

Version No.: B

*8W WAVE SOLAR ROOF TILE ON-GRID
POWER GENERATION SYSTEM*

MANUAL



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I. Precautions before use

1. Shall not have any objects attached to the PV module, or shadowed live cells.
2. In order to make a better waterproof roofing system performance, flat solar tile must be installed staggered joint.
3. Please choose the appropriate standard system according to roof structure, area, orientation
4. Please check the system BOM (bill of material) and tooling list complete or not before installing.
5. System must be performed by qualified personnel with professional or trained personnel for installation and adjustment.
6. During installation, do not short the positive and negative.
7. Gravity trample, collision, hitting on solar PV tile is strictly prohibited.

II. Introduction

2.1 Brief Instruction of Solar roof tile power generation system



PV tile on-grid system consists of PV tile, on-grid inverter, protection of electrical switches and other components. During installation, do not short the positive and negative of solar array circuit. Solar PV tile can convert solar radiation into direct current, then through on-grid inverter converts direct current to alternating current for household appliance or into the public electricity grid.

2.2 8W Wave PV tile and matching tile

Electrical Characteristic for 8W wave PV tile

Type	SA08M -2
Max-Power Pm	8W
Open-Circuit Voltage	1.23V
Short-Circuit Current	8.31A
Max-Power Voltage	1.04V

Max-Power Current	7.78A
Cell Size	156mm*156mm
Number of Cells	2pcs

Mechanical Characteristics for 8W wave PV tile and matching tile

Mechanical Characteristics for 8W wave tile and matching tile			
8W wave-shape PV tile		Matching tile	
Dimension	PV tile	325*440*45mm	
	Matching tile (uncut)	335*440*45mm	
effective size	375*285mm (length*width)		
Overlap length(portrait)	65mm	Overlap length (lateral)	40mm
Weight	PV tile	Around 3.2kg/pcs	
	Matching tile	3.5kg/pcs	
Standard	PV tile	Up to IEC61215、IEC61730 standard	
	Matching tile	Up to JC/T746-2007 standard	
anti-permeability	Up to JC/T746-2007 standard		
Water absorption	PV tile	<0.5%	
	Matching tile	<5%	
Endurance Life	PV tile	>5000N/m ²	
	Matching tile	>1800N/m ²	
Fire Index	Anti flaming		
Lap Method	Straight seam overlap		
Frost Freezing	Up to JC/T746-2007 standard; after soaking to saturation and freezing for 2 hours in water under -15℃, melted 1 hour in water of 15℃-30℃, after 25 freeze-thaw cycles, appearance quality, anti-permeability, pressure endurance all meet the requirements in JC/T746-2007		
Min. Installation of slope	If the roof slope is less than 15°, for the leak proof consideration, application of PV tile is not recommended		
Max. Installation of slope	90°		
Amount/m ²	Overlap up and down 65mm	9.3pcs/m ²	

roof lateral batten dimension	30mm*20mm
Amount for roof lateral batten	2.7m/m ²

2.3 Photovoltaic on-grid Inverter

Electrical Characteristic	HNS2000TL-1	HNS2500TL-1	HNS3000TL-1	HNS4000TL-1	HNS4500TL-1	HNS5000TL-1	HNS6000TL-1
Input Characteristics							
Max. Input DC power (W)	2200	2700	3200	4200	5000	5600	6200
Max. Input DC voltage (V)	500	500	550	550	550	550	550
MPPT Voltage range (V)	120-400	120-400	120-450	120-450	120-450	120-450	120-450
Max. DC (A)	11	13	10+10	13+13	14+14	15+15	16+16
MPPT Tracking Channels/ Each road can be connected to the group	1/1	1/1	2/1	2/1	2/1	2/1	2/1
Output Characteristics							
Power Connector	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase	Single Phase
Rated Output Power (W)	2000	2500	3000	4000	4500	5000	6000
Rated Voltage Output Range (V)	230/ AU:200-270 IT:196-253 UK:207-264	230/ AU:200-270 IT:196-253 UK:207-264	230/ AU:200-270 IT:196-253 UK:207-264	230/ AU:200-270 IT:196-253 UK:200-253	230/ AU:200-270 IT:196-253 UK:207-264	230/ AU:200-270 IT:196-253 UK:207-264	230/ AU:200-270 IT:196-253 UK:200-253

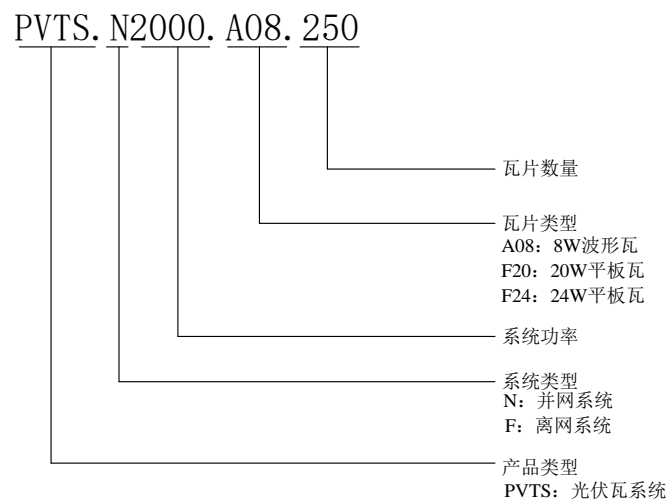
Output frequency range(Hz)	50/ AU:48.5-51.5 IT:47.5-51.5 UK:47.0-50.5	50/ AU:48.5-51.5 IT:47.5-51.5 UK:47.0-50.5	50/ AU:48.5-51.5 IT:47.5-51.5 UK:47.0-50.5	50/ AU:48.5-51.5 IT:47.5-51.5 UK:47.0-51.5	50/ AU:48.5-51.5 IT:47.5-51.5 UK:47.0-50.5	50/ AU:48.5-51.5 IT:47.5-51.5 UK:47.0-50.5	50/ AU:48.5-51.5 IT:47.5-51.5 UK:47.0-51.5
Rated Output Current (A)	11	12	14	18	20	22	24
Power Factor	>0.99	>0.99	>0.99	>0.99	>0.99	>0.99	>0.99
Harmonic distortion	<3%	<3%	<3%	<3%	<3%	<3%	<3%
Power Efficiency							
Max. Power	97.02%	96.97%	96.90%	97.00%	95.90%	96.00%	96.10%
European Efficiency	95.83%	95.90%	96.18%	96.43%	95.99%	96.00%	96.10%
MPPT Efficiency	>99%	>99%	>99%	>99%	>99%	>99%	>99%
Safety Device							
Electromagnetic Compatibility	EN61000-6-1/6-3	EN61000-6-1/6-3	EN61000-6-1/6-3	EN61000-6-1/6-3	EN61000-6-1/6-3	EN61000-6-1/6-3	EN61000-6-1/6-3
Anti-islanding Protection	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in	Built-in
General Information							
length*width*height (mm)	487*340*156	487*340*156	550*370*166	550*370*167	550*370*167	550*370*167	550*370*167
Protection Class	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Weight (kg)	16	16	24	26	26	26	27
Working Temp. (°C)	-20°C-+55°C	-20°C-+55°C	-20°C-+55°C	-20°C-+55°C	-20°C-+55°C	-20°C-+55°C	-20°C-+55°C

Topology	No Transformer	No Transformer	No Transformer	No Transformer	No Transformer	No Transformer	No Transformer
Communication Interface	RS485	RS485	RS485	RS485	RS485	RS485	RS485
Power Consumption at night(W)	<1	<1	<1	<1	<1	<1	<1
Heat-dissipating Method	Convection	Convection	Convection	Fan	Fan	Fan	Fan
Noise (dB)	<28	<28	<43	<43	<43	<43	<43
Elevation	2000 meters above sea level operation without power decrease						

2.4 8W flat PV tile on-grid system standard configuration

No.	System Type	Peak Power (W)	Quantity of PV tile (pcs)	Operating Voltage (V)	Number of Each String (Pcs)	Inverter	On-grid Voltage
1	S -PVTS.N2000.A08.250	2000	250	250	250	2KW/220V	Single Phase 220V/50Hz
2	S -PVTS.N2500.A08.320	2500	320	320	320	2.5KW/220V	Single Phase 220V/50Hz
3	S -PVTS.N3000.A08.384	3000	384	384	384	3KW/220V	Single Phase 220V/50Hz
4	S -PVTS.N4000.A08.512	4000	512	256	256	4KW/220V	Single Phase 220V/50Hz
5	S -PVTS.N4600.A08.576	4600	576	288	288	4.5KW/220V	Single Phase 220V/50Hz
6	S -PVTS.N5100.A08.640	5100	640	320	320	5KW/220V	Single Phase 220V/50Hz
7	S -PVTS.N6100.A08.768	6100	768	384	384	6KW/220V	Single Phase 220V/50Hz

Numbering Rules for On-grid system type:



III. Installation steps and Explanation

3.1 Preparation before Installation

System before the installation should be according to the bill of materials and tools list, complete the completeness of accessories, tools before installation.



Checking of materials





System Type Parts	S -PVTS.N2000.A 08.250		S -PVTS.N250 0.A08.320		S -PVTS.N300 0.A08.384		S -PVTS.N4000.A 08.512	
	Type	Quantity	Type	Quantity	Type	Quantity	Type	Quantity
PV tile	8W	250pcs	8W	320cps	8W	384	8W	512
On-grid inverter	2000W	1pcs	2500	1pcs	3000	1	4000	1
DC Circuit Breaker	500V/10A/2P	1pcs	500V/10A/2P	1pcs	500V/10A/2P	1	500V/10A/2P	2
AC Circuit Breaker	16A/2P	1pcs	20A/2P	1pcs	25A/2P	1	32A/2P	1
DC Rated Fuses	440V/10A	1pcs	440V/10A	1pcs	440V/10A	1	440V10A	2
AC Rated Fuses	2P/16A	1pcs	2P/20A	1pcs	2P/25A	1	2P/32A	1
DC Surge Protector	2P/500V	1pcs	2P/500	1pcs	2P/500	1	2P/500	2
AC Surge Protector	2P/20A	1pcs	2P/20A	1pcs	2P/20A	1	2P/40A	1
DC Side Cable	4mm ²	Red:20m black:20	4mm ²	red:20m Black:20	4mm ²	red:20m black:20	4mm ²	red:40m black:40m
Switching Box		1		1		1		1






System Type Parts	S -PVTS.N4600.A08.576		S -PVTS.N5100.A08.640		S -PVTS.N6100.A08.768	
	Type	Quantity	Type	Quantity	Type	Quantity
PV tile	8W	576pcs	8W	640pcs	8W	768pcs
On-grid Inverter	4500W	1pcs	5000	1pcs	6000	1pcs



DC Circuit Breaker	500V/10A/2P	2pcs	500V/10A/2P	2pcs	500V/10A/2P	2pcs
AC Circuit Breaker	32A/2P	1pcs	40A/2P	1pcs	50A/2P	1pcs
DC Rated Fuses	440V/10A	2pcs	440V/10A	2pcs	440V/10A	2pcs
AC Rated Fuses	2P/32A	1pcs	2P/40A	1pcs	2P/50A	1pcs
DC Surge Protector	2P/500V	2pcs	2P/500	2pcs	2P/500	2pcs
AC Surge Protector	2P/20A	1pcs	2P/20A	1pcs	2P/20A	1pcs
DC Side Cable	4mm ²	red:40m black:40m	4mm ²	red:40m black:40m	4mm ²	red:40m black:40m
Switching Box		1		1		1

Preparing Installing Tools

No.	Name	Type	Use	Picture	Remark
1	Hammer		With concrete nails, fixed the battens and rafters		
	Instruction	Before use, wear cotton gloves. Left hand holding concrete nails, right hand holding the hammer handle, and gradually force the battens and rafters fixed.			
2	Electric hand drill	AC portable rechargeable	With wood screw, to fix the battens and rafters		
	Instruction	Before use, make sure hand drill clockwise direction of rotation. Left hand fix the wood screw and hand drill to right position, right hand holding the hand drill and start switch, slightly hard to fix the tile and tile battens. Detail refer to hand drill operation manual. Note: Cotton glove is prohibited wearing in case of preventing hand from being hurt during high-speed rotation.			

