



AUXSOL

WIN GREEN FUTURE TOGETHER

INSTALLATION OPERATION MANUAL

ASG series

ASG-(5~20)TL-ZH

AUXSOL

WIN GREEN FUTURE TOGETHER

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PREFACE

Summary

This document mainly introduces the installation, electrical connection, adjustment, maintenance and troubleshooting methods of ASG series three-phase hybrid inverter. Before installing and using the inverter, please read this manual carefully to understand the safety information and get familiar with the functions and characteristics of the inverter. The document may be updated from time to time. Please obtain the latest version of the information and other product information from the official website.

Applicable products





This document is applicable to the following ASG series three-phase hybrid inverter:
ASG-(5~20)TL-ZH

Applicable staff

It is only applicable to professionals who are familiar with local regulations and standards and electrical system, have received professional training and are familiar with the relevant knowledge of the product.

Symbol definition

To better use this manual, the following symbols are used to highlight important information. Please read the symbols and instructions carefully.

	Danger: Indicates a highly potential danger that, if not avoided, could result in death or serious injury to personnel.
	Warning: Indicates a moderate potential hazard, which could lead to death or serious injury if not avoided.
	Watch out: Indicates a low level of potential danger that, if not avoided, may result in moderate or mild injury to personnel.
	Watch out: Emphasizing and supplementing the content may also provide tips or tricks for optimizing product usage, which can help you solve a problem or save you time.

1 OPEN-PACKAGE INSPECTION

1.1 Inspection before acceptance

Before signing for the product, please carefully check the following contents:

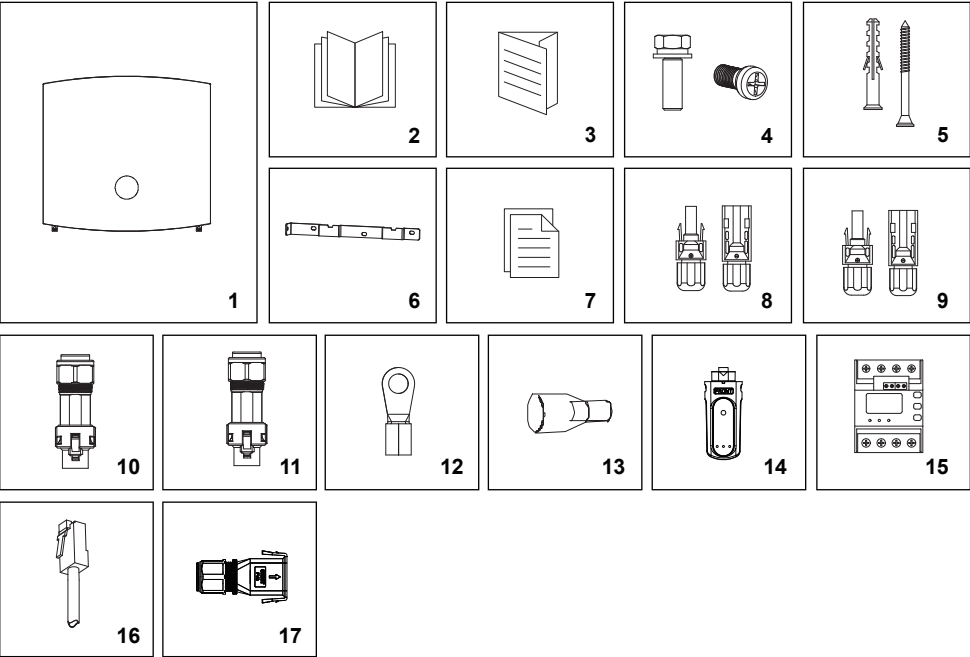
- Check the outer packaging for any damage, such as deformation, holes, cracks, or other signs that may cause damage to the equipment inside the packaging. If there is any damage, do not open the packaging and contact your dealer.
- Check if the inverter model is correct. If there is any discrepancy, do not open the packaging and contact your dealer.
- Check whether the type and quantity of delivered items are correct, and whether there is any damage to the appearance. If there is any damage, please contact your dealer.

1.2 Packing list



Watch out:

- The number of PV and Battery input terminals matches the number of inverter DC input terminals.
- The datalogger ,electricity meter kit and parallel cable are provided as optional, please refer to the actual situation.



This picture is for reference only. Please refer to the actual situation.

No.	Description	Model	Unit	QTY	Remark
1	Inverter		pcs	1	
2	User manual		pcs	1	
3	Quick installation manual		pcs	1	
4	Combination screws	M5×12	pcs	1	
5	Self tapping screws+bolt expansion	ST8×40+M12×60	set	4	
6	Wall-mounting bracket		pcs	1	
7	Inspection report		pcs	1	
8	PV terminals (+, -) *		pair	4	black
9	Battery terminals (+, -) *		pair	2	blue
10	Grid wiring connector		set	1	black
11	Load wiring connector		set	1	blue
12	Grounding OT terminal		pcs	1	
13	AC wiring terminal		pcs	10	
14	Datalogger		pcs	1	optional
15	Meter Kit		set	1	optional
16	Parallel cable	CAT5e	pcs	1	optional
17	Multi-function communication terminal		set	1	optional

* The number of PV/BAT terminals allocated corresponds to the number of specific inverter terminals.

1.3 Storage

If the inverter is not put into use immediately, please store it according to the following requirements:

- Make sure that the outer packing box is not removed.
- Make sure that the storage temperature is always - 40°C~+70°C and the storage relative humidity is always 0~100% without condensation.
- Make sure the inverter stacking height and direction are placed according to the label on the packing box.
- Make sure there is no risk of toppling the inverter after stacking.
- Regular inspection is required during storage. If the package is damaged due to insect and rat bite, the packaging materials shall be replaced in time.
- The inverter shall be put into use after being stored for a long time and inspected and confirmed by professionals.

2 SAFETY PRECAUTIONS

The safety precautions contained in this document must always be observed when operating the equipment.



Watch out:

The inverter has been designed and tested in strict accordance with safety regulations, but as electrical equipment, the relevant safety instructions must be observed before any operation on the equipment. Improper operation may lead to serious injury or property damage.

2.1 General safety



Watch out:

- Due to product version upgrading or other reasons, the document content will be updated from time to time. If there is no special agreement, the document content cannot replace the safety precautions in the product label. All descriptions in this document are for guidance only.
- Please read this document carefully for products and precautions before installing the equipment.
- Professional and qualified electrical technicians who shall be familiar with the relevant standards and safety specifications of the project site must carry out all equipment operations.
- Insulation tools and personal protective equipment shall be used to ensure personal safety during inverter operation. Electrostatic gloves, wrist strap and antistatic clothing shall be worn when contacting with electronic devices to protect the inverter from electrostatic damage.
- Equipment damage or personal injury caused by inverter not installed, used or configured in accordance with the requirements of this document or corresponding user manual is not within the responsibility scope of equipment manufacturer.

2.2 PV string safety



Danger:

- Please use the DC wiring terminals provided with the box to connect the inverter DC cable. If other types of DC wiring terminals are used, serious consequences may be caused, and the equipment damage caused thereby is not within the scope of the equipment manufacturer.
- The solar array (solar panel) will have DC high voltage.



Warning:

- PV modules used with inverters must have IEC 61730 class A rating or other equivalent standard class.
- Make sure good grounding of component frame and support system.
- Do not ground the PV array positive (+) or negative (-) as this may cause serious damage to the inverter.
- Make sure that the DC cables are firmly connected without looseness after connection.
- Use a multimeter to measure the positive and negative electrodes of the DC cable. Make sure that the positive and negative electrodes are correct, no reverse connection occurs and the voltage is within the allowable range.
- Do not connect the same PV string to multiple inverters, or the inverter may be damaged.
- In order to reduce the risk of fire, the inverter connected circuit requires an overcurrent protection device (OCPD). DC OCPD shall be installed according to local requirements. All PV power supplies and circuit conductors shall have disconnect connections in accordance with NEC Article 690, Part II.

2.3 Inverter safety



Danger:









- Please connect the inverter AC cable with the AC wiring terminals provided with the box. If other types of AC wiring terminals are used, serious consequences may be caused, and the equipment damage caused thereby is not within the scope of the equipment manufacturer.
- Danger of electric shock. There are no serviceable parts inside the machine. Please do not disassemble it. Please obtain service from qualified and recognized service technicians.



Warning:

- Make sure that the voltage and frequency of the grid connection access point meet the inverter grid connection specifications.
- It is recommended to add circuit breaker or fuse and other protective devices at the AC side of the inverter, and the specification of the protective device shall be 1.25 times greater than the maximum AC output current of the inverter.
- The protective ground wire of inverter must be firmly connected to make sure that the impedance between neutral wire and ground wire is less than 10 Ω .
- Copper core cable is recommended for AC output cable, and aluminum wire is prohibited.
- If the PV system is not equipped with batteries, do not use the off-grid load function. The system power consumption risk caused by this will exceed the warranty scope of the equipment manufacturer.
- It is forbidden to connect the power grid to the off-grid output terminal.

Identifications on inverter box are as follows:

 <p>There is high voltage after the inverter is powered on. Trained professional electrical technicians must perform all inverter operations.</p> <p>There is large contact current after the inverter is powered on. Before the inverter is powered on, it must be ensured that the inverter has been well grounded</p>	 <p>Residual voltage still exists after the inverter is powered off, and it takes 10 minutes to discharge to the safe voltage.</p>
 <p>Please read the product manual carefully before operating the equipment.</p>	 <p>Potential hazards after equipment operation. Please take protective measures during operation.</p>
 <p>When the inverter is working, the enclosure temperature is high and there is a danger of scalding. Do not touch it.</p>	 <p>Connection point of protective earthing wire.</p>
 CE symbol	 <p>The equipment shall not be treated as domestic garbage. Please treat the equipment according to local laws and regulations or send it back to the equipment manufacturer.</p>

2.4 Battery safety

Warning:

- The inverter manufacturer must approve the battery used in conjunction with the inverter, and the approved battery list can be obtained through the official website or consulted with local distributors.
- Before installing the device, please carefully read the user manual corresponding to the battery to understand the product and precautions. Please strictly follow the requirements of the battery user manual.
- If the battery has been fully discharged, please strictly follow the corresponding battery user manual to charge the battery.
- The battery current may be affected by some factors, such as temperature, humidity, weather conditions, etc., which may lead to battery current limiting and affect charging and discharging performance.
- If the battery cannot start, please contact the after-sales service center as soon as possible. Otherwise, the battery may be permanently damaged.
- Use a multimeter to measure the positive and negative poles of the DC cable, ensuring that the positive and negative poles are correct, and the voltage is within the allowable range.
- Do not connect the same battery pack to multiple inverters, as this may cause damage to the inverters.
- The inverter must be used with a matching lithium battery. Lithium batteries with relays do not require additional breaker. If breaker needs to be added, the breaker must be turned on first and then powered on. Otherwise damage will occur.

2.5 Personnel requirements

Watch out:

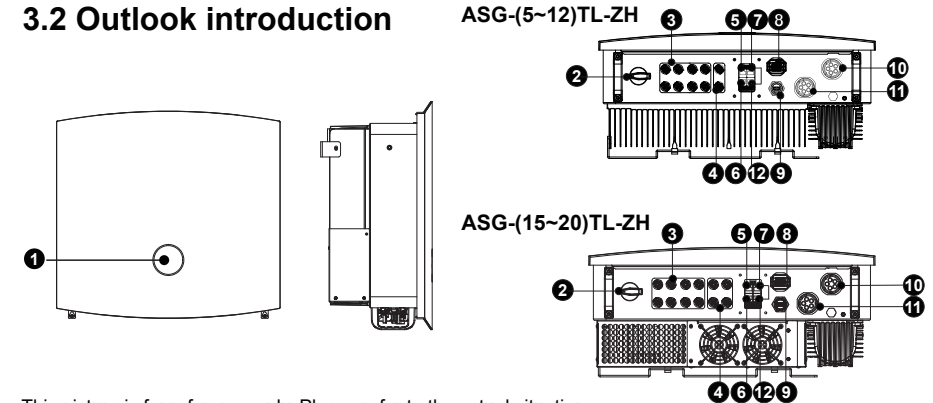
- Personnel responsible for installing and maintaining equipment must first undergo strict training, understand various safety precautions, and master the correct operating methods.
- Only qualified professionals or trained personnel are allowed to install, operate, maintain, or replace equipment or components.

3 INTRODUCTION

3.1 Products introduction

The ASG series three-phase hybrid inverter integrates an energy management system in the PV system, controls and optimizes energy flow, and can adapt to the requirements of the smart grid. The load, stored in the battery, and output to the grid, uses the electricity generated in the PV system.

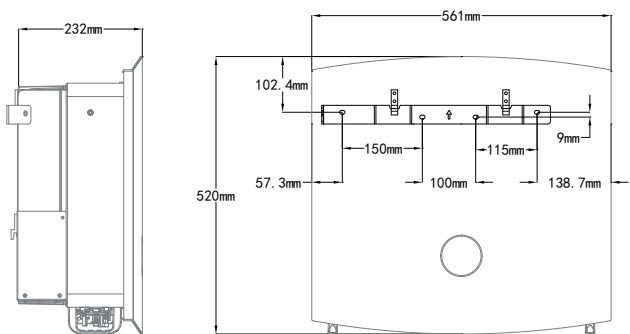
3.2 Outlook introduction



This picture is for reference only. Please refer to the actual situation.

