



ZERUN Z8X Series

Junction Box for Photovoltaic Module



Connection System for Solar Panel

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1. Scope

This specification contains guidelines for the assembly, installation and fitting of the Z8X Solar connecting boxes, and connection parts to customer solar panels.

2. Product Characteristics

2.1 Product Specifications

Rated System Voltage	TUV: 1000V/1500V DC	UL: 1000V/1500V DC
Rated Impulse Voltage	12KV/16KV	12KV/16KV
Rated Current	22A for Z8-abcd Z8-abcd (b=B; c=D); 24A for Z8-abcd Z8-abcd (b=A; c=E); 25A for Z8-abcd (c=P); 30A for Z8-abcd (c=N); 35A for Z8-abcd (c=X)	
Reverse Current	40A	
Application class	Class A	
Over voltage category	I/II/III/IV	
Conductor Size	1x4.0mm ²	
Protection Degree	IP65/IP68(1m,1h)	
Temperature Range	-40°C~+85°C	
Pollution degree	1 / 2 / 3 / 4 (after potting)	
Bus ribbons size	Width: 2.0mm ~ 8.0mm, Thickness: 0.2mm ~ 0.5mm	
Flame Resistance	5VA	
Insulation Material	110°C for PPE+PS, PX9406P(f1)(IT) (rely on the material sheet provided by manufacturer)	
Max. working (module) voltage	135V	

Intended for Module Type	Crystalline
No. of Diodes	3
No. of Boxes	3
Material of contact rails	Copper alloy
Connection Method	Soldering / Resistance welding-type
Waterproofing Structure	Potting
Munting Type	Adhesive

