

Polar Bear™ Roof Connector with Eco-Fasten™ Technology Installation Instructions for Membrane and Other Flat Roofs

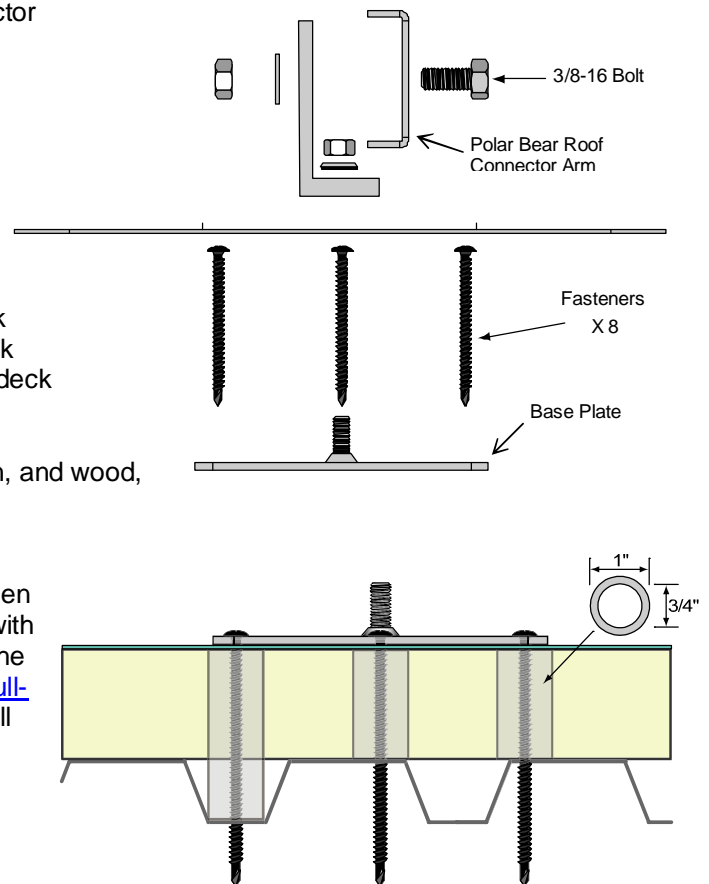
The Polar Bear Roof Connector with Eco-Fasten Technology is a mechanical attachment option for PanelClaw's Polar Bear flat roof photovoltaic mounting system. This component may be required in high basic wind speed areas and certain seismic zones.

Assess the Suitability of the Polar Bear Roof Connector with Eco-Fasten Technology

1. Determine the type of roof that the Polar Bear Roof Connector with Eco-Fasten technology is to be installed on:
 - A. EPDM
 - B. TPO
 - C. Vinyl
 - D. Torch Applied (Modified) membrane
 - E. Hot Tar
 - F. Other

2. Determine the roof construction, i.e.,
 - A. roofing material over insulation, over steel deck
 - B. roofing material over insulation, over wood deck
 - C. roofing material over insulation, over concrete deck
 - D. roofing material over wood deck only
 - E. roofing material over concrete deck only
 - F. roofing material over recovery board, insulation, and wood, concrete, or metal
 - G. other

3. Choose appropriate fastener to work in conjunction with given roof construction. EcoFasten has tested fasteners for use with steel and wood decks. Those test results are available on the Eco-Fasten website <http://www.eco-fasten.com/pdf/ASG-Pull-Test-Report.pdf>. Fasteners for concrete and other decks will need to be determined by the project engineer. For applications where the insulation thickness is greater than one inch, the use of ferrules is recommended.

