iMars XD30-60KTR

Quick Installation Guide

INVT Solar Technology (Shenzhen) Co., Ltd.

- Only qualified electricians are allowed to install the inverter.
- Do not put and install the inverter on or close to combustible materials.
- Install the inverter away from electronic devices with strong electromagnetic interference.
- Keep the installation site away from children and other public places.
- Select an appropriate battery that matches the system, and set the battery type correctly. If you select a battery that does not match the hybrid inverter, the system cannot run.
- If the battery has been completely discharged, please strictly follow the User Manual of the battery to charge the battery.
- Remove any metal jewelry such as ring and bracelet before you perform installation and electrical connection, in order to avoid electric shock.
- The input voltage to the inverter must not exceed the maximum input voltage of the inverter, as this may cause damage to the inverter.
- The inverter is not compatible with the positive or negative grounding system of solar cell module.
- Make sure the PE of the inverter is reliably grounded. If the PE is not grounded or not reliably grounded, the inverter cannot operate properly.
- Ensure reliable installation and electrical connection of the inverter.

❶ Unpacking Inspection

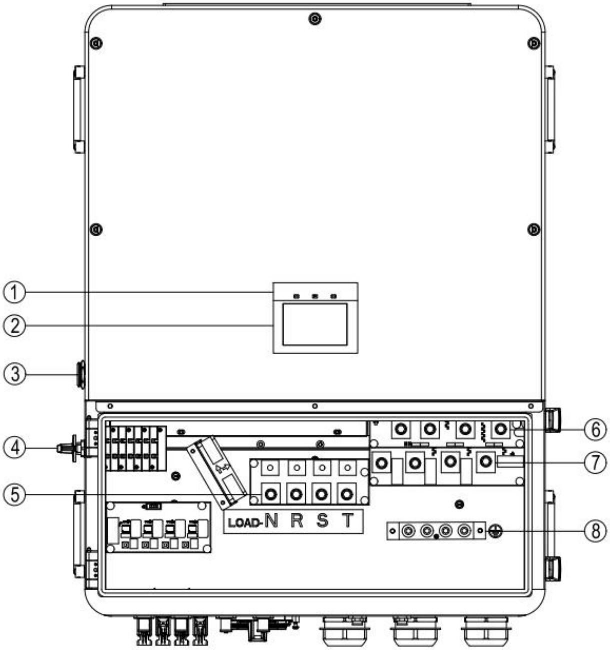
Before unpacking, carefully check whether the product information indicated on the carton is consistent with that indicated in the Purchase Order, and whether the product package is in good condition. If any problem, contact the supplier as soon as possible.

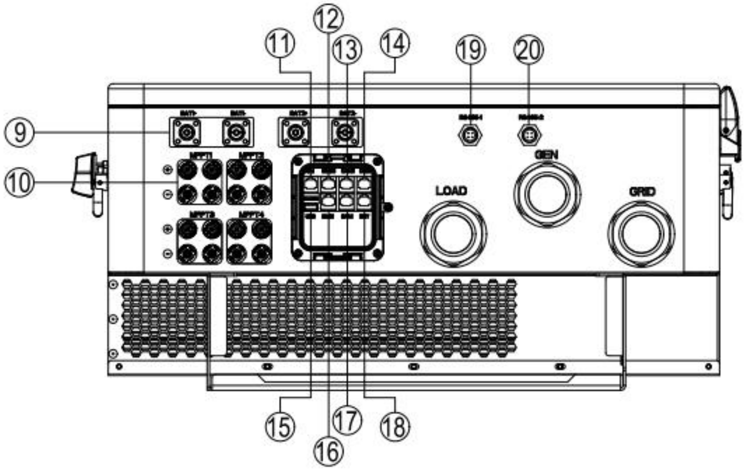
Table 1 Deliverables for Three-phase Hybrid Inverter

No.	Name	Quantity
1	Inverter	1
2	Wall-mounted board	1
3	Waterproof junction box	1
4	Parallel communication cable	1
	battery communication cable	1
5	RS485 communication cable	1
6	PV connector (pair)	8
7	Battery connector (pair)	2

8	Quick installation guide	1
9	M10*90 expansion bolt	4
10	M10*40 bolt	4
11	M4*16 bolt assembly	1
12	M10 nut	4
13	M10 stainless steel flat gasket	4
14	M10 spring gasket	4
15	Smart electric meter	1
	Three-phase CT kit	1
16	GPRS Module(Domestic optional)	1
17	WIFI Module(Overseas optional)	1

Overview





No.	Name	No.	Name
1	LED indicator	2	LCD display
3	Battery soft start button	4	PV switch
5	EPS connection port	6	Diesel generator port
7	Grid connected port	8	PE grounding point
9	Lithium battery input port	10	PV input port
11	COM（ARM parallel port）	12	BMS2 (second cluster of lithium battery communication)
13	CAN2 (Parallel communication)	14	RJ45 interface of DRM (Australia)
15	USB (software update)	16	BMS1 (first cluster of lithium battery communication)
17	CAN1 (Parallel communication)	18	DRY (Generator dry contacts)
19	RS485-1 (WiFi/GPRS communication)	20	RS485-2 (electric meter RS485 communication)

