

Istel Grid-tied PV Inverter user manual



IGT-8~30KTA

Thank you for choosing non-isolated on-grid PV inverter.
In order to ensure your safety and proper use, please
read the manual in details before using. Thanks for your
cooperation!

Contents

1.Overview	3
1.1 Use of this manual	3
1.2 Symbols	3
1.3 Nameplate	4
2.Delivery	5
2.1 Scope of Supply	5
2.2 Product Acceptance	5
3.Description	6
3.1. Brief Introductions	6
3.2 General Introduction	7
4.Installation	9
4.1 Installation Procedure	9
4.2 Installation Preparation	9
4.3 Mechanical Installation	13
4.4 Electrical Connection	15
5.Monitoring	24
5.1 Overview	24
5.2 WIFI Logger Quick Guide	26
5.3 ATSolar App	29
5.4 Cloud Server	32
6.Trial run	33
6.1 Inspection before trial run	33
6.2 Test run steps	33
7.Shut down & Dismantle	34
7.1 Shut down	34
7.2 Dismantle the inverter	34
7.3 Discarding the inverter	34
8.Operating	35
8.1 Working Mode	35
8.2 Disconnect from grid	37
9.Maintenance	38
9.1 Maintenance	38
9.2 Troubleshooting	38
9.3 Quality Assurance	40

10.1 Specification	41
--------------------------	----

1.1 Use of this manual

This manual mainly introduces installation, operating and maintenance of inverter and related technical parameters. It is suitable for people who install the inverters and do other related jobs. Readers need to have some knowledge of electric, electrical wiring and mechanics. Before installing this product, please read this manual carefully, and put it in a suitable place, so as to ensure that relevant personnel of installation and operation can easily get it.

This manual applies to the following types of PV inverters

8/10/12/15/17/20/23/25/28/30KTA Series

1.2 Symbols

Please strictly follow below safety rules when installing and operating.



DANGEROUS

DANGEROUS indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



WARNING

WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury



CAUTION

CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



NOTE

NOTE indicates a situation which, if not avoided, could result in equipment or property damage.

1.3 Nameplate

Take IGT-12KTA for example

<u>Grid-Tied Inverter</u>			
IGT-12KTA NO.			
V _{max} PV	1100V	AC voltage	3φ/N/PE400Vac
I _{sc} PV	2*23A	Frequency	50Hz/60Hz
MPPT voltage range	180-1000Vdc	Max. continuous current	20A
Max. PV input current/ MPPT	2*18A	Max. continuous Power	13.2kW
PF	1(0.8Leading-0.8Lagging)	Max. AC apparent Power	13.2kVA
Protective class		Class I	
Ingress protection		IP 66	
Working temperature		-25℃-60℃(Derating 45℃)	
Overvoltage category		OVC II(PV) OVCIII(AC)	
			

2.1 Scope of Supply

There are following items in the packing box, as shown in Table 2-1.

Please check in time after receiving the products.

NO.	Name	Qty	Note
1	PV on-grid inverter	1	
2	Product qualification certificate	1	
3	Fixed bracket	1	
4	Factory inspection report	1	
5	PV cable connector	2	Male/female cable connector: 2 for each
6	Cross recessed hex bolt	2	Used for fastening machine and the fixed plate
7	Expansion bolt	3	Used for fastening the fixed plate
8	Hexagon bolt	3	Used for fastening the fixed plate
9	Flat washer	3	Used for fastening the fixed plate
10	Spring washer	3	Used for fastening the fixed plate

Table 2-1: Scope of supply

2.2 Product Acceptance

Although we have carefully tested and inspected the products before delivery, but there might be damages during transport. So, please check them when sign for them. If there is any damage, please contact the shipping company or directly contact us. Please provide photos of the damaged parts, and we will provide the best service as fast as possible.

3.1. Brief Introductions

On-grid PV power generation system usually is composed of solar panels, junction box, inverter, ammeter and power grid. The core of the system is PV grid-connected inverter. The sunshine irradiates on the surface of the solar panels, solar panels output DC, converted by inverter, then output AC of the same frequency and phase with the grid, and then feed into the grid.

TLC series in application of PV power generation system is shown in Figure 3-1.

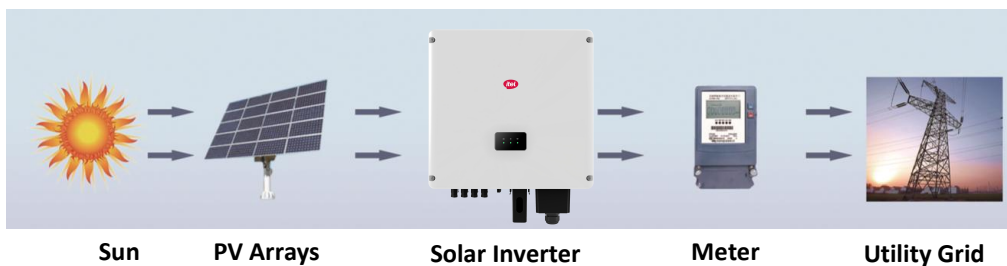


Fig 3-1 Grid-connected PV Power Generation System

Product performance

- Transformerless, highest efficiency is 98.7%
- Wide input voltage, MPPT efficiency is 99.9%
- Two way independent MPPT control to deal with different installation angles, enhance power generation
- Active and passive anti-islanding protection technology
- Comprehensive protection, higher reliability
- IP66 Outdoor design, suitable for harsh environment
- RS485,WIFI,GPRS multi-communication interface, user friendly.

3.2 General Introduction

✧ Appearance and interface

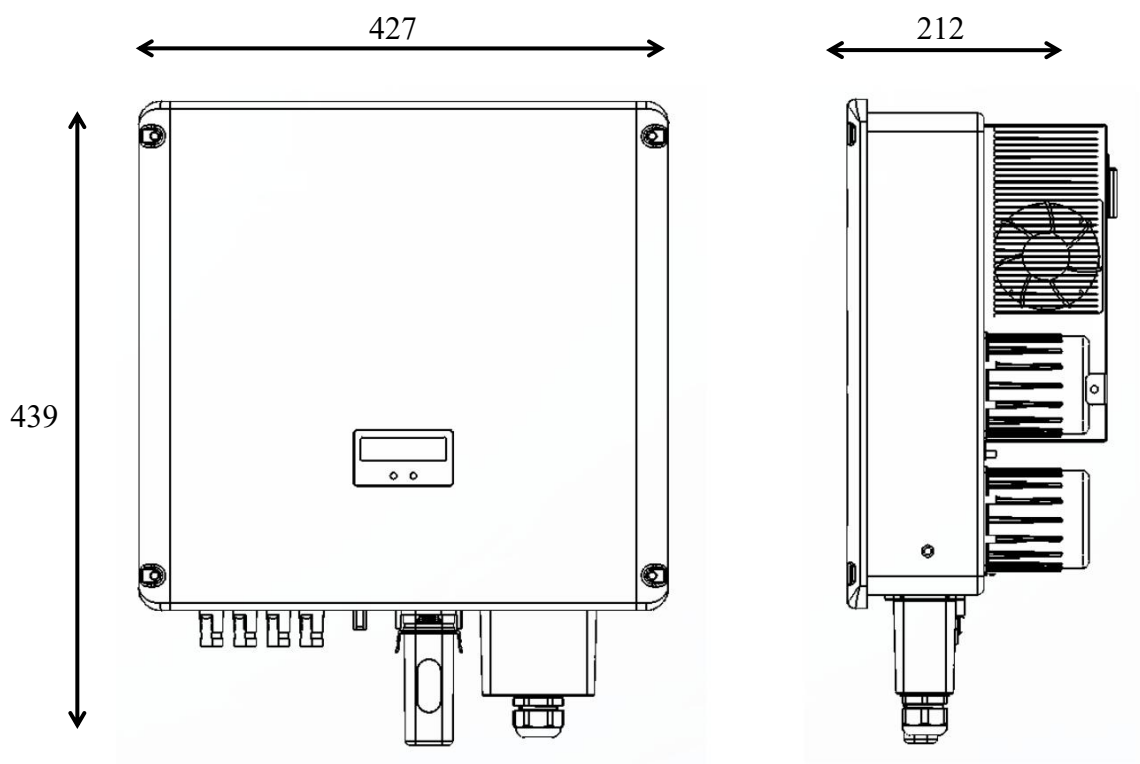


Fig 3-2 Appearance of 8~30KTA

Appearance of IGT 8-30KTA (take 10KTA for example) is as shown in Figure 3-2. Its external interface is in the bottom of the machine and is composed of PV input port +, PV input port-, communication port, DC switch, AC output. Please refer to Figure 3-5 and Table 3-1 for details.

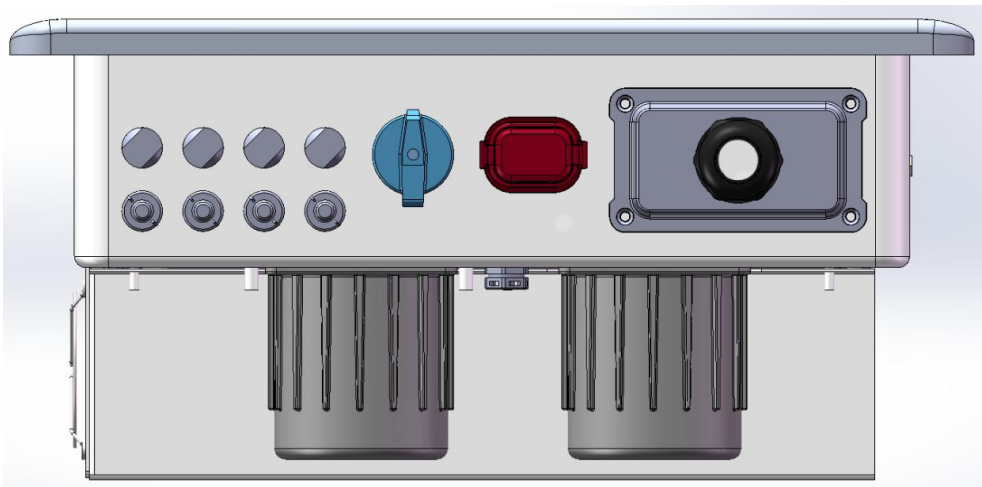


Fig 3-3: External Port

No.	Name	Description
1	PV input port +	Inverter's DC input port, connect with + port of PV arrays
2	PV input port -	Inverter's DC input port, connect with – port of PV arrays
3	DC switch	Electric cut off between inverter and PV arrays
4	WIFI/GPRS/RS485	Connect inverter with PC through this port for remote monitoring
5	Earthing bolt	Connect machine case with ground
6	AC output port	Connect with phase L1, L2, L3 and wire N of the grid through the breaker, connect ground wire to the ground

Table 3-1: External Interface

4

Installation

Please carefully read below installation guide for IGT 8-30KTA.