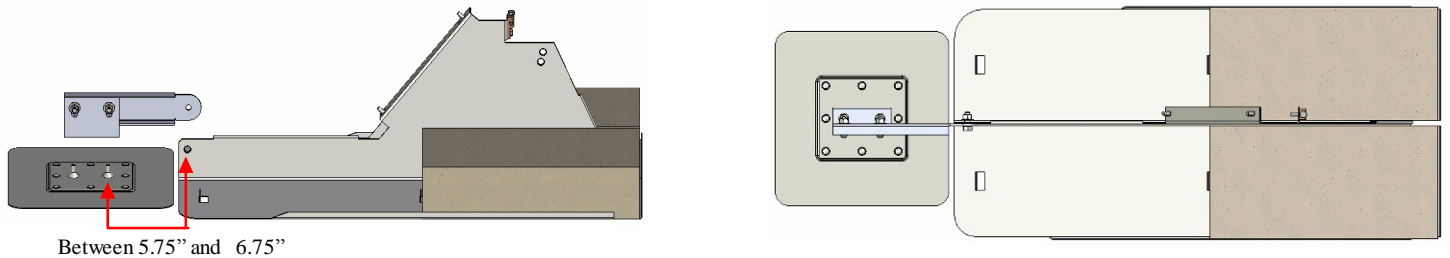


Installation Instructions

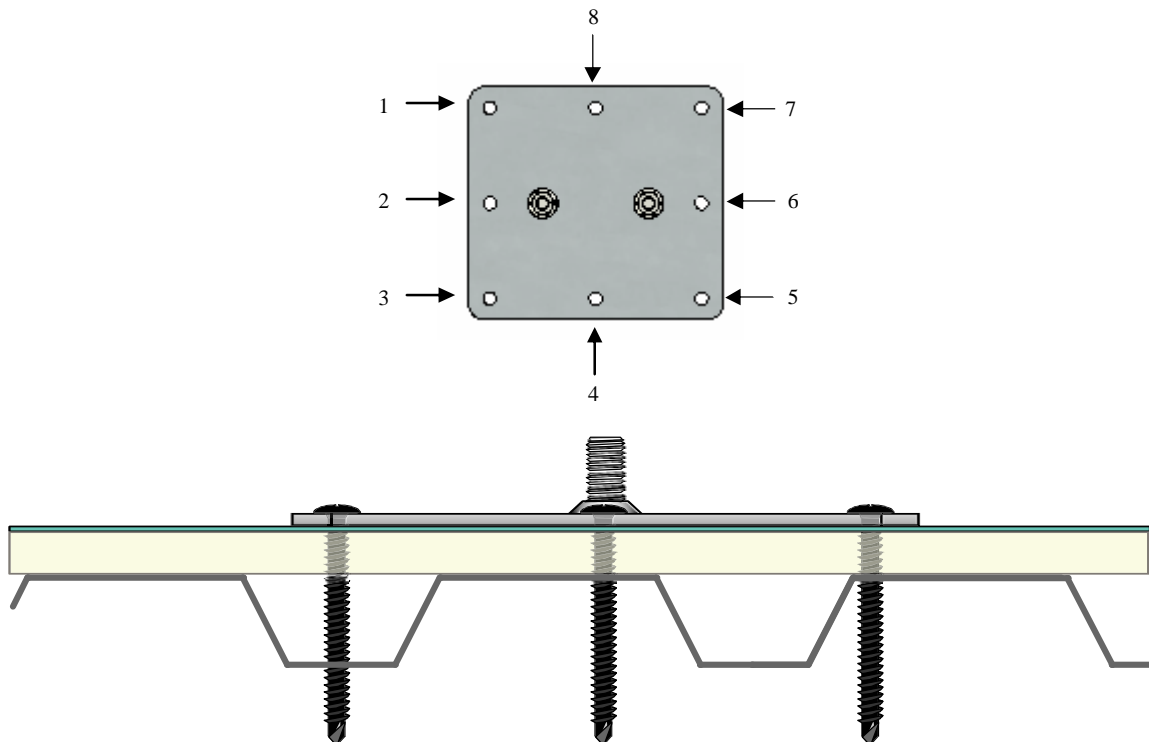
Refer to the array ballast and mechanical attachment layout provided to you by groSolar® or PanelClaw™ for required mechanical attachment locations on your array. Once all modules have been mounted, proceed to the installation of the Polar Bear Roof Connector with Eco-Fasten Technology to each required Polar Bear Support as outline below.