❷ Before Installation

2.1 Location

Select installation site based on the following considerations:

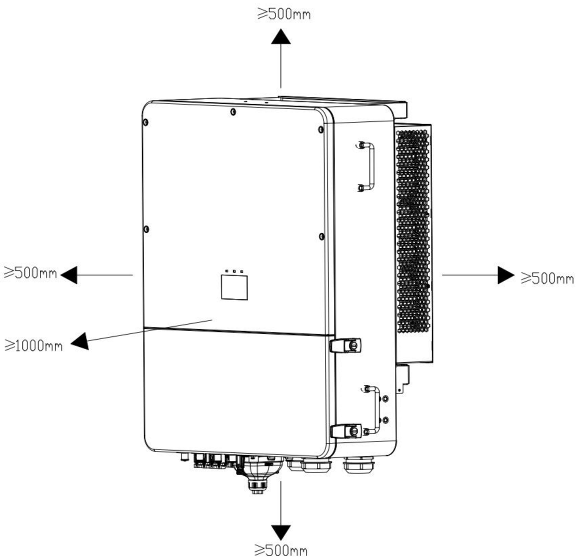


Fig. 1 Installation Spacing of Inverter (mm)

(1)The ambient temperature should be between -25℃~60℃.

(2)The installation surface should be vertical. Refer to Figure 2.

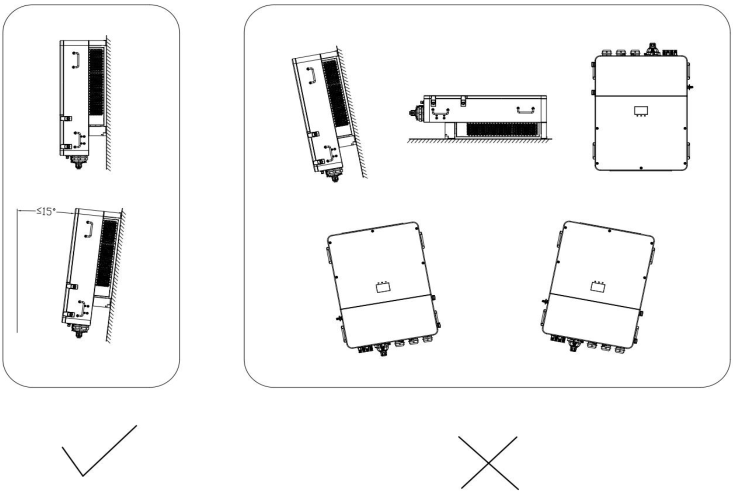


Fig. 2 Installation Location of Inverter

2.2 Cable specifications

In order to ensure the compatibility of the AC/DC connectors/terminals of the inverter, please always select the following AC/DC wires for the inverter:

Table 2 Cable Specifications

PV connection wire

Type	Cross section (mm2)	
	Range	Recommended value
30K/40K/50K/60K	4-6（10-8AWG）	4（10AWG）

BAT connection wire

Type	Cross section (mm2)	
	Range	Recommended value
30K/40K/50K/60K	（1-2AWG）	（2AWG）

AC connection wire

Type	Wire specification	Cable (Copper wire)(mm2)	Torque (max.)
30K/40K	5-4AWG	17-21	12.4NM
50K/60K	3-2AWG	27-34	16.9NM

❸ Mechanical Installation

The following takes wall mounting as an example.

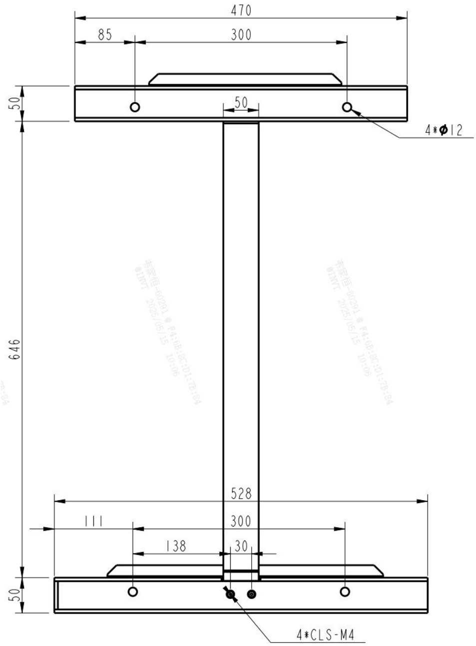


Fig. 3 Mounting Bracket of Inverter

Installation steps of inverter:

(1) Based on the installation dimensions, proceed with the wall-mounted installation. The thickness of the wall for wall-mounted installation should be greater than or equal to 60mm. Using a marker and a spirit level, mark the points where you need to drill the holes for the wall-mount.

