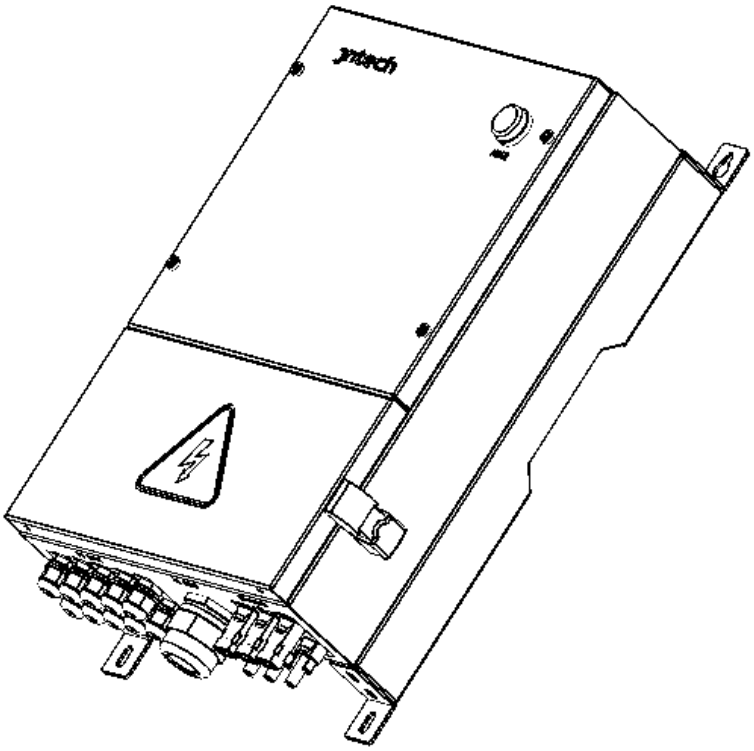
Power Pack

user manual

JNPH1AR

JNPH2AR



jntech

Hefei JNTECH New Energy Co., Ltd

V1.2

Preface

Manual Instruction

This manual describes the transportation, installation, operation, maintenance and troubleshooting of the following JNTECH Power Pack (Short as Power Pack).

- JNPH1AR

  For JNP2K2H/ JNP3KH/ JNP3K7H/ JNP4KH/ JNP5K5H/JNP7K5H solar pumping system.

- JNPH2AR

  For JNP11KH/ JNP15KH/JNP18K5H solar pumping system.

In order to describe conveniently later, there is no distinguish between JNPH1AR, JNPH2AR, They will be short for JNPH x AR.

Target Reader

This manual applies to the professional engineering and technical person who is responsible for installing and operating of Power Pack.

Use the Manual

Please read this manual carefully before installing and operating Power Pack.
Please keep this manual well for operation and maintenance in future.
The manual content would be constantly updated and revised, but it unavoidably has slightly discrepancies or errors with real Power Pack, please kind prevails if user purchases our Power Pack.

Symbol Used

The following safety symbols may be used in this manual, and the meanings are shown in below.

Safety Symbol	Meaning
Danger	Means that it may lead to serious accident of injuries, if safety warning is ignored.
Warning	Means that it may lead to serious accident of injuries, equipment serious damage or main business interruption, if safety warning is ignored.
Notice	Means that it may lead to moderate accident of injuries, equipment moderate damage or part of the business interruption, if safety warning is ignored.
Noted	Means that the content is additional information.

Power Pack related symbols:

Symbol	Meaning
⎓	DC power.
~	AC power.
	Refer to relevant instructions.
	Cannot discard Power Pack together with domestic garbage.
	Beware of dangerous high-voltage.
	Should wait for 5 minutes after Power Pack and PV panel or AC power are disconnected, then Power Pack only can be touched.
	Beware of hot surface The Power Pack temperature can exceed 60℃ during operation.

Contents

1 Safety Instructions

For the electrical and electronics equipment, safety relates to the whole process of installation, commissioning, operation and maintenance. Therefore, incorrect use or operation would damage the life and personal security of operating person or the third party, and Power Pack.
In order to reduce damage of Power Pack and other equipment, user or operating person should strictly abide by all the safety information tips of danger, warning and notice which are in the process of operating and maintaining.


Warning!

All the installation and operation of JNPHxAR Series Power Pack must be done by professional and technical person. Professional and technical person need:

- Receive special training.
- Read this manual carefully and master the operation related to safety matters.

Any damage caused by improper installation or operation will be beyond the warranty scope.

Before installation


Notice!

User should check the Power Pack if there is any damage during transportation. Please contact Hefei JNTECH New Energy Co., Ltd or transportation company immediately if some problems of Power Pack are found.

Installing

Ensure Power Pack not have electrical connections and electricity before installing.


Danger!

The solar cell arrays should be covered with opaque materials when installing the photovoltaic arrays during the day, otherwise the solar cell arrays will generate high voltage, causing person casualties.


Waning!

If Power Pack damage caused by the following circumstances will be beyond the warranty scope.

- Ensure that the open circuit voltage (Voc) of every PV module string do

not exceed 880V

- It would influence the machine performance and may cause machine damage if the installation environment is selected improperly.
- Do not install the Power Pack in inflammable, explosive place or inflammable, explosive materials storage place.
- Do not install the Power Pack in explosive dangerous place.
- Do not install the Power Pack in place where is vulnerable to lightning strike.
- Do not install the Power Pack in place where have much salt fog.
- When running the Power Pack, please ensure good ventilation.
- Power Pack should be installed erectly, and ensure the heat sink is without shelter.

