



Bohai New Energy (Hefei) Co., Ltd. (document)

博海新能源（合肥）有限公司（文件）

博海新能源（合肥）有限公司
受 控 文 件

安 装 手 册 Instruction Manual

(适用于博海系列光伏组件)

(Applicable to Bohai series PV modules)

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1. 概述 Overview

首先非常感谢您选择了博海新能源光伏组件，本手册适用于博海新能源(以下简称博海)生产的边框系列太阳能组件的安装、维护和使用。如果不遵守这些安全指南，将可能导致人员伤亡或财产损失。First of all, thank you very much for choosing BoHai New Energy module, This Manual applies to the installation, maintenance and use of the framed series solar modules manufactured by BoHai New Energy (Hefei) Co., Ltd. (hereinafter referred to as “BoHai New Energy”). Failure to follow these safety instructions could result in personal injury or property damage.

安装和操作太阳能组件需要专业的技能，只有专业人员才可以从事该项工作。请在使用和操作组件之前仔细阅读安全和安装说明。安装商必须相应地把上述事项告知终端客户(或消费者)。

Installation and operation of solar modules require specialized skills, and only professional personnel can engage in the work. Please read the “Safety and Installation Instructions” carefully before using and operating the modules. The installer must inform the end customer (or consumer) of the above matters accordingly.

请将此手册进行妥善保管，以备日后参考（维护和保养）或者组件可能的出售及处置情。Please keep this manual safe for future reference (maintenance and maintenance) or possible sale and disposal of components.

2. 免责声明 Disclaimer Notices

博海新能源保留在没有预先通知的情况下变更本安装手册的权利。客户在安装组件过程中未按照本手册中所列出的要求操作，会导致提供给客户的产品有限质保失效。

Bohai Solar reserves the rights to change this User Manual without prior notice. Failure of the customer to follow the requirements outlined in this Manual during the installation of the module will result in the invalidity of product's limited warranty.

博海太阳能不为任何形式的伤害负责，包括但不限于组件操作、系统安装失误以及未按照本手册的指示产生的身体伤害、受伤和财产损失负责。

Bohai Solar is not responsible for any form of damage, including but not limited to module operation and system installation error, and personnel injury, hurt, and property loss resulted from failure to follow the instructions in this Manual.

3. 适用产品 Applicable product

本手册适用于以下型号系列的的组件产品：

This manual applies to the following model series of components:

182mm 单晶硅半片电池片(双玻)

182mm Monocrystalline Silicon half cell (Double glass)

序号	组件型号	组件尺寸(mm)	安装孔距(mm)
Type1	BHM156N1DGT-XXX(XXX=600-645)	2279*1134*30	400/1200/1600
Type2	BHM144N1DGT-XXX(XXX=560-590)	2279*1134*30	400/1100/1400
Type3	BHM132N1DGT-XXX(XXX=520-545)	2094*1134*30	400/790/1400

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Type4	BHM120N1DGT-XXX(XXX=475-495)	1908*1134**30	860/1360
Type5	BHM108N1DGT-XXX(XXX=415-445)	1722*1134*30	990/1400

210mm 单晶硅半片电池片(双玻)

210mm Monocrystalline Silicon half cell (Double glass)

序号	组件型号	组件尺寸(mm)	安装孔距(mm)
Type6	BHM132N3DGT-XXX(XXX=680-710)	2384*1303*30	400/1400
Type7	BHM132N3DGT-XXX(XXX=690-720)	2384*1303*35	400/1400

210*182mm 矩形电池片(双玻)

210*182mm rectangular cell (Double glass)

序号	组件型号	组件尺寸(mm)	安装孔距(mm)
Type8	BHM132N4DGT-XXX(XXX=590-620)	2382*1134*30	400/1000/1400
Type9	BHM120N4DGT-XXX(XXX=540-555)	2172*1134*30	400/790/1400
Type10	BHM108N4DGT-XXX(XXX=485-500)	1961*1134*30	400/990/1300
Type11	BHM96N4DGT-XXX(XXX=430-445)	1762*1134*30	860/1400

注 1: XXX 代表功率

Note1: XXX stands for power

注 2: Type7 为海上光伏组件;

Note2: Type7 is an offshore photovoltaic module;

4. 安全防范 Safety Precautions

4.1 警告 Warning

对组件进行安装、接线、操作或维护前，应阅读并理解所有安全细则。当组件电池面直接暴露在阳光或其他光源下时，会产生直流电(DC)，无论是否连接组件，直接接触组件的带电部分，例如接线端子等，将可能导致人员伤亡。

Before installing, wiring, operating, or maintaining modules, you should read and understand all safety precautions. Direct current (DC) is generated when the battery surface of the module is exposed to direct sunlight or other light sources, and direct contact with the live parts of the module, such as terminals, may result in death of personnel whether connected to the module or not.

4.2 通用安全 General Safety

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组件适用于大于 50 伏直流电压或 240 瓦功率以上的系统，通过 IEC 61730-2 标准即符合安全等级 II 才可以用于安全安装（仅 IEC）

The components are suitable for systems with a dc voltage greater than 50 volts or 240 watts of power and can be used for safe installation in accordance with THE IEC61730-2 safety class II standard (IEC only).

