CNBM | JETION SOLAR

Visionary Green Energy

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INSTALLATION MANUAL

Double Glass Modules

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JX-PI-RD-003 B6

Please read this manual carefully before installation and keep it for future reference.

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INTRODUCTION

- Jetion Solar photovoltaic modules consist of crystalline silicon solar cells, high transmission and low iron tempered glass, anti-aging EVA and high flame resistant back sheet, and anodized aluminum alloy frame.
- Jetion modules are qualified for international standard IEC61215 and IEC61730. Jetion modules can be used in ground PV stations, roof solar systems, communication stations .
- We are committed to providing technical and installation support for our customers worldwide.
- This manual contains important information regarding the installation, safe handling and maintenance of PV modules made by Jetion.
- All instructions should be read and understood prior to installation. The installer should conform to all requirements in this manual. The appropriate local standards and regulations, construction rules and safety instructions should also be followed during installation. All related work on a PV system must be carried out only by appropriately qualified and certificated engineers, who must be familiar with international and local the mechanical and electrical standards and principles including cable connection, building codes, etc for such PV system.

DISCLAIMER OF LIABILITY

- The installation, handling and use of Jetion modules are beyond company control. Therefore, Jetion assumes no responsibility for loss, damage, injury or expense resulting from improper installation, handling, use or maintenance.
- Jetion reserves the right to update the products, specifications or this INSTALLATION MANUAL without prior notice.

1、CERTIFICATES REQUIREMENTS

1.1 IEC 61215&61730

- Jetion modules are designed to meet the requirements of IEC 61215, IEC61730,and also fulfill the criteria of safety class Ⅱ. Modules that are rated as safety class Ⅱ may be used in systems operating with DC higher than 50V or 240W. Modules rated as safety class Ⅱ and qualified for security authentication of IEC61730 are considered to meet the requirements of safety class Ⅱ.

1.2 UL

- The electrical characteristics are within +/- 3% of the rated values of Isc, Voc and Pmp under standard test condition(irradiance of 100 mW/cm2,AM 1.5 , and cell temperature of 25℃).
- The Modules passed UL 790 class C fire tests, the slope of tested module is 5 inches (127mm) to the horizontal foot (0.3m), which is the most severe condition.To ensure the roof fire resistance rating, the minimum distance between the module frame and the roof surface is 115mm, and the installation method shall be conducted according to the local electrical safety regulations or laws.
- The modules have been evaluated by UL for a maximum positive or negative design loading of 50 lb/ft².
- Wiring methods should be in accordance with the NEC.
- For installation in Canada, the installation shall also be in accordance with CSA C22.1, safety Standards for Electrical Installations, Canadian Electrical Code, Part 1.

2、INSTALLATION REQUIREMENTS

2.1 Installation environment requirements

- **Avoid shading**

· Even if the smallest local shelter (such as dust deposition) will also decrease the output power.

- **Adequate ventilation**

· High temperature of the module may reduce the performance and output power of the module. Good ventilation can effectively avoid the overheating of PV modules.

- **Others**

· Do not install the module near inflammable gas.（such as gas station, air tank etc.）

· Do not install the module near naked flame or flammable materials.

· Do not install the module in a location with potential extreme sand and dust damage.

·Do not install the module in a location with extreme air pollution, such as chemical vapors, acid rain, heavy metal particle fume, and/or soot.

· Do not expose the module close to a laser source.

· Do not install the module in a location with extreme hail and/or snow.

· Do not install the module in a location where it could be immersed in water or continually exposed to water from a sprinkler or fountain.

· Do not install the module in a marine environment and/or area where salty wind hit directly. It is recommended that the module should be installed at least 500m from the sea.

· 98th Percentile operating temperature: It is possible that modules mounted with restricted airflow are not allowed for use in certain high-temperature regions, depending on the system design parameters.

· The project team should assess whether the system design at a specific geographic location will result in a 98th percentile module operating temperature exceeds 70°C. Additionally, the following factors must be considered in the system design (for further details, refer to IEC TS 63126):

-Site specific environmental conditions: irradiance, ambient temperature, wind speed;

-System design: mounting distance, array size, array spacing, anti-nesting features that may reduce airflow.

·The maximum altitude of the PV module is designed: 2000 m. Meanwhile, Please be aware that the increase of altitude will be with higher irradiance and lower temperature, which may have impact on power rating.

2.2 Orientation and tilt for modules installation

- Solar modules produce the max power when they are pointed directly at the sun. In order to achieve maximum annual yield, optimum orientation and tilt of PV modules is necessary. The modules, which connected in a system, must be in the same orientation and tilt, otherwise, it will lose the power because of the differences of sunshine radiation.
- The modules must be facing the north in the south hemisphere, and facing south in the north hemisphere.

For off-grid installations where the Jetion modules are attached to a permanently structure, the Jetion modules should be tilted for optimum winter performance. As a rule, if the system power production is adequate in winter, it will be satisfactory during the rest of the year. The maximum output tilt of the module is the angle between the solar module and the ground. At the same time, it shall be determined by the system designer according to the terrain, landform, wind power, wind speed, meteorological resources and system mechanical properties of the installation site.

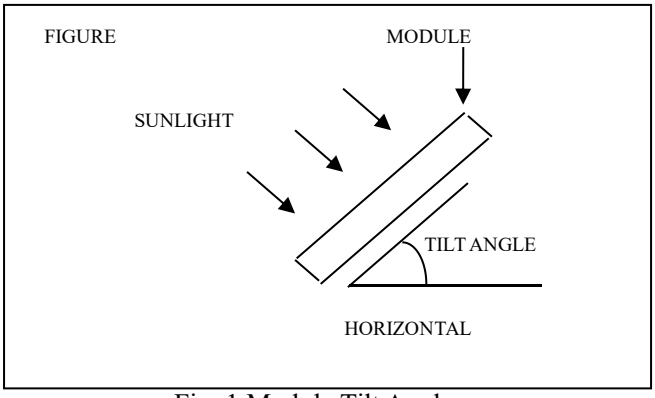


Fig. 1 Module Tilt Angle

RECOMMENDED TILT ANGLES FOR A FIXED SYSTEM	
SITE LATITUDE IN DEGREES	FIXED TILT ANGLE
0^0 TO 15^0	15^0
15^0 TO 25^0	SAME AS LATITUDE
25^0 TO 30^0	LATITUDE+5^0
30^0 TO35^0	LATITUDE+10^0
35^0 TO 40^0	LATITUDE+15^0
40^0 +	LATITUDE+20^0

Table15 Module Tilt Angle

- Nameplate is placed on rear side of the module.

2.3 Materials requirements

- **Support structure**

· The support structure of the module shall be made of abrasion proof, corrosion resistant and UV resistant materials which correspond to the appropriate structural requirements. The mounting structure and the module attachments must be designed in accordance with the local wind and snow loads.

- **Bypass diode**

· Partial shading of an individual module can cause a reverse voltage across the shaded module. Current is then forced go through the shaded area by the other unshaded modules. When a bypass diode is wired in parallel with the series string, the current of unshaded area will detoured round the shaded area and flow though the diode and bypass, thereby minimizing module heating and array current losses.

- **Blocking diode**

· In a system that uses a battery, blocking diodes are typically placed between the battery and the module output to prevent battery discharge at night and rainy weather.

· Diodes that are used as blocking diodes must have a:

Rated Average Forward Current［IF(AV)］above the maximum system current at the highest module operating temperature.

Rated Repetitive Peak Reverse Voltage ［V_{RRM}］ above the maximum system voltage ［Vmax］ at the lowest module operating temperature（IEC：Vmax=1500V）.

- **Battery**

· When solar modules are used to charge batteries, the battery must be installed in a manner which will protect the performance of the system and the safety of its users. The battery should be away from the mainstream of people and animal crowds. Select a battery site that is protected from sunlight, rain, snow, debris, and is well ventilated. Most batteries generate hydrogen gas when charging, which is explosive. Do not light matches or create sparks near the battery bank. When a battery is installed outdoors, it should be placed in an insulated and ventilated battery case specifically designed for the purpose.

- **Cable and other components**

· Ensure that all components meet the requirements of the systems` maximum voltage, current, humidity, and temperature when they are exposed to sunlight. We recommended that all wiring and electrical connections comply with the appropriate national electrical and building code.