Electrical connections

Warning!

- All the operation and wiring work should be operated by professional electrical or machine engineer.
- Please do not close any breakers before all the equipment are not fully connected well.

Notice!

- All the electrical installation must meet the electrical installation standard of local and country.
- In order to ensure safe running, proper grounding, using appropriate conductor size and providing short circuit protection are required.
- Connection cable must select suitable specification, firm connection and good insulation.

Running

Danger!

- Please do not plug any connectors under Power Pack charged state!
- Please do not open the cover plate under Power Pack charged state!

Maintenance


Danger!

- Maintenance should be done by professional maintenance technical person.
- Please ensure that AC side breakers should be turned off firstly, then DC side breakers should be turned off before checking and maintaining, after waiting at least 5 minutes, should measure DC side and AC side voltage with a voltage meter, to ensure that operation under the circumstance of no voltage between DC side and AC side.

2 Product Introduction

2.1 Power Pack application system Introduction

The application of Power Pack can keep water pumping system working 24 hours a day. As Utility grid or Generator shall worked as power supplement in system, besides of solar energy, which produce a great flow rate than you will see with only solar power. A common application is for diesel generator or unstable regions of utility grid. When the sun irradiation is insufficient, just switch on the AC power source, which will work as supplement; And even at night, AC power source can work as pass by.

> Warning!
>
> Power Pack can't be connected with the PV array, which is positive or negative grounded!

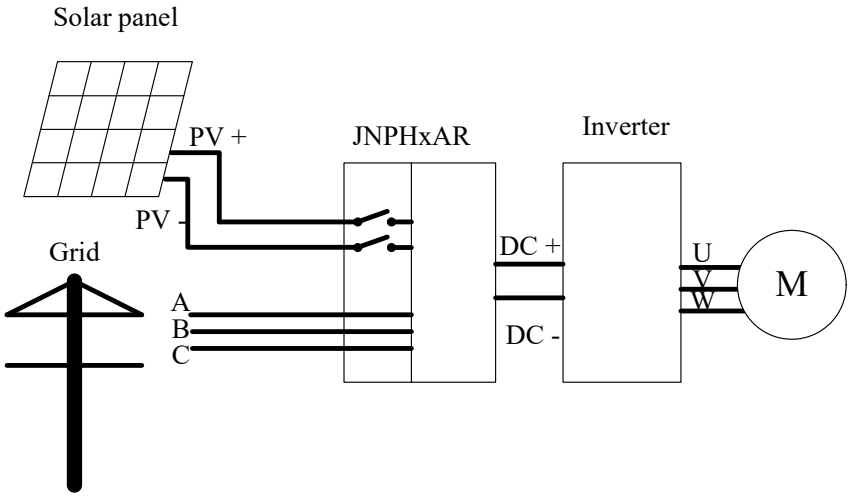


Figure2-1 Power Pack application System

> Noted!
>
> Make sure that Vmp is very near to the rectifier voltage when the system was designed. That means if the AC voltage is 380V,then the rectifier voltage is 1.414*380V≈537.3V,and the system was designed used 18 pieces panels which is 30V(Vmp),so Vmp is 30*18=540V.if the rectifier voltage is more different from Vmp , the power of solar will not be used in maximum mode.

2.2 Product's Introduction

2.2.1 Appearance

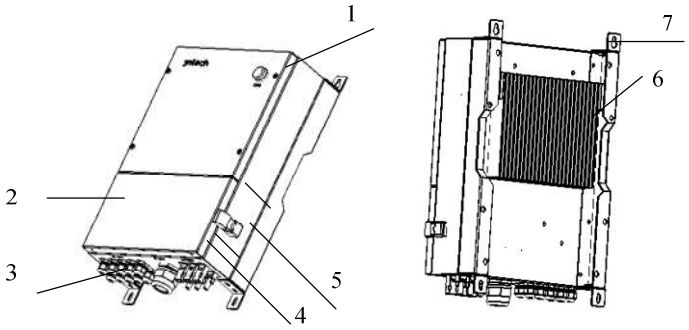


Figure 2-2 Appearance of Power Pack

Table 2-1 Power Pack appearance information table

No.	Name	Introductions
1	Power Indicator	Light on when Power Pack AC side power on.
2	Bottom Cover	To switch the connect and disconnect PV input.
3	Connection Terminals	PV Input, AC Input, DC Output.
4	Machine serial No.	Manufacturing code, when need after-sales service should provide the No.
5	Nameplate	Power Pack basic parameters listed on the nameplate for basic information about Power Pack.
6	Radiator	Help machine heat dissipation.
7	Hanger	Help to install and fix Power Pack.

