



PoleLock Installation Manual

Version 4.0 - updated September 2014



www.sunlock.com.au

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INTRODUCTION

Thank you for choosing the PoleLock solar photovoltaic (PV) module pole-mounted framing system, part of the SunLock family of solar framing products. PoleLock is suitable for a wide variety of commercial and remote installations.

PoleLock is backed by a 10-year warranty and compliant with the Australian / New Zealand Standard on Wind Actions (AS/NZS1170.2.2011).

PoleLock can support one or two modules on one pole. More modules can be supported by joining several PoleLock frames together in a line.

**WARNING****WARNING**

Indicates a hazardous situation which, if not avoided, can result in death or serious injury or moderate injury.

**CAUTION****CAUTION**

Indicates a hazardous condition which, if not avoided, can result in minor or moderate injury.

SAFETY AND INSTALLER RESPONSIBILITIES

Wind Loads

PoleLock complies with AS/NZS1170.2.2011 on Wind Actions, as per the following table:

	1 Panel Frame	2 Panel Frame	Multiple Frame
Wind Region	A, B	A	A, B
Terrain Category	2, 3, 4	2, 3, 4	2, 3, 4
Topographic Factor M_t	1.0, 1.2	1.0	1.0

AS/NZS1170.2.2011 provides guidance on determining the wind pressures applicable to your PoleLock installation site, taking in local terrain and topography. Sufficient guidance is given in this document, but you may wish to procure a copy of these standards if your company installs Australia wide.

If you are unsure about complying with standards, or if you are not qualified to install this product, please consult either SunLock or a registered structural engineer.