3	Screwdriver	Screwdriver set	Screws fixed object with the desired fixed		According to the specifications of choosing the right screwdriver
	Instruction	Before use, confirm screwdriver and screws specifications meet. Left hand to screw with a screwdriver head fit, and alignment mark position, right hand holding the handle and turn clockwise, gradually forced the screw with the desired stationary objects.			
4	Cutting machine	220V AC	Cut to the desired shape of the tile		Cutting discs: tile cutting discs
	Instruction	Before use, make sure the cutting between the plate and the shaft is not loose, wearing face masks. Left hand fixing the tile, right hand holding the handle aligned with the position marked on the tile and start button for cutting. High speed is not recommended while cutting machine approaching the tile , then gradually increase the speed. Another people use water for cooling the cutting disc. Refer to cutting machine operation manual. Note: Cotton glove is prohibited wearing incase of preventing hand from being hurt during high-speed rotation. Safety glass is required while cutting tiles			
5	Impact drill	220V DC	Drill the mounting holes on wall (for Inverter, Control box)		Drill's diameter : 8mm bits;
	Instruction	Before use, to confirm whether there is a loose bit, wear masks. Left hand holding the front handle of hammer, right hand holding the lower handle, alignment has been marked wall and press the start button. High-speed not recommended at first, then gradually increase the speed to drill the hole with appropriate depth. Note: Cotton glove is prohibited wearing incase of preventing hand from being hurt during high-speed rotation.			
6	Snap line ink fountain		Confirm horizontal line		ink

	Instruction	Before use, import the ink into ink fountain, ink sufficient contact with the ink line. One person grasps one end of the ink line and zeroed on the marked place, another person, left hand holding the fountain, the alignment mark points, right hand flicking ink line will stay with clear traces on battens.			
7	Tape	Steel tap	Confirm dimension		3-5M
	Instruction	Hooked the end of tape and one end of the measured object, measuring distance and mark.			
8	Multi-meter		Measure the open-circuit voltage, short-circuit current		
	Instruction	Before use, choose the correct shifts and distance, measured respectively with red and black probe line contact, then read and show the number of records. Open-circuit voltage: red and black probe and measured circuit in parallel Short-circuit current: red and black prove and measured circuit in parallel			
9	Wire stripers		Wire stripping		
	Instruction	The wire against the corresponding strippers, strip the cables with one hand firmly.			
10	Hydraulic Clamp		Tighten terminals and cables		
	Instruction	Will wear a cable end into the hydraulic clamp terminals corresponding notch, exert by hands and check the effect of hydraulic, moveable or not.			
11	Nipper pliers		Fastening cable and cable		
	Instruction	To cross over the cable with the nipper pliers twist in the same direction until securely fastened.			

12	MC4 wrench		Tightening solar connector and solar cable		
	Instruction	When used, the beginning and end of MC4 head wrench into the intermediate space, respectively, and circular holes, and clockwise until tightened.			
13	Knife		Cut the cable sheath		
	Instruction	The knife blade out of the sheath cutting and stripping.			

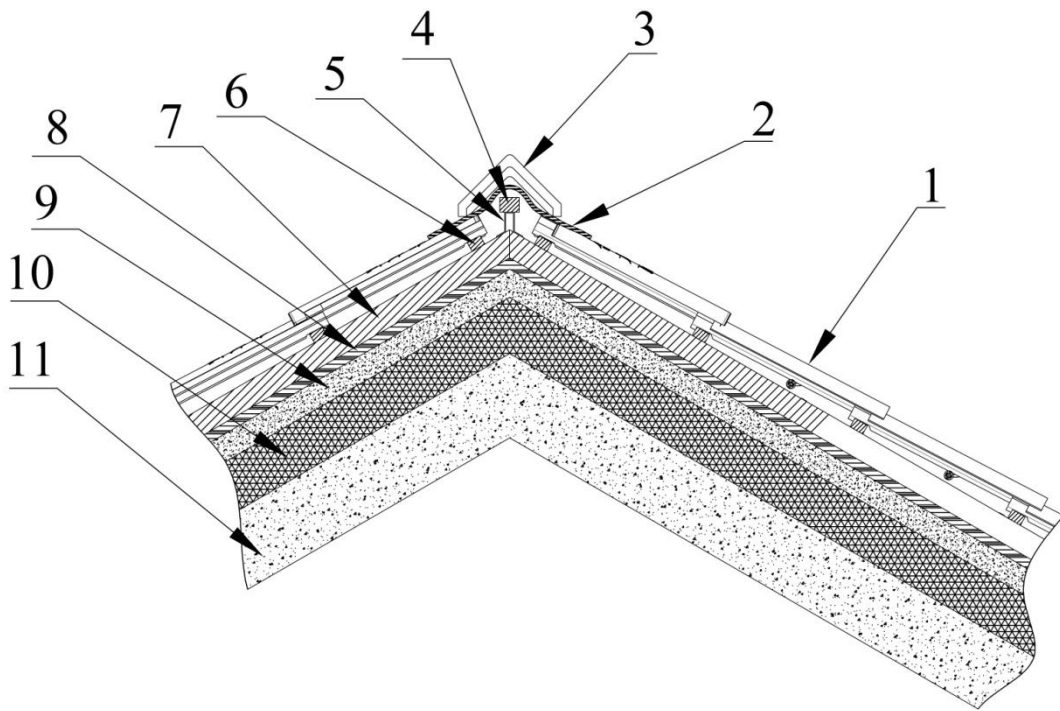
Determine if the selected roofing is suitable to install the system.

According to the reference standard roofing system size, and arrangement of the standard required under the roof size, choose the appropriate standard systems. Roof mounting area must be larger than the area that required by the system.

No.	Quantity of PV tile (pcs)	Standard arrangement (line*row)	Number of strings (pcs/string*st)	String voltage (V)	Min. roofing size (vertical m*horizontal m=size m ²)	
1	250	10*25	250*1	250	3.82*7.17=27.4	
2	320	16*20	320*1	320	6.07*5.75=34.9	
3	384	16*24	384*1	384	6.07*6.89=41.8	
4	512	16*32	256*2	256	6.07*9.17=55.6	
5	576	16*36	288*2	288	6.07*10.30=62.5	
6	640	20*32	320*2	320	7.57*9.17=69.4	
7	768	24*32	384*2	384	9.07*9.17=83.2	
Notice	Tile size	up / down	440mm	overlap method	up /down	375mm
		left / right	325mm		left / right	285mm

3.2 Installation for PV tile and matching tile

3.2.1 PV tile roof structure of the system



PV tile ventilation roofing system structure

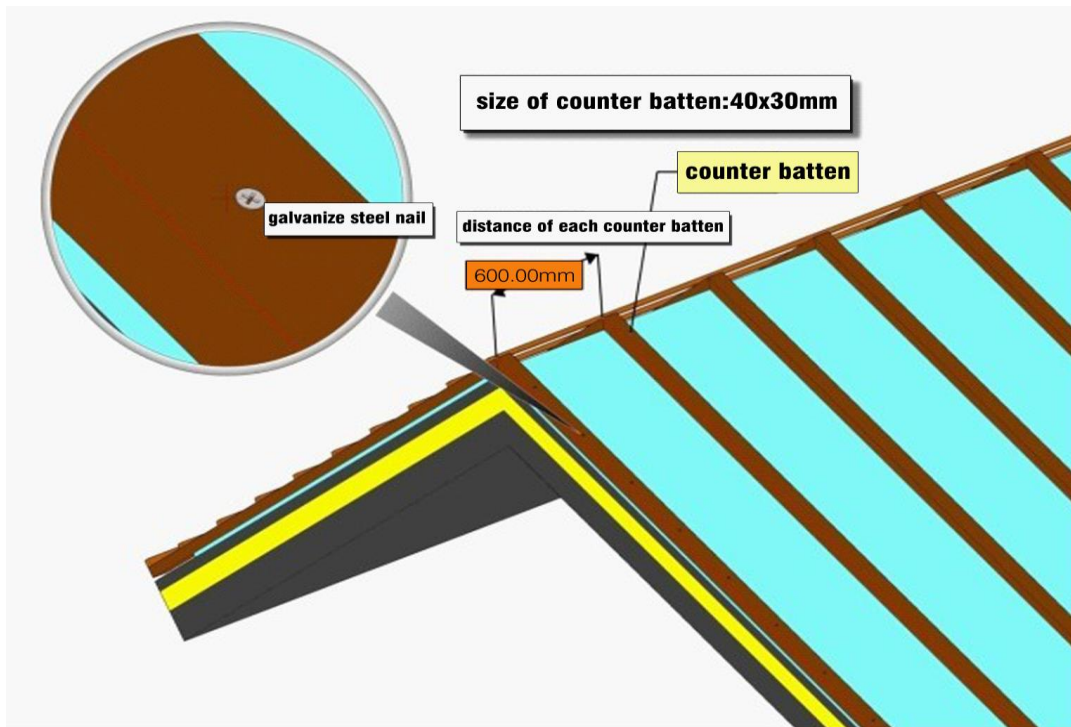
- 1- PV tile (or matching tile) 2-Ventilation waterproof self-adhesive tape 3-Ridge tile 4- Ridge supporting wood 5- holding wooden bracket 6-roof batten 7-counter batten 8-Waterproof layer 9-held nail layer 10-Insulation layer 11-concret roof

3.2.2 Installation Steps of PV Tile and Matching Tile

1. How to install counter batten

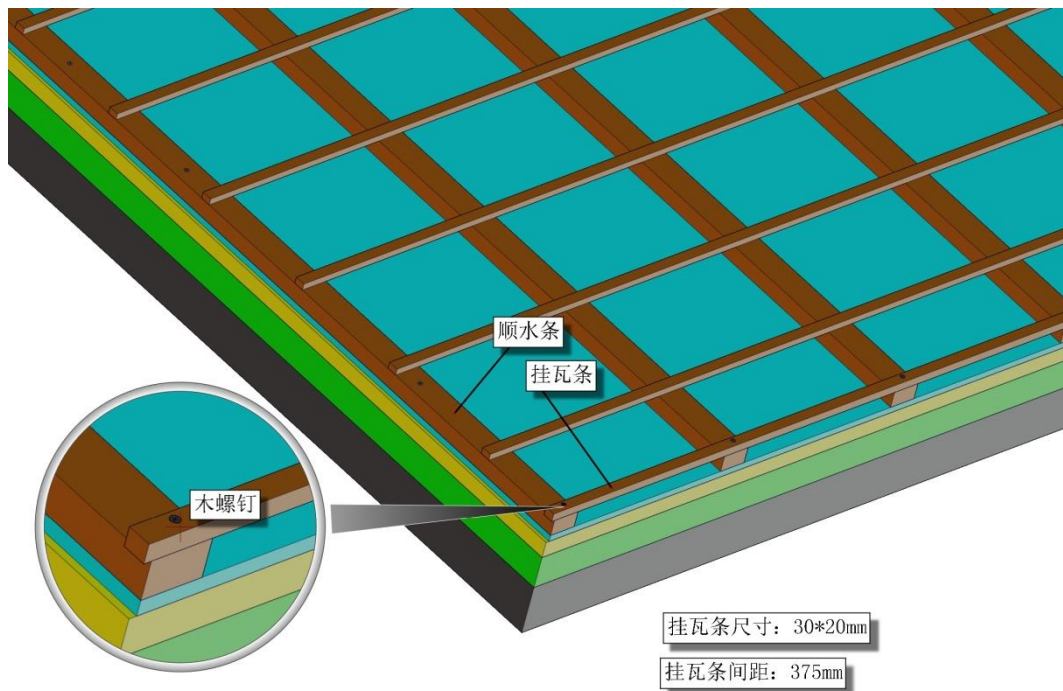
(Remark: This installation process is different per the different structure of roofs,

Finish the concrete roof according to the structure of roof surface, laying the heat preservation and insulation layer, held nail layer, waterproof layer. The material for counter batten is section size 40*30mm anticorrosive batten, the length for counter batten is according to the roof size, transverse spacing distance for counter batten is 400~600mm. Counter batten should be fixed by galvanized steel nail, the distance between nails should be less than 500mm, the length of steel nail should be moderate, and must in held nail layer. The layout of counter batten as shown in the figure below.



