

**TOTAL KITS  
INSTALLATION  
MANUAL**





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## 1.0 GENERAL INFORMATION

This general manual provides important safety information relating to the installation, maintenance and handling of CS-series solar modules. System users and professional installers should read this manual carefully and strictly follow the instructions in the manual.

Failure to follow these instructions may result in death, injury or property damage. The installation of solar modules and other electrical equipments requires specialized skills and should only be performed by licensed professionals.

Please retain this manual for future reference. It is recommended to regularly check on [www.canadiansolar.com](http://www.canadiansolar.com) for the most updated version.

### 1.1 DISCLAIMER OF INSTALLATION MANUAL

The information contained in this manual is subject to change by Canadian Solar Inc. without prior notice. Canadian Solar Inc. makes no warranty of any kind whatsoever, either explicitly or implicitly, with respect to the information contained herein.

### 1.2 LIMITATION OF LIABILITY

Canadian Solar Inc. shall not be held responsible for damages of any kind, including without limitation bodily harm, injury and property damage, relating to PV module handling, system installation, or compliance or non-compliance with the instructions set forth in this manual.

## 2.0 SAFETY PRECAUTIONS



### Warning

All instructions should be read and understood before attempting to install, wire, operate and/or maintain the module and the other electrical equipments. PV Module interconnects pass direct current (DC) when exposed to sunlight or other light sources. Contact with elec-

trically active parts of the module, such as terminals, can result in injury or death, whether the module and the other electrical equipments are connected or disconnected.

### GENERAL SAFETY

- All installations must be performed in compliance with all applicable regional and local codes or other national or international electrical standards.



Wear suitable protection (non-slip gloves, clothes, etc.) to prevent direct contact with 30VDC or greater, and to protect your hands from sharp edges during the installation.



Remove all metallic jewelry prior to installation to reduce the chance of accidental exposure to live circuits.

- Use electrical insulated tools to reduce the risk of electric shock.
- Cover the front of the modules in the PV array with an opaque material to halt production of electricity when installing or working with a module or wiring.
- **Do not** install or handle the modules when they are wet or during periods of high wind.
- **Do not** use or install broken modules and other broken equipments used in the system.
- If the front glass is broken, or the back sheet is torn, contact with any module surface or the frame can cause electric shock.
- There're no serviceable parts within the PV module. **Do not** attempt to repair any part of the module.
- Keep the junction box cover closed at all times.
- **Do not** disassemble a module or remove any module part.
- **Do not** artificially concentrate sunlight on a module.
- **Do not** connect or disconnect modules when current from the modules or an external source is present.





### 3.0 STRUCTURE INSTALLATION AND THE PV MODULE INSTALLATION

Canadiansolar share three different types of the structure for the general types of the rooftop, if the rooftop isn't different from the general types, we will supply you special solution for different types of the rooftop.

### 3.1 TRIANGLE FRAME FOR FLAT CONCRETE ROOFTOP



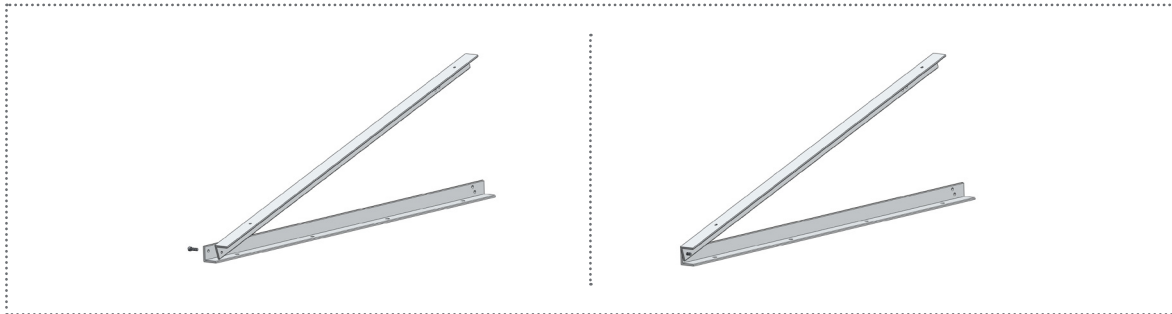
#### 3.1.1 Components list

Model name	Picture	Material
Base Pipe		AL 6005-T5
Contact Pipe		AL 6005-T5
Supporting Pipe		AL 6005-T5
Rail Splice		AL 6005-T5

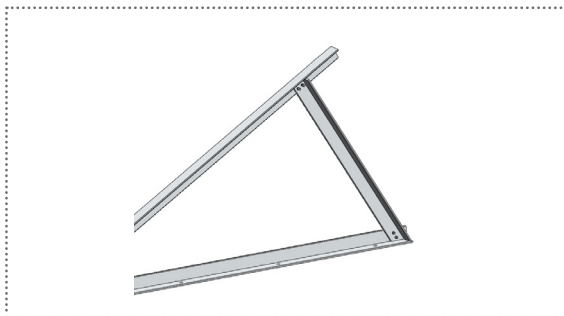
Model name	Picture	Material
Rail		AL 6005-T5
Rail connect AC		AL 6005-T5
End Clamp		AL 6005-T5
Mid Clamp		AL 6005-T5
M8 * 25 mm Screws		SUS 305

### 3.1.2 Installation Step

- ① Contact pipe with M8\*25 contact base pipe.



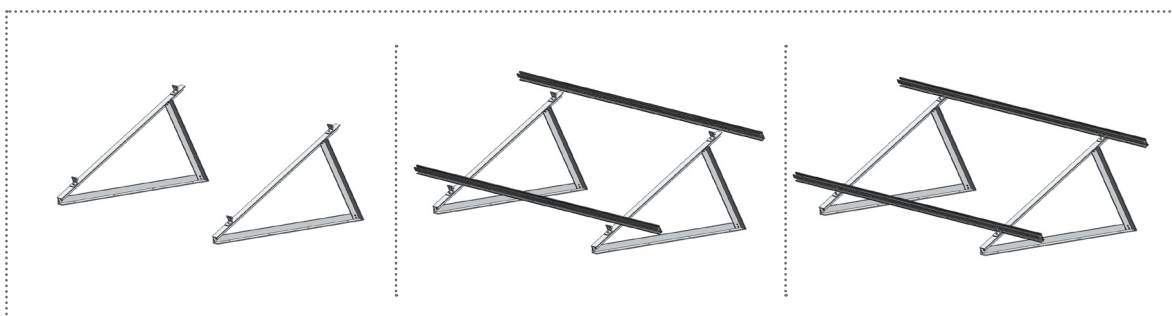
- ② Used M8\*25 contact support pipe.



