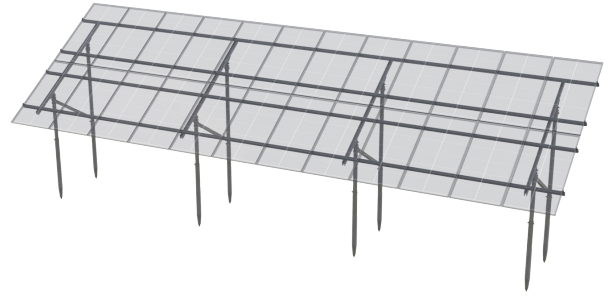




POWER SPIKE™ GROUND MOUNT A POWER PEAK™ SYSTEM

INSTALLATION INSTRUCTIONS



IMPORTANT SAFETY INFORMATION

READ AND COMPLETELY UNDERSTAND ALL INSTRUCTIONS BEFORE INSTALLING PRODUCT. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR DEATH.

This product is intended for use by trained technicians only. This product should not be used by anyone who is not familiar with and not trained to use it. When working in the area of energized lines, extra care should be taken to prevent accidental electrical contact. Be sure to wear proper safety equipment per your company protocol. These instructions are not intended to supersede any company construction or safety standards. These instructions are offered only to illustrate safe installation for the individual. PLP products are intended for the specified application only. Do not modify this product under any circumstances. Do not reuse or reinstall any PLP product unless that capability is expressly indicated in the product's Installation Instructions. For proper performance and personal safety, be sure to select the proper PLP product before installation. PLP products are precision devices. To ensure proper performance, they should be stored in cartons under cover and handled carefully.



WARNING

Stainless steel hardware can gall when tightened too quickly. Installer should use a silver grade anti-seize compound prior to assembling any stainless steel hardware. Do not use an impact driver. All other driver types should be set to low speed settings.

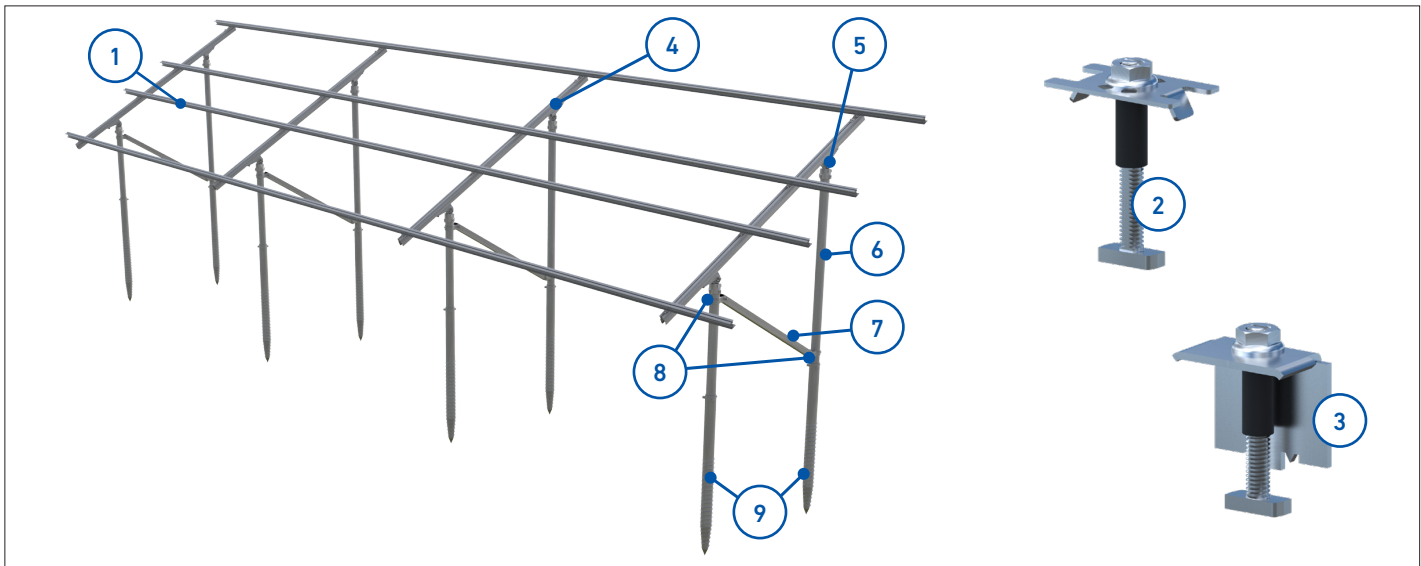
⚠ IMPORTANT INFORMATION

Before you start installing your ground screws, it is important to know the type of soil you are working with. Insufficient soils could require the use of longer screws.

To avoid frost heave, ground screws must penetrate the soil beyond the frost line at least 26 inches. Refer to your local jurisdiction to determine frost line information.

For assistance, contact PLP solar technical support at (440) 461 5200, or solar@plp.com.

PACKAGE COMPONENTS



1. UD Rail
2. AMP™ Clamp Assembly
3. RAD™ End Clamp Assembly
4. Strongback Assembly
5. Strongback Casting Assembly
6. 3.5" O.D. Vertical
7. Strut
8. Strut Collar Assembly
9. Ground Screw

Tools Required:

- 24 mm wrench or socket for M16 hardware
- 15/16" wrench or socket for 5/8" hardware
- 9/16" wrench or socket for 3/8" hardware
- 1/2" wrench or socket for 5/16" module clamp hardware
- Torque wrench
- Ratchet wrench
- Ratchet extension bar
- String
- Framing Square
- Tape Measure
- Inclinator
- Skid Steer with earth screw attachment (optional)
- 3/8" Driver Bit for 1/4" Self-Tapping Screws

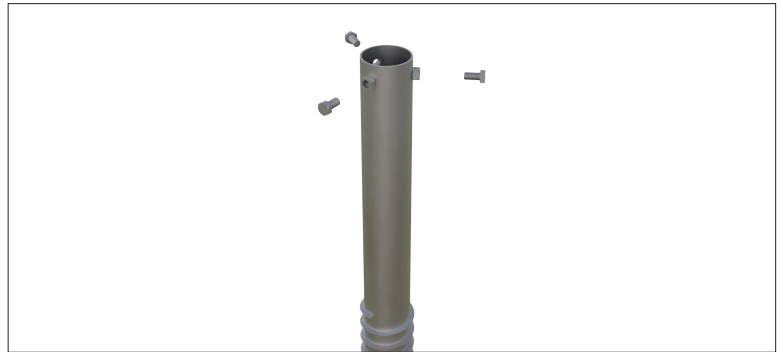
- 1 Using your installation plans, measure and mark the location of each screw on the ground.

The use of pilot holes is recommended, but not required, to help with the accuracy of the screw installation. In the marked out areas, use a 1" drill bit or driven stake to create the pilot holes.



- 2 A skid steer with an earth screw attachment is recommended for installation. This is not a requirement, so you may use your preferred installation method and skip to Step 4 of these instructions.

Begin by seating the ground screw in the adapter that is connected to the skid steer drive shaft. It is important to ensure the screw is seated properly.



- 3 Position the screw over the marked pilot holes and begin rotating the screw in a clockwise direction. As the screw enters the soil, adjust the downward pressure on the screw so that one thread advances into the soil per rotation.

CAUTION

Failure to use the correct downward pressure could cause failure. If there is not enough pressure, the screw will not bite into the soil and will create a loose connection. If there is too much pressure, torque on the screw could exceed maximum allowances and result in failure.



4 Continue driving the screw until the top of the screw sits 3 inches above grade.

NOTE: If the screw is driven too deep, the nuts for the set screws will not be accessible. During installation, you may encounter obstructions or refusals. There are two options for dealing with these situations:

OPTION 1: The PLP POWER SPIKE™ Ground Mount is designed for maximum flexibility during installation. If a refusal is encountered, begin by reversing the screw out of the hole by rotating counter-clockwise.

Next, move the screw location East or West of the original hole up to 24 inches. When the new location has been selected, start back at Step 1 of these instructions.

OPTION 2: If repositioning the screw is not an option or does not solve the problem, the hole can be drilled out using an appropriate skid steer attachment.

Start by removing the screw from the hole and swapping out the skid steer attachments. Use an attachment to drill out a 4 inch hole. Pre-drill the hole to a depth equal to the length of the screw.

Once the final depth has been achieved, backfill the hole with small diameter, all purpose gravel. At this time, switch back the skid steer screw attachment and reposition the screw over the hole. In reverse, counter-clockwise, drive the screw into the gravel filled hole. The reverse direction will force the gravel to the bottom of the hole. Continue to add gravel as needed.

Once the gravel starts compacting, it will begin lifting the machine. Continue rotating the screw in reverse while reducing downward pressure, allowing the screw to lift itself out of the hole 6-8 inches.

To finish installation, reapply downward pressure and change the screw rotation to clockwise until the top of the screw sits 3 inches above grade.

Contact PLP solar technical support at (440) 461 5200, or solar@plp.com, with any questions or issues.

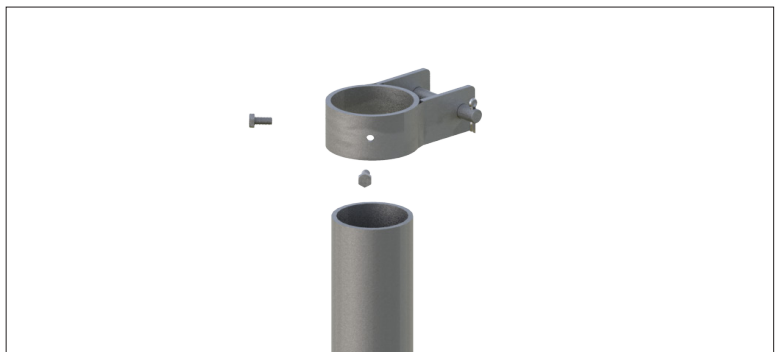
5 With all the screws installed, back out of the set bolts to prepare for installation of the 3 inch pipes.

Slide the pipes into screws. Two lengths of pipe are supplied. The shorter pipe should be installed in the south row of ground screws with the longer pipes at the back (northern most) row of screws. Lightly tighten for now. Refer to your plans to determine the height of the exposed pipe.



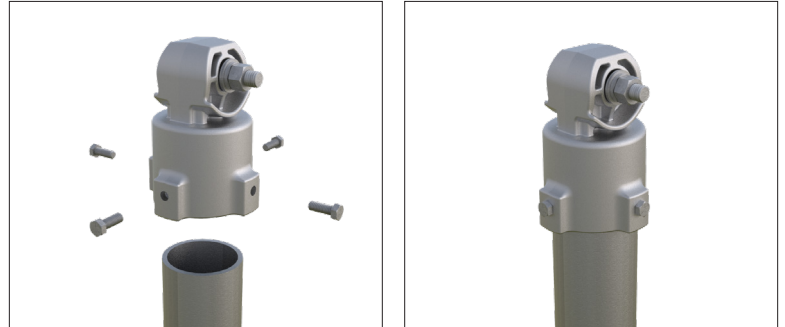
6 Slide the strut collar over the top of the pipe. Ensure the collar is far enough down the pipe to not obstruct the top 6 inches of the pipe. Hand-tighten the set bolts, for now.

Repeat this step for all the front and back legs for the project.



7

Install the Strongback Attachments by sliding the opening over the 3" pipe. Hand-tighten, for now.



8

Remove the pre-installed 5/8"-11 x 4" Hex Bolt, Flat Washers, Lock Washer, and Hex Nut from the Strongback Attachment. Lift the strongback onto the attachments and allow it to rest in place. Re-install the 5/8"-11 x 4" Hex Bolt, Flat Washers, Lock Washer, and Hex Nut and hand-tighten, for now.

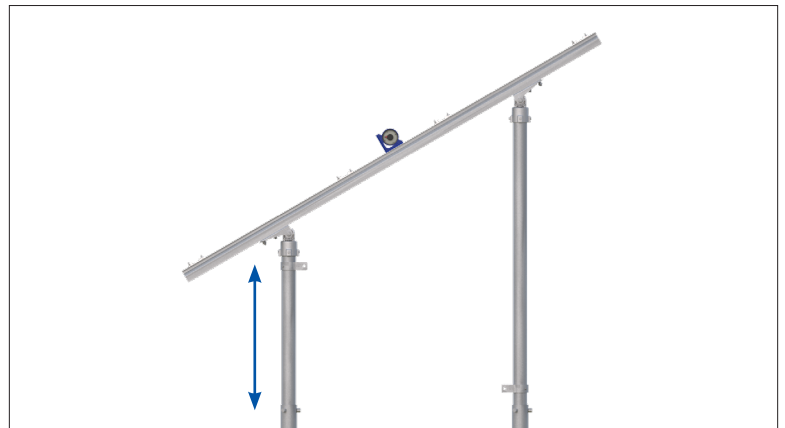


9

- A. Place an inclinometer on the Strongback.
- B. Loosen the set screws securing the pipe to the ground screw.
- C. Slide the pipe up or down to bring the tilt to the desired angle.
- D. Re-tighten the set screw hardware securing the pipe to the ground screws. Hand-tighten, for now.

⚠ WARNING

This is a two person activity. During the tilt adjustment, one person must hold the southern end of the Strongback while the second person loosens the hardware and then re-tightens the hardware after the desired tilt has been achieved.



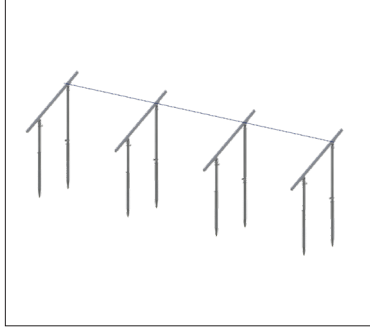
10

A. Pull a string on top of and between the east and west most Strongbacks. Align the string with the center of the rear pipe leg.

B. On those Strongbacks that need tilt adjustment, loosen the ground screw set bolts and slide the pipe up or down to bring the Strongback within 1/8" of the string.

C. To adjust the N-S alignment of the UD rail mounting brackets, loosen the two Strongback Slide Attachment and slide the Strongback in the appropriate direction to align the Rail Bases. Once aligned, re-tighten the strongback slide attachments. Torque to 85 ft-lb.

NOTE: It is very important to align the Rail Base surfaces to within 1/8" of each other before installing the Rails.


11

The strut braces can be assembled to the strut collar attachment. Start by positioning the strut collar, on the southern pole, about 1 inch below the strongback attachment.

Next, remove the pre-installed clevis and cotter pin from the strut attachment.

While resting strut brace on the ground, line up the holes on the strut with the holes on the strut collar.

Re-install the clevis and cotter pin.

Next, install the other end of the strut onto the northern strut collar. Remove the pre-installed clevis and cotter pin from the strut attachment. Lift the strut and slide the collar along the pipe until attachment holes line up.

Re-install the clevis and cotter pin.



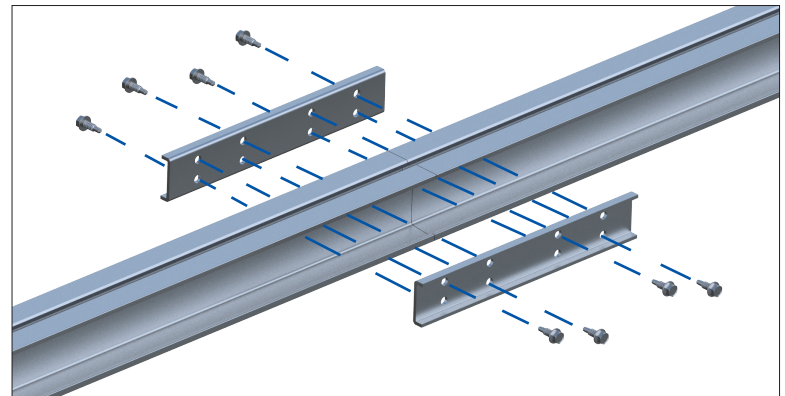
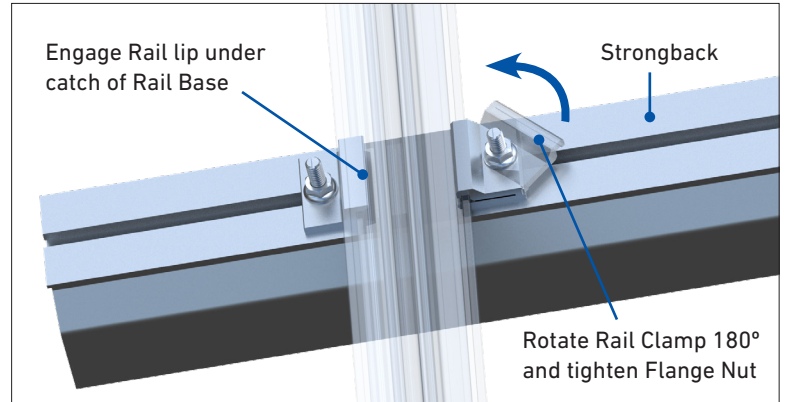
- 12** The Rails are secured via the pre-assembled clamping system (Rail Base & Rail Clamp) which are attached to the Strongbacks. Cantilever distance between the outermost Strongback and the Rail end must be set per specifications. Once the rail is installed onto the rail base, loosen and rotate the pre-installed rail clamp 180-degrees to clamp over the flange. Torque the 5/16" hardware to 15 ft-lb.

If necessary, Rails are spliced using a Splice Plate and self-tapping hardware. Splicing can be done either before or after the Rails are installed on the Strongbacks. Install the Splice Plates with 1/4" x 3/4" self-drilling screws. Torque to 8 ft-lb.

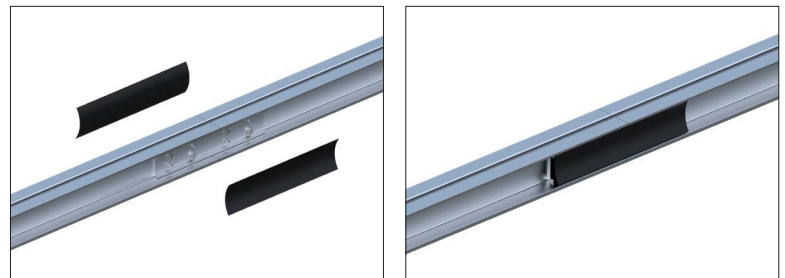
NOTE: The location of the Rail Bases are preset at the factory. If alignment with the Rails is a problem, simply slide the Rail Bases along the Strongback to align with the Rails.

⚠ WARNING

This is a two person activity. Each person must hold an end of the Rail while placing it onto each Rail Base of the Strongback. One person should continue to hold the Rail in place while the second person secures it with the Rail Clamp.



- 13** Slide the black plastic covers into the UD Rail. This is to cover the screw heads and points to prevent damage to PV wiring.

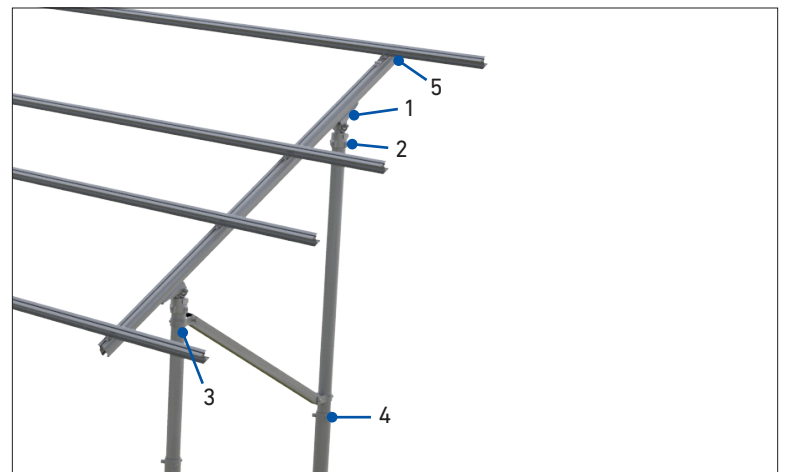


- 14** Torque all hardware. It is extremely important to tighten and torque all hardware as specified below.

CAUTION

Exceeding torque values can result in damage to components and/or hardware.

1. 5/8" x 4" bolts connecting the strongback and Strongback casting to 85 ft-lb.
2. 3/8" set bolts in the Strongback casting to 32-34 ft-lb.
3. 3/8" Set bolts in strut collar assemblies to 32-34 ft-lb.
4. M16 set bolts in ground screws to 85 ft-lb.
5. 5/16" bolts for the rail brackets to 15 ft-lb.



16

AMP™ Clamp bonding Mid Clamps must be installed as shown at above left and not as shown to the right. There cannot be any visible gaps between the bonding Mid Clamps and Module Frames.

Install End Clamps by pushing the End Clamp assembly tightly against the module frame. There should not be a visible gap between the Neoprene Washer and the Module Frame.

Prepare to install the Modules by first marking the Rails 1-1/2" from their ends as indicated above. The End Clamps will align to these marks.

RAD End Clamps are used on the outer Modules. Insert the 5/16" RAD Bolt into Rail and rotate 90° clockwise to lock the RAD Bolt within the Rail. Secure with 5/16" Flange Nut. Torque to 15 ft-lb.

AMP Clamp bonding Mid Clamps are inserted into the Rail and positioned between adjacent Modules. Insert the 5/16" RAD™ Bolt into Rail and rotate 90° clockwise to lock the RAD Bolt within the Rail. Push Modules against AMP Clamp. Tighten 5/16" Flange Nut. Torque to 15 ft-lb.

NOTE: The RAD Bolts used in the AMP Clamps and End Clamps must be locked into the channel by rotating clockwise 90°. Use the indicator slot on the threaded end to identify whether or not the bolt has been locked.

WARNING

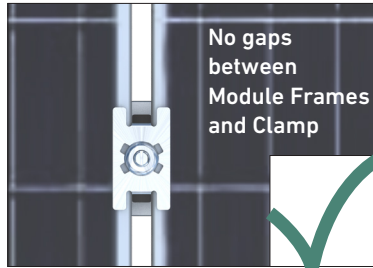
This is a two person activity. In addition to the difficulties associated with working on a sloped rack, PV Modules are heavy. One person should hold and align the modules while a second person secures modules with clamping hardware. Failure to do so could lead to serious personal injury and/or damaged components.

Module Clamps must be correctly installed. Failure to follow the correct method could lead to personal injury structural failure, and/or damaged components.

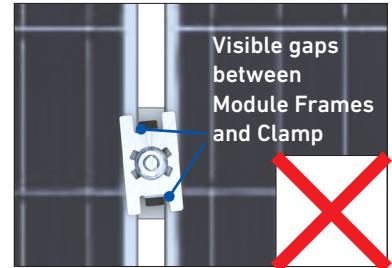
CAUTION

If the Flange Nut has been removed from the assembly, add a silver-grade anti-seize compound on threads of RAD Bolt before re-installing Flange Nut.

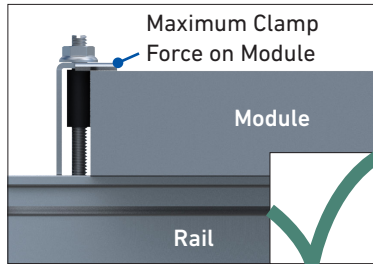
Exceeding torque values can result in damage to Rail and/or hardware.



