HYSOLAR

Installation Manual

V.2506

List of Applicable Modules

	HY-NT10/54H HY-NT10/54BH
	HY-NT10/60H
	HY-NT10/72H
	HY-P10/54H HY-P10/54BH
	HY-P10/60H
	HY-P10/72H
	HY-NT11/48H HY-NT11/48BH
	HY-NT11/54H HY-NT11/54BH
	HY-NT11/60H
	HY-NT11/66H
	HY-NT12/60H
	HY-NT12/66H
	HY-P12/60H
	HY-P12/66H
	HY-NT10/54GDF HY-NT10/54BGDF
	HY-NT10/60GDF HY-NT10/60BGDF
	HY-NT10/72GDF
	HY-NT10/78GDF
	HY-P10/54GDF
	HY-P10/60GDF
	HY-P10/72GDF
	HY-NT11/48GDF HY-NT11/48BGDF
	HY-NT11/54GDF HY-NT11/54BGDF
	HY-NT11/60GDF
	HY-NT11/66GDF
	HY-NT11/78GDF
	HY-NT12/60GDF
	HY-NT12/66GDF
	HY-P12/60GDF
	HY-P12/66GDF

pa r s and components in the system, including cables, connector, charge monitors, storage batteries, and inve r ers,

- The installation and maintenance of PV modules must be done by quali f ed engineers, and they must wear safety helmets, insulating gloves, safety shoes and use insulating tools to avoid direct contact with 30V DC or higher volt
- During the installation and transpo r of module at the project site, rain-proof measures shall be taken to prevent the
- It is prohibited to repair PV modules by users themselves, including but not limited to replacing any PV module pa r s (diode, junction box, or connector, etc.).
- Interconnecting connectors of di f erent types and models is prohibited.

grease or organic ester compounds (such as DOP, or plasticizer), aromatic, phenolic, ketone, halogenated substances, mineral oil, butter, edible oil, alkane (such as gasoline, cleaning lubricant, or electronic reactivator), alcohol, ce r ain drugs (BaiHuaYou, woodlock medicated balm, bonesettin, banana oil, or essential balm), adhesive board and potting (only for connectors) that can generate oxime gas.

- TBP (plasticizer), cleaning agent, herbicide, paint remover, adhesive, rust inhibitor, descaling agent, emulsi f er, or cut ting oil, cosmetics, etc., so as to avoid chemical damage and impact on the electrical safety pe r ormance of PV mod
- It is forbidden to use PV module in places where f ammable gases may be generated.
- It is forbidden to use PV module in places related to mobile platforms, etc.(except for tracker).
- It is prohibited to disassemble and move any pa r of PV module;
- If the PV module connector is wet, do not pe r orm any action to avoid electric shock hazard.
- The cover of the junction box shall be kept closed at all times.
- And the PV module shall be prevented from pa r ial shadow for a long time. Otherwise, the temperature of the shadow solar cell will rise (hot spot e f ect), and in serious cases, the PV module may be burnt and even a f re may be
- For PV modules used in dese r or sandy areas, it is recommended to use connector dust cap before installation, or

vent moisture or sand entering metal pa r s, which may cause plugging or use problems.

- For f eld wiring, special photovoltaic cables with minimum 90 temperature resistance, light resistance, and cross

- During transpo r ation and storage, avoid damage or drop of the package; ensure that the packaging box is ventilat ed, rain-proof and d r ; after arriving at the installation site, carefully open the outer package to prevent the PV modules from being scratched and bumped due to improper unpacking behavior; and the stacking of PV module

- Any pa r of the PV module shall be prevented from being bumped or scratched, so as not to a f ect the reliability and safety of the PV module; it is prohibited to stand or walk on the PV module; meanwhile, in order to avoid glass

- Do not install or car r the PV module by one person, and it is forbidden to lift, drag or move the PV module by grasping the junction box (including the box body, cable and connector); and when placing a PV module on the

- When installing or maintaining the PV system, do not wear any metal accessories to avoid an electric shock hazard,

  Also, to avoid the risk of arcing and electric shock, please do not touch the junction box and the output cable ends (connectors) directly with naked hands.
- When the PV modules are electrically connected, select the morning or evening with d r and low irradiance; or completely cover the PV module su r ace with an opaque material to prevent the generation of electric current.
- The PV module and the mounting su r ace shall be spaced to avoid direct contact with the junction box.
- When installing on the roof, the f re resistance requirements of the building must be obse r ed. It is recommended that the PV module be installed on f reproof and insulating roof covering layer with adequate ventilation between the PV module and the mounting su r ace. To ensure the f re rating on the roof, the minimum distance between the PV module frame and the roof su r ace is 10cm.
- The connectors must be fully plugged when wiring. If the cable is too long, it is recommended to f x the cable on the installation system with a nylon cable tie with UV resistance. When f xing the conducting wire to the rack, the bending radius of the wire shall not be less than 48mm.

- It is strictly prohibited to paint or apply any adhesive on the su r ace of PV module.

