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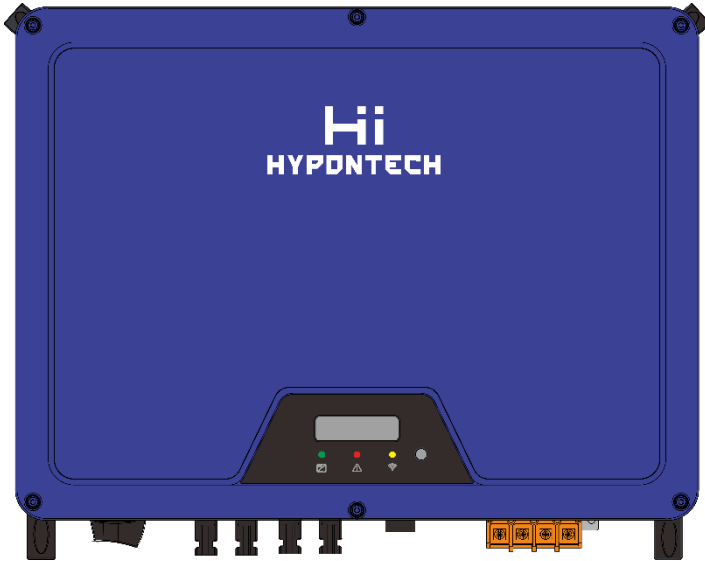
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Hi **HYPONTECH**
海鹏科技



HPT-30K/33K/36K/40K/50K Series

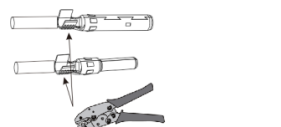
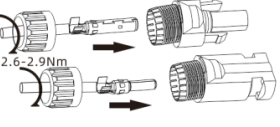
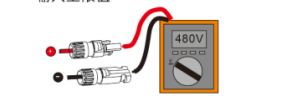
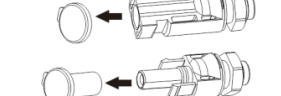
3-Phase Grid-tied Solar Inverters

USER MANUAL

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DC Commissioning:

<p>步骤一: 剥去电缆绝缘层,并插入对应端子 截面2.5-6mm²</p>  <p>7mm 直径5-8mm 正极冷压端子 7mm 负极冷压端子</p>	<p>步骤二: 用合适的压线钳, 压接对应线材</p> 	<p>步骤三: 把压接好的端子插到对应的塑胶壳</p>  <p>2.6-2.9Nm</p>
<p>步骤四: 检查光伏组串的连接电缆极性是否正确, 确保开路电压不超过逆变器输入上限值</p>  <p>480V</p>	<p>步骤五: 拔出机器端直流端子上的防尘帽 注意:不用的端子请保留其防尘帽</p> 	<p>步骤六: 连接接好线的客户端与机器端</p> 

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1. SYMBOLS ON THE LABEL

	DANGER, WARNING AND CAUTION		RECYCLABLE AND REUSABLE
	HIGH VOLTAGE AVOID CONTACT		AVOID DAMP AND MOISTURE
	HIGH TEMPERATURE AVOID CONTACT		SHIPMENT STACK LIMIT: 8
	CE MARKS		DO NOT DISPOSE WITH HOUSEHOLD WASTE
	PROCEED OPERATIONS AFTER 5 MINUTES DISCHARGE		BREAKABLE ITEM
	PLACE UPWARDS		USER MANUAL IN PACK

2. SAFETY AND WARNINGS

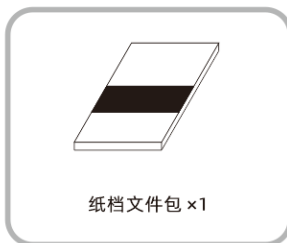
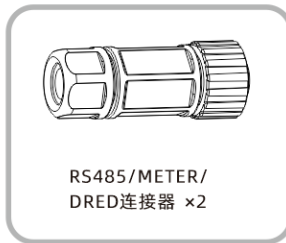
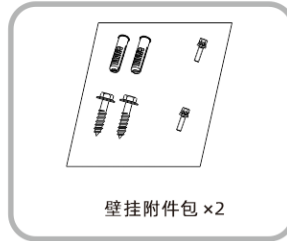
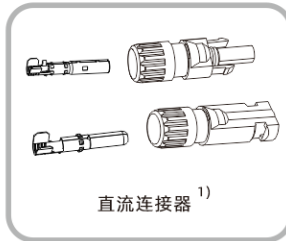
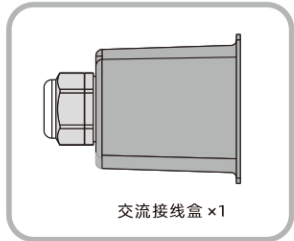
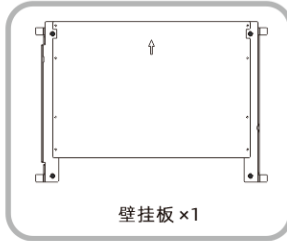
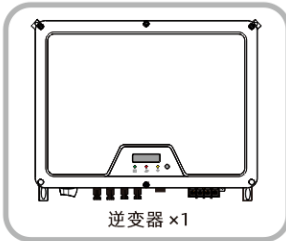
1. All persons who are responsible for mounting, installation, commissioning, maintenance, tests, and service of HYPONTECH inverter products must be suitably trained and qualified for corresponding operations. They MUST be experienced and have knowledge of operation safety and professional methods. All installation personnel must have knowledge of all applicable safety information, standards, directives, and regulations.

