

Gokin Solar

Installation manual for

Photovoltaic Module

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APPLICABLE PRODUCT LIST

01 Introd[illegible]on

F[illegible] [illegible]., Ltd. 's ph[illegible]ltaic modules (herein[illegible] [illegible]erred to [illegible]odules").

This installation manual [illegible]ins important electric[illegible] mechanical install[illegible] [illegible]ety [illegible]nation that you [illegible]e familiar with, provid[illegible]portant safety instr[illegible]ns for the installa[illegible] [illegible]e and [illegible]nance of so[illegible]dules. Users, installation [illegible] maintenance person[illegible]ust r[illegible]al [illegible]efully a[illegible] safety guidelines may [illegible] property damage.

The installation and operation of solar modules requires professional skills, and only qualified professionals can perform this work. Please read the safety and installation instructions before operating, installing and maintaining the modules, and keep this manual in a safe place for future reference (maintenance and maintenance), and the installer must inform the end customer (or consumer) of the above matters accordingly.

Gokin reserves the right to change this installation manual without prior notice. You are advised to visit the Gokin official website for the latest version installation manual.

This installation manual does not have any warranty meaning, either express or implied. Gokin shall not be liable for any product defect or destruction, personal injury or property damage caused by any operation during the disposal of modules (including but not limited to disassembly/packaging, loading and unloading, handling, transportation, storage, installation, connection, disassembly, operation and maintenance, etc.). Failure by the customer to follow the requirements set forth in this manual in the installation of modules may result in the invalidation of the limited warranty provided to the Customer. Gokin shall not be liable for any infringement of patent rights or rights of third parties caused by the use of modules. At the same time, the suggestions in this manual are tested and verified by practice, and the purpose is to improve the security and stability of the module during installation and operation.

02 Laws and Regulations

Mechanical and electrical installation of photovoltaic modules should refer to the corresponding regulations, including electrical law, construction law and electrical connection requirements. These regulations vary depending on the installation location, and requirements may vary depending on the voltage, current nature (AC or DC) of the installed system. Please contact your local authority for specific terms.

3.1 G



systems.

For your safety, please do not perform installation and maintenance work without safety precautions, including but not limited to fall protection, ladders or stairs, and personal protective equipment.

For your safety, do not install or handle modules in dangerous or harsh environments, including but not limited to strong winds, rain, snow, or dust storms.

Please ensure that you install or handle the integrity of the modules, do not use or install damaged modules, including but not limited to

[illegible]

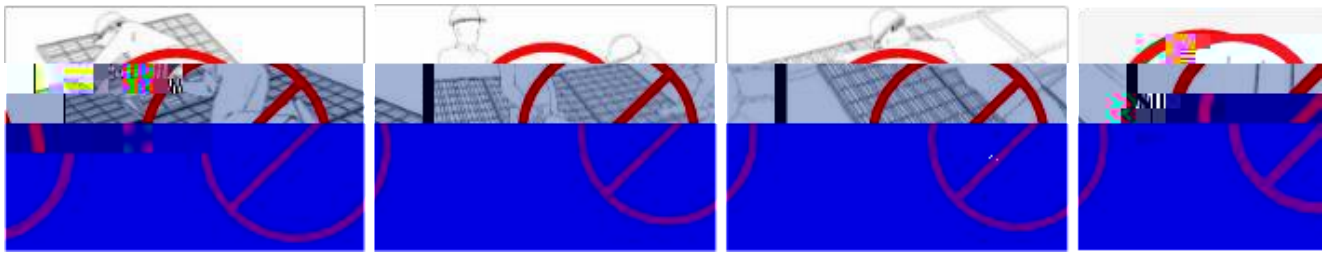
[illegible]

To ensure the [illegible] of modules during transportation and storage, unpack modules [illegible] they arrive at the installation site.

When stacking modules, strictly comply with the upper limit on the number of layers printed on the packing case. Do not stack more than two layers of vertical packages on the short side, but allow stacking of vertical packages on the long side.

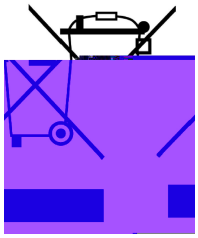
During the storage process, protect the package from damage, and store the module in a dry and ventilated environment to avoid direct sunlight and humidity. If the modules are stored in an uncontrolled environment, they shall not be stored for more than 3 months and additional measures shall be taken to protect the modules from moisture or sunlight.

If the modules will not be installed within a short time after unpacking, the remaining modules should be placed horizontally on the packing, [illegible] of [illegible] alignment, and the [illegible] stacked pieces should not exceed 12.



Do not paint or apply any other adhesive to the surface of the module.

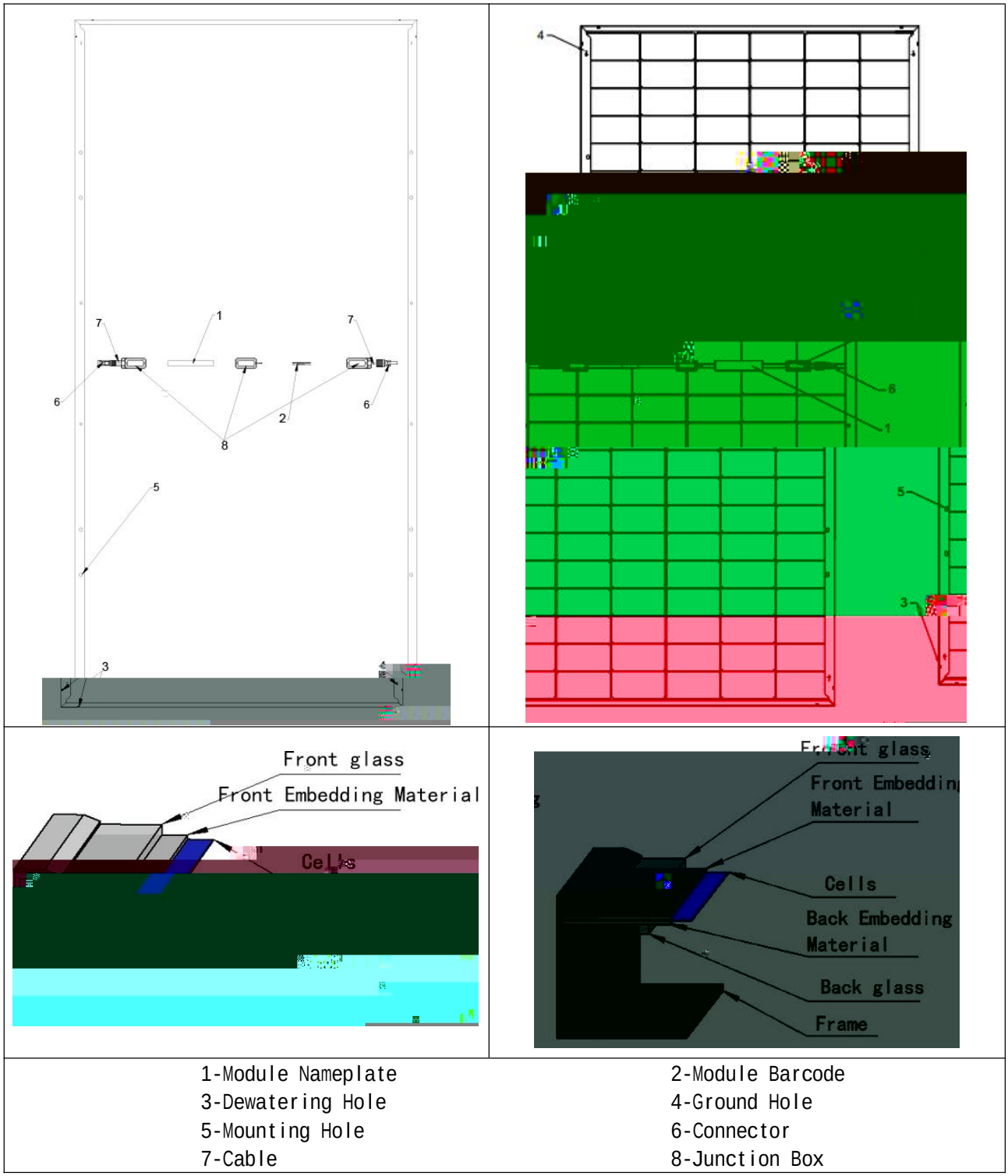
Drilling in the frame of the module is prohibited, which will result in a re