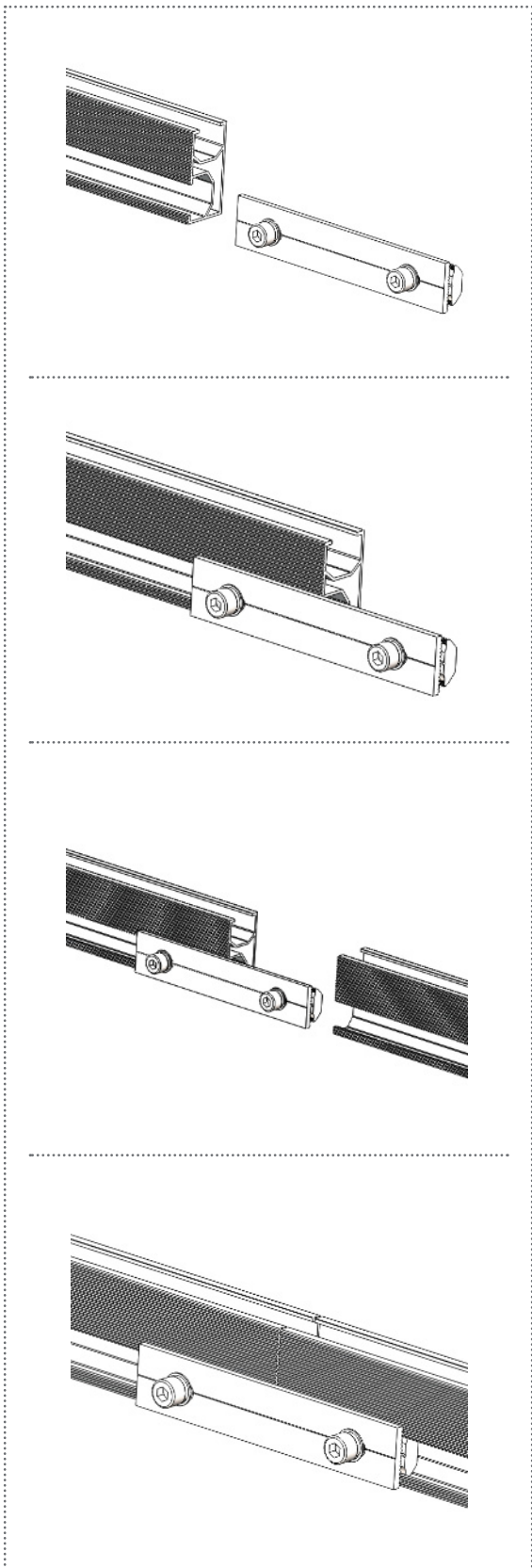
- ③ Rail AC with M8\*25 fixed on contact pipe.



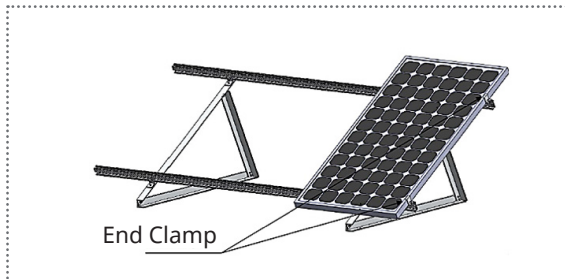
- ④ Take 2 Fixed Tile Rack and contact with Rail.



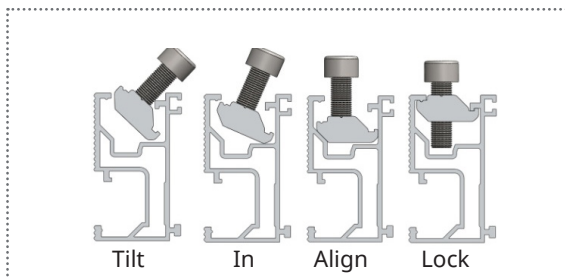
- ⑤ Installation of the splice to connect multiple rails together. Slide the splice on the rear side of the Pre-assembled rails. Fasten the first bolt. Then slide the next rail into the splice.



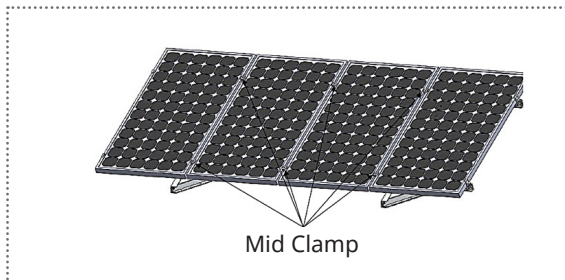
- ⑥ Put one panel on the rack, use 2 end clamp to hold and fixed as follow picture  
**(Attention: End of Rail distance must < 25 mm to 30 mm)**



- ⑦ Install method for Mid Clamp and End Clamp.



- ⑧ Fixed as follow, use mid clamp fixed between panels follow picture.



## 3.2 ROOFHOOK FOR CERAMIC ROOFTOP

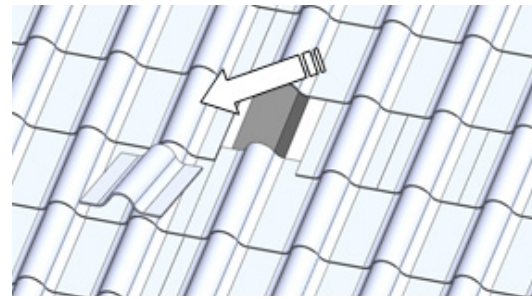


### 3.2.1 Components List

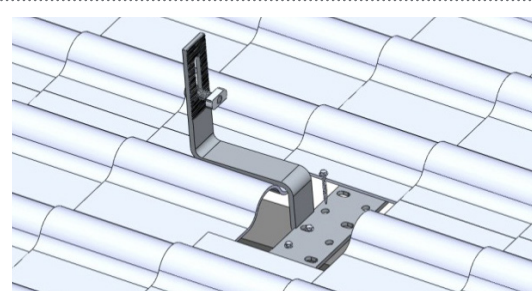
Model name	Picture	Material
Roof Hook 01		SUS 304
Rail		AL 6005-T5
Splice		AL 6005-T5
End Clamp		Al 6005-T5
Mid Clamp		AL 6005-T5

### 3.2.2 Installation Step

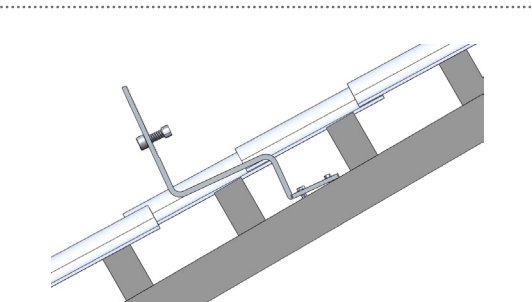
- ① Remove the roof tiles at the marked positions or simply lift them up slightly.



- ② Insert the roofhook to the wooden beam. Fix the roof hooks with screws.

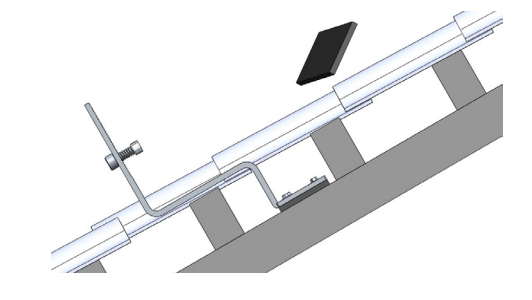


- ③ The roof hook must not press against the roof tile. Place it flat. If necessary, shim the roof hook with wood.



