

HP pro-T SERIES SOLAR INVERTER



User Manual

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Warning

This is A class inverter. It might cause slightly radio interference in daily life. And practical measure is required to take under this condition.

Preface

Thank you for the purchase of HP pro-T series solar inverter (Hereinafter referred to as inverter). Please read this manual carefully before installing and using the inverter!

Copyright

We have been devoted to technological innovation and aims to meet the demands of its customers with better product and services. And product design and specification would be updated without prior notice. Please in kind prevail!

1. Installation Instructions

1-1: Open-package inspection

After opening the package, please check random accessories, including user manual (contains conformity certificate and warranty card), 2pcs battery cables and accessories for optional functions. And check whether the inverter is still kept well after transportation, if find any broken or component missing, do not turn on the machine, feedback to the carrier and distributor.

Note:

- **Please keep the packing box and packing material, can be used for next delivery if needed.**
- **This series of product is very heavy (check appendix as reference), please handle with care when carrying.**

1-2: Installation notice

- 1)Install in an area of well ventilated, free of water, burning gas and corrosive.
- 2)The installation method of the machine is wall-mounted, and the air inlet of the fan and the air outlet on the side and top of the box should be kept unobstructed.
- 3)Around environment temperature should remain 0 to 40 centigrade.
- 4)If disassembling and operate under low temperature environment, may happen water condense, only can work till thorough dry of machine inside and outside, otherwise will be shock risk.
- 5)If the machine is placed for a long time, it should be confirmed that the machine is completely dry and no corrosion can be installed and used.

1-3: Installation steps

1)Environmental requirements

Open the package and place the inverter in a reasonable working environment. Refer to the “Installation Precautions” for specific requirements.

2)Wire diameter selection

Use a cable with a suitable wire diameter, which can not be lower than the national safety standard. The general wire diameter is selected according to the current density of not more than 5A/mm², and the length of the connecting wire is minimized to reduce the loss.

3)Connect the battery

Determine the appropriate number of battery cells according to the rated battery voltage of the inverter. Connect the battery cable to a circuit breaker that meets the breaking capacity, and then connect it to the BATTERY terminal of the inverter. Note that the positive and negative poles cannot be reversed. Otherwise, the product may be damaged.

4) Connect load

First turn off all loads, connect the AC load to the AC output of the inverter, and ensure that the load power is lower than the rated power of the inverter.

5) Connect PV

Connect the PV cable to the circuit breaker that meets the breaking capacity first, and then connect it to the PV input end of the inverter. The open circuit voltage/short-circuit current of the PV array should be lower than the maximum PV input voltage/current of the inverter. Note that its positive and negative poles cannot be reversed.

6) Connect mains power

Connect the mains power input cable to the circuit breaker that meets the breaking capacity first, and then connect it to the AC input end of the inverter. Note that its phase and polarity should not be reversed.

7) Selection of circuit breaker

a. The circuit breaker at the battery end shall be a DC circuit breaker, and the working voltage of the circuit breaker shall be greater than the rated voltage of the battery; The circuit breaker at the PV input end shall be a DC circuit breaker whose working voltage shall be greater than the voltage of the PV array. The circuit breaker at the AC input end shall be an AC circuit breaker whose working voltage shall be greater than the rated voltage of the mains supply.

b. The rated current of the circuit breaker should be about 1.5 times of the maximum current when the inverter is working.

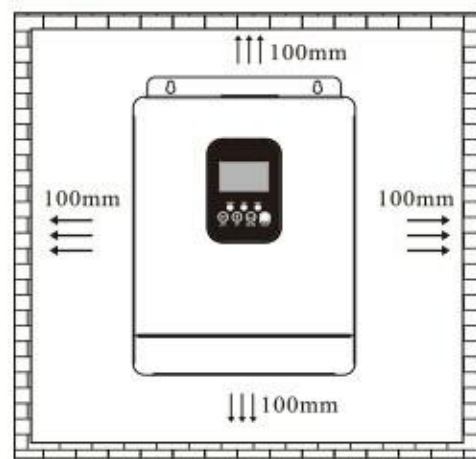
Note:

- Before connecting the load to the machine, please turn to the loads firstly.
- This product can only protect high-voltage surges with low energy. In areas with high lightning output, it is recommended to install lightning protection devices outside the mains input terminals and PV input terminals.
- To ensure the personal safety of the user and ensure the correct use of the product, please confirm that it is properly grounded before starting the machine.
- If user want to load an inductive load such as a motor or a laser printer which operating power is too large, the inverter rated capacity should be selected according to its peak power .The load starting power is generally 2 to 3 times of its rated power.

1-4: Placement

Please leave 100mm of space for each side of inverter to keep good air circulation.

(Only suitable for installation on concrete or other non-combustible surfaces)



★ Avoid direct sunlight

★ Avoid dust

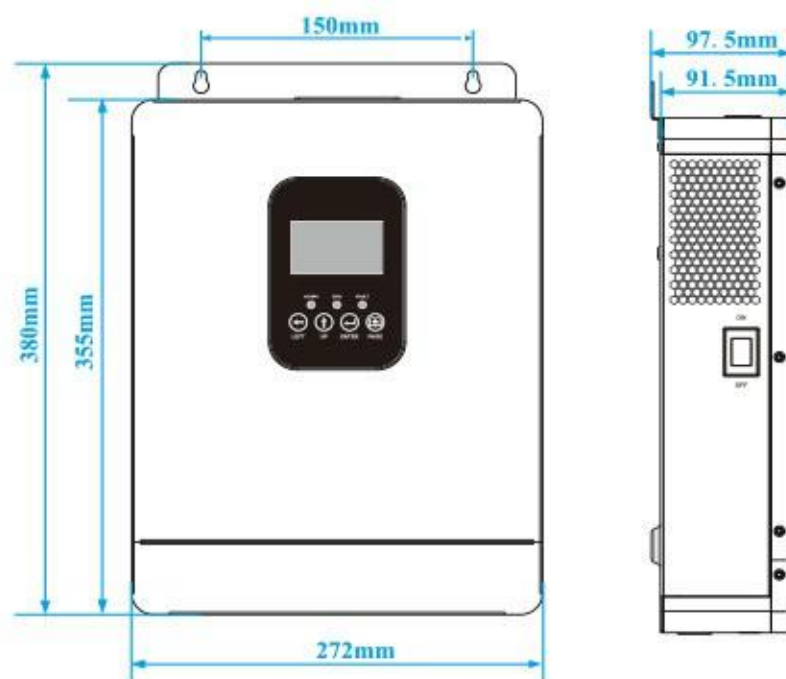
★ Avoid moisture and liquids

★ Avoid over heating

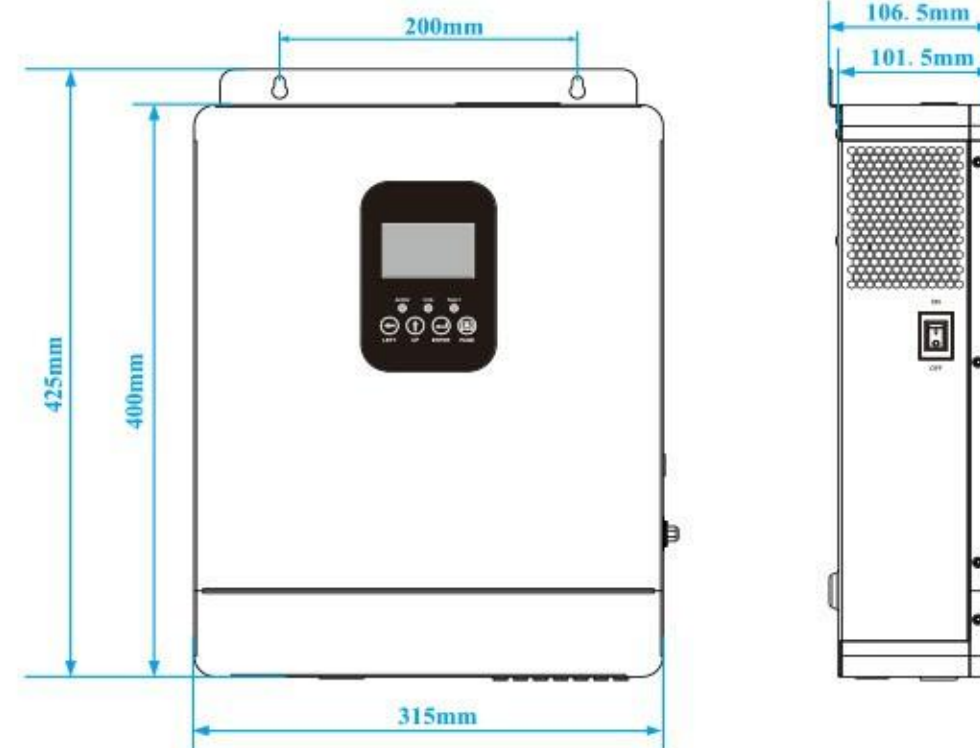
1-5: Installation size & Wall mounted installation

