# ZERUN Z8 Series

# Junction Box for Photovoltaic Module

*Connection System for Solar Panel*

## Content

## 1. Scope

This specification contains guidelines for the assembly, installation and fitting of the Z8 Solar connecting boxes, and connection parts to customer solar panels.

## 2. Product Characteristics

## 2.1 Product Specifications

| | |
|---|---|
| Rated System Voltage | 1000V or 1500V DC |
| Rated Current | 16A or 18A or 20A |
| Reverse Current | 25A |
| Temperature Rage | -40℃~+85℃ |
| Protection Degree | IP68 (1m,1h) |
| Rated Impulse Voltage | 12KV/16KV |
| Contact Material | Brass, Tin Plated |
| Insulation Material | PPO |
| Flame Resistance | 5VA |
| UL Certificate No. TUV<br>UL | R 50360697 0001(EN)<br>R 50359034 0002(IEC)<br>E 351403 |

| | |
|---|---|
| Intented for Module Type | Crystalline |
| No. of Diodes | 3 |
| No. of Boxes / Contact rails | 3 / 6 |
| PV Ribbon Size | Width：max 8.0 mm or 6.0 mm<br>Thickness：max 0.5 mm |
| Connection Method | Soldering |
| Waterproofing Structure | Potting |
| Mounting Type | Adhesive |

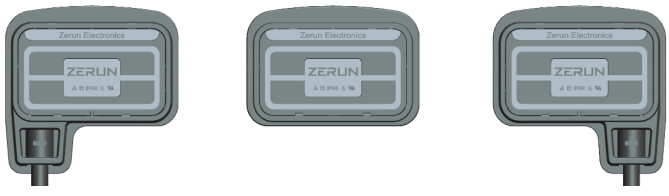
## 2.2 Features

- Triple boxes, mini size, slim, easy for transportation after assembled onto module.
- With cable exit in line, shorter cable length while wiring the panel.
- Full potting design, meet IP68(1meter, 1hour).
- Low heat generation, low power consume.
- Low cost with high performance, more competitive.

## 2.3 Product Family

| | |
|---|---|
| Type Designation | Z8-abcde |
| Structure | Z8：Traditional triple potting J-box |
| a: No. of Diode & Rails | 4: 3 diodes ,6 conducting strip |
| b: Structure: | S: Width 43.5mm<br>T: Width 20mm + Diode close to Cable<br>U: Width 20mm + Tin Pad close to Cable<br>V: Width 27.8mm + Diode close to Cable<br>W: Width 27.8mm + Tin Pad close to Cable<br>X: “L” Box |
| c: Rated Current: | G: 16A ; I: 18A; W: 20A |
| d: System Voltage | K: 1000V<br>O: 1500V |
| e: Material | 1: PPO + Horizontal bus-bar<br>2: PPO + Vertical bus-bar |

### Picture

| | |
|---|---|
| Z8-abcde (b=S) |  |
| Z8-abcde (b=T/U) |  |
| Z8-abcde (b=V/W) |  |
| Z8-abcde (b=X) |  |
| Note: Note: since any of the four modes operate in the same way, this specification only takes Z8-aS as an example. | |

## 2.4 Related Documents

- Customer Drawing Z8_C001
- Data Sheet Z8_S001

# 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 dry plugged 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 Z8 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 Z8 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 contract occurs, rinse for a period of 15 minutes and seek medical help.
- Avoid prolonged contact with skin.

### **3.2.4** Final Assembly Process Using Single Component Silicon Adhesive

#### 3.2.4.1 Preparation

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. 4mm~10mm wide band of adhesive applied to the area which as shown in Figure 1 is adequate. During this process, Ensure that the silicon bead is continuous and free of gaps.

Figure 1

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 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 2.


Figure 2

Bend the foil tabs and insert them through the correlated contact slots, see Figure 3.

Figure 3

3.3.1 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 4.

