

General rule

- Installation of solar PV power generation systems requires specialized skills and knowledge. The installer should understand in advance the risk of injury during installation, including shocks, etc. Assembly installation must be completed by a professionally qualified engineer.
- Each component comes with a junction box permanently connected. For the convenience of installation, Gift Sun can provide prefabricated cables according to customer needs.
- Parts exposed to the sun may have arcs on a short circuit. Arcs may cause burns, fires, or other safety hazards. Sun-exposed components must be careful on a short-circuit condition.
- Solar cell modules can convert light energy into DC current and applied to the environment. Reasonable design of the support structure is the responsibility of the system design and the installer.



- Do not disassemble the components, move any nameplates or attached components, otherwise your warranty is not guaranteed.
- Do not focus the mirror or lens on the assembly with a mirror and do not expose

Safety precautions for installing solar photovoltaic systems

- When sunlight hits the front of the module, the solar photovoltaic module generates electricity and the DC voltage may exceed 30V. If the components are connected in series, the total voltage is equal to the sum of the single component voltage; if the component is connected in parallel, the total current is equal to the sum of the single component current.
- Keep the child away from the assembly when transporting and installing them.
- Fully cover the assembly with opaque material during installation to prevent current generation.
- Observe the safety rules applicable to all mounting components, such as wires, cables, connectors, charging controllers, inverters, batteries, etc.
- Use only equipment, connectors, wires, and supports that match solar power systems. In a particular system, use the same type of components as possible.
- Under ordinary outdoor conditions, the current and voltage generated by the assembly differ from those listed in the parameter table. The parameter table is measured under standard test conditions, so when determining other parameters related to the unrated voltage, wire capacity, fuse capacity, controller voltage and the component power output, the value of the

short circuit current and open circuit voltage on the assembly is designed and installed at a value of 125%.

- National E-8 Part 690 multiplied by 125% (80% reduction) may be an additional factor.
- The recommended maximum insurance current is 15A (156 assembly).
- The assembly passes a maximum mechanical load test of 5400pa (front load 5400pa, reverse load 2400pa).
- The components mentioned in this installation manual are only suitable for installation below 2000 m above sea level.
- The load capacity is a design load (front load 3600pa, reverse load 1600pa) with a safety factor of 1.5.



- Do not wear metal or fingers, strap, earrings, nose ring, lip ring and ring or other metal configuration. Be sure to use the appropriate safety equipment (e. g., tools, insulation gloves, etc.) for electrical installation.
-

Mechanical installation

Select the location

- Select the appropriate location to install the components.
- Assemblies should be installed facing the sun in order to reduce external sunlight loss and increase output power.
- More information about the best installation direction of the components depends on sunlight and the specific system design.
- For the ideal annual output power, the recommended installation angle is the same latitude as the component installation. To optimize solar cell power in winter, we recommend installation another 10 degrees higher than the same latitude. To optimize solar cell power all year round, we recommend installation in areas 10 degrees below the same latitude.
- The assembly shall be installed in locations where sunlight is fully exposed and is not covered at any time.
- Do not place the components where they are easy to produce or gather combustible gases.