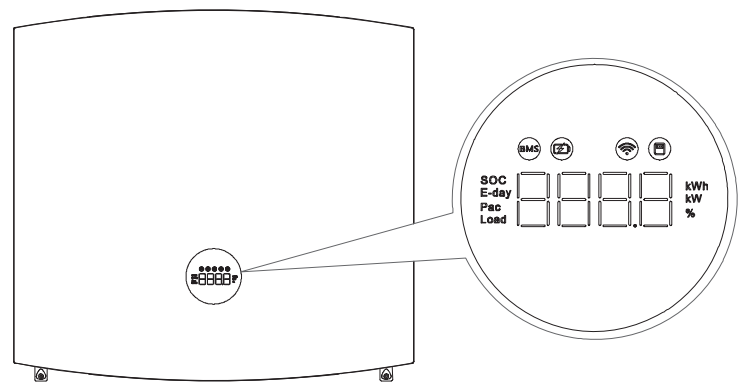
No.	Items	Description
1	Screen	Indicates the working status of the inverter
2	DC switch	Control DC input on or off (warning: this switch does not have breaking capacity and is prohibited to operate when the machine is running)
3	PV DC ports	Connect PV module with PV wiring connector
4	Battery DC ports	Connect the battery with the battery connector
5	BMS communication port	The battery BMS communication cable can be connected via CAN or RS485
6	Meter communication port	Smart meters can be connected via RS485
7	Parallel ports	Connect and communicate units to units (note: optional)
8	Multi-function signal port	METER, DRM communication interface
9	Communication module port	The communication module can be connected via RS485, supporting optional communication modules such as bluetooth, Wi-Fi and 4G
10	Utility/National grid power interface (black)	Connect AC utility/national grid supply
11	Load interface (blue)	Connect AC load
12	Dry contact input&output	Connect input and output dry contact signals

3.3 Dimension



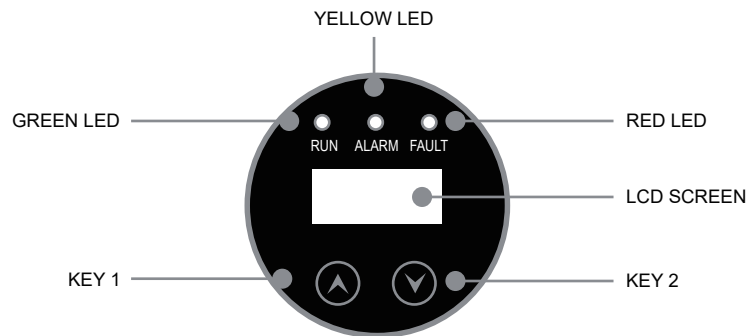
3.4 Display description

3.4.1 LED (Optional)



Indicator diagram	Status	Description
BMS diagram	Off	BMS no communication
	Flashing	There is battery voltage, but BMS communication is abnormal
	Always on	BMS establishes communication
Battery diagram	Off	Battery not connected (battery voltage not detected)
	Flashing	Battery connected but voltage below cutoff voltage
	Always on	Battery connection is normal
WiFi diagram	Off	Communication module port has no communication
	Always on	Communication module port is normal
Electricity meter diagram	Off	No communication established with the meter
	Flashing	Turn on the meter's anti-reverse current function, but the meter's communication is abnormal
	Always on	Establish communication with the electricity meter
SOC	Light on	At this point, the central digital area displays the battery SOC
E-day	Light on	At this point, the central digital area displays the today PV power generation
Pac	Light on	Currently, the central digital area displays the current grid power (When purchasing electricity, the digital area will display a "-" symbol)
Load	Light on	Currently, the central digital area displays real-time off grid load power
Light strip	Red light always on	Fault mode (corresponding fault code displayed in the central digital area)
	Yellow light flashes	There are over temperature and overload alarms
	Yellow light always on	Standby mode
	Green light always on	Normal operation, battery not discharge
	Green light flashes	Normal operation, battery discharge

3.4.2 LCD (Optional)



The LCD screen display module contains a display screen, two touch keys, and three LED display lights. The LED display light has three colors of red, green and yellow. The display effect of the LED display light is always on, off and flashing (on 0.5s and off 0.5s), as the follows:

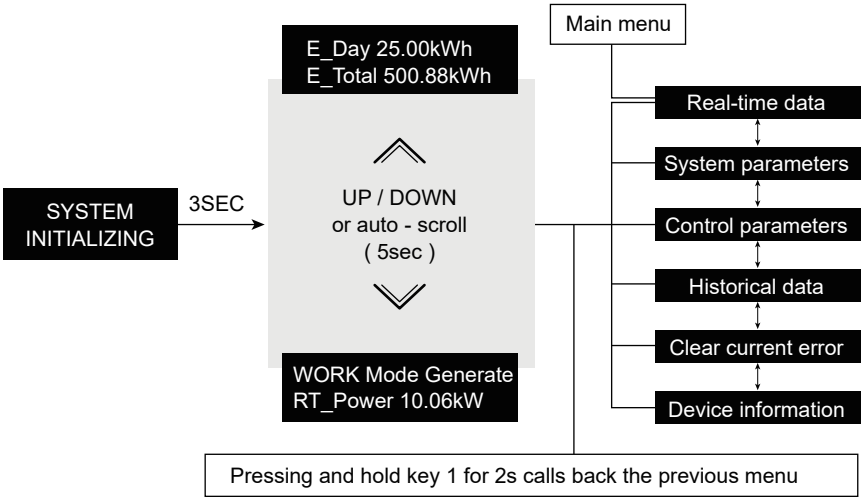
Equipment status		LED	Priority
Upgrade	Red, green and yellow LED indicators flash alternately		1
Error	Red LED indicator always on		2
Alarm	Yellow LED indicator flashes		3
Running	Green LED indicator always on		4
Standby	Green LED indicators flashes		5
Power-on mode	Red, green and yellow LED indicators are on at the same time		6

The function of two keys are as follows:

Mode	Meaning
Press key 1	Up
Press key 2	Down
Long press key 1 for 2s	Return
Long press key 2 for 2s	Confirm
Key 1, key 2 long press 2s at the same time	Jump to the off-grid output enable setting interface

3.4.2.1 LCD menu

- Mode display by turns, by keys or by menu.
- Key-based modification of equipment parameters such as time, regulations, language, etc.



3.4.3 Echo loop

The system will automatically switch to this interface once powered on or when no key is pressed within 1min. Interfaces can be switched by pressing Up or Down or automatically every 10s.

Day E 10.0kWh Total E 0.123MWh	Display daily generated energy and total generated energy
Work Mode Error Backup ON	Display current work mode and load status
Error Code 3201 Alarm Code ----	Display error code and alarm code
PV Power 12.00kW Bat Power 0.00kW	Display PV power and battery power
Grid Power 0.00kW Load Power 0.00kW	Display cyclic menu of grid power and load power

3.4.4 Main menu

You can press Up and Down for switching in the checked item, and then press Confirm 2s to jump to the corresponding sub-menu. If you switch from a menu to the main menu, the checked item will become the menu item you previously switch from the main menu, which is the memory function of the main menu.

In loop mode, press Confirm 2s to enter the main menu	
1. Real Data 2. System Para.	You can select to view real-time data and set system parameters
3. Control Para. 4. Data Log	You can select to set control parameters and view historical data
5 Quit Error 6. Device Info.	You can select to clear current error and view the device information

3.4.5 Real-time data

Select the "1. Current Data." option in the main menu and press Confirm to jump to the Real-time Data menu. The data in the Real-time Data menu is read-only and unmodifiable.

1. Mode Error	Display current work mode of inverter
2. Grid Volt (V) 12.3 456.9 0.0	Display grid voltage for L1 phase, L2 phase and L3 phase,respectively
3. Grid Power 12.01kW	Display active power of grid
4. Grid Frequency 50.01Hz	Display grid frequency
5. Day Energy 50.1kWh	Display daily energy
6. Total Energy 3.213MWh	Display total generated energy
7. PV1 INFO. 600.4V 15.3A	Display PV1 voltage and PV1 current
8. PV2 INFO. 600.4V 15.3A	Display PV2 voltage and PV2 current
9. BAT1 INFO. 123.4V 678.9A 100%	Display battery1 information, including voltage1, current1 and SOC
10. BAT2 INFO. 123.4V 678.9A 100%	Display battery2 information, including voltage2, current2 and SOC
11. Load Power (kVA) 0.00 0.00 0.00	Display apparent power of load for L1 phase, L2 phase and L3 phase, respectively
12. Load Power (kW) 0.00 0.00 0.00	Display active power of load for L1 phase, L2 phase and L3 phase, respectively

3.4.6 Historical data

Select to view historical data

1. History Error

2. History Gen

You can select to view the History Error menu and the History Gen menu, press Up and Down to select history error or historical generated energy, and press Confirm to view relevant information.

3.4.6.1 History error

Select to view the error information

2023-03-11 19:35:15

1.3201

There are no more than 30 recent error records displayed in the History Error menu, including the time and type of error, and you can press Up and Down to switch between history errors.

3.4.6.2 Historical generated energy

You can press Up and Down to select historical daily generated energy, historical monthly generated energy or historical annual generated energy, and press Confirm to view relevant information.

Select to view the Historical Generated Energy menu

1. His DIAL Elec

2. His Month Elec

You can select to view the "Historical Daily Generated Energy" menu and the "Historical Monthly Generated Energy" menu.

2. His Month Elec

3. His Year Elec

You can select to view the "Historical Annual Generated Energy" menu and the "Historical Monthly Generated Energy" menu.

Select to view the historical daily generated energy

2023-03-11

0.00kWh

At most 93 days of historical daily generated energy can be displayed in "Historical Daily Generated Energy". You can select the "Historical Daily Generated Energy" and press Confirm to view the generated energy of the previous day.

Select to view the historical monthly generated energy

2023-02

0.00kWh

At most 120 months of historical monthly generated energy can be displayed in "Historical Monthly Generated Energy". You can select the "Historical Monthly Generated Energy" and press Confirm to view the generated energy of the previous month.

Select to view the historical annual generated energy

2022

12.00kWh

At most 10 years of historical annual generated energy can be displayed in "Historical Annual Generated Energy". You can select the "Historical Annual Generated Energy" and press Confirm to view the generated energy of the previous year.

3.4.7 System parameters

3.4.7.1 Setting of communication address

Select Comm Addr. which is used to set the address of multiple inverters connected to one monitor. The address number can be assigned from 01 to 255

1. Comm Addr.

1

To display the communication address, you can press Confirm, then Up and Down to switch between communication addresses, and press Confirm again.

3.4.7.2 Language setting

Select the Language option

2. Language

English

To set language to Chinese or English, you can press Confirm, then Up and Down to switch between languages, and press Confirm again.

3.4.7.3 Time set

Date and time can be set in Time Set

3. Time Set

2023-09-06 01:45:31

Display the Time Set interface, and press Confirm to jump to "Date-Year" modification menu.

Press Confirm in the Time Set interface to jump to the following interface:

1. Date-Year

2023

Year modification

2. Date-Month

3

Month modification

3. Date-Day

12

Date modification

4. Time-Hour

18

Hour modification

5. Time-Minute

15

Minute modification

6. Time-Second

8

Second modification

Language can be set by pressing Confirm, then pressing Up and Down to switch between languages, and pressing Confirm again.

3.4.8 Control parameters

A correct password is needed to enter this menu in which you can modify the corresponding function parameters.

Touch key 1: change password;
Long press key 1: Return;

Touch key 2: Shift;
Long press key 2: Confirm password;

Password
1020

To enter the Control Parameters menu from the main menu, you need to enter a password which is initially set as 1020.

Password Error!

If a wrong password is entered, a prompt will be given and the system will return to the main menu after 3s.

Select to enter the Control Parameters menu

1. Remote Control
2. Regulation

You can select to make settings in Remote Control and Regulation.

3. Clear Err Log.
4. Restore Setting

You can select to make settings in Clear Error Log and Restore Setting.

4. Restore Setting
5. Energy Reset

You can select to make settings in Restore Settings and Energy Reset.

Select to enter Remote Control

Remote Control
Power on

Select Remote Control, press Confirm to enter the interface, and press Confirm, then Up and Down to switch on and off, and finally press Confirm again to complete the setting.

Select to enter Regulation CQC

Regulation
CQC

Select Regulation, press Confirm to enter the interface, and press Confirm, then Up and Down to switch between regulations, and finally press Confirm again to complete the setting (CQC, Brazil (NBR16149), EN50549, IEC61727_50, IEC61727_60, Wide_Range_50Hz, Wide_Range_50Hz, Spain, Poland, South Africa, VDE4105).

Select to enter Clear Error Log

Error Log Clear?
cancel affirm

Select Clear Error Log, press Confirm to enter the interface, then press the key again to clear the error log or press Back to cancel the setting.

Select to enter Restore Setting

Restore Setting?
cancel affirm

Select Restore Setting, press Confirm to enter the interface, then press the key again to restore setting or press Back to cancel the setting.

Select to enter Energy Reset

Energy Reset?
cancel affirm

Select Energy Reset, press Confirm to enter the interface, then press the key again to reset energy or press Back to cancel the setting.

3.4.9 Device information

Select and enter to view device information which is read-only and unmodifiable

1. Software Version
A2507/D1335

Display software version number (ARM version, DSP version)

2. Rated Power
10kW

Display rated power

3. Platform Code
000

Display platform code

4. SN Number
ASN-10TL2305270020

Display SN number

3.4.10 Off-grid output enabled

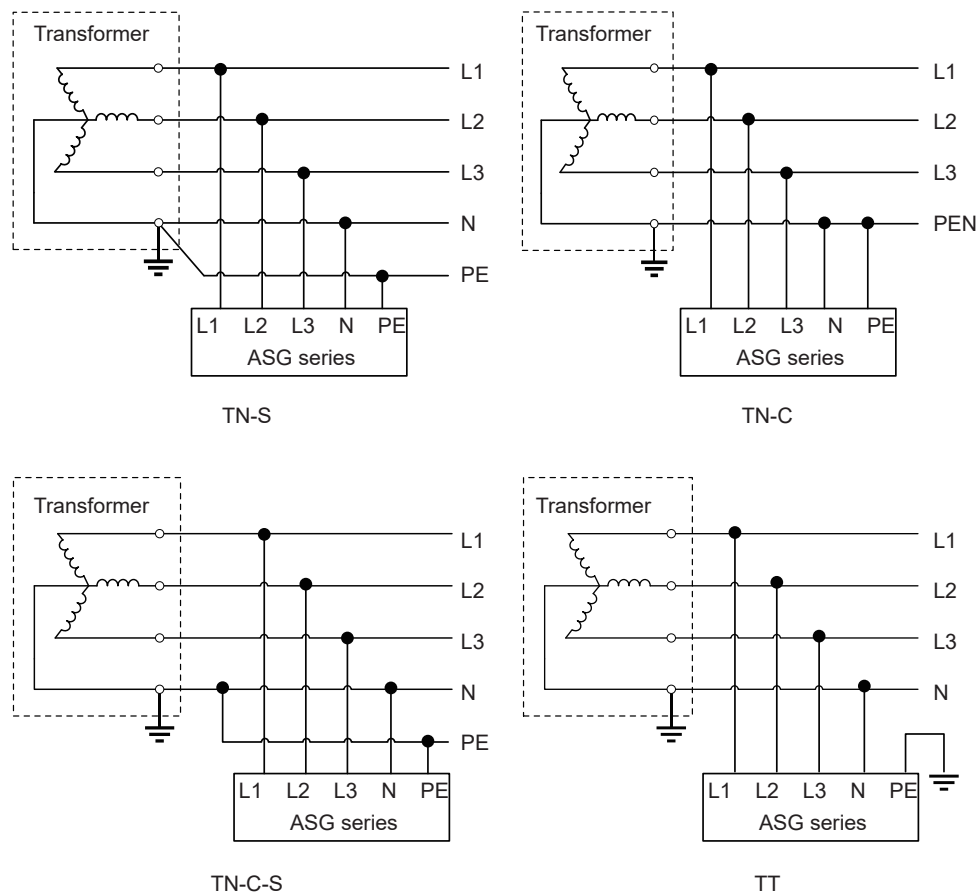
In any interface, pressing "Key 1" and "Key 2" for 2s at the same time will jump to the Off-grid Output Enabled menu in which the off-grid output status can be set

Backup Output
OFF

Pressing Key 1 and Key 2 for 2s at the same time will enter the Off-grid Output Enabled interface.