corrosive substances modules, affecting modules' safety or performance.

Please take protective measures to ensure reliable and safe installation of modules in severe environments such as heavy snow, cold and strong wind or islands close to water and salt mist or deserts.

the corrosion may still occur where the modules frame is connected to the bracket or where the grounding is connected. Gokin modules can be installed ≥50 m away from the ocean side, and related parts and com



1-Module Nameplate	2-Module Barcode
3-Dewatering Hole	4-Ground Hole
5-Mounting Hole	6-Connector
7-Cable	8-Junction Box

Three labels on the module contain the information below:

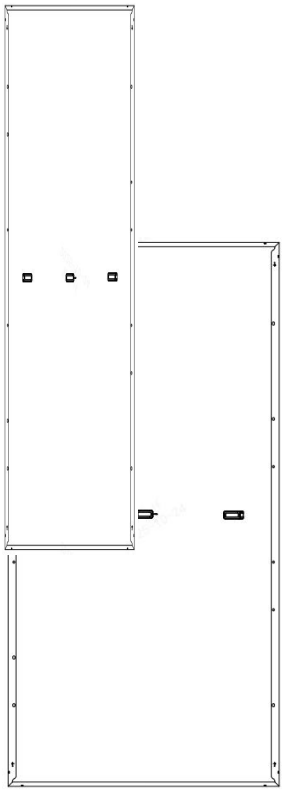
1.Nameplate: Nameplate is placed on rear side of the module, which is printed with information such as product type, rated power, rated current, rated voltage, open circuit voltage, short circuit current under testing conditions, certification indicator, maximum system voltage, etc.

2.Current classification label: Rated working current. (H indicates High, M indicates Medium, L indicates Low)

3.Serial Number label: A unique serial number which is laminated inside the module permanently which can be found in the front of the module. There is another same serial number beside the module nameplate.

5.2 Wiring method

The Gokin component junction box is located in the middle. Refer to the table below for various component connection methods.



Portrait installation: Standan »a

ical al ion

s: mmend 2 people to handle the PV modules during the installation.

Modules can usually be mounte using the following methods: fixed installation-mounting with bolts, fixed installation-mounting with clam nd tracker installation.

Note:

All installation methods herein are only for reference, and they are based on the test results from third-party tests and Gokin internal tests;

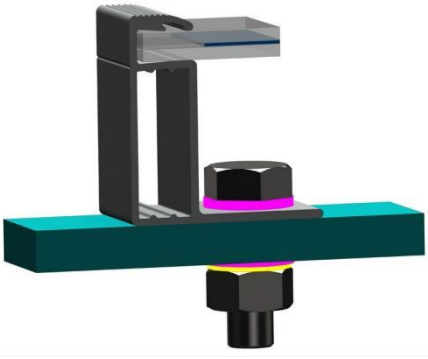
1.Gokin will not provide related mounting accessories, the system installer or trained professional personnel must be responsible for the PV system's design, installation, and mechanical load calculation and system security.

2.Before installation, the following items shall be addressed:

a) Visually check the module for any damage. Clean the module if any dirt or residue remains;

b) Check if module serial number stickers match.

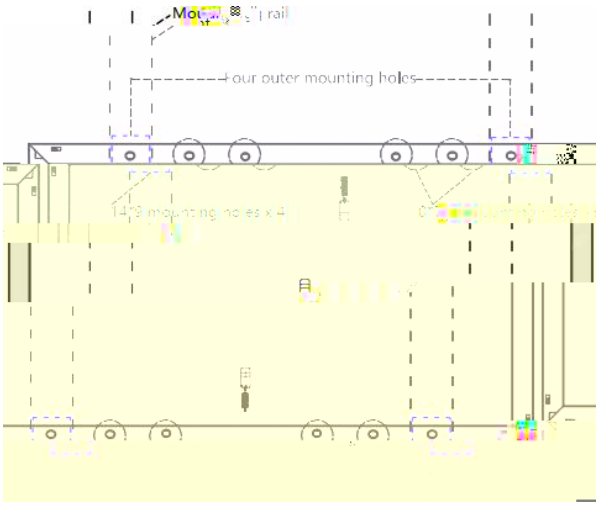
3.The maximum loads that different types of modules can withstand on the front side and back side are dependent on installation methods, which can be referred to Table 2, T [illegible] and Page 5. If there is heavy snow and strong



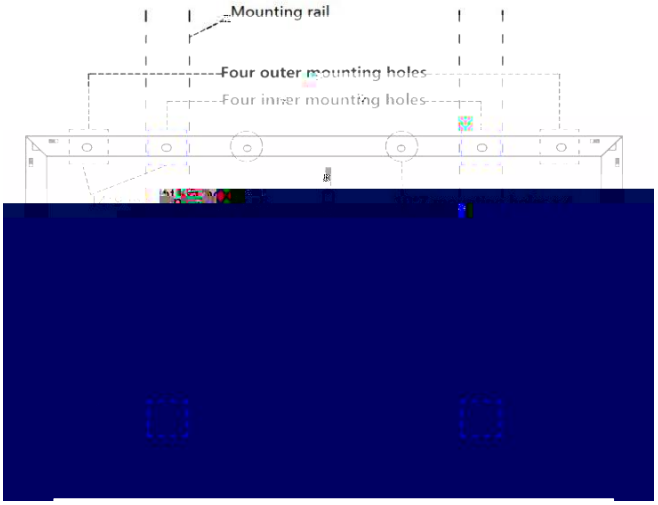
Mounting hole (mm)	Recommended bolt size
14 x 9	M8
10 x 7	M6

