Photovoltaic Module Installation Manual
Suncell Energy Ltd
(2025)

SUNCELL®

This manual applies to Module types:

	With ½ cut of 182 mono c-Si cell	With ½ cut of 210*210 mono c-Si cell	With ½ cut of 182.2*191.6 mono c-Si cell	With ½ cut of 182*210 mono c-Si cell
Monofacial Module	SCL-XXXH8M-156 SCL-XXXH8MB-156	SCL-XXXH2M-132 SCL-XXXH2MB-132	SCL-XXXH8NG-144 SCL-XXXH8NGB-144	SCL-XXXH8NH-132 SCL-XXXH8NHB-132
	SCL-XXXH8M-144 SCL-XXXH8MB-144	SCL-XXXH2M-120 SCL-XXXH2MB-120	SCL-XXXH8NG-108 SCL-XXXH8NGB-108	
	SCL-XXXH8M-132 SCL-XXXH8MB-132	SCL-XXXH2M-108 SCL-XXXH2MB-108		
	SCL-XXXH8M-120 SCL-XXXH8MB-120	SCL-XXXH2M-110 SCL-XXXH2MB-110		
	SCL-XXXH8M-108 SCL-XXXH8MB-108	SCL-XXXH2M-100 SCL-XXXH2MB-100		
	SCL-XXXH8N-156 SCL-XXXH8NB-156			
	SCL-XXXH8N-144 SCL-XXXH8NB-144			
	SCL-XXXH8N-132 SCL-XXXH8NB-132			
	SCL-XXXH8N-120 SCL-XXXH8NB-120			
	SCL-XXXH8N-108 SCL-XXXH8NB-108			
Bifacial Module	SCL-XXXDH8M-156	SCL-XXXDH2M-132	SCL-XXXDH8NG-144	SCL-XXXDH8NH-132
	SCL-XXXDH8M-144	SCL-XXXDH2M-120	SCL-XXXDH8NG-108 SCL-XXXDH8NGB-108	SCL-XXXDH8NH-96 SCL-XXXDH8NHB-96
	SCL-XXXDH8M-132	SCL-XXXDH2M-110		
	SCL-XXXDH8M-120	SCL-XXXDH2M-108		
	SCL-XXXDH8M-108	SCL-XXXDH2M-100		
	SCL-XXXDH8N-156	SCL-XXXDH2N-132		
	SCL-XXXDH8N-144	SCL-XXXDH2N-120		
	SCL-XXXDH8N-132			
	SCL-XXXDH8N-120			
	SCL-XXXDH8N-108			

- The WEEE symbol is displayed on every module nameplate label at the rear of the panel. This means that this product shall not be treated as household waste and must be disposed of at an appropriate collection point. Contact your local government for information regarding the collection systems available.
- If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

Contents

01 PURPOSE OF THIS MANUAL

- This manual applies exclusively to the solar photovoltaic module (here in after referred to as Module) of Suncell Energy Ltd (here in after referred to as Suncell). The contents of this manual involve the installation methods, operation safety and maintenance information of Suncell's Modules.
- Modules must be installed by professionals. Please read this manual carefully before installation. The installers must follow all the rules in this manual strictly as well as local requirements and regulations by law or authorized organizations.
- Before installation, the installer must be familiar with their mechanical and electrical requirements. Please keep this manual in a safe place for future reference (care and maintenance) and in case of sale or disposal of the Modules.

02 DISCLAIMER

- Suncell shall not be responsible for any loss arising from the installation, operation, use or maintenance of the Modules which is not complying with the guidance of this manual, including breakdown or damage of the Modules or any other expenses incurred.
- Any customer shall not get any patent or authorization of the patent when using the Modules, expressed or implied. Any infringement of patents or other rights of the third party, which may result from the use of the Module, is not within the responsibility scope of Suncell. The information in this manual is based on Suncell's knowledge and experience and is believed to be reliable, but such information including product specification (without limitation) and relevant suggestions do not constitute a warranty, expressed or implied.
- Suncell reserves the right to change the manual, the Modules, the specifications or any other information of the Modules without prior notice.

03 SAFETY & TRANSPORT

3.1 General Rules

- Keep all the Modules and electrical connectors clean and dry before installation.
- Use both hands to carry Modules. Do not overlap Modules.
- Be cautious when carrying Modules. Slip-proof gloves are necessary.
- Use supportive disassembling tools when unpacking.
- The application level of Suncell module is Class A, which can be used in systems operating at greater than 50 V DC or 240W.


Do not step or walk on Modules or put weight on Modules.


Do not disassemble or drop Modules. Do not remove any nameplate or component of the module.


Do not use mirrors or magnifiers to concentrate sunlight onto Modules.


Do not lift the module by grasping the junction box or cable wire.

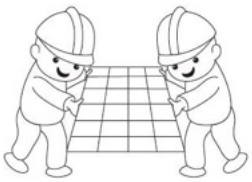

Do not use any sharp object with Modules.


Do not directly apply pressure on the glass surface or back sheet of Modules.


Do not touch the surface of the coated glass with bare hands.

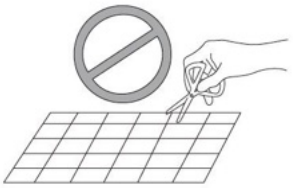

Ensure all contacts and the operating environment are clean and dry.

