



# **Photovoltaic Modules Installation Manual for Australia**

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Before installation, operation and maintenance be sure to read the instruction and use the photovoltaic module safely. This photovoltaic module produces electricity when exposed to light. Follow all applicable electrical safety precautions.



## **WARNING ELECTRICAL HAZARD**

### **General use**

- 1、 Do not use the PV module where failure would result in death or fatal injury or damage property.
- 2、 Confirm that PV module conforms to the requirements for the equipment used in the global system.
- 3、 The modules are qualified for application class A: Hazardous voltage (IEC 61730: higher than 50V DC; EN 61730: higher than 120V), hazardous power applications (higher than 240W) where general contact access is anticipated (Modules qualified for safety through EN IEC 61730-1 and -2 within this application class are considered to meet the requirements for Safety Class II)
- 4、 Artificially concentrated sunlight shall not be directed on the module.

### **Handling**

- 1、 Handle the PV module with care.
- 2、 Do not handle PV module when it is wet.
- 3、 Do not drop the PV module.
- 4、 Do not damage or scratch the rear surface of the PV module. The rear surface may be damaged by sharp objects.
- 5、 Do not disassemble the PV module.
- 6、 Do not walk on the PV module.
- 7、 Do not touch live parts of cable or connectors. Use insulated tools and rubber gloves when touching them.

### **Installation**

- 1、 Installers should be qualified personnel and be familiar with electricity and electric appliances.
- 2、 Do not use damaged modules. The damaged PV module may cause a fire and/or an electrical shock that result in death of users or installers.
- 3、 Artificially concentrated sunlight shall not be directed on the module or panel.
- 4、 Cover the front surface of the PV module by an opaque cloth or other material when installing. The PV module exposed to sunlight generates high voltage and current. Contact with the module output wiring may cause a fire or an electrical shock.
- 5、 Fasten the PV modules to the mounting structure respectively.

- 6、 Install modules so as not to cause accidents that result in death, injury or any damage to property by accumulated snow falling from the PV module.
- 7、 Don't disconnect under load.
- 8、 Rated electrical characteristics are within 3 percent of measured values at Standard Test Conditions of: 1000 W/m<sup>2</sup>, 25°C cell temperature and solar spectral irradiation of AM1.5 spectrum.
- 9、 Under normal conditions, a photovoltaic module is likely to experience conditions that produce more current and/or voltage than reported at standard test conditions. Accordingly, the value of I<sub>sc</sub> and V<sub>oc</sub> marked on this module should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor current ratings, fuse sizes, and size of controls connected to the PV output.

## Product identification

Nameplate: describes the product type; rated power, rated current, rated voltage, open circuit voltage, short circuit current, all as measured under standard test conditions; weight, dimension etc. the maximum system voltage 1000 or 1500 volts DC and is shown on the nameplate. Maximum fuse rating is also shown.

## CLIMATE CONDITION:

Installing the PV module in the following conditions:

Ambient temperature: -20°C to +40°C.

Operating temperature: -40°C to +85°C.

Snowfall pressure: test load is 5400Pa with certain mounting methods

Wind speed: below 130km/h.

Hail: could withstand the speed of 23m/s by the Ø25 mm ice ball.

Water resistance: don't install the PV module in a location where it would be immersed in water or continually exposed to water from a sprinkler or fountain etc.

Corrosion resistance: except for corrosive salt area and sulfurous area.

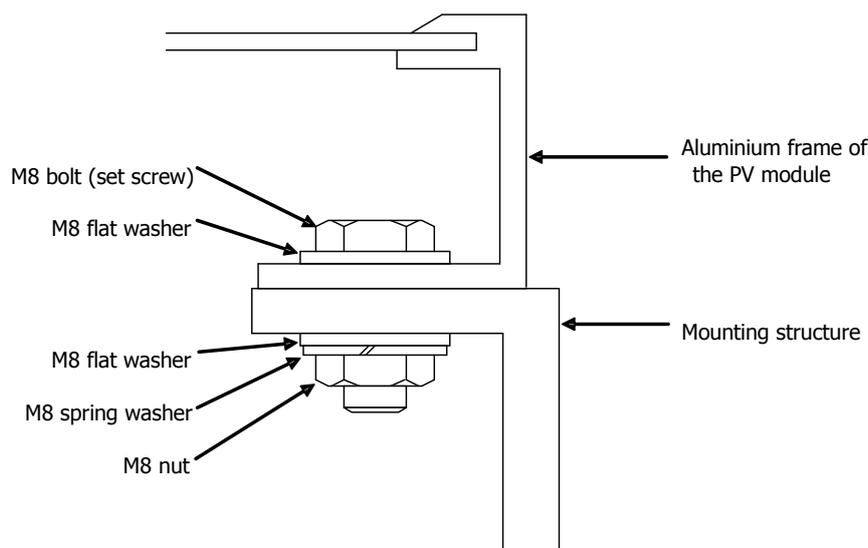
## Orientation:

- 1、 Install the PV module facing South (in Northern Hemisphere), or to North (in Southern Hemisphere). Module facing West or East can generate smaller amount of electricity than facing South (in Northern Hemisphere), or to North (in Southern Hemisphere). Incorrect orientation will result in loss of power output.

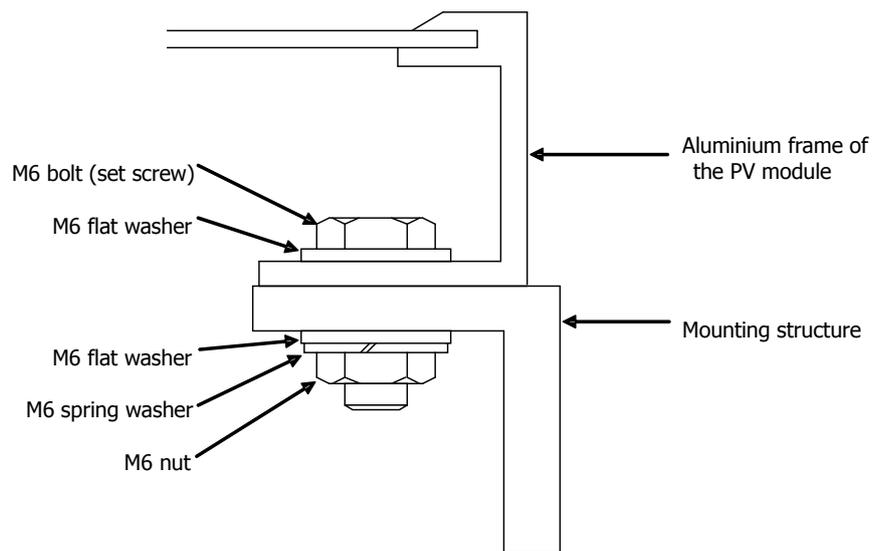
- 2、 PV modules connected in series should be installed at same orientation and angle. Different orientation or angle may cause loss of output power due to difference of amount of sunlight exposed to the module.
- 3、 Install the PV modules as free as possible from shading. Shading causes loss of output, even though the factory fitted bypass diode of the PV module will minimize any such loss.

## **MOUNTING AND NOTES:**

- 1、 Do not install the PV module near naked flame or flammable materials.
- 2、 Use mounting structures that can withstand forces from wind pressure and snowfall pressure specific to your installation area.
- 3、 Use mounting structures that can withstand the environment where the PV modules are to be used.
- 4、 Select proper materials and corrosive treatments.
- 5、 Use appropriate methods or parts in addition to the following to fasten the module, when installing in high place from which fall of the module causes death, injury or damage to property.
- 6、 Install the PV module with a space for draft behind the PV module to radiate heat.
- 7、 For RNSAF001-004 and RNSAF00SA frame, there are 8 pre-drilled mounting holes on the frame. Use the 4 inner symmetry holes of the PV module to bolt to the mounting structure. If excessive wind or snow loads are expected, all eight mounting holes must be used. Fasten the aluminium frame using M8 or M6 stainless steel screw. Then a split locks washer and finally a nut to secure the entire assembly, as shown in the picture below.

