REKOR®

INTELLIGENCE DRIVEN INNOVATION

Solar Pro Solar Kit Installation Guide

Version 1.0

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Revision History

Version	Date	Description	Author
1.0	4/2025	Initial release	M. Covington

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Trademarks

Contents

1 Introduction

Rekor's solar solutions allow Rekor Edge systems to be utilized and powered in any location. This document provides information on the parts included in this solar kit, as well as installation instructions.

There are several steps to this installation:

- Calculate the Tilt and Azimuth according to the latitude and longitude (before installation).
- Install the solar panels.*
- Install the antenna on the enclosure.
- Install the enclosure:
    - Set the DIP switches and install the solar controller dongle on the control panel.
    - Install the Master Edge.
    - Mount the enclosure on the pole (using a spacing jig, if needed).
    - Install the batteries in the enclosure.
- Connect the wiring inside the enclosure and connect the solar panels wiring to the enclosure.
- Test the system.

*It is up to the installation team on whether to install the solar panels before the enclosure or after the enclosure.

WARNING:

Photovoltaic (PV) modules generate electricity when exposed to light. Modules pose a shock hazard and risk of serious injury or death if instructions and safety precautions are not followed carefully. Cover the glass faces of the modules with opaque material while working on the system to stop the production of electricity. Avoid touching the terminals and isolate wire ends until all connections are complete.

Batteries can explode or severely burn if the terminals are shorted to the opposite polarity. A single point system ground is required per NEC A.690. It is recommended to tie the battery negative (-) terminal to the equipment chassis at the time of installation. Always observe proper polarities when making electrical connections to the modules, batteries, and the controller.

2 Preparation

2.1 Calculate Installation Tilt and Azimuth

For optimum performance, your PV array should face true south in the Northern Hemisphere (and true north in the Southern Hemisphere). However, when determining direction using a magnetic compass, indicated bearings will vary from true bearings because of the difference between the location of the true and magnetic north poles. This angular difference varies with location on the globe and is called the "declination."

1. Locate your installation site using the following website (This site calculates magnetic variation from an input of latitude and longitude, or Zip code Great accuracy is not critical): http://www.ngdc.noaa.gov/geomag-web/#declination
2. Using the magnetic declination from the web site calculate true South. For example, the declination for Washington, D.C., is approximately -11º; for Chicago, IL, -3º; and for Los Angeles, CA, +14º.
3. Determine magnetic south at your site using a magnetic compass.
   NOTE!: If the local declination found in step 2 is negative, true south is that number of degrees added to magnetic south. For example, at Washington, D.C., true south is the same as 180º + 11º = 191º indicated. If the local declination found in step 2 is positive, true south is that number of degrees subtracted from magnetic south. For example, at Los Angeles, true south is the same as 180º – 14º = 166º indicated.
4. Orient your array in the direction of true south (or north, if applicable) as determined above.
5. For optimum performance, your PV array should set to a specific tilt angle. To determine the desired tilt angle of the array, us the latitude from step one above.
6. Take this value and add the factor based on the table below. This will provide the optimum worst-case performance with the minimum amount of annual adjustment, based on the winter months (Northern hemisphere).

LATITUDE SETTINGS

Latitude Range Actual Degrees:	Set To:
90 – 45°	60°
40 – 25°	+15°
25 – 15°	+5°
10 – 0°	15°

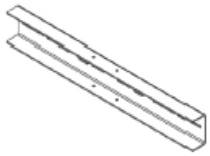
3 Solar Panel Hardware Mounting Instructions

3.1 Parts List

Included Parts:

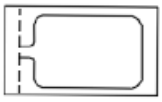
A) 2x Module Rail

B) 2x Saddle Bracket

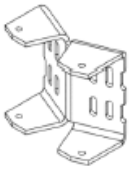


C) 2x Tilt Leg

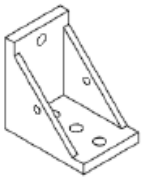
D) 1x Anti-Seize Packet



E) 2x Easy Mount Bracket



F) 4x Angle Bracket

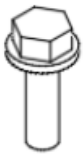


G) 4x Band Clamp

H) ¼" Flange Nut

I) 5/16" Flange Nut

J) 5/16" Flange Bolt

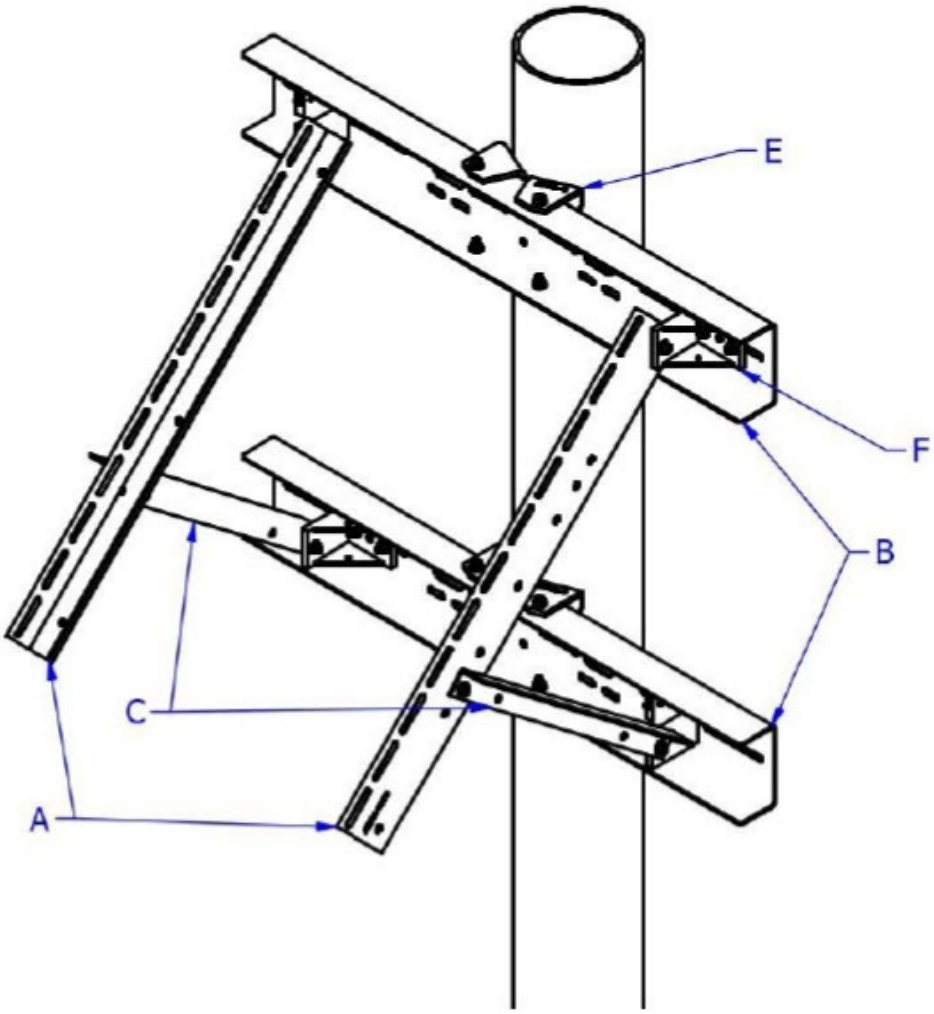


K) ¼" Flange Bolt

3.2 Side of Pole Mounts

Hardware Note:

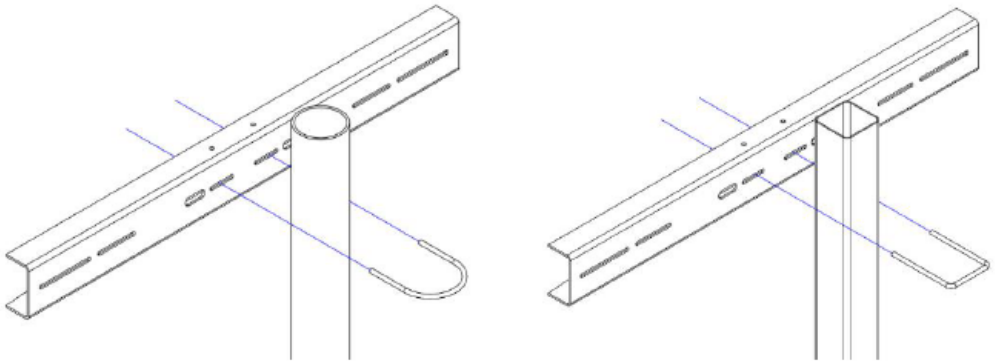
- Apply anti-seize to all hardware to prevent galling
- 1 ft-lb = 12 in-lb = 1.36 Nm
- Use 5/16” hardware - > Mount assembly
- Use 1/4" hardware -> Mounting module to rails
- Use 3/8” bolts -> Tilt leg spring nuts (if applicable)



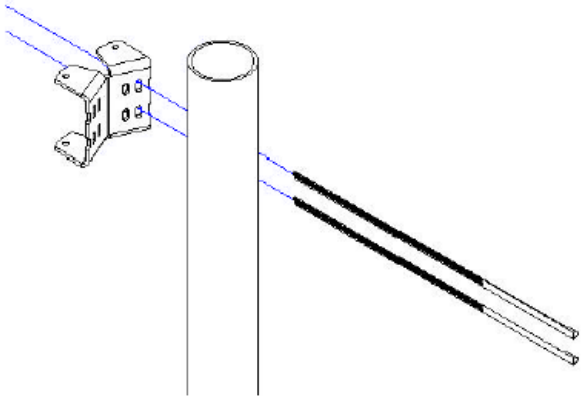
3.3 Mounting Hardware Installation

1. Fasten the upper *Easy Mount Solar Bracket* to the pole at the desired maximum height of the mount using two 1/2" stainless steel band clamps (provided). For high wind loads U-bolts (not provided) are required. DO NOT use the easy mount bracket when using U-bolts. The saddle or *Easy Mount Solar Bracket* can optionally be lag-bolted or through-bolted to the pole.

U-Bolt Mounting (recommended):

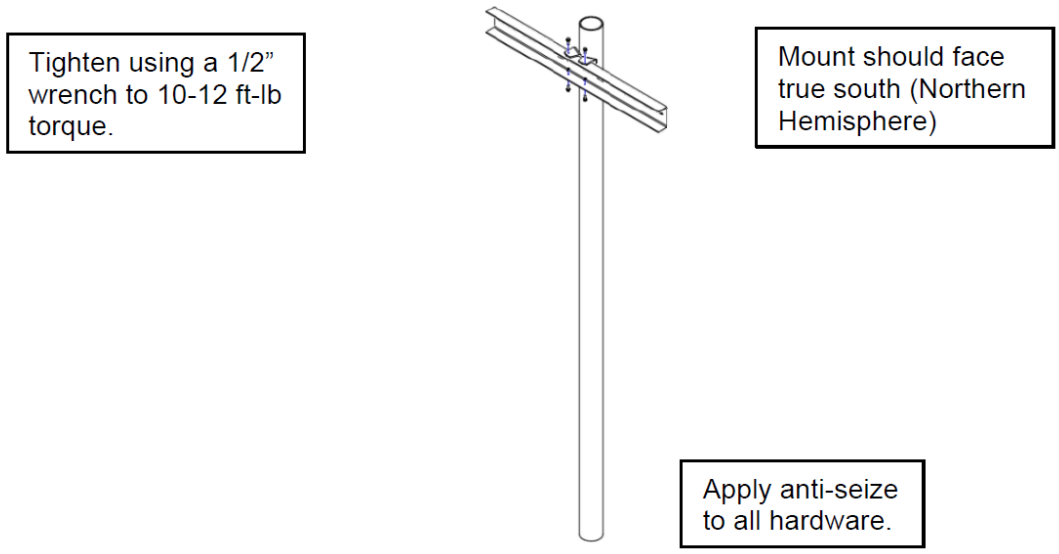


Band Clamp Mounting:

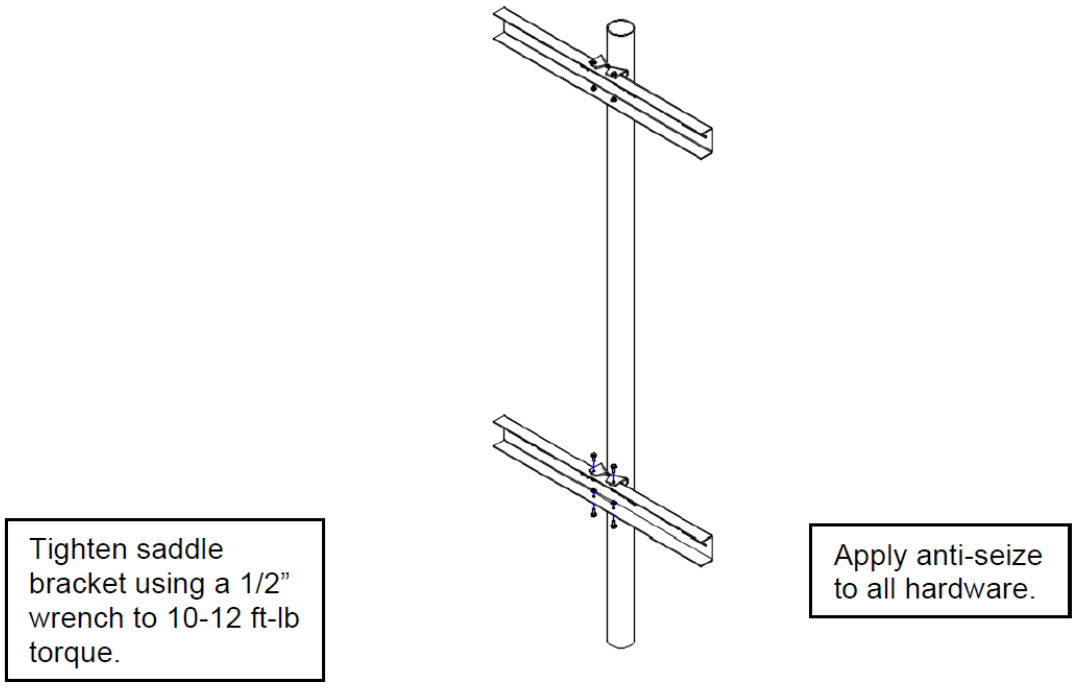


NOTE: When using band clamps, tighten to 4-5 ft-lb torque. Wiggle saddle bracket to remove slack in band clamps and retighten. Repeat until clamps are snug.