Modules handling and installation instructions

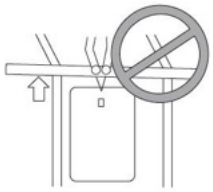


Both hands when handling Modules

Ensure Modules are fixed properly

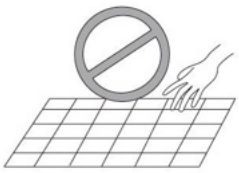


Do not use sharp objects with Modules

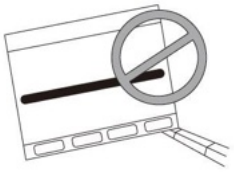


Do not pull the wiring cables or junction box

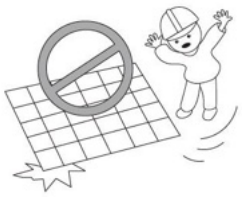
Do not stand on Modules



Do not touch Modules with bare or dirty hands



Do not stack Modules on uneven ground



Do not drop or throw Modules

3.2 Electrical Performance Safety

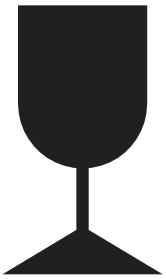
- PV Module can produce DC current under sunlight. So appropriate protective measures (insulated gloves, insulated shoes, etc.) should be taken to prevent personnel from direct contact with 30V or higher direct current voltage. 30V or higher direct current voltage can be potentially lethal.
- In case of no connected load or external circuits, Module can still produce voltage. Please use insulation tools and wear rubber gloves when operating Module in the sunlight.
- PV Module do not have switches，operating of PV Module can only be stopped when they are kept from sunlight or covered by hard board or UV-proof materials or when the angle of the Module facing sun are placed on smooth and flat surfaces.
- To avoid electric arc and electric shock hazards，please do not break down electric connection in loaded conditions. Incorrect connections will also lead to electric arc or shock. Keep connectors dry and clean and make sure that they are in good operating conditions. Do not insert other metals into the connectors or carry out electric connection by whatever means.
- Snow, water or other reflective medium in surrounding environment that intensify light re-flection will increase output current and power. And Module voltage and power will increase under low temperature condition.
- If Module glass or other sealing materials are damaged, please wear personal protective equipment and then isolate Module from the circuit.
- Work must only be carried out in dry conditions using dry tools. Do not operate when Module are wet unless you wear personal protective equipment. Please follow the cleaning requirements in this manual when cleaning Module.
- Installation must be carried out under the guidance of a qualified electrician.
- No matter what weather condition is, personnel entering the power station shall wear safety helmet, insulating gloves and insulating shoes correctly, taking-safety protection measures.

3.3 Package labeling instructions

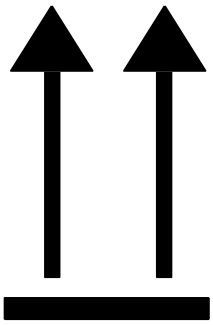
➢ Before installation, it is necessary to read carefully the unpacking instruction and outer packing box instruction, and carry out the operation as instructed.

1. DO NOT expose the module to rain or moisture.

2. The Modules in the carton box are fragile. Handle with care.



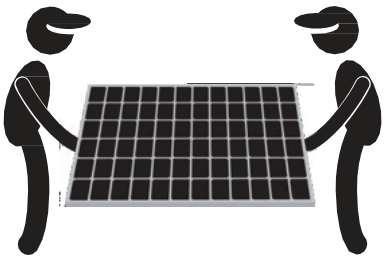
3. The package must never be upside down, including during transport and storage.



4. It is prohibited to stand or walk on the packing box and module.

5. During the storage of the Modules, the packing box can be stacked, not exceeding the maximum layer allowed. (n=2 meaning it is allowed to stack two layers at most.)

6. One module must be handled by two people.



3.4 Unloading, Transportation and Storage

- When the Modules are delivered to the project site, Modules should be unloaded in a level, open area.
- Forklift unloading: Use an appropriate carrying forklift according to the pallet weight, unload the Modules from the vehicle and place them on flat ground.
- Unloading with a crane: Affix the lifting belt in the wood supporting frame buckle (Fig. 1, 2). It is allowed only to lift one pallet at a time. Before lifting, it is necessary to confirm whether the pallet and paper box are damaged and ensure that the lifting rope is robust and firm. When being lifted close to the ground, the paper box will be gently placed in a relatively flat position on the project site by two people, one on each side.

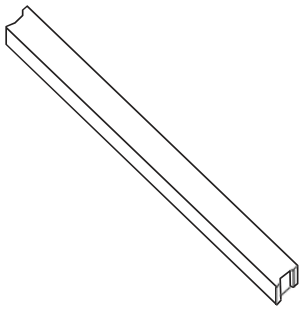


Figure.1 Wood Supporting Frame

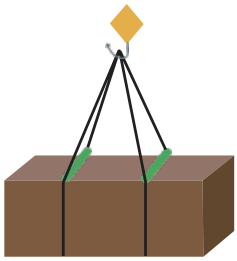
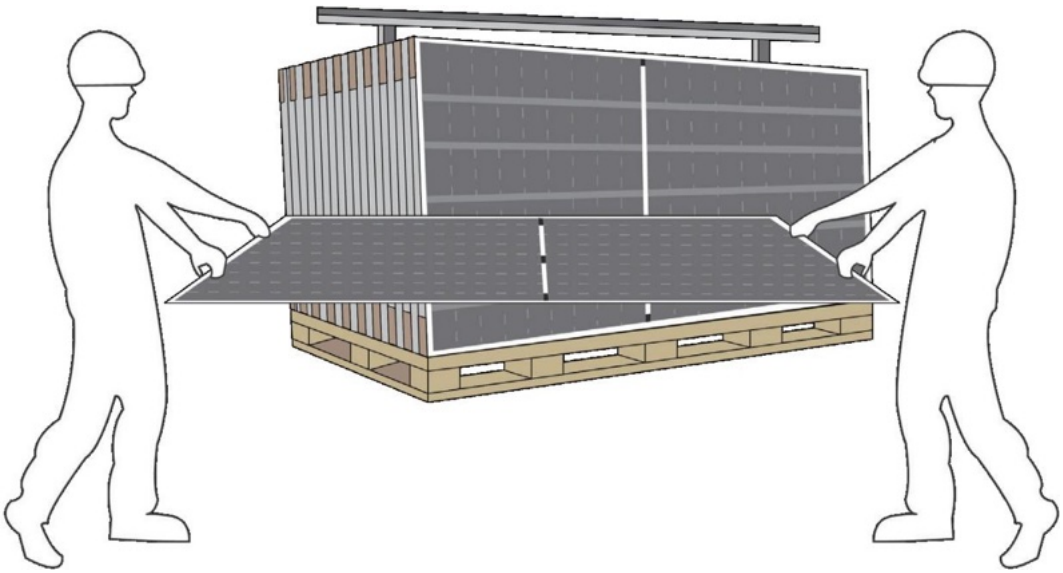


Figure.2 Lifting Schematics

- It is forbidden to double stack the modules on the project site.
- During transportation to the project site, the Modules shall not be double stacked, only one layer during shipping is allowed.
- Storage in the project site warehouse:
    - Storage environment requirements: Humidity < 85%, temperature -20 ~+50℃; Modules statically stacked for ≤2 layers.
    - Temporary storage at the project site: The Modules shall be stored in a dry, well-ventilated place. They shall not be stacked but shall be covered with waterproof material to prevent the Modules becoming damp.



