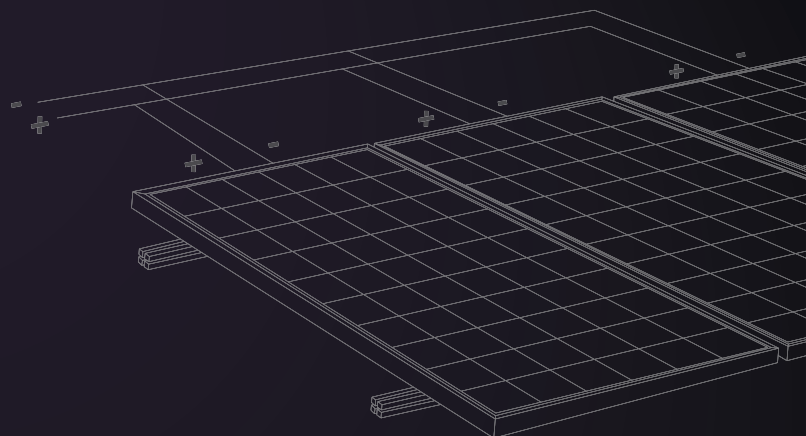
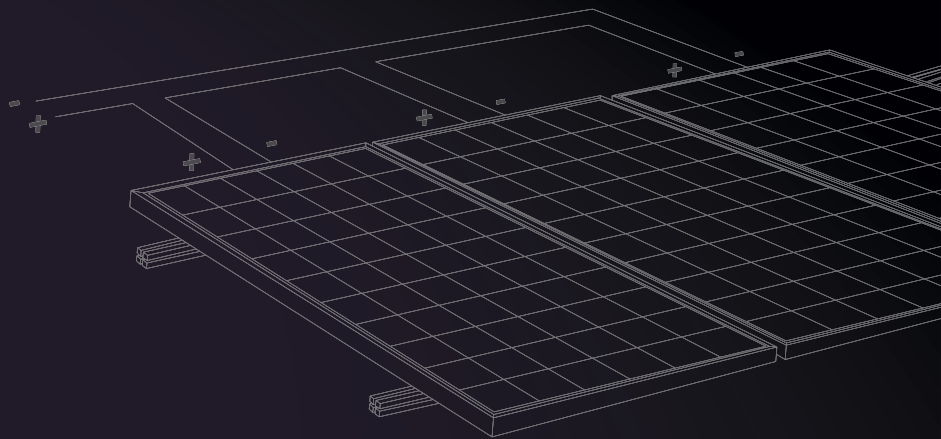
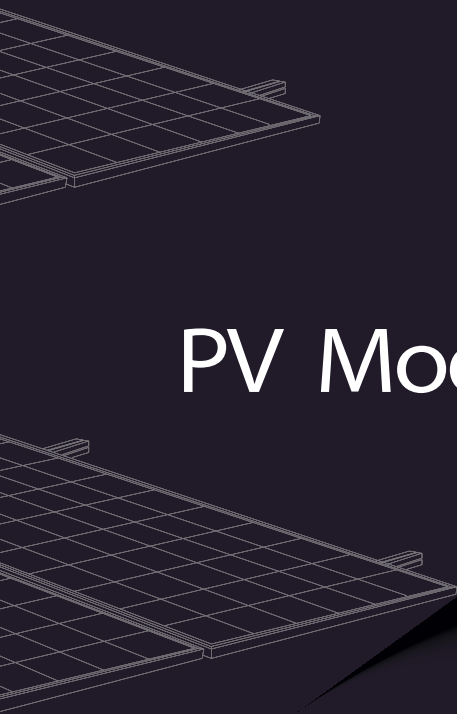


PV Module Installation Manual

Version 2012.09



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PURPOSE

This manual is for Hareon solar PV module (hereinafter referred to as Module), introduce safety and maintenance information of module installation. Please read this manual carefully before you start the installation, follow the rules strictly during the installation.