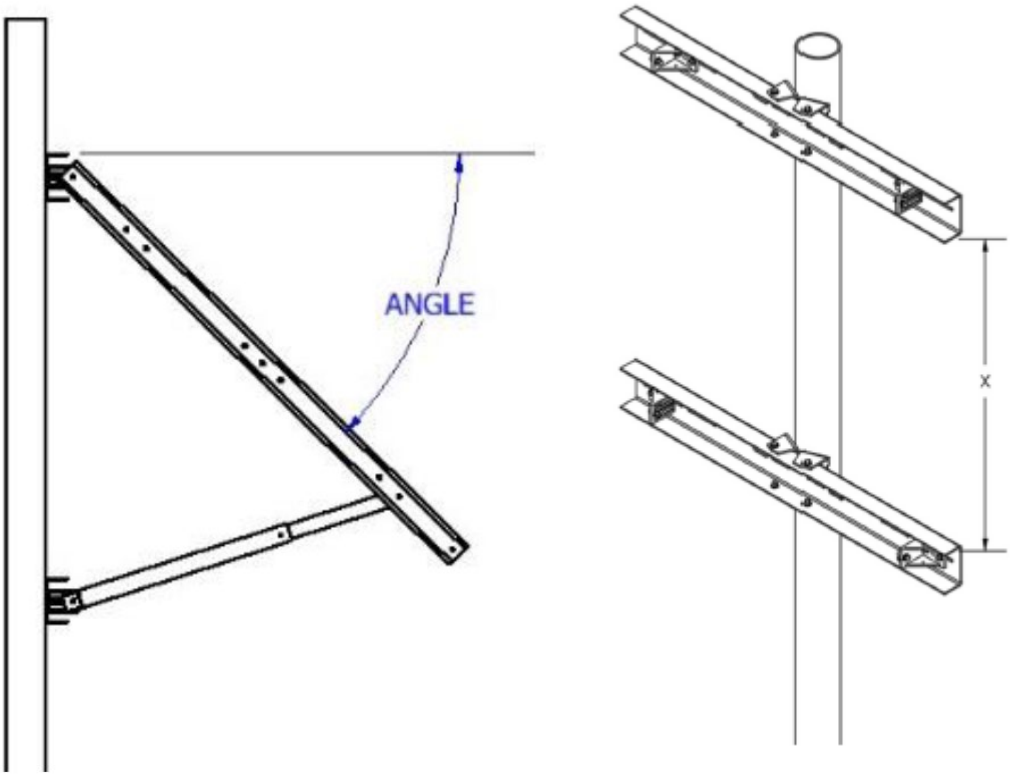
2. Fasten the saddle bracket to the *Easy Mount Solar Bracket* using the provided 5/16”” hardware.



3. Attach lower *Easy Mount Solar Bracket* and saddle bracket using same method in steps one and two. **Do not fully tighten *Easy Mount Solar Bracket*.**

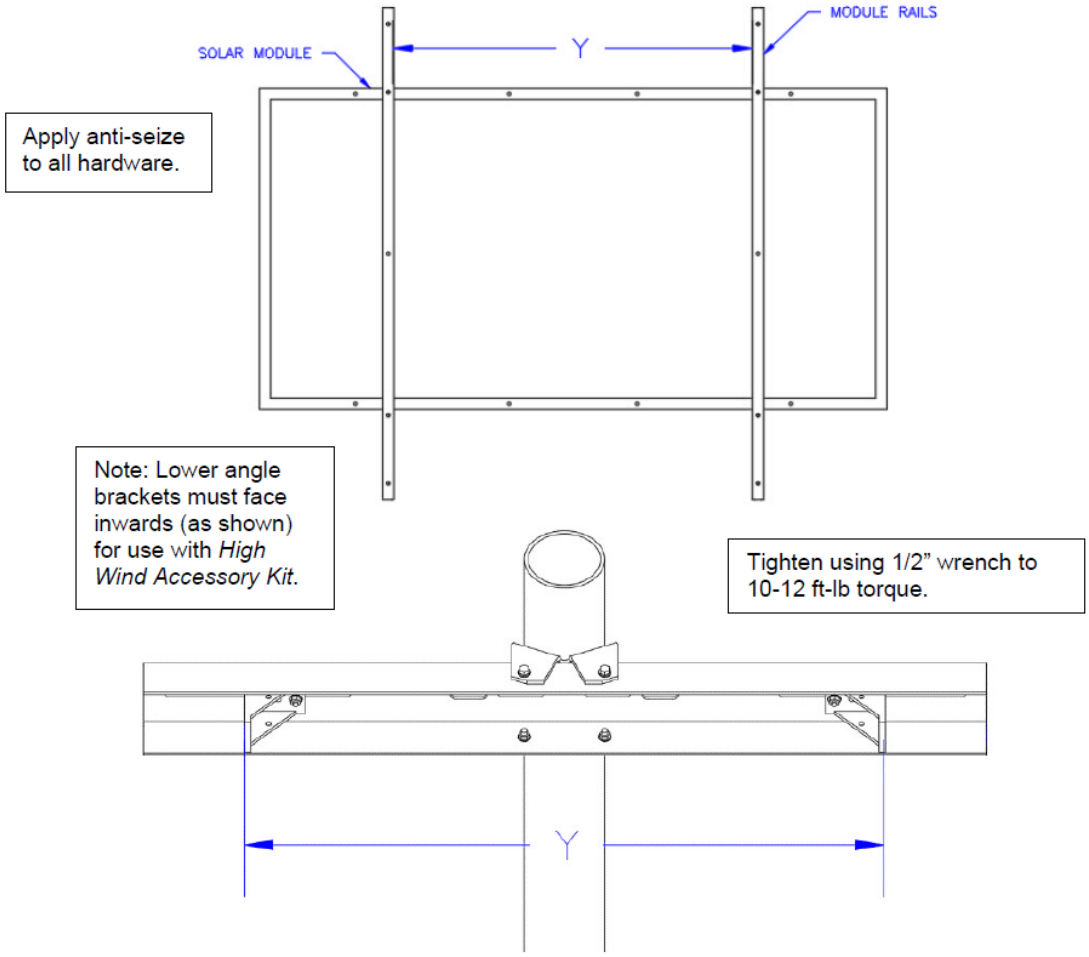


4. Adjust the lower *Easy Mount Solar Bracket* and saddle bracket to the approximate distance from the upper saddle bracket and fully tighten U-bolts or band clamps. Use the below chart for rough spacing between the two saddles.

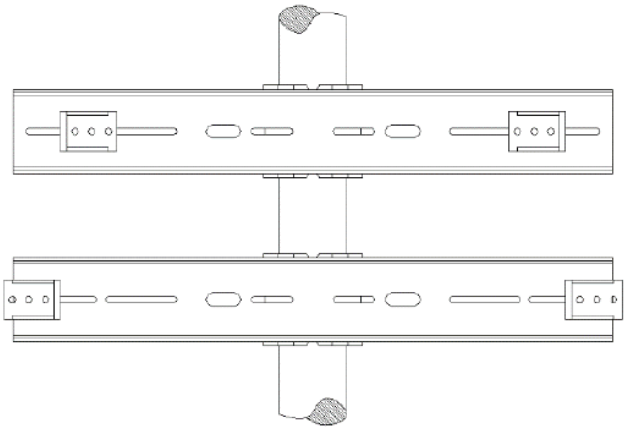


5. Lay rails on module holes (but do NOT attach) to determine upper angle bracket spacing. Measure between the inside of the module rails. Attach angle brackets so that the module rails can be mounted with the correct spacing.

