iMars XD5-12KTR

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

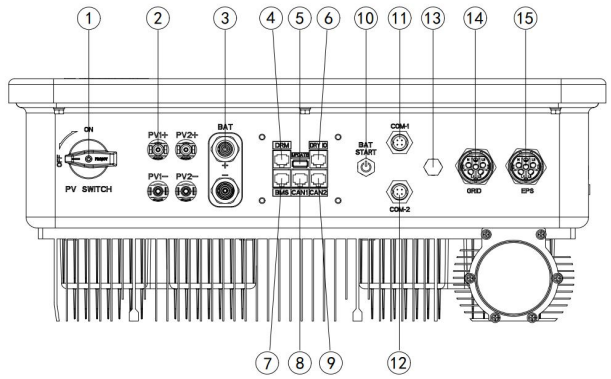
Before unpacking, carefully check whether the product information indicated on the carton is consistent with that indicated in the Purchase Order, and whether the product package is in good condition. If any problem, contact the supplier as soon as possible.

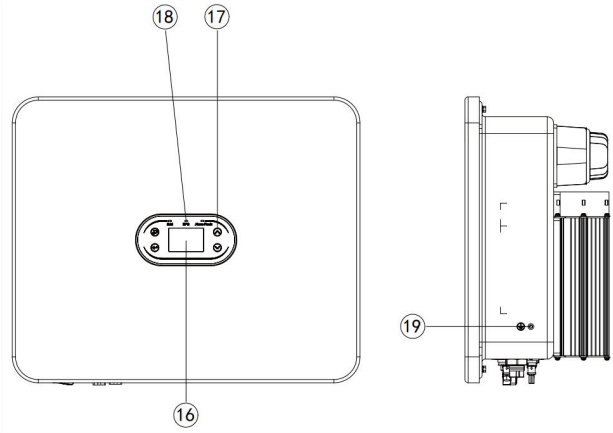
Table 1 Deliverables for Three-phase Hybrid Inverter

No.	Name	Quantity
1	Hybrid Inverter (unit)	1
2	PV Connector (pair)	2
3	Battery Connectors (pairs)	1
4	Network Cable	1
5	Quick installation guide	1
6	Wall-mounting Bracket	1
7	Waterproof Junction Box	1
8	M6*50 Expansion Bolts	3
9	M6*16 Bolt Assemblies	3
10	M6 Flange Nuts	3
11	M6 Stainless Steel Flat Washers	3
12	M4*12 Bolt Assemblies	2
13	485 Communication Cable	1
14	Smart meter	1

15	GPRS Module (Optional)	1
16	WIFI Module (Optional)	1

Overview





No.	Description	No.	Description
1	PV Input DC Switch	2	PV Input Terminal
3	Battery Terminal	4	DRM's RJ45 Interface (For Australia)
5	USB Port (Software Upgrade)	6	Dry Contact & NTC
7	BMS Lithium Battery Communication	8	CAN1 (Parallel Communication)
9	CAN2 (Parallel Communication)	10	Battery Cold Start Button

11	COM-1 (RS485 / Wi-Fi / GPRS communication)	12	COM-2 (smart meter RS485 communication)
13	Breather Valve	14	Grid Terminal
15	EPS Output Terminal	16	LCD Screen
17	Function Keys	18	LED Indicator Light
19	PE Grounding Point	/	/

❷ Before Installation

2.1 Location

Select installation site based on the following considerations:

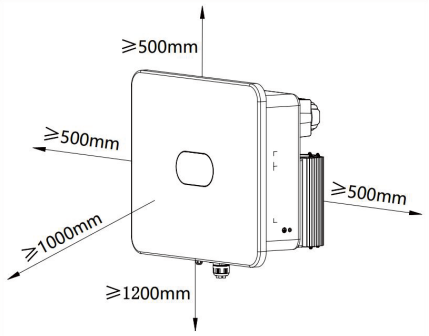


Fig. 1 Installation Spacing of Inverter (mm)

