

PV-HBE4x四代 – 规格说明书

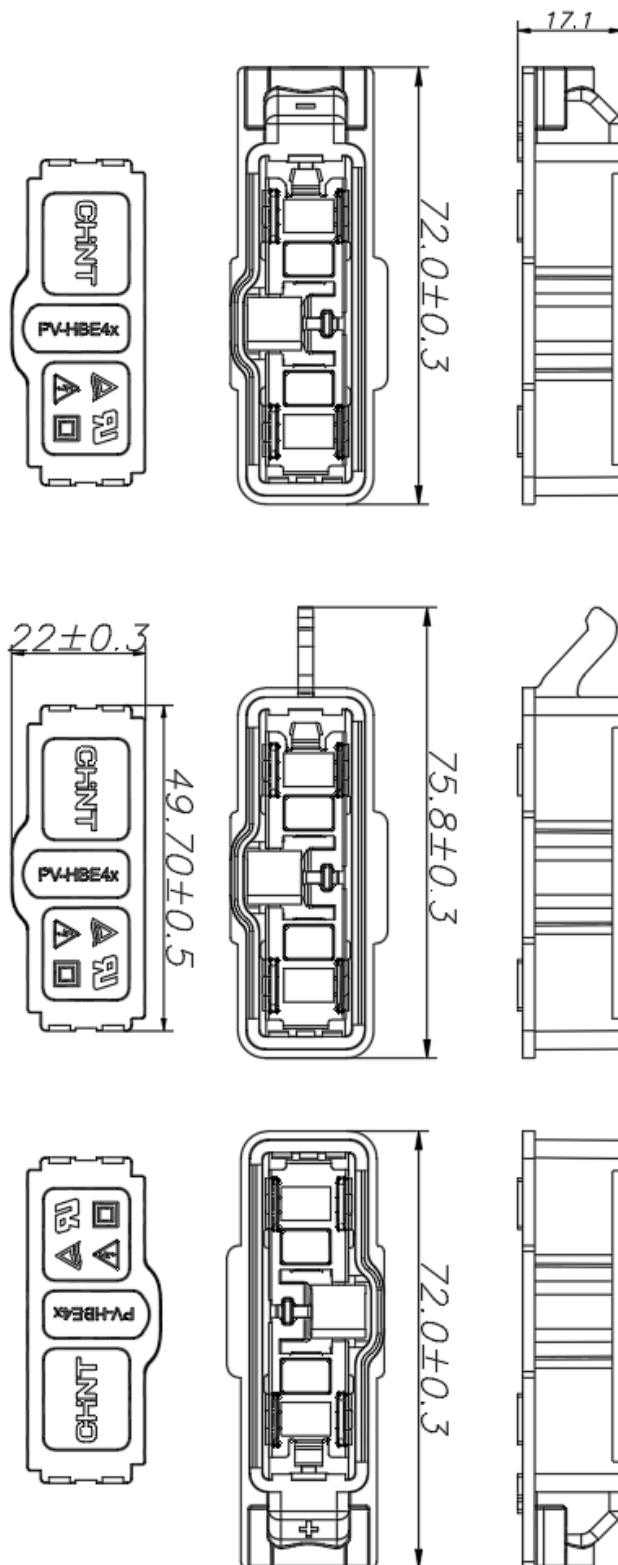
PV JUNCTION BOX INSTRUCTION



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产品图纸 Product Drawing



产品介绍 Product Overview

该产品在设计使用时有以下特点：

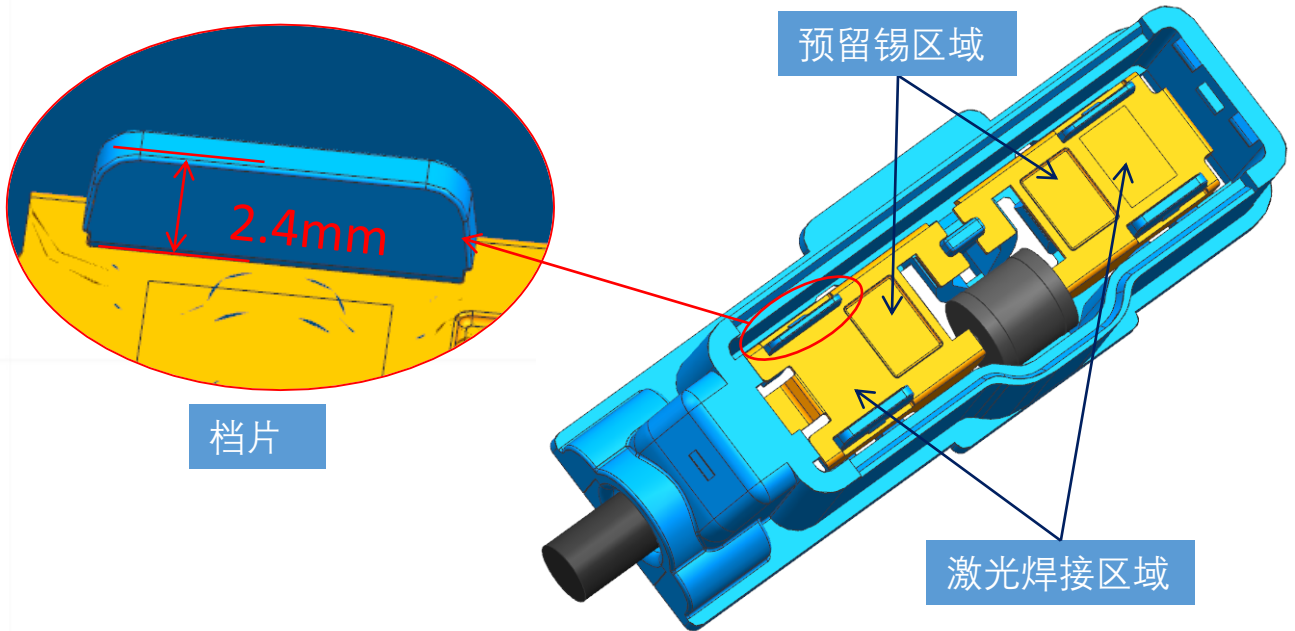
1. 使用灌封胶的方式对内部金属件以及二极管进行密封。
2. 线缆与导体采用电阻焊接工艺。
3. 线缆引出位置采用超声波工艺与箱体、底座锁紧。
4. 该系列适用于单、双玻组件。
5. 该系列接线盒体积小，灌胶后散热性好，额定电流大。
6. 接线盒型号为PV-HBE4x系列，适用于UL 61730-1、UL 61730-2等要求的1级模块。

The product has the following features when designed and used:

1. Seal the internal metal parts and diodes by means of potting glue.
2. The cable and conductor are welded using resistance welding technology
3. The outlet position of the cable is locked with the box body and base by ultrasonic technology.
4. This series is suitable for single and double glass components.
5. This series of junction box has small volume, good heat dissipation after glue filling and large rated current.
6. Junction Boxes, Models PV-HBE4x series, are only applicable to the modules with pollution degree 1 for UL 61730-1、UL 61730-2 or other Equal requirements.