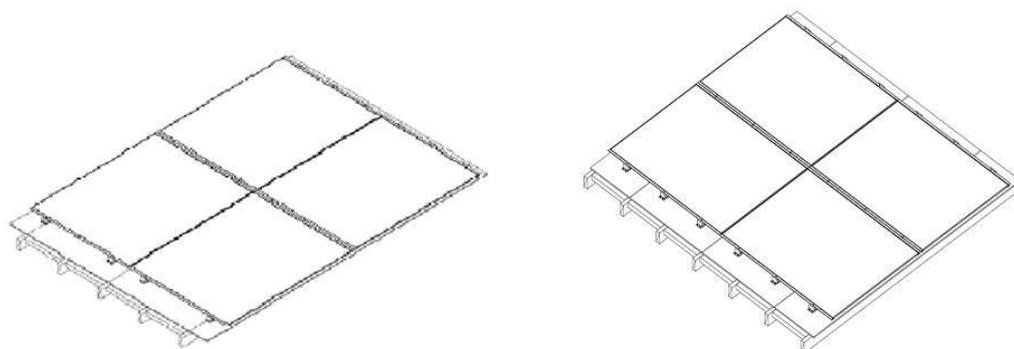
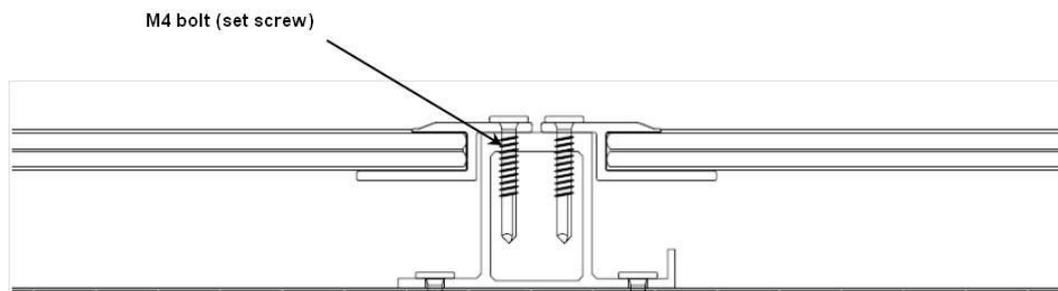


**Figure 1a Mounting method with bolts**  
(For RNSAF001, RNSAF004, RNSAF00SA frame)



**Figure 2b Mounting method with bolts  
(For RNSAF002, RNSAF003 frame)**

- 8、 For RNSAF00H/V & RNSAF00HE/VE frame, there are 6 pre-drilled mounting holes on the frame (Horizontal), 4 pre-drilled mounting holes on the frame (Vertical). Use the all mounting holes. Fasten the aluminium frame using M4 stainless steel screw. Then a split locks washer and finally a nut to secure the entire assembly, as shown in the picture below.



**Vertical Stainless screw  
and support hardware  
mount**

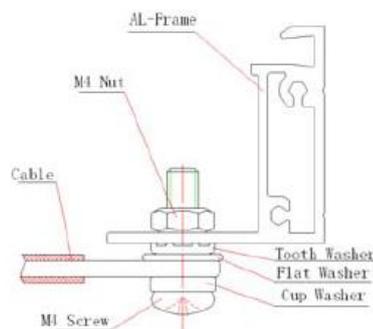
**Horizontal Stainless screw and  
support hardware mount**

- 9、 The mounting design must be certified by a registered professional engineer. The mounting design and procedures shall comply with local codes and all authorities having jurisdiction.

## Grounding



- 1、 Grounding method should meet local code in accordance with specification of system.
- 2、 Ground the module properly in accordance with mounting structures and environment. Refer to local code.
- 3、 There is a grounding hole indicated with the symbol "  $\perp$  " on frame. The area of cross-section of ground conductor should not be less than the primary current-carrying conductors 2.1mm<sup>2</sup>, 10 or 12 AWG Conductor should be used.
- 4、 All mounted module should be connected to ground reliably. It is required that the grounding method using a cup washer, a flat washer, an M4 nut and a tooth washer (the latter is to secure a proper galvanic connection through the aluminum oxide of the frame).



## Bypass diode

In systems with more than two modules in series, high reverse current can flow through cells that are shaded partially or outright when part of a module is shaded and the rest is exposed to the sun. These currents can cause the affected cells to get very hot and could even damage the module. To protect module from such high reverse currents, by-pass diodes are used in module. In the unlikely event of diode failure, we recommend a qualified service technician be employed to determine if diodes have failed and to make replacement.

## Wiring



- 1、 Do not short the positive and negative cables.

