ANTAI

Aluminum & AI Tech for Solar

Always be your solar support

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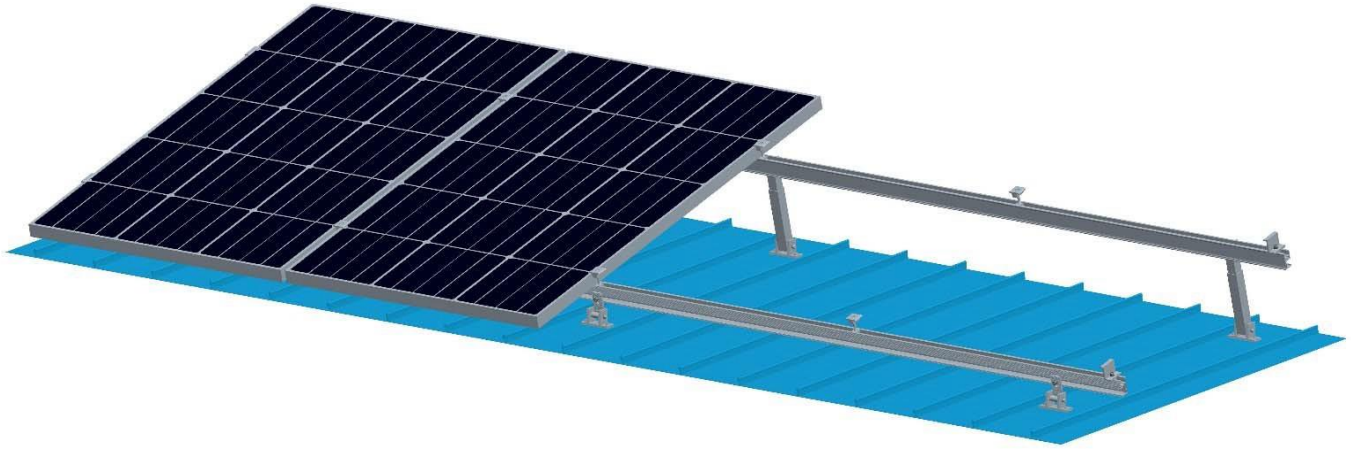


ANTAI Installation Manual

Flat Roof Solution

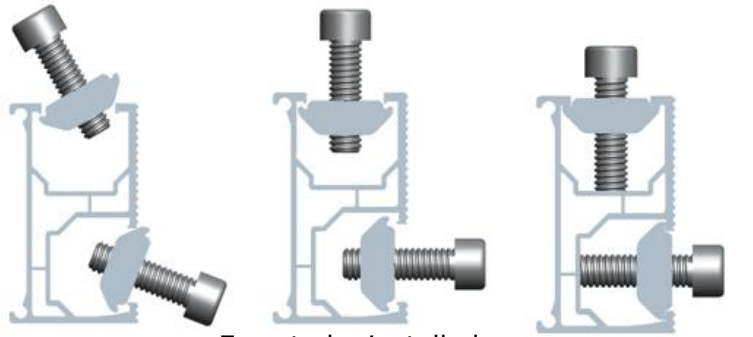
(Solar mounting system)

CONTENTS

GENERAL INTRODUCTION

ANTAISOLAR/ANTAI flat roof adjustable tilt mounting system has been developed as a universal PV module mounting system for flat roof or open space ground installation. 10-15, 15-30, 30-60 adjustable degree optional. The innovative and the high degree of pre-assembly eliminate the need for onsite cutting, welding and enables quick and easy field PV module installation.

Rail II



Easy to be installed

ANTAISOLAR/ANTAI features series of highly engineered new innovative product, designed with experienced engineers to the speed of installation.
ANTAISOLAR/ANTAI pitched roof solar mounting system is backed by a 10-year warranty and is compliant with AS/NZS1170.2.2011(R2016)

Benefits of ANTAISOLAR/ANTAI Flat Roof Mounting System

- Easy Installation
- Diversified Application
- High Accuracy
- Choice Quality
- Engineered to highest standards
- Maximum Lifespan
- Guaranteed durability

TECHNICAL SPECIFICATIONS

Applications

- Commercial and residential buildings
- Marine applications and remote areas

Features

- Anodized 6005-T6 aluminum extrusion
- Innovated designed of the Tilt-in modules, which can be pre-assembly with the clamp, make the installation easy and quick.
- Suitable for different conditions and most solar panels at present market.
- Significantly higher strength-to-weight ratio than other framing products, providing improved efficiency due to greater frame spans, inherent corrosion resistance resulting in low ongoing maintenance and an extended product life.
- Complies with Australian/New Zealand Standard on Wind Actions, AS/NZS1170.2.2011 (r2016)
- 10 years limited warranty backed up by parent company ANTAISOLAR/ANTAI Aluminum

Material

Material	Tensile strength	
	Tensile	Yield
6005-T6 aluminum extruded	≥260Mpa	≥225Mpa
Stainless steel 304	625.55Mpa	263.8Mpa
Stainless steel A2-70	700MPa	450Mpa

