Urban Green Energy
Photovoltaic Panel Installation Manual

Version 1.1

CONTENTS

INTRODUCTION

Dear Customer,

Congratulations on purchasing your photovoltaic panel array and welcome to our family.

This manual includes the transportation, installation and maintenance of Photovoltaic panels, a.k.a. PV modules. Please read this manual carefully before installing and using the modules.

This installation manual includes mechanical and electric installation directions. Mechanical installation introduces three methods: using mounting holes, clamps and insertion system to install. Users can choose the appropriate installation method according to their needs. Before installing a solar photovoltaic system, installers should familiarize themselves with its mechanical and electrical requirements. Please check the modules periodically after installation and read the third section on maintenance. The modules are provided with mounting holes, drain holes, and grounding holes. These holes have passed all safety testing. Installers should not drill or block drain holes. This manual is the same for all modules from UGE.

Please read the "Transportation and Storage" section carefully if the panels will be stored prior to installation.

We would like to hear from you with any questions or comments that you have. Please contact us during working hours (Monday-Friday 9:00am to 6:00 pm - US Eastern Time) at:

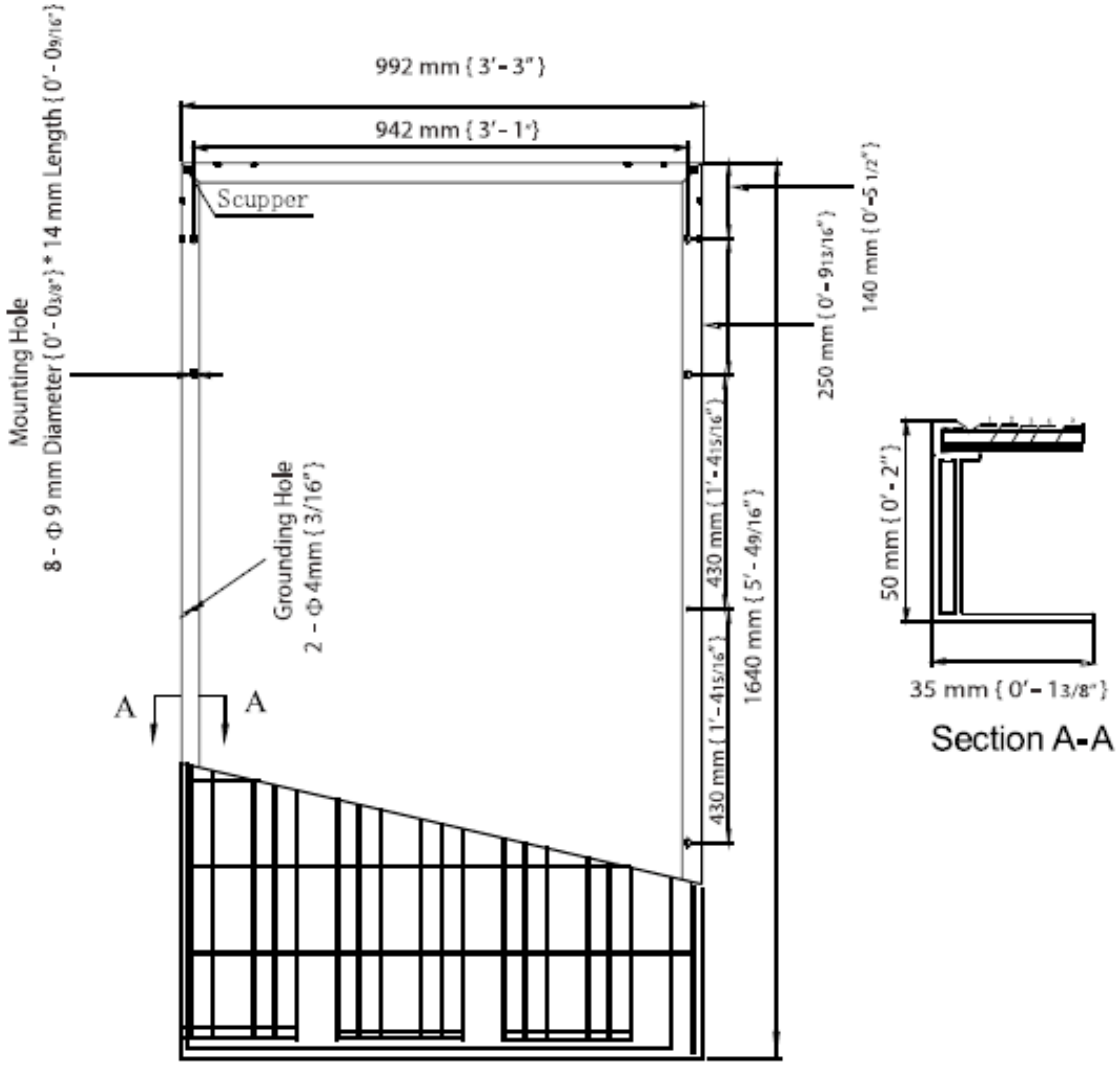
Telephone: +1 (917) 720-5685
Website: www.urbangreenenergy.com
Email: techsupport@urbangreenenergy.com