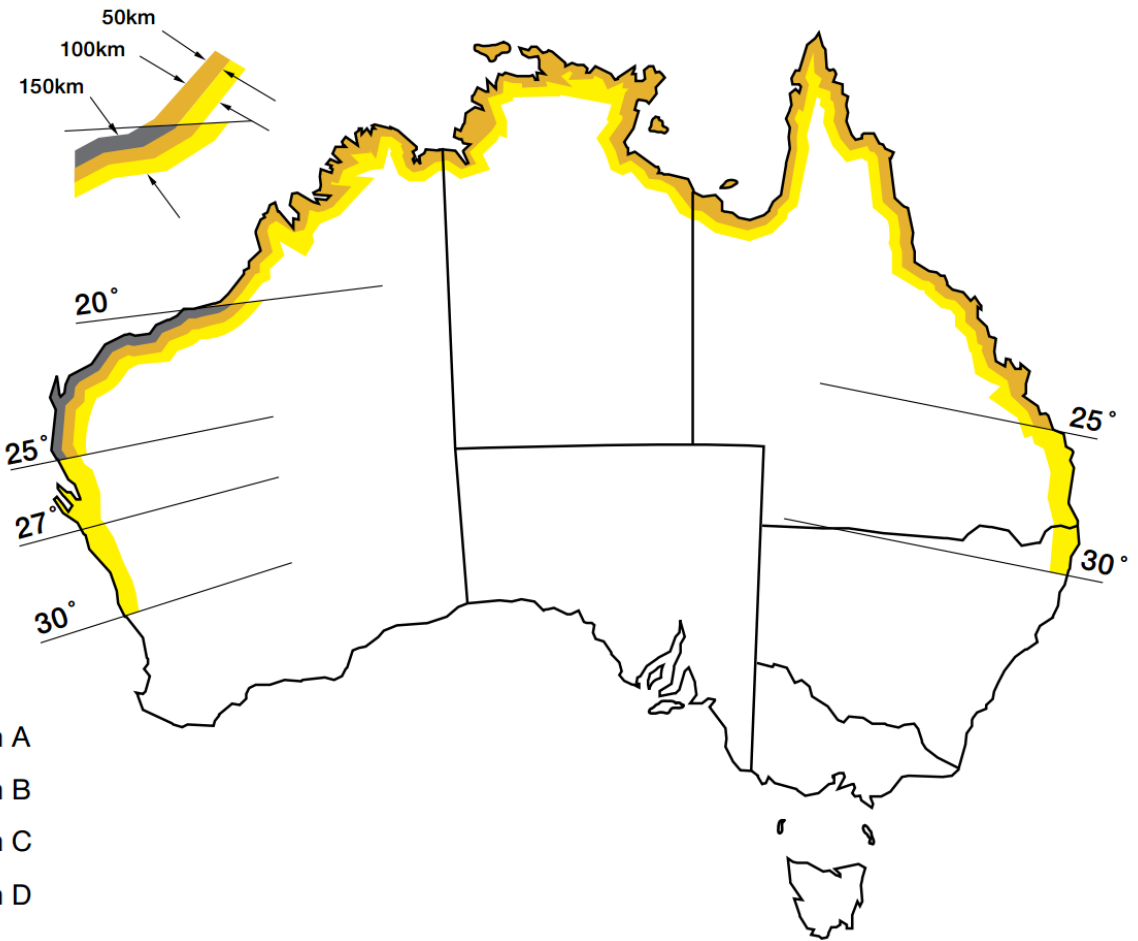
Footings

The footings for PoleLock have been designed by a registered structural engineer, and are appropriate for natural ground, not topsoil, fill, or disturbed ground.

Check that the soil at the install location is appropriate for this footing design. If it is not appropriate, you will need to get the footing checked by a registered structural engineer.

Handling

The materials used in the PoleLock frame can have sharp corners or edges. Wear personal protective equipment such as safety glasses, hearing protection and gloves during cutting and handling.



- Region A
- Region B
- Region C
- Region D

Included Towns:

Region A:

- > Callytharra Springs
- > Gascoyne Junction
- > Green Head
- > Kununurra
- > Lord Howe Island
- > Morawa

- > Toowoomba
- > Wittanoom
- > Bourke

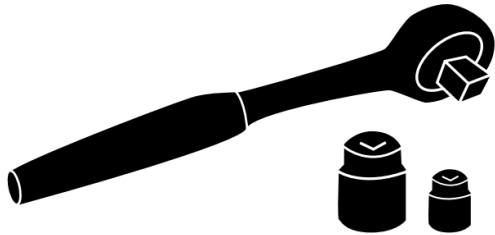
Region B:

- > Adelaide River
- > Atherton

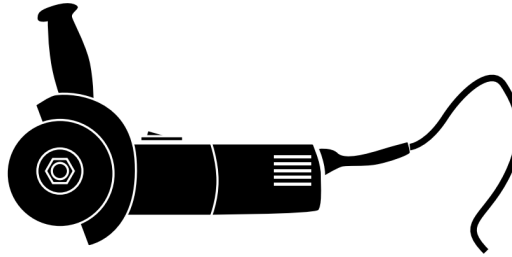
- > Biloela
- > Brisbane
- > Christmas Island
- > Collinsville
- > Corindi
- > Geraldton
- > Ivanhoe

- > Kyogle
- > Marble Bar
- > Mullewa
- > Norfolk Island
- > Torres Strait Islands
- > Wyndham

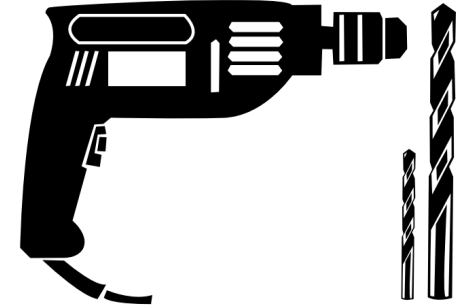
TOOLS REQUIRED FOR INSTALLATION



Socket and Ratchet (A 17mm, 19mm socket and ratchet for tightening supplied fasteners)



Angle Grinder (If required, an angle grinder with an aluminium cutting blade can be used to trim the SunLock channel to the desired length)



Hand Drill (An electric hand drill for drilling holes in the base of the mounting post)

Drill Bits (A 6mm & 13mm drill bit is required to drill holes in the mounting post)



Anti-galling Lubricant (if required, anti-galling lubricant may be required to aid in the tightening of stainless steel fasteners)



Ring Spanner (A 17mm, 19mm ring spanner for tightening supplied fasteners)



Hex Key (A 6mm hex key / driver bit is required to secure the SunLock channel to the channel feet)



Gloves (For handling SunLock framing, as aluminium can develop sharp corners)

TYPICAL INSTALLATION

The PoleLock range of frames can support either one or two modules of various sizes in a portrait orientation. If required, multiple PoleLock frames can be installed on one site to provide increased power.