3.5 Unpacking description

- Do not unpack the Modules outdoors during rainy conditions.
- Special care and attention shall be paid when handling Modules in windy conditions. Particularly in the event of heavy wind, it is recommended not to handle the module, and it is essential to properly secure the unpacked Modules.
- The work surface shall be such that the packing box can be placed in a stable, level position, avoiding being overturned.
- During unpacking, it is necessary to wear protective gloves to avoid scratching hands and leaving fingerprints on the glass.
- Before the unpacking, it is necessary to carefully check the product information on the carton box, and carefully read the unpacking instructions.
- Every module shall be carried by two people. It is prohibited to lift the Module by or pull the junction box.

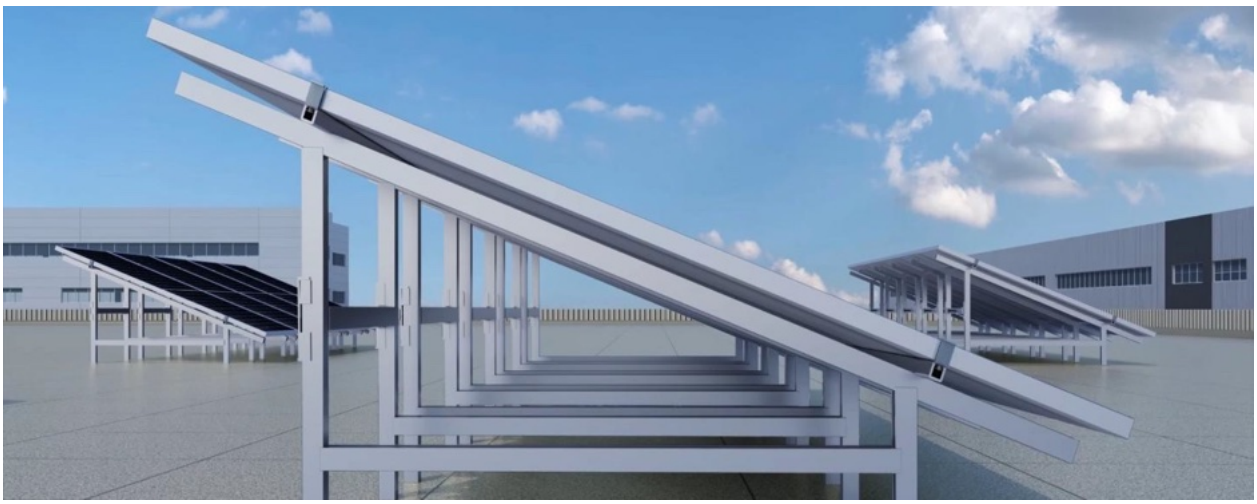
3.6 Fire Safety

- Before installing the Module, please consult the local laws and regulations and comply with their requirements regarding the fire resistance of the building.
- Roofs are constructed and installed differently to affect the fire safety of the building. If not properly installed, a fire may result.
- The minimum distance between the Module frame and the roof surface is 10 cm to facilitate ventilation and heat dissipation of the Module.
- Please use appropriate Module accessories such as fuses, circuit breakers, and grounding connectors as required by local codes.
- It is prohibited to store, install or use the Module in a place where flammable gases are likely to be generated or gathered.

04 MECHANICAL INSTALLATION

4.1 Location Selection

- Select suitable places to install Modules.
- Install Modules at the places with sufficient sunlight and without shade at any time. If a module is shaded or even partially shaded, it will result in lower power output. A permanent or regular shade will cause module damage, which will result in the invalidity of product's limited warranty.
- Do not store, install or use Modules in places where combustible gas is easily generated or gathering.
- Modules can be installed on land 50 to 500m away from the coastline. However, the connectors must be well protected or a dust-proof plug must be added when installing Modules within this distance. Connect the dust-proof plug immediately after removing it and take other anti-rust measures to prevent the parts from rusting.
- Modules in the same string should be installed at the same angle. Modules installed in different angles will receive different irradiation, which will cause current differences. As a result, it will decrease the operation efficiency of the system.



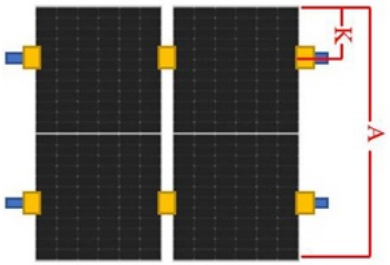
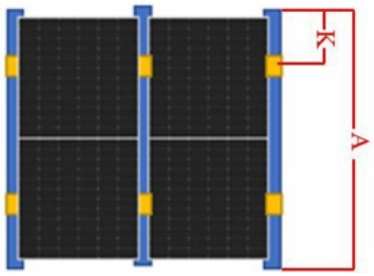
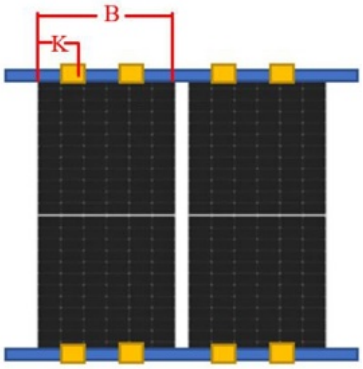
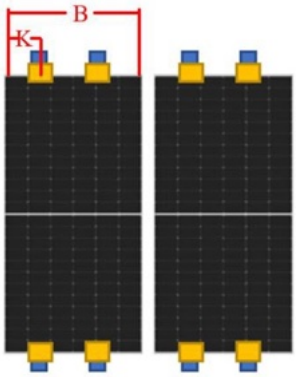
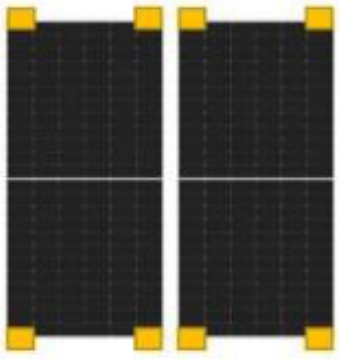
4.2 Installation requirements