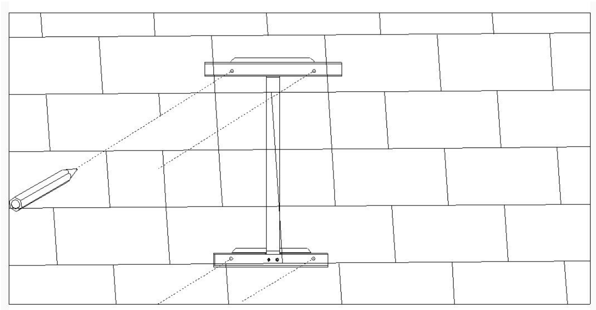


Fig. 4 Marking Screw Positions

(2) Drill the holes (diameter: φ8; depth: ≥55mm) using a hammer drill, and then install M10×90 stainless-steel expansion bolts.

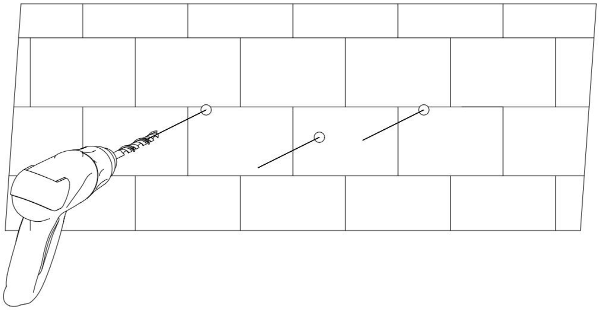


Fig. 5 Installing Expansion Bolts

(3) Fix the mounting bracket. Clean the holes, drive expansion bolts into the holes using a rubber hammer. Tighten the nut to fix the tail of the bolt using a wrench, and then remove the nut, spring washer and flat washer. Fix the wall mount bracket to the wall with the nuts using a tightening torque of 5N•m.

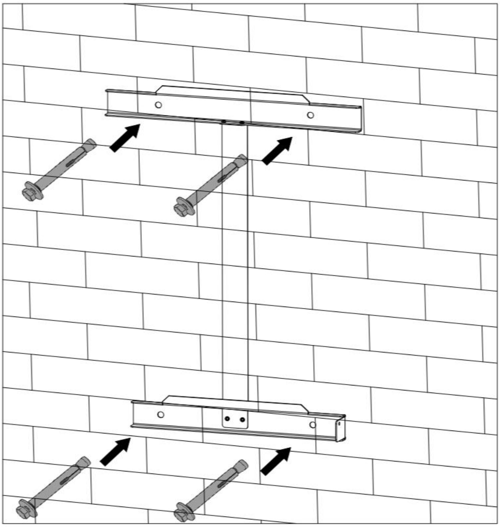


Fig. 6 Fixing and Locking the Wall-mounting Bracket

(4) Align the inverter with the wall-mounting bracket, and then slide it down until it stops to attach the inverter to the wall-mounting brackets firmly.

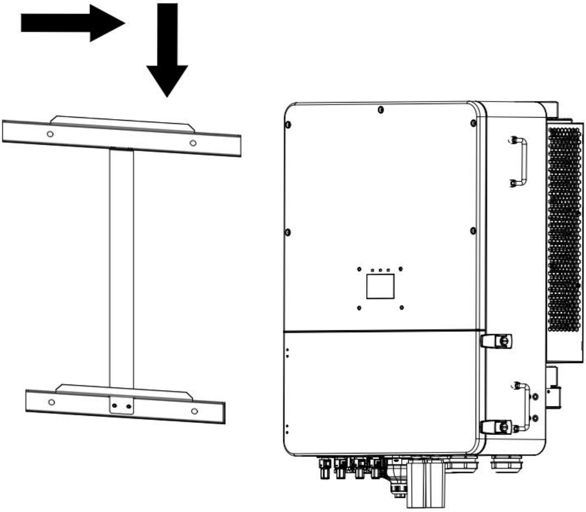


Fig. 7 Attach the Inverter to the Wall-mounting Bracket

(5) Tighten M4×16 screws into the left and right holes of the radiator with a torque of 2N•m so as to fix the inverter onto the wall-mounting bracket.