4 APPLICATION

4.1 Grid form



Watch out:

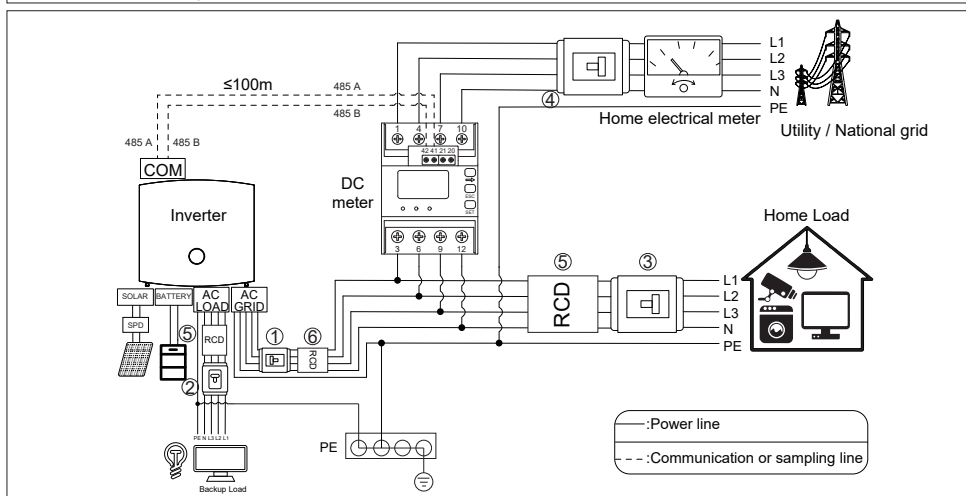
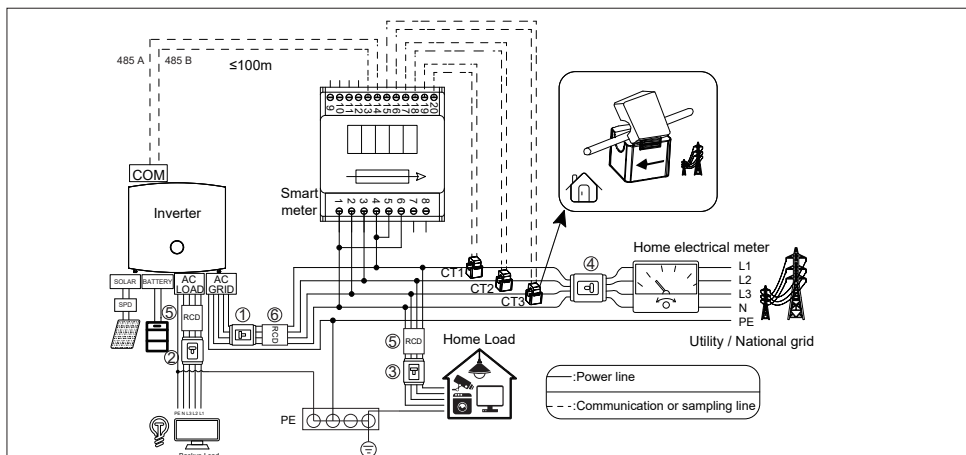
- To prevent power outage of off grid loads, it must be applied to power grids with N cables.
- The voltage of N to PE should be less than 10V.

4.2 Application scenario

Warning:

- PV systems are not suitable for connecting devices that rely on stable power supply, such as life-sustaining medical equipment. Please ensure that the power outage of the system does not cause personal injury.
- Please try to avoid using loads with high starting currents in PV systems, such as high-power water pumps, as this may result in off grid output failure due to excessive instantaneous power.
- If the photovoltaic system is not equipped with batteries, do not use the off grid load function, as the resulting system power consumption risk will exceed the warranty range of the equipment manufacturer.
- The battery current may be affected by some factors, such as temperature, humidity, weather conditions, etc., which may lead to battery current limiting and affect the carrying capacity.
- The inverter has UPS function, and the switching time is less than 10ms. Please ensure that the off grid load capacity is less than the rated power of the inverter, otherwise it may cause the UPS function to fail to start when the power grid is powered off.
- When the inverter is protected for a single time, it can automatically restart. If it occurs multiple times, the inverter will stop and wait, and the inverter can be immediately restarted through the APP.
- When the inverter is in off grid mode, it can be used normally by ordinary household loads, such as
 - Inductive load: 1.5-pit non-variable frequency air conditioner.
 - Capacitive load: total power $\leq 0.6 \times$ inverter rated output power.





No.	ASG-5/6/8/10/12TL-ZH	ASG-15/20TL-ZH
①	40A/400V AC breaker	50A/400V AC breaker
②	Maximum 40A/400V AC breaker	Maximum 50A/400V AC breaker
③	Depends on loads	
④	Depends on family loads and inverter capacity	
⑤	30mA RCD Type A Suitable, Type B Recommended	
⑥	30mA RCD Type A Suitable, Type B Recommended	

Note1: *If the battery is integrated with a readily accessible internal DC breaker, no additional DC breaker is required for Battery.

Note2: The values in the table are recommended values and could be set to other values according to actual conditions.

4.3 Application mode

4.3.1 Self-use

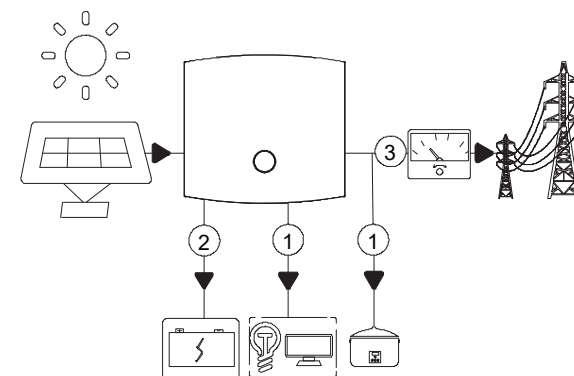


Watch out:

It is applicable to regions with high electricity cost, low electricity sales revenue and stable power grid.

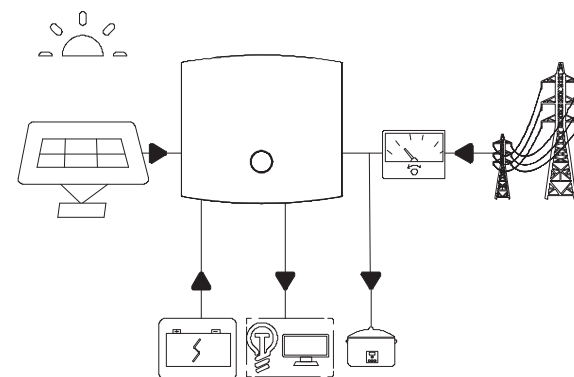
PV energy sufficient:

PV energy shall be used to supply power to the load in priority, excess energy shall be used to charge the battery, and the remaining energy shall be sold. As shown in the figure below, 1. 2. 3 represents energy priority.



Insufficient PV energy or night conditions:

The load energy is preferentially supplied by the PV energy, supplemented by the battery discharge. If the battery energy is insufficient, the power is purchased from the grid.



4.3.2 UPS mode

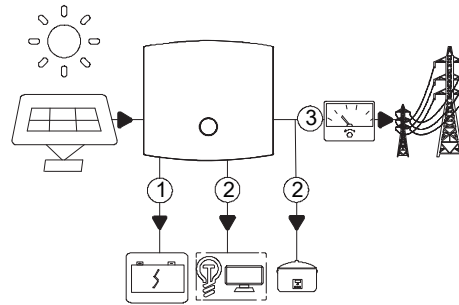


Watch out:

- It is applicable to areas with important load and unstable power grid.
- All energy priorities are to ensure that the battery reserves energy as much as possible to ensure that off-grid output loads can be powered in case of grid abnormality.

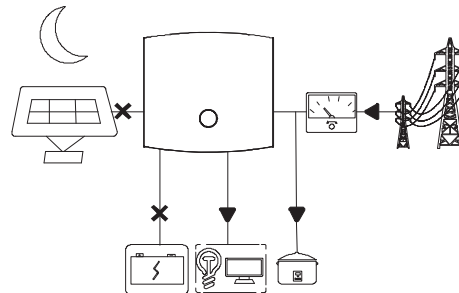
Day time:

The PV energy shall be used to charge the battery in priority, the excess energy shall be used by the load, and the remaining energy shall be sold. As shown in the figure below, 1. 2. 3 represents energy priority.



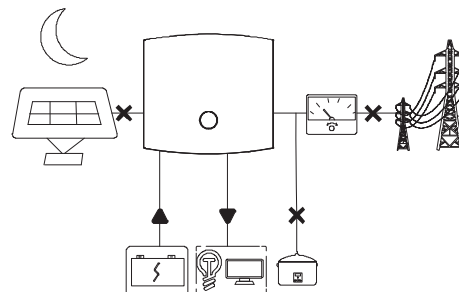
Night time:

The power grid is normal, the power is purchased from the power grid to supply power for the load, and the battery is used for power backup.



Night time:

The grid is abnormal, the inverter enters the off-grid mode, and the battery discharges to supply power to the off-grid port load.



4.3.3 Peak load shifting

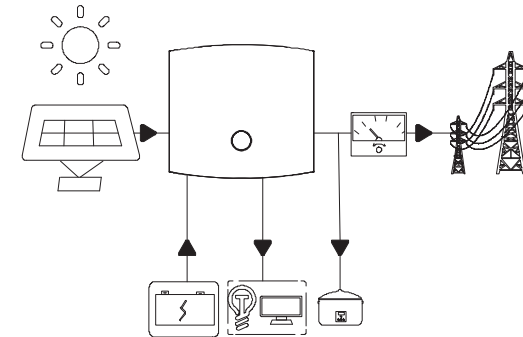


Watch out:

- The economic mode can only be selected if the local laws and regulations are met. For example, if the power grid is prohibited to charge the battery, do not use this mode.
- It is recommended to use peak shaving and valley filling in the scenario with large difference between peak and valley electricity prices.

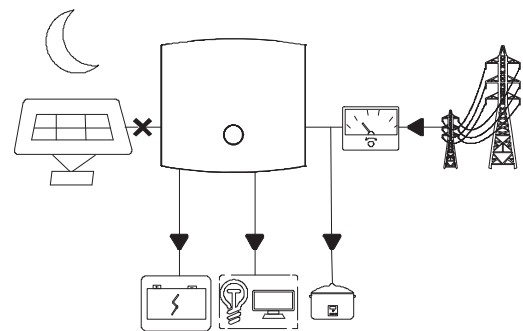
Grid peak period:

Set the PV energy priority as load → grid → battery within the time range of 04:01~23:59. PV energy will flow preferentially to off-grid load, and excess energy will be sold.



Grid off-peak period:

Set the charging time of the grid as 00:00~04:00, and purchase electricity from the grid to charge the battery.



4.4 Function characteristics

4.4.1 Power derating

In order to make the inverter operate safely, the inverter will automatically reduce the output power when the operating environment is not ideal.

The following factors may cause power derating, so please try to avoid them during use.

- Unfavorable environmental conditions such as direct sunlight, high temperatures, etc
- The inverter's output power percentage has been limited by the app or web-end settings
- Variation with grid voltage frequency
- High input voltage
- High input current value
- Insufficient battery pack power configuration

4.4.2 Battery standby to shutdown automatically

In order to protect the battery SOC, when only the battery is powered and in the standby mode, after waiting 5 minutes, the inverter will automatically turn off the power supply and enter the power saving mode.

At this time, the battery discharge power is 0W, and the remote communication and other functions are synchronously stopped. After the mains supply is recovered or the PV is recovered, the inverter will be automatically activated again.

If the battery is required to supply power separately and start the inverter power supply due to application or commissioning, please turn on the battery switch and activate the battery.

5 INSTALLATION

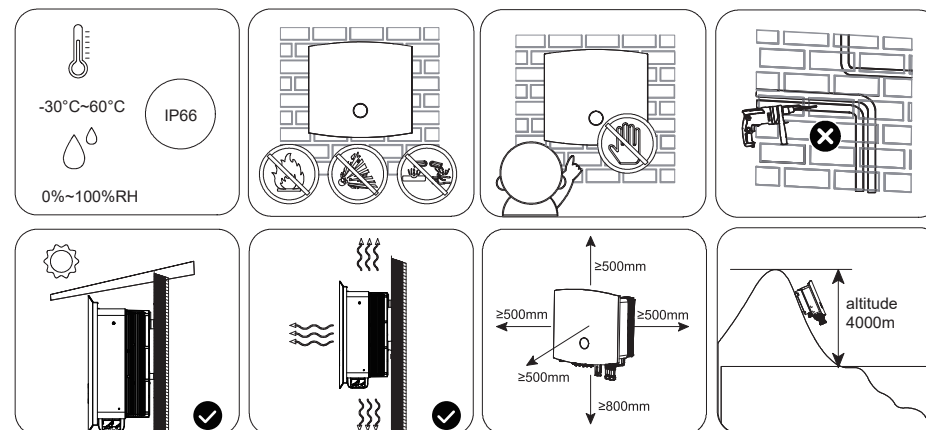
5.1 Installation requirements

5.1.1 Environmental requirements

- The protection class of inverter is IP66, which can be installed indoor and outdoor.
- Equipment shall not be installed in flammable, explosive and corrosive environment.
- The installation position shall be kept away from the accessible range of children and the position easy to be touched.
High temperatures may be present on the surface when the equipment is in operation to prevent burns.
- The installation position shall avoid the water pipe and cable in the wall to avoid danger during punching.
- The inverter shall avoid salt fog areas and installation environments such as sunshine, rain and snow. It is recommended to install the inverter in a sheltered installation position. If necessary, a sunshade can be erected.
- When installing the inverter, certain space shall be reserved around the inverter to ensure sufficient installation and heat dissipation space.
- Under the installation scenario of multiple inverters, when the space is sufficient, the installation mode of "straight line" is recommended. When the space is insufficient, it is recommended to install the product in a zig-zag manner. It is not recommended to install multiple inverters by overlapping.
- The installation height of the equipment shall be convenient for operation and maintenance, ensure that the equipment indicator lights, all labels are easy to see, and the terminal blocks are easy to operate.
- The inverter is installed at an altitude lower than the maximum working altitude of 4000m.
- Keep away from strong magnetic field environment to avoid electromagnetic interference. If there is a radio station near the installation location or wireless communication equipment below 30MHz, please install the equipment according to the following requirements:

Ferrite core with multi-circle winding or low-pass EMI filter at inverter DC input or AC output.

The distance between inverter and wireless electromagnetic interference equipment exceeds 30m.

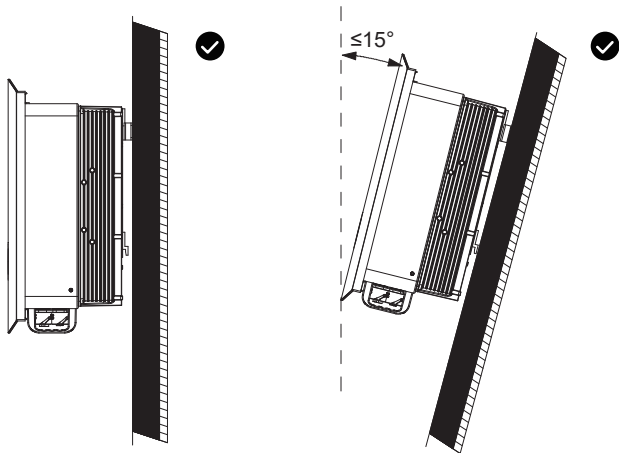


5.1.2 Carrier requirements

- Installation carriers must not be flammable and must be fire resistant.
- Please make sure that the mounting carrier is solid and reliable and can bear the weight of inverter.
- The equipment will vibrate during operation, so do not install it on the carrier with poor sound insulation, so as to avoid disturbance to residents in the living area caused by the noise generated by the equipment during operation.

5.1.3 Installation angle requirements

- Recommended inverter installation angle: vertical or pitching $\leq 15^\circ$.
- Do not invert, tilt forward, tilt backward beyond the angle and install the inverter horizontally.



5.1.4 Installation tool requirements

The following installation tools are recommended for installation. Other auxiliary tools can be used on site if necessary.