Installation condition

Roof slope	Up to 60°
Building height	Up to 20m
Mounting structure	Timber/ steel
Roof types	Open Area/Trapezoidal metal sheet/Klip-Lok® roof
System angle	10°-15° / 15°-30° / 30°-60°

Note: If the condition is beyond the table list, please contact us to confirm

Handling and Installing ANTAISOLAR/ANTAI

It is critically important that safety practices are observed when installing

- Do not throw or roughly handle any ANTAISOLAR/ANTAI components.
- Do not bring ANTAISOLAR/ANTAI solar system into contact with sharp or heavy objects.
- Do not modify ANTAISOLAR/ANTAI solar 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.
- It is the installer's responsibility to verify the integrity of the structure to which ANTAISOLAR/ANTAI solar components is fixed. Roofs or structures with rotten/rusted bearers, undersized bearers, excessively spaced bearers, or any other unsuitable substructure cannot be used with ANTAISOLAR/ANTAI solar components, and installation on such structures will void the warranty, and could result in death or serious injury.

Wind and Climate Design

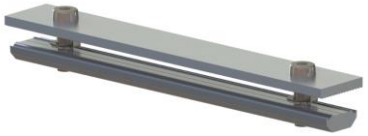
AS/NZS1170.2.2011 (R2016) provides guidance on determining the wind pressures applicable to your ANTAISOLAR/ANTAI solar system install site, taking into account roof shape and geographic location. Sufficient guidance is given in this document, but you may wish to procure a copy of these standards if your company installs Australia/New Zealand wide.

- REMEMBER average wind speeds are higher for structures mounted closer to the roof perimeter zone

  (edge). Refer to 'Fixing within Roof Installation Zone' for more information)
- Make sure your installation complies with local and national building codes. Take into account relevant design parameters (wind speed, exposure and topographic factor) when determining the loading for the installation.
- If alternative fasteners are used to ix the framing to the roof (assuming supplied fasteners are unsuitable for any reason), all screw fasteners must conform to corrosion resistance Class 4 Australian Standard AS3566 and be of equal or greater strength to those supplied with your ANTAISOLAR/ANTAI solar system order.

CAUTION: INSTALLATION OF THIS PRODUCT IS TO BE PERFORMED ONLY BY PROFESSIONALLY TRAINED INSTALLERS. ANY ATTEMPT BY AN UNQUALIFIED PERSON TO INSTALL THIS PRODUCT COULD RESULT IN DEATH OR SERIOUS INJURY.

Overview of system components

Part name	Picture	Part name	Picture
Rail VI TYN-355		Rail Splice	
Front foot		Adjustable rear leg 220mm(10-15deg) 350mm(15-30deg) 600mm(30-60deg)	
Inter Clamp (with T-module)		End Clamp (with T-module)	
T-module		Hexagon socket bolt M8*30/45/50/55/60	
Klip-lok 700 Clamp		Klip-lok 406 Clamp	

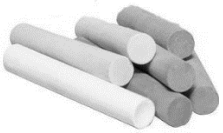
Note: The quantity of requested components depends on the system you ordered.

BEFORE INSTALLING

Receipt of goods

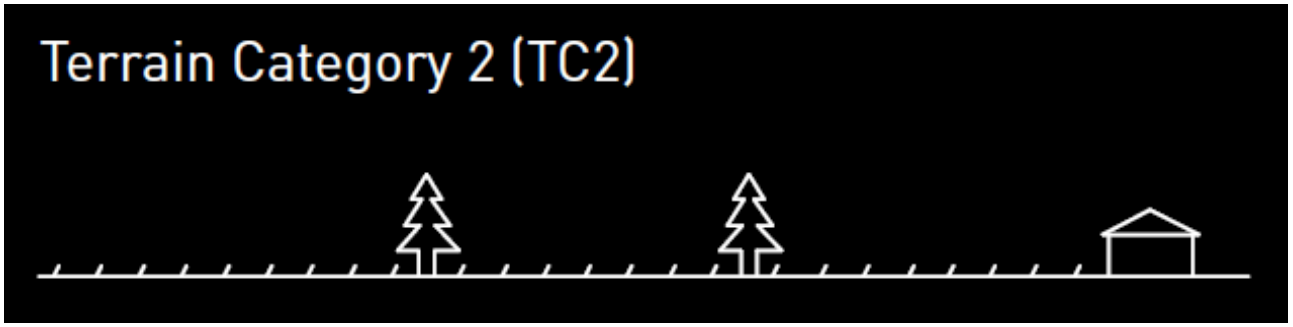
Check that the ANTAISOLAR/ANTAI solar equipment is undamaged and that the order is complete.
Check for correct quantities of the items.

