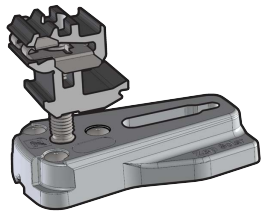
Q CELLS
Engineered in Germany

ZEP COMPATIBLE™

Residential

Commercial


850-1388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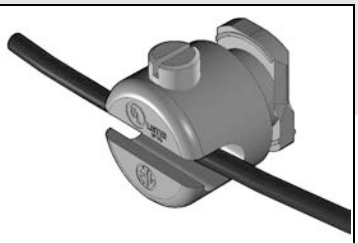
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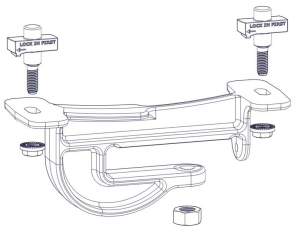
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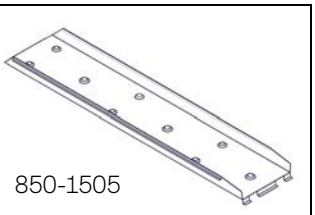
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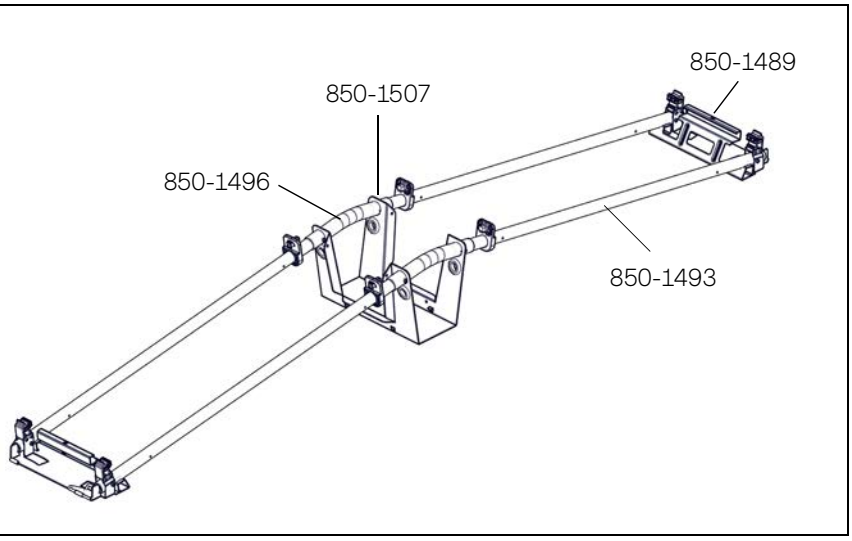


Q.PEAK DUO-G6/TS, Q.PEAK DUO BLK-G6/TS

Installation Supplement for Zep Compatible PV Mounting Solutions

Hanwha Q CELLS America Inc.

Based on Zep Solar Document No.
800-1444-001 Rev G

File Generated July 2020

Notices

This manual contains important installation instructions for the core hardware components required for mounting Zep Compatible™ PV arrays.

WARRANTY VOID IF NON-ZEP-CERTIFIED HARDWARE IS ATTACHED TO GROOVE IN MODULE FRAME.

This supplement applies to Q.PEAK DUO-G6/TS, Q.PEAK DUO BLK-G6/TS photovoltaic modules manufactured by Hanwha Q CELLS America Inc. and is explicitly written for qualified professionals ("Installer" or "Installers"), including without limitation licensed electricians and NABCEP-Certified PV Installers. This document is intended to serve as a supplement to the Q.PEAK DUO-G6/TS, Q.PEAK DUO BLK-G6/TS Installation and User Manual from Hanwha Q CELLS America Inc.. Q.PEAK DUO-G6/TS, Q.PEAK DUO BLK-G6/TS modules feature a Zep Compatible groove in the aluminum frame to which hardware manufactured by Zep Solar, Inc. is directly connected. For detailed instructions about the design and assembly of Zep Compatible systems, refer to the Zep Solar installation support tools available online at www.zepsolar.com.

Contents

1 Residential

Zep Compatible™ PV modules have been evaluated for design loads on the back surface (e.g., wind load) and on the front surface (e.g., wind and snow load) with the following Zep Solar solutions when installed with the Interlock and Leveling Foot or Cam Foot mounting hardware:

- ZS Comp
- ZS Tile
- ZS Span
- ZS Wave
- ZS Trap
- ZS Seam

The array layouts on the following pages show the maximum allowable spans and range of cantilevers that were evaluated with Zep Solar hardware in order for **Q.PEAK DUO-G6/TS, Q.PEAK DUO BLK-G6/TS Zep Compatible modules** to obtain the following load ratings using specified test procedures:

- **UL 61730 requirements:** 50 psf (2400 Pa) downward and upward design load (push/pull) for Landscape module orientation and 50 psf (2400 Pa) downward and upward design load (push/pull) for Portrait module orientation
- **IEC 61215 requirements:** 75 psf (3600 Pa) downward and 33 psf (1600 Pa) upward design load, Landscape module orientation

Zep Solar hardware must be installed following all applicable instructions.

1.1 Array Layouts and Design Loads, UL 61730 Requirements

Figure 1.1 Layout With Leveling Feet, Landscape Example, 50 psf (2400 Pa) Design Load push/pull (safety factor 1.5)

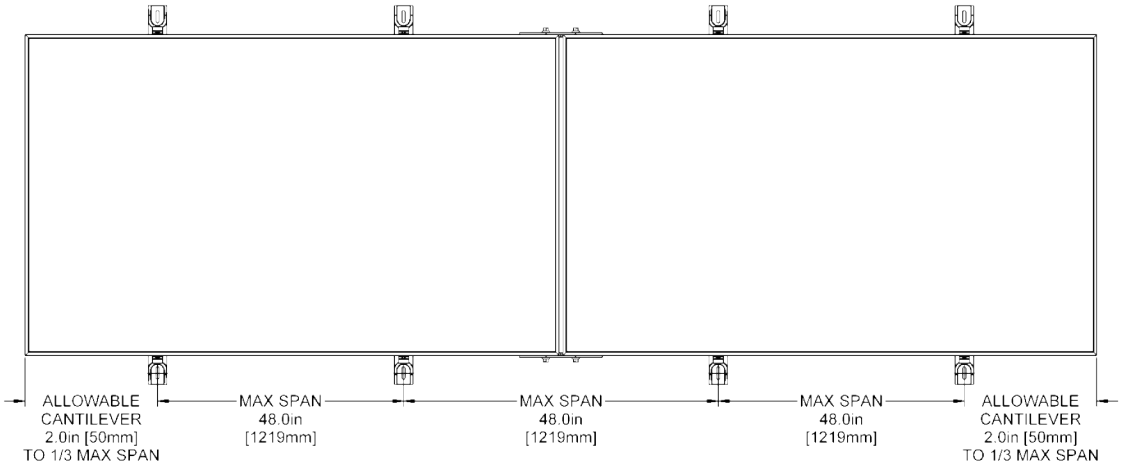


Figure 1.2 Layout With Leveling Feet, Portrait Example, 50 psf (2400 Pa) Design Load push/pull (safety factor 1.5)

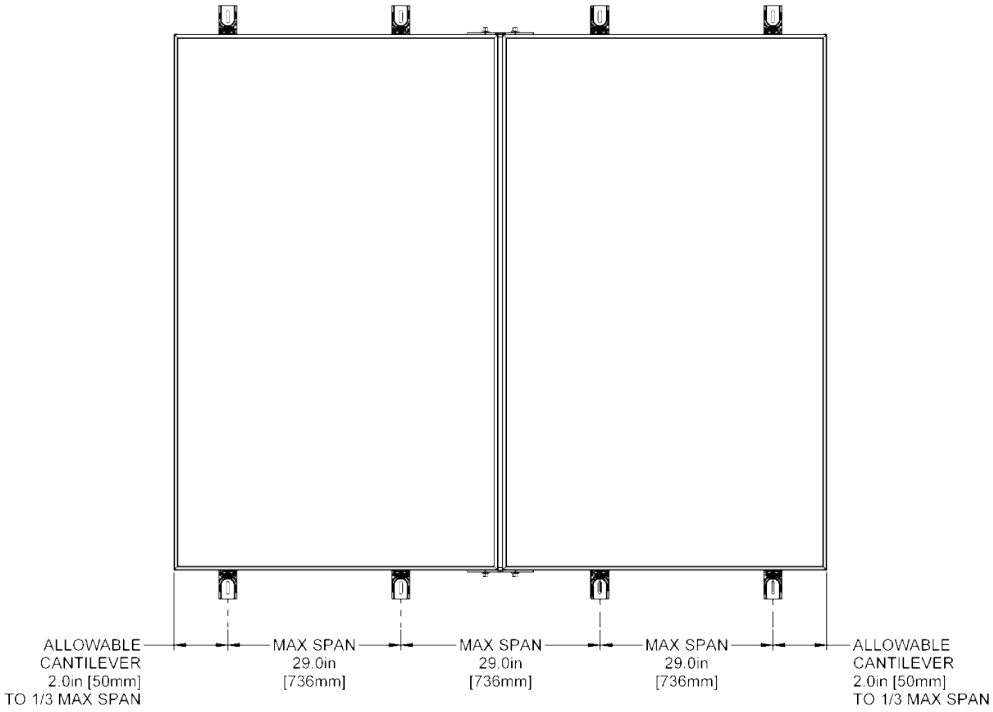


Figure 1.3 Layout With Cam Feet, Landscape Example, 50 psf (2400 Pa) Design Load push/pull (safety factor 1.5)

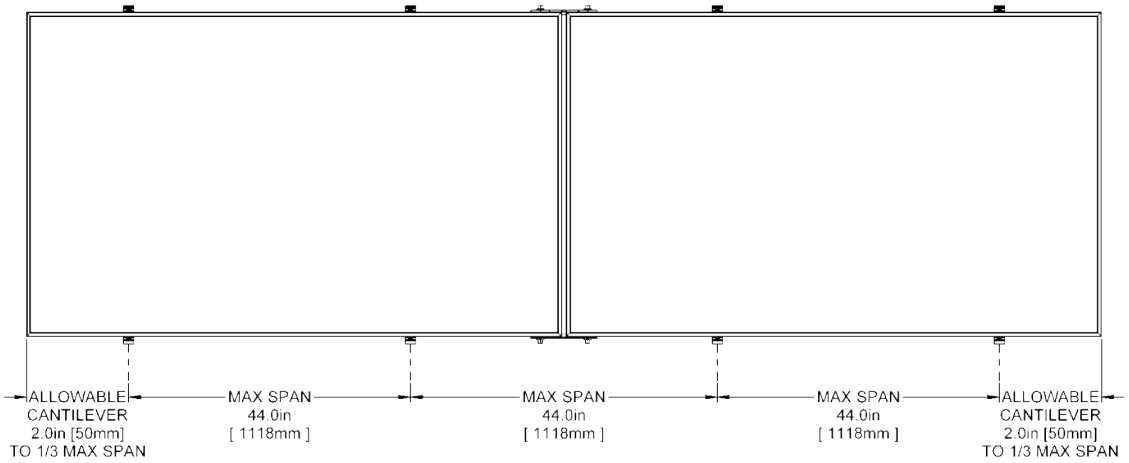
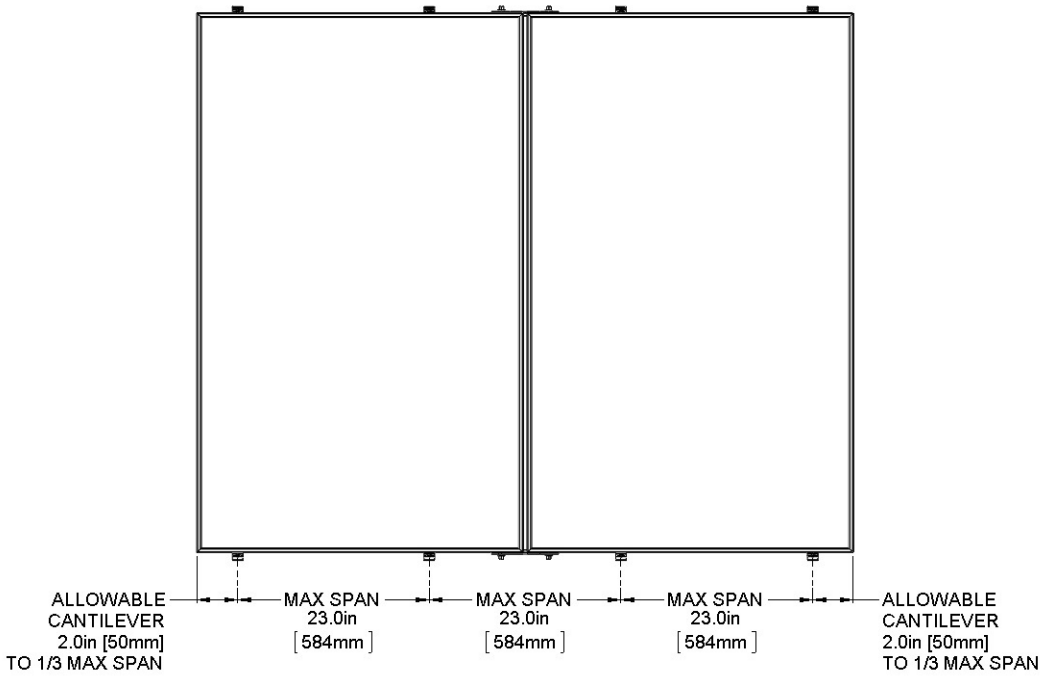