· A photovoltaic module is likely to experience conditions that produce higher current and/or voltage than reported at standard test conditions. Factors to consider include module temperature and front side irradiance (and, for bifacial modules, ground or roof albedo, row spacing, and installation height). Accordingly, the values of VOC and ISC (or for bifacial modules, ISC-aBSI) marked on this PV module should be multiplied by a factor of 1,25 when determining voltage and current ratings for components connected to the PV output." "The safety factor of 1,25 given for the minimum voltage rating of the components in the example statement above may be modified during the design of a system according to the minimum temperature of the location of the installation and the temperature coefficient for VOC. The safety factor of 1,25 given for conductor current ratings values for ISC (or for bifacial modules, ISC-aBSI) may be adjusted based on the maximum values of irradiance incident on the front side of the module (and the rear side for bifacial modules). To this purpose, a full simulation for the specific location and module orientation (and for bifacial modules, ground albedo, row spacing and installation height) is required. Further guidance for the choice of a safety factor other than 1,25 is given in IEC 62548."

· Only cables with one conductor are to be used.

· The cross-sectional area of the DC copper cable connected to the connector is 4~6 mm^2. length: ≤1000mm,

temperature range:-40℃ to 70℃. IMax. Series fuse（Mono-182：IMax. Series fuse=25A，Mono-210：IMax. Series fuse=30A）.

· PV connector model/types and manufacturer to which the module connectors shall be mated.

Junction Box and Connector Supplier Model Reference Table

Photovoltaic System Connector Supplier	Junction box	Connertor Type
Zhejiang Jiaming Tianheyuan Photovoltaic Technology Co., Ltd.	JM07w	PV-JM608
Zhejiang Zhonghuan Sunter PV Technology Co.,Ltd.	PV-ZH011C-5	PV-ZH202B
Zhejiang Renhe Photovoltaic Technology Co.,Ltd.	FT50xy	RHC2xyzu

Bypass diode and Cable Supplier Model Reference Table

Photovoltaic System Connector Supplier	Cable	Bypass diode
Zhejiang Jiaming Tianheyuan Photovoltaic Technology Co., Ltd.	62930 IEC 131	RT3550 RT4550
Zhejiang Zhonghuan Sunter PV Technology Co.,Ltd.		35SQ045 40SQ045
Zhejiang Renhe Photovoltaic Technology Co.,Ltd.		MK4045 MK5045

2.4 The requirements for different types of mounting

Positive ("+" or downward) and negative ("−" or upward) design load ratings in pascal (Pa) excluding the test load safety factor.

Design load: +3600Pa, -1600Pa； Safety factor for both sides: 1.5

, which can vary from different mounting methods of the modules (please refer to the following installation guidance), the described load in this manual is for the test load.

Note: on the basis of IEC61215 - 2021 installation requirements, when computing the corresponding maximum design load, a safety factor of 1.5 need to be considered.

- **Ground mounting**

· Select the height of the mounting system to prevent the lowest edge of the module from being covered by snow for a long time in winter in areas that experience heavy snow falls. In addition, assure the lowest portion of the module is placed high enough so that it is not shaded by grass, and sand and stone driven by wind.

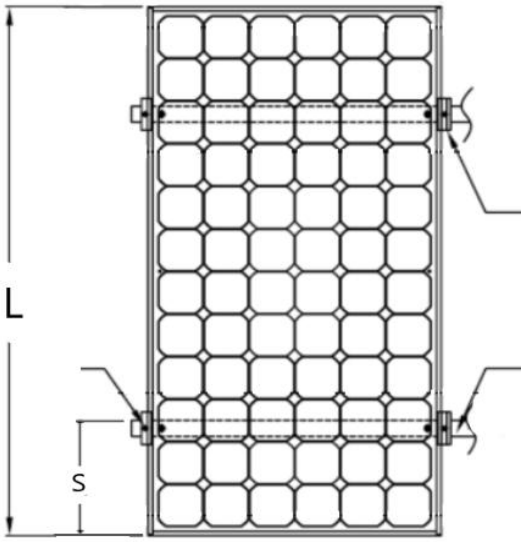
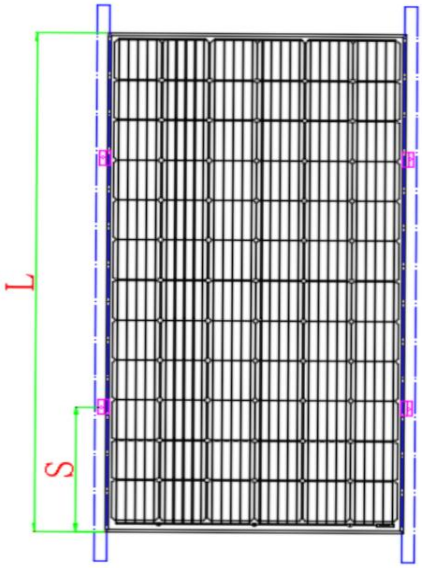
- **Pole mounting**

· When installing a module on a pole, choose a pole and module mounting structure that should withstand anticipated winds for the area.

3、MOUNTING METHODS

Type 1 -Clamping mounting:

The clamp must have an overlap of 7mm to 10mm with the mounting width on the front of the module frame. Minimum thickness of clamp must be≥3mm, and length ≥40mm. Contact width of frame and guide rail should be at least 10mm. To attach the module to the mounting bracket, at least 4 clamps must be used, and the torque tighten to 16-20N▪m. The clamp shall not distort the frame. Installation diagram and illustrations are as follows:

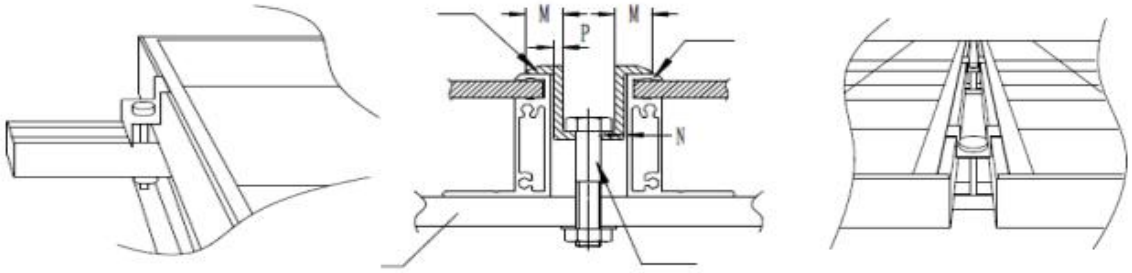
Clamp installation (the movement range of the mounting rail)	
 Single-sided/ Bifacial double glass modules ①	 Bifacial double glass modules ②

1. Mounting range: (1/4L-50)≦S≦(1/4L+50) (L is the length of Module)

   Note: Installation method ① has passed the evaluation test (61215:2021+61730:2023)

   Composite frame and steel frame is suitable for installing type 1 ①

End clamp 2pcs/module(both ends) & Middle clamp 2pcs/module(modules in the middle)



Dimension “M” represents the mounting overlap dimensions for clamp and moudule frame fronts;
Dimension “N” represents the distance between clamp and frame;

Dimension “P” represents the thickness of clamp; 8mm≤M≤11mm ； P≥3mm ; 0.5mm≤N≤2mm ； length of clamp ≥50mm Bolt contains: bolt , spring shim ,washer, nut.