- 2、 Make sure connectors are fully engaged without a gap between the insulators. In case there is a gap, a fire and/or an electrical shock may occur.
- 3、 Connect required number of PV modules to meet the voltage specification of equipment used in system.
- 4、 Wire the output cable connectors so that they do not exert any strength on the PV module's junction box. Attach the cable to the mounting structure using approved fixings.
- 5、 The PV module has a pair of male and female waterproof connectors. For a series electrical connection, connect positive (+) connector of the first PV module to the negative (-) connector of the following module. For a parallel electrical connection, connect positive (+) connector of the first PV module to the positive (+) connector of the following module.
- 6、 Under normal conditions, the PV module is likely to experience conditions that produce more current and/or voltage than reported at standard test conditions. Accordingly, the values of  $I_{sc}$  and  $V_{oc}$  marked on this module should be multiplied by a factor of 1.25, when determining component voltage ratings, conductor capacity (cross sectional area), fuse sizes, and sizes of controls connected to the PV output. Customers should refer to the codes relevant to the location of installation for further guidance. Connect the output cable with equipment correctly.
- 7、 Final output field wiring should be done with commercially available wiring product and minimum 12AWG cables rated for 90°C. In all cases, connectors to be used should never be a section less than  $4\text{mm}^2$ . (More information in Annex 2)
- 8、 The cables should be UV-resistant, and be secured to the mounting system. Protect exposed cables from damage by taking appropriate precautions, Avoid exposure to direct sunlight.
- 9、 A minimum bending radius of 60 mm is required when securing the junction box cables to racking system.

## **Installation of modules on the roof**

Modules are insured to be safely fixed and not to be destroyed by strong wind and heavy snow when the installation on the roof or buildings takes place. The assembly is to be mounted over a fire resistant roof covering rated for the application.

It should be assured that the rear of the modules will be well ventilated for the cooling of the modules.

When installing modules on the roof, the appropriate structure of the roof should be guaranteed. Besides, the penetrated roof must be properly covered when the modules are fixed in case that the rain leaks from the roof.

In some events, special mounting is required.

It is possible to affect the fire resistance of the roof by installing solar modules. The

recommended stand-off height is about 100 mm, if other mounting means are employed, this may affect the Listing for Fire Class Ratings. It is not suggested to install the modules on the roof or the buildings when strong wind or storm occurs in case of danger.

## **Series and parallel connection**

- Do not use modules of different configurations in the same system. The max number of module in series connection  $(N) \leq \text{Maximum system voltage} / [\text{Voc(at STC)} * 1.25]$ . and the max number of module in parallel connection  $(N) \leq \text{fuse current} / [\text{Isc(at STC)} * 1.25]$
- Several modules are connected in series and then in parallel to form a PV array, especially for application with a high operation voltage. If modules are connected in series, the total voltage is equal to the sum of individual voltages.
- For applications requiring high currents, several photovoltaic modules can be connected in parallel; the total current is equal to the sum of individual currents. Recommended number of modules in parallel connection is two.

## **Maintenance**

- 1、 Do not touch the live parts of cables or connectors. Use appropriate safety equipment (insulated tools, insulating gloves, etc.) when touching them.
- 2、 Cover the front surface of the PV module by an opaque cloth or other material when repairing. The PV modules when exposed to sunlight generate high voltage and are dangerous.

## **Annual inspection**

- 1、 Check if nuts, bolts of mounting structure are secure and not loose. Tighten the loose component again, if required.
- 2、 Check connections of cables, grounding cables and connectors.
- 3、 Check all electrical and mechanical connections from freedom of corrosion.
- 4、 Check the ground resistance of metal parts such as the module frames and the mounting structures.