Tools required for installation

6 mm Allen key or hexagonal driver bit. If using a 6mm driver bit, make sure the cordless power tool used for the driving has a hand-tight clutch setting a fine (soft) impact drive to prevent damage to the fragile glass panels and threads on the structure.	
Cordless drill. Drill or impact driver for driving roof material fixings	
Gloves. Protect the hazard of the sharp corners.	
Cord or color pen. Mark the installation position.	
Spirit level	
Measuring tape	

DETERMINING WIND TERRAIN CATEGORY

Terrain Category 2
Open terrain, including grassland with well scattered obstructions having heights generally from 1.5 meters to 5 meters. Examples include farmland or cleared sub-divisions with isolated trees and uncut grass.



Terrain Category 3
Terrain with numerous closely spaced obstructions having heights generally from 3 meters to 10 meters. Examples include typical suburban housing or light industrial areas.

DETERMINING WIND REGION

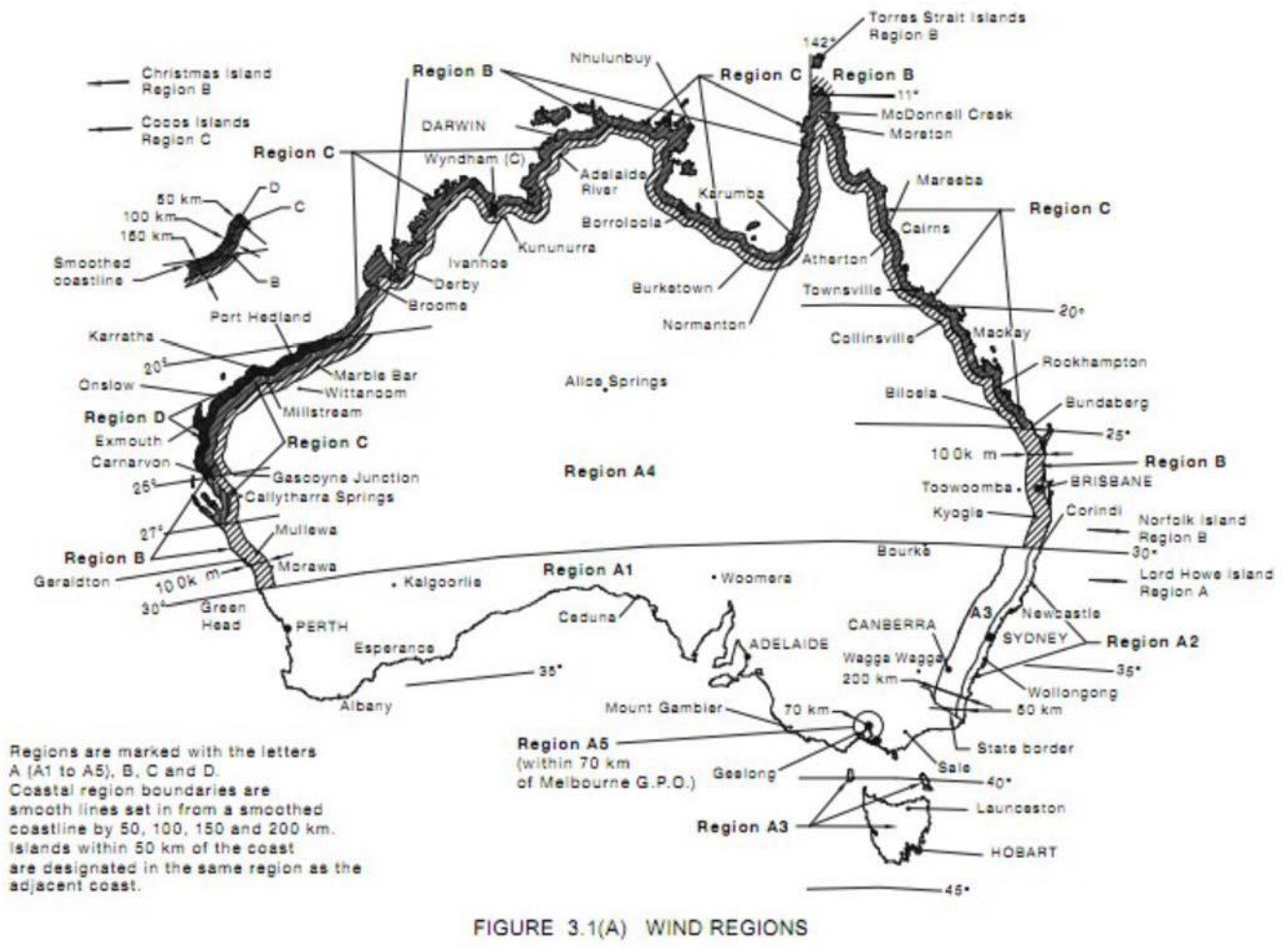


FIGURE 3.1(A) WIND REGIONS

Figure: National wind map (in accordance with AS/NZS 1170.2:201 (R2016))

Wind regions are pre-defined for all of Australia by Australian Standard AS/NZS 1170. The Wind Region has nothing to do with surrounding topography or buildings.

