

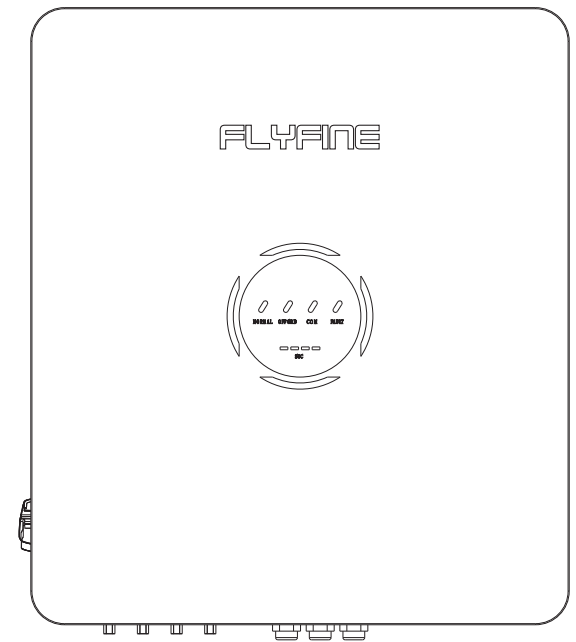
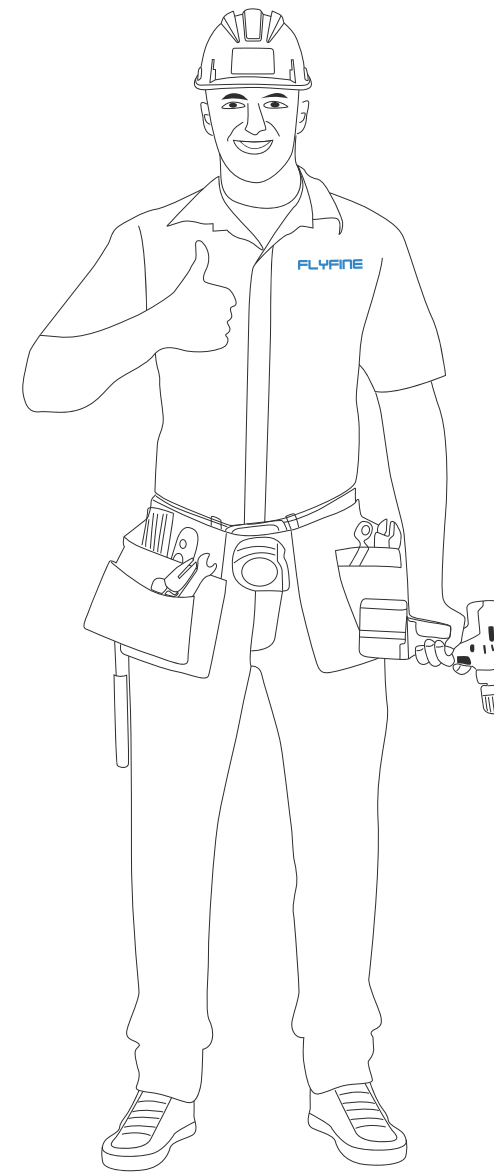
User Manual

Three Phase Hybrid Storage Inverter(HV)

FH8000T/FH10000T/FH12000T/FH15000T



FLYFINE DIGITAL ENERGY CO.LTD



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Incorrect operation of the product or product abnormality caused by force majeure such as fire, typhoon, flood and earthquake may cause unnecessary harm to yourself or others or cause damage to this product and loss of property. All accidents and losses caused by this may have nothing to do with our company. Correspondingly, the service warranty terms promised to you will automatically become invalid.

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If you still have questions, please visit our official website www.flyfinebattery.com to get the latest product information.

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1. About This Manual

This manual describes the product information, installation, electrical connection, commissioning, troubleshooting, and maintenance. Read through this manual before installing and operating the product. All the installers and users have to be familiar with the product features, functions, and safety precautions. This manual is subject to update without notice.

1.1 Peculiarity

The EC series which is also called three phase hybrid or bidirectional solar inverters, provides energy management in a PV system that includes solar modules, battery, loads, and utility grid connection. The energy produced by the PV system is prioritized to supply loads and then any excess energy to charge the battery. When the battery is fully charged, excess energy can be exported to the utility grid or setting to zero export.

1.2 Applicable Model

The manual can not include complete information about the photovoltaic (PV) system, or inverter type. This manual is only for products below:

| Model | Output Power Rating | Inverter Type |
|---------|---------------------|-------------------|
| EC08P3H | 8000W | 380/400V, 3L/N/PE |
| EC10P3H | 10000W | |
| EC12P3H | 12000W | |
| EC15P3H | 15000W | |

1.3 Target Audience

This manual applies to trained and knowledgeable technical professionals. The technical personnel have to be familiar with the product, local standards, and electric systems.









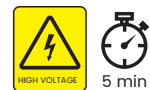



1.4 How to Use This Manual

Read the manual and other related documents before performing any operation on the inverter. Documents must be stored carefully and be available at all times.

Contents may be periodically updated or revised due to product development. The information in this manual is subject to change without notice. The latest manual can be acquired on the website of manufacturer.

1.5 Symbol Explanation

The EC series has been designed and tested strictly according to international safety regulations. Read all safety instructions carefully prior to any work and observe them at all times when working on or with the inverter operation and maintenance, as any improper operation might cause personal injury or property damage.


| | |
|---|--|
|  DANGER | DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury. |
|  WARNING | WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury. |
|  CAUTION | CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. |
| NOTICE ! | Highlights key information and supplements the texts. Or some skills and methods to solve product-related problems to save time. |
|  | Potential risks exist. Wear proper PPE before any operations. |
|  | High-temperature hazard. Do not touch the product under operation to avoid being burnt. |
|  | The components of the product can be recycled. |
|  | Read through the user manual before any operations. |
|  | Do not disconnect under load. |
|  | DANGER High voltage hazard. Disconnect all incoming power and turn off the product before working on it. |
|  | Do not touch live parts for 5 minutes after disconnecting from the power sources. |
|  | Products shall not be disposed as household waste. |
|  | CE mark. |

2. Safety Instructions

Please strictly follow these safety instructions in the user manual during the operation.


| | |
|-----------------|--|
| NOTICE ! | <ul style="list-style-type: none"> • The inverter has been designed and tested strictly according to international safety regulations. Read all safety instructions carefully prior to any work and observe them at all times when working on or with the inverter. • Personnel who install or maintain the equipment must be strictly trained and learn about safety precautions and correct operations. • Only qualified professionals or trained personnel are allowed to install, operate, maintain, and replace the equipment or parts. • Appropriate methods must be adopted to protect the inverter from static electricity damage. Any damage caused by static electricity is not warranted by the manufacturer. |
|-----------------|--|

2.1 General



| | |
|--|--|
|  DANGER | <ul style="list-style-type: none"> • Ensure that the hybrid inverter is not connected to a power supply or powered on before finishing installation or during replacement and maintenance. • Do not open the inverter cover or change any components without manufacturer's authorization. Otherwise, the warranty for the inverter will be invalid. • Any installation or operations on the inverter must be performed by qualified electricians in compliance with standards, wiring rules and the requirements of local grid authorities or companies. • All labels and warning marks should be visible after the installation. Do not cover, scrawl, or damage any label on the equipment. |
|--|--|

| | |
|-----------------|--|
| NOTICE ! | <ul style="list-style-type: none"> • The inverter has been designed and tested strictly according to international safety regulations. Read all safety instructions carefully prior to any work and observe them at all times when working on or with the inverter. • Personnel who install or maintain the equipment must be strictly trained and learn about safety precautions and correct operations. • Only qualified professionals or trained personnel are allowed to install, operate, maintain, and replace the equipment or parts. • Appropriate methods must be adopted to protect the inverter from static electricity damage. Any damage caused by static electricity is not warranted by the manufacturer. |
|-----------------|--|



2.1 General

| | |
|--|---|
|  DANGER | <ul style="list-style-type: none"> • Never power on the inverter during installation. • Before installations, read through the user manual to learn about the product and the precautions. • All operations should be performed by trained and knowledgeable technicians who are familiar with local standards and safety regulations. • Use insulating tools and wear personal protective equipment when operating the equipment to ensure personal safety. Wear anti-static gloves, clothes, and wrist strips when touching electronic devices to protect the inverter from damage. • Install in areas where children can not access. • Make sure DC input voltage does not exceed the maximum input voltage of the inverter. |
|--|---|



2.3 Electrical Connection

| | |
|---|---|
|  DANGER | <ul style="list-style-type: none"> • Ensure that the inverter is secured in position before connecting cables, or it can cause personal injury. • Ensure that the cables used in the system are properly connected and insulated and meet all specification requirements. • Connect the DC cables of the inverter to the included DC terminals. Severe damage might happen if other types of DC terminals are used, which are beyond the manufacturer's liability. • PV negative (PV-) and battery negative (BAT-) on inverter side are not grounded as the default design. • Connecting either (PV-) or (BAT-) to EARTH is strictly forbidden. |
|  WARNING | <ul style="list-style-type: none"> • Ensure the component frames and the bracket system are securely grounded. • Ensure the DC cables are connected tightly, securely and correctly. • Do not connect one PV string to more than one inverter at the same time. Otherwise, it may damage the inverter. • The PV modules used with the inverter must have an IEC61730 class A rating. • Measure the DC cables with a multimeter to avoid reverse polarity connection. Also, the voltage should be under the permissible range. • The voltage and frequency at the connecting point should meet the on-grid requirements. • Additional protective devices like circuit breakers or fuses are recommended on the AC side. Specification of the protective device should be at least 1.25 times the maximum AC output current. • Make sure that all the groundings are tightly connected. When there are multiple inverters, make sure that all the grounding points on the enclosures are equipotential bonding. • The alarm can be cleared automatically if the inverter triggers a fault for less than 5 times within 24 hours. The inverter will shut down for protection after the 5th electric arc fault. The inverter can operate normally after the fault is solved. • BACK-UP is not recommended if the PV system is not configured with batteries. Otherwise, the risk in system power usage is beyond the equipment manufacturer's warranty scope. • The inverter, with a built-in RCMU, will prevent the possibility of DC residual currents up to 6mA. Thus, in the system, an external RCD (type A) can be used ($\geq 30\text{mA}$). |



2.4 Operation

| | |
|---|---|
|  DANGER | <ul style="list-style-type: none"> When the inverter is operating, do not disconnect under load. |
|  WARNING | <ul style="list-style-type: none"> The temperature of the inverter surface can exceed 60°C during operation. Make sure it has cooled down before touching it and make sure the inverter is out of reach of children. |

2.5 Maintenance

| | |
|---|---|
|  DANGER | <ul style="list-style-type: none"> High voltage may cause an electric shock, which results in serious property damage, serious injury, or death, or serious property damage Prior to maintenance, power off the inverter and strictly comply with the safety precautions in this document. Before performing maintenance tasks, power off the inverter and wait at least 5 minutes. |
|  WARNING | <ul style="list-style-type: none"> Do not touch an energized inverter while the heat sink will reach a high temperature. |

2.6 Battery Safety Instruction

| | |
|---|--|
|  DANGER | <ul style="list-style-type: none"> Use the multimeter to measure the DC cable to avoid reverse polarity connection. Also, the voltage. should be under the permissible range. |
|  WARNING | <ul style="list-style-type: none"> Before installations, read through the corresponding battery's user manual to learn about the product and the precautions. Strictly follow its requirements. If the battery discharged completely, please charge it in strict accordance with the corresponding model's user manual. Factors such as: temperature, humidity, weather conditions, etc. may limit the battery's current and affect its load. Contact after-sale service immediately if the battery is not able to be started. Otherwise, the battery might be damaged permanently. Do not connect one battery pack to more than one inverter at the same time. Otherwise, it may cause damage to the inverter. |

3. Product Introduction

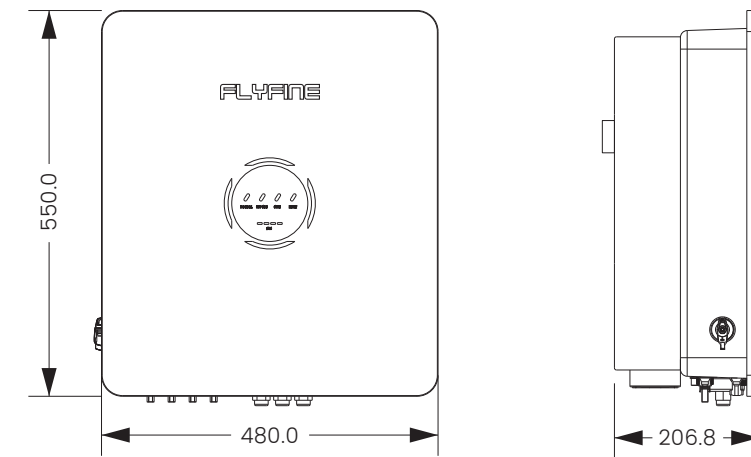
3.1 Product Overview

EC serial inverter is a bi-directional PV inverter with battery storage function which can convert solar energy to feed the AC grid or store energy into battery for future use.