Figure 1.4 Layout With Cam Feet, Portrait Example, 50 psf (2400 Pa) Design Load push/pull (safety factor 1.5)



1.2 Array Layouts, Design Loads, IEC 61215 Requirements

Figure 1.5 Layout With Cam Feet, Landscape Example, 75 psf/33.4 psf (3600 Pa/1600 Pa) Design Load push/pull (safety factor 1.5)

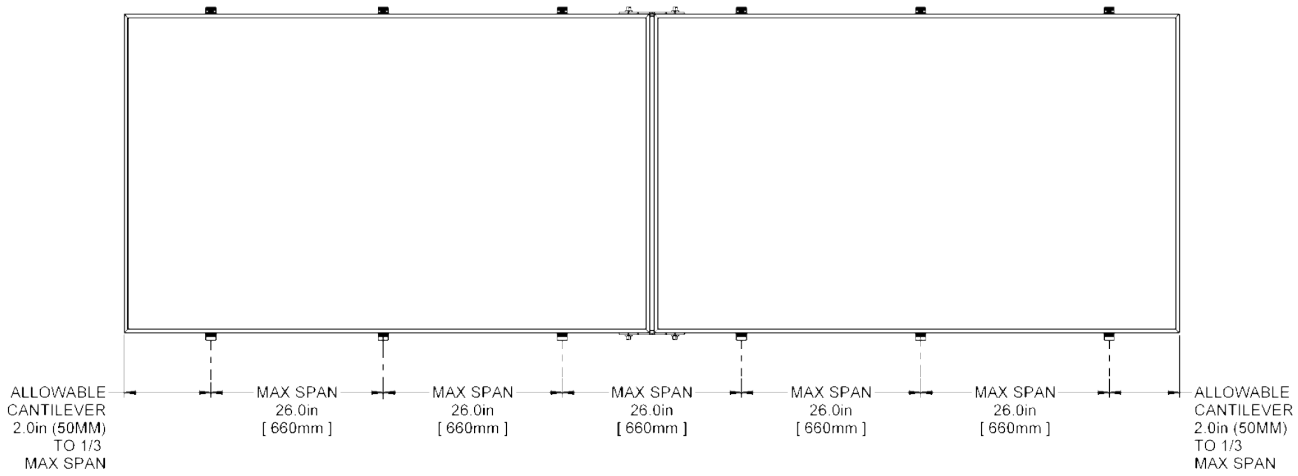
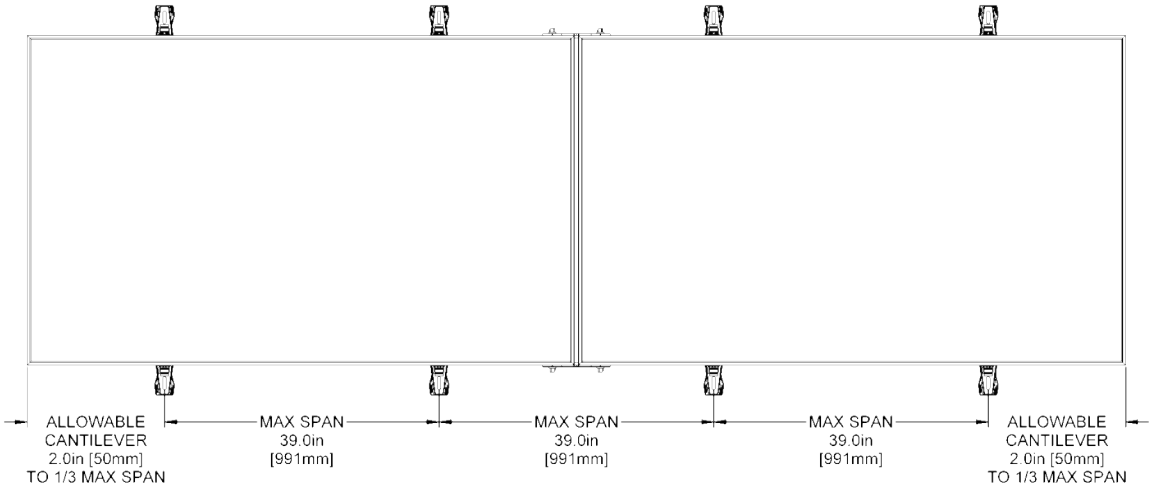


Figure 1.6 Layout With Leveling Feet, Landscape Example, 75 psf/33.4 psf (3600 Pa/1600 Pa) Design Load push/pull (safety factor 1.5)



2 Commercial

Zep Compatible™ PV modules have been evaluated for design loads with a safety factor of 1.5 on the back surface (e.g., wind load) and on the front surface (e.g., wind and snow load) with the following Zep Solar commercial PV mounting solutions when installed with the mounting hardware specific to each solution:

- ZS Beam
- ZS Peak

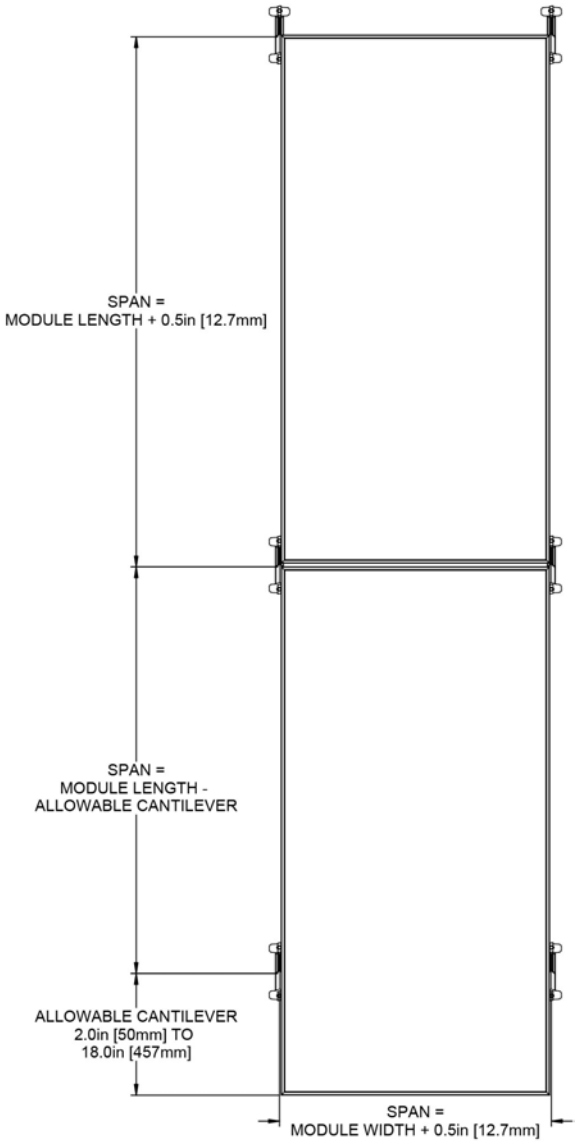
The array layouts on the following pages were evaluated with Zep Solar hardware in order for **Q.PEAK DUO-G6/TS, Q.PEAK DUO BLK-G6/TS Zep Compatible modules** to obtain the following load ratings using specified test procedures:

- **UL 61730 requirements:** 50 psf (2400 Pa) downward and upward design load (push/pull).

Note: Zep Solar hardware must be installed following all applicable instructions.

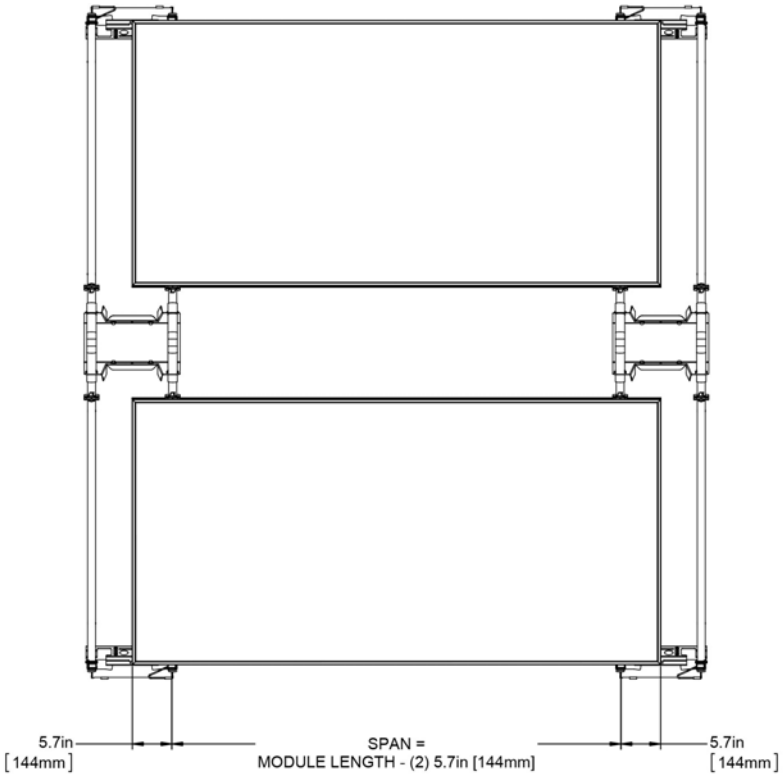
2.1 ZS Beam Layout

Figure 2.1 ZS Beam Array Layout, 50 psf (2400 Pa) Design Load push/pull (safety factor 1.5)



2.2 ZS Peak Layout

Figure 2.2 ZS Peak Array Layout, 50 psf (2400 Pa) Design Load push/pull (safety factor 1.5)



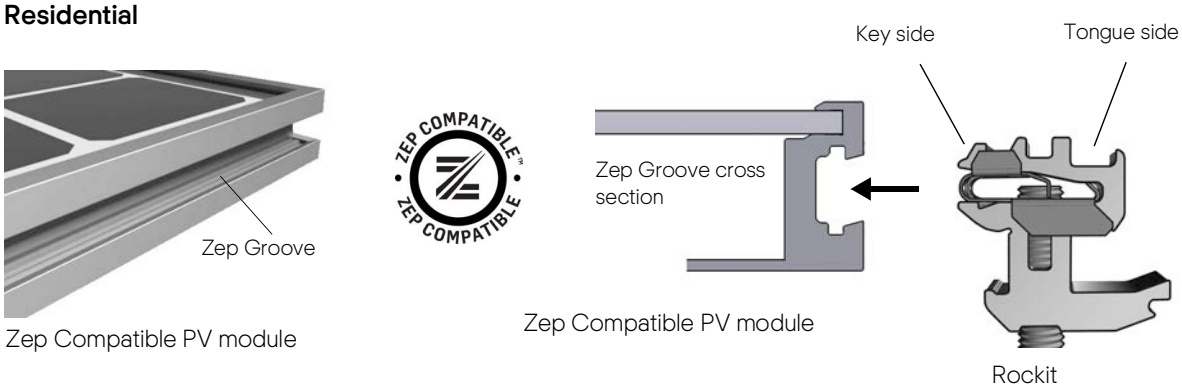
3 Zep Compatible™

Zep Solar mounting solutions are based on the Zep Groove, a patented module frame profile designed to mate easily and precisely with Zep components. Module frames with the Zep Groove are considered "Zep Compatible", and are manufactured according to specifications determined by Zep Solar, Inc.