4.1 Installation Procedure

Before installing and operating this product, please strictly abide by the installation sequence and warning symbols.

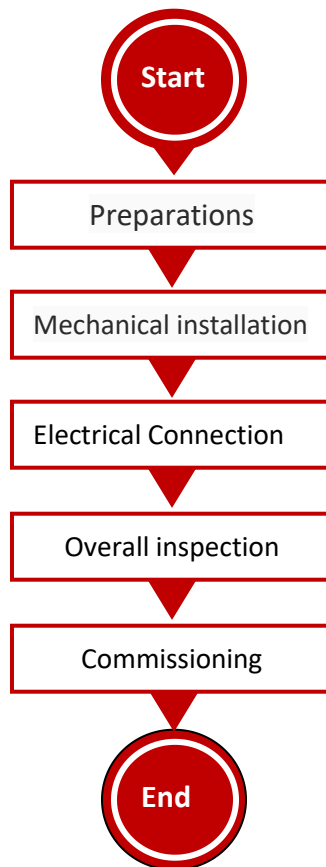


Fig 4-1 Installation procedure

4.2 Installation Preparation

- **Check whether there is damage during transport**

Although we have carefully tested and inspected the inverter before shipping, there might be damage during transport. So please check them before installation. If there is any damage, please contact the shipping company or directly contact us. Please provide photos of the damaged part. We will provide the

best service at fast as possible.

● Tools for installation

The following installation tools and parts are needed.

- ✓ Spanner
- ✓ Electric impact drill
- ✓ Cross screwdriver
- ✓ M4 Allen wrench
- ✓ Megameter & Multimeter

● Choose installation location



WARNING

Please read carefully and follow the following basic installation requirements. Failure to follow these warnings will directly lead to serious personal injury or even life-threatening.



WARNING

Poor ventilation in the installation environment will affect system performance. It is necessary to ensure good ventilation during the operation of the equipment. The device must be kept upright and the heat sink is not blocked to ensure adequate cooling inside the device.

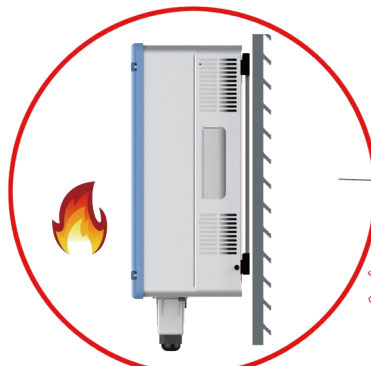
The inverter protection level reaches IP66 and can be used for indoor or outdoor installation.

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

- 1 Ensure that the installation wall has the capacity to support the inverter for a long time.
2. The inverter should be installed in a location that is easy for electrical connection, operation and maintenance.
3. The installation wall must have fireproof performance, and there must be no flammable materials or flammable gas in the installation space.

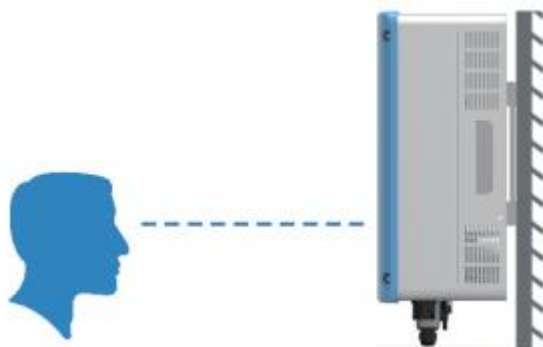


The wall material is flammable

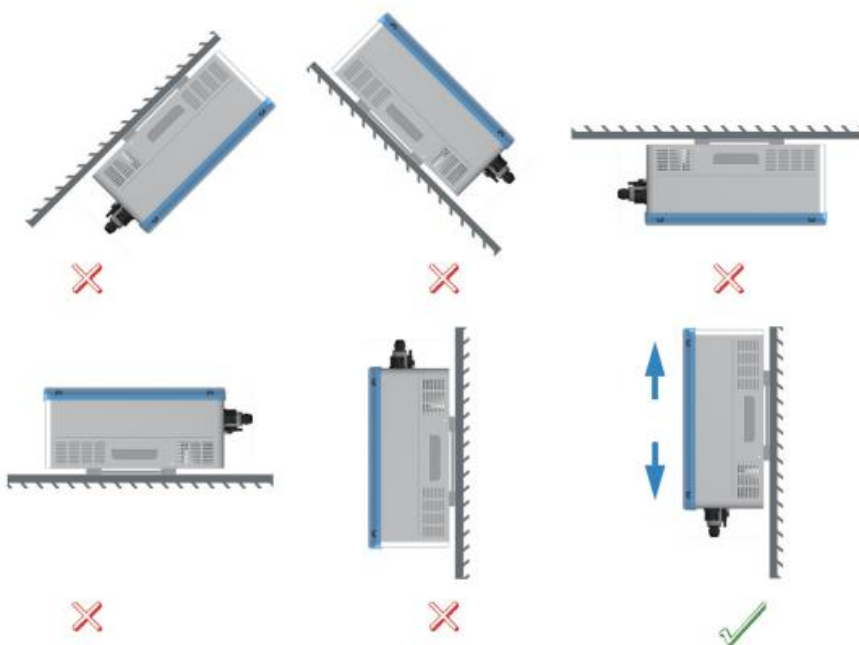


There is flammable material or flammable gas in the installation space

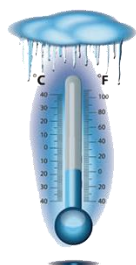
4. Do not install the inverter in the living area to avoid noise affecting daily life.
5. The installation location of the inverter should be far away from the reach of children.
6. Installation height is better to make the LCD at the same level with people's eye so as to make it convenient to operate on the LCD.



7. The inverter needs to be installed uprightly, and cannot be placed horizontally or upside down, or tilted.



8. The temperature range of the installation environment should be between -25°C and 60°C , relative humidity. $\sim 95\%$ (When the ambient temperature exceeds 45°C , the output power of the inverter will decrease).



Minimum ambient
temperature -25°C

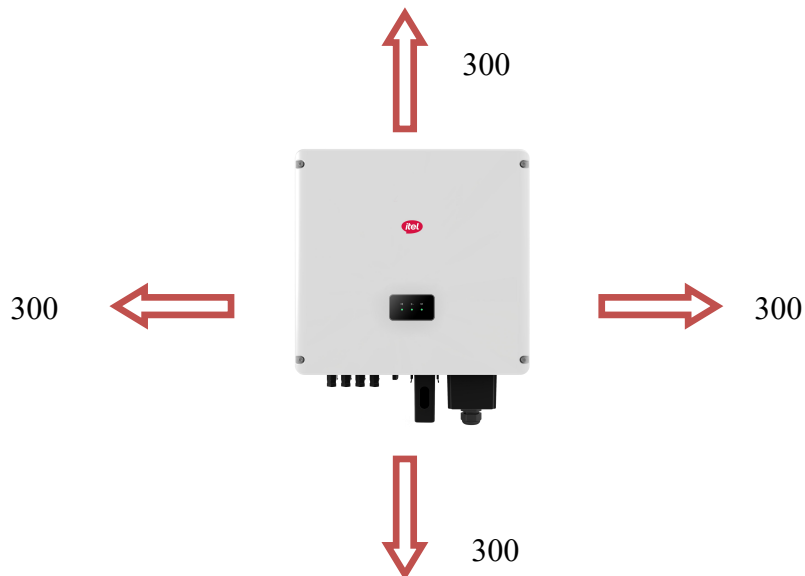


Maximum ambient
temperature 60°C

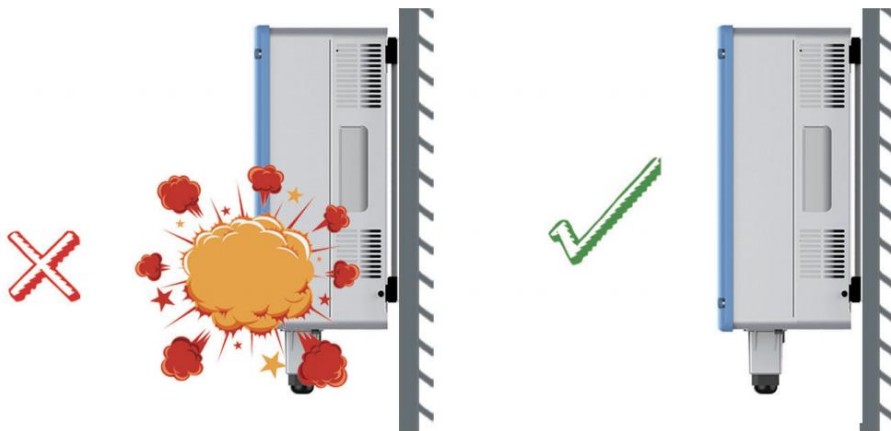


Environmental
humidity: 0-95%
non-condensing

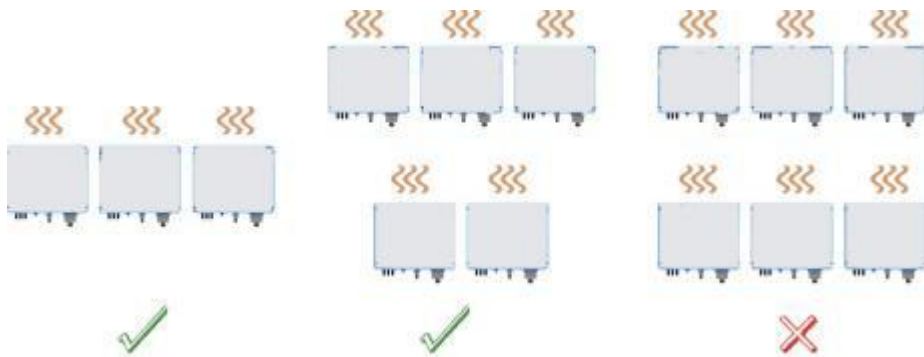
9. Enough space surrounding the inverter is needed to ensure good heat dissipation.