2.2.2 Production Dimensions

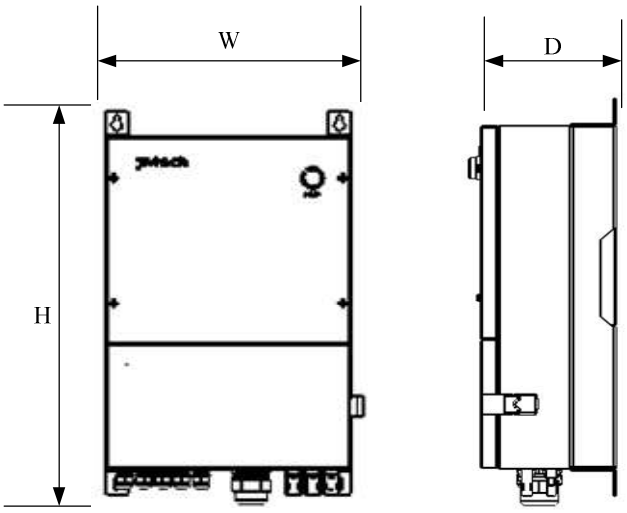


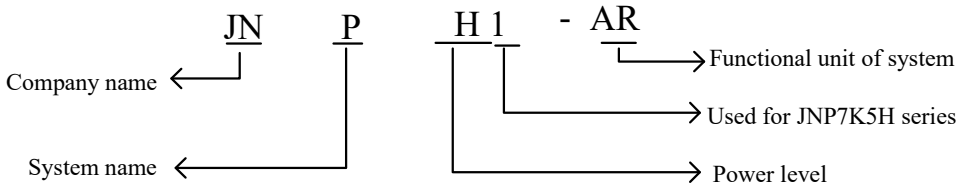
Figure 2-3 Dimension drawing of Power Pack (Unit：mm)

Table 2-3 Power Pack dimension table

Model	Width (mm)	Height(mm)	Depth(mm)	Net weight(kg)
JNPH1AR	320	450	150	13.5
JNPH2AR	320	450	150	13.5

2.2.3 Product Name

The way of product naming, take JNPH1AR for example



3 Power Pack Unpacking

3.1 Unpacking Check

The product has been tested and checked carefully before transportation, but damage may be caused during transportation, therefore, the product should also be checked carefully before installation

- Please check whether Power Pack outer packing is in good condition;
- After unpacking, please check whether the equipment is in good condition;
- According to the packing list to check whether all the parts is correct and in good condition

If any damage is found, please contact Hefei JNTECH New Energy Co., Ltd. or the transportation company. Please keep well the photos taken at the damaged parts and we'll provide you with best and fastest services. Hefei JNTECH New Energy Co., Ltd. supplies the standard Power Pack and some commonly used accessories as below:

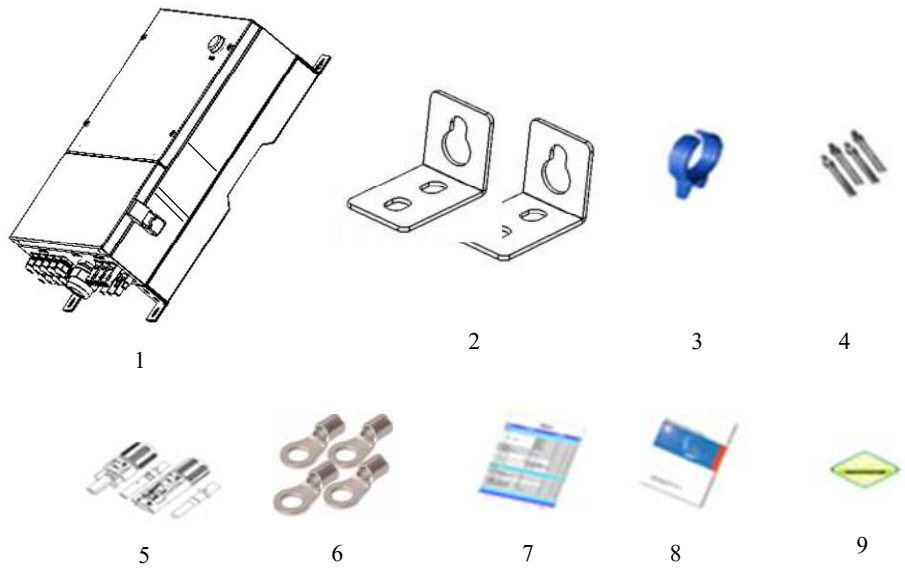


Figure 3-1 Power Pack and standard fittings

Noted!

Photos are for reference only, please in kind prevail!

Table 3-1 Power Pack and fittings table

No.	Introduction	
1	Power Pack	Included
2	Installation hanger	Included

3	Blue ring tool	Included
4	Expansion bolt	Included
5	PV connector	Included
6	Cool pressure terminal	Included
7	Packing list	Included
8	Quick installation guideline	Included
9	Certificate of inspection	Included

3.2 Identify Power Pack

The nameplate in the side of Power Pack, and it shows the Power Pack model, some important parameter and certificate mark.

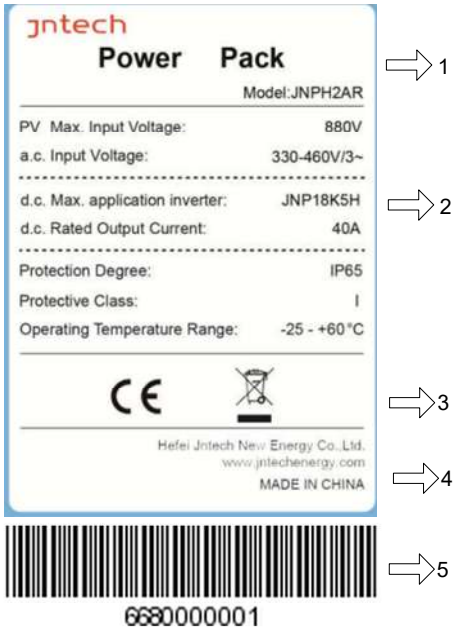


Figure 3-2 Power Pack nameplate

Table3-2 Nameplate information table

No.	Description
1	JNTECH Logo and name.
2	Power Pack model and parameter information.
3	Certificate and safety signs, concrete meaning as “Preface”.
4	Company and website.
5	Manufacturing code.