The matching test load for type1 is as follows:

Module model			Front/Rear	Clamp mounting	
				Long side perpendicular to the purlin ①	Parallel-to-Purlin Mounting (Long Side) ②
66*2 cell	JTxxxSLk(B)	xxx: 685-745	Positive	5400pa	/
			Negative	2400 pa	/
60*2 cell	JTxxxSIk(B)	xxx: 620-675	Positive	5400pa	/
			Negative	2400 pa	/
55*2 cell	JTxxxSZk(B)	xxx: 570-600	Positive	5400pa	/
			Negative	2400 pa	/
54*2 cell	JTxxxSJk(B)	xxx: 570-610	Positive	5400pa	/
			Negative	2400 pa	/
48*2 cell	JTxxxSNk(B)	xxx: 505-545	Positive	5400pa	/
			Negative	2400 pa	/
40*2 cell	JTxxxSYk(B)	xxx: 420-440	Positive	5400pa	/
			Negative	2400 pa	/
Module model			Front/Rear	Clamp mounting	
				Long side perpendicular to the purlin ①	Parallel-to-Purlin Mounting (Long Side) ②
78*2 cell	JTxxxSRt(B)	xxx: 610-640	Positive	5400pa	/
			Negative	2400 pa	/
72*2 cell	JTxxxSSt(B)	xxx: 560-590	Positive	5400pa	/
			Negative	2400 pa	/
66*2 cell	JTxxxSLt(B)	xxx: 510-530	Positive	5400pa	/
			Negative	2400 pa	/
60*2 cell	JTxxxSIt(B)	xxx: 460-490	Positive	5400pa	/
			Negative	2400 pa	/
54*2 cell	JTxxxSJt(B)	xxx: 410-440	Positive	5400pa	/
			Negative	2400 pa	/
66*2 cell	JTxxxSLt(B)	xxx: 605-630	Positive	5400pa	/
			Negative	2400 pa	/
54*2 cell	JTxxxSNt(B)	xxx: 440-460	Positive	5400pa	/
			Negative	2400 pa	/

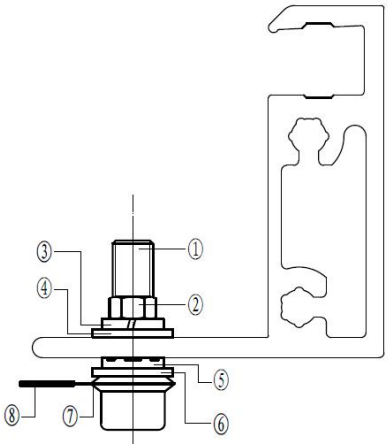
Note:Positive ("+" or downward) and negative ("−" or upward) design load ratings in pascal (Pa) excluding the test load safety factor.

Design load: +3600Pa, -1600Pa； Safety factor for both sides: 1.5

4、GROUNDING

- To avoid the risk of electrical shock or fire,the module frame should be grounded before the electrical connection of the modules is operated.
- The frame shall be grounded in accordance with NEC Article 250（USA）or CEC in Canada.

- For an adequate grounding,the grounding hardware should penetrate the anodic oxidation layer.
- Jetion recommends using the following components or equivalents.



① Stainless steel bolt
② Stainless steel nut
③ Stainless steel spring washer
④ ⑥Stainless steel flat washer
⑤ Stainless steel lock-toothed washer
⑦ Stainless steel cup washer
⑧ Grounding wire

Fig. 6

- Attach a separate conductor as grounding wire to the 4mm diameter grounding holes with a set of M4 bolt,cup washer,flat washer,lock-toothed washer,spring washer,and nut.
- Jetion's photovoltaic module can be grounded by using the third-party earthing device, which is applicable to the metal frame earthing of the photovoltaic module and shall be installed according to the manufacturer's INSTALLATION MANUAL.
- Exposed copper of the grounding wire shall not contacts the module frame in case of corroding the frame.

5、WIRING

5.1 For the wiring, pay attention to:

- Correct wiring scheme: To minimize the risk of indirect lighting strike,avoid forming closed loops when designing the system.Check that wiring is correct before operating the photovoltaic system.If the measured open circuit voltage （Voc）and short-circuit current（Isc）are different from those in the specifications,there may be a wiring fault.
- The J-Box Jetion uses on the backside of the module is weatherproof and is designed to be used with standard wiring or conduit connections. Wiring methods should be in accordance to the NEC(National Electrical Code). Bypass diodes and cable clamps are included with each module when the modules are shipped out from the factory.
- Use modules of the same specification in the same system. When connected in series, all modules must have the same current. When connected in parallel, the modules must all have the same voltage.The quantity of modules to be connected should match the voltage specifications of the devices used in the system. The modules must not be connected together to create a voltage, which is higher than the permitted system voltage.When designing the system, please always take into consideration the variation of the voltage under different temperatures (please check the respective temperature coefficients of the modules, the Voc of the modules will be rise when the temperature drops).
- Make sure the connector is clean and the sealing ring is complete before connection. The male and female connectors shall connect tightly, and poor connection may cause the junction electrical leakage and burning at the junction. The shell of Junction box and the connector are of organic materials, so they cannot contact with organic solvents, otherwise They will get deformed or cracked.

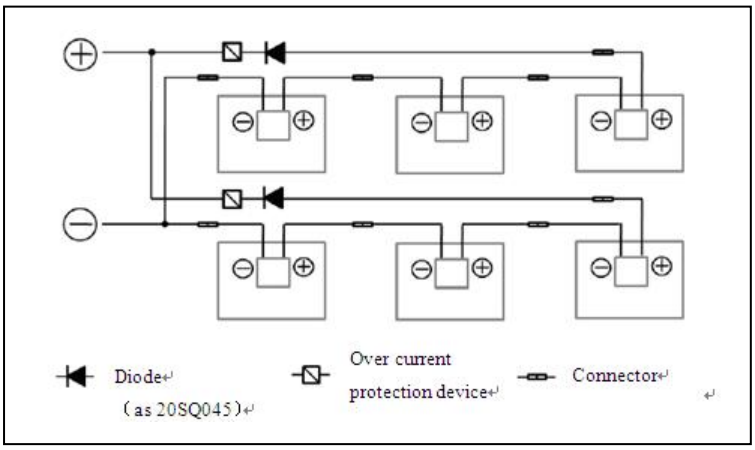
The minimum bending radius of the module cable is not less than four times of the cable diameter.

Wrong bending mode Correct bending mode

- When the cable is fixed on the support, never damage the cable or module mechanically. Never press the cable with force. The special light-fast bundle and line card shall be used for fixing the cable properly on the support. Although the cable can resist sunshine and water, avoid direct sunshine and water as much as possible.

5.2 The number of modules in series and in parallel in a system

- When modules are connected in series, the total voltage should be less than the maximum system voltage Vmax （IEC：1500V）.
- When modules are connected in parallel, the total current should be less than the maximum system current.
- The modules shall be connected in a serial manner followed by the parallel way. If a reverse current exist, which exceeds the largest fuse current, an over-current protection device of equal specification shall be used to protect the modules. If there are two or more parallels of modules, one over-current protection device and one anti-reverse charging diode shall be installed on each parallel.



- recommended maximum series/parallel module configurations

Formula	**Maximum system voltage V ≥ N x Voc x [1+βx (Tmin-25)]**
V	Maximum system voltage
N	The number of maximum solar PV modules in series
Voc	The open circuit voltage of each module (see product label or data sheet)
β	Temperature coefficient of open circuit voltage of the module (refer to data sheet)
Tmin	The lowest ambient temperature at installation site
Formula	**N≤fuse rating/Isc+1**
N	The number of maximum parallel connection
Isc	The short circuit current of each module (see product label or data sheet)

5.3 PID effect prevention

● It is recommended to adopt negatively earthed installation of inverter to avoid the PID effect for non-anti PID modules.

● It is recommended to adopt negatively earthed installation of inverter to avoid the PID effect for water PV projects.

● If the inverter does not have negatively earthed function, PID restorer (PID-box) can also be adopted.

5.4 Clean and protection of connectors

● During module installation, connectors are easily exposed in air, and even contact with the land, which causes pollution to connectors. It is not allowed to use organic solvents to clean connectors (eg. electrode cleaner), because it will easily cause a crack on the connector.

● The connector is easily corroded in the environment where there are the chemical substances below. Please never save it in the environment with chemical substances marked by "△" in long term and never make it contact the chemical substances marked by "×".