1) Installation size

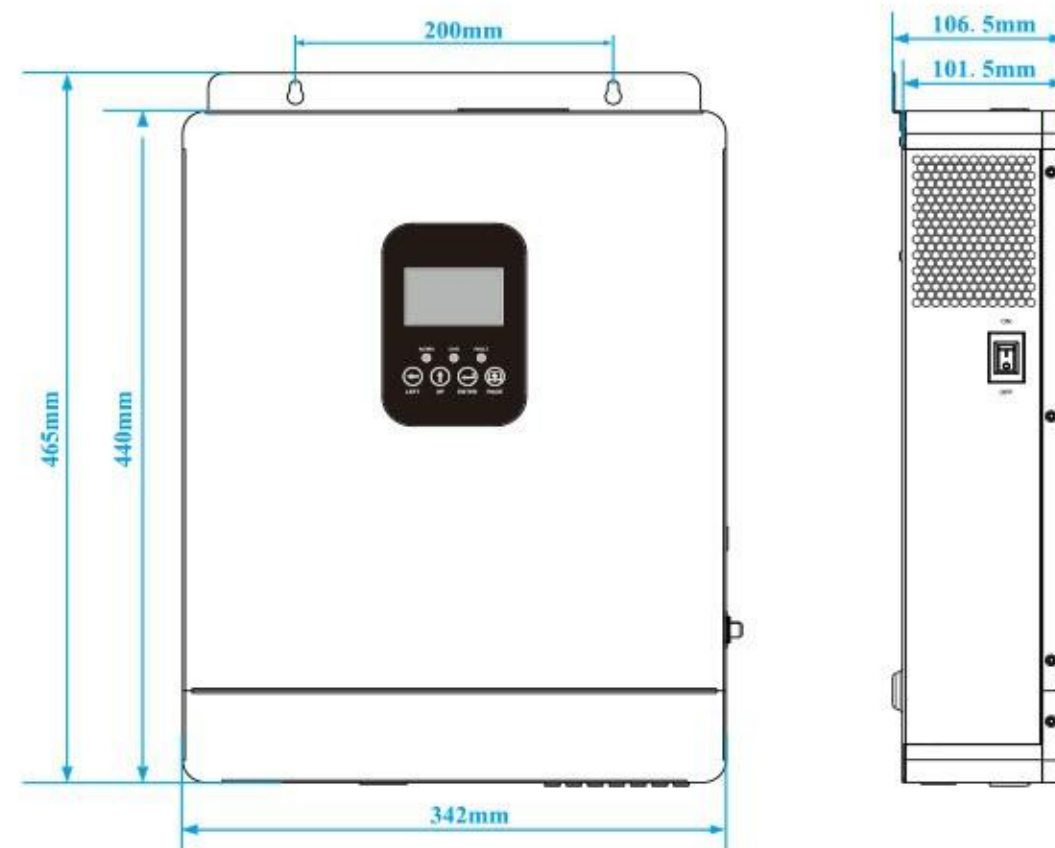
a. 1KW/1.5KW/2KW Series

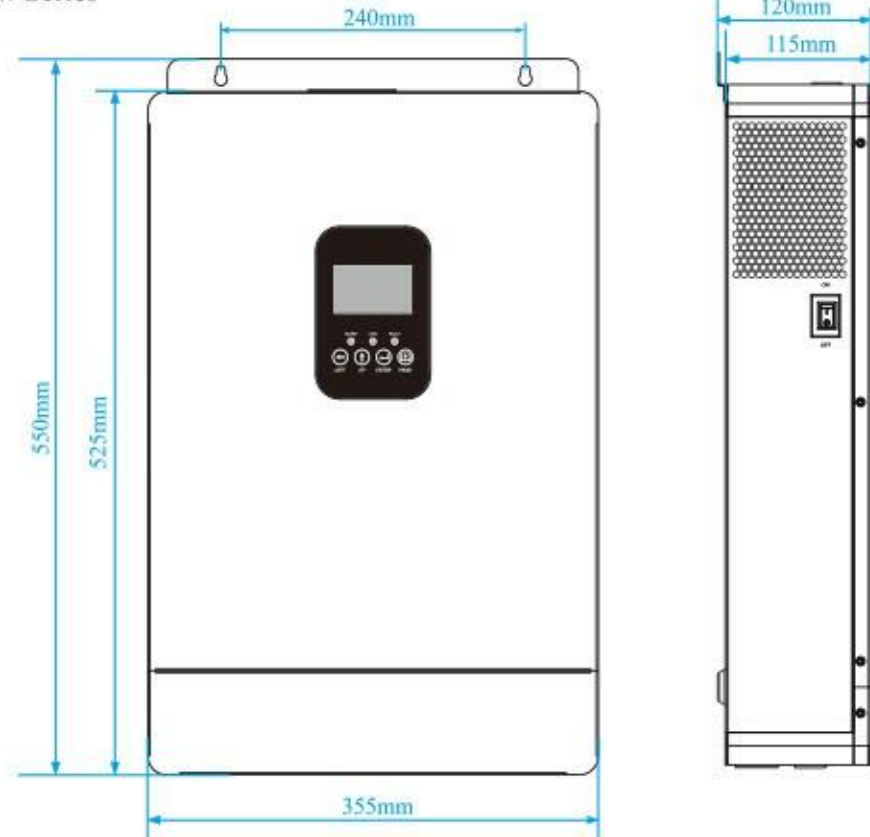


b. 3.2KW Series



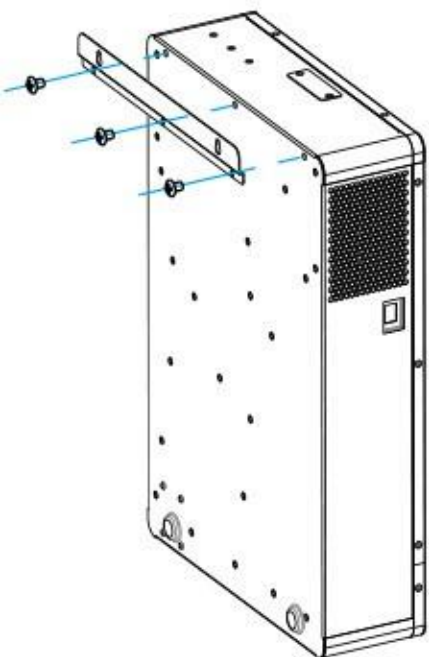
c. 5KW Series





2) Wall mounted installation

a. Fix the wall Pendant on the solar inverter with 3pcs M4*6 screws (the wall pendant and screws included in the package)

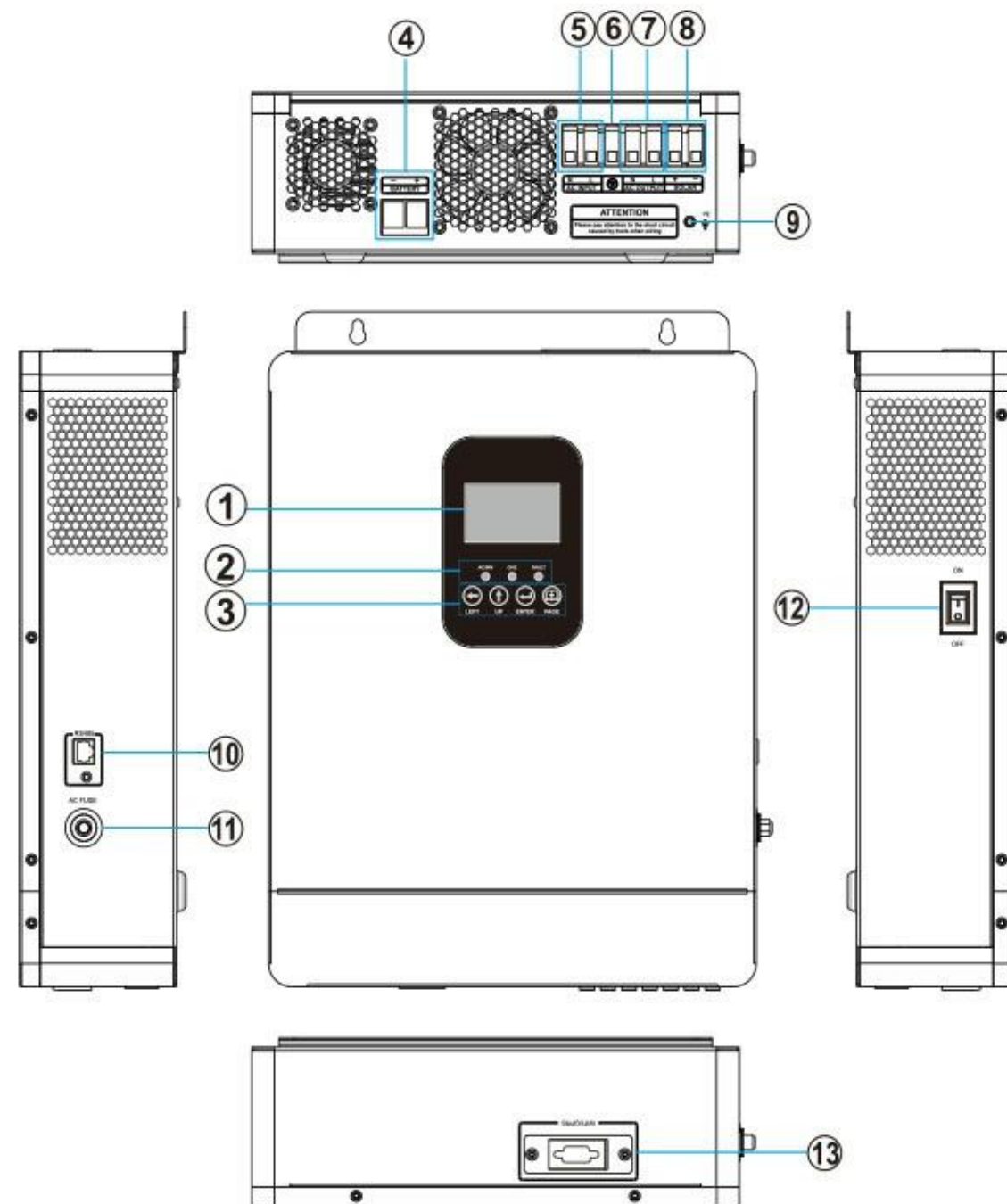


b. Tighten two screws to install the inverter, it is recommended to use M6 expansion screws (the screws need to be purchased by the user. Please refer to the mark on the machine size drawing for the distance between mounting holes.)