10. Ensure that the inverter is ventilated and dissipated smoothly. It is strictly forbidden to install the inverter in a closed space, otherwise the inverter will not work normally, and there may even be a danger of explosion.



11. Multiple inverters can be installed side by side, and multiple rows of inverters need to be installed staggered to facilitate heat dissipation.



12. Please choose a place where you can avoid rain, snow, and direct sunlight for installation (sunlight, rain, snow, etc. will directly affect the service life of the inverter. If it is unavoidable, please shield the inverter reasonably. To ensure the best operating environment)

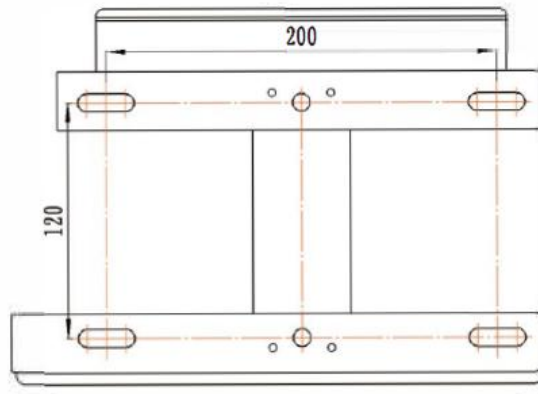


4.3 Mechanical Installation

After moving the inverter to the installation site, install the fixing bracket to the wall through the expansion bolt (expansion bolt is M8×30) assembly, and then install the inverter to the fixing bracket.

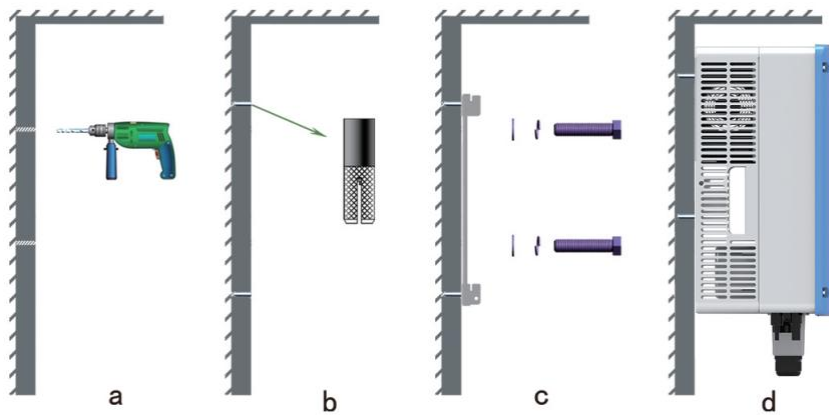
Installation:

1. Place the fixed bracket on the wall at a suitable height and position. Mark the drilling position according to the fixed bracket specification.



4-2 Installation size

2. Drill holes and install fixed brackets



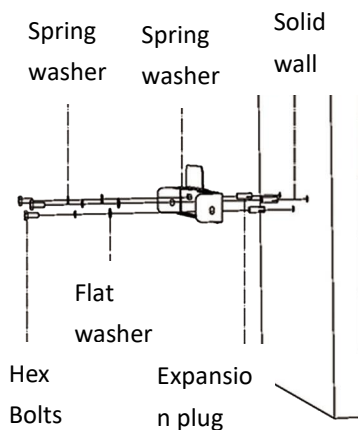
4-3 installation steps

If install the inverter on concrete wall

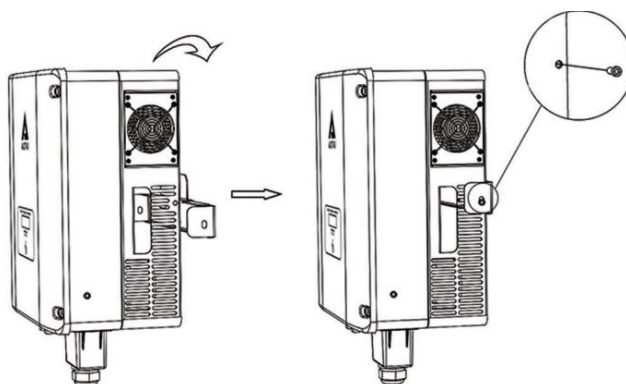
- Mark the drilling position on the wall according to the specifications of the fixing plate in Figure 4-2, and then drill at the marked position. A circular hole with a diameter of 10mm and a depth of 35mm.
- Insert the expansion coil of M8×30 into the round hole.
- Align the mounting holes of the fixing plate with the expansion solenoids and fix them with hexagonal bolts.
- Hang the inverter on the fixed bracket.

If install on metal scaffolds

Similar to drilling holes on the wall, drill holes according to the specifications of the fixing plate, fix the fixing plate with MS bolts, and hang the chassis on the fixing plate.



Note: Please cooperate with the machine before installing the fixed bracket to prevent reverse installation.



The inverter must be wall-mounted vertically

4.4 Electrical Connection

When performing electrical wiring work, personal protective equipment must be worn.



DANGEROUS

High voltage! Electrical shock!

Pay attention to safety before making electrical connections. Exposing photovoltaic strings to sunlight will generate dangerous high voltages.

Before making electrical connections, make sure that all cables are not live. Do not turn on the AC circuit breaker before completing the electrical connections..



WARNING

Any improper operation during the wiring process may cause equipment damage or personal injury or death.

The wiring operation must and only allow professional and technical personnel to complete. The cables used in the photovoltaic power generation system must be firmly connected, intact, well insulated, and have the correct specifications.



NOTE

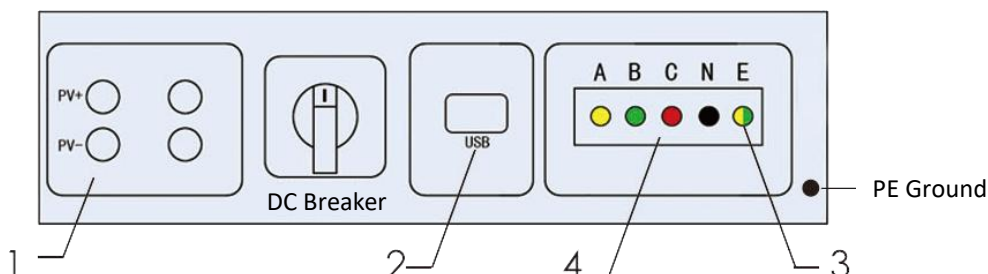
The relevant rules of the local power grid and the relevant safety instructions of the photovoltaic string must be followed.

All electrical installations must comply with the electrical standards of the country/region where the installation is located.

Only after getting permission from the local power supply department, can the inverter be integrated into the grid.

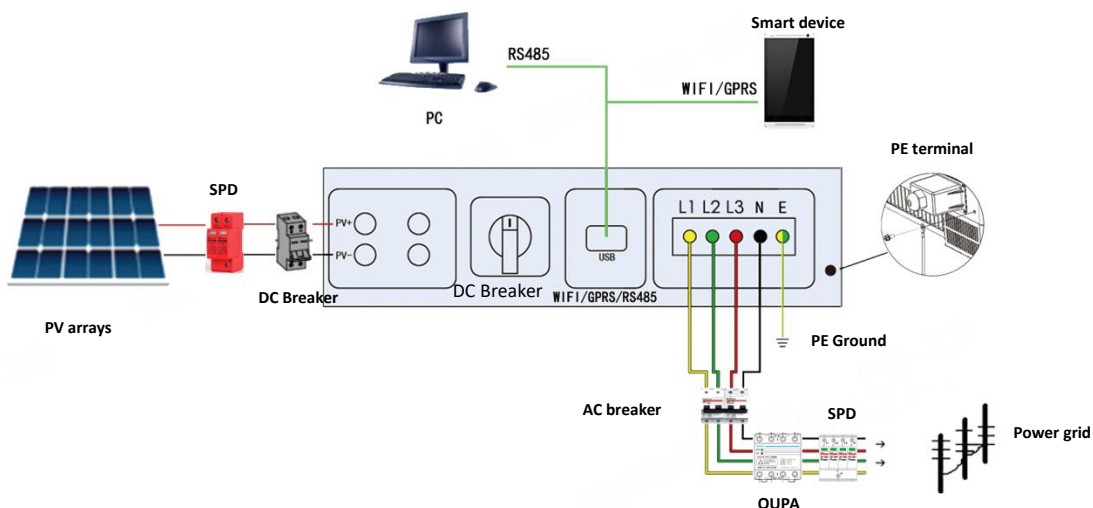
4.4.1 Terminal introduction

The external wiring terminal is located at the bottom of the inverter, as shown in the figure below:



No.	Terminal	Description
1	PV input terminal	Inverter's DC input port, connect to solar panels.
2	RS485 interface	Used to connect to WiFi module or GPRS data acquisition module
3	PE terminal	For reliable grounding of the inverter
4	AC output terminal	Connect to the grid through the AC terminal

4.4.2 Wire Connection



In the figure, the L1 phase of the power grid is represented by a yellow line, the L2 phase is represented by a green line, the L3 phase is represented by a red line, and the power grid N line is represented by a black line. It can be adaptive, and the N line can be omitted.) The protective grounding line is represented by a yellow-green line. It must be ensured that the inverter shell is reliably grounded.

4.4.3 AC Wiring



NOTE

The inverter can be connected to the grid only if the local power company or the competent authority has obtained the access permission. Before connecting to the grid, make sure that the grid voltage and frequency meet the requirements of the inverter.

• **AC Circuit Breaker**

An independent three-level or four-level circuit breaker on the AC side of each inverter can ensure that the inverter is safely disconnected from the grid.