安装组件必须具备专业技能和知识，安装工作必须由具有相关资质的人员进行，电气连接需要由持证电工进行操作，并符合当地法律法规；组件设计用于室外用途，可以将光能直接转化为直流电能。组件可以安装在地面、屋顶、车辆或船只等不同地点，进行合理的支撑结构设计是系统设计者和安装者的责任。

Components must be installed by qualified personnel with professional skills and knowledge. Electrical connections must be operated by licensed electricians and comply with local laws and regulations. The components are designed for outdoor use and convey.

不要人为在组件上聚光。

Do not artificially focus light on the module.

不要用具有腐蚀性的化学物品来擦拭组件。

Do not wipe components with corrosive chemicals.

不要安装玻璃已损坏或背板损坏的组件。

Do NOT install modules with damaged glass or damaged backsheet .

当组件有电流或外部电流出现时，不得连接或断开组件。

Do NOT connect or disconnect the module when it is energized or connected with an external power supply

4.3 搬运安全 Transportation safety

不要通过抓握组件接线盒或引线的方式来搬运组件。

Do not move a component by holding the component junction box or lead.

不要摔扔组件或允许物品掉落至组件上。

Do not drop components or allow items to fall onto components.

在移动、运输和安装组件的过程中必须小心轻放。

Handle with care when moving, transporting, and installing components.

不要刮蹭或者敲击组件背板。

Do not scratch or tap the backplane of the component.

不要在组件边框上打孔，这会导致边框机械强度降低且电池片因振动产生隐裂。

Do not punch holes in the frame of the component, as this will reduce the

mechanical strength of the frame and cause the cell

不要破坏边框表面的阳极氧化层（除了用于接地），这会导致边框腐蚀。

Do not break the anodized layer on the surface of the frame (except for grounding), which can cause frame corrosion.

不要使用玻璃碎裂或者背板撕裂而具有触电危险的组件。

Do not use components that could be electrocuted if the glass is broken or the backplane is torn.

除非采取了适当地保护措施，否则不要在潮湿情况下搬运组件。

Do not move components in wet conditions unless proper protection is taken. 在未安装之

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前不要将组件暴露在阳光下，以避免不必要的衰减。

Do not expose components to sunlight before installation to avoid unnecessary
 在所有的搬运和运输过程中，确保组件不会受到剧烈的震动，因为震动有可能导致组件内部的电池片隐裂或者损坏组件。

During all handling and transportation, ensure that the components are not subjected to severe vibration, because vibration may cause hidden cracks in the batteries or damage the components.

4.4 安装安全 Install security

光伏发电系统的安装需要具备专业的技能和知识，必须由专业的工程师完成。

The installation of photovoltaic power generation systems requires professional skills and knowledge and must be completed by professional engineers.

光伏组件推荐安装海拔不超过 2000 米。

It is recommended that the pv module be installed at an altitude of less than 2000 m. 不要在组件上站立行走或放置重物。

Do not stand, walk or place heavy objects on the components.

安装之前应仔细检查支架的平行度、平整度、牢固度以及支架的接地是否正常。

Before installation, carefully check the parallelism, flatness, firmness and grounding of the support.

穿戴好防护用品，如：安全帽、安全鞋、安全带等必要的安全防护用具，做好安全防护措施。

Wear protective equipment, such as safety helmet, safety shoes, safety belt and other necessary safety protection equipment, and take safety protectio

安装时确保组件的水平度和垂直度，在有光照的情况下严禁用手或身体其他部位触碰到接线 部位的任何金属附件，否则有触电的危险。

Ensure the levelness and verticality of the components during installation. Do not touch any metal accessories in the wiring part with your hands or other parts of the body under the condition of light. Otherwise, there is the risk of electric shock.

组件安装完成后做好防护措施，避免类似油漆或其他粘合剂污染组件，影响系统的发电量。

After components are installed, take protective measures to prevent components from being contaminated by paints or other adhesives, which may affect the power generation of the system.

请不要在潮湿或者大风期间安装或处理组件。在安装现场，请保持组件电器元件的清洁与干燥。如果线缆插头在潮湿条件下互相接触，会被腐蚀。任何被腐蚀的组件都不能被使。

Do NOT install or handle modules when they are wet or during periods of high wind. At the installation site, take care to keep modules and in particular their electrical contacts, clean and dry before installation. If connector cables are left in damp conditions then the contacts may corrode. Any module with corroded contacts should not be used.

安装组件之间的连接线时必须佩带相应等级的绝缘手套，否则会有触电伤人的危险。

Wear insulation gloves when installing cables between components; otherwise, electric shock may occur.

安装组件或进行接线时，必须用不透明的材料覆盖组件正面，否则会有触电伤人的危险。

When installing components or connecting cables, cover the front of components with opaque materials; otherwise, electric shock may occur.

安装组件时，禁止在组件的任何地方打孔或切割，否则质保失效。

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When installing a component, do not drill or cut any part of the component.

Otherwise, the warranty will be invalid.