No.	Type of chemical substances	Endurance capacity	NO.	Type of chemical substances	Endurance capacity
1	Aliphatic hydrocarbon	×/△	8	Ether	×
2	Aromatic hydrocarbon	×	9	Inorganic acid	×/△
3	Halogenated hydrocarbon	×	10	Organic acid	△
4	Ethyl alcohol	+	11	Oxidizing acid	×
5	Phenol	×	12	Alkaline	×
6	Ketone	×	13	Gasoline	×
7	Ester	×/△	Note: +,good ; △,Moderate; ×,Poor		

6、LOADING & UNLOADING AND TRANSPORTATION

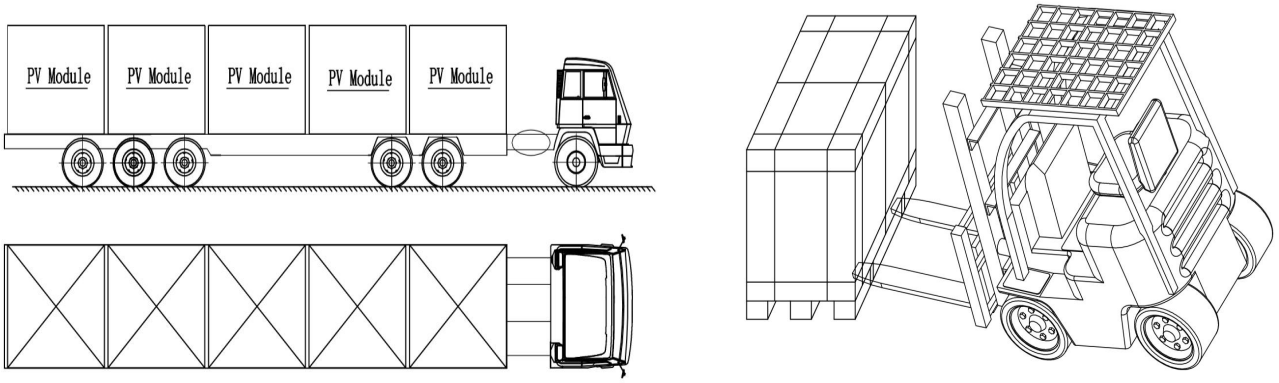
6.1 Module Loading & Unloading

● If the modules are to be transported by containers, the fork tooth of electric forklift shall go from the pallet's short edge when lifting the pallets. The fork tooth's length must be longer than two-thirds of the pallets length, if fork tooth's length can not meet the requirement, a tooth sleeve shall be added to lengthen the fork tooth. If the modules are to be transported by platform cars, fork tooth can go from the pallet's long edge, but slotting space must be adjusted to the biggest, and go in the middle of the gap at the long edge. Forklift truck shall maintain a constant speed, forbid a sudden acceleration or stop, lift and drop slowly to avoid module concussion.

6.2 Transport Modules on Project Site

● If use flatbed truck to transport modules on the project site, the modules can only be moved as one layers stacking, as shown in Transportation/by flatbed truck(Fig a).

● If use forklift to transport modules on the project site, the modules can only be moved as one layers stacking, as shown in Transportation/by forklift(Fig b).



(a) by flatbed truck. (b) by forklift.

Fig. Transportation

6.3 Storage

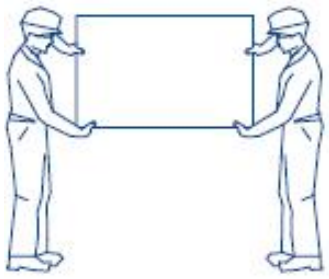
- Store the arrived modules properly to avoid breakage. Jetion modules are packed vertically, and each pallet is vertically placed with two boxes; Please separate the top box and bottom box once the modules arrived.
- For temporary storage, please store the modules in dry and well ventilated space, with temperature 0 - 40 ℃, humidity: 30% -70%.
- The current grade labels of different colors are attached to the outer box and the frame. The same system shall be installed with modules of same current grade .
- If the modules are stored in an uncontrolled environment, they should not be stored for more than 3 months, and additional measures need to be taken to prevent the connector from moisture or the component from sunlight, and the packaging should be protected from damage.

6.4 Unpacking for vertical landscape package

- Correct unpack method:

First, tear off packing belts and wrapping Film, and open the top cover.;

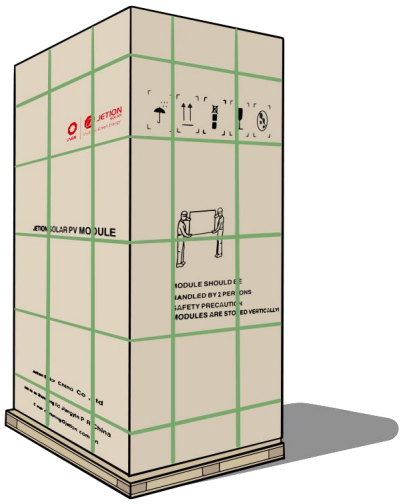
Second, two constructors lift modules vertically from the package in turn, and take out modules.The remaining modules in the box shall be inclined to the other side.



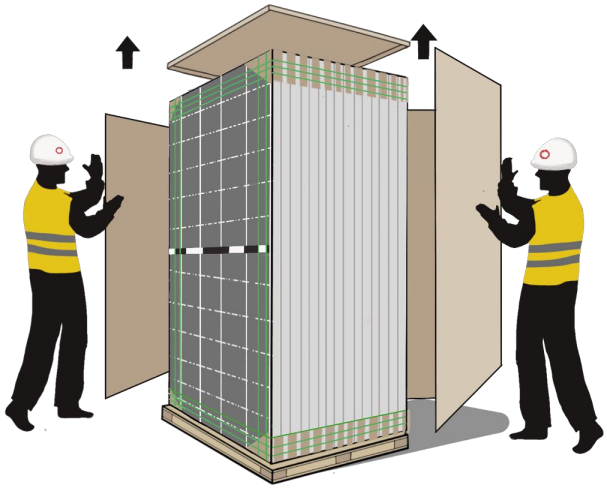
Correct way to take out the module

6.5 Unpacking for vertical portrait package.

If the unpacked modules are not installed immediately, they should be fixed to the stand supporter with a safety rope under weather of 6 class wind (the modules should be less than 12 pieces).



① Remove the wrapping film and packing



②Remove the top cover and sealing tape , and then remove the carton box.

③Place the stand supporter from the glass or backsheet side.

④ Cut off all the horizontal packing belts. When there are 1-2 vertical packing belts remaining, push the module gently to tilt toward the stand supporter.

⑤ Cut off the remaining packing belts so that the modules rest on the stand supporter.

⑥ Take out the modules in order.

6.6 Module carrying

- The module should be carried by two people with both hands whether it's to be moved or lifted. It's not allowed for a single person or a single hand to carry the module. It's forbidden to lift the module by grasping the junction box or cable.
- No more than 15 stacked components are placed with the glass side facing the top frame.

6.7 Others

- **Disclaimer of liability:** Jetion shall not be liable for any loss, damage, injury or expense resulting from irregular unpacking operations.

- Before the modules arriving the site, please don't unpack the box, and please protect the package from damage.
- Smoothly loading and unloading the modules, don't place on a slope or seriously uneven ground to avoid the package slanting or falling. When stacking modules, do not exceed the allowed max layers printed on the package.
- Standing, climbing, walking or jumping on modules is prohibited under any circumstances. Localized heavy loads can create microcracks in the battery, which in turn can reduce component reliability.
- When unpacking outdoors, it is forbidden to do it in the rain. Because the outer packaging carton will become soft or damaged due to moisture, the modules in the box may tilt and tip.
- When handling or installing modules, do not support the modules by the back plate, neither the back plate can be forced.
- It is forbidden to drop or stack items (such as installation tools) on modules. At the same time, avoid the back plate of the module being scratched by sharp objects, scratches will directly affect the safety of the module.
- It is forbidden to expose modules or their electrical interfaces to unauthorized chemicals (e.g. oils, lubricants, pesticides, etc.). All electrical interfaces need to be kept clean and dry at all times.
- In the case of wind, more attention needs to be paid to the safety management of the site, especially in the strong wind environment, Jetion Sun does not recommend transporting modules in this environment. Modules that have been unpacked need to be secured in an appropriate manner.
- Operators should wear labor protection gloves.

7、MAINTENANCE AND CLEANING

- Do not change the PV components optionally (diode, junction box, plug connectors).
- Given a sufficient tilt (at least 15°), it is not generally necessary to clean the modules (rainfall will have a self-cleaning effect). In case of heavy dust adhesion (which will result in output reductions), we recommend cleaning the modules with plenty of water and using a gentle cleaning tool (for example, a sponge).
- Dirt must never be scraped or rubbed away when it's dry, as this will cause micro-scratches. We recommend that the system be inspected at regular intervals.
- Do not clean the modules with cold water during the warmer hours of the day in order to avoid creating any thermal shock that may damage the module.
- CAUTION： **DON'T USE DETERGENTS CONSISTING OF ABRASIVE, ACETONE OR OTHER CORROSIVE ELEMENTS.**

8、CHECKLISTS

- All fastenings are tight, secure and free of corrosion.
- All cable connections are secure, tight, clean and free of corrosion.