6.3 Installation and Mechanical Load of Mono-facial Module

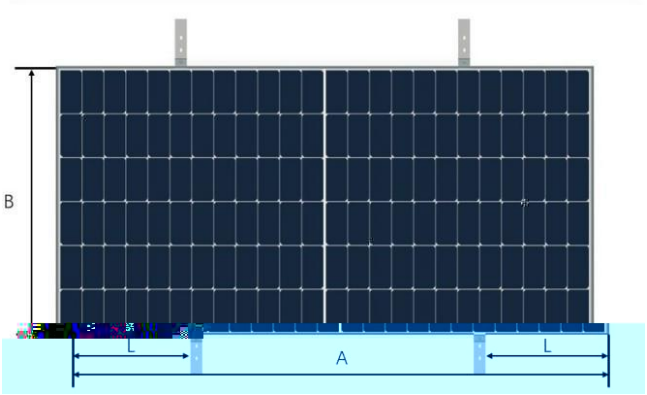
Mono-facial modules can be mounted by bolts or clamps. The mounting method and maximum test load are shown asfollow (The unit of distance and length in the table below is millimeter (mm), and the unit of pressure is Pascal (Pa)).



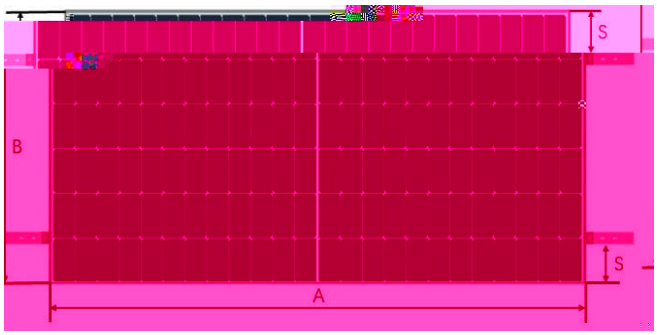
Outer four-hole bolts mounting
Mounting rails cross the long frame(Method 1)



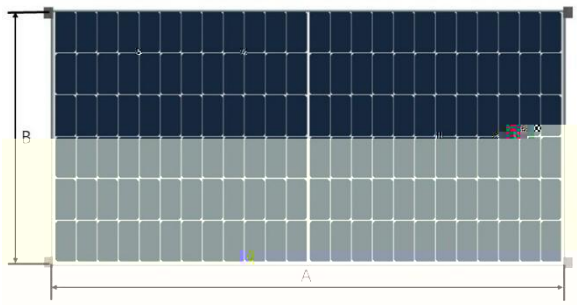
Inner four-hole bolts mounting
Mounting rails cross the long frame(Method 2)



Clamps mounting
Mounting rails cross the long frame(Method 3)



Clamps mounting
Mounting rails cross the short frame(Method 4)



Clamps are mounted at the corners of short frame(Method 5)

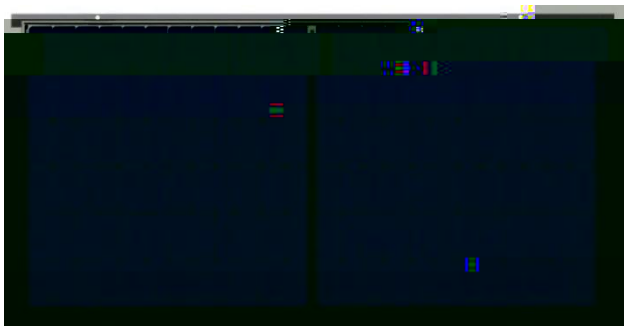
Fig.3 Mono-facial Module Installation Position

Installation method / Module Type	Bolts Mounting		Clamps Mounting		
	Mouning rails cross the long frame		Mounting rails cross the long frame	Mounting rails cross the short frame	Clamps are mounted at the corners of short frame
	Outer Four-hole	Inner Four-hole	L=1/4A±50	150≤S≤250	
	Method 1	Method 2	Method 3	Method 4	Method 5
GK-1-54HP-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-1-60HP-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-1-54HT-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-1-60HT-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-4-48HT-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-4-54HT-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-5-54HG-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-5-54HGb-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-3-54HG-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-3-54HGb-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-1-60HG-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-1-60HGb-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-5-60HG-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-5-60HGb-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800
GK-1-72HP-xxxM	+5400,-2400	+5400,-2400	+5400,-2400	/	/
GK-1-72HT-xxxM	+5400,-2400	+5400,-2400	+5400,-2400	/	/
GK-2-60HP-xxxM	+5400,-2400	/	+5400,-2400	/	/
GK-2-60HT-xxxM	+5400,-2400	/	+5400,-2400	/	/
GK-2-60HP-xxxM	+5400,-2400	/	+5400,-2400	/	/
GK-2-66HP-xxxM	+5400,-2400	/	+5400,-2400	/	/
GK-2-66HT-xxxM	+5400,-2400	/	+5400,-2400	/	/
GK-3-72HG-xxxM	+5400,-2400	/	+5400,-2400	/	/
GK-3-72HGF-xxxM	+5400,-2400	/	+5400,-2400	/	/
GK-3-54HGFb-xxxM	±2400	+5400,-2400	+5400,-2400	±2400	+2400,-1800

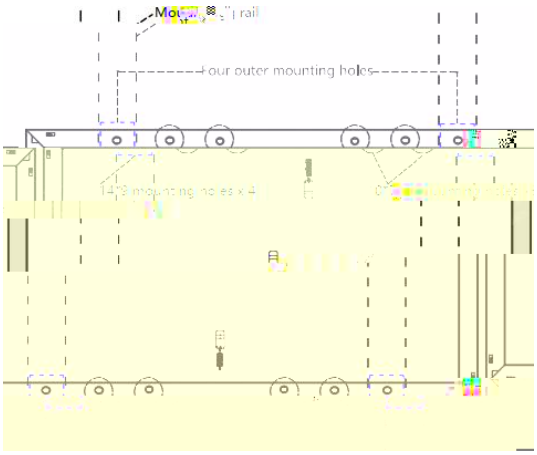
Table 3 The maximum test load of framed mono-facial modules

6.4 Installation and Mechanical Load of Bifacial module

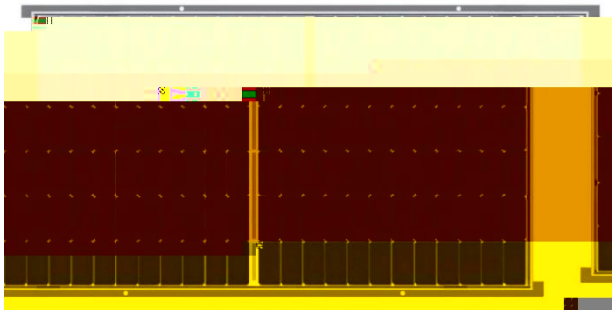
Bifacial modules can be mounted by bolts or clamps. The mounting method and maximum test load are shown as follow(The unit of distance and length in the table below is milimeter (mm), and the unit of pressure is Pascal (Pa)).