- It is forbidden to scratch anodized coating on the su r ace of aluminum alloy frame (except for grounding connec tion). Scratches may cause corrosion of the frame, a f ecting its load resistance and long-term reliability.

  separate the PV module from the f eld or circuit.
- Do not touch the wet PV module unless wearing the quali f ed anti-electric shock equipment.
- When professional personnel replace or repair PV modules, please do not damage the peripheral PV modules or their suppo r structure.
- When cleaning the PV module, the cleaning requirements of PV modules must be followed.
- Connectors must be kept d r and clean to ensure they are in good working condition. Do not inse r other metal ob jects into the connector or make electrical connections in any other way.

product package. The goods shall be stored in a d r and ventilated place

It is suggested to unpack an appropriate amount of PV modules eve r day according to the progress of the project, and the unpacked PV modules

a long time in case of severe weather such as rainstorm, which may a f ect

When the PV module is transpo r ed to the project site, it must be transpo r ed in the packing box provided by HY SOLAR, and shall be stored in the original packing box before installation. Please

Long-side ve r ical

roof projects. The PV modules shall be placed in protective devices before being hoisted to the

There are two packing methods for modules: sho r -side ve r ical and long-side ve r ical. The two packing methods have di f erent unloading and unpacking requirements. And the packing mode is as follows;

Sho r -side ve r ical

Precautions for unloading by crane are as follows:

1. When the crane is used for unloading from the f at truck (as shown in the f gure), please use the special tooling for

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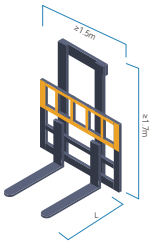
Precautions for forklift truck unloading are as follows:

1. When the forklift truck unloading is adopted for the platform truck, it shall be unloaded from both sides of the vehicle.

tween the teeth of the forklift truck is adjustable, and the teeth

as possible. The teeth of the forklift truck can be inse r deeply into the position L≥3/4 at the bottom of the pallet. The height of the forklift truck mast shall be ≥1.7M, and the width of the forklift truck mast shall be ≥1.5M.



Forklift truck mast: height ≥1.7M, width ≥1.5M; cushion

4. In the process of unloading, if the package blocks the driver' s

nel to command to prevent personnel or a r icles from being collid ed during the driving, resulting in personal inju r or package falling.

truck shall lift the module, and the distance between the bottom su r ace of the package and the bottom su r ace of the container shall be less than 50mm; otherwise, the product package may collide with the door frame of the container, which may cause damage to the PV module. When unloading from the container, after each row of

!

1. During turnover of long-side ve r ical modules, the packing box shall be propped against the forklift truck mast. The mast shall be ve r ical to the fork. The mast structure shall be f rm (bearable pressure≥1.5t). When the

ropes with tensile strength ≥2000kgf shall be fastened on the forklift truck, and safety guardrails shall be

2. The straight-line running speed of the vehicle shall be controlled to be ≤5km/h, and the turning speed shall be ≤3km/h to avoid emergency stop and rapid sta r .

3. When the manual hydraulic lift is used for turnover, the distance between the upper su r ace of the forks and the ground shall be ≤75mm.

Before unpacking, please confirm that the outer package is intact. It is recommended to use an air knife to remove the packing straps and wrapping film. It is forbidden to dismantle by force so as to avoid scratching the modules in the box. It is forbidden to unpack in case of wind force > Level 6, in rainy or snowy weather.

Follow the recommended steps below to unpack the modules. When unpacking, there shall be more than 2 persons

If it is not installed in a short time after unpacking, it shall be fixed on the leaning frame with safety rope; in case of long-term non-operation, the modules shall be laid flat on two pallets with suitable size, and it is recommended no

1. Prepare tools before unpacking: air knife (scissors), safety helmet, anti-falling bracket, safety shoes, and insulating

2. For the long-side vertical unpacking steps, a special anti-falling bracket must be used:

(1) Cut the wrapping straps, get rid of the wrapping film, and remove the upper cover and the carton;

(2) Insert the anti-falling bracket into the bottom of the pallet from the glass surface or the back plate surface of the module;

(3) Insert the fixing pin into the front hole of the bracket;