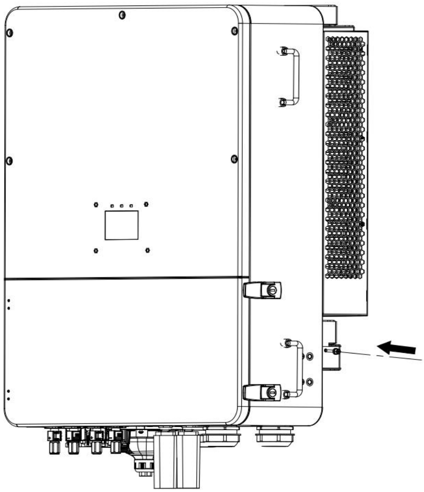


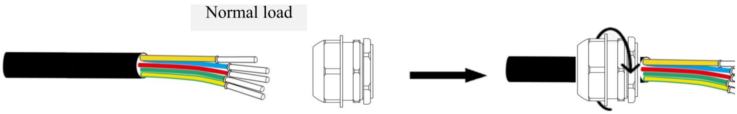
Fig. 8 Fixing and Locking the Inverter

❹ Electrical Connection

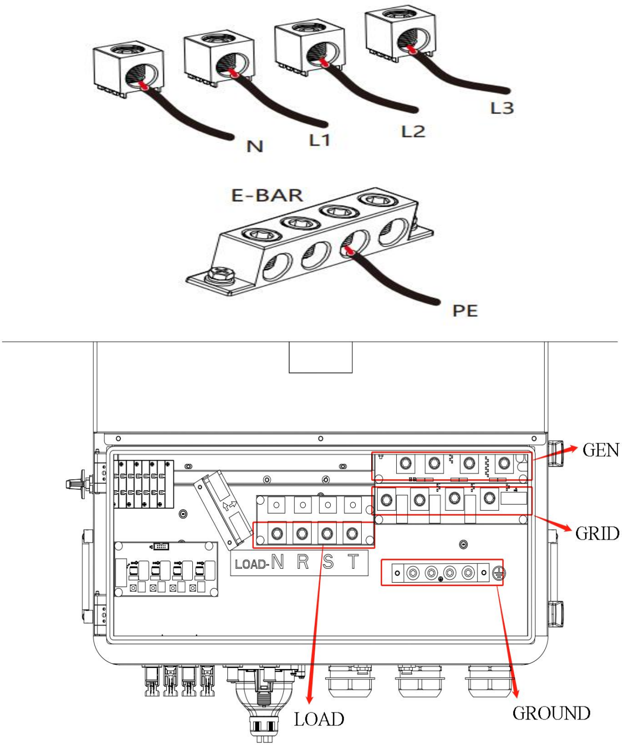
4.1 AC Wiring

The AC output is located at the lower right of the energy storage inverter; its left terminal is an off-grid load port , and its right terminal is a grid-connected and diesel generator port. (For detailed locations, please see product introduction chapter)

Step 1: Unscrew the nylon waterproof joint and thread the AC cable through the flat washer, as shown in the following figure:



Step 2: Use installation tools to sequentially lock the AC wires into the AC wiring sockets of LOAD, GEN, GRID, and GROUND, as shown in the following figure:



Step 3: Tighten the three nylon waterproof joints as shown in the following figure:

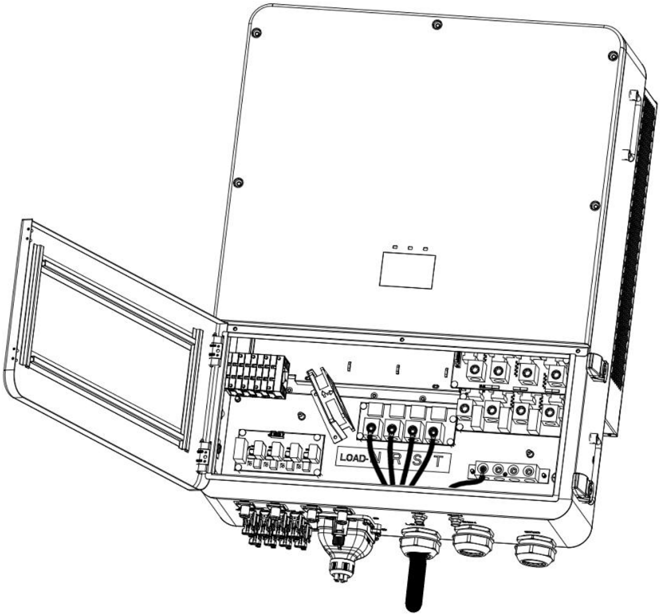


Fig 9 Connection of Power Grid, Load and Generator (Copper Wire)

Note:

（1） If you only use the grid-connected function, please connect the grid to the inverter GRID interface;

（2） The grid-connected and off-grid ports cannot be directly connected together, otherwise the inverter will be damaged;

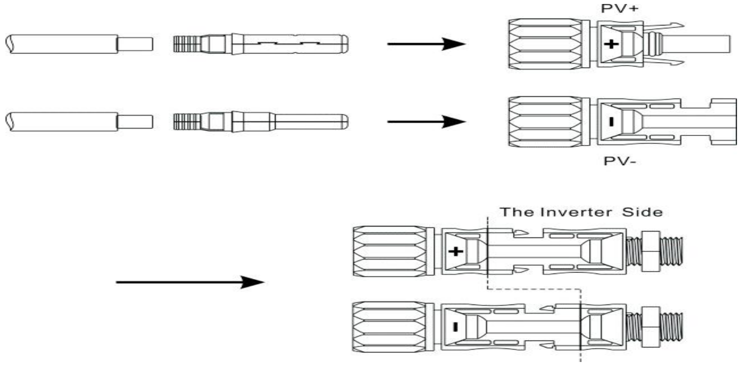
（3）Remove the insulating sleeve with length of 20mm , insert the cable terminal according to the polarity indicated above, and make sure the connection is firm;

4.2 PV Wiring

The DC input side of energy storage series uses MC4 connector. The specific connection steps are as follows:

(1) Turn off the DC switch;

(2) Connect the anode and cathode of the module to PV+/PV- on the energy storage inverter respectively. Please ensure that the input voltage and current are within the allowable range:



(3) Maximum PV input voltage: 1100V (voltage change at the minimum temperature must be considered)