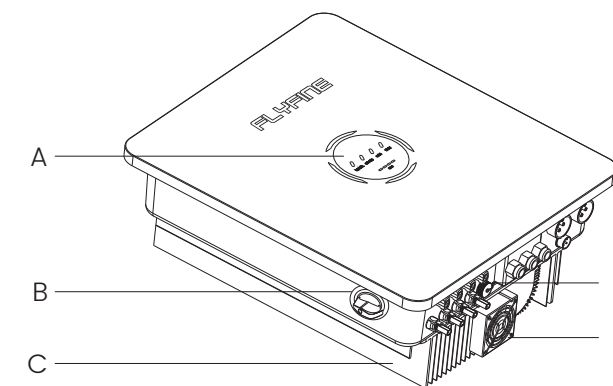
User can select different work mode to achieve different goals like self-consumption, time of use or backup use.

It can also provide power to loads for emergency use during the grid lost by using the energy from battery and PV arrays.

Dimension



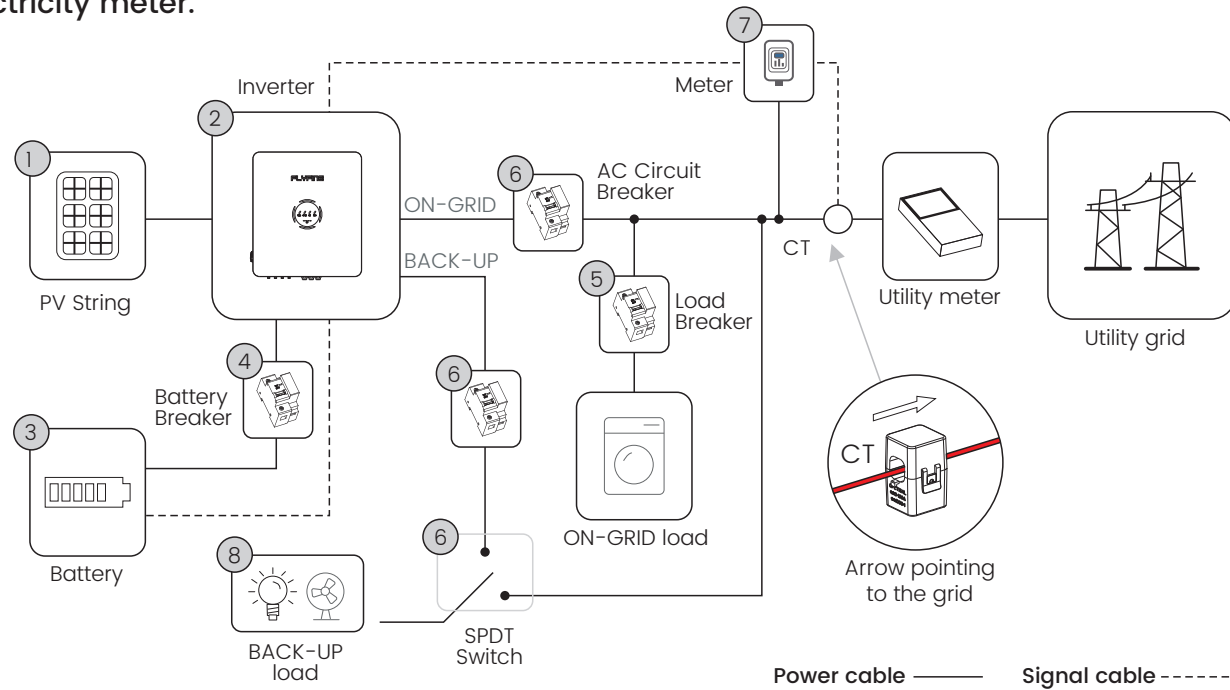
Appearance



| | | |
|---|-------------------------|---|
| A | LED display module | Display the running information of the inverter |
| B | PV switch | Enable or disable the PV |
| C | Heat sink | Provide heat dissipation to the inverter |
| D | Function port | Function port of the inverter |
| E | Intelligent cooling fan | Improve the heat dissipation efficiency of the inverter |

3.2 System Diagram

The EC serial hybrid inverter used to configure a residential grid-tied system. This system consists of the PV string, grid-tied hybrid inverter, power distribution unit (PDU), and electricity meter.



| Items | Name of the Part | Description |
|-------|------------------------------------|---|
| 1 | PV Strings | Serial PV panels into one or two strings. |
| 2 | Inverter | Hybrid inverter describe in this manual. |
| 3 | Battery | The battery used with the inverter shall be approved by the inverter manufacturer. The approved battery list can be obtained through the official website. |
| 4 | Battery Breaker | Recommended specifications: nominal current \geq 63A, nominal voltage \geq 1000Vdc. |
| 5 | Load Breaker | Depend on the actual using load. |
| 6 | AC Circuit Breaker and SPDT Switch | Recommended specifications: nominal current \geq 32A, nominal voltage \geq 400Vac. |
| 7 | Smart Meter | The smart meter is delivered with the inverter or purchased from the inverter manufacturer. |
| 8 | BACK-UP Loads | Connecting BACK-UP loads which need power supply continually or other important loads. Connecting unbalanced loads. L1, L2, L3 of the inverter respectively connected to loads with different power. Do not connect three-phase motor loads without N wire. |

3.3 System Work Modes

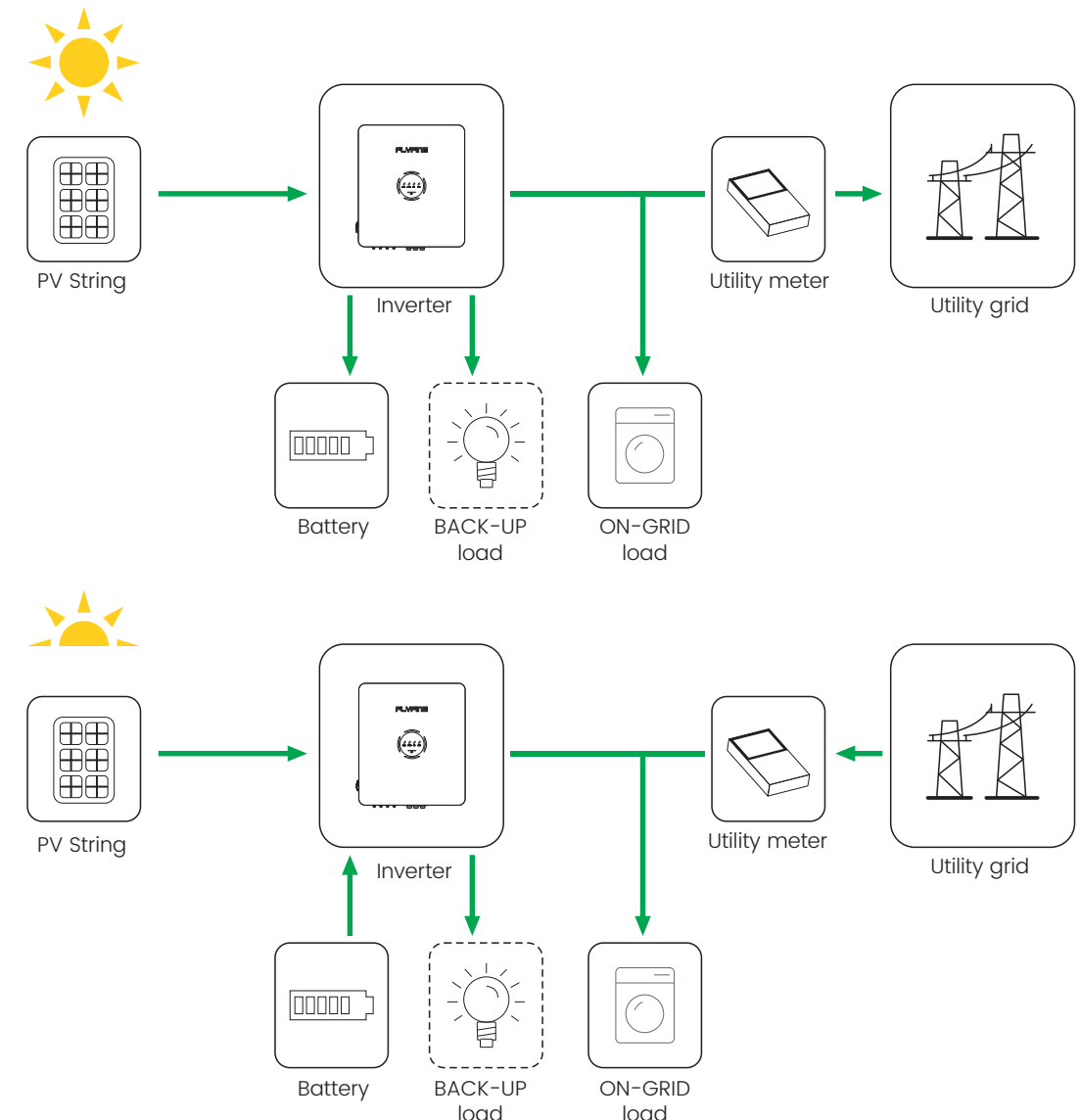
3.3.1 Self-consumption mode

| | |
|-----------------|--|
| NOTICE ! | <ul style="list-style-type: none"> For solar system, self-consumption mode is recommended. In the daytime, the excess power charges the battery, while the battery power the load when there is no solar power generated at night. This will improve the self-consumption rate and saves electricity costs. It is suitable for areas with high electricity prices and little or no solar power generation subsidies. |
|-----------------|--|

Day time:

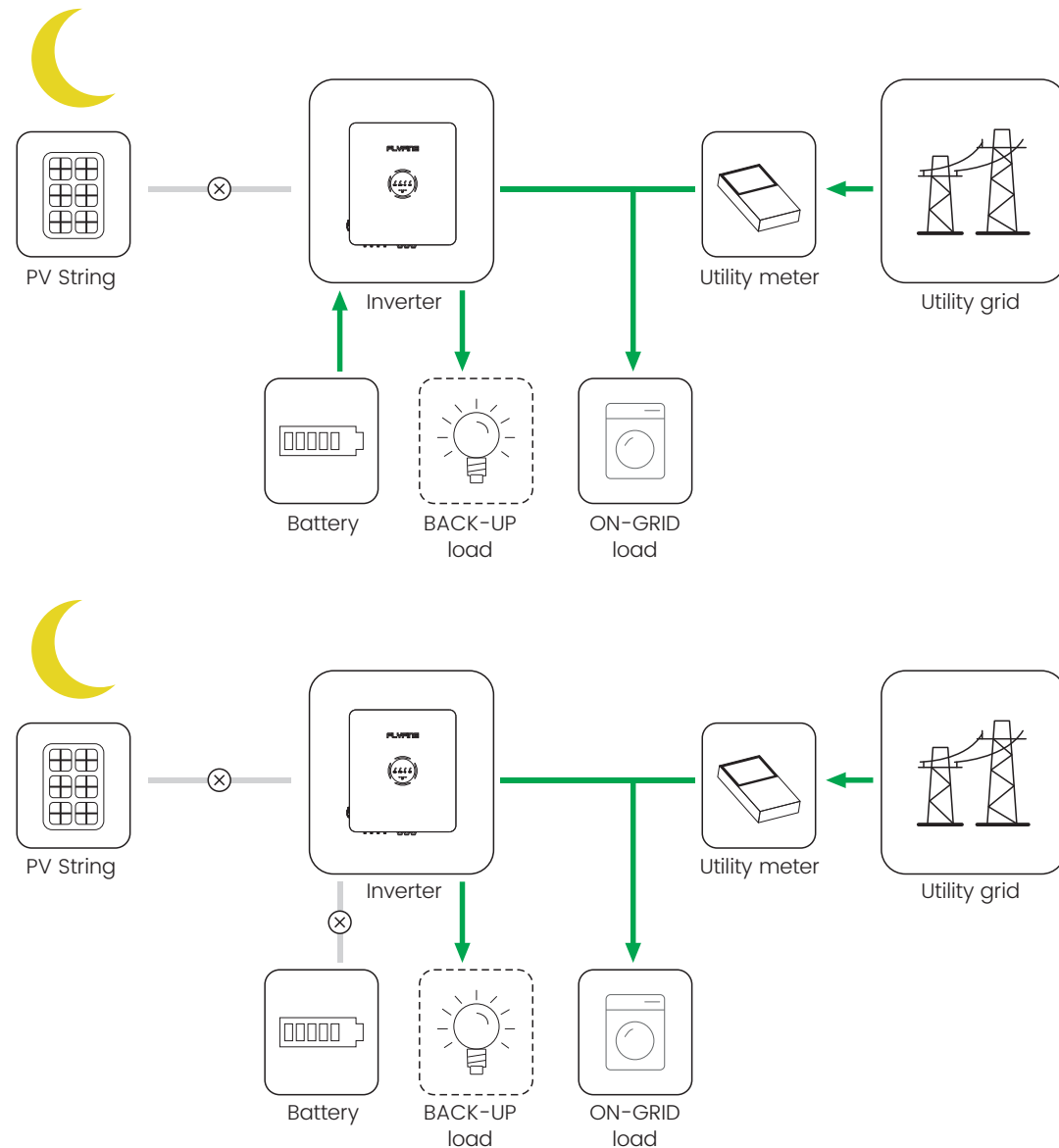
When the power generated in the PV system is sufficient, it will supply the loads in priority. The excess power will charge the batteries first, then the remaining power will be sold to the power grid.