2. The product must ONLY be connected and operated with PV arrays of protection class II, in accordance with IEC 61730, application class A. The PV modules must also be compatible with this product. Power resources other than compatible PV arrays MUST not be connected and operate with the product.
3. When designing or constructing a PV system, all components MUST remain in their permitted operating ranges, and their installation requirements MUST always be fulfilled.
4. Under exposure to sunlight, the PV array may generate dangerous output in DC voltage. Contacts with the DC wires, conductors and live components in the inverter may result in lethal shocks.
5. High voltages in inverter could cause lethal electrical shocks. Before proceeding any work, including maintenance and/or service, on the inverter, fully disconnect it from all DC input, AC grid and other voltage sources. There MUST be a 5-minute waiting time after the full disconnection.
6. The DC input voltage of the PV array MUST never exceed the maximum input voltage of the inverter.
7. DO NOT touch parts of the inverter during operation as heat will be induced and these parts will exceed 60°C.

3. 3 UNPACKING

3.1 Scope of Delivery

Please inspect and check for completeness in the scope of delivery. Confirm with purchase order.

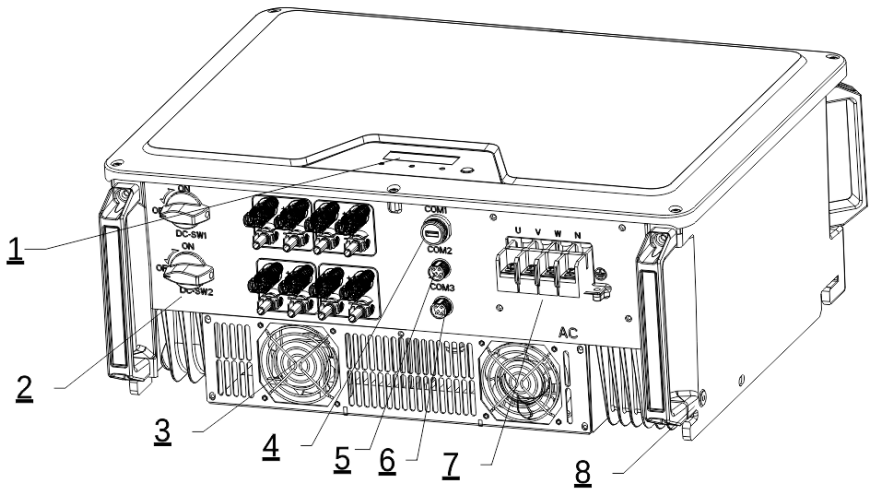


1. DC Connector

HPT-30K/33K/36K	6 pairs
HPT-40K/50K	8 pairs

2. Wi-Fi/GPRS optional

3.2 Product Overview

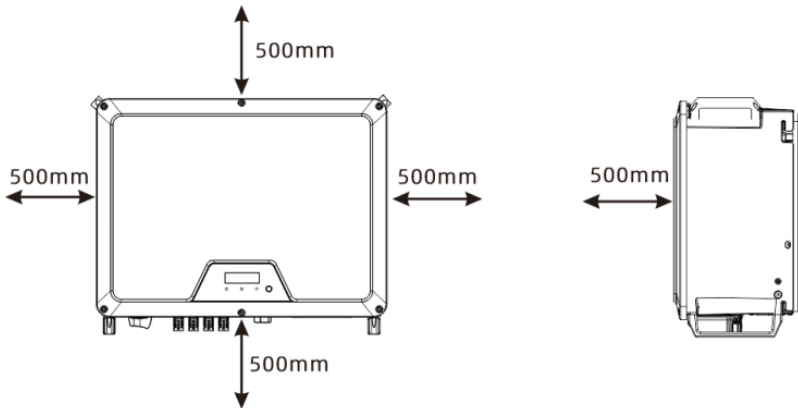


1. LED&LCD or LED
2. DC Switch
3. PV Terminal (s)
4. COM1: Wi-Fi/GPRS/RS485 port
5. COM2: Smart Meter port
6. COM3: RS485
7. AC Terminal
8. Secondary PE Terminal