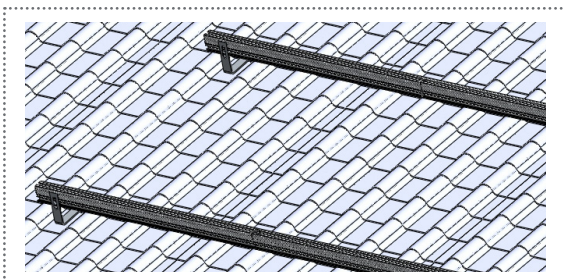
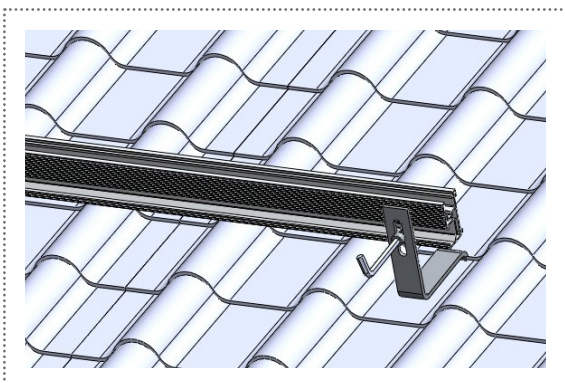
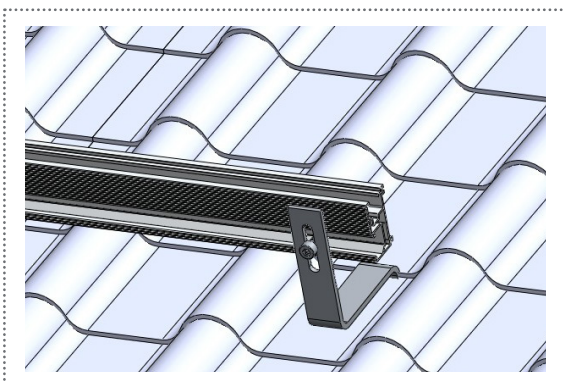
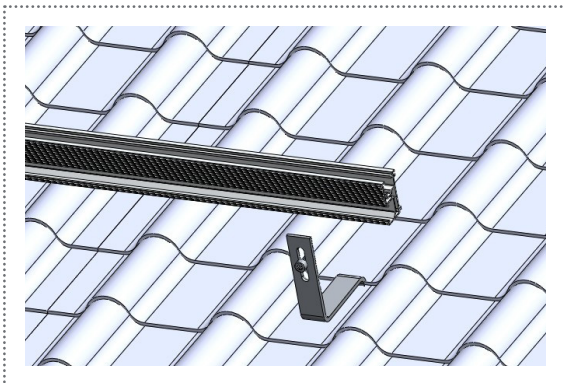
**wrong**

**correct**

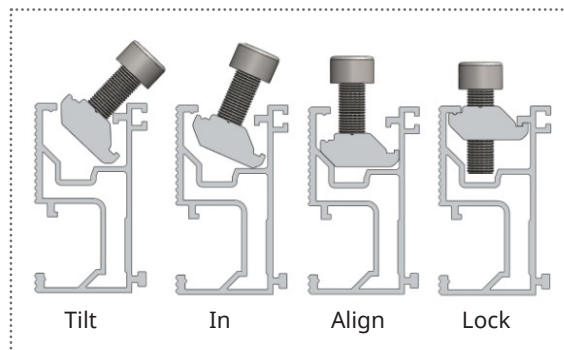




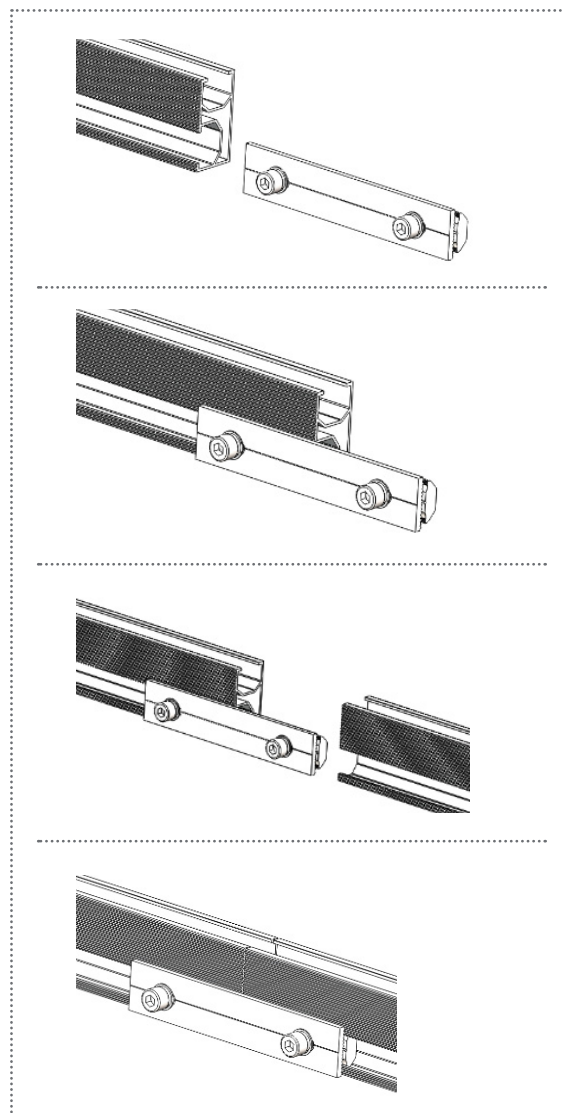
- ④ Installation of the rails on roof hooks. Your rails consist of different length, always begin with the shortest piece. Install the rails on the roof hooks loosely at first, using T-screw.



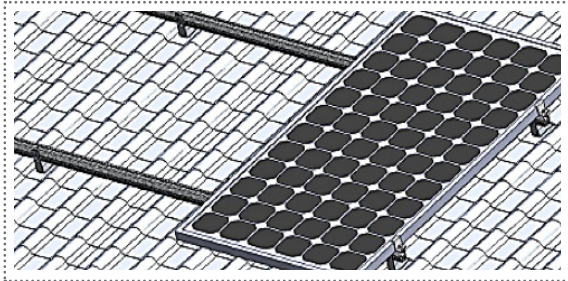
- ⑤ Install method for Mid Clamp and End Clamp



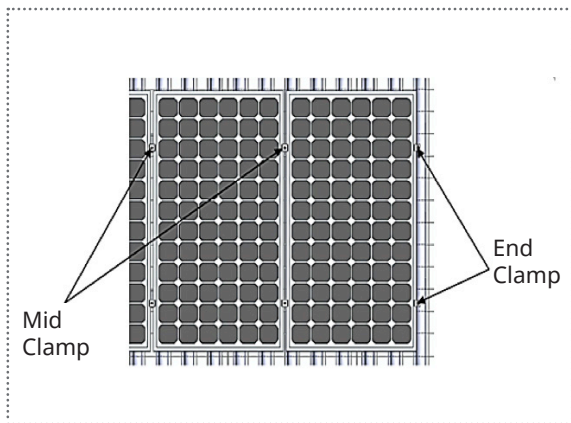
- ⑥ Installation of the splice to connect multiple rails together. Slide the splice on the rear side of the Pre-assembled rails. Fasten the first bolt. Then slide the next rail into the splice.