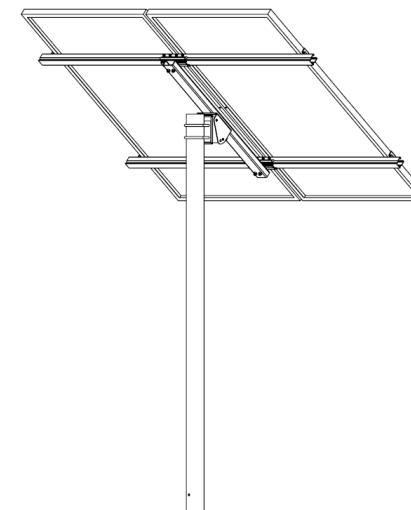
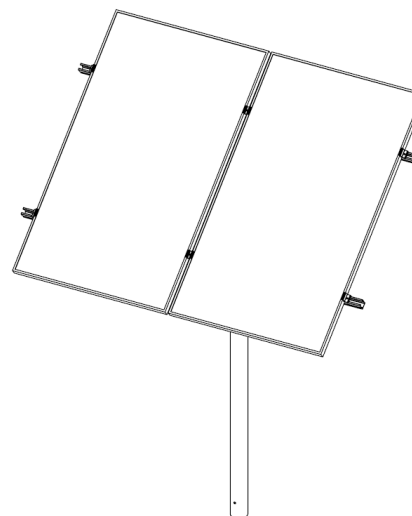
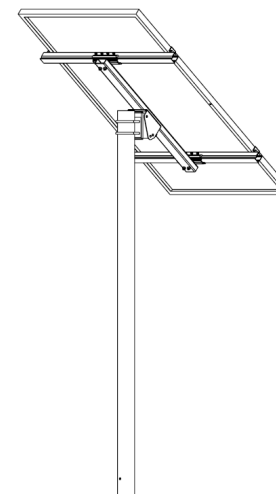
PoleLock has been designed to accommodate the following panels:

(675mm x 1500mm) ~ 120W - 160W panels

(808mm x 1580mm) ~ 170W - 210W panels

(1000mm x 1680mm) ~ 215W - 250W panels

(1046mm x 1556mm) ~ 327W panels



INSTALLATION—POLE

Note: PoleLock is certified for use with the following mounting post:

- 90 DN DuraGal pole (101.6mm outer diameter, 4mm wall thickness)
- 250 MPa
- 3200mm pole length

Installation

1. Ensure the location is suitable for pole mounted solar installation.
2. Ensure no building / trees are shading the modules.
3. Dig holes in undisturbed, natural ground with a soil friction angle of 22 degrees or greater.