- Ensure the module installation method and support system is sufficiently robust, so that the Modules can undertake the preset loading conditions, the support installer or supplier shall provide a necessary guarantee and other related certifications. The installation support system shall pass the inspection and test by the third-party test institution with the static mechanical analysis capability, and use the local national or international standards, such as DIN1055 or equivalent.
- The support structure shall be made of durable, corrosion resistant and ultraviolet resistant materials.
- The module shall be firmly mounted on the support.
- Choose proper installation height of the photovoltaic support system and ensure the lowest part of the module is high enough to avoid being shaded by plants, being damaged by the flying sand or being covered by snow for a long time in winter.
- When the module is installed on roof or building, it is necessary to ensure that the roof structure is fixed firmly and will not be damaged by heavy wind or heavy snow, and the back of the module shall be well-ventilated to facilitate the cooling of the module.
- Due to the thermal expansion of physical properties of materials, the Modules are asymmetric structure, which will produce a certain degree of warping deformation at different temperatures, which does not affect the installation, use and reliability of the Modules. The minimum distance between two Modules should not be less than 10 mm.
- Ensure that the module backside will not contact the support or architectural structure, including when the module surface is under external pressure.
- It is required to observe the instruction guide and safety rules of the support system.
- It is not allowed to drill holes in the glass surface or frame of the module. Otherwise, the guarantee will be invalidated.
- When installing the Modules on roof, it is necessary to guarantee the roof structure is suitable for the module installation. And the installed modules should not be beyond the roof zone. Additionally, the roof area where it is penetrated by module installation shall be properly sealed to prevent water leakage.
- When the module is installed on the supporting column, it is necessary to ensure the supporting column and module installation structure is capable of withstanding the expected local wind load.

4.3 Installation method

◆ **Installation with the mounting clamp**

Table 1 Installation Method

Clamping on the long side	Installation Method A	Installation Method B	
			
Clamping on the short side	Installation Method C	Installation Method D	Installation Method E
			

Note: Bracket length≥ 50mm

Table 2 Installation method and load capacity

Classification	Installation method		method A		method B		method C		method D	
	Modules model	Height of the frame (mm)	Mounting clamp position K (mm)	Test load: front/back, (Pa)	Mounting clamp position K (mm)	Test load: front/back, (Pa)	Mounting clamp position K (mm)	Test load: front/back, (Pa)	Mounting clamp position K (mm)	Test load: front/back, (Pa)
Monofacial Module	SCL-XXXH8M-108 SCL-XXXH8MB-108 SCL-XXXH8N-108 SCL-XXXH8NB-108	B30	A/4±50	5400/2400	200 ~ 300	3600/2400	100 ~ 240	±1600	100 ~ 240	±1600
	SCL-XXXH8NG-108 SCL-XXXH8NGB-108	B30		5400/2400	200 ~ 300	3600/2400	100 ~ 240	±1600	100 ~ 240	±1600
	SCL-XXXH8M-120 SCL-XXXH8MB-120	B30		5400/2400	300 ~ 400	2400/2400	100 ~ 240	±1600	100 ~ 240	±1600
	SCL-XXXH8N-120 SCL-XXXH8NB-120	B35		5400/2400	300 ~ 400	3600/2400	100 ~ 240	±1600	100 ~ 240	±1600
	SCL-XXXH8M-132 SCL-XXXH8MB-132 SCL-XXXH8N-132 SCL-XXXH8NB-132	B35		5400/2400	--	--	0 ~ B/4	±1200	150 ~ 240	±1600
	SCL-XXXH8M-144 SCL-XXXH8MB-144	B30		5400/2400	--	--	--	--	--	--
	SCL-XXXH8N-144 SCL-XXXH8NB-144	B35		5400/2400	--	--	0 ~ B/4	±1200	--	--
	SCL-XXXH8M-156 SCL-XXXH8MB-156 SCL-XXXH8N-156 SCL-XXXH8NB-156	B35	570~630	5400/2400	--	--	--	--	--	--
	SCL-XXXH2M-100 SCL-XXXH2MB-100	B35	360~420	5400/2400	--	--	--	--	--	--
	SCL-XXXH2M-110 SCL-XXXH2MB-110	B35	440~540	5400/2400	--	--	--	--	--	--
	SCL-XXXH2M-108 SCL-XXXH2MB-108	B35	360~430	5400/2400	--	--	--	--	--	--
	SCL-XXXH2M-120 SCL-XXXH2MB-120	B35	360~420	5400/2400	365~435	3600/2400	45~485	±1000	--	--
	SCL-XXXH2M-132 SCL-XXXH2MB-132	B35	440~540	5400/2400	--	--	--	--	--	--
	SCL-XXXH8NG-144 SCL-XXXH8NGB-144	B35	A/4±50	5400/2400	A/4±50	5400/2400	--	--	--	--
	SCL-XXXH8NH-132 SCL-XXXH8NHB-132	B35		5400/2400		5400/2400	--	--	--	--

Classification	Installation method		method A		method B		method D		method E	
	Modules model	Height of the frame (mm)	Mounting clamp position K (mm)	Test load: front/back, (Pa)	Mounting clamp position K (mm)	Test load: front/back, (Pa)	Mounting clamp position K (mm)	Test load: front/back, (Pa)	Mounting clamp position K (mm)	Test load: front/back, (Pa)
Bifacial Module	SCL-XXXDH8M-108 SCL-XXXDH8N-108	B30	A/4±50	5400/2400	A/4±50	3600/2400	--	--	--	--
	SCL-XXXDH8M-120 SCL-XXXDH8N-120	B30		5400/2400		3600/2400	--	--	--	--
	SCL-XXXDH8M-132 SCL-XXXDH8N-132	B30		5400/2400		3600/2400	--	--	--	--
	SCL-XXXDH8M-144	B30		5400/2400		3600/2400	--	--	--	--
	SCL-XXXDH8N-144	B35		5400/2400		3600/2400	--	--	--	--
	SCL-XXXDH8M-156	B30		5400/2400		--	--	--	--	--
	SCL-XXXDH8N-156	B35		5400/2400		--	--	--	--	--
	SCL-XXXDH2M-100	B35		5400/2400	--	--	--	--	--	--
	SCL-XXXDH2M-110	B35		5400/2400	440~540	3600/2400	--	--	--	--
	SCL-XXXDH2M-108	B35		5400/2400	--	--	--	--	--	--
	SCL-XXXDH2M-120 SCL-XXXDH2N-120	B35		5400/2400	360~420	3600/2400	--	--	--	--
	SCL-XXXDH2M-132	B33	450 ~ 550	5400/2400	--	--	--	--	--	--
	SCL-XXXDH2N-132	B35	A/4±50	5400/2400	440~540	3600/2400	--	--	--	--
	SCL-XXXDH8NG-108 SCL-XXXDH8NGB-108	B30		5400/2400	--	--	100~240	±1600	four angles	±1200
	SCL-XXXDH8NG-144	B30		5400/2400	A/4±50	3600/2400	--	--	--	--
	SCL-XXXDH8NH-96 SCL-XXXDH8NHB-96	B30		5400/2400	--	--	100~240	±1600	four angles	±1200
	SCL-XXXDH8NH-132	B30		5400/2400	A/4±50	3600/2400	--	--	--	--