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

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

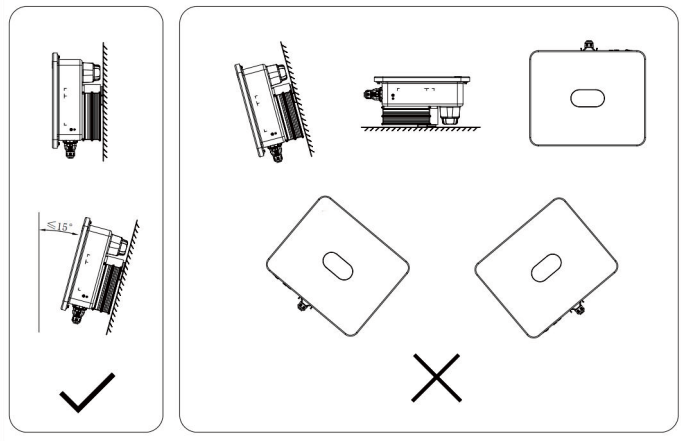


Fig. 2 Installation Location of Inverter

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

Inverter Model	DC side	AC side
	Recommended minimum wire size (length ≤ 50m)	Recommended minimum wire size (length ≤ 50m)
XD5-12KTR	11AWG	11AWG

❸ Mechanical Installation

The following takes wall mounting as an example.

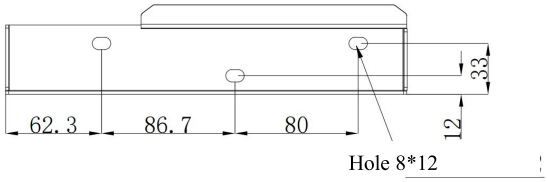


Fig. 3 Mounting Bracket of Inverter

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.

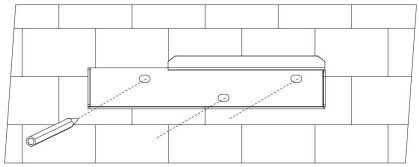


Fig. 4 Marking Screw Positions

(2) Drill the holes (diameter: φ8; depth: ≥55mm) using a hammer drill, and then install M6×50 stainless-steel expansion bolts.

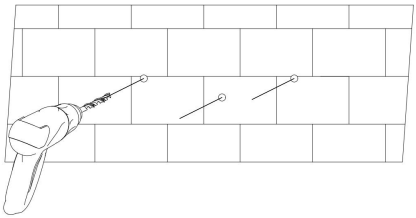


Fig. 5 Installing Expansion Bolts

(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.

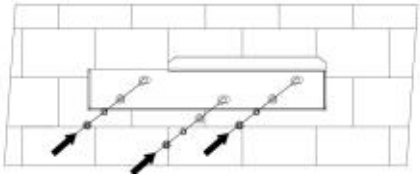


Fig. 6 Fixing and Locking the Wall-mounting Bracket

(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.

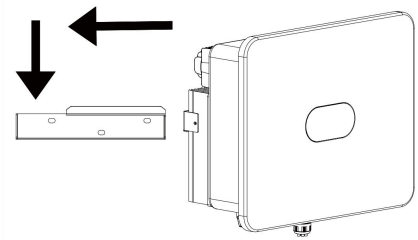


Fig. 7 Attach the Inverter to the Wall-mounting Bracket

(5) Tighten M4×12 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.

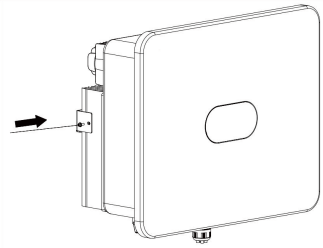


Fig. 8 Fixing and Locking the Inverter

❹ Electrical Connection

Note: The following wiring method is appropriate for Australia, New Zealand and South Africa.