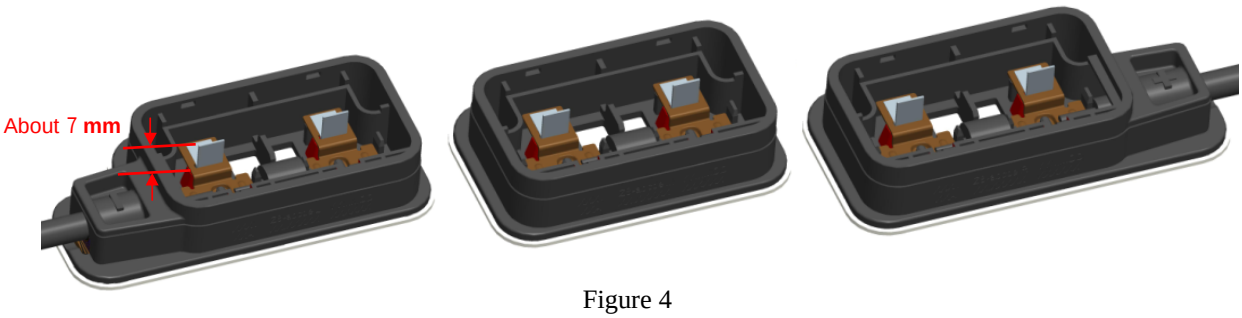



Figure 4

Bend the foil tabs and insert them through the correlated contact slots, see Figure 5.

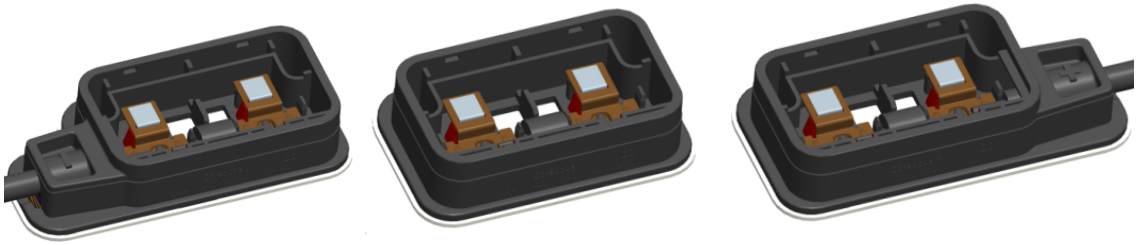


Figure 5

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

Set the soldering iron head temperature to 360-380 degrees, and the rear end diameter is about 5mm. Iron heating contact rails for about two 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.

## 3.4 Potting

Set the junction box horizontal, then pour the glue evenly and carefully into the junction box which has been attached with module and finished connected with foil tabs. The left and right box's volume of the potting glue is about 12mL ,the middle box's volume is about 11mL, and glue level can't be higher than 13.5 mm. See Figure 6.