严禁人工聚光照射组件正面，否则对组件造成不可逆转的损坏，同时也会造成人身伤害。

Do not spotlight the front of the component. Otherwise, irreversible damage may be caused to the component and personal injury may occur.

接线时请务必连接地线，否则有触电，火灾的危险。

Be sure to connect the ground wire when wiring, otherwise there may be electric shock and fire risk.

请有相应操作资格的电工专业人员完成配线接线工作，否则会有触电，火灾的危险。

Complete wiring by qualified electricians; otherwise, electric shock or fire may occur.

安装方式不能阻塞组件排水孔。

The installation can not block the module' drain hole.

正常情况下，一块光伏组件产生的电流和/或电压可能比标准试验条件下产生的多。因此在计算组件额定电压、额定电流、保险熔断和连接至 PV 输出的控件规格时，应当将标记在该组件上的 I_{sc} 和 V_{oc} 的值乘以 1.25 的系数。

Normally, a photovoltaic module may generate more current and/or voltage than under standard test conditions. The I_{sc} and V_{oc} values marked on the component should therefore be multiplied by a factor of 1.25 when calculating the rated voltage, rated current, fuses and control specifications connected to the PV output.

4.5 位置与角度 Position and Angle

我们建议将组件安装在阳光资源充足的地方。在北半球，组件通常应该面向南方；而在南半球，组件通常应该面向北方。组件的最佳安装角度会根据经纬度的不同而变化，请在确定安装位置和角度时咨询具有相应知识的专家。（推荐的组件安装夹角不小于 10° ）

We recommend installing components in a sunny location. In the Northern hemisphere, components should normally face south; In the southern hemisphere, components should normally face north. The optimal installation Angle for components varies according to latitude and longitude. Consult experts with relevant knowledge when determining the installation position and Angle. (The component installation Angle recommended by no less than 10°)

对于地面安装系统，建议地面离组件底部的最小距离至少为 60 厘米。

For ground-mounted systems, recommends a minimum distance of at least 60 cm from the floor to the bottom of the assembly.

在选择安装地点时，请避开可能在组件上投射阴影的树木、建筑物或障碍物，阴影会引起热斑和发电损失，即便工厂在组件中配置了旁路二极管也只能减少而不能避免这项损失。

When selecting installation sites, avoid trees, buildings, or obstacles that may cast shadows on the components. Shadows can cause hot spots and loss of power generation, which can only be reduced, not avoided, even if the factory is equipped with bypass.

请勿安装在可燃气体附近。

Make sure flammable gases are NOT generated near the installation site.

不要在可能遭到水淹或者不断被洒水器或喷泉淋到的地方安装组件。

Do not install components in areas that are likely to be flooded or continuously flooded

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by sprinklers or fountains.

当在屋顶安装太阳能电池组件时，务必在屋顶的边缘和太阳能电池阵列之间保持一个安全的工作区域。大型电站的阵列之间要有一定的安全距离，方便对阵列里面的组件进行清理，检测和维修。
When installing solar modules on the roof, be sure to maintain a safe working area between the edge of the roof and the solar arrays. There must be a certain safety distance between arrays of large power stations in order to facilitate the cleaning, inspection, and maintenance of the modules inside the array

在屋顶安装组件时，要保证屋顶结构合适，遵循当地的建筑规范和特定的屋顶材料安装在一起才能满足防火 class C。此外，安装固定组件时需要穿透的屋顶必须适当密封，以防屋漏。
When installing components on the roof, ensure that the roof is structurally appropriate and is installed together with specific roof materials in accordance with local building codes to meet fire Class C requirements. In addition, the roof penetration required to install the fixtures must be properly sealed to prevent leaks. 组件框架和墙面或屋面之间的空隙建议至少保持 115 毫米；如果有其他安装方式，就可能影响防火等级的评估。

A minimum of 115 mm is recommended between the assembly frame and the wall ; Tests by other installers may affect the fire rating assessment.

两个组件最小间距为 10 毫米。

The spacing between two modules should be at least 10mm.

常规安装情况下，使用边框内侧的四个对称安装孔将组件固定在支架上。如果预计对安装有更高的抗风或者抗雪要求，同时采用 12 个安装孔来加强固定。

In normal installation cases, four symmetrical mounting holes inside the border are used for securing the modules to the bracket. If the installation is expected to have a higher wind or snow-resistant requirements, then it could use twelve mounting holes to strengthen. 博海推荐组件工作温度为-20℃ ~46℃的环境，组件的极限工作温度为-40℃ ~85℃；湿度：<85RH%使用光伏组件。

Bohai recommends the working environment temperature of the components is -20℃ ~46℃, and the limit working environment temperature of the components is -40℃ ~85℃; Humidity: < 85RH % using photovoltaic modules.

5. 安装 Installation



5.1 螺栓/压块安装 Bolt/block mounting

通过组件背面边框上的安装孔，使用螺栓把组件固定在支架上，
安装细节如下图所示。

module to the support rails with bolts. The mounting details are shown in the following figures.