 Percussion drill	 Sockets tool box	 Torque screw driver	 Diagonal pliers	 Wire stripper
 Crimping pliers	 Pressing terminal crimping plier	 Hydraulic tongs	 Wire cutter	 Multimeter (Vdc range > 1000V)
 Rubber hammer	 Vacuum cleaner	 Tape measure	 Levelling instrument	 Electrician's knife
 Heat shrinkable sleeve	 Air heater	 Cable ties	 Goggles	 Insulating gloves
 Protective gloves	 Respirator	 Protective shoes	 Cable clamp	

5.2 Installation of inverter



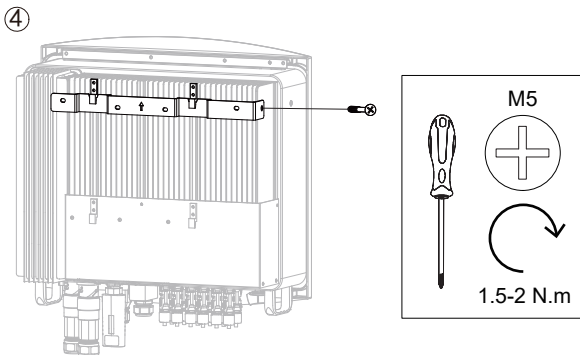
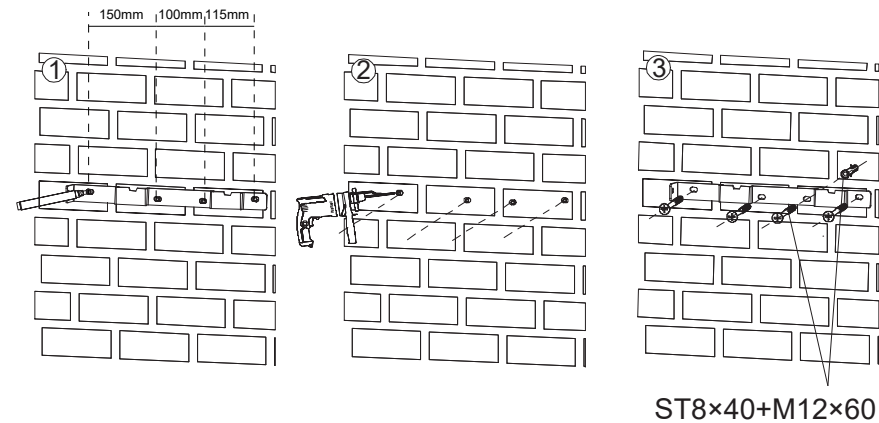
Watch out:

- Transportation, turnover, installation and other operations must meet the requirements of national and regional laws and regulations and relevant standards.
- Please equip corresponding personnel according to the weight of the equipment to prevent the equipment from exceeding the weight range that can be handled by human body and damaging personnel.
- Wear safety gloves to avoid injury.
- Please make sure that the equipment is balanced during handling to avoid dropping.



Watch out:

- When drilling holes, make sure that the drilling position is kept away from water pipes, cables, etc. in the wall to avoid danger.
- Wear goggles and dust mask when punching to avoid dust inhalation into respiratory tract or into eyes.
- Make sure that the inverter is securely installed to prevent injuries from falling.



5.3 Electrical connection

5.3.1 Safety precautions



Danger:

- Specifications of all operation, cables and components used in electrical connection shall comply with local laws and regulations.
- Before electrical connection, please disconnect the DC switch and AC output switch of inverter to make sure that the equipment is powered off. It is strictly forbidden to operate with electricity, otherwise, electric shock and other hazards may occur.
- Cables of the same type shall be bound together and arranged separately from cables of different types. It is forbidden to wind or cross cables.
- If the cable bears too much tension, it may lead to poor wiring. When wiring, please reserve a certain length of the cable before connecting to the inverter wiring port.
- When crimping the connecting terminal, please make sure that the conductor part of the cable is fully contacted with the connecting terminal, and do not crimp the cable insulation skin together with the connecting terminal, otherwise, the equipment may be unable to operate, or the inverter terminal block may be damaged due to heating due to unreliable connection after operation.



Watch out:

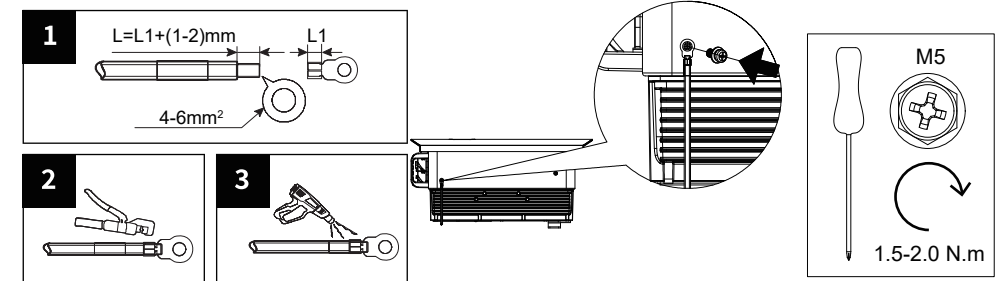
- When making electrical connection, please wear safety shoes, protective gloves, insulating gloves and other personal protective equipment as required.
- Only professionals are allowed to carry out operations related to electrical connection.

5.3.2 Connecting protective earth wire



Warning:

- The protective grounding of the crate shell cannot replace the protective grounding wire of the AC output port. When wiring, ensure that the protective grounding wires at the two places are reliably connected.
- In case of multiple inverters, make sure that the protective earthing point of all inverter crate enclosures is equipotentially connected.
- To improve the corrosion resistance of the terminal, it is recommended to apply silicone or paint on the external of the grounding terminal for protection after the connection and installation of the protective ground wire.
- Please prepare the protective ground wire, and the recommended specification:
Type: Outdoor single-core copper wire
conductor cross-section: 4-6mm²(12-10AWG)



5.3.3 Connect PV input cable



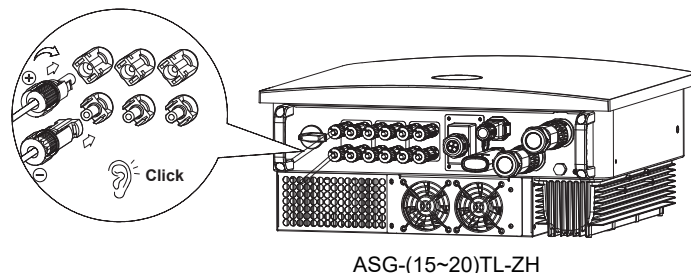
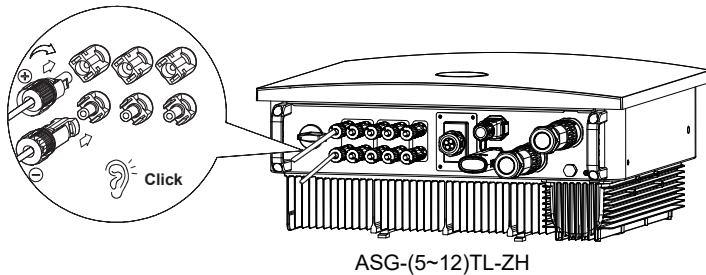
Danger:

- Do not connect the same PV string to multiple inverters, otherwise the inverter may be damaged.
- Please make sure that the maximum short circuit current and maximum input voltage of each MPPT are within the allowable range of the inverter.
- Please make sure that the positive electrode of the PV string is connected to the PV port+ of the inverter, and the negative electrode of the PV string is connected to the PV port - of the inverter.
- Please prepare your own PV input cable. Recommended specification:
Type: Outdoor PV multi-core copper wire
conductor cross-section: 4-6mm² (12 - 10AWG)
Outer diameter of conductor insulation layer: $\phi 3\sim 7\text{mm}$

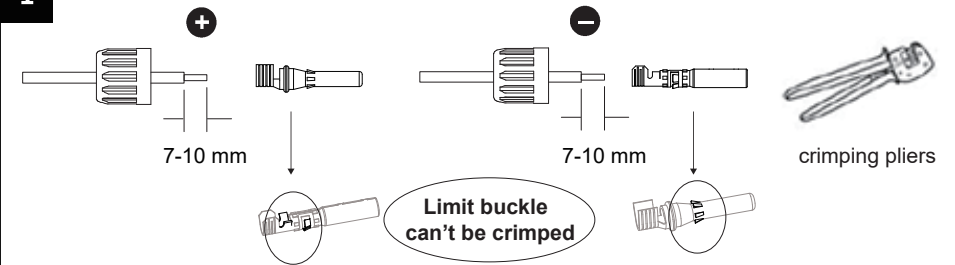


Warning:

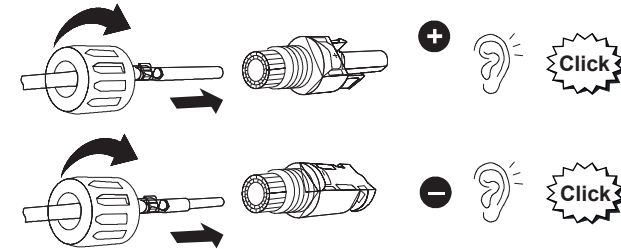
- PV string output does not support grounding. Before connecting PV string to inverter, please make sure that the minimum insulation resistance to ground of PV string meets the minimum insulation impedance requirements ($R = \text{maximum input voltage} / 30\text{mA}$).
- Make sure that the DC cables are firmly connected without looseness after connection.
- Use a multimeter to measure the positive and negative electrodes of the DC cable and ensure that the positive and negative electrodes are correct without reverse connection, and the voltage is within the allowable range.



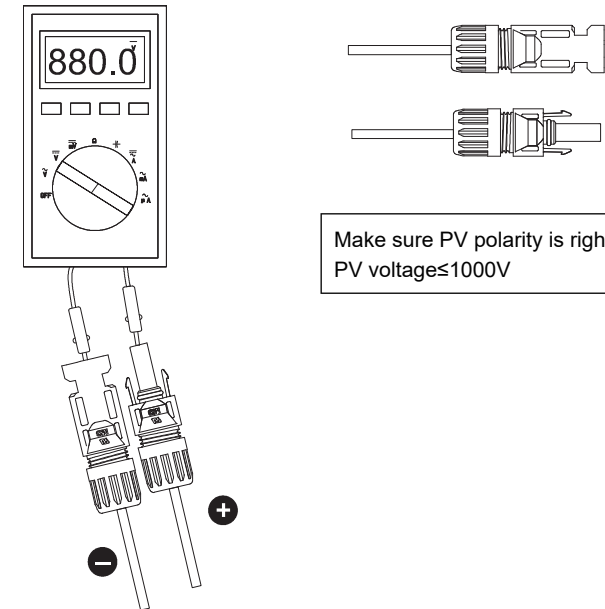
1



2



3



5.3.4 Connect the battery input cable



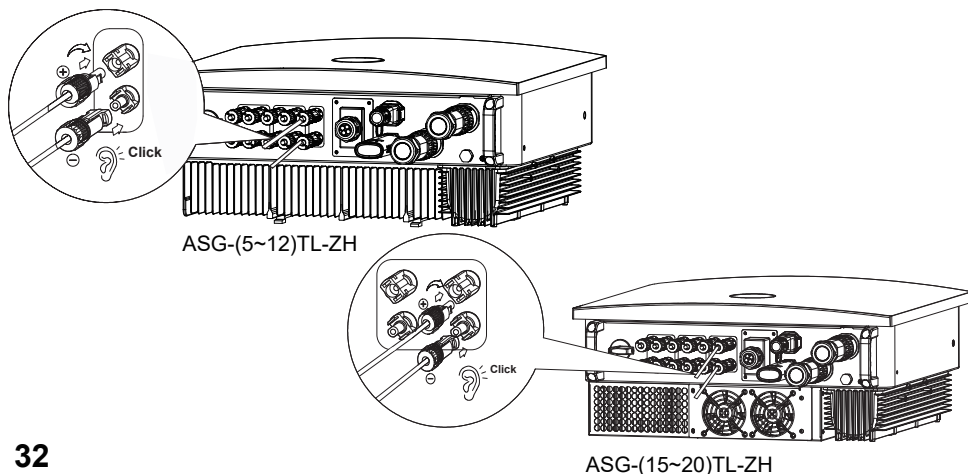
Danger:

- The inverter manufacturer shall approve the battery used with inverter, and the approved battery list can be obtained through the official website.
- Short-circuit of battery may cause personal injury. Instantaneous large current caused by short circuit can release a lot of energy and may cause fire.
- Before connecting the battery cable, please confirm that the inverter and battery are powered off and the front and rear switches of the equipment are disconnected.
- When the inverter is operating, do not connect or disconnect the battery cable. Violation operation may cause electric shock.
- When connecting the battery cable, please use insulated tools to prevent accidental electric shock or battery short circuit.
- Make sure that the battery open circuit voltage is within the allowable range of the inverter.
- One DC switch is required between inverter and battery.
- Please prepare your own DC input cable. Recommended specification:
 - Type: Outdoor DC multi-core copper wire
 - Conductor sectional area: 8mm² (8AWG)
 - Outer diameter of conductor insulation layer: $\phi 3\sim 7\text{mm}$

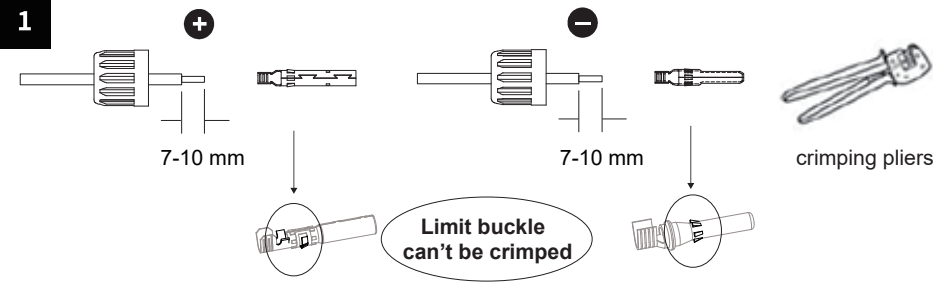


Warning:

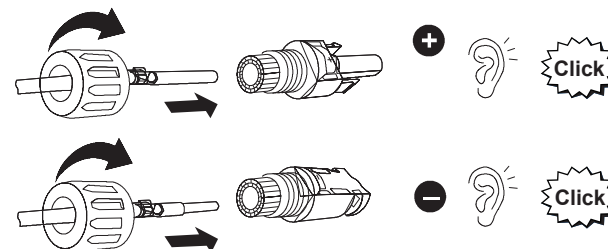
- During wiring, the battery cable is completely matched with the "BAT+", "BAT -" and grounding port of the battery terminal. If the cable connection is wrong, the equipment will be damaged.
- Do not connect load between inverter and battery.
- Do not connect the same battery pack to multiple inverters as this may cause inverter damage.
- Make sure that the DC cables are firmly connected without looseness after connection.
- Use a multimeter to measure the positive and negative electrodes of the DC cable and ensure that the positive and negative electrodes are correct without reverse connection, and the voltage is within the allowable range.