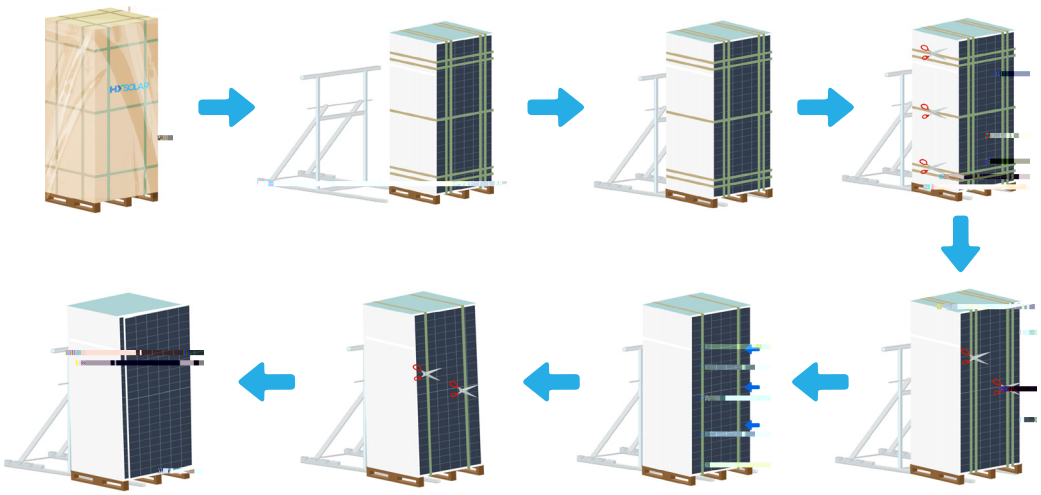
(4) Cut off all the transverse packing straps inside;

(5) Cut off the rest packing straps in the longitudinal direction except the inner two;

(6) Slowly push the module against the bracket;

(7) Cutting off the remaining packing straps;

(8) Tear off the anti-dump adhesive tape on both sides, notice to tear off only one piece of anti-dump adhesive tape



Long-side vertical unpacking steps

3. For the short-side vertical unpacking steps, the module shall be provided with fixed supports (wall surfaces, brackets, or unpacked modules, etc.):

(1) Cut all the packing straps of the outer box, remove the wrapping film, and remove the upper cover and the carton;

(2) Cut off all the transverse packing straps inside, and cut off the rest packing straps in the longitudinal direction except the two inside packing belts;

(3) Push the module against the stable support;

(4) Cutting off the remaining packing straps;

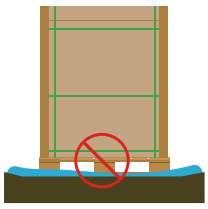
(5) Take out the modules one by one in sequence.

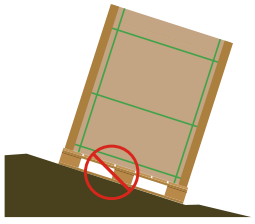
Short-side vertical unpacking steps

When the PV module is taken out of the packaging box, the cardboard shall be laid on the ground to prevent the PV module from being scratched due to collision and friction with hard objects on the cement surface/ground, or color

Objects such as installation tools, etc. shall be avoided from being placed on the surface of the PV module.

Current classification is adopted for HY SOLAR modules. The handling personnel shall place them separately and mark them according to the identification on the power list of the outer package of PV modules. According to the require





It is forbidden to stack in the place where the foor is

- Recommended ambient temperature:-20° C to+50° C; extreme operating ambient temperature of PV module:-40° C to+85°C.
- PV module mechanical load: Under standard installation conditions, the maximum test snow/wind load is 5400Pa/2400Pa respectively , and the design load (considering 1.5 safety factor) is 3,600Pa/1,600Pa. For specifc

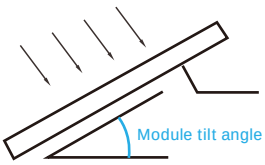
  PV Module.

  sive substances (such as salt, salt mist, salt water, active chemical vapor, acid rain, strong vapor enclosed environ ment or any other substances that will corrode the PV module and afect the safety or perormance of the PV module).
- If PV modules are to be installed in high-temperature and high-humidity environment, wet salt mist environment (in the C3 area and above specifed in ISO9223), water, farms and other special environments, the Buyer or the user shall inform HY SOLAR in advance. The type, BOM and quality warranty of PV modules used in such areas shall be determined by both parties through re-agreement.

- The installation angle of the PV module refers to the angle between the PV module surface and the ground plane, as

- When installed in the norhern hemisphere, the PV modules should preferably face south. When installed in the southern hemisphere, the PV modules should preferably face norh. For detailed installation inclination angle, please follow local regulator guidelines or recommendations from experienced PV module installers. The installation tilt angle of the PV module recommended by HY SOLAR is not less than 10 ° , so that the dust on the surface of the PV module is easy to be taken away by rain when it rains, so as to reduce the cleaning times of the PV module; mean while, it is benefcial for the accumulated rainy water on the surface of PV modules to fow away, so as to avoid a large amount of long-time accumulated water from leaving marks on the glass surface, thereby afecting the appearance and perormance of the

  angle. Diferent orientations and angles may result in diferent amounts of solar radia



Tilt Angle of PV Module

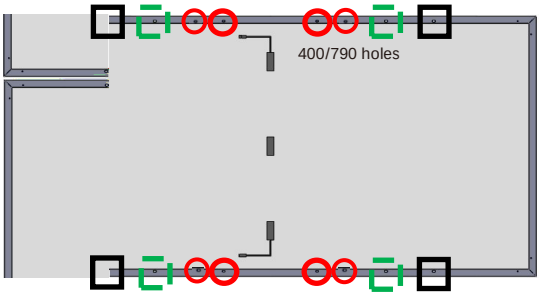
  the mounting rack system must be subjected to static mechanical analysis test by the competent third-pary testing agency to meet the requirements of the countr , region or corresponding international standards.