3.1 Zep Groove and Rockit

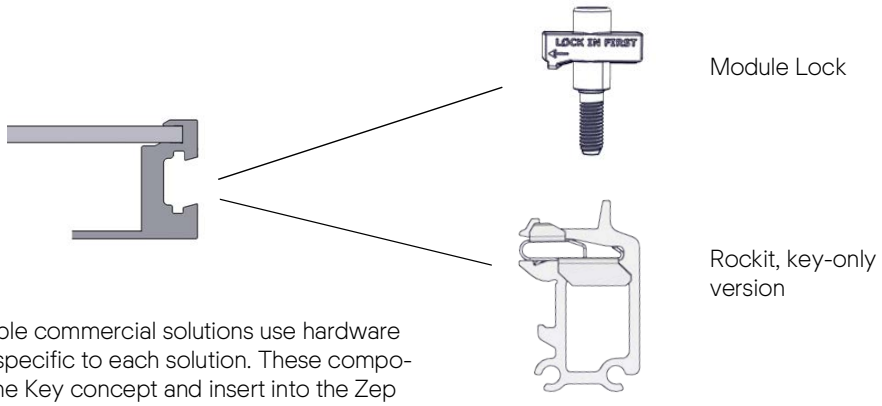
Figure 3.1 Zep Groove and Rockit

Residential



The Rockit is a hardware feature used to secure PV modules to the roof attachments. The Rockit fits into the Zep Groove on both sides: The Key side inserts, while the Tongue side receives.

Commercial



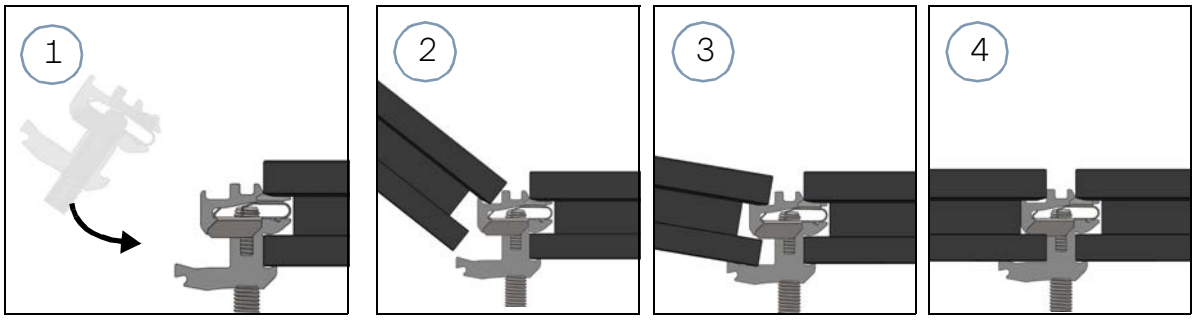
The Zep Compatible commercial solutions use hardware components that specific to each solution. These components also utilize the Key concept and insert into the Zep Groove.

3.2 Key and Tongue

The Key and Tongue concept informs all Zep Compatible designs. The Key side inserts into the Zep Groove, similar to inserting a key into a lock. On the other side, the Zep Groove allows PV modules to “drop in” easily onto the Tongue side.

3.2.1 Key and Tongue: Module Drop-In on Rockit

Figure 3.2 Module Drop-In Example



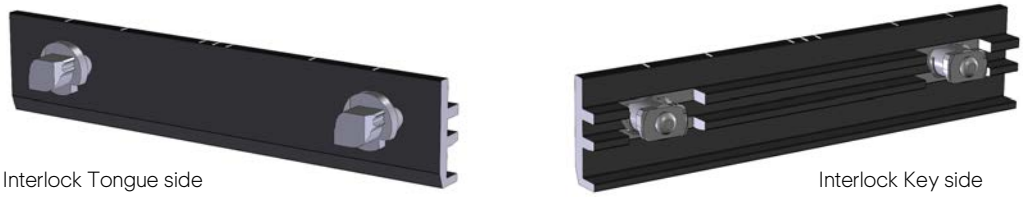
First, the Key side of the Rockit is inserted into the Zep Groove.

In the next row, modules are “dropped in” on the Tongue side (the receiving side). Each Tongue provides an in/out adjustability with the Zep Groove, allowing for optimized placement of each module.

3.2.2 Key and Tongue: Interlock

Another example of the use of Key and Tongue in a Zep Compatible design is seen with the Interlock, a component that couples and bonds two modules together. Here, the Key and Tongue are differently shaped, but they still fit into the Zep Groove in the same manner as the Rockit. The Zeps are rotated 90 degrees to create the Key side bond with the module frame.

Figure 3.3 Interlock, Key and Tongue Side Views



Interlock Tongue side

Interlock Key side

Other components which utilize the Interlock’s method of keying include:

- Ground Zep (all solutions)
- Lock Block (ZS Peak solution)

4 Component Installation

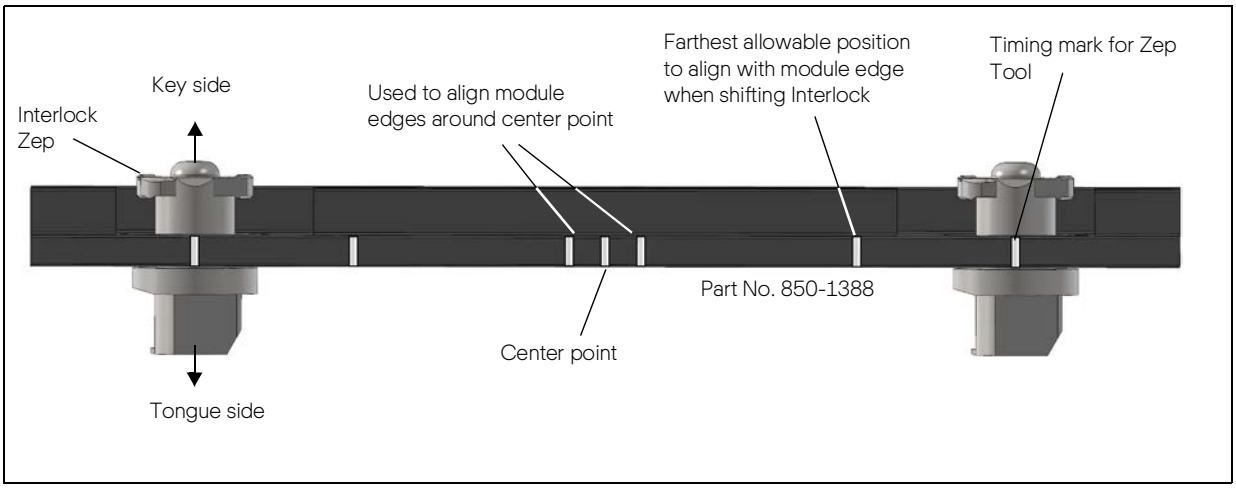
Zep Solar components are installed using precision-fitted, quarter-turn connections.

4.1 Interlock Installation

The Interlock provides module-to-module frame bonding through the interface with the Zep Groove. The Interlock is UL Listed to UL 2703.

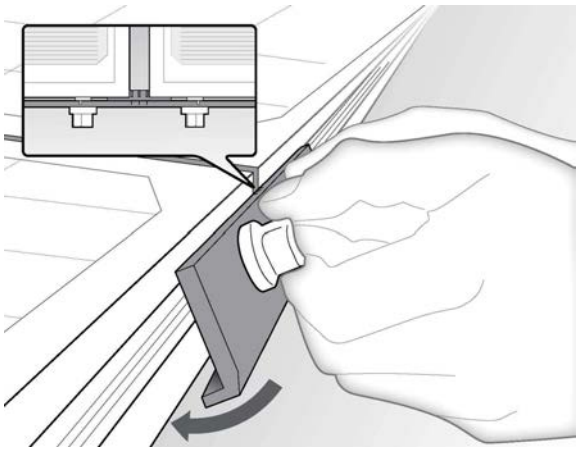
Alignment marks along the top edge of the Interlock aid in module positioning and tightening of the fasteners.

Figure 4.1 Interlock Alignment Marks

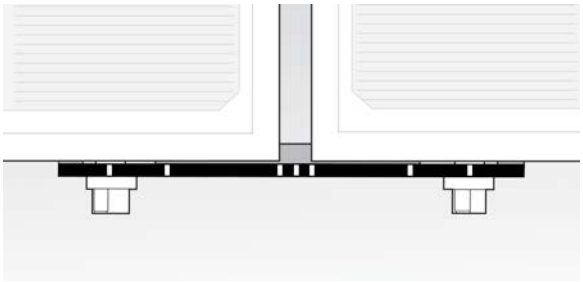


The Interlock is used to connect modules together.

Figure 4.2 Interlock Insertion



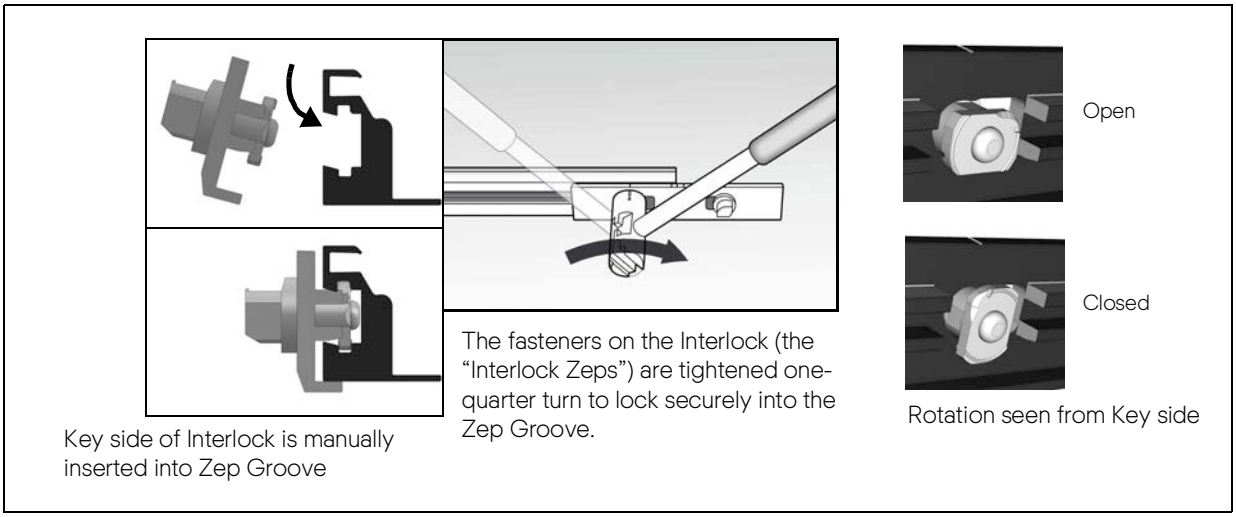
During installation of the Interlock, the Key side is inserted into the Zep Groove with a downward sweeping motion.