Installation drawing for Counter batten

2. How to install roof batten

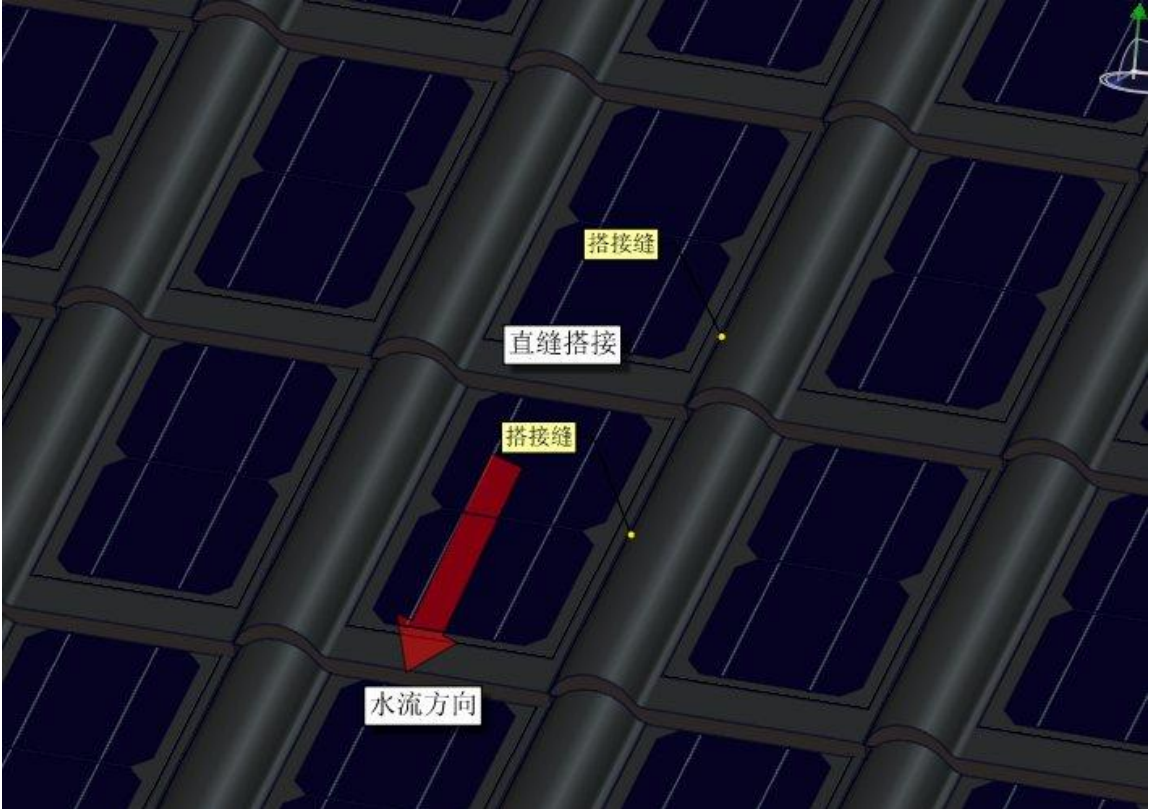


The roof batten uses 30*20mm anticorrosive roof batten, transverse spacing distance for roof batten is 375mm. The overlap length between two portrait paved tiles is 65mm. (Remark: if the distance for roof batten or overlap size for PV tile needs to adjust, must ensure solar cell not affected by the overlap.) When you install the roof batten, you must use steel tape confirm

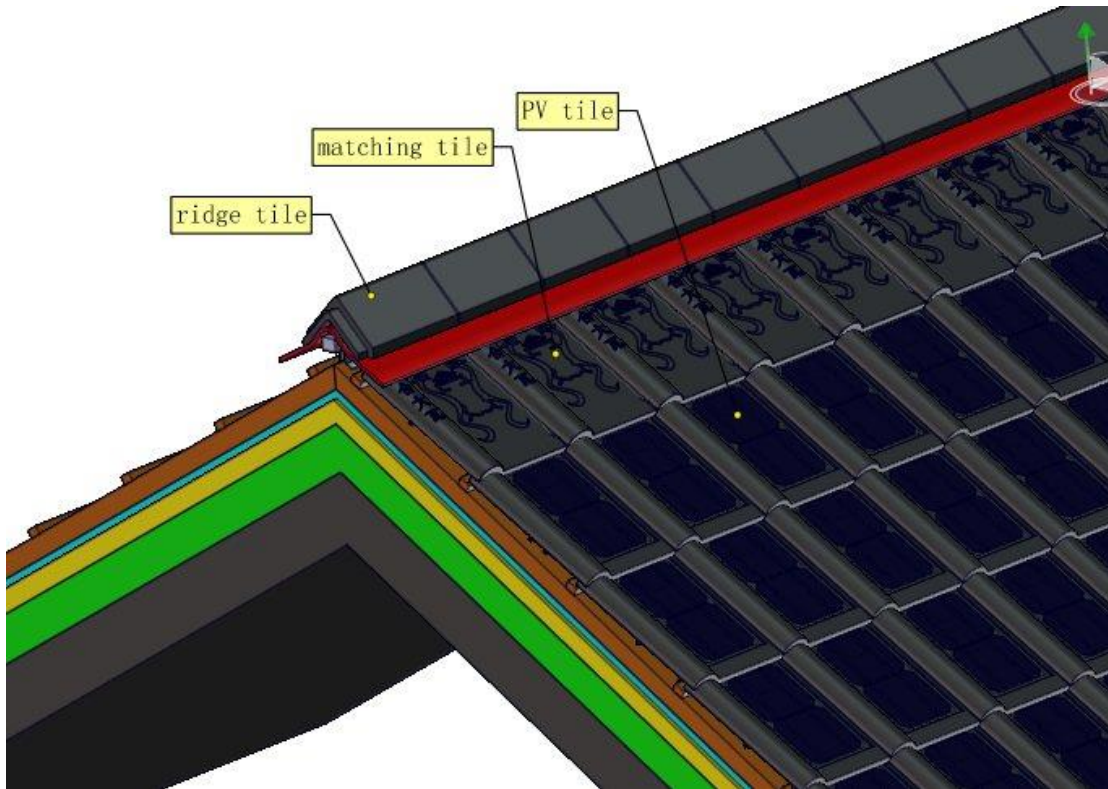
the distance between roof battens, fixed position by snap line ink fountain, using wood screw (or steel nail), and electric hand drill (or hammer) to fix the roof batten on the counter batten. When you flip the elastic line, be sure the battens parallel to each other.

3. How to install PV tile and matching tile

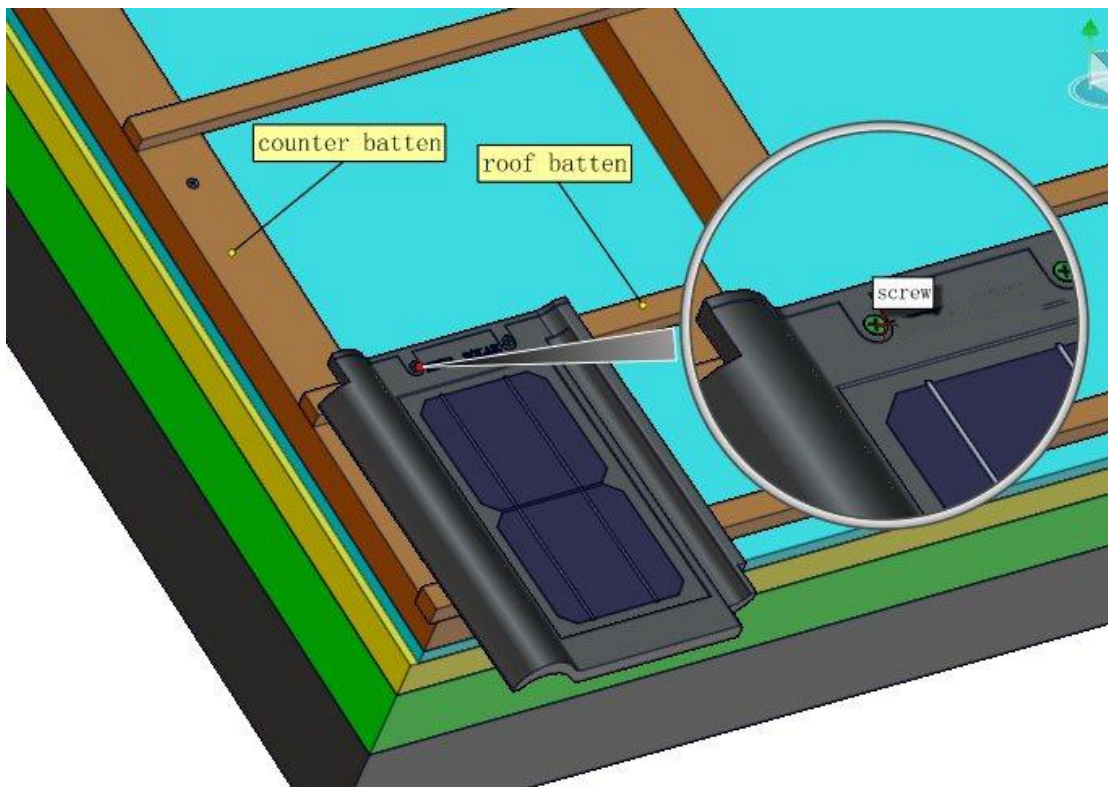
1、 The install sequence for 8w PV wave tile and matching tile is from right side to left side, then from down side to up side. In order to make the roof has a better waterproof performance, we suggest overlap joint between upper and lower two layers. As shown before.



2、 Notice: When install the PV tile, matching tile and ridge tile, the lower edge of upper tile cannot shield the lower layer PV tile’s solar cell, as incorrect installation will seriously affect the power performance of the system, thus requiring the last layer of tile should use matching tile. On the edge of the roof or roofing oblique need cutting tiles, require to use matching tile. When the PV tile installed, the roof must keep clean in case of affecting generate power, such as cement covered by pollutant on PV tile.