单块组件使用四个 $\phi 7*10\text{mm}$ 安装孔和八个 $\phi 9*14\text{mm}$ 安装孔安装（实际可根据现场实际情况使用）。

The single module is installed with four $\phi 7*10\text{mm}$

mounting holes and eight $\phi 9 \times 14$ mm mounting holes, (It can be used based on the actual situation.)

如右图

单玻组件系列安装图示

Backsheet-Glass module

双玻带框组件系列安装图示

Duomax serial module with frame

1. 铝边框 aluminum frame

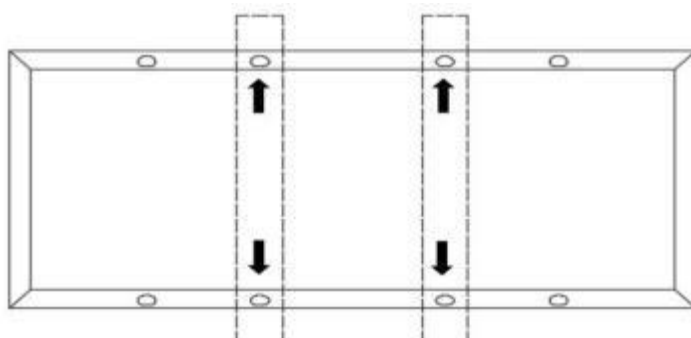
2. 螺栓 boit

3. 平垫片 flat stainless washer

4. 弹簧垫片 spring stainless

washer

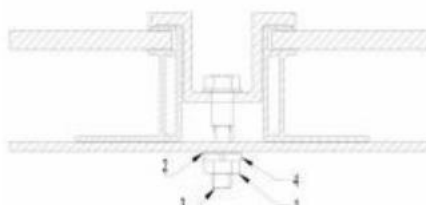
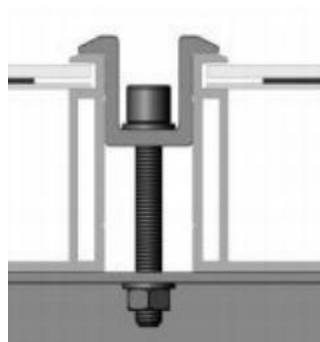
5. 螺母 nut



设计载荷正面(Design Load Front side)3600 Pa, 设计载荷反面(Design Load Backside)1600Pa,
注：测试载荷= γm (安全因子) \times 设计载荷, $\gamma m=1.5$
Note: Test load = γm (safety factors) \times design load, $\gamma m=1.5$

通过使用压块在组件边框 A/B 面施加力，使用螺栓把组件固定在支架上，安装细节下图所示。

By applying force to sides A/B of the frame of the assembly using A press block, the assembly is bolted to the bracket, installation details shown below.



- 1) 不锈钢螺母 Stainless steel nut
- 2) 不锈钢垫圈 Stainless steel washers
- 3) M8 的不锈钢螺栓 M8 stainless steel bolts
- 4) 弹簧垫圈 Spring washer

安装压块 Install pressure block

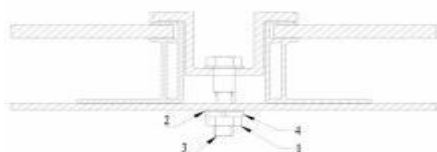


设计载荷 Design Load	安全系数 Safety factor	安装范围 Mounting range	安装图 Mounting Direction
+1600Pa/ -1600Pa	1.5	$L/B \leq L/4$	
3600Pa/ -1600Pa	1.5	$L/5 \leq L/4$	

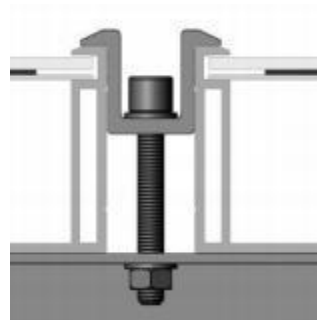
注：测试载荷= γm (安全因子) \times 设计载荷, $\gamma m=1.5$; $a \geq 50$
Note: Test load = γm (safety factors) \times design load, $\gamma m=1.5$; $a \geq 50$

组件可以使用安装孔、夹具*或滑槽被安装在支架上，建议的安装扭矩 20Nm-25Nm, 每个夹具最小建议长度为 50 mm。

Components can be mounted on brackets using mounting holes, clamps * or chute with recommended mounting torque of 20nm-25nm and minimum recommended length of 50 mm per clamp.



- 1) 不锈钢螺母 Stainless steel nut
- 2) 不锈钢垫圈 Stainless steel washers
- 3) M8 的不锈钢螺栓 M8 stainless steel bolts
- 4) 弹簧垫圈 Spring washer



5.2 电气安装 Electrical installation

在一个光伏发电系统中尽量使用相同的组件，组件的最大数量

Try to use the same modules in a photovoltaic system with maximum number of the modules
几个组件串联，然后并联形成光伏阵列，这特别适用于电压较高的情况下。如果组件串联，总电压等于各个组件电压的总和。

Several modules in series, and then form a PV array in parallel, which is particularly suitable for high voltage situations. If the modules are connected in series, the total voltage is equal to the sum of the voltages of the individual modules. $N = V_{(max)} / [V_{oc}(atSTC)]$

需要使用高电流的情况下，为保证安全一组串一个保险丝后再并联，总电流等于各个组件电流的总和。

When a high current is required, the total current is equal to the sum of the current of each component in a series of fuses connected in parallel to ensure safety.

