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Rooftop installation manual – Version 4.3 (updated September 2012)
INTRODUCTION

Thank you for choosing the SunLock solar panel roof mounting system. Made from custom-designed aluminium extrusions and components, SunLock’s streamlined design and improved frame strength greatly simplify solar panel installation.

Offering a high level of adjustability for module width and depth SunLock’s versatile design makes it suitable for a wide variety of building types and zones including residential, commercial and remote environments.


**WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. This symbol is not used for hazards relating to property damage unless there is also a risk of personal injury to this level.

**CAUTION**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to draw attention to unsafe practices that may cause damage to property.
SAFETY AND INSTALLER RESPONSIBILITIES

Handling and Installing SunLock
It is critically important that safety practices are observed when installing SunLock.

- Do not throw or roughly handle any SunLock components.
- Do not bring SunLock into contact with sharp or heavy objects.
- Do not modify SunLock 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 SunLock is fixed. Roofs or structures with rotten/rusted purlins, undersized purlins, excessively spaced purlins, or any other unsuitable substructure cannot be used with SunLock, and installation on such structures will void the warranty, and could result in death or serious injury.

Wind and Climate Design
A SunLock frame installed in accordance with this installation manual is compliant with AS1170.2:2011. This manual (including the drawings) cannot cover all types of buildings and eventualities.

For buildings outside the limits stated on the drawings (maximum 10 m roof height, maximum roof pitch 35°, slopes, hills) contact a structural engineer for a custom design.

AS/NZS1170.2:2011 provides guidance on determining the wind pressures applicable to your SunLock 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).
- 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 fix 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 SunLock order.

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.
TECHNICAL SPECIFICATIONS

Applications
- Commercial and residential buildings
- Marine applications and remote areas

Features
- 6106-T6 aluminium extrusion with 210 MPa yield strength
- Ripple design on rail, L-foot and tile brackets increases joint strength
- Suitable for buildings up to 10 m in height
- Suitable for roof slopes in the range from 0° to 35°
- 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
- Optional anodised finish (standard is mill finish)
- Australian design and manufacture

Custom Design
A SunLock frame can be designed to suit almost any roof and wind region, including buildings up to 200 m in height, roof pitches up to 65°, and located on slopes or hills.

For a custom design please contact either SunLock or an Australian registered structural engineer.
BEFORE INSTALLING

Receipt of Goods
Check that the SunLock equipment is undamaged and that the order is complete. Check for correct quantities of the following items:

- **Rails:** slightly more than twice the length of the proposed solar array in linear metres
- **End clamps:** a minimum of 4 per row (unless 3 rails are required) of panels (fitted at the ends)
- **Mid clamps:** 2 for every gap between neighbouring panels, e.g. number of panels in row, minus one, multiplied by two.
- **L-feet or Tile Brackets:** at least 2 for each panel; L-feet, roof screws and isolation washers for steel roof interfaces; tile brackets and rafter screws for tile roofs. Refer to the drawings to determine the number of fixings required.

**CAUTION**
Refer to the section ‘Designing Your Framing System’ before attempting installation. Failure to correctly establish the requirements of the proposed installation site is dangerous and will void the framing warranty.

Tools Required for Installation

- **T-bar Allen Key or 6 mm hexagonal driver bit.** If using a 6 mm driver bit, make sure the cordless power tool used for driving has a hand-tight clutch setting and a fine (soft) impact drive to prevent damage to the fragile glass panels and threads on the SunLock framing.

- **Drill or impact driver for driving roof material fixings.**

- **Gloves for handling SunLock framing (aluminium can develop sharp corners).**

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

SL2R – Rails, in pairs, hold each panel row and are custom designed and Australian made 6106-T6 extruded aluminium.

Note: custom rail lengths available on request. Minimum order quantity, deposit & lead time apply.

SLJ150 – Joiners extend SunLock Rails to any length as required by the quantity or width of the solar panels.

SLLF – L-foot roof mounts secure the railing to steel roofs. Each L-foot is supplied with a potable grade EPDM washer to prevent water ingress or galvanic corrosion with the roof material.

SLLF002 – standard, with a 75 mm roofing screw
SLLF004 – with a Tek screw
SLLF005 – with a 10 mm hole in the base

<table>
<thead>
<tr>
<th>Rail lengths</th>
<th>For standard 808 mm wide panels</th>
<th>For wider 990 - 1005 mm wide panels</th>
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<tr>
<td>2600 mm</td>
<td>2100 mm</td>
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<tr>
<td>3410 mm</td>
<td>3200 mm</td>
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<tr>
<td>4200 mm</td>
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SLTB005 – Adjustable tile brackets allow adjustment of the elevation and side position of the bracket to provide a closer fit for different tile batten heights, tile profiles, and tile positions. Each tile bracket includes two 90 mm roofing screws. If attaching to hardwood of minimum joint group JD2, these can be substituted by 50 mm screws.