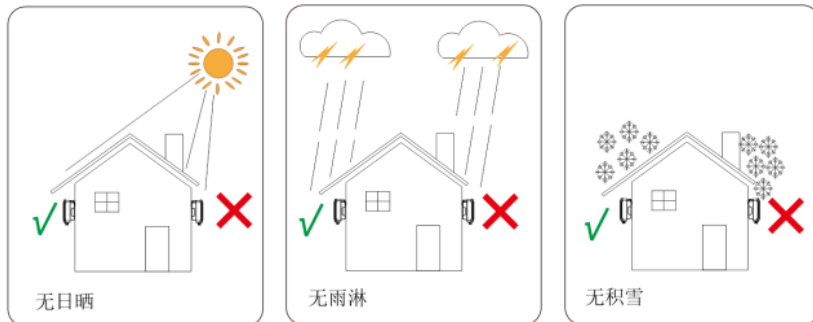
4. 4 INSTALLING

4.1 Installation Requirement

1. Please install the inverter(s) in places that can avoid inadvertent contact.
2. Installation method, location and surface must be fitting for the inverter's weight and dimensions.
3. Please install the inverter in an accessible location for operation, future maintenance and service.
4. The inverter performance peaks at ambient temperature lower than 45°C.
5. When installing in residential or domestic environment, it is recommended to install and mount the inverter on a solid, concrete wall surface. Mounting the inverter on composite or plaster boards or walls with similar materials would induce noise during its operation and is therefore not recommended.
6. DO NOT cover the inverter NOR place any objects on top of the inverter.
7. To ensure sufficient room for heat dissipation and maintenance, the clearing space between inverter(s) and other surroundings is indicated below for reference:

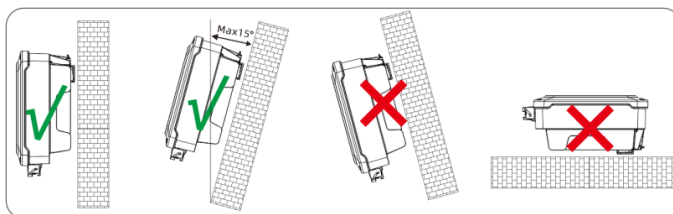


8. Avoid direct exposure to sunlight and rain and snow layup.



4.2 Mounting Location

1. DO NOT mount the inverter near any inflammable materials.
2. DO NOT mount the inverter near any explosive materials.



3. DO NOT mount the inverter on tilting surface over 15° backwards. Please mount the inverter on a vertical wall surface.
4. DO NOT mount the inverter on any surfaces tilting forward or to either sides.
5. DO NOT mount the inverter on a horizontal surface.
6. For easy installation and operation, please mount the inverter on a height that the display could match eye level.
7. The bottom side where all commissioning terminals are equipped MUST always point downwards.

4.3 Mounting

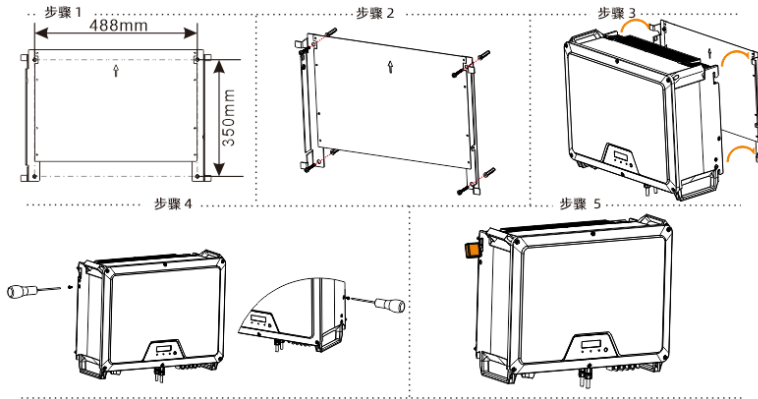
Moving the inverter:

1. Use machinery or manpower to move the inverter according to the situation on site.
2. It is recommended to move the inverter manually by at least two workers. Protective shoes, gloves and other PPE's (Personal Protective Equipment) are highly recommended. Focus on the pivot of the inverter and prevent tilting the inverter.
3. When using lifting machinery, thread the rope through two lifting handles on the upper side of the inverter. Pause when lifting the inverter up to 100 mm above the ground, ensure tightness of rope, then lift to the destination.

Wall-mounting the inverter

1. Use the mounting bracket as a template and drill holes of 10mm diameter and 70mm depth.
2. Fix the mounting bracket with the screws and expansion bolts packed in mounting accessories.
3. Hold onto the handles on the inverter and tilt it slightly forward. Hang up the inverter and attach it to the mounting bracket. Check both sides of the heat sink to ensure its stably attached.
4. Observe from above, ensure the inverter has been securely attached to the bracket.
5. Use M5 screws (T25 screwdriver, torque 2.5 Nm) to attach the heat sink fins to the mounting bracket.

It is recommended to attach the anti-theft lock to the inverter. Lock diameter $\varphi 4-5.5\text{mm}$ recommended.

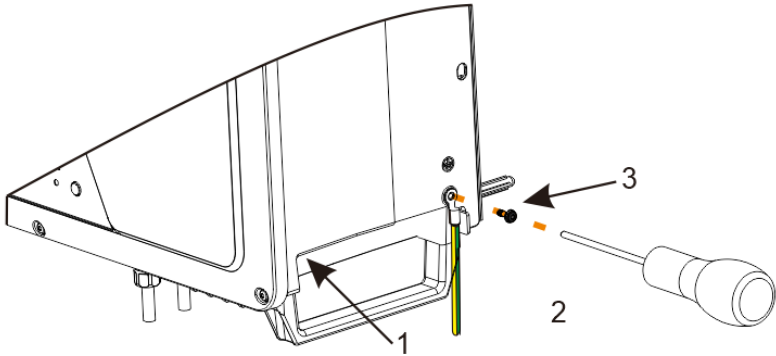


Racket-mounting the inverter:

In the same way as wall-mounting the inverter, only replace the expansion bolts and screws with M10*45 Stainless steel full thread screw assembly (The assembly incl. bolt, nut, flat washer, spring washer is not included in the package)

4.4 Installing the secondary PE cable

1. Insert the grounding conductor into the suitable OT terminal lug and crimp the contact.
2. Align the terminal lug with the grounding conductor and the ground washer on the screw. The teeth of the ground washer must be facing the housing.
3. Tighten it firmly into the housing (M6 PE terminal, screwdriver type: Pan head, torque: 4.5Nm).



