



CONNECTING TO ENERGY



TEGRA

Mounting Instructions  
standard roof mount  
extruded aluminum

Front mounting for 40x60mm and  
22x65mm Mounting Rails

- Corrosion-resistant materials
- Quick and easy to mount
- Structural calculations of the system in compliance with ASCE 7-05
- Easy to install flashing



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## ROOF TYPES



The standard roof mounts (1A, 1B, 1C) can be used on the following roof types:

Asphalt Shingles



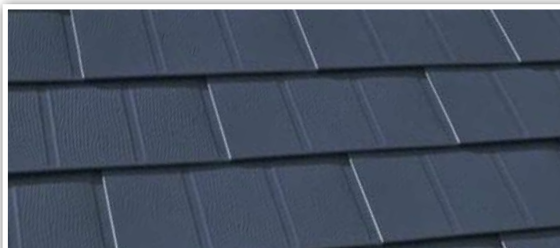
Slate/Simulated Slate



Shake/Simulated Shake



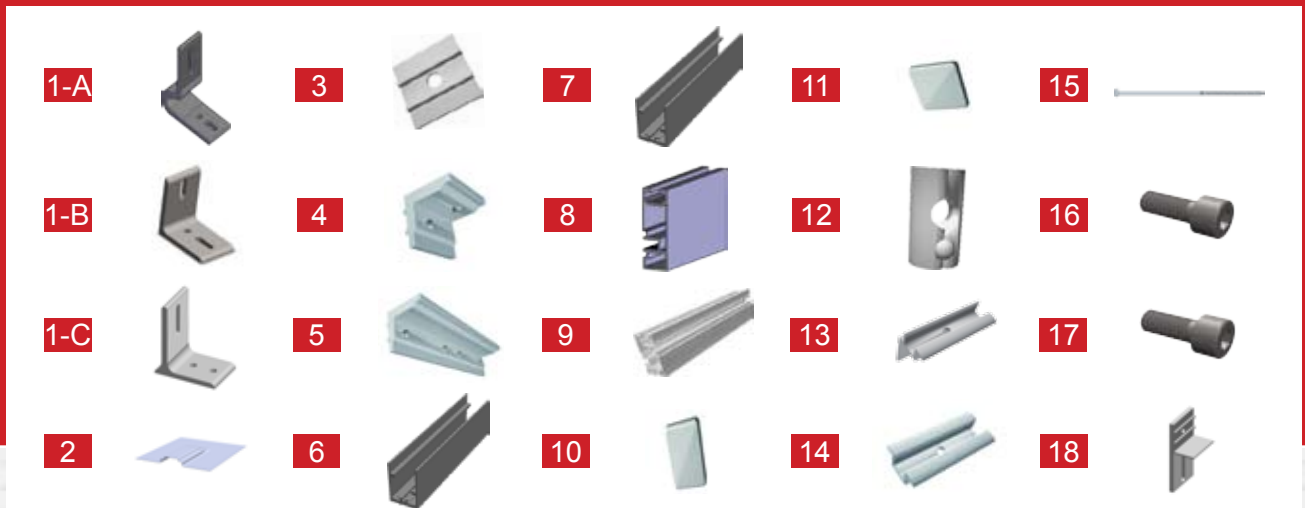
Wood Shingle



Metal Shingle (without flashing)