SLECF - Fixed end clamps are available in 35, 38, or 45 mm heights, and are simple and fast to install.
- SLECFS35 – 35 mm panels
- SLECFS38 – 38 mm panels
- SLECFS45 – 45 mm panels

SLEC – Adjustable End Clamps allow the easy modification of the clamp to suit almost any panel frame height. Note: Minimum of two fins must be engaged.
- SLECFC003 – 30 - 42 mm panels
- SLECFC004 – 34 - 46 mm panels
- SLECFC006 – 46 - 58 mm panels
**SUNLOCK COMPONENTS (CONTINUED)**

**SLMC – Mid clamps** fit between panels and hold the panels to the rails. Two variations are available, differing only by the length of the cap screw.

- **SLMC014** – 30 - 40 mm panels
- **SLMC016** – 40 - 50 mm panels

Note: Other panel thickness accommodated by special orders.

**SLEL – EarthLock** system comprises the EarthLock washer (SLELW) and the EarthLock bonding terminal (SLELBT). This system provides earth continuity from each panel frame to the rail, allowing the quick and effective connection of the array to an earthing cable if required.

**SLMB – Isolator Mounting Bracket** is easily attached to the SunLock rail and provides a mounting surface for the rooftop DC isolator.
SUNLOCK COMPONENTS (CONTINUED)

SLTL – Tilt Leg kits comprise one front leg and one rear leg. The front leg is 150 mm long.
- SLTL300 – 300 mm rear leg
- SLTL500 – 500 mm rear leg
- SLTL600 – 600 mm rear leg
- SLTL700 – 700 mm rear leg
- SLTL800 – 800 mm rear leg

SLCA – Channel Assembly allows tilt arrays to be correctly inclined, even if the purlins are not ideally spaced or located. The channel has outer dimensions of 41.3 x 41.3 mm and is extruded from 6061-T6 structural grade aluminium with a minimum yield strength of 240 MPa.
- SLCA1500 – 1500 mm long, 1 L-foot
- SLCA2000 – 2000 mm long, 2 L-foot
- SLCA3000 – 3000 mm long, 2 L-foot

SLTBLA – Tile bracket landscape adaptors can be used in conjunction with a tile bracket to convert a traditional portrait solar array into landscape format.

SLDB1200 - Diagonal brace is to be used on each end of each row of the tilt array to provide bracing against side loads.
DESIGNING YOUR FRAMING SYSTEM

Design your system:

1. Select the correct drawing
2. Determine the width of the edge zone
3. Read off the maximum fixing spacing and calculate the total number of fixings required

The ten drawings are as follows:

S1 – Tile roofs of pitch 10 - 20°
S2 – Tile roofs of pitch 20 - 35°
S3 – Tin roofs of pitch 10 - 20° with steel purlins
S4 – Tin roofs of pitch 20 - 35° with steel purlins
S5 – Tin roofs of pitch 10 - 20° with timber purlins
S6 – Tin roofs of pitch 20 - 35° with timber purlins
S7 – Tilt legs on roofs with steel purlins
S8 – Tilt legs on roofs with timber purlins
S9 – Tile roofs of pitch 10 - 20° (terrain category 3)
S10 – Tile roofs of pitch 20 - 35° (terrain category 3)

The installation site, roof material, roof angle, the size and quantity of solar panels and the number of module rows used will determine the dimensions, quantity and layout of framing components required for installation. This section of the installation manual can assist you to determine critical job specifications.

In most cases the SunLock frame itself (rails and clamps) is strong enough to withstand any wind load. When designing the frame, the two main points to consider are:

› ensuring sufficient fixings are used to hold the SunLock frame to the roof frame
› ensuring the roof frame itself is not overloaded by the extra wind load from the solar system

Ten drawings have been supplied with this installation manual, one for each roof type. Select the appropriate drawing for the installation site and follow the detailed instructions contained within it.

Note the following details:

When a panel ‘covers’ three roof battens, then three rails should be used. This ensures that the battens are not overloaded by the point loads from the L-feet. In other words, for tin roof installations where the purlin spacing is less than 750 mm, three rails should be used per row of panels.