No.	Inverter model	Breaker model
2	8/12KTA	36A
3	15/17KTA	36A
4	20/23/25/28/30KTA	60A



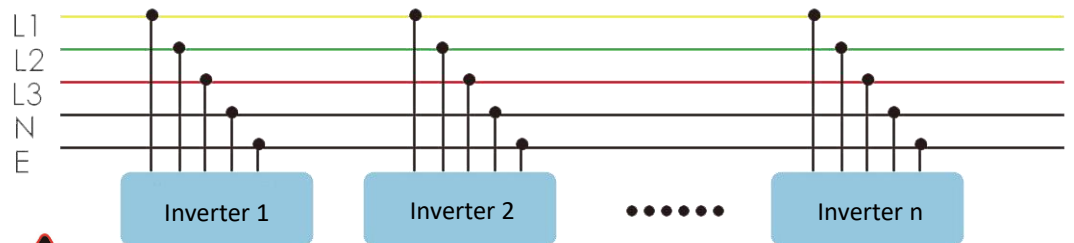
NOTE

Multiple inverters cannot share one circuit breaker
No load can be connected between the inverter and the circuit breaker

• **Leakage protector**

There is an integrated integrated leakage current detection unit inside the inverter. When the inverter detects a leakage current greater than the allowable value, it will quickly disconnect from the grid.

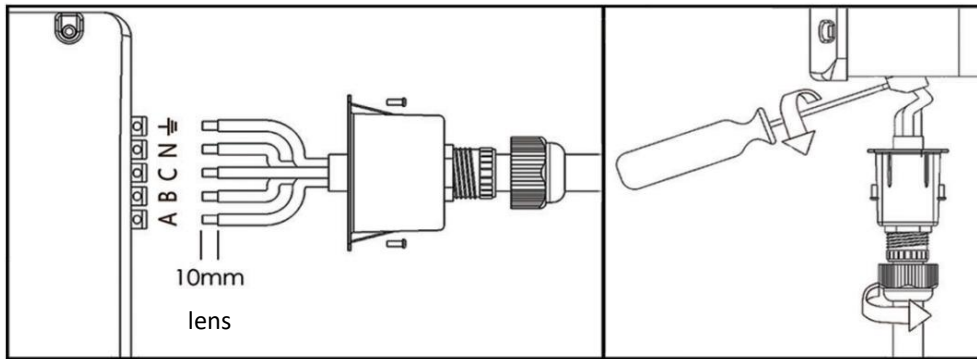
• **Parallel requirements for multiple inverters**



DANGEROUS

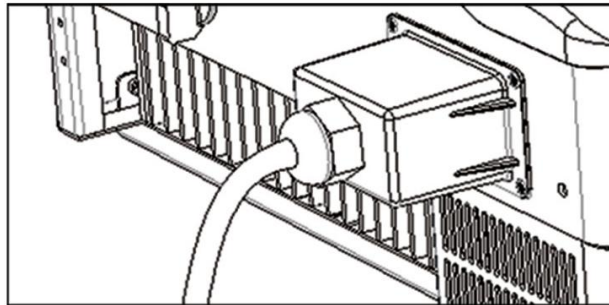
High voltage! Electrical shock!
Before electrical operation, make sure that all cables are not live.
Do not turn on the AC circuit breaker before the electrical connection of the inverter is completed

● AC cable wiring steps



1. Turn off the AC side circuit breaker and place a "no power-on" sign to prevent it from being switched on.
2. Connect the AC side connector to the corresponding AC terminal at the bottom of the inverter.
3. Connect the "PE" cable to the ground.
4. Connect the live and neutral wires to the AC circuit breaker.
5. Connect the other end of the AC circuit breaker to the grid.
6. Check that all cables are firmly connected.

After fixing the AC cover, tighten the AC waterproof connector, as shown in the following figure



NOTE

1. Pay attention to the wiring terminal layout of the AC terminal. The live wire and the neutral wire cannot be reversed, otherwise the inverter may not operate normally.
2. The terminals on the other side of the inverter except for the AC side wiring terminals are all in-line.
3. Flexible copper cable is the best choice for AC side cable.
4. The grounding wire must be connected and well grounded.

Model	Distance between inverter and grid connecting point, corresponsive cable(cable diameter: mm ²)			
	10-30m	30-50m	50-80m	Above 80m
8/12K	4	6	6	When there is only one inverter in the project, try to avoid distance between inverter and grid connecting point more than 80m. When there are multiple inverters in project, it can firstly use combiner box to combine outputs of inverters, then choose cable with bigger diameter.
15/17K	6	10	10	
20/23/25/28/30K	16	20	25	

4.4.4 PV array connection



DANGEROUS

High voltage! Electrical shock!

Pay attention to safety before electrical connection. Exposure of PV array to sunlight will generate dangerous voltage.



WARNING

Before connecting the PV array to the inverter, ensure that the PV array is well insulated to the ground.

• PV array input configuration

The inverter has two PV array input areas PV1 and PV2, and the inverter is equipped with an MPPT tracker for each input area.



NOTE

The following two precautions must be met, otherwise, the damage to the inverter will be without the scope of the warranty.

- **When designing a PV array, be sure to ensure that the voltage of each PV array is lower than 1100V even at the lowest temperature, otherwise it will cause irreversible damage to the inverter.**
- **Ensure that the maximum short-circuit current on the DC side is within the allowable range of the inverter, otherwise it may cause irreversible damage to the inverter.**

The two PV string inputs operate independently, and each has an independent MPPT. Therefore, the two photovoltaic inputs can be different from each other, including: different panel types; different numbers of cells in the PV string; different inclination angles, different azimuth angles.



NOTE

In order to make full use of the DC input power, the PV strings of the same input should be close to the same (especially the voltage), including: the same model; the same number of panels; the same inclination angle; the same azimuth angle.

- PV array input connection

The PV input needs to be connected with plug-in PV input terminals, and plug-in terminals for quick connection to the PV input are provided in the scope of supply.

The DC cables on the PV string side need to be installed with DC connectors. The connector is already provided in the scope of supply.



NOTE

In order to ensure that the inverter reaches the IP66 protection level, only use the supplied connector or products with the same protection level.

- DC cable

DC cable requirements

Cross-sectional area	Cable outer diameter	Maximum withstand voltage	Maximum input current of each string
2.5~6mm ²	6-9mm ²	1100V	15A



NOTE

The maximum designed current of each DC terminal is not more than 15A

- DC cable connection steps



DANGEROUS

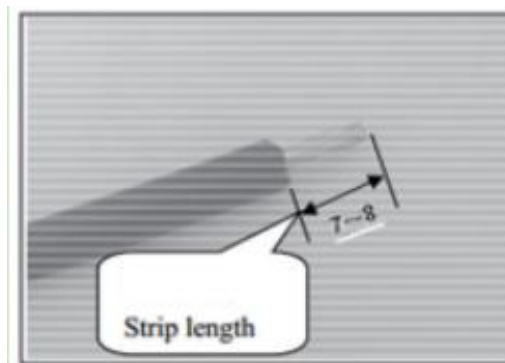
High voltage! Electrical shock!

There may be high voltage in the inverter!

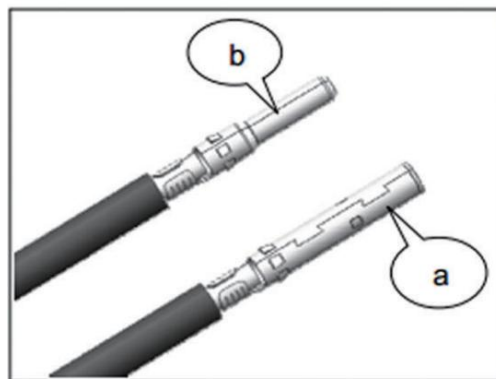
Before electrical operation, make sure that all cables are not live.

Before the electrical connection of the inverter is completed, the AC circuit breaker switch shall not be installed.

1. This series of connectors only supports multi-strand copper wires. Cut and strip as required, the stripping length is 7-8mm.

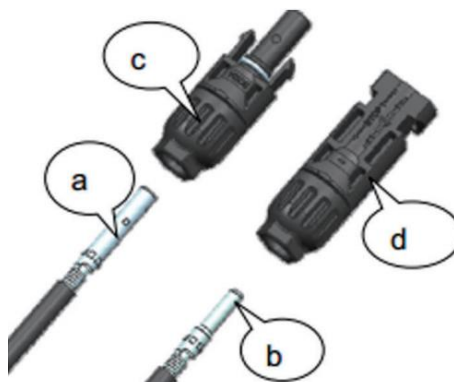


2. Crimp the wire. Place the terminal correctly in the terminal crimping pliers, then put the bare copper wire part of the cable into the terminal opening slot and press it firmly. Be careful not to damage the terminals and the copper wires of the wires.



a-female terminal b-male terminal

3. Insert the terminals into the main body of the plastic case. Correctly insert the corresponding plastic case according to the positive and negative polarity. You can gently pull the wire in the reverse direction to verify whether the connection is firm.



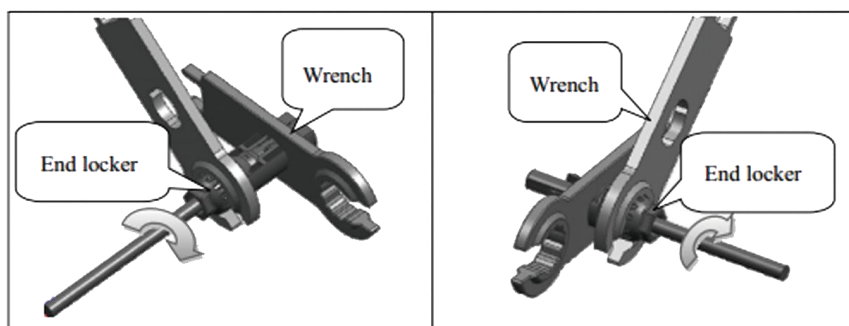
a-female terminal b-male terminal
c-male housing body d-female housing body



WARNING

When wiring the PV cable, the positive and negative poles must be connected correctly. Please cut off the power of the system and verify whether the male and female connectors are of the same model before use.

4. After the cable is plugged in, use a special wrench or adjustable wrench to tighten the nut. In order to achieve better results, two wrenches can be used to work together.



5. Connect the male head and the female head, align the buckle on the male head with the groove on the female head and insert, there will be a crisp sound when connected.



WARNING

1. The maximum DC input voltage of the two sets of PV arrays connected to MPP Tracker A and MPP Tracker B must be less than 1100V, and the MPP working voltage must be between 250V and 1000V. The specifications and installation methods of the two sets of PV arrays may be inconsistent.