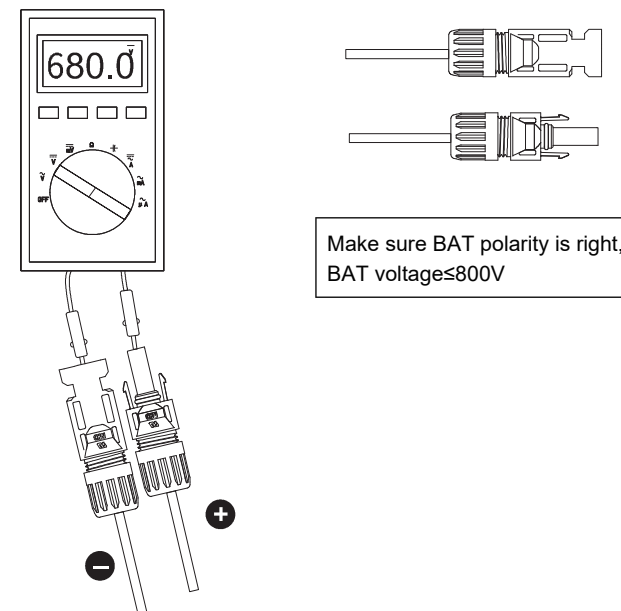
1



2



3



5.3.5 Connecting AC cable

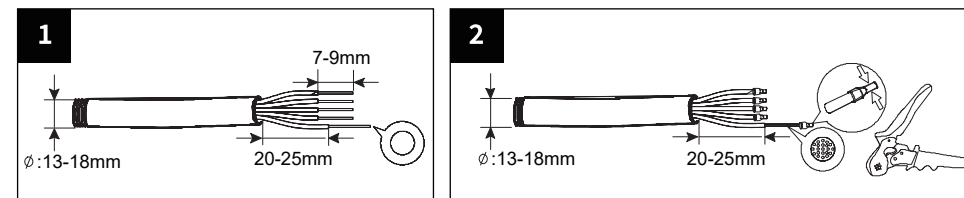
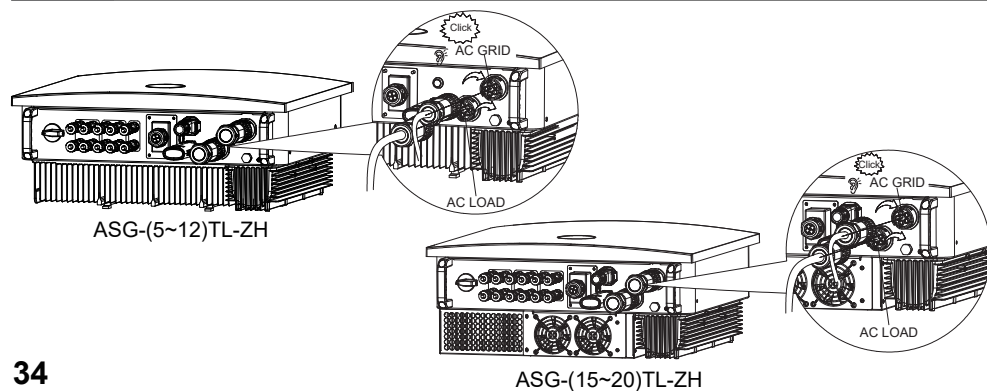
Danger:

- In order to ensure that the inverter and the grid can be safely disconnected from the grid in case of abnormal conditions, please connect the AC switch on the AC side of the inverter. Multiple inverters cannot be connected to one AC switch at the same time. Please select proper AC switch according to local regulations.
- When the inverter is powered on, the AC off-grid port will be powered. If the off-grid port load needs to be maintained, make sure to disconnect the off-grid port circuit breaker or power down the inverter, otherwise it may cause electric shock.
- Please prepare your own AC input cable. Recommended specification:
Type: Outdoor AC single-core copper wire
Conductor sectional area: 6mm² (10AWG) ASG-(5~12)TL-ZH;
8mm² (8AWG) ASG-(15~20)TL-ZH.
Outer diameter of conductor insulation layer: ϕ 13~18mm
- If multi-core copper wire is selected, supporting crimping terminal shall be used for assembly. It is forbidden to directly press multi-core copper wire into the connector.



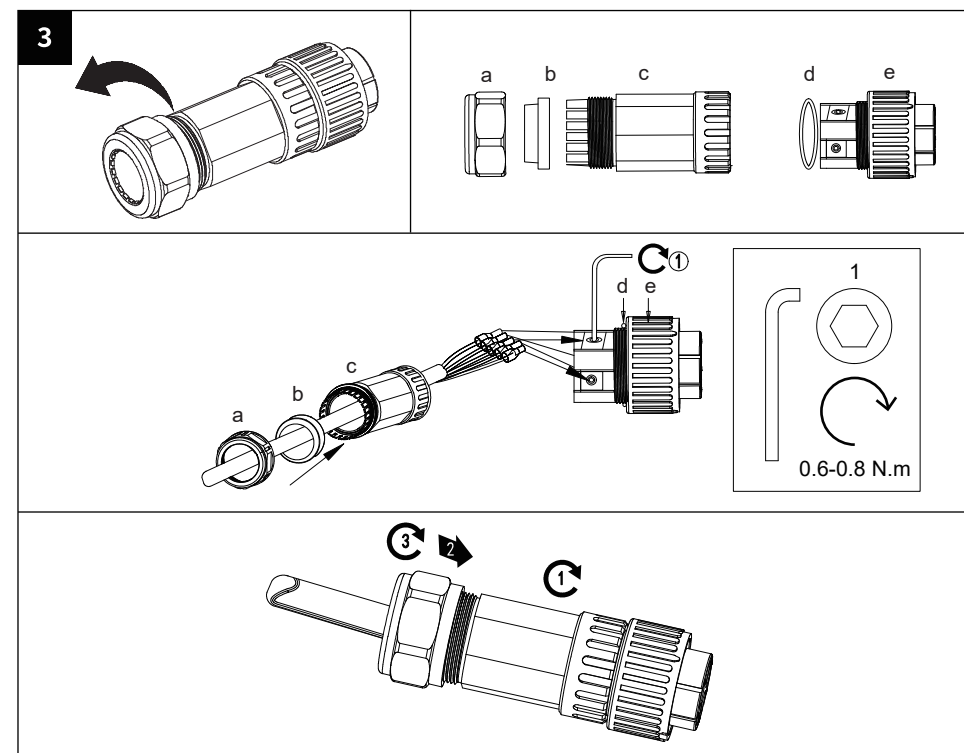
Warning:

- The residual current monitoring unit (RCMU) is integrated inside the inverter, and when the inverter detects a leakage current greater than the allowable value, it will quickly disconnect from the power grid.
- When wiring, the AC cable matches the "L1", "L2", "L3", "N", and grounding ports of the AC terminal completely. If the cable is connected incorrectly, it will cause equipment damage.
- Please make sure that the wire core is fully inserted into the terminal-wiring hole and not exposed.
- Make sure that the cable connections are tight, otherwise equipment operation may cause overheating of the wiring terminals and damage to the equipment.
- When connecting AC cables, it is recommended to first connect the off grid output cable and then connect the mains cable. It is strictly prohibited to connect the mains cable to the off grid output port.




Note:

- Single core wire, no terminal pressing operation required.
- For multi-core wires, cold-pressed terminal crimping pliers shall be used for crimping terminals.

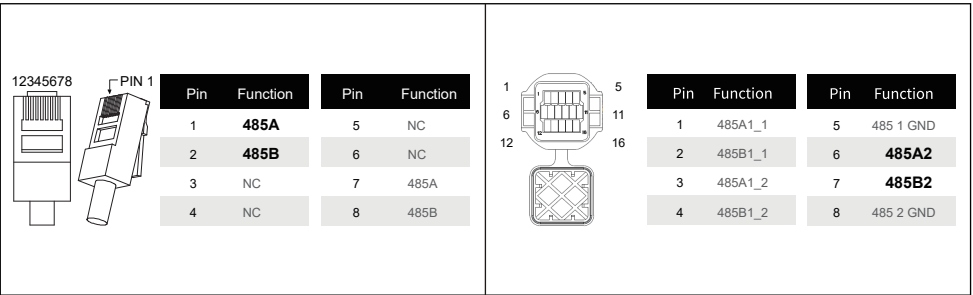
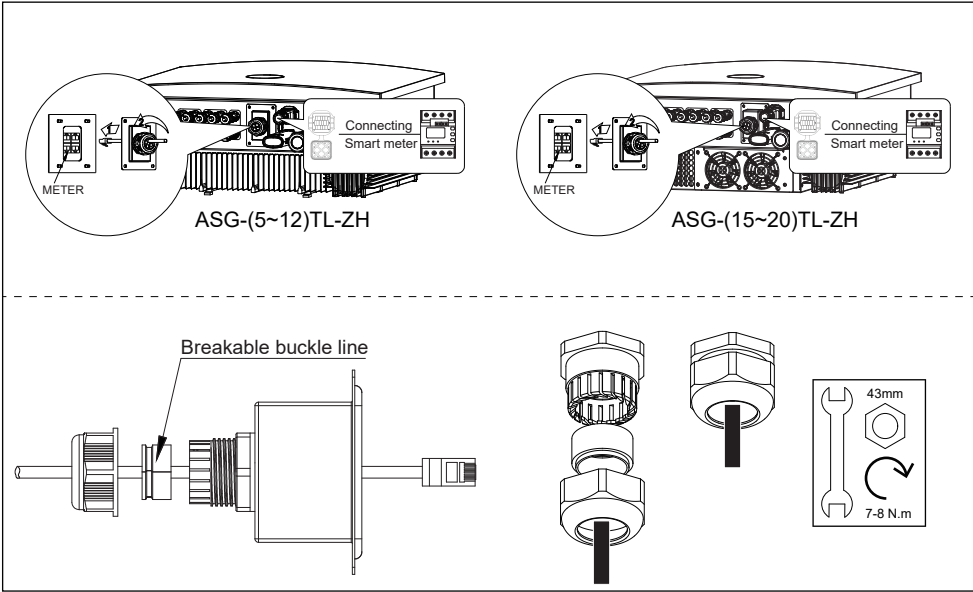


5.3.6 Smart meter (optional)



Watch out:

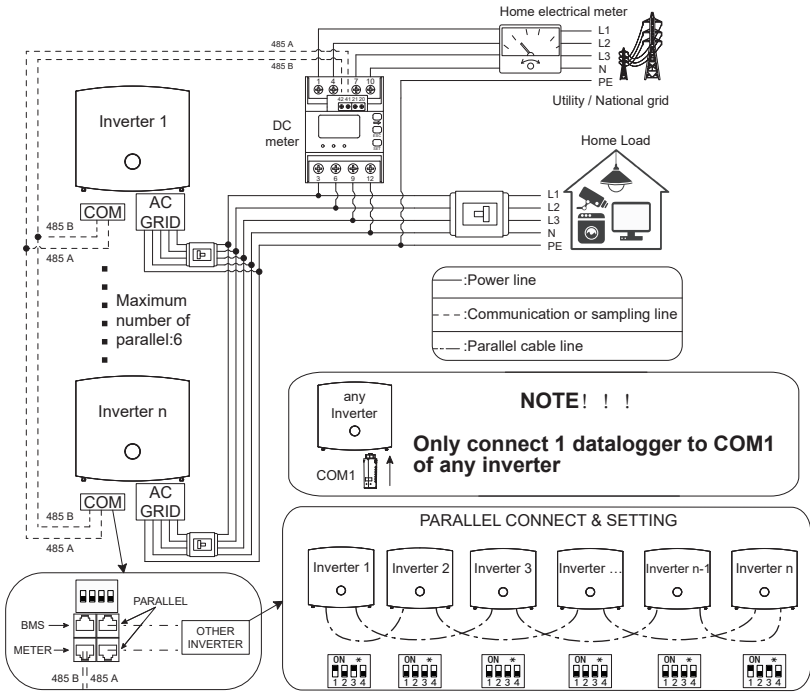
- When connecting communication cables, please ensure that the definition of the wiring port matches the device perfectly, and the cable routing should avoid interference sources, power cables, etc. to avoid affecting signal reception.
- The electrical meter and CT are shipped with the inverter, and the relevant parameters have been preset at the factory. Please do not modify the relevant parameters of the electricity meter and CT.
- Each inverter needs to be connected to a separate meter. Do not connect multiple inverters to the same electrical meter.
- To ensure the normal use of the electricity meter and CT, please ensure that the CT is connected to the phase cable, CT1 is connected to L1, CT2 is connected to L2, and CT3 is connected to L3.
- Please connect the CT according to the direction of the electrical meter. If it is reversed, a CT reverse fault will be reported.
- The length of the CT cable provided with the inverter is 3m or 5m. Please install the electricity meter and CT according to the actual situation.
- Please provide your own communication cable for the electrical meter, and it is recommended to use T568B standard network cables of Class 5 or higher standards.
- The communication cable connecting the electrical meter to the inverter supports a maximum of 100m and can be connected to a standard RJ45 crystal head. The port definition is as follows:



The ASG three-phase inverter can meet the requirements of the zero export function through one electrical meter and three CTs. It can be set to separate phase control and three-phase total control as required. Take the 12kW model as an example:


Single phase independent control: The three-phase grid connected power is independently regulated. For example, if the loads of L1/L2/L3 phases are 1kW/4kW/8kW respectively, then the on grid power of L1/L2/L3 will be 1kW/4kW/6kW respectively (the single-phase grid connected power of a 12kW model is 6kW). The remaining electricity required will be purchased from the grid.

Total power control: total adjustment of three-phase grid connected power. If the loads of L1/L2/L3 phases are 1kW/4kW/8kW respectively, then the on grid power of L1/L2/L3 will be 4kW/4kW/4kW respectively (the maximum grid connected power of a 12kW model is 4kW). The remaining electricity required will be purchased from the grid.



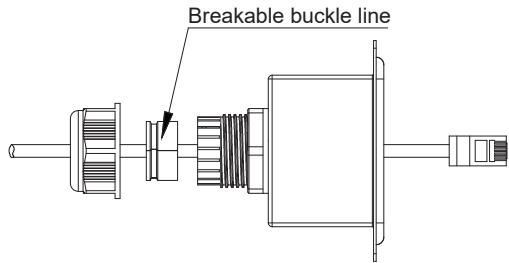
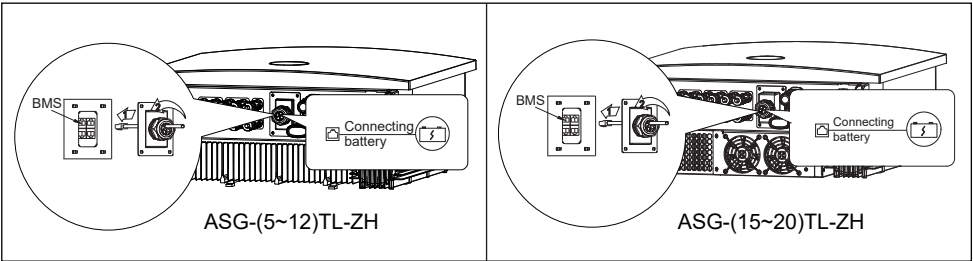
Note: This picture shows the DC meter connection, see the page 20 of the user manual for the CT meter connection.