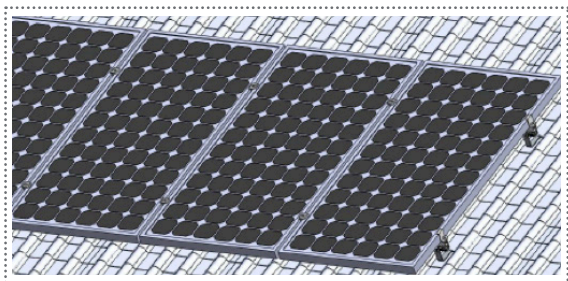
- ⑦ Place the first module of the bottom row. Slide the end clamp tightly against the module and fasten it. Install the end clamp and mid clamps.



- ⑧ Slide the next module against the installed module. Fasten the mid clamp. Install other modules and clamps in this way. Keep module even.



- ⑨ Finished



### 3.3 HANGER BOLT+L FEET FOR COLOR STEEL ROOFTOP



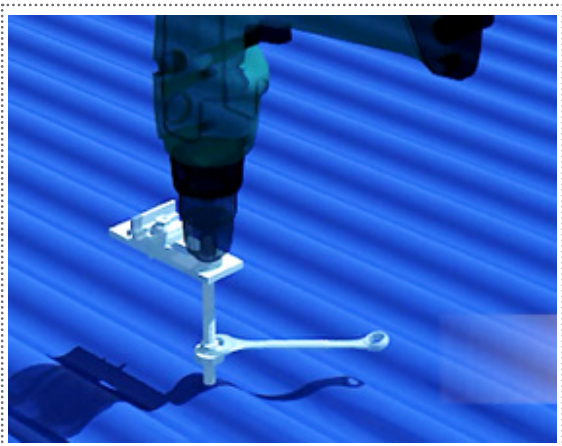
#### 3.3.1 Components List

Model name	Picture	Material
Hanger Bolt + L Feet		SUS 304
Rail		AL 6005-T5
Splice		AL 6005-T5
End Clamp		AL 6005-T5
Mid Clamp		AL 6005-T5

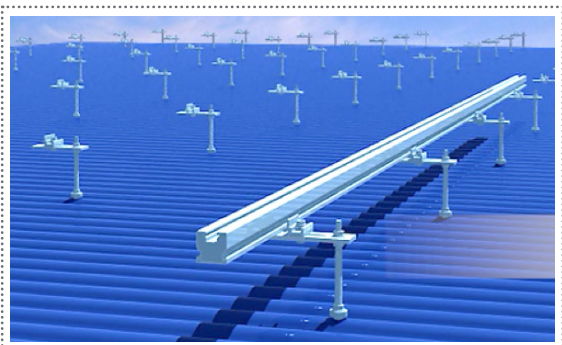


### 3.3.2 Installation Step

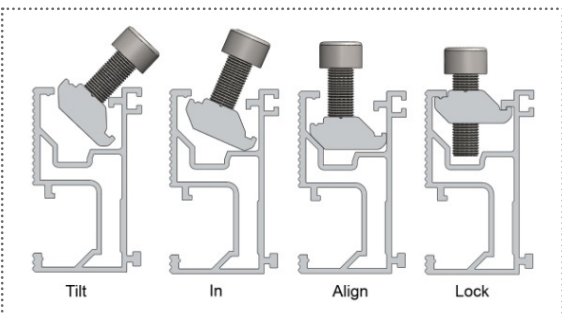
- ① Drill through the roof cladding at the planned location and screw the timber screw into the purlins. Then mount the Hanger bolt with Allen key and Electrical wrench.



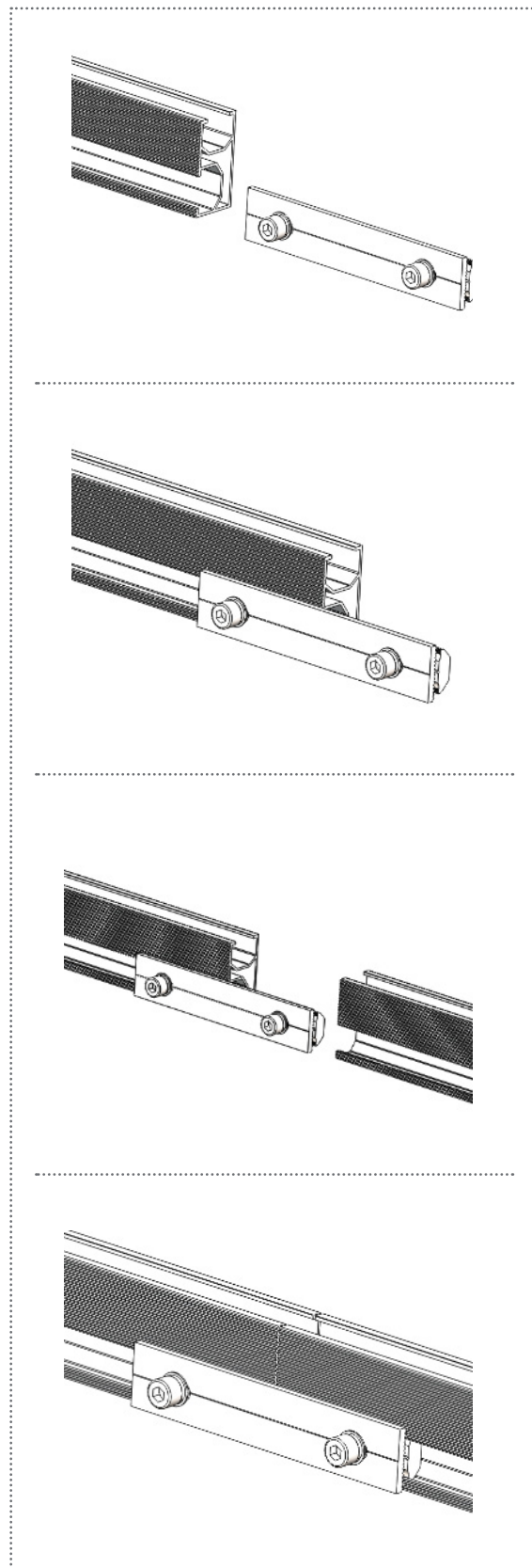
- ② Installation of the rails on Hanger Bolts. Your rails consist of different length always begin with the shortest piece. Install the rails on the hanger bolts loosely at first, using T-screw.



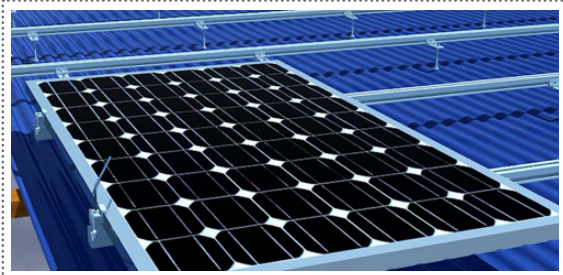
- ③ Install method for Mid Clamp and End Clamp.



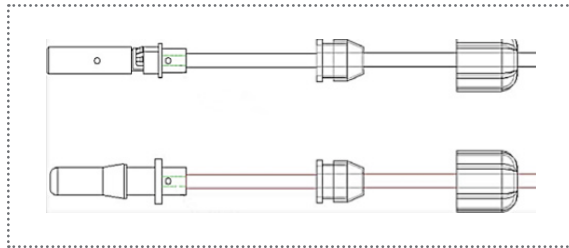
- ④ Installation of the splice to connect multiple rails together. Slide the splice on the rear side of the Pre-assembled rails. Fasten the first bolt. Then slide the next rail into the splice.



