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**SOLAR**  
**THAILAND**

Ronnachai S.

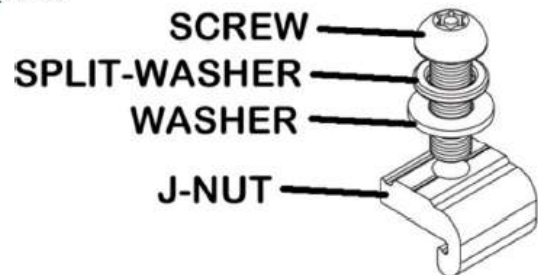
Solar (Thailand)

## RAIL-TO-BRACKET CONNECTOR

The Rail-to-Bracket connector (#308-001) is used to connect the roof bracket to the rail.

The Aluminum "J-Nut" profile is also used in the following Lock Solar parts:

- RAIL-TO-BRACKET CONNECTOR (#308-001)
- RAIL JOINER (#307-001)
- ADJUSTBLE MID CLAMP (#301-001)
- ADJUSTABLE END CLAMP (#302-001)
- RAIL EARTHING LUG ASSEMBLY (#309-001)



Please use the following procedure, when installing the "J-Nut" profile parts into the rail:

STEP-1: Align the screw into the J-Nut, so the screw thread does not protrude from below the bottom of the J-NUT (Bottom of screw is flush with the J-Nut)

*Bottom of screw is flush with J-Nut*

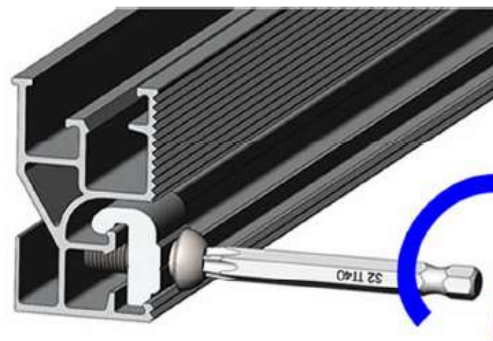


STEP-2: Slot the J-NUT into the rail profile and using your fingers, turn the screw 2 turns clockwise. This ensures the J-NUT is locked into the rail. The J-NUT is now secured into the rail and will not fall out.



**2-TURNS BY HAND**

STEP-3: Once the piece is aligned and ready to tighten, use an electric drill, fitted with the Lock Solar security drill tec bit (#110-001) and tighten to 8Nm of screw torque.



**8Nm DRILL TORQUE**

Lock Solar security drill Tec-bit (#110-001)



**ADJUSTABLE END CLAMP SPACER**

**Set the Adjustable End Clamp height, for lower solar panel frame heights (above 31mm):**

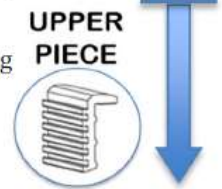


**\*\*The UPPER PIECE is located in a lower position\*\***

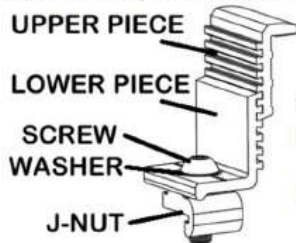
Slide out (sideways) the UPPER PIECE from the LOWER PIECE and re-position it to match the same height as the solar panel frame that is being installed.

Be sure the WASHER is included, when reassembling.

*Adjust for lower height*



**Set the Adjustable End Clamp height, for higher solar panel frame heights (below 55mm):**



**\*\*The UPPER PIECE is located in a higher position\*\***

Slide out (sideways) the UPPER PIECE from the LOWER PIECE and re-position it to match the same height as the solar panel frame that is being installed.

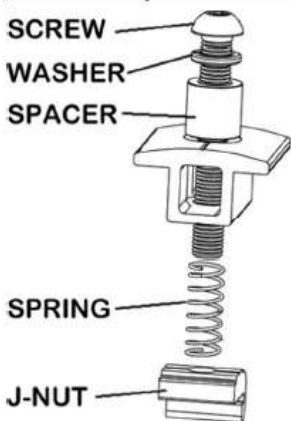
Be sure the WASHER is included, when reassembling

*Adjust for higher height*



**ADJUSTABLE MID CLAMP SPACER**

**Set the Adjustable Mid Clamp height, for solar panel frames with 31mm to 44mm height:**



**\*\*Make sure the SPACER is included\*\***

If the Aluminum SPACER is missing, it needs to be included, as shown in this diagram.

STEP-1: Disassemble the Mid Clamp.  
Unscrew the security SCREW from the Aluminum J-NUT.

STEP-2: Reassemble the Mid Clamp with the SPACER:  
Then reassemble the Mid clamp with the aluminum SPACER inserted.  
Be sure the WASHER and the SPRING are also included.

**WITH SPACER**



**Set the Adjustable Mid Clamp height, for solar panel frames with 45mm to 55mm height:**



**\*\*Make sure the SPACER is removed\*\***

If the Aluminum SPACER is attached, it needs to be removed, as shown in this diagram.