只有具有资质的人员可以进行组件的安装或维护工作

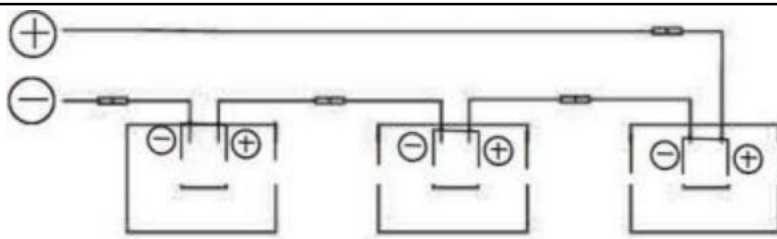
Only qualified personnel are allowed to install or maintain components

不得在组件处于潮湿状态时进行搬运或安装使用的线缆配件必须与组件相兼容

Do not move or install components when they are wet. Cable accessories must be compatible with components

相互串联的组件具有相同的电流，每个组串的开路电压不得高于系统的最大电压（参考组件背面铭牌上所标识的最大系统电压），在计算组串的开路电压时必须考虑到温度系数以及安装地点极端最低气温所带来的影响。

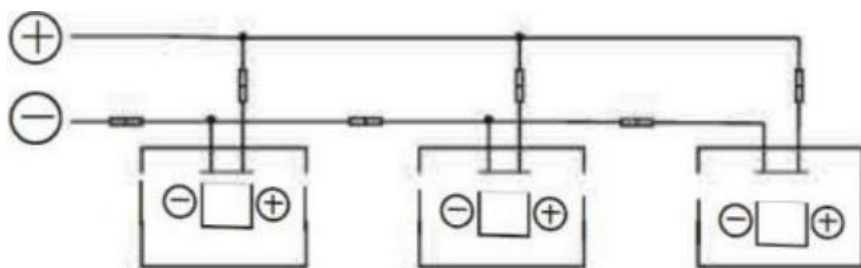
Components connected in series have the same current. The open circuit voltage of each string must not be higher than the maximum system voltage (refer to the maximum system voltage identified on the nameplate on the back of the component). The temperature coefficient and the influence of the extreme minimum temperature at the installation site must be taken into account when calculating the open circuit voltage of the string.



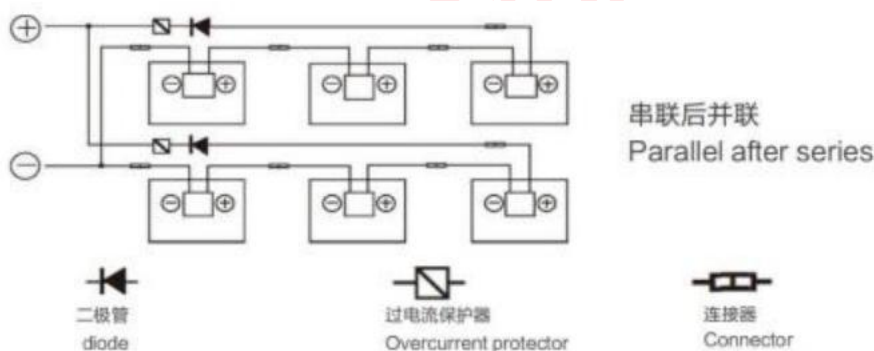
串联 Tandem

相互并联的组件具有相同的电压，在计算阵列的短路电流时必须考虑到温度系数以及安装地点极端最高气温所带来的影响。

The components in parallel have the same voltage, and the temperature coefficient and the influence of the extreme maximum temperature at the installation site must be taken into account when calculating the short-circuit current of the array.



并联 Parallel



串联后并联
Parallel after series

连接器正负极(MC4 兼容) Connector positive and negative terminals(MC4 compatible)

序号	厂家 manufacturer	连接器 (Connector)	序号	厂家 manufacturer	连接器 (Connector)
1	Staubli Electrical Connectors AG	PV-KST4-EVO 2/xy_UR	1	Staubli Electrical Connectors AG	PV-KST4/xy_UR
		PV-KBT4-EVO 2/xy_UR	4		PV-KBT4/xy_UR
2	Jiangxi Jinko PV Material Co., Ltd.	PV-JK03M/xy	1 5	AmphenolTechnology (Shenzhen) Co., Ltd.	UTXCFabcd