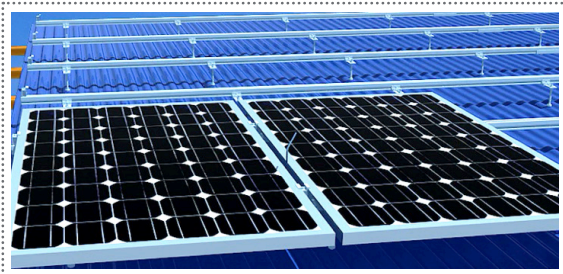
- ⑤ Place the first module of the bottom row. Slide the end clamp tightly against the module and fasten it. Install the end clamp and mid clamps.



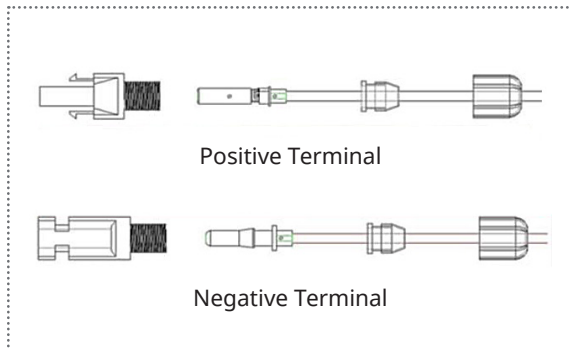
- ② Crimp the terminal



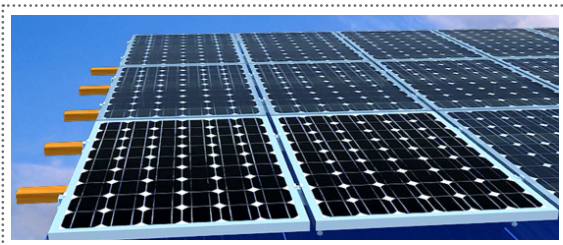
- ⑥ Slide the next module against the installed module. Fasten the mid clamp. Install other modules and clamps in this way. Keep module even.



- ③ Insert into plastic terminal

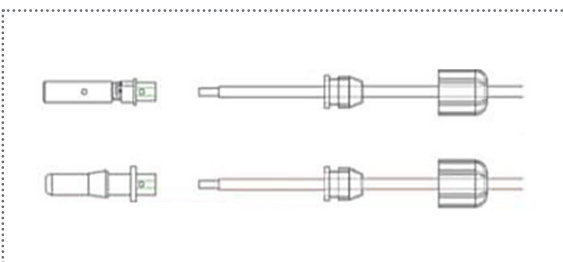


- ⑦ Finished



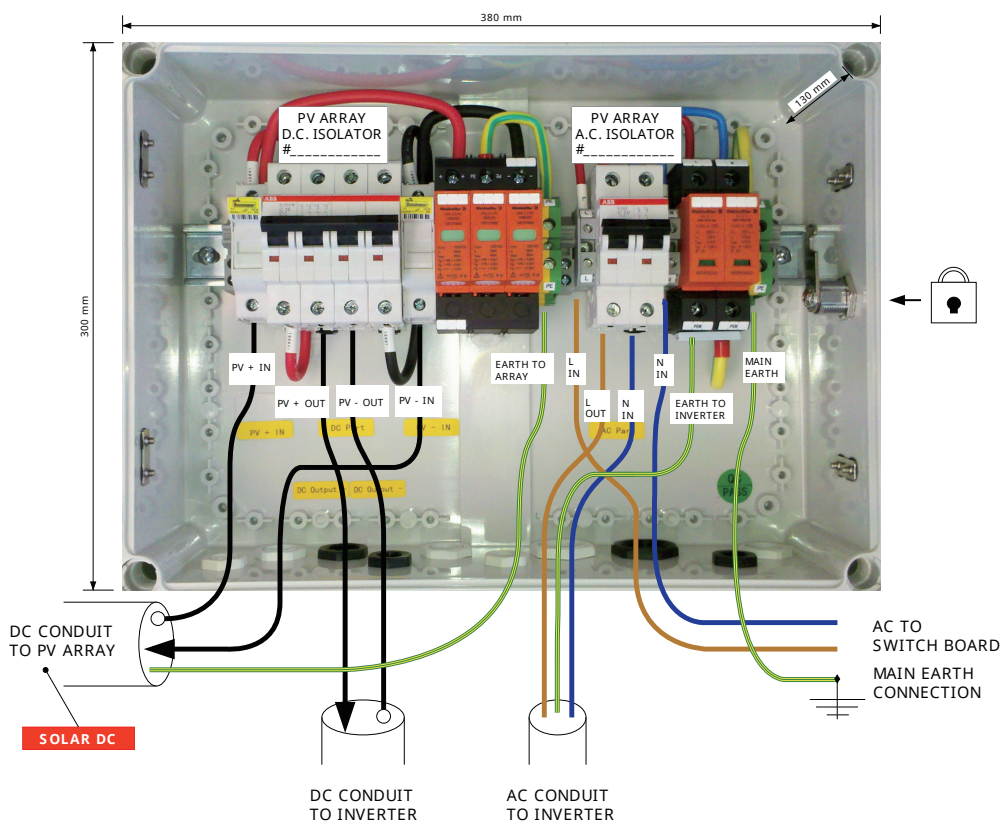
**4.0 DC CABLE WIRING**

- ① Put the threaded sleeve and pressure screw through the DC wire





## 5.0 DC ISOLATOR AND AC ISOLATOR CABLE WIRING



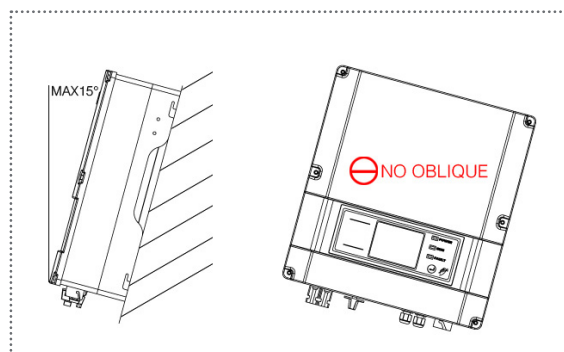
## 6.0 INVERTER INSTALLATION AND WIRING

### 6.1 INVERTER INSTALLATION

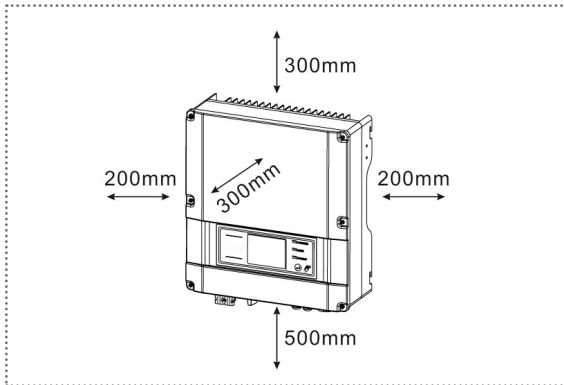
Installation position should be selected based on the following aspects:

The installation method and mounting location must be suitable for the inverter's weight and dimensions.

- > Mount on a solid surface.
- > Select a well-ventilated place sheltered from direct sun radiation.
- > Install vertically or tilted backward by max 15°. The device cannot be installed with a sideways tilt. The connection area must point downwards.