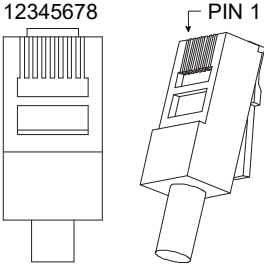
5.3.7 BMS Communication



Watch out:

- When connecting the communication cable, please ensure that the wiring port definition is completely matched with the equipment, and the cable route shall avoid the interference source, power cable, etc. to avoid affecting the signal receiving.
- CAN communication or RS485 communication shall be selected between inverter and battery according to actual demand.
- Please prepare the BMS communication cable by yourself. It is recommended to use the Cat5e and above standard network cable of T568B standard.
- It is suggested that the communication cable between BMS and inverter should be $\leq 5\text{m}$, and standard RJ45 crystal head can be connected. The port definition is as follows:






12345678

PIN 1

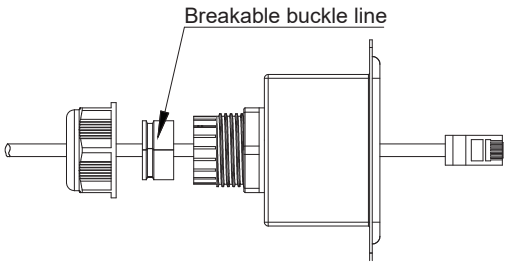
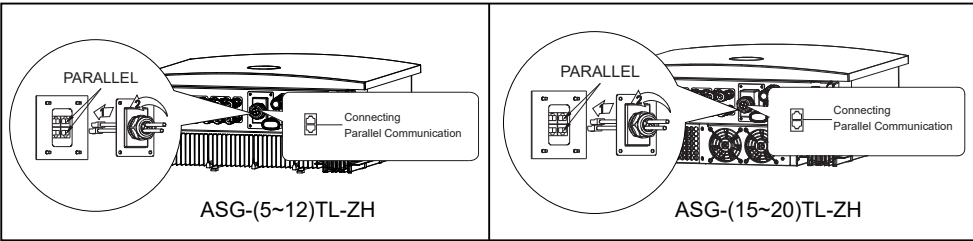
Pin	Function	Pin	Function
1	NC	5	CANL
2	NC	6	GND
3	NC	7	485A
4	CANH	8	485B

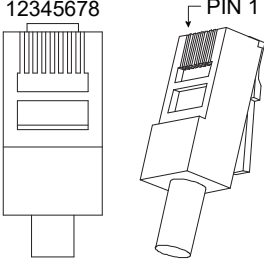
5.3.8 Parallel Communication (optional)



Watch out:

- When connecting the communication cable, please ensure that the wiring port definition is completely matched with the equipment, and the cable route shall avoid the interference source, power cable, etc. to avoid affecting the signal receiving.
- Please prepare the meter communication cable by yourself. It is recommended to use the Cat-5 and above standard network cable of T568B standard.
- Parallel related wiring and setting detailed operations are shown in **Appendix 1** Parallel operation.
- The communication cable between inverter and inverter can be connected with standard RJ45 crystal head, and the port definition is as follows:





12345678

PIN 1

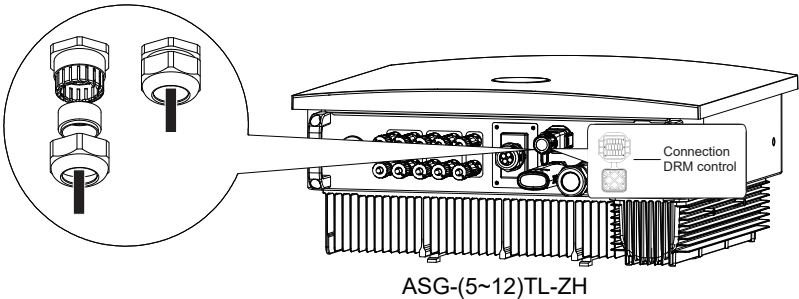
Pin	Function	Pin	Function
1	CANB_H	5	PAR-HOST
2	CANB_L	6	PAR-MODE
3	GNDCOM	7	PAR.CAN_H
4	PAR-SYN	8	PAR.CAN_L

5.3.9 DRM Control (optional)

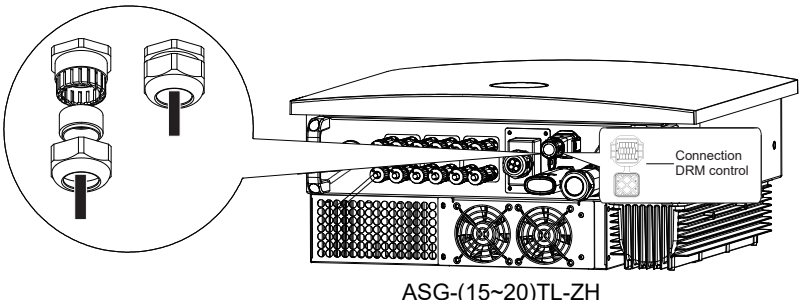


Watch out:

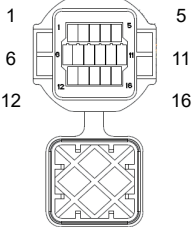
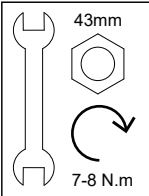
- When connecting the communication cable, please ensure that the wiring port definition is completely matched with the equipment, and the cable route shall avoid the interference source, power cable, etc. to avoid affecting the signal receiving.
- The port definition is as follows:



ASG-(5~12)TL-ZH



ASG-(15~20)TL-ZH



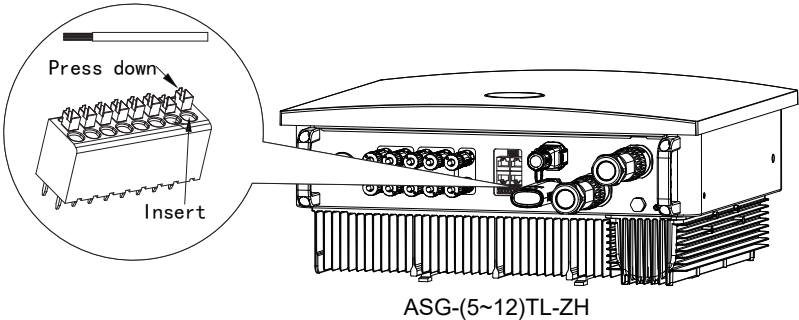
Pin	Function	Pin	Function
9	DRM1/5	13	DRM_REF
10	DRM2/6	14	DRM_GND
11	DRM3/7	15	DRM_+12V
12	DRM4/8	16	DRM_GND

5.3.10 DRY Communication (optional)

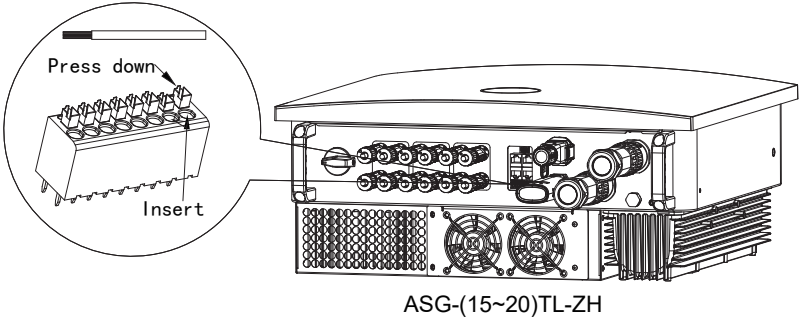


Watch out:

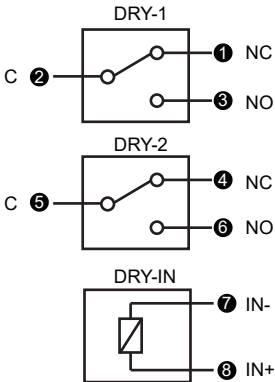
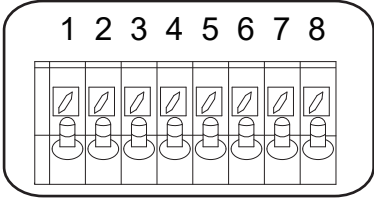
- When connecting the communication cable, please ensure that the wiring port definition is completely matched with the equipment, and the cable route shall avoid the interference source, power cable, etc. to avoid affecting the signal receiving.
- The port definition is as follows:



ASG-(5~12)TL-ZH



ASG-(15~20)TL-ZH



5.3.11 AC Coupling (optional)

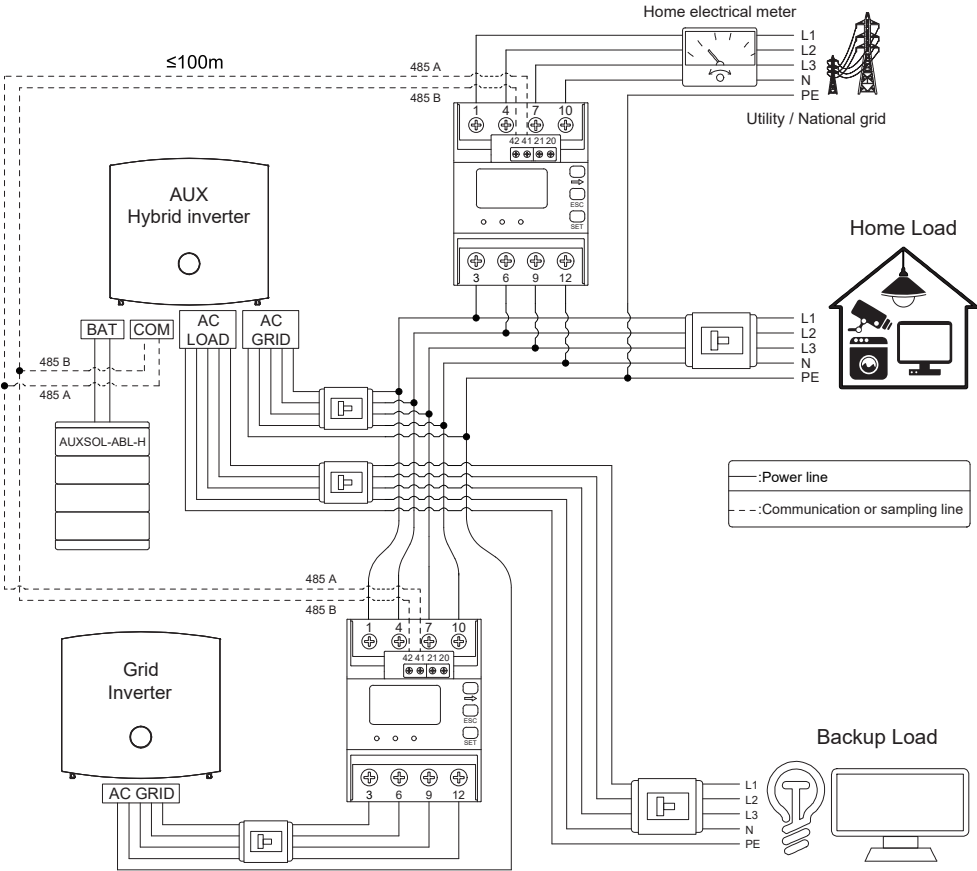


Watch out:

- When connecting the communication cable, please ensure that the wiring port definition is completely matched with the equipment, and the cable route shall avoid the interference source, power cable, etc. to avoid affecting the signal receiving.
- The port definition is as follows:
- The anti-backflow mode needs to be set to "Overall Anti-Backflow".

AC coupling function

1. Enable the dual meter function;
2. Set the communication address of meter 2 to 30 through the meter button;
3. Enable the anti backflow function code and set the anti backflow percentage to 100%.



Note: This picture shows the DC meter connection, see the page 20 of the user manual for the CT meter connection.

5.3.12 Datalogger connection (optional)



Watch out:

Detailed introduction of communication module can be obtained from the official website.

1. Open the COM port cover plate, assemble the datalogger and USB port together as shown in the figure, and tighten the datalogger.
2. The datalogger can support Wifi, 4G, LAN or SUNSPEC communication. Refer to the datalogger installation guide for detailed operation.

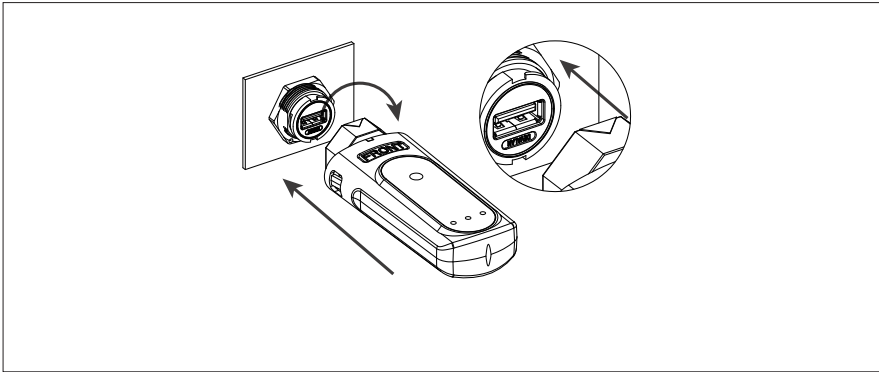


fig. 1

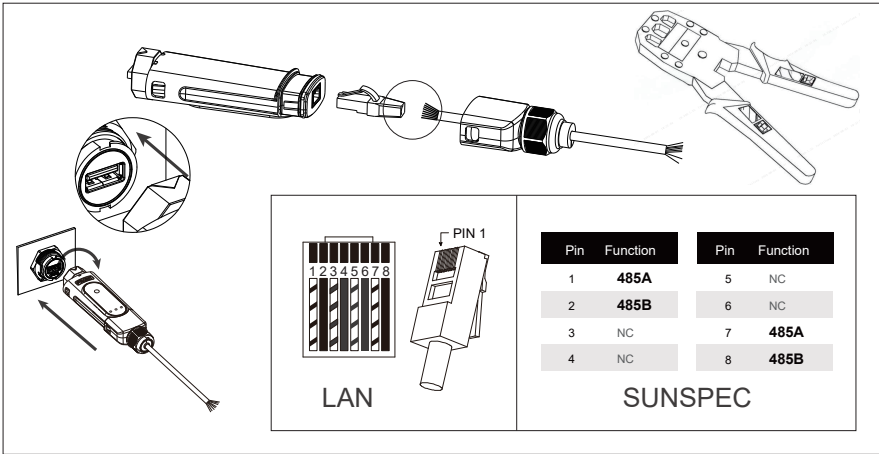


fig. 2

6 EQUIPMENT COMMISSIONING AND MAINTENANCE

6.1 Check before power-on

Items	Checking items	Standard
1	Installation of inverter	The inverter shall be installed correctly, firmly and reliably
2	Cable arrangement	Cables shall be reasonably arranged and well protected, without damage
3	Datalogger	The datalogger shall be installed correctly, firmly and reliably
4	Identifying	The safety signs and warning labels on the inverter are not blocked or damaged
5	Switch	"DC SWITCH" and all switches connected to the inverter are "OFF"
6	Cable connection	The AC output cable, DC input cable and grounding wire are connected correctly, firmly and reliably
7	Unused terminals and interfaces	Unused terminals and interfaces are protected with waterproof covers
8	Circuit breaker	Reasonable selection of AC circuit breaker
9	Environmental requirements	Reasonable installation space, clean and tidy environment, no construction remains

6.2 Power on the equipment

- Step 1: At the AC switch between the inverter and the power grid, measure the voltage at the power grid side with a multimeter to confirm that the voltage of the power grid is within the allowable range of the inverter operating voltage.
- Step 2: Turn off the AC switch.
- Step 3: Battery system startup:
a: Press the POWER button and the indicator lights up.
b: Long press the ON/OFF button for more than 3s.
- Step 4: Turn on the "DC SWITCH" on the Inverter.
- Step 5: Observe the inverter LCD/LED indicator and check the inverter operation status.

6.3 Set inverter parameters via APP



Watch out:

To ensure that the inverter works properly, please use the AUXSOL application program to complete the inverter parameter setting.

Scan the QR code below to download the AUXSOL application or log in following website to download this application:
<https://www.auxsolcloud.com>



Watch out:

Please also obtain the operating instructions of the communication rod from the official website, to set the contents more consistent with the application scenario.

6.4 Power off the equipment



Danger:

- When operating and maintaining the inverter, please turn off the inverter for treatment. Live operation of the equipment may cause damage to the inverter or electric shock.
- After the inverter is powered off, it will take a certain amount of time for internal components to discharge. Please wait until the equipment is fully discharged according to the required label time requirements.