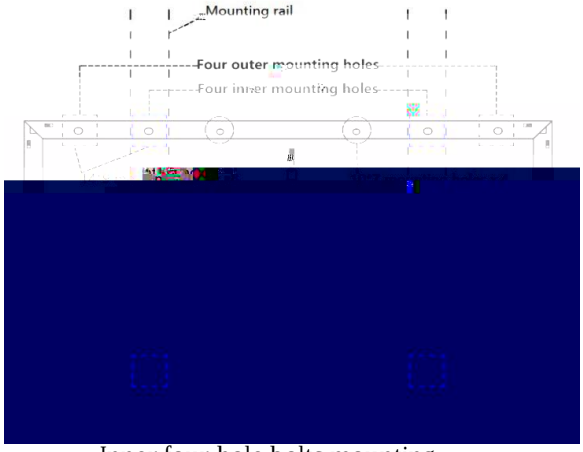
Outer Four-hole bolts Mounting
Mounting rails parallel the long frame(Method 1)



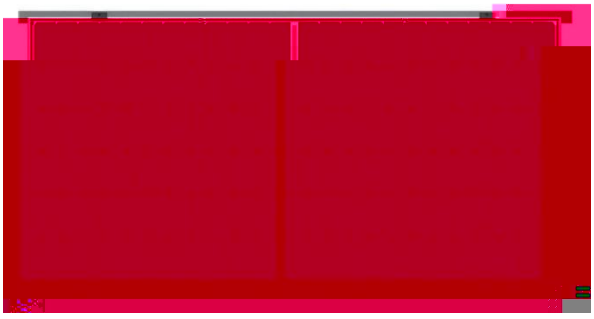
Outer four-hole bolts mounting
Mounting rails cross the long frame.(Method 2)



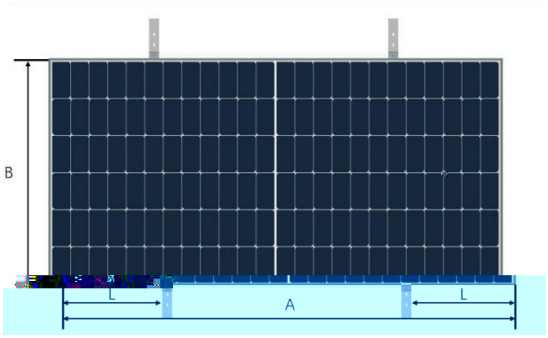
Inner Four-hole bolts Mounting
Mounting rails parallel the long frame(Method 3)



Inner four-hole bolts mounting
Mounting rails cross the long frame(Method 4)



Clamps mounting
Mounting rails cross the long frame(Method 5)



Clamps Mounting
Mounting rails cross the long frame(Method 6)

Fig.3 Bifacial Module Installation Position

Installation method / Module Type	Bolts Mounting				Clamps Mounting			
	Mounting rails cross the long frame		Mounting rails parallel the long frame		Mounting rails cross the long frame	Mounting rails parallel the long frame	Mounting rails cross the short frame	Clamps are mounted at the corners of short frame
	Outer Four-hole	Inner Four-hole	Outer Four-hole	Inner Four-hole		450≤ L ≤550	S=1/4B±50	
	Method 2	Method 4	Method 1	Method 3	Method 6	Method 5	Method7	Method 8
GK-1-54HPBD-xxxM	±2400	+5400,-2400	/	/	+5400,-2400 / +5400,-3600/ L=1/4A±50	/	/	/
GK-1-54HTBD-xxXM	±2400	+5400,-2400	\ /	/	+5400,-2400 / +5400,-3600/ L=1/4A±50	/	/	/
GK-5-54HGBD-xxxM	±2400	+5400,-2400	/	/	+5400,-2400 / +5400,-3600/ L=1/4A±50	/	/	/

GK-5-60HGDb-xxxM	±2400	+5400,-2400

07 Grounding

To ensure safety and protect modules froù

(AWG6-12) exposed copper cable is recommended.

Gokin PV modules can be grounded using a third-party grounding device, but the grounding must be proven reliable.

08 Electrical Installation

8.1 Safety Instruction

All wiring installation should be carried out by qualified installers in accordance with local electrical construction codes, procedures, and regulations.

Modules can be connected in series to increase the operating voltage by connecting the positive terminal of one module into the negative terminal of the next one. Before connecting, always ensure that the contacts are corrosion-free, clean, and dry.