When the power generated in the PV system is insufficient, the battery will supply the loads in priority. If the battery power is insufficient, the load will be powered by the power grid.



Night:

If the battery power is sufficient, the load will be powered by the battery. If the battery power is not enough, the load will be powered by the power grid.



3.3.2 Economic Mode

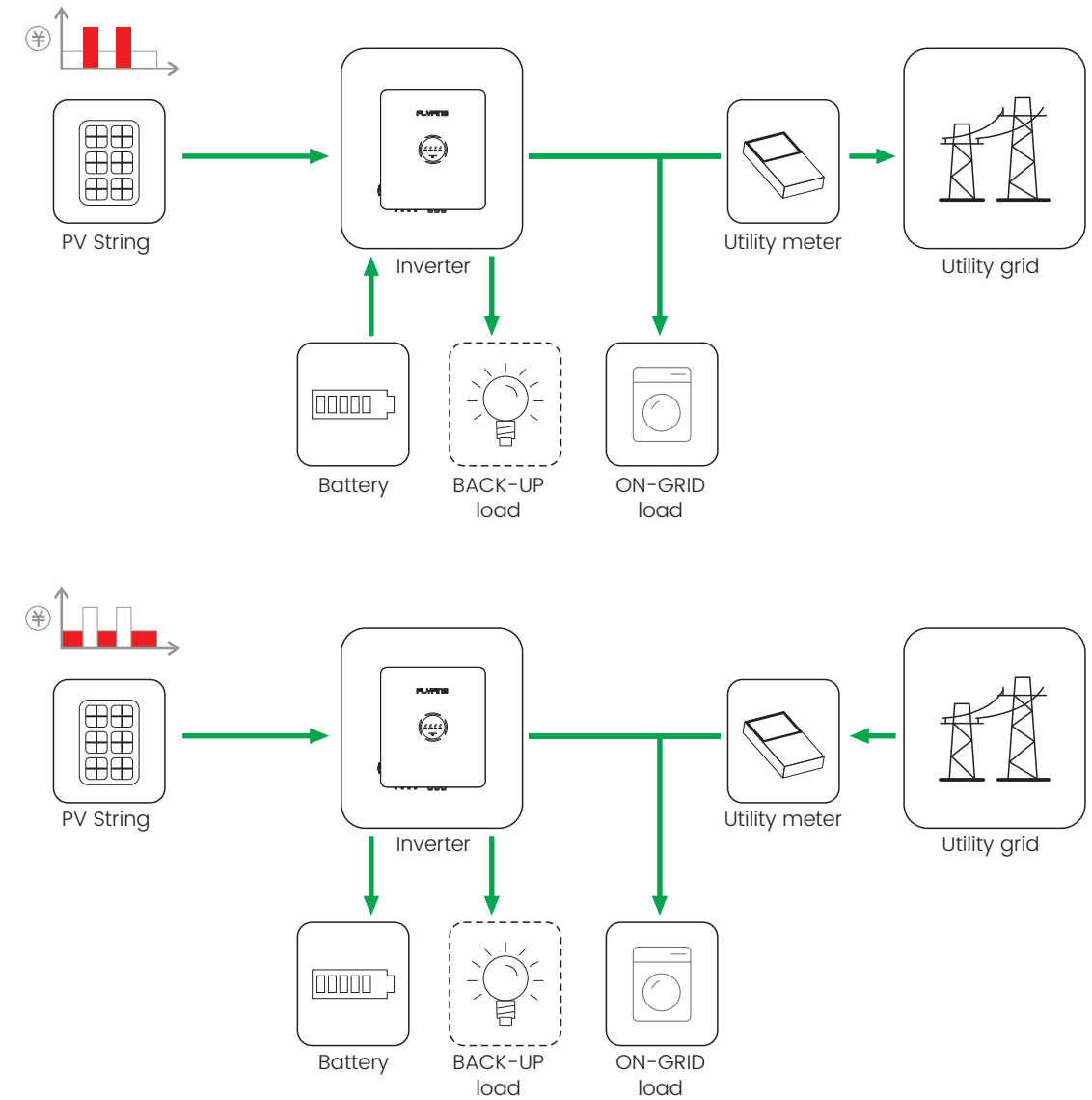
NOTICE !

- Economic mode can only be selected if local laws and regulations are met. It should be permitted to allow the power grid to charge the battery and allow the battery to be discharged power and sold to the grid. If not, do not select this mode.
- It is recommended to use economic mode in scenarios when the peak-valley electricity price varies a lot.

Day time:

When the electricity price is at its peak, the battery will power the load first, and the remaining power can be sold to power grid.

When the electricity price is at its valley, set the time for power grid to charge the battery.

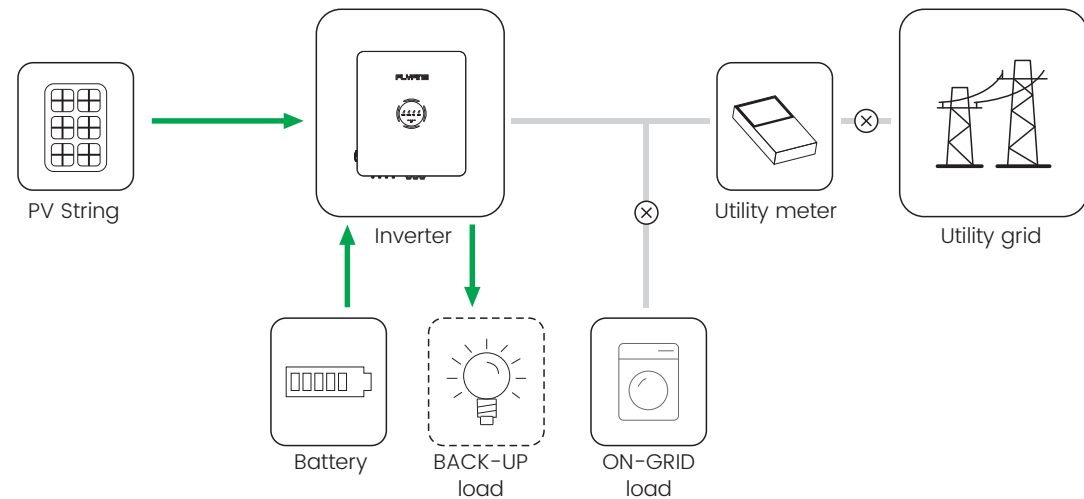
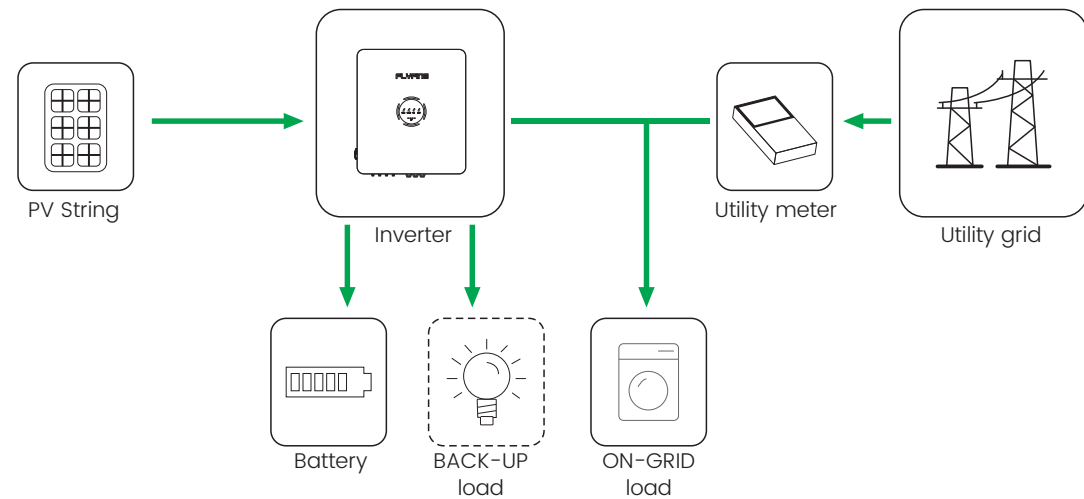


3.3.3 Backup Mode

| | |
|-----------------|--|
| NOTICE ! | <ul style="list-style-type: none"> • The Backup mode can set different battery SOC values during grid connection and off grid. When the power grid loses power, the inverter switches to off grid mode, and the battery can discharge to supply power to the load to ensure that the Back-UP output of the inverter does not lose power; When the power grid is restored, the inverter switches to grid connected mode. If the battery's SOC is lower than the set SOC, the battery can be charged by power grid. • The purchase of electricity from the power grid to charge the battery must comply with local laws and regulations. • Recommended for use in areas with unstable power grid. |
|-----------------|--|

When the SOC of the battery is lower than the set value, using solar power generation and purchasing electricity from the power grid to load and charge the battery.

When the power grid is cut off, if the PV power generation cannot meet the load usage, the battery discharge will supplement this part of power to ensure that the BACK-UP end load does not cut off.

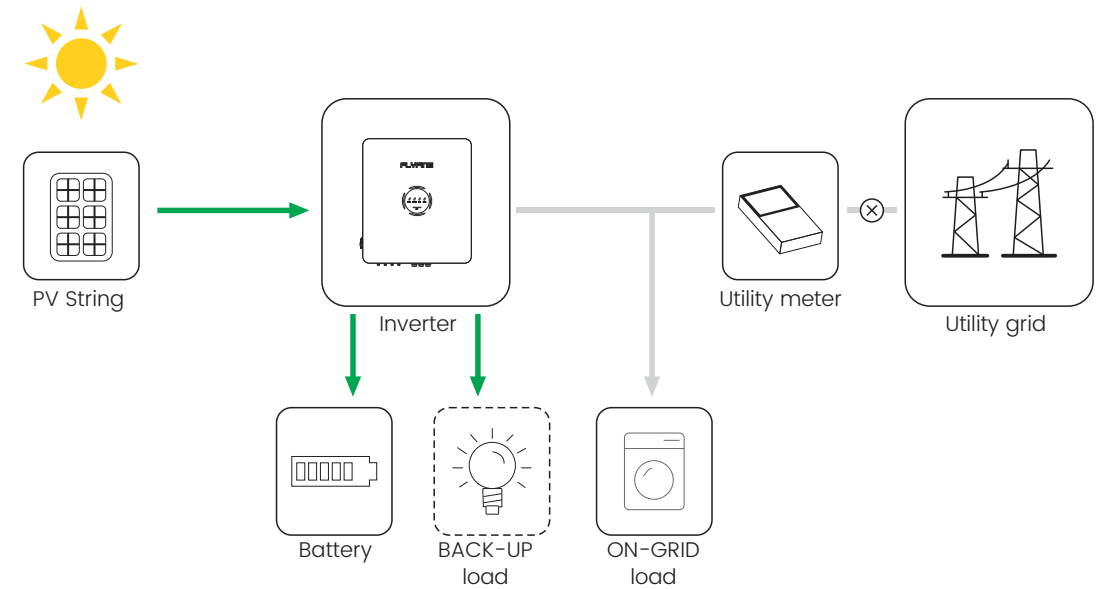


3.3.4 Off-grid Mode

| | |
|-----------------|--|
| NOTICE ! | <ul style="list-style-type: none"> • Off Grid Mode After the setting is completed, the off-grid function of the inverter is enabled, and the inverter can work without being connected to the grid. This feature will help in areas without grid power. |
|-----------------|--|

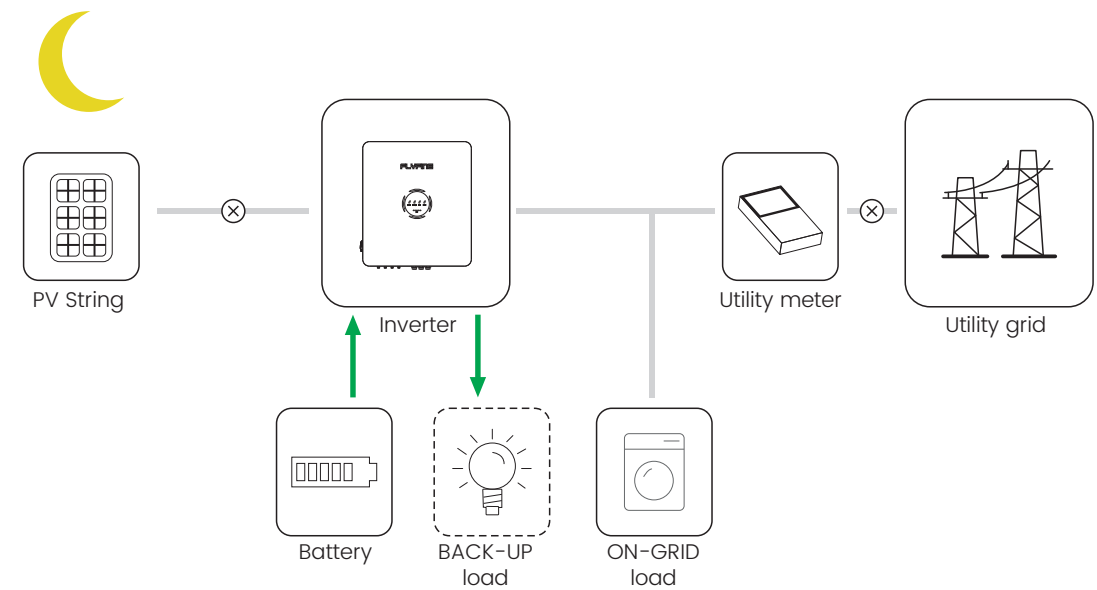
Day time:

When the power generation of the photovoltaic power generation system is sufficient, it will give priority to the power supply to the load, and the excess power will first charge the battery.