Sincerely,

1. SPECIFICATIONS

Maximum Power in STC (P_{max})	235 W_p
Open Circuit Voltage (V_{OC})	37.07 V
Maximum Operating Voltage (V_{mp})	29.06 V
Short Circuit Current (I_{SC})	8.69 A
Maximum Operating Current (I_{mp})	8.09 A
Module Efficiency	14.44%
Operating Temperature	-40°C ~ + 85°C
Maximum System Voltage	1000 VDC (IEC) / 600 VDC (UL)
Cell	Polycrystalline Silicon solar cells 155mm*156 mm / 6 in.
Dimension of Module	1640mm x 992mm x 50mm [64.6in. x 39.1in. x 2.0in.]
Weight	19.6 kg [43.21 lbs]
Frame	Anodized aluminum alloy
Junction Box	IP65 rated
Bypass-Diodes	6 pcs. (IEC) / 3 pcs. (UL)
Max. Fuse Current Rating	15 A
Type of Connector	MC4, MC4 compatible, MC3 compatible, 0-1394462-4/6-1394461-2
Cable Section Area	4 mm^2 [12 AWG]
Cable Length	2 x 1000 mm [2 x 39.4 in.]
Certifications	IEC 61215, IEC 61730, CE, UL 1703, ISO9001:2008, ISO 14001:2004

2. DIMENSIONS



3. TRANSPORTATION AND STORAGE

Please observe the follow criterion after packing.

(1) Do not lean ≥15° when transporting packing boxes

(2) Box up according to the instruction of packing box.

(3) Handle with care during transit.

(4) The packing boxes should be kept dry.

(5) Transportation condition should make sure the packing boxes are in accordance with modules' requirement for environmental conditions.

4. SAFETY INSTRUCTIONS

(1) Do not use mirrors or other magnifiers to artificially concentrate sunlight on the modules.

(2) Do not touch live terminals with bare hands. Use insulated tools for electrical work.

(3) Although modules are quite rugged, the glass can be broken (and the module will no longer work properly) if it is dropped or hit by tools or other objects.

(4) 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_{sc} and V_{oc} marked on this module should be multiplied by 1.25 when determining component voltage ratings, conductor current ratings, fuse sizes, and size of controls connected to the PV output.

(5) The installation work of the PV array can only be done under the protection of sun-sheltering covers or sunshades and only qualified person, such as a UGE distributor, licensed contractor or a certified electrician can install or perform maintenance work on this module.

(6) One single module may generate more than 30V DC when exposed to direct sunlight. If modules are in series, voltage is equal to the sum of every module's voltage. If modules are in parallel, current is equal to the sum of every module's current. If many modules have been installed in series or in parallel, do not touch them with bare hands.

(7) Systems should be installed by qualified personnel only and at least two persons. The system carries electricity and can be dangerous if the persons are not familiar with the appropriate safety procedures.

(8) Please read and understand the manual carefully before installing, connecting, operating or maintaining.

(9) Follow the battery manufacture's recommendations provided batteries are used with the modules. Please observe the local law when installing modules. The users must obtain the proper license(s).

(10) Please unpack carefully.

(11) For roof application, the PV system must be mounted over fire resistant roof covering rated for the application.

Caution: Please unpack in an appropriate environment.

5. INSTALLATION

5.1. WARNINGS

(1) A visual check should be conducted before installation to ensure there was no shipping or other damage to the junction box or the surface of the module.