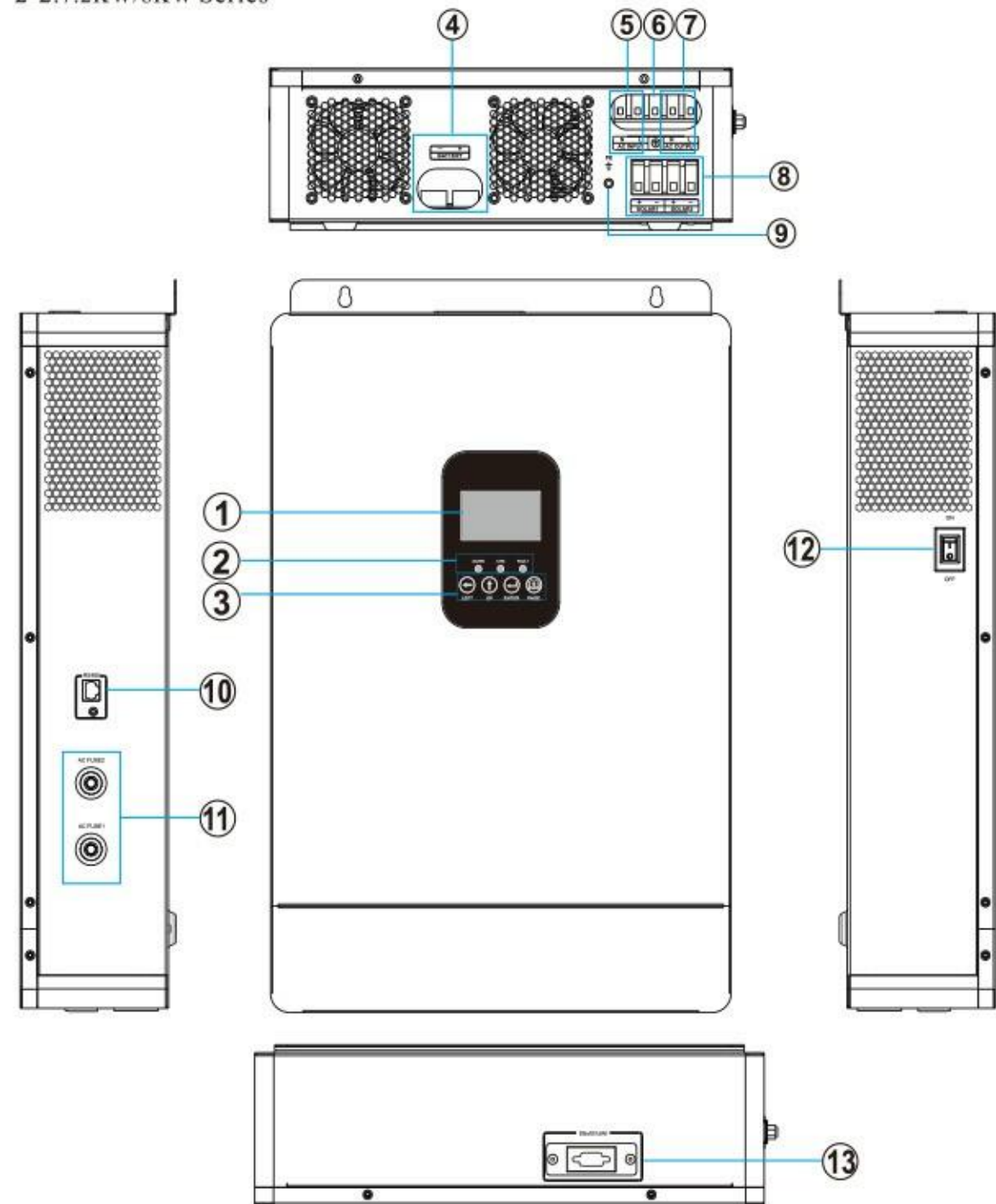
2. Outlook/Product description of Inverter

2-1.1KW/1.5KW/2KW/3.2KW/5KW Series



| | | |
|--|--|---------------------------------|
| 1. LCD display | 2. LED indicator | 3. Function button |
| 4. Battery input terminal | 5. AC input terminal | 6. Grounded(AC input/AC output) |
| 7. AC output terminal | 8. PV input terminal | 9. Grounded |
| 10. RS485 communication port(optional) | | 11. Mains input fuse |
| 12. Power on/off switch | 13. APP data collector module interface(WIFI/GPRS monitoring) (optional) | |

Note : The image shown here is indicative only. The actual product may differ.



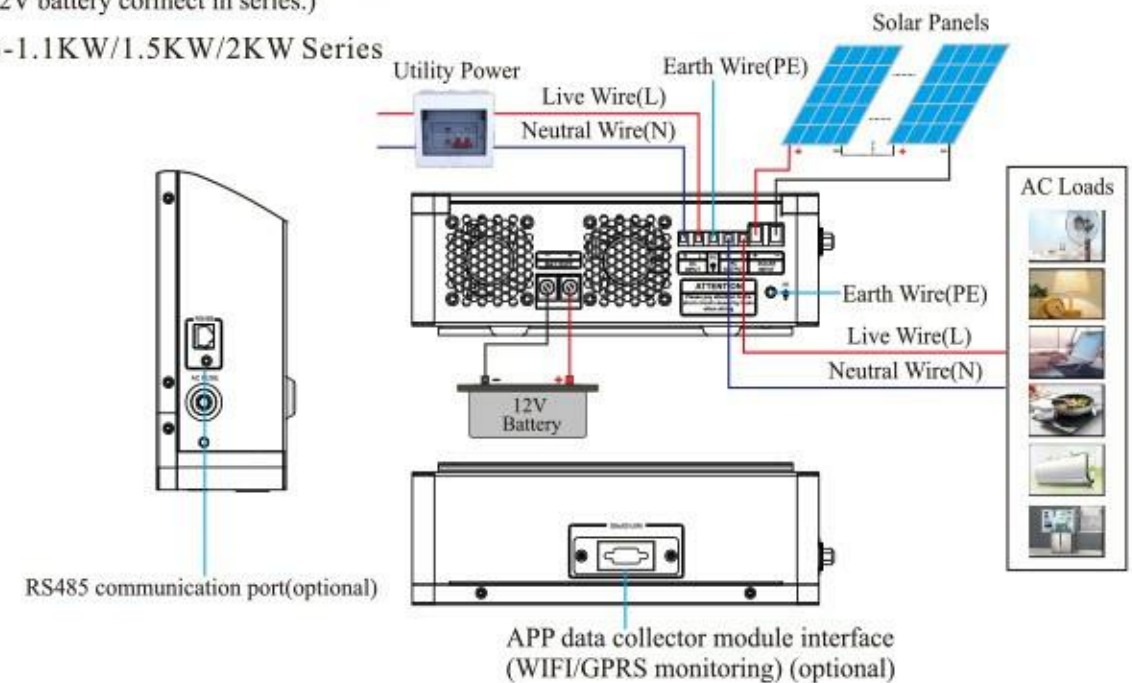
| | | |
|--|--|---------------------------------|
| 1. LCD display | 2. LED indicator | 3. Function button |
| 4. Battery input terminal | 5. AC input terminal | 6: Grounded(AC input/AC output) |
| 7. AC output terminal | 8. PV input terminal(1/2) | 9: Grounded |
| 10. RS485 communication port(optional) | 11. Mains input fuse(1/2) | |
| 12. Power on/off switch | 13. APP data collector module interface(WIFI/GPRS monitoring) (optional) | |

Note : The image shown here is indicative only. The actual product may differ.

3. Wiring instructions

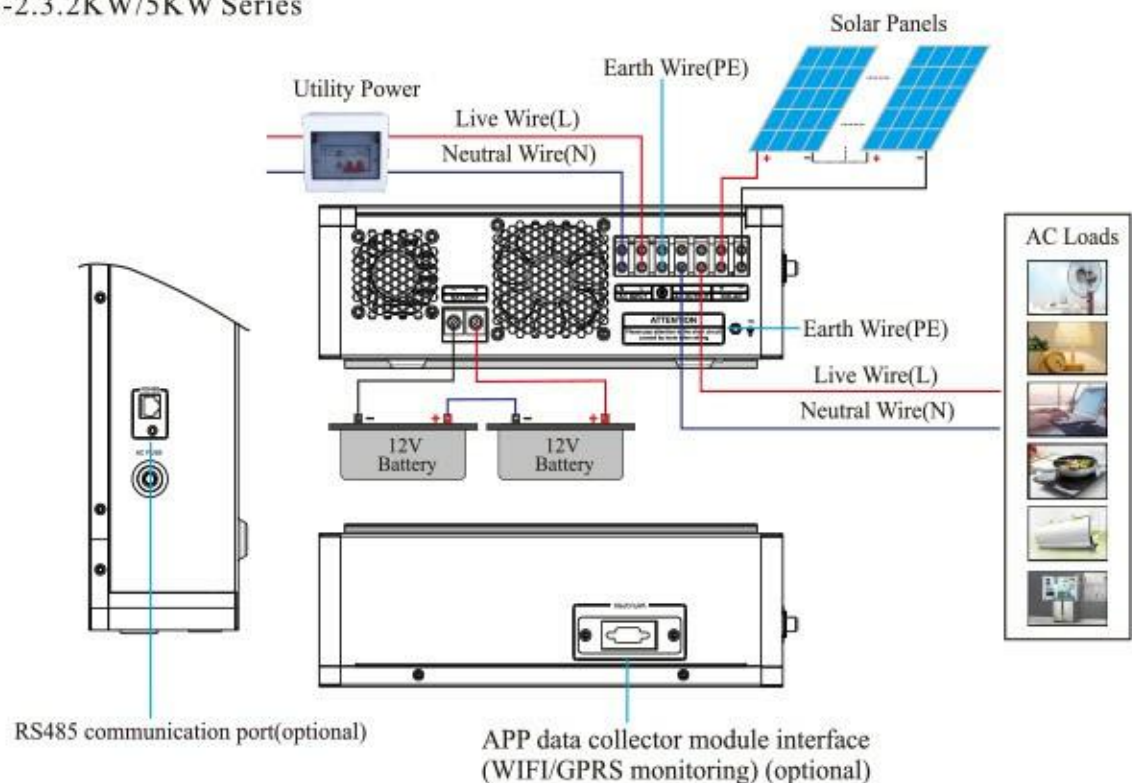
(Remarks: Please refer to the technical parameter table for specific battery voltage and solar panel parameter, This diagram is only for wiring diagram. 24V system: 2 units 12V battery connect in series; 48V system: 4 units 12V battery connect in series.)