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		PV-JK03M1/xyz	1 6	Zhejiang Zhonghuan Sunter PVTechnology Co, Ltd.	PV-ZH202B
		PV-JK03M1/xy	1 7	Tyco Electronics (Shanghai)Co., Ltd.	PV4-S1yx(y=ForM; x=4,0)
		PV-JK03M2/xy	1 8	Trina Solar Co., Ltd.	TS4-xz(x=1;z=2)
3	Zhejiang JiamingTianheyuan Photovoltaics Technology Co., Ltd.	PV-JM601A	1 9	Phoenix Contact GmbH&Co.KG	PV-CF-C-2.5-4-SETxxxx
		PV-JM608			PV-CM-C-2.5-4-SETxxxx
4	ZhejiangChuangyuanPhotov oltaic TechnologyCo., Ltd	PV-CY03L	2 0	Hanwha Q CELLS(Qidong)Co., Ltd	HQC4
		PV-CY02L			PV-JK03 M/xyPlug+Socket)(x=2.y=B)
5	Jiangsu Holysun Electronics Technology Co., Ltd.	C1xyz	2 1	Jiangxi Jinko PV MaterialCo., Ltd.	PV-JK03M1/xy(Plug+Socket)(x= 2,y=B)
		C2			JK03M2/xy(Plug+Socket)(x=2.y =8)
		C2A			PVJK03M/xy(Plug+Socket)(x=2, y=C)
6	Zerun Co., Ltd.	Z4S-abcde	2 2	Zerun Co., Ltd	PV-JK03M1/xy(Plug+Socket)(x= 2.y=C)
7	AmphenolTechnology (Shenzhen) Co.. Ltd.	UTXCFabce(female) UTXCMabcd(male)			PV-JK03M2/xy(Plug+Socket)(x= 2.y=C)
8	Tyco Electrical AustriaGmbH	PV4-S1yx			Z4S-abcde Z4S-abcd

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9	Zhejiang Zhonghuan SunterPV Technlogy Co. Ltd.	PV-zh202B	2 3	Amphenol Technology	UTXCFabce UTXCMabcd
1 0	JINZHOUYANGGUANG ENERGY CO.,LTD.	C1xyz(x=blank ,y=blank;z=blank)	2 4	Tyco Electronics	PV4-S1yx
1 1	Jiangsu Holysun Electronics Technology Co., Ltd.	C1xyz(x=blank ,y=blank;z=blank)	2 5	Staubli Electrical Connectors AG	PV-KST4-EVO2/xy PV-KBT4-EVO 2/xy
		C2xyz(x=blank;y=blank.z=blank)	2 6	Zhejiang Renhe PhotovoltaicTechnology Co., Ltd	5月8日
1 2	AmphenalTechnology (Shenzhen)Co.,Ltd.	PV-TT02			
1 3	Taizhou Jinxiu Electrical Science & Technology Co., Ltd.	LJQ-1	2 7	Suzhou Xtong Photovoltaic Technologies Co. Ltd	PV-XT101.2
		LJQ-3			

二极管型号 (Diode model)

序号	二极管型号 (Diode model)		序号	二极管型号 (Diode model)	
1	TPA4050B-T	25A	33	TPA3045	18A
2	TPA4050-T	25A	34	FMK4530B	30A
3	TPA4050D-T	25A	35	FMK5040D	25A
4	TPA4050A-T	30A	36	FMK3040P	28A
5	TPA3050C-T	22A	37	FMK5060D	30A
6	TPA3050B-T	22A	38	FMK4545D	25A
7	TPA4050S-2	25A	39	FMK4560T	25A
8	TPA4050S-3	30A	40	THY4050	25A
9	THY2550(3)	20A	41	SBT4050DY	25A

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10	THY2550(1)	20A	42	RT3050	20A
11	THY2550(4)	20A	43	RT3550	25A
12	30SQ045-SL	25A	44	RT4550	30A
13	GFT4050SM	20A	45	TPA3045A	20A
14	30SQ045	20A	46	TPA3045B	20A
15	35SQ045	25A	47	TPA3045S-1	20A
16	40SQ045	30A	48	TPA4050S-4	35A
17	FMK4530T	20A	49	GFT3050SM	20A
18	FMK4525A	16A	50	GF3045	20A
19	FMK4530A	18A	51	GF5045	25A
20	MK5045	30A	52	GF6045	30A
21	2545W	22A	53	25SQ045 for PV-CY21xyz(x=1)	20A
22	2545S	22A	54	40SQ045for PV-CY21xyz(X=3)	30A
23	3045W	25A	55	30SQ045-SLforPV-CY21xyz(X=2)	25A
24	3045S	25A	56	SB2545DY	15A
25	4045W	30A	57	SB3045DY	25A
26	4045S	30A	58	SPA4045	25A
27	4545W	35A	59	SPA4545	30A
28	4545S	35A	60	TPA4050U-3	30A
29	30SQ045	20A	61	XT4550M-B	30A
30	40SQ050A	25A	62	XT3050M-B	20A
31	40SQ050B	30A	63	XT4050M-B	25A
32	TPA3550U	25A	64	XT4050M-B	25A

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缆的横截面积和连接器容量必须满足光伏系统最大短路电流的需求（对于不同版型组件我们推荐的线缆横截面积为 $\geq 4\text{MM}^2$ ），否则线缆会因为大电流而过热。请注意：线缆的温度限制为 85°C 而连接器的温度限制为 105°C 。

The cross-sectional area of the cable and the capacity of the connector must meet the requirements of the maximum short-circuit current of the photovoltaic system (the cross-sectional area of the cable is recommended to be $\geq 4\text{MM}^2$ for different modules); otherwise, the cable may overheat due to high current. Note: The cable temperature limit is 85°C and the connector temperature limit is 105°C .