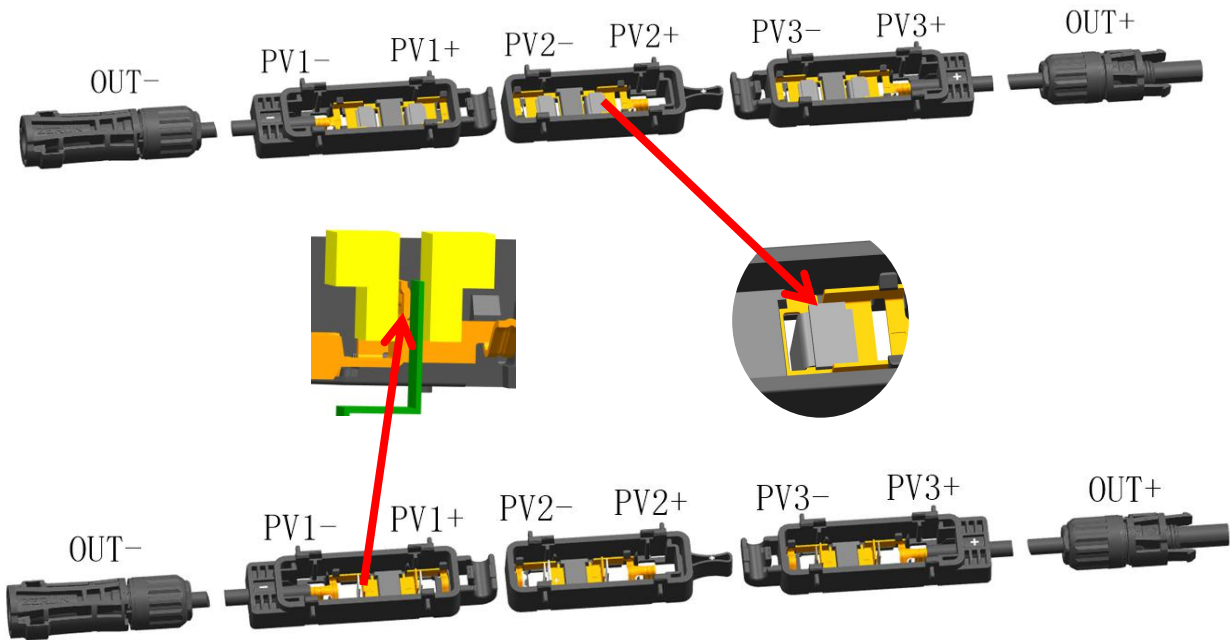


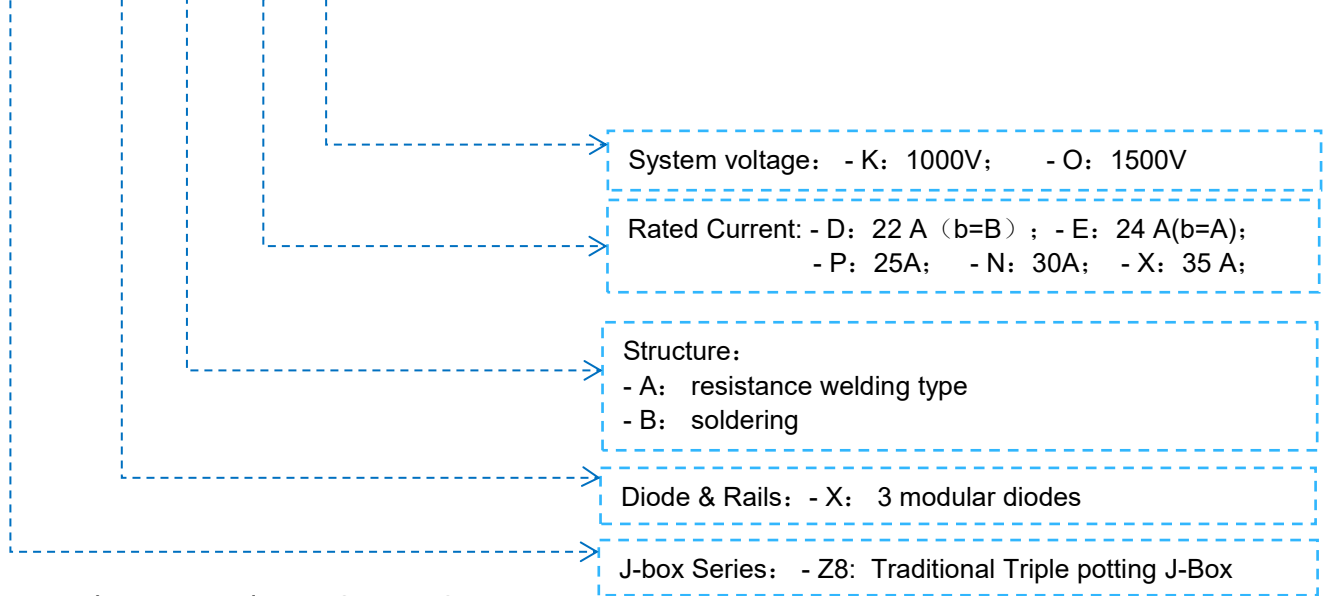
Figure 1

2.2 Features

- Triple boxes, mini size, slim.
- With cable holder on box ,fantastic cable wiring for module automation.
- Full potting design, meet IP65/IP68(1meter, 1hour).
- Low heat generation, low power consume.
- Low cost with high performance, more competitive.
- Has soldering type and resistance welding type for choice.
- First time to use resistance welding to connect box and foil ,NO soldering failures.
- Compliance with the latest TUV and L standards, current up to 35A, system voltage up to 1500V.

2.3 Product Family

Z8- a b c d



Part number example – **Z8-XAXO**

Split type Junction Box Assembly, 3 modular diodes, foil connection type is resistance welding, rated current 35A, 1500V certification.

Picture

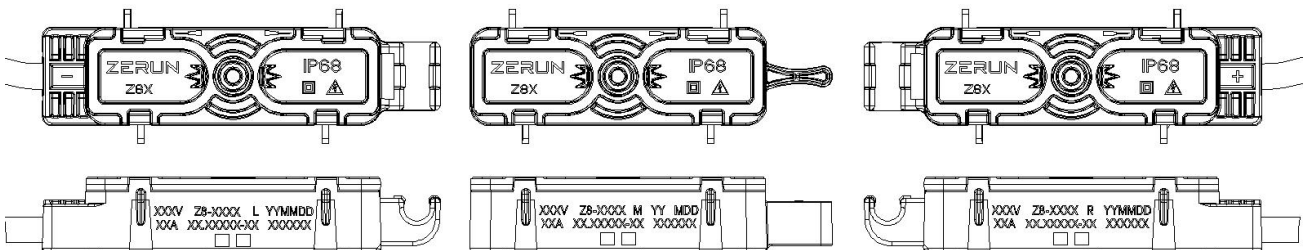


Figure 2

2.4 Related Documents

- Customer Drawing Z8X_CD01/Customer Drawing Z8X_CD02
- Data Sheet Z8X_DS01

3. User Instruction

3.1 Cleaning

Any type of exposure to contaminants (dust, humidity etc.) can negatively affect the system with regards to its functions, over the duration of use. This applies especially to the functionality of the connector seals and crimped contact connections. Therefore, during assembly, it is necessary to ensure a careful and clean processing environment.