产品特点介绍 Product Overview

特点一



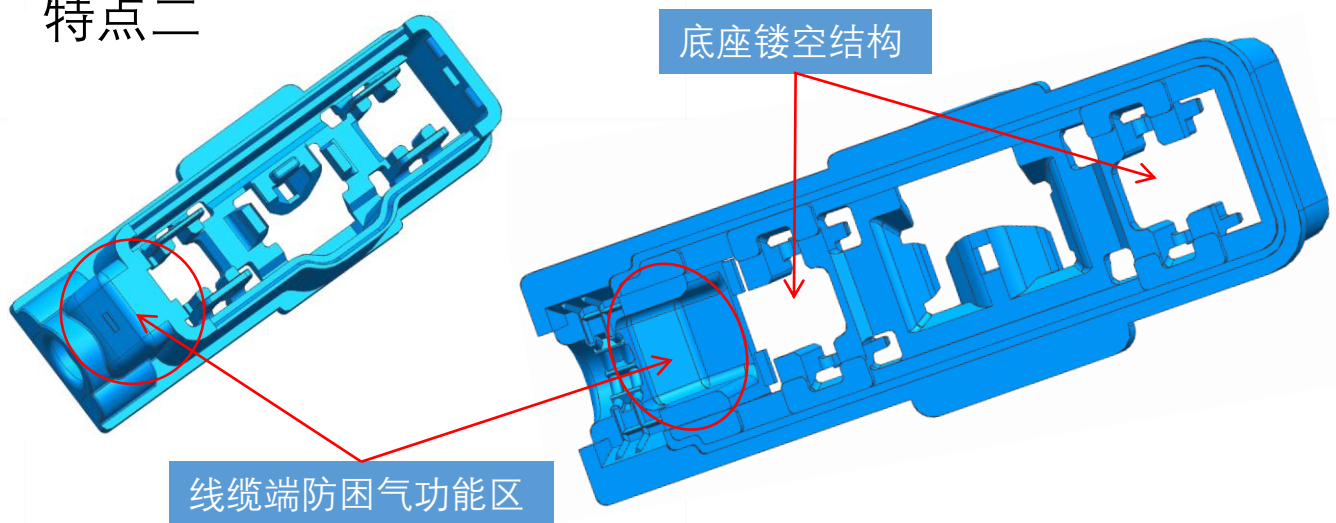
1. 塑料底座档筋高出铜端子面2.4mm, 阻挡汇流带激光焊接时产生的热浪流向底座内壁,对内壁造成破坏,影响灌封胶与内壁贴合密封效果。
2. 铜端子同时留有激光焊区域和预留锡区域,兼容两种不同焊接工艺的需求
3. 留有两种焊接区域,可以实现激光焊接异常时,预留锡区域进行补焊
4. 激光焊接区域位于汇流带穿孔远方,成品组件因异常需要拆除接线盒时新装接线盒可以在预留锡区域进行锡焊,不会因汇流带过短造成产品报废。

1. The reinforcing bars of the plastic base are 2.4mm higher than the copper terminal surface, blocking the heat wave generated during laser welding of the busbar from flowing towards the inner wall of the base, causing damage to the inner wall and affecting the sealing effect of the sealing adhesive on the inner wall.
2. Copper terminals have both laser welding area and reserved tin area, which are compatible with the requirements of two different welding processes
3. There are two types of welding areas that can be reserved for repair welding in case of abnormal laser welding

产品特点介绍 Product Overview

4. The laser welding area is located far away from the perforation of the busbar. When the finished components need to be removed from the junction box due to abnormalities, the newly installed junction box can be soldered in the reserved tin area, and the product will not be scrapped due to the short busbar.