3-1.1KW/1.5KW/2KW Series

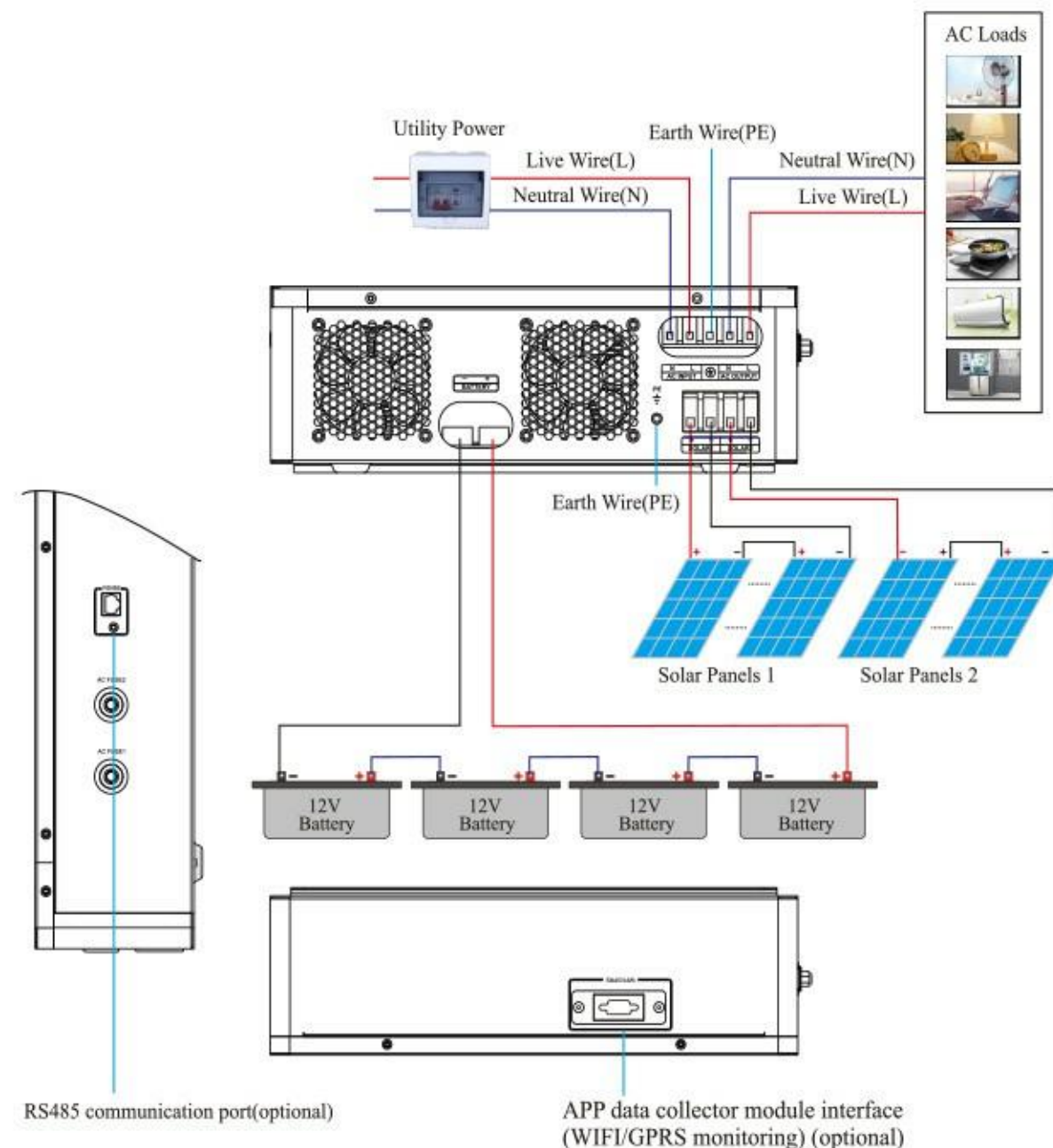


Note: 1000W is a 12V system, with 1Pcs 12V battery
 1500W/2000W is a 24V system, with 2Pcs 12V batteries connected in series

3-2.3.2KW/5KW Series



Note: 3200W is a 24V system, with 2Pcs 12V batteries connected in series
 5000W is a 48V system, with 4Pcs 12V batteries connected in series

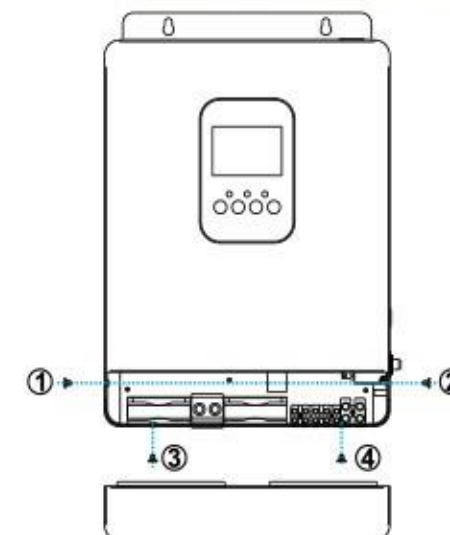


Note:

- Please avoid reverse connection while connecting batteries and PV to the inverter;
- If a generator is used as input power, the operation is as follow: start up the generator, after it runs steadily, connect and turn on inverter. When the inverter starts to work, connect user's equipment to the AC output;
- Capacity of generator ≥ 3 times of the rated capacity of inverter.

Preparation

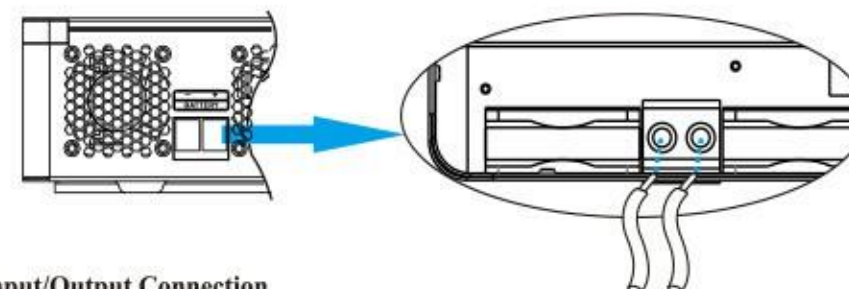
Before connecting all wirings, please take off bottom cover by removing four screws as shown below.



1) Battery Connection

Please follow below steps to implement battery connection:

- Remove insulation sleeve 6 mm for positive and negative conductors.
- Check correct polarity of connection cable from battery modules and battery input connectors. Then, connect positive pole (+) of connection cable to positive pole (+) of BATTERY input connector. Connect negative pole (-) of connection cable to negative pole (-) of BATTERY input connector.
- Make sure the polarity of the wiring is correct and the connection is firm.

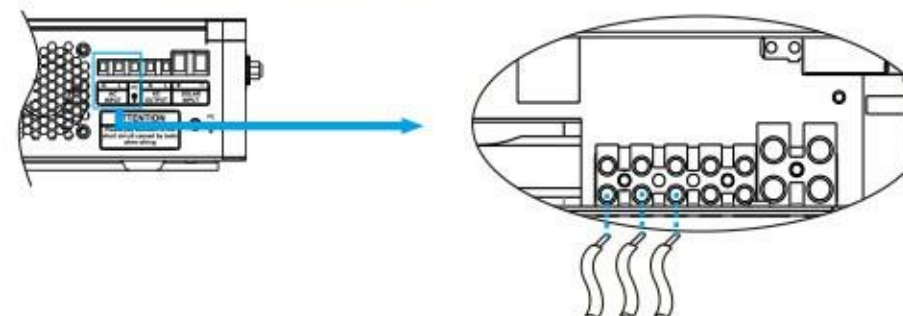


2) AC Input/Output Connection

CAUTION!! There are two terminal blocks with "INPUT" and "OUTPUT" markings. Please do NOT mis-connect input and output connectors.

Please follow the following steps to connect the AC input / AC output cable:

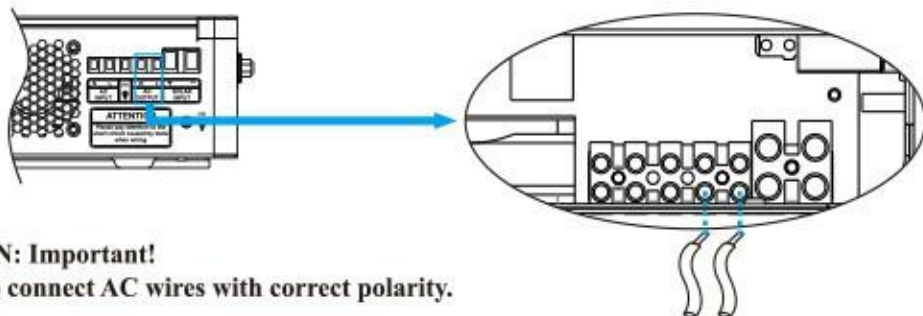
- Before connecting to AC input power source, please install a separate AC breaker between inverter and AC input power source. This will ensure the inverter can be securely disconnected .
- Remove insulation sleeve 10mm for five conductors.
- Insert AC Input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor first.



WARNING:

Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

- Then, insert AC output wires according to polarities indicated on terminal block and tighten terminal screws.

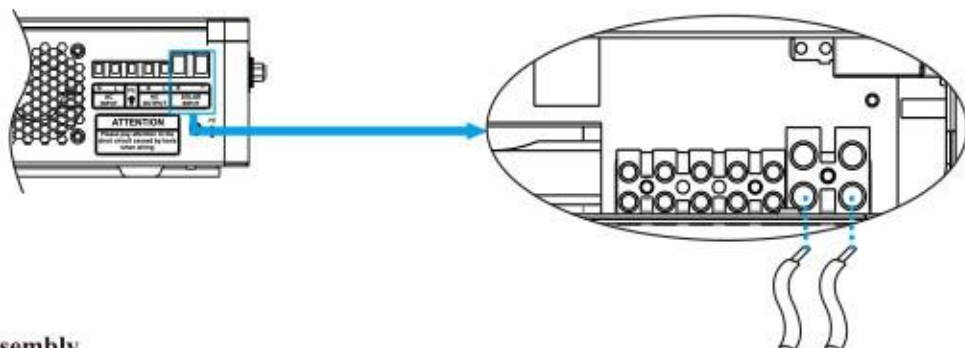


CAUTION: Important!
Be sure to connect AC wires with correct polarity.