I. Base Plate (The base plate is the flat piece with the two threaded studs.)

- A. The base plate is 6" long and 5.5" wide.
- B. Place the base plate on top of the finished membrane roof. Align the base plate so that the two studs are oriented parallel to the North end (low end) of the Polar Bear Support. Measure the distance from the base plate to the Support and ensure that there is enough room for the target patch to be installed without the Support interfering with the target patch and that the Polar Bear Roof Connector Arm will reach the mounting hole located on the North end (low end) of the Support. The distance between the front stud and the Support mounting hole will be between 5.75" and 6.75".

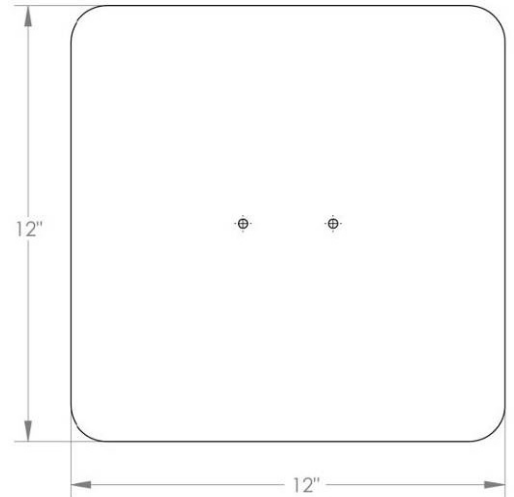


- C. Install 8 fasteners through the holes in the perimeter of the base plate. Screws should penetrate a minimum of 0.5" into the deck (not including the tip of the screw).



II. Base Plate Counter Flashing (Target Patch). PanelClaw provides target patches for the most common roof types.

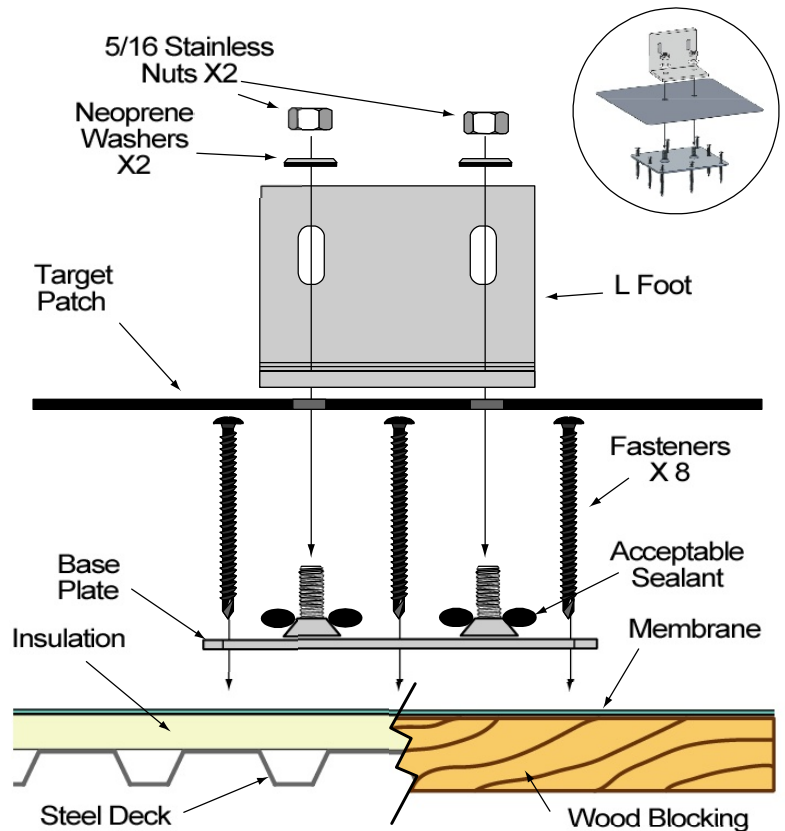
- A. Use an acceptable piece of flashing material at least 10" square. (Target Patch). Consult roof material manufacturer for confirmation of minimum target patch size.
- B. Cut two small holes in target patch such that when installed it will fit tightly over threaded studs and be centered over base plate.
- C. Before installing target patch apply a generous amount of acceptable sealer around threaded rods.
- D. Apply target patch over base plate using proper mastics or welding installation techniques (varies with type of roofing material, please consult manufacturers specifications) so as to create a water tight patch.
- E. The threaded studs are now the only part of the base plate exposed. NOTE: Due to the sealer applied around the studs there may be "bleed out" at the openings. When the base block is installed and tightened this "bleed out" will help to create a water tight compression fitting.