1 Panel Frame:

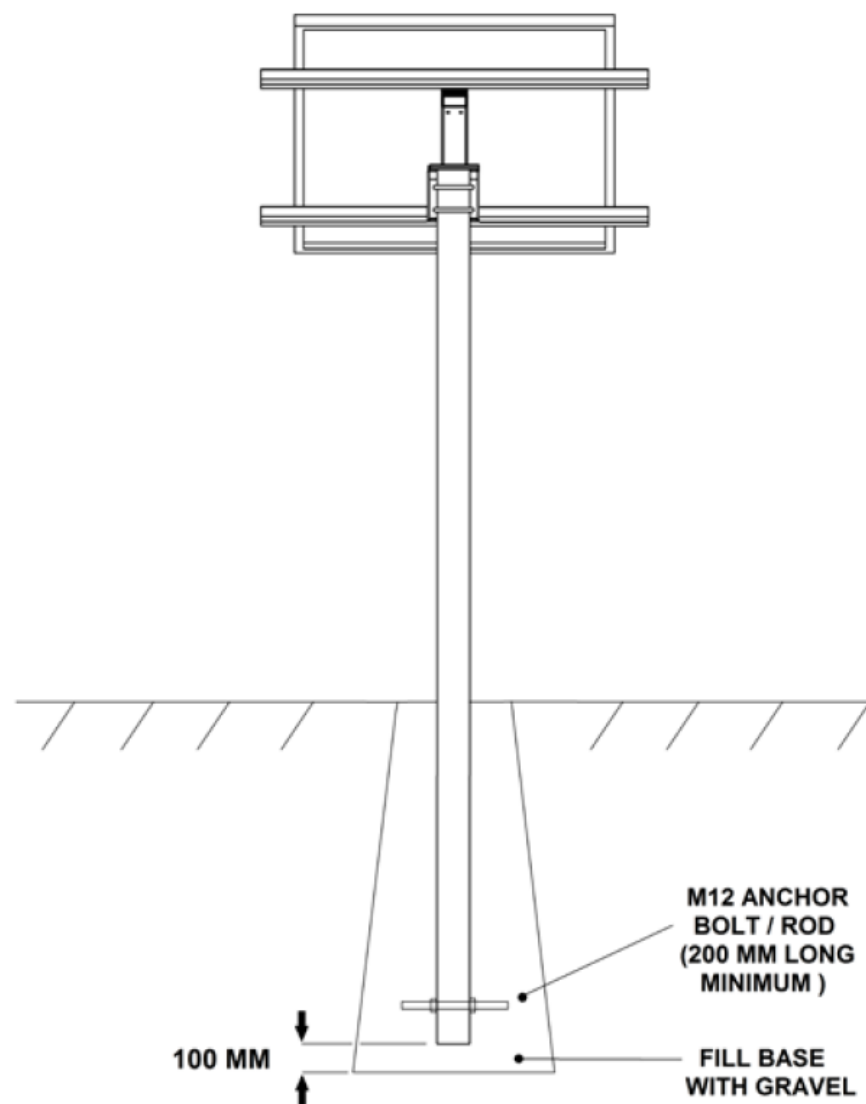
450mm diameter pier, 1200mm deep

2 Panel Frame:

450mm diameter pier, 1400mm deep

600mm diameter pier, 1200mm deep

4. Drill a hole in the end of the mounting pole, insert an M12 bolt/rod and fasten
5. Place the galvanised pole into the hole ensuring that the pole sits on a 100mm base of gravel. Fill with the required amount of 25 MPa concrete. Ensure the pole is oriented plumb.

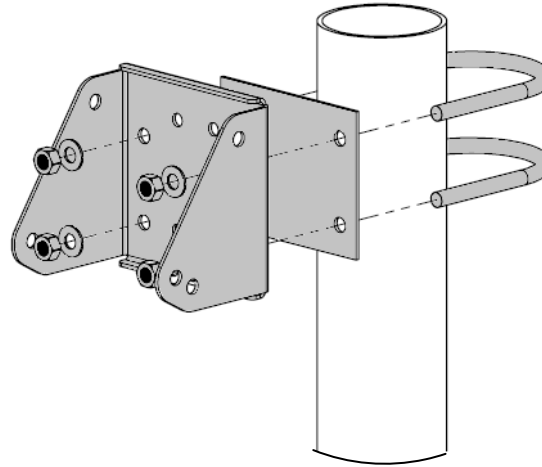


INSTALLATION

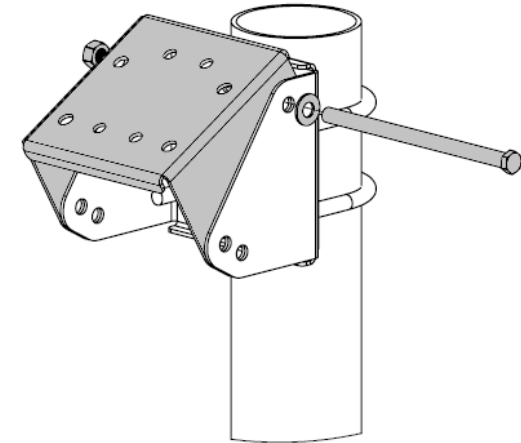
The PoleLock frame consists of two parallel SunLock channels connected to a central beam through two channel brackets. This frame is connected to a pivot assembly which in turn is mounted on the top of a mounting post.

Pivot Assembly

1. Insert each U-bolt through the corresponding holes in the supporting plate and pivot bracket and loosely attach the washers and nuts. Slip the assembly over the top of the mounting pole and tighten. Ensure the pivot flanges are pointing in the intended northerly direction.
2. Take the second pivot bracket and slide the pivot bolt through the mating holes ensuring that both brackets rotate freely. Loosely tighten all fasteners.