STEP-1: Disassemble the Mid Clamp.  
Unscrew the security SCREW from the Aluminum J-NUT.

STEP-2: Reassemble the Mid Clamp without the SPACER:  
Be sure the WASHER and the SPRING are also included.

**NO SPACER**





<b>Ref: Difference between T5 and T6 Aluminium Tempering</b>
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This report shows the structural differences in the Aluminium T5 and T6 Tempering.

**What is Tempering?**

Temper is a measure of a metal's resistance (Aluminium) to bending or kinking. It has a direct impact on the strength and other characteristics of the material.

There are a variety of different tempering letters (F, O, W, H, T)

**What is "T" Tempering?**

(T1 to T10) tempers are thermally-treated tempers that are imparted by heating and cooling the Aluminium material in a controlled way, during the manufacturing process.

**T5 Tempering**

T5 is the process of Aluminium material that is cooled after being shaped to its final dimensions during a process involving a lot of heat (such as extrusion), then artificially aged to a stable condition.

**T6 Tempering**

T6 is the process of Aluminium material that is heat treated and artificially aged to a stable condition.

Source: [http://www.metalreference.com/INFO\\_Aluminum.html](http://www.metalreference.com/INFO_Aluminum.html)

**TABLE-1: Comparisons T5 & T6**

The following table shows the strength difference between the T5 and T6 Aluminium alloy properties. *Lock Solar* uses T6 Aluminium.

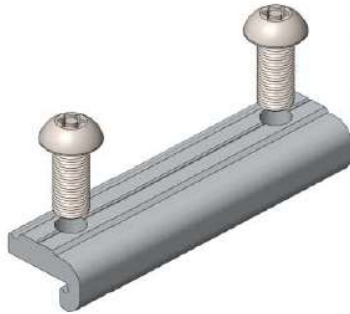
Property Description	Units	T5 test results	T6 test results
Hardness	Brinell	60	73
Shear Strength	MPa	117	152
Strength to Weight ratio	Shear (kN-m/kg)	43	56
Strength to Weight ratio	Tensile, Ultimate (kN-m/kg)	69	89
Strength to Weight ratio	Tensile, Yield (kN-m/kg)	53	79
Tensile Strength Ultimate	(MPa)	186	241
Tensile Strength Yield	(Proof, MPa)	145	214

Source: <http://www.makeitfrom.com/compare-materials/?A=6063-T5-Aluminum&B=6063-T6-Aluminum>

**Conclusion**

T6 Aluminium Temper provides much stronger characteristics than T5. It also has a much higher hardness property, gaining overall a much better product for outdoor structural engineering projects, such as solar mounting products.

*Lock Solar* is proud to use T6 Aluminium tempering in all of its Aluminium rails and mounting parts, to provide the strongest materials possible.



### Rail Joiner

The Rail Joiner allows rail pieces to be aligned and firmly locked together, extending the length of a solar array.

*Includes 2x 20mm M8 security-head screws*

*\*Also available in black anodised\**



### Adjustable Mid Clamp (31mm to 55mm height)

The spring loaded Adjustable Mid-Clamp accommodates different PV module frame heights ranging from 31mm to 55mm, with the simple addition or removal of its concealed spacer.

*Part includes: rail nut, 60mm M8 security-head screw, spring, spacer and washer. \*Also available in black anodised\**



### Adjustable End Clamp (31mm to 55mm height)

The Adjustable End-Clamp accommodates different PV module frame heights ranging from 31mm to 55mm, by simply changing the locking position of the upper clamp piece.

*Part includes: rail nut, 25mm M8 security-head screw and washer.*

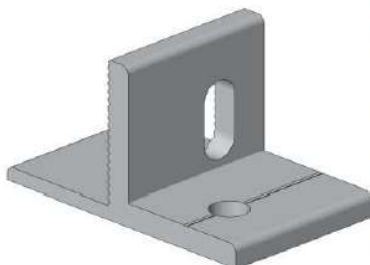
*\*Also available in black anodised\**



### Rail-to-Bracket Connector

This component is used to connect the rail pieces to the roof brackets. This part is required and attached to, for every roof bracket used.

*Part includes 25mm M8 security-head screw, washer and rail nut*

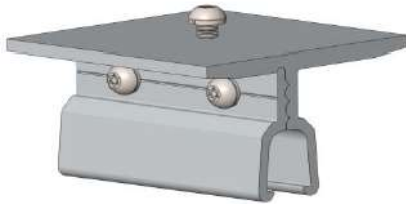


### Cross-bracing rail bracket

The Cross-bracing bracket is designed to join two rails together (lower rail and upper rail pieces), at 90-degrees.

This bracket is only used with advanced cross-bracing installation methods, where panels and roof battens do not align up.