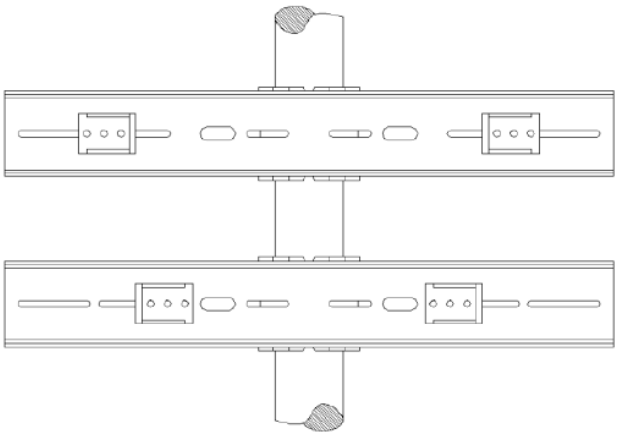
Mount Angles from Horizontal vs Saddle Spacing	
Degrees	Spacing (in)
30	12.5 (fourth hole)
45	20 (fourth hole)
60	30.2 (first hole)



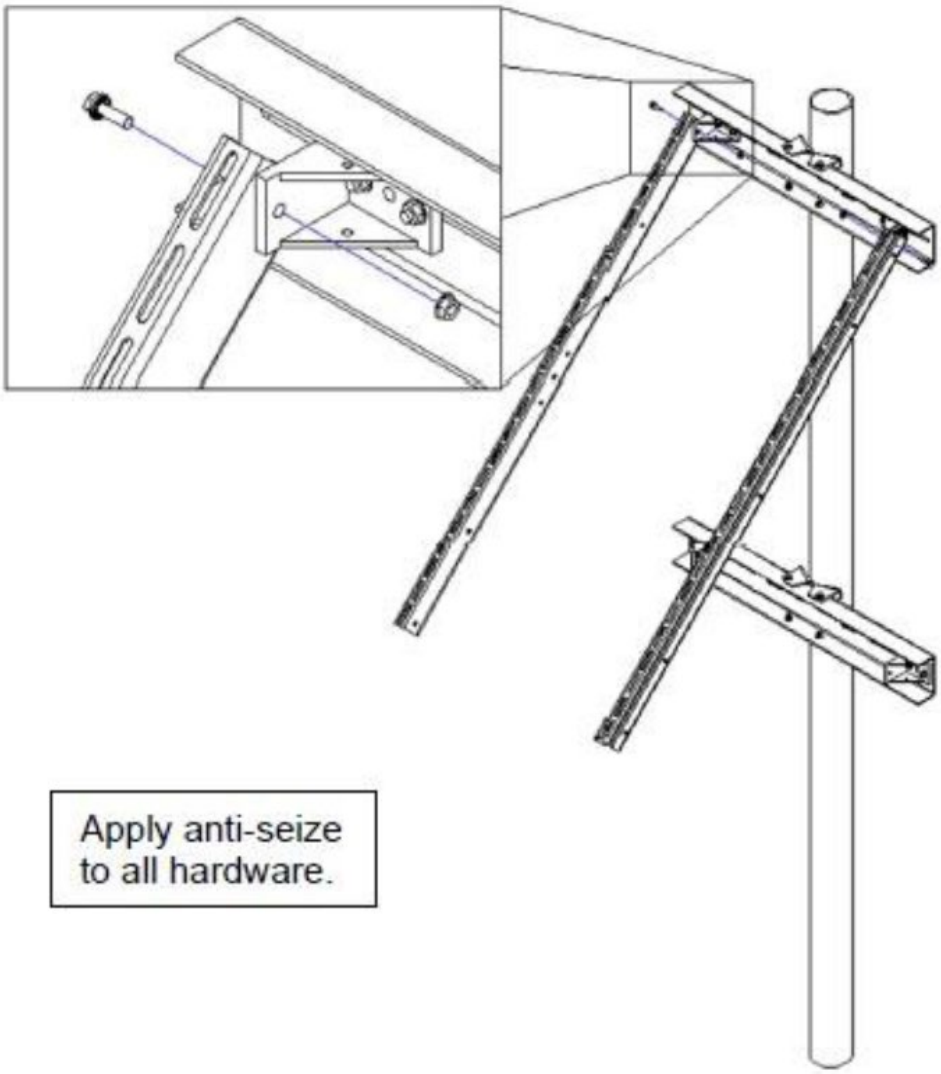