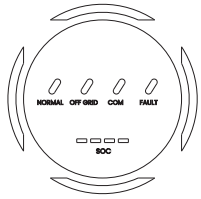













Night:

The load will be battery powered.



3.4 LED Indicators

The LED indicator on the front of the inverter can indicate the current working state of the inverter.

| LED Indicator | Status | Description | |
|---|----------|--|---|
|  | NORMAL | Steady on  | Inverter is running |
| | | Single flash  | Inverter is powered on |
| | | Double flash  | Inverter is starting |
| | | OFF  | Inverter power off |
| | OFF GRID | Steady on  | Backup mode is ready |
| | | Single flash  | Grid bypass mode |
| | | OFF  | Backup port has no voltage |
| | COM | Steady on  | BMS and Meter communication successful |
| | | Single flash  | Meter communication is successful but BMS communication is failed |
| | | Double flash  | BMS communication is successful but Meter communication is failed |
| | | OFF  | Both BMS and Meter communication are failed |
| | FAULT | Steady on  | Error occurred |
| | | OFF  | No error |
| | SOC | Steady on | 4th LED Blinks = $0\% < SOC < 25\%$ |
| | | | 3rd LED Blinks = $25\% < SOC < 50\%$ |
| | | | 2nd LED Blinks = $50\% < SOC < 75\%$ |
| 1st LED Blinks = $75\% < SOC < 100\%$ | | | |

4. Storage

The following requirements should be met when the inverter needs to be stored:

- Do not unpack the outer package.
- Keep the storage temperature at -30°C to $+60^{\circ}\text{C}$ and the humidity at 5%–95% RH and no condensation.
- The inverter should be stored in a clean and dry place and be protected from dust and water vapor corrosion.
- The height and direction of the stacking inverters should follow the instructions on the packing box.
- The inverters must be stacked with caution to prevent them from falling.
- Regular inspection is required during the storage. Replace the packing materials when necessary.
- After long-term storage, an inspection and test are necessary before the inverter is put into use. The inspection and test must be conducted by qualified personnel.


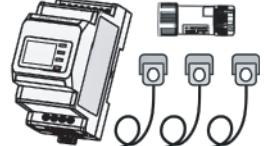

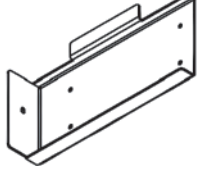

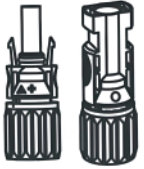
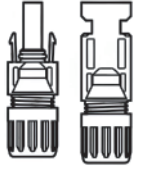



5. Installation

5.1 Check before Unpacking

Check the following items after receiving the product.

- Check the packaging box for damage, such as holes, cracks, or other signs of equipment damage. Do not unpack the package and contact the supplier as soon as possible if any damage is found.
- Check the inverter model. If the inverter model is not what you requested, do not unpack the product and contact the supplier.
- Check the deliverables for correct model, complete contents, and intact appearance. Contact the supplier as soon as possible if any damage is found.

5.2 Packing List

| | | | |
|---|--|---|---|
|  | Inverter *1 |  | Smart meter *1 Aviation plug *1 CT *3 |
|  | WiFi collector *1 |  | Metal hanging plate *1 |
|  | Load connection terminal *1 Grid connection terminal *1 |  | Battery connection terminal *2 |
|  | PV connection terminal Notice: 8K/10K *4 12K/15K *6 |  | Expansion bolt *4 |
|  | M5 *12 Screw *2 |  | User manual *1 |

5.3 Installation Requirements

Installation Environment Requirements

1. Do not install the equipment in a place near flammable, explosive, or corrosive materials.
2. Do not install the equipment in a place that is easy to touch, especially within children's reach. High temperature exists when the equipment is working. Do not touch the surface to avoid burning.
3. Avoid the water pipes and cables buried in the wall when drilling holes.
4. Install the equipment in a sheltered place to avoid direct sunlight, rain, and snow. Build a sunshade if it is needed.
5. The place to install the equipment shall be well-ventilated for heat radiation and large enough for operations.
6. The equipment with a high ingress protection rating can be installed indoors or outdoors. The temperature and humidity at the installation site should be within the appropriate range.
7. Install the equipment at a height that is convenient for operation and maintenance, electrical connections, and checking indicators and labels.
8. The altitude to install the inverter shall be lower than the maximum working altitude 2000m.
9. Follow the above installation requirements to extend the service life of the inverter.



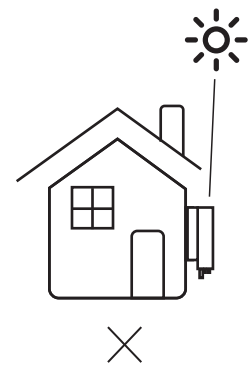
No Direct Sunlight



No Exposure to Rain



No Exposure to Snow



Direct Sunlight



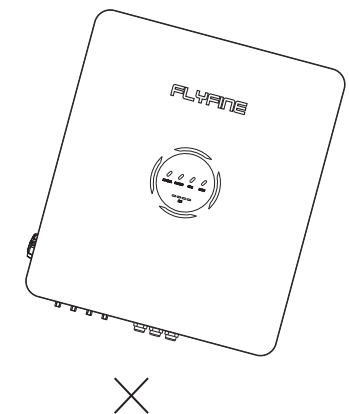
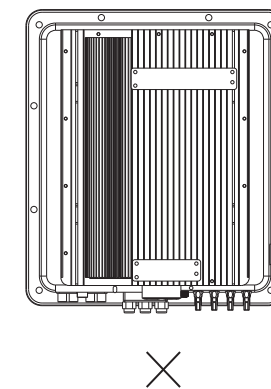
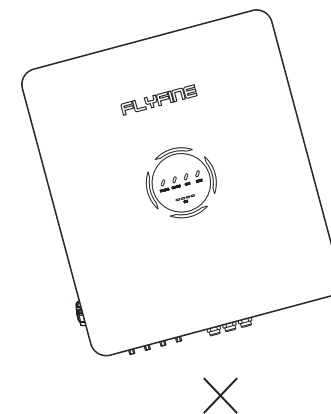
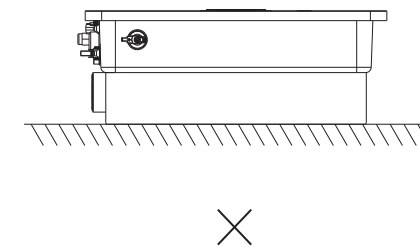
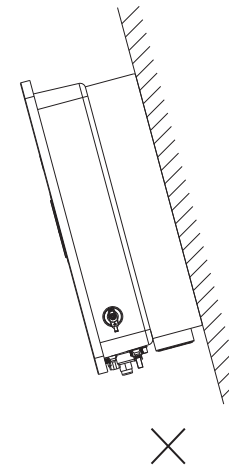
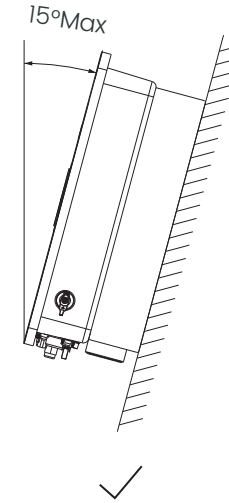
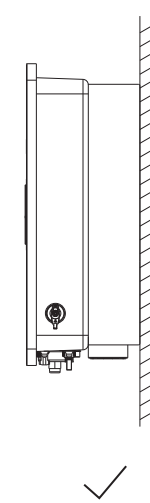
Exposure to Rain



Exposure to Snow

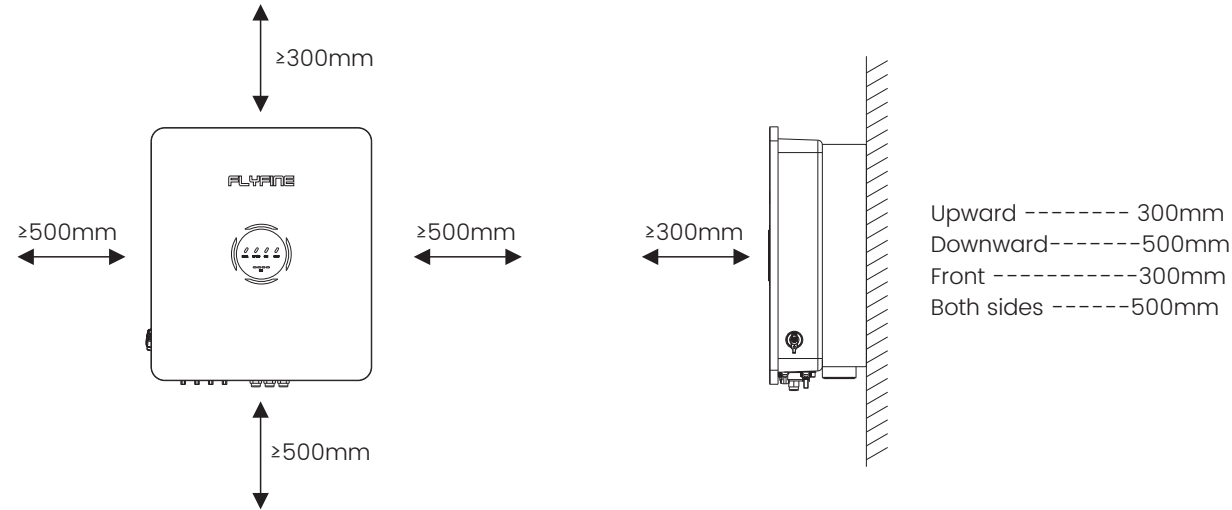
5.4 Mounting Angle

1. The inverter should be installed vertically or tilted no more than 15°.
2. Do not install the inverter on a forward-leaning or horizontal plane.
3. Install the inverter on a solid and ventilated surface.



5.5 Mounting Clearance

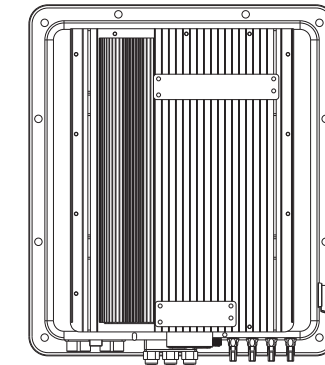
To secure good heat dissipation and easy dismantlement, the minimum clearance around the inverter should not be smaller than the below values.