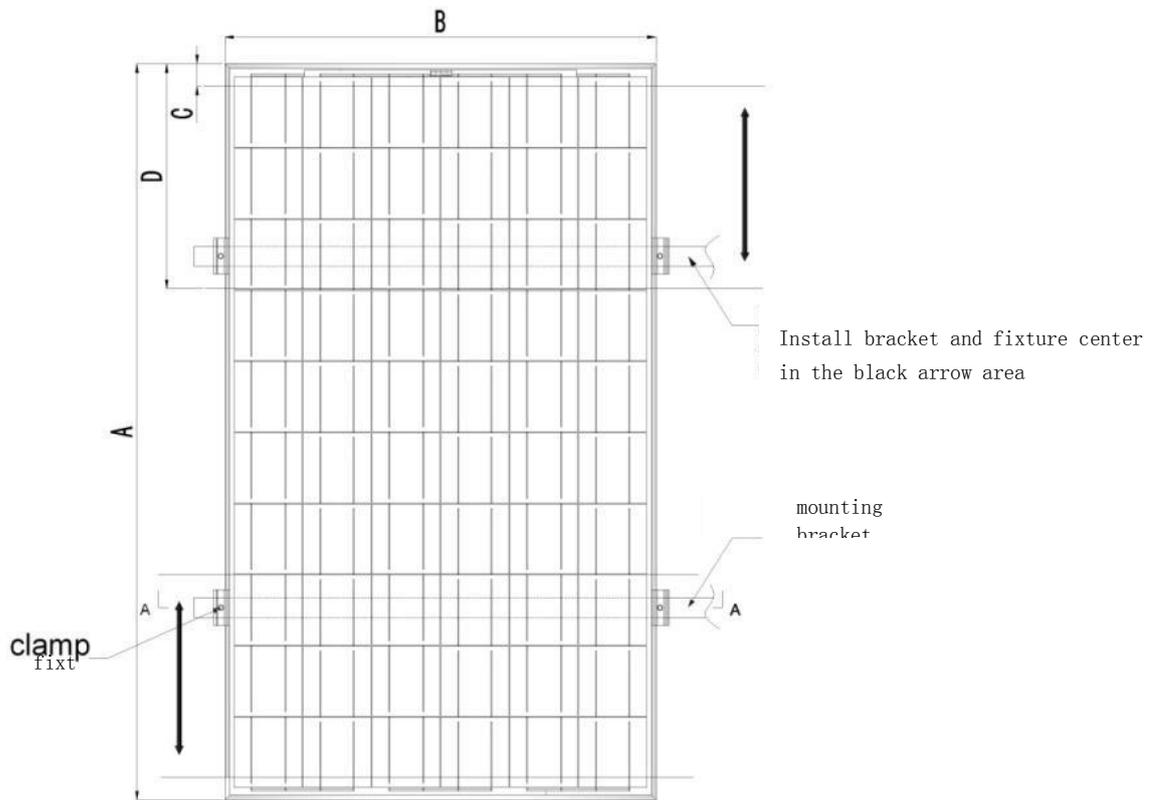
Select the appropriate installation structure and hardware.

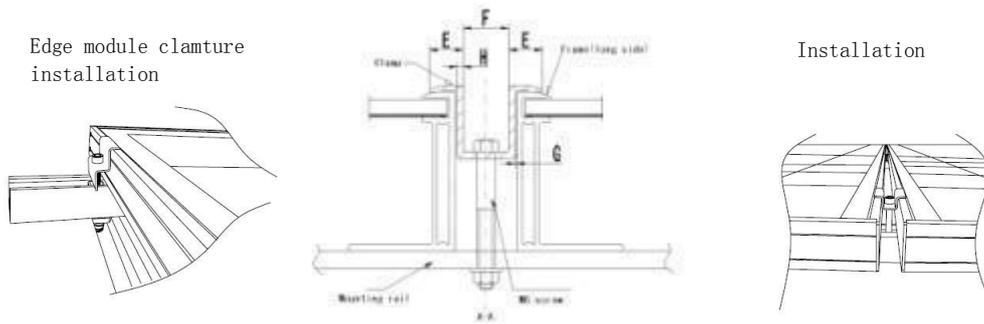
1. Install the structure

(1) Jture installation:

- Use a certain number of fixtures to secure the module on the mounting track.
- The fixture shall not contact the front glass of the module and shall not deform the frame. We must avoid the shadow of the module.
- In neither case does the module border need to be modified.
- When choosing this installation method, be sure to use at least four clamps on each module, two attached to the long edge of the module.
- Depending on local wind and snow loads to ensure the module can withstand may require additional fixtures.
- The torque applied shall be approximately 8 Newtonian meters.