2. When two sets of PV arrays connected to MPP Tracker A (MPP Tracker B) are connected in parallel, the specifications and installation methods of the two sets of PV arrays must be consistent, otherwise the power generation of the PV system will be affected! If the voltage difference between the two sets of PV arrays is greater than 5%, an arc may occur when the battery panels are plugged in and out, which will burn out the PV plug and even cause personal injury.

- Grounding



WARNING

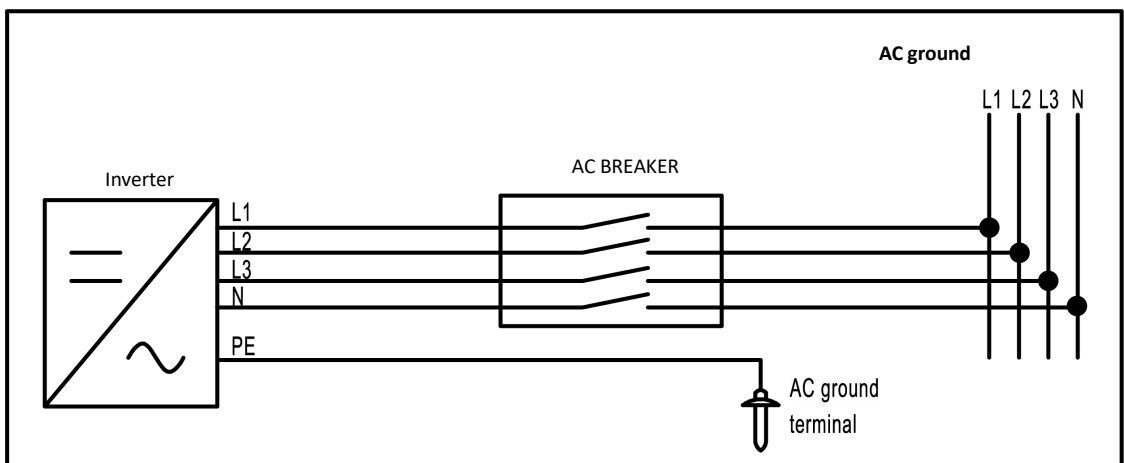
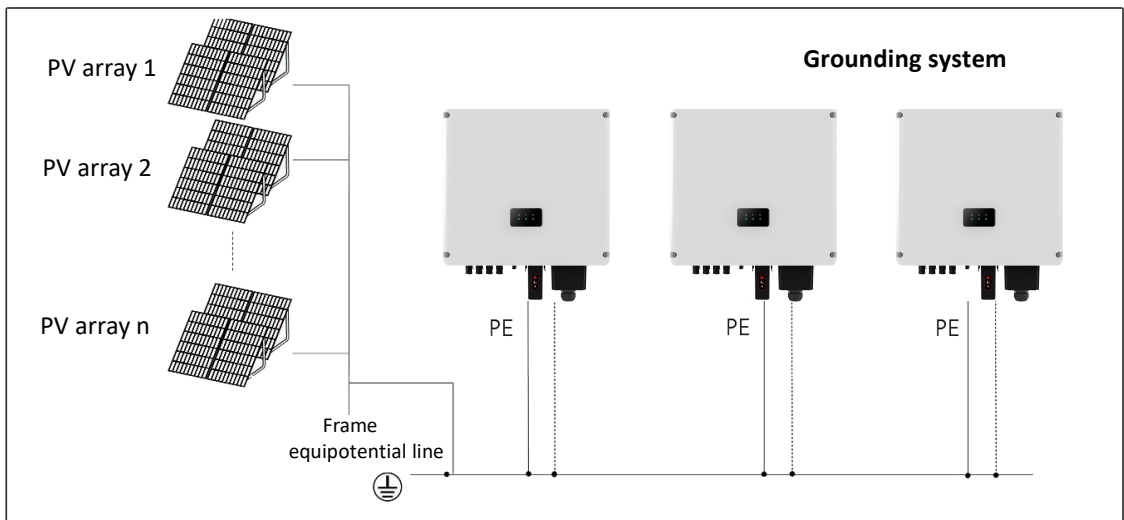
Since the inverter is a transformerless type, it is required that the positive and negative poles of the photovoltaic string cannot be grounded, otherwise the inverter will not operate normally.

Grounding system

In this PV power generation system, all non-current-carrying metal parts and equipment housings should be grounded (such as the bracket of the PV arrays, the inverter housing, etc.).

A single inverter system needs to ground the "PE" cable.

Multiple inverter systems support multi-point grounding, but all inverter "PE" cables and the grounding points of the metal frame of the PV array need to be connected to the equipotential line (depending on site conditions) to achieve equipotential connection .



5

Monitoring

5.1 Overview

The inverter has a variety of communication methods. When users need to monitor the operation information of the photovoltaic power generation system, we provide the communication system solutions shown in Figures 5-1 and 5-2.

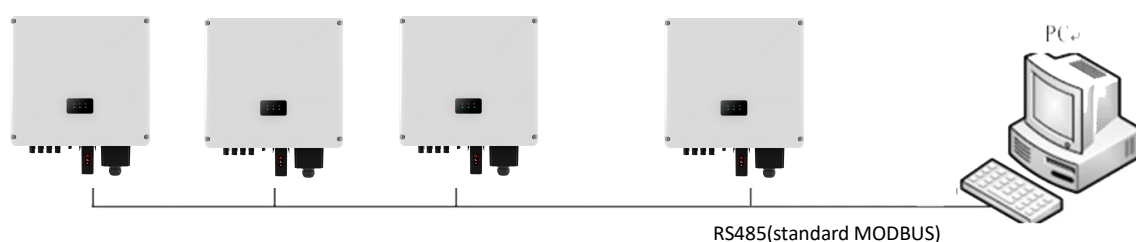


Figure 5-1 RS485 (standard MODBUS protocol) communication system mode

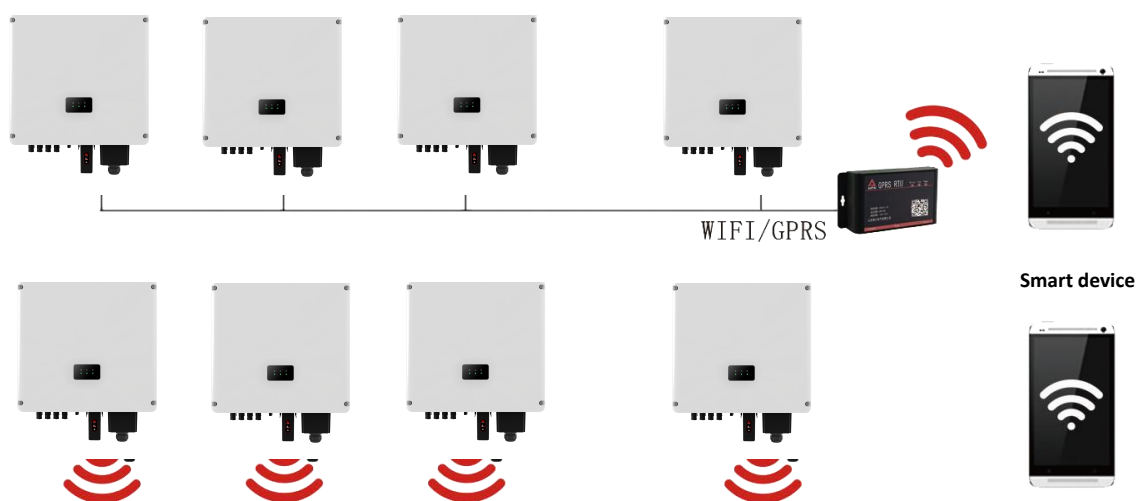


Figure 5-2 WIFI/GPRS communication system mode

After installing the GPRS or Wi-Fi data collector module, you can monitor the operation of the PV system through the App program or the Cloud server.

- Collector description

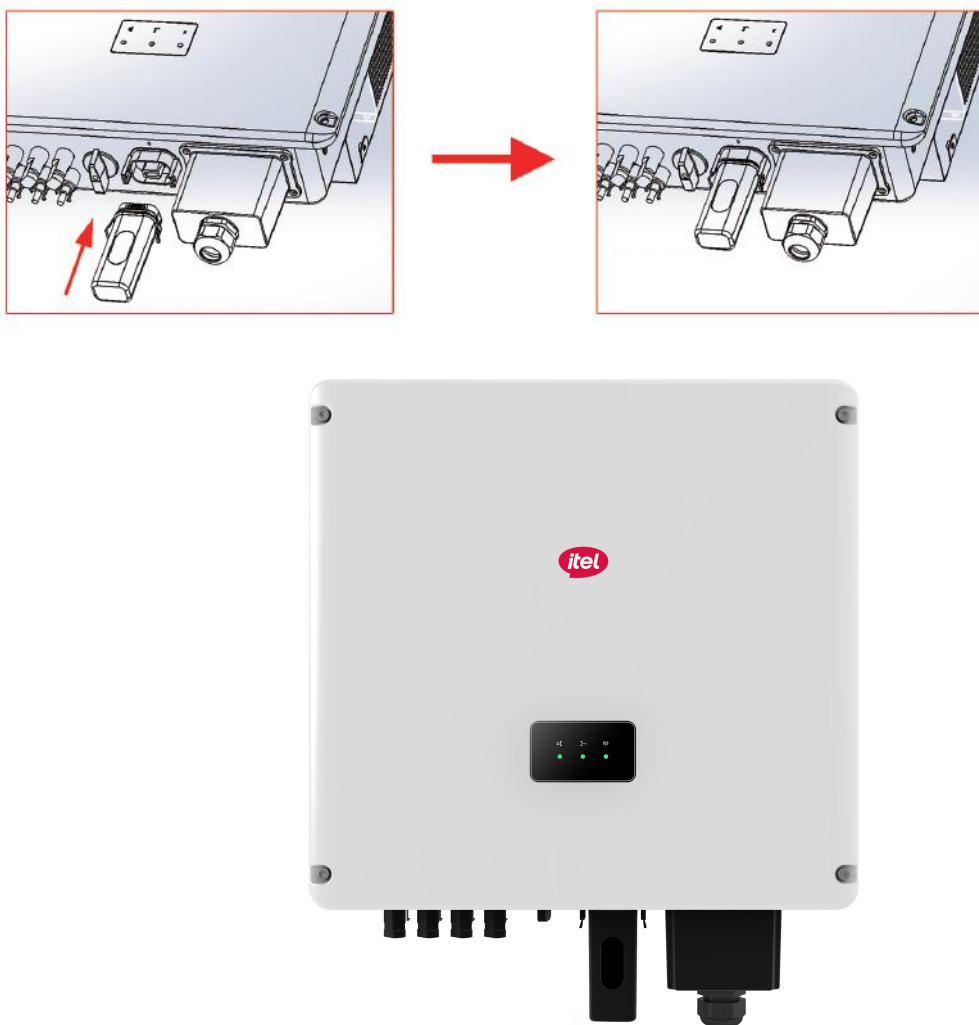


Figure 5-3 Installation diagram

5.2 WIFI Logger Quick Guide

Notice: Please read this manual carefully before using products and keep it in the place where O&M providers can easily find. Due to product upgrade and other factors, the content of this manual might change from time to time. Unless otherwise agreed herein, this manual will only be used as guidance. Any statement, information or suggestion in this manual will not take any form of responsibility. Without written permission, any content of this document (partly or entirely) cannot be extracted, copied or transmitted in any form by any company or individual.