Information on grounding components:

Object	Description
1	Housing
2	M6 terminal lug with protective conductor
3	M6×12 pan head screw

Note: PE cable requirements

Diameter	Cross-section	备注
$16 < S \leq 35 \text{mm}^2$	16mm^2	Only suitable when the material of PE cable is aligned with other AC phase cables. In case the materials are different, please ensure the resistance is equivalent to the figure mentioned in the table.
$S > 35 \text{mm}^2$	$S/2$	



Please install the secondary PE before connect any other cables.

Secondary PE cannot replace the connection of PE terminal in AC wiring. Both PE and secondary PE should be properly installed.

Hypontech will not take account for any consequences caused by violating the requirement.

5. 5 COMMISSIONING

5.1 Safety Instructions

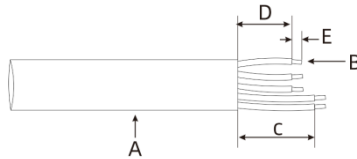
1. Measure the frequency and voltage of grid connection and make sure they follow the inverter's grid connection specifications.
2. An external circuit-breaker on the AC side (or a fuse) at $1.25 \times AC$ rated current is strongly recommended.
3. Reliability of all earth connections must be tested and valid.
4. Before commissioning, disconnect the inverter and the circuit-breaker or fuse, and prevent accidental reconnection.

5.2 AC Wire Assembly and Connection

5.2.1 AC Commissioning

AC cable requirement:

Five core flexible copper cable recommended, and strip the cable in such way:



	Description	Value
A	Outer Diameter	HPT-30K/HPT-33K/HPT36K: 22~30mm HPT-40K/HPT-50K: 30~50mm
B	Conductor cross-section	U,V,W,N线 (HPT-30K/HPT-33K/HPT36K): 16~35mm ²
		U,V,W,N线 (HPT-40K/HPT-50K): 铜线推荐35~50mm ² 铝线推荐用70 mm ²
		PE线: 见下表要求
C	N/PE Cable insulation strip length	Approx. 90 mm
D	U/V/W Cable insulation strip length	Approx. 70 mm
E	Cable insulation strip length	Approx. 20 mm
Make sure the strip length of PE is approx. 20 mm longer than L1、L2、L3 and N.		

AC phase cable cross-section	PE cable cross-section	Note
16<S≤35mm ²	16mm ²	

S>35mm ²	S/2	Only suitable when the material of PE cable is aligned with other AC phase cables. In case the materials are different, please ensure the resistance is equivalent to the figure mentioned in the table.
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Cable cross-section depends on the model of the inverter, ambient temperature, cable routing method, cable type, cable losses and other installation requirements.

Aluminum cable requirements:

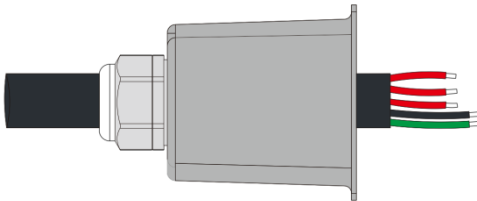
Copper aluminum transition terminal is obligated to prevent electrochemical reaction.

Please follow the steps:

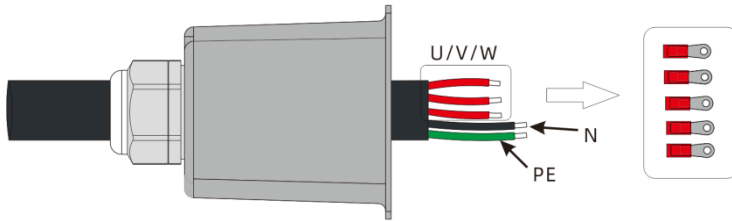


Danger due to high voltage electricity

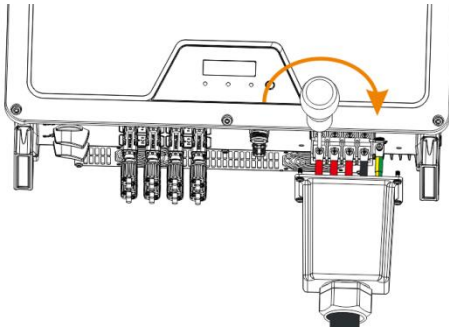
1. Disconnect AC circuit breaker and ensure it cannot be connected by accident.
2. Strip the cable as required.
3. Thread the cable through forcing nut of waterproof joint, sealing plug, waterproof joint and junction box.



4. Insert the grounding conductor into the OT terminal lug in the accessory pack and crimp the contact, ensure the insulation protection has been done properly.