4 Installation procedure

4.1 Prepare Installation Tools

The following tools will be needed during Power Pack installation and wire connection. You also can choose the right tools according to your own experience.

Table 4-1 Installation tools list

Sketch map	Name	Recommend Specification	Function
	MC4 Wire crimpers	M2.5-M8	Used for PV connector wire core pressure welding
	Electric drill	Φ8	Used for Power Pack installation plate fixed hole drilling
	Straight screwdriver	Φ5	Used for the PV and AC input wire installation
	Open-end wrench	No. 10	Used for locking expansion bolt

4.2 Installation Site Required

Power Pack installation site environment has very important influence to the safe operation, the performance and life of the Power Pack. Choose the right installation site before install the Power Pack.

- All installation must comply with local standards.
- Do not install the Power Pack at a flammable or explosive place or a place where the flammable or explosive materials are stored.
- Do not install the Power Pack in a place where there is a risk of explosion.
- Do not install the Power Pack in places where the Power Pack is vulnerable to lightning strike.
- Do not install the Power Pack in a higher salt spray environment.
- Power Pack installation site must be in good ventilation, do not install the Power Pack in the closed case.
- Power Pack protection level is IP65, can be installed outdoor, when the Power Pack is installed outdoor, should be installed as far as possible in the eaves or other have the shadow place, avoiding direct sunlight, rain and snow.

- Power Pack is installed indoor; keep away from windows, avoiding lightning.
- The installation place selected should be solid enough to support the Power Pack weight for a long period.
- The site for Power Pack installation must be clean and the ambient temperature must be maintained within -25 to +60 °C.
- Power Pack installation site relative humidity should not be more than 95%, water vapor may corrode Power Pack, and damage the internal components.
- The Power Pack must be installed in a place convenient for observation and maintenance.

4.3 Installation Direction

- The Power Pack should be installed vertically or titled backwards with a maximum angle of 10°.
- Do not install Power Pack tilted forwards.
- Never install the Power Pack horizontally.

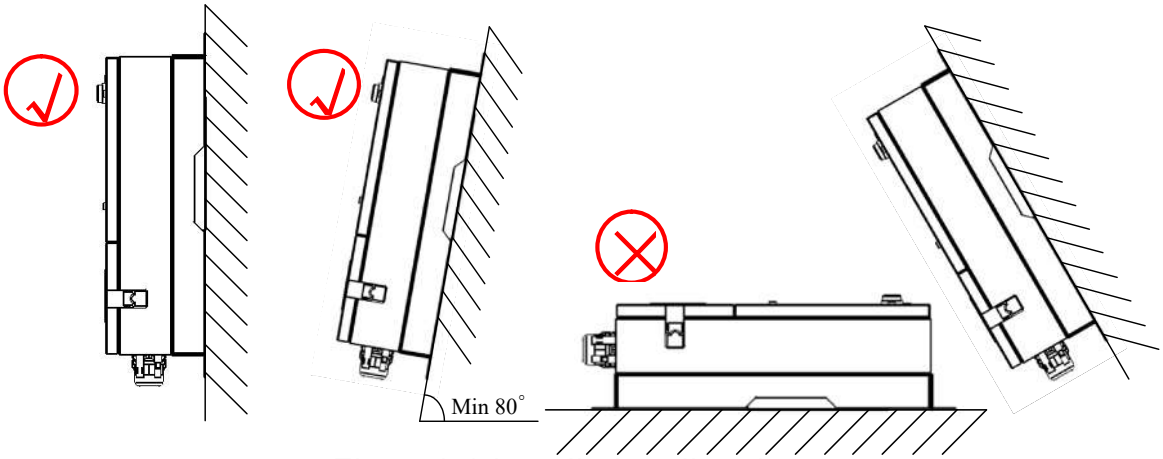


Figure4-1 Installation directions

- Do not install the Power Pack in a place where children can touch.
- The Power Pack uses air cooling mode and the installation site selected should ensure the minimum installation spacing between the Power Pack and the fixed object and the nearby inverters to ensure good ventilation.