Foot Orientation for Maximum Spacing



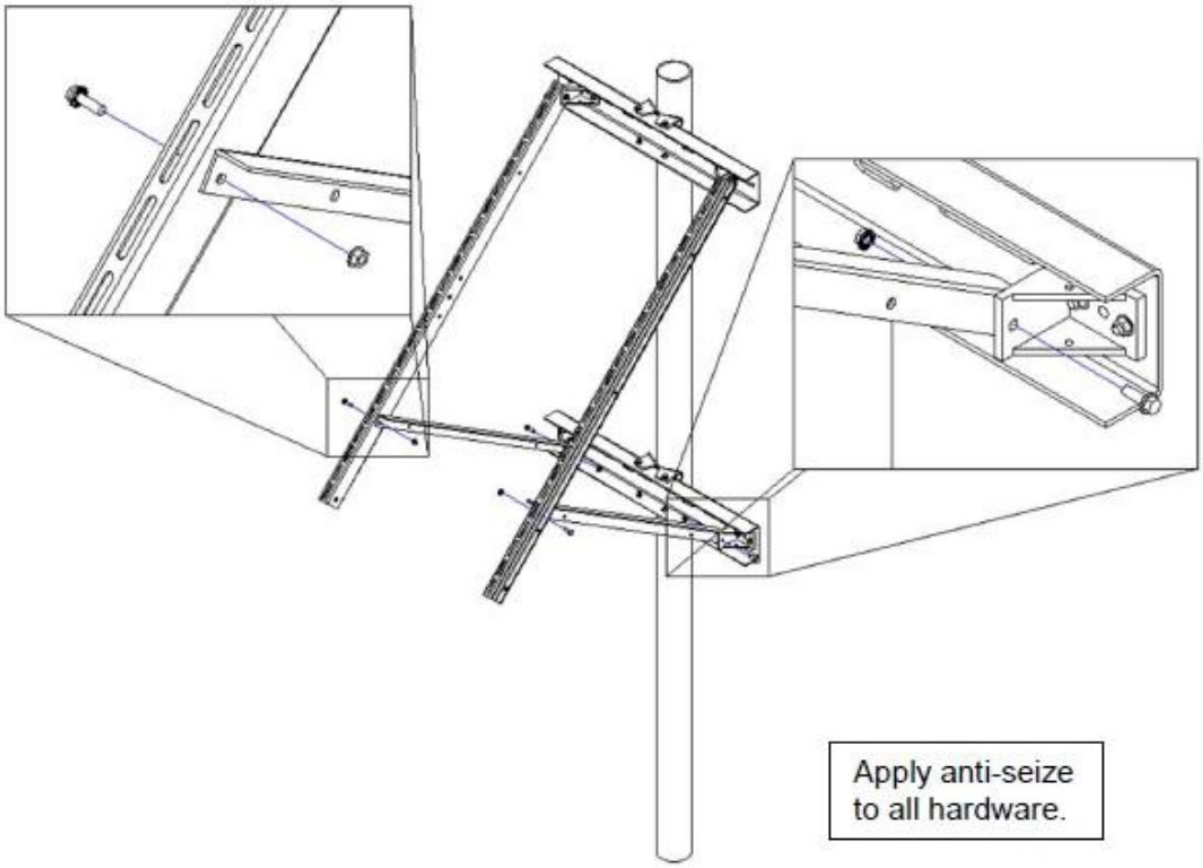
Foot Orientation for Minimum Spacing



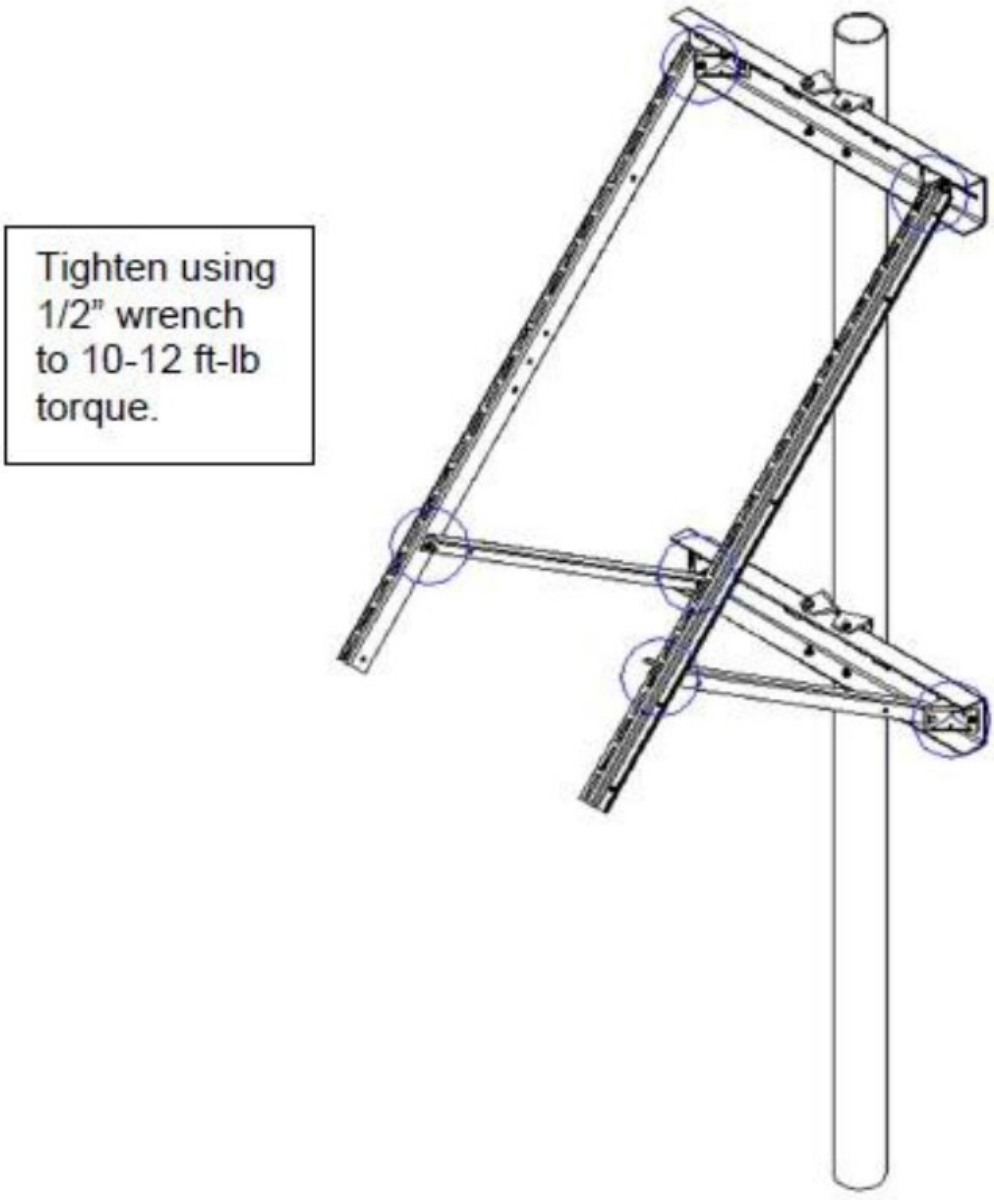
6. Attach panel rails to upper saddle L-brackets using 5/16” hardware provided.