During storage, transportation and installation, it is necessary to protect the non-inserted contacts against contamination from dust or moisture. Connectors should be protected with the appropriate recommended dust caps* prior to being fully connected.

* Suitable protective covers are available for connectors.

Articles which can erode the plastics (connector and Junction Box) must not be used to clean the products. We recommend the use of soft cloths moistened with isopropyl alcohol for cleaning.



Unplugged terminal points must be protected against moisture, dust and any environmental pollution. Only clean and dryplugged terminal points fulfill their respective pollution class.

3.2 Installation Guidelines for the Junction Box Attachment to the PV Modules

The following application technical instructions are made as guidelines. These instructions do not excuse the user or installer of the Z8X boxes from independently testing the adhesive tapes or silicone glues to determine the suitability for their proposed assembly process and application.

3.2.1 Content

This section describes the gluing of Z8X connecting boxes onto the rear side of the solar modules with the goal to secure the product in accordance with this specification.

3.2.2 Equipment

The recommended adhesive is typically provided in cartridges. Refer to supplier's application instructions for adhesive applicator and application.

- Guns for spraying from the cartridge
- Gloves, soft and clean cloths
- Cleaning product isopropyl alcohol
- Spatula, brush
- Weight, for example a piece of metal with an approximate weight of 1kg

3.2.3 Safety Instructions

Before beginning the junction box attachment process, obtain, review and follow the manufacturer's material safety information.



The use of appropriate gloves and eye protection is required throughout the attachment process. Ensure adequate ventilation at all times during the attachment process. Refrain from eating, drinking or smoking in the vicinity. Do not expose to open flames.

When working with silicone adhesive:

- Avoid contact with eyes. If eye contact occurs, rinse for a period of 15 minutes and seek medical help.
- Avoid prolonged contact with skin.

3.2.4 Assembly Process

3.2.4.1 Preparation Attach Junction Box (RTV Application type I)

Place the photovoltaic panel face down on the work table. The attachment area of the photovoltaic panel must be dry, oil-/fat-free and free of any dust, oil and contaminants. Thoroughly clean the attachment area with a clean, lightly moistened Isopropyl alcohol soft cloth (e.g. moistened using a dosing unit). Further auxiliary or other cleaning agents are not permitted. Use of any other cleaning agents has to be specified and tested by the customer. The attachment area must be free from condensation and moisture.

To improve adherence, junction boxes may be treated with primer. The attachment area should be thoroughly covered with primer by using a small spatula brush. The specification from the supplier of the primer has to be followed.

Bend the photovoltaic panel foil tabs so that they extend perpendicular from the plane of the panel.

3.2.4.2 Adhesive Application Procedure

Before applying the adhesive, it is recommended that the junction box lid be opened to ease later attachment to the solar panel. 8mm~12mm wide and 3mm~5mm high band of adhesive applied to the area which as shown in Figure 3 is adequate. During this process, Ensure that the silicon bead is continuous and free of gaps.

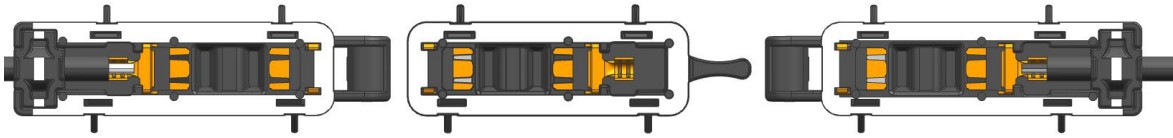


Figure 3

To attach the junction box to the photovoltaic panel, thread the foil tab through the openings in the bottom of the junction box. Make sure the junction box is properly oriented in a horizontal position before firmly placing the junction box into its final position on the photovoltaic panel. Then, the 1kg metal weight can be applied to the top of the junction box to ensure adequate adhesive coverage.

If needed, use the spatula to smooth any excess silicon that may have extruded out of the joint. Keep the photovoltaic module assembly in the horizontal until full cure is obtained.