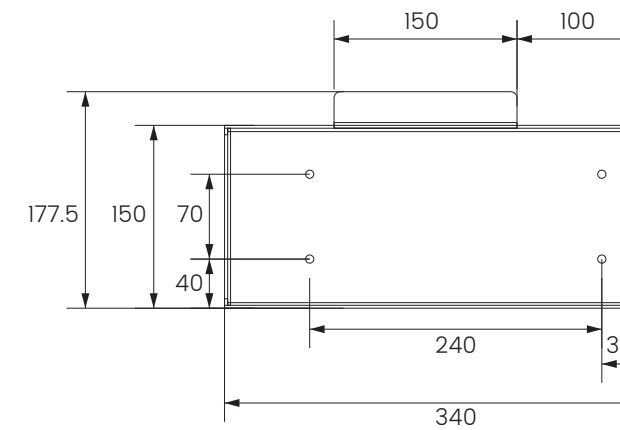
5.6 Mounting Tools



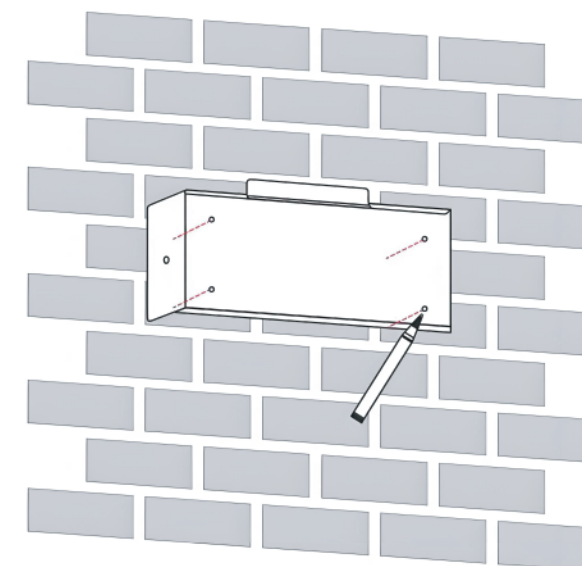
5.7 Mounting Steps



Step1: Install the bracket



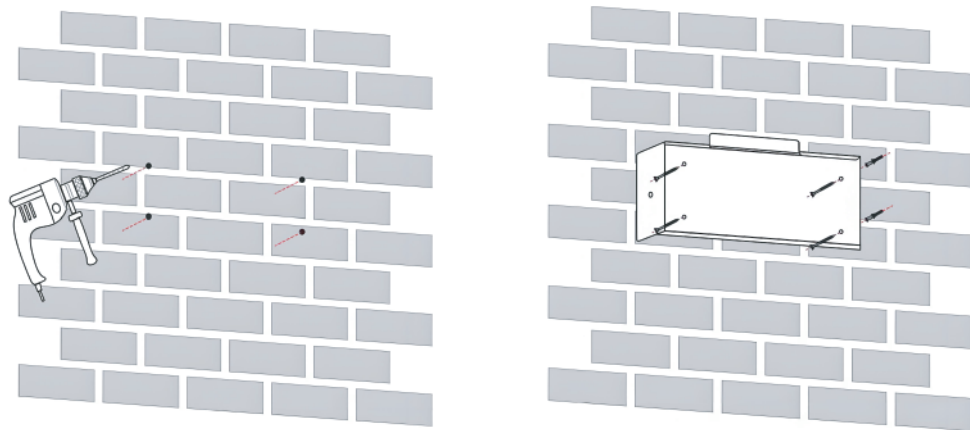
Place the support at the drilled position marked on the wall of the selected area. The specific size of the support is shown in the figure above. Drill holes at the locations shown in the following figure, using a hammer drill as the tool. Borehole positioning should be as accurate as possible.



NOTICE !

- Avoid the water pipes and cables buried in the wall when drilling holes.
- Wear goggles and a dust mask to prevent the dust from being inhaled or contacting eyes when drilling holes.
- Make sure the inverter is firmly installed in case of falling down.

Purge away the dust inside and outside the drilling hole. Strike expansion tube directly with the hammer to make it fully into the wall, then align the rack to the hole and tighten it with the self-tapping screw.



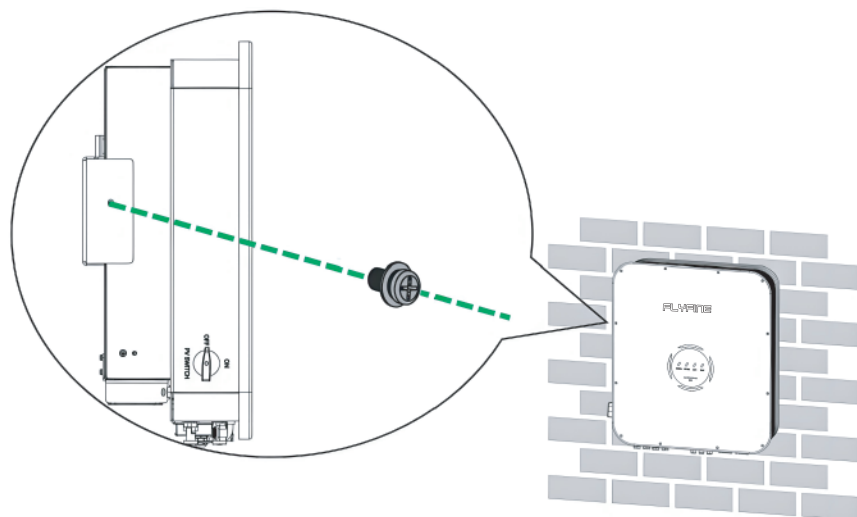
Step2: Install inverter



CAUTION

- Operations such as transportation, turnover, installation and so on must meet the requirements of the laws and regulations of the country or region where it is located.
- To prevent personal injury and damage to the inverter, take care to keep your balance and wear safety gloves when moving the inverter.
- Do not use the wiring terminals and ports at the bottom to support any weight of the inverter.
- Use foam or other protective materials to prevent damage to its enclosure.

Place the inverter on the wall mounted bracket Gently hang the inverter onto the rack top-down, lock the setscrews flanking the inverter, and make sure they are mounted correctly.



6. Electrical Connections

6.1 System Wiring Diagram

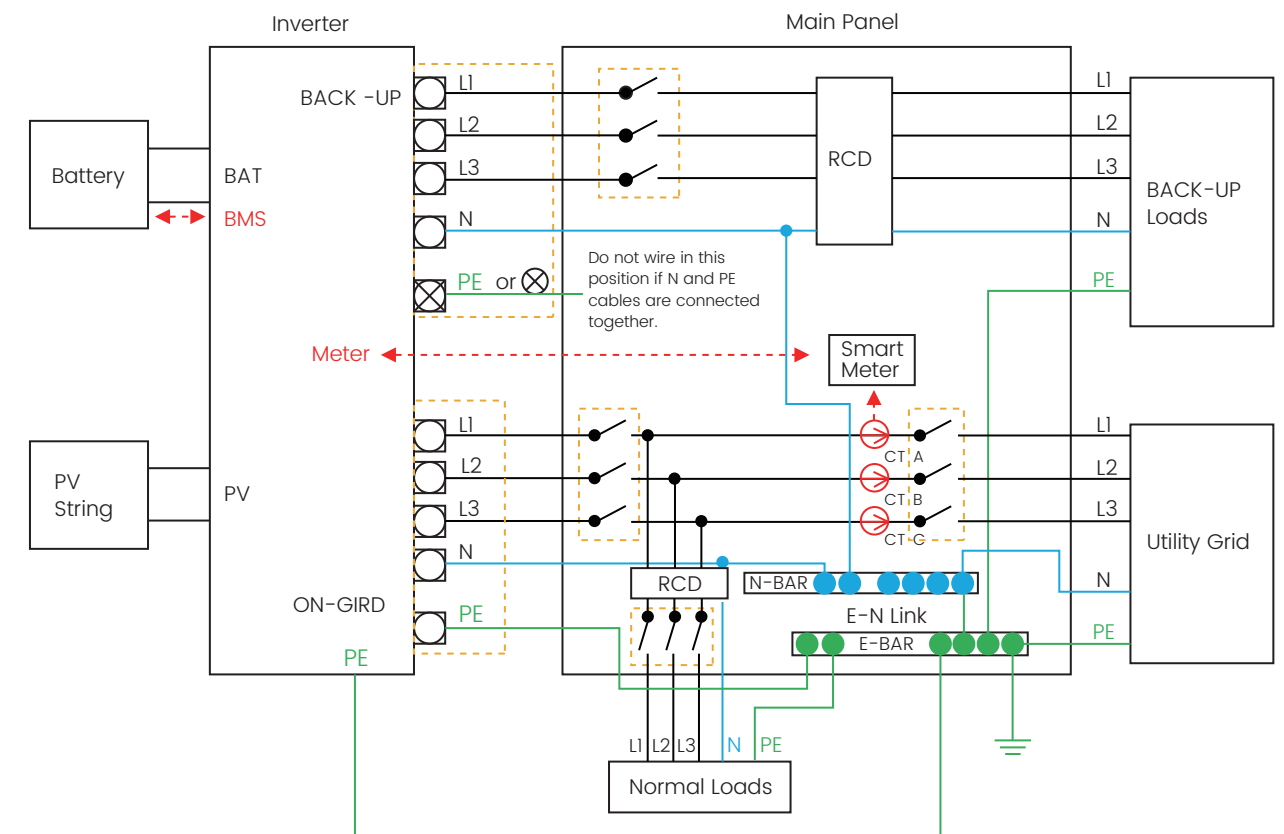
NOTICE !

- N and PE wiring via ON-GRID and BACK-UP ports of the inverter are different based on the regulation requirements of different regions. Refer to the specific requirements of local regulations.
- There are built-in relays inside of the inverter's ON-GRID and BACK-UP AC ports. When the inverter is in the off-grid mode, the built-in ON-GRID relay is open; while when the inverter is in grid-tied mode, it is closed.
- When the inverter is powered on, the BACK-UP AC port is charged. Power off the inverter first if maintenance is required for the loads connected with BACK-UP ports. Otherwise, it may cause electric shock.

N and PE cables are connected together in the Main Panel for wiring!

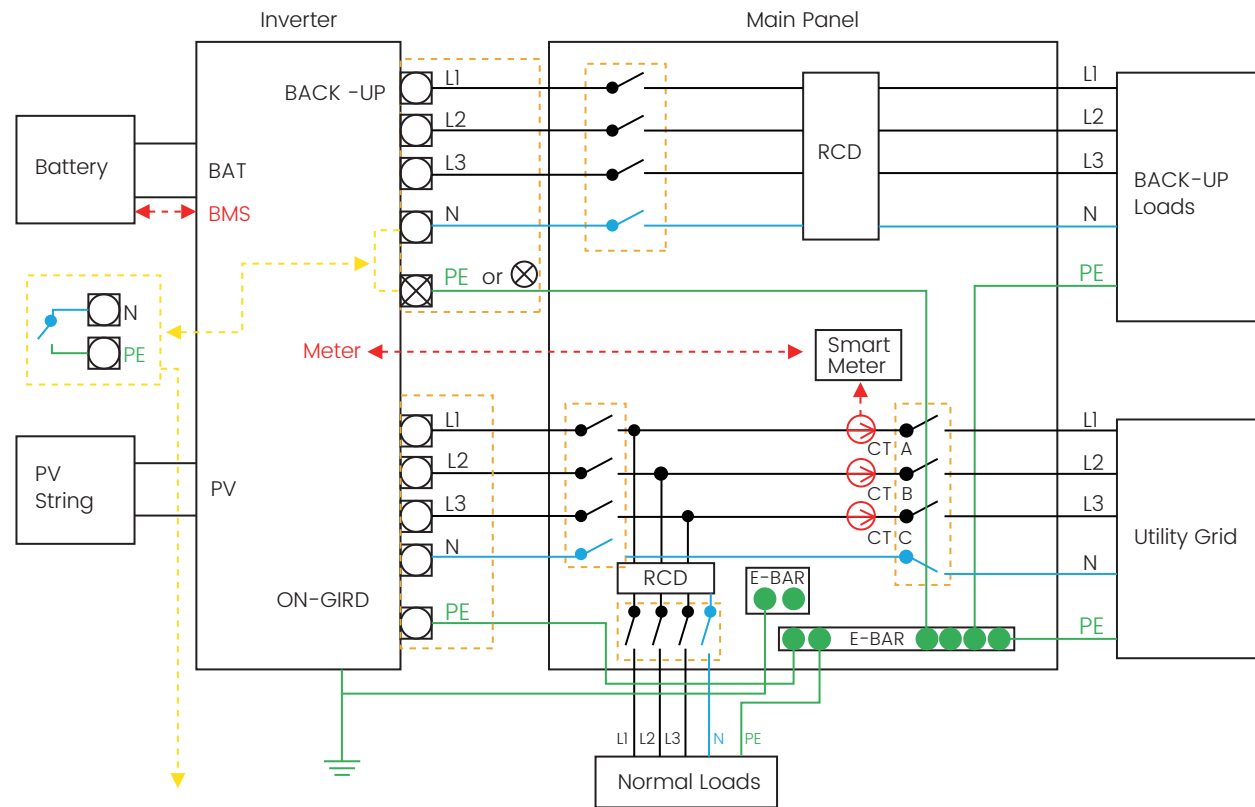
NOTICE !

- To maintain neutral integrity, the neutral cable of ON-GRID side and BACK-UP side must be connected together, otherwise BACK-UP function will not work.



N and PE cables are separately wired in the Main Panel.