Wind Zone	A	B	C	D
Wind Speed (m/s)	43	52	64	79.2

Included towns:

Region A:

Callytharra Springs, Gascoyne Junction, Green Head, Kununurra, Lord Howe, Island, Morawa, Toowoomba, Wittanoom, Bourke

Region B:

Adelaide River, Atherton,Biloela, Brisbane,Christmas Island, Collinsville, Corindi, Geraldton, Ivanhoe, Kyogle, Marble Bar, Mullewa, Norfolk Island, Torres Strait Islands, Wyndham

Region C:

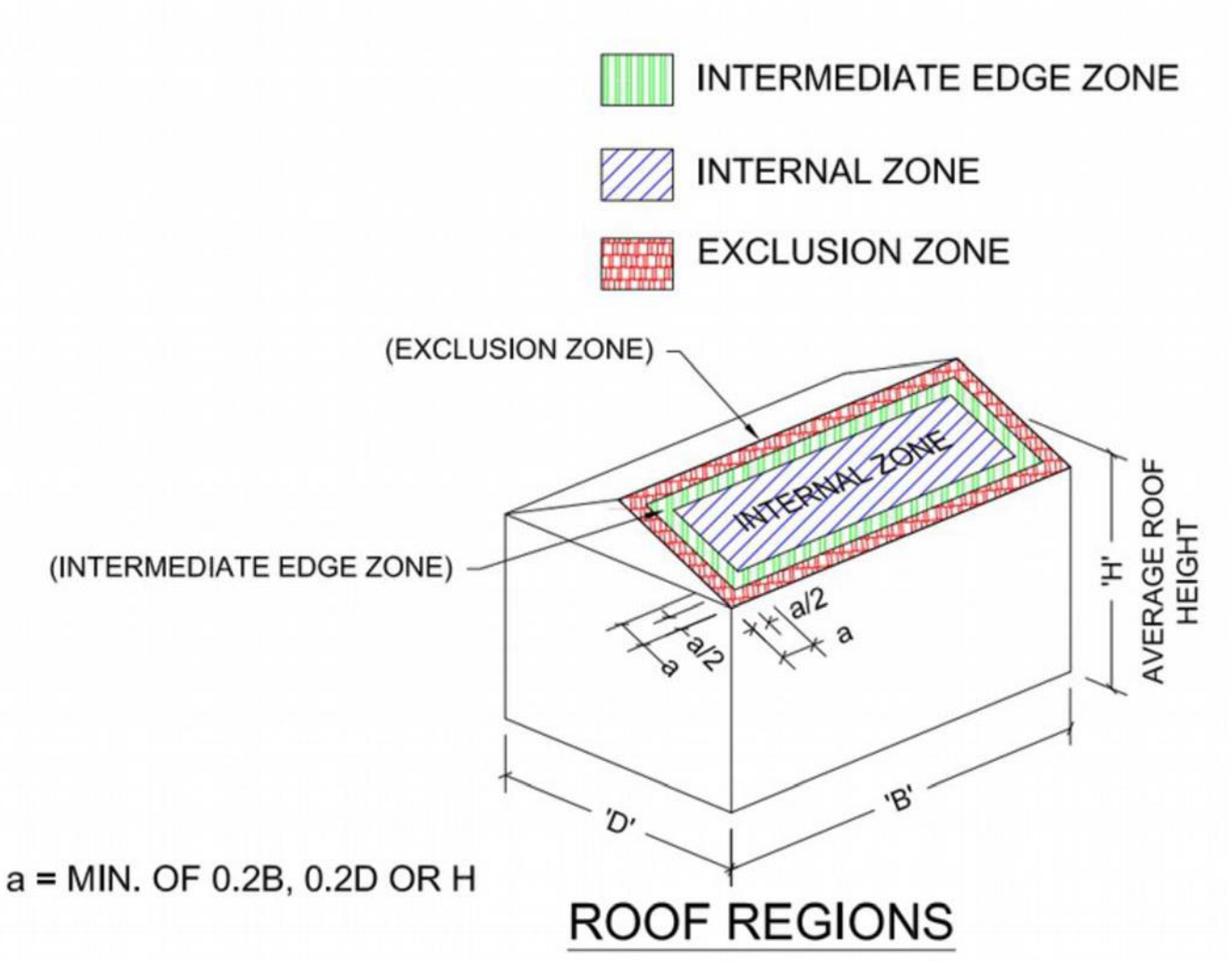
Borroloola, Broome, Bundaberg, Burketown, Cairns, Cocos Islands, Darwin, Derby, Karumba, Mackay, Mareeba, Millstream, Moreton, Nhulunbuy, Normanton, Rockhampton, Townsville

Region D:

Carnarvon, Exmouth, Karratha, Onslow, Port Hedland

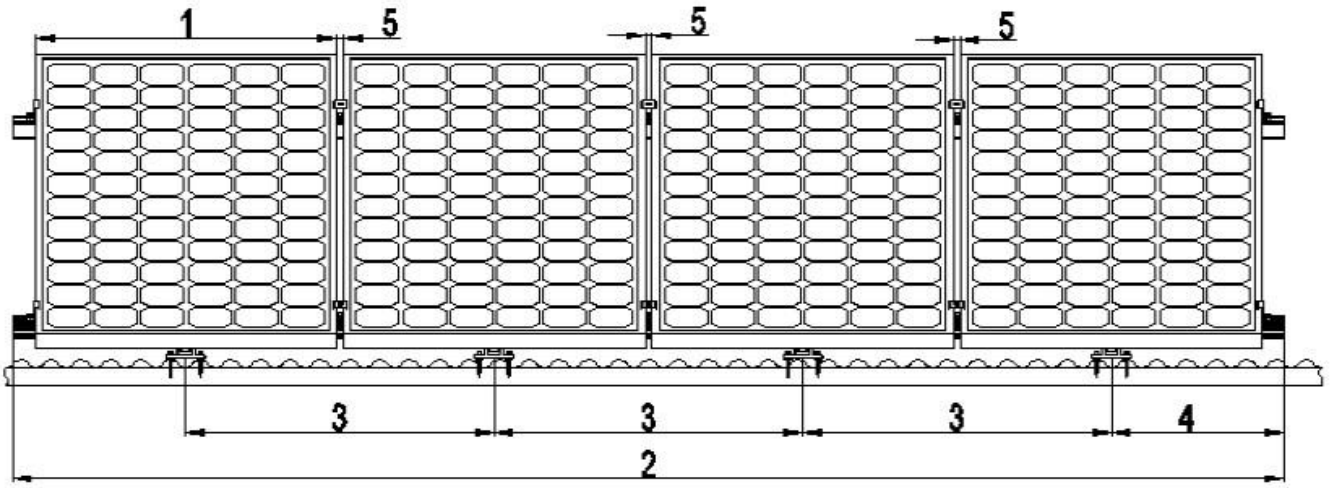
PLANNING THE MODULE AREA

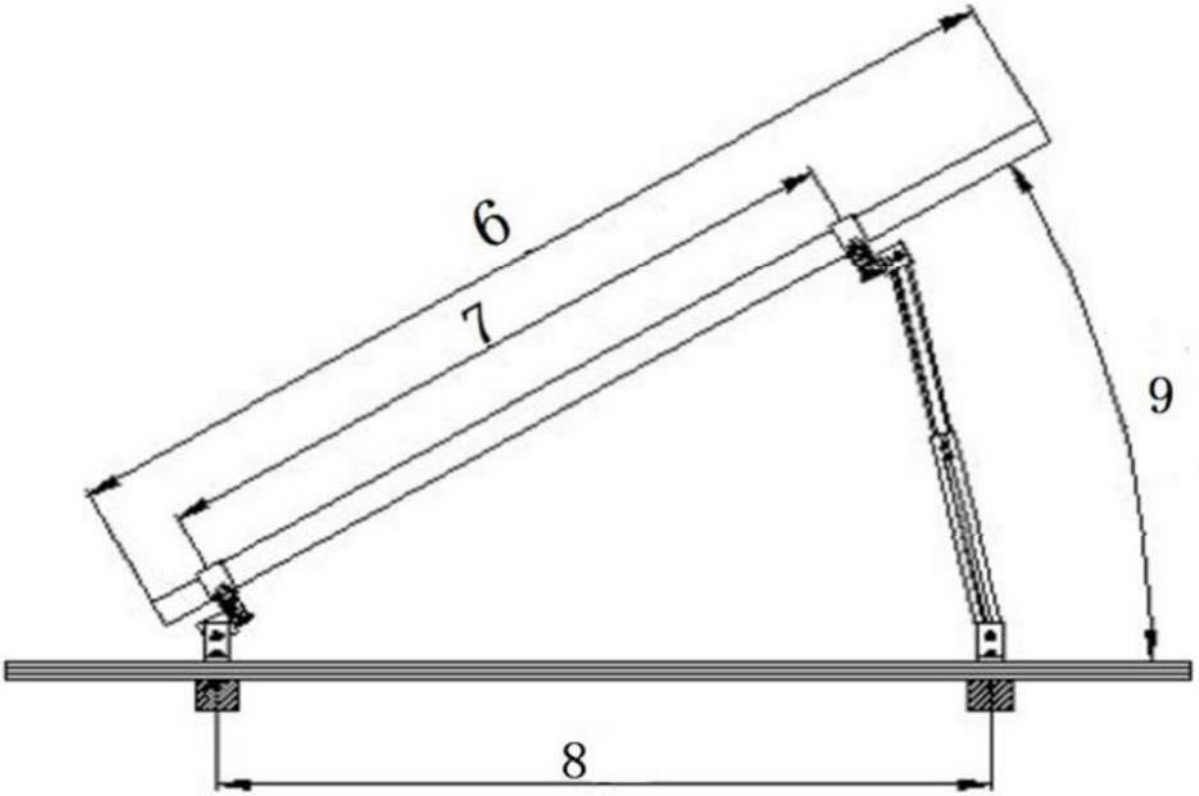
Solar panels can be installed anywhere on the roof, as long as sufficient fixings are used. Higher wind speeds are encountered at the edges of roofs and therefore more fixings are required in these areas. For a tilted array, a roof can be divided into three zones, the internal zone, intermediate zone and the edge zone. The width of these outer zones can be determined based on the length, width and average height of the building. If fixings are located in the intermediate, edge or end zones, then the maximum spacing to the next fixing must be reduced, as per the table in the certifications.