7. Attach legs to lower saddle angle brackets.

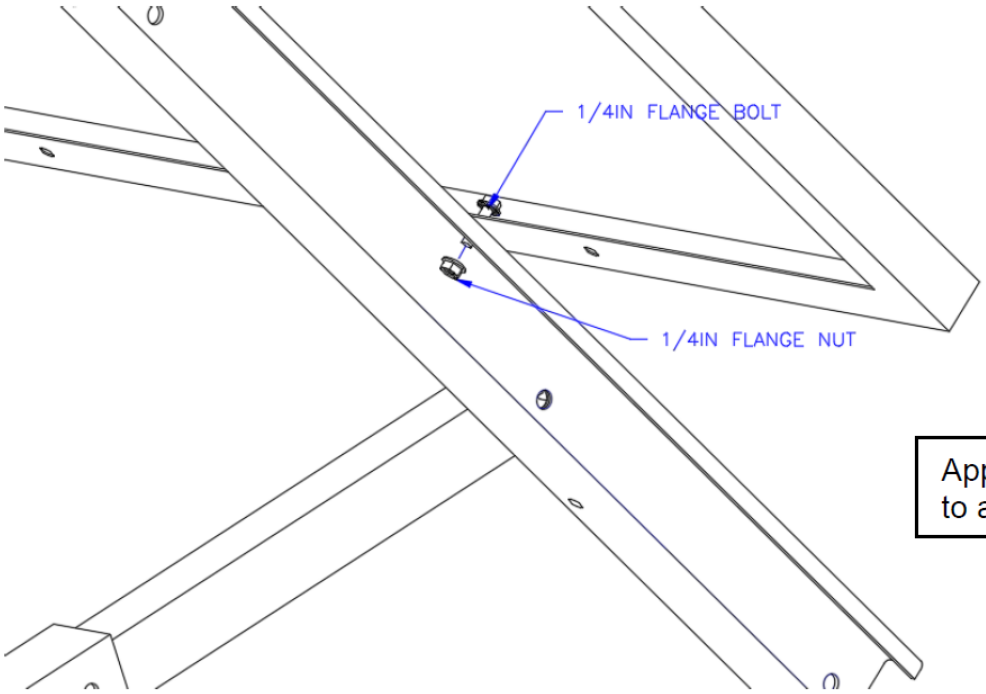


8. Tighten all remaining bolted connections circled below.



9. Check alignment of all assembled parts and ensure all bolted connections are tight.

10. Mount the solar modules to the rails using the 1/4” hardware provided.
11.

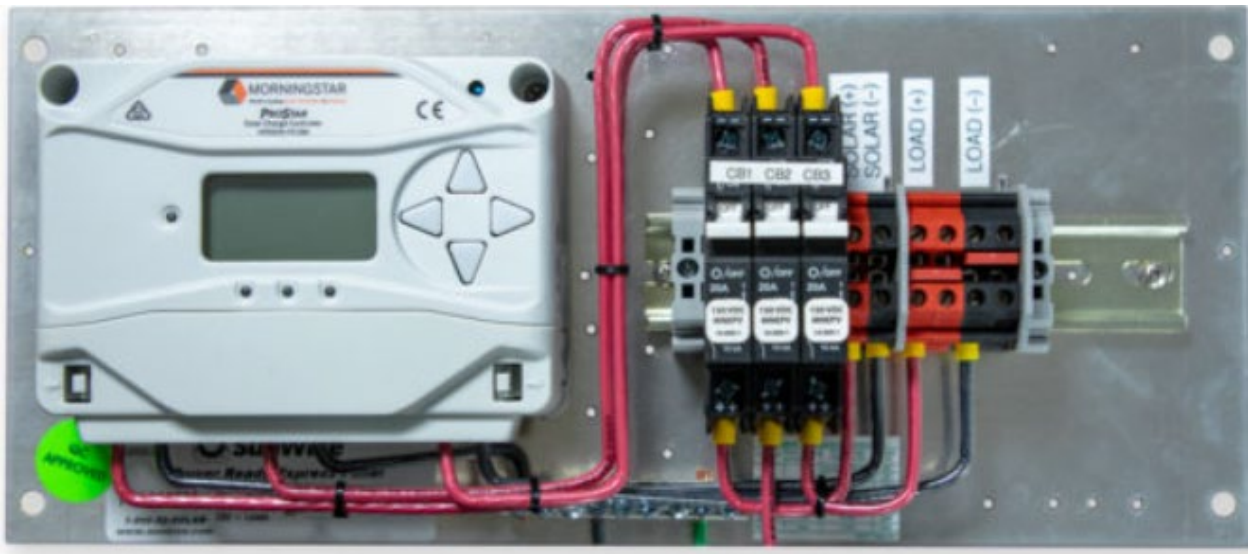


Apply anti-seize to all hardware.

4 Enclosure Setup

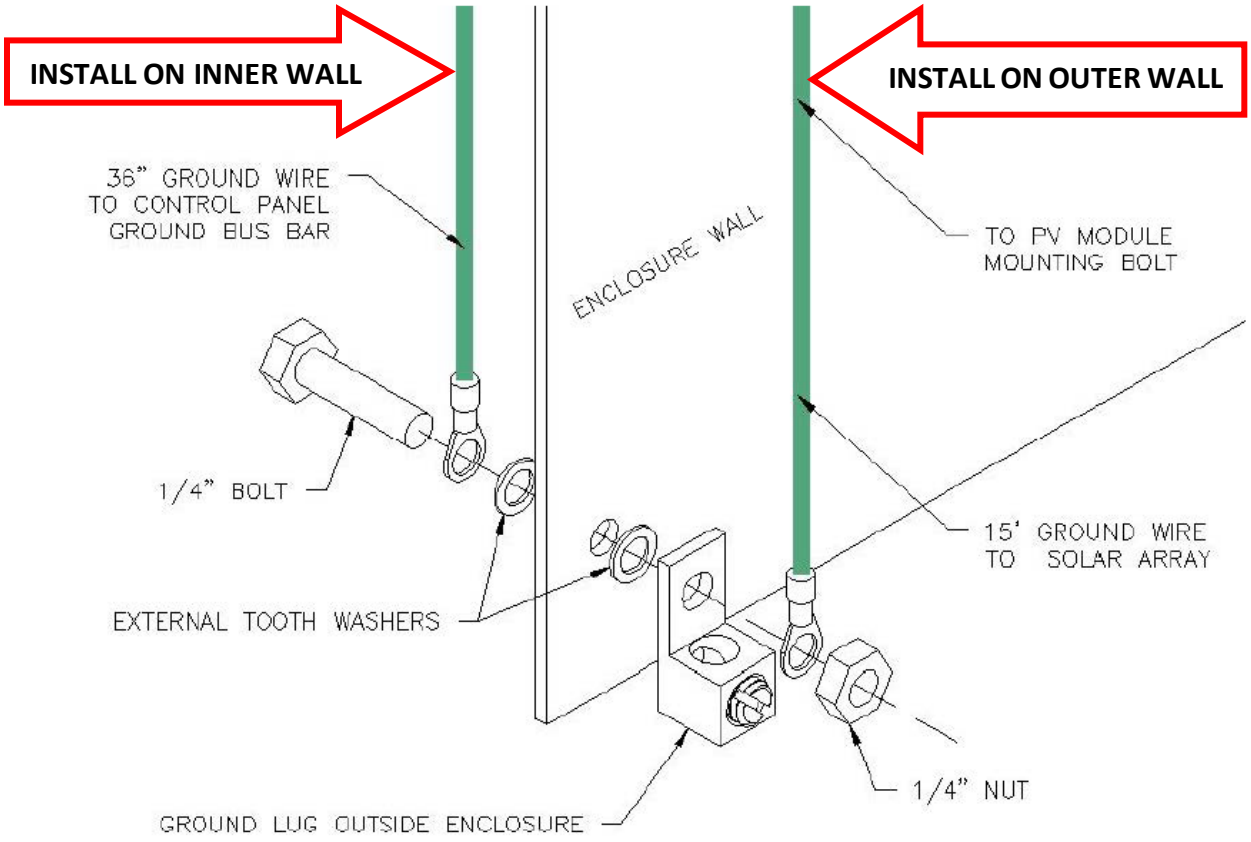
4.1 Control Panel Mounting

The control panel is mounted on a mounting plate with a load panel mounted on a din rail.



1. Remove the second set of supplied nuts from the mounting studs located on the back top wall of the enclosure.
2. Adjust the first set of nuts on each stud to the same distance from enclosure wall leaving enough stud exposed for control panel and second nuts.
3. Install the control panel and second set of nuts as shown above.
4. Verify all breakers are in the OFF (open) position.
5. Ground the control panel to the enclosure (see grounding below).