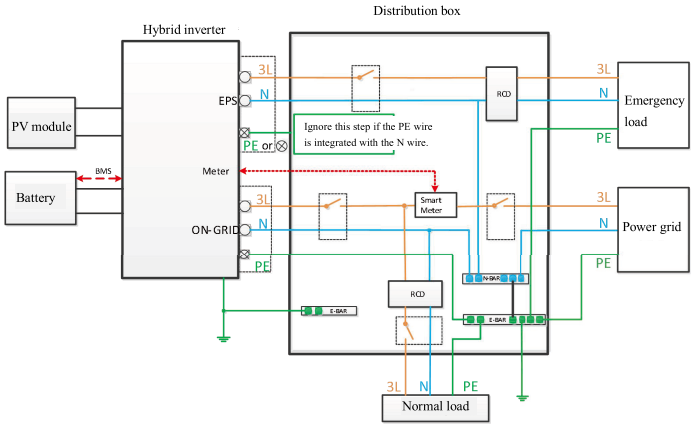


Fig. 9 Electrical Wiring Diagram of Hybrid Inverter

Note: The following wiring method is appropriate for regions other than Australia, New Zealand and South Africa.

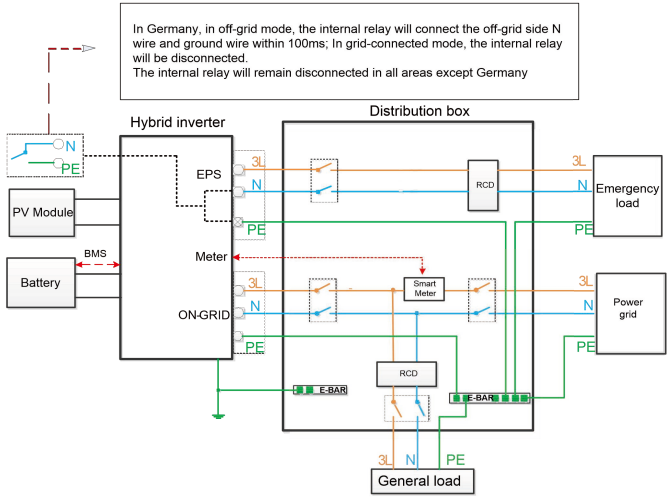
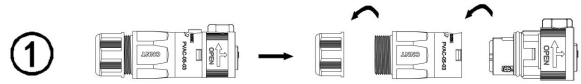


Fig. 10 Electrical Wiring Diagram of Hybrid Inverter

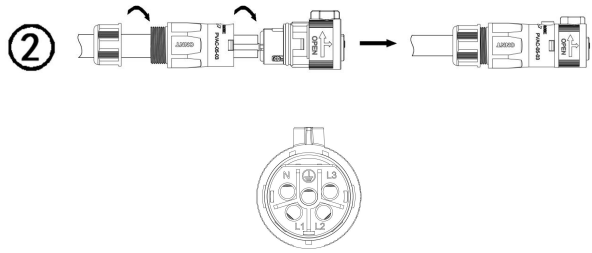
4.1 AC Wiring

The AC output is located at the bottom right of the hybrid inverter. The terminal on its left is the EPS port, while the terminal on the right is the GRID port. Steps for electrical connection of the hybrid inverter are as follows:

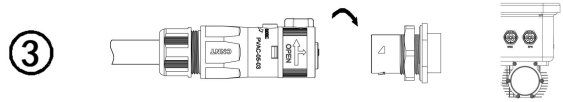
Step 1: Unscrew the AC terminal, and then use an appropriate tool to remove it as shown below.



Step 2: Pass the cable through the rubber nut, sealing ring and threaded sleeve in turn; connect the cable to the corresponding terminal with the correct polarity mark, and then tighten the threaded sleeve onto the AC terminal as shown below:



Step 3: Connect the prepared AC terminal to the EPS terminal or GRID terminal of the hybrid inverter as shown below.