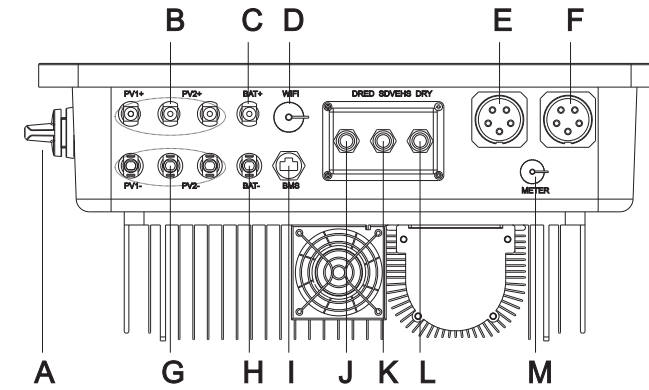
| | |
|-----------------|---|
| NOTICE ! | <ul style="list-style-type: none"> • Ensure that the grounding of BACK-UP is correctly and tightened. Otherwise, the BACK-UP function may be abnormal in case of grid failure. |
|-----------------|---|



1. In Germany, the internal relay will automatically connect the N wire and PE cable in back-up mode with in100ms and automatically disconnect in on-grid mode.
2. In areas other than Germany, the internal relay is disconnected by default in either mode

| | |
|----------------------|---|
| <p>DANGER</p> | <ul style="list-style-type: none"> • Perform electrical connections in compliance with local laws and regulations. Including operations, cables, and component specifications. • When connecting cables, ensure that each terminal corresponds to the correct interface before connecting them. Do not use force to avoid damage. • The polarity of all terminals cannot be reversed. Otherwise, the inverter will be damaged. • Before performing maintenance tasks, power off the inverter and wait at least 5 minutes. |
|----------------------|---|

6.2 System Overviews

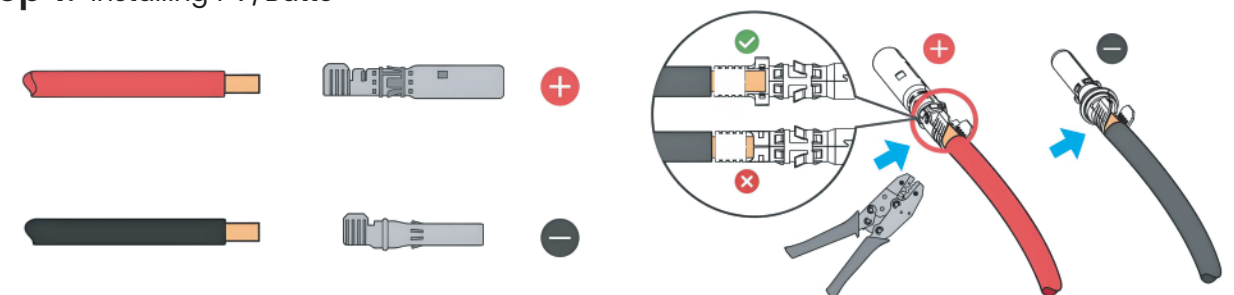


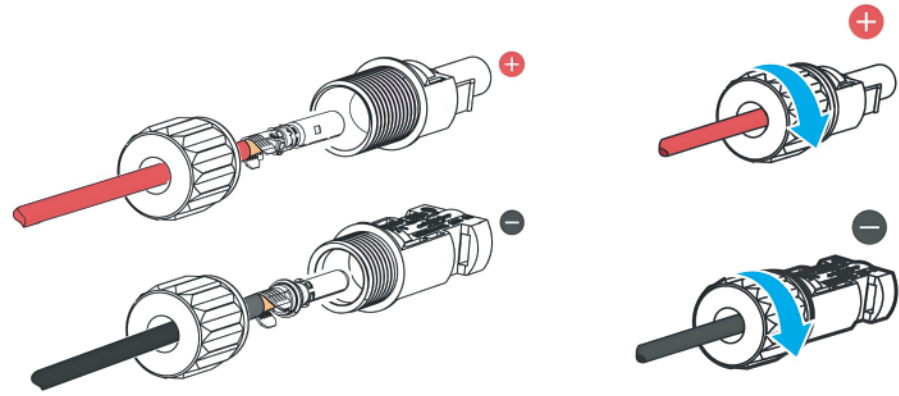
| Object | Description | Object | Description |
|--------|----------------------------------|--------|----------------------------------|
| A | PV Switch | H | Battery Negative Cable Connector |
| B | PV Positive Cable Connector | I | Communication Cable For BMS |
| C | Battery Positive Cable Connector | J | Power Scheduling |
| D | Wi-Fi Stick Connected Port | K | EMS Communication |
| E | Load Cable Connector | L | Dry Contact |
| F | Grid Cable Connector | M | Communication Cable for Meter |
| G | PV Negative Cable Connector | | |

| | |
|-----------------|--|
| NOTICE ! | <ul style="list-style-type: none"> • Wear personal protective equipment like safety shoes, safety gloves, and insulating gloves during electrical connections. • All electrical connections should be performed by qualified professionals. • Cable colors in this document are for reference only. The cable specifications shall meet local laws and regulations. |
|-----------------|--|

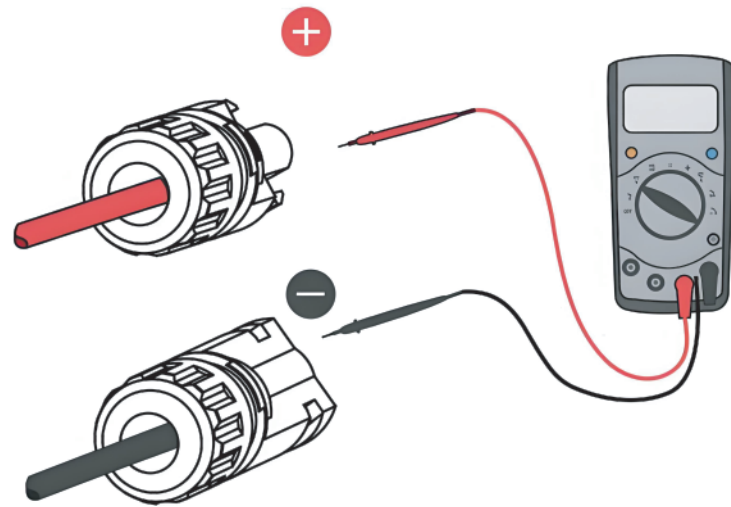
6.3 Installing PV/Battery Terminals

Step 1: Installing PV/Batte

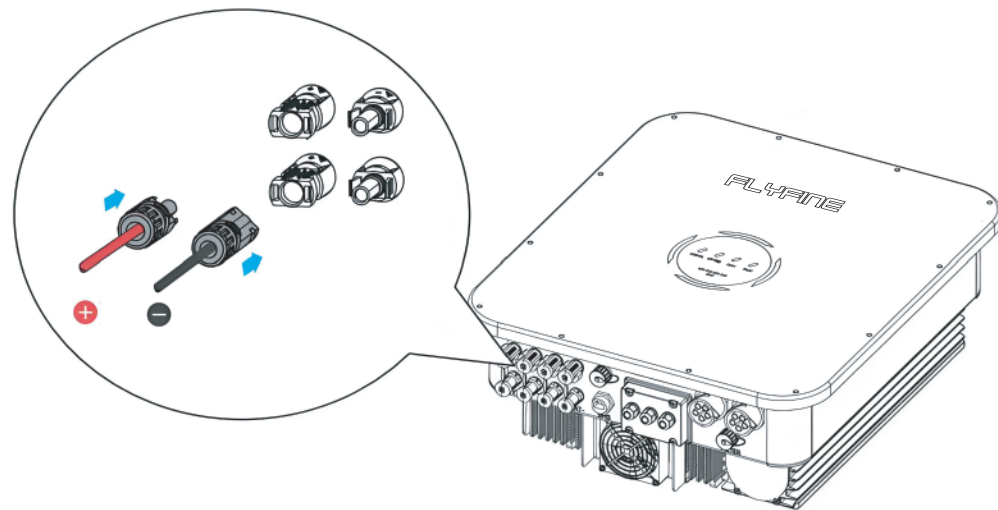




Step 2: Use a multimeter to measure the voltage (Normal voltage $\leq 850V$, Max voltage $\leq 1000V$)