3、Nail hole in tile must use galvanized screws to fix tiles on the counter batten.



4、Wiring and arrangement of PV tile

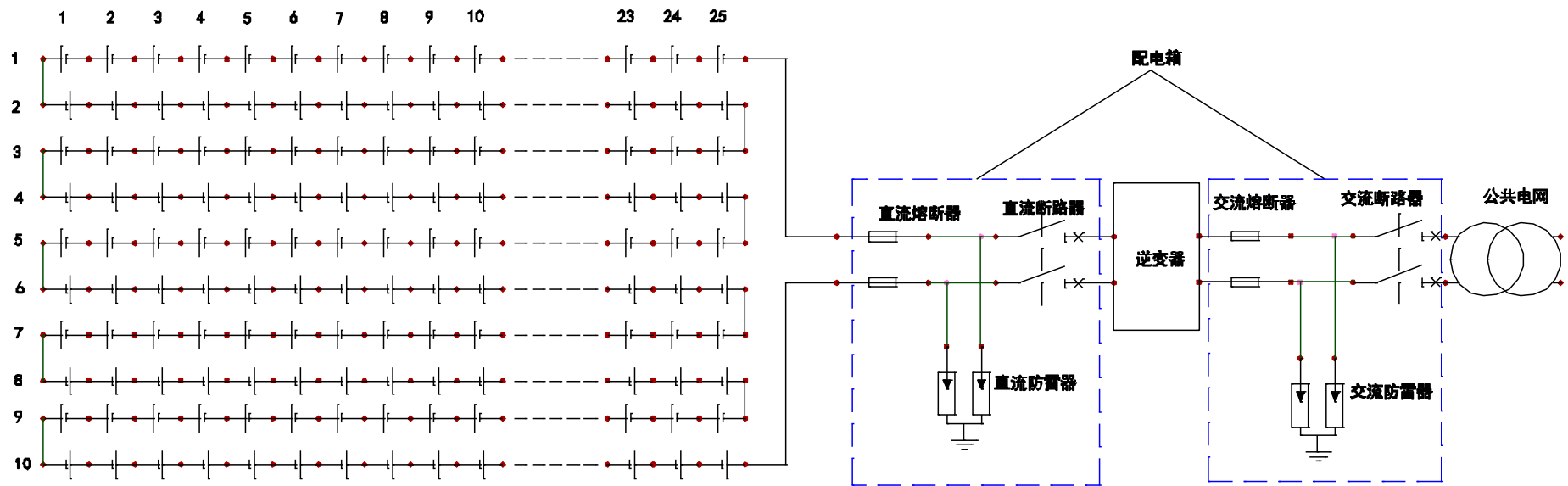
Even the same type of PV tile, there will be a large difference because of the roof structure, the mounting area of the different tile arrangement. In order to standardize the installation, as


well as for PV system engineers in selecting system can accurately choose suitable for the selected standard roofing system. In the following table lists the standard arrangement of standard systems, as well as in the standard arrangement under the required installation dimensions.

Standard arrangement for installation is recommended when installing a PV tile. If the selected roof cannot meet the standard arrangement, please contact PV system engineer to change PV arrangement, in the case of the installation is feasible.

Standard arrangement table

System Type	Quantity of PV tile (pcs)	Standard arrangement (line*row)	Number of strings (pcs/string*string)	String voltage (V)	Min. roofing size (vertical m* horizontal m=size m ²)	
S -PVTS.N2000.A08.250	250	10*25	250*1	250	3.82*7.17=27.4	
S -PVTS.N2500.A08.320	320	16*20	320*1	320	6.07*5.75=34.9	
S -PVTS.N3000.A08.384	384	16*24	384*1	384	6.07*6.89=41.8	
S -PVTS.N4000.A08.512	512	16*32	256*2	256	6.07*9.17=55.6	
S -PVTS.N4600.A08.576	576	16*36	288*2	288	6.07*10.30=62.5	
S -PVTS.N5100.A08.640	640	20*32	320*2	320	7.57*9.17=69.4	
S -PVTS.N6100.A08.768	768	24*32	384*2	384	9.07*9.17=83.2	
Notice	Tile size	up / down	440mm	Overlap method	up /down	375mm
		left / right	325mm		left / right	285mm