**NOTE:**  
Flashing is not used when installing on metal shingles.

## COMPONENTS



	PART #	DESCRIPTION		PART #	DESCRIPTION
1-A	77000500	Standard Roof Mount	9	74010601	Mounting Rail large 40x60, L=10ft
1-B	77000502-503	L Base or L Base WP	10	18000325 or 326	End Cap PP, 22x65 mm
1-C	77000505	L Base EX-T	11	18000306	End Cap PP, 40x60 mm
2	77000501	Standard Roof Mount Flashing	12	15100025	Sliding Block
3	72201701	Clamping Plate	13	72202901 35-50mm varies based on size	Corner Clamp
4	74011001	Cross Connector KP01, 53mm, 8.2mm	14	72202801 or 803	MG-MK 01, Middle Clamp
5	74011003	Rail Connector Fixed	15	SDS25112, 412, 600, 112-SS, 312-SS	Simpson SDS 1/4" Fastener (3.5", 4.5", 6")
6	74032901	Rail Connector Flexible, for Mounting Rail 22x65mm	16	15100019	Socket Head Cap Screw A2, M8x20 DIN 912
7	74016101	Rail Connector Flexible, for Mounting Rail 40x60mm	17	15100020-058 varies based on size	Socket Head Cap Screw M8x25, M8x35, M8x40, M8x45, M8x50, M8x55
8	74031901	Mounting Rail 22x65, L=10ft	18	74022601	Clamping Plate Adjustable

### RECOMMENDED TOOLS:

Power screwdriver with 6mm bit  
Allen key - 6mm  
Wrench



### NOTE:

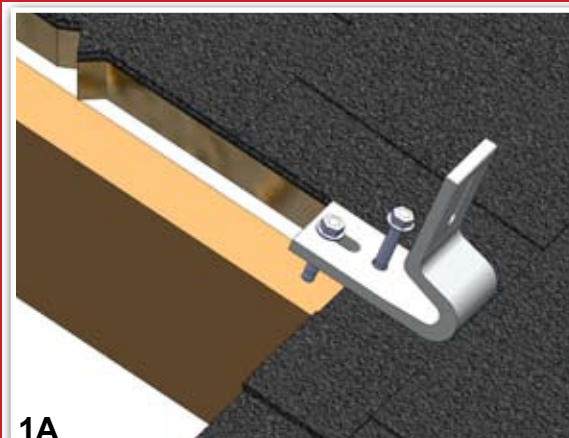
Part numbers and/or descriptions may vary. Please refer to the product images.



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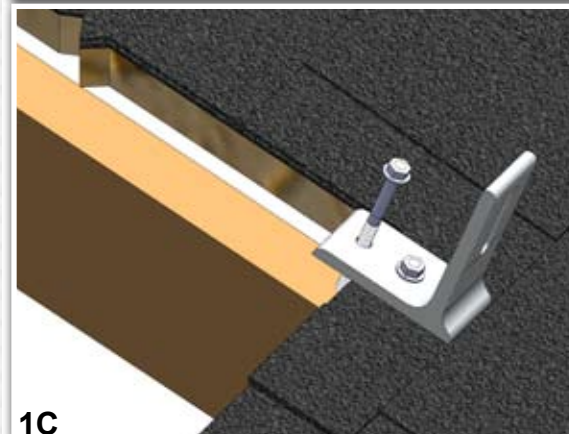
### INSTALLING THE ROOF MOUNT



1A



1B



1C

#### Fastening:

Each Solar Roof Mount (1A, 1B, or 1C) must be attached using two Simpson Strong Drive® (SDS) type screws (16) and must be fastened directly into the roof framing below the roof decking (i.e. truss, purlin, beam, etc). The use of the SDS screw allows installation without pre-drilling.

- 1 The first fastener is to be placed in the top (up-slope) slotted hole of the Solar Roof Mount. Do not tighten the screw completely as this will allow for vertical mount adjustment. Install all mounts using this method.
- 2 Once the mounts are fastened, they may be adjusted vertically to ensure proper alignment. The second fastener should then be placed in the non-slotted hole to secure the position of the Solar Roof Mount. Once the second fastener is in place, the first fastener may be tightened to fix the mount securely to the roof.