3) PV Connection

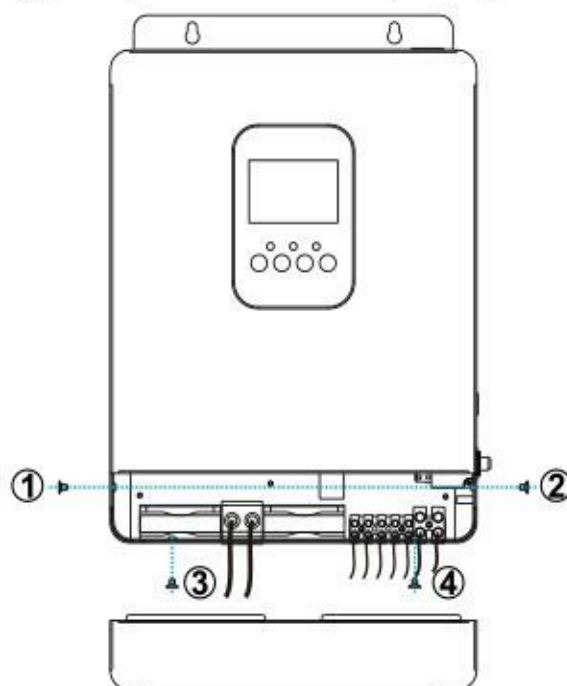
Please follow below steps to implement PV module connection:

- Remove insulation sleeve 10 mm for positive and negative conductors.
- Check correct polarity of connection cable from PV modules and PV input connectors. Then, connect positive pole (+) of connection cable to positive pole (+) of SOLAR input connector. Connect negative pole (-) of connection cable to negative pole (-) of SOLAR input connector.
- Make sure the polarity of the wiring is correct and the connection is firm.



Final Assembly

After connecting all wirings, please put bottom cover back by screwing four screws as shown below.

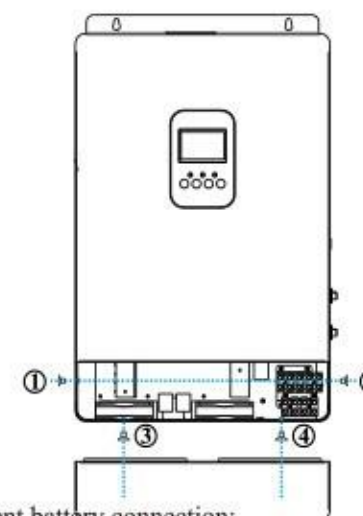


Note : The image shown here is indicative only. The actual product may differ.

7.2KW/8KW Series

Preparation

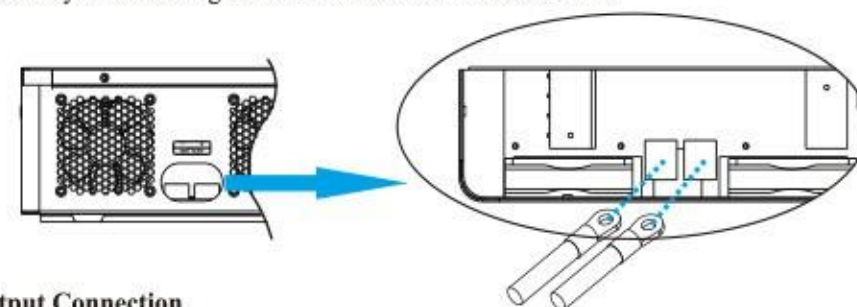
Before connecting all wirings, please take off bottom cover by removing four screws as shown below.



1) Battery Connection

Please follow below steps to implement battery connection:

- Remove insulation sleeve 6 mm for positive and negative conductors.
- Check correct polarity of connection cable from battery modules and battery input connectors. Then, connect positive pole (+) of connection cable to positive pole (+) of BATTERY input connector. Connect negative pole (-) of connection cable to negative pole (-) of BATTERY input connector.
- Make sure the polarity of the wiring is correct and the connection is firm.

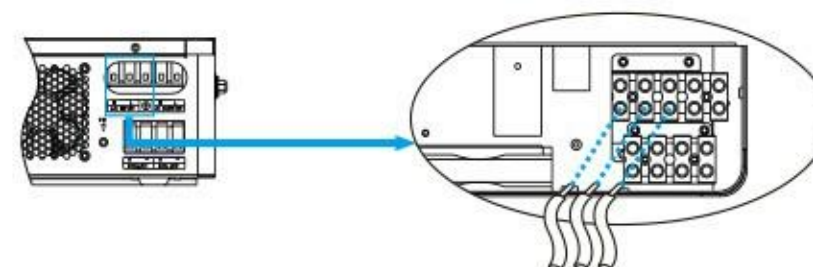


2) AC Input/Output Connection

CAUTION!! There are two terminal blocks with “INPUT” and “OUTPUT” markings. Please do NOT mis-connect input and output connectors.

Please follow the following steps to connect the AC input / AC output cable:

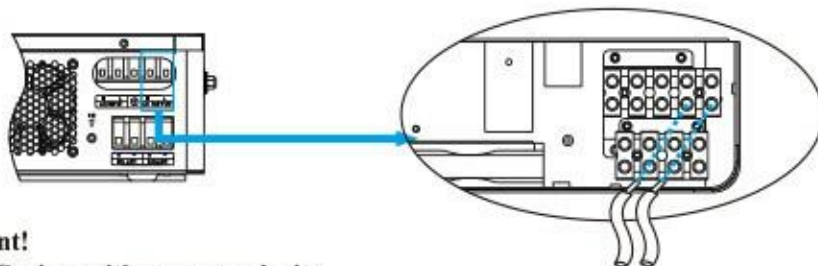
- Before connecting to AC input power source, please install a separate AC breaker between inverter and AC input power source. This will ensure the inverter can be securely disconnected .
- Remove insulation sleeve 10mm for five conductors.
- Insert AC Input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor first.



WARNING:

Be sure that AC power source is disconnected before attempting to hardwire it to the unit.

• Then, insert AC output wires according to polarities indicated on terminal block and tighten terminal screws.

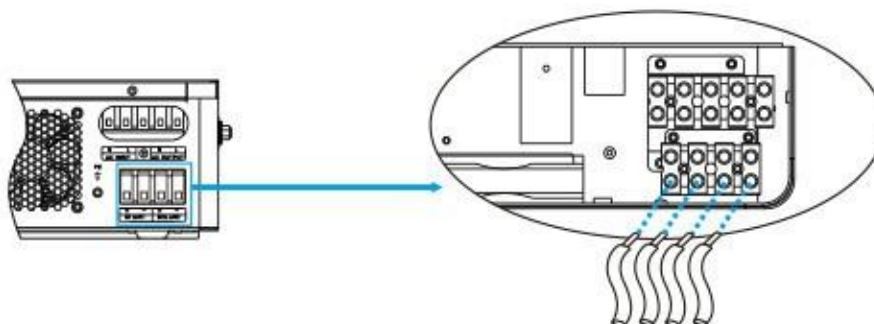


CAUTION: Important!
Be sure to connect AC wires with correct polarity.

3) PV Connection

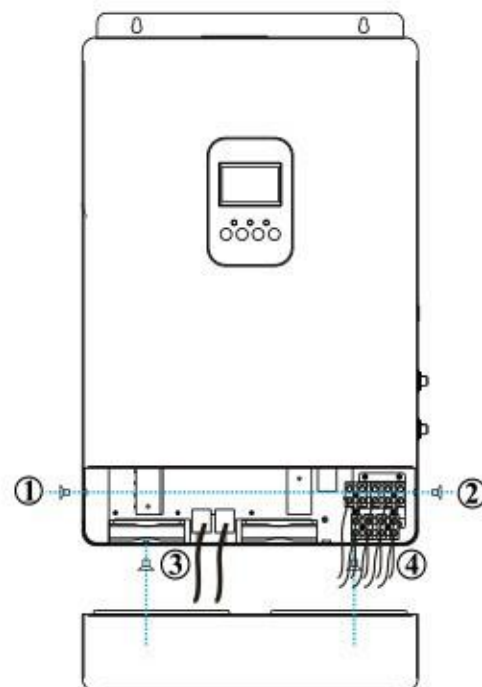
Please follow below steps to implement PV module connection:

- Remove insulation sleeve 10 mm for positive and negative conductors.
- Check correct polarity of connection cable from PV modules and PV input connectors. Then, connect positive pole (+) of connection cable to positive pole (+) of SOLAR input connector. Connect negative pole (-) of connection cable to negative pole (-) of SOLAR input connector.
- Make sure the polarity of the wiring is correct and the connection is firm.



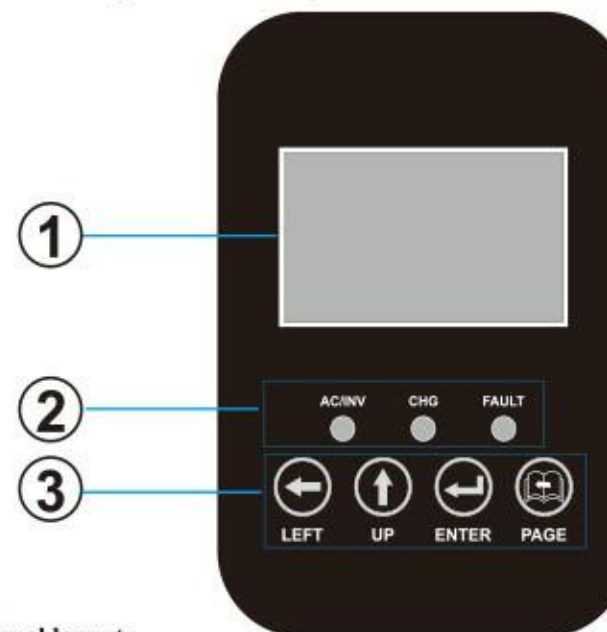
Final Assembly

After connecting all wirings, please put bottom cover back by screwing four screws as shown below.



Note : The image shown here is indicative only. The actual product may differ.

4. Display control area panel description



4-1. Display control panel layout

The display control area panel is divided into three functional areas according to functions, shown in below chart:

① LCD display area, ② LED display area, ③ function key control area.