III. Installation of the L Foot Attachment Bracket for the Polar Bear Roof Connector with Eco-Fasten technology (Top Plate)

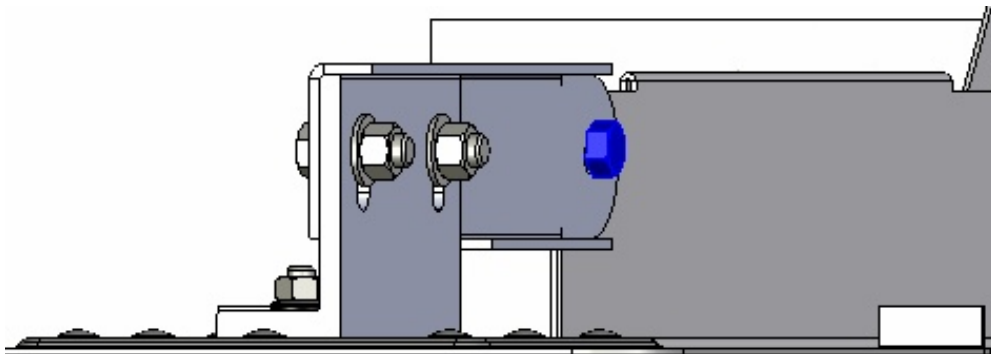
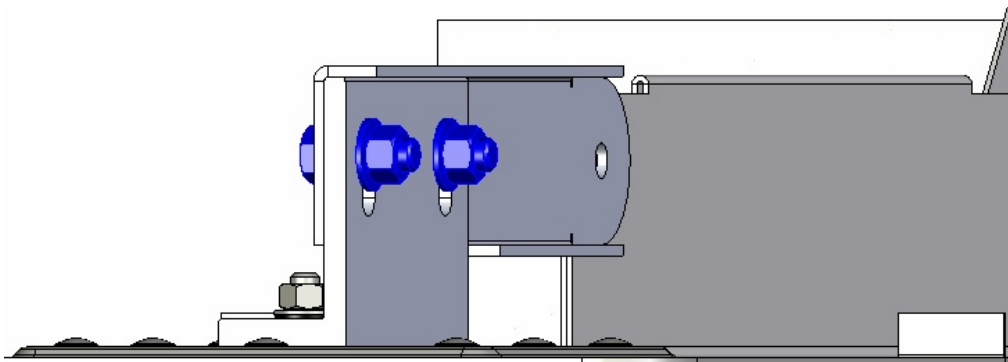
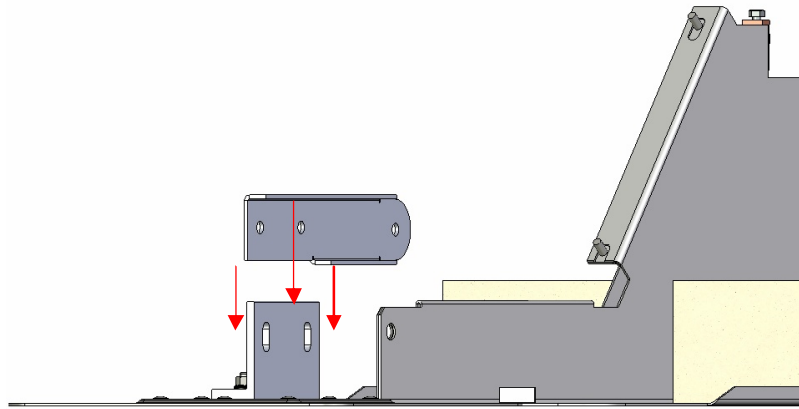
- A. Install L Foot over threaded studs. The L Foot will be centered on the base plate when installed properly.
- B. Place one neoprene washer over each stud (neoprene side down).
- C. Place two 5/16-18 nuts over neoprene washer and tighten.