Figure 1: Installation diagram of the assembly clamp





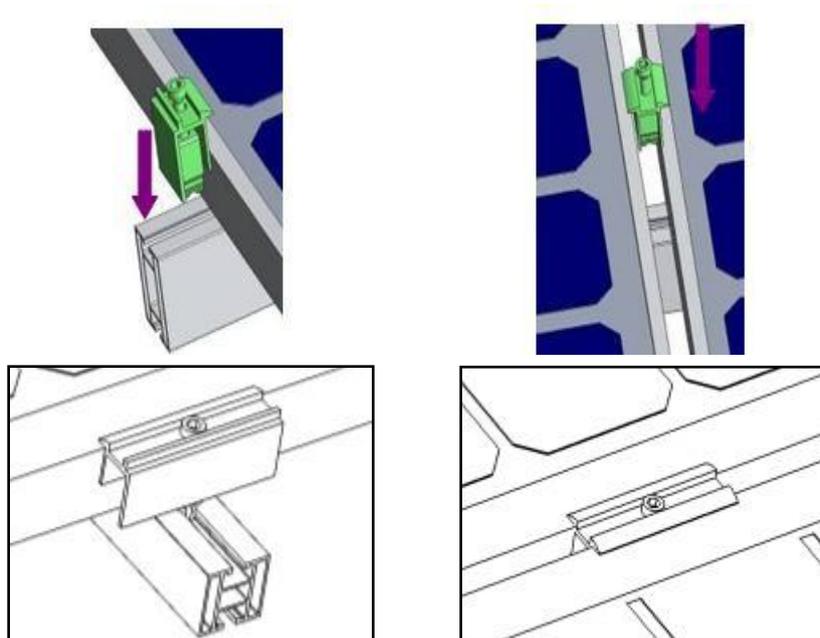
outside,1 Different models of assembly and installation sizes of fixture

Component type	Number of batteries	size (mm)						
		A*B	C	D	E	F	G	H
158 single crystal	6*12	1956*992	50	490	11	14	0.5~2	2.5~3
	6*10	1636*992	50	427	11	14	0.5~2	2.5~3
	6*10	1640*992	50	428	11	14	0.5~2	2.5~3
	6*10	1650*992	50	430	11	14	0.5~2	2.5~3

Note: 6 * 10 Specification module serves as an example. Size "G" indicates the distance between the grip and the frame. Size "H" indicates the thickness of the clamp.

hardware

- The modules can be mounted on a horizontal or oblique plane, and we can fixture the modules we place on the mounting bracket.
- Position the module on the mounting bracket according to the installation position in Table 2.
- Press the clamp on the mounting bracket to ensure that the clamp is stuck and use a middle clamp to connect the two modules as shown in the figure below (2). Use a terminal clamp to secure the edge module as shown in Figure (1).
- Attach the fixture on the mounting bracket firmly to the mounting bracket using a hexagonal screwdriver.
- All fixtures (including bolts and French nuts) shall be stainless steel.



(1) Terminal clamp

(2) Intermediate fixture

2. Method of erection

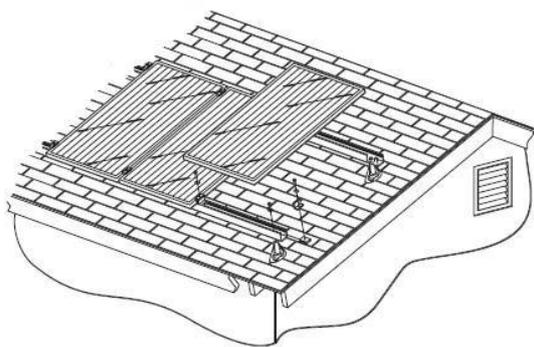
Ground installation

- Select the appropriate installation system height to prevent snowy areas from being covered by snow at the lowest edge of the component. In addition, ensure that the minimum part of the assembly is placed high enough not to be blocked by plants or damaged by sand and stone.



