



ALLSTAR

INSTALLATION MANUAL

ALLSTAR SOLUTIONS AUSTRALIA

About Allstar

Allstar Solutions is an internationally certified manufacturer of premium PV solar panel mounting systems. All our mounting systems have been carefully designed and innovated by our very own PV research and development team.

We take pride in creating quality products that have been not only designed by industry experts but are manufactured in state-of-the-art facilities. With a dedicated global sales and installation team, you can rest assured that Allstar has the solution no matter your mounting and installation needs. Tried and tested by our technical team with over 20 years' experience, Allstar have developed products that you will be able to rely on now and into the future.

Here at Allstar Solutions our company philosophy is to create value for our clients, by providing them with technical expertise, high-quality and easy-to-install products that they can use to win the future. This is a sentiment which all our employees pursue daily.

Since Allstar established, we are focused on creating mounting systems that are;

- Easy to install:** Being pre-assembled before shipment means the hard work has already been done, which saves you on installation time.
- High Quality:** Allstar Solutions mounting systems are all strictly tested and adhere to Australian and New Zealand Standards. AS/NZS 1170.2:2011(Amdt 2016)
- Robust:** Our expert team focus on creating robust products with 6005-T5 Alloy extrusion and SUS304 components.
- Warranty:** With our 10-year warranty, our Anodized systems are built for corrosion and rust resistance.
- Support:** We provide you with our technical expertise that spans over 20 years in engineering mounting systems.
- Global Distribution:** Allstar Solutions currently export to markets all over the world, including Europe, United States of America, Australia, and South-East Asia.

Here at Allstar Solutions we are focused on taking the hassle out of everyday solar installations.

By providing a service that does the hard work for you;

- 1. Design & Quotation:** Based on your project needs, we design a custom project scope with a quotation, so you know exactly what is required for the job at hand, and the costs associated.
- 2. Approval of project & production:** Once the project has been agreed upon, we will arrange the production plan immediately, ensuring timely delivery, to help you get the project underway as-soon-as-possible.
- 3. Delivery of Goods & Installation Guide:** Not only are our products pre-assembled to suit your project needs, but also come with a detailed installation manual to help you cut down on installation time. This means you can complete more jobs in one day increasing your profitability and work capacity.

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1.0 General Information

Allstar Mounting System was designed in Four Focused Areas to suit the worldwide application in different solar markets and various roof structures. The benefit of using Allstar Mounting System:

1. Easy Installation
2. Compliance AS/NZS 1170.2:2011 (Amdt 2016)
3. Robust 6005-T5 Alloy extrusion and SUS304 components*
4. Anodized for corrosion and rust resistance

Safety Instruction and Responsibilities

- It is critically important that safety practices are observed when installing such as your surroundings, installation conditions and safety harness when working at height.
- Do not throw or roughly handle any Allstar components.
- Do not bring Allstar Mounting System into contact with sharp or heavy objects.
- Do not modify Allstar components in any way. The exchange of bolts, drilling of holes, bending or any other physical changes not described in standard installation procedure will void the warranty and may cause substantial damages to the roof structure, and also the mounting system.
- It is the installer's responsibility to verify the integrity of the structure to which Allstar components is fixed. Roofs or structures with rotten/rusted bearers, undersized bearers, excessively spaced bearers, or any other unsuitable substructure cannot be used with Allstar components, and installation on such structures will void the warranty, and could result in death or serious injury.

After installing the system it is important to check all the drilling points to the roof structure is seal from water leakage.

Caution

Installation of this product is to be performed only by professionally trained installers.

Any attempt by an unqualified and untrained person to install this product could result in death or serious injury.

*03-ASL01 4200MM Rail may not be anodized subject to supply. Non-anodized surface will not cause damage by corrosion to the product and shorten the lifespan with 6005A Aluminum material.

1.1 Easy Installation

Allstar Mounting System provides easy installation with its parts and great compatibilities to other mounting system components, by its special designed and engineered Aluminium Rail.

Each components are attaching to the rail with the Tilt-In Module, and installation steps as illustrated below:



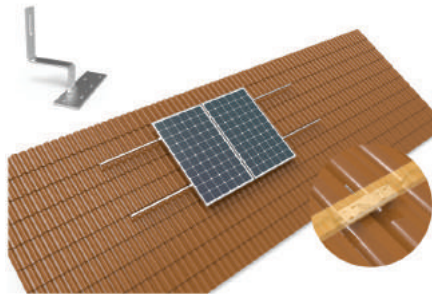
1.2 Materials Used in Allstar Mounting System

Description	Materials
Aluminium Parts/Components	6005-T5 Aluminium Extruded
Tile Brackets	SUS304 Stainless Steel
Bolts	SUS304 Stainless Steel
Washers, Rings & Clips	SUS304 Stainless Steel
Wood Screws	SUS410 Stainless Steel (Chromium Coated)
Finishing on Aluminium Parts/Components	Anodized 12um Clear*

*03-ASL01 4200MM Rail may not be anodized subject to supply. Non-anodized surface will not cause damage by corrosion to the product and shorten the lifespan with 6005A Aluminum material.

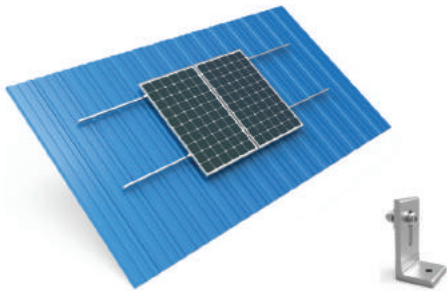
2.0 Mounting Kits

Mounting Kits For Tile Roof



Product Code	Description	03-ASB01	03-ASB04
		Tile Kit for 6 Panel (35/40mm)	Tile Kit for 8 Panel (35/40mm)
03-ASL17	Tile Hook Kit (3 screws)	12	14
03-ASL06	Mid Clamp (35/40mm)	10	14
03-ASL10	End Clamp (35/40mm)	4	8
03-ASL15	Grounding Lug	2	2
03-ASL16	Rail splicer	2	2
17-ASB04	Grounding Clip	5	7
03-ASL01	4200MM RAIL	3	4

Mounting Kits For Metal (Tin) Roof



Product Code	Description	03-ASB02	03-ASB05
		Tin Kit for 6 Panel (35/40mm)	Tin Kit for 8 Panel (35/40mm)
03-ASL18	Tin Feet Set (1 screw)	12	16
03-ASL06	Mid Clamp (35/40mm)	10	14
03-ASL10	End Clamp (35/40mm)	4	8
03-ASL15	Grounding Lug	2	2
03-ASL16	Rail splicer	2	2
17-ASB04	Grounding Clip	5	7
03-ASL01	4200MM RAIL	3	4

Mounting Kits For Metal Flat Roof (Tilt)



Product Code	Description	03-ASB03	03-ASB06
		Tilt Kit for 6 Panel (35/40mm)	Tilt Kit for 8 Panel (35/40mm)
03-ASL19	Tilt Arm Front	6	8
03-ASL21	Tilt Arm Rear 15/30	6	8
03-ASL06	Mid Clamp (35/40mm)	10	14
03-ASL10	End Clamp (35/40mm)	4	8
03-ASL15	Grounding Lug	2	2
03-ASL16	Rail splicer	2	2
17-ASB04	Grounding Clip	5	7
03-ASL01	4200MM RAIL	3	4

3.0 Components List

3.1 Footings and Brackets

Hook for Sloped Tile Roofs - 03-ASL17

- ✓ Fixed on battern or rafter
- ✓ Support of the 4200MM Rail joining with Tilt-In Module Adapter
- ✓ 3x 80MM Timber screw provided



Aluminium Hook for Metal Roof - 03-ASL18

- ✓ Fixed on purlin
- ✓ Support of the 4200MM Rail joining with Tilt-In Module Adapter
- ✓ 1 x 80MM Timber screws provided



Adjustable Front Leg for Metal Roof - 03-ASL19

- ✓ Fixed on purlin or Klip Lok bracket
- ✓ Support of the 4200MM Rail joining with Tilt-In Module Adapter for Front Row
- ✓ 2x 80MM Timer screws provided



Adjustable Rear Leg for Metal Roof - 03-ASL21

- ✓ Fixed on purlin or Klip Lok bracket
- ✓ Support of the 4200MM Rail joining with Tilt-In Module Adapter for Back Row
- ✓ 2x 80MM Timer screws provided



3.2 Clamps

Mid Clamp (35/40mm) - 03-ASL06

- ✓ Clamps to hold panel frames on the railing in between panels
- ✓ Sizes available - 35MM - 40MM - 46MM - 50MM



End Clamp (35/40mm) - 03-ASL10

- ✓ Clamps to hold panel frames on the railing at each end of the row
- ✓ Sizes available - 35MM - 40MM - 46MM - 50MM

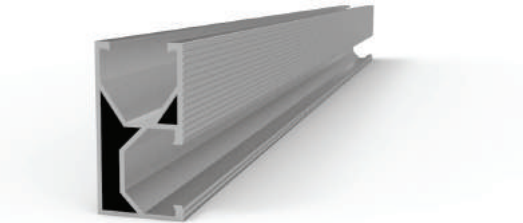


3.0 Components List (continued)

3.3 Railing Parts

Rail - 03-ASL01

- ✓ Support of solar panels on the roof by footings & brackets
- ✓ 4200MM railing



Rail Splicer - 03-ASL16

- ✓ Connect and bonding two rails of the same row
- ✓ Provide continuous earthing of two joint rails
- ✓ Extra washer provided for anodize finish penetration



Grounding Clip - 17-ASB04

- ✓ Bonding the earthing of panel frame and railing
- ✓ Installed under the panel frame in each Mid Clamp between the railing



Earthing Clamp - 03-ASL15

- ✓ Earthing clamp for each row of railing
- ✓ Earth cable to be used connecting each clamp to bond the earthing of each row and the hold PV system.



Bonding Jumper - 03-ASL35

- ✓ Provide extra earthing bonded between each rail
- ✓ Connect earthing of two rails
- ✓ Optional part if earthing is adequate



3.4 Accessories and others

Tilt-in Module Adaptor - 03-ASL32

- ✓ Connector or adapter between footings & brackets and railing to bond both parts



Cable Tie - 03-ASL33

- ✓ Secure cables on panel frame or rail



Cable Clip - 03-ASL34

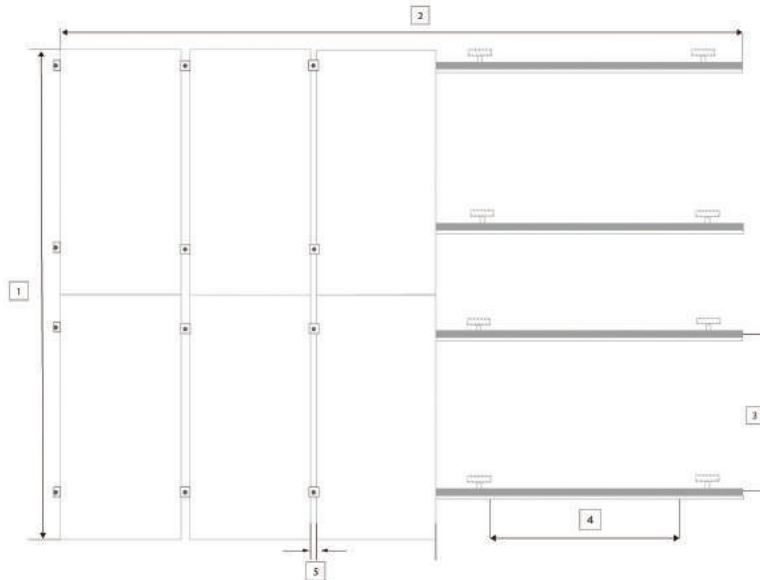
- ✓ Secure cables on panel frame



Failure to identify the Wind Regions and using the correct and adequate spacing may result in damages to mounting system and the roof structure.

5.0 Designing the Module Field

Below is the distance between roof connection for a portrait installation specified. Clamp on roof hooks need to be installed in the specific distances, depending on the distance of rafters and the site-specific wind load conditions.



1. **Height of the module field:** module height x numbers of modules vertically.
2. **Width of module field:** number of modules horizontally x width of the module + 18mm + 32mm.
3. **Distance between roof connections vertically:** (according to the clamping points pre-defined by the module producer): Quarter-points of the modules, about $\frac{1}{2}$ module height.
4. **Distance between roof connections horizontally:** Depending on the distance between rafters and on the static requirements (refer to section 8 of this product manual).
5. **Distance between modules:** 17mm

When positioning the module please take into consideration;

- The dimensions of the tiles or other roof covering.
- The position of the rafters.
- Define the precise actual horizontal distance between roof connections.
- The distance between roof paths defines the precise actual vertical distance between roof connections.

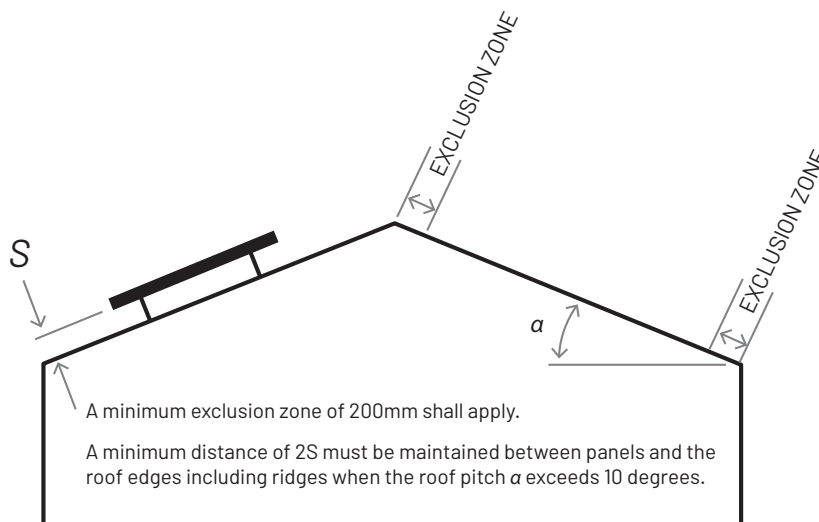
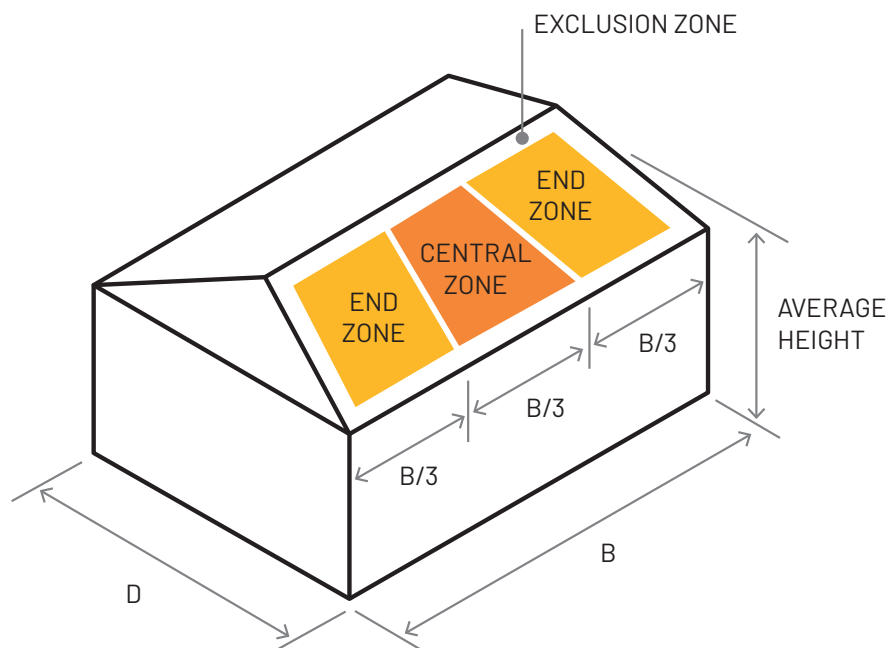
5.0 Designing the Module Field (continued)

5.1 Certified Installation Area

Allstar Mounting System is designed to be installed anywhere on the roof structure except for Exclusion Zone (refer to above figure) which is normally the high wind load area.

It is recommended to install the mounting system as close to Central Zone as possible as the central roof structure would be much stronger to support the weight of the whole system after solar panels installed.

When installing within the End Zone you should note that the spacing is less due to more supporting is required.



IMPORTANT – THE MOUNTING SYSTEM AND STRUCTURE WILL ONLY ADEQUATE AND CONFORM TO THE AUSTRALIAN STANDARD IF BELOW ARE MET:

COMMON QUALIFICATIONS (METAL FLUSH, TILE & TILTED ON FLAT ROOF):

1. The deflection of the railing has not been controlled in the design. If deflection has to be limited then spacing shall be reduced as advised by a practicing structural engineer.
2. The roofing to which the panels are to be installed shall conform to the relevant Australian Standards including AS1684, AS4440, AS1720, AS4100 and AS4600.
3. The buildings to which the panels are to be installed shall be of approved construction and conform to BCA and the relevant Australian Standards. The roof framing and the building shall be regularly maintained as required.
4. The installation of the framing shall conform to relevant Australian Standards, Manufacturer's specifications and good building practice.
5. The spacing of the rail fixings shall not exceed the recommended spacing, and shall be reduced to match the location of the roof rafters.
6. The cantilever span of the panel shall not exceed 25% of panel length (i.e. 412mm for 1650 long).
7. The cantilever span of the railing shall not exceed 33% of the adjacent spacing of the installed fixings.
8. Each fixing shall have a minimum of two gauge 14 screws.
9. The screws used to attach the railing to the roof framing shall conform to AS3566, ISO 3506.1.
10. The cold formed steel purlins shall have a minimum base material thickness of 1.2mm in Regions A & B and 1.9mm in Regions C & D.
11. Timber with Joint Type classification J4 to J6 are excluded unless tested for Screw capacity. i.e. minimum joint strength requirement shall be J3. Please refer Table AS1720.1.
12. Predrilled holes shall be used for all screw fixings into timber. The width of Timber purlins shall not be less than 35mm. The minimum embedment for each screw shall be 50mm. Minimum edge distance for screws shall be 17mm.
13. Dissimilar metals shall be separated with a suitable inert material to prevent galvanic corrosion.
14. The installation and fixings shall be periodically inspected and maintained.
15. The following are excluded from this certification.
 - a. x Framing of the solar panel assembly.
 - b. x Material Testing and or Verification of test certificates for the materials and components.

CERTIFIED BY SPAD PTY LTD (Project U032_FP1A & U032_AP3A)
Consulting Structural & Civil Engineers. Contact: (02) 9565 5558



5.0 Designing the Module Field (continued)

5.2 Qualifications for metal flush and tiled roof (Project U032_FP1A)








1. The gap between the underside of the solar panels and the roof shall be between 50mm minimum and 300mm maximum. Nominate the actual gap as "S" mm.
2. The solar panels shall be installed $2 \times S$ mm or 200 mm (whichever is greater) away from the roof edges and the ridge. Example: If the gap below the panel is 150mm then the panels shall be located 300mm away from the roof edge and the ridge. See Figure C above.
3. Each row of 1650 long solar panels shall have a minimum of two rows of railing fixed to the roof framing.
4. The connections between the solar panels shall be flexible to accommodate deflection of the railing.
5. The existing framing shall be verified for compliance to Clause D6, of AS1170.2.

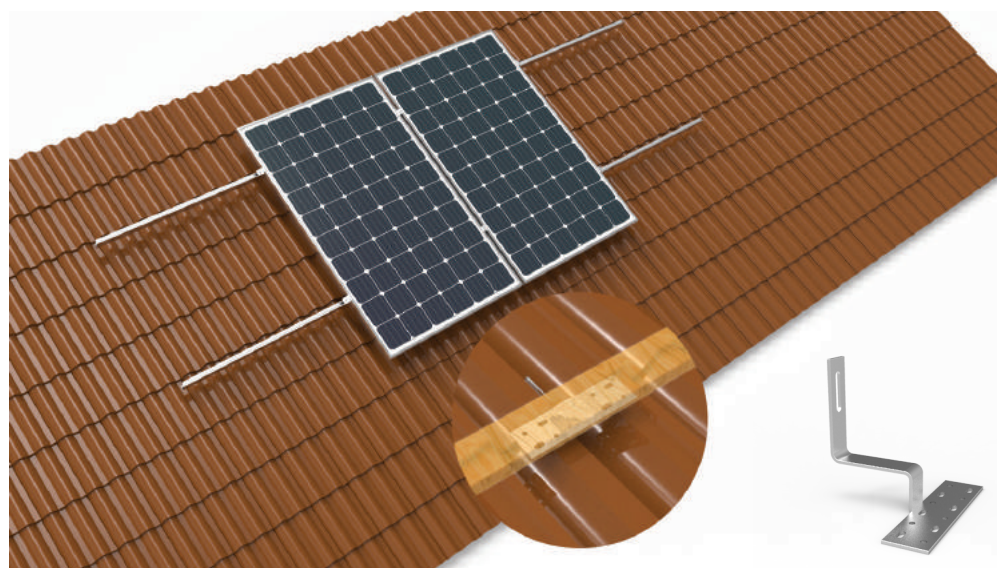
5.3 Qualifications for tilted on flat roof (Project U032_AP3A)

1. Each row of 1650 / 1970mm long solar panels shall have a minimum of two rows of railing to support the panels. The upper railing is supported with back legs (struts). The struts shall be directly fixed to the purlins. The lower railing shall be fixed to the roof purlins with shorter legs or with a use of a ase bracket.
2. The purlin spacing shall be in the range of 1200mm to 1400mm as nominated in the installation manual.
3. The connections between the solar panels shall be flexible to accommodate deflection of the railing
4. The panel edge that is supported by the longer leg shall not be located within the edge zone, minimum of $0.2b$, or $0.2d$ or h , as defined in Clause 5.4.4 of AS1170.2.
5. The panel edge that is supported by the short leg shall have a clearance of 300mm from the roof edge.
6. The space under the panels shall not be blocked.

6.0 Tile Roof Mounting Design

Recommended Components for Region A & B (TC3):








Product Code	Product	For 12 Panels	For 18 Panels	For 24 Panels	SAMPLE PHOTO
		(1 Split)	(2 Split)	(2 Split)	
03-ASL17	Tile Hook Kit	24	36	48	
03-ASL10	End Clamp (35/40mm)	8	12	16	
03-ASL15	Grounding Lug	4	6	8	
03-ASL16	Rail Splicer	4	6	8	
03-ASL06	Mid Clamp (35/40mm)	22	30	44	
17-ASB04	Grounding Clip	11	15	22	
03-ASL01	4200MM RAIL	6	9	12	

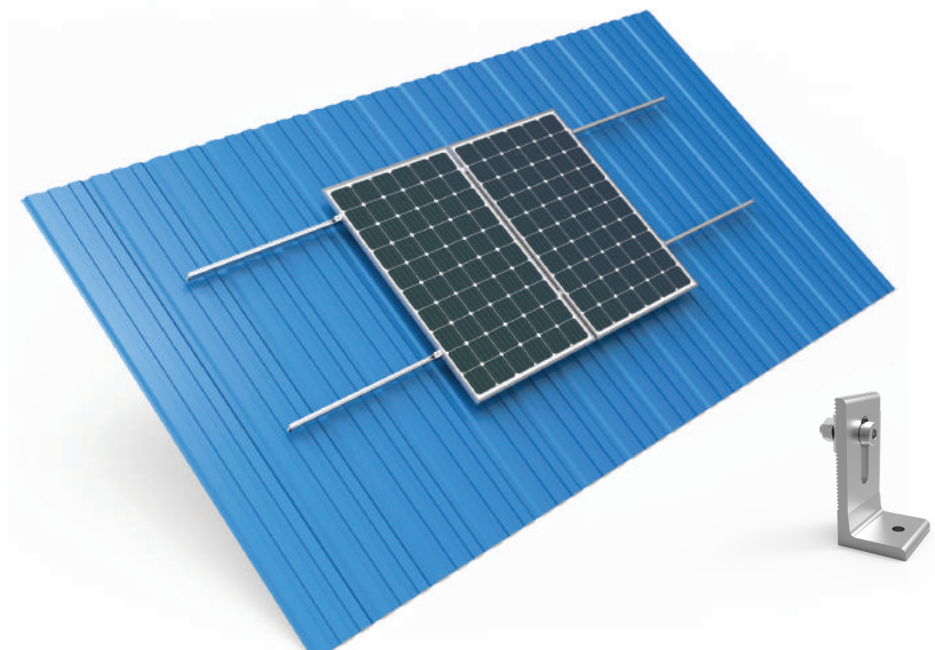


	Region A		Region B		Region C		Region D	
Roof Height	Central Zone	Edge Zone	Central Zone	Edge Zone	Central Zone	Edge Zone	Central Zone	Edge Zone
5m	2150	1820	1790	1450	1460	1010	910	560
10m	2150	1820	1790	1450	1170	810	700	490
15m	2000	1720	1700	1250	1020	590	560	#N/A
20m	1900	1600	1560	1100	830	530	500	#N/A
Panel Size 1970 Long								

7.0 Tin Roof Mounting Design

Recommended Components for Region A & B (TC3):

Product Code	Product	For 12 Panels	For 18 Panels	For 24 Panels	SAMPLE PHOTO
		(1 Split)	(2 Split)	(2 Split)	
03-ASL18	Tin Feet Set	24	36	48	
03-ASL10	End Clamp (35/40mm)	8	12	16	
03-ASL15	Grounding Lug	4	6	8	
03-ASL16	Rail Splicer	4	6	8	
03-ASL06	Mid Clamp (35/40mm)	22	30	44	
17-ASB04	Grounding Clip	11	15	22	
03-ASL01	4200MM RAIL	6	9	12	



7.0 Tin Roof Mounting Design (continued)

7.1 Spacings



In accordance with SPAD Project R045_02A. AS1170.2-2011-R2016

Table 2.1 METAL ROOF

Roof Slope: 0 to 15 deg

Maximum spacing (mm) of the fixing of the railing to Pitched METAL Roof

	Region A		Region B		Region C		Region D	
Roof Height	Central Zone	Edge Zone	Central Zone	Edge Zone	Central Zone	Edge Zone	Central Zone	Edge Zone
5m	2180	1980	1820	1690	1510	1250	960	780
10m	2180	1980	1820	1690	1220	1000	760	550
15m	2030	1860	1720	1520	1070	870	570	510
20m	1930	1770	1610	1370	870	590	510	#N/A

Panel Size 1700 x 1100

Table 2.2 METAL ROOF

Roof Slope: 15 to 30 deg

Maximum spacing (mm) of the fixing of the railing to Pitched METAL Roof

	Region A		Region B		Region C		Region D	
Roof Height	Central Zone	Edge Zone	Central Zone	Edge Zone	Central Zone	Edge Zone	Central Zone	Edge Zone
5m	2380	1980	1950	1690	1690	1250	1130	780
10m	2380	1980	1950	1690	1430	1000	900	550
15m	2200	1860	1830	1520	1250	870	790	510
20m	2080	1770	1750	1370	1020	590	560	#N/A

Panel Size 1700 x 1100

Table 2.3 METAL & TILED ROOF**Roof Slope: 0 to 15 deg**

Maximum spacing (mm) of the fixing of the railing to Pitched METAL & TILED Roof

	Region A		Region B		Region C		Region D	
Roof Height	Central Zone	Edge Zone	Central Zone	Edge Zone	Central Zone	Edge Zone	Central Zone	Edge Zone
5m	1990	1820	1690	1450	1240	1010	770	560
10m	1990	1820	1690	1450	990	810	550	490
15m	1860	1720	1520	1250	870	590	510	#N/A
20m	1780	1600	1370	1110	590	5300	#N/A	#N/A

Panel Size 2100 x 1100

Table 2.4 METAL & TILED ROOF**Roof Slope: 15 to 30 deg**

Maximum spacing (mm) of the fixing of the railing to Pitched METAL & TILED Roof

	Region A		Region B		Region C		Region D	
Roof Height	Central Zone	Edge Zone	Central Zone	Edge Zone	Central Zone	Edge Zone	Central Zone	Edge Zone
5m	2150	1820	1790	1450	1460	1010	910	560
10m	2150	1820	1790	1450	1170	810	700	490
15m	2000	1720	1700	1250	1020	590	560	#N/A
20m	1900	1600	1560	1110	830	530	500	#N/A

Panel Size 2100 x 1100

7.0 Tin Roof Mounting Design (continued)

7.2 Standards and Compliance

Australian Standards and Building Codes Compliance (tin and tile mounting)









AS/NZS 1170.0-2002	Structural design Actions Part 0: General principles
AS/NZS 1170.0-2011(R2016)	Structural design Actions Part 2: Wind actions
AS 1644.1-1997	Aluminium structures Part 1: Limit state design
AS/NZS 4673-2001	Cold Formed Stainless Steel
AS 1684.1-1999	Residential timber - framed construction - Design criteria
AS 1684.2-2010	Residential timber - framed construction - Non-cyclonic areas
AS 1684.3-2010	Residential timber - framed construction - Cyclonic areas
AS 1720.1-2010	Timber structures - Design methods.pdf.
AS 3566.1-2002	Self-drilling screws for the building and construction industries
AS 3566.2-2002	Part 2: Corrosion resistances requirements
IOS 3506.1-2009	Mechanical Properties of Corrosion-Resistance Stainless Steel Fasteners

Design Criteria has been used for structural verification (tin and tile mounting)

Design Life	25 Years	
Importance Level	Type 2: Ordinary	
Annual Probability of Exceedance	1/200	
Terrain Category to AS1170.2	2	
Service Deflection	Not Limited	
Snow loading	Not Considered	
Earthquake Loading	Not Considered	
Maximum Roof Pitch (Metal)	45 Degrees	
Maximum Pitch for Tile Roof	15 Degrees	
Aluminium Rails	6005-T5	
Minimum Weight and Maximum Dimension of Panels	18KG Panel	1700 x 1100mm
	25KG Panel	2100 x 1100mm

8.0 Flat Metal Roof Mounting Design

Recommended Components for Region A & B (TC3):

Product Code	Product	For 12 Panels	For 18 Panels	For 24 Panels	SAMPLE PHOTO
		(1 Split)	(2 Split)	(2 Split)	
03-ASL21	Tilt Arm Rear 15/30	12	18	24	
03-ASL19	Tilt Arm Front	12	18	24	
03-ASL06	Mid Clamp (35/40mm)	8	12	16	
03-ASL10	End Clamp (35/40mm)	4	6	8	
03-ASL15	Grounding Lug	4	6	8	
03-ASL16	Rail Splicer	22	30	44	
17-ASB04	Grounding Clip	11	15	22	
03-ASL01	4200MM RAIL	6	9	12	



8.0 Flat Metal Roof Mounting Design (continued)

8.1 Spacings Tilt



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CONSULTING ENGINEERS

In accordance with SPAD Project R045_02A. AS1170.2-2011-R2016

Table 3.1 INCLINATION

0 to 15 degrees
Inclination

Maximum spacing (mm) of the fixing of the Back legs METAL

Roof Height	Region A	Region B	Region C	Region D
5m	1910	1570	1130	590
10m	1910	1570	910	520
15m	1790	1400	800	480
20m	1720	1250	560	#N/A

Panel Size 1700 x 1100

Table 3.2 INCLINATION

15 to 30 degrees
Inclination

Maximum spacing (mm) of the fixing of the Back legs

Roof Height	Region A	Region B	Region C	Region D
5m	1300	880	550	#N/A
10m	1300	880	480	#N/A
15m	1130	740	420	#N/A
20m	1010	580	#N/A	#N/A

Panel Size 1700 x 1100

#N/A - Failure to screw fixing to purlins

Table 3.3 INCLINATION
**0 to 15 degrees
Inclination**

Maximum spacing (mm) of the fixing of the Back legs (0-15 degrees)

Roof Height	Region A	Region B	Region C	Region D
5m	1760	1320	920	530
10m	1760	1320	710	450
15m	1630	1140	560	#N/A
20m	1510	1020	500	#N/A

Panel Size 2100 x 1100

Table 3.4 INCLINATION
**15 to 30 degrees
Inclination**

Maximum spacing (mm) of the fixing of the Back legs (0-15 degrees)

Roof Height	Region A	Region B	Region C	Region D
5m	1060	590	480	#N/A
10m	1060	590	#N/A	#N/A
15m	920	550	#N/A	#N/A
20m	820	#N/A	#N/A	#N/A

Panel Size 2100 x 1100

#N/A - Failure to screw fixing to purlins

8.0 Flat Metal Roof Mounting Kit (continued)

8.2 Standards and Compliance

Australian Standards and Building Codes Compliance (Tilt Mounting)

AS/NZS 1170.0-2002	Structural design Actions Part 0: General principles
AS/NZS 1170.0-2011(R2016)	Structural design Actions Part 2: Wind actions
AS 1644.1-1997	Aluminium structures Part 1: Limit state design
AS/NZS 4673-2001	Cold Formed Stainless Steel
AS 1684.1-1999	Residential timber - framed construction - Design criteria
AS 1684.2-2010	Residential timber - framed construction - Non-cyclonic areas
AS 1684.3-2010	Residential timber - framed construction - Cyclonic areas
AS 1720.1-2010	Timber structures - Design methods.pdf.
AS 3566.1-2002	Self-drilling screws for the building and construction industries
AS 3566.2-2002	Part 2: Corrosion resistances requirements
IOS 3506.1-2009	Mechanical Properties of Corrosion-Resistance Stainless Steel Fasteners

Design Criteria has been used for structural verification(Tilt Mounting)

Design Life	25 Years	
Importance Level	Type 2: Ordinary	
Annual Probability of Exceedance	1/200	
Terrain Category to AS1170.2	2	
Service Deflection	Not Limited	
Snow loading	Not Considered	
Earthquake Loading	Not Considered	
Maximum Roof Pitch (Metal)	7 Degrees	
Aluminium Rails	6005-T5	
Minimum Weight and Maximum Dimension of Panels	18KG Panel	1700 x 1100mm
	25KG Panel	2100 x 1100mm

9.0 Tools for Installation

The following tools are required for installation:

6mm Allen key or hexagonal driver bit

If using a 6mm driver bit, make sure the cordless tool used for the driving has a hand-tight clutch setting and fine (soft) impact drive to prevent damage to the fragile glass panel and threads on the structure.



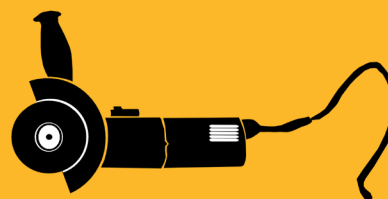
Cordless drill

Drill or impact drive for driving rood material fixings.



Angle Grinder

For terracotta tile roof installation, an angle grinder fitted with a continuous edge diamond tipped tile cutting blade, gloves, hearing protection, a face mask, and a suitably rated breathing protection mask for all people in the proximity of grinding.



Gloves

Must be worn when installing an All Star system to protect against any sharp hazards.

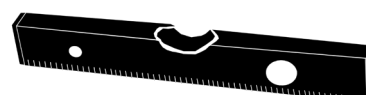


Cord or Colour Pen

This is to mark the installation position.



Spirit Level



Rule or Measuring Tape

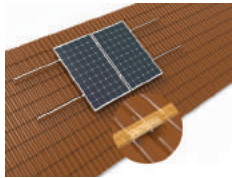


If necessary, use timber to shim the roof hooks.

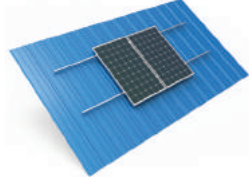
10.0 Installation Instructions

10.1 Installation Instructions for Tile and Flush Metal Roof For Roman Tile and Metal Flush Roof (Tin)

1.0 Identify the correct type of Hook and Bracket to be used



Tile Roof



Tin Roof



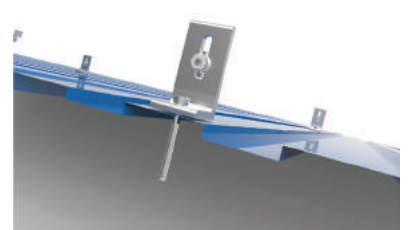
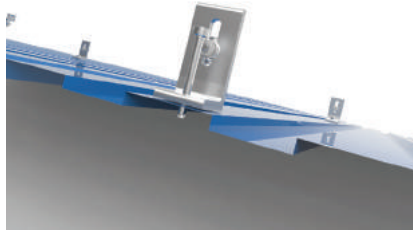
Tile Bracket



Tin Hook

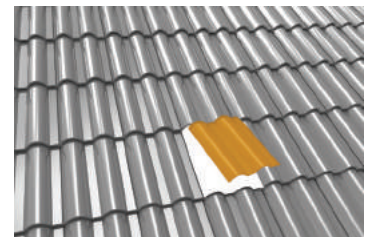
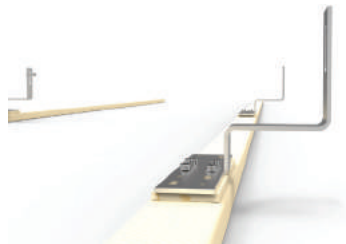
2.1 Fixing Tin Hook on Metal Roof

1. Measure the installation point making sure the space between each hook meets the minimum spacing.
2. Use the power tool to predrill into timber.
3. Assemble the Tin hook with rubber and timber screw provided.
4. Secure the screw with minimum 50mm embedment into timber.



2.2 Fixing Tile Brackets on Tile Roof

1. Measure the installation point making sure the space between each hook meets the minimum spacing.
2. Lift up and remove the tile at the installation point carefully.
3. Place tile brackets on rafter and mark the predrill location for minimum 3 screws.
4. Predrill the timber for screws and secure all screws with power tool on the predrilled position with minimum 50mm embedment into timber.
5. Replace the tile back to cover the bracket.
6. Leaving only the supporting bracket arm outside carefully.
7. Check the surrounding of the tile making sure no possible water leakage.

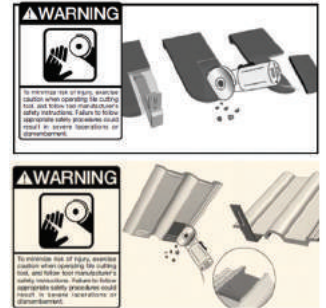


2.3 Tile Grinding (If necessary)

1. Mark roof hook installation points, and cut recesses for hooks into plain tiles/slate at each installation point.
2. If necessary, use an angle grinder or hammer to cut a concavity in the tile that covers the roof hook at the point where the roof hook comes through.

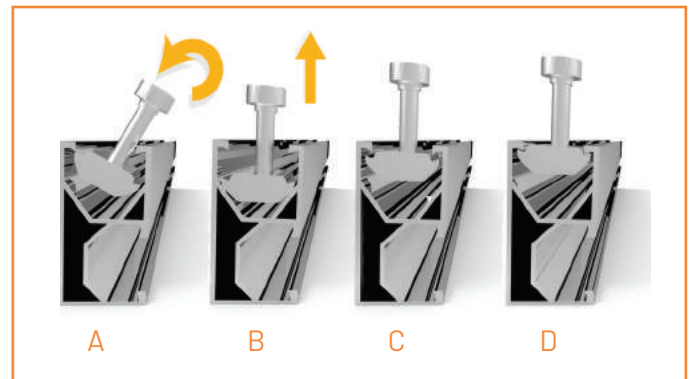
Caution

Must not use fixed roof hook as a ladder, as this extreme point load could damage the tile below.



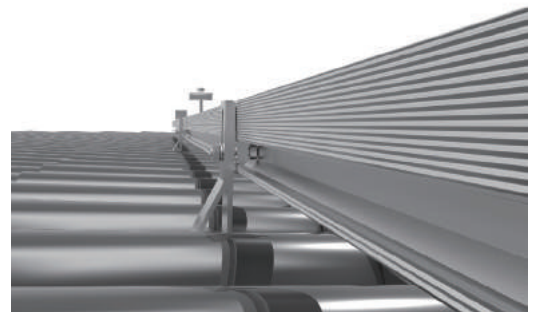
3.0 Easy Installation with Allstar Rail and Tilt-in Module

1. Both top and side channel of the Allstar rail is designed for easy installation with the Allstar module nut - Tilt-In Module.
2. To insert the tilt-in module follow these 4 steps:
 - a. Insert the tilt-in module approximately 45 degrees into the channel.
 - b. Push the module inward so the whole module is inside.
 - c. Lift up the module so it touches both side of the inner channel.
 - d. Tighten the bolt with power tool to secure the component on the rail.
3. The same steps applies to all Allstar components need to be fixed and secured onto the rail



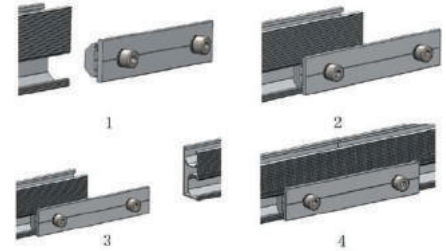
3.1 Installing Rails on the Tin Hook OR Tile Bracket

1. Insert the Tilt-in Module assembled on the Tin Hook or Tile Bracket into the rail, and secure following steps in 3.0.
2. Repeat the same steps for all Hooks and Brackets which are already installed on the installation point from 2.1. or 2.2.



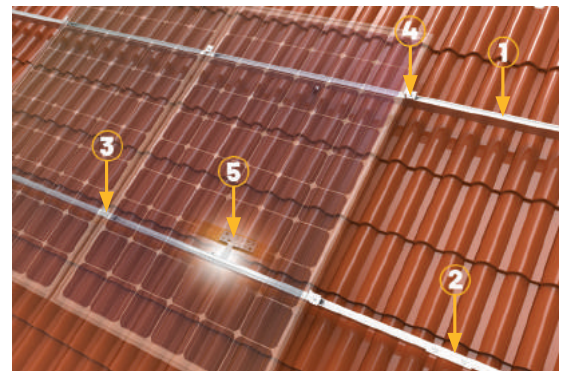
3.2 Joining Each Rail in the Same Row

1. Insert the Rail Joiner on one end of the rail.
2. Move another Rail until it touches each other.
3. Slide the Rail Joiner across until it clamps on both rails evenly.
4. Fasten and Secure the Rail Joiner.
5. The Rail Joiner will provide Earthing contacts between rails when the stainless washers are used.



4.0 Installing Solar Modules

1. Make sure all screws and bolts on the component is securely fasten before installing solar modules.
2. Always check the recommended clamping zone of your solar modules with the manufacturer.
3. Use only the correct size of mid and end clamps according to the panel frame thickness.



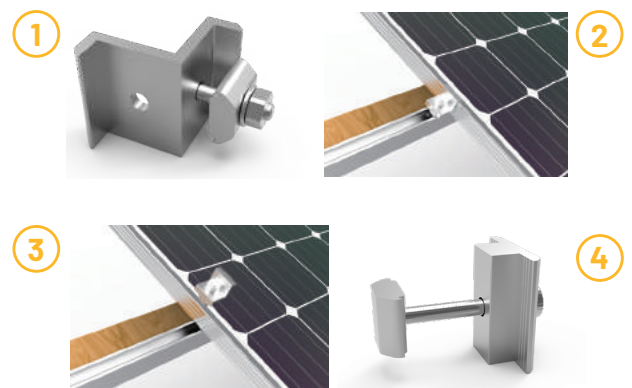
Overview of the Installation

- | | |
|----------------------------------|--|
| ① 03-ASL01 - 4200MM RAIL | ② 03-ASL16 - Rail Splicer (rail joiner) |
| ③ 03-ASL06 - Mid Clamp (35/40mm) | ④ 03-ASL10 - End Clamp (35/40mm) ⑤ 03-ASL17 - Tile Hook Kit |

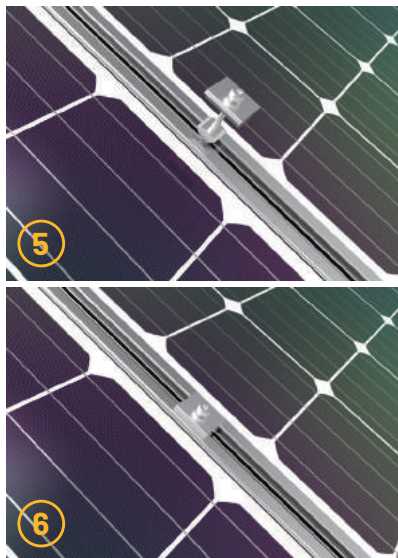
For a full list of components please refer to previous section for the Component List of Standard Installation.

4.1 Securing Solar Panels on the Mounting System

1. Insert the End Clamp into the top channel of Rail on both rows.
2. Place the solar panel on top of the rail and adjust the panel position to fit the recommend clamp zone.
3. Slide the End Clamp to the panel frame, and securely fasten to hold the panel on the rail.
4. Insert the Mid Clamp into the top channel of the Rail on both rows and insert the Grounding Clips (refer to the Grounding Section) into the Mid Clamp.



5. Slide the solar panel towards the first panel into the Mid Clamp until the panel frame aligns with the clamp.
6. Securely fasten the Mid Clamp until panels securely holding on the rail.
7. Repeat Step 4 to 6 for the next panel.
8. Repeat Steps 1 to 3 for the last panel of the same row.
9. Repeat 1 to 8 again for second row of panels.



TIP

Use Spirit Level to measure the alignment after installing the first two panels of the row, and the last panel of the row to make sure all panels are in a straight line.

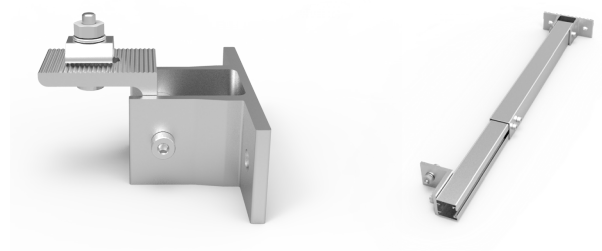
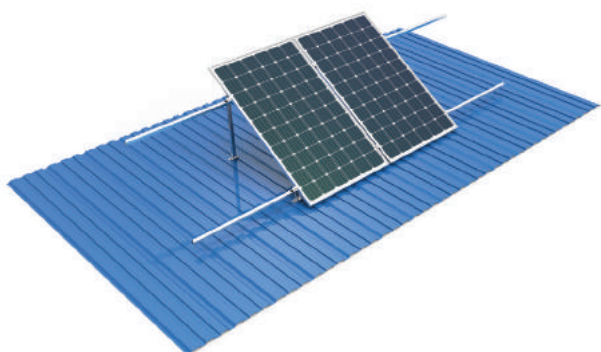


10.2 Installation instructions for Tilted System on Flat Metal Roof

1. Installation with a Tilted System is similar to Tile Roof and Tin Roof, except that the measure of the Front Arm and Back Leg may be different. (Refer to Instructions above).

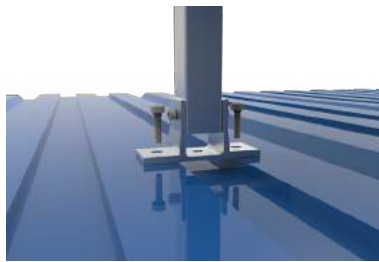
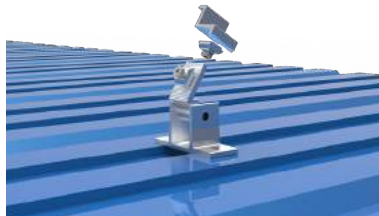
A. 03-ASL19 - Tilt Arm Front

B. 03-ASL21 - Tilt Arm Rear 15/30



5.1 Installing Front and Rear Tilt Arms

1. Measure the installation point making sure the space between each legs meets the minimum spacing.
2. Use the power tool to predrill into timber.
3. Assemble the Legs with rubber and timber screws provided.
4. Secure the screw with minimum 50mm embedment into timber.
5. Insert the Rail lining up with the Arms refer to Steps 3.0 – 3.2.
6. Adjust both Front and Rear Arms to the required tilting angle, and then fasten the bolts on the arms so to hold the rails on position.
7. The Length of the Rear Arm is adjustable to suit angles from 15 degree to 30 degrees. (For different angle requirement please select the appropriate Rear Arms).
8. After required angle is set in position, repeat Steps 4.0-4.1 for installing solar modules.



1

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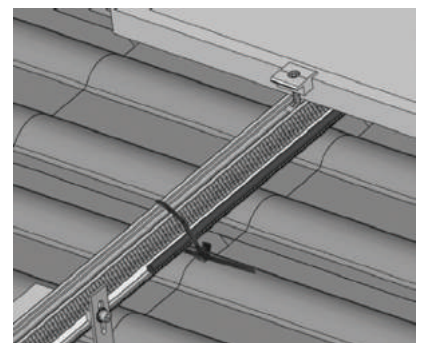
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6.0 Cabling

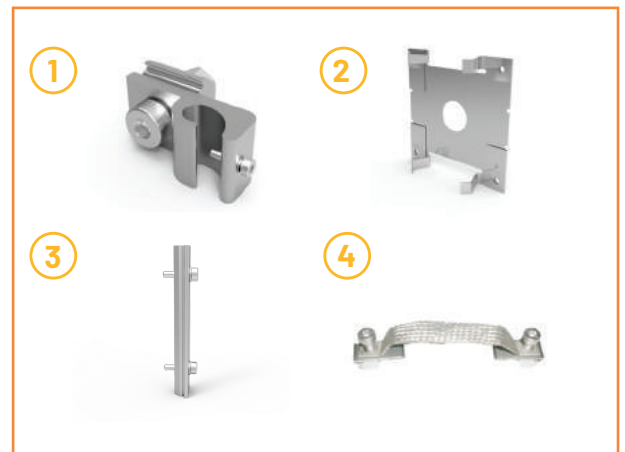
1. Cables of the panel and earth cable can be tied on the Rail with Cable ties.
2. It is recommended to use Conduit for cables to provide protection from weather and UV although they are already weather proof and UV resistance.
3. Using conduits can also protect the cabling from wild animals.



11.0 Grounding System Installation

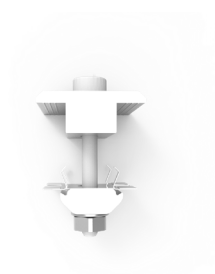
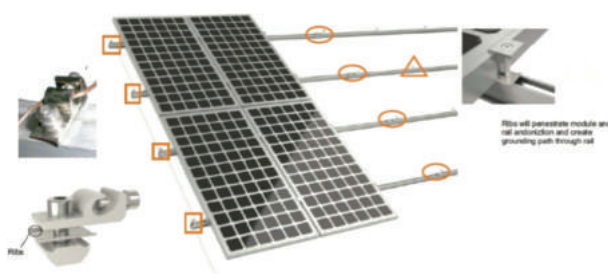
1.0 Components can be used for Earthing/Grounding

- Earthing/Grounding the Mounting System and Solar Panel is important and compulsory as per CEC Installation Guideline, Issue 11, Section 7.7, dated 01.05.2017.
- Components can be used for grounding/earthing.
 1. 03-ASL15 Grounding Lug
 2. 17-ASB04 Grounding Clips
 3. 03-ASL16 Rail Splicer (Rail Joiner) with Washer
 4. 03-ASL35 Bonding Jumper
- Every Mounting Kit from Allstar includes items 1-3. Bonding Jumper is optional only needed when extra earthing required by inspector.



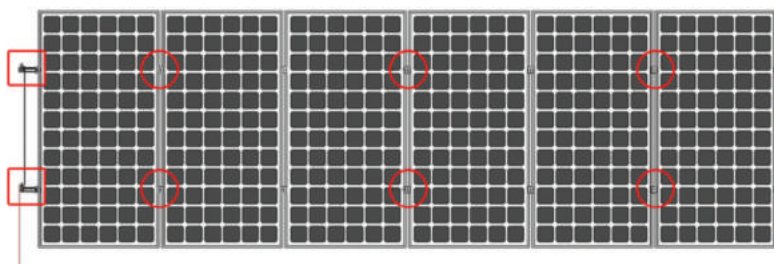
2.0 Earthing without Bonding Jumper

1. Install the Grounding Lug at the end of the rail in each row (preferably underneath the panel frame to avoid direct exposure to weather).
2. Connect earth Grounding Lug with Earth cable (Minimum earth cable size 4.0mm as per AS/NZS 5033 Clause 4.4.2.1 requirement).
3. Contact point of the Grounding Lug and Earth Cable should be directly without the cable's insulation layer (bare copper).
4. Grounding Clips should be installed with at least two Mid Clamp between each panel on both row of rails.
5. The Allstar Rail Splicer is pre-assembled with washers to provide better penetration into the anodized layer of the Rail to increase earthing capability and maintain continuity of earth.



2.1 Illustration

- Red Square - Location of Ground Lug
- Red Circle - Location of Mid Clamp and Grounding Clips



3.0 Earthing with Bonding Jumper

- Follow Steps 1-5 in Section 2.0
- Adding Bonding Jumper between two separate rails on each end

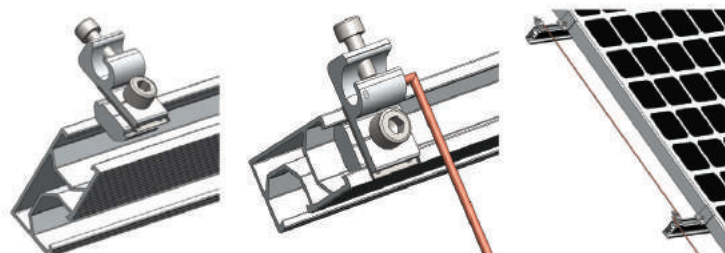


3.1 Illustration



4.1 Installing Grounding Lug

1. Insert the Grounding Lug into the position of the top channel of the Rail. Repeat for another Rail need to be grounded.
2. Insert the Copper Wire or Earthing Cable into the open of the Grounding Lug, and fasten the side bolt to fix the wire.
3. Repeat with the Step 2 to install the wire into the other Grounding Lug.



Note: The contact point of the cable and lug must be bared without insulation layer in between.

12.0 Disclaimer & Limited Warranty Terms

Allstar Solutions Pty Ltd ("Allstar" hereafter) warrants its solar mounting system ("mounting system") is free from defects in material, and workmanship for ten (10) years from the date ("Starting Date") which the mounting system is purchased from Allstar, or its Authorised Distributor(s) ("Distributor") in Australia. The Warranty Terms set out in this paper should not overwrite the rights of consumers stated in Australian Consumer Law ("ACL"). Consumer has the right to seek available remedies from Allstar such as repair, replace or refund if major defect has been found on the product in its sole discretion.

1.0 General Terms

1.1 Starting Date

The warranty starting date is the date which is shown on proof of purchase issued by Allstar or its authorised distributor(s), such as the Invoice Date. Starting date should not be extended in any circumstances without written confirmation by Allstar.

1.2 Expiry Date

The expiry date is strictly on the same date of starting date (Clause 1.1) after ten (10) years, or 120 months. Expiry date shall not be extended or renewed in any circumstances unless approval granted by Allstar or its distributors.

1.3 Proof of Purchase

Proof of Purchase must be supplied to identify the starting date (Clause 1.1) or otherwise the warranty claim can be rejected.

Accepted form of Proof of Purchase:

- a) Invoice issued by Distributor;
- b) Other document issued by Distributor confirmed the date and site details

1.4 Application(s)

Application of the mounting system should be in accordance to its design and purpose as described and installed in accordance to its wind load capacity and spacing outlined in the Installation Manual based on the Zones where it is being installed. The guideline set out on the structural engineering certificate must be met so to compliant with AS/NZS1170.2 and relevant building code stated on the engineering certificate.

1.5 Qualified Installation

A qualified installation refers to installation which has been by a qualified and licensed person who has been or has experience in installing and assembling the mounting system following the instruction outlined in the Installation Manual.

1.6 Design Alternation

Alternation to the mounting system design which is not mentioned or in discrepancy to the Installation Manual must be approved and signed off by a qualified structural engineer complying with local Building Code and Council regulation, or it is deemed to be an improper installation otherwise. A copy of the signed off design should be kept for record and future reference. It is recommended that such design is also submitted to Allstar as record and confirmation.

2.0 Exclusions and Limitations

This warranty will not apply and exclude to any defect and damage to the mounting system caused directly, or indirectly due to –

- a) Failure to comply with Allstar Installation Manual;
- b) Installation and assembly was not completed or supervised by a qualified installer who was qualified and licenced under local regulation or permitted to work in the solar industry as an installer, at place of installation;
- c) Assembled with parts, or components which are not an Allstar product or not an approved compatible parts (refer to Product List);
- d) Shipment or storage of the mounting system;
- e) Improper installation and design, maintenance, repair or use of the mounting system;
- f) Normal wear and tear;
- g) Misuse, neglect, abuse, accidental damage or modification to the mounting system;
- h) Failure to observe the instructions set out in the installation manual;
- i) Power failure, power surges, lightning, fire, explosion, flood, extreme weather conditions, environmental disasters or other causes outside Allstar's control, as determined by Allstar in its sole discretion;
- j) Structures where the mounting system fixed on due to lack of engineering assessment;
- k) D.I.Y. assembly and installation (unqualified installation);
- l) Screws and fastener not fixed correctly and securely.

3.0 Rights and Remedies

- 3.1 Consumer has the right to seek remedies under ACL if the mounting system has deemed to have major defects which has been proven by a qualified person with relevant testing conducted. Allstar will in its sole discretion to offer a repair, replace, or refund on the products affected.
- 3.2 Remedies will not be available if such claim was approved under a commercial decision and has no relation to the product quality, or the cause of damage falls into any exclusion in Clause 2.0.
- 3.3 Remedies is only available for claims that have been approved by Allstar or Distributor(s) with relevant and required supporting documents.
- 3.4 Replace, repair or refund is only applicable on parts deemed to be defective.

4.0 Warranty Claim and Limitations

- 4.1 Warranty claim must be submitted and delivered to Allstar or Distributor in writing immediately after discovery of issue such as email, facsimile, letter specifying the alleged issue.
- 4.2 Any claim for breach of this Limited Warranty must be brought within one (1) month after discovery of breach.
- 4.3 The return of any defective product(s) will not be accepted unless written approval granted from Allstar or Distributor.
- 4.4 Allstar or Distributor may decline and reject any warranty claim if insufficient document can be supplied or the defect cannot be supported by qualified engineer.
- 4.5 This Limited Warranty only applies to Allstar products which already have been installed or fixed on the structure. For defective parts found before installation you should stop continue the use of parts and contact Allstar or Distributor immediately for return or replace.
- 4.6 Damages due to transportation, storage, mishandling, by human, normal wear and tear, are not considered as warranty related issue (Clause 2.0).

4.7 Rust and stain on aluminium and stainless steel finishing can be normal due to environmental factor, chemical reaction, or aging which are not covered under this Limited Warranty if the structure of the parts and expected lifetime are not affected as such effect is deemed to be superficial.

4.8 This Limited Warranty only applies to parts manufactured and supplied by Allstar in the Product List.

5.0 Force Majeure

Allstar and Distributor shall not be responsible or liable in any way to the Buyer for any non-performance or delay in performance under Limited Warranty due to occurrences of force majeure such as war, riots, strikes, and unavailability of suitable and sufficient labour, material, or capacity or technical yield failures and any unforeseen event beyond its control, including, without limitation, any technological or physical event or condition which is not reasonably known or understood at the time of the sale of the defective Product(s) or the notification of the relevant warranty claim under this Limited Warranty.

6.0 Disclaimer

- a) Replacement and repair parts are subject to availability in the location where the mounting system was installed. If parts are not available we will in our best to source a compatible parts to repair and replace the defective products.
- b) Allstar and Distributor shall not be liable and responsible to damages and loss on any property or any person or performance if the product is not at fault and the installation is not qualified.
- c) Allstar and Distributor shall not be liable and responsible to damages and injuries to any person who is installing and assembling the mounting system without protective equipment worn, correct use of tools and correct safety measurement on the installation environment.
- d) Damages and loss due to design alternation regardless the approval of qualified structural engineer and such damage and loss should be liable to the engineer.

7.0 Validity

- a) This Limited Warranty apply to mounting systems sold and despatched on and after 01 March 2018 until newer version issued by Allstar.

8.0 Explanation, Escalation and Objection

- a) Allstar will remain its right to the final explanation of the terms and contents written in this Limited Warranty, and such terms may subject to change without notice when newer version is issued.
- b) Any escalation and objection to the final decision of the Warranty Claim should be delivered to Allstar or Distributor in writing specifying the reason with supporting documents.

9.0 Miscellaneous

9.1 Qualified Person

- a) It is recommended that the Allstar mounting system is assembled and installed by a qualified person with experience and background in the solar installation and licenced to work as a solar designer and installer.
- b) If the person who is assembling and installing the mounting system the person should be supervised and the work should be signed off by a qualified person to ensure the installation is correct and no structural concern and risk of damages.
- c) Example of Qualified Person
 - CEC Designer and Installer
 - Structural Engineer
 - Solar Installation Contractor



ALLSTAR

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Manufacturer: Allstar Solutions China

Zhiqian Town Jintan, Changzhou Jiangsu,
China

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