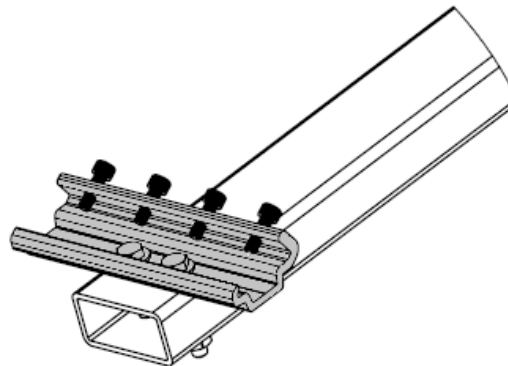
Attach the pivot bracket to the pole



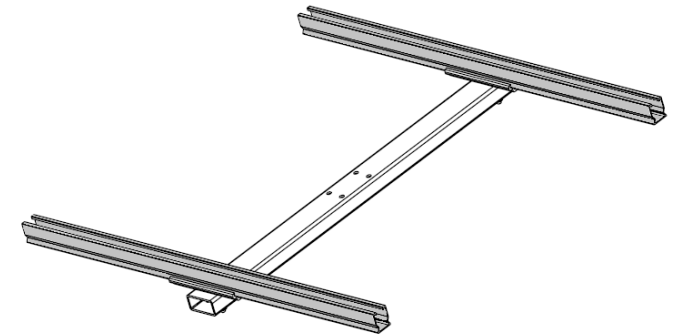
Add the second pivot bracket

Frame Assembly

1. Take the central beam and fasten the channel brackets to the ends.
2. Centre and attach the SunLock channel to the channel brackets by fastening the supplied M8 socket head cap screws.



Attach the channel bracket to the beam

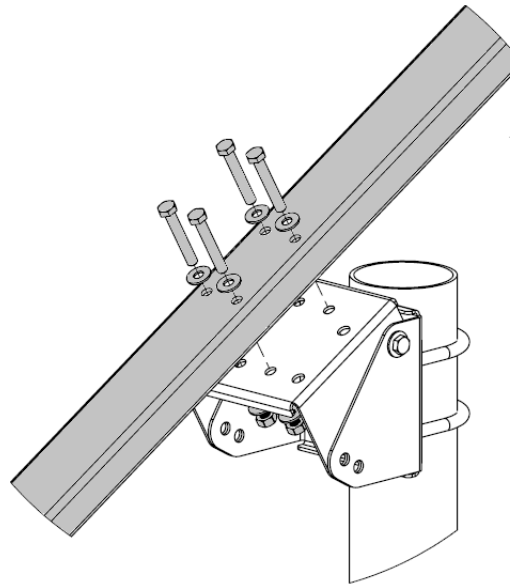


Frame assembly ready to attach to the pivot

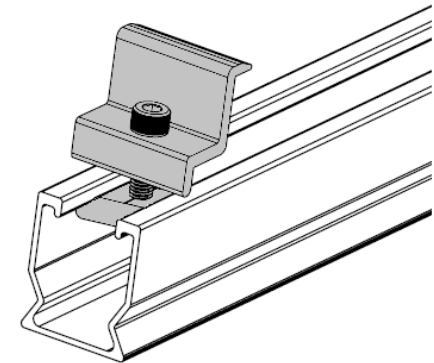
INSTALLATION

Total Assembly

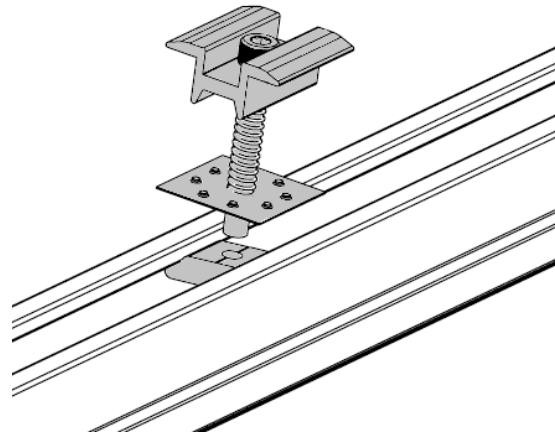
1. Place the frame assembly on top of the pivot assembly and tighten all fasteners.
2. Loosely attach the required PV module end-clamps to the end of the SunLock channels.
3. Loosely attach the module mid-clamps in the centre of the SunLock channels (2 panel only).
4. Place the solar panel on top of the frame and fasten down the end clamps, ensuring that the clamps securely hold down the panel.
5. (2 Panel Only) Attach and fasten the supplied mid clamps to the other side of the panel.
6. (2 Panel Only) Repeat steps 4 and 5 for the second panel.
7. Ensure all clamps are sufficiently fastened to prevent panels dislodging from the frame.
8. Set the desired inclination angle of the solar array by placing the 30mm M12 bolts through the two sets of holes in the pivot bracket.
9. Securely tighten all fasteners and ensure that the assembly is rigid.