4-2. LED Indicator

The four light-emitting diodes (LED) in the LED display area in the figure are used as indicators of operation status and fault.

| Name | Illustrate |
|----------------|---|
| AC/INV (Green) | On: The inverter is working in the mains state Flashing: The inverter is working in the battery state Off: Other States |
| CHG (Yellow) | On : Battery is charging at float or the battery is fully charged. Flashing: Battery is charging at constant voltage and constant current Off: Other States |
| FLUAT (Red) | On: Fault occurs in the inverter Off: Works normally |

3-3. Function key control area

The function key control area includes 4 buttons:

(LEFT): It is the left shift key when the parameter is set, and the mute key when the buzzer rings. Long press for 2 seconds to mute;

(UP): In the parameter setting interface, it is the key to increase the value;

(ENTER): In the password input interface, it is the OK key, and in other interfaces, it is the page turning key to query the parameter setting value and operation information;

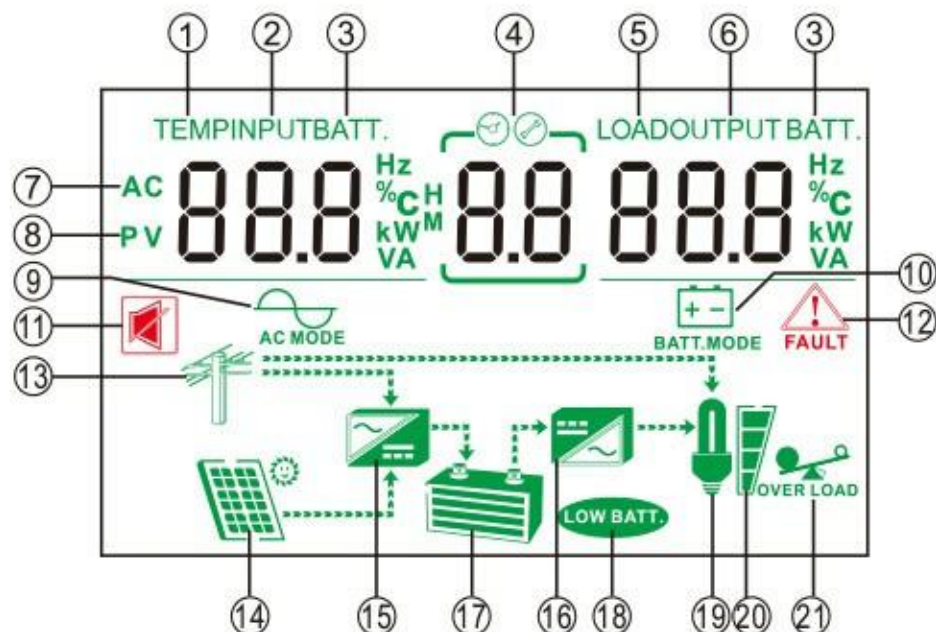
(PAGE): In the display interface, setting interface, and query interface are page turning keys, which can query the parameter setting and operation information.

Composite key

(LEFT) and (UP): press and hold the parameter query keys to enter the parameter query interface;

(UP) and (ENTER): press and hold these two keys at the same time, and enter the password 103 to enter the parameter setting interface.

4-4. LCD screen description



1) Parameter display area

| | |
|---|-------------------------------------|
| 1 TEMP: Temperature displayed | 2 INPUT: Mains input data displayed |
| 3 BATT: Battery data displayed | |
| <p>4 1) Page number display: on the main interface, press enter briefly to display the page number in this area, which can realize the manual operation of different tasks interface switching in turn; when the specific page number is not displayed in this area, the machine will enter the automatic page turning mode, and short press enter to enter the manual switching mode; (Note: if the machine is in the same page number (i.e. the same working interface) for a long time, the machine will enter the automatic page turning mode 15 minutes later.)</p> <p>2) Parameter display: on the parameter setting interface, press enter briefly, and U0-U11 will be] displayed in turn in this area.</p> | |
| 5 LOAD: Load data displayed | 6 OUTPUT: AC output data displayed |
| 7 AC: AC data displayed | 8 PV: PV input data displayed |

2) Icon display area

| | | |
|--|---------------------------------------|---------------------------|
| 9 AC MODE: Indicates that the machine has been set in the mains priority mode | | |
| 10 BATT.MODE: Battery priority or photovoltaic priority mode (it means that the machine has been set in battery priority or photovoltaic priority mode, please refer to the actual mode setting value for details) | | |
| 11: Turn mute on/off | 12: FAULT: fault alarm | 13: Utility |
| 14: Solar panel | 15: AC charging and PV charging icons | 16: Battery powered icons |
| 17: Battery | 18: Low battery alarm | 19: Load |
| 20: Load capacity(The load is divided into 4 grids, and the single-grid load is 25% of the full load) | | |
| 21: Overload alarm | | |

3) Daily startup and Shutdown operations

Please refer to this manual for on / off operation

a. Startup steps

When connecting qualified batteries or mains power (the mains power needs to confirm the reasonable input range according to the output mode), the startup operation can be carried out.

• Mains power supply status

Connect the normal mains power, press the switch and turn it to the on state, and the system will start up. If it is set to mains power output priority, wait for a period of time, and then the panel displays mains power mode, indicating that the startup is complete, and enter the mains power mode.

• Battery power supply status

Connect the normal battery, press the switch, and the inverter establishes the working power supply. The system will start up automatically. After waiting for a period of time, the panel displays battery mode, indicating that the startup is complete and enters battery mode.

b. Shutdown steps

When the system outputs in battery mode or mains mode, disconnect mains power and PV, press the switch key again and turn it to off state, and the system will shut down.

d. Operation in failure mode

When the inverter buzzer keeps ringing and the LED fault light keeps on, it indicates that the inverter is working in the fault mode. You can contact the supplier or maintenance personnel to provide information related to the fault alarm and assist in troubleshooting.

4) Parameter query operation

• Normally, there are 9 pages on the display page. Press the key ENTER or PAGE key for 0.2 to 1s to turn the display page and display the input and output voltage, input and output frequency, battery, PV voltage and current, load, software version, and other information.

4-5. Introduction to the work interface(Mains and PV input are normal)

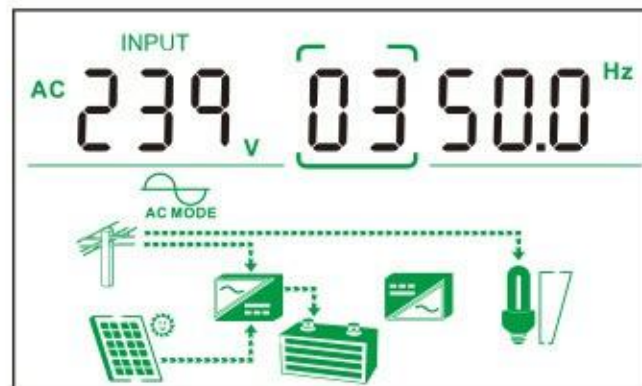
1) Display the fault code (when the machine has no fault, the last fault code will be displayed; when the machine has fault, it will jump to the current interface and display the current fault code) and the current work priority mode (d0: commercial power priority, D1: photovoltaic priority, D2: Battery priority)



2) Communication address interface



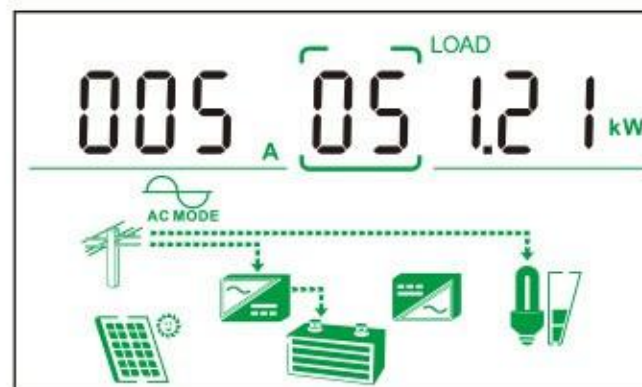
3) AC input interface(Display AC input voltage and frequency)



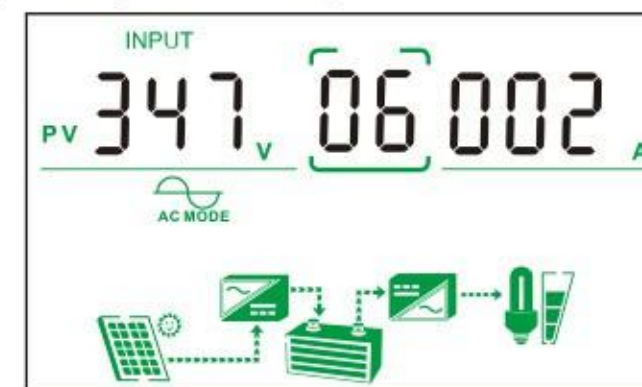
4) Output interface(Display output voltage and frequency)



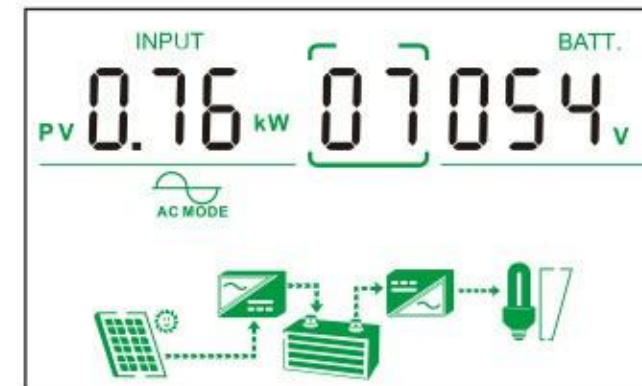
5) Loads interface(Display load current and load power)



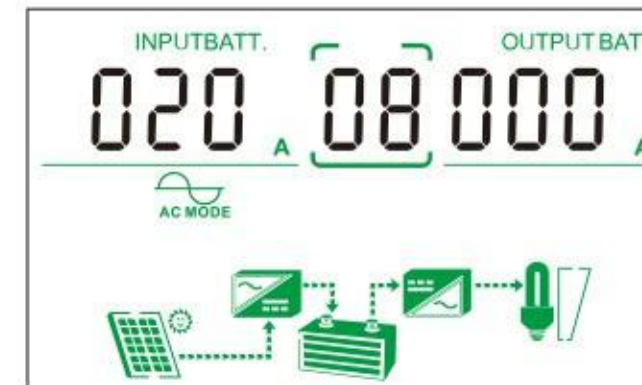
6) PV interface(Display PV voltage and PV current)



7) Display PV input power and battery voltage



8) Display battery charge current and discharge current(The left is the charging current, the right is the discharge current)



9) Internal temperature interface(The left side is the inverter temperature, the right side is the DC-DC temperature)



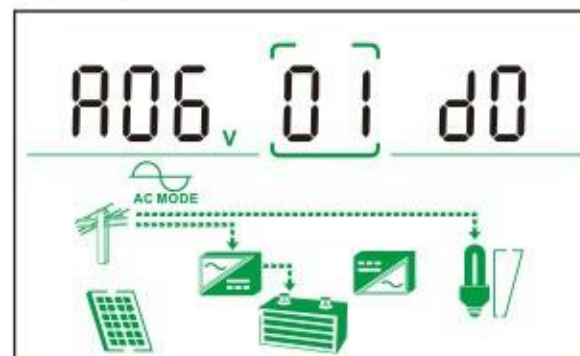
10) Select the lithium battery communication display interface (the lithium battery capacity AH is displayed on the left, and the SOC percentage is displayed on the right)

Note: This page is displayed only for models that reached a communication protocol with the lithium battery and open BMS communication function at the same time.