5. Insert PE, N, U, V and W cable into correspondent hole. And secure with cross screwdriver (Torque: 4.5-6Nm).



False connection could damage the inverter

6. Screw the junction box onto inverter.

5. 2. 2 AC Switch Types

Please install an individual 2-stage miniature circuit breaker according to the following specifications:

Model	Maximum output current (A)	AC Breaker Rated current (A)
HPT-30K	50	63
HPT-33K	55	63
HPT-36K	60	80
HPT-40K	66.7	80
HPT-50K	80	100

5.3 DC Wire Assembly and Connection

1. PV modules of the connected strings must be of: the same time, identical alignment and tilting angle.
2. Before commissioning and connecting the PV arrays, the DC switch MUST be open.
3. Parallel strings must have the same number of modules.
4. It is mandatory to use the DC connectors within package for the connection of PV arrays.
5. The polarity of the PV arrays MUST be compatible to the DC connectors of the inverter.
6. The DC input voltage AND DC input current of the PV array MUST never exceed the maximum input allowance of the inverter.

DC Commissioning:



5.4 Residual Current Protection

This product is equipped with residual current protection device internally, in accordance with IEC 60364-7-714. An external residual current protection device is not needed.

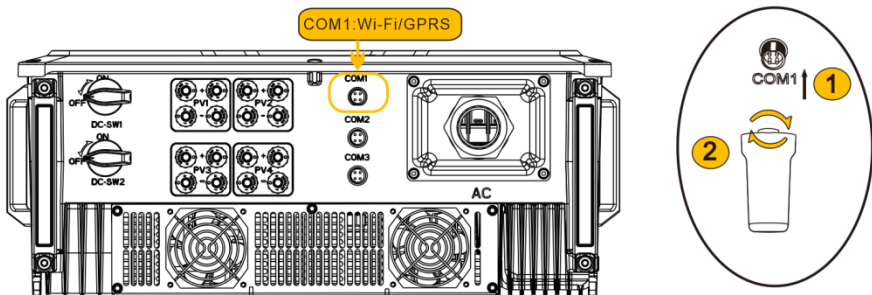
If the local regulation demands otherwise, it is recommended to install a 30mA Type B residual current protection device.

6. 6 COMMUNICATION

6.1 System monitoring via Datalogger - RS485/Wi-Fi /GPRS

(Optional)

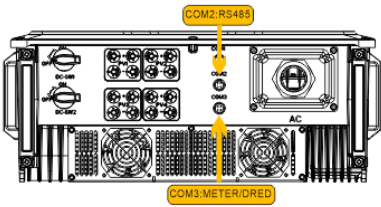
Wi-Fi /GPRS Datalogger Installation



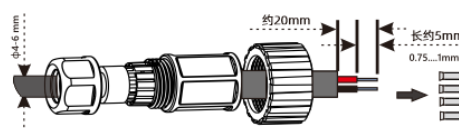
1. Unpack the Datalogger from package.
2. Unscrew the cap in COM1 port and plug the Datalogger in and tighten.
3. For user guidance and configuration of Datalogger, please refer to the corresponding HYPONTECH Wi-Fi Stick Guide manual, which is available in printed form inside Documents pack, or an online manual on HYPONTECH website at <https://www.hypontech.com/xiazai>

RS485 Installation

位置说明



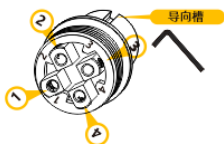
步骤 1



将导线端插入欧式端子 (DIN46228-4) 并压接好

步骤 2

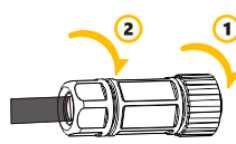
将压接好的导体插入相应的端子中, 用所附包装袋内的螺丝刀拧紧螺钉。



<p>▶ RS485 接到 COM1接口</p> <p>Power + ▶ PIN 1</p> <p>Power - ▶ PIN2</p> <p>RS485 A ▶ PIN3</p> <p>RS485 B ▶ PIN4</p>	<p>▶ METER与DRED接到 COM2接口</p> <p>RS485 A ▶ PIN2</p> <p>RS485 B ▶ PIN3</p> <p>COM LOAD/0 ▶ PIN1</p> <p>REF GEN/0 ▶ PIN4</p>
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步骤 3

将线缆穿过螺纹套筒和压紧螺母, 并拧紧



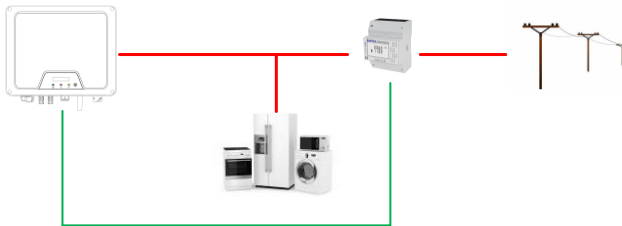
步骤 4

将完成接线的连接器插入交流输出端口并旋紧。
操作时, 先将接线端子座头部的凹槽对准输出端口内圈的凸筋



6.2 Output Efficiency Control via Smart Meter

The inverter's active power output and efficiency could be monitored via the application of a smart meter.



Please refer to **SDM630-Modbus V2 User manual** for its connection and baud rate settings.