When modules are connected together using the Interlock, there must be a 1/2” (12.7mm) gap between modules

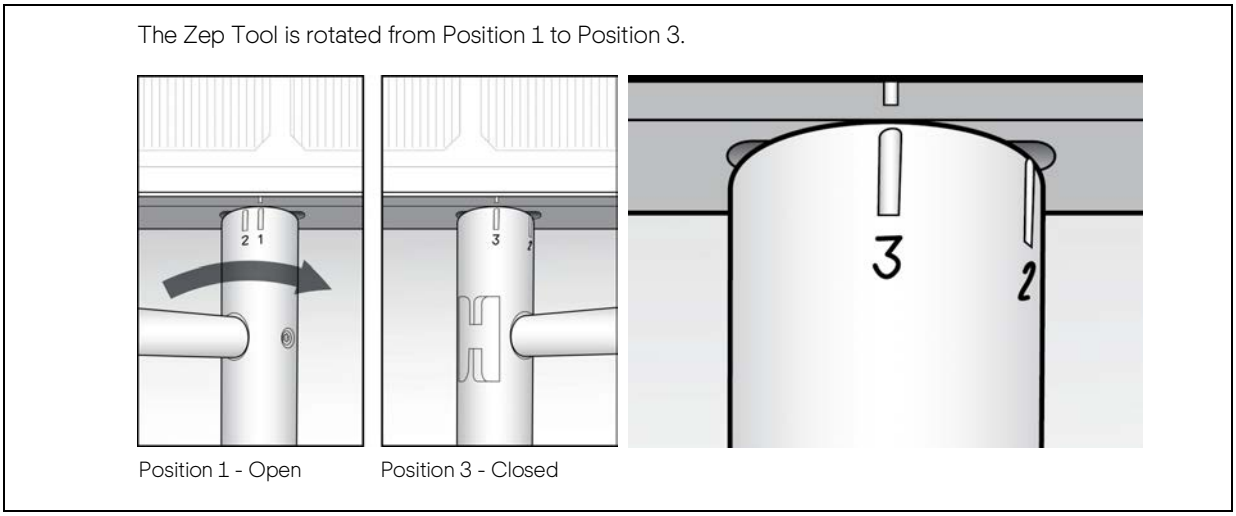
After the Interlock is inserted into the Zep Groove, the fasteners on the Interlock (the Interlock Zeps) are rotated to provide East-West module bonding.

Figure 4.3 Interlock Key Side Installation Uses Zep Tool



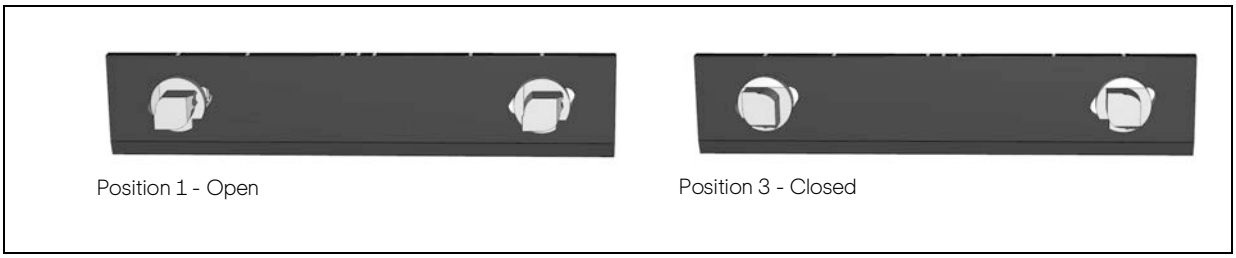
Alignment marks on the Interlock and the Zep Tool indicate exactly how far to rotate the Interlock Zeps to secure the Key side. Installers should not over-tighten or under-tighten.

Figure 4.4 Zep Tool Rotation Positions



When the Interlock Zeps are rotated to the closed position (Position 3), they are also in the correct position to receive a module drop-in on the Tongue side. The difference between positions is easily visible.

Figure 4.5 Interlock Zeps Showing Open and Closed Position



After the Interlock Zeps are secured on the Key side, the next row of modules is dropped-in on the Tongue side to provide North-South bonding within the array.