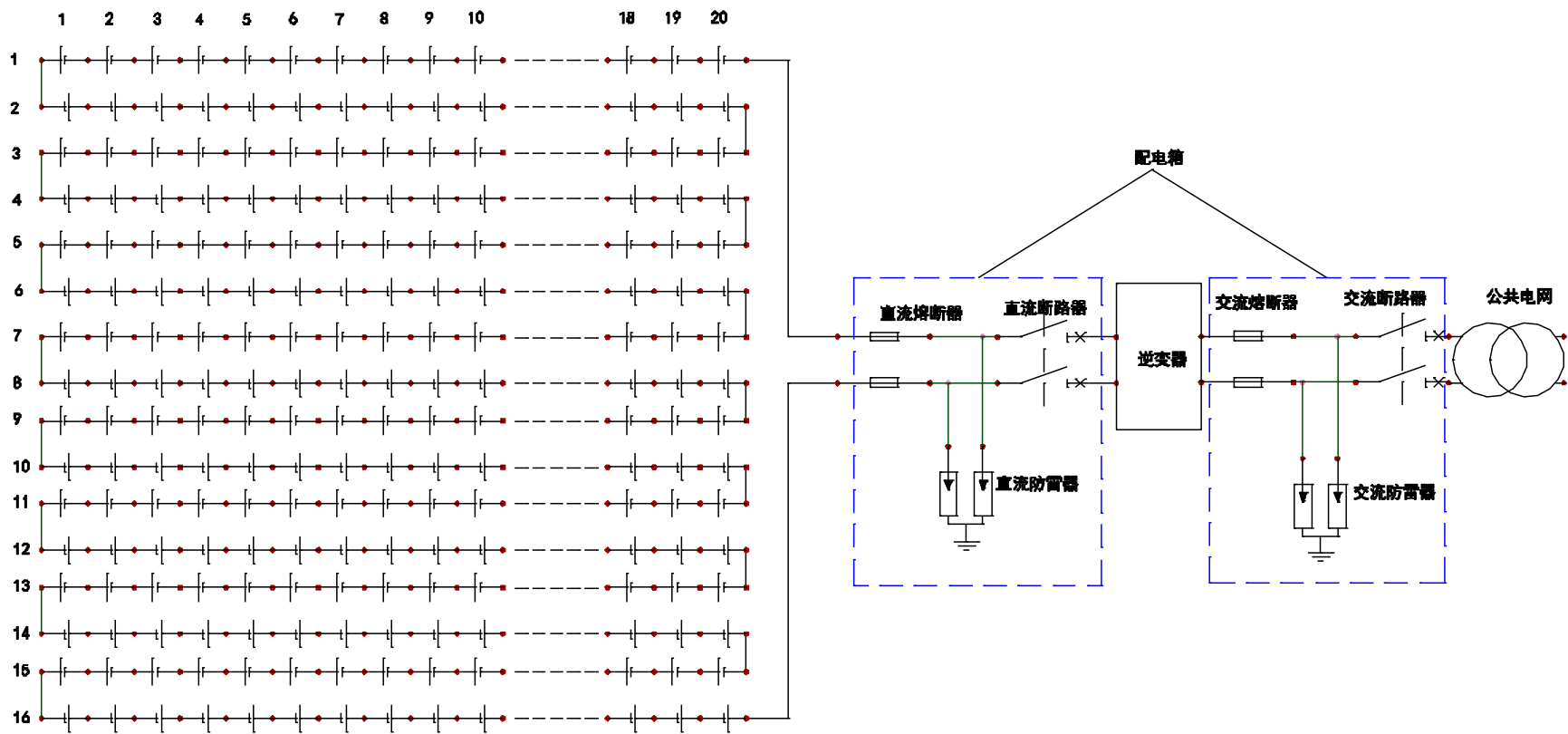



说明：1、表示一片8W波形光伏瓦

2、在该系统中总共使用了250片8W波形光伏瓦，总装机容量2000W。

3、标准排列方式10行×25列，需安装面积 $3.82*7.17=27.4m^2$

S-PVTS.N2000.A08.250 System wiring diagram

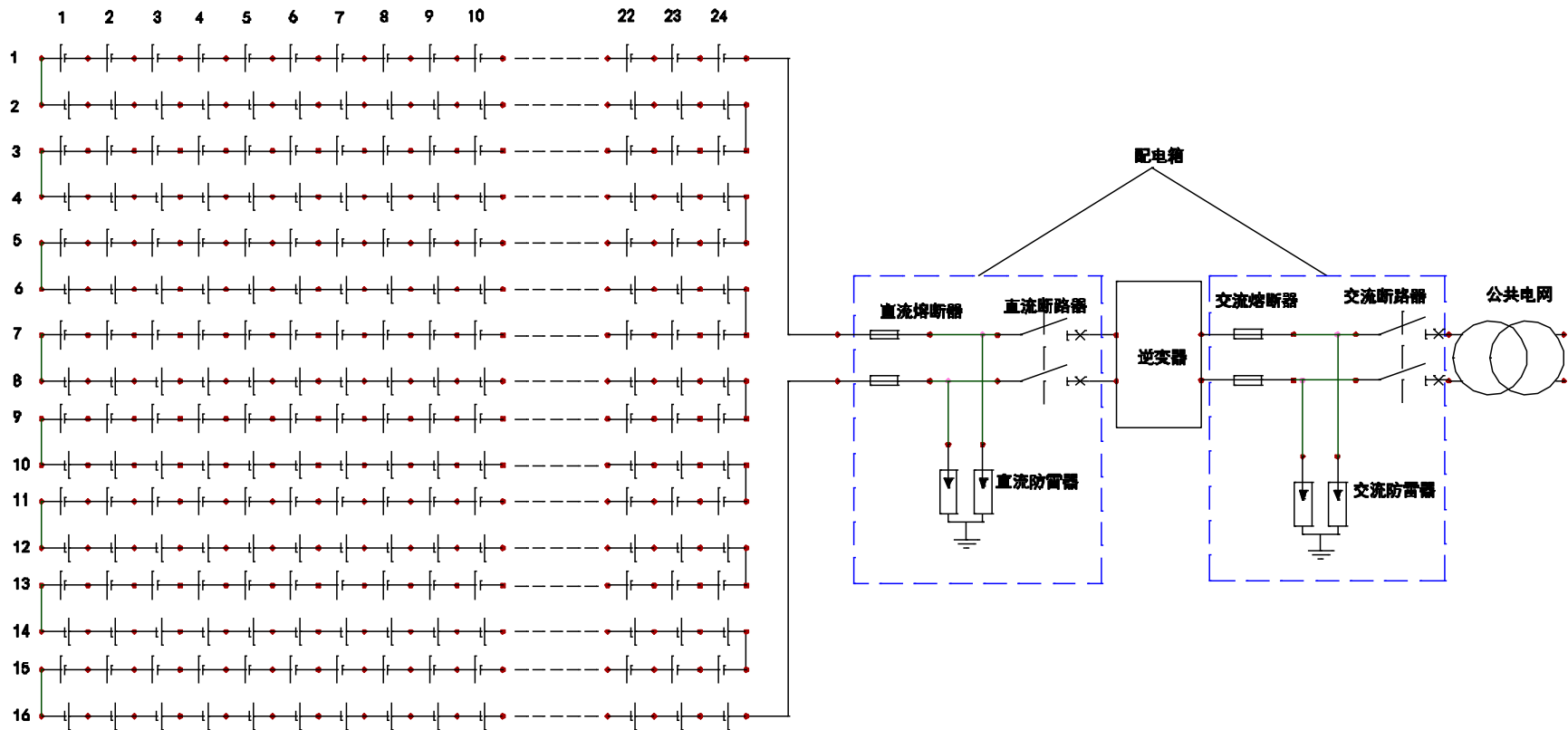



说明：1、表示一片8W单晶光伏瓦

2、在该系统中总共使用了320片8W单晶光伏瓦，总装机容量2500W。

3、标准排列方式16行×20列，需安装面积6.07*5.75=34.9m²

S -PVTS.N2500.A08.320 System wiring diagram

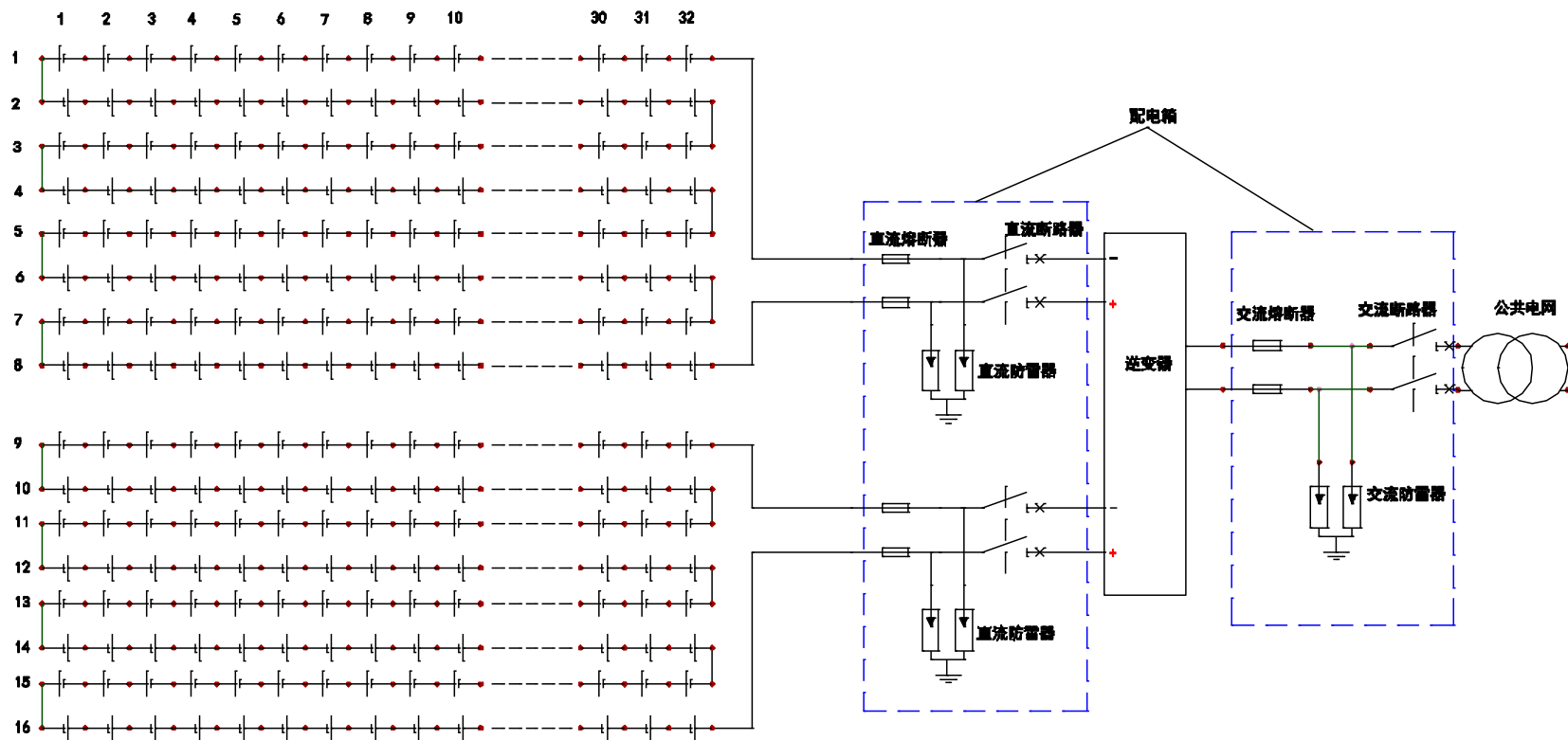



说明：1、表示一片8W单晶光伏瓦

2、在该系统中总共使用了384片8W单晶光伏瓦，总装机容量3000W。

3、标准排列方式16行×24列，需安装面积6.07*6.89=41.8m²

S-PVTS.N3000.A08.384 System wiring diagram



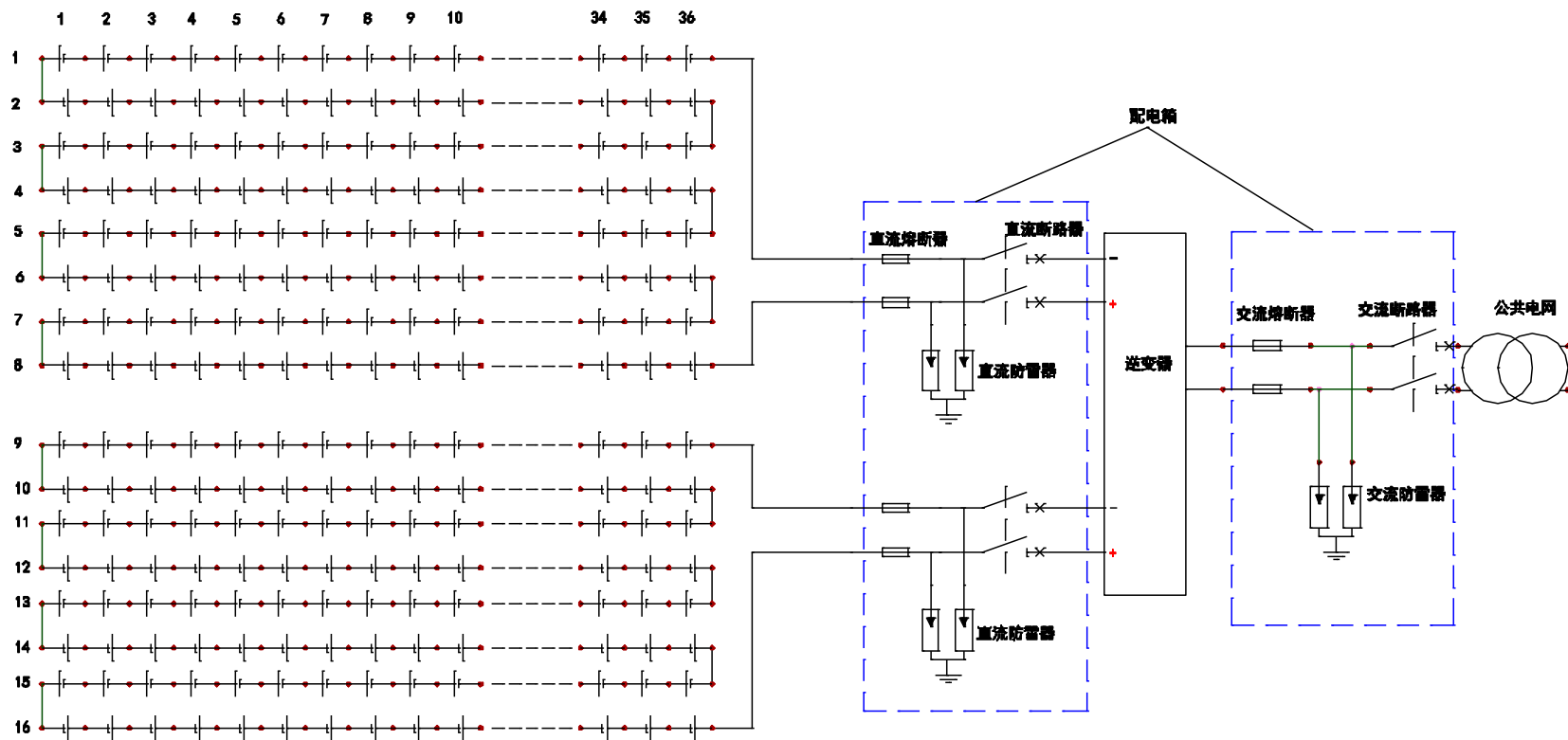
说明：1、表示一片8W波形光伏瓦


2、在该系统中总共使用了512片8W波形光伏瓦，总装机容量4000W。

3、标准排列方式16行×32列，需安装面积 $6.07 \times 9.17 = 55.6\text{m}^2$

4、接线方式：256片光伏瓦为一串，总共2串光伏瓦阵列汇流后接入逆变器

S-PVTS.N4000.A08.512 System wiring diagram



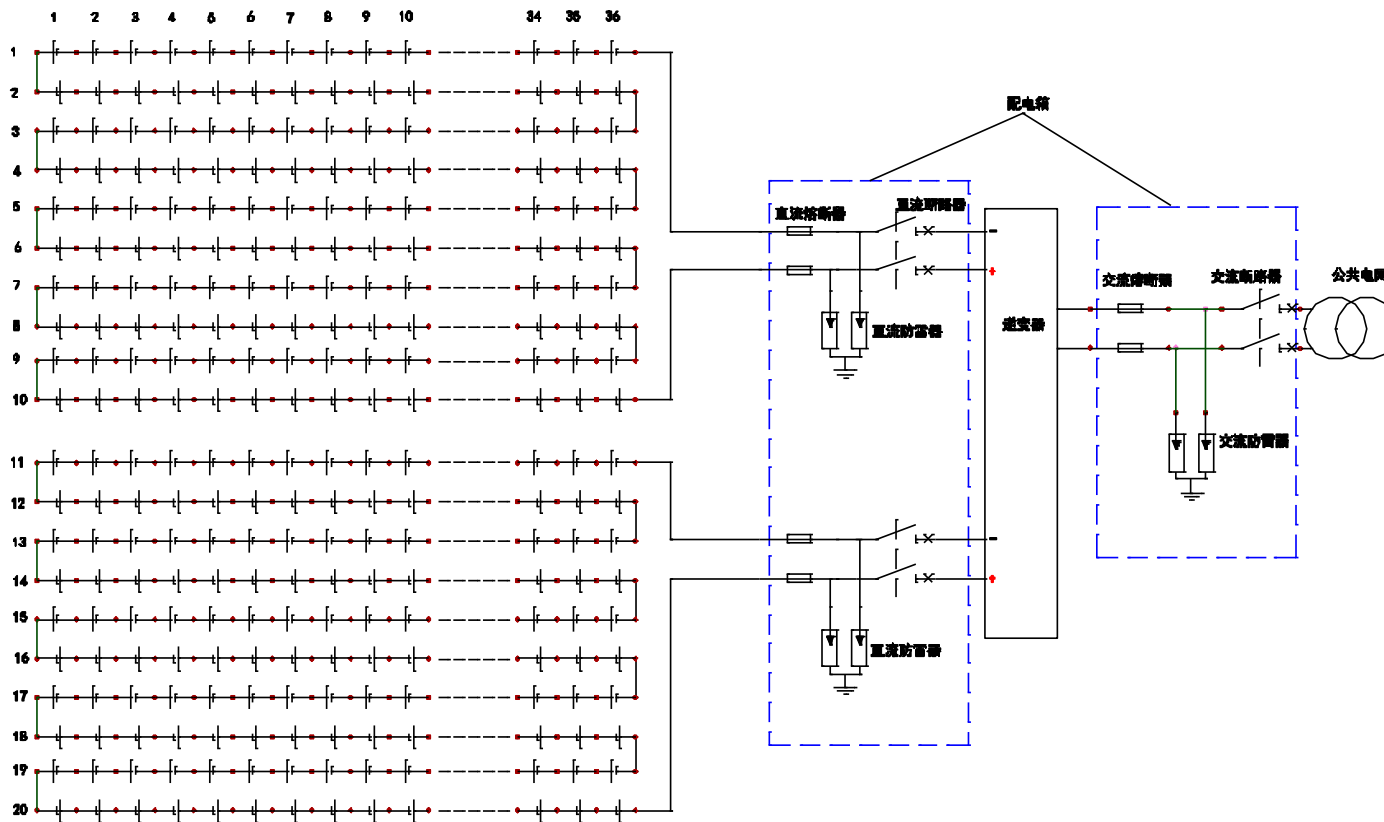
说明：1、表示一片8W波形光伏瓦


2、在该系统中总共使用了576片8W波形光伏瓦，总装机容量4600W。

3、标准排列方式16行×36列，需安装面积 $6.07 \times 10.3 = 62.5\text{m}^2$

4、接线方式：288片光伏瓦为一串，总共2串光伏瓦阵列汇流后接入逆变器

S-PVTS.N4600.A08.576 System wiring diagram



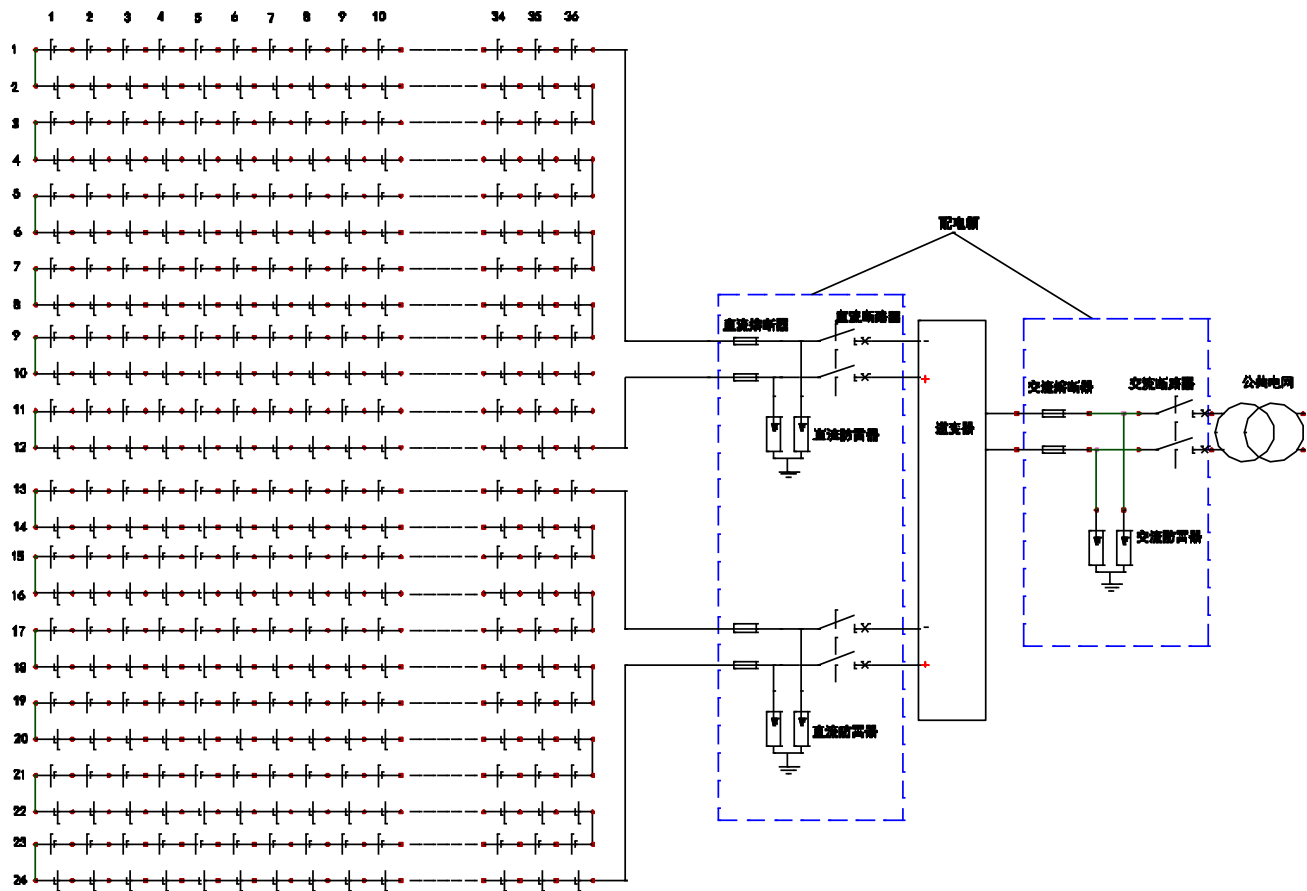
说明：1、 表示一片8W波形光伏瓦


2、在该系统中总共使用了640片8W波形光伏瓦，总装机容量5100W。

3、标准排列方式20行×32列，需安装面积7.57*9.17=69.4m²

4、接线方式：32片光伏瓦为一串，总共2串光伏瓦阵列汇流后接入逆变器

S-PVTS.N5100.A08.640 System wiring diagram



说明：1、 表示一片8W波型光伏瓦

2、在该系统中总共使用了768片8W波型光伏瓦，总装机容量6100W。

3、标准排列方式24行×32列，需安装面积9.07*9.17=83.2m²

4、接线方式：384片光伏瓦为一串，总共2串光伏瓦阵列汇流后接入逆变器

S-PVTS.N6100.A08.768 System wiring diagram

After every 20 pieces PV tiles are installed, the string must be detected with the open circuit voltage, if the open circuit voltage is zero, the PV tile should be double checked to eliminate trip point. Do not test only after all PV tiles are installed.

After all PV tiles are installed, every string of PV tile array should be verified if the open circuit voltage matching with its ideal output, if the output voltage's deviation exceeds the tolerance, please inspect tube service whether there is a damage during the installation.