7. 7 START UP AND OPERATION

7.1 Safety Check Before Start Up




Please check before switching on any voltage resources connected to the inverter and closing inverter's DC switch:

1. Grid Voltage: Check the grid voltage at point of connection at the inverter complies with permitted range of the inverter.
2. Mounting Bracket: Check if the mounting bracket is properly and securely installed.
3. Mounting of the inverter: Check if the inverter is properly mounted and attached to the mounting bracket.
4. DC Connectors: Check if the DC connectors are installed correctly on terminals.
5. AC Connectors and Wire Assembly: Check if wires are assembled correctly on the AC side and if the AC connector is properly and securely installed. Check if the AC connector is firmly plugged into AC terminal.
6. Cables: Check if all cables are reliably connected. Check if the connections are effective, while the insulations are undamaged.
7. Groundings: Check all groundings using multimeter and if all exposed metal parts of the inverter are properly grounded.
8. DC Voltage: Check if the largest open-circuit voltage of PV arrays complies with the permitted range.
9. DC Polarity: Check if the wires from DC voltage resource are connected to terminals with correct polarity.
10. Grounding Resistance: Check if the grounding resistance of PV strings $>1\text{M}\Omega$ using a multimeter.

After all installation and checks, close the AC circuit-breaker, then the DC switch. The inverter will start to operate when DC input voltage and grid conditions meet the requirements of inverter startup.

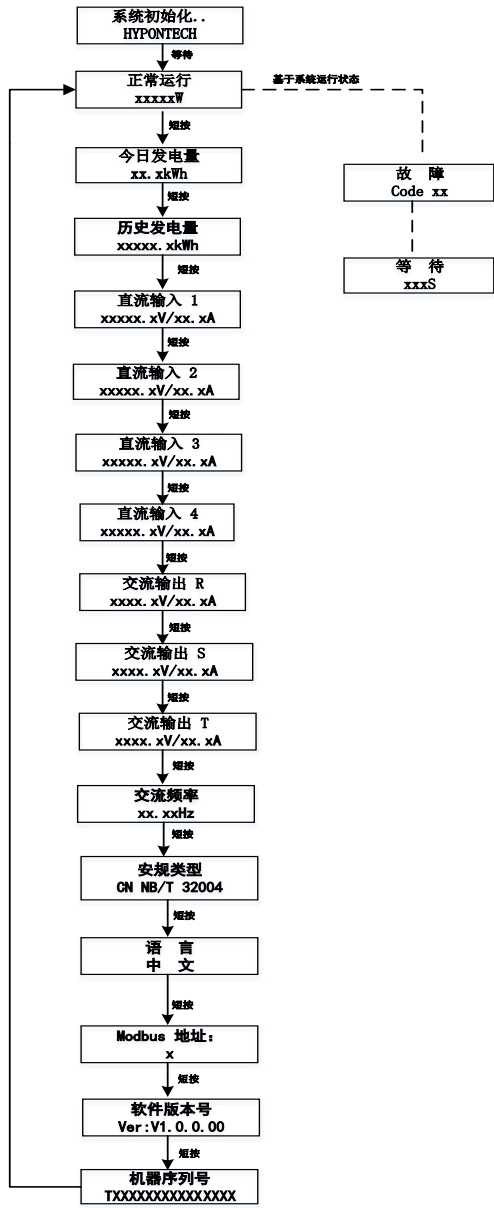
7.2 Inverter LED Indicators

When the inverter operates, LED symbols on display have the following meanings:

 <p>POWER</p>	<ul style="list-style-type: none"><input checked="" type="radio"/> ON Inverter Power ON and Feeding Power to Grid<input type="radio"/> Blink Inverter Power ON. Not Feeding Power to Grid<input type="radio"/> OFF Inverter Power OFF. DC Disconnected
 <p>FAULT</p>	<ul style="list-style-type: none"><input checked="" type="radio"/> ON Inverter is Faulty<input type="radio"/> OFF No Fault
 <p>COM</p>	<ul style="list-style-type: none"><input type="radio"/> Blink Communication Device Connected<input type="radio"/> OFF Communication Device Disconnected

7.3 Display and Control Logics

When inverter starts up and operates, there is a control button beside LCD Display of the inverter. Please follow the logics listed below.



8. DISCONNECTING FROM VOLTAGE RESOURCES

Before proceeding any operations on inverter, please disconnect the inverter from all voltage resources as described in this manual.

Following these steps in described sequence are mandatory.

1. Disconnect miniature circuit-breaker and prevent from unintentional reconnections.
2. Open the DC switch and prevent the switch from closing unintentionally.
3. Use clamps to ensure there is no electrical current in DC wires.
4. Disconnect all DC connections and resources. Unplug the DC connectors, and DO NOT pull the cables.
5. Use multimeter to ensure the voltage on DC terminals of inverter is 0.
6. Unscrew and remove the AC connector.



Danger to life due to high voltages.

Inverter capacitors need 10 minutes to be completely de-energized. Please wait for 10 minutes to remove the cover.

When an error occurs, DO NOT remove the cover of the inverter onsite. Improper operations and attempts may induce electric shock.