Figure 4.6 Module Drop-In on Interlock Tongue Side 1

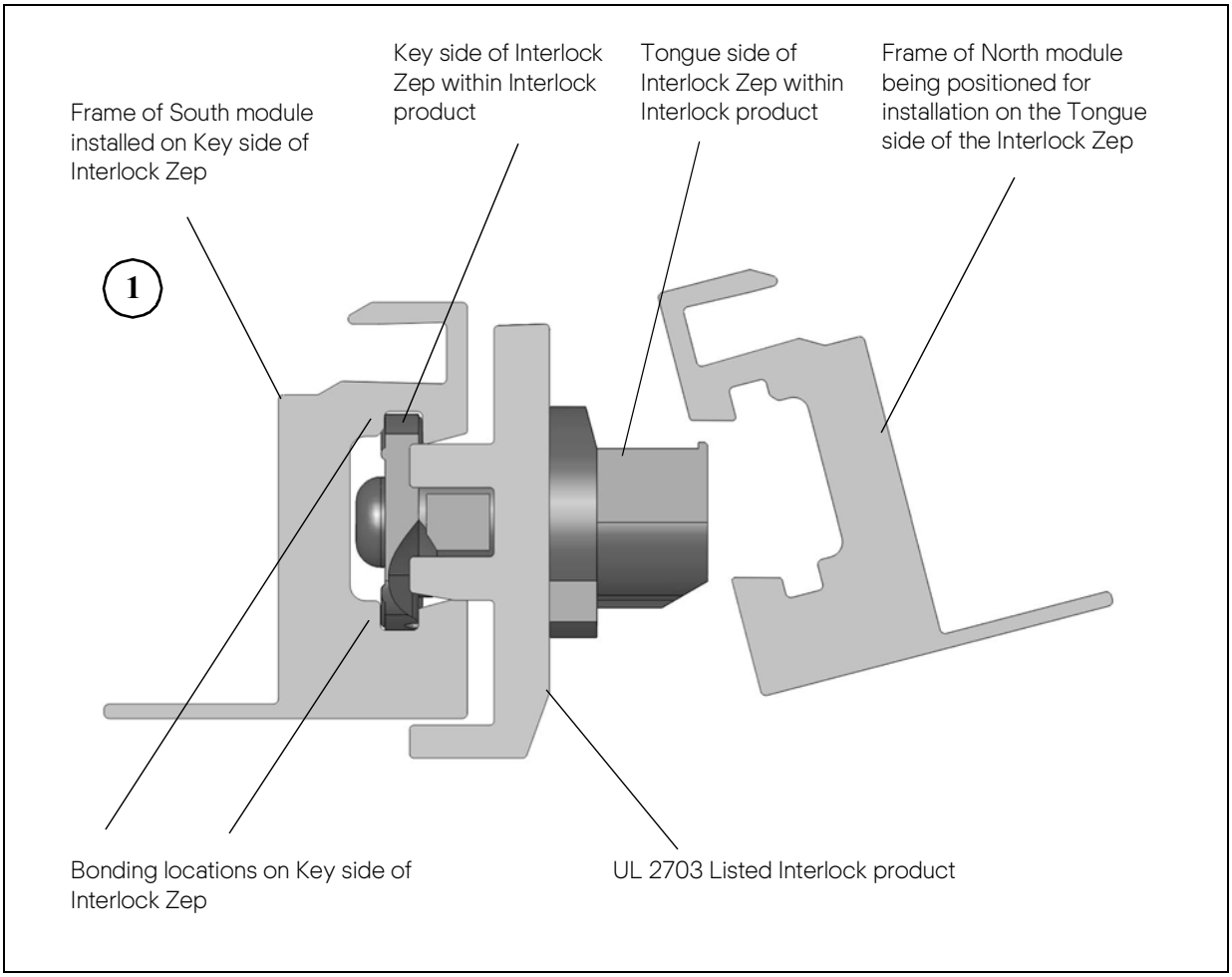


Figure 4.7 Module Drop-In on Interlock Tongue Side 2

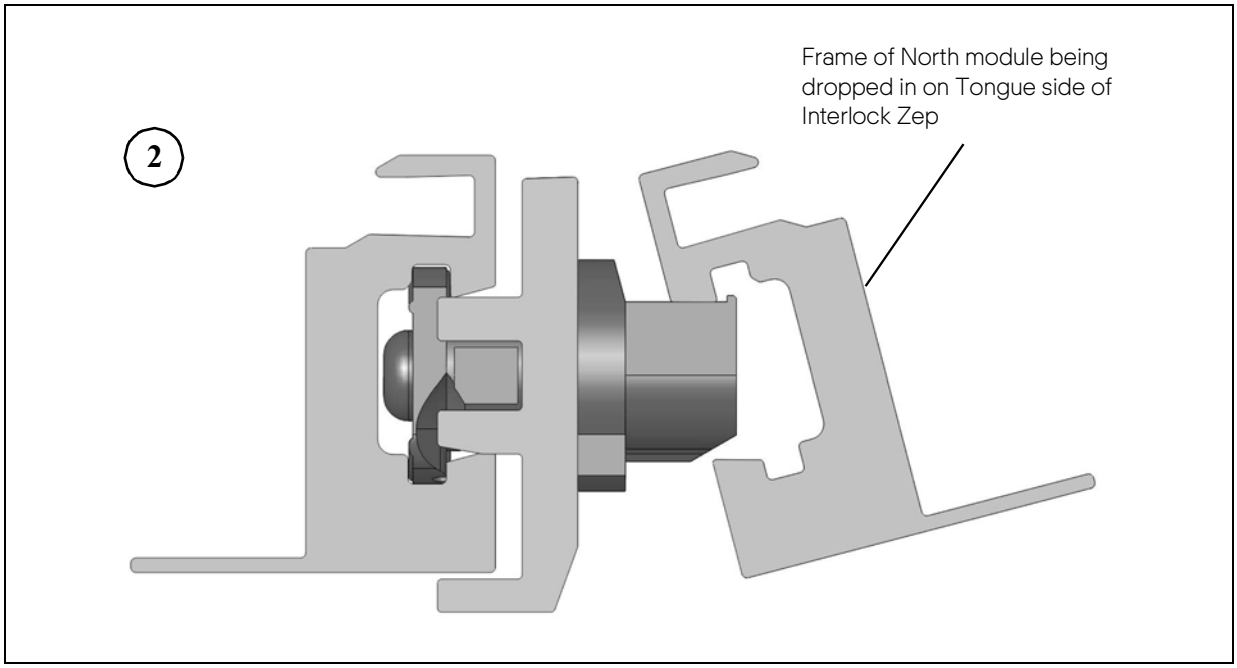


Figure 4.8 Module Drop-In on Interlock Tongue Side 3

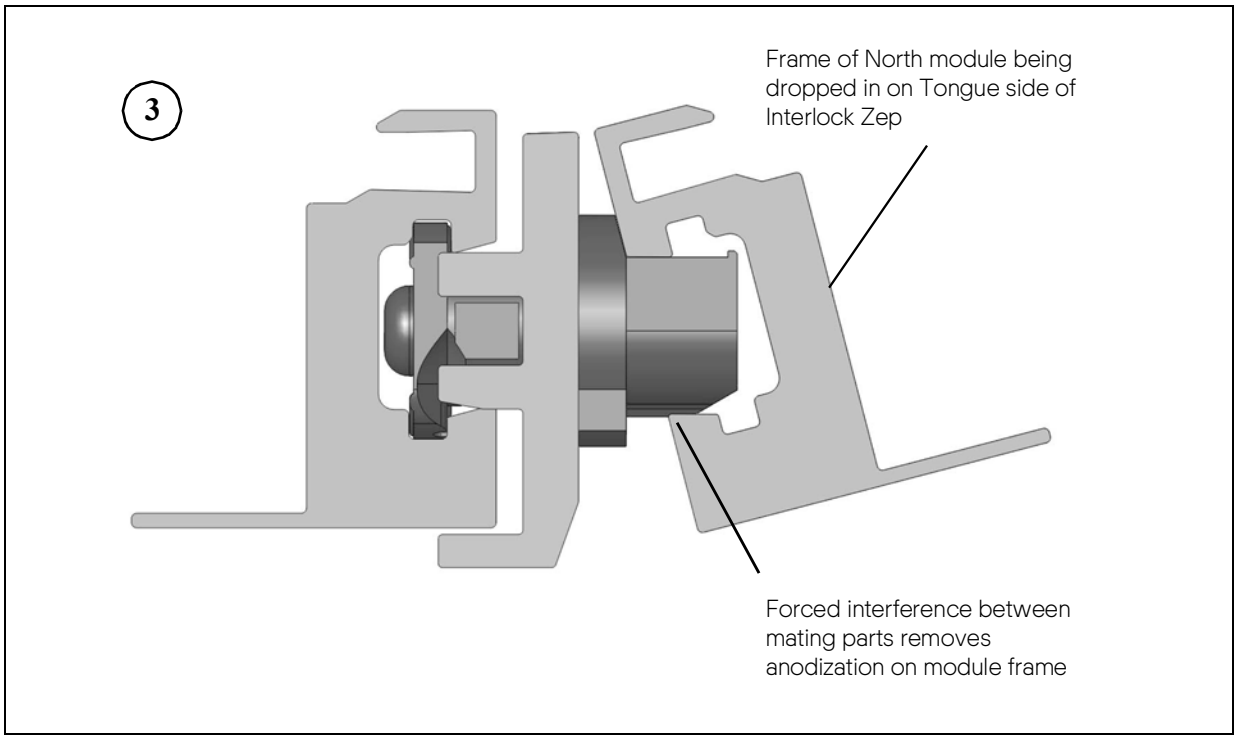
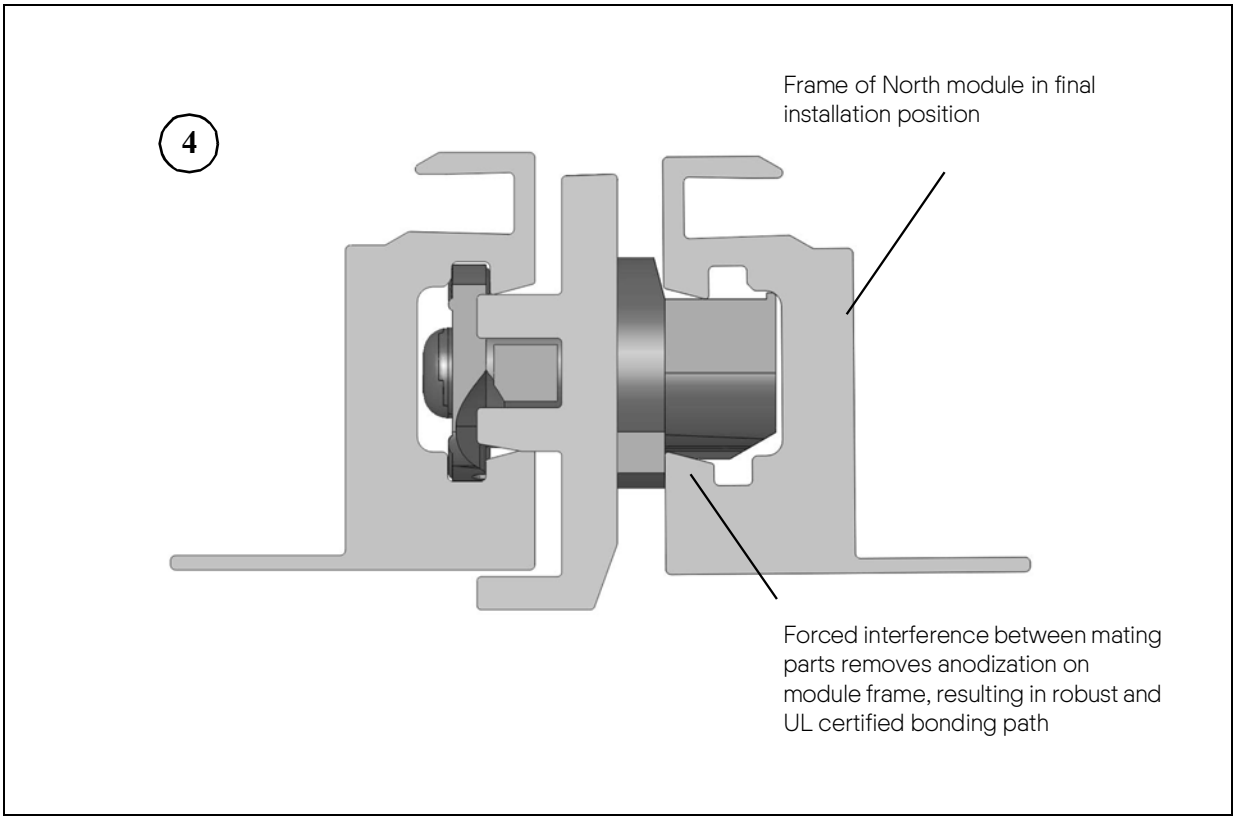


Figure 4.9 Module Drop-In on Interlock Tongue Side 4

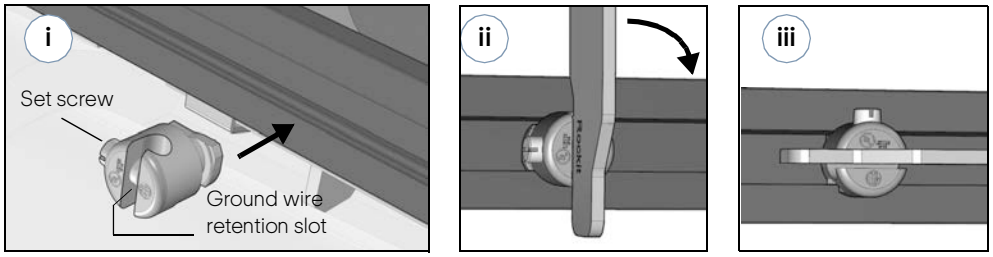


4.2 Ground Zep Installation

The Ground Zep is used to provide a path to ground for a Zep Compatible array. The Ground Zep is UL Listed to UL 467 and UL 2703.

Figure 4.10 Ground Zep Installation

1 **Insert a Ground Zep Into Module**



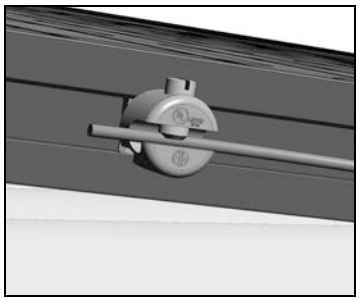
Insert a Ground Zep in the Zep Groove of any module around the array perimeter.

Start with the set screw at 9 o'clock position (pointing left).

Using either the Zep Tool or the Flat Tool (shown), lock the Ground Zep into place by turning 1/4 turn clockwise. After the Ground Zep is turned 90 degrees, the set screw should be pointing straight up.

This locks the Ground Zep into the Zep Groove and creates a solid ground bond with the module frame.

2 **Connect Ground Zep to Building Ground/Earth.**



Insert solid copper ground wire into the ground wire retention slot and turn the set screw wtih a flat-bladed screwdriver until the ground wire is captured by the set screw. To fully secure, torque the set screw as follows:

- 14-10 AWG: 40 inch-lbs
- 8 AWG: 45 inch-lbs
- 6 AWG: 50 inch-lbs

4.3 Cam Foot Installation

The Cam Foot is used to connect Zep Compatible modules to a Zep Compatible roof attachment system. For ZS Span, the Cam Foot connects modules to Zep Solar Spanner Bars.

Figure 4.11 Cam Foot

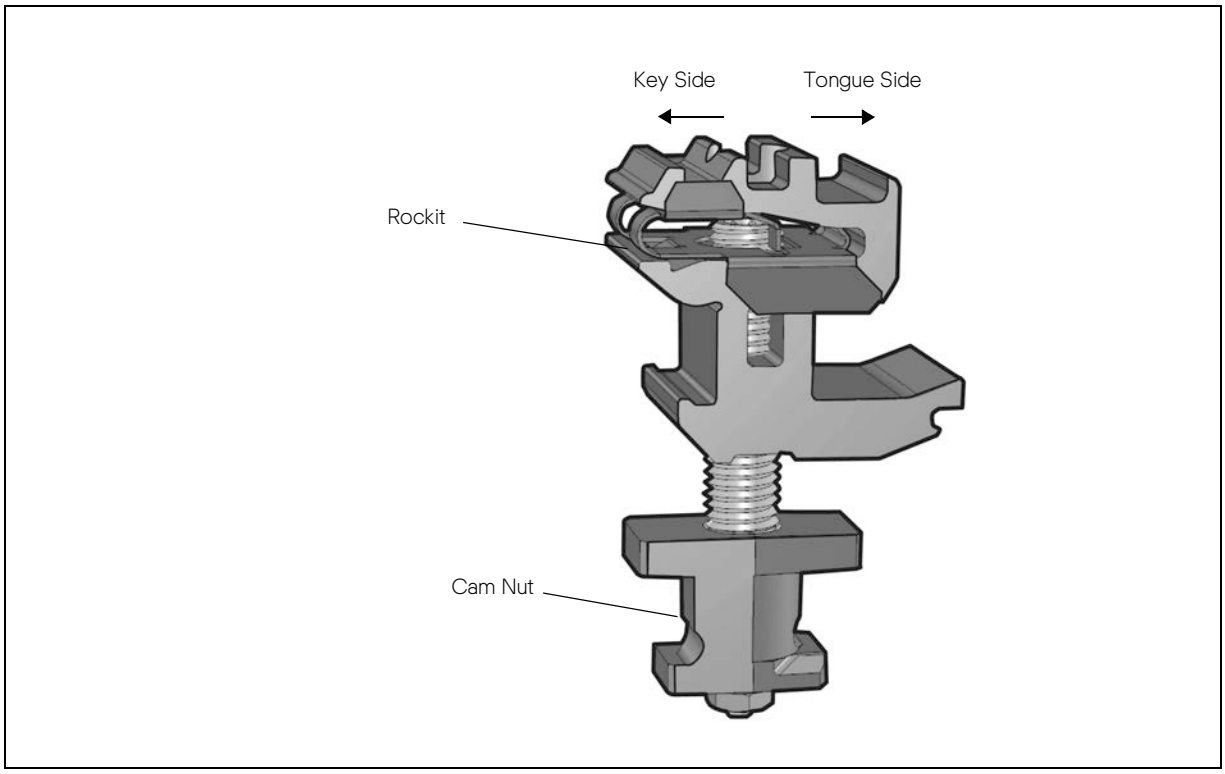
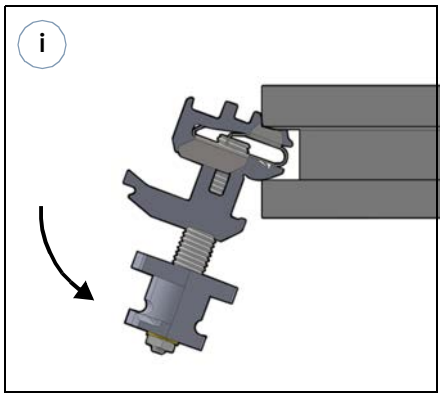
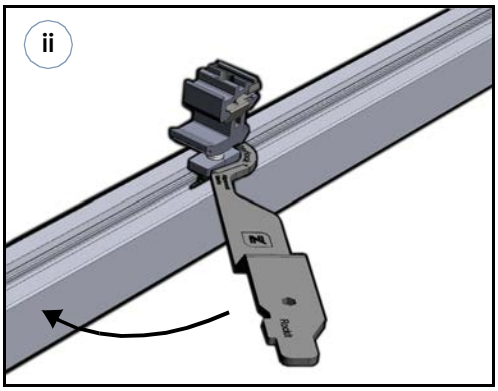


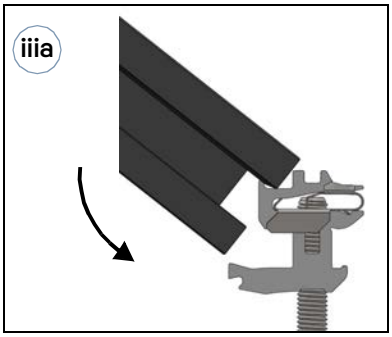
Figure 4.12 Cam Foot Installation - Zep Groove and Spanner Bar

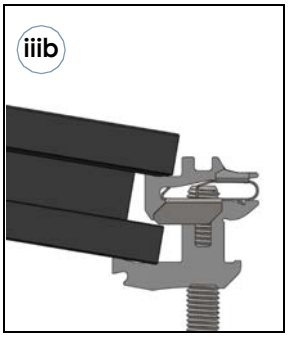


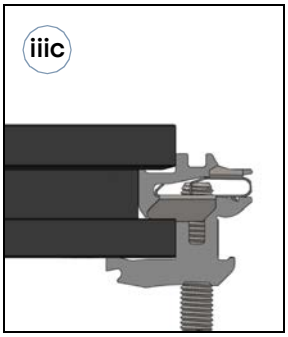
Install the Cam Foot into the rear edge of a module row by inserting the Key side into the Zep Groove. Use a sweeping downward force to rotate the Cam Foot until the Cam Nut is positioned within the Spanner Bar channel.



Use the Flat Tool to rotate the Cam Nut 100 degrees clockwise to lock the Cam Nut into the Spanner Bar.







Install the next row of modules by dropping the module onto the Tongue side of the Cam Foot Rockit to engage the Zep Groove. Pivot the module downwards so that the top surface of the module is parallel with the roof surface.