- When the PV module is mounted on the ground, it is recommended that the minimum distance from the foor to the

bottom of the module be at least 60cm.

- When the PV module is mounted on a suppo r parallel to the roof, the minimum clearance between the PV module frame and the roof is 10cm and air circulation is required, so as to prevent the PV module from being damaged.
- The PV module frame will have the e fect of temperature expansion and cold contraction, and the spacing between two adjacent PV module frames during installation shall not be less than 20mm.

There are at least 4φ9*14mm mounting holes matching M8 bolts on the frame of each module (most of version modules have 8, hereinafter referred to as external four holes and inner four holes), and some of version modules have additional 7*10mm mounting holes (hereinafter referred to as 400/790 holes) matching M6 bolts. (Note: All pa r s in contact with the frame shall use f at washers ≥18mm.)

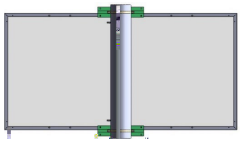


Installation Diagram of Component Mounting Hole

Installation of single-axis tracking system:

Single-axis tracking method: M6 bolt, two f at wash

connect the 400/790 holes on the long frame of the module to f x the module on the tracking axis. Instal lation torque range of fasteners: 8~14N·m. When installing accessories, take care to avoid the junction box or provide bu f er protection measures.



Single-Axis Tracking System Module

The installation method in this manual is only for guidance. The design of tracking suppo r system, selec

single-axis suppo r system refers to the installation load value of 400/790-hole bolt, but it is a f ected by

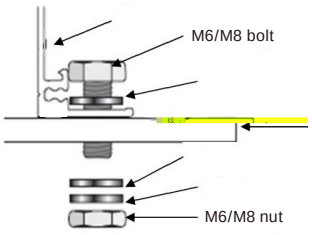
All f ttings shall be kept and tightened on tracker by wrench when using a cushion block *. And pa r s shall be kept in the center of the module without connecting junction box directly to avoid force caused.

holes be used; and in coastal areas, it is recommended to use four bolts plus medium pressure clamp. installation steps are as follows:

The PV module is placed on the suppo r rack.

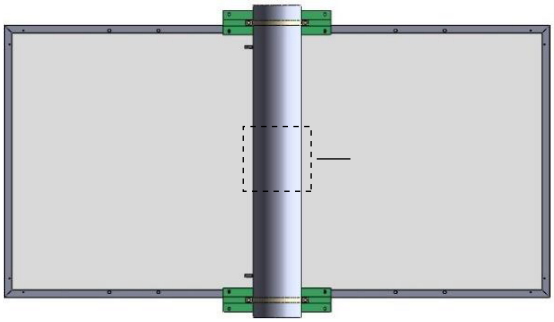
As shown in the above bolt installation diagram, inse r 4 stainless steel bolts (M8) into the mounting hole (9x14mm).

The size of mounting holes shall be 7x10mm at 400/790mm spacing and 4 stainless steel bolts of M6 type shall be used.



Ensure that two stainless steel washers are adopted for each bolt, one on the upper side and one on the lower side of the rack. The washer shall have a minimum thickness of 2mm and an outside diameter of 18mm,

The tightening torque of M6 bolt is recommended to be 9~12Nm, and the tightening torque of M8 bolt is recommended to be 17~23Nm.

	Installation mode B:
	

Maximum design load corresponding to installation of single-glass module				
	Mounting mode		Mounting mode B	
	400 holes	790 holes		
0/			00/ 00	
0/ BH			00/ 00	
0/			00/ 00	
0/ BH			00/ 00	
0/ 0			00/ 00	
0/ 0			00/ 00	
0/ 2H(35H)	00/			00/ 00
0/ 2H(30H)		00/ 00		00/ 00
0/ (35H)	00/			00/ 00
0/ (30H)		00/ 00		00/ 00
/60	1266/	00/ 00		00/ 00
/	1266/	00/ 00		00/ 00
/ 8				00/ 00
/ 8B				00/ 00
/				00/ 00
/ BH				00/ 00
/ 0		00/ 00		00/ 00
/		00/ 00		00/ 00