Ensure panels are installed in accordance with the solar panel manufacturer’s installation manual. Typically, these manuals state that the clamps holding the panel to the rail must be installed in a certain region, commonly a maximum of 10-25% of the length of the panel from each end of the panel.
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
- H

‘A’ = MINIMUM OF 0.2 x B, 0.2 x D OR 1 x H
**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

---

**WIND REGION MAP AUSTRALIA** (in accordance with AS/NZS1170.2:2011)
INSTALLATION

Start any roof/structure installation by marking the fixing points at the calculated centres and spacing along the proposed length of the array (in a parallel row).

Installing L-Feet on Steel Roofs:

› For a steel roof with exposed fixings

1. Determine where the roof mounts will be positioned based on position of existing roof screws.
2. Do not remove existing roof screws. Instead, install on unused crest. This is because the existing screws are there to hold down the roof sheet, while the new screws are there to hold down the solar system.
3. Fix L-feet in place and fix with the upright part of the ‘L’ facing towards the ridge of the roof.
4. Secure the L-foot roof mounts with the roof screws. Use the supplied isolation washers between the base of the L-foot and the roof surface.

› For a steel roof with hidden fixings (clip-type roofing)

1. Lift the sheets of steel to expose the structure beneath.
2. Using a marker, mark out the precise locations of the structure below the roofing material and clip the roof back in place.
3. Place L-feet on the markings and screw down with supplied isolation washers between the base of the foot and the roof surface.

Note: SunLock can only be attached to “406” style roof sheets.
Installing Tile Brackets

Installation of the SLTB005 Adjustable Tile Bracket requires no special tools – only a 13 mm socket/spanner and the 6 mm internal hex driver/Allen key normally used for SunLock framing.

- Expose the timber rafters where the SunLock Tile Brackets are to be attached by sliding or removing tiles at a suitable spacing.
- Loosely assemble the tile brackets ready for adjustment. Place the first tile bracket on a rafter and adjust the elevation to a low and flush fit. Use a 13 mm socket to secure the bolt assembly. Generally, the other brackets on the roof can be adjusted to the same elevation position.
- Attach the tile brackets to the rafters using the supplied screws. To prevent splitting the timber, pre-drill the screw holes at an inward facing angle. This is especially important for hardwood rafters.
- Move the tiles back into place. Attach the SunLock rails to the Adjustable Tile Bracket uprights, and your framing installation is nearly complete.

Tile brackets are supplied as standard with 90 mm timber roofing screws, which supply the required 80 mm embedment in softwood rafters. For hardwood rafters, the embedment can be reduced to 40 mm (i.e. use at least a 50 mm screw, or longer if you have any packers between the tile bracket and the rafter).

If the purlins are steel (e.g. cold formed galvanized c-sections), note that Tek screws cannot be used unless the purlin is at least 3 mm thick, as they do not have sufficient pull out capacity. Other options are to position a section of timber in the section and screw into the timber, or use bolts, washers and nuts.
1. Connecting Rail to Roof Mounts
Connect the rail to the roof mounts by inserting the roof mount keylock into the rail channel. Make sure the ridged rail surface faces the ridged surface of roof attachments. Fasten the cap screw on the keylock 2-3 turns to loosely hold the rail in position.

2. Connecting Rail to Roof Mounts
The rail can be adjusted vertically within the roof attachment slot when bolts are loosely fastened.

3. Connecting Multiple Rails
Join rail segments by inserting the rail joiner into the rail channel.

4. Connecting Multiple Rails
Fasten cap screws to secure.

5. Installing End Clamps
Insert keylock of the end clamp into the rail channel. Using a 6 mm hex driver/Allen key, secure the first solar panel to the railing starting as close to the end of the row as possible. A minimum of 50 mm between the end of the rail and edge of the first solar panel is required.

6. Installing Mid Clamps
Insert the keylock of the mid clamp into the rail channel and position the clamp against the first panel frame. Hand-tighten the screw 2-3 turns to loosely hold the clamp in position. Ensure the EarthLock washer is placed between the SunLock rail and the frame of the panel.
7. Installing Mid Clamps
Slide second panel firmly into place against the mid clamps and fasten bolts.

8. Check Alignment of the Array
After fixing the first 2 panels, check that the array is straight. If there appears to be a deviation from square (e.g. if the ridge cap shows the row to be falling or rising slightly), readjust the panels until they appear square with the roof. Alternatively, measure the distance from the rail to the edge of the panel.

9. Continue Installing Mid Clamps
Continue to clamp the neighbouring panels in the array to the rails.

10. Install End Clamps
Finish the array row by securing the remaining two end clamps. You should have a minimum of 50 mm clearance between the edge of the last panel and the end of the rail. Tighten all bolts to secure the panels.

11. EarthLock Bonding Terminal
Fasten the EarthLock Bonding Terminal directly to a SunLock rail by placing the insert key in the rail and tightening the cap screw.
Note: The SLELBT02 can be connected to the top or the side of the rail.