Notice: During installation, do not to bring PV tile array short circuit the positive and negative.

PV tile connector and wiring method as shown below.

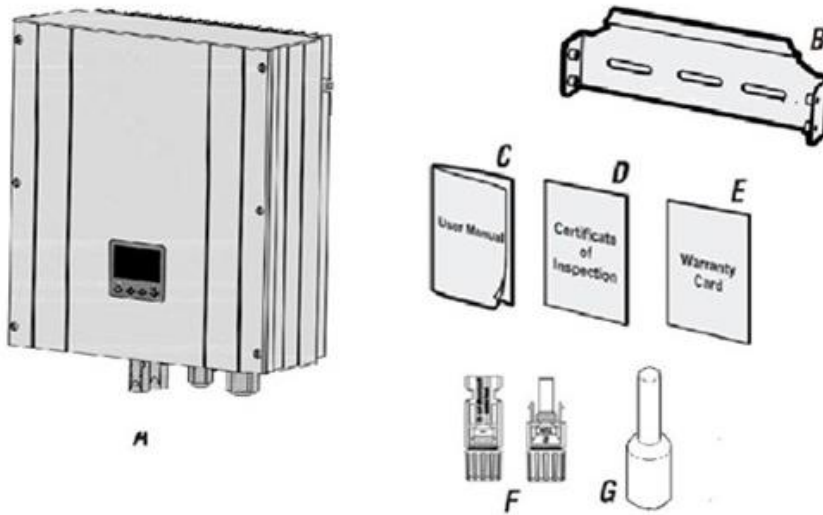


3.3 Installation for Photovoltaic on-grid inverter

(if any discrepancy between this instruction with manual of inverter, please follow the latter)

3.3.1 Packing list of Inverter

Check to verify the completeness of inverter, no visible damage. If any damage or part missing, please contact the distributor.



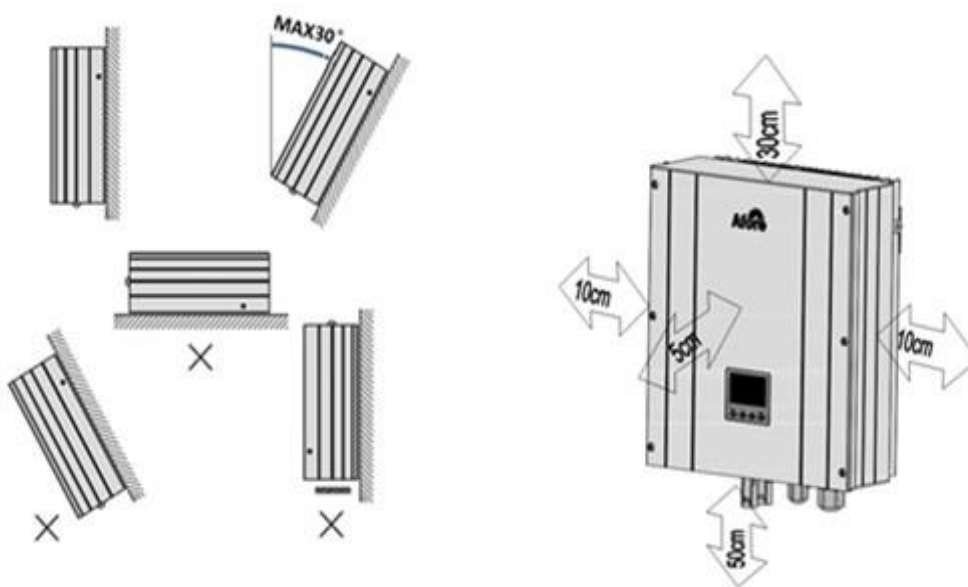
Item	QTY	Description	Item	QTY	Description
A	1	on-grid inverter	E	1	Warranty Card
B	1	Mounting sheet metal	F	HNS1000TL-1~HNS2500TL-1 /1 pair HNS3000TL-1~HNS4000TL-1 /2 pair HNS4500TL-1~HNS6000TL-1 /4pair	DC terminals
C	1	Manual	G	3	Terminals
D	1	Inspection Report			

3.3.2 Install the main engine of Inverter

一、Select appropriate location for inverter

The following considerations should be

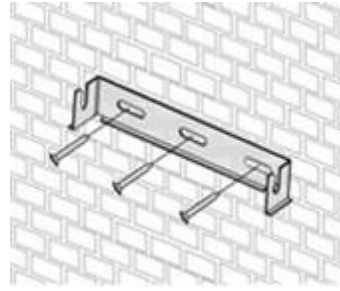
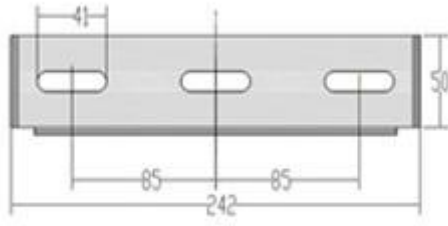
- Matching with weight and dimension of inverter
- inverter must be securely installed on solid surface instead of those unsolid to avoid vibration and noise
- Inverted must be installed at where could be easily and safely accessible without additional help such as scaffold.
- For easy installation and operation, the inverted should be installed as high as human eye.
- When inverted installed vertically, wiring area should be installed as downward; inclination angle rear-ward less than 30 degree.
- No forward inclination and no horizontal installation
- Enough space around inverted for heat evacuation
- If inverted installed at an elevation higher than 1000m, efficiency of inverted will decrease.
- For better performance of inverter, the ambient temperature should be $-20\sim 55^{\circ}\text{C}$
- Do not install the inverter at where the sunshine will directly apply, otherwise the inverted will output lower due to high temperature.