特点二

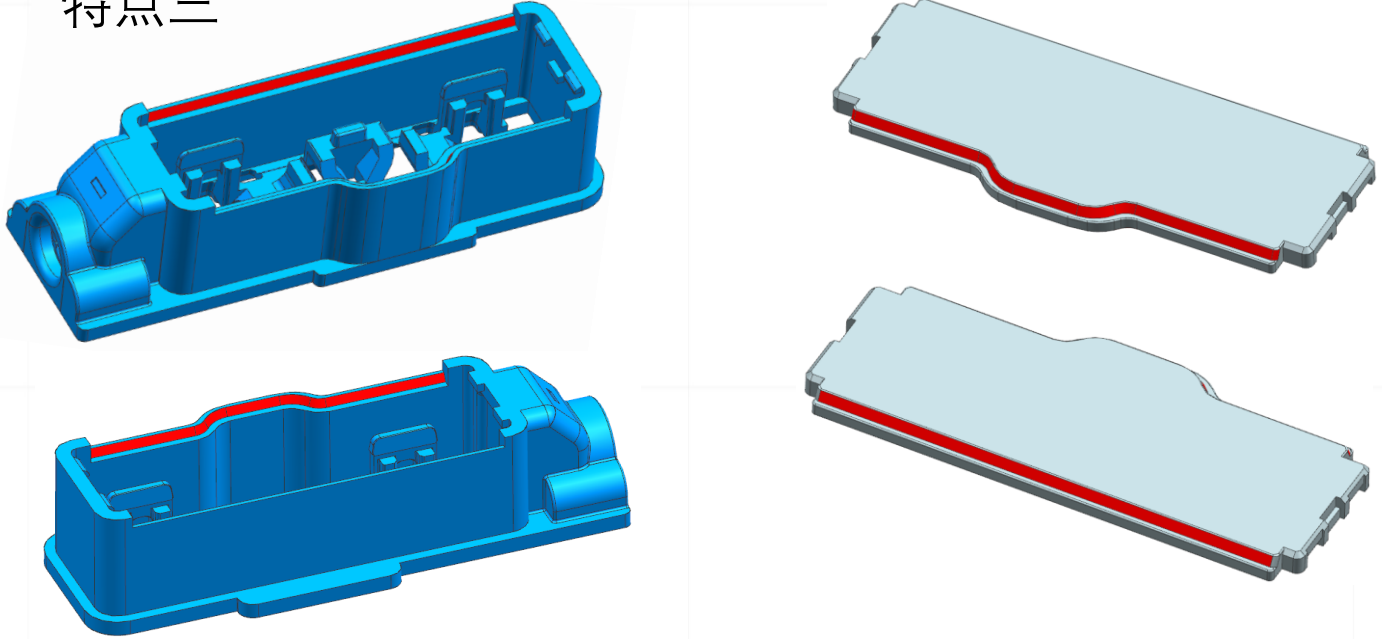


1. 线缆出口端灌胶时容易发生困气，通过斜面结构形成广口大空腔，空腔顶部高于灌胶面，灌胶时空气通过广口排除，不易发生困气。
2. 底座在端子片支撑位置增加镂空设计，使灌密封胶更容易漏出箱体，灌满底座与组件板空腔区域。

1. When the cable outlet end is filled with glue, it is easy to experience trapped air. A wide opening large cavity is formed through an inclined structure, and the top of the cavity is higher than the glue surface. When the glue is filled, the air is discharged through the wide opening, making it less likely to experience trapped air.
2. The base adds a hollow design at the support position of the terminal block, making it easier for the sealing adhesive to leak out of the box and fill the cavity area of the base and component board.

产品特点介绍 Product Overview

特点三



1. 盒盖与底座采用间隙配合，使箱体内部与外界空气有一定的流通，增加箱体散热能力
2. 接线盒在实际应用中为倒着安装，盒盖面朝下，斜面设计，可以减少水灰尘进入，同时间隙配合可以避免箱体内部水汽淤积凝露

3. 接线盒斜面将盒盖周边包围，避免因盒盖扣盖后较松，被人为强行打开

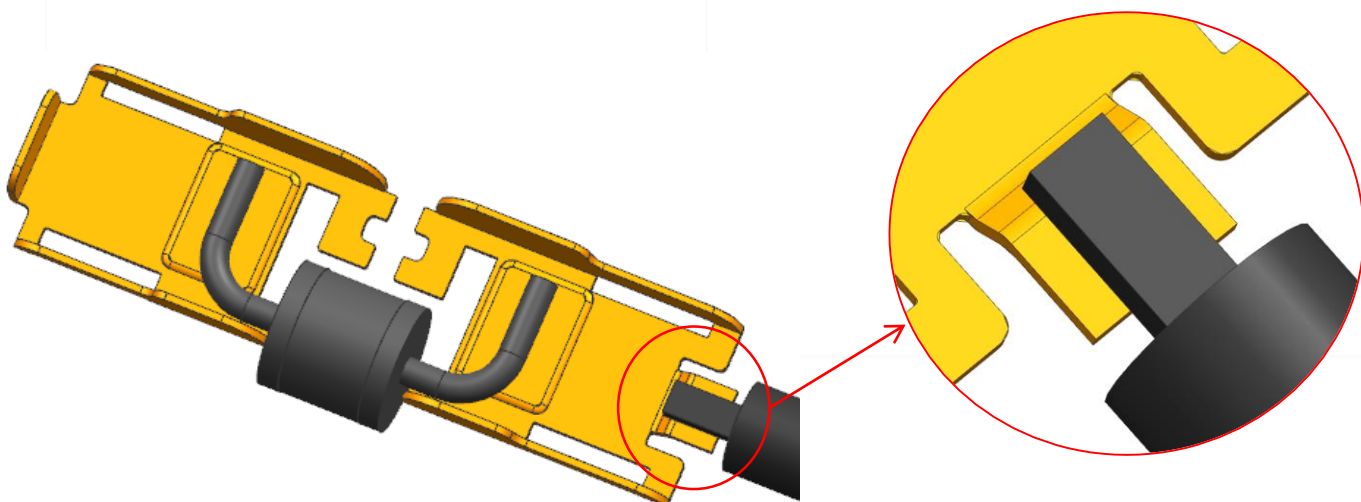
1. The box cover and base adopt a gap fit, which allows for a certain amount of air circulation between the inside of the box and the outside, increasing the heat dissipation capacity of the box