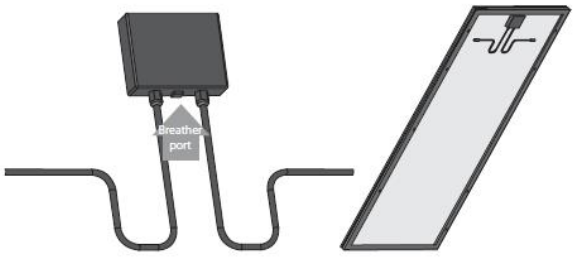
- All connectors are not damaged in any way.
- Checking the earthen resistively of metals.

9、WARNING!

- The maximum load on the module must not exceed 30 lb/ft²（146.5 kg/m²）. To avoid exceeding the maximum load, real-time load for specific areas such as wind and snow should be taken into account.

When modules or strings are planned to be connected in parallel, a fuse should be used in each string.The number of modules in series is based on the maximum system voltage of the module used, and the corresponding combiner box, inverter are matched.

- The open-circuit voltage of all modules in series should never exceed the max system voltage.
- The plug connector has its own polarity.Make sure that the connection is safe and tight.Ensure that they are in good electrical and mechanical condition.
- The plug connector should not receive extreme stress.
- Never pull the connector and cable forcefully and the well bound cable can be untied by special tools (such as pliers).
- Never rotate the fixed nut of the connector.
- Do not attempt to drill holes in the surface glass of the modules.
- Do not drill additional mounting holes in the frame of the modules.
- Do not hoist the module by the J-Box or cable.
- Never use a module with broken glass or torn substrate.Broken modules cannot be repaired and contact with any module surface or frame can lead to electrical shock.
- Do not install or handle modules when they are wet or during the period of high wind.
- Keep children well away from the system while transporting and installing mechanical and electrical components.
- Do not strike or physically damage the module.
- Avoid cutting and damaging the frame, the front side or the backside surface of the module during handling and installation.
- Do not stand or step on the module.
- Do not put extra objects on the module lest the glass will be broken.
- The J-Box must be on the higher side of the module when it is mounted.



- Do not dismantle or drop the module,and do not remove any attached nameplate or components from the module.
- Do not bend or twist the module.
- Do not apply paint or adhesive to module top surface.
- Do not use pointed or sharp objects with the module.
- Artificially concentrated sunlight producing a PV module's current above the value reported on the nameplate shall not be directed onto the front side or the back side of the PV module.
- Precipitation can run off through small openings on the back side of the module. Make sure that the openings are not masked after mounting.
- Do not wear rings ,watch,and metal jewelry during installation.

10、HAZARD WARNINGS:

⚠ Danger of death from electric shock!

PV modules generate electricity as soon as they are exposed to sunlight. One module generates a safe, extra low voltage level, but multiple modules connected in series (summing the voltage) or in parallel (summing the current) represent a danger. The following points must be noted when handling the solar modules to avoid the risk of fire, sparking and fatal electric shock.

- **Do not insert electrically conducting parts into the plugs or sockets!**
- **Do not fit solar modules and wiring with wet plugs and sockets!**
- **Exercise utmost caution when carrying out work on wiring and safety equipment (use insulated tools, insulated gloves, etc.)!**
- **Do not use damaged modules! Do not dismantle modules! Do not mark on the rear of the module using sharp objects!**
- **Exercise utmost caution when working on wiring and the inverter. Be sure carefully to follow manufacture's installation instructions!**

⚠ Danger of death from arcing!

- **Modules generate direct current when light shines on them. An electric arc may be generated when connectors are used to turn the circuit on or off. Don't touch the connectors. When breaking a connected string of modules (e.g. when disconnecting the line from the inverter under load), a lethally strong arc can occur.**
- **Since the modules have been connected into working system, there would be electric arc while being switched off, so the operation should be finished by certificated, professional electrician.**
- **Ensure the connectors are clean and have not been contaminated, and that the electrical connection and mechanical joint are good!**

Appendix 1 : Applicable Products

No.	Cell/pcs	Cell Type	Module model	Size(L×W×T=Length×Width×Thickness）/mm	Mounting holes	Note
1	132	MONO	JTxxxSLk(B)	2384*1303*35/33	400-1400	xxx=680~720，xxx,in step of 5
2	120	MONO	JTxxxSIk(B)	2172*1303*35	400-1400	xxx=620~650，xxx,in step of 5
3	110	MONO	JTxxxSZk(B)	2384*1096*35	400-1400	xxx=570~600，xxx,in step of 5
4	108	MONO	JTxxxSJk(B)	1961*1303*35	400-1200	xxx=570~590，xxx,in step of 5
5	96	MONO	JTxxxSNk(B)	1750*1303*35	400-1100	xxx=505~525，xxx,in step of 5
6	80	MONO	JTxxxSYk(B)	1750*1096*30	400-990-1300	xxx=420~440，xxx,in step of 5
7	156	MONO	JTxxxSRt(B)	2465*1134*30	400-1200-1600	xxx=610~640，xxx,in step of 5
8	144	MONO	JTxxxSSt(B)	2278*1134*30	400-1400	xxx=560~590，xxx,in step of 5
9	132	MONO	JTxxxSLt(B)	2094*1134*30 2382*1134*30	400-900-1300 400-790-1400	xxx=510~530，605-630 xxx,in step of 5
10	120	MONO	JTxxxSIt(B)	1908*1134*30	400-900-1300	xxx=460~490，xxx,in step of 5
11	108	MONO	JTxxxSJt(B)	1722*1134*30	400-900-1400	xxx=415~440，xxx,in step of 5
12	96	MONO	JTxxxSNt(B)	1762*1134*30	1100	xxx=440~460，xxx,in step of 5

Appendix 2:Electrical Specifications

- **Product Temperature coefficient & Performance at low irradiance refer to user manual & Datssheet.**
- **manufacturer's stated tolerance for Voc, Isc and maximum power output under standard test conditions.**

Voc:±3% **Isc:±3%** **Pmax:±3%**

	Module type	JT570SZk(B)	JT575SZk(B)	JT580SZk(B)	JT585SZk(B)	JT590SZk(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	570	575	580	585	590
	Voc [V] /Tolerance	41	41.15	41.3	41.45	41.6
	Isc [Adc] /Tolerance	17.3	17.38	17.45	17.52	17.59
	Vmp [V]	34.55	34.7	34.85	35	35.15
	Imp [Adc]	16.5	16.58	16.65	16.72	16.79
BNPI condition（For bifacial modules, corresponding to 1 000 W/m2 on the module front and 135 W/m2 on the module rear）	Pmax [W] /Tolerance	628	634	640	645	651
	Voc [V] /Tolerance	41	41.15	41.3	41.45	41.6
	Isc [Adc] /Tolerance	18.99	19.07	19.15	19.23	19.31
	Vmp [V]	34.55	34.7	34.85	35	35.15
	Imp [Adc]	18.19	18.27	18.35	18.43	18.51
Bifaciality coefficient	φPmax	85±10%	85±10%	85±10%	85±10%	85±10%
	φVoc	95±5%	95±5%	95±5%	95±5%	95±5%
	φIsc	85±10%	85±10%	85±10%	85±10%	85±10%
Isc at aBSI(BSI) (For stress on bifacial modules, corresponding to 1 000 W/m2 on the module front and 300 W/m2 on the module rear)		21.24	21.34	21.43	21.51	21.6
Maximum System Voltage[V]		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		35A	35A	35A	35A	35A

	Module type	JT595SZk(B)	JT600SZk(B)	JT680SLk(B)	JT685SLk(B)	JT690SLk(B)
STC condition	Pmax [W]	595	600	680	685	690