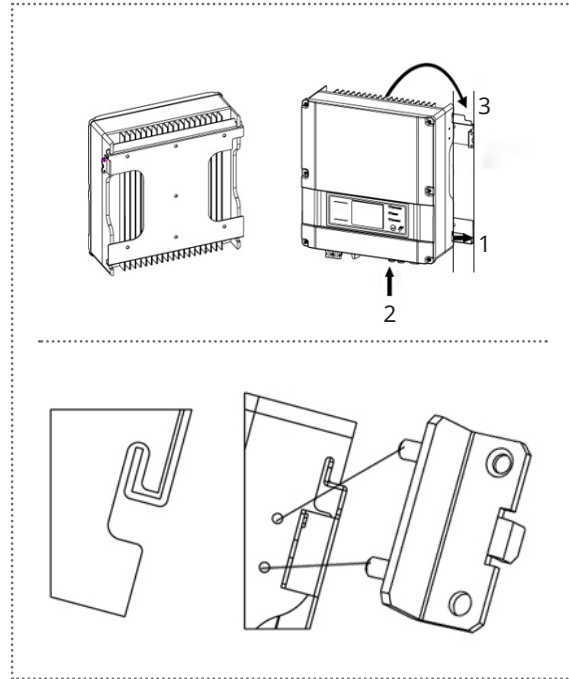


In consideration of heat dissipation and convenient dismantlement, the minimum clearances around the inverter should be no less than the following value:

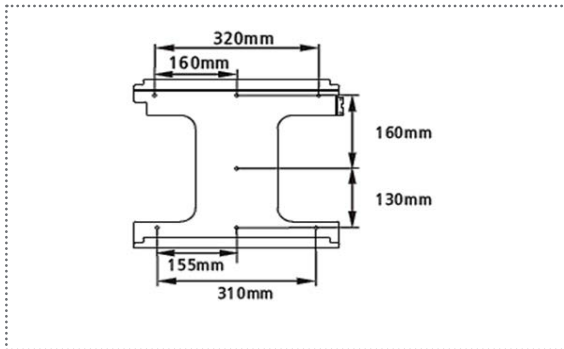


Upward	300 mm
Downward	500 mm
Front	300 mm
Both sides	200 mm

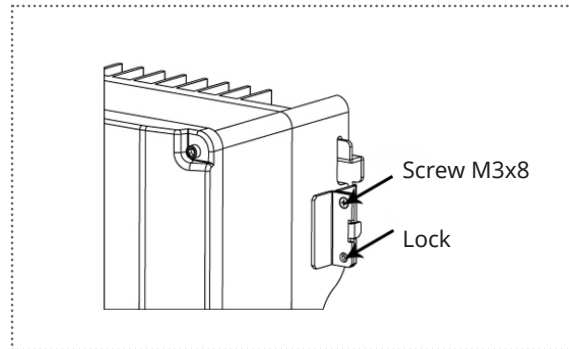
Place the inverter on the wall-mounted bracket (as illustrated below).



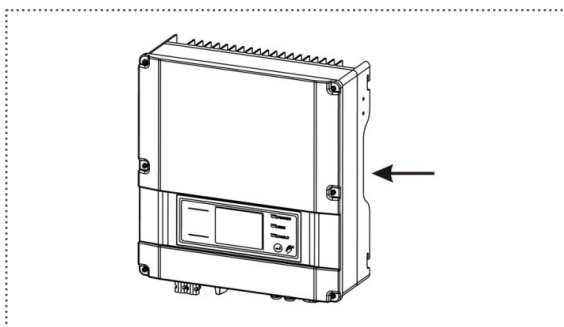
Use the wall-mounted bracket as a template and drill 7 holes on the wall, 10 mm in diameter and 80 mm deep.



Insert lock plate into two holes in the heat-sink, then fix the inverter with a padlock and screw M3x8.



Fix the wall mounting bracket on the wall with the expansion bolts in accessory bag. Carry the inverter by holding the groove on the heat sink.

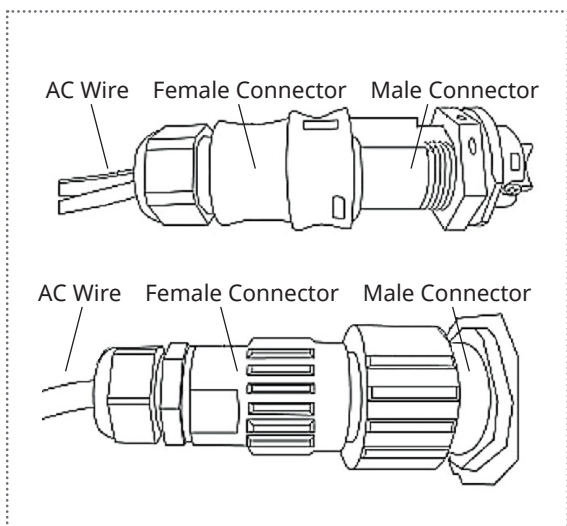


## 6.2 INVERTER WIRING

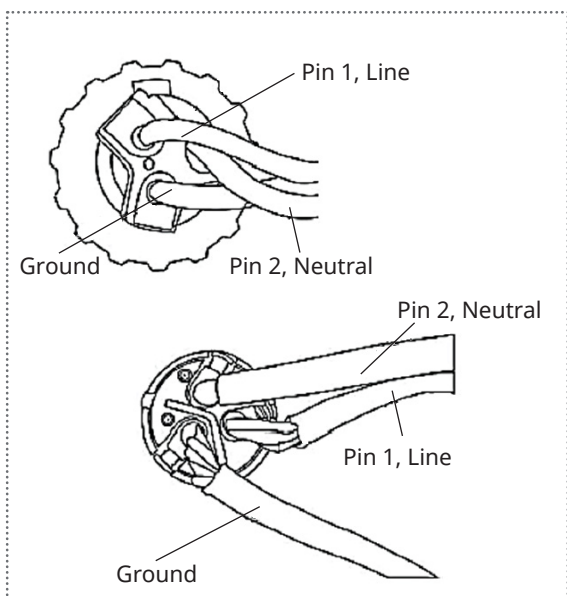
### 6.2.1 AC Side Connection

- ① Check the grid (utility) voltage and frequency at the connection point of the inverter. It should be 230 VAC (or 220 VAC), 50 Hz, and single phase.
- ② Disconnect the breaker or fuse between PV-Inverter and utility.

- ③ Connect the inverter to the grid as follows:
- ④ Switch off the AC switch, please pay more attention for this issue.
- ⑤ Disassemble female connector of the AC wire connector and connect AC wires to connection socket as indicated.



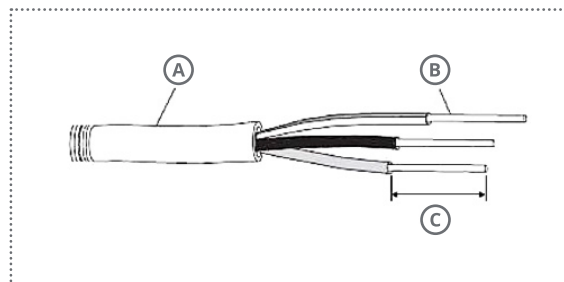
Insert Line wire to Pin 1, Neutral wire to Pin 2 and Ground wire to Pin



After fastening all screws, reassemble the female connector of the AC wire connector.