12. Isolator mounting bracket
Fasten the Isolator Mounting Bracket to the end of the SunLock rail. The DC isolator can then be fixed to this plate.
**WARRANTY AGAINST DEFECTS**

Energy Matters Pty Ltd (trading as Energy Matters and Apollo Energy) (Energy Matters) is the manufacturer of the Sunlock Solar Module Mounting System (Frame).

Energy Matters warrants, on the terms set out below, that the Frame will be free from defects in materials and workmanship for a period of 10 years from the date on which the Frame is purchased from Energy Matters (Warranty against Defects).

**Transferability**

Our Warranty against Defects is only provided to the original purchaser of the Frame from Energy Matters (Purchaser) or, where the Purchaser is an installer or builder who on-supplies the Frame to another party, to that other party (End-User). Our Warranty against Defects is not otherwise transferable.

**Making a claim**

If you believe that the Frame is defective and you are an End-User, you may either make a claim against the installer or builder from whom you purchased the Frame or you may make a claim against us directly.

In order to make a claim against us, you must post, fax or email us a notice, using the contact details set out below. In your notice you must provide:

- details of why you believe the Frame is defective;
- a copy of your invoice, receipt or any other document which provides proof of purchase;
- details of any expenses you have incurred in making your claim; and
- details of how we should contact you.

Within a reasonable time after receipt of your claim we will contact you to arrange a time to attend the premises at which the Frame is located.

**Remedies**

If we determine that the Frame is defective and the defect is not a major failure then, if possible, we will try to repair the defective Frame at the premises. If this is not possible, we will remove the defective Frame and provide a replacement Frame at our expense.

If we determine that the Frame is defective and the defect is a major failure then you have the option of rejecting the Frame and obtaining a refund from us, rejecting the Frame and obtaining a replacement Frame from us at our expense or of keeping the Frame and receiving compensation from us for the difference between the actual value of the Frame and the amount you paid for the Frame.

If we determine that the Frame is defective we will also pay the substantiated reasonable expenses incurred by you in making your claim.

**Exclusions**

Our Warranty against Defects does not include:

- damage caused to the Frame during shipment or storage of the Frame by a party other than Energy Matters;
- damage caused to the Frame during installation by a party other than Energy Matters;
- damage caused by ‘Acts of God’, vermin, animals or pests or by other causes or acts outside Energy Matters’ reasonable control; or
- normal wear and tear, including normal weathering.

**Jurisdiction**

Our Warranty against Defects is to be construed in accordance with the laws of Victoria and any disputes will be determined by the exclusive jurisdiction of the courts of Victoria.

**Your obligations**

In order to have the benefit of our Warranty against Defects:

- if you are a Purchaser, you must have paid all amounts owed by you to Energy Matters in relation to the purchase of the Frame;
- you must have complied with all reasonable instructions of Energy Matters (whether written or verbal) in relation to the transport, installation, care, repair and use of the Frame; and
- you must not have misused, neglected, damaged or modified the Frame.
CONSUMER GUARANTEES

In addition to our Warranty against Defects, the Frame also comes with guarantees that cannot be excluded under the Australian Consumer Law (Consumer Guarantees).

In the event that the Frame fails to satisfy a Consumer Guarantee, you are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the Frame repaired or replaced if the Frame fails to be of acceptable quality and the failure does not amount to a major failure.

Please note that in addition to the rights and remedies set out in this document, you may also have other rights and remedies available to you under the law.

CONTACT DETAILS

Energy Matters Pty Ltd (trading as Energy Matters and Apollo Energy)
Address: Level 2, 101-105 Clarke Street,
South Melbourne, VIC, 3205
Postal Address: PO Box 5265,
South Melbourne, VIC, 3205

Sales and Service:
1300 855 484 (local call from anywhere in Australia)
International: +61 3 9697 1990
Fax: +61 3 9697 1919
Email: sunlock@apolloenergy.com.au
MAINTENANCE AND CLEANING

6106-T6 aluminium is largely maintenance free. Only in highly polluted or marine conditions is rinsing with clean water required, during scheduled panel cleaning.

REFERENCES

AS/NZS1170.2:2011 on wind actions
AS/NZS1664.1:1997 on aluminium structures
AS1720.1:2012 on timber structures
AS/NZS4600:2005 on cold-formed steel structures
AS3566-2011, self-drilling screws for the building and construction industries.