2. In practical applications, the junction box is installed upside down, with the box cover facing downwards and a sloping design, which can reduce the entry of water and dust. At the same time, the gap fit can avoid the accumulation of water vapor and condensation inside the box body

3. The inclined surface of the junction box surrounds the perimeter of the box cover to prevent it from being forcefully opened due to the looseness of the box cover after being fastened

产品特点介绍 Product Overview

特点四



1. 线缆电阻焊区域折弯后形成独立区域，此区域因电阻焊发生形变对激光焊接区域不影响。

1. After bending the resistance welding area of the cable, an independent area is formed, and the deformation of this area due to resistance welding does not affect the laser welding area.

功能描述 Function description

该产品有以下功能：

1. 电气连接：将太阳能组件产生的电力与外部线路连接，传导光伏组件所产生的电流。
2. 旁路保护：该产品内存在旁路二极管，当组件内某处电池片出现热斑效应不能发电时，起旁路作用，让其他电池片所产生的电流从二极管流出，使组件继续发电。

The product has the following functions:

1. Electrical connection: connect the power generated by solar modules with external lines to conduct the current generated by photovoltaic modules.
2. Bypass protection: there is a bypass diode in the product. When the hot spot effect of a battery in the module fails to generate power, it plays the role of bypass, allowing the current generated by other batteries to flow out of the diode, so that the module can continue to generate power.

技术规格

Technical Data

技术规格 TECHNICAL DATA				
产品型号Product Type	PV-HBE4x			
额定电流Rated Current	TUV	25A	30A	35A
	UL	25A	30A	35A
额定电压 Rated Voltage	1000V		1500V	
反向电流 Reverse current	50A			
环境温度 Temperature Range	-40~+85℃			
保护等级 Protection Degree	IP65/IP68(1m,1h)			
线缆规格 Rated Cable Wire	IEC:4MM ² /6MM ₂		UL: Rated sunlight resistant, 90℃ wet or dry, 2000 V, 12 AWG/10 AWG, with nominal 6.3mm/7.0mm outer diameter, 56/78 strands.	
接线盒尺寸 Overall Dimensions	Left Housing: 72mm*25.78mm*17.1mm Middle Housing: 75.8mm*25.78mm*17.1mm Right Housing: 72mm*25.78mm*17.1mm			
安全等级 Safety Degree	II			
阻燃等级 Flame Resistance	UL94 5VA			
绝缘材料 Insulation Material	PPE(黑)			
二极管数量No. of Diode	3			
可选连接器 Optional Connector	HCB40/MC4 EVO2/MC4 EVO2A (1500V) MC4(1000V)			
二极管 Diode selection	25SQ045			
	30SQ045-SL			
	40SQ045-SL/40SQ045			

Type name details

Type designation	Rated voltage (x)	Rated current (y)	Wire cross section (z)
PV-HBE4x	(x=1) 1000VDC	(y=1) 20A	(z=1) 1 x 4,0mm ² ; (z=2) 1 x 6,0mm ²
		(y=2) 25A	(z=1) 1 x 4,0mm ² ; (z=2) 1 x 6,0mm ²
		(y=3) 30A	(z=1) 1 x 4,0mm ² ; (z=2) 1 x 6,0mm ²
	(x=2) 1500VDC	(y=1) 20A	(z=1) 1 x 4,0mm ² ; (z=2) 1 x 6,0mm ²
		(y=2) 25A	(z=1) 1 x 4,0mm ² ; (z=2) 1 x 6,0mm ²
		(y=3) 30A	(z=1) 1 x 4,0mm ² ; (z=2) 1 x 6,0mm ²