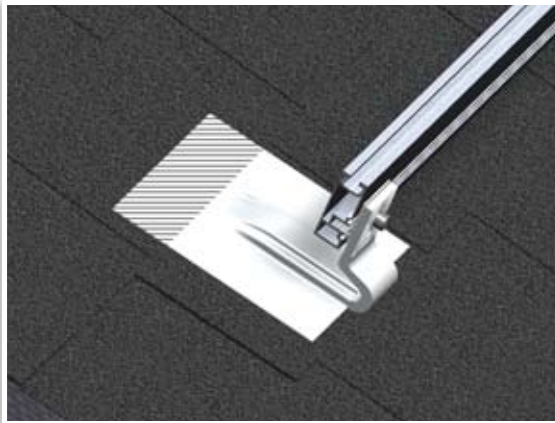


The number and position of the roof mounts can be determined from the roof configuration layout provided by T.R.A.-MAGE or the Solar Mount Estimator, [www.solarmountestimator.com](http://www.solarmountestimator.com)

#### NOTE:

- It is important to align all of the Mounts horizontally to prevent unnecessary tension on the mounting rails. Also, 1-C does not have a slotted hole and cannot be adjusted vertically.

## PREPARING TO MOUNT THE RAILS



**NOTE:**  
The roofing material must lap over the Standard Roof Mount Flashing (2) as shown above.

### **Flashing:** (optional)

If waterproofing the mount locations is required, the Standard Roof Mount Flashing (2) may be used.

**3**

Slide the tail of the flashing under the head lap of the roofing material directly above the installed mount and rotate the flashing down so that its final position is centered horizontally over the mount.

**4**

Fasten/Adhere flashing in place following NRCA Standards or roofing material manufacturer specifications.



### **NOTE:**

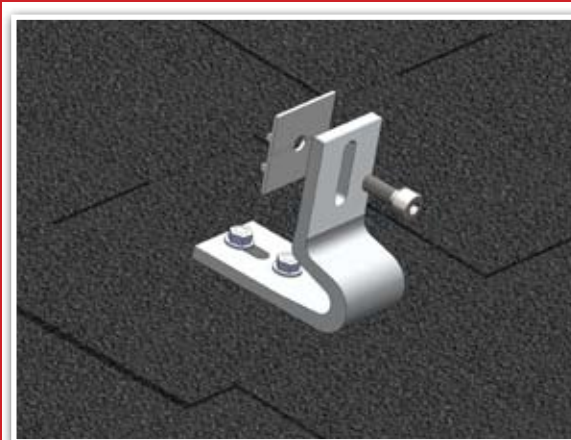
- Flashing can be manufactured with a head lap length from 2" to 12" depending on the type of roofing material.



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### INSTALLING 40X60MM OR 22X65MM MOUNTING RAILS



5

The mounting rails (8 or 9) are to be attached to the Standard Roof Mount (1A, 1B, 1C) using the vertical slotted hole and are to be parallel to the roof eave.

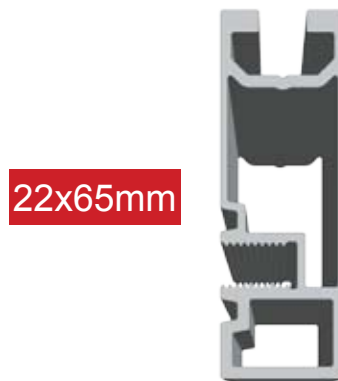
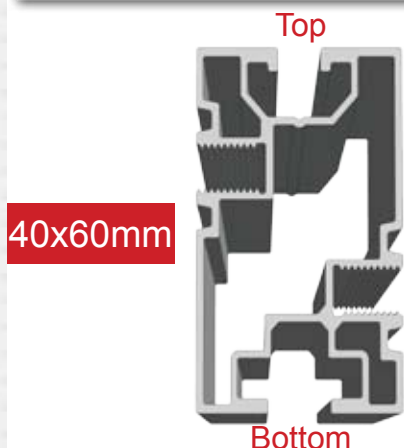
6

Attach the mounting rails (8 or 9) to the Solar Roof Mount using the Clamping Plate (3) or Clamping Plate Adjustable (18) in conjunction with a M8X20mm Socket Head Cap Screw (16). The clamping plate (3) or Clamping Plate Adjustable (18) should be oriented so that the ribs are facing away from the Solar Roof Mount (up-slope).