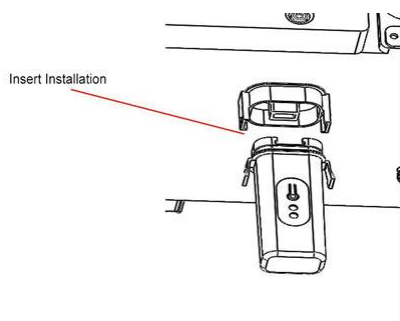


Warning:

Please remove logger after power off.

1. WIFI Logger Installation

Assemble logger to the inverter communication interface as shown in the diagram.



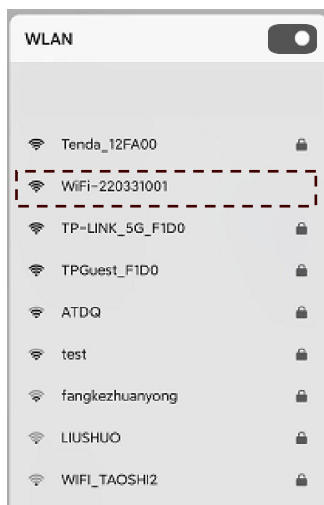
2. Logger Status

Check Indicator light

Lights	Implication	Status Description(All lights are single green lights.)
NET	Communication with router	1. Light off: No power. 2. On 1s/Off 1s(Slow flash): Normal work. 3. On 100ms/Off 100ms(Fast flash):Software upgrade status.

3. Network Configuration

Step 1: After installing the logger, turn on inverter DC switch. Wait for the display to light up and turn on your phone's WLAN. Search for logger's own WIFI signal, beginning with "WIFI-XXXXXXXX". Connect to this signal, wait for the phone to confirm successful connection, as below.



Notice:

5G WiFi is not supported .

Step 2: WIFI Logger connect the router wifi signal. Open the mobile browser and enter the IP: **10.10.100.254**. Enter the WIFI Logger network connection page.



Step 3: Click on the FIND WIFI button to look for the router signals to be connected to the Internet.



Step 4: Select the wifi signal of router and input the wifi password, finally click OK.

WiFi CCID:w00880123c610541a768

WiFi IMEI:1233c610541a768

WiFi Connet:1

Fand WiFi



Notice:
If connect displays 1, it means that
the network connection is successful.

If configuration failure occurs, please check the following reason and try it again.

- (1) Make sure WLAN is ON.
- (2) Make sure WiFi is normal.
- (3) Make sure wireless router does not implement the white-black list.
- (4) Remove the special characters in Wi-Fi network.
- (5) Shorten the distance between the phone and device.
- (6) Try to connect to other Wi-Fi.



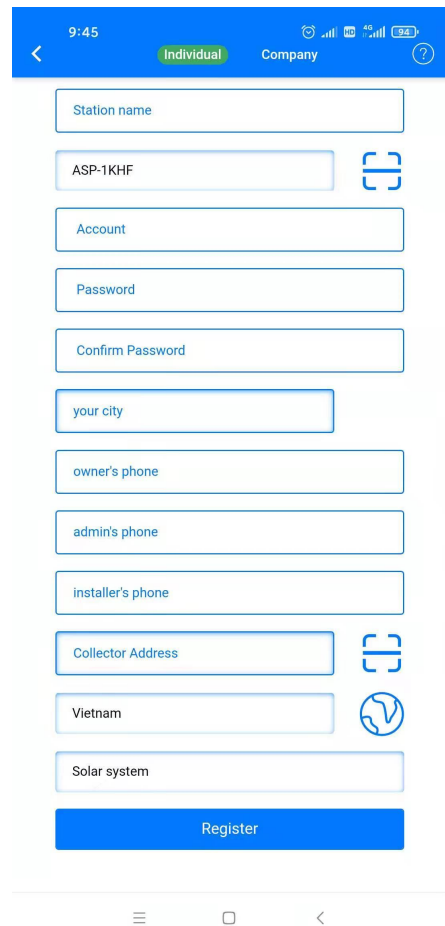
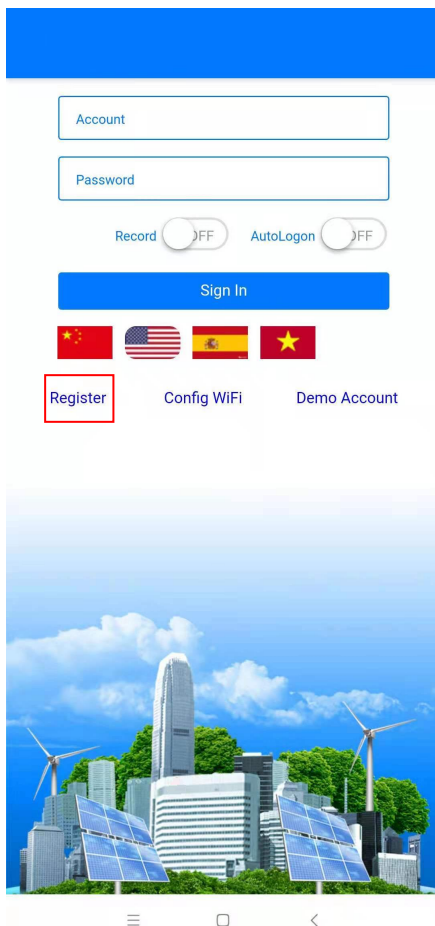
Warning: Please make sure the WIFI logger is working
properly before you leave the site. If there is anything
abnormal, please do not leave the site and contact

5.3 ATSolar App

ATSolar App is a set of smart systems based on mainstream mobile platforms that realize data docking between smart devices and cloud platforms. It can display the operating data and status of the system in real time.

- Register an account

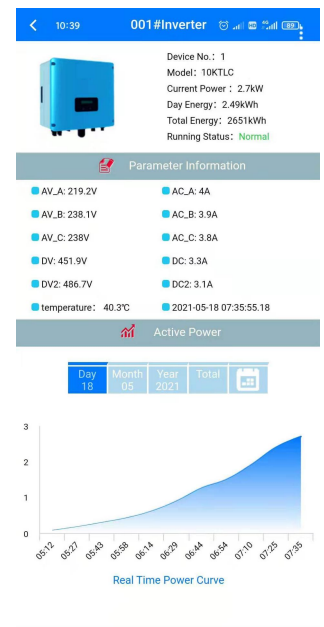
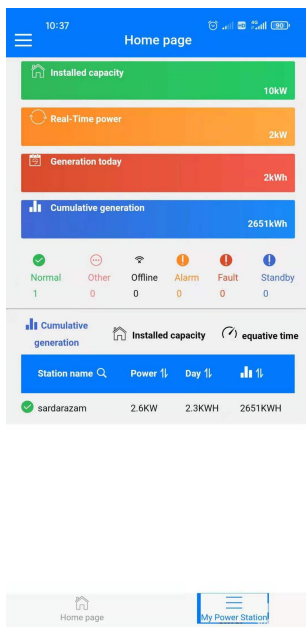
Open the App, click "register" to enter the registration interface, fill in the information: plant name, device type, account password, location of the project, collector address, and click registration to complete.



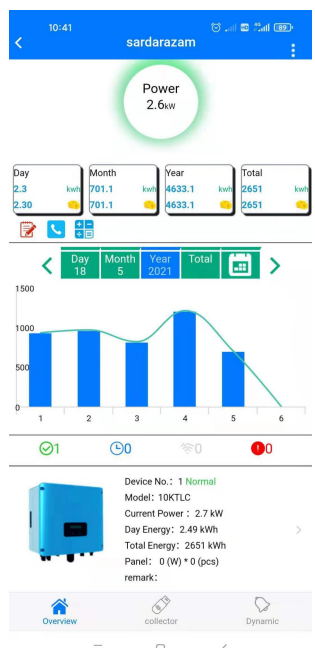
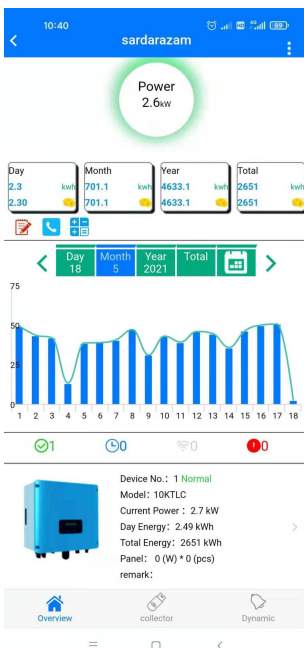
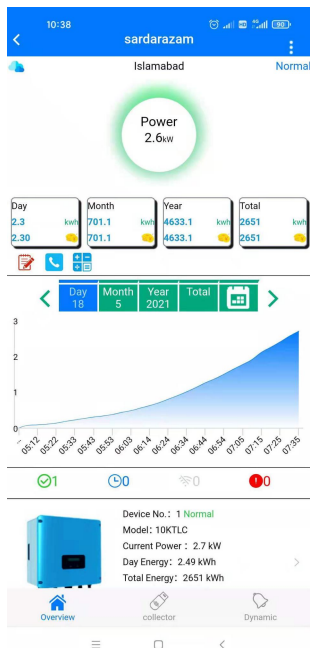
- APP interface

On the login page, enter the account number and password, enter the APP, you can see the information of the power station: current power, current power generation, cumulative power generation, operating status, power curve and working status of each device in the power station.