(4) Maximum PV input current: 20A

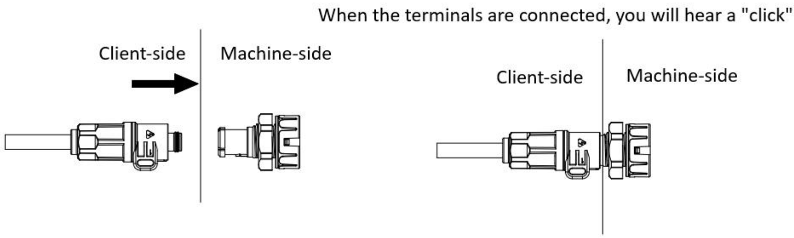
(5) Note: It is recommended that you choose a special photovoltaic cable with a wire diameter ≥ 2.5mm²(10AWG).

4.3 BAT wiring

The steps to install the battery power cable are as follows:

(1) Crimp the battery cable to the corresponding O-terminal;

(2) Connect the positive pole of the battery to the positive pole of the machine battery terminal and the negative pole to the negative pole of the machine battery terminal.



（1）A DC switch is required to be equipped between the battery and the inverter.

（2）Maximum input voltage of battery: 800 V;

（3）Maximum charging and discharging current of the battery: 100A;

Note: The power line length between the battery and the energy storage inverter is ≤ 2.5m, and the line diameter is ≥50mm^2(2AWG).

4.4 Communication Wiring

4.4.1 lithium battery connection

When using lithium batteries, it is required to connect the BMS management system of the lithium batteries. The steps for connecting the lithium battery port are as follows:

(1) Unscrew the rubber nut on the waterproof cover of the energy storage inverter;

(2) The cable is sequentially passed through the rubber nut, sealing ring, threaded sleeve and waterproof cover;

(3) Connect the RJ45 terminal head of the LAN cable to the BMS1/BMS2 port on the energy storage inverter;

Lock the waterproof cover with screws;

(4) Tighten the rubber nut to the waterproof cover.

(5) RJ45 interface definition of energy storage battery clusters 1 and 2 corresponding to BMS1 and BMS2:

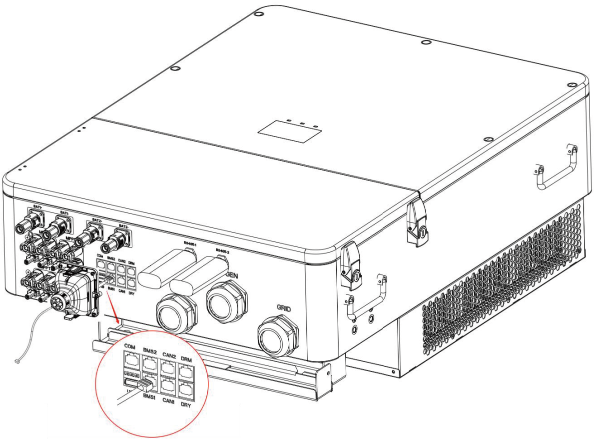
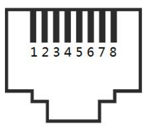
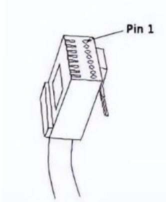


Fig.10 The inverter is connected to the battery PACK communication

Note:

	BMS1	BMS2
Pin 1	BAT1_TEMP	BAT2_TEMP
Pin 2	GND	GND
Pin 3	Empty	Empty
Pin 4	BAT1.CAN-H	BAT2.CAN-H



Pin 5	BAT1.CAN-L	BAT2.CAN-L	
Pin 6	Empty	Empty	
Pin 7	GND	GND	
Pin 8	WAKE-UP1	WAKE-UP2	

If a lead-acid battery or a lithium battery without BMS communication is used, you can directly jump to 4.4.2 without connecting the BMS communication cable.

The Pin 4, Pin 5, Pin 7, and Pin 8 pins of the BMS port are used for the lithium battery communication connection.

4.4.2 Lead-acid battery temperature sensor connections

When a lead-acid battery is used, you need to connect a temperature sensor to monitor the surface temperature of the battery. The following are the temperature sensor connection steps:

(1) Unscrew the rubber nut on the waterproof cover of the energy storage inverter;

(2) The NTC wire is sequentially passed through the rubber nut, sealing ring, threaded sleeve and waterproof cover;

(3) Connect the RJ45 terminal head of the NTC cable to the DRY IO/NTC port on the energy storage inverter;

(4) Lock the waterproof cover with screws;

(5) Tighten the rubber nut to the waterproof cover.

Interface definitions:

	BMS1	BMS2
Pin 1	BAT1_TEMP	BAT2_TEMP
Pin 2	GND	GND
Pin 3		
Pin 4	BAT1.CAN-H	BAT2.CAN-H
Pin 5	BAT1.CAN-L	BAT2.CAN-L
Pin 6		
Pin 7	GND	GND
Pin 8	WAKE-UP1	WAKE-UP2

Note: The sensor probe is used to monitor the ambient temperature of lead-acid battery, and its length should be less than 1.5m. If you choose a lithium battery, there is no need to install a temperature sensor.