(1000 W/m2，25℃)	/Tolerance					
	Voc [V] /Tolerance	41.75	41.9	49.4	49.55	49.7
	Isc [Adc] /Tolerance	17.66	17.73	17.19	17.25	17.31
	Vmp [V]	35.3	35.45	41.5	41.65	41.8
	Imp [Adc]	16.86	16.93	16.39	16.45	16.51
BNPI condition（For bifacial modules, corresponding to 1 000 W/m2 on the module front and 135 W/m2 on the module rear）	Pmax [W] /Tolerance	656	662	750	756	761
	Voc [V] /Tolerance	41.75	41.9	49.6	49.75	49.9
	Isc [Adc] /Tolerance	19.38	19.46	18.93	19	19.06
	Vmp [V]	35.3	35.45	41.55	41.7	41.85
	Imp [Adc]	18.58	18.66	18.05	18.12	18.18
Bifaciality coefficient	φPmax	85±10%	85±10%	85±10%	85±10%	85±10%
	φVoc	95±5%	95±5%	95±5%	95±5%	95±5%
	φIsc	85±10%	85±10%	85±10%	85±10%	85±10%
Isc at aBSI(BSI) (For stress on bifacial modules, corresponding to 1 000 W/m2 on the module front and 300 W/m2 on the module rear)		21.69	21.77	21.11	21.18	21.26
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		35A	35A	35A	35A	35A
	Module type	JT695SLk(B)	JT700SLk(B)	JT705SLk(B)	JT710SLk(B)	JT715SLk(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	695	700	705	710	715
	Voc [V] /Tolerance	49.85	50.20	50.25	50.3	50.35

	e					
	Isc [Adc] /Tolerance	17.37	17.86	17.94	18.02	18.10
	Vmp [V]	41.95	42.32	42.36	42.4	42.44
	Imp [Adc]	16.57	16.55	16.65	16.75	16.85
BNPI condition（For bifacial modules, corresponding to 1 000 W/m2 on the module front and 135 W/m2 on the module rear）	Pmax [W] /Tolerance	767	785	791	796	801.69
	Voc [V] /Tolerance	50.05	50.2	50.25	50.3	50.35
	Isc [Adc] /Tolerance	19.13	20.03	20.12	20.21	20.30
	Vmp [V]	42	42.32	42.36	42.4	42.44
	Imp [Adc]	18.25	18.56	18.67	18.79	18.89
Bifaciality coefficient	φPmax	85±10%	90±5%	90±5%	90±5%	90±5%
	φVoc	95±5%	95±5%	95±5%	95±5%	95±5%
	φIsc	85±10%	90±5%	90±5%	90±5%	90±5%
Isc at aBSI(BSI) (For stress on bifacial modules, corresponding to 1 000 W/m2 on the module front and 300 W/m2 on the module rear)		21.33	22.68	22.78	22.89	22.98
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		35A	35A	35A	35A	35A
	Module type	JT720SLk(B)	JT620SIk(B)	JT625SIk(B)	JT630SIk(B)	JT635SIk(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	720	620	625	630	635
	Voc [V] /Tolerance	50.40	44.8	44.95	45.1	45.25
	Isc [Adc] /Tolerance	18.18	17.25	17.32	17.38	17.45

	Vmp [V]	42.48	37.7	37.85	38	38.15
	Imp [Adc]	16.95	16.45	16.52	16.58	16.65
BNPI condition（For bifacial modules, corresponding to 1 000 W/m2 on the module front and 135 W/m2 on the module rear）	Pmax [W] /Tolerance	807.12	684	689	695	700
	Voc [V] /Tolerance	50.40	44.8	44.95	45.1	45.25
	Isc [Adc] /Tolerance	20.39	18.93	19.01	19.08	19.15
	Vmp [V]	42.48	37.7	37.85	38	38.15
	Imp [Adc]	19.00	18.13	18.21	18.28	18.35
Bifaciality coefficient	φPmax	90±5%	85±10%	85±10%	85±10%	85±10%
	φVoc	95±5%	95±5%	95±5%	95±5%	95±5%
	φIsc	90±5%	85±10%	85±10%	85±10%	85±10%
Isc at aBSI(BSI) (For stress on bifacial modules, corresponding to 1 000 W/m2 on the module front and 300 W/m2 on the module rear)		23.09	21.18	21.27	21.34	21.43
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		35A	35A	35A	35A	35A
	Module type	JT640SIk(B)	JT645SIk(B)	JT650SIk(B)	JT570SJk(B)	JT575SJk(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	640	645	650	570	575
	Voc [V] /Tolerance	45.4	45.55	45.7	40.7	40.85
	Isc [Adc] /Tolerance	17.52	17.58	17.64	17.53	17.62
	Vmp [V]	38.3	38.45	38.6	34.2	34.35
	Imp [Adc]	16.72	16.78	16.84	16.67	16.74
BNPI condition	Pmax [W]	705	711	717	629	634

（For bifacial modules, corresponding to 1 000 W/m2 on the module front and 135 W/m2 on the module rear）	/Tolerance					
	Voc [V] /Tolerance	45.4	45.55	45.7	40.7	40.85
	Isc [Adc] /Tolerance	19.22	19.3	19.37	19.24	19.34
	Vmp [V]	38.3	38.45	38.6	34.2	34.35
	Imp [Adc]	18.42	18.5	18.57	18.38	18.46
Bifaciality coefficient	φPmax	85±10%	85±10%	85±10%	85±10%	85±10%
	φVoc	95±5%	95±5%	95±5%	95±5%	95±5%
	φIsc	85±10%	85±10%	85±10%	85±10%	85±10%
Isc at aBSI(BSI) (For stress on bifacial modules, corresponding to 1 000 W/m2 on the module front and 300 W/m2 on the module rear)		21.51	21.59	21.66	21.53	21.64
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		35A	35A	35A	35A	35A
	Module type	JT580SJk(B)	JT585SJk(B)	JT590SJk(B)	JT505SNk(B)	JT510SNk(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	580	585	590	505	510
	Voc [V] /Tolerance	41	41.15	41.3	36.15	36.3
	Isc [Adc] /Tolerance	17.69	17.76	17.83	17.54	17.63
	Vmp [V]	34.5	34.65	34.8	30.35	30.5
	Imp [Adc]	16.82	16.89	16.96	16.64	16.73
BNPI condition （For bifacial modules, corresponding to 1 000 W/m2 on	Pmax [W] /Tolerance	639	645	650	557	562
	Voc [V] /Toleranc	41	41.15	41.3	36.15	36.3

the module front and 135 W/m2 on the module rear)	e					
	Isc [Adc] /Tolerance	19.41	19.49	19.57	19.25	19.34
	Vmp [V]	34.5	34.65	34.8	30.35	30.5
	Imp [Adc]	18.54	18.62	18.7	18.35	18.44
Bifaciality coefficient	φPmax	85±10%	85±10%	85±10%	85±10%	85±10%
	φVoc	95±5%	95±5%	95±5%	95±5%	95±5%
	φIsc	85±10%	85±10%	85±10%	85±10%	85±10%
Isc at aBSI(BSI) (For stress on bifacial modules, corresponding to 1 000 W/m2 on the module front and 300 W/m2 on the module rear)		21.72	21.81	21.9	21.54	21.65
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		35A	35A	35A	35A	35A
	Module type	JT515SNk(B)	JT520SNk(B)	JT525SNk(B)	JT420SYk(B)	JT425SYk(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	515	520	525	420	425
	Voc [V] /Tolerance	36.45	36.6	36.75	30.1	30.25
	Isc [Adc] /Tolerance	17.72	17.81	17.89	17.54	17.63
	Vmp [V]	30.65	30.8	30.95	25.2	25.35
	Imp [Adc]	16.81	16.89	16.97	16.67	16.77
BNPI condition（For bifacial modules, corresponding to 1 000 W/m2 on the module front and 135 W/m2 on the module rear)	Pmax [W] /Tolerance	568	573	579	463	469
	Voc [V] /Tolerance	36.45	36.6	36.75	30.1	30.25
	Isc [Adc] /Tolerance	19.44	19.54	19.62	19.25	19.35