- Step 1: Disconnect the AC switch between the inverter and the utility/ national grid.
- Step 2: At the AC switch between the inverter and the utility/ national grid, measure the voltage on the power grid side with a multi-meter to confirm that the power has been cut off.
- Step 3: Battery system shutdown:
a: Long press the ON/OFF button for more than 3s.
b: Press the POWER button and the indicator light will go out
- Step 4: Observe the inverter LCD/LED indicator, check the inverter operation status, and confirm to enter standby.
- Step 5: Turn off "DC SWITCH" on the inverter.

6.5 Equipment removal



Danger:

- Make sure inverter is power off.
- Wear personal protective equipment when operating the inverter.

Step 1: Successively remove all electrical connections of inverter, including DC cable, AC cable, communication cable, communication module and protective earth wire.

Step 2: Remove the inverter from the back cladding.

Step 3: Remove the back cladding.

Step 4: Properly save the inverter and ensure that the storage conditions meet the requirements if the subsequent inverter is still put into use.

6.6 Equipment scrapping

If the inverter cannot be used anymore and needs to be scrapped, please dispose according to the electrical waste disposal requirements of the inverter country/region.

The inverter shall not be treated as household garbage.

6.7 Trouble shooting

Please trouble shoot according to the following methods. If the trouble shooting methods cannot help you, please contact the after-sales service center.

When contacting the after-sales service center, please collect the following information for quick solution.

1. Inverter information, such as serial number, software version, equipment installation time, fault occurrence time, fault occurrence frequency, etc.
2. Equipment installation environment, such as weather conditions, whether components are sheltered and whether there is shadow, etc. It is recommended to provide photos, videos and other documents to assist in analyzing problems.
3. Utility/National grid condition.

Defect codes	Defect name	Cause	Solutions
101	BUS software overvoltage	1. Abnormal grid or load fluctuation. 2. Weak light or abnormal light changes.	1. If it happens by chance, it may be caused by abnormal power grid, load or light for a short time. After the self-check is normal, the inverter will return to normal operation without manual intervention. 2. Check the series configuration of the corresponding photovoltaic array string to ensure that the open circuit voltage of the string is not higher than the maximum working voltage of the inverter. 3. Check the impedance of the PV strings to the protective ground. If a short circuit occurs, please find the short circuit point and rectify it. 4. Restart the inverter after disconnecting the off-grid load. If The restart is normal, you need to increase the battery or reduce the off-grid load (hybrid inverter).
102	BUS undervoltage	3. The configuration of the photovoltaic array is wrong, and the number of photovoltaic panels connected in series is too large. 4. Poor insulation of photovoltaic to ground.	
103	BUS imbalance		
104	BUS hardware overvoltage		
201	Battery soft start BUS timeout	1. Abnormal fluctuation of power grid. 2. Inverter sampling fault. 3. Wiring failure.	1. If it happens by accident, it may be caused by the abnormal power grid or load for a short time. After the self-check is normal, the inverter will return to normal operation without manual intervention. 2. Disconnect the AC circuit breaker, battery circuit breaker and photovoltaic input switch in turn. After 10 minutes, close the battery circuit breaker, AC circuit breaker and photovoltaic input switch in turn to check whether the fault is still the same. 3. Please check whether the photovoltaic, AC and battery cables are correctly connected according to the wiring requirements of the manual.
202	Grid soft start BUS timeout		
203	DCDC boost soft start BUS timeout		
301	Phase A soft start timeout		
302	Phase B soft start timeout		
303	Phase C soft start timeout		
401	DCDC software overcurrent	1. Abnormal fluctuation of power grid or load. 2. Inverter sampling fault. 3. Battery wiring failure.	1. If it happens by accident, it may be caused by abnormal power grid or load for a short time. After the self-check is normal, the inverter will return to normal operation without manual intervention. 2. Disconnect the AC circuit breaker, battery circuit breaker and photovoltaic input switch in turn, and close the battery circuit breaker, AC circuit breaker and photovoltaic input switch in turn after 10 minutes to check whether the fault is still there. 3. Please check whether the battery cable is correctly connected according to the wiring requirements of the manual.
501	DCDC hardware overcurrent		

Defect codes	Defect name	Cause	Solutions
601	Phase A software overcurrent	1. Abnormal grid or load fluctuation. 2. Inverter sampling fault.	1. If it happens by accident, it may be caused by abnormal power grid or load for a short time. After the self-check is normal, the inverter will return to normal operation without manual intervention. 2. If it occurs frequently, check whether the voltage frequency of the power grid is stable. If the power grid fluctuates greatly, enable the weak power grid mode and restart the inverter. 3. If it appears during the first installation, please check whether the power grid is connected to the off-grid output interface (hybrid inverter) by mistake according to the wiring requirements of the manual. 4. Restart the inverter after disconnecting the off-grid load. If The restart is normal, you need to increase the battery or reduce the off-grid load (hybrid inverter).
602	Phase B software overcurrent		
603	Phase C software overcurrent		
701	Phase A hardware overcurrent		
702	Phase B hardware overcurrent		
703	Phase C hardware overcurrent		
801	Phase A overvoltage		
802	Phase B overvoltage		
803	Phase C overvoltage		
901	Phase A undervoltage		
902	Phase B undervoltage		
903	Phase C undervoltage		
1001	Battery overvoltage	The battery voltage is higher than the allowable range.	1. Please check whether the battery configuration voltage meets the Inverter Specifications according to the wiring requirements of the manual. 2. Confirm whether the inverter charging voltage setting matches the battery specification.
1101	Battery reverse connection	Wrong positive and negative battery wiring.	Turn off the AC circuit breaker, battery circuit breaker and photovoltaic input switch in turn. After the inverter is turned off, adjust the positive and negative wiring of the battery, turn on the battery circuit breaker, AC circuit breaker and photovoltaic input switch in turn to check whether the fault is still there.
1201	Back-up overload	Off-grid load power exceeds inverter rated power.	Reduce the off-grid output load of the inverter.

Defect codes	Defect name	Cause	Solutions
1301	Back-up phase A short circuit	Short circuit in off-grid output.	Disconnect the AC circuit breaker, battery circuit breaker, and PV input switch in sequence. After the inverter is turned off, check whether the corresponding off-grid output side wiring and load are short-circuited.
1302	Back-up phase B short circuit		
1303	Back-up phase C short circuit		
1304	Back-up AB short circuit		
1305	Back-up BC short circuit		
1306	Back-up AC short circuit		
1501	Control board overtemperature	1. The installation position of the inverter is not ventilated. 2. The ambient temperature is too high. 3. The fan works abnormally.	1. Check whether the ventilation of the inverter installation position is good and whether the ambient temperature exceeds the maximum allowable ambient temperature range. 2. If there is no ventilation or the ambient temperature is too high, please improve its ventilation and heat dissipation conditions. 3. Check whether the fan is working normally, whether the air duct is blocked or blocked by dust.
1502	Battery module overtemperature		
1503	PV module overtemperature		
1504	Invert module overtemperature		
1505	Control board NTC not connected	Temperature detection circuit abnormality.	Disconnect the AC circuit breaker, battery circuit breaker, and PV input switch in sequence. After 10 minutes, close the battery circuit breaker, AC circuit breaker, and PV input switch in sequence to check whether the fault persists.
1506	Battery module NTC not connected		
1507	PV module NTC not connected		
1508	Inverter module NTC not connected		
1601	Phase A current DC component protection	The DC component of the inverter output current is higher than the safety regulations or the default allowable range of the machine.	If it happens occasionally, it may be caused by a short-term abnormality in the power grid or load. After the inverter self-checks normally, it will resume normal operation without manual intervention.
1602	Phase B current DC component protection		
1603	Phase C current DC component protection		
1801	PV1 overvoltage	There are too many PV panels in the PV string.	Check the series configuration of the corresponding photovoltaic array string to ensure that the open circuit voltage of the string is not higher than the maximum operating voltage of the inverter.
1802	PV2 overvoltage		

Defect codes	Defect name	Cause	Solutions
1901	PV software overcurrent	1. Improper PV panel configuration. 2. Abnormal lighting changes.	1. Ensures that the current of the strings are within the specifications of the inverter. 2. If it occurs occasionally, it may be caused by abnormal short-term light. After the inverter self-checks normally, it will resume normal operation without manual intervention.
2001	PV hardware overcurrent		
2101	PV arcing	1. The DC connection terminals are not firmly connected. 2. The DC cable is damaged.	Please check whether wires of PV side are connected correctly according to the wiring requirements in the manual.
2201	PV1 reverse connection	The positive and negative poles of the DC series connection are reversed.	Disconnect the AC circuit breaker, battery circuit breaker, and photovoltaic input switch in sequence. After the inverter is turned off, adjust the DC positive and negative poles, and then close the battery circuit breaker, AC circuit breaker, and photovoltaic input switch in sequence to check whether the fault persists.
2202	PV2 reverse connection		
2301	PV1 short circuit	Short circuit in DC string.	Disconnect the AC circuit breaker, battery circuit breaker and photovoltaic input switch in turn, and then close the battery circuit breaker, AC circuit breaker and photovoltaic input switch in turn after 10 minutes to check whether the fault persists.
2302	PV2 short circuit		
2401	Internal fan abnormal	1. Abnormal power supply of fan. 2. Mechanical failure (locked rotor). 3. The fan is aged and damaged.	Check whether the fan is working properly, whether the air duct is blocked or blocked by dust.
2402	External fan abnormal		
2801	Grid port reverse connection	The off-grid output port is incorrectly connected to the mains.	Please check whether the grid is connected to the off-grid output interface by mistake according to the wiring requirements in the manual.
2901	ISO protection	1. The photovoltaic string is short-circuited to the protection ground. 2. The installation environment of photovoltaic string is relatively humid for a long time and the line insulation to ground is poor.	1. Check the impedance of the photovoltaic string to the protection ground. It is normal that the resistance value is greater than 50kΩ. If the resistance value is less than 50kΩ, please check the short circuit point and rectify it. 2. Check whether the protective earth wire of the inverter is connected correctly.



Defect codes	Defect name	Cause	Solutions
3001	GFCI sensor abnormal	The leakage current sensor has abnormal sampling.	Disconnect the AC circuit breaker, battery circuit breaker and photovoltaic input switch in turn, and then close the battery circuit breaker, AC circuit breaker and photovoltaic input switch in turn after 10 minutes to check whether the fault persists.
3002	GFCI protection	1. The photovoltaic string or AC line is short-circuited to the protection ground. 2. Electric equipment has Leakage Current. 3. The installation environment of the machine is relatively humid for a long time and the insulation of the line to the ground is poor.	1. Confirm whether the insulation of photovoltaic string and AC line is normal. 2. Check whether there is leakage current in the electrical equipment.
3101	Auxiliary power protection	Power circuit failure.	Disconnect the AC circuit breaker, battery circuit breaker and photovoltaic input switch in turn, and then removing the external communication cable, data acquisition rod and other equipment, close the battery circuit breaker, AC circuit breaker and photovoltaic input switch in turn, check if the fault persists.
3201	Unplugged control cable	Internal cable failure.	Disconnect the AC circuit breaker, battery circuit breaker and photovoltaic input switch in turn, and then close the battery circuit breaker, AC circuit breaker and photovoltaic input switch in turn after 10 minutes to check whether the fault persists.
3301	Relay abnormal	1. Abnormal relay (relay short circuit). 2. Control circuit is abnormal. 3. Abnormal AC side wiring (virtual connection or short circuit may exist).	1. Please check whether the AC cable is correctly connected according to the wiring requirements of the manual. 2. Disconnect the AC circuit breaker, battery circuit breaker and photovoltaic input switch in turn. After 10 minutes, close the battery circuit breaker, AC circuit breaker and photovoltaic input switch in turn to check whether the fault is still the same.

Defect codes	Defect name	Cause	Solutions
3401	Phase A current excessive sampling bias	Abnormal control circuit.	Disconnect the AC circuit breaker, battery circuit breaker, and PV input switch in sequence. After 10 minutes, close the battery circuit breaker, AC circuit breaker, and PV input switch in sequence to check whether the fault persists.
3402	Phase B current excessive sampling bias		
3403	Phase C current excessive sampling bias		
3501	Phase A output current excessive sampling bias		
3502	Phase B output current excessive sampling bias		
3503	Phase C output current excessive sampling bias		
3601	Phase A DC current excessive sampling bias		
3602	Phase B DC current excessive sampling bias		
3603	Phase C DC current excessive sampling bias		
3701	PV1 current excessive sampling bias		
3702	PV2 current excessive sampling bias		
3801	GFCI excessive sampling bias		
3901	DCDC1 current excessive sampling bias		
3902	DCDC2 current excessive sampling bias		

Defect codes	Defect name	Cause	Solutions
4201	DRM off	Respond to scheduled shutdown.	No need to deal with, if you have any questions, please contact the installer.
4202	Command off		
4203	Remote locking		
4301	DSP/ARM protocol version mismatch	Wrong firmware version matching.	Please upgrade the inverter's firmware to the latest version.
4302	Hardware version error		
4401	Parallel CAN communication protection	Parallel communication failure.	Please check whether the parallel communication cable is correctly connected according to the wiring requirements in the manual.
4402	Parallel synchronization signal protection		
4403	Parallel host signal protection		
4404	Parallel current sharing protection	In the parallel system, the inverter current sharing is inconsistent.	1. Please check whether the parallel communication cable is correctly connected according to the wiring requirements in the manual. 2. Please confirm whether the off-grid outputs of all inverters in the parallel system are connected together.
4405	Inconsistent parallel version	Wrong firmware version matching.	Please upgrade the firmware of the inverter in the parallel system to the latest version.
4406	Parallel machine parameter conflict	The rated voltage and frequency settings of the machine in the parallel system are inconsistent.	Set the regulations and rated voltage of all machines in the system to be consistent.
4407	Parallel number conflict	Parallel machine number is repeated.	Check whether the parallel machine number of two or more inverters in the parallel machine system is duplicate, and change the duplicate machine number to non-duplicate machine number within 1~15.
4408	System overload	The off-grid load power exceeds the parallel system rated power.	1. Confirm whether all inverters' off-grid outputs are connected in parallel. If so, follow suggestion 2. Reduce the inverter's off-grid output load or add another inverter to the parallel system.

Defect codes	Defect name	Cause	Solutions
4601	DCDC2 software overcurrent	1. Abnormal fluctuation of power grid or load. 2. Inverter sampling fault. 3. Battery wiring failure.	1. If it happens by accident, it may be caused by abnormal power grid or load for a short time. After the self-check is normal, the inverter will return to normal operation without manual intervention. 2. Disconnect the AC circuit breaker, battery circuit breaker and photovoltaic input switch in turn, and close the battery circuit breaker, AC circuit breaker and photovoltaic input switch in turn after 10 minutes to check whether the fault is still there. 3. Please check whether the battery cable is correctly connected according to the wiring requirements of the manual.
4701	DCDC2 hardware overcurrent		
4801	Battery 2 High Voltage	The battery voltage is higher than the allowable range.	1. Please check whether the battery voltage meets the Inverter Specifications according to the wiring requirements of the manual. 2. Confirm whether the inverter charging voltage setting matches the battery specification.
4901	Battery 2 Reverse connection	Wrong positive and negative battery wiring.	Turn off the AC circuit breaker, battery circuit breaker and photovoltaic input switch in turn. After the inverter is turned off, adjust the positive and negative wiring of the battery, turn on the battery circuit breaker, AC circuit breaker and photovoltaic input switch in turn to check whether the fault is still there.