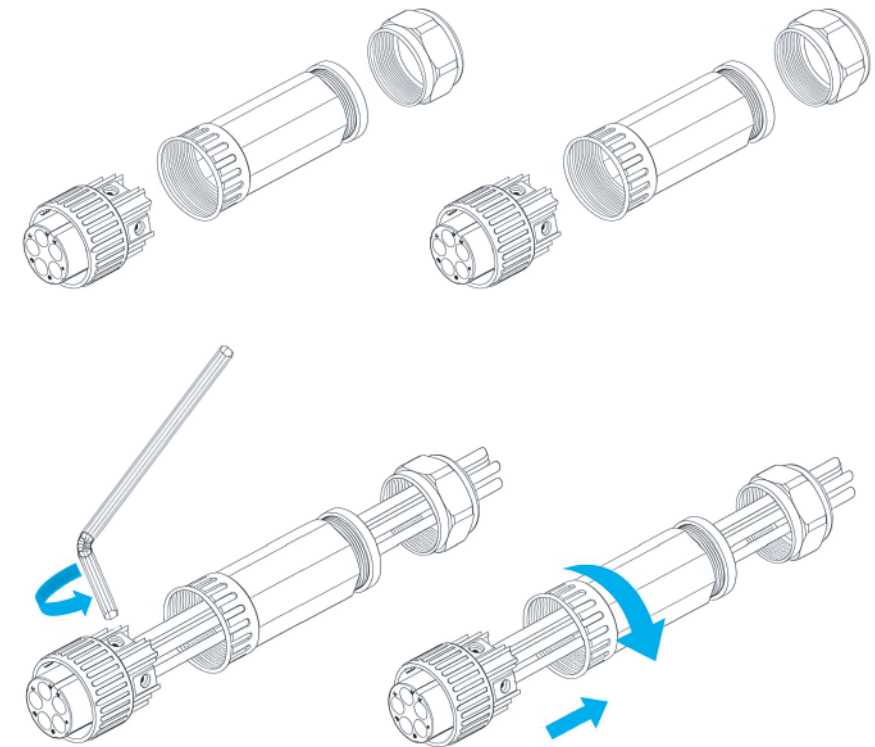


Step 3: Connecting PV/Battery Terminals

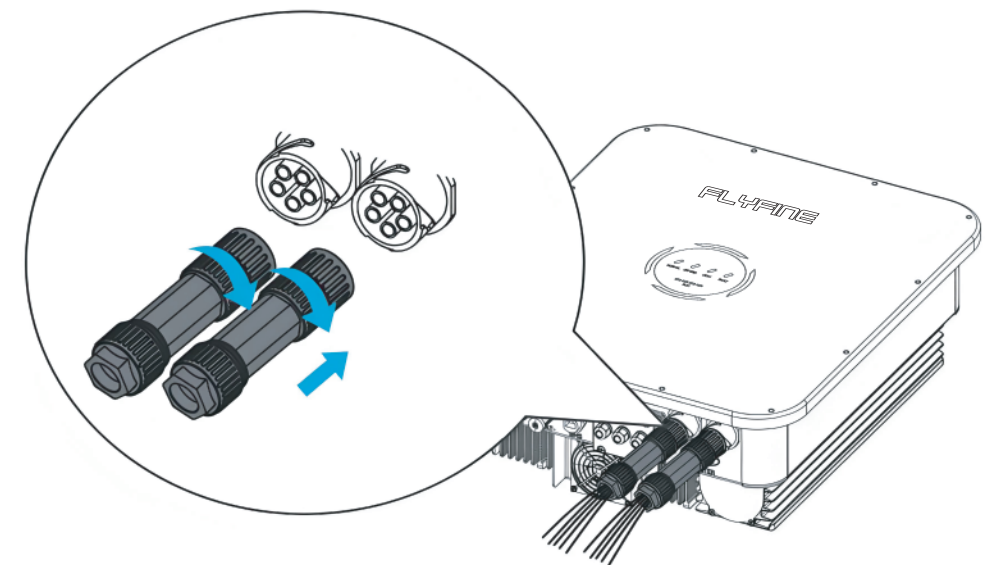


6.4 Installing Load/Off-Grid Terminals

Step 1: Connecting the terminal to the PE cable



Step 2: Connecting Load/Off-Grid Terminals



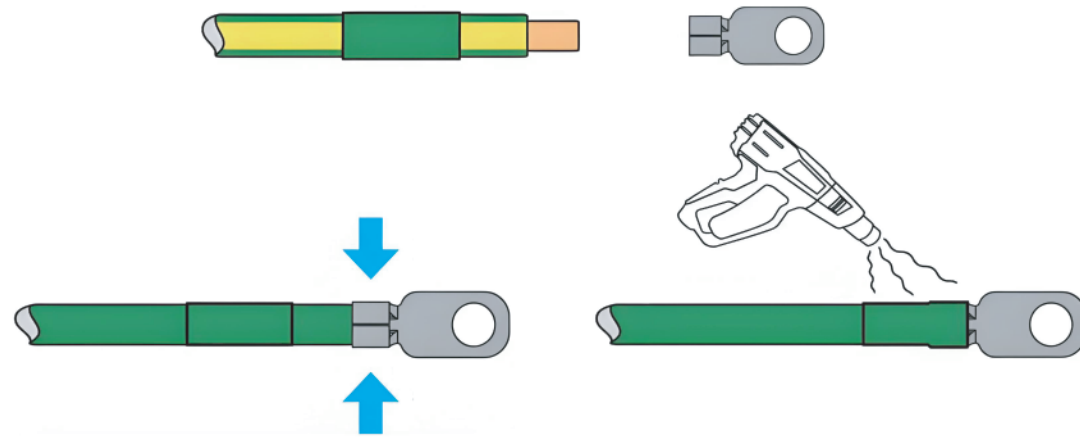
6.5 Connecting the PE cable



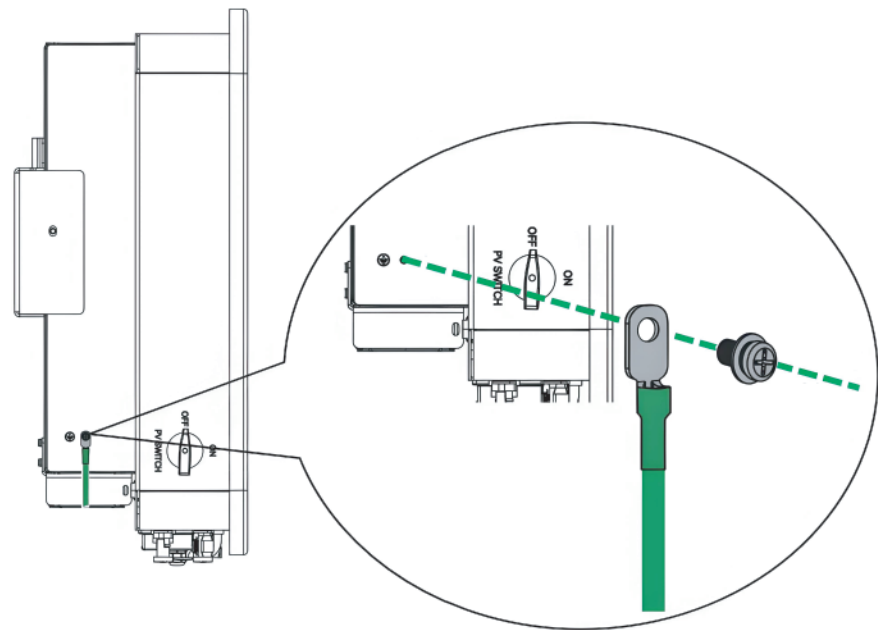
WARNING

- The PE cable connected to the enclosure of the inverter cannot replace the PE cable connected to the AC output port.
- Make sure that all the grounding points on the enclosures are equipotentially connected when there are multiple inverters.
- To improve the corrosion resistance of the terminal, you are recommended to apply silica gel or paint on the ground terminal after installing the PE cable.
- The PE cable should be prepared by the customer.
- Recommended specifications: Copper, 10mm².

Step 1: Connecting the terminal to the PE cable



Step 2: Fixed PE cable

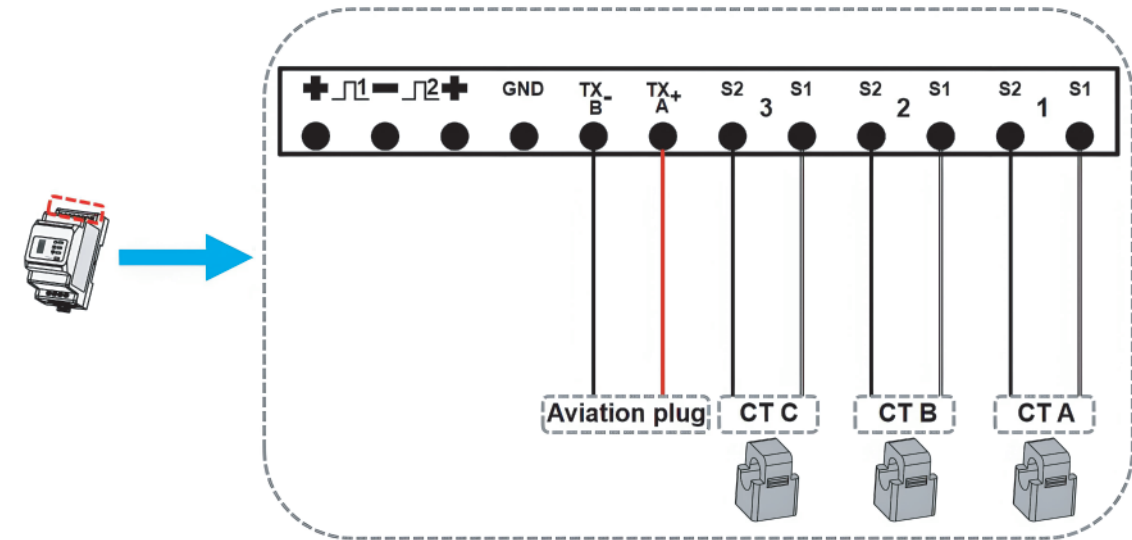


6.6 Installing Meter

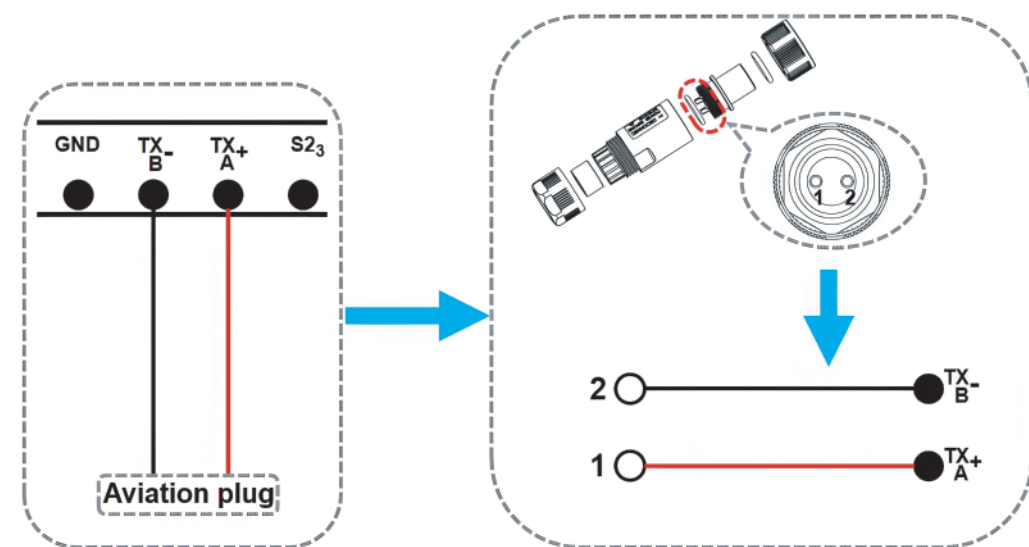
NOTICE !

- The smart meter and CT have been preset parameters before delivered with the inverter. Do not modify the relevant parameters.
- Each inverter needs to be connected to one smart meter independently. Do not connect one smart meter to multiple inverters. Contact the manufacturer or supplier to purchase additional smart meter(s) if you need.
- Ensure that CT connects with the corresponding phase line: CT A is connected to L1; CT B is connected to L2; and CT C is connected to L3. And ensure that the CT is connected in the right direction.
- For more information on this module, please refer to the delivered Intelligent representative User manual.

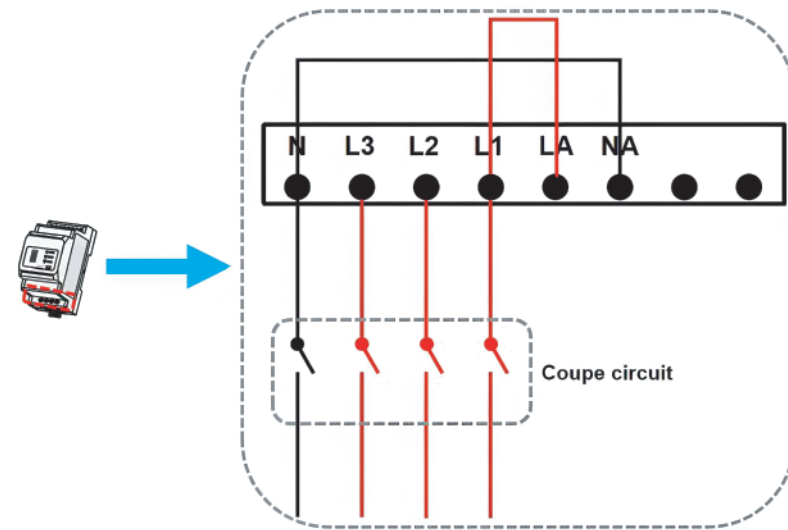
Step 1: Connecting aviation plug to CT (S1:WhiteS2:Black)



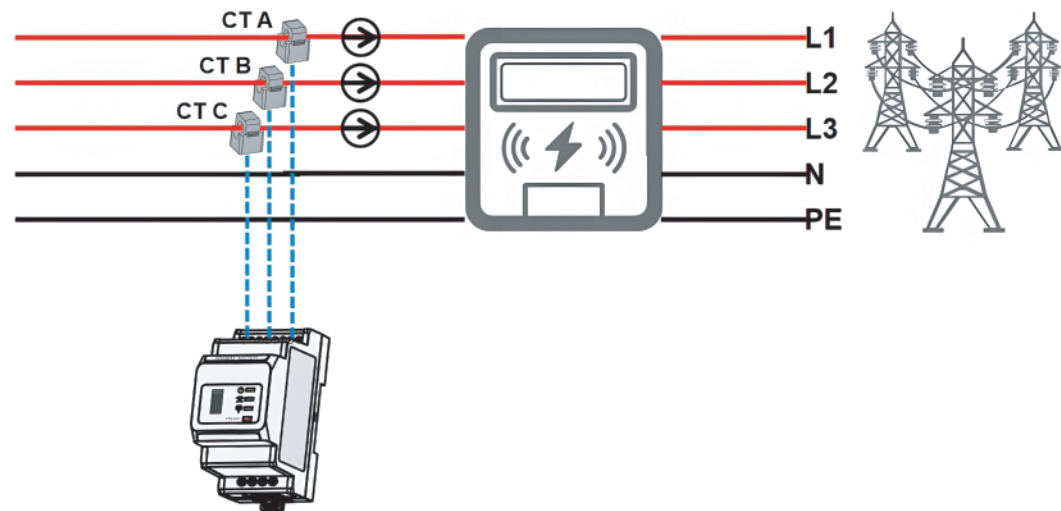
Step 2: Connecting aviation plug (Attention correspondence)



