINTENANCE

Inverter Cleaning

Clean the enclosure lid and LED indicator of the inverter with moistened cloth with clear water only. Do not use any cleaning agents as it may damage the components.

Heat Sink Cleaning

Clean the heat sinks with dry cloth or air blower. Do not clean the heat sink with water or cleaning agents. Make sure there is enough space for inverter ventilation.

9.

RECYCLING AND DISPOSAL

This device should not be disposed as residential waste. An inverter that has reached the end of its life and is not required to be returned to your dealer it must be disposed carefully by an approved collection and recycling facility in your area.