In the statistical list, you can view all power generation data information for the current day, current month, current year, and calendar year of the power station, which is convenient for users to query.



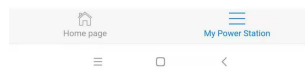
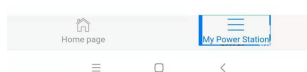
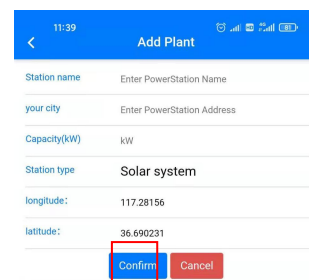
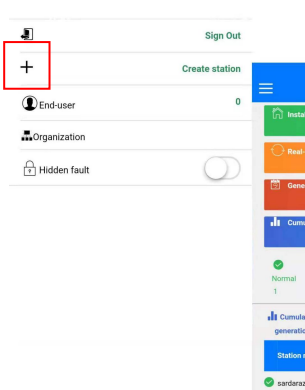
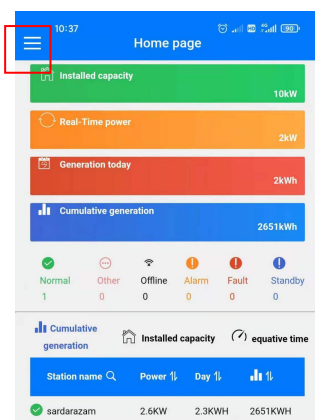
Power station list



Daily power generation

- Add multiple power plants under the same account

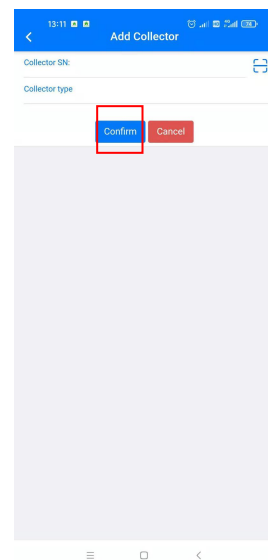
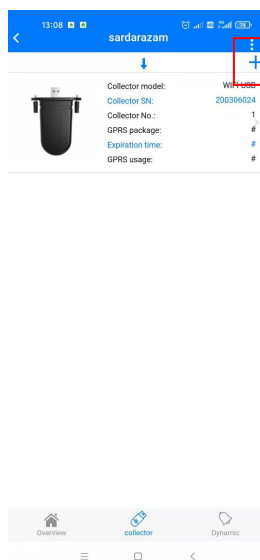
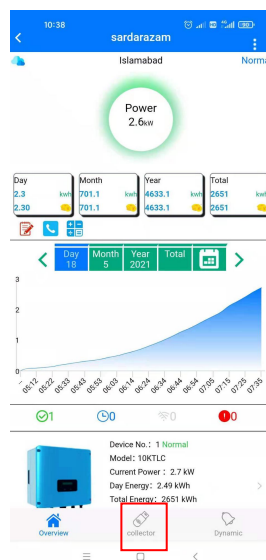
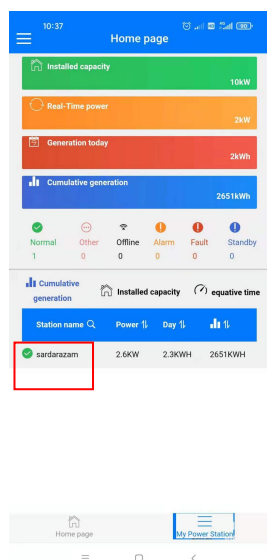
Log in to the list of "My Power stations", Click the drop-down menu in the upper left corner, click "+" to add power station. Enter your power station name and city location, and at the same time correct the location of your power station in the middle map position (you can manually enter the longitude and latitude of your power station in the longitude and latitude edit box) to complete the addition of your power station.



Click on drop-down menu

Click to add station

Fill in the station information



Click to add collector

Fill in the collector information

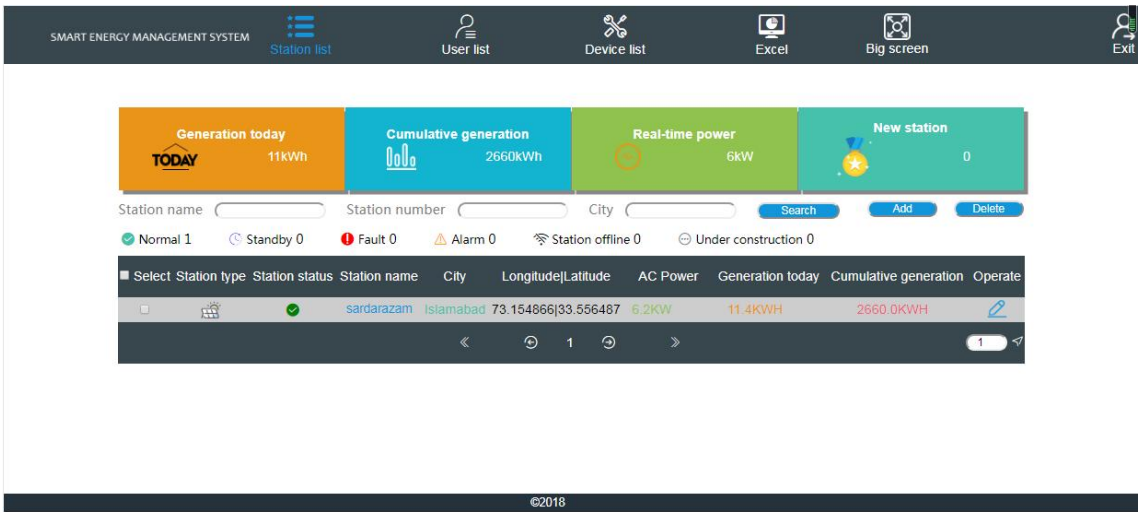


NOTE

Due to the different operations caused by the software upgrade, please refer to the actual situation. For specific operations, please contact the supplier!

5.4 Cloud Server

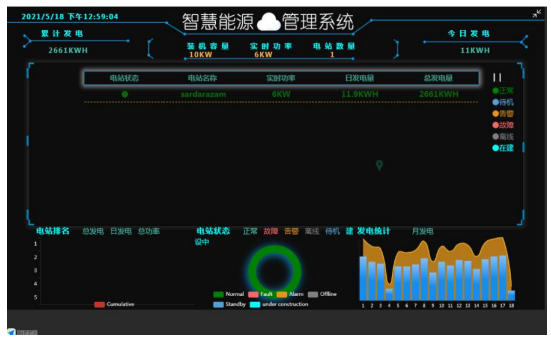
Smart energy management platform is a web-based remote monitoring system. After adding an inverter and binding the device data source, you can monitor the operating status of the PV system in real time, and know the power generation, power, temperature, CO2 Key data such as emission reductions and revenue; view equipment operating status, including information such as faults and alarms; effectively evaluate the operating status of the system through various analysis charts and report definitions. For detailed operations, please refer to the user manual attached to the web page.



Power station list



Power station web homepage



Device web homepage

● Data collector

The GPRS collector has the characteristics of convenient installation, powerful functions, stable operation, simple maintenance, and stable transmission. The collector adopts industrial-grade RS485 communication to ensure the reliability of data collection, adopts industrial-grade chips and modules, and has a wide temperature design that is resistant to high and low temperature environments and strong electrical interference. The collector parameters support remote configuration.

6

Trial run

Trial run is an important step in the installation of PV systems. Correct trial operation can prevent system fires, electric shocks and other accidents.

6.1 Inspection before trial run

Before turning on the inverter for the first time, you need to do the following inspections.

Environmental inspection

- 1). The installation position of the inverter is convenient for operation and maintenance.
- 2). Reconfirm that the inverter is installed firmly.
- 3). Good ventilation.
- 4). No external objects or parts are left on the top of the inverter.
- 5). The accessories around the inverter are correctly connected.
- 6). Cables are reasonably distributed, well protected and will not be mechanically damaged.
- 7). Reasonable selection of AC circuit breaker.
- 8). The vacant terminal has been sealed.
- 9). All safety signs and warning labels on the inverter are firmly pasted and clearly visible.

6.2 Test run steps

If all the above inspections have passed, the inverter can perform the following trial operation steps for the first startup.

- 1) Make sure that the above inspection items meet the requirements.
- 2) The AC side circuit breaker is placed in the "ON" position.
- 3) Rotate the DC switch to the "ON" position.

Assuming sufficient light and power grid conditions meet the conditions:

The PV array is initialized and begins to provide power.

The grid-connected inverter starts to charge the DC bus.

The inverter start generate AC power,and AC power into the power grid.

- 4) Observe the status of the control panel

7 Shut down & Dismantle

7.1 Shut down

In normal operation, there is no need to shut down the inverter manually, but it is necessary to shut down the inverter during maintenance or repair. To disconnect the inverter from the AC and DC power supply, follow the steps below, otherwise it may cause personal injury or death or equipment damage.

- 1) Disconnect the external AC circuit breaker and prevent reconnection due to misoperation.
- 2) Turn the DC switch to the "OFF" position and unplug all DC string inputs.
- 3) Wait for about 10 minutes until the internal capacitor is discharged.
- 4) At the AC terminal, measure the AC-to-ground voltage to confirm that the AC output voltage of the inverter at the AC circuit breaker is zero.
- 5) Remove the DC connection cable.
- 6) Remove the AC connection cable.



NOTE

Please strictly follow the above steps, otherwise the inverter will not work normally.

7.2 Dismantle the inverter

The user can dismantle the inverter according to the above electrical installation and mechanical installation and follow the reverse steps.

7.3 Discarding the inverter

For inverters that will no longer be put into operation in the future, users need to properly dispose of them by themselves. (The control panel, batteries, modules and other components contained in the inverter may pollute the environment. Users need to properly dispose of them in accordance with relevant local laws and regulations.)

8

Operating

8.1 Working Mode

The working modes of the inverter include-start mode, run mode, and standby mode. In each working mode, the LCD displays corresponding information.