Connect the female connector of the AC wire connector to the Male connector on the inverter.

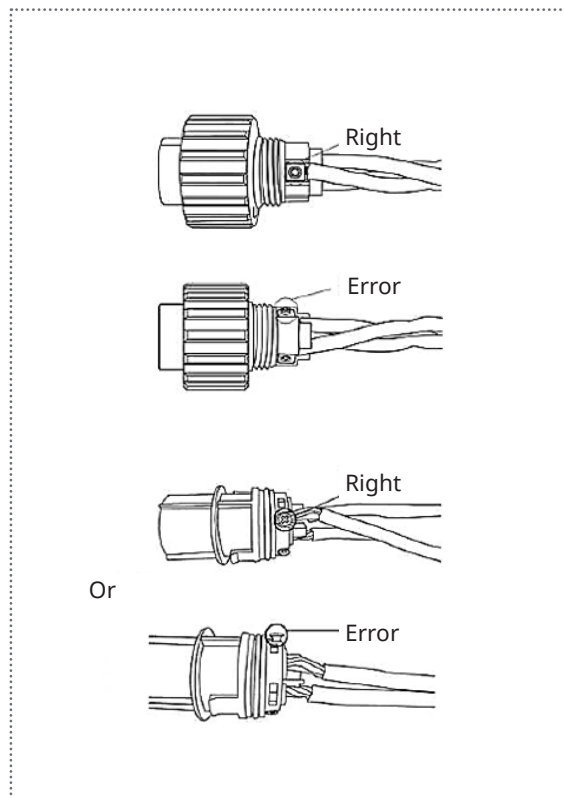
Specifications of the AC wires:



Depiction	Size
Ⓐ External Diameter of the wire	12 mm – 25 mm
Ⓑ Sectional area of conducting materials	Max. 6 mm <sup>2</sup>
Ⓒ Length of bare wire	Approx. 10 mm

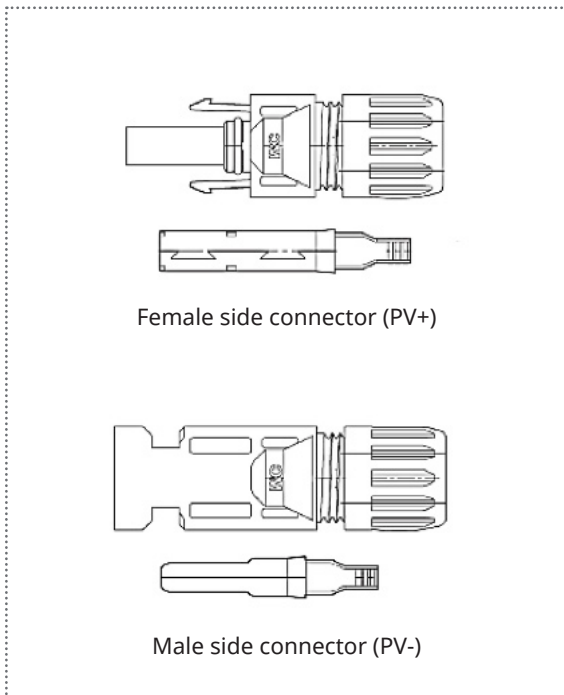
AC output connection diagram

Please tighten the screw with a screw driver until the head of the screw is inside the connector. Otherwise the wire could be loose.

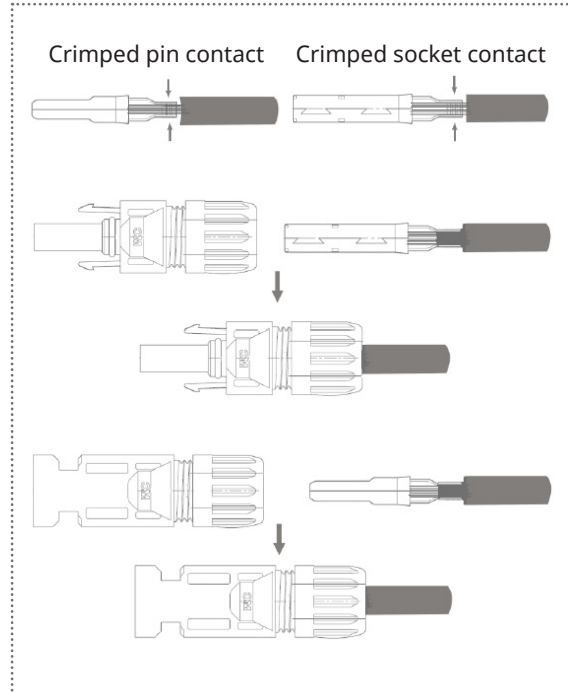
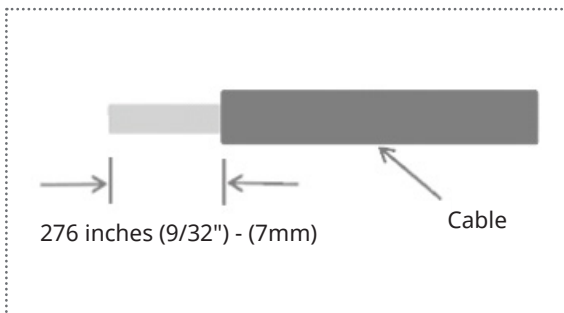


### 6.2.2 DC Side Connection

- ① Make sure the maximum open circuit voltage (Voc) of each PV string does not exceed the inverter input voltage  $V_{max}$  under any condition.
- ② Use Phoenix contact or Multi-contact connectors for PV array terminals.
- ③ Connect the positive and negative terminals of the PV panel to corresponding terminals on the Inverter. The DC terminal on each Inverter can bear 20 A DC current.
- ④ If use Multi-contact connectors for PV array terminals, installation as follows.



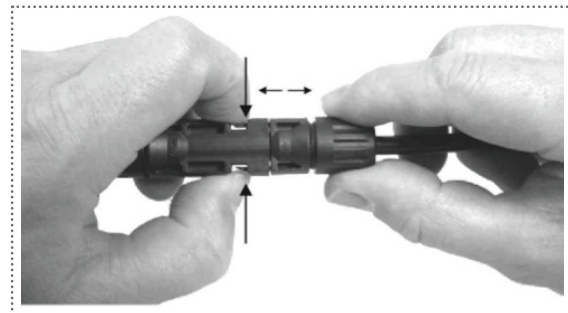
Both types of connectors must be equipped in pair strictly according to above graphs



Tighten the screw connection then the terminal can be connected to the inverter side.