4.4 Leveling Foot Installation

The Leveling Foot is used to connect Zep Compatible modules to a Zep Compatible roof attachment system. For ZS Comp, the Leveling Foot connects modules to Zep Solar Comp Mounts or Zep Solar-approved standoffs.

Figure 4.13 Leveling Foot

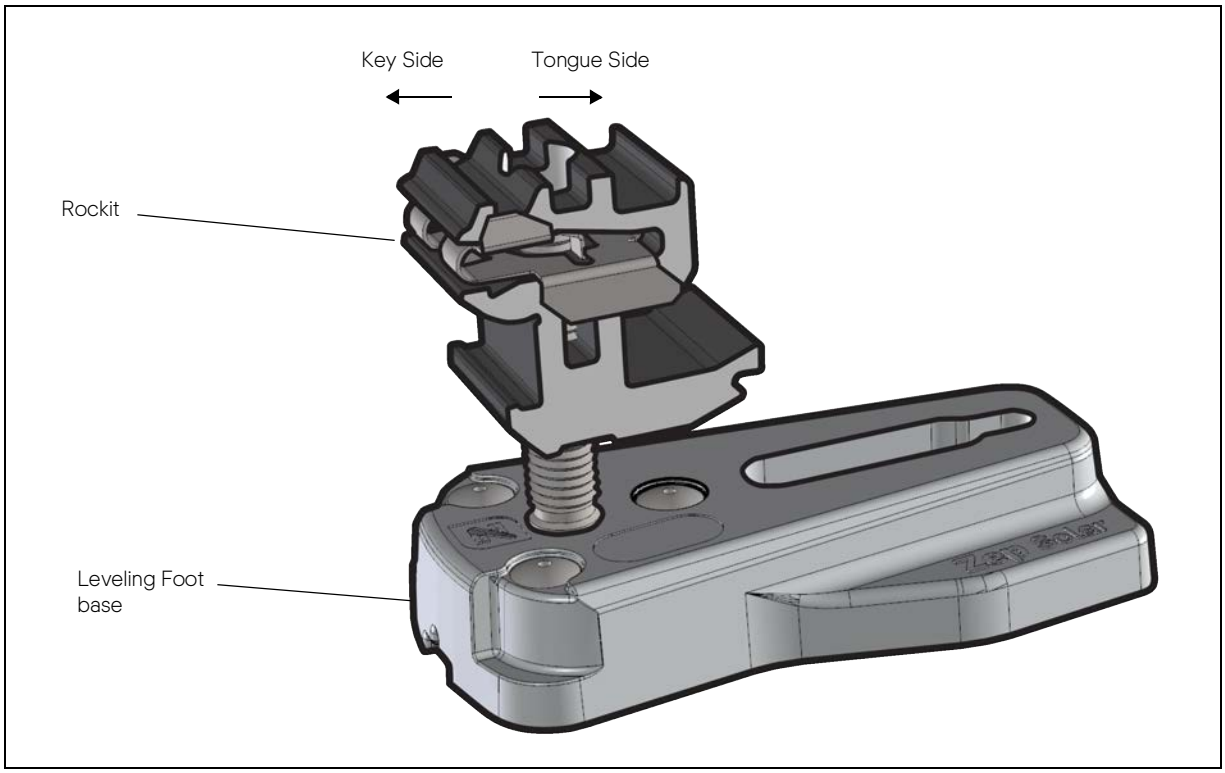
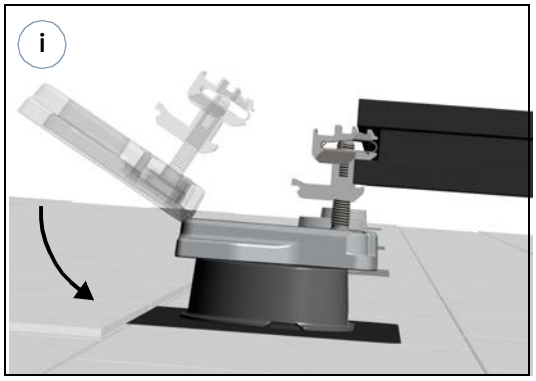
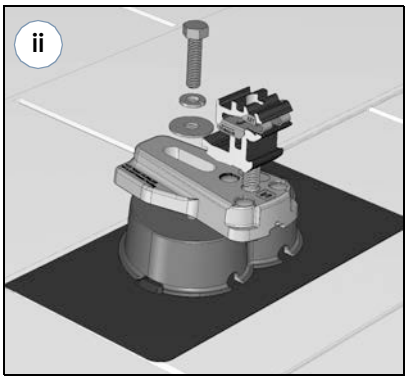


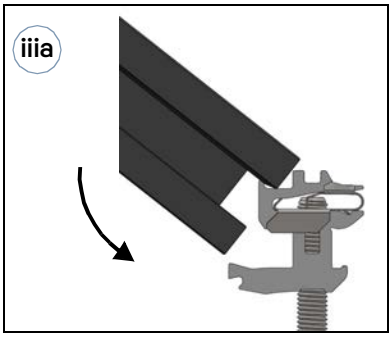
Figure 4.14 Leveling Foot Installation - Zep Groove and Comp Mount

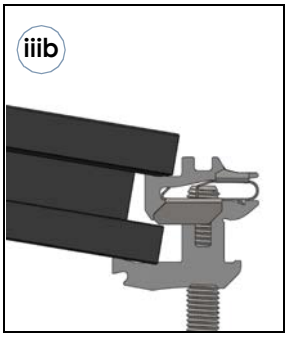


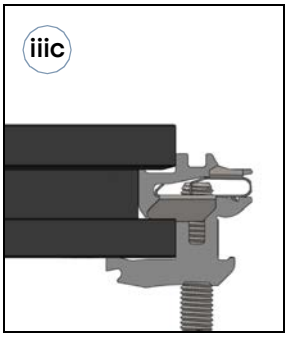
Install the Leveling Foot into the rear edge of a module row by inserting the Key side into the Zep Groove, using a sweeping downward force. Base of Leveling Foot should be positioned directly over the Comp Mount.



Secure Leveling Foot base to Comp Mount using hardware provided by Zep Solar, Inc.







Install the next row of modules by dropping the module onto the Tongue side of the Leveling Foot Rockit to engage the Zep Groove. Pivot the module downwards so that the top surface of the module is parallel with the roof surface.

4.5 Beam Clamp Installation

The Beam Clamp, used in ZS Beam, connects Zep Compatible modules to a Cee or Zee purlin within a solar support structure.

Figure 4.15 Beam Clamp

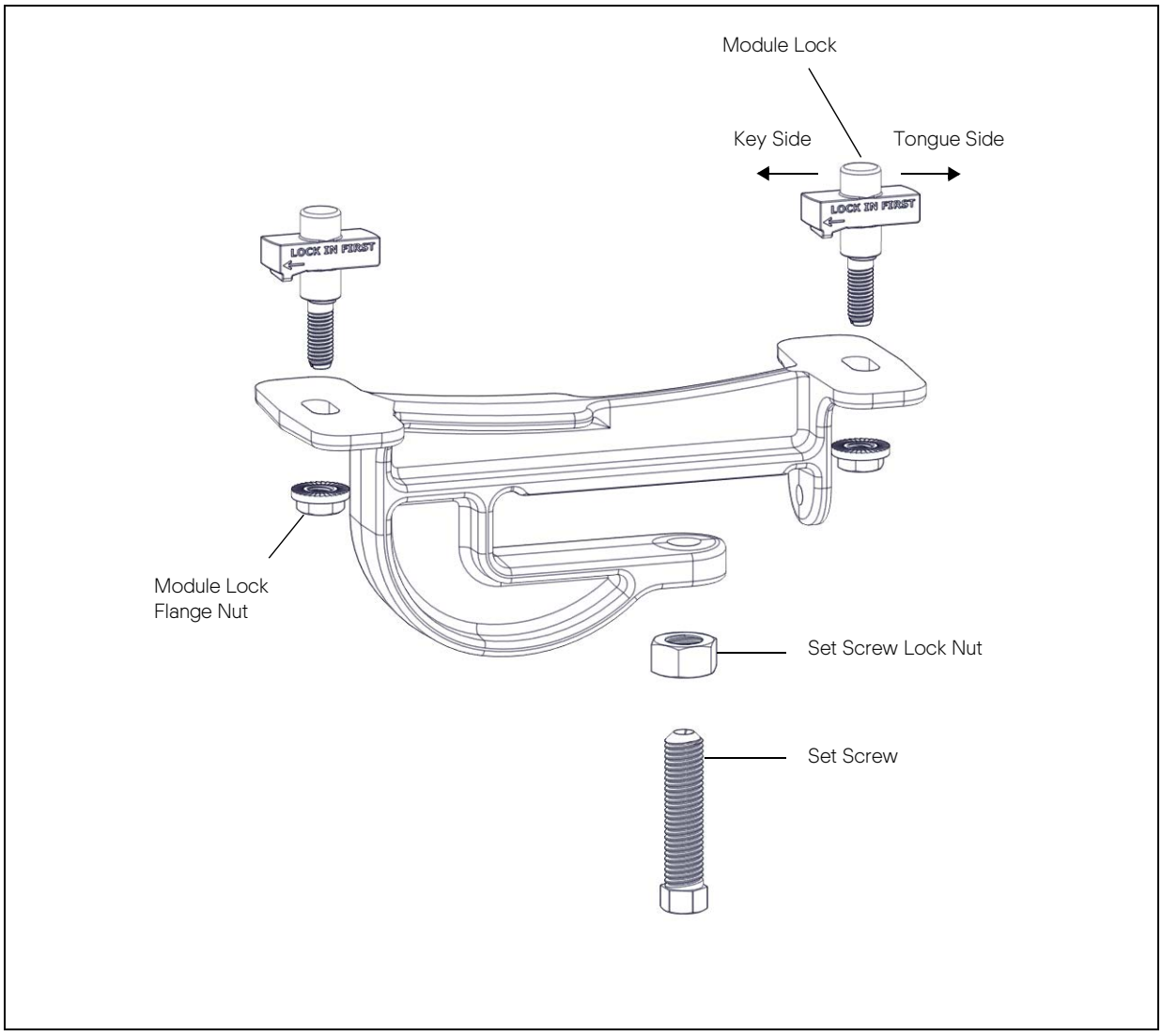
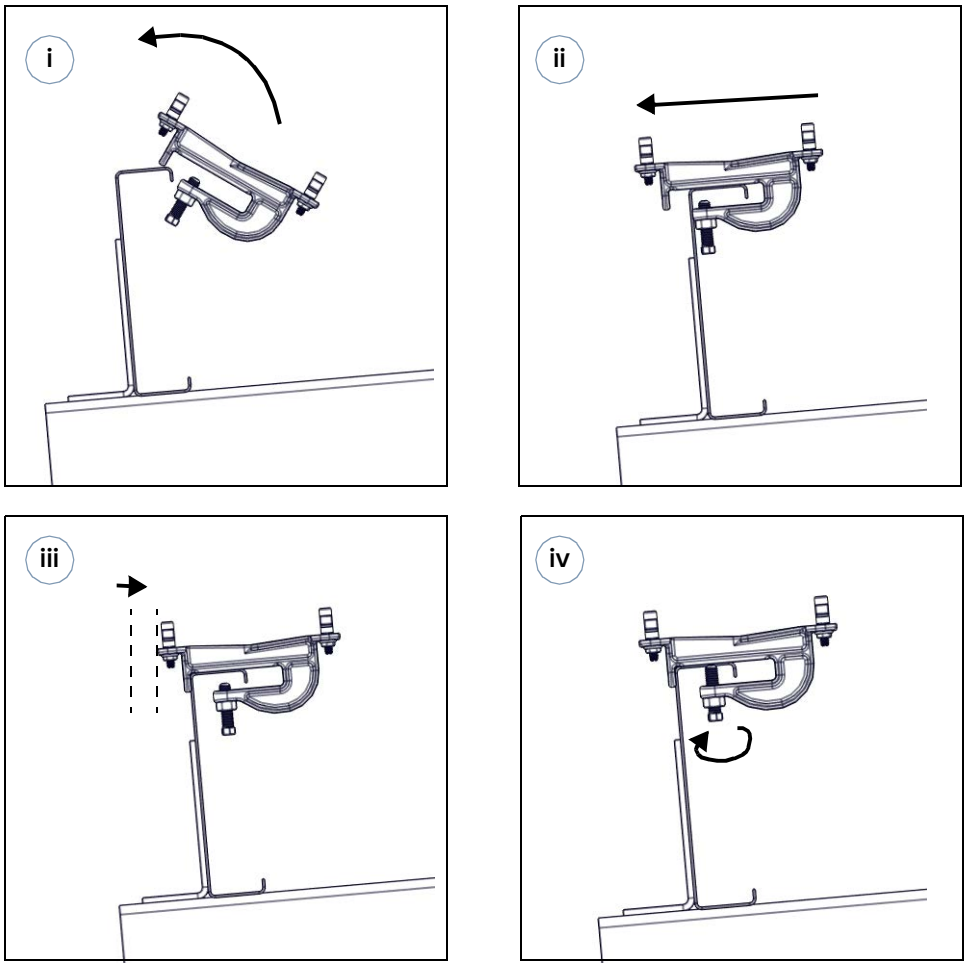
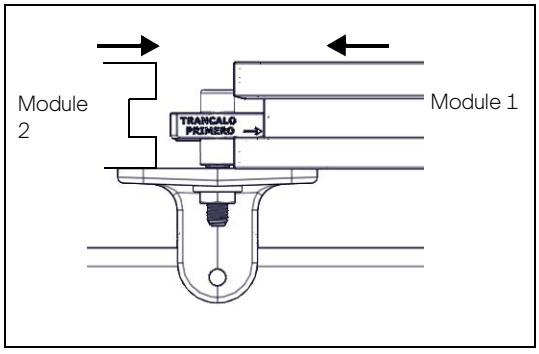


Figure 4.16 Beam Clamp Installation and Module Attachment



Hook the Beam Clamp over the lip of the purlin, slide onto purlin. Make sure that Beam Clamp is flush against the side of the purlin, and then tighten the Set Screw and Set Screw Lock Nut.