A full cure requires 24 hours at room temperature before the photovoltaic module can be connected and tested.



***Touching or handling of the foil tabs during the pressing of the box is not permitted.
Mechanical stressing of foil tabs can cause their destruction and thereby the malfunction of the panel.***

3.2.5 Final Assembly Process Using

3.2.4.3 3.2.5.1 Preparation Attach Junction Box (RTV Application type II)

Place the photovoltaic panel face down on the work table. The attachment area of the photovoltaic panel must be dry, oil-/fat-free and free of any dust, oil and contaminants. Thoroughly clean the attachment area with a clean, lightly moistened Isopropyl alcohol soft cloth (e.g. moistened using a dosing unit). Further auxiliary or other cleaning agents are not permitted. Use of any other cleaning agents has to be specified and tested by the customer. The attachment area must be free from condensation and moisture.

To improve adherence, junction boxes may be treated with primer. The attachment area should be thoroughly covered with primer by using a small spatula brush. The specification from the supplier of the primer has to be followed.

Bend the photovoltaic panel foil tabs so that they extend perpendicular from the plane of the panel.

3.2.5.2 Adhesive Application Procedure

Before applying the adhesive, it is recommended that the junction box lid be opened to ease later attachment to the solar panel. The sealant 8mm ~ 12mm wide and 3mm ~ 5mm high is evenly extruded and distributed on the photovoltaic module. During this process, Ensure that the silicon bead is continuous and free of gaps. Shown as Figure 4 below.

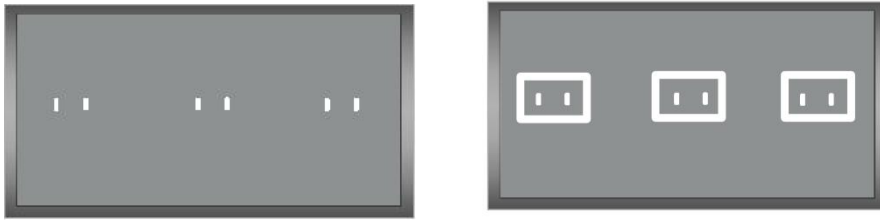


Figure4

To attach the junction box to the photovoltaic panel, thread the foil tab through the openings in the bottom of the junction box. Make sure the junction box is properly oriented in a horizontal position before firmly placing the junction box into its final position on the photovoltaic panel. Then, the 1kg metal weight can be applied to the top of the junction box to ensure adequate adhesive coverage.

If needed, use the spatula to smooth any excess silicon that may have extruded out of the joint. Keep the photovoltaic module assembly in the horizontal until full cure is obtained.

A full cure requires 24 hours at room temperature before the photovoltaic module can be connected and tested.



Touching or handling of the foil tabs during the pressing of the box is not permitted.
Mechanical stressing of foil tabs can cause their destruction and thereby the malfunction of the panel.

3.3 Wiring the Junction Box

3.3.1 For Soldering Tapy Junction Box

Make sure the polarities of foil tabs from solar module keep conformity with that of junction box, reference length of the foil tab is 12mm from the conductive contact as shown, see Figure 5.

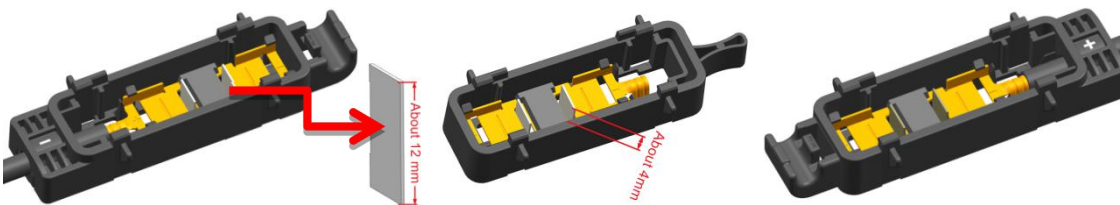


Figure 5

Bend the bus strip and use tin soldering to connect the bus bar to the conductive plate, see Figure 6. Set the soldering iron head temperature to ≤ 330 degrees. Iron heating contact rails for about 4 seconds till the solder is totally melted, then take iron away. For quality control, this process shall only be operated by mechanical equipment. After that, immediately use tweezers or other tools to hold the foil tab for about two seconds.