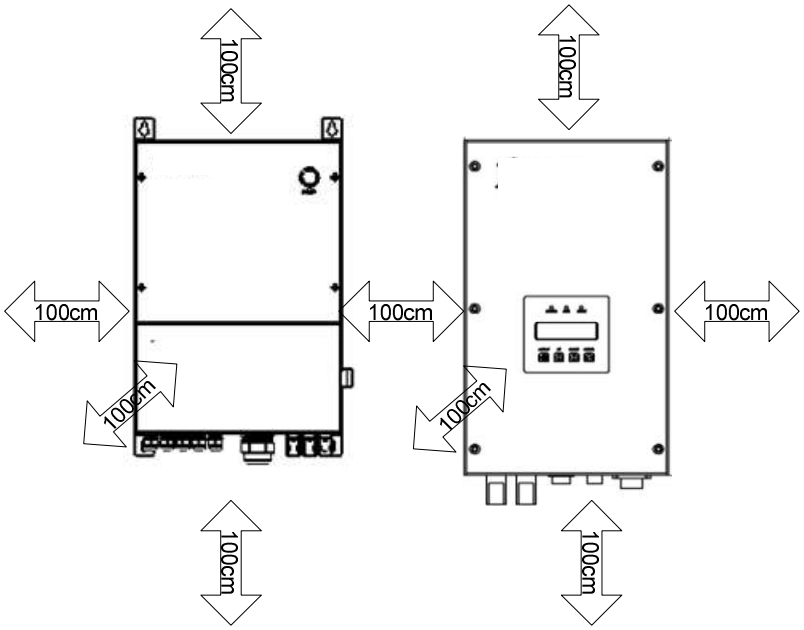


Figure 4-2 Minimum spacing of adjacent installations

Table 4-1 Minimum spacing dimension

Direction	Minimum spacing
Above	100cm
Below	100cm
Sides	100cm
Front	100cm

4.4 Installation of Power Pack

Step 1: Fix four hangers to the four corners of Power Pack, shown as sketch map as below after fastening.

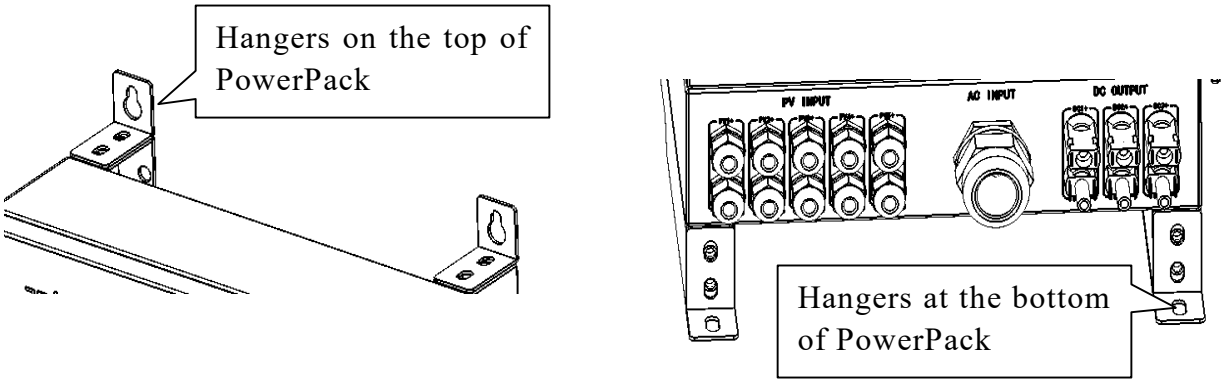


Figure 4-3 Power Pack hangers sketch map

Step 2: Drill holes in the selected installation position according to the size and shape of installation bracket; suggest drill Diameter 10+1/0, depth 60+5/-0.

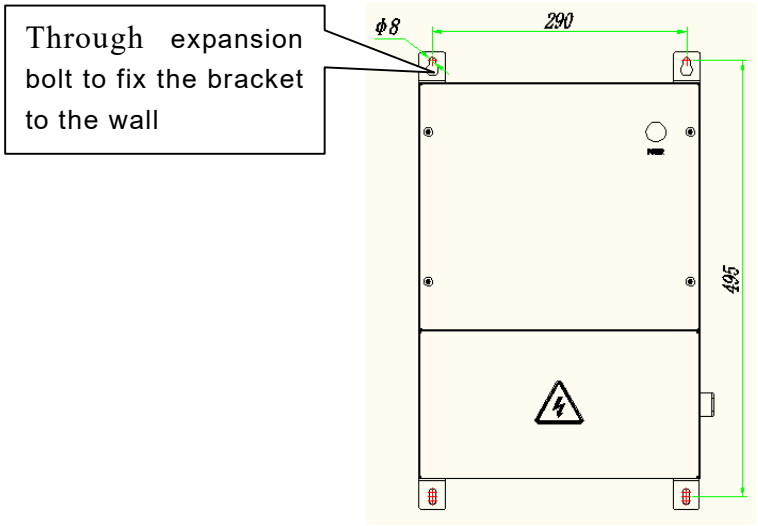


Figure 4-4 JNPH x AR Installation hole position figure

Step 3: Hang the Power Pack four hangers to the fixed expansion bolt, tighten bolt with wrench.

5 Electrical Connection

After the mechanical installation of Power Pack being finished, the electrical connection can be carried out. Following are the operation rules that need to be followed.

Warning!

- All the electrical connection must meet local electrical connection standard.
- Only qualified electrical personnel can perform the wiring installation work.
- Incorrect wiring operation may cause operating casualties or equipment damage permanently.
- Ensure that there is no electricity in Output and Input side before the electrical connection.
- Grounding correctly, using proper conductor and taking necessary short-circuit protection to ensure the safe operation of the Power Pack.
- Do not close any circuit breaker before all the electrical connections being finished.

5.1 Power Pack Connecting Terminals

The input and output terminals are at the bottom of the Power Pack, including PV INPUT terminals, AC INPUT terminals, and DC OUTPUT terminals, as shown in the following diagram.