The Pin 1, Pin 2 pin for temperature sensor connection for lead-acid batteries.

4.5 Current transformer (CT) connection

The electric meter can also be used to monitor the energy use of household users.The connecting steps of the communication line of the electric meter are as follows:

The meter is connected to the RS485-2 terminal with waterproof function by inserting and then tightening it, as shown in the following picture:

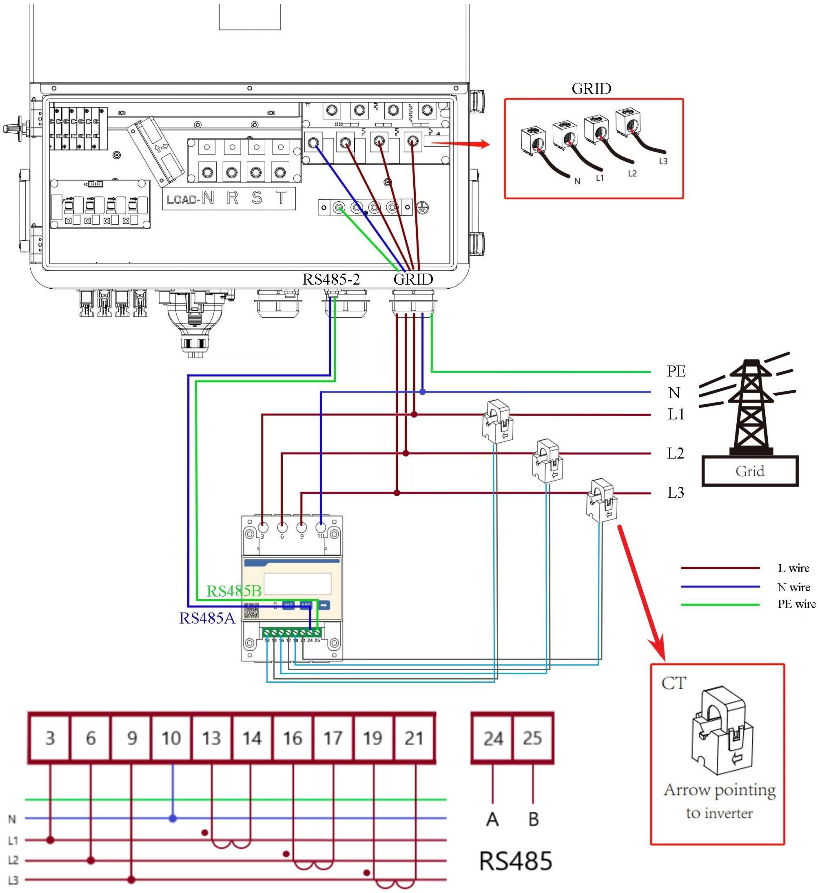


Fig 11 Smart meter connection

4.6 Generator dry contact connection

A separate generator interface is equipped on the inverter. When using generator, it is required to connect the dry contact of the generator. The connection steps of the dry contact of the generator are as follows:

(1) .The generator is set to automatic mode;

(2) .The dry contact of the generator is connected to the 2th pin and 3th pin of the inverter DRY IO;

(3) .DRY IO interface definition.

	Generator
Pin 1	NO OUT
Pin 2	COM
Pin 3	NC OUT
Pin 4	
Pin 5	CONTACT2
Pin 6	+12V
Pin 7	CONTACT1
Pin 8	+12V

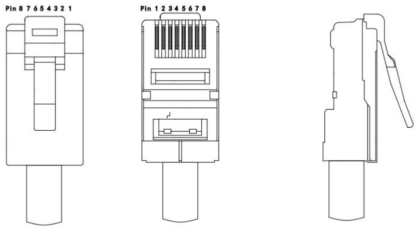


Fig 12 Generator dry node connection

4.7 Earth wire connection

The energy storage inverter must be grounded reliably. It is recommended that the diameter of the ground cable is greater than 10mm². The grounding point is shown as below:

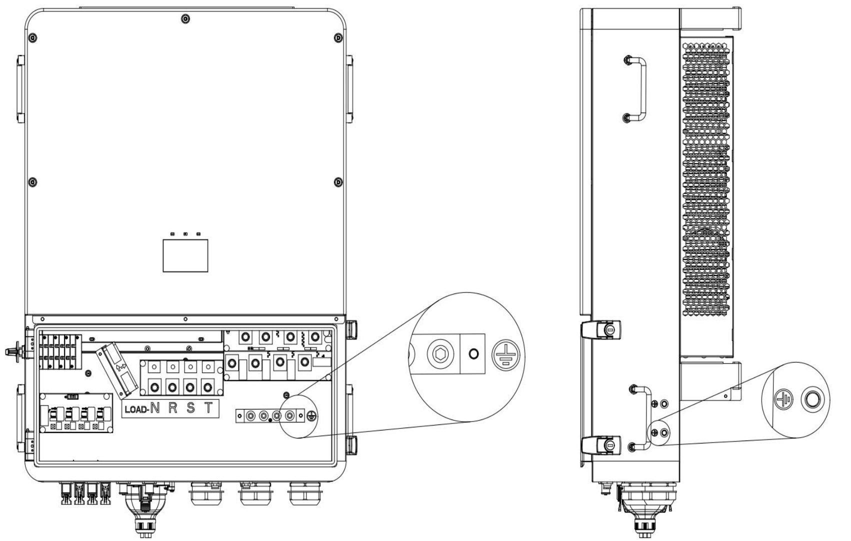


Fig 13 Ground wire connection

4.8 Parallel connection

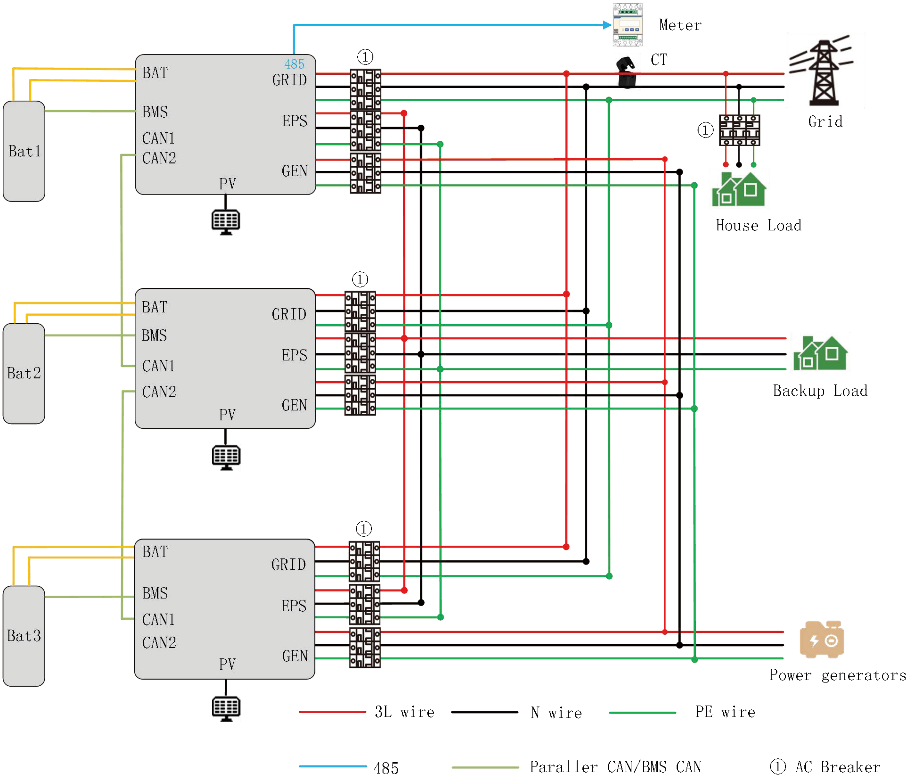


Fig 14 Parallel connections

❺ Operation

5.1 Equipment operation

Step 1: Close the inverter GRID side AC circuit breaker.

Step 2: Close the BAT HP box side DC circuit breaker.

Step 3: Press the BAT soft Start button of the inverter.

Step 4: Close the inverter EPS side AC circuit breaker.

Step 5: Close the inverter PV switch.

Note: When PV, power grid and battery are all normal, the system will work in "grid-connected mode".

At this time, the green LED light is always on, and the screen of the energy storage machine shows "State: On Grid".

5.2 Equipment shutdown

When the inverter stops working, all energy sources must be disconnected, and then the energy storage will automatically enter the shutdown mode.

Step 1: Disconnect the inverter PV switch.

Step 2: Close the BAT HP box side DC circuit breaker.

Step 3: Disconnect the inverter GRID side AC circuit breaker.

At this time, the LED light and LCD screen are off.

Note: When all the above operations are completed, it is required to wait at least 5 minutes before proceeding with other operations.

LED Indications of Hybrid Inverter

LED indicator

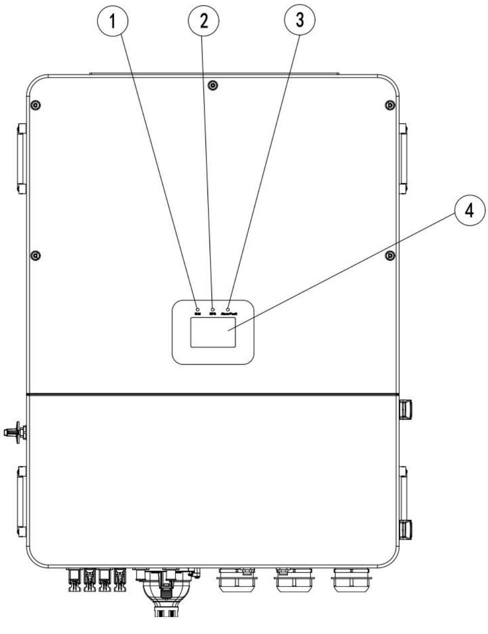


Figure 15 LED display

Table . 5-1

No.	Description
1	The green light keeps on: in the grid-connected state.
	The green light flashes: during the power-on self-test.
	Green and yellow LED lights flash: during programming.
2	The yellow light keeps on: in off-grid state.
3	The red light keeps on: it is in a fault state.
4	LED screen