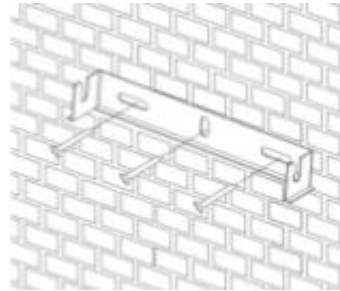
Sketch Map

二、Installed on wall

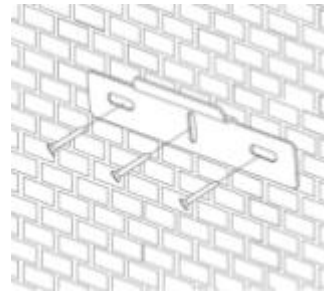
- ◆ Mark the mounting hole by mounting sheet metal



HNS1000TL-1~HNS2500TL-1



HNS3000TL-1~HNS4000TL-1

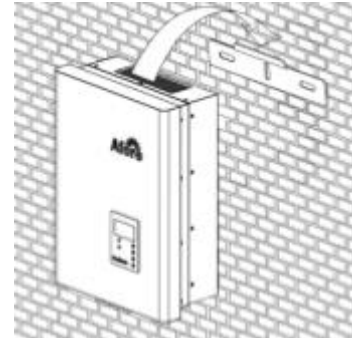
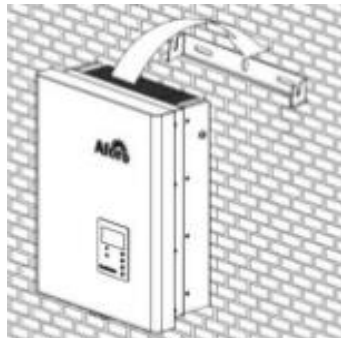
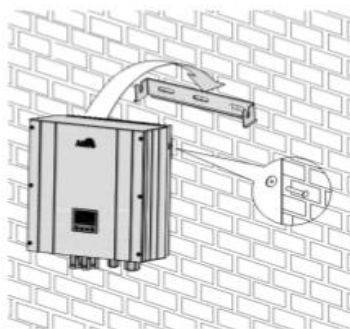


HNS4500TL-1~HNS6000TL-1

◆ using appropriate screw (OD:6~8mm) and washer (OD: 12~24mm) to secure the mounting sheet metal。

◆ Hang the inverted on mounting sheet metal

◆ Double check securely installed



Installation of inverter

3.3.3 Electrical connection of Inverter

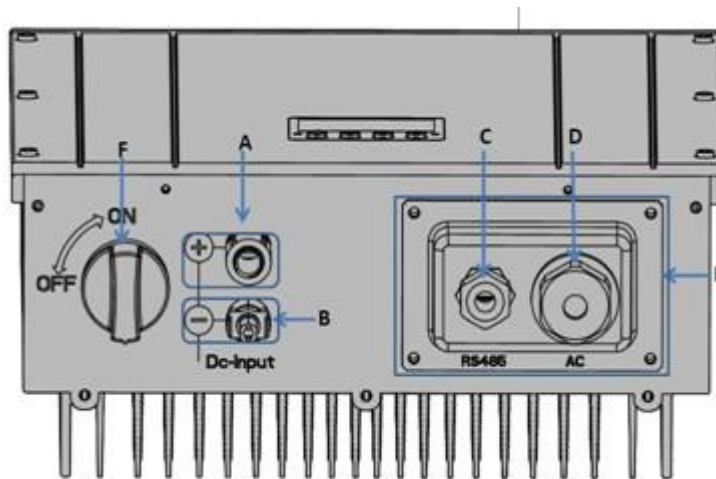
Warning • only after inverter securely installed, the electric wiring can begin

Ensure maximum open circuit voltage and short circuit current meet the standard;

Choose the appropriate wiring diameter for DC/AC

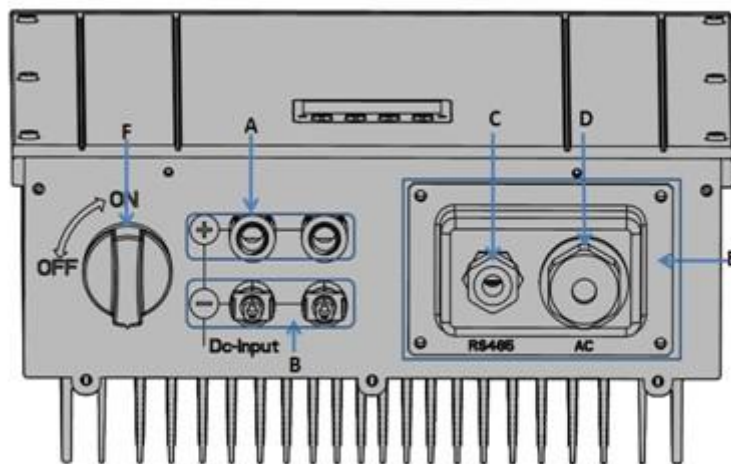
When connecting with inverted, segregate all DC/AC power from inverter

Before connecting inverter with PV array or grid, make sure the correct polarity—、 **Overview of the connection**

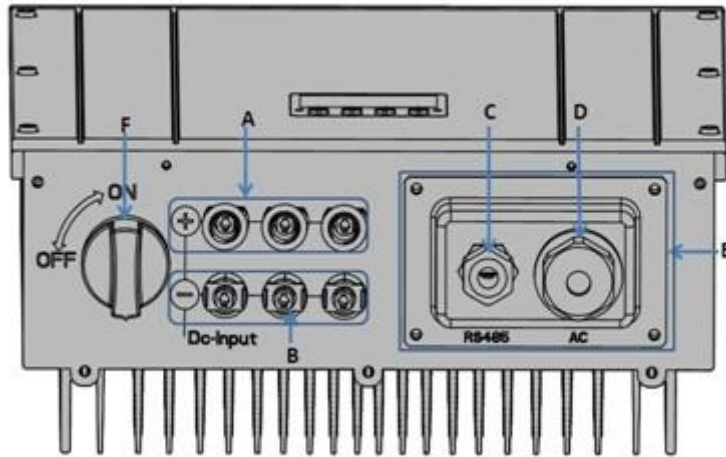


Bottom of inverter

HNSxxxTL-1(xxx=1000/1500/2000/2500)



HNSxxxTL-1(xxx=3000/3600/4000)



HNSxxxTL-1(xxx=4500/5000/5500/6000)

Description of Inverter

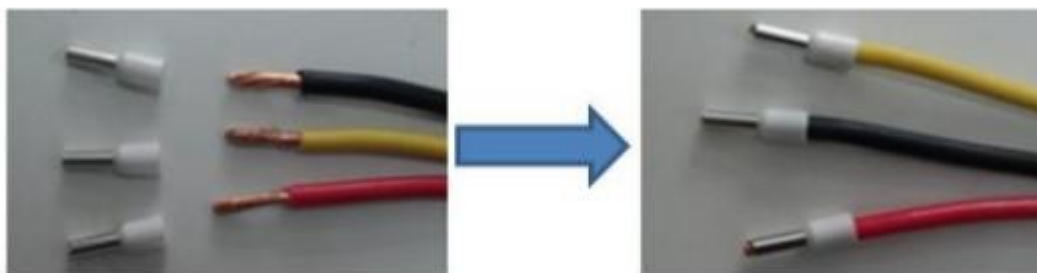
Item	Description
A	DC side + connected to PV array
B	DC side - connected to PV array
C	RS485 connector
D	For AC to grid
E	Removable cover (for RS485 and connection to grid)
F	(Switch)

二、 the conditions for communication and AC on grid

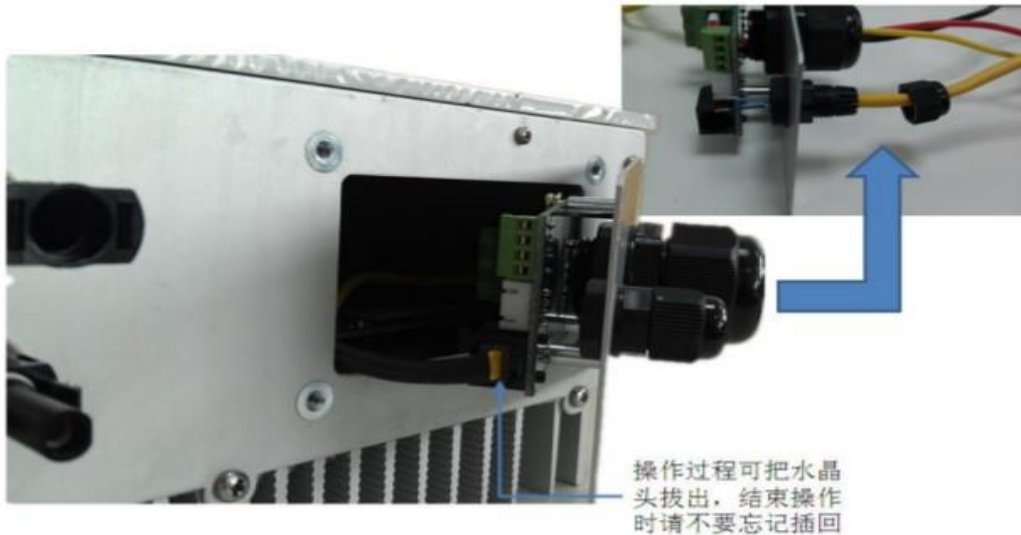
S -PVTS.N2000.A08.250、 S -PVTS.N2500.A08.320Refer to following wiring method:

Measure the voltage of grid, to ensure it within tolerancedisconnect the inverter and grid

Wiring as belowRemove 120mm length of insulation of grounding wire, live wire, neutral wire and put on the terminal



Open the removable cover to assemble the cable and wires, detail as below:



Connection for communication: cable of twisted pair or AB wire There are four pins in RS485 socket, definition of pins as following:

Pin1	+5V	Pin 2	485A	Pin 3	485B	Pin 4	GND
------	-----	-------	------	-------	------	-------	-----

Pin 1, 4 are only for wireless application Only pin 2, 3 are used in case of RS485. Up to 31 PCS inverter when multiple points communication, and can be monitored by one module connecting to grid: following the label which specified the L, N and PE

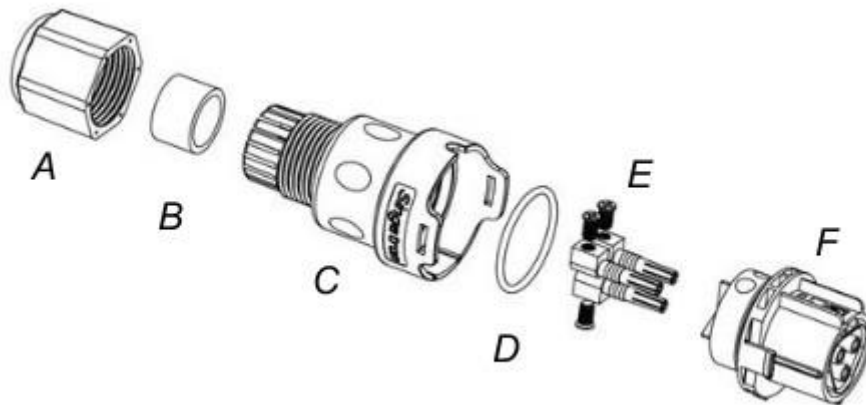


Confirm the RJ45 securely inserted and put back the removable cover, tighten the screw