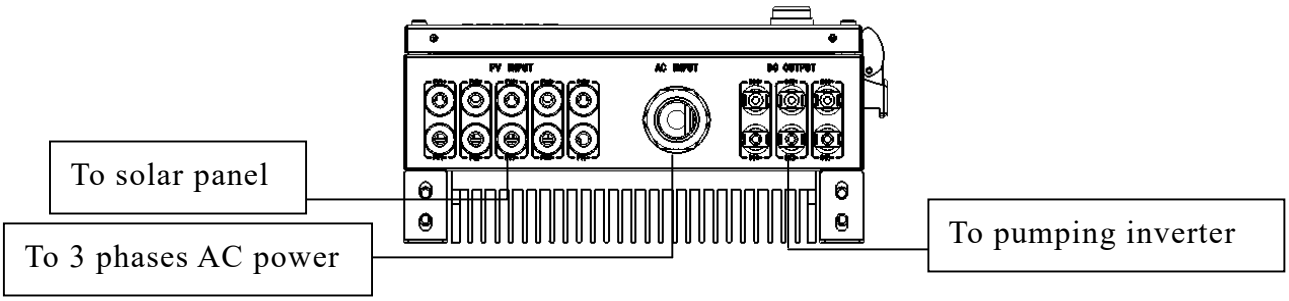


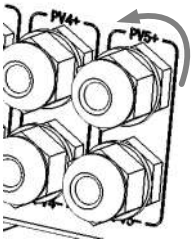
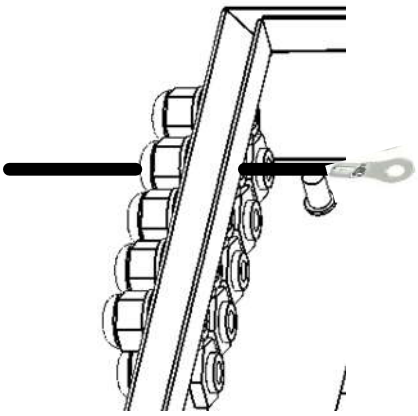
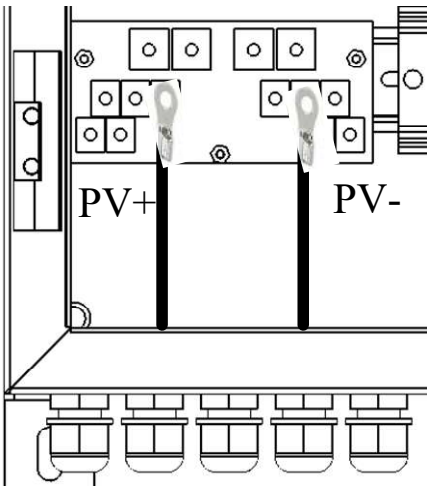
Figure 5-1 External connection terminals of the Power Pack

Table 5-1 Description

Terminals	Description
PV INPUT	PV array input terminals.
AC INPUT	AC power input terminals.
DC OUTPUT	DC output terminal; connect with the input side of solar pumping inverter.

1. PV INPUT terminals connection

Open the cover through the lock catch on right bottom of Power Pack. PV connecting terminals are waterproof. Put the cable through terminal block, and crimp the end into cold-pressed terminals, then finish the connection in accordance with the PV+ and the PV-.

Operation Instruction	Operation Demonstration
1. Loosen the waterproof terminal cap, rotate the nut in counterclockwise to remove the terminal caps.	
2. Put cable through the waterproof terminal block, and then crimp the end into cold-pressed terminals.	
3. Connect the cold-pressed terminals correctly according to the "PV+" and "PV-" which are marked on the terminal board	

In accordance with the above steps, fixing the positive and negative terminals of PV arrays onto the Power Pack's input terminal one by one.

Noted!

PV+ waterproof terminals are on top of the panel, while the lower are PV-.

Warning!

Before connecting the PV array to the Power Pack, ensure its earth impedance is not less than 1Mohm.

Warning!

The positive and negative polarities of PV arrays cannot be inversely connected to Power Pack.

2. AC INPUT terminals connection

AC INPUT terminals adopt M25 waterproof terminals. The operation method is the same as terminal disassembling method of the DC INPUT side. Putting AC input cable through the waterproof terminals block, then accessing three-phase AC input and grounding wire in accordance with the "U, V, W, PE" logo.