When fastening the Mounting Rails, align the 2 ribs on the Clamping Plate (3) or Clamping Plate Adjustable (18) with the channel screw grooves in the Mounting Rail. Install the screw through the Standard Roof Mount (1-A, 1-B, 1C) and Clamping Plate (3) or Clamping Plate Adjustable (18) into the Mounting Rail (8 or 9).

7

Tighten the Socket Head Cap Screw (16) until the ribs of the Clamping Plate (3) are fully seated in the grooves of the Mounting Rail (8 or 9) and the rail is held tightly in place.



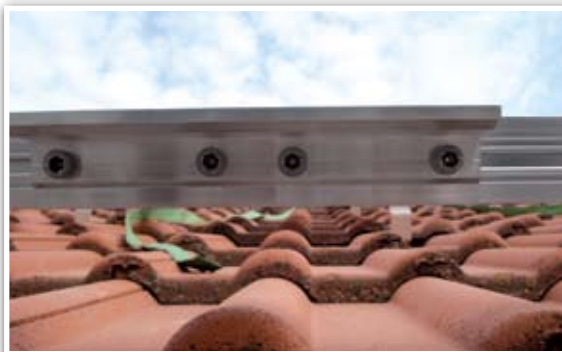
#### NOTE:

When fully tight the ribs act as a clamp to tighten the screw channel onto the fastener.

## MOUNTING OF RAIL CONNECTORS



To join two rail sections together, the Rail Connector Fixed (5) is used. To fasten the connector to the rails, place the Rail Connector Fixed (5) on the Mounting Rail (8 or 9) so that the ribs on the connector are aligned with the screw channel grooves in the rail. The connector is installed using four M8X20mm Socket Head Cap Screws (16).



After every 40' of mounting rail, a Rail Connector Flexible (6) is used. The Rail Connector Flexible is installed by sliding the connector onto the end of one mounting rail section and then sliding the next mounting rail section into the open end of the connector.

**The Rail Connector Flexible (6) may not be used directly beneath a solar module. The solar modules on either side of the Rail Connector Flexible (6) must be attached using a End Clamp (13).**



The exact positions of the Rail Connectors Fixed or Flexible (5 or 6) can be determined from the roof configuration layout provided by T.R.A.-MAGE or the Solar Mount Estimator, [www.solarmountestimator.com](http://www.solarmountestimator.com)

### NOTE:

- ! The Rail Connector Flexible (6) allows for expansion and contraction of the Mounting Rail as
- the ambient temperatures rise and fall.



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### INSTALLING THE SLIDING BLOCK




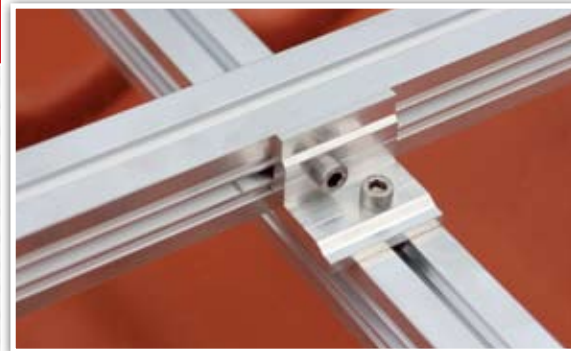
Sliding Blocks (12) are installed by holding the block at an angle and inserting the narrow edge into the mounting rail slot then rotating the block until it seats into the mounting rail slot. The block can slide along the slot until the desired location is reached.