Check and make sure every foil tab was fixed well with the contact rail.

Note: If bus bars too high, press down all of the bus bars.

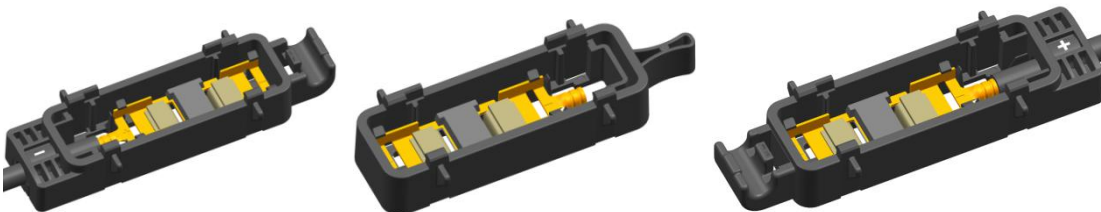


Figure 6

3.3.2 For Resistance Welding Tapy Junction Box



Resistance welding junction box pitch is 21mm, before attach the box, make sure the foil is adjusted to meet this requirement

Note that the polarity of junction belt and outlet position are consistent with that of junction box. The bus bar is connected to the module diode by resistance welding with an electrode. Below picture show the detail.

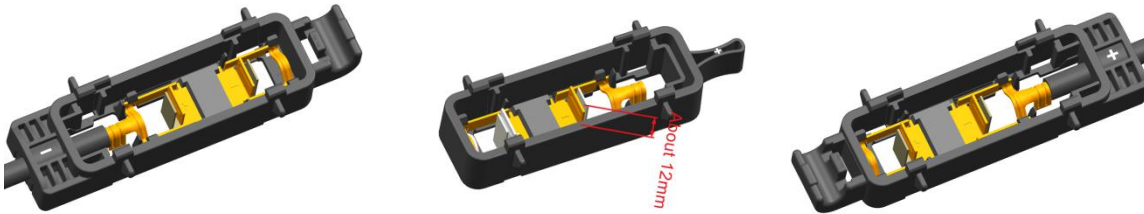


Figure 7



All the wiring steps shall be going with the operators wearing anti-static gloves.

Note: After welding, bus height must be lower than diode tongue piece, or must be trimmed

3.4 POTTING

Place the model horizontally, then pour the potting glue evenly into the junction to the overflow surface, as picture 8.



Figure 8



Attention: During the potting, Make sure all the conductors be covered!

A full cure requires 24 hours at room temperature before the photovoltaic module can be connected and tested.

3.5 Junction Box Lid Assembly

Close the Box: After potting, Cover the junction box by pressing the lid into the housing until snaps hold the lid firmly.



Figure 9

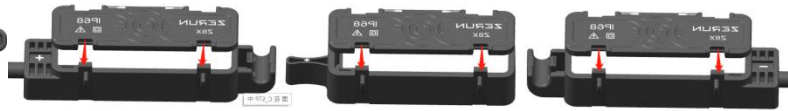


Figure 10



Figure 11

Open the Box: To open the lid , the tip of a screwdriver having a 3 to 5 mm flat blade must be inserted into the corresponding slot of the lid, see Figure 13, and then pushing the screwdriver evenly and slightly until the snap get loose, see Figure 14. then remove the Lid carefully.



Figure 12

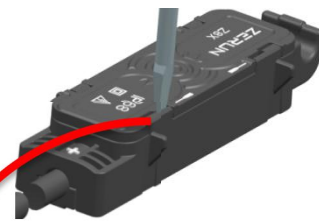


Figure 13



Figure 14



Do not open the junction box while it is under an electrical load. Components within the junction box may be electrically charged and capable of inflicting severe injury or death. Extreme caution should be applied when opening the junction box.

For protection against injury by electrical current, the box and the connector must always be completely separated from other sources of voltage during the prefabricating and cannot be connected or disconnected under voltage. All the openings in the casing must be entirely closed.



Attention: The junction box should only be opened by authorized and trained personnel.

3.6 Cable Routing

The cable must not be bent or crushed on the direct exiting. A minimum bending radius $R \geq 5 \times \text{cable diameter}$ must be maintained. The cable must be routed in a way that tensile stress on the conductor or connections is prevented.



Figure 15