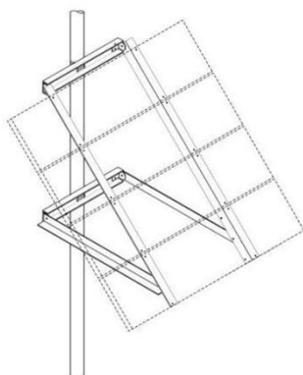
Roof installation

- When the assembly is installed on a roof or building, ensure that it is safely secured against damage by strong winds and heavy snow.
- The back of the assembly should ensure smooth ventilation cooling the assembly (minimum spacing between assembly and mounting surface is 93mm).
- When the assembly is installed on the roof, ensure that the roof structure is fit. In addition, the seepage roof needs to be properly sealed when installing the components.
- In special cases, special border support may be required.
- Solar modules mounted on the roof may affect the fire prevention performance of the roof.
- Select a small wind time when installing components on the roof or building. Installing components during high winds can cause accidents.



Stand rod installation

- When mounting with a vertical rod, select the rod and assembly installation structures that can be resistant to high wind.



2. General installation precautions

- Drainage holes shall not be covered by any part of the assembly. The vent of the junction box is mounted downward and will not be exposed to the rain. The correct direction of the vent is that the junction box is mounted on the highest side of the assembly.
- Do not mention the assembly junction box or other electrical parts.
- Do not stand or trample on the components.
- Do not throw objects on the assembly.
- Do not hold the heavy objects on the assembly.
- Improper transportation and installation may cause damage to the assembly glass or frame.

Electrical installation

General rules for electrical installation

- Do not use different electrical devices or different supplier components in the same system.
- The component uses a MC connector (PV-KST4, PV-KBT4), or other electrical connections that meet TUV approval.
- To determine the appropriate type and rated temperature of the conductor according to NEC # 690.31. The cable shall be # 12AWG, minimum of 4 square mm and minimum rated temperature of 90° C.
- The system shall be fully covered with the insulation to prevent the current from breaking the wire.
- The cables and connectors that meet the maximum system short circuit current must be selected, otherwise the cables and connector will overheat. See the NEC for more details.
- To achieve optimal performance, ensure that the forward and reverse currents cooperate closely to avoid circuits.
- Bypass diode, maximum reverse voltage is 50V and maximum average forward current is 10A.
- Note: Electrical danger! Do not touch bare wires or other potentially charged parts.

Preventive maintenance

Gift Sun PV recommends the following maintenance items to ensure the best performance of the module:

- It is necessary to clean the component of the glass. Use clean water and a soft sponge or cloth with mild, nonabrasive cleaners, if necessary. Do not use the detergent.
- Please have qualified personnel regularly check electrical and mechanical connections to ensure their clean, safe and intact.
- If questioned, please have qualified personnel to check.
- Follow the maintenance instructions for all the other components used in the system.

Shutdown system

- To cover the assembly system to prevent the current generated when the wire is disconnected.
- Disconnect the other parts as described in the instructions.
- The system is operable and removable, but follow all safety instructions.

Product identification

- Each component has the following identification information:
- Nameplate: according to IEC standards

- Pass: The product department provides detailed detection date and batch tracking information
- Barcode: Each barcode has a unique serial number.

for instance:





- Don't tear off any labels
- If the label is torn off, Gift Sun will no longer provide a product warranty

Typical barcode labels

Cross-wheel trash bin identification

- Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being. When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposals at least free of charge.



Disclaimer

- Since the use or methods of this manual and the installation, operation, use and maintenance of photovoltaic (PV) products are beyond the control of Gift Sun, Gift Sun is not responsible for loss damage or costs caused by any operations related to such installation, operation, use or maintenance.
- The infringement of third-party patents or other rights that may result from the use of PV products does not fall within the scope of responsibility of Gift Sun. The customer does not obtain any patent or use of the products, whether express or implied.
- The information in this manual is based on its knowledge and reliable experience, but such information and recommendations including the product specifications do not constitute any warranty, whether express or implied.
- Gift Sun Photovoltaic has the right to modify the instructions, solar photovoltaic products, specifications or product information sheets without notice.