DISCLAIMER OF LIABILITY

Because the use of this manual and the conditions or methods of installation, operation, use and maintenance of module are beyond Hareon's control, Hareon does not accept responsibility and expressly disclaims liability for loss, damage, and expense arising out of or in any way connected with such installation, operation, use or maintenance.

No responsibility is assumed by Hareon for any infringement of patents or other rights of third parties, which may result from use of the module.

No license is granted by implication or otherwise under any patent or patent rights.

The information in this manual is based on Hareon's knowledge and experience and is believed to be reliable; but such information including product specification (without limitations) and suggestions do not constitute a warranty, expresses or implied. Hareon reserve the right to change the manual, the PV produce, the specifications, or product information sheets without prior notice.

QUALITY ASSURANCE

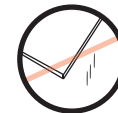
Hareonsolar provide 10 years ensure for materials and process of module in 10 years after module sold.

12 years ensure for 90% output, 25 years ensure for 80% output.

SECURITY AND TRANSPORT



Do not step on the module



Do not dismantle drop the module



Do not artificially concentrated light directly on the module by mirror or lens



Do not hoist on the connection boxes



Do not use pointed or sharp objects with the module



Do not bend the module. Use both hands!



Ensure all contacts are kept clean and dry

MECHANICAL INSTALLATION

SITE CHOOSING

- Select a suitable location for installing the modules.
- The modules should be facing south in northern latitudes and north in southern latitudes.
- The module should not be shaded at any time.
- Do not use modules near equipment or in locations where flammable gases may be generated or collected.
- Modules are not design for seaside.
- The module to be installed under the following conditions:

Operating Temp
-40°~85°

Storage Temp
-40°~60°

Humidity
≤85%

Wind Pressure
≤2400Pa

Snow Pressure
≤5400Pa

Corrosion resistance
except area with salt or sulfur corrosion

MOUNTING ANGLE

- A string of module should be mounted at the same angle, radiation exposure differ from mounting angle, it will cause current difference, which lead to lower operating efficiency of the whole system.
- Mounting angle please refer to table 1.

Table 1

LATITUDE	MOUNTING ANGLE
0°~15°	=15°
15°~25°	=Latitude
25°~30°	=Latitude+5°
30°~35°	=Latitude+10°
35°~40°	=Latitude+15°
>40°	=Latitude+20°