Determining the width of the edge and intermediate zones, 'A' the width of the edge and intermediate zones, 'A', is determined by calculating each of the following values, and then using the smallest: 0.2 x B, 0.2 x D and H

DESIGNING YOUR TILT SYSTEM





1. Width of the module
2. Length of ANTAISOLAR/ANTAI solar Rail: number of modules horizontally x (width of the module + 17 mm) +70 mm
3. Distance between roof connections horizontally: Depending on the distance between rafters and on the static requirement.
4. Distance between modules: 17 mm
5. Length of the module
6. Length of support: similar with the dimension 8
7. Front and Rear Space: 1200~1400mm
8. Adjustable degree: 10-15deg / 15-30deg / 30-60deg

DETERMINE THE HEIGHT OF THE INSTALLATION SITE

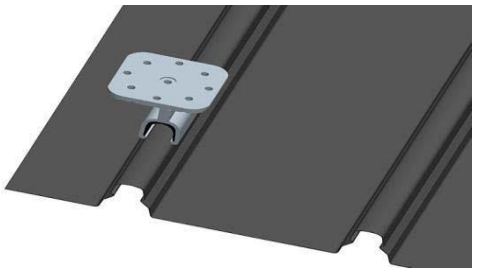
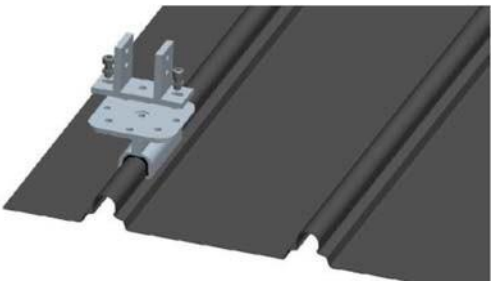
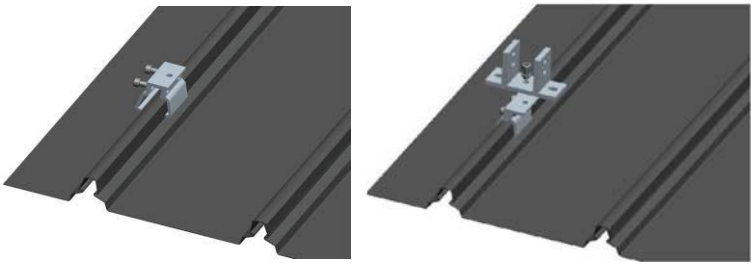
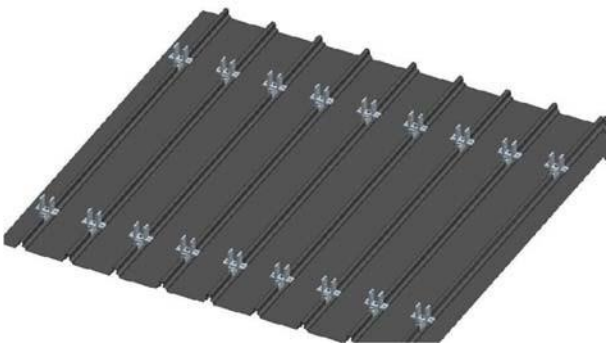
This document provides sufficient information for ANTAISOLAR/ANTAI solar system installation height less than 20 meters. If your installation site is more than 20 meters in height, please contact ANTAISOLAR/ANTAI to obtain engineering data to support your installation.