4.2 Grounding

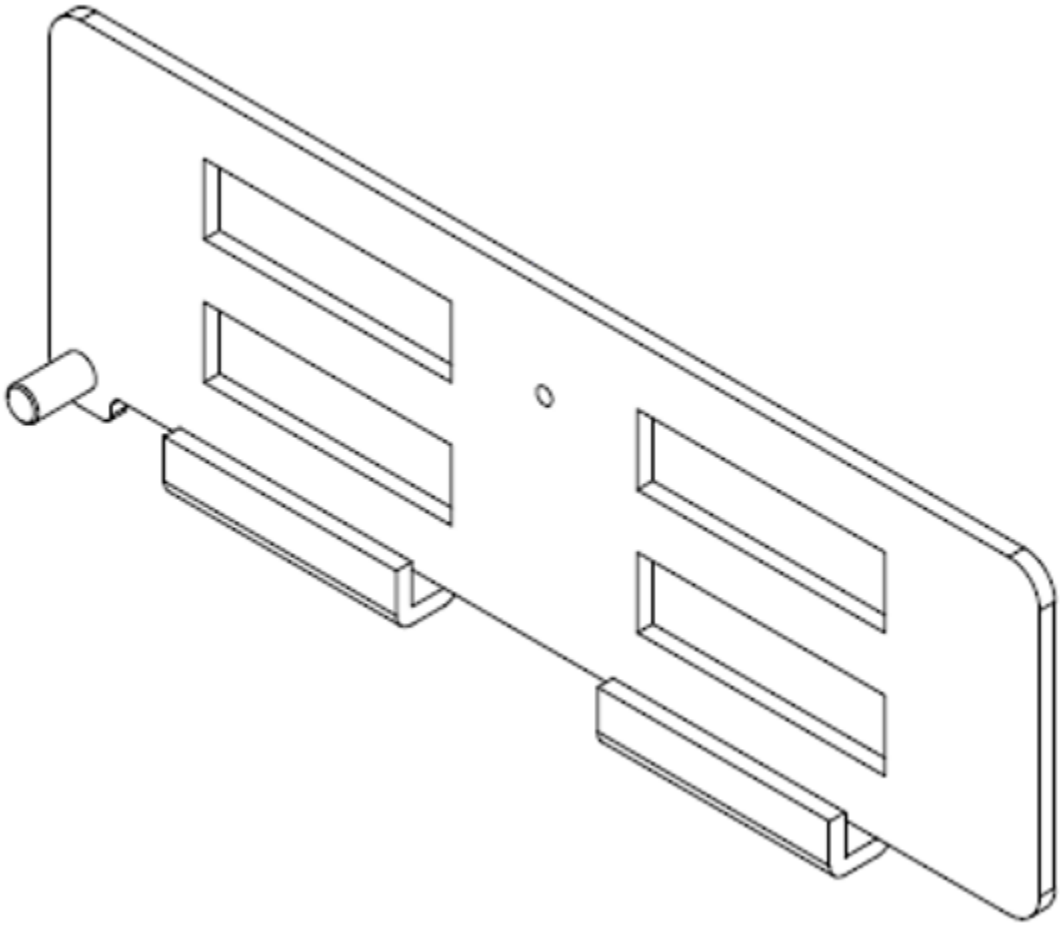


1. Set all circuit breakers in enclosure to OFF (open).
2. Install ground kit (provided) per figure below. Use wire rated for outdoor use per local codes and size per NEC A.690 for system earth grounding. Verify system neutral bonding is per local code.

5 Enclosure Installation

5.1 Side of Pole Mount Enclosure

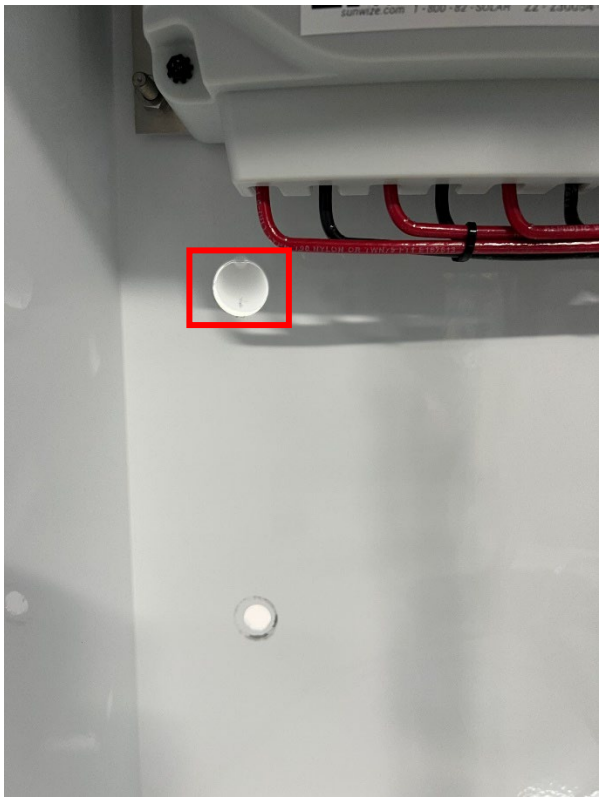
NOTE: Remove the door to the enclosure before installing the enclosure onto the pole.



1. Mount the bracket to the pole with U-bolt or banding.
2. Hang the enclosure on the bracket.
3. Install lower u bolt or banding material on lower enclosure flange.

6 Enclosure Knockouts

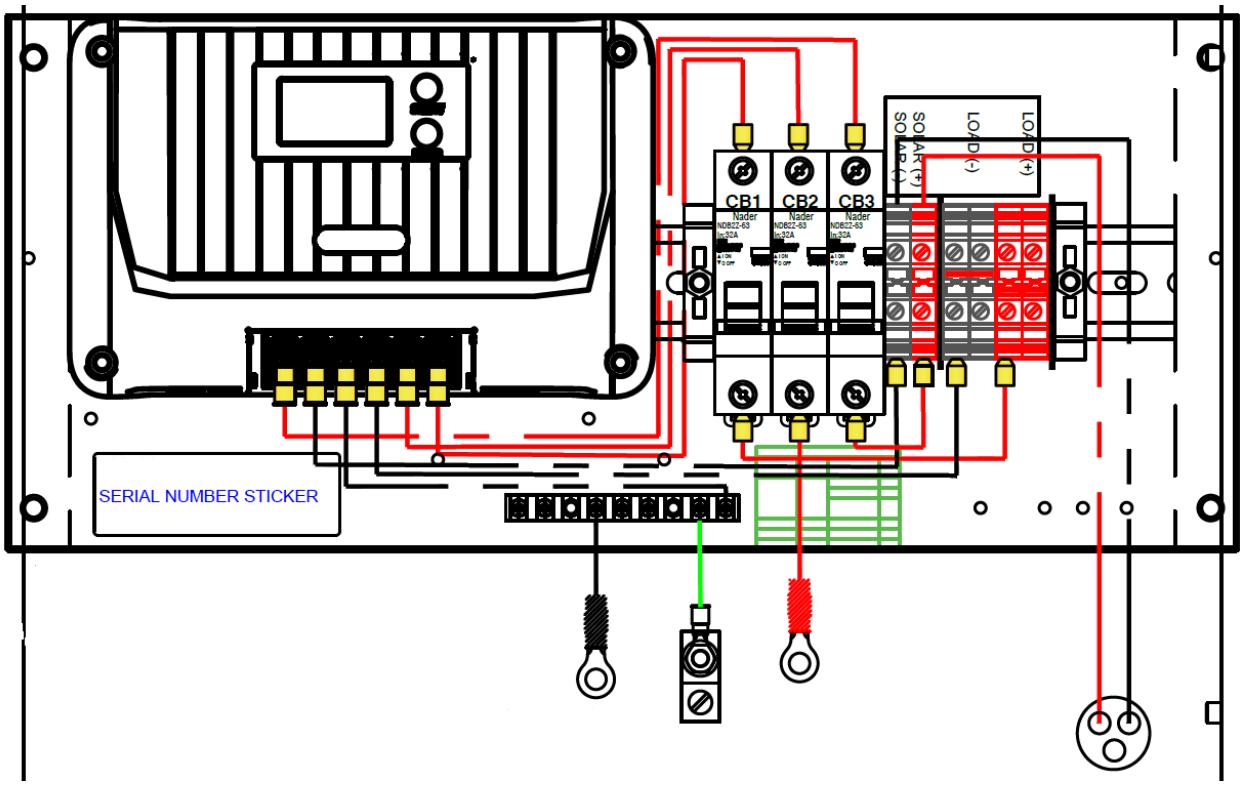
Before installing the batteries, the knockouts in the back wall of the enclosure lust below the solar controller need to be removed. This allows the solar panel cables to be run inside the enclosure and connect to the solar controller.



To remove the knockout plugs, use a screwdriver and mallet to strike the BOTTOM of the plugs. Avoid striking the knockout plugs at the top, as they are attached to the enclosure at the top.