(2) In most applications, PV modules should be installed in a location where they will receive the maximum sunlight throughout the year. In the Northern Hemisphere, the modules should typically face south, and in the Southern Hemisphere, the modules should typically face north. When choosing a site, please avoid trees, buildings or obstructions, which could cast shadows on the module.

(3) The PV modules should be placed on metal mounting brackets designed to support the weight of the modules, the wind and snow loads that act on the PV module as determined by the local building code. The bracket design may vary for roof vs. ground mounting. When choosing clamping or insertion system, please choose an appropriate bracket based on the module's specification. The clamping and bracket system should be corrosion resistant.

(4) Put the modules on the frame and screw the module into place. All the screw caps should be fixed on the frame together firmly. The module frame is made of anodized aluminum, and therefore corrosion can occur if the module is subject to a salt-water environment with contact to a rack of another type of metal (Electrolysis Corrosion). If required, stainless steel washers can be placed between the solar module frame and support structure to prevent this corrosion.

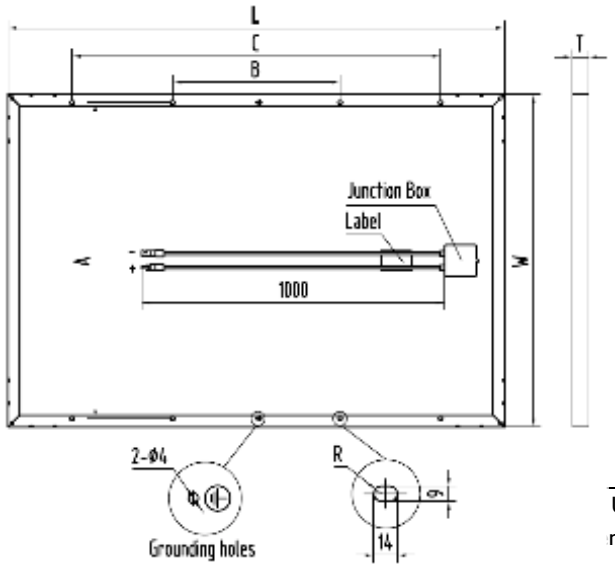
(5) Do not block the drain holes with other components when installing modules. The junction box should be at the top of the module.

(6) Do not grasp the junction box or cable when installing modules.

(7) The minimum slope of the PV modules should be 22° which is equal to 5in/ft (127mm/305 mm) when modules are installed on a rooftop.

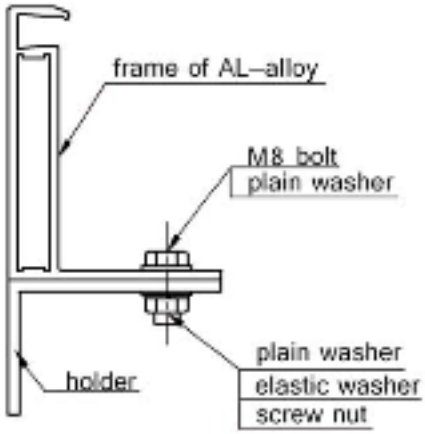
5.2. MECHANICAL INSTALLATION

Us mounting holes to set up (see the figure below). Users must tighten 8 mounting screws to a minimum of 24N*m [18 ft*lb].



Measurement	Z (
L	1640mm [5' - 49/16"]
W	992mm [3' - 3"]
T	50mm/40mm [0'- 2"] / [0'- 17/8"]
A	942mm [3'- 1"]
B	860mm [2'- 97/8"]
C	1360mm [4' - 57/16"]

The detail of installation*:

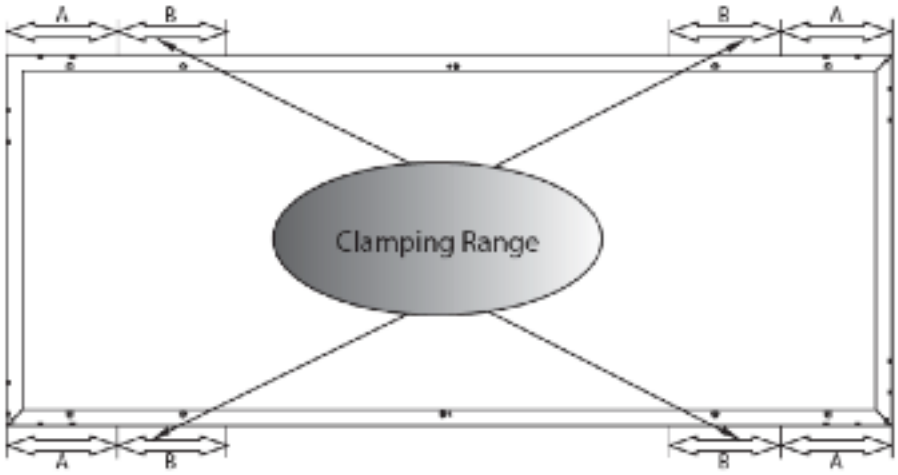


For a 5400Pa load (110 pounds per square foot)

*Note: M8 bolt is not included.

(2)Clamping Modules could use the clamps as in the following image. The clamps must be able to bear enough weight to hold the modules up (we recommend using stainless steel), and their structure should not shadow the cells.

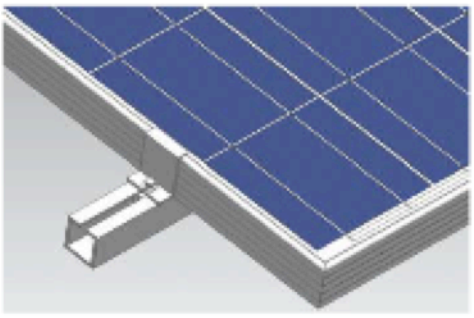
Module should be installed with clamps on the long frame, “B" is the clamping range:

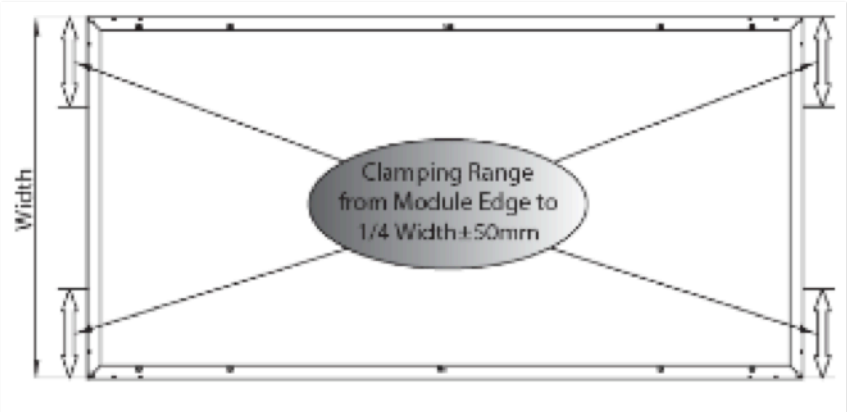


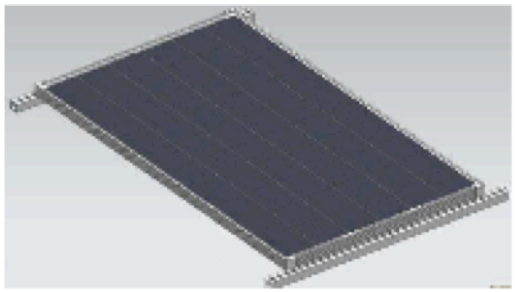
For a 5400Pa load (110 pounds per square foot), using four clamps on a long frame

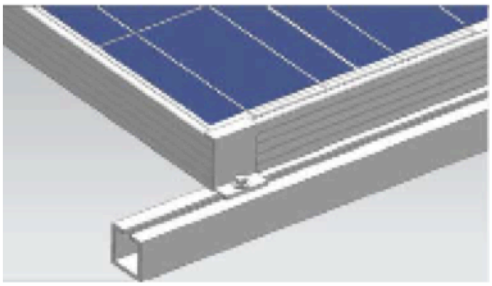
Measurement	Value
A (module edge to clamping range)	140mm [0'- 5 1/8"]
B (clamping range)	300mm [0'- 11 13/16"]

Installation method:





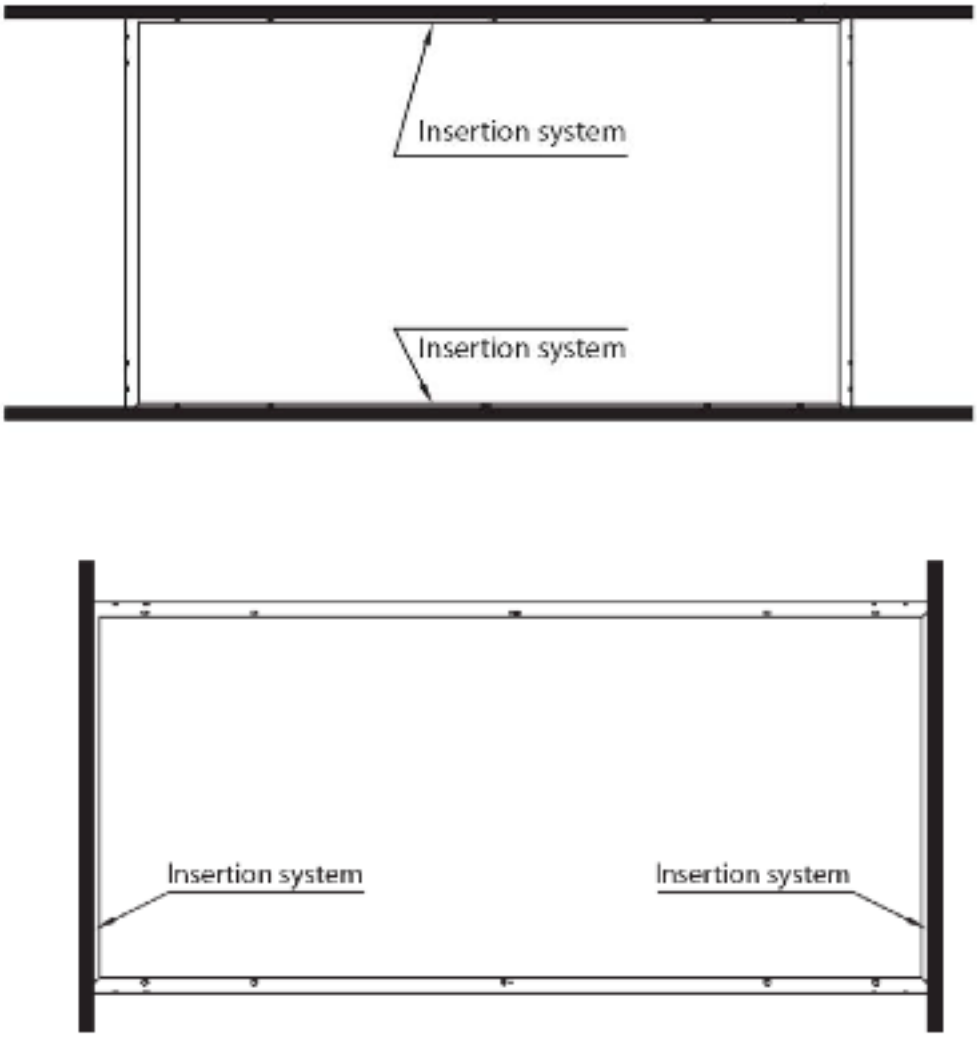




For a 2400Pa load (50 pounds per square foot), using four clamps on a short frame

Insertion system:

All modules should use the proper insertion system (shown below). The insertion system must have enough strength to hold up the modules. When insertion system is installed on a long frame, the grounding holes should not be covered.



Top: For a 5400Pa load (110 pounds per square foot), using an insertion system on the long frames