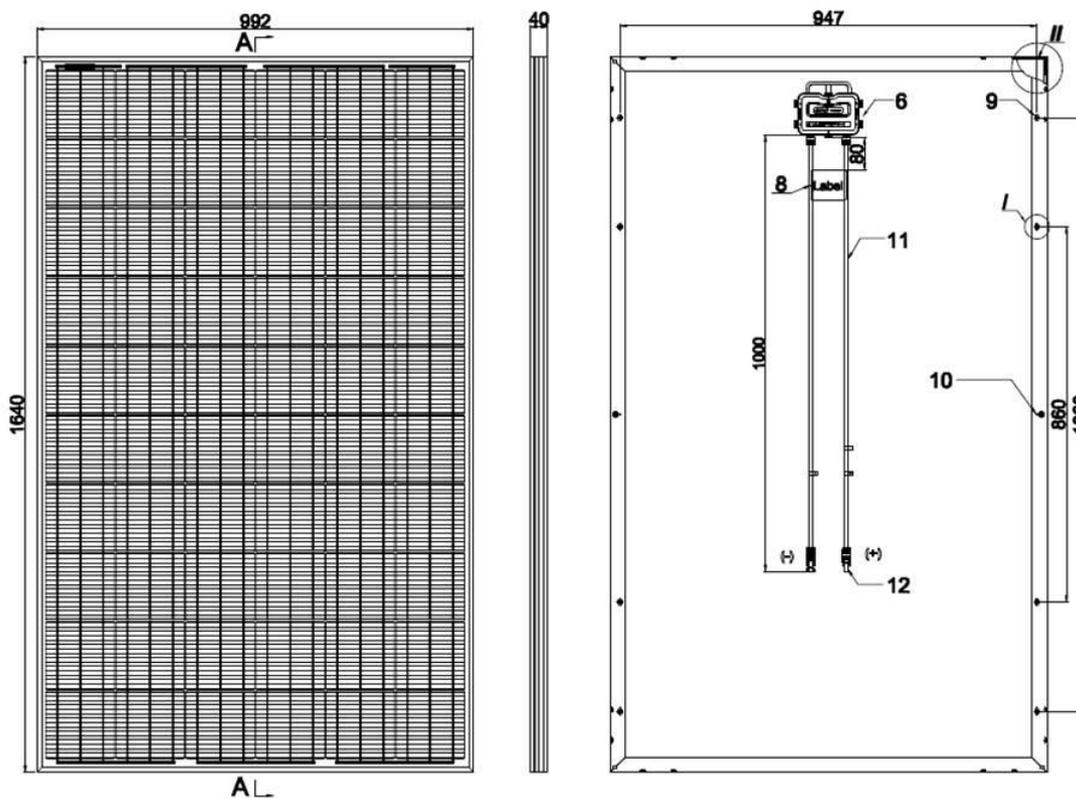
## Annex 1 Electrical Parameter and Drawings for 1500V system voltage modules

Bb Series for 1500V system voltage (60 pieces of cells)

Poly Crystalline

Module type	Pmax (W)	I <sub>mp</sub> (A)	V <sub>mp</sub> (V)	I <sub>sc</sub> (A)	V <sub>oc</sub> (V)	Maximum System Voltage (VDC)
JC275M-24/Bbps	275	8.88	31.0	9.30	38.3	1500
JC270M-24/Bbps	270	8.80	30.7	9.21	38.1	1500
JC265M-24/Bbps	265	8.75	30.3	9.20	37.9	1500
JC260M-24/Bbps	260	8.62	30.2	9.19	37.8	1500
JC255M-24/Bbps	255	8.56	30.2	9.12	37.8	1500
JC250M-24/Bbps	250	8.45	30.0	9.04	37.5	1500
JC245M-24/Bbps	245	8.35	29.8	8.97	37.1	1500