9. TECHNICAL PARAMETER

MODEL	HPT-30K	HPT-33K	HPT-36K	HPT-40K	HPT-50K
INPUT / DC					
Max. PV Power / Wp	49500		54000	60000	65000
Max. Input Voltage / V	1100				
MPP Voltage Range / V	150-1000				
Full Load MPP Voltage Range / V	330-900	330-900	380-900	430-900	500-900
Min. DC Voltage / Start Up Voltage / V	150/180				
Nominal DC-Input Voltage / V	620				
Max. Input Current / A	30/30/30			30/30/30/30	
Max. DC Short Circuit Current / A	45/45/45			45/45/45/45	
No. of Independent MPPT Inputs	3			4	
No. of PV Strings per MPPT	2				
OUTPUT / AC					
Rated Power / W	30000	33000	36000	40000	50000
Max. Apparent AC Power / VA	33000	36300	39600	44000	55000
Rated Grid Voltage / Vac	380/400 3 / 3L-N-PE or 3 / 3L-PE				
Rated Power Frequency / Hz	50/60				

Max. Output Current / A	50	55	60	66.7	80
Power Factor	0.8ind to 0.8cap				
THDi @ Rated Power	<3%				
EFFICIENCY					
Max. Efficiency	98.7%				98.8%
Euro. Efficiency	98.3%				98.4%
PROTECTION FUNCTION					
Anti-Islanding Protection	Integrated				
Input Reverse Polarity Protection	Integrated				
Insulation Resistance Detection	Integrated				
Residual Current Monitoring	Integrated				
Output Over Current Protection	Integrated				
Output Short Circuit Protection	Integrated				
Over Voltage Protection	II (DC), III (AC)				
Surge Protection	DC: Type II / AC: Type II				
GENERAL DATA					
Dimensions (W*H*D) / mm	580*435*242				
Weight / Kg	38			40	
User Interface	LCD & LED or LED				
DC Connection Type	MC4 (D4, SUNCLIX, H4 optional)				
AC Connection Type	Plug-in Connector				

Communication	RS485/WiFi/GPRS (optional)			
Cooling Method	Smart Fan Cooling			
Operating Ambient Temperature / °C	-25 ~ +60			
Relative Humidity	0% to 100%			
Max. Operating Altitude / m	2000 (>2000 Derating)			
Protection class (IEC 60529)	IP65			
Climatic Category (IEC 60721-3-4)	4K4H			
Topology	Transformerless			
Night Consumption / W	<1			

10. 10 TROUBLE SHOOTING

Earth Fault Alarm

This inverter complies with IEC 62109-2 clause 13.9 for earth fault alarm monitoring.

If an **Earth Fault Alarm** occurs, the **error code 6** will be displayed on the LCD. Red LED indicator will also light up.

If an external indication of earth fault alarm is required, please connect PV System to inverter monitoring app/portal. The monitoring platform will send email notification in the event of an Earth Fault. Please refer to Sector 6.1 and HYPONTECH WI-FI STICK GUIDE on how to setup your inverter communication function.

Full Error Code and Corrective Measures

When the PV system does not operate normally, we recommend the following solutions for quick troubleshooting. If an error occurs, the Error code will be displayed on the inverter's screen or on the Hypontech's monitoring App/Web, the red LED will light up.

The corresponding corrective measures are as follows:

Error Code	Fault Name	Description	Corrective Measures
1	Functional fault in Micro-Controller Unit (MCU)	MCU abnormal self-check in start process	Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. If this fault is still being displayed, please contact service.
2	A faulty current sensor detected	AC current sensor detect current abnormal in the start process	Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. If this fault is still being displayed, please contact service.
3	Ground fault circuit interrupter (GFCI) sensor error	GFCI sensor self-check abnormal	Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. If this fault is still being displayed, please contact service.

4	A faulty grid relay detected	The difference between INV voltage and output voltage exceeds limit.	<ol style="list-style-type: none"> 1. Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. 2. If the fault persists, measure the phase to phase voltage and phase to zero and zero to ground voltage with a multimeter to ensure that the voltage is normal and the zero to ground voltage value should not be greater than 10V. 3. Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. <p>If this fault is still being displayed, please contact service.</p>
5	PV voltage too high	When the PV voltage of any circuit is greater than 1020V, it is determined as the PV voltage is too high.	Check the open-circuit voltages of the strings and make sure it is below the maximum DC input voltage of the inverter. If the input voltage lies within the permissible range while the fault occurs, please contact the service.
6	Surface insulation resistance error	In the process of power on and start-up, the insulation impedance of PV + and PV - to ground is detected. When the detection insulation impedance is less than 200kohm, it is judged as insulation fault.	<ol style="list-style-type: none"> 1. If it happens occasionally, it may be caused by rainy or humid environment. After the fault is eliminated, the inverter can resume normal operation without other actions. 2. If there is continuous alarm, please check the PV array's insulation to ground and make sure that the insulation resistance to ground is greater than 200KΩ. Otherwise, visual inspection of all PV cables and modules. Make sure the grounding connection of the inverter is reliable. <p>If all above are normal, please contact the service.</p>
7	Ground fault circuit interrupter (GFCI) exceeds the permissible range	residual current over the permission range	<ol style="list-style-type: none"> 1. Make sure the grounding connection of the inverter is reliable. 2. Make a visual inspection of all PV cables and modules. <p>If this fault is still shown, contact the service.</p>
8	Inverter temperature too high	Heat sink and internal environment temperature higher than 85 degree	<p>Please confirm:</p> <ol style="list-style-type: none"> 1. Whether the airflow to the heat sink is obstructed. 2. Whether the installation site is in direct sunlight and ambient temperature around the inverter is too high. <p>If all above is normal, contact the service.</p>