7 Battery Installation

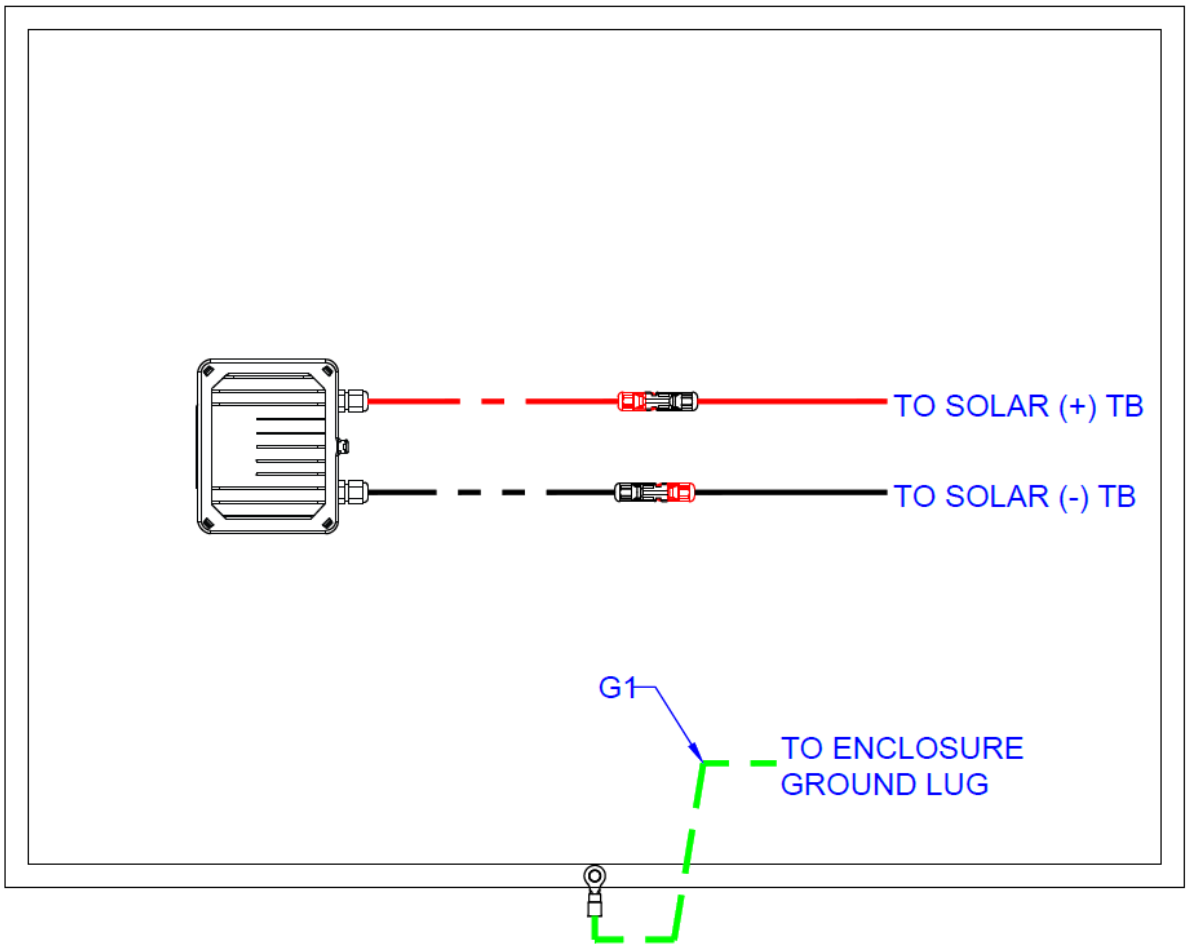
7.1 12V System Battery Wiring



Inside the control/battery enclosure, connect the controller RED BAT (+) wire to the battery POSITIVE (+) terminal. Connect the controller BLK BAT (-) wire to the battery NEGATIVE (-) terminal.

8 Solar (PV) Array Wiring

WARNING!: Set the circuit breakers to OFF (open) and remove the fuses in enclosure (if provided) before starting the wiring installation.



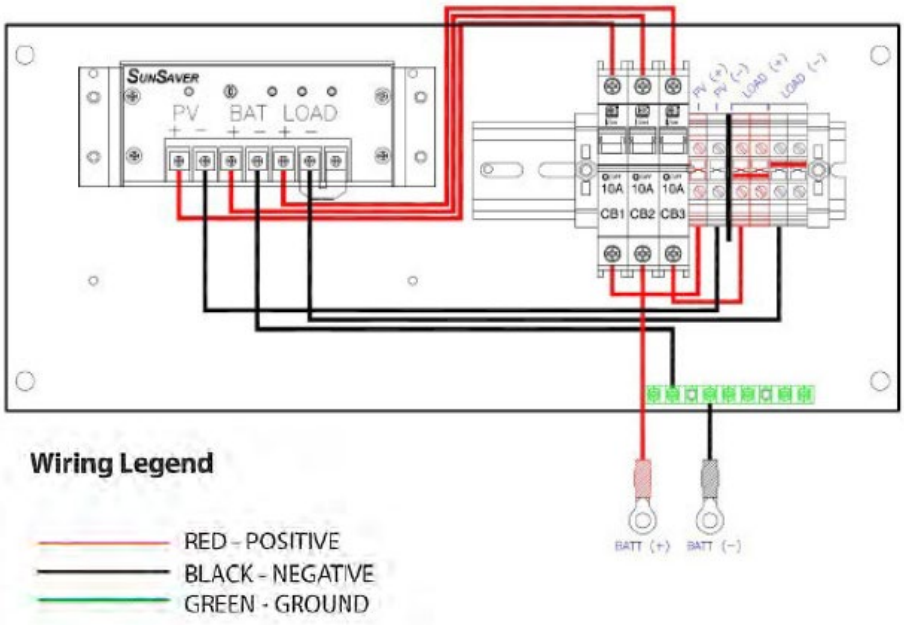
1. Route the output conductors from the solar (PV) panel to the enclosure. Secure the conductors to the panel frame or the mounting surface using wire ties or other restraining hardware (not provided). Install the cord grip fitting to the rear of the enclosure using the ½ inch knock out provided.
2. Inside the enclosure, mate the PV array PV(+) conductor to the controller PV(+) terminal block. Mate the BLACK PV(-) conductor to the controller PV(-) terminal block. Mate the PV array GREEN GND conductor per instructions in grounding section.

9 System Testing

1. Confirm all connections, fittings, and fasteners are secure and the PV array surface is clean and facing South.
2. Measure Voltages (Confirm all breakers are off before measuring)
3. Verify both the PV and battery polarity is positive. If negative, reverse wiring to the system and check again.
4. Measure PV array voltage from the PV(+) terminal to the PV(-) terminal in the enclosure:
   12V systems: 21VDC (open circuit voltage)

5. Measure battery voltage from either the BAT(+) terminal block to the BAT(-) terminal block or the BANK(+) to the BANK(-) to verify that they are approximately:
   12V systems: 12-13V
   24V systems: 24-26V

6. Set breakers to the ON (closed) position.



On the charge control panel:

1. Set the BAT(+) CB2 input breaker.
2. Set PV(+) CB1 input breaker.
3. Set the LOAD (+) CB3 output breaker.
4. Confirm that the controller status LEDs function properly.
5. On the charge control panel, measure the voltage from the LOAD(+) terminals to the LOAD(-) terminals which should be the same as the battery voltage.

10 Connect the Equipment

1. Turn the Power Ready System OFF.
    a. Turn the PV breaker (CB1) OFF.
    b. Turn the Battery breaker (CB2) OFF.
    c. Turn the Load breaker (CB3) OFF.
    d. Connect your equipment to the terminal blocks on the control panel.
2. Turn the Power Ready System ON.
    a. Turn the Battery breaker (CB2) ON.
    b. Turn the PV breaker (CB1) ON.
    c. Turn Load breaker (CB3) ON.
    d. Confirm the Power Ready System is providing power to the load.

Re-install the door back onto the enclosure, close the door and lock it.