6.8 Regular maintenance

	Danger: The machine must be kept power off state during maintenance.
	Watch out: Regular maintenance can maintain the stability of inverter performance.

Content	Method	Cycle
System Cleaning	Check the cooling fin and air inlet/outlet for foreign matter and dust. Especially the fan needs regular maintenance to prevent debris from blocking the fan and affecting the operation of the inverter.	half year
DC switch	Turn on and off the DC switch for 10 times continuously to ensure the normal function of DC switch.	one year
Electrical connection	Check whether the electrical connection is loose, whether the cable appearance is damaged and whether there is copper leakage.	half year
Tightness	Check whether the tightness of the equipment inlet hole meets the requirements. If the gap is too large or not sealed, it shall be re-closed.	one year

7 TECHNICAL PARAMETER

Model	ASG-5TL-ZH	ASG-6TL-ZH	ASG-8TL-ZH	ASG-10TL-ZH
Input DC				
Max.input power	7.5kW	9kW	12kW	15kW
Max.input voltage	1000V			
Rated voltage	600V			
Start-up voltage	160V			
MPPT voltage range	170-900V			
MPPT number	2			
Max.input strings number	2	2	4	4
Max.input current	16A/16A	16A/16A	26A/26A	26A/26A
Max.short circuit current	20A/20A	20A/20A	32A/32A	32A/32A
Input Battery				
Battery type	Li-ion			
Battery Voltage Range	180-800V			
Number of battery input channels	1			
Max.charge/discharge current	30A/30A			
Communication	CAN/RS485			
Charging Strategy for Li-Ion Battery	Self-adaption to BMS			

Model	ASG-12TL-ZH	ASG-15TL-ZH	ASG-20TL-ZH
Input DC			
Max.input power	18kW	22.5kW	30kW
Max.input voltage	1000V		
Rated voltage	600V		
Start-up voltage	160V		
MPPT voltage range	170-900V		
MPPT number	2		
Max.input strings number	4	4	4
Max.input current	26A/26A	36A/36A	36A/36A
Max.short circuit current	32A/32A	45A/45A	45A/45A
Input Battery			
Battery type	Li-ion		
Battery Voltage Range	180-800V		
Number of battery input channels	1	2	2
Max.charge/discharge current	30A/30A	2×30A/2×30A	2×30A/2×30A
Communication	CAN/RS485		
Charging Strategy for Li-Ion Battery	Self-adaption to BMS		

Model	ASG-5TL-ZH	ASG-6TL-ZH	ASG-8TL-ZH	ASG-10TL-ZH
Output AC (Grid side)				
Rated output power	5kW	6kW	8kW	10kW
Max.apparent output power	5kVA	6kVA	8kVA	10kVA
Max.output current	11.4A	13.6A	18.2A	22.7A
Grid voltage range	165-288V(Phase voltage),286-498V(Line voltage)			
Rated grid voltage	220V/380V,230V/400V,3/N/PE			
Rated grid frequency	50/60Hz			
Power Factor	>0.99 (0.8 leading...0.8 lagging)			
THDi	<3%			
Input AC (Grid side)				
Rated input power	5kW	6kW	8kW	10kW
Max.input power	10kW	12kW	16kW	20kW
Max.apparent input power	10kVA	12kVA	16kVA	20kVA
Max.input current	15.2A	18.2A	24.2A	30.3A
Rated input voltage	220V/380V,230V/400V,3/N/PE			
Rated input frequency	50/60Hz			
Output AC (Back-up)				
Rated output power	5kW	6kW	8kW	10kW
Max.output current	7.6A	9.1A	12.1A	15.2A
Back-up switch time	<10ms			
Rated output voltage	220V/380V,230V/400V,3/N/PE			
Rated frequency	50/60Hz			
THDv	<2%			

Model	ASG-12TL-ZH	ASG-15TL-ZH	ASG-20TL-ZH
Output AC (Grid side)			
Rated output power	12kW	15kW	20kW
Max.apparent output power	12kVA	15kVA	20kVA
Max.output current	27.3A	34.1A	45.5A
Grid voltage range	165-288V(Phase voltage),286-498V(Line voltage)		
Rated grid voltage	220V/380V,230V/400V,3/N/PE		
Rated grid frequency	50/60Hz		
Power Factor	>0.99 (0.8 leading...0.8 lagging)		
THDi	<3%		
Input AC (Grid side)			
Rated input power	12kW	15kW	20kW
Max.input power	24kW	30kW	30kW
Max.apparent input power	24kVA	30kVA	30kVA
Max.input current	36.4A	45.5A	45.5A
Rated input voltage	220V/380V,230V/400V,3/N/PE		
Rated input frequency	50/60Hz		
Output AC (Back-up)			
Rated output power	12kW	15kW	20kW
Max.output current	18.2A	22.7A	30.3A
Back-up switch time	<10ms		
Rated output voltage	220V/380V,230V/400V,3/N/PE		
Rated frequency	50/60Hz		
THDv	<2%		

Model	ASG-(5~12)TL-ZH	ASG-(15~20)TL-ZH
Efficiency		
Max.efficiency	97.34%	
EU efficiency	96.45%	
BAT charged/discharged Max.efficiency	97.35%	
MPPT Efficiency	99.80%	
Protection		
Integrated DC switch	Yes	
DC rever-polarity protection	Yes	
Anti-islanding protection	Yes	
Short circuit protection	Yes	
Output over current protection	Yes	
DC Surge protection	Type II	
AC Surge protection	Type II	
Insulation impedance detection	Yes	
Ground Fault Monitoring	Yes	
Residual leakage current detection	Yes	
Temperature protection	Yes	
Battery reverse protection	Yes	NO
AC Over voltage Protection	Yes	
DC Over current Protection	Yes	
I/V Curve scanning	Optional	
24-hour load monitoring	Optional	
Integrated AFCI (DC arc-fault circuit protection)	Optional	
Antibackflow	Optional	
LVRT	Optional	
Parallel	Optional	

Model	ASG-(5~12)TL-ZH	ASG-(15~20)TL-ZH
General Data		
Dimensions (W × H × D)	561 × 520 × 232mm	
Weight *[1]	33.2kg	37.8kg
Self consumption(night) (Rated voltage)	≤20W	
Operating temperature range	-30...+60°C	
Cooling concept	Natural Cooling	Smart Fan Cooling
Max.operation altitude	4000m (Derating above 3000m)	
Relative humidity	0-100%	
Ingress protection	IP66	
Topology Structure	Transformerless	
Grid connection standard	EN 50549-1, IEC 61727, IEC 62116, IEC 61683, UNE 217001, UNE 217002, NTS-631, PSE, PTPIREE, NC RfG	
Safety/EMC standard	IEC/EN 62109-1/2, IEC/EN 62477-1, EN IEC61000-6-1/2/3/4, EN IEC 61000-3-11, EN 61000-3-12	
Type of DC terminal	MC4 connector	
Battery connection type	MC4 connector	
Type of AC terminal (Back-up)	Quick connection plug	
Type of AC terminal (Grid side)	Quick connection plug	
Display & communication		
Display	LED+Bluetooth+APP (Optional:LCD)	
Communication interface	RS485,WIFI+Bluetooth,Optional:4G,LAN	

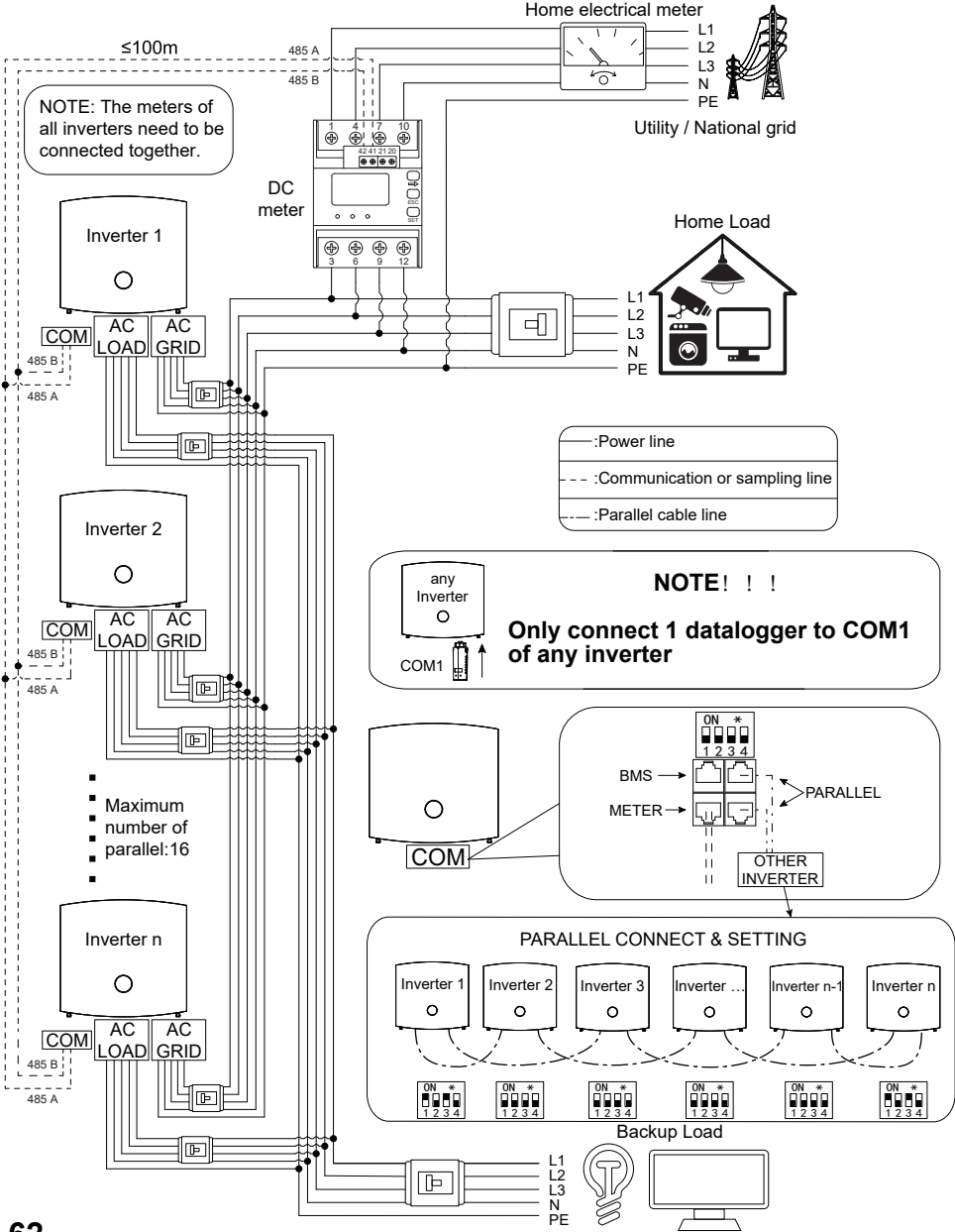
The product may be update in the future. The above parameters are for reference only. Please refer to the real thing.

*[1]:The weight parameters here are for reference only, and the actual weight shall prevail outside the box or official website.

APPENDIX 1 PARALLEL OPERATION(OPTIONAL)

1 Parallel system connection

Note: This picture shows the DC meter connection, see the page 20 of the user manual for the CT meter connection.



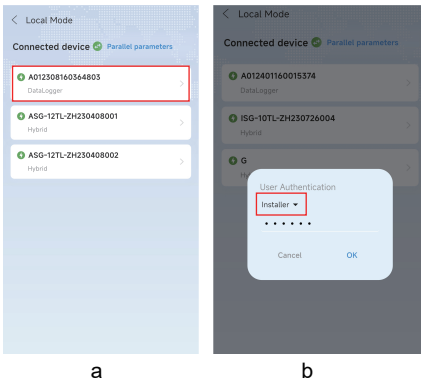
2 Parallel Setup

2.1 One-key to assign an address

The default address of the inverters is 1. If you want to use the inverters on the bus simultaneously, you need to re-assign the addresses of the inverters on the bus.

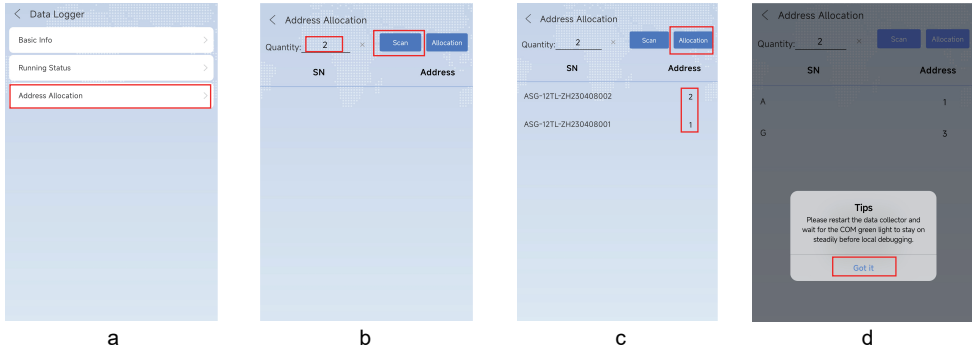
2.1.1 Connect the communication stick

- Select the communication stick. Make sure that the parallel bus of the collector is connected, open the mobile phone APP "AUXSOL", enter the "My-Tools-local debugging", and select the collector from the connected device.
- User authentication. User authentication Select "Installer", password: 888888.



2.1.2 One-key address allocation

- Enter the one-click address allocation. On the data collector page, click Address Allocation.
- Fill in the number of parallel machines for scanning bus machines, click "Scan", and wait for the page to display the connected machines on the bus, and display the SN and current address of each machine.
- Assign an address. After the machine scans out all the machines on the bus, modify the corresponding address of each machine; Note that the address range is 1-16, and ensure that the address of each machine is different; After the modification, click the "Assign" button to assign addresses to all machines in turn.
- After clicking the "Assign" button, it will show whether the corresponding address assignment of each machine is successful. If all Settings are successful, restart the communication stick as prompted to complete the one-click address assignment.

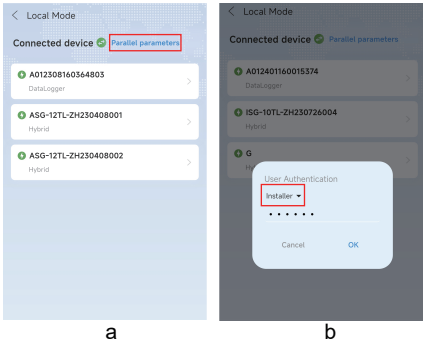


2.2 Set the parallel mode

By default, the inverters are in standalone mode. To use them in parallel, set all inverters to the parallel mode.

2.2.1 Enter parallel parameter Settings

- Enter parallel parameters. Make sure that the parallel bus of the collector is connected, open the mobile phone APP "AUXSOL", enter the "My -Tools - near debugging", and click "Parallel Parameters" at the top of the screen to enter the parameter setting page.
- User authentication. User authentication Select "Installer", password: 888888.



2.2.2 Set the parallel mode

- Go to the Quick Settings page. After entering the parallel parameters page, click "Confirm" to enter the quick setting.
- In "Quick Settings-Special Parameters" (STEP 2 OF 5).
- Set "Off-grid Output Mode" to "Parallel".
- In the "Quick Settings-Confirm Settings" (STEP 4 OF 5), confirm that the "off-grid output mode" is set to "parallel", and then click "Next" to complete the following operations as prompted to achieve the parallel mode setting.