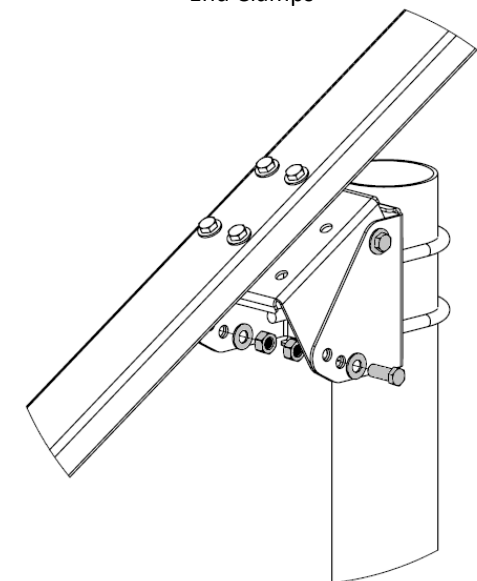
Frame—Pivot assembly attachment



End Clamps



Mid-Clamps (2 panel only)



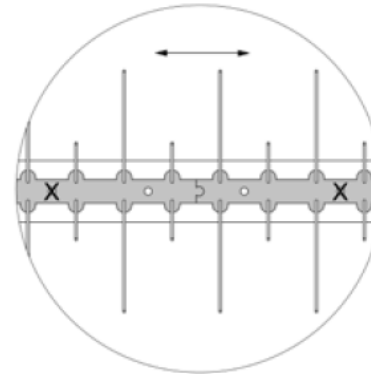
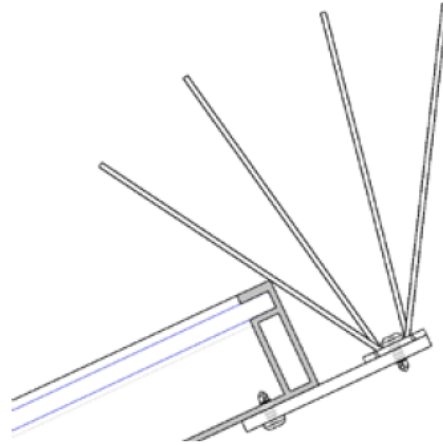
Set desired inclination angle

INSTALLATION—ANTI-BIRD SPIKE MOUNTING KIT (OPTIONAL)

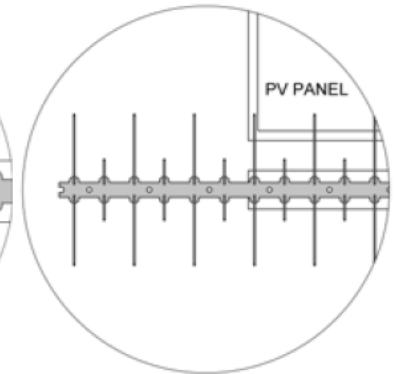
Anti-bird spike mounting kits are effective in the prevention of perching and nesting of birds. The spikes act as a preventative measure and will not cause any harm to the animal.

1. Cut the aluminium strap to the desired length (ideally to match the length of the solar panel)
2. Connect lengths of anti-bird spikes together to match the length of the aluminium strap. Mark excess portions and trim to suit.
3. Attach the lengths of anti-bird spikes using tek screws in 150mm intervals (or every third mounting hole). Ensure that the bird spikes are mounted as close to the edge of the strap as possible to allow for connection to the solar panel.
4. Use the supplied tek screws to attach the aluminium strap to the return flange of the solar panel frame.

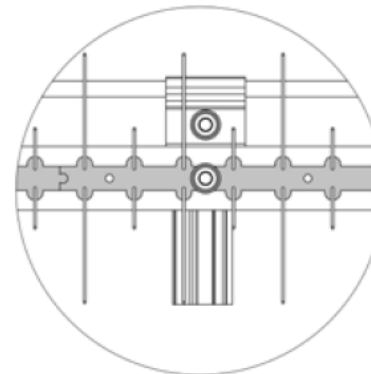
NOTE: The anti-bird spike kit should be mounted as close to the solar panel as possible.



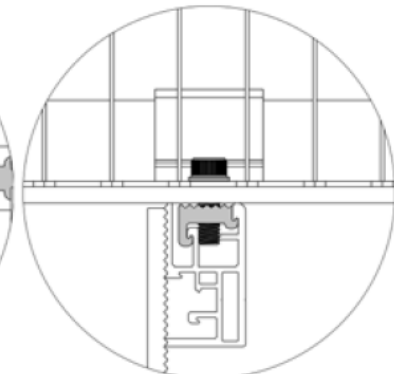
1 / 2 / 4 Panel Frame - Tek screw fastening spacing



1 / 2 / 4 Panel Frame - Trim excess length of anti-bird spikes



2 / 4 Panel Frame - Bolted attachment



2 / 4 Panel Frame - Bolted attachment

MULTIPLE FRAME INSTALLATION

If required, multiple PoleLock frames can be installed on one site to provide increased power. The PoleLock frames can be assembled in series to accommodate 3 to 6 panels in wind region A or B.