*This bracket requires 2x Rail-to-Bracket Connectors (#308-001), which are not included*



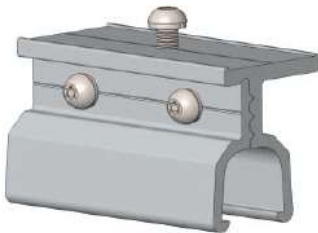
### **Klip-Lok 406 Bracket (1 Hole)**

Designed to clamp directly onto Klip-Lok 406 sheet-metal roof profile. This bracket allows mounting of the solar arrays, without penetration of the roof sheeting.

To be used with L-Bracket, M8 hole (#305-002)

*Includes 20mm security-head screw, for attaching L-bracket.*

*Does not include L-Bracket (#305-002)*



### **Klip-Lok 700 Bracket (1 Hole)**

Designed to clamp directly onto Klip-Lok 700 sheet-metal roof profile. This bracket allows mounting of the solar arrays, without penetration of the roof sheeting.

To be used with L-Bracket, M8 hole (#305-002)

*Includes 20mm security-head screw, for attaching L-bracket.*

*Does not include L-Bracket (#305-002)*



### **V-600 Bracket (1-screw)**

Designed to clamp directly onto V600 sheet-metal roof profile. This bracket allows mounting of the solar arrays, without penetration of the roof sheeting.

To be used with L-Bracket, M8 hole (#305-002)

*Includes 20mm security-head screw, for attaching L-bracket.*

*Does not include L-Bracket (#305-002)*



### **L-Bracket (with 6.3mm hole & EPDM)**

This L-bracket mounts directly onto tin roofs. Its adaptable rail height adjustment slot allows for a level PV array to be established, no matter how uneven the roof is. The hole is drilled to 7.1mm, to fit a 6.3mm roofing screw.

*Includes EPDM rubber gasket. Does not include rail-to-bracket connector or roofing screw. \*Also available in black anodised\**



### **Hanger Bolt with L-Bracket, 200mm M10**

The Hanger Bolt with L-Bracket mounts directly onto tin roofs. Its adaptable height adjustment allows for a level PV array to be established, no matter how uneven the roof. This Hanger Bolt has a 3/8" 12-TPI thread. It is Stainless Steel and DICO™ coated, to ensure maximum corrosion resistance, when screwing into a steel roof purlin.

*Part included L-Bracket and does not include rail-to-bracket connector*



### Adjustable Portrait, Pan Tile Bracket

Designed for universal and flatter-type tile roof applications, the adjustable tile hook mounts directly to roof rafters and is concealed between tiles to ensure water proofing is unaffected.

This bracket allows rails to be installed left to right on a tiled roof (solar panels mounted in Portrait configuration)

*Does not include rail-to-bracket connector or roofing screws*



### 10-30 deg, ADJUSTABLE TILT KIT

Designed for installing solar panels on flat roofs, including metal-sheet and concrete roofs.

The adjustable telescopic rear leg will provide a tilt angle between 10 to 30 degrees, for an optimum panel mounting angle. The mounting holes are drilled to 9mm, to fit an M8 roofing screw.

*This kit includes the following components:*

*Front-Foot assembly*

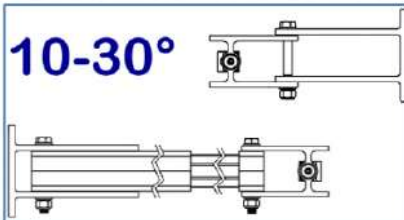
*Adjustable 10-30 degrees, telescopic rear leg assembly*

*2x rail-to-bracket connectors (with 2x 60mm security-head screws)*

*Does not include:*

*EPDM rubber pieces (#104-002)*

*Roofing screws*



### 30-60 deg, ADJUSTABLE TILT KIT

Designed for installing solar panels on flat roofs, including metal-sheet and concrete roofs.

The adjustable telescopic rear leg will provide a tilt angle between 30 to 60 degrees, for an optimum panel mounting angle. The mounting holes are drilled to 9mm, to fit an M8 roofing screw.

*This kit includes the following components:*

*Front-Foot assembly*

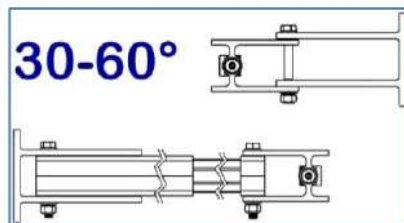
*Adjustable 30-60 degrees, telescopic rear leg assembly*

*2x rail-to-bracket connectors (with 2x 60mm security-head screws)*

*Does not include:*

*EPDM rubber pieces (#104-002)*

*Roofing screws*



### Lock Solar Security Drill Tec Bit

This 60mm Tec-bit is used to securely fasten the Lock Solar M8 security head screws.

It is easily fitted to any electric hand drill, for fast installation times.





**Solar Cable PV1-F**



**Fuse Holder**



**15A**  
**1000VDC**