**\*Overcurrent Protection: Listed Fuse Rating 20A.**



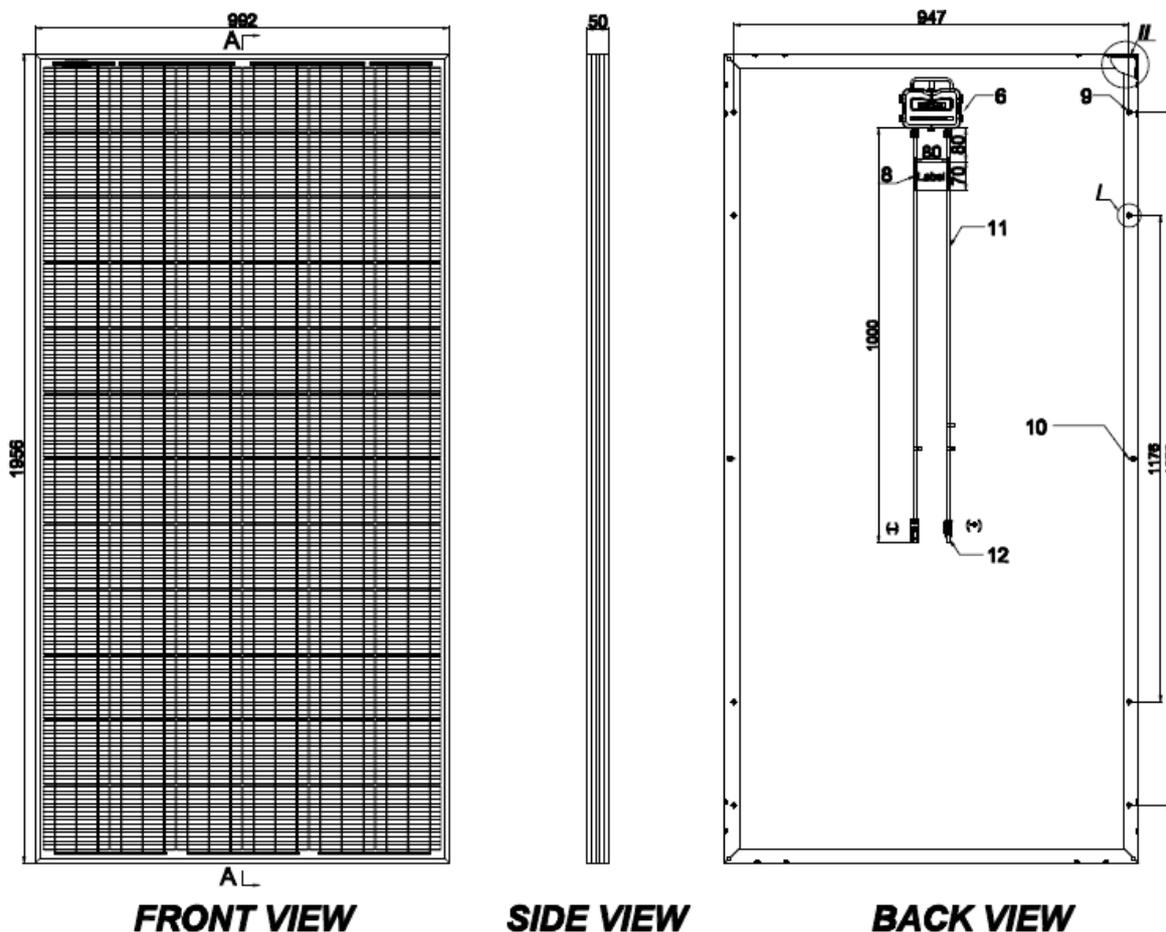
9	安装孔	8个
10	接地孔及标示	2个

Ab Series for 1500V system voltage (72 pieces of cells)

Poly Crystalline

Module type	Pmax (W)	I <sub>mp</sub> (A)	V <sub>mp</sub> (V)	I <sub>sc</sub> (A)	V <sub>oc</sub> (V)	Maximum System Voltage (VDC)
JC330M-24/Abps	330	8.78	37.6	9.34	46.1	1500
JC325M-24/Abps	325	8.72	37.3	9.29	45.8	1500
JC320M-24/Abps	320	8.68	36.9	9.20	45.6	1500
JC315M-24/Abps	315	8.63	36.5	9.14	45.4	1500
JC310M-24/Abps	310	8.60	36.1	9.11	45.1	1500
JC305M-24/Abps	305	8.50	36.1	9.05	45.1	1500
JC300M-24/Abps	300	8.45	36.0	9.03	45.0	1500
JC295M-24/Abps	295	8.36	35.7	8.93	44.8	1500
JC290M-24/Abps	290	8.30	35.5	8.89	44.7	1500