Cell size (mm)	Model	Pmax (W)	Voc (V)	Vmp (V)	Isc (A)	Imp (A)	组件效率 (%)
158 Single-crystal single-glass glass	GS60M-330/02	330	42.2	34.3	10.14	9.63	19.6
	GS60M-335/02	335	42.6	34.6	10.20	9.69	19.9
	GS60M-340/02	340	43	34.9	10.26	9.75	20.2
	GS60M-345/02	345	43.4	35.2	10.32	9.81	20.5
166 Single-crystal single-glass glass	GS60M-360/03	360	40.7	33.6	11.24	10.7	19.6
	GS60M-365/03	365	41	33.9	11.3	10.76	19.9
	GS60M-370/03	370	41.3	34.2	11.37	10.82	20.2
	GS60M-375/03	375	41.6	34.4	11.45	10.89	20.5
	GS60M-380/03	380	41.9	34.7	11.52	10.96	20.7
182 Single-crystal single-glass glass	GS54M-395/04	395	36.98	30.84	13.7	12.81	20.2
	GS54M-400/04	400	37.07	31.01	13.79	12.9	20.5
	GS54M-405/04	405	37.23	31.21	13.87	12.98	20.7
	GS54M-410/04	410	37.32	31.45	13.95	13.04	21
	GS54M-415/04	415	37.45	31.61	14.02	13.13	21.3
	GS54M-420/04	420	37.58	31.8	14.1	13.21	21.5
182 Single-crystal single-glass glass	GS60M-440/04	440	41.02	33.72	13.73	13.05	20.39
	GS60M-445/04	445	41.1	33.82	13.79	13.16	20.62
	GS60M-450/04	450	41.18	33.91	13.85	13.27	20.85
	GS60M-455/04	455	41.33	34.06	13.93	13.36	21.08

158 Single-crystal single-glass glass	GS72M-395/02	395	50.1	40.8	10.13	9.69	19.7
	GS72M-400/02	400	50.4	41.1	10.18	9.74	19.9
	GS72M-405/02	405	50.8	41.4	10.23	9.79	20.2
	GS72M-410/02	410	51.2	41.7	10.29	9.84	20.4
	GS72M-415/02	415	51.5	42	10.34	9.89	20.7
166 Single-crystal single-glass glass	GS72M-440/03	440	49.1	39.94	11.1	10.76	19.7
	GS72M-445/03	445	49.56	41.22	11.32	10.8	20.1
	GS72M-450/03	450	49.7	41.52	11.36	10.84	20.4
	GS72M-455/03	455	49.85	41.82	11.41	10.88	20.6
	GS72M-460/03	460	50.1	42.13	11.45	10.92	20.7
	GS72M-465/03	465	50.15	42.43	11.49	10.96	20.9
182 Single-crystal single-glass glass	GS72M-540/04	540	49.6	41.64	13.86	12.97	20.89
	GS72M-545/04	545	49.75	41.8	13.93	13.04	21.09
	GS72M-550/04	550	49.9	41.96	14.00	13.11	21.28
	GS72M-555/04	555	50.02	42.11	14.07	13.18	21.5
	GS72M-560/04	560	50.15	42.27	14.14	13.25	21.7
210 Single-crystal single-glass glass	GS60M-590/05	590	41.30	34.2	18.31	17.25	20.8
	GS60M-595/05	595	41.50	34.4	18.36	17.3	21.0
	GS60M-600/05	600	41.70	34.6	18.42	17.34	21.2
	GS60M-605/05	605	41.90	34.8	18.47	17.39	21.4
	GS60M-610/05	610	42.10	35.0	18.52	17.43	21.6
	GS60M-615/05	615	42.30	35.2	18.57	17.47	21.7
210 Single-crystal single-glass glass	GS66M-645/05	645	45.1	37.2	18.39	17.35	20.8
	GS66M-650/05	650	45.3	37.4	18.44	17.39	20.9
	GS66M-655/05	655	45.5	37.6	18.48	17.43	21.1
	GS66M-660/05	660	45.7	37.8	18.53	17.47	21.2
	GS66M-665/05	665	45.9	38	18.58	17.51	21.3
	GS66M-670/05	670	46.1	38.2	18.63	17.55	21.4