Note: Test load = γm(safety factors) × design load， some installation methods require special clamps, please consult technical support department of Suncell for special clamp structure shape.

◆ **Installation with the mounting hole**

Table 3 Installation Method

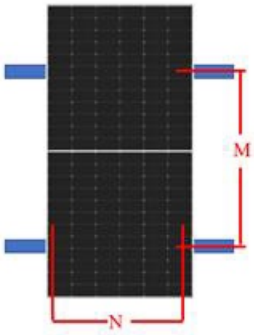
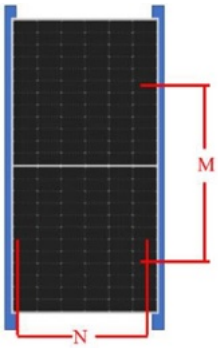
	Method F	Method G
Mounting on the long side		

Table 4 Mounting dimension and load capacity

Classification	Modules model	Height of the frame (mm)	The mounting clamp position M(mm)	The mounting clamp position N(mm)	Installation Method F	Installation Method G
					Test load: front/back (Pa)	Test load: front/back (Pa)
Monofacial Module	SCL-XXXH8M-108 SCL-XXXH8MB-108 SCL-XXXH8N-108 SCL-XXXH8NB-108	B30	990	1085	5400/2400	--
	SCL-XXXH8NG-108 SCL-XXXH8NGB-108	B30	1150	1093	5400/2400	--
			1400	1093		
	SCL-XXXH8M-120 SCL-XXXH8MB-120 SCL-XXXH8N-120 SCL-XXXH8NB-120	B30	1100	1086	5400/2400	
			1400	1086	3600/2400	
		B35	990	1085	5400/2400	--
			1400	1085	±2400	--
	SCL-XXXH8M-132 SCL-XXXH8MB-132 SCL-XXXH8N-132 SCL-XXXH8NB-132	B35	990	1085	±2400	--
			1400	1085	5400/2400	--
	SCL-XXXH8M-144 SCL-XXXH8MB-144 SCL-XXXH8N-144 SCL-XXXH8NB-144	B30	1400	1096	5400/2400	--
		B35	990	1085	±2400	--
			1400	1085	5400/2400	--
	SCL-XXXH8M-156 SCL-XXXH8MB-156 SCL-XXXH8N-156 SCL-XXXH8NB-156	B35	1200	1085	5400/2400	--
	SCL-XXXH2M-100 SCL-XXXH2MB-100	B35	1400	1055	5400/2400	--
	SCL-XXXH2M-110 SCL-XXXH2MB-110	B35	1400	1055	5400/2400	3600/2400
	SCL-XXXH2M-108 SCL-XXXH2MB-108	B35	1400	1262	5400/2400	--
	SCL-XXXH2M-120 SCL-XXXH2MB-120	B35	1400	1262	5400/2400	3600/2400
	SCL-XXXH2M-132 SCL-XXXH2MB-132	B35	1400	1262	5400/2400	3600/2400
	SCL-XXXH8NG-144	B35	790	1085	±2400	±2400

	SCL-XXXH8NGB-144		1400	1085	5400/2400	3600/2400
	SCL-XXXH8NH-132 SCL-XXXH8NHB-132	B35	790	1085	±2400	±2400
			1400	1085	5400/2400	3600/2400

Table 4 Mounting dimension and load capacity

Classification	Modules model	Height of the frame (mm)	The mounting clamp position M(mm)	The mounting clamp position N(mm)	Installation Method F Test load: front/back (Pa)	Installation Method G Test load: front/back (Pa)
Bifacial Module	SCL-XXXDH8M-108 SCL-XXXDH8N-108	B30	1200	1096	5400/2400	--
			1400	1096	3600/2400	--
	SCL-XXXDH8M-120 SCL-XXXDH8N-120	B30	1200	1096	5400/2400	--
			1400	1096	3600/2400	--
	SCL-XXXDH8M-132 SCL-XXXDH8N-132	B30	1200	1096	5400/2400	±2400
			1400	1096	3600/2400	3600/2400
	SCL-XXXDH8M-144 SCL-XXXDH8N-144	B30	1200	1096	5400/2400	--
			1400	1096	3600/2400	--
		B35	1200	1096	5400/2400	±2400
			1400	1096	3600/2400	3600/2400
	SCL-XXXDH8M-156 SCL-XXXDH8N-156	B30	1200	1096	5400/2400	--
		B35	1200	1096	5400/2400	--
	SCL-XXXDH2M-100	B35	1400	1055	5400/2400	--
	SCL-XXXDH2M-110	B35	1400	1055	5400/2400	3600/2400
	SCL-XXXDH2M-108	B35	1400	1262	5400/2400	--
	SCL-XXXDH2M-120 SCL-XXXDH2N-120	B35	1400	1262	5400/2400	3600/2400
	SCL-XXXDH2M-132 SCL-XXXDH2N-132	B33	1400	1262	5400/2400	--
		B35	1400	1262	5400/2400	3600/2400
	SCL-XXXDH8NG-108 SCL-XXXDH8NGB-108	B30	1100	1096	5400/2400	--
	SCL-XXXDH8NG-144	B30	790	1096	±2400	±2400
			1400	1096	5400/2400	3600/2400
	SCL-XXXDH8NH-96 SCL-XXXDH8NHB-96	B30	1100	1096	5400/2400	--
	SCL-XXXDH8NH-132	B30	790	1096	±2400	±2400
			1400	1096	5400/2400	3600/2400

Note: Test load = γm(safety factors) × design load.