**\*Overcurrent Protection: Listed Fuse Rating 20A.**



9	安装孔	8个
10	接地孔及标示	2个

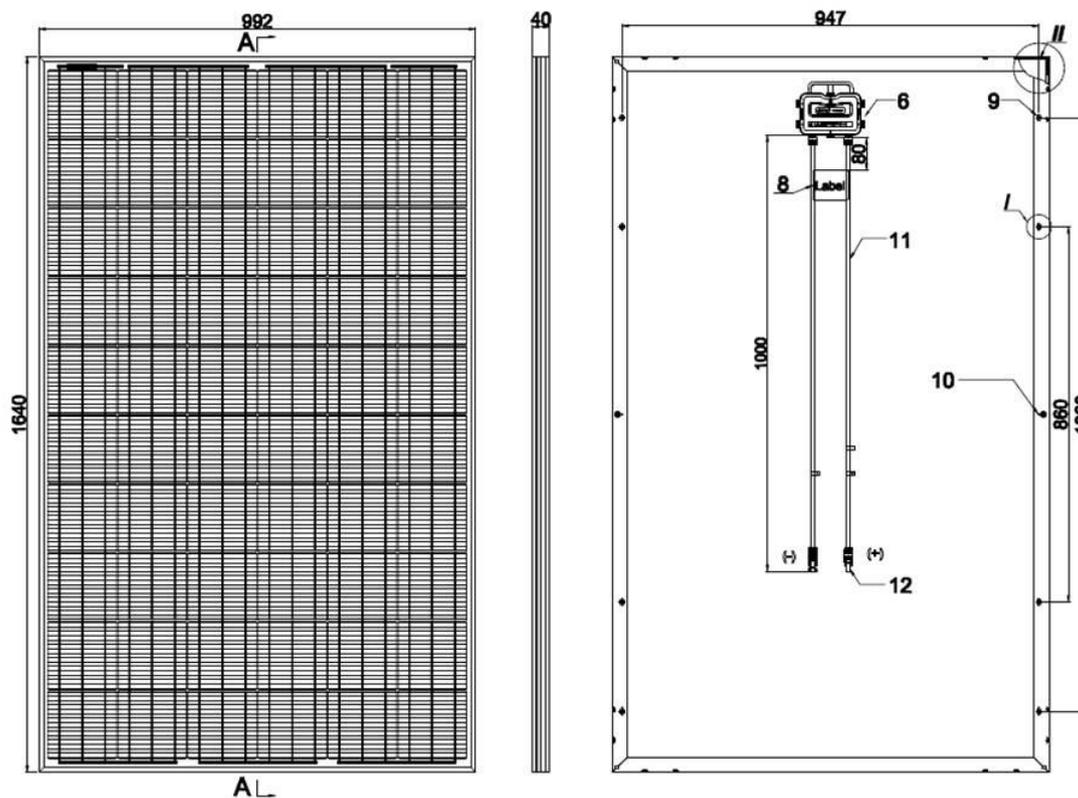
## Annex 2 Electrical Parameter and Drawings for 1000V system voltage modules

Bb Series for 1000V system voltage (60 pieces of cells)

Poly Crystalline

Module type	Pmax (W)	I <sub>mp</sub> (A)	V <sub>mp</sub> (V)	I <sub>sc</sub> (A)	V <sub>oc</sub> (V)	Maximum System Voltage (VDC)
JC275M-24/Bbs	275	8.88	31.0	9.30	38.3	1000
JC270M-24/Bbs	270	8.80	30.7	9.21	38.1	1000
JC265M-24/Bbs	265	8.75	30.3	9.20	37.9	1000
JC260M-24/Bbs	260	8.62	30.2	9.19	37.8	1000
JC255M-24/Bbs	255	8.56	30.2	9.12	37.8	1000
JC250M-24/Bbs	250	8.45	30.0	9.04	37.5	1000
JC245M-24/Bbs	245	8.35	29.8	8.97	37.1	1000