CERTIFICATE OF COMPLIANCE

September 3rd 2012

Energy Matters Pty Ltd
Level 2, 101-105 Clarke Street
South Melbourne VIC 3205

Attention: Mr Jeremy Lawrence

CERTIFICATE OF STRUCTURAL ADEQUACY

Project Description: SunLock Solar Panel Roof Mounting System

We, Partridge Partners Pty Limited, being professional Structural Engineers within the meaning of the Building Code of Australia, hereby certify that we have reviewed the structural design of the SunLock Solar Panel Roof Mounting System and associated fixing centres as detailed in the SunLock Rooftop Installation Manual Version 4.3, updated September 2012, and that this work is in accordance with the relevant provisions of the Standard Building Codes and in accordance with accepted engineering practice and principles.

This certification is subject to the limitations imposed on the system as detailed in the Manual. This document does not constitute certification of the existing roof structure to which the mounting system is to be fixed. Adequacy of the existing structure should be determined on site by the installer prior to installation.

This certificate shall not be construed as relieving any other party of their responsibilities, liabilities or contractual obligations.
**PRODUCT NAME**
SUNLOCK SOLAR PANEL MOUNTING SYSTEM

**PRODUCT DESCRIPTION**
- SOLAR PANEL SUPPORT FRAME AND FIXINGS FOR SUNLOCK
- FOR 10° – 20° METAL SHEETED ROOFS
- PORTION MOUNTED PANELS

**MANUFACTURER'S NAME**
ENERGY MATTERS PTY LTD

**DESIGN CRITERIA**
- WIND SPEEDS AND Pressures are calculated in accordance with AS/NZS 1170.2: 2011
- INFLUENCE LEVEL 2
- ANNUAL PROBABILITY OF EXCEEDANCE 1:500
- TOPOGRAPHIC MULTIPLIER M = 1.0 (FLAT)
- TERRAIN CATEGORY 2 - MA/CAT = 1.0
- REGION A, VR = 45 m/s
- REGION B, VR = 57 m/s
- REGION C, VR = 69 m/s
- REGION D, VR = 88 m/s

**LIMITATIONS**
- THE EXISTING ROOF CONSTRUCTION SHALL BE VERIFIED TO ENSURE ITS SUITABILITY FOR THIS PRODUCT AND THAT IT IS CAPABLE OF SUPPORTING THE ADDITIONAL LOADS.
- IF THE BUILDING IS SITUATED ANYWHERE OTHER THAN ON A FLAT AREA (BE A SLOPE, A HILL, ETC.) DO NOT USE THIS DRAWING. CONTACT A STRUCTURAL ENGINEER FOR A CUSTOM DESIGN.
- MAXIMUM ROOF HEIGHT = 10 m
- MINIMUM 10° ROOF PITCH
- MAXIMUM 20° ROOF PITCH
- SOLAR PANELS TO BE CERTIFIED SEPARATELY
- MAXIMUM SOLAR PANEL 1600mm x 1000mm
- FOR EXISTING ROOF FIXING ONLY
- MAXIMUM UPRIGHT FORCE PER FOOTING BRACKET 1.05MN IN NON CYCLONIC REGIONS, 0.63MN IN CYCLONIC REGIONS.
- MINIMUM STEEL BATTEN OR PURLINE THICKNESS 0.75MM GRADE 550

**PLAN ON SOLAR PANELS**
- REFER TO TABLE
- INTERMEDIATE RAIL CLAMPED AT 900, 1200 & 1300
- MAX 1/3 L-FOOT SPACING
- END CLAMP
- SUNLOCK END SLPF
- SUNLOCK RAIL SLF
- MAX L-FOOT SPACING
- REFER TO TABLE
- SUNLOCK L-FOOT SLPF
- SUNLOCK L-FOOT SLPF BEYOND SOLAR PANEL
- MINIMUM OF ONE SUNLOCK L-FOOT SLPF
- DRILLING SCHEMATIC
- WATERPROOF SEAL BY INSTALLER
- EXISTING STEEL PURLINE OR BATTEN
- PANELS TO BE MOUNTED ON SOLAR PANELS AS PER INSTALLER'S MANUAL

**SECTION 1**
- NOT TO SCALE

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**APPROVED FOR CONSTRUCTION**

**Partridge Partners**
Energy Matters Pty Ltd
16a, 1 Charlotte Street, Tweed Heads NSW 2485
www.partridgepartners.com.au

**SUNLOCK**
MOUNTING SYSTEM AND FIXINGS
SHEETED ROOF AT 10° TO 20° PITCH
STEEL ROOF STRUCTURE

**Design**
R.M.

**Scale at AS**
N/A

**Date**
AUG 2011

**No.**
2011.0063

**Date**
S3 D
### Product Name
SUNLOCK SOLAR PANEL MOUNTING SYSTEM

### Product Description
- Solar panel support frame and fixings for SUNLOCK
- For 20° - 35° metal sheeted roofs
- Portrait mounted panels