Maximum design load corresponding to installation of double-glass module				
	Mounting mode A		Mounting mode B	
	400 holes	790 holes		
HY-NT10/54GDF	---	---	3600/1600	---
HY-NT10/54BGDF	---	---	3600/1600	---
HY-P10/54GDF	---	---	3600/1600	---
HY-NT10/60GDF	---	---	3600/1600	---
HY-P10/60GDF	---	---	3600/1600	---
HY-NT10/72GDF	1200/1200	1600/1600*	---	3600/1600
HY-P10/72GDF	1200/1200	1600/1600*	---	3600/1600
HY-NT10/78GDF(35H)	---	---	---	3600/1600
HY-NT10/78GDF(30H)	---	1600/1600*	3600/1600	2400/1600
HY-NT12/60GDF(35H)	1466/1466	---	---	3600/1600
HY-NT12/60GDF(33H)	1333/1333	1866/1600*	---	3600/1600
HY-NT12/66GDF (35H)	1466/1466	---	---	3600/1600
HY-NT12/66GDF(33H)	1333/1333	1866/1600*	---	3600/1600
HY-NT11/48GDF	---	---	---	3600/1600
HY-NT11/48BGDF	---	---	---	3600/1600
HY-NT11/54GDF	---	---	---	3600/1600
HY-NT11/54BGDF	---	---	---	3600/1600
HY-NT11/60GDF	* 1066	1600/1600*	---	3600/1600
HY-NT11/66GDF	* 1066	1600/1600*	---	3600/1600
HY-NT11/78GDF	---	---	3600/1600	3600/1600
HY-NT10/54GDF (188)	---	---	3600/1600	
HY-NT10/54BGDF (188)	---	---	3600/1600	
HY-NT10/60GDF (188)	---	---	3600/1600	
HY-NT10/60BGDF (188)	---	---	3600/1600	

Note: Test load=ym (1.5 times safety factor)×design load. Cushion blocks are used for those marked with "*". "(188)" represents a 182.2*188 cell.

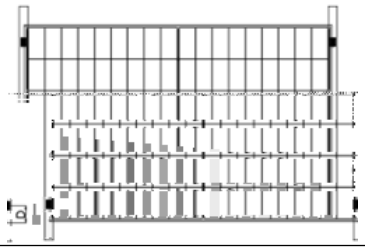
The quantity and position of clamp are ve r crucial for the reliability of installation. Generally, the number of clamp must not be less than 4. According to the requirements of di f erent loads and installation meth ods, the position of the center line of the clamp is speci f ed. During installation, the clamp must be within

Installation mode C: four clamps are f xed, and the beam is perpendicular to the long frame		
Maximum design load corresponding to installation of single-glass module		
	Mounting mode C	
	Installation range D (mm)	Design load (pa)
0/	≤ ≤	00/ 00
0/ B	≤ ≤	00/ 00
0/	≤ ≤	00/ 00
0/ BH	≤ ≤	00/ 00
0/ 0	≤ ≤	00/ 00
0/ 0	≤ ≤	00/ 00
0/	400≤ ≤ 00	00/ 00
0/	400≤ ≤ 00	00/ 00
/60	38 ≤ ≤ 8	00/ 00
/	0≤ ≤ 0	00/ 00
/ 8	≤ ≤	00/ 00
/ 8B	≤ ≤	00/ 00
/	≤ ≤	00/ 00
/ BH	≤ ≤	00/ 00
/ 0	38 ≤ ≤ 8	00/ 00
/	≤ ≤	00/ 00

Maximum design load corresponding to installation of double-glass module		
	Mounting mode C	
	Installation range D (mm)	Design load (pa)
HY-P10/54GDF	316≤D≤416	3600/1600
HY-P10/54BGDF	316≤D≤416	3600/1600
HY-NT10/54GDF	316≤D≤416	3600/1600
HY-NT10/54BGDF	316≤D≤416	3600/1600
HY-P10/60GDF	335≤D≤435	3600/1600
HY-NT10/60GDF	335≤D≤435	3600/1600
HY-P10/72GDF	440≤D≤490	3600/1600
HY-NT10/72GDF	440≤D≤490	3600/1600
HY-NT10/78GDF	480≤D≤580	3600/1600
HY-NT12/60GDF	450≤D≤530	3600/1600
HY-NT12/66GDF	440≤D≤540	3600/1600
HY-NT11/48GDF	316≤D≤416	3600/1600
HY- NT11/48BGDF	316≤D≤416	3600/1600
HY-NT11/54GDF	345≤D≤445	3600/1600
HY-NT11/54BGDF	345≤D≤445	3600/1600
HY-NT11/60GDF	385≤D≤485	3600/1600
HY-NT11/66GDF	440≤D≤540	3600/1600
HY-NT11/78GDF	480≤D≤580	3600/1600
HY-NT10/54GDF (188)	316≤D≤416	3600/1600
HY-NT10/54BGDF (188)	316≤D≤416	3600/1600
HY-NT10/60GDF (188)	335≤D≤435	3600/1600
HY-NT10/60BGDF (188)	335≤D≤435	3600/1600

Note: Test load=ym (1.5 times safety factor)×design load."(188)" represents a 182.2*188 cell.