➢ **Modules can be installed and fixed using the following installation methods：**

◇ **Bolt hole installation：** Use anti-corrosion bolts to secure with the mounting brackets through the mounting holes on the assembly frame, as shown in Figure 3;

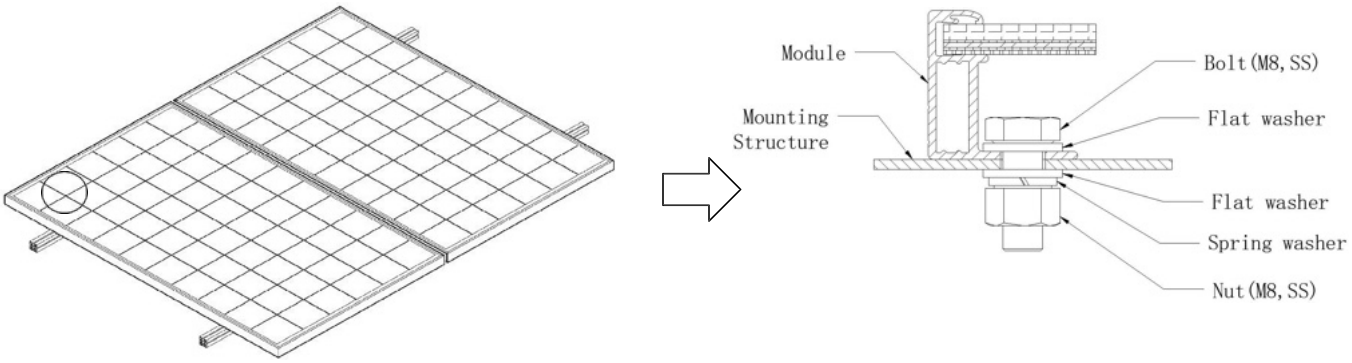


Figure 3 Bolt hole installation

➢ **Recommended bolt kits are as follows：**

Install fasteners	M8 bolt kits	M6 bolt kits	Notes
Bolt	M8 （full thread recommended）	M6 （full thread recommended）	The material is hot-dip galvanized or stainless steel, and the material selection is selected according to the local environment.
Washer	2pcs,thickness≥1.5mm and outside diameters≥16mm	2pcs,thickness≥1.5mm and outside diameters= 12～16mm	
Spring Washer	8mm	6mm	
Nut	M8	M6	
Bolt tightening torque range (N·m)	16~20	8~12	

➢ Bracket installation: Use a suitable bracket and fix it with components, as shown in Figure 4.

◇ The bracket must maintain at least 10mm overlap with the component frame (to ensure reliable installation of the component, the section of the bracket can be changed), and the bolt torque of the fixed bracket should be determined according to the mechanical design standards of the bolts and brackets used by the customer, such as：M8：16~20 N·m.

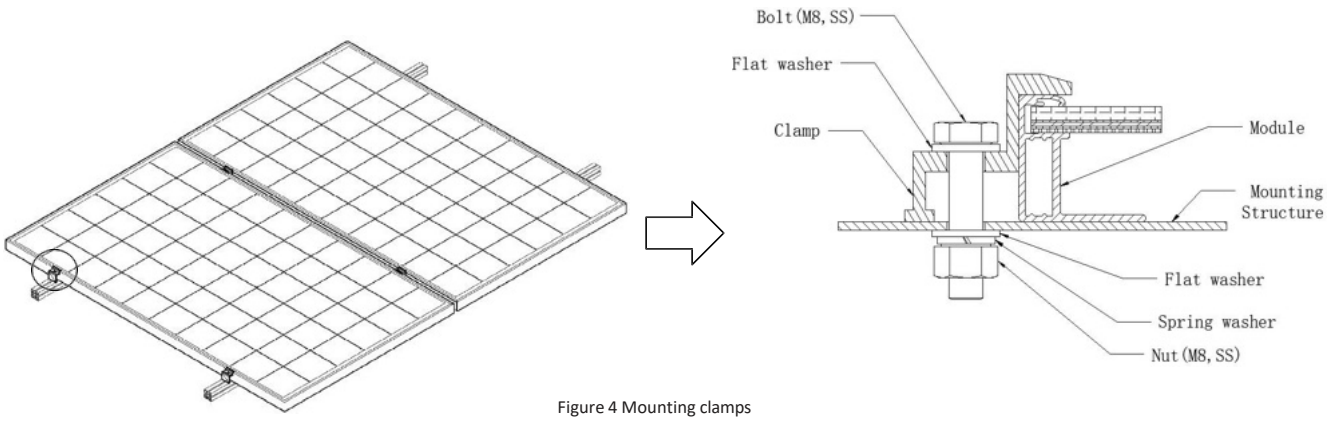


Figure 4 Mounting clamps

05 ELECTRICAL INSTALLATION

- DC power generated by the photovoltaic system can be converted into AC power and fed into the grid. Policies on connecting renewable energy systems to the grid vary from region to region. Consult a senior system designer before designing the system. Generally, the system installation shall be formally approved by the local power network.