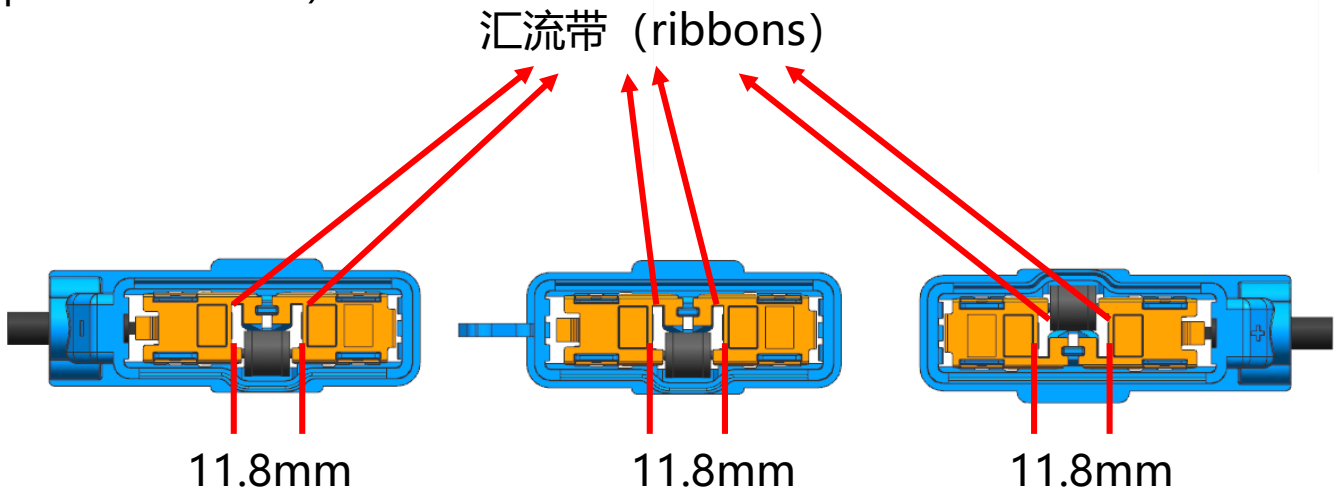
操作方法 Operation Method

1. 用专用粘合剂将接线盒粘到指定位置。 Exhibit the junction box to the relevant position by special adhesive gel
2. 粘合位置如下：阴影部分粘接面积硅胶用量为18mL，安装后硅胶溢出至少2mm。
Area for adhesive gel (Shaded area as shown): The dosage of silica gel is about 18mL. The outer silicone width is at least 2mm.



Area for adhesive gel 粘合位置

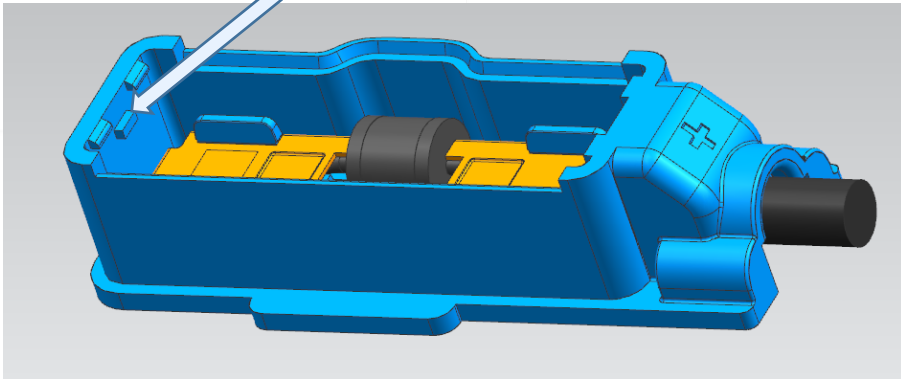
3. 将汇流带穿过开口焊接到1, 2, 3, 4, 5, 6处铜片上。两个开口之间的中心距离为11.8mm，参见下图：白色标注为汇流带
Through the slotting solder ribbons on the copper 1, 2, 3, 4, 5, 6. The central distance between two slotting is 11.8mm .(as shown, white parts are ribbons)



操作方法 Operation Method

4. 灌胶不超过箭头所指平面。The glue filling shall not exceed the plane indicated by the arrow.

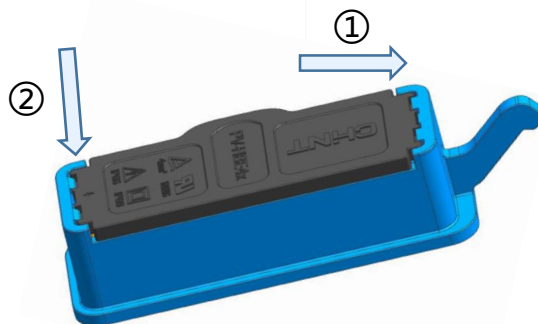
不得超过此平面
shall not exceed the plane
indicated



5. 盒盖安装 The lid is installed

将盖板无箭头标识的一侧先放入卡扣，然后用力向下压箭头标识一侧盖子直到听到嗒的一声盖子盖紧（盖子区分方向，盒盖凸起与盒体凸出对应）。

Put the side of the cover without the arrow mark into the buckle, and then press down the cover on the side with the arrow mark until you hear a click (the cover distinguishes the direction, and the protrusion of the box cover corresponds to the protrusion of the box body).