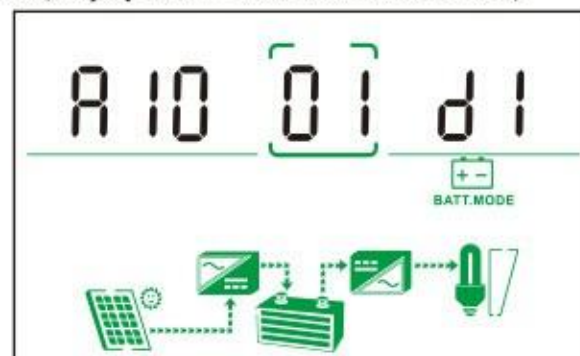


4-6. Three working modes

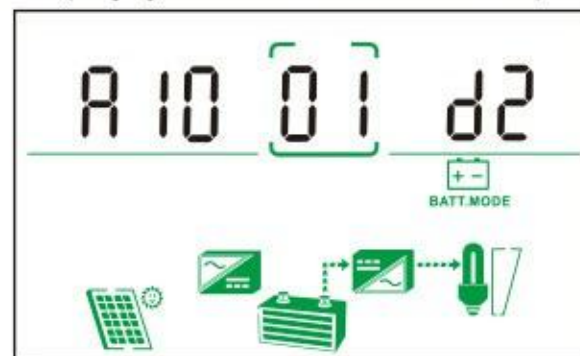
1) d0: Mains priority mode (Display AC MODE icon and d0 code)



2) d1: Solar priority mode (Display BATT MODE icon and d1 code)



3) d2: Battery priority mode (Display BATT MODE icon and d2 code)



Note: The actual display parameters are subject to the specific model, and the picture display contents are only used as examples.

5. Function setting operation

The function setting operation of the inverter, entering and exiting the function setting page and the function setting are as follows:

1) LEFT + UP: parameter query key combination

Parameter query function: in the main interface, press the LEFT + UP combination key at the same time to enter the parameter query interface. Short press ENTER key to view the relevant setting values of U0-U11 in turn. After the query is completed, wait for 15 seconds, and the machine will exit automatically.

2) UP + ENTER: parameter setting key combination

Parameter setting function: in the main interface, press the UP + ENTER combination key at the same time to enter the password input interface, enter the password 103 (short press the UP key for 3 times, the value of data editing will increase by 3, that is, the digit is 3; short press the LEFT key for 2 times, the data editing cursor will move to the left by 2, that is, the optical calibration digit will reach 100; short press the UP key for 1 time, the value of data editing will increase by 1, that is, the digit is 1), and short press ENTER key. After confirmation, you can enter the parameter setting interface; short press ENTER key or PAGE key to switch U0-U11 setting interface in turn; short press LEFT key to shift the data editing cursor to the left; short press UP key to increase the value of data editing by 1; wait 15 seconds after completion, the machine will automatically exit to save the setting value (The inverter will automatically restart). At this time, the inverter cannot be turned off manually, otherwise the set parameters cannot be saved.

Note: when setting the parameters, please disconnect the photovoltaic and commercial power first, and set the parameters only in the case of battery power supply.

| Content description | Remarks |
|--|--|
| U0: Communication address setting(0-247) | |
| U1: Working mode setting(0-2) | d0(AC priority mode)/d1(PV priority mode)/d2(Battery priority mode) |
| U2: Equalize charging voltage setting(13.0-16.5V) | 13.0-16.5V for 12V system, auto multiply by 2 for 24V system, auto multiply by 4 for 48V system |
| U3: Float charging voltage setting(13.0-16.5V) | 13.0-16.5V for 12V system, auto multiply by 2 for 24V system, auto multiply by 4 for 48V system |
| U4: PV charging current setting(2A-150A) | Max PV charging current based on product model |
| U5: AC charging current setting(2A~80A) | Max AC charging current based on product model |
| U6: Battery high-voltage cut off setting(8.0-18.0V) | 8.0-18.0V for 12V system, auto multiply by 2 for 24V system, auto multiply by 4 for 48V system |
| U7: Battery low-voltage cut off setting(8.0-18.0V) | 8.0-18.0V for 12V system, auto multiply by 2 for 24V system, auto multiply by 4 for 48V system |
| U8: AC supply→Battery supply voltage point setting (8.0-18.0V, available for d1/d2 working mode) | Under working mode d1/d2, set AC supply→Battery supply voltage point 8.0-18.0V for 12V system, auto multiply by 2 for 24V system, auto multiply by 4 for 48V system |
| U9: AC output voltage setting | 220VAC/230VAC/240VAC available to set |
| U10: AC output frequency setting | 50Hz/60Hz available to set |
| U11: UPS mode/INV mode setting | (00: INV mode, 01: UPS mode) When UPS mode is selected, the mains input voltage range is 170VAC-280VAC; when INV mode is selected, the mains input voltage range is 120VAC-280VAC. |
| U12: BMS communication function (This setting is supported only on the inverter that reached a communication protocol with the lithium battery) | 00: Disable BMS communication, 01: Enable BMS communication |

6. Introduction to three working modes

1) Mains priority mode (d0)

- When the power supply is normal(in line with the machine power input voltage range), on the one hand, the power supply and PV charge the battery at the same time; on the other hand, the power supply only supplies power to the load(the load does not consume PV and battery energy);

- When the mains power is abnormal(the mains power is beyond the working range of the machine or the mains power is interrupted), the machine will switch to the battery inverter power supply, and the battery will supply power to the load, when the PV power is greater than the load power, the load will be completely supplied by the PV power, and the excess energy will charge the battery; when the PV power is less than the load power, the insufficient part will be supplemented by the battery The load is supplied by PV and battery together.

2) PV priority mode (d1)

- When the PV is normal (in line with the PV input voltage range of the machine), if the PV power is greater than the power of the load, the load is completely powered by PV, and the PV excess energy charges the battery; when the PV power is less than the power of the load, the insufficient part is supplemented by the battery, and the PV and the battery supply power to the load together. If the battery is low voltage due to the load Then the machine will turn to the full load of the commercial power, and the PV will charge the battery;

- When the PV is abnormal (the PV voltage exceeds the working range of the machine or the PV is interrupted), the machine will directly switch to the municipal power supply mode, and the municipal power will charge the battery.

3) Battery priority mode (d2)

- When the machine has no low-voltage battery alarm, even if the mains power input is normal, the machine will switch to the battery inverter power supply, and the battery will supply power to the load. When the PV power is greater than the load power, the PV power will supply power to the load completely, and the excess energy will charge the battery. When the PV power is less than the load power, the insufficient part will be supplemented by the battery, and the PV and battery will supply power to the load Start to supply power to the load;

- When the battery is low voltage (i.e. the voltage of a conventional single battery is 11vdc) and the mains input is normal, the machine will switch to the mains mode for power supply, and the mains will supply power to the load completely, while the PV will charge the battery.

Note: Model of 10212/15224/20224/32224L/50248L only support mains priority mode and battery priority mode, PV priority work mode is not supported.

7. Error and Solution

7-1: Regular error

| Error | Reason | Solution |
|---------------------|------------------------------------|--|
| Unable to boot | Low voltage in battery or overload | Charging the battery or reduce the loads |
| Shut down with load | Low voltage in battery or overload | Charging the battery or reduce the loads |
| Alarm for boot | Low voltage in battery or overload | Charging the battery or reduce the loads |
| Heat of connector | Poor contact | Check and fasten the screws |

7-2: Code for alarm

| Alarm code | Reason | Solution |
|------------|------------------------------------|---|
| A01 | Battery high voltage protection | Please check whether the number of batteries is correct and whether the voltage of each battery is normal |
| A02 | Battery high voltage alarm | Please check whether the number of batteries is correct and whether the voltage of each battery is normal |
| A03 | Battery low voltage protection | Please restart the machine, switch to the mains power supply and charge the battery |
| A04 | Battery low voltage alarm | The machine is about to shut down, please switch to the mains power supply and charge the battery |
| A05 | DC bus over voltage protection | Please contact the supplier |
| A06 | DC bus low voltage protection | Please contact the supplier |
| A07 | DC-DC over temperature protection | Please check if it is overloaded or lightened |
| A08 | Abnormal DC-DC temperature | Please contact the supplier |
| A09 | Over voltage protection of mains 1 | Please check if the mains input voltage is too high |
| A10 | Mains low voltage protection 1 | Please check if the mains input voltage is too low |
| A11 | Over voltage protection of mains 2 | Please check if the mains input voltage is too high |
| A12 | Mains low voltage protection 2 | Please check if the mains input voltage is too low |
| A13 | Low voltage alarm | Please check if the mains input voltage is too low |
| A14 | Mains over frequency | The frequency of mains power is too high. Please check whether the frequency of mains power input is normal |
| A15 | Low frequency power supply | The power frequency is too low, please check whether the power input frequency is normal |
| A16 | Inverter overvoltage | Please contact the supplier |
| A17 | Inverter over current | Please check whether it is overloaded or reduce the load |
| A18 | Inverter overtemperature | Please check whether it is overloaded or reduce the load |
| A19 | Abnormal inverter temperature | Please check whether it is overloaded or reduce the load |
| A20 | Load over current | Please check whether it is overloaded or restart to reduce the load |
| A21 | Load over current alarm | Please check whether it is overloaded or reduce the load |
| A22 | Hardware over current | Please check whether the user equipment is short circuited |
| A23 | Software over current | Please check whether the user equipment is short circuited |
| A25 | Abnormal communication | Please contact the supplier |
| A26 | Abnormal inversion sampling | Please contact the supplier |
| A49 | MPPT output overvoltage protection | Please check if the PV input voltage exceeds the working range |

| | | |
|-----|----------------------------------|--|
| A50 | PV1 over current | Please contact the supplier |
| A51 | PV1 overvoltage | Please check if the PV input voltage exceeds the working range |
| A52 | PV1 low pressure | Please check if the PV input voltage is lower than the working range |
| A53 | PV1 over temperature | Please check if it is overloaded or reduce the load |
| A54 | Abnormal PV1 temperature | Please contact the supplier |
| A60 | Hardware over current protection | Please check for overload or load short circuit |
| A61 | Software over current protection | Please check for overload or load short circuit |