最大系统电压 DC1500V (IEC/UL)

Maximum system voltage DC1500V (IEC/UL)

5.3 接地 Grounding (Apply to Framed Duomax and Framed Duomax Twin)

所有组件边框和安装架必须按照相应的《国家电气规程》正确接地。

All module frames and mounting racks must be properly grounded in accordance with appropriate respective National Electrical Code.

使用 M5 螺栓、垫圈在边框预留接地孔处将接地线缆与边框连接固定并形成导通，螺母拧紧力矩为 $3 \sim 7 \text{ N} \cdot \text{m}$ 。螺母、垫圈均使用不锈钢材质，接地线推荐使用 $4 \sim 14 \text{ mm}^2$ (AWG6-12) 外露铜线，接地导体必须通过合适的接地电极连接到大地。

Use M5 bolts and washers to connect the ground cable to the reserved ground hole in the frame, and tighten the nut to a torque of 3 to 7 $\text{N} \cdot \text{m}$. The nuts and washers are made of stainless steel. It is recommended to use 4 to 14 mm^2 (AWG6-12) exposed copper wire. The ground conductor must be connected to the ground through a proper ground electrode.

6. 电性能参数 Electrical performance parameter

182 mm 单晶半片电池片(双玻)最大保险丝额定电流 25A

182 mm single crystal half battery (double glass) maximum fuse rated current 25A

组件型号	BHM156N1DGT-600~635							
最大功率 [P _{max} /W]	600	605	610	615	620	625	630	635
最大功率点电压 [V _{mp} /V]	46.7	46.87	47.04	47.2	47.37	47.54	47.7	47.86
最大功率点电流 [I _{mp} /A]	12.85	12.91	12.97	13.03	13.09	13.15	13.21	13.27
开路电压 [V _{oc} /V]	56.3	56.43	56.56	56.69	56.82	56.95	57.08	57.21
短路电流 [I _{sc} /A]	13.5	13.56	13.62	13.68	13.74	13.8	13.86	13.92

组件型号	BHM144N1DGT-565~590					
最大功率 [P _{max} /W]	565	570	575	580	585	590

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最大功率点电压 [V _{mp} /V]	43.15	43.35	43.56	43.75	43.94	44.19
最大功率点电流 [I _{mp} /A]	13.09	13.15	13.2	13.26	13.31	13.35
开路电压[V _{oc} /V]	51.44	51.6	51.75	51.9	52.1	52.2
s 短路电流[I _{sc} /A]	13.83	13.89	13.95	14.01	14.27	14.49

组件型号	BHM132N1DGT-520~540				
最大功率[P _{max} /W]	520	525	530	535	540
最大功率点电压[V _{mp} /V]	40.28	40.61	40.9	41.22	41.51
最大功率点电流 [I _{mp} /A]	12.91	12.93	12.96	12.98	13.01
开路电压[V _{oc} /V]	46.86	46.93	47.13	47.26	47.34
短路电流[I _{sc} /A]	13.51	13.54	13.6	13.64	13.68

组件型号	BHM120N1DGT-475~495				
最大功率[P _{max} /W]	475	480	485	490	495
最大功率点电压[V _{mp} /V]	35.77	37.07	37.37	37.67	37.99
最大功率点电流 [I _{mp} /A]	12.92	12.95	12.98	13.01	13.02
开路电压[V _{oc} /V]	42.6	42.78	42.9	43.08	43.2
短路电流[I _{sc} /A]	13.52	13.58	13.63	13.69	13.72

组件型号	BHM120N1DGT-475~495				
最大功率[P _{max} /W]	475	480	485	490	495
最大功率点电压[V _{mp} /V]	35.77	37.07	37.37	37.67	37.99
最大功率点电流 [I _{mp} /A]	12.92	12.95	12.98	13.01	13.02

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开路电压[Voc/V]	42.6	42.78	42.9	43.08	43.2
短路电流[Isc/A]	13.52	13.58	13.63	13.69	13.72

210mm 单晶半片电池片(双玻)最大保险丝额定电流 30A

210 mm single crystal half battery (double glass) maximum fuse rated current 30A

组件型号	BHM132N3DGT-675~720									
最大功率 [Pmax/W]	675	680	685	690	695	700	705	710	715	720
最大功率点电 压[Vmp/V]	39.01	39.21	39.41	39.61	39.81	40	40.19	40.39	40.56	40.75
最大功率点电 流 [Imp/A]	17.31	17.35	17.39	17.43	17.47	17.51	17.55	17.59	17.63	17.67
开路电压 [Voc/V]	46.91	47.11	47.31	47.51	47.71	47.91	48.11	48.31	48.51	48.71
短路电流 [Isc/A]	18.24	18.29	18.34	18.39	18.44	18.49	18.54	18.59	18.64	18.69