Note: 1. If you use the grid connection function only, connect the power grid to the GRID port of the inverter.

2. Do not connect the GRID port directly to the EPS port, as this could cause damage to the inverter.

3. Do not connect the power grid to the EPS port, as this could cause damage to the inverter.

4. Power cable for GRID port or EPS port shall be ≥4mm^2 (11AWG).

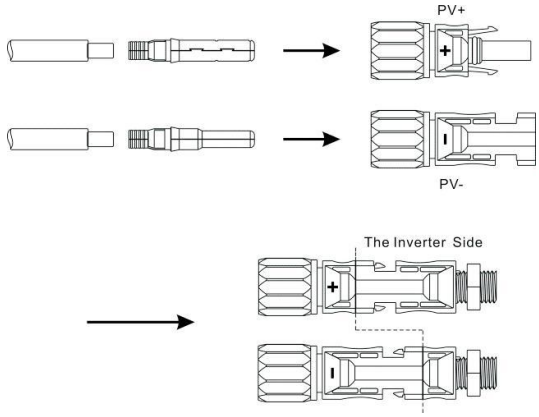
4.2 PV Wiring

MC4 connectors are provided at DC input side of the hybrid inverter. Below are the connection steps:

1.Turn off the DC switch.

2.Connect the positive terminal and negative terminal of the PV module respectively to the PV+ port and PV- port of the hybrid inverter.

Make sure the actual input voltage and current fall within the allowable range.



- Maximum allowable PV input voltage: 1100V (Please consider changes in the voltage at the minimum temperature).
- Maximum allowable PV input current: 20A

Note: It is recommended to use a specialized PV cable ≥4mm² (11AWG).

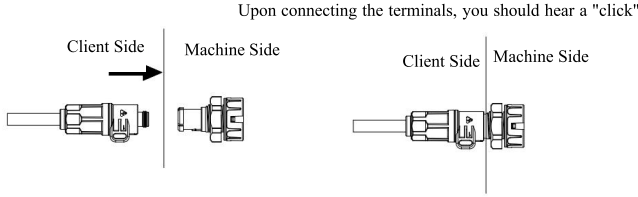
4.3 BAT wiring

Install the battery cable in the following steps:

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

(2) Pass the cable through the rubber nut, sealing ring, threaded sleeve and waterproof cover in turn;

(3) Crimp the battery cable supplied in the package to the corresponding O-terminal, and then connect the positive (negative) terminal of the battery to the positive (negative) end of the battery terminal of the inverter.



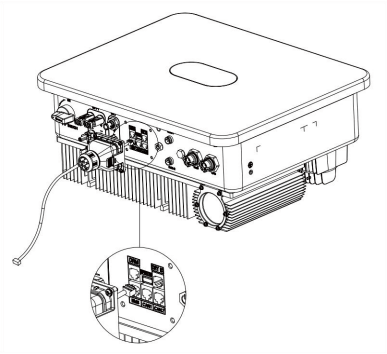
4.4 Communication Connection

4.4.1 To use a lithium battery, you need to connect the BMS system of the lithium battery in the following steps:

1. Unscrew the rubber nut on the waterproof cover of the hybrid inverter;
2. Pass the LAN cable through the rubber nut, sealing ring, threaded sleeve and waterproof cover in

turn;

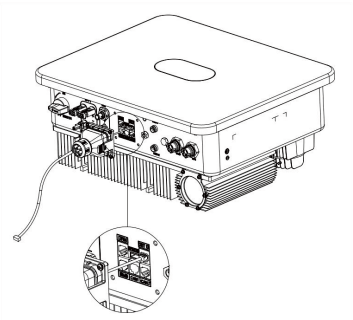
3. Connect the RJ45 terminal of the LAN cable to the BMS port of the hybrid inverter;
4. Lock the waterproof cover with screws;
5. Screw the rubber nut reliably onto the waterproof cover.