MODULE MOUNTING

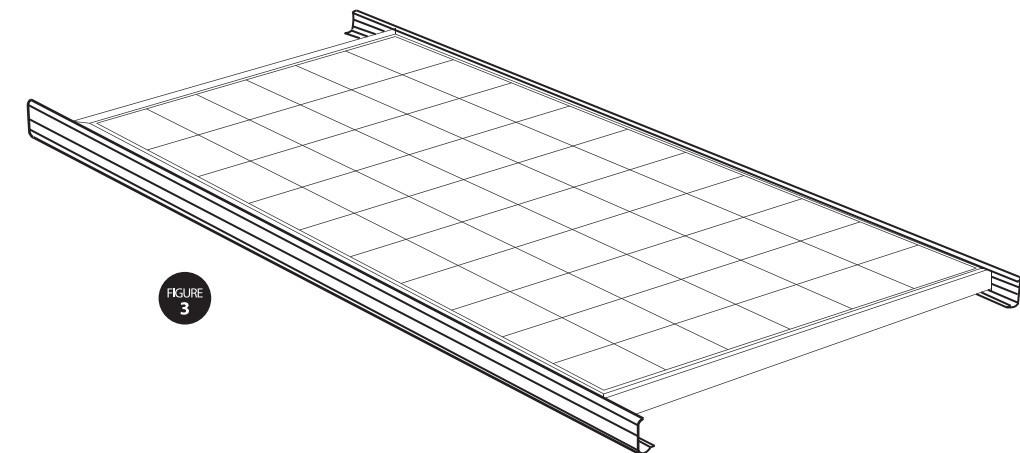