组件型号	BHM132N4DGT-600~625					
最大功率[Pmax/W]	600	605	610	615	620	625
最大功率点电压 [Vmp/V]	40.31	40.51	40.79	40.99	41.21	41.4
最大功率点电流 [Imp/A]	14.88	14.93	14.95	15	15.04	15.1
开路电压[Voc/V]	48.42	48.71	48.99	49.31	49.6	49.82
短路电流[Isc/A]	15.69	15.72	15.76	15.79	15.82	15.68

组件型号	BHM120N4DGT-540~555			
最大功率[Pmax/W]	540	545	550	555
最大功率点电压[Vmp/V]	37.06	37.28	37.47	37.7
最大功率点电流 [Imp/A]	14.57	14.62	14.68	14.72
开路电压[Voc/V]	44.81	45.11	45.4	45.67

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短路电流 [Isc/A]	15.45	15.49	15.53	15.58
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组件型号	BHM108N4DGT-485~500			
最大功率 [Pmax/W]	485	490	495	500
最大功率点电压 [Vmp/V]	34.56	34.8	35.01	35.26
最大功率点电流 [Imp/A]	14.03	14.08	14.14	14.18
开路电压 [Voc/V]	40.8	40.83	40.85	41.12
短路电流 [Isc/A]	15.24	15.29	15.34	15.39

组件型号	BHM96N4DGT-430~445			
最大功率 [Pmax/W]	430	435	440	445
最大功率点电压 [Vmp/V]	32.62	32.88	33.16	33.41
最大功率点电流 [Imp/A]	13.18	13.23	13.27	13.32
开路电压 [Voc/V]	38.26	38.59	38.9	39.24
短路电流 [Isc/A]	14.41	14.45	14.5	14.54

以上电性能参数 The above electrical performance parameters

功率公差 ±3%W

Power tolerance ± 3%W

电流公差 ±4%

Current tolerance ±4%

电压公差 ±3%

Voltage tolerance ± 3%

开路电压的温度系数 -0.270%/° C

Temperature coefficient for voltage at open-circuit -0.270%/° C

最大功率点的温度系数 -0.350%/° C

Temperature coefficient for maximum power -0.350%/° C

短路电流的温度系数 +0.048%/° C

Temperature coefficient for short-circuit current. +0.048%/° C

TUV 认证组件安全等级 Class II。

TUV certified component Safety Class II.

STC: E=1000W/m², AM1.5, Tc=25°C

BNPI: Ef=1000W/m², Er=135W/m², AM1.5, Tc=25°C

BSI: Ef=1000W/m², Er=300W/m², AM1.5, Tc=25°C

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P 型双玻双面率 (P-type double glass double-sided ratio)

ϕP_{max} : $70 \pm 10\%$; $\phi Vocx$: $100 \pm 3\%$; ϕIsc : $70 \pm 10\%$

N 型双玻双面率 (N-type double glass double-sided ratio)

ϕP_{max} : $80 \pm 10\%$; $\phi Vocx$: $100 \pm 3\%$; ϕIsc : $80 \pm 10\%$

正面设计载荷 (Design load - downwards) : 3600Pa

背面设计载荷 (Design load - downwards) : 1600Pa

机械载荷安全系数 (Safety factor for mechanical load) : 1.5

Module(T98)max: 70°C

7. 维护 Safeguard

定期使用清水和干净的海绵或布清洗组件玻璃表面,同时可以使用温和且不含磨料的清洁剂来去除顽固污垢。不建议使用含有矿物质的水来清洗组件。

Clean component glass surfaces regularly with water and a clean sponge or cloth, while a mild, non-abrasive cleaner can be used to remove stubborn dirt. It is not recommended to use water containing minerals to clean components.

应定期检查光伏方阵中组件是否有坏,例如玻璃破裂、线缆破损、接线盒损坏等因素导致组件发生功能性和安全性故障,须更换相同型号组件。

The modules in a PV array should be regularly checked for damage. Factors such as glass breakage, cable breakage, and junction box damage may lead to function and safety problems.

In the case of a damaged module, replace it with the same type of module. Refer to the appropriate Product Installation Manual for installation and dis-assembly of module.

建议至少每年检查一次端子螺栓的扭矩和接线的各方面情况。此外检查安装的硬件是否紧固到位。连接松动会导致阵列损坏。

It is recommended to check the torque of terminal bolts and the general condition of wiring at least once a year. Also, check that mounting hardware is properly torqued. Loose connections will result in damage to the array.

不要将电器作为未分类的城市垃圾处理,应使用单独的收集设备。

Do not dispose of electrical appliances as unclassified municipal waste, use separate collection equipment.

有关收集系统的信息,请联系当地政府获取。

For information about the collection system, contact your local government.

如果电器被丢弃在垃圾填埋场或垃圾场,有害物质会渗入地下水并进入食物链,损害您的健康和幸福。

If appliances are thrown away in landfills or dumps, harmful substances can seep into groundwater and enter the food chain, harming your health and well-being.

如有更新恕不另行通知

Subject to change without prior notice

请注意本手册前面列出的安全注意事项。

Observe the safety precautions listed earlier in this Manual



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