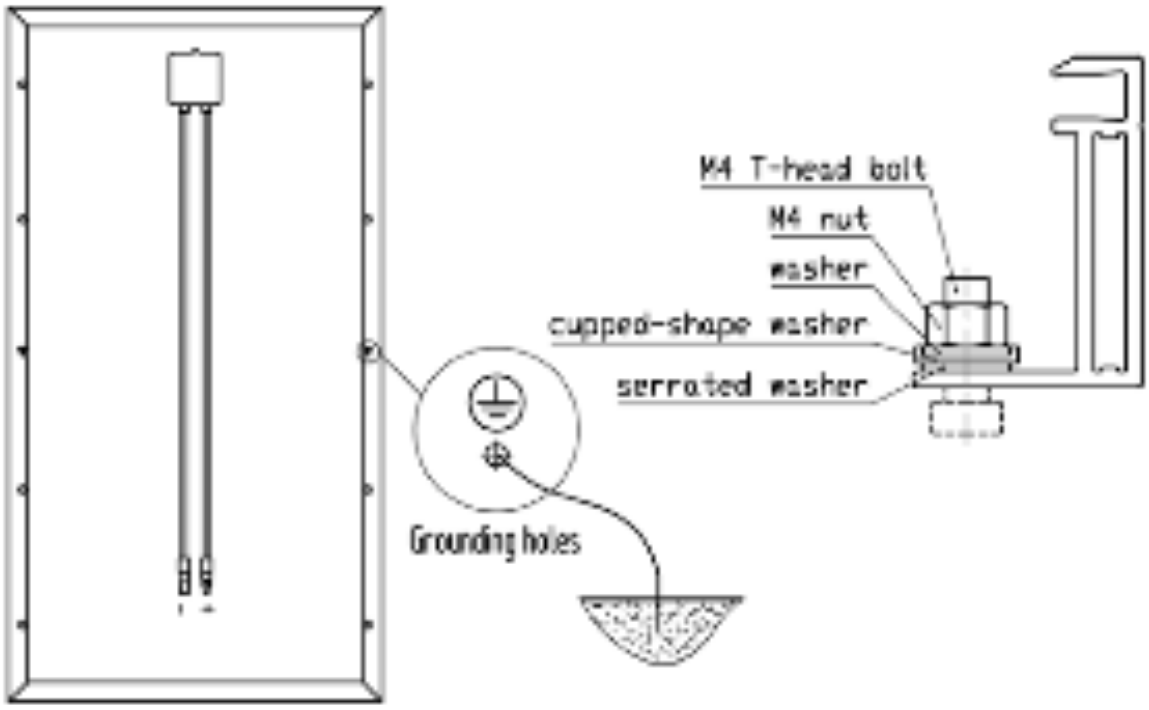
Bottom: For a 2400Pa load (50 pounds per square foot), using an insertion system on the short frame

5.3 ELECTRIC INSTALLATION

5.3.1 GROUNDING

(1) Method of grounding: All module frames should be grounded for safety. Using modules with different configurations (grounding, wiring) in the same system is not recommended.

(2)For grounding and bonding requirements, please refer to regional and national safety and electricity standards. If grounding is required, use a recommended connector type (or equivalent) for the grounding wire. The grounding wire must be properly fastened to the module frame to assure adequate electrical connection.

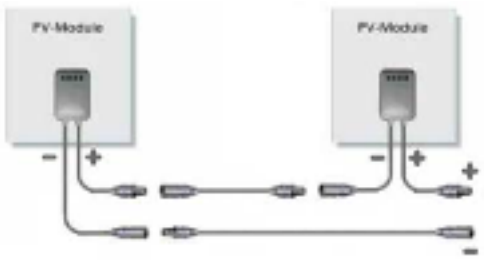


(3)All module frames should be grounded for safety. The grounding connections between modules must be approved by a qualified electrician and the grounding itself must be made by a qualified electrician. The ground wire should be at least the same size as the electrical conductors.

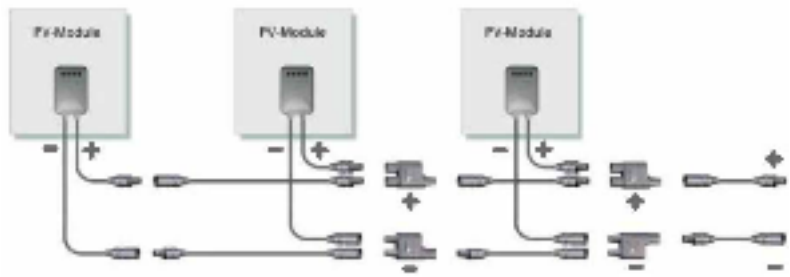
5.3.2 GENERAL INSTALLATION

(1)When the modules are connected in series or parallel, we recommend simple serial -connections and parallel-connections between the modules.

Serial – connection of modules *:



Parallel- connection of modules *:



*Note: The wires directly connected to the PV-module are included, whereas the wires and splitters which connect two PV-modules together are not included.