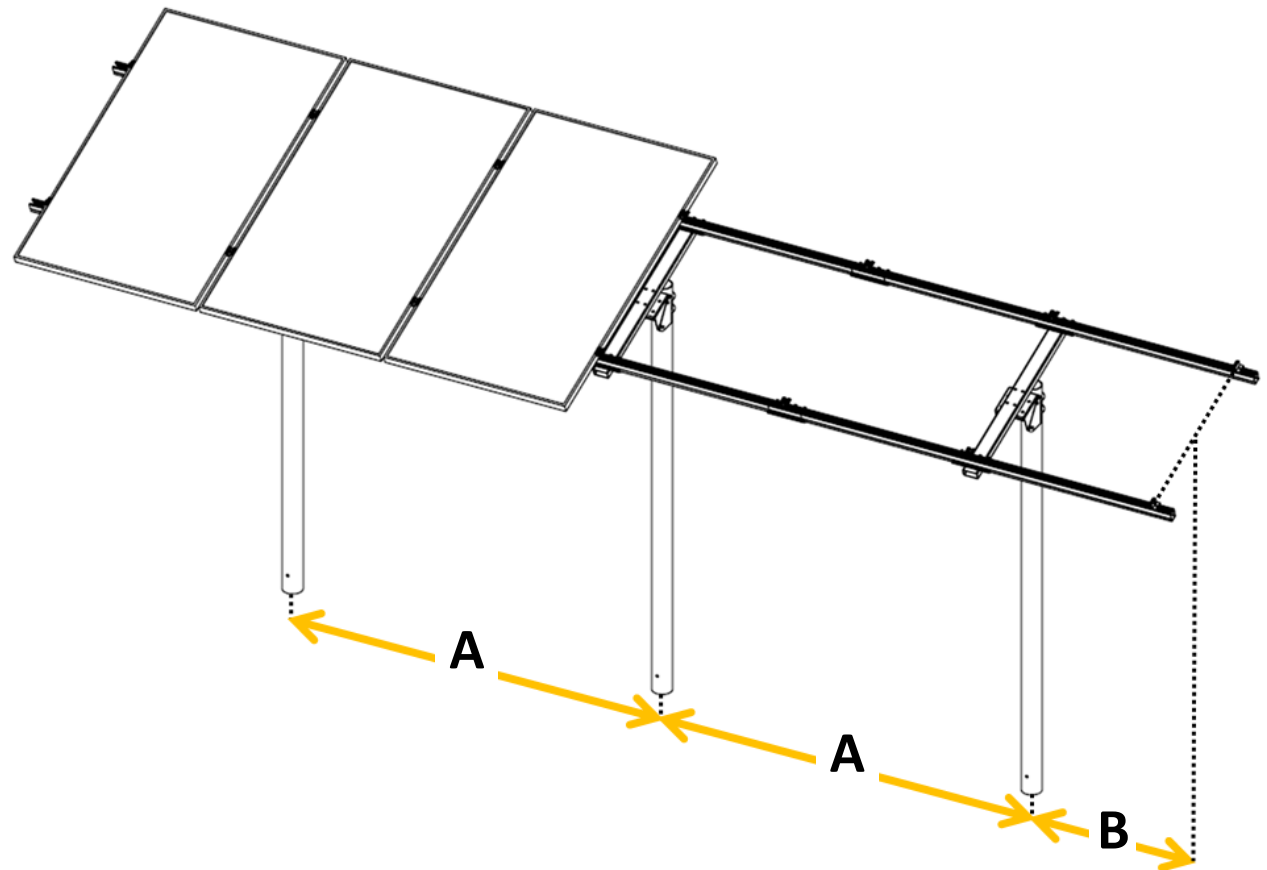
The multiple frame installation consists of multiple single or double panel frames arranged in series, with the channel ends joined using SunLock channel joiners. Channels can either be cut to appropriate lengths, using a circular saw with an aluminium cutting blade, or longer lengths of channel can be custom ordered.

The number of poles required for installations in wind region A & B, $M_t = 1.0$, can be found in the table below.

	Maximum [A]	Maximum [B]
Wind Region A	2200mm	1050mm
Wind Region B	1700mm	720mm

Number of Panels	Number of poles for wind region A	Number of poles for wind region B
3	2	2
4	2	3
5	3	4
6	3	4

If you wish to assemble an array of more than 6 modules in wind region B, or for terrain with $M_t = 1.2$, please contact us to discuss the correct number of poles required.