5.1 General Installation

- Installation structure should be compatible with the modules, in order to avoid galvanic corrosion. Any defects caused by such corrosion will void the warranty.
- The DC-side system potential of the photovoltaic array includes the practice of floating ground, positive-pole grounding and negative-pole grounding according to the system requirements; and different cell technologies have different adaptability. In a power-station project, particularly the module of the crystalline silicon photovoltaic cells, too large an absolute value of the negative to the ground might cause potential induced degradation (PID). Consequently, it is appropriate to use the negative grounding system so that the potential of the circuit is positive. Consult the inverter manufacturer for details.
- It is forbidden for non-professionals to open the Module connector. Make sure that the connectors are clean, dry and fully connected (A click sound should be heard when fully connected), otherwise it may lead to electric arcing, which will damage the connector or cause a fire.
- The connector given to the customer or the connector purchased by the customer as well as the junction box connector used in the order component must remain of the same brand and the same specification model, and connectors of different brands/specifications are not allowed to plug each other.
- Under normal conditions, a module is likely to experience conditions that produce more current and/or voltage than reported at standard test conditions, Accordingly, the values of ISC and VOC marked on the Module should be multiplied by a factor of 1.25 when to determining component voltage ratings, current ratings, fuse sizes, and size of controls connected to the PV output.
- Completely cover the Modules with an opaque material to prevent electricity from being generated during disassembly.
- It is not allowed to use different models of Modules in the same solar photovoltaic system. When the Modules are connected in series, the voltage of every string shall not be higher than the maximum voltage of the system (as shown in Figure 5). Reference equation of the maximum number of the Modules in serial connection: maximum system voltage of the module/ (1.25* open-circuit voltage)， Please refer to the country's or local regulations for details.
- When connected in parallel, the current output is equal to the sum of each string’s current (as shown in Figure 6). A fuse is necessary for each module string. Take reference to the local regulations. Recommended maximum parallel Module configurations: Fuse rating/ (1.25* short-circuit current). Please refer to the national or local regulations for details.

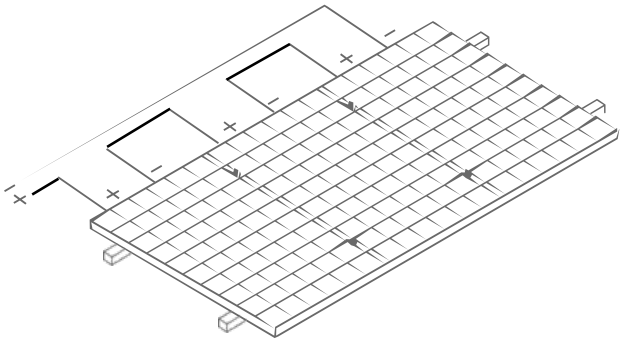


Figure 5. Connection in Series

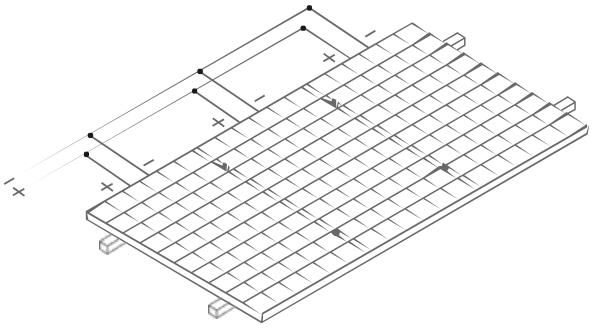


Figure 6. Connection in parallel

- Refer to the local regulations to determine the system cable sizes, types and temperatures.
- The cross section of the cables and the capacity of the connectors must be selected to suit the maximum system short circuit current (The recommended section area for a single piece of Module is 4mm^2, and the recommended rated current for the connector is greater than 20A, please refer to the national or local regulations for details), otherwise there will be a risk of cables and connectors overheating under large current. Caution: The maximum temperature of the cable is 85℃ while the upper limit temperature of the connector is 105℃.
- Make sure the electrical components such as the connectors and inverters are in an off-state during the installation. To reduce lightning damage, the loop area should be kept as small as possible when laying cables. It is recommended to use fuses in each string.

5.2 PV module layout and wiring selection instructions

- At present, the PV module arrangement is more common in single vertical row, double vertical row, single horizontal row or double horizontal row, as shown in Figure 7:

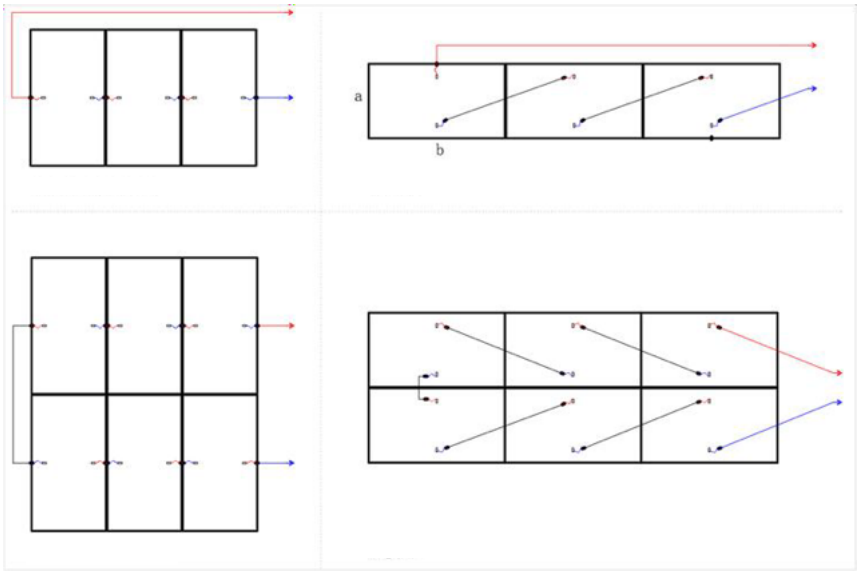


Figure.7 Common arrangement of modules

- **The recommended cable length for different installation methods of each product is as follows:**

Battery specifications	Modules model	Modules dimensions (Length*Width/mm)	Single/double vertical row Recommended cable length (mm)	Single/double horizontal row Recommended cable length (mm)
182/183.75	156	2465*1134	+ 400/-200	±1500
	144	2278*1134	+ 400/-200	±1400
	132	2093*1134	+ 400/-200	±1400
	120	1908*1134	+ 400/-200	±1200
	108	1722*1134	+ 400/-200	±1200
210	132	2384*1303	+ 400/-200	±1400
	120	2172*1303	+ 400/-200	±1400

Notes: 1. The junction box cable length of the above components includes connectors.
2. This size is a reasonable size recommended and larger than the recommended size does not affect the installation.

06 Grounding

6.1 Grounding by cable

- The grounding bolts must be made of stainless steel and be used in the specified grounding holes. First, make the stainless steel bolt pass through the spring washer, cup washer, flat washer, and star washer, and then insert through the grounding hole, flat washer and spring washer on the frame. Finally, tighten with a nut. Caution: The upper limit temperature of the conductor is 85℃. As for the installation, refer to Figure 8.