(2) The bypass diodes have a Rated Average Forward Current of at least 10A, and a Rated Repetitive Peak Reverse Voltage of at least 40V.

(3) The modules are supplied with connectors to be used for electrics system connections. The connectors are MC3 and MC4 compatible. When users connect PV modules with an inverter, users should use the same connector type as the inverter. If this is not possible, installers can use a switchover connector.

(4) The maximum number of series connected modules depends on system design, the type of inverter used and environmental conditions.

According to a system voltage (600V): Place no more than 30 modules in series.

(5) There is no limitation on the number of modules that can be connected in parallel. The number of modules is determined by system design parameters such as current or power output. Every PV array in parallel should install protection circuit.

(6) Please refer to local regulations to determine the proper system wire size, type and temperature. To prevent the cables and the connectors from overheating, 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 cable cross-section is 4mm^2 for a single

module and if rated current of a connector is higher than 10A. Please note that the upper limit temperature of cable is 90°C, and that of the connector is 100°C.

6. MAINTENANCE AND CARE

The PV module is the most important part for the solar photovoltaic energy system, as it affects the dynamoelectric efficiency of the system and the usability of the sunshine. Shading the module(s) will affect the dynamoelectric efficiency greatly. The module(s) can be eroded, so the surface of the module(s) and brackets should be kept clean.

6.1 MAINTENANCE OF THE PV MODULES

KEEP SURFACES CLEAN

Clean the surface of the module(s) regularly. Check the glass to ensure the surface is intact before cleaning. If it is broken, please do not clean. Do not wear a watch or jewelry when cleaning. Use a soft fabric to clean off dust. If the dust is hard to wipe out, use water to clean. Then use the cleaning fabric wiping up the water carefully. Do not use hard tools or abrasive solution to avoiding leaving scrapes. The power attenuation caused by any scrape is beyond our warranty guarantee range. Perform all cleaning in the morning or at night, out of direct sunshine. Do not use cold water to clean the module so as to avoiding breaking the glass. In case of extreme weather events, take care to protect the module surfaces.

MACHINE AND ELECTRICITY EXAMINATION

(1) Check the module's settings regularly. Check the support equipment (fastness, erosion, bolts and nuts, especially where wind is strong. If not fast, screw them down.)

(2)Check the module's electric line (connection to the equipment and earth). Check the grounded resistance, ensuring that it satisfies requirements. If the connection is not fastened, join it. After or before a thunderstorm, check the junction box and other protectors. If any are broken, replace them.

(3)Check the lead connector for current leakage. When checking the lead, insulated gloves and tools must be used. Do not touch the naked lead or connectors with uncovered hands. Check the connections of each part every 6 months to ensure their functionality. Wipe the dust up from the equipment regularly to keep it clean.

(4)If the module needs repairing, cover it with fabric or other material. Notice: If the connection malfunctions, please obtain professional assistance.

SETTING SITE MAINTENANCE

The site where the modules will be installed should not have high trees or buildings. The modules must be open to the sun.

MAINTENANCE OF SUPPORTING EQUIPMENT

(1) Avoiding corrosion: corrosion should be checked for during regular panel maintenance.

(2) Basic maintenance of support equipment: Set some essential safeguard to protect all the modules' basic and peripheral equipment from corrosion in the rain.

Notice: If the system malfunctions, please obtain professional assistance. Others should not disassemble the system

7. LIMITATIONS

As the adherence to this manual and the conditions or methods of installation, operation, use and maintenance of photovoltaic (PV) products are beyond UGE's control, Neither UGE nor its suppliers accept responsibility and expressly disclaim liability for any loss, damage, or expense arising out of or in any way connected with such installation, operation, use or maintenance not in strict accordance with the instructions of this manual.

The information in this manual is based on the knowledge and experience of UGE and its suppliers and is believed to be reliable; the manual provides reference, and the consumer should choose appropriate installation according to place and environment.

UGE reserves the right to change the manual, the PV production, the specifications, or product information sheets without prior notice.

This manual is an adaption of the BYD installation manual for this product and is meant to be used as a guideline only. For specific details refer to the BYD manual. A certified electrician or the project electrician is responsible for verifying that the photovoltaic module installation meets local electrical code. UGE provides this manual as a guideline and is not responsible for any errors which may occur due to the use of this manual.