S-PVTS.N3000.A08.384 、 S-PVTS.N4000.A08.512 、 S-PVTS.N4600.A08.576 、
 S-PVTS.N5100.A08.640、 S-PVTS.N6100.A08.768 Please refer to following wiring

Warning Shut down the power supply before wiring operation. explosive view of the AC



coupler

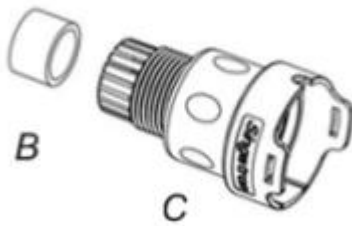
Item	Description	Item	Description
A	Cap	D	Washer
B	O ring	E	母针和螺钉
C	Thread conduit	F	Socket of AC side

Connection to grid (AC side) (VAC) Measure the voltage from grid

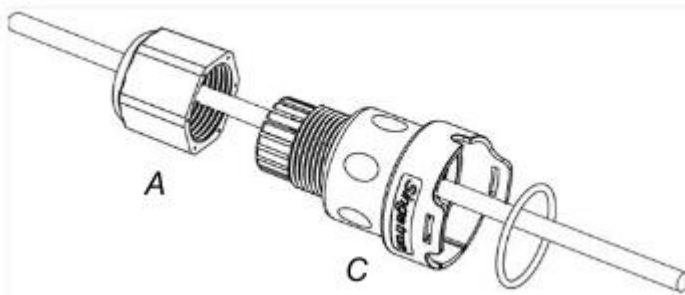
. Segregate the inverter from grid

.connecting as below

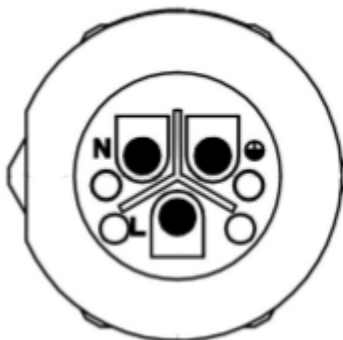
- ◆ Insert the B into C



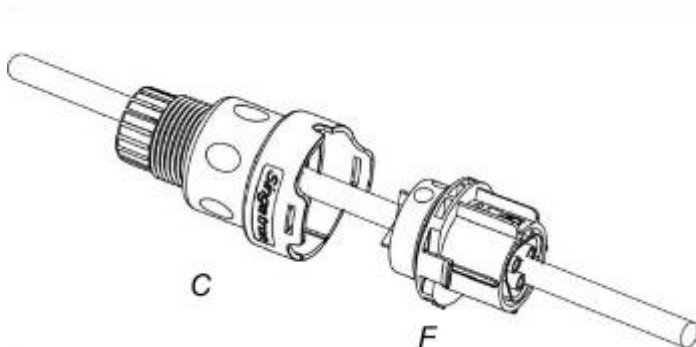
- ◆ Put the AC cables through A and C as below



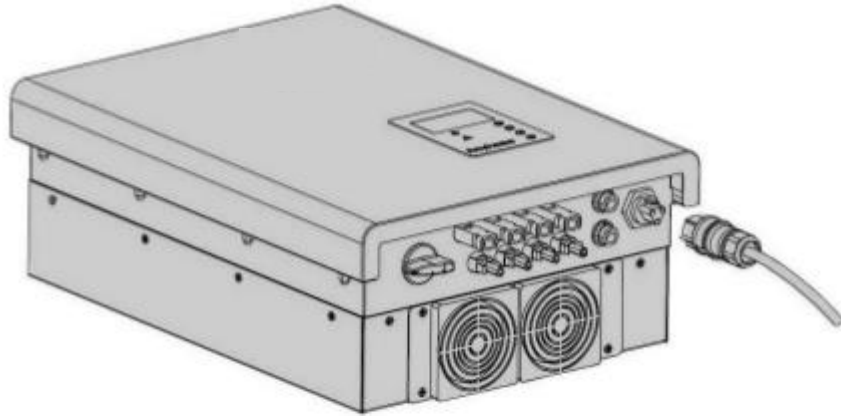
- ◆ Connecting the grounding wire, live wire and neutral wire respectively to corresponding terminal




- ◆ After three wires securely assembled, tighten all the sub-assemblies.



- ◆ Finally, connect C with F, and a “click” could be heard to indicate secure connection.




危险!
 逆变器内有高压，触碰对生命有危险

- 在光伏阵列与逆变器连接并安全关闭之前，不得闭合断路器。

三、The connection to PV arrays(DC side)

There are male side connectors included in inverter package, to be used for connection between inverter and PV arrays, please make sure the correct polarity Male plug and female plug as following.

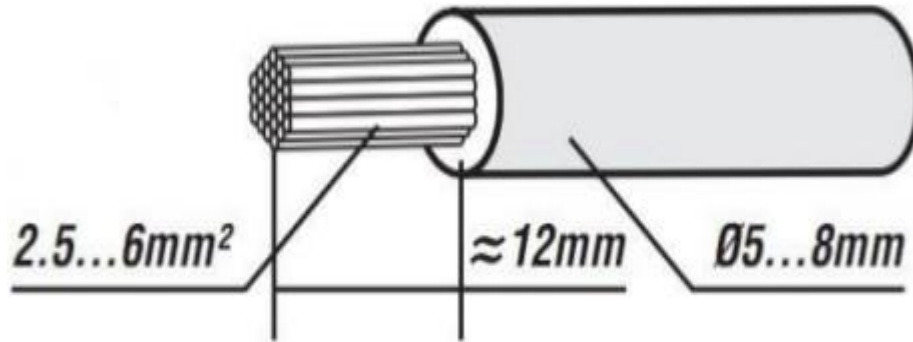


Male side connector(M)

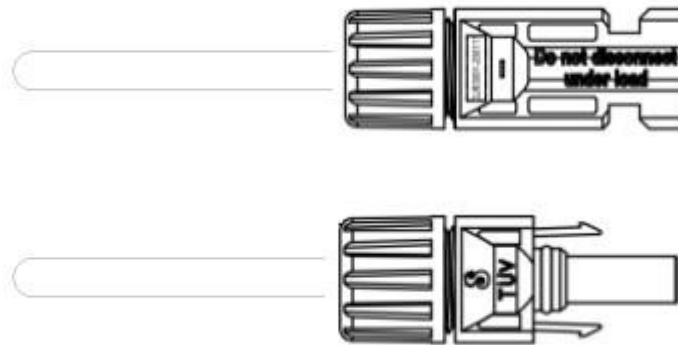


Female side connector(F)

Note:◆Cutting the insulation as figure below.



- ◆ All wiring be inserted within conduit
- ◆ Tighten the conduit
- ◆ Insert the cable sub-assembly into rear side of the male/female connector, when inserted correctly, a “click” will be heard Nut cap is following



figure

Warning • Before connection to PV array, make sure DC side is segregated from AC grid side.

Break the circuit breaker. Check the polarity of PV module’s cable and maximum input voltage is within Spec. • Verify the correct polarity of side male connector at DC side.

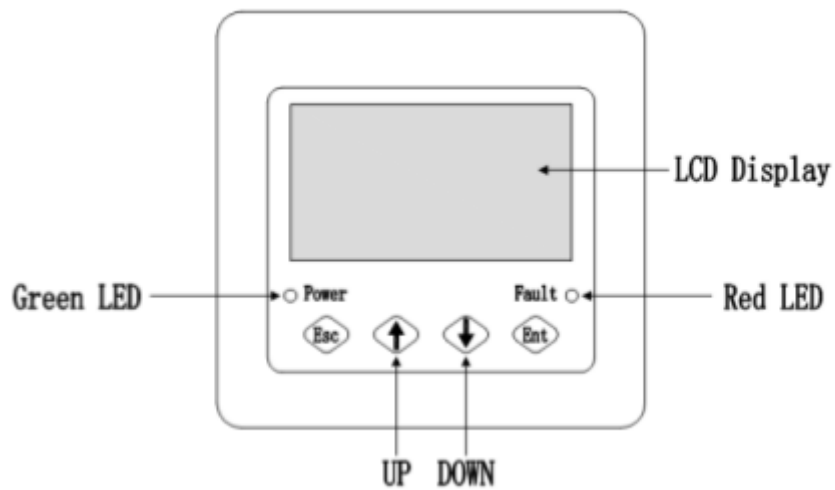
- Insert the male side connector into inverter’s DC terminal

3.3.4 The display and operation of inverter

Product Overview



一、 Overview of control and display module



there are four functional buttons on the panel: Esc,Up ,Down ,Enter
Buttons function:

. Scroll to display the parameters (“Up” and “Down”)

. Enter to modify the settings

二、 Trial run

After installation panels and connecting the wirings, inverted could be turned on.。

Switch on the breaker on DC side and grid side

The inverted will start automatically when requirements are met. Observe the LED display to ensure inverted working regularly

A	Green LED	ON: Status OK
B	Red LED	Flick: Contact the service

三、

There are two LED in the inverter, one is green and the other is red, which are used to indicate the operation status, and defined as “Good” or “No Good”. When the inverted works in good status, the green one is on; when inverter is operated correctly but the red LED is still flicking, it means the mistake in the whole PV system (including inverter), there will be some guide information on the display.

DC power indicator (green LED) If the green LED is on, it means the inverter is activated and the control system as well, if the LED is off, it means the inverter can't running well to output the power to grid. At normal working condition, the LED will be lightened on the morning and be turned off in the evening. Error indicator (red LED) If the red LED is on, it means the electric generating system is stopped due to error. Please waiting for ten minutes to confirm if it is a temporary error only, otherwise, please call the certified repair man. After error is eliminated, the system will be restarted after 5 minutes.

四、 LCD display information

The inverter will started automatically after the PV array provides the DC voltage high enough, therefore the green LED will be lightened and the logo of inverter supplier and version number will appear on LCD display accordingly.

The initialization will last for around 3 seconds, if everything is OK, the default(see below) will

Power:0W
Ipva :0A
Vpva :0V
Iac :0A
↔Wait
08-03-2011 08:25

appear on the display.

五、 main menu

Press the “ESC” to enter the main menu, next level menu is as below. Press “UP” and “DOWN” to select the item in sub-menu. After item selected, just press “ENTER” to open it. Press “ESC” to come back to main menu.

MENU ▾ Display Info Device Info History Info Advanced Info	MENU ▲ Device Info History Info Advanced Info Date/Time Adj.
---	---

Display information “Display Info” All the parameters for normal status will be displayed, it looks like the default menu after LCD is initialized.

Power :0W
Iac :0A
Vac :238V
EToday:0KWH
↔MPPT
08-03-2011 08:25

Device Information Press “Enter” to open menu of “Device Info”. The item includes the following information: rated power, rated current, rated voltage, rated frequency, bus bar voltage, cooler’s temperature and case temperature.

Device State ▾ Standard:1 Rated P :1.5KW Rated I :7A Rated V :230V Rated F :50Hz	Device State ⇅ Busbar V:458V Cooler T :26°C Case T :24°C
--	--

3.4 *Technical requirements for connecting to grid, please refer to the national technical requirement from your government*

四、 Dealing with the error, detail will change according different brand inverter configured.