5.3 First boot guide:

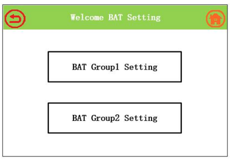
(1) Click the General Settings box to go to the General Settings page to set the time parameters

Click”confirmation”

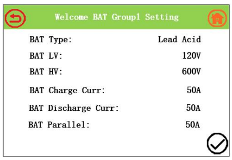
(2) Click the Country box to enter the national safety standard setting page

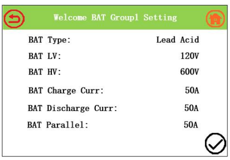
Click”confirmation”

(3) Click the BAT box to enter the battery parameter setting page

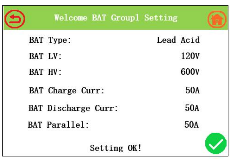


Select the battery pack





Click ”confirmation”



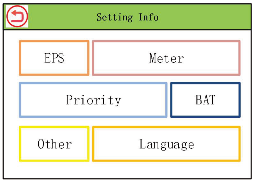
(4) Click the Language box to enter the language settings page

Click “Language”

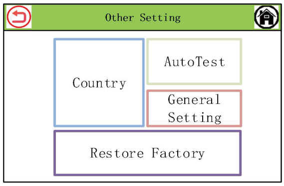
(5) Click the home button on the settings page to return to the main menu interface

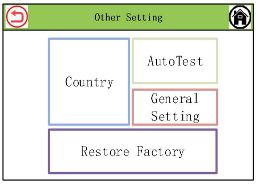
(6) Click the back button on the menu interface to exit the boot boot

5.4 Master/slave settings:

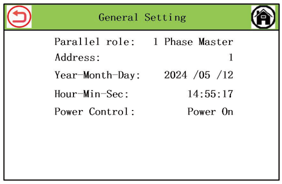


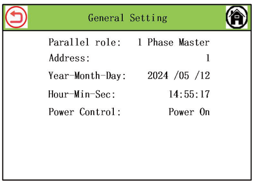
Click “Other”



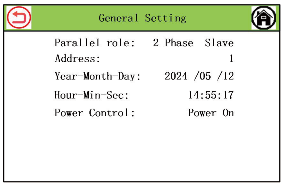


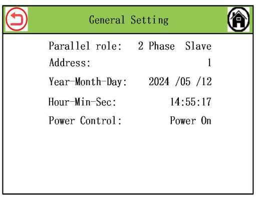
Click “General Setting”



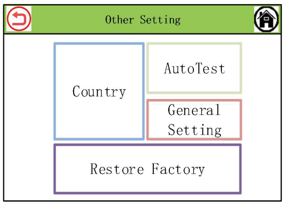


Click “I Phase Master”

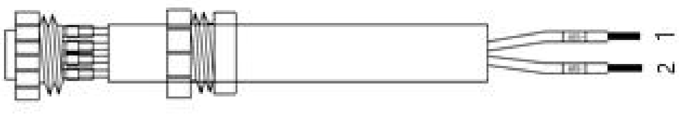




Click OK to complete the Settings



5.5 Accessories and Wiring



485 pins definition

1(orange)	A (RS485+)
2(brown)	B (RS485-)

Comm. optional accessories

Comm. optional accessories	Inverter port	CPU port
Ethernet converter	RS485-M	RS485 signal
Wi-Fi converter	RS485-M	Wi-Fi signal
GPRS converter	RS485-M	Wireless GPRS signal

5.6 Maintenance

When power-off maintenance, overhaul, troubleshooting of the inverter is required, please stop the inverter strictly as follows:

(1) Shut down via the LCD screen setting.

(2) Disconnect the inverter's AC switch for the public power grid;

(3) Disconnect the DC switch integrated on the inverter;

(4) Contact our customer service staff or local distributors.

More information
For complete instruction of relevant parameters, please refer to Operation Manual of INVT iMars Series PV Grid-tied Inverters. You can visit www.invt.com or scan QR code to download. Service line: +86 400 700 9997

INVT Solar Technology (Shenzhen) Co., Ltd.

Certificate of Quality

OQA03

PASS

Quality Inspector：________________

The product is tested by our quality control and quality assurance department, is in line with the product standards and specified technical requirements and is ready to be shipped.

Warranty Card

Customer Name：	
Customer Address：	
Contact Person：	Tel/Phone：
Product Model Number：	Factory Serial Number：
Purchase Date：	Fault Date：
Open Circuit Voltage (Voc) / DC Input Power (W):	Grid Rated Voltage / Frequency :

Setup Model	Noise ?	Smoke ?
☐ Independent ☐ Parallel	☐ YES ☐ NO	☐ YES ☐ NO

Inverter Software Version: Version 1__________________; Version 2__________________

MCU Version:

Error Code:

Error Description:

Please return this card with information to us. Thank you!

66001-01586

V1.1