	Vmp [V]	30.65	30.8	30.95	25.2	25.35
	Imp [Adc]	18.53	18.62	18.7	18.38	18.49
Bifaciality coefficient	φPmax	85±10%	85±10%	85±10%	85±10%	85±10%
	φVoc	95±5%	95±5%	95±5%	95±5%	95±5%
	φIsc	85±10%	85±10%	85±10%	85±10%	85±10%
Isc at aBSI(BSI) (For stress on bifacial modules, corresponding to 1 000 W/m2 on the module front and 300 W/m2 on the module rear)		21.76	21.87	21.97	21.54	21.65
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		35A	35A	35A	35A	35A
	Module type	JT430SYk(B)	JT435SYk(B)	JT440SYk(B)		
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	430	435	440		
	Voc [V] /Tolerance	30.4	30.55	30.7		
	Isc [Adc] /Tolerance	17.73	17.82	17.92		
	Vmp [V]	25.5	25.65	25.8		
	Imp [Adc]	16.87	16.96	17.06		
BNPI condition（For bifacial modules, corresponding to 1 000 W/m2 on the module front and 135 W/m2 on the module rear）	Pmax [W] /Tolerance	474	480	485		
	Voc [V] /Tolerance	30.4	30.55	30.7		
	Isc [Adc] /Tolerance	19.46	19.56	19.66		
	Vmp [V]	25.5	25.65	25.8		
	Imp [Adc]	18.6	18.7	18.8		
Bifaciality coefficient	φPmax	85±10%	85±10%	85±10%		
	φVoc	95±5%	95±5%	95±5%		

	φIsc	85±10%	85±10%	85±10%		
Isc at aBSI(BSI) (For stress on bifacial modules, corresponding to 1 000 W/m2 on the module front and 300 W/m2 on the module rear)		21.77	21.88	22.01		
Maximum System Voltage		1500V	1500V	1500V		
Maximum Over-Current Protection Rating [A]		35A	35A	35A		

	Module type	JT610SRt(B)	JT615SRt(B)	JT620SRt(B)	JT625SRt(B)	JT630SRt(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	610	615	620	625	630
	Voc [V] /Tolerance	55.03	55.23	55.43	55.63	55.83
	Isc [Adc] /Tolerance	14.17	14.23	14.29	14.35	14.41
	Vmp [V]	45.49	45.66	45.82	45.96	46.12
	Imp [Adc]	13.41	13.47	13.53	13.60	13.66
BNPI condition（equivalent to 1 000 W/m2 on the front side and 135 W/m2 on the back side，25℃）	Pmax [W] /Tolerance	672	678	683	689	695
	Voc [V] /Tolerance	55.03	55.23	55.43	55.63	55.83
	Isc [Adc] /Tolerance	15.54	15.61	15.68	15.74	15.81
	Vmp [V]	45.49	45.66	45.82	45.96	46.12
	Imp [Adc]	14.78	14.85	14.92	14.99	15.06
Bifaciality coefficient	φPmax	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
	φVoc	95%±5%	95%±5%	95%±5%	95%±5%	95%±5%
	φIsc	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
Isc at aBSI(BSI)		17.4	17.47	17.55	17.62	17.7
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		30A	30A	30A	30A	30A

	Module type	JT635SRt(B)	JT640SRt(B)	JT555SSt(B)	JT560SSt(B)	JT565SSt(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	635	640	555	560	565
	Voc [V] /Tolerance	56.03	56.23	50.47	50.67	50.87
	Isc [Adc] /Tolerance	14.47	14.53	14.07	14.13	14.19
	Vmp [V]	46.29	46.45	41.77	41.96	42.15
	Imp [Adc]	13.72	13.78	13.29	13.35	13.41
BNPI condition（equivalent to 1 000 W/m2 on the front side and 135 W/m2 on the back side，25℃）	Pmax [W] /Tolerance	700	706	611.9	618	623
	Voc [V] /Tolerance	56.03	56.23	50.47	50.67	50.87
	Isc [Adc] /Tolerance	15.87	15.94	15.43	15.50	15.56
	Vmp [V]	46.29	46.45	41.77	41.96	42.15
	Imp [Adc]	15.12	15.19	14.65	14.72	14.78
Bifaciality coefficient	φPmax	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
	φVoc	95%±5%	95%±5%	95%±5%	95%±5%	95%±5%
	φIsc	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
Isc at aBSI(BSI)		17.77	17.84	17.28	17.35	17.43
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		30A	30A	30A	30A	30A
	Module type	JT570SSt(B)	JT575SSt(B)	JT580SSt(B)	JT585SSt(B)	JT590SSt(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	570	575	580	585	590
	Voc [V] /Tolerance	51.07	51.27	51.47	51.67	51.87
	Isc [Adc] /Tolerance	14.25	14.31	14.37	14.43	14.49
	Vmp [V]	42.32	42.47	42.62	42.77	42.92
	Imp [Adc]	13.47	13.54	13.61	13.68	13.75

BNPI condition（equivalent to 1 000 W/m2 on the front side and 135 W/m2 on the back side，25℃）	Pmax [W] /Tolerance	629	634	639	645.0	651
	Voc [V] /Tolerance	51.07	51.27	51.47	51.67	51.87
	Isc [Adc] /Tolerance	15.63	15.70	15.76	15.83	15.90
	Vmp [V]	42.32	42.47	42.62	42.77	42.92
	Imp [Adc]	14.85	14.93	15.00	15.08	15.16
Bifaciality coefficient	φPmax	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
	φVoc	95%±5%	95%±5%	95%±5%	95%±5%	95%±5%
	φIsc	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
Isc at aBSI(BSI)		17.50	17.57	17.65	17.72	17.79
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		30A	30A	30A	30A	30A
	Module type	JT500SLt(B)	JT505SLt(B)	JT510SLt(B)	JT515SLt(B)	JT520SLt(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	500	505	510	515	520
	Voc [V] /Tolerance	45.85	45.95	46.10	46.25	46.40
	Isc [Adc] /Tolerance	14.03	14.11	14.19	14.26	14.34
	Vmp [V]	37.90	38.05	38.20	38.35	38.50
	Imp [Adc]	13.20	13.28	13.36	13.43	13.51
BNPI condition（equivalent to 1 000 W/m2 on the front side and 135 W/m2 on the back side，25℃）	Pmax [W] /Tolerance	551.4	556.7	562	568.0	573
	Voc [V] /Tolerance	45.85	45.95	46.10	46.25	46.40
	Isc [Adc] /Tolerance	15.38	15.46	15.55	15.64	15.72
	Vmp [V]	37.90	38.05	38.20	38.35	38.50
	Imp [Adc]	14.55	14.63	14.72	14.81	14.89
Bifaciality coefficient	φPmax	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
	φVoc	95%±5%	95%±5%	95%±5%	95%±5%	95%±5%

	φIsc	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
Isc at aBSI(BSI)		17.23	17.33	17.43	17.51	17.61
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		30A	30A	30A	30A	30A
	Module type	JT525SLt(B)	JT530SLt(B)	JT460SIt(B)	JT465SIt(B)	JT470SIt(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	525	530	460	465	470
	Voc [V] /Tolerance	46.55	46.70	42.00	42.15	42.30
	Isc [Adc] /Tolerance	14.42	14.49	14.07	14.16	14.24
	Vmp [V]	38.65	38.80	34.60	34.75	34.90
	Imp [Adc]	13.59	13.66	13.30	13.39	13.47
BNPI condition（equivalent to 1 000 W/m2 on the front side and 135 W/m2 on the back side，25℃）	Pmax [W] /Tolerance	579.0	584	507	513	518
	Voc [V] /Tolerance	46.55	46.70	42.00	42.15	42.30
	Isc [Adc] /Tolerance	15.81	15.89	15.43	15.52	15.62
	Vmp [V]	38.65	38.80	34.6	34.75	34.90
	Imp [Adc]	13.59	13.66	14.66	14.75	14.85
Bifaciality coefficient	φPmax	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
	φVoc	95%±5%	95%±5%	95%±5%	95%±5%	95%±5%
	φIsc	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
Isc at aBSI(BSI)		17.71	17.79	17.28	17.39	17.49
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		30A	30A	30A	30A	30A
	Module type	JT475SIt(B)	JT480SIt(B)	JT485SIt(B)	JT490SIt(B)	JT410SJt(B)
STC condition	Pmax [W] /Tolerance	475	480	485	490	410