Installation mode D:Sho r edge installation. Four clamps are fxed, and the beam is perpendicular to the long frame.
Overlap width between the beam and the sho r side of the module shall be≥ 20mm.
The length of the clamps shall be ≥60mm. It is recommended to use clamps with an arc design to ft the A-side frame, featuring



Maximum design load corresponding to installation of double-glass module		
	Mounting mode D	
	Installation range D (mm)	Design load (pa)
HY-NT11/48GDF	50≤D≤150	1066/1066
HY-NT11/48BGDF	50≤D≤150	1066/1066
HY-NT10/54GDF (188)	50≤D≤150	1066/1066
HY-NT10/54BGDF (188)	50≤D≤150	1066/1066
HY-NT10/60GDF (188)	50≤D≤150	866/666
HY-NT10/60BGDF (188)	50≤D≤150	866/666

Note: Test load=ym (1.5 times safety factor)×design load."(188)" represents a 182.2*188 cell.

The length of the rack must be longer than the size of the PV module, or it shall be confrmed by HY SOLAR in advance;

The above two diagrams show the installation method by using aluminum clamp . "D" indicates the allowable installation range of aluminum clamp, and the specifc recommended installation position and corresponding load are as shown in Table 1("---" indicates that the PV module is not applicable to the above installation method).

Each aluminum clamp is matched with an M8 bolt, a fat washer, a spring washer and an M8 nut, square nut is recommended, and the fxing steps are as follows:

Place the PV module on two racks (not provided). Which must be made of stainless steel or be treated with corrosion protection (e. g. hot-dip galvanized treatment). Each PV module needs at least 4 clamps to fx.

Be sure to avoid the shading efect of the PV module due to the shadow formed by the clamp. The drain hole shall not be covered by the clamp . The clamp must have an overlap of at least 10mm with the PV module frame (the section of the clamp can be changed on the premise of ensuring the reliable installation of the PV module).

The upper surface of the rack in contact with the PV module frame shall be provided with a groove matched with the M8 bolt.

If there is no groove on the rack, a hole of appropriate diameter shall be drilled at the position mentioned above for bolt fxing.

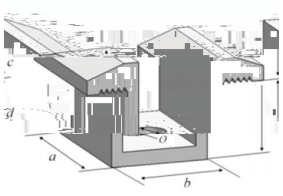
Make sure that the installation sequence of each clamp is fat washer, spring washer and nut.

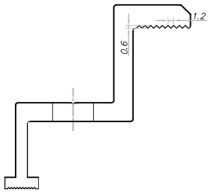
section view. The size of the middle and side pressing blocks are a≥50mm, b≥26mm, c≥5mm, d≥28mm, =9mm and the recommended wall thickness≥4mm. When the bolts and screws are of Grade 8.8, the recommended tightening torque is 17-23Nm. Consult the installer or rack supplier for specifc torque values.

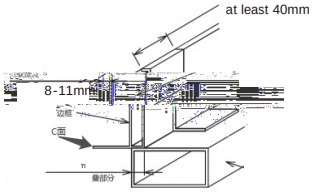
In order to prevent the module from falling of from the frame after installation, it is recommended to select the clamp with patterned groove structures for edge and intermediate clamp k with contact surfaces with frame A. The recommended number of groove structures is about 9, the distance between adjacent grooves is recommended to be about 1.2mm, and the groove depth is recommended to be about 0.6mm, as shown in

The PV module shall be fxed by using professional solar clamp (as shown in Figure 3), and the overlapping par between the surface C of PV module and the guide rack shall be ≥15mm. If improper clamp or incorrect installation method is used, the warranty of HY SOLAR will be invalid.

For the modules with the length of more than 2.2m or the width of more than 1.3m, it is recommended to use the clamp with special anti-skidding design. If it is attached to the arc-shaped pressing surface of side A of the frame, or with the structure design of clamping, the clamp shall meet the requirements of length a≥ 60mm, thickness ≥5mm, material 6005-T6, Rp0.2>225MPa, and Rm265MPa. Technical requirements and details of pressing clamps can be consulted by after-sales se rice team of HY SOLAR.







for Ovrlapping Long Frame of guide rail

6.1 Electrical performance

The rated electric pe r ormance data of the modules were measured under standard test conditions (STC: irradiance 1000W/m2, AM1.5, cell temperature 25°C). For the main electric pe r ormance parameters, maximum system voltage and Isc, Voc and Pmpp, please refer to the product datasheet or nameplate of HY SOLAR Module.

In some circumstances, the current or voltage generated by the PV Module may be greater than the operating current or voltage in its standard testing environment (STC). Therefore, in determining ratings and loads of the module, the module sho r -circuit current at the STC should be multiplied by 1.25 and the open-circuit voltage should be multiplied by a more conse r ative correction factor (see Table 2 below), and the module sho r -circuit current should be multiplied by 1.25(i. e., multiplied by 1.56) according to local regulations when determining the appropriate conducting wire and fuse speci f cation.