6.2 Grounding by lugs

- All the Module frames and mounting structures shall be grounded according to regional and national electricity regulations. Use recommended hardware to connect grounding cables and fasten to the Module frames.
- While using the metal structure, make sure the surface of the system has been electroplated to ensure a good conducting circuit.

- Use suitable grounding conductors to connect the Module frame to the mounting structure. This can achieve proper grounding effects.
- First, expose the grounding cable to a proper length without damage to the metal core. Then insert the exposed cable into the lug, tighten the screw. As shown in Figure 9, connect the lug to the aluminum frame with stainless steel bolts and connection components.

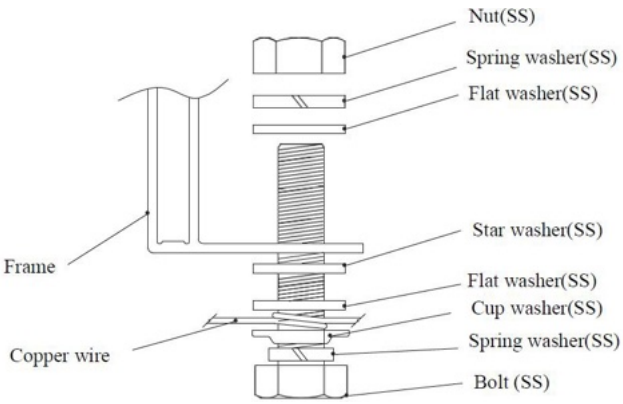


Figure 7

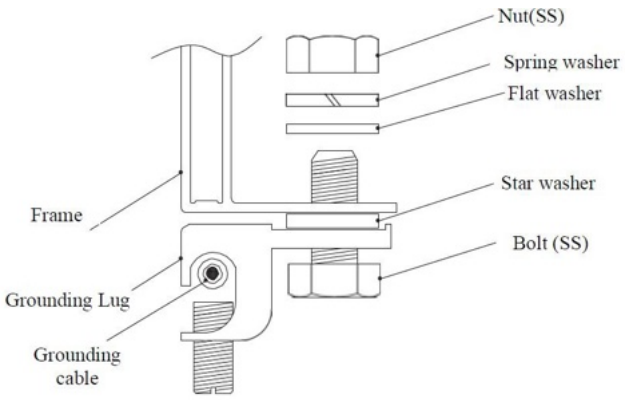


Figure 8

07 BYPASS DIODES AND BLOCK DIODES

- In a system with two or more Modules connected in series, if part of a Module is shaded while the other part is exposed to the sun, a very high reverse current will go through the cells which have been partly or entirely covered and it will cause overheat on the cells, which may damage the Module. Using bypass diodes can protect Modules from this kind of risk. There are bypass diodes in junction boxes, which can reduce the effects of partial shadows. Do not disassemble the junction box to replace the diodes, even when the diodes are broken. This should be repaired only by professionals with guidance and prior approval from Suncell.
- In a system with batteries, if the controller doesn't have the function of backswing protection, blocking diodes installed between the battery and the Module should be used to prevent the reverse current from damaging the Module.

08 MAINTENANCE

- To ensure safe operation and optimum performance of the Module, they must be inspected and maintained on a regular basis.

8.1 Module Appearance Inspection

- Preventive examinations are recommended every 6 months, focusing on observing the following items:

◇ Check if the Module surface is obstructed by obstacles or foreign objects.

◇ Check whether the Module glass is broken.

◇ Check whether there is any change in the colour of the Module (the Module uses a reflection-reducing film technology, so it is normal to observe the Module from different angles and find that there is a difference in colour).

◇ Check the Module negative-sheet whether there is high temperature, negative film raised, burn through the traces and so on.

◇ Check whether the cell bus-bar is corroded, whether encapsulation materials of the Module has delamination, bubbles, etc.

◇ Check the tightness of the bolts and the electrical connections at the connection points between the Module and the supporting rail.

8.2 Inspection of Connector And Cable

- Preventive examinations are recommended every 6 months, focusing on observing the following items:

◇ Check Junction box adhesive for cracks or gaps.

◇ Check the connector interface sealing and whether there is loose connection, melt deformation, aging or corrode.

◇ Check that the cable connections are secure and that the Module are properly grounded.

◇ When Module is found to be defective, consult a qualified service technician.If servicing is required, it should be serviced by a qualified service technician.

◇ Module exposure generates high voltages in the sun, so cover the Module with opaque material when servicing Module to prevent electrical shock.

◇ Note:
1. If found in the maintenance of any problems, feedback to the professional service personnel for confirmation.
2. If using maintenance and repair measures not included in this manual, consult your local dealer for professional support.

8.3 Module Cleaning

➢ The accumulation of foreign objects or obstacles on the Module surface over time can reduce the Module's power output, so, it is necessary to regularly clean the surface of the Modules glass. Normally, rainfall is sufficient to keep the Module glass clean, it is still recommended that the Module should be cleaned at least once a year, and more frequently in dusty environments. The following should be noted when cleaning the Module:

◇ Modules cleaning should be performed during the early morning or evening when the sunlight is not too strong, and the temperature of Modules is relatively low. Before cleaning, please ensure that the circuit is disconnected.

◇ The cleaners should wear insulation gloves and other protective gear. It is strictly prohibited to clean the back panel, cables, and connectors of the Modules with water.

◇ Glass surfaces of the Modules can be cleaned with a dry or damp soft sponge or cloth. For stubborn dirt, you may use a neutral, non-abrasive cleaning agent. It is strictly prohibited to use cleaning agents containing acid, alkali when cleaning.

◇ If using high-pressure water for washing, the maximum water pressure should not exceed 4 Mpa. Soft water is recommended, with PH 6-8;

◇ Avoid applying localized pressure on the Modules during cleaning, as this may cause deformation of the Modules glass, damage to solar cells, and a reduction in the Modules' lifespan.

◇ Timely removal of snow from the Modules is important to prevent long-term accumulation and the damage caused by snow melting and freezing. However, refrain from cleaning the Modules in extreme weather conditions.

◇ Do not pierce the back-sheet when cleaning the back of the Module.

◇ Do not attempt to clean Module with features such as broken glass or the presence of exposed wires, which may be subject to electrical shock.

Warning: Shut down the system before any electric repair.
Improper maintenance may cause electric shock or fire