9	Utility grid disconnected	inverter detected grid voltage failed	<p>1.If it happens occasionally, it belongs to the short-time abnormality of the power grid, the inverter will return to normal operation after detecting that the power grid is normal, and there is no need to deal with it.</p> <p>2.If it cannot be recovered for a long time, please confirm:</p> <p>①whether the AC circuit breaker is disconnected</p> <p>②whether the AC terminal or fuse is in good contact</p> <p>③whether the power supply line is normal</p> <p>If this fault is still being shown, contact the service.</p>
10	Grid voltage exceeds the permissible range	grid voltage exceeds the Safety regulations	<p>1.If it happens occasionally, it belongs to the short-time abnormality of the power grid, the inverter will return to normal operation after detecting the normal power grid, and there is no need to deal with it.</p> <p>2. In case of frequent occurrence but automatic recovery, please confirm if the grid voltage is outside the permissible range due to local grid conditions, try to modify the values of the monitored operational limits after informing the electric utility company first.</p> <p>3.If it cannot be recovered for a long time, please confirm:</p> <p>①whether the AC circuit breaker is disconnected</p> <p>②whether the AC terminal is in good connection</p> <p>③whether the power supply line is normal</p> <p>④whether the AC cable wiring (such as wire length and wire diameter) complies with the user manual guidance</p> <p>⑤whether the safety regulation settings are normal</p>
11	Grid frequency exceeds the permissible range	grid frequency exceeds the Safety regulations	<p>1.If it happens occasionally, it belongs to the short-time abnormality of the power grid, the inverter will return to normal operation after detecting the normal power grid, and there is no need to deal with it.</p> <p>2. In case of frequent occurrence but automatic recovery, please confirm if the grid voltage is outside the permissible range due to local grid conditions, try to modify the values of the monitored operational limits after informing the electric utility company first.</p> <p>3.If it cannot be recovered for a long time, please confirm:</p>

			<p>①whether the AC circuit breaker is disconnected</p> <p>②whether the AC terminal is in good connection</p> <p>③whether the power supply line is normal</p> <p>④ whether the safety regulation settings are normal</p>
12	DC component of the electricity exceeds the permissible range	the current exceeds 1A in stastic state and 4A in dynamic state	Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. If this fault is still being displayed, please contact the service.
13	EEPROM Error, e.g. transition disturbance	Micro CPU read EEPROM failed	Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. If this fault is still being displayed, please contact the service.
14	Internal communication fault	Master CPU communicate with slave CPU abnormal	Disconnect the inverter from the utility grid and the PV array, and reconnect it after LED turns off. If this fault is still being displayed, please contact the service.
15	Bus-voltage too high	Bus-voltage is greater than 1030V	Check the open-circuit voltages of the strings and make sure it is below the maximum DC input voltage of the inverter. If the input voltage lies within the permissible range while the fault occurs, please contact the service.
16	Bus-voltage too low	Bus-voltage is 20V lower than standard Bus-voltage	Check the open-circuit voltages of the strings and make sure it is below the maximum DC input voltage of the inverter. If the input voltage lies within the permissible range while the fault occurs, please contact the service.
17	DRM S9 Error	DRM switch S9 fault	Check the connection of DRM device. If the DRM device is connected normally while this fault occurs, please contact the service.
18	DRM S0 Error	DRM switch S0 fault	Check the connection of DRM device. If the DRM device is connected normally while this fault occurs, please contact the service.

19	N and PE voltage exceeds permitted range		Check if the inverter is securely grounded.
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11. SYSTEM MAINTENANCE

For the inverter's long-term performance, it is suggested to maintain your inverter regularly:

NOTICE:

HEAT SINK MIGHT INDUCE INJURY

When the inverter is operating, the heat sink might exceed 60°C

- Please disconnect all electrical cables and connections. Wait for the inverter to cool down completely.
- Use compressed air cleaning or a soft brush to clean the inverter heat sink.
- ALL aggressive chemicals, cleaning solvents or strong detergents are FORBIDDEN

Content	Maintenance Measures	Cycle
System Cleaning	<ul style="list-style-type: none"> • Check if the heat sink is covered and dusted • Maintenance of DC Switch can be performed at night. Turn the switch to ON and OFF positions for 4~5 times. • Use a wet cloth to clean the display 	Annually OR Half a year
System Status	<ul style="list-style-type: none"> • Inspect the enclosure for damage/deformation • Listen for abnormal noises during operation • Check if the parameters are normal during operation 	Half a year
Commissioning	<ul style="list-style-type: none"> • Check if the cables are loose • Check if the cable insulations are damaged, especially the parts in contact with metal surfaces 	Half a year after first commissioning Annually OR Half a year
Grounding	<ul style="list-style-type: none"> • Check if the cables are securely grounded 	Half a year after first commissioning Annually OR Half a year