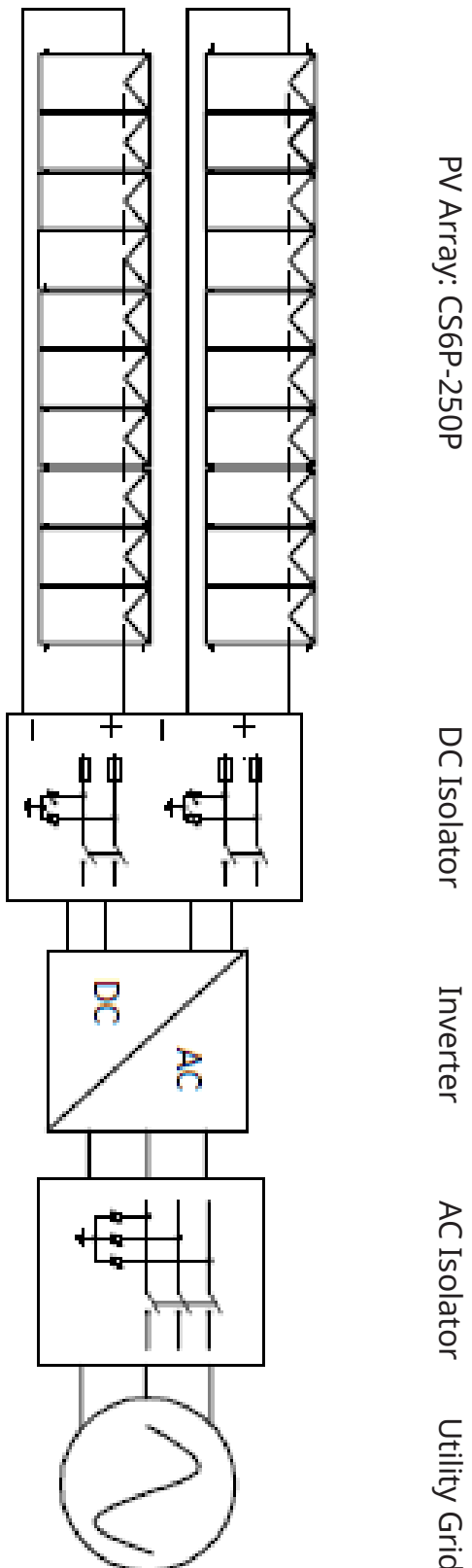
Compress the two snap-in springs by hand and release.



**Note:** Regarding the inverter equipped with DC switch, please ensure the switch is in "OFF" position before connecting the inverter with PV panels. Then switch to "ON" when connecting job is done.



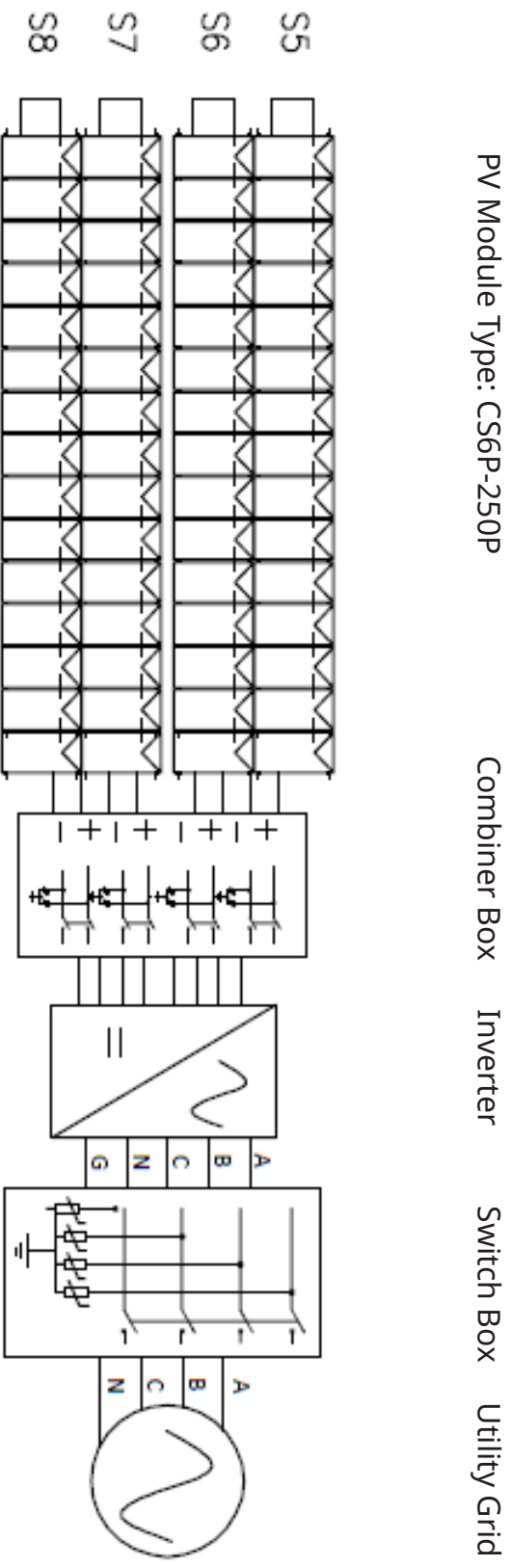
**7.0  
ON-GRID SYSTEM  
SINGLE LINE DIAGRAM**



**7.1  
SINGLE PHASE ON-GRID  
SYSTEM**

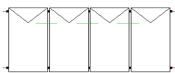
**Single Phase Solar On-Grid System Single Line Diagram**

## Three Phase Solar On-Grid System Single Line Diagram



**8.0  
PV MODULE REFERENCE LAYOUT**

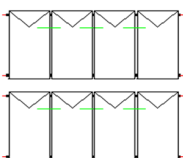
① 1 kW PV Module Reference Layout



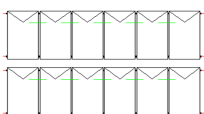
② 1.5 kW PV Module Reference Layout



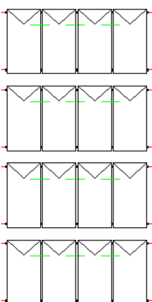
③ 2 kW PV Module Reference Layout



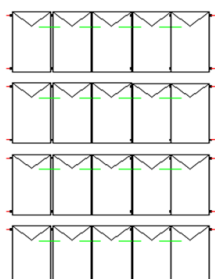
④ 3 kW PV Module Reference Layout



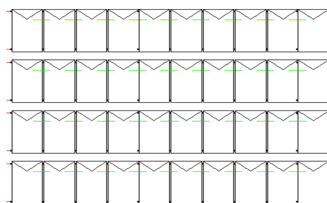
⑤ 4 kW PV Module Reference Layout



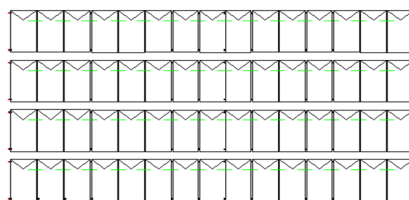
⑥ 5 kW PV Module Reference Layout



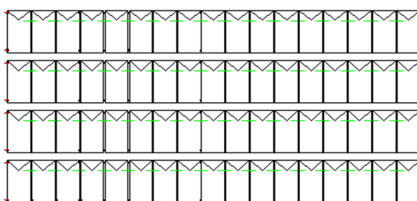
⑦ 10 kW PV Module Reference Layout



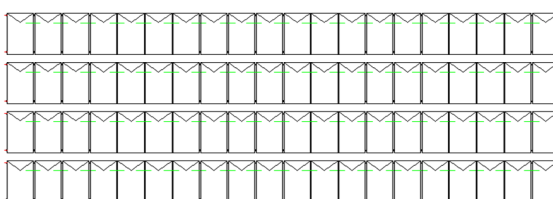
⑧ 15 kW PV Module Reference Layout



⑨ 17 kW PV Module Reference Layout



⑩ 20 kW PV Module Reference Layout



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