8. Maintenance

- 1) The inverter just needs the minimum maintenance. And life of Pb(battery) can be preserved by frequent charge.
- 2) Batteries should be charged for every three months if the inverter is long-term unused.
- 3) Lifespan of battery normally lasts for three to five years. It should be replaced in advance if any battery is found in poor state. And the replacement shall be operated by the professional.
- 4) Batteries should be wholly replaced by the instruction of the supplier.
- 5) For every three months, batteries should be discharged (until the inverter shuts down) and recharged. Every charge (by standard inverter) should last at least for 12 hours.
- 6) Among high temperature area, batteries should be discharged and recharged forevery two months. Every charge (by standard inverter) should last at least for 12 hours.

Note:

- **Please shut down the inverter , then disconnect AC input and PV input before replacing batteries.**
- **Please do not wear metal jewelry such as ring or watch.**
- **Please use screwdriver with insulated handle and avoid to place tools or metal objects on batteries.**
- **Please avoid short circuit or reverse connection.**

Warning:

- **Battery must not be put in the fire, which may cause explosion.**
- **Shall not open or damage the battery. Electrolyte released will cause harm to eyes and skin and even intoxication.**

9. Technical specification

| Model: HP pro-T | | 10212 | 15224 | 20224 | 32224L | 32224 | 50248L | 50248 | 72248 | 80248 | |
|--------------------------|--|---|--|----------|---------------|-------------|---------------|-------------|-------------|-------|--|
| Rated Power | | 1000W | 1500W | 2000W | 3200W | 3200W | 5000W | 5000W | 7200W | 8000W | |
| Battery Voltage | | 12VDC | 24VDC | 24VDC | 24VDC | 24VDC | 48VDC | 48VDC | 48VDC | 48VDC | |
| Size(L*W*Hmm) | | 355x272x91.5 | | | 400x315x101.5 | | 440x342x101.5 | | 525x355x115 | | |
| Package Size(L*W*Hmm) | | 443x350x187 | | | 488x393x198 | | 528x420x198 | | 615x435x210 | | |
| N.W.(kg) | | 6.5 | | | 8.5 | | 10 | | 14 | | |
| G.W.(kg) | | 7.5 | | | 9.5 | | 11 | | 15.5 | | |
| Installation Method | | Wall-Mounted | | | | | | | | | |
| PV | Charging Mode | MPPT | | | | | | | | | |
| | MPPT tracking voltage range | 15V-80VDC | 30V-100VDC | | | 120V-450VDC | 60V-140VDC | 120V-450VDC | | | |
| | Rated (recommended) operating voltage of PV array | 15V-30VDC | 30V-60VDC | | | 360VDC | 60V-90VDC | 360VDC | | | |
| | Max PV Input Voltage Voc (At the lowest temperature) | 120VDC | | | | 500VDC | 180VDC | 500VDC | | | |
| | PV Array Maximum Power | 840W | 1680W | | | 4000W | 3360W | 6000W | 4000Wx2 | | |
| | MPPT tracking channels (input channels) | 1 | | | | | | | 2 | | |
| | Input | DC Input Voltage Range | 10.5-15VDC | 21-30VDC | | | | 42-60VDC | | | |
| Rated AC input voltage | | 220VAC/230VAC/240VAC | | | | | | | | | |
| AC Input Voltage Range | | 170VAC~280VAC (UPS mode) / 120VAC~280VAC (INV mode) | | | | | | | | | |
| AC Input Frequency Range | | 45Hz~55Hz (50Hz); 55Hz~65Hz (60Hz) | | | | | | | | | |
| Output | Efficiency (Battery/PV Mode) | 94%(Peak value) | | | | | | | | | |
| | Output Voltage (Battery/PV Mode) | 220VAC±2%/230VAC±2%/240VAC±2% | | | | | | | | | |
| | Output Frequency (Battery/PV Mode) | 50Hz±0.5 or 60Hz±0.5 | | | | | | | | | |
| | Output Wave (Battery/PV Mode) | Pure Sine Wave | | | | | | | | | |
| | Efficiency(AC Mode) | >99% | | | | | | | | | |
| | Output Voltage(AC Mode) | Follow input | | | | | | | | | |
| | Output Frequency (AC Mode) | Follow input | | | | | | | | | |
| | Output waveform distortion Battery/PV Mode) | ≤3%(Linear load) | | | | | | | | | |
| | No load loss (Battery Mode) | ≤1% rated power | | | | | | | | | |
| | No load loss (AC Mode) | ≤0.5% rated power(charger does not work in AC mode) | | | | | | | | | |
| Battery | Battery Type | VRLA Battery | Charge Voltage :13.8V; Float Voltage:13.7V(Single battery voltage) | | | | | | | | |
| | | Customize Battery | Charging and discharging parameters of different types of batteries can be customized according to user requirements(charging and discharging parameters of different types of batteries can be set through the operation panel) | | | | | | | | |
| | Maximum Charging Current(Mains+PV) | | 120A | 100A | 110A | 120A | 100A | 120A | 100A | 150A | |
| | Max PV Charging Current | | 60A | 60A | 60A | 60A | 100A | 60A | 100A | 150A | |
| | Max AC Charging Current | | 60A | 40A | 50A | 60A | 60A | 60A | 60A | 80A | |
| | Charging method | | Three-stage (constant current, constant voltage, floating charge) | | | | | | | | |

| | | |
|-------------------------|--|--|
| Protection | Battery low voltage alarm | Battery undervoltage protection value+0.5V(Single battery voltage); following BMS instruction (after reaching the communication agreement) |
| | Battery low voltage protection | Factory default: 10.5V(Single battery voltage); following BMS instruction (after reaching the communication agreement) |
| | Battery over voltage alarm | Constant charge voltage+0.8V(Single battery voltage); following BMS instruction (after reaching the communication agreement) |
| | Battery over voltage protection | Factory default: 17V(Single battery voltage) |
| | Battery over voltage recovery voltage | Battery overvoltage protection value-1V(Single battery voltage); following BMS instruction (after reaching the communication agreement) |
| | Overload power protection | Automatic protection (battery mode), circuit breaker or insurance (AC mode) |
| | Inverter output short circuit protection | Automatic protection (battery mode), circuit breaker or insurance (AC mode) |
| | Temperature protection | >90°C(Shut down output) |
| Working Mode | | Mains priority/PV priority/Battery priority(Can be set) |
| Transfer Time | | 10ms(Typical value) |
| Display | | LCD+LED |
| Thermal method | | Cooling fan in intelligent control |
| Communication(Optional) | | RS485/APP(WIFI monitoring or GPRS monitoring) |
| Environment | Operating temperature | -10°C~40°C |
| | Storage temperature | -15°C~60°C |
| | Noise | ≤55dB |
| | Elevation | 2000m(More than derating) |
| | Humidity | 0%~95% (No condensation) |

Note:

1. Model of 10212/15224/20224/32224L/50248L only support mains priority mode and battery priority mode, PV priority work mode is not supported.
2. Above parameter revision change without notification.

10. Appendix--485 Communication Port

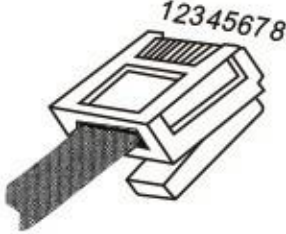
(External communication /BMS communication can only choose one or the other)

RS485 communication port pin definition(External communication)

| | |
|------------------|--|
| PIN1-----RS485-A |  |
| PIN2-----RS485-B | |
| PIN3-----NC | |
| PIN4-----GND | |
| PIN5-----NC | |
| PIN6-----NC | |
| PIN7-----NC | |
| PIN8-----NC | |

NC: refer to as not connect.

RS485 communication port pin definition(BMS communication)

| | |
|------------------|--|
| PIN1-----RS485-B |  |
| PIN2-----RS485-A | |
| PIN3-----NC | |
| PIN4-----NC | |
| PIN5-----NC | |
| PIN6-----NC | |
| PIN7-----NC | |
| PIN8-----NC | |

NC: refer to as not connect.

Warranty Card

Customer Name: _____ Tel.: _____

Address: _____

Brand: _____ Model: _____

Serial No.: _____ Date of Purchase: _____

Bought From: _____

Invoice Number: _____ Invoice Price: _____

Warranty Instruction

- Please keep this warranty card as proof of maintenance.
- The warranty period is 1 year from the date of purchase.
- During the warranty period, under the condition of normal use and maintenance, if damage caused by the product's own quality, the company will provide free repair and replacement parts after verification.
- The company reserves the right to maintain and interpret all contents.

Free maintain won't be given under the following circumstance:

- The damage caused by the manipulation that hasn't follow the requests of the manual.
- The product has been repaired, modified by technicians other than our company's, and any internal parts of the product have been replaced by users.
- The product number has been altered or product is inconsistent with the warranty card.
- Damage caused by careless use, penetration of water or other substances into the product.
- Damage caused by accident or natural disaster.

Certificate

Name: _____

Model: _____

Inspectors: _____

Date: _____

Products have been tested qualified by standard and permitted to deliver.