Note: If you are using a lead-acid battery or a lithium battery that does not support BMS communication, there is no need to connect the BMS communication cable. You can directly proceed to connect the lead-acid battery.

4.4.2 With a lead-acid battery, you need to connect a temperature sensor to monitor the ambient temperature of the battery. Connect the temperature sensor in the following steps:

1. Unscrew the rubber nut on the waterproof cover of the hybrid inverter;
2. Pass the NTC cable through the rubber nut, sealing ring, threaded sleeve and waterproof cover in turn;
3. Connect the RJ45 terminal of the NTC cable to the NTC port of the hybrid inverter;
4. Lock the waterproof cover with screws;
5. Screw the rubber nut reliably onto the waterproof cover.



Note: The probe of the temperature sensor used to monitor the ambient temperature of the lead-acid battery should be shorter than 1.5m; if you use lithium battery instead, there is no need to install a temperature sensor.

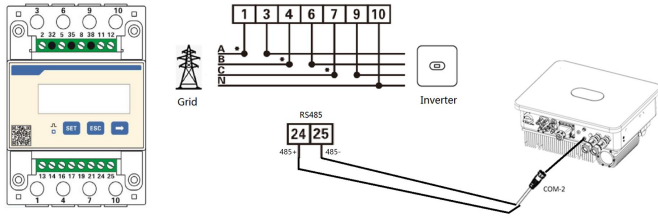
When all communication cables have been installed, push the waterproof cover into the bottom,

tighten the screws that fix the frame, and finally lock the waterproof cover.

4.5 Connection of Smart Meter

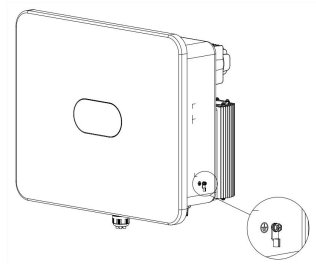
Ender user can also monitor home consumption with a smart meter. You can connect the communication cable of the smart meter as described below.

Connect the smart meter to COM-2 (waterproof RS485 terminal) by plugging and tightening, as shown in the figure below:



4.6 Connection of Grounding Wire

The hybrid inverter should be grounded reliably. The grounding wire should be ≥10mm². The grounding point (GND) is shown below.



❺ Operation

5.1 Inspection before Operation

Check as follows before operation:

(1) Check whether the voltage of the PV strings is in the allowable input voltage range of the inverter or not.

(2) Check whether the voltage of the AC side is normal or not.

(3) Check whether the battery connection is correct and the battery voltage is normal.

(4) Check whether the inverter is grounded properly or not.

(5) Ensure all switches are at "Off".

(6) Ensure all electrical safety precautions are clearly identified on the installation site.

(7) Ensure the communication module is correctly connected.

5.2 Grid-tied Operation

Perform the following steps to start the inverter and complete the grid-connected operation of the inverter:

(1) Turn on the PV switch;

(2) Turn on the switch between the grid and the hybrid inverter;

(3) Turn on the switch between the battery and the hybrid inverter to wake up the battery;

(4) If you need to set the hybrid inverter, read the User Manual of the hybrid inverter for more instructions;

(5) The shutdown procedure is in the reverse order of the above.

LED Indications of Hybrid Inverter

The user can read more information via the buttons. The LED indications are explained below.

Solid red	Failure
Solid green	Normal working
Flashing in green	Countdown of grid connection
Solid yellow	Grid disconnected
Flashing in yellow and green	Program burning

5.3 Accessories and Wiring

485 pins definition

1 (red)	+5VDC
2 (orange)	A (RS485+)
3 (brown)	B (RS485-)
4 (black)	GND

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

5.4 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 Solar Inverters. You can visit www.invt.com or scan the QR code to download it. Service line: +86 400 700 9997

INVT Solar Technology (Shenzhen) Co., Ltd.

Certificate of Quality

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!

66001-01573 V1.1