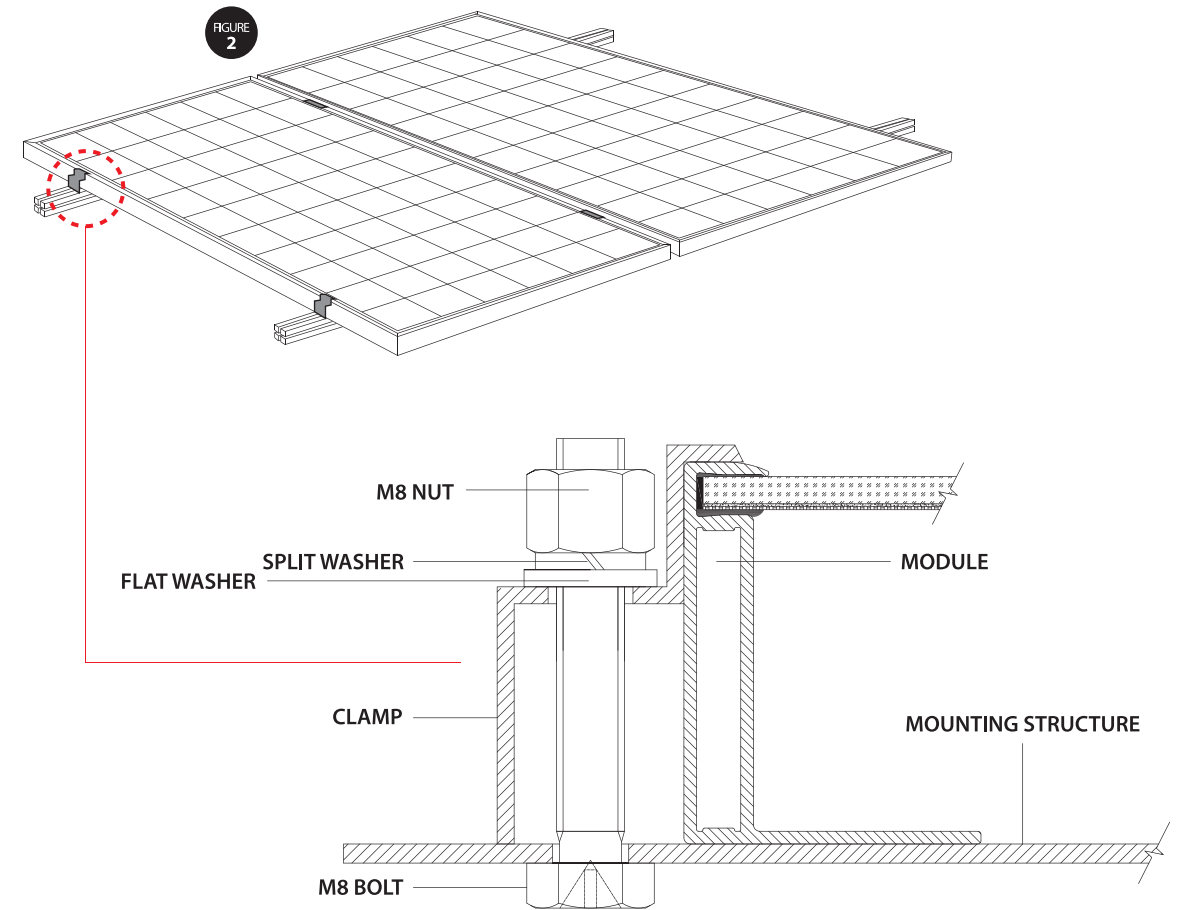
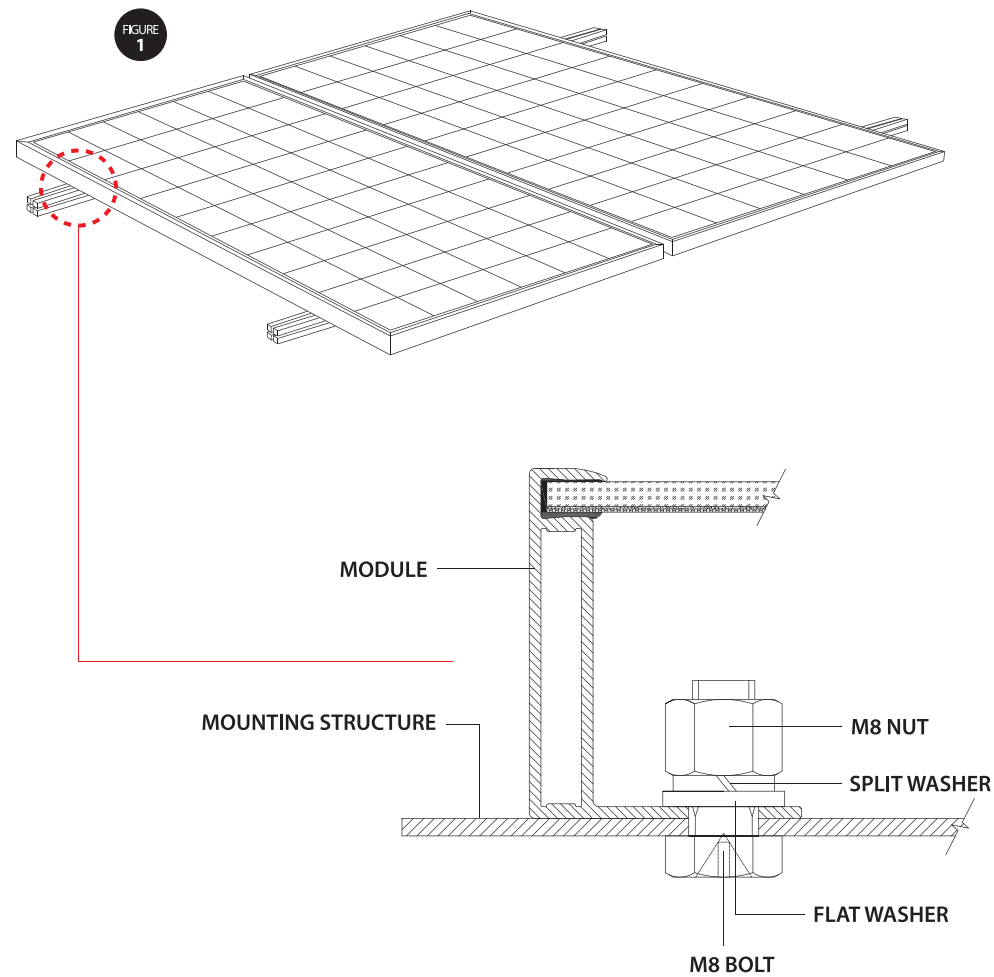
GENERAL RULES