Note: Typical roof insulation has a compressive load value of 20 psi. Each "standard" EcoFasten base plate is 33 square inches. This means that each EcoFasten assembly when installed over typical roof insulation alone will support an ultimate compressive load of 660 pounds. For design purposes do not exceed 500 pounds per "standard" assembly.



IV. Proceed with the installation of the Polar Bear Roof Connector Arm.

- A. Attach the Polar Bear Connector Arm to the L Foot using two 3/16-16 x 1 1/4" bolts and two 3/8-16 serrated flange nuts.
- B. Attached the Polar Bear Connector Arm to the Polar Bear support using a 3/16-16 x 1 1/4" bolt and a 3/8-16 serrated flange nut.



Quick Reference Guide

1. Based on your answers to the Polar Bear intake form, the type of installation, the number of base plates, fasteners and attachments necessary will be determined by PanelClaw / groSolar.



2. Use the right fastener for the roof and deck you are working with. Eco-Fasten has tested fasteners for use with steel and wood decks. Those test results are available on the Eco-Fasten website <http://www.eco-fasten.com/pdf/ASG-Pull-Test-Report.pdf>. Fasteners for concrete and other decks will need to be determined by the project engineer.



Be sure the fasteners are long enough to penetrate a minimum of 0.5” into the deck (not including the tip of the screw).



3. Align the base plate with the Support allowing for enough distance to connect the Polar Bear Connector Arm to the Support and ensuring that the Support will not interfere with the target patch. Use 8 fasteners per base plate.



4. Use a cleaner recommended by the roof manufacturer to clean the area around the Eco-Fasten base plate.



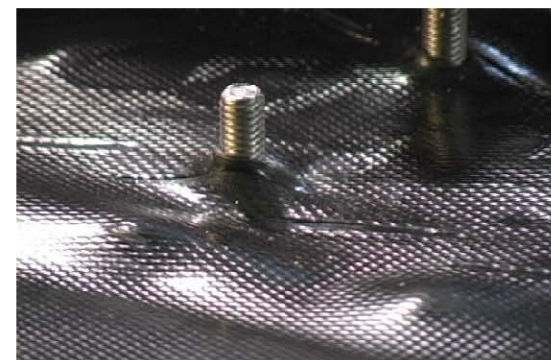
5. Apply sealant around the bolts on the base plate and use the supplied flashing or make your own from a compatible material.



6. Apply target patch over base plate using proper mastics or welding installation techniques (varies with type of roofing material) so as to create a water tight patch.



7. The threaded studs are now the only part of the base plate exposed.
NOTE: Due to the sealer applied around the studs there may be "bleed out" at the openings.



8. When the L-foot is installed and tightened excess material will create "bleed out" to help to create a water tight compression fitting. Install the L-Foot bracket by placing the countersunk holes over the studs and tighten using the neoprene bonded washers and stainless steel nuts.



9. Place the countersunk holes over the studs and fasten the L-foot in place with the included neoprene bonded washers and stainless nuts.



10. Proceed with installation of the Polar Bear Connector Arm.