Slide the first module onto the surface of the Beam Clamp. Rotate the Key side of the Module Lock into the Zep Groove.

Slide the second module in from the other side onto the Tongue side o the Module Lock, and tighten the Module Lock Flange Nut to hold both modules in place.

4.6 Rockit Assembly Installation

The Rockit Assembly is a feature found on the Valley Base component of ZS Peak.

Figure 4.17 Valley Base

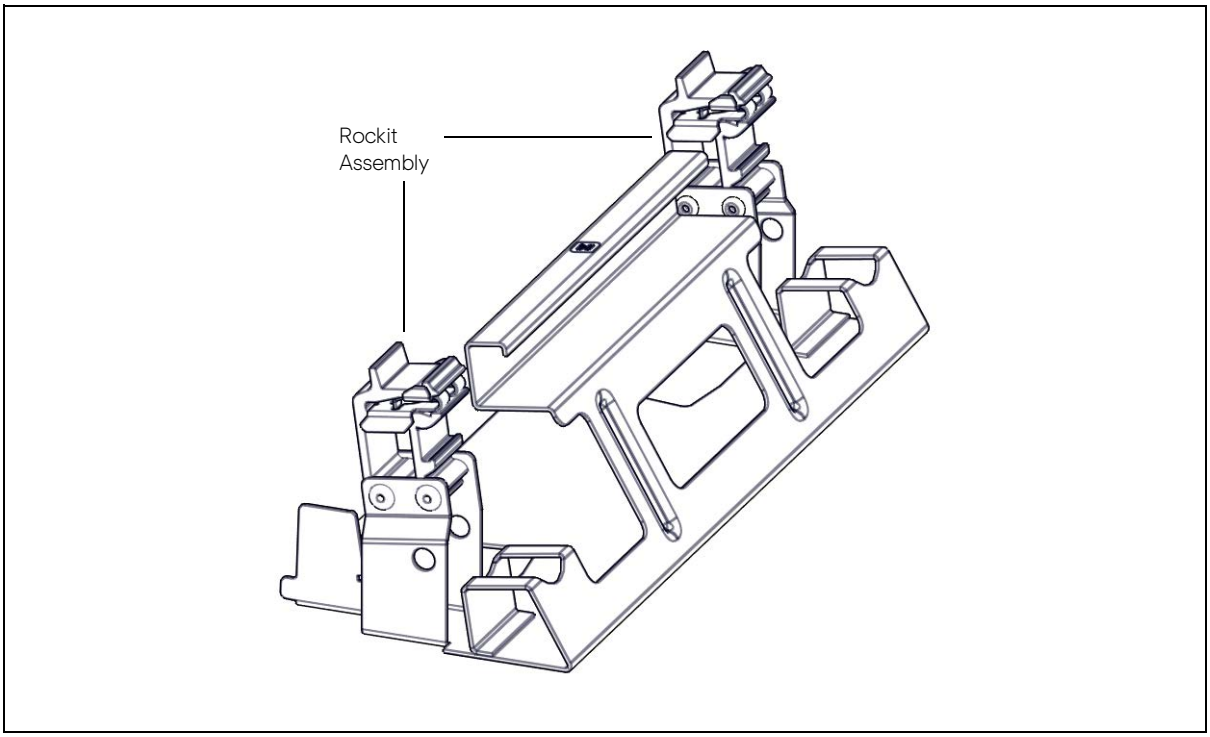
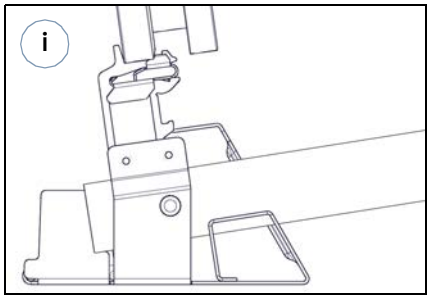
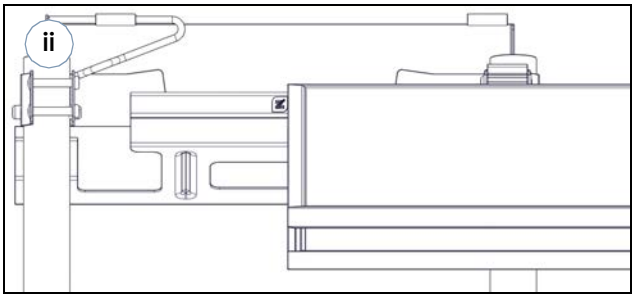


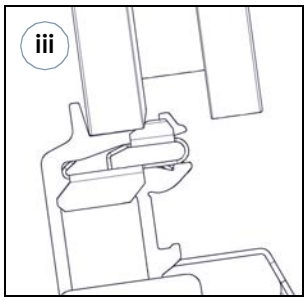
Figure 4.18 Module Attachment to Valley Base

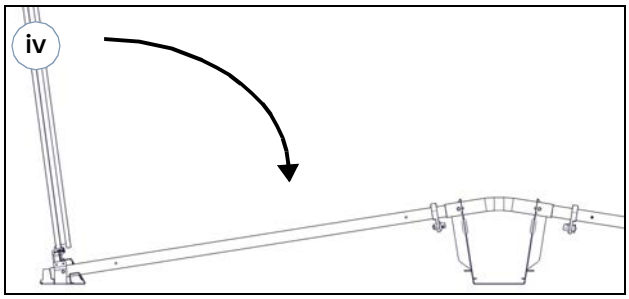


Position the module on edge across the first two Bridge Assemblies in the array column so that it rests against the lip of the Rockit Assembly.

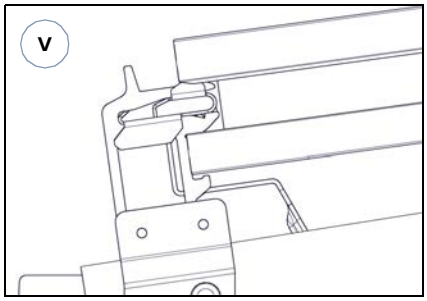


Align the module corner with the edge of the Alignment Mark on the Valley Base to ensure 1/2" spacing between modules.





Rotate the module downwards until the Zep Groove is fully engaged with the Rockit Assembly.



The Zep Groove should be flush against the base of the Rockit Assembly.

4.7 Lock Block Installation

The Lock Block is a feature found on the Tube Assembly component of ZS Peak.

Figure 4.19 Lock Block on Tube Assembly

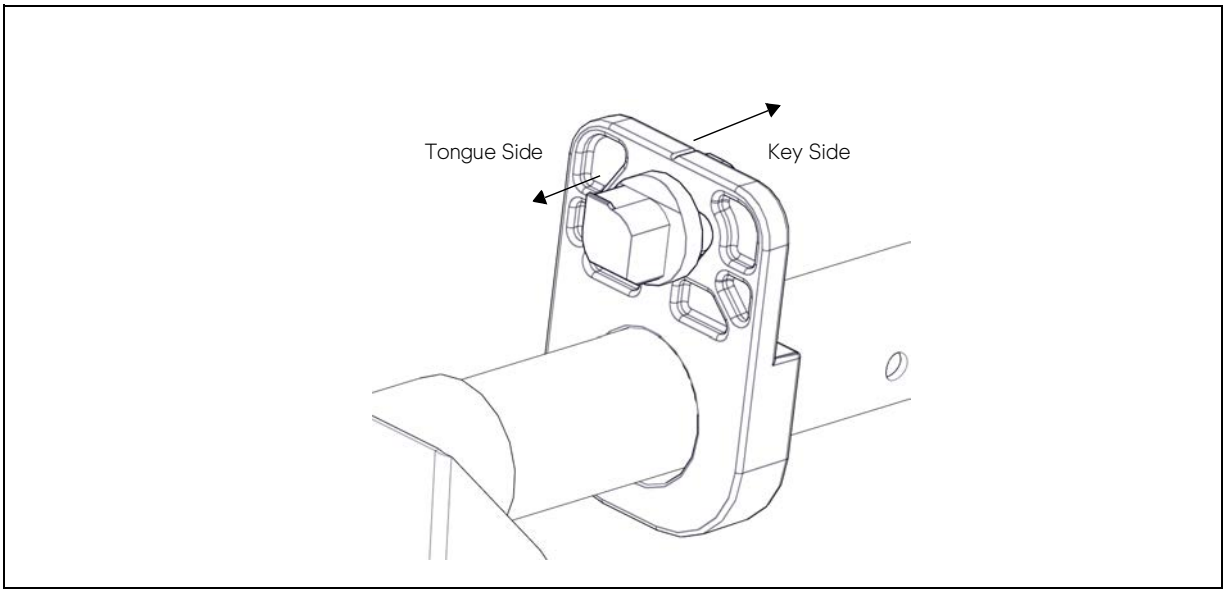
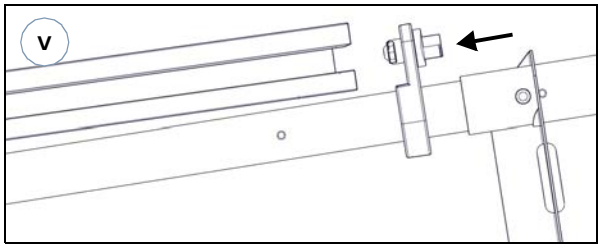
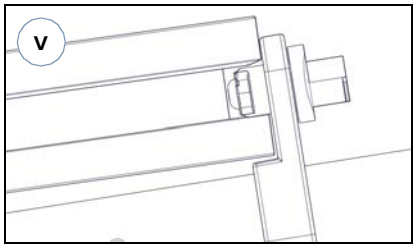


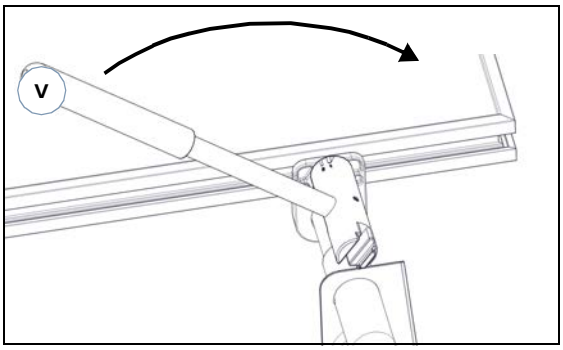
Figure 4.20 Connecting Lock Block to Module



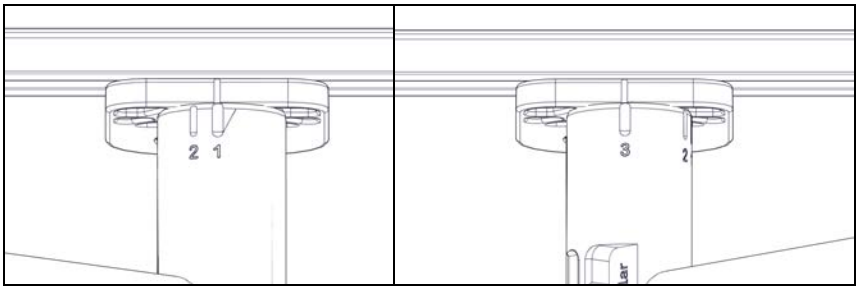
On the other side of the module, move the Lock Block into position and insert the Key side of the Lock Block into the Zep Groove.