**\*Overcurrent Protection: Listed Fuse Rating 20A.**



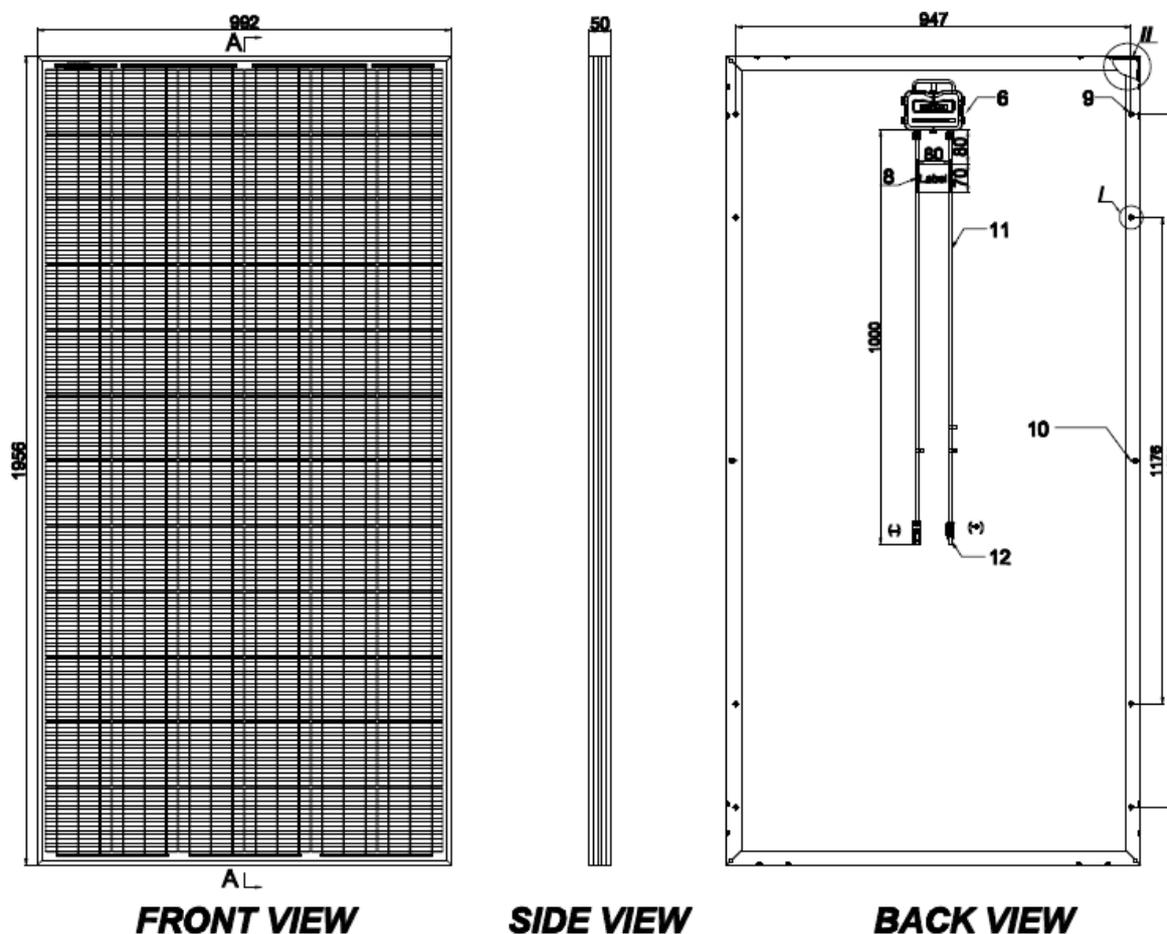
9	安装孔	8个
10	接地孔及标示	2个

Ab Series for 1000V system voltage (72 pieces of cells with side length 156mm)

Poly Crystalline

Module type	Pmax (W)	Imp (A)	Vmp (V)	Isc (A)	Voc (V)	Maximum System Voltage (VDC)
JC330M-24/Abs	330	8.78	37.6	9.34	46.1	1000
JC325M-24/Abs	325	8.72	37.3	9.29	45.8	1000
JC320M-24/Abs	320	8.68	36.9	9.20	45.6	1000
JC315M-24/Abs	315	8.63	36.5	9.14	45.4	1000
JC310M-24/Abs	310	8.60	36.1	9.11	45.1	1000
JC305M-24/Abs	305	8.50	36.1	9.05	45.1	1000
JC300M-24/Abs	300	8.45	36.0	9.03	45.0	1000
JC295M-24/Abs	295	8.36	35.7	8.93	44.8	1000
JC290M-24/Abs	290	8.30	35.5	8.89	44.7	1000

\*Overcurrent Protection: Listed Fuse Rating 20A.



9	安装孔	8个
10	接地孔及标示	2个

## Annex 3 bypass diode information

Bypass Diode Information					
Bypass diode	PanJit International Inc.	THY2550(1)	Tj max =200°C	—	—
Remark: bypass diode could be used for both 1000V & 1500V system voltage modules					