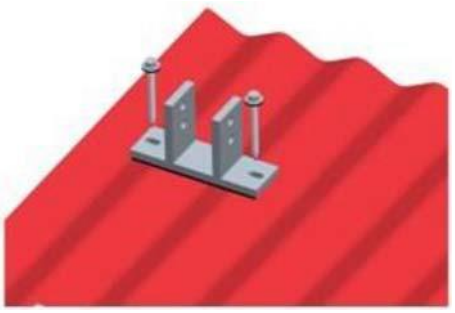
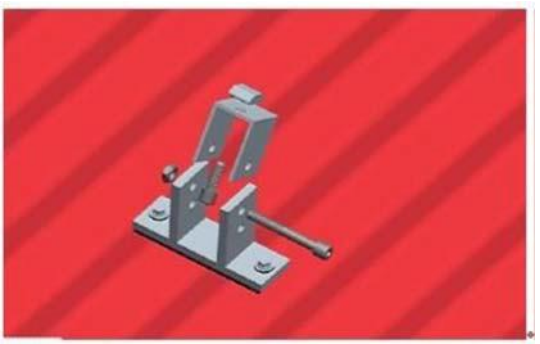
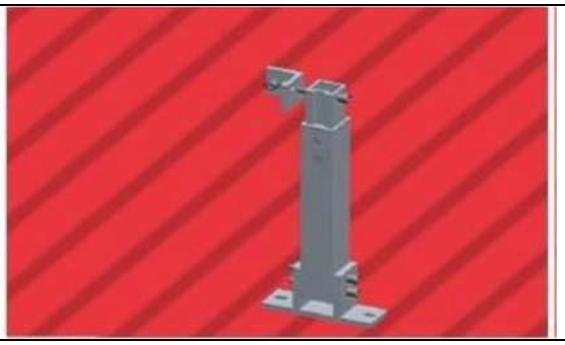
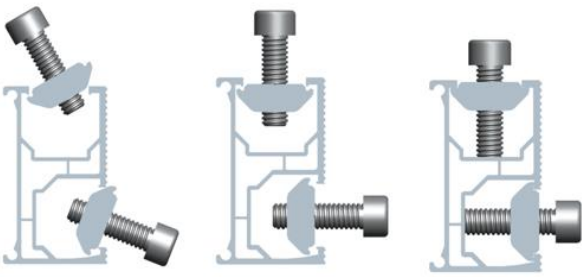
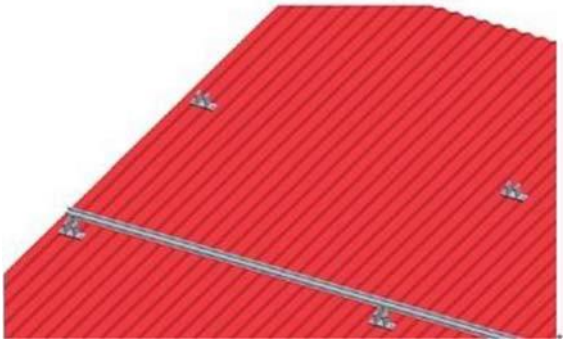
DETERMINE ROOF SLOPE

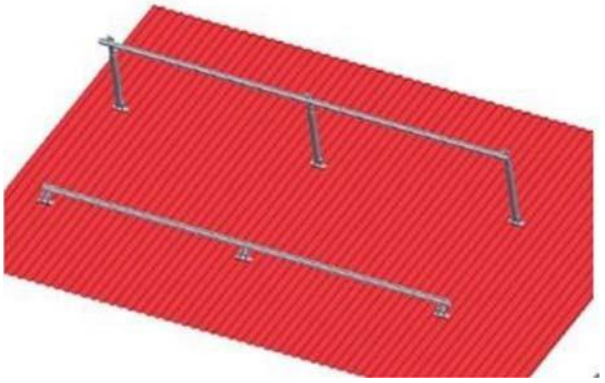
ANTAISOLAR/ANTAI solar mounting system can be used for roof slope up to 60 degrees. This document provides sufficient information for below 30 degrees, please contact ANTAISOLAR/ANTAI solar for between 30 and 60 degrees.

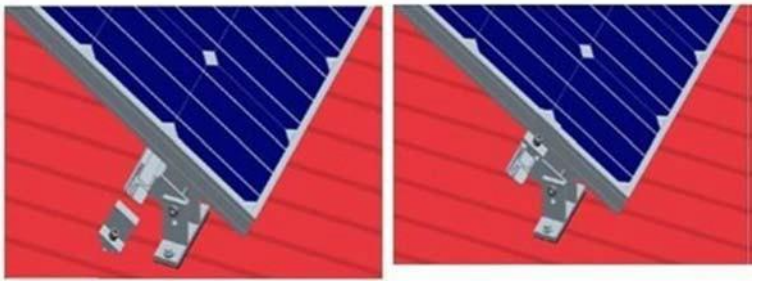
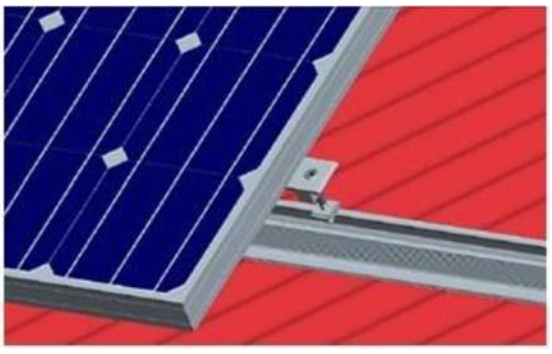
DETERMINE THE MAXIMUM RAIL SUPPORT SPACING