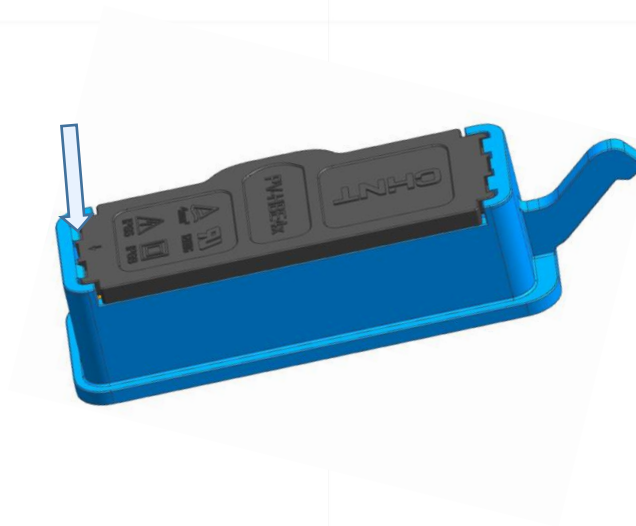


操作方法 Operation Method

6. 打开盒盖的方法 Open the cover of the method

将工具插入有箭头标记盒盖一侧和底盒之间，然后翘起。

Insert the tool between the side of the cover marked with arrow and the bottom box, and then tilt it up.



注意事项

1. 禁止烷烃类、强酸、强碱物质接触连接器、接线盒，如汽油、清洗润滑剂、电子复活剂等含有烷烃物质的溶剂和工业污染排放的特殊气体等。
2. 连接器不可以和硅胶、灌封胶直接接触，连接器线缆禁止挂、拉重物。
3. 产品装卸及运输过程中注意轻拿轻放，不要受外力重压，以免造成损坏。
4. 工作人员应配有适当的静电防护措施。
5. 接线盒箱体底面和背板粘接时，沿箱体底面涂抹粘接剂要均匀，防止漏水。
6. 汇流带装入时要注意汇流带是否干净，有无粘接剂，否则会影响焊接质量和组件的发电功率。
7. 安装接线盒时不能将同一套的接线盒的正负极连接器插合在一起。
8. 如果不是维护需要，请不要频繁进行连接系统的开合或插拔。
9. **维护时连接器不允许带电插拔**（见下图连接器警示语）。
10. 户外维护应由专业人员进行。
11. 电气安装说明应包括根据美国国家电气规范ANSI/NFPA 70使用的接线方法的详细描述。



Matters Needing Attention

1. It is forbidden for alkane, strong acid and strong alkali substances to contact connectors and junction boxes, such as gasoline, cleaning lubricants, electronic resurrection agents and other solvents containing alkane substances, as well as special gases discharged from industrial pollution.
2. The connector shall not be in direct contact with the silica gel or the filling and sealing glue. The connector cable shall not be hung or pulled.
3. Handle gently when load , unload and transportation, and not subject to external pressure, so as to avoid damage.
- 4.The staff should be equipped with appropriate electrostatic protected measure.
- 5.When the bottom of the box is spliced with the solar panels, adhesives should be daubed evenly to prevent leakage
6. Pay attention that confluence straps is clean or not , whether it have adhesive or not When they are inserted. Otherwise, it will impact the quality of welding and the generating power of components.
- 7.When the junction box is installed, the positive and negative pole of the same set of junction box can not be inserted together.
8. If do not need to maintenance, please don't open , close plug the connection system frequently.
- 9.**Do not plug or unplug under load. This information printed on the connector.**(See the connector warning below)
- 10.Outdoor maintenance should be carried out by professionals
- 11.The electrical installation instructions shall include a detailed description of the wiring method to be used in accordance with the National Electrical Code, ANSI/NFPA 70.