- The module mounting structure must be made of durable, corrosion-resistant and UV-resistant material.
- Modules must be securely attached to the mounting structure.
- In regions with heavy snowfall in winter, select the height of the mounting system so that the lowest edge of the module is not covered by snow for any length of time. In addition, ensure that the lowest portion of the module is placed high enough so that it is not shaded by plants or trees or damaged by flying sand.
- Provide adequate ventilation under the modules in conformity to your local regulations. A minimum distance of 10 cm between the roof plane and the frame of the module is generally recommended.
- Observe the linear thermal expansion of the module frames (the recommended minimum distance between two modules is 2 cm).
- Always observe the instructions and safety precautions included with the module support frames.
- Do not attempt to drill holes in the glass surface or the frames of the modules as this will void the warranty.
- Before installing modules on a roof, ensure that the roof construction is suitable. In addition, any roof penetration required to mount the module must be properly sealed to prevent leaks.
- When installing a module on a pole, choose a pole and module mounting structure that will withstand the anticipated winds for the area.

INSTALLATION METHODS

MODULES CAN BE INSTALLED ON THE FRAME BY THE FOLLOWING 3 METHODS

- Mounting hole system: use corrosion free M8 bolt, module can be installed on the support frame through the installation holes on its own frame, show in figure1.
- Clamping system: choose the right fixture to fix the module on the support frame, show in figure2.
- Insertion system: Insert the whole module into the rail, show in figure3.



SELECT THE PROPER INSTALLATION METHOD DEPENDING ON THE LOAD,
PLEASE REFER TO FIGURE 4 FOR DETAILS:

	2400Pa LOAD	3800Pa LOAD	5400Pa LOAD
MOUNTING HOLE SYSTEM		 use four mounting holes	 use eight mounting holes
CLAMPING SYSTEM ATTACHMENT TO THE LONG MODULE SIDES	 use four mounting clips	 use four mounting clips	 use four mounting clips use six mounting clips
CLAMPING SYSTEM ATTACHMENT TO THE SHORT MODULE SIDES	 use four mounting clips		 short frame use four mounting clips long frame use two mounting clips
INSERTION SYSTEM	 insertion system		 insertion system

FIGURE 4

permissible clamp

	2400Pa LOAD	3800Pa LOAD	5400Pa LOAD
MOUNTING HOLE SYSTEM		 use four mounting holes	 use eight mounting holes
CLAMPING SYSTEM ATTACHMENT TO THE LONG MODULE SIDES	 use four mounting clips	 use four mounting clips	 use four mounting clips use six mounting clips
CLAMPING SYSTEM ATTACHMENT TO THE SHORT MODULE SIDES	 use four mounting clips		 short frame use four mounting clips long frame use two mounting clips
INSERTION SYSTEM			 insertion system

FIGURE 4

permissible clamp

MODULE SPECIFICATION (SHOW IN FIGURE 5, TABLE 2)