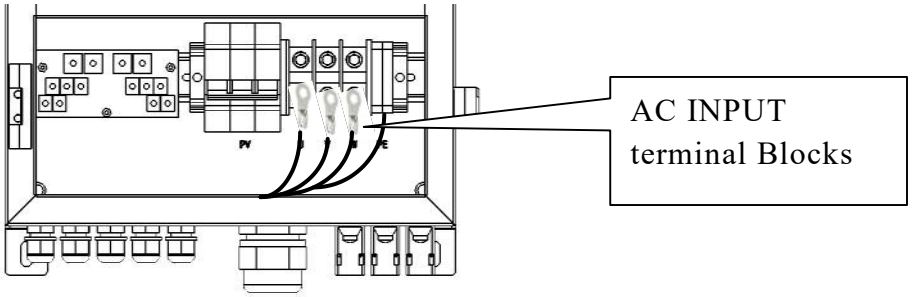


Figure 5-2: Power Pack's AC input wiring diagram

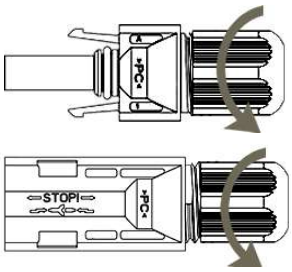
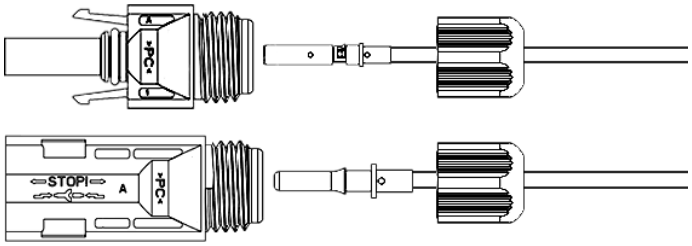
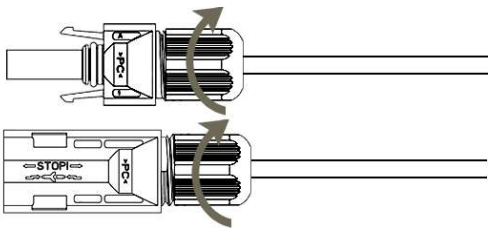
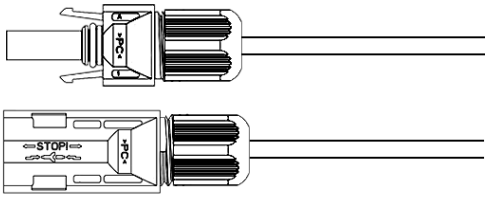
Warning!

For operation safety, please make sure that "PE" of the Power Pack is well grounded.

3. DC Output terminals connection

DC output side terminals could be connected directly through the finished MC4 terminals. Please refer to the follow steps for making MC4 terminals.

Step 1: Please connect the connector wires of DC side according to the following steps:

Operation Instruction	Operation Demonstration
1. Unscrew the nut from connector.	
2. Strip about 7mm of insulation off the DC Cable. Plug the bare wire core into the connector tube, fixed it with crimping pliers.	
Effect picture	
3. Plug the part of cable that with tube core through the fastening nut.	
4. Plug the tube into the wiring groove until a sound indicating inserted in place is heard. Tighten the nut in the opposite direction of step one.	
Effect picture	

Step 2: Ensure that the DC-side circuit breaker is in “OFF” state.

Step 3: Check to ensure that the cable polarities that connected to the PV module are correct.

Step 4: Plug the positive and negative connectors into the corresponding

terminals at the bottom of the inverter respectively.
Step 5: Other PV arrays should also be connected according to the above steps.

5.2 Cable Selection

Please select cable according to the following table. The 4 core coaxial cable is recommended to be used on AC side.
Table 5-2 Cable specification for Electrical Connection

Model of Power Pack	Cable recommended（ AWG）				
	DC side（Input and Output）	AC side			
	PV+、PV-、DC+、DC-	U	V	W	PE
JNPH1AR	12	10	10	10	12
JNPH2AR	12	8	8	8	12

5.3 Connector Disassembling

1. Disassembling of MC4 Connector

PV connector of JNTECH Power Pack is not limited to one type, there are some different types of connectors while the same machine uses the same connector; If it is needed to disassemble DC side PV connector after installation, please refers to its connection way to operate.
Professional tool, which is designed specifically for PV connector, it can help to pull out the connected PV connectors easily.
Please operate as following:

Operation instructions	Demonstration picture
Ring tool: Special tool for disassembling PV connector	
Step 1: Putting the professional tool into the holes of the PV connector totally, as shown on the picture, the connectors are disengaged.	
Step 2: Remove the connector.	

2. Disassembling of Waterproof Joint Connector

Please refer to the following diagram, using M8 screwdriver to remove the cold-pressed terminals from the terminal board or terminal row, rotating the nut in counterclockwise to remove the waterproof terminal cap. Then you can draw the AC cable out from the terminal block.

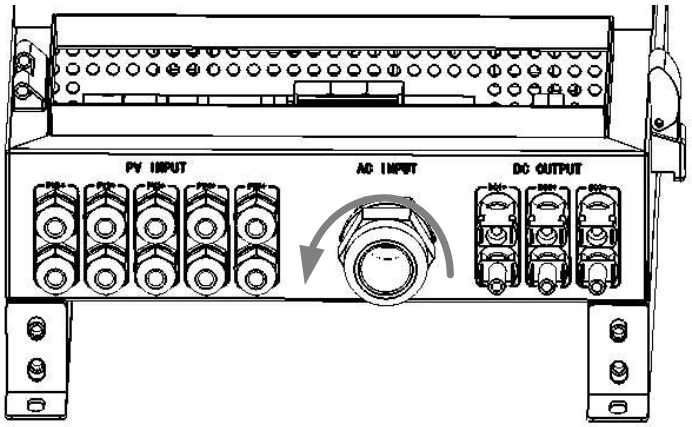


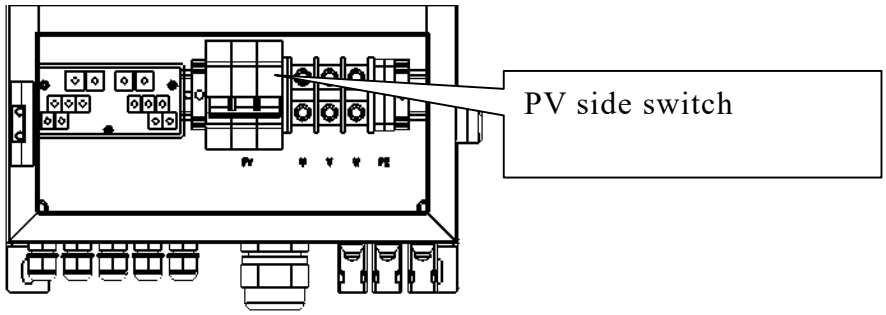
Figure 5.3: AC side terminal disassembling