MAINTENANCE AND CLEANING

Galvanised steel, aluminium and stainless steel are largely maintenance free. Only in highly polluted or marine conditions is rinsing with clean water required during scheduled panel cleaning.

WARRANTY CONDITIONS

Energy Matters Pty Ltd (trading as Energy Matters and Apollo Energy) (Energy Matters) warrants that its PoleLock and SunLock Solar Panel Mounting System (Frame) is 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 Period), on the terms set out in this warranty.

In the event that the Frame does not conform to this warranty during the Warranty Period, Energy Matters will, at its option, either repair or replace the Frame or pay the cost of having the Frame repaired or replaced.

To the extent permitted by law, Energy Matters's total liability under this warranty will in no circumstances exceed the repair or replacement of the Frame or payment of the cost of having the Frame repaired or replaced. In the event of replacement of the Frame, any remaining part of the Warranty Period will be transferred to the replacement Frame.

This warranty will not apply to any defect or damage to the Frame arising directly or indirectly from:

1. Shipment or storage of the Frame;
2. Improper installation, maintenance, repair or use of the Frame;
3. Normal wear and tear;
4. Misuse, neglect, abuse, accidental damage or modification to the Frame;
5. Failure to observe the instructions set out in the System Manual; or
6. Power failure, power surges, lightning, fire, explosion, flood, extreme weather conditions, environmental disasters or other causes outside Energy Matters' control, as determined by Energy Matters in its sole discretion.

This warranty does not cover, and under no circumstances will Energy Matters be liable for, any costs associated with the removal, shipping, handling or re-installation of the Frame or the costs of sending personnel to any site to repair or replace the Frame.

This warranty 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).

This warranty is not transferable. Where an End-User wants make a claim under this warranty, the End-User must in the first instance contact the installer or builder from whom the Frame was purchased.

All warranty claims must be made in writing and addressed to the Customer Service Officer, Energy Matters, PO Box 5265, South Melbourne, Victoria, 3205; and accompanied by proof of purchase of the Frame in a form acceptable to Energy Matters.

This warranty will not apply to any claims received by Energy Matters after the expiration of the Warranty Period. Energy Matters makes no warranties, express or implied, other than the warranties made herein, and specifically disclaims all other warranties, representations and conditions to the extent permitted by law.

To the extent permitted by law, in no circumstances will Energy Matters be liable for direct, indirect, special or consequential damages arising from a defective Frame or for any damage or injury to persons or property. Energy Matters' aggregate liability, if any, in damages or otherwise, will not exceed the invoice value of the Frame at the time of purchase from Energy Matters.

Any provision contained in this warranty which is prohibited or unenforceable in any jurisdiction will be deemed to be ineffective to the extent of such prohibition or unenforceability and will not invalidate the remaining provisions nor affect the validity or enforceability of that provision in any other jurisdiction.

This warranty will be governed and construed in accordance with the laws of Victoria, Australia and the parties irrevocably submit to the exclusive jurisdiction of the courts of Victoria.

REFERENCES

AS/NZS1170.2.2011, structural design actions,
Part 2: Wind Actions

CONTACT DETAILS

For further information contact Apollo Energy on
1300 855 484 (local call from anywhere in
Australia) or at sunlock@apolloenergy.com.au

CERTIFICATE



PARTRIDGE
STRUCTURAL | REMEDIAL | EVENT

October 10th 2014

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

Attention: Mr Jeremy Lawrence

CERTIFICATE OF STRUCTURAL ADEQUACY

**Project Description: PoleLock Pole Mounted Solar Panel Mounting System
PoleLock Installation Manual Version 4.0,
September 2014**

We, Partridge Structural 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 PoleLock Solar Panel Mounting System and associated footings as detailed in the PoleLock Installation Manual Version 4.0, dated September 2014, by Energy Matters Pty Ltd 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 adequacy of the ground or soil in which the footings are placed.

This certificate shall not be construed as relieving any other party of their responsibilities, liabilities or contractual obligations.



Rob O'Reilly
BE(Hons) MIEAust CPEng NPER(Structural) RPEQ
For and on behalf of:
Partridge Structural Pty Ltd

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Partridge Structural Pty Ltd – 73 902 451 925
Partridge Event Pty Ltd – 52 339 603 433
Partridge Remedial Pty Ltd – 69 146 990 921

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