### Manufacturer's Name
ENERGY MATTERS PTY LTD

### Design Criteria
- Wind speeds and pressures are calculated in accordance with AS/NZS 1170.2:2011
- Importance level 2
- Annual probability of exceedance 1:500
- Topographic multiplier M = 1.0 (flat)
- Terrain category 2
- Region A: VR = 45 m/s
- Region B: VR = 57 m/s
- Region C: VR = 69 m/s
- Region D: VR = 88 m/s

### Limitations
- The existing roof construction shall be verified to ensure its suitability for this product and that it is capable of supporting the additional loads.
- If the building is situated anywhere other than on a flat area (e.g., a slope, a hill, etc.), do not use this drawing. Contact a structural engineer for a custom design.
- Maximum roof height - 10m
- Minimum 20° roof pitch
- Maximum 35° roof pitch
- Solar panels to be certified separately
- Maximum solar panel 1680mm x 1000mm
- For rail and rail fixing only.
- Maximum ultimate uplift-lift force per footing bracket 1.05kN in non-cyclonic regions, 0.63kN in cyclonic regions
- Minimum steel batten or purlin thickness 0.75mm grade 550

### Table: Maximum L-Foot Spacing in mm for Steel Battens/Purlins, for Sheeted Roofs of Pitch 20° - 35°

<table>
<thead>
<tr>
<th>Zone</th>
<th>Wind Regions</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>A</td>
<td>1800</td>
<td>1280</td>
<td>520</td>
<td>320</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>1360</td>
<td>850</td>
<td>345</td>
<td>215</td>
</tr>
<tr>
<td>Intermediate</td>
<td>C</td>
<td>1370</td>
<td>850</td>
<td>345</td>
<td>215</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>905</td>
<td>585</td>
<td>230</td>
<td>140</td>
</tr>
<tr>
<td>Edge</td>
<td>A</td>
<td>1025</td>
<td>640</td>
<td>260</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>680</td>
<td>420</td>
<td>170</td>
<td>105</td>
</tr>
</tbody>
</table>

### Plan on Solar Panels

- Solar panel by others
- Sunlock rail S 1/2
- Maximum L-foot spacing
- Sunlock rail S 1/2
- Maximum width of solar panel
- Existing metal roof sheeting

### L-Foot Fixing

- Sunlock rail S 1/2
- Maximum L-foot spacing
- Sunlock rail S 1/2
- Minimum of 120mm
- Existing roof batten/purlin

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**Note:** The drawings and specifications are subject to change without notice. Always consult the latest drawings and specifications before commencing work. Use only approved sunlock mounting systems and fixings. Always consult the latest drawings and specifications before commencing work. Use only approved sunlock mounting systems and fixings.
**PRODUCT NAME**
SUNLOCK SOLAR PANEL MOUNTING SYSTEM

**PRODUCT DESCRIPTION**
- **Solar Panel Support Frame and Fixings** for SUNLOCK
- For 10° – 20° Metal Sheeted Roofs
- Portrait Mounted Panels

**MANUFACTURER’S NAME**
ENERGY MATTERS PTY LTD

**DESIGN CRITERIA**
- Wind speeds and pressures are calculated in accordance with AS/NZS 1170.2:2011
- Importance Level 2
- Annual Probability of Exceedance 1:500
- Topographic Multiplier $M = 1.0$ (Flat)
- Terrain Category $Z = 2$
- $W_0 = 1.0$
- Region A, $V = 45 \text{ m/s}$
- Region B, $V = 57 \text{ m/s}$
- Region C, $V = 69 \text{ m/s}$
- Region D, $V = 88 \text{ m/s}$

**LIMITATIONS**
- The existing roof construction shall be verified to ensure its suitability for this product and that it is capable of supporting the additional loads.
- If the building is situated anywhere other than on a flat area (e.g., a slope, a hill, etc.), do not use this drawing. Contact a structural engineer for a custom design.
- Maximum roof height = 10m
- Minimum 10° roof pitch
- Maximum 20° roof pitch
- Solar panels to be certified separately
- Maximum solar panel 1800mm x 1000mm
- For rail and rail fixing only
- MAX Ultimate up-lift force per footing bracket 1.8KN
- Timber battens or purlins to support frame to be joint group J4 or better