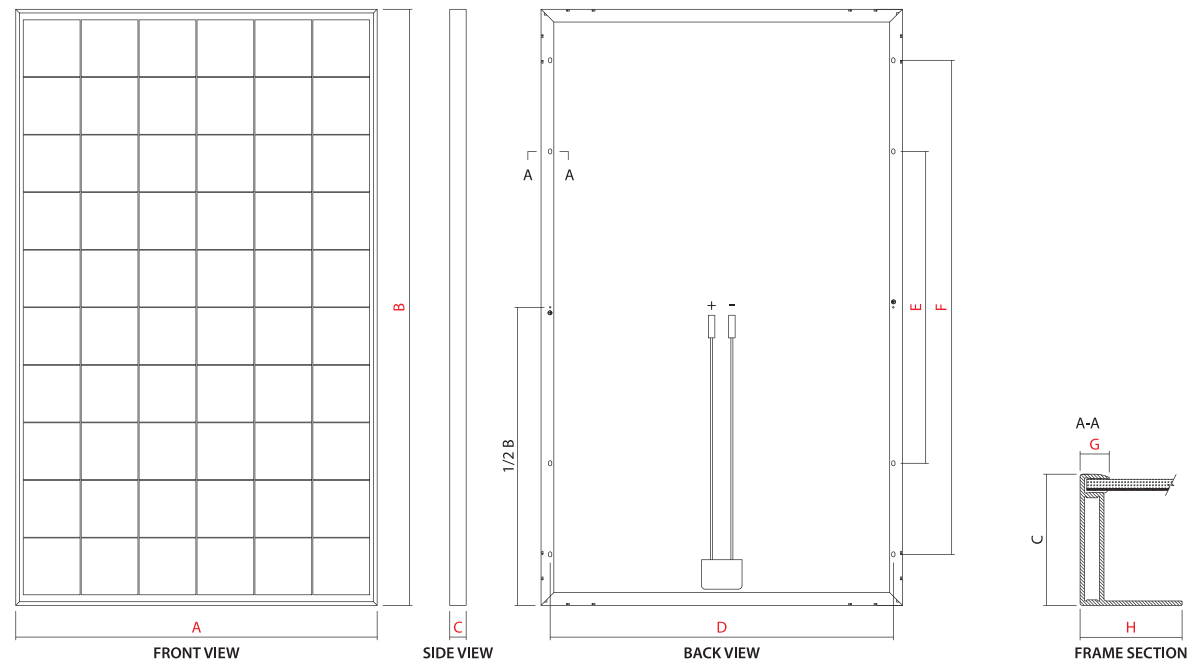


FIGURE 5

Table 2

NO.	MODULE TYPE	A	B	C	D	E	F	G	H	WEIGHT(KG)
1	HR-XXX-24/Aa	808	1580	35	NA	NA	NA	11	16.4	15.5
				40	758	800	1300	10	35	15.8
				45	758	800	1300	10	35	16
2	HR-XXX-24/Aab	808	1580	35	NA	NA	NA	11	16.4	15.5
				40	758	800	1300	10	35	15.8
				45	758	800	1300	10	35	16
3	HR-XXX-32/Az	1068	1580	50	1018	800	1300	11	35	21
4	HR-XXXP-18/Bb	1636	992	35	NA	NA	NA	11	16.4	19
				40	942	856	1356	10	35	19.3
				45	942	856	1356	10	35	19.5
		1662	1000	45	950	856	1356	10	35	20
5	HR-XXXP-18/Bbb	1636	992	35	NA	NA	NA	11	16.4	19
				40	942	856	1356	10	35	19.3
				45	942	856	1356	10	35	19.5
		1662	1000	45	950	856	1356	10	35	20
6	HR-XXX-18/Cb	1636	992	35	NA	NA	NA	11	16.4	19
				40	942	856	1356	10	35	19.3
				45	942	856	1356	10	35	19.5
		1662	1000	45	950	856	1356	10	35	20
7	HR-XXX-18/Cbb	1636	992	35	NA	NA	NA	11	16.4	19
				40	942	856	1356	10	35	19.3
				45	942	856	1356	10	35	19.5
		1662	1000	45	950	856	1356	10	35	20
8	HR-XXXP-24/Ba	1952	992	35	NA	NA	NA	11	16.4	21.5
				40	942	856	1356	10	35	21.8
				50	942	856	1356	11	35	23
		1982	1000	50	950	856	1356	11	35	24
9	HR-XXXP-24/Bab	1952	992	35	NA	NA	NA	11	16.4	21.5
				40	942	856	1356	10	35	21.8
				50	942	856	1356	11	35	23
		1982	1000	50	950	856	1356	11	35	24
10	HR-XXX-24/Ca	1952	992	35	NA	NA	NA	11	16.4	21.5
				40	942	856	1356	10	35	21.8
				50	942	856	1356	11	35	23
		1982	1000	50	950	856	1356	11	35	24
11	HR-XXX-24/Cab	1952	992	35	NA	NA	NA	11	16.4	21.5
				40	942	856	1356	10	35	21.8
				50	942	856	1356	11	35	23
		1982	1000	50	950	856	1356	11	35	24
12	HR-XXXP-18/Ebb	1636	992	45	942	856	1356	10	35	19.5
13	HR-XXXP-24/Eab	1952	992	50	942	856	1356	11	35	23