## INSTALLING THE CROSS BRACING SYSTEM

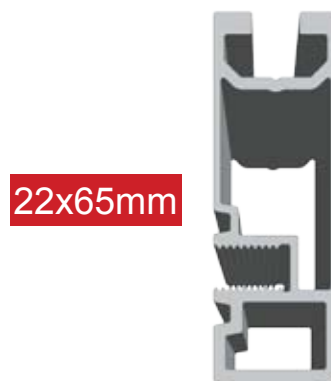
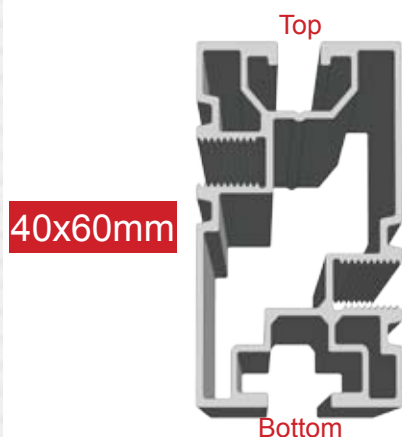


The mounting layout for a single-layer or cross-braced system can be determined from the roof configuration layout provided by T.R.A.-MAGE or the Solar Mount Estimator  ([www.solar-mountestimator.com](http://www.solar-mountestimator.com)). In the case of a cross-braced mounting system, the mounting rails are installed using the Cross Connector (4), and the M8X20mm Socket Head Cap Screw (16).



To mount the rails in a cross-braced pattern, the Cross Connector (4) is installed on the bottom Mounting Rail (8 or 9) using a Socket Head Cap Screw (16) fastened through the Cross Connector (4) into the Sliding Block (12). The upper rail is to be installed perpendicular to the bottom rail by aligning the ribs on the Cross Connector (4) with the screw channel grooves of the upper mounting rail and attaching the rail with a Socket Head Cap Screw (16).

Tighten all connections securely so there will be no movement of the Mounting Rails (8 or 9).



**NOTE:**  
The 40x60mm has a top and a bottom, the 22x65mm does not.



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### MOUNTING OF CORNER AND MID CLAMPS



Photovoltaic Modules are secured to the Mounting Rails (8 or 9) using End Clamp (13) and Middle Clamp (14). End Clamps are used on the first and last module of a string or array to secure the edges of the module to the mounting rails. Middle clamps are used to secure 2 modules to the mounting rails and are installed between the modules.

The clamps are installed using a Socket Head Cap Screw (17) fastened through the clamp and into the slot block that was previously installed in the Mounting Rail.

The height of the End Clamp (13) and Socket Head Cap Screws (17) vary and are dependent on the solar module frame thickness.

Required screw length as compared to thickness of the module frame	
Socket Head Cap Screws, DIN 912 A2 M8 x 25	For edge bracket with frame thickness 25mm
Socket Head Cap Screws, DIN 912 A2 M8 x 35	For edge bracket with frame thickness 35mm
Socket Head Cap Screws, DIN 912 A2 M8 x 40	For edge bracket with frame thickness 40mm
Socket Head Cap Screws, DIN 912 A2 M8 x 45	For edge bracket with frame thickness 45mm
Socket Head Cap Screws, DIN 912 A2 M8 x 50	For edge bracket with frame thickness 50mm
Socket Head Cap Screws, DIN 912 A2 M8 x 55	For edge bracket with frame thickness 55mm



The positioning of the Corner and Middle Clamps (13 & 14) can be determined from the roof configuration layout provided by T.R.A.-MAGE or the Solar Mount Estimator [www.solarmountestimator.com](http://www.solarmountestimator.com).

## MOUNTING OF END CAPS



All open ends of the Mounting Rails (8 or 9) must have an End Cap PP installed (10 or 11). To install the End Cap PP (10 or 11), align the pegs of the End Cap PP with the corresponding locations in the rail profile and press in. The End Cap PP may also be gently tapped with a hammer or similar instrument. It must be completely seated into the end of the rail to ensure effectiveness.





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## NOTES

A large, empty grid area for taking notes, consisting of a white grid pattern on a light gray background, framed by a red border.