**PLAN ON SOLAR PANELS**

**L-FOOT FIXING**

**APPROVED FOR CONSTRUCTION**
### Metal Sheeted Roof — Installation Zones

**Section 1**

**Panel Fixing**
- Not to Scale

**Solar Panel Fixing Points**
- Not to Scale

**Solar Panels by Others**
- Not to Scale

**Sunlock L-Foot SLIP**
- Not to Scale

**46.3 (145) TWIN SCREW**
- Not to Scale

**Existing Truss/Slat**
- Not to Scale

**Sunlock Rail SLIP**
- Not to Scale

**Waterproof Seal by Installer**
- Not to Scale

**Approved for Construction**

---

**Maximum L-Foot Spacing in mm for Timber Battens/Purlins, for Sheeted Roofs of Pitch 20°-35°**

<table>
<thead>
<tr>
<th>Roof Zone</th>
<th>Battens Spacing</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>600</td>
<td>1870</td>
<td>1840</td>
<td>1330</td>
<td>815</td>
</tr>
<tr>
<td>800, 1200, 1300</td>
<td>1635</td>
<td>1300</td>
<td>875</td>
<td>540</td>
<td></td>
</tr>
<tr>
<td>Intermediate</td>
<td>600</td>
<td>1635</td>
<td>1300</td>
<td>880</td>
<td>545</td>
</tr>
<tr>
<td>800, 1200, 1300</td>
<td>1280</td>
<td>865</td>
<td>580</td>
<td>360</td>
<td></td>
</tr>
<tr>
<td>Edge</td>
<td>600</td>
<td>1485</td>
<td>970</td>
<td>650</td>
<td>400</td>
</tr>
<tr>
<td>800, 1200, 1300</td>
<td>1035</td>
<td>650</td>
<td>435</td>
<td>270</td>
<td></td>
</tr>
</tbody>
</table>

**Design Criteria**
- Wind speeds and pressures are calculated in accordance with AS/NZS 1170.2:2011
- Importance Level 2
- Annual probability of exceedance 1:500
- Topographic multiplier M = 1.0 (Flat)
- Terrain category A; MLOF = 1.0
- Region A; VR = 45 m/s
- Region B; VR = 57 m/s
- Region C; VR = 68 m/s
- Region D; VR = 86 m/s

**Limitations**
- The existing roof construction shall be verified to ensure its suitability for this product, and that it is capable of supporting the additional loads.
- If the building is situated anywhere other than on a flat area (i.e., a slope, a hill, etc.) do not use this drawing.
- Contact a structural engineer for a custom design.
- Maximum roof height = 10m
- Minimum 20° roof pitch
- Maximum 35° roof pitch
- Solar panels to be certified separately
- Maximum solar panel 1680mm x 1000mm
- For rail and rail fixing only
- Maximum ultimate up-lift force per footing bracket 1.6kN
- Timber battens or purlins to support frame to be joint group J4 or better

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**Product Description**
- Sunlock Solar Panel Mounting System
- Solar panel support frame and fixings for Sunlock
- For 20°-35° metal sheeted roofs
- Portrait mounted panels

**Manufacturer's Name**
- Energy Matters Pty Ltd

---

**Partridge Partners**
- Structural Engineers
  - 24-26 Harbord Road, Bondi 2026
  - Tel: 9902 6200
  - Email: info@partridge.com.au
  - Website: www.partridge.com.au

**Energy Matters Pty Ltd**
- Sheeted Roof at 20° to 35° Pitch
- Timber Roof Structure
- Level 1, 1 Charles Street, Alexandria, Sydney 2070
- Tel: 9902 6200
- Email: info@energymatters.com.au
- Website: www.energymatters.com.au

**Drawing Code**
- R074427

**Revision Date**
- 31.08.12

**Scale**
- 1:50

**Drawn by**
- RSM

**Design by**
- KCS

**Drawn by**
- N/A

**Drawn by**
- AUG 2011

---

**Approval Note**
- All drawings are preliminary and are subject to change. Final drawings are required for approval.

---

**Issued for Construction**
- A
- B
- C
- D
- Issued for Construction

---

**Products and Designations**
- Sunlock
- Sunlock Mounting System and Fixings
- Sheeted Roof at 20° to 35° Pitch
- Timber Roof Structure
**PRODUCT NAME**

**MANUFACTURER'S NAME**

**DESIGN CRITERIA**
- Wind speeds and pressures are calculated in accordance with AS/NZS 1170.2:2011
- Importance level: 2
- Annual probability of exceedance: 1:50
- Topographic multiplier: M = 1.0 (Flat)
- Terrain category: 2
- Resid A: VR = 45 m/s
- Resid B: VR = 57 m/s
- Resid C: VR = 69 m/s
- Resid D: VR = 88 m/s