8.1.1 Control panel with indicator light only

For the indicator panel of the TLC series grid-connected photovoltaic inverter, in order to better carry out the interactive operation of the man-machine interface, 3 LED lights are set on the panel, as shown in Figure 8-1.

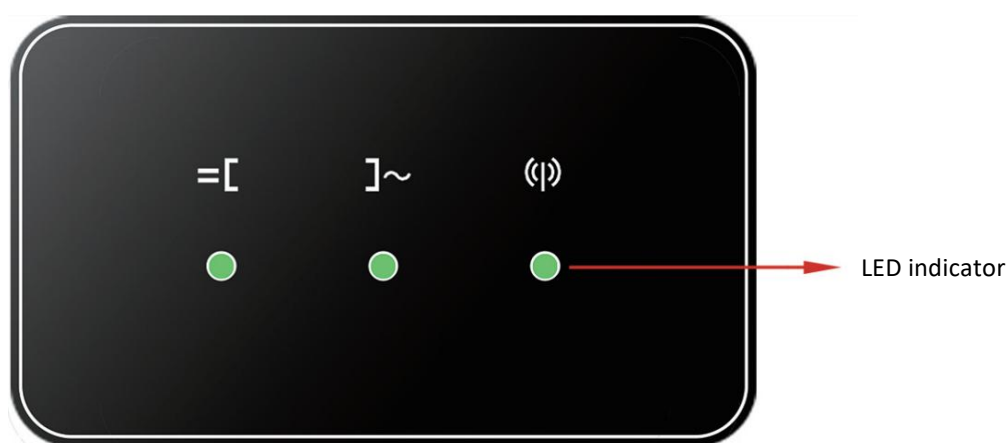
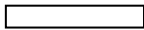
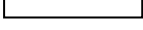
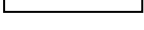
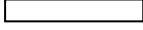
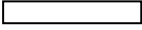


Figure 8-1 TLC series indicator panel

• LED display status

Function	Status		Description
Running	=[	]~	
			Grid-connected and power generation
			DC is normal, AC is not powered on
			DC is normal, grid-connected standby
			Equipment failure
			DC is not powered on
Communication			
			The communication cable or communication module is connected, and there is data interaction on the communication channel
			The communication cable or communication module is not connected or there is no data interaction on the communication channel
Light ON		Light OFF	 light flashes 



NOTE

The data in the following tables and graphs are only sample data, and take 10KTA as an example, the actual display content and data may change

8.2 Disconnect from grid

When the grid has below abnormal situation, inverter will disconnect from the grid immediately.

- ☐ The grid voltage is outside the normal range of 310V-480V;
- ☐ The grid frequency is outside the normal range of 45-55Hz/55-65Hz;
- ☐ The voltage of the photovoltaic array is outside the allowable working range of the inverter;
- ☐ The ambient temperature is outside the allowable working range of the inverter.

9

Maintenance



DANGEROUS

Do not open the machine. Users trying to repair the machine by themselves may cause electric shock and fire hazard.

9.1 Maintenance

Due to the influence of ambient temperature, humidity, dust and vibration, the internal components of the inverter will age and wear, which will affect the service life of the inverter. Therefore, daily and regular maintenance of the inverter should be carried out to ensure its normal Operation and service life.

- ☐ Clean the dust and debris from the radiator frequently.
- ☐ When dust accumulates on the photovoltaic array, clean the photovoltaic array with water, and the cleaning should be carried out when the weather is cool.
- ☐ Check the system regularly to ensure that all wiring and supply conditions are error-free.
- ☐ Always read the information on the LCD display to understand the changes in the inverter's working status.



WARNING

Never use a pressure washer to clean the inverter, or other cleaning methods that may cause water to enter the machine.

9.2 Troubleshooting



WARNING

Only qualified engineers can repair the inverter!

Most errors and malfunctions will be displayed. The following table proposes solutions to several possible problems.

Table.9-1.troubleshooting

No.	Failure	solution
1	LED indicator and LCD screen do not light up	1. Disconnect AC side circuit breaker
		2. Disconnect DC side circuit breaker
		3. Check the input voltage of the PV array (whether it is lower than 300V) and the grid voltage
		4.If the above conditions are met, check the circuit breaker
2	"on line" indicator goes off	1. Disconnect AC side circuit breaker
		2. Disconnect DC side circuit breaker
		3.Check whether the parameters on the AC and DC sides meet the startup requirements. If the parameters meet the requirements, check the wiring according to 4.4 Electrical connection
3	Abnormal DC voltage (DC voltage>1100v or <250V)	1. Disconnect AC side circuit breaker
		2. Disconnect DC side circuit breaker
		3. Check whether the voltage of each group of PV array meets the range of 300V-900VDC
		4. When the DC voltage is restored to the allowable range of the inverter, restart the inverter
4	The grid voltage is abnormal (the grid voltage>450V or <310VAC)	1. Disconnect AC side circuit breaker
		2. Disconnect DC side circuit breaker
		3.Detect the voltage on the AC side
		4.4. If the grid voltage is not within the allowable voltage range of the inverter, please contact the local power company to adjust the grid voltage
5	The grid frequency is abnormal (the grid frequency is neither 45-55Hz nor 55-65Hz)	1. Disconnect AC side circuit breaker
		2. Disconnect DC side circuit breaker
		3.Detect the frequency on the AC side
		4.If the current grid frequency is not in the inverter's allowable frequency range, please contact the local power company to adjust the grid frequency
6	The temperature is too high (inverter temperature is too high)	1. Disconnect AC side circuit breaker
		2. Disconnect DC side circuit breaker
		3. Check whether the ambient temperature is higher than 60 °C or lower than -25 °C
		4. Please check whether the ventilation of the machine is normal, whether the hook-up installation is correct, and whether the air

		duct is unblocked
		5. Whether the output power exceeds the rated value
7	Abnormal grounding	1. Disconnect AC side circuit breaker
		2. Disconnect DC side circuit breaker
		3. Check whether the ground resistance of each group of PV arrays is greater than 2MΩ

If the fault cannot be solved or your problem is not mentioned in the above table, please contact us.

9.3 Quality Assurance

● warranty

The warranty period of this product is subject to the contract.

● Conditions

1. Itel will offer free repair service or replace with new product for faults during the warranty.
2. The replaced unqualified product will be returned to Itel.
3. Customers need to give Itel reasonable time to deal with the machine fault.

● Itel will not be liable for the following cases.

1. Transportation damage
2. Improper installation
3. Improper modification
4. Incorrect use
5. Very harsh environment that is beyond the specified in this manual
6. Any installation and use that is beyond the relative international standards
7. Damages caused by improper natural environment

10

Specification

10.1 Specification

DC Input Data	IGT-8KTA	IGT-10KTA	IGT-12KTA	IGT-15KTA	IGT-17KTA
Max. DC input power (W)	10400W	13000W	15600W	19500W	22100W
Max. DC input voltage(VDC)	1100V				
Max. DC current(A)	18 /18A			18/30A	
MPPT voltage range(VDC)	180-1000V				
Recommended working voltage(VDC)	650V				
MPPT number	2				
Max. input strings per MPP tracker	1/1			1/2	
AC Output Data					
Rated output power (W)	8000W	10000W	12000W	15000W	17000W
Max. AC power (KVA)	8.8kVA	11kVA	13.2kVA	16.5kVA	18.7kVA
Max. output current(A)	13.3A	16.7A	20A	24A	28.3A
Rated power grid voltage(Vac)	400V				
Power grid voltage range(Vac)	310～480V				
Rated power grid frequency	50Hz/60Hz				
Grid frequency range	45～55Hz/55～65Hz				
THD	<2%(Under the rated power)				
Power factor	>0.99(Under rated power)/Adjustable range 0.8(Leading)～0.8（Lagging）				
DC component	<0.5%(Under rated power)				
System Data					
Max. Efficiency(%)	98.5%	98.6%	98.7%	98.7%	98.7%
Euro. efficiency(%)	98%	98.2%	98.1%	98.2%	98.2%
Humidity	0～100%， No condensation				
Cooling	Intelligent forced air cooling				
Allowed ambient temperature range	-25℃～+60℃				
Consumption during night	<1W				
Max. working altitude	4000m				
Display & Communication					
Display	LED indication / LCD display (Optional)				
Communication interface	Wifi/RS485/GPRS				
Mechanical Data					
Size (width x height x depth)	427x450x204mm				
Weight	15kg			18kg	

Protection class	IP66
------------------	------

DC Input Data	IGT-20KTA	IGT-23KTA	IGT-25KTA	IGT-28KTA	IGT-30KTA
Max. DC input power (KW)	26000W	29900W	32500W	36400W	39000W
Max. DC input voltage(VDC)	1100V				
Max. DC current(A)	30/30A		36/30A	36/36A	36/36A
MPPT voltage range(VDC)	180-1000V				
Recommended working voltage(VDC)	650V				
MPPT number	2				
Max. input strings per MPP tracker	2/2				
AC Output Data					
Rated output power (KW)	20000W	23000W	25000W	28000W	30000W
Max. AC power (KVA)	22kVA	25.3kVA	27.5kVA	30.8kVA	33kVA
Max. output current(A)	32A	36.5A	41A	45A	48A
Rated power grid voltage(Vac)	400V				
Power grid voltage range(Vac)	310-480Vac				
Rated power grid frequency	50Hz/60Hz				
Grid frequency range	45~55Hz/55~65Hz				
THD	<2%(Under the rated power)				
Power factor	>0.99 (Under the rated power) / Adjustable range: 0.8 leading~0.8 lagging				
DC component	<0.5%(Under the rated power)				
System Data					
Max. Efficiency(%)	98.7%	98.8%	98.8%	98.8%	98.8%
Euro. efficiency(%)	98.2%	98.2%	98.2%	98.2%	98.2%
Humidity	0~100%, No condensation				
Cooling	Intelligent forced air cooling				
Allowed ambient temperature range	-25℃~+60℃				
Consumption during night	<1W				
Max. working altitude	4000m				
Display	LED indication / LCD display (Optional)				
Communication interface	Wifi/RS485/GPRS				
Mechanical Data					
Dimensions (WxHxD)	427x450x204mm				
Weight	18kg				
Protection class	IP66				