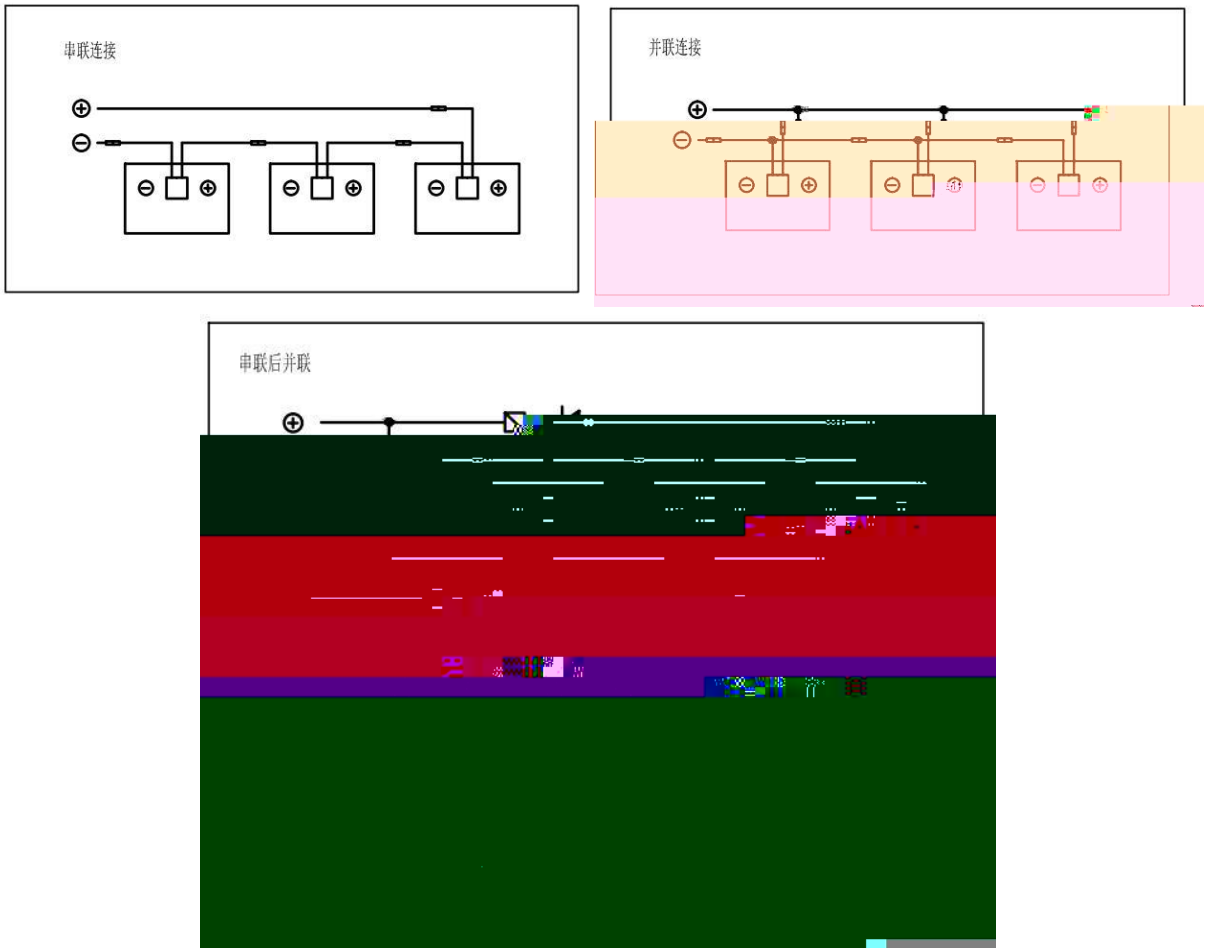


Fig.10 Electrical diagram of series and parallel lines

If reverse current exceeding the component's maximum fuse current may flow through it, a current-limiting protection device of the same specification must be used to protect the component. For parallel strings of two or more, each string must have a current-limiting protection device, as shown in Figure 10.

8.2 WIRING

The number of modules that can be connected shall be determined by a qualified institution or person in accordance with the design specifications of the photovoltaic system and the local electrical design specifications. The calculation formula recommended by Gokin Solar shall be for refÔo

increase the voltage and connected in parallel to increase the current.

Before connecting the module, please make sure using the connector approved by Gokin. Otherwise, Gokin does not responsible for any potential problem.

8.3 FUSING

The correction factor of a fuse shall be determined by an authorized professional electrical engineer in accordance with the relevant design regulations and system simulation results. Gokin Solar does not responsible for determining the minimum rating of fuse.

The fuse rated current should be chosen depending on different standards, as follows:

1.5

9.2 Cleaning

The power generation of photovoltaic modules is related to the solar radiation received by their cells. Dirt blocking the glass surface of the module will reduce its power output and may even cause regional heat spots, so it is important to keep the surface of the module clean, usually need to clean the surface of the module dirt such as: bird droppings, leaves, ash layer, etc. Gokin recommends that modules be cleaned at least once a year, and modules installed in dusty environments or at low angles should be cleaned appropriately to ensure the cleanliness of the module surface. Uncontrolled contamination and failure to clean modules in a timely manner will void the warranty.

This section contains Gokin PV module cleaning requirements, system users and professional installers should carefully read and strictly follow. Failure to follow these instructions may result in personal injury or property damage. Gokin is not responsible for any damage caused by improper cleaning methods and will lose the limited warranty of the product.

Warning

Cleaning can cause damage to modules and a range of modules, as well as increasing the risk of electric shock.

Cracked or damaged modules pose a risk of electric shock due to leakage of current, and damp modules increase this risk. It is necessary to thoroughly inspect the modules for cracks, damage, and loose joints before cleaning.

During the day, the voltage and current present in the array is sufficient to cause a fatal electric shock accident, and the photovoltaic module should be cleaned under low irradiance conditions.

Before cleaning, make sure the circuit is disconnected.

Please wear suitable protective clothing (clothing, insulating gloves, insulating shoes, etc.) when cleaning.

Do not immerse the module in part or in whole in water or any kind of cleaning solution.

Generally, the back of the module does not need to be cleaned. If it is necessary to clean the back of the double-sided module, be careful to avoid damage to the back of the module. It is recommended to carefully clean the stain with your hand or sponge.

Please use the solvent specified by Gokin in the cleaning method.

Cleaning Method

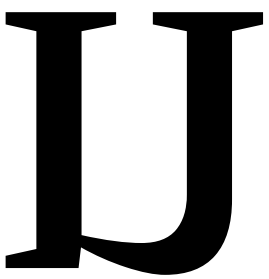
1. High pressure water cleaning

Water quality requirements: PH6~8
Water hardness: calcium carbonate concentration ≤600mg/L (Soft water cleaning is recommended)
Water pressure: ≤4MPa(40bar)

2. Compre

other soft cleaning tool.

Make sure any brushes or agitating tools are made of insulating material to minimize the risk of electric



	GK-2-66HT-670M	GK-2-66HT-675M	GK-2-66HT-680M	GK-2-66HT-685M	GK-2-66HT-690M	GK-2-66HT-695M	GK-2-66HT-700M	GK-2-66HT-705M	GK-2-66HT-710M	GK-2-66HT-715M	GK-2-66HT-720M	GK-2-66HT-725M
Voc-STC (±3%) [V]	46.50	46.70	46.90	47.10	47.30	47.50	47.90	48.68	48.91	49.14	49.36	49.55
Isc-STC (±3%) [A]	17.90	17.93	17.96	17.99	18.02	18.05	18.08	18.11	18.15	18.19	18.24	18.32
VPmax-STC [V]	39.90	40.10	40.30	40.50	40.70	40.86	41.10	41.29	41.50	41.69	41.91	42.10
IPmax-STC [A]	16.86	16.89	16.92	16.95	16.9ьһ							

	GK-1-72HT-560M	GK-1-72HT-565M	GK-1-72HT-570M	GK-1-72HT-575M	GK-1-72HT-580M	GK-1-72HT-585M	GK-1-72HT-590M	GK-1-72HT-595M	GK-1-72HT-600M	GK-1-72HT-605M		
Voc-STC (±3%) [V]	51.67	51.83	51.99	52.15	52.31	52.47	52.63	52.79	52.95	53.11		
Isc-STC (±3%) [A]	13.77	13.83	13.89	13.95	14.01	14.07	14.13	14.19	14.25	14.31		
VPmax-STC [V]	42.62	42.80	42.99	43.17	43.35	43.53	43.70	43.88	44.05	44.23		
IPmax-STC [A]	13.14	13.20	13.26	13.32	13.38	13.44	13.50	13.56	13.62	13.68		
Pmax (±3%) [W]	560	565	570	575	580	585	590	595	600	605		
Vsys [V]	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500		
Maximum series fuse [A]	25	25	25	25	25	25	25	25	25	25		
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class		

	GK-1-60HT-465M	GK-1-60HT-470M	GK-1-60HT-475M	GK-1-60HT-480M	GK-1-60HT-485M	GK-1-60HT-490M	GK-1-60HT-495M	GK-1-60HT-500M	GK-1-60HT-505M			
Voc-STC (±3%) [V]	42.22	42.38	42.54	42.71	42.86	43.02	43.18	43.34	43.50			
Isc-STC (±3%) [A]	14.07	14.15	14.23	14.31	14.39	14.48	14.56	14.64	14.72			
VPmax-STC [V]	34.89	35.05	35.21	35.38	35.54	35.70	35.84	36.00	36.15			
IPmax-STC [A]	13.33	13.41	13.49	13.57	13.65	13.73	13.81	13.89	13.97			
Pmax (±3%) [W]	465	470	475	480	485	490	495	500	505			
Vsys [V]	1500	1500	1500	1500	1500	1500	1500	1500	1500			
Maximum series fuse [A]	25	25	25	25	25	25	25	25	25			
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class			