(1000 W/m2，25℃)	Voc [V] /Tolerance	42.45	42.60	42.75	42.90	37.70
	Isc [Adc] /Tolerance	14.32	14.40	14.48	14.56	13.92
	Vmp [V]	35.05	35.20	35.35	35.50	31.20
	Imp [Adc]	13.56	13.64	13.72	13.81	13.15
BNPI condition（equivalent to 1 000 W/m2 on the front side and 135 W/m2 on the back side，25℃）	Pmax [W] /Tolerance	524	529	535	540	452.1
	Voc [V] /Tolerance	42.45	42.60	42.75	42.90	37.7
	Isc [Adc] /Tolerance	15.70	15.80	15.89	15.97	15.26
	Vmp [V]	35.05	35.2	35.35	35.50	31.20
	Imp [Adc]	14.94	15.04	15.13	15.22	14.49
Bifaciality coefficient	φPmax	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
	φVoc	95%±5%	95%±5%	95%±5%	95%±5%	95%±5%
	φIsc	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
Isc at aBSI(BSI)		17.58	17.68	17.78	17.88	17.09
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		30A	30A	30A	30A	30A
	Module type	JT415SJt(B)	JT420SJt(B)	JT425SJt(B)	JT430SJt(B)	JT435SJt(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	415	420	425	430	435
	Voc [V] /Tolerance	37.85	38.00	38.15	38.30	38.5
	Isc [Adc] /Tolerance	14.01	14.11	14.20	14.30	14.39
	Vmp [V]	31.35	31.50	31.65	31.80	31.95
	Imp [Adc]	13.24	13.34	13.43	13.53	13.62
BNPI condition（equivalent to 1 000 W/m2 on the front	Pmax [W] /Tolerance	458	463	469	474	480
	Voc [V] /Tolerance	37.85	38	38.15	38.3	38.45
	Isc [Adc] /Tolerance	15.37	15.47	15.58	15.68	15.78

side and 135 W/m2 on the back side，25℃）	Vmp [V]	31.35	31.5	31.65	31.80	31.95
	Imp [Adc]	14.60	14.70	14.81	14.91	15.01
Bifaciality coefficient	φPmax	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
	φVoc	95%±5%	95%±5%	95%±5%	95%±5%	95%±5%
	φIsc	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
Isc at aBSI(BSI)		17.20	17.33	17.44	17.56	17.67
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		30A	30A	30A	30A	30A

	Module type	JT440SJt(B)	JT630SLt(B)	JT625SLt(B)	JT620SLt(B)	JT615SLt(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	440	630	625	620	615
	Voc [V] /Tolerance	38.6	49.5	49.3	49.1	48.9
	Isc [Adc] /Tolerance	14.48	16.18	16.12	16.06	16
	Vmp [V]	32.1	41.16	40.99	40.82	40.65
	Imp [Adc]	13.71	15.31	15.25	15.19	15.13
BNPI condition（equivalent to 1 000 W/m2 on the front side and 135 W/m2 on the back side，25℃）	Pmax [W] /Tolerance	485	696	690	685	679
	Voc [V] /Tolerance	32.10	49.5	49.3	49.1	48.9
	Isc [Adc] /Tolerance	15.11	17.86	17.80	17.73	17.66
	Vmp [V]	38.6	41.16	40.99	40.82	40.65
	Imp [Adc]	15.88	16.91	16.84	16.78	16.71
Bifaciality coefficient	φPmax	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
	φVoc	95%±5%	95%±5%	95%±5%	95%±5%	95%±5%
	φIsc	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
Isc at aBSI(BSI)		17.78	19.87	19.80	19.72	19.65
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V

Maximum Over-Current Protection Rating [A]		30A	30A	30A	30A	30A
	Module type	JT610SLt(B)	JT605SLt(B)	JT460SNt(B)	JT455SNt(B)	JT450SNt(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	610	605	460	455	450
	Voc [V] /Tolerance	48.7	48.5	36	35.85	35.7
	Isc [Adc] /Tolerance	15.94	15.89	16.20	16.13	16.06
	Vmp [V]	40.48	40.30	30.27	30.08	29.89
	Imp [Adc]	15.07	15.02	15.20	15.13	15.06
BNPI condition（equivalent to 1 000 W/m2 on the front side and 135 W/m2 on the back side，25℃）	Pmax [W] /Tolerance	674	667	508	502	497
	Voc [V] /Tolerance	48.7	48.5	36	35.85	35.7
	Isc [Adc] /Tolerance	17.60	17.54	17.88	17.81	17.73
	Vmp [V]	40.48	40.30	30.27	30.08	29.89
	Imp [Adc]	16.65	16.55	16.78	16.69	16.63
Bifaciality coefficient	φPmax	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
	φVoc	95%±5%	95%±5%	95%±5%	95%±5%	95%±5%
	φIsc	80%±10%	80%±10%	80%±10%	80%±10%	80%±10%
Isc at aBSI(BSI)		19.57	19.51	19.89	19.81	19.72
Maximum System Voltage		1500V	1500V	1500V	1500V	1500V
Maximum Over-Current Protection Rating [A]		30A	30A	30A	30A	30A
	Module type	JT445SNt(B)	JT440SNt(B)			
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	445	440			
	Voc [V] /Tolerance	35.5	35.3			
	Isc [Adc] /Tolerance	15.99	15.92			
	Vmp [V]	29.69	29.5			

	Imp [Adc]	14.99	14.92
BNPI condition（equivalent to 1 000 W/m2 on the front side and 135 W/m2 on the back side，25℃）	Pmax [W] /Tolerance	491	486
	Voc [V] /Tolerance	35.5	35.3
	Isc [Adc] /Tolerance	17.65	17.57
	Vmp [V]	29.69	29.5
	Imp [Adc]	16.54	16.48
Bifaciality coefficient	φPmax	80%±10%	80%±10%
	φVoc	95%±5%	95%±5%
	φIsc	80%±10%	80%±10%
Isc at aBSI(BSI)		19.64	19.55
Maximum System Voltage		1500V	1500V
Maximum Over-Current Protection Rating [A]		30A	30A

	Module type	JT715SLk(B)	JT720SLk(B)	JT725SLk(B)	JT730SLk(B)	JT735SLk(B)
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	715	720	725	730	735
	Voc [V] /Tolerance	50.35	50.4	50.45	50.5	50.55
	Isc [Adc] /Tolerance	18.1	18.18	18.26	18.35	18.44
	Vmp [V]	42.44	42.48	42.52	42.56	42.6
	Imp [Adc]	16.85	16.95	17.06	17.16	17.26
BNPI condition （ equivalent to 1 000 W/m2 on the front side and 135 W/m2 on the back side ，25℃）	Pmax [W] /Tolerance	801.69	807.12	812.98	818.66	824.31
	Voc [V] /Tolerance	50.35	50.4	50.45	50.5	50.55
	Isc [Adc] /Tolerance	20.3	20.39	20.48	20.58	20.68
	Vmp [V]	42.44	42.48	42.52	42.55	42.6
	Imp [Adc]	18.89	19	19.12	19.24	19.35

Bifaciality coefficient	φPmax	90%±5%	90%±5%	90%±5%	90%±5%	90%±5%
	φVoc	95%±5%	95%±5%	95%±5%	95%±5%	95%±5%
	φIsc	90%±5%	90%±5%	90%±5%	90%±5%	90%±5%
Isc at aBSI(BSI)		22.98	23.09	23.19	23.3	23.42
Maximum System Voltage		1500	1500	1500	1500	1500
Maximum Over-Current Protection Rating [A]		30	30	30	30	30
	Module type	JT740SLk(B)	JT745SLk(B)	JT655SIk(B)		
STC condition (1000 W/m2，25℃)	Pmax [W] /Tolerance	740	745	655		
	Voc [V] /Tolerance	50.6	50.65	45.74		
	Isc [Adc] /Tolerance	18.53	18.62	17.76		
	Vmp [V]	42.64	42.68	38.64		
	Imp [Adc]	17.36	17.46	16.96		
BNPI condition （ equivalent to 1 000 W/m2 on the front side and 135 W/m2 on the back side ，25℃）	Pmax [W] /Tolerance	829.77	835.48	731.07		
	Voc [V] /Tolerance	50.6	50.65	45.74		
	Isc [Adc] /Tolerance	20.78	20.88	19.82		
	Vmp [V]	42.64	42.67	38.64		
	Imp [Adc]	19.46	19.58	18.92		
Bifaciality coefficient	φPmax	90%±5%	90%±5%	90%±5%		
	φVoc	95%±5%	95%±5%	95%±5%		
	φIsc	90%±5%	90%±5%	90%±5%		
Isc at aBSI(BSI)		23.53	23.65	22.34		
Maximum System Voltage		1500	1500	1500		

Maximum Over-Current Protection Rating [A]		**30**	**30**	30		

PV Modules that are rated as safety class Ⅱ.