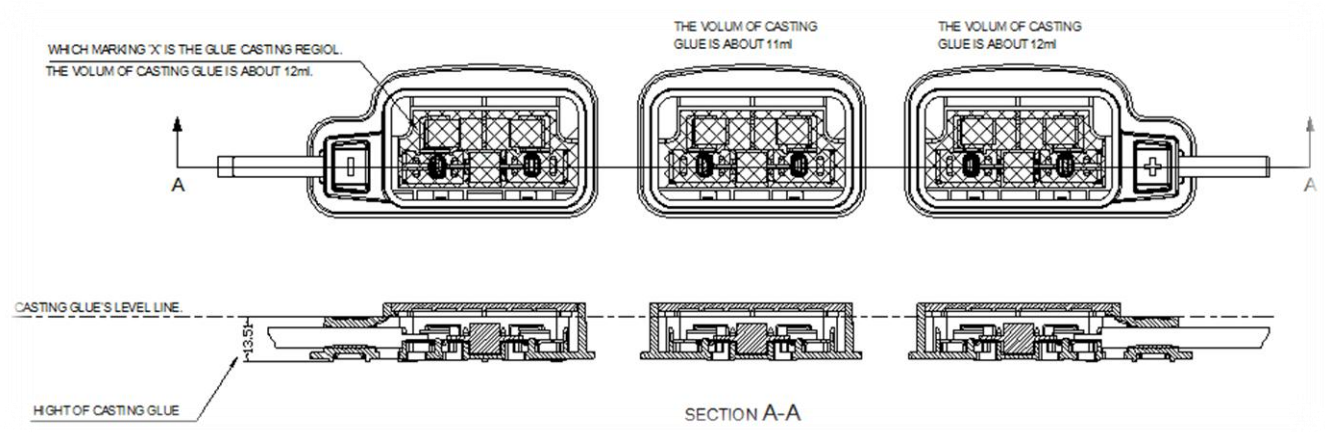



Figure 6

Figure 7

**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, Close the connecting box by pressing the lid into the housing until snaps hold the lid firmly.

**Open the Box:** To open the lid of the junction box, 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 8, and then pushing the screwdriver evenly and slightly until the snap get loose, see Figure 9. then remove the Lid carefully.

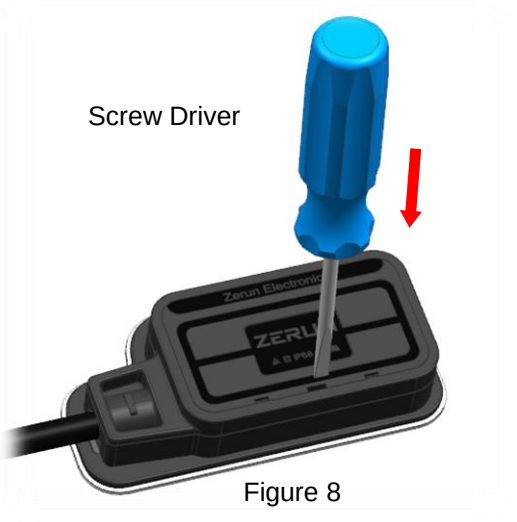



Figure 8

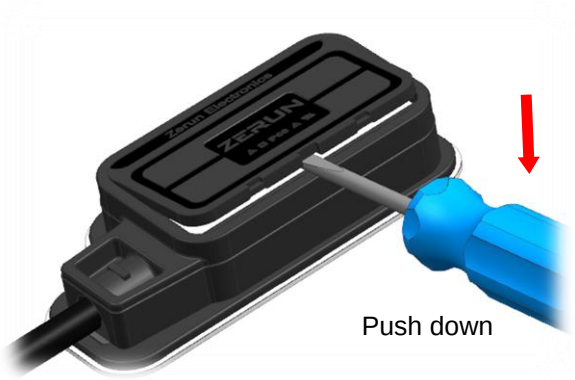



Figure 9

***<u>Do not</u> 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 ≥ 5 x cable diameter*** must be maintained. The cable must be routed in a way that tensile stress on the conductor or connections is prevented.

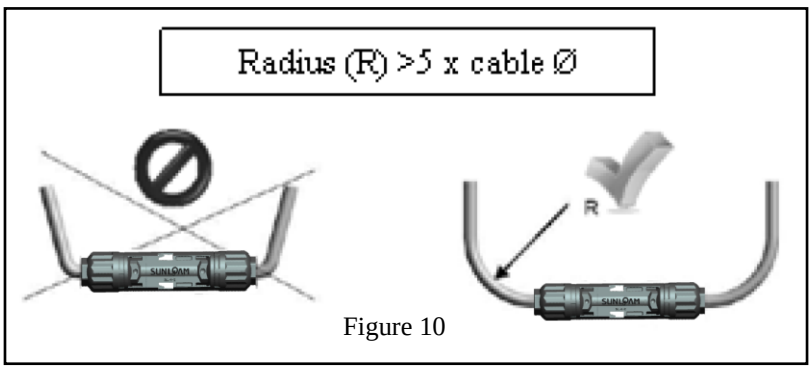



Figure 10