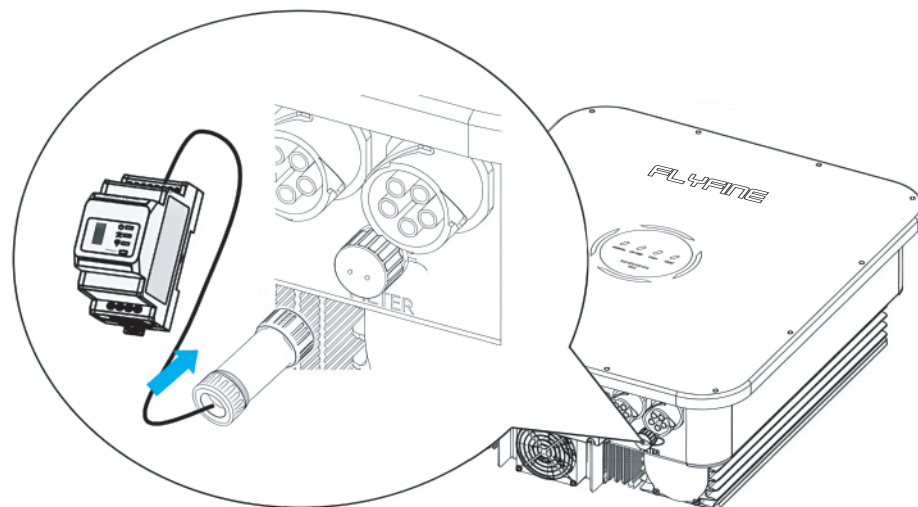
Step 3: Connecting Coupe circuit



Step 4: CT connection to the power grid



Step 5: Installing smart meters



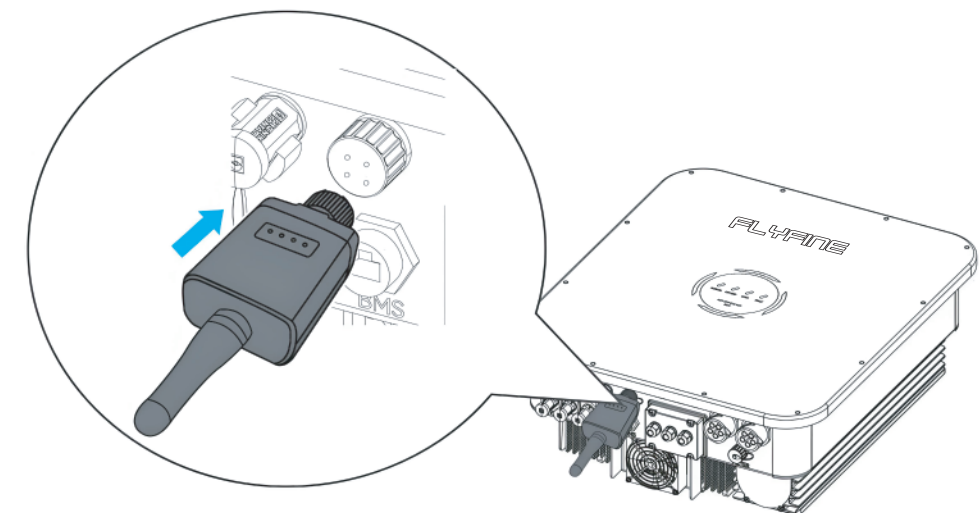
Key operation instruction

| Address | 3 | Baud rate | 9600 |
|---------|--|-----------|------|
| Button | Operation | | |
| | Selects the Voltage and Current display screens In Set-up Mode, this is the "Left" or "Back" button. | | |
| | Select the Frequency and Power factor display screens In Set-up Mode, this is the "Up" button | | |
| | Select the Power display screens In Set-up Mode, this is the "Down" button | | |
| | Select the Energy display screens In Set-up mode, this is the "Enter" or "Right" button | | |

6.7 Installing Wi-Fi Collector

NOTICE !

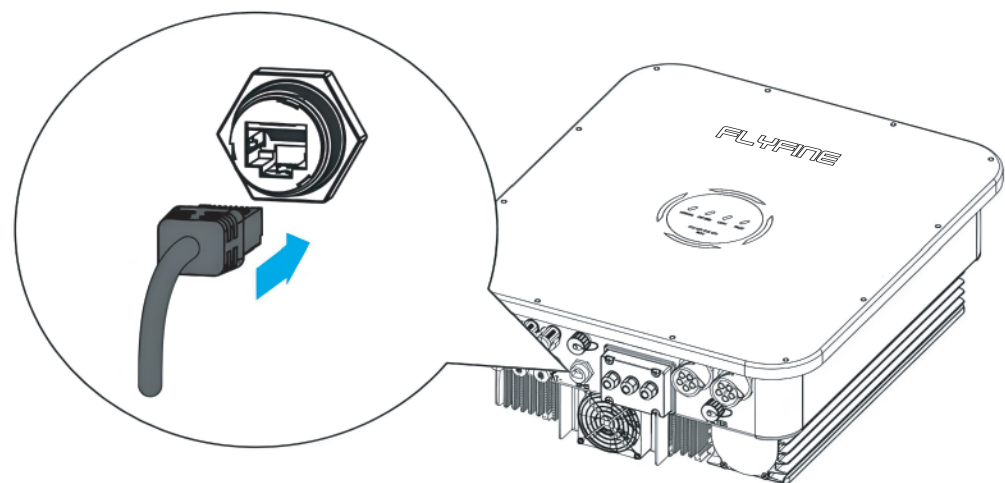
- Plug the communication module into the inverter to establish a connection between the inverter and the APP. Communication module can be Bluetooth module, Wi-Fi module, 4G module. Set inverter parameters through the APP, view the running information and fault information, and observe the system status in time.
- Refer to Chapter 6 to get more introduction to the module.



6.8 Connecting The BMS Communication Cable(RJ45 Connector)

NOTICE ! •RJ45 connector with the following definition can be connected:

| RJ45 Connector | PIN | Color | EMS/PAR |
|---|-----|--------------|---------|
|  | 1 | Orange&white | NC |
| | 2 | Orange | GND |
| | 3 | Blue&white | NC |
| | 4 | Blue | CAN_H |
| | 5 | Green&white | CAN_L |
| | 6 | Green | NC |
| | 7 | Brown&white | NC |
| | 8 | Brown | NC |

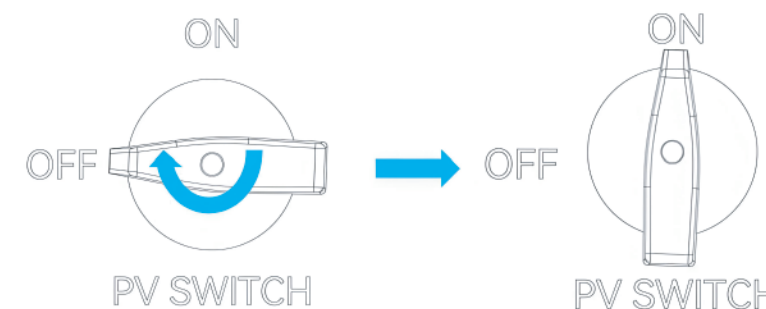


| Battery Type | | | |
|--------------|------------------------|-------------------------|--------------------------|
| PYLON H1*4 | BYD Battery-Box H 5.0 | BYD-Box Premium HVS 5.1 | BYD-Box Premium HVM 8.3 |
| PYLON H1*5 | BYD Battery-Box H 6.4 | BYD-Box Premium HVS 5.1 | BYD-Box Premium HVM 11 |
| PYLON H1*6 | BYD Battery-Box H 7.7 | BYD-Box Premium HVS 5.1 | BYD-Box Premium HVM 13.8 |
| PYLON H1*7 | BYD Battery-Box H 9.0 | BYD-Box Premium HVS 5.1 | BYD-Box Premium HVM 16.6 |
| PYLON H1*8 | BYD Battery-Box H 10.2 | | BYD-Box Premium HVM 19.3 |
| PYLON H1*9 | BYD Battery-Box H 11.5 | | BYD-Box Premium HVM 22.1 |

6.9 Check Before Power ON

NOTICE !


- The product is firmly installed at a clean place that is well-ventilated and easy-to operate.
- Unused cable holes are fitted using the waterproof nuts.
- The electrical conduit holes are sealed.
- The voltage and frequency at the connection point meet the inverter grid connection requirements.
- Before powering on the inverter, check whether all terminals are properly connected and securely connected. Otherwise, power-on will cause damage to the inverter.
- Before the inverter is powered ON, set the PV switch to "OFF" state. If the inverter is switched to ON after the power is powered on, the protection mechanism of the inverter will be triggered, causing the inverter to enter the protection state and cannot be started normally.
- The voltage and frequency at the connection point meet the inverter grid connection requirements.
- After the inverter is powered on, wait one minute before using the inverter.



6.10 Power ON

- Step 1:** Turn on the AC breaker on the ON-GRID side of the inverter.
- Step 2:** Turn on the AC breaker on the BACK-UP side of the inverter.
- Step 3:** Turn on the battery breaker between the inverter and the battery.
- Step 4:** Turn on the DC switch of the inverter.

6.11 Power OFF

 **DANGER**

- Power off the inverter before operations and maintenance. Otherwise, the inverter may be damaged or electric shocks may occur.
- Delayed discharge. Wait until the components are discharged after power off.
- Set the PV switch to the "OFF" state avoid damage.
- The polarity of all terminals cannot be reversed. Otherwise, the inverter will be damaged.
- Before performing maintenance tasks, power off the inverter and wait at least 5 minutes.

- Step 1:** Turn off the AC breaker on the ON-GRID side of the inverter.
- Step 2:** Turn off the AC breaker on the BACK-UP side of the inverter.
- Step 3:** Turn off the battery breaker between the inverter and the battery.
- Step 4:** Turn off the DC switch of the inverter.

7. Inverter Parameters

| MODEL | FH8000T | FH10000T | FH12000T | FH15000T |
|-----------------------------------|--|-------------|-------------|-------------|
| Battery Input Data | | | | |
| Battery Type | Lithium battery | | | |
| Battery Voltage Range(V) | 180-750 | | | |
| Max. Charge/Discharge Current(A) | 30/30 | | | |
| Max. Charge/Discharge Power(W) | 8800 | 11000 | 13200 | 15000 |
| Battery Input Data | | | | |
| Max. PV Input Power (W) | 17000 | 21500 | 22500 | 22500 |
| Max. PV Input Voltage (V) | 1000 | | | |
| MPPT Range Voltage(V) | 200-850 | | | |
| SPS Start-up Voltage (V) | 180 | | | |
| MPPT Range for Nominal Power (V) | 280-800 | 350-800 | 280-800 | 350-800 |
| Nominal PV Input Voltage (V) | 620 | | | |
| Max. Input Current(A) | 15/15 | | 15/30 | |
| Max. Short Current(A) | 20/20 | | 20/40 | |
| No. of MPP Trackers | 2 | | | |
| Strings per MPP Tracker | 1 | | 1/2 | |
| AC Output Data (On-grid) | | | | |
| Nominal Power Output to Grid (VA) | 8000 | 10000 | 12000 | 15000 |
| Max. Power Output to Grid (VA)* | 8000 | 10000 | 12000 | 15000 |
| Max. Power from Grid (VA) | 16000 | 20000 | 24000 | 25000 |
| Nominal Output Voltage (V) | 400/380, 3L/N/PE | | | |
| Nominal Output Frequency (Hz) | 50/60 | | | |
| Max. AC Current to Grid (A) | 12.1 | 15.2 | 18.2 | 22.7 |
| Max. AC Current from Grid (A) | 24.2 | 30.2 | 36.0 | 36.0 |
| Output Power Factor | 1 (Adjustable from 0.8 leading to 0.8 lagging) | | | |
| Output THDI (Nominal Power) | <3% | | | |
| Three Phase Unbalance | YES | | | |
| AC Output Data (Back-up) | | | | |
| Max. Output Power (VA) | 8000 | 10000 | 12000 | 15000 |
| Peak Output Power (VA)** | 16000,10sec | 20000,10sec | 24000,10sec | 24000,10sec |
| Max. Output Current(A) | 12.1 | 15.2 | 18.2 | 22.7 |
| Nominal Output Voltage (Vac) | 3/N/PE,220/380,230/400 | | | |
| Nominal Output Frequency (Hz) | 50/60 | | | |
| Output THDv (@Linear Load) | <3% | | | |
| Switch time | <10ms | | | |
| Load Control | YES | | | |

| MODEL | FH8000T | FH10000T | FH12000T | FH15000T |
|---|--|----------|-------------------|----------|
| Efficiency | | | | |
| MPPT efficiency | 99.90% | | | |
| Max. efficiency | 98.30% | | 98.40% | |
| Euro-efficiency | 97.50% | | 97.60% | |
| Protection | | | | |
| Anti-island Protection | Integrated | | | |
| PV & Battery AFCI | Optional | | | |
| PV Reverse Protection | Integrated | | | |
| Battery Reverse Protection | Integrated | | | |
| Residual Current Monitoring Unit | Integrated | | | |
| Over Current/Voltage Protection | Integrated | | | |
| DC Switch (PV) | Integrated | | | |
| Surge Protection | DC Type II / AC Type III | | | |
| Communication Interface | | | | |
| Battery BMS | CAN | | | |
| EMS | RS485 | | | |
| Meter | RS485 | | | |
| DRED/RCR | YES(DI) | | | |
| Remote Shut Down | YES(DI) | | | |
| Dry-Point | YES(DO) | | | |
| Cloud | Wi-Fi, Bluetooth,4G(Optional) | | | |
| Display/User Interface | LED/APP | | | |
| General Data | | | | |
| Operating Temperature Range (°C) | -25~+60 | | | |
| Relative Humidity (%) | 0-100% | | | |
| Operating Altitude(m) | ≤2000 | | | |
| Cooling | Nature Cooling | | Smart Fan Cooling | |
| Noise(dB) | <35 | | <50 | |
| Weight(kg) | 28.5 | | 30.0 | |
| Size(W/H/D) (mm) | 480×550×215 | | | |
| Installation | Wall-Mounted | | | |
| Protection Degree | IP65(outdoor application) | | | |
| Certifications & Standards | | | | |
| Grid Regulation | CEI0-21; VDE4105-AR-N; VDE0126-1-1; EN50549; G98, G99, G100 | | | |
| Safety Regulation | IEC62109-1&2 | | | |
| EMC | EN610006-1, EN61000-6-2, EN610006-3, EN61000-6-4, EN61000-4-16, EN61000-4-18, EN61000-4-29 | | | |
| *May vary depending on specific country grid standard | | | | |
| *Can be reached only if PV and battery power are enough | | | | |