Unit: mm

Note: "XXX" refer to power index

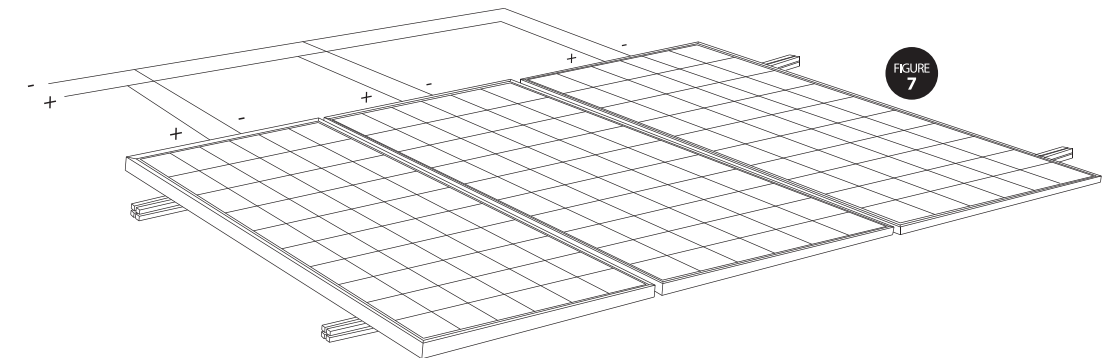
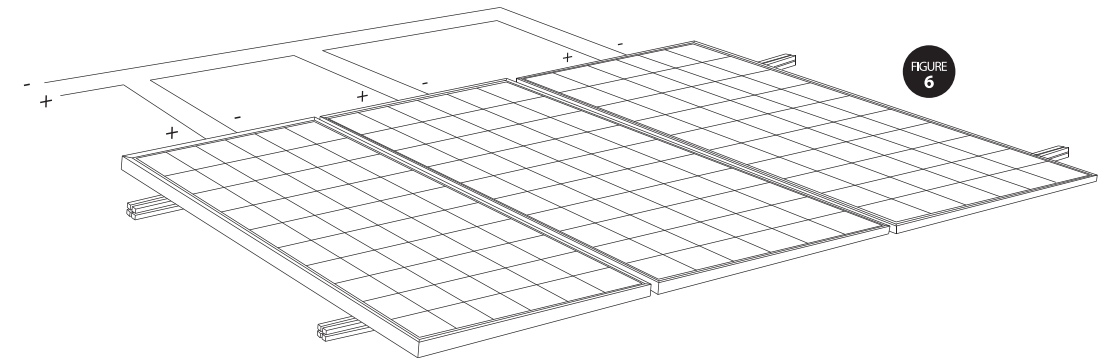
ELECTRICAL INSTALLATION

DC power generated by PV system can be converted to AC power, connected to the Grid. Policies to the Grid connected renewable energy system are vary from region to region. Please turn to Senior system design engineer for relevant information before you start to design the PV system.

Usually, you should get a formal approval from local public utilities sector before you start it.

GENERAL RULES

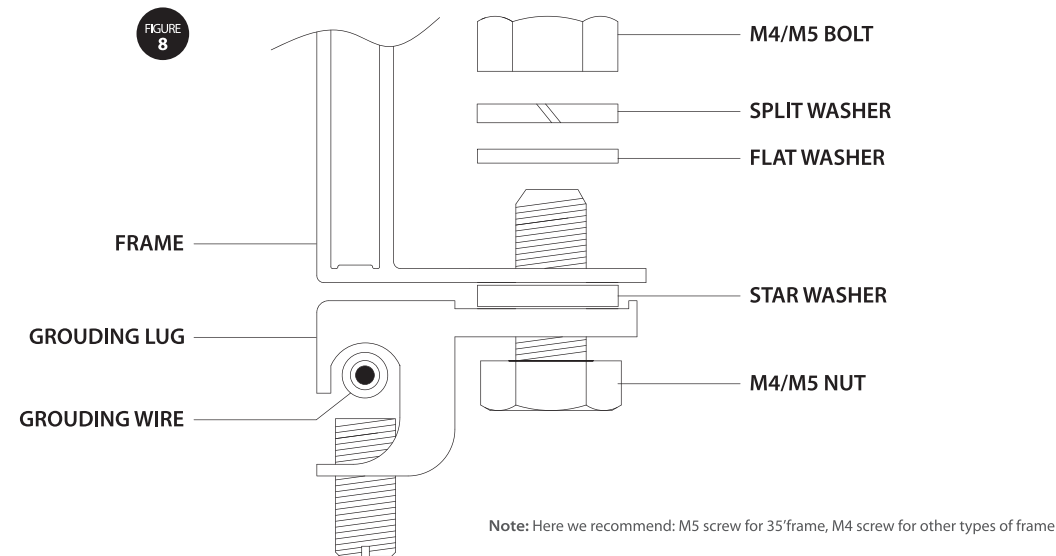
- Installation structure should be compatible with Aluminum frame of module, in order to avoid galvanic corrosion.
- Positive and negative part of the module should use the same type of connector for electrical connection.
- All electrical components should have ratings greater than or equal to the system rating. Do not exceed the maximum allowable system, voltage as listed on the module label.
- To prevent discharge in the process of dismantling conductor, you must use an opaque material to completely cover the module.
- PV system only installed by certified professionals, module can generate a current under light, non-professionals not familiar with safety regulations may be subject to the risk of electric shock, etc.
- Always use the same type of module in a PV system. While connected in series, voltage of each string should below maximum system voltage(show in figure6).As a reference, the largest number of modules (N)can be calculated from maximum voltage of the system dividing by open-circuit voltage of an individual module under-40°C.
- While connected in parallel, the output current is equal to the sum of current of each string(show in figure7). Use a fuse in each string of module, please refer to the application requirements locally.