Ensure that the module frame sits securely on the shelf of the Lock Block.



To secure the Lock Block, rotate the Zep Tool from Position 1 to Position 3, using the alignment marks on the Zep Tool and the Lock Block as a guide.



4.8 Electrical Layout

4.8.1 Module Selection

For detailed key electrical data, please refer to the actual data sheet referring to the relevant Module.

NOTE: For maximum energy yields, mismatches of specified electric current (IMPP) of more than 5 % should be avoided for all modules connected in series.

4.8.2 Safety Factor

During normal operation, a module may generate a greater current and / or higher voltage than that determined under standardized test conditions. Please use a safety factor of 1.25 for the following:

- Calculating the voltage measurement values (V_{OC}) of components
- Calculating the current measurement values (I_{SC}) of conductors
- Sizing of control systems connected to the outlets of the solar modules

NOTE: Please follow the valid national guidelines for the installation of electrical systems.

4.8.3 Series Connection

Connection of modules in series is only permitted up to the maximum system voltage as listed in the applicable data sheet of all the relevant modules to be installed.

NOTE: Take into account all possible operating situations and all relevant technical norms and regulations when designing the system. It has to be ensured that the maximum system voltage, including all necessary safety margins, is not exceeded.

NOTE: Take the voltage limit of the inverter into account when determining the maximum number of modules in the string.

4.8.4 Parallel Connection

Modules may be damaged by the occurrence of reverse currents

(caused by module defects, ground leaks, or defective insulation).

NOTE: Ensure that the maximum reverse current load capacity indicated in the data sheet is met. In order to limit reverse currents that may occur, we recommend using the following safety options:

1) Layout with a limited number of parallel connected strings:

Without undertaking further current blocking measures, a maximum of two module strings may be operated in parallel on a single inverter or MPP tracker.

2) Layout with string fuses:

Place fuses for each string of modules at the plus and minus ends. Use gPV-fuses according to IEC 60269-6. Observe the maximum permitted number of strings as indicated in the specifications provided by the respective string fuse manufacturer and the technical guidelines.

NOTE: Ensure that the cabling is not under mechanical stress (Comply with bending radius of ≥ 60 mm).

NOTE: When installing different product versions, the lowest minimum permitted reverse current load capacity applies.

NOTE: Do not use light concentrators (e.g. mirrors or lenses).

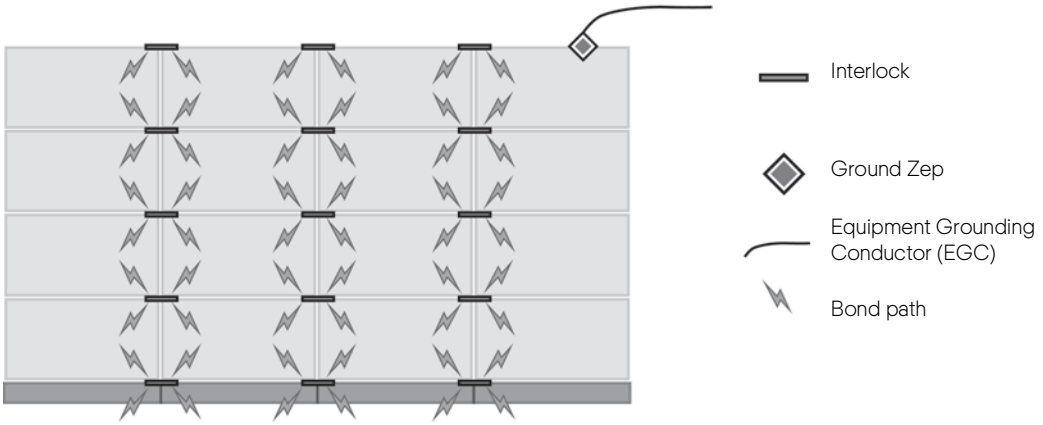
5 Array Bonding

The Zep Compatible design concept allows the installer to build a hyper-bonded array with a single ground bond connection. In a hyper-bonded array, every module is structurally and electrically bonded to the surrounding modules, on all sides. The rotation of the Key side into the Zep Groove, and the dropping in of the next row of PV modules onto the Tongue side, acts to establish a bond for all UL listed components by cutting through the surface coating on the Zep Groove. This eliminates the need for extensive lengths of copper wire run to every module in order to ground the array.

5.1 Grounding Path Examples

The following examples show how a Zep Compatible PV array is hyper-bonded using Interlocks.

Figure 5.1 Grounding Path - Simple Array

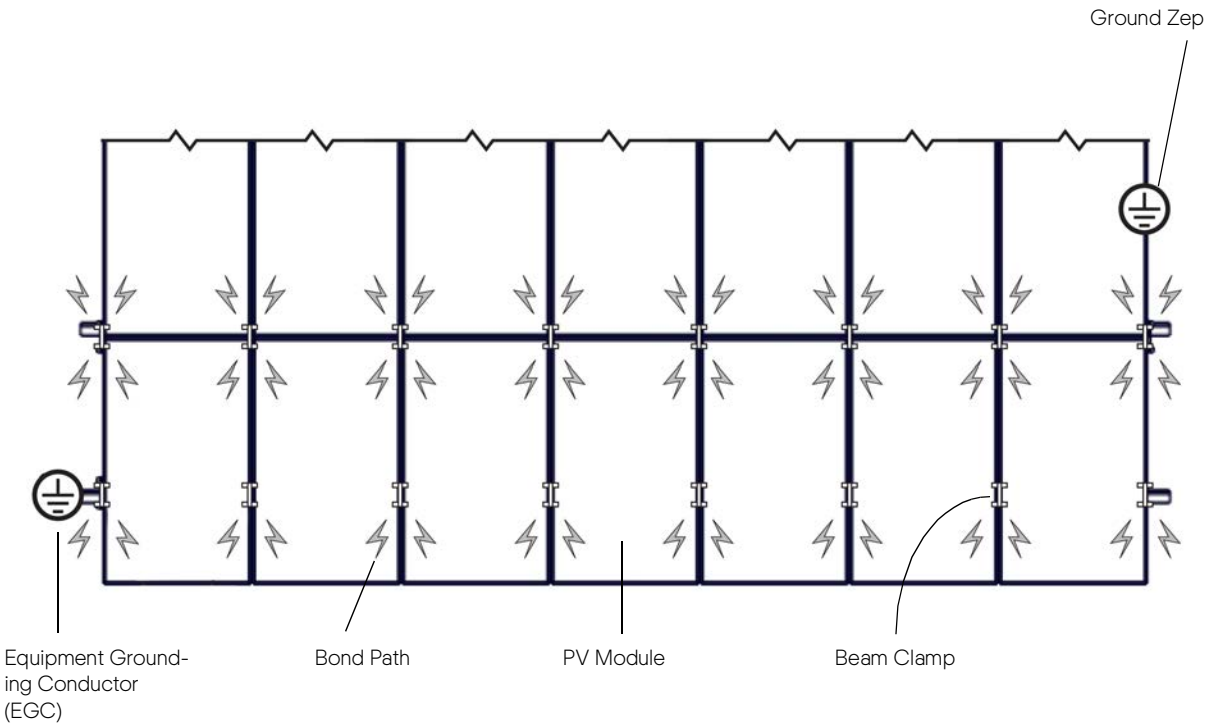


NOTE: If an array contains Thermal Expansion Joints, an additional Ground Zep may be required. Please refer directly to the Zep Solar installation manuals for further details.

5.2 Ground Path Example - ZS Beam

For ZS Beam, each module is structurally and electrically bonded to the surrounding modules via the Beam Clamps.

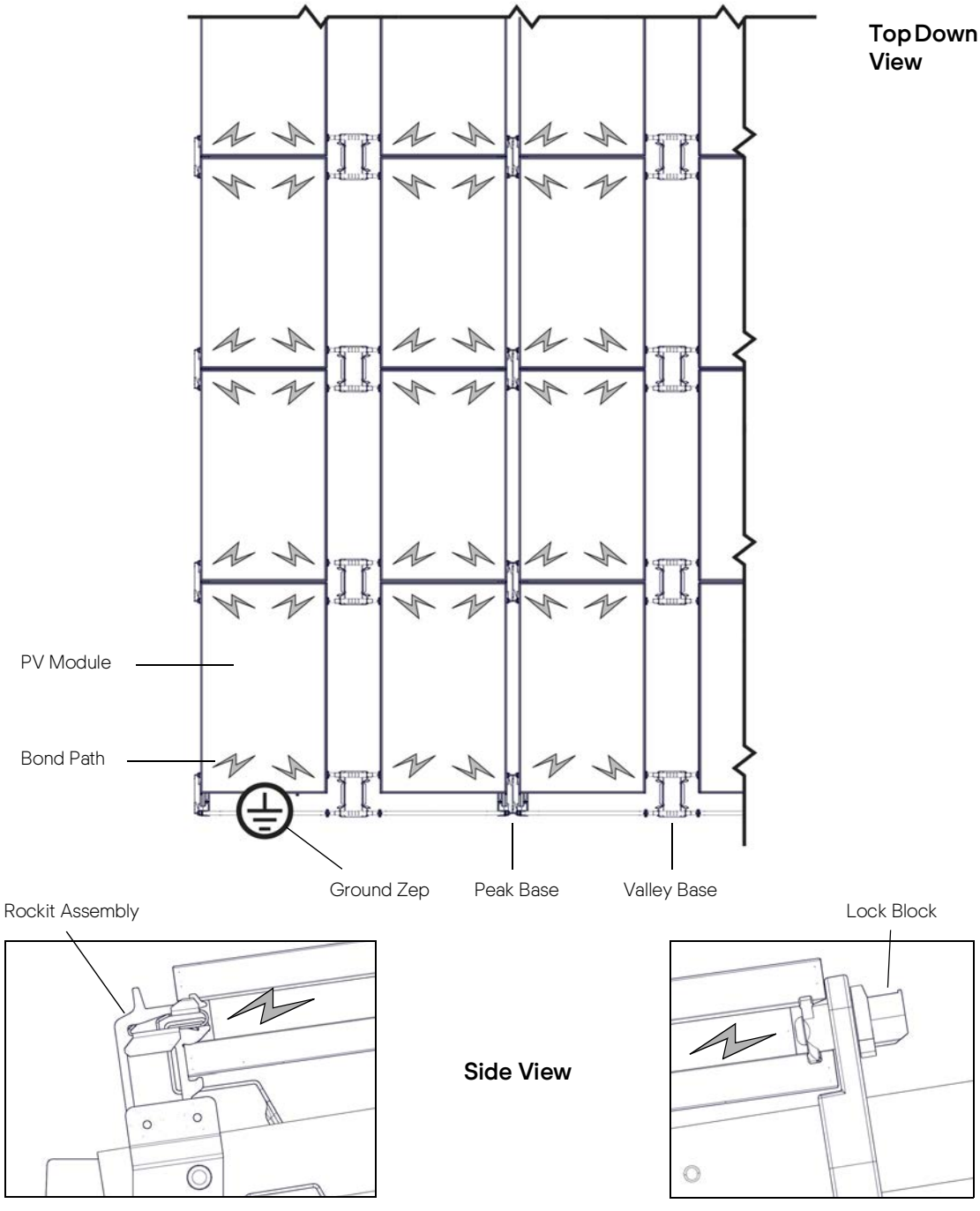
Figure 5.2 Grounding Path - ZS Beam



5.3 Ground Path Example - ZS Peak

For ZS Peak, each contiguous ZS Peak array is a single hyper-bonded matrix, including the Bridge Assemblies.

Figure 5.3 Grounding Path - ZS Peak



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