(	

%)

	GK-2-66HP-650M	GK-2-66HP-655M	GK-2-66HP-660M	GK-2-66HP-665M	GK-2-66HP-670M
Voc-STC (±3%) [V]	45.20	45.40	45.60	45.80	46.00
Isc-STC (±3%) [A]	18.46				

	GK-1-60HP-450M	GK-1-60HP-455M	GK-1-60HP-460M	GK-1-60HP-465M							
Voc-STC (±3%) [V]	41.18	41.33	41.48	41.63							
Isc-STC (±3%) [A]	13.85	13.93	14.01	14.09							
VPmax-STC [V]	33.91	34.06	34.20	34.37							
IPmax-STC [A]	13.27	13.36	13.45	13.53							
Pmax (±3%) [W]	450	455	460	465							
Vsys [V]	1500	1500	1500	1500							
Maximum series fuse [A]	25	25	25	25							
Class of Protection	Class	Class	Class	Class							

	GK-1-54HP-405M	GK-1-54HP-410M	GK-1-54HP-415M	GK-1-54HP-420M							
Voc-STC (±3%) [V]	37.06	37.14	37.22	37.31							
Isc-STC (±3%) [A]	13.85	13.92	14.01	14.10							
VPmax-STC [V]	30.52	30.62	30.79	30.88							
IPmax-STC [A]	13.27	13.39	13.48	13.60							
Pmax (±3%) [W]	405	410	415	420							
Vsys [V]	1500	1500	1500	1500							
Maximum series fuse [A]	25	25	25	25							
Class of Protection	Class	Class	Class	Class							

	GK-3-72HG-610M	GK-3-72HG-615M	GK-3-72HG-620M	GK-3-72HG-640M	GK-3-72HG-645M	GK-3-72HG-650M	GK-3-72HG-655M	GK-3-72HG-660M	GK-3-72HG-665M	GK-3-72HG-670M	
Voc-STC (±3%) [V]	53.60	53.70	53.80	54.20	54.30	54.40	5				

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fuse [A]												
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class		

	GK-5-54HG-440M/GK-5-54HGb-440M	GK-5-54HG-445M/GK-5-54HGb-445M	GK-5-54HG-450M/GK-5-54HGb-450M	GK-5-54HG-455M/GK-5-54HGb-455M	GK-5-54HG-460M/GK-5-54HGb-460M	GK-5-54HG-465M/GK-5-54HGb-465M	GK-5-54HG-470M/GK-5-54HGb-470M	GK-5-54HG-475M/GK-5-54HGb-475M	GK-5-54HG-480M/GK-5-54HGb-480M	GK-5-54HG-485M/GK-5-54HGb-485M		
Voc-STC (±3%) [V]	40.82	40.88	40.94	41.00	41.06	41.12	41.18	41.24	41.30	41.36		
Isc-STC (±3%) [A]	13.92	14.02	14.12	14.22	14.25	14.29	14.32	14.36	14.41	14.47		
VPmax-STC [V]	34.38	34.44	34.50	34.56	34.62	34.68	34.74	34.80	34.86	34.92		
IPmax-STC [A]	12.80	12.93	13.05	13.17	13.29	13.41	13.54	13.66	13.78	13.90		
Pmax (±3%) [W]	440	445	450	455	460	465	470	475	480	485		
Vsys [V]	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500		
Maximum series fuse [A]	25	25										

Pmax (±3%) [W]	470	475	480	485	490	495	500	505	510			
Vsys [V]	1500	1500	1500	1500	1500	1500	1500	1500	1500			
Maximum series fuse [A]	25	25	25	25	25	25	25	25	25			
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class			

	GK-2-66HTBD-670M	GK-2-66HTBD-675M	GK-2-66HTBD-680M	GK-2-66HTBD-685M	GK-2-66HTBD-690M	GK-2-66HTBD-695M	GK-2-66HTBD-700M	GK-2-66HTBD-705M	GK-2-66HTBD-710M	GK-2-66HTBD-715M	GK-2-66HTBD-720M	GK-2-66HTBD-725M
Voc-STC (±3%) [V]	46.50	46.70	46.90	47.10	47.30	47.50	47.90	48.68	48.91	49.14	49.36	49.55
Isc-STC (±3%) [A]	17.90	17.93	17.96	17.99	18.02	18.05	18.08	18.11	18.15	18.19	18.24	18.32
Vmax-STC [V]	39.90	40.10	40.30	40.50	40.70	40.86	41.10	41.29	41.50	41.69		

	GK-2-60HTBD-610M	GK-2-60HTBD-615M	GK-2-60HTBD-620M	GK-2-60HTBD-625M	GK-2-60HTBD-630M	GK-2-60HTBD-635M	GK-2-60HTBD-640M	GK-2-60HTBD-645M	GK-2-60HTBD-650M	GK-2-60HTBD-655M	GK-2-60HTBD-660M	GK-2-60HTBD-665M
[illegible]%) [V]	42.66	42.84	43.01	43.19	43.36	43.54	43.72	43.90	44.08	44.26	44.44	44.62
[illegible]-STC (±3%) [A]	17.83	17.96	17.99	18.02	18.05	18.08	18.11	18.14	18.17	18.21	18.25	18.29
[illegible]Pmax-STC [V]	36.46	36.66	36.88	37.06	37.24	37.42	37.60	37.79	37.97	38.15	38.33	38.51
[illegible]Pmax-STC [A]	16.7	16.78	16.82	16.87	16.92	16.97	17.02	17.07	17.12	17.17	17.22	17.27
Pmax (±3%)-STC [W]	[illegible]	615	620	625	630	635	640	645	650	655	660	665
Voc-BNPI (±3%) [V]	42.75	42.91	43.07	43.23	43.39	43.57	43.75	43.93	44.11	44.29	44.47	44.65
Isc-BNPI (±3%) [A]	19.66	19.80	19.82	19.85	19.87	19.90	19.95	19.99	20.03	20.07	20.11	20.15
VPmax-BNPI [V]	36.61	36.78	36.97	37.14	37.31	37.47	37.64	37.81	37.97	38.15	38.33	38.51
IPmax-BNPI [A]	18.44	18.49	18.53	18.58	18.63	18.67	18.73	18.78	18.83	18.88	18.93	18.98
Pmax (±3%)-BNPI [W]	675	680	685	690	695	700	705	710	715	720	725	730
Isc-BSI (±3%) [A]	21.92	22.06	22.08	22.10	22.12	22.21	22.18	22.21	22.24	22.27	22.31	22.35
Vsys [V]	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Maximum series fuse [A]	35	35	35	35	35	35	35	35	35	35	35	35
Class of Protection												
Bifaciality coefficient	φPmax=80±5%,φIsc=80±5%,Voc=100±5%											