In addition, a more accurate open circuit voltage correction coe f cient can be calculated according to the following

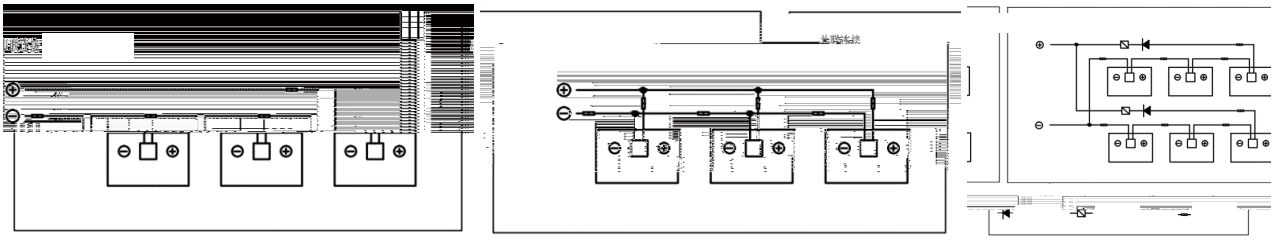
Where: Cvoc is the open circuit voltage correction coe f cient. αvoc (%/ ° C) is the temperature coe f cient of the open-circuit voltage of the selected module (refer to the module speci f cation). Tmin (° C) is the lowest expected ambi

maximum input voltage of the inve r er and other electrical equipment in the installation system. To ensure this, the

Where: N-Number of serial module. Voc-open circuit voltage of each PV module (refer to nameplate or product manual).

The electrical design and calculation of the system shall be determined by the quali f ed electrical engineers.

In order to ensure the normal operation of the system, when connecting the PV module or connecting the load (such as frequency conve r er, or batte r , etc.), it is necessa r to obse r e and ensure that the polarity of the cable is connect



occur. Be sure to verify the voltage and polarity of each string before connection in parallel. If the measurement shows that the polarity between the string is reversed or the voltage di ference is greater than 10V, the structural con guration must be checked before making the connection.

system con guration. The PV modules of di erent electric pe r ormance models cannot be connected in one

2(12AWG), and must withstand the maximum open circuit volt

When the cable is xed on the rack, it is necessa r to avoid mechanical damage to the cable or PV module, and do not press the cable with force. Cables shall be xed by proper means, and shall be xed on the rack by spe

Keep the connector d r and clean, and make sure that the nut of the connector is in a tightened state before connecting. Do not connect the connector when it is found to be wet, di r y or in other bad conditions. Protect

When the PV module is in load condition , please do not inse r or unplug the connector. When it is necessa r to

The junction box of the PV module contains a bypass diode which is connected in parallel with the cell string of the PV module. The bypass diode in the junction box can avoid the PV module pe r ormance degradation caused by shadow or covering. Please refer to the junction box diode speci cation provided in the relevant product speci cation.

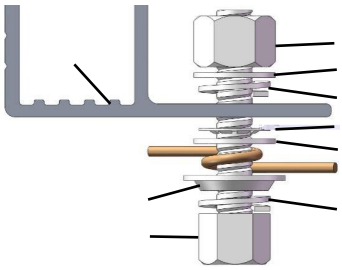
When the local hot spot phenomenon of the PV module occurs due to shadow or covering, the diode in the junction box is triggered in active condition, so that the current of the PV module does not ow through the hot spot cell any more, thereby limiting the heating and pe r ormance loss of the PV module. When suspecting or nding that the diode is faulty, please contact HY SOLAR and do not t r to open the junction box cover by your

In the design of the PV module, the anodized corrosion-resistant aluminum alloy frame is adopted as the rigid suppo r .

the frame of the PV module must be grounded. When grounding, the grounding device must be in full contact with the interior of the aluminum alloy to penetrate the anodized coating on the su r ace.

There is a grounding hole with a diameter of about Φ4mm on the edge of the module frame. As well as standard grounding symbol mark "⏚" beside the grounding hole. The grounding wire can be connected with bolts. Please do

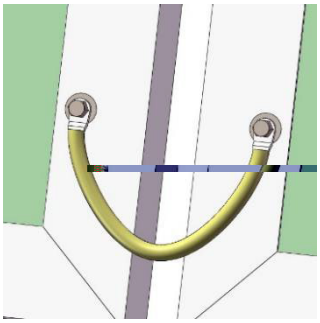
The grounding bolt is made of stainless steel. First inse r the bolt through the spring washer, cup washer, fat washer and star washer, and then pass through the grounding hole, spring washer and fat washer of the frame, and fnally tighten the bolt with the nut. Please note: the upper limit of tem perature of the wire is 85° C. Refer to the Figure for installation of grounding



Grounding Aluminum Bezel With Copper Cable

Modules are grounded to each other:

copper core wire can be adopted between modules to contact the grounding holes of adjacent

Connection mode		Schematic diagram
adjacent modules, and then use the nut to tighten and fx the grounding adjacent modules.		