- During the installation, make sure the connectors, inverters and other electrical components in a disconnected status.
- In order to reduce lightning damage, keep the loop as small as possible while laying cable. Recommended that each string using the appropriate fuse.

GROUNDING

- All frame and mounting structure are required to grounding cetricity standards. If grounding is required, use a recommended connector type, or an equivalent, for the grounding wire.
- While using mental structure, please make sure its surface have been electroplating treated, in order to keep a good conducting circuit.
- Choose a proper grounding conductor, connecting frame with the mounting structure, effectively grounding.
- grounding conductor must be connected to ground via a suitable ground electrode. Lugs recommended. Mounting frame should also be grounding without bolts and nuts electrically connecting to module frame.
- Striping the grounding wire to proper length, do not hurt the metal core during, insert it into the lug, fastening the screw then. Follow figure8 use bolt to connect lug to the frame. Recommended M4 screw assembly is 1.2 N·m. Recommended M5 screw assembly is 1.5 N·m.



BYPASS DIODE AND BLOCK DIODE

- In system with more than 2 strings of module, while one module shaded and others under light, overload Isc will cause overheat of cell to damage the module.
- By-pass diodes are required to protect each string of the module from the effect of shading. Do not try to open the j-box by yourself to change diode even if it breaks down, turn to professionals for help.
- Blocking diodes are used between battery and module to prevent damage on module while discharge.

MAINTENANCE

Module under normal circumstances no maintenance. Here we recommend the following maintenance methods to ensure the best performance of module:

- In most conditions, the rain can be enough to keep the glass clean.
- Clean the glass surface of the module when required. Always use clean water and a soft sponge or cloth for cleaning. A mild, non-abrasive cleaning agent may be used to remove stubborn dirt.
- Do not try to clean a module with broken glass or perforated backsheet, it will cause serious electrical shock.
- Regulation inspection every 6 month for grounding, mechanical and electrical connections. Make sure all connectors clean, reliable, no damage or corrosion happened.
- You must use an opaque material to completely cover the module during maintenance. If you need electrical or mechanical inspection or maintenance, it is recommended to have a licensed, authorized professional carry out the job to avoid hazards of electric shock or injury.



Warning: Before any electrical maintenance, you should firstly shut down the system, any Improper maintenance can lead to electric shock or injury.

RECYCLING

- As a member of PV CYCLE , Hareonsolar promise after module has been out of use, it will be recycled by specialized organizations to ensure all over the PV process is environment friendly. All service items are compliance with CE, providing free terminal service also (except accidents occurring during the installation)

To get more information please visit: <http://www.pvcycle.org/>





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