6 Power Pack Commissioning

6.1 Inspection before Commissioning

PV Arrays

Before operating the Power Pack, make sure PV arrays' positive and negative polarities are connected correctly. Otherwise, the damage may be caused to Power Pack. Make sure that the open-circuit voltage of PV arrays do not exceed the max. input voltage of machine.



PV INPUT

Make sure that the positive and negative polarities of the Power Pack's DC terminals are connected correctly and are consistent with the PV arrays.

AC INPUT

Ensure the AC INPUT terminals' "U, V, W, PE "of Power Pack being right accessed.

DC OUTPUT

DC OUTPUT terminals of the Power Pack shall be directly connected to Solar Pumping Inverter.

6.2 First Commissioning of Power Pack

Please ensure the following status before commissioning:

- Ensure the correct connection between Power Pack and Solar Pumping Inverter;
- Ensure correct polarities of PV arrays;
- Ensure that the grid U, V, W and PE connection is correct;
- If the Solar Pumping Inverter is equipped with DC switch inside, ensure that the switch is "ON";

After finishing the above steps, please wait for initialization.

Close AC input side circuit breaker, waiting for about 1~2 seconds till Power Pack power indicator light, check whether the Solar Pumping

Inverter power led and its LCD are light or not. If only turn on DC input side circuit breaker, and Power Pack indicator is not lit, you can check whether the input side is normal or not through Solar Pumping Inverter.

 Warning!

If the power indicator of Power Pack is light after turning on the AC input circuit breaker, while the Solar Pump Inverter power led and the LCD are not lit; checking whether the DC switch of the Solar Pump Inverter is on or off. If the DC switch is off, the circuit breaker of the AC side should be disconnected first till the the power indicator of the Power Pack turned off, turn on the DC switch of the Solar Pump Inverter. Reconnect the AC side circuit breaker of Power Pack.

Do not turn on the DC switch of the Solar Pump Inverter directly when the Power Pack power indicator is lit !!!

At this point, the commissioning of Power Pack is finished.

7 Common troubleshooting and maintenance

7.1 Troubleshooting

The following table lists the typical state of fault and treatment scheme:

Table7-1 Exception handling operation table

Phenomena	Cause value	Troubleshooting
Solar Pumping Inverter's power led and its LCD are not lit when the external AC input side switch of Power Pack is on.	1. Power Pack was not connected with Solar Pumping Inverter. 2. Solar Pumping Inverter DC switch is off.	1. Properly wire connection between Power Pack and Solar Pumping Inverter 2. Disconnect the input side circuit breaker of Power Pack till its power indicator turn off, and turn on the DC switch of Solar Pump Inverter, then reconnect the input side circuit breaker of Power Pack.
Solar water pump fail to achieve full load operation when Power Pack AC input side circuit breaker is on.	1. The voltage of AC power source is too low; 2.The input voltage of solar panel is too high, resulting in grid power being cut-off.	1. Boost voltage through transformer. 2. Turn off the DC switch of the power pack.

7.2 Maintenance

Please check and ensure the Power Pack is not charged before any maintenance.

A routine examination must be done every half year:

- Check whether the Power Pack be damaged or with deformation.
- Check whether there is abnormal noise when the Power Pack is work.
- Check whether the fan operation is normal and the presence of foreign bodies blockage

Every half to one year, check the Power Pack as following:

- Check humidity and dust of the Power Pack surrounding environment, if there is too much dust, clean the charger.
- Check whether the Power Pack cable connection is loose, if it is, tightening again according to the mentioned wire connection method.
- Check whether the cable is damaged, especially the part that who's surface contact directly with the metal.

7.3 Contact Customer Service

If you have any question about the Power Pack, please contact us,
Telephone: +86-551-62931312 (0323)
Email: sales@jntechenergy.com

In order to provide faster and better service, please provide us with the following information:

- Model of the Power Pack;
- Series number of the Power Pack;
- Malfunction description

8 Appendix

Quality Assurance

The product malfunction in the warranty period, Hefei Jntech New Energy Co., LTD. will be free repair or replacement products. The warranty period take the contract as a standard.

Evidence

During the warranty period, customers should provide the invoices for the purchase of products and date. And the trademarks of the products should be clearly visible. Otherwise we do have the right not to assume quality assurance.

Conditions

- The replaced products should be returned to Hefei JNTECH.
- Hefei JNTECH should be given reasonable time to repair the malfunctioning equipment.

Exemption from liability

The company has the right not to carry out quality assurance in the following:

- Transport damage.
- Incorrect installation, modification and usage.
- Overall, components have been beyond the warranty period.
- Bad operating environment beyond the descriptions in this manual.
- Non company services, personnel to repair, replacement or demolition cause machine damage.
- Damage caused by abnormal natural environment.

If the product size and parameters have changed, the latest information given by the company shall prevail without notice.

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