The welding and grounding devices, including Burndy (formerly Wiley Electronics) WEEB and similar equipment such as barb washers, to compliance with the UL-467 and suitable for electrical welding and grounding of PV

Other methods of grounding may be used when testing suppo r systems as required by UL2703. Do not drill any

that the user shall unde r ake, which will help to identify and eliminate problems in time and ensure the safe and e f ec

glass, broken cables, damaged junction boxes, damaged cells, cracked back-sheet and other factors that may lead to

It is recommended to pe r orm a preventive inspection eve r 6 months, and not to replace components of PV modules without authorization. If inspection or maintenance of electrical or mechanical pe r ormance is required, it is recom

Appendix A: Installation Guidelines for Offshore Photovoltaic Modules

In accordance with the conditions specified in the HY SOLAR Module Installation Manual and the warranty statement, the installation of our company's photovoltaic modules in offshore areas must be carried out strictly in accordance with

This appendix is intended to allow customers to install photovoltaic modules within offshore areas. It specifies the general requirements for ensuring the correct and reliable installation of our company's photovoltaic modules in offshore

Before installing photovoltaic modules in offshore areas, please carefully read this appendix and strictly follow the

environmental corrosion damage to photovoltaic modules and bracket systems, and render HY SOLAR's product and performance limited warranty invalid. For further consultation, please contact our technical after-sales service depar

The reliability of photovoltaic modules is closely related to their distance from the coastline. Offshore land areas are divided according to their distance from the coastline. HY SOLAR usually divides coastal photovoltaic installation types into 5 different usage scenarios, as shown in the following table:

Scenario Definition	Module	Mounting Structure
Offshore (Floating)	Double-glass with front-side double coating + AA20 aluminum frame + IP68 junction box and connectors + caps. Recommendation: Dual protection for connectors +	
(Floating / Pile foundation)	Double-glass with front-side double coating + AA20 aluminum frame + IP68 junction box and connectors + caps.	
(Pile Foundation)	Double-glass with front-side double coating + AA20 aluminum frame + IP68 junction box and connectors + caps.	
500m - 2000m		
≥2000m		

1."Offshore photovoltaic" module products refer to a type of module products specially designed for offshore areas. These module products have undergone special material matching and strict third-party reliability enhanced testing, and can meet the anti-corrosion installation and use requirements in offshore areas.

2.For "offshore photovoltaic" module products, they must be installed above the sea level, and after installation, the

3.The local environmental conditions have a significant impact on the salt mist deposition rate, which depends to a large extent (but not absolutely) on the specific area and local wind patterns. HY SOLAR reserves the right to modify the above definitions in specific cases. Please contact HY SOLAR's pre-sales technical support to determine the type of your

4.The "coastline" mentioned in this manual refers to the boundary line between seawater and land at high tide.

5.The "distance from the coastline" mentioned in this manual refers to the shortest straight-line distance between the

6.Please contact HY SOLAR's technical support department for more information on the installation of anti-corrosion modules. During installation, the surface of the module must not come into contact with sharp objects, and there must be no scratches on the surfaces of glass, frames, connectors, junction boxes, etc.

8.The process specifications of parts and components must comply with relevant international anti-corrosion standards.

9.Regularly maintain anti-corrosion coatings (photovoltaic brackets, fasteners, grounding devices, etc.).

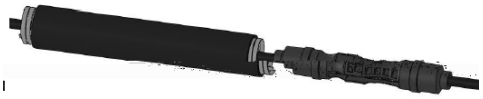
10.Modules (glass, junction boxes, connectors, etc.) are prohibited from long-term exposure to environments containing

ited from contacting organic solvents that can damage the anti-reflective coating of the front glass or the polymers of the junction boxes and backsheets.

11.Before installation, the connectors are protected by dust plugs/waterproof plugs (blocking plugs). After removing the dust plugs, the connectors should be connected immediately to prevent moisture, mud, and other foreign objects from entering and corroding the conductive metals inside the connectors. If further enhancement of anti-corrosion per or

tubes are prohibited from being used underwater. (The cold shrink tubes must meet the quality and technical require ments of HY SOLAR.)

	Method Description	
	the right figure.	

	Method Description	
		
		
	Position the connection inte r ace at the middle	
		
		

Before installation, ensure there are no foreign objects such as sand, water droplets, or sharp objects inside the cold shrink tube;

It is prohibited to tie nameplates to the cold shrink tube to prevent the cable ties from scratching the tube;

Pay attention to on-site environmental protection (proper disposal of suppo r strips, instructions, and packaging bags);

There shall be no cracks or gaps at both ends of the cold shrink tube, and no holes on the su r ace;

The cold shrink tube shall shrink smoothly and naturally to f t tightly on the connector and cable, with no

12.When installing o f shore photovoltaic modules, all requirements listed in the HY SOLAR Installation Manual shall be

13.To minimize salt mist corrosion, HY SOLAR recommends the following:

13.1 It is recommended to use anti-corrosion materials for the (suppo r s) and system-related installation compo nents (such as SUS 316 stainless steel, hot-dip galvanized carbon steel, new anti-corrosion materials like Zn-Al-Mg composite coated steel, etc.).

speci f ed in JIS H 8641 and JIS H 8601 standards.

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