**LIMITATIONS**
- The existing roof construction shall be verified by a suitably qualified structural engineer to ensure that it can support the additional loads.
- If the building is situated anywhere other than on a flat area (i.e., a slope, a hill, etc.), do not use the framing.
- Contact a structural engineer for a custom design.
- Maximum roof height: 10m
- Maximum 10° roof pitch
- Solar panels to be certified separately
- Maximum solar panel: 1680mm x 1000mm
- Max ultimate uplift force per footing bracket: 1.6kN
- Timber battens or purlins to support frame to be joint group J4 or better

**CONCRETE FIXING DETAIL**

**SCALE 1:5**

**SUNLOCK MOUNTING SYSTEM AND FIXINGS**

**Sheeted Roof at Maximum 10° Pitch**

**Timber Roof Structure**

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**Partridge Partners**

Structural Engineers
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Pavilion Forensic Events
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**Client**

**Approval Date**

**Signature Date**

**Electronic Code**

---

**ACKNOWLEDGEMENT**

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**Signatory**

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**Stamp**

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**Design**

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**Scale**

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**Date**

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**No.**

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**Issue/Amendment**

---

**Date**

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**Client**

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**Electronic Code**

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**Signature Date**

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**Stamp**

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**Design**

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**Scale**

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**Date**

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**No.**

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**Issue/Amendment**

---

**Date**

---

**Client**

---

**Electronic Code**

---

**Signature Date**

---

**Stamp**

---

**Design**

---

**Scale**

---

**Date**

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PRODUCT NAME
SUNLOCK SOLAR PANEL MOUNTING SYSTEM

PRODUCT DESCRIPTION
- Solar panel support frame and fixings for sunlock for 20° – 35° tiled roofs
- Portrait mounted panels
- Sunlock tile bracket

MANUFACTURER'S NAME
ENERGY MATTERS PTY LTD

DESIGN CRITERIA
- Wind speeds and pressures are calculated in accordance with AS/NZS 1170.2:2011
- Importance level 2
- Annual probability of exceedance 1:500
- Topographic multiplier \( M = 1.0 \)
- Terrain category = 3
- Region A: \( V_R = 45 \text{ m/s} \)
- Region B: \( V_R = 57 \text{ m/s} \)

LIMITATIONS
- The existing roof construction shall be verified to ensure its suitability for this product and that it is capable of supporting the additional loads.
- If the building is situated anywhere other than on a flat area (ie, a slope, a hill etc) do not use this drawing. Contact a structural engineer for a custom design.
- Maximum roof height = 10m
- Minimum 20° roof pitch
- Maximum 35° roof pitch
- Solar panels to be certified separately
- Maximum solar panel 1600mm x 1000mm
- For rail and rail fixing only.
- Max ultimate uplift force per tile bracket 1.03kN
- Timber rafters to support frame to be joint group J4 or better

TERRAIN CATEGORY 3
MAXIMUM RAFTER SPACING 'S' IN mm, FOR TILED ROOFS OF PITCH 20°–35°

<table>
<thead>
<tr>
<th>Location</th>
<th>No of Rails</th>
<th>Wind Region A</th>
<th>Wind Region B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>2</td>
<td>1800</td>
<td>1140</td>
</tr>
<tr>
<td>Zone</td>
<td>3</td>
<td>1800</td>
<td>1425</td>
</tr>
<tr>
<td>Intermediate</td>
<td>2</td>
<td>1220</td>
<td>760</td>
</tr>
<tr>
<td>Zone</td>
<td>3</td>
<td>1525</td>
<td>950</td>
</tr>
<tr>
<td>Edge Zone</td>
<td>2</td>
<td>910</td>
<td>570</td>
</tr>
<tr>
<td>Zone</td>
<td>3</td>
<td>1145</td>
<td>710</td>
</tr>
</tbody>
</table>

SECTION 1
NOT TO SCALE

SECTION 2
NOT TO SCALE

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ENERGY MATTERS PTY LTD
SUNLOCK MOUNTING SYSTEM AND FIXINGS
TILED ROOF 20° – 35° PITCH, TCS
TIMBER ROOF STRUCTURE

APPROVED FOR CONSTRUCTION

No. | Issue/Amendment | Date |
---|-----------------|------|
A | General Amendments | 15.12.11 |
B | Panel Rafter Brackets Amend | 28.06.12 |
C | Blank | 31.08.12 |

Signed: R/P
Date: 15.12.11
KGS: N/A

No. | Design | R/P | KGS |
---|--------|-----|-----|
1 | N/A | N/A | N/A |
A | SUNLOCK MOUNTING SYSTEM AND FIXINGS | 2011.0063 | S10c |
B | TLED ROOF 20° – 35° PITCH, TCS | 2011.0063 | S10c |
C | TIMBER ROOF STRUCTURE | 2011.0063 | S10c |