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	GK-4-66HTBD-590M	GK-4-66HTBD-595M	GK-4-66HTBD-600M	GK-4-66HTBD-605M	GK-4-66HTBD-610M	GK-4-66HTBD-615M	GK-4-66HTBD-620M	GK-4-66HTBD-625M	GK-4-66HTBD-630M	GK-4-66HTBD-635M	GK-4-66HTBD-640M	
Voc-STC (±3%) [V]	47.32	47.49	47.66	47.83	48.00	48.17	48.34	48.51	48.68	48.85	49.02	
Isc-STC (±3%) [A]	15.79	15.86	15.93	16.00	16.07	16.14	16.21	16.28	16.35	16.42	16.49	
VPmax-STC [V]	39.67	39.81	39.95	40.09	40.22	40.35	40.48	40.63	40.73	40.85	40.98	
IPmax-STC [A]	14.88	14.96	15.03	15.10	15.18	15.25	15.33	15.41	15.48	15.55	15.62	
Pmax (±3%)-STC [W]	590	595	600	605	610	615	620	625	630	635	640	
Voc-BNPI (±3%) [V]	47.32	47.49	47.66	47.83	48.10	48.27	48.44	48.61	48.78	48.95	49.12	
Isc-BNPI (±3%) [A]	17.37	17.44	17.51	17.58	17.72	17.79	17.97	18.05	18.12	18.19	18.26	
VPmax-BNPI [V]	39.71	39.84	39.96	40.09	40.35	40.47	40.58	40.73	40.81	40.93	41.06	
IPmax-BNPI [A]	16.37	16.45	16.52	16.59	16.74	16.81	16.89	16.97	17.04	17.11	17.18	
Pmax (±3%)-BNPI [W]	650	655	660	665	675	680	685	690	695	700	705	
Isc-BSI (±3%) [A]	19.41	19.48	19.55	19.62	19.75	19.82	20.02	20.09	20.16	20.23	20.3	
Vsys [V]	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	
Maximum series fuse [A]	30	30	30	30	30	30	30	30	30	30	30	
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class	
Bifaciality coefficient	φPmax=80±5%,φIsc=80±5%,Voc=100±5%											

	GK-4-78HTBD-720M	GK-4-78HTBD-725M	GK-4-78HTBD-730M	GK-4-78HTBD-735M	GK-4-78HTBD-740M	GK-4-78HTBD-745M	GK-4-78HTBD-750M					
Voc-STC (±3%) [V]	56.77	56.92	57.07	57.22	57.37	57.52	57.67					
Isc-STC (±3%) [A]	16.06	16.12	16.18	16.24	16.30	16.36	16.42					
VPmax-STC [V]	47.47	47.60	47.73	47.86	47.99	48.12	48.25					
IPmax-STC [A]	15.17	15.23	15.29	15.36	15.42	15.48	15.54					
Pmax (±3%)-STC [W]	720	725	730	735	740	745	750					
Voc-BNPI (±3%) [V]	56.77	56.92	57.07	57.22	57.37	57.52	57.67					
Isc-BNPI (±3%) [A]	17.63	17.69	17.75	17.81	17.87	17.93	17.99					
VPmax-BNPI [V]	47.49	47.62	47.75	47.88	48.01	48.14	48.27					
IPmax-BNPI [A]	16.64	16.69	16.75	16.81	16.87	16.93	16.99					
Pmax (±3%)-BNPI [W]	790	795	800	805	810	815	820					
Isc-BSI (±3%) [A]	19.54	19.60	19.66	19.72	19.78	19.84	19.90					
Vsys [V]	1500	1500	1500	1500	1500	1500	1500					
Maximum series fuse [A]	35	35	35	35	35	35	35					
Class of Protection	Class	Class	Class	Class	Class	Class	Class					
Bifaciality coefficient	φPmax=80±5%,φIsc=80±5%,Voc=100±5%											

	GK-4-54HTBD-480M	GK-4-54HTBD-485M	GK-4-54HTBD-490M	GK-4-54HTBD-495M	GK-4-54HTBD-500M	GK-4-54HTBD-505M	GK-4-54HTBD-510M	GK-4-54HTBD-515M	GK-4-54HTBD-520M			
Voc-STC (±3%) [V]	39.21	39.41	39.61	39.81	40.02	40.22	40.42	40.62	40.82			
Isc-STC (±3%) [A]	15.62	15.68	15.75	15.81	15.88	15.95	16.01	16.08	16.14			
VPmax-STC [V]	32.25	32.45	32.65	32.85	33.05	33.25	33.45	33.64	33.84			
IPmax-STC [A]	14.89	14.95	15.02	15.07	15.13	15.19	15.25	15.31	15.37			
Pmax (±3%)-STC [W]	480	485	490	495	500	505	510	515	520			
Voc-BNPI (±3%) [V]	39.21	39.41	39.61	39.81	40.02	40.22	40.42	40.62	40.82			
Isc-BNPI (±3%) [A]	17.23	17.29	17.35	17.41	17.47	17.53	17.59	17.64	17.7			
VPmax-BNPI [V]	32.28	32.45	32.65	32.85	33.05	33.25	33.45	33.64	33.84			
IPmax-BNPI [A]	16.42	16.49	16.54	16.59	16.64	16.69	16.74	16.80	16.86			
Pmax (±3%)-BNPI [W]	530	535	540	545	550	555	560	565	570			
Isc-BSI (±3%) [A]	19.17	19.22	19.27	19.32	19.37	19.42	19.47	19.51	19.56			
Vsys [V]	1500	1500	1500	1500	1500	1500	1500	1500	1500			
Maximum series fuse [A]	35	35	35	35	35	35	35	35	35			
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class			
Bifaciality coefficient	φPmax=80±5%,φIsc=80±5%,Voc=100±5%											

	GK-1-72HTBD-560M	GK-1-72HTBD-565M	GK-1-72HTBD-570M	GK-1-72HTBD-575M	GK-1-72HTBD-580M	GK-1-72HTBD-585M	GK-1-72HTBD-590M	GK-1-72HTBD-595M	GK-1-72HTBD-600M	GK-1-72HTBD-605M
Voc-STC (±3%) [V]	50.67	50.87	51.07	51.27	51.47	51.67	51.87	52.07	52.27	52.47
Isc-STC (±3%) [A]	14.13	14.19	14.25	14.31	14.37	14.43	14.49	14.55	14.61	14.67
VPmax-STC [V]	41.95	42.14	42.29	42.44	42.59	42.74	42.89	43.04	43.19	43.36
IPmax-STC [A]	13.35	13.41	13.48	13.55	13.62	13.69	13.76	13.83	13.90	13.96
Pmax (±										

	GK-1-54HTBD-420M	GK-1-54HTBD-425M	GK-1-54HTBD-430M	GK-1-54HTBD-435M	GK-1-54HTBD-440M	GK-1-54HTBD-445M	GK-1-54HTBD-450M	GK-1-54HTBD-455M
Voc-STC (±3%) [V]	38.11	38.30	38.49	38.68	38.87	39.06	39.25	39.44
Isc-STC (±3%) [A]	14.07	14.15	14.23	14.30	14.37	14.44	14.51	14.59
VPmax-STC [V]	31.51	31.70	31.88	32.07	32.26	32.45	32.59	32.76
IPmax-STC [A]	13.33	13.41	13.49	13.57	13.65	13.73	13.81	13.89
Pmax (±3%)-STC [W]	420	425	430	435	440	445	450	455
Voc-BNPI (±3%) [V]	38.12	38.37	38.54	38.71	38.90	39.09	39.28	39.47
Isc-BNPI (±3%) [A]	15.44	15.60	15.68	15.75	15.82	15.88	15.95	16.03
VPmax-BNPI [V]	31.51	31.80	31.97	32.13	32.30	32.48	32.61	32.78
IPmax-BNPI [A]	14.62	14.78	14.86	14.94	15.02	15.10	15.18	15.26
Pmax (±3%)-BNPI [W]	460	470	475	480	485	490	495	500
Isc-BSI (±3%) [A]	17.21	17.38	17.45					

	GK-2-66HPBD-650M	GK-2-66HPBD-655M	GK-2-66HPBD-660M	GK-2-66HPBD-665M	GK-2-66HPBD-670M
Voc-STC (±3%) [V]	45.20	45.40	45.60	45.80	46.00
Isc-STC (±3%) [A]	18.46				

	GK-1-78HGBD-655M	GK-1-78HGBD-660M	GK-1-78HGBD-665M	GK-1-78HGBD-670M	GK-1-78HGBD-675M	GK-1-78HGBD-680M	GK-1-78HGBD-685M
Voc-STC (±3%) [V]	58.74	58.80	58.86	58.92	58.98	59.04	59.10
Isc-STC (±3%) [A]	14.21	14.28	14.35	14.42	14.49	14.56	14.64
VPmax-STC [V]	48.61	48.67	48.73	48.79	48.85	48.91	48.97
IPmax-STC [A]	13.4						

				GK-3-	K-3-		GK-
					HGB	54	54H
				485M		4	M
				/GK-3		/	K-3-
				54HGB		54	GDb-
			80M	485M	90	4	0M
Voc			0.76	40.89	1	4	1.28
				15	5.10		15.24
VPmax-STC [V]	33.64	33.74	33.84	33.94	34.04	34.14	34.24
IPmax-STC [A]	13.98	14.09	14.19	14.30	14.40	14.50	14.60
Pmax (±3%)-STC [W]	470	475	480	485	490	495	500
Voc-BNPI (±3%) [V]	40.53	40.63	40.73	40.83	40.93	41.03	41.13
Isc-BNPI (±3%) [A]	15.96	16.06	16.16	16.26	16.36	16.˛ ˜ŭ	16.˛ 6
VPmax-BNPI [V]	33.65	33.75	33.85	33.95	34.05	34.15	34.25

Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class	Class		
Bifaciality coefficient	φPmax=70±5%,φIsc=70±5%,Voc=100±5%											

GK-5-54HG

Bifaciality coefficient	φPmax=70±5%,φIsc=70±5%,Vocc±

Bifaciality coefficient	φPmax=40±5%,φIsc=40±5%,Voc=100±5%

	GK-3-54HGFDb-470M/GK-3-54HGFBD-470M	GK-3-54HGFDb-475M/GK-3-54HGFBD-475M	GK-3-54HGFDb-480M/GK-3-54HGFBD-480M	GK-3-54HGFDb-485M/GK-3-54HGFBD-485M	GK-3-54HGFDb-490M/GK-3-54HGFBD-490M	GK-3-54HGFDb-495M/GK-3-54HGFBD-495M	GK-3-54HGFDb-500M/GK-3-54HGFBD-500M	GK-3-54HGFDb-505M/GK-3-54HGFBD-505M	GK-3-54HGFDb-510M/GK-3-54HGFBD-510M			
Voc-STC (±3%) [V]	40.24	40.34	40.44	40.54	40.64	40.74	40.84	40.94	41.04			
Isc-STC (±3%) [A]	14.58	14.68	14.78	14.88	14.98	15.08	15.18	15.28	15.38			
VPmax-STC [V]	34.94	35.04	35.14	35.24	35.34	35.44	35.54	35.64	35.74			
IPmax-STC [A]	13.47	13.57	13.67	13.77	13.88	13.98	14.08	14.18	14.28			
Pmax (±3%)-STC [W]	470	475	480	485	490	495	500	505	510			
Voc-BNPI (±3%) [V]	40.24	40.34	40.44	40.54	40.64	40.74	40.84	40.94	41.04			
Isc-BNPI (±3%) [A]	11.76	12.76	13.76	14.76	15.76	15.86	15.96	16.06	16.16			
VPmax-BNPI [V]	34.94	35.04	35.14	35.24	35.34	35.44	35.54	35.64	35.74			
IPmax-BNPI [A]	14.18	14.28	14.38	14.48	14.58	14.68	14.78	14.88	14.98			
Pmax (±3%)-BNPI [W]	495	500	505	510	515	520	525	530	535			
Isc-BSI (±3%) [A]	16.66	16.71	16.76	16.81	16.86	16.91	16.96	17.01	17.06			
Vsys [V]	1500	1500	1500	1500	1500	1500	1500	1500	1500			
Maximum series fuse [A]	30	30	30	30	30	30	30	30	30			
Class of Protection	Class	Class	Class	Class	Class	Class	Class	Class	Class			
Bifaciality coefficient	φPmax=40±5%,φIsc=40±5%,Voc=100±5%											

J-box		Connector		cable		Bypass diode	
Manufacture	Type	Manufacture	Type	Manufacture	Type	Type	Technical data
		Ningbo Minghe New Energy Technology Co.,Ltd	PV-MH5	Wuxi Xinhongye Wire&Cable Co., Ltd.	62930 IEC131 1*4mm²	25SQ045	Max. diode current [A]: 25 Tj
Ningbo Minghe New Energy Technology Co.,Ltd	MH2z						

			Jiangxi Jinko PV Material Co., Ltd.	62930 IEC 131 1X1,5...10mm² HALOGEN FREE LOW SMOKE		
			Jiangxi Jinko PV Material Co., Ltd.	62930 IEC 131 1x4,0mm2		
	Suzhou Xtong Photovoltaic Technologies Co.,Ltd	PV-XT101.1;PV-XT101.2;XT2	Wuxi Xinhongye Wire & Cable Co., Ltd.	62930 IEC 131 1X1,5...35mm²	XT3050A (x=3, y=3, z=7)	Max. diode current [A]: 30 Tj [°C]: 200
	Stäubli Electrical connectors AG	PV-KST4-EVO 2/xy_UR&PV-KBT4-EVO2/xy_UR PV-KST4-EVO2A/xy&PV-KBT4-EVO2A/xy	Suzhou Xtong Photovoltaic Technologies Co., Ltd	62930 IEC 131 1X1,5...35mm² HALOGEN FREE LOW SMOKE	XT3050M-B (x=2 or 4, y=2, z=8)	Max. diode current [A]: 30 Tj [°C]: 200
Suzhou Xtong Photovoltaic Technologies Co.,Ltd	PV-XT1609Nxyz				XT4050M-A (x=2	