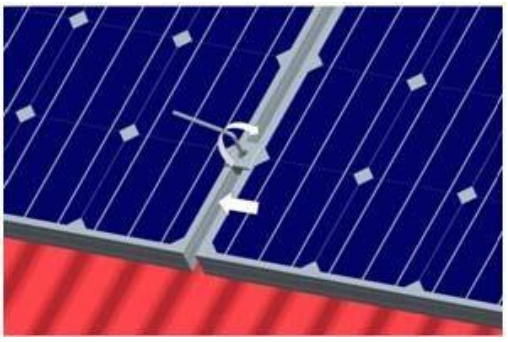
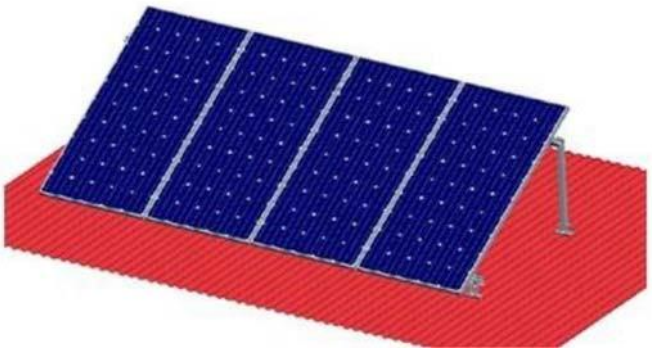
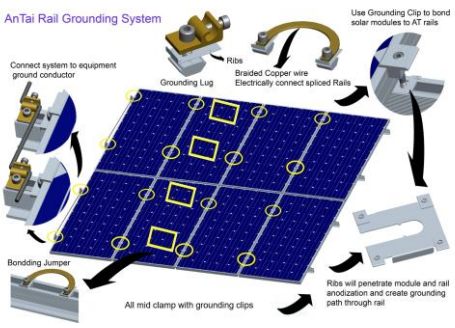
Please use the table in engineering certificate to determine the ANTAISOLAR/ANTAI support spacing for installations.

<table>
<tr><th colspan="2">Installation of Kliplok Clamp and fix foot</th></tr>
<tr><td>1. Mark the installation points of the clips according to your plans and the fixing spacing table in certification
Note: The EPDM rubber pad play the role of waterproof.</td><td>  </td></tr>
<tr><td rowspan="2">2. Place the fix foot on the Kliplok 700 Clamp, and connect them by tightening 2 pcs M8 x 20 Bolt.
Note: Please make sure the clips are in a line.</td><td>  </td></tr>
<tr><td>  </td></tr>
<tr><td rowspan="2">3. Install the Kliplok 406 Clamp and Fix foot as the installation of Kliplok 700.</td><td>  </td></tr>
<tr><td>  </td></tr>
</table>

Install the front foot and rear leg	
1. Determine the positions of the front foot and adjustable rear leg according to your plans and the fixing spacing table in certification. 2. Fix the front foot to the rafter using 2 pcs ST6.3*80 self-tapping screws. 3. Fix the rear leg to the rafter using 2 pcs ST 6.3*80 self-tapping screws. 4. Make sure the front foot and rear leg in a line. Note: The EPDM rubber pad play the role of waterproof.	  
Install the Rail	
a. Tilt in the T module Only Four steps to quick mount the tilt-in T-module into ANTAISOLAR/ANTAI rail channel	
b. Connect the rail 1. Insert the tilt-in module (Front foot) into the side channel of the ANTAISOLAR/ANTAI rail as the step above shown. 2. Adjust the rail to be level. 3. Fasten the bolt. Note: Fasten firmly in place by torque bolt to 10Nm.	

c. Loosen the 2 Hex screws in the rear leg and adjust the length of rear legs as demanding angle. Install the rail with the rear leg as the step b.	
d. Connect the rail splice kits Install the splice to connect multiple rails together. Slide the splices on the rear side of the pre-assembled rails halfway to the side. Fasten the first M8 bolt firmly using the Allen key. Now slide the next rail segment into the splice. Tighten the second M8 bolt .The connection is finished.	

Install the module	
a. Place the solar module on the rails, slide the end clamp tightly against the solar module and fasten tightly using the Allen bolt.	
b. Slide the pre-assembled inter clamp into the rails from above, place it firmly against the module and fasten loosely. Note: Install the grounding equipment as the next step	

c. Slide the next module against the previously installed module and tighten the inter clamp using the Allen key, Take care that the anti-slip protection sits in the rail channel of the lowest row of rails.	
d. Slide the next module against the previously installed module and tighten the inter clamp using the Allen key, Take care that the anti-slip protection sits in the rail channel of the lowest row of rails.	
d. Place the last module in the row on the rails (with the first row of modules, take care that the anti-slip protection sits properly in the rail channel) and fasten the last mid clamp and the end clamp using the Allen key.	
e. Leg Strut and fix foot can be adjusted.	
f. ANTAISOLAR/ANTAI rail grounding system.	

* The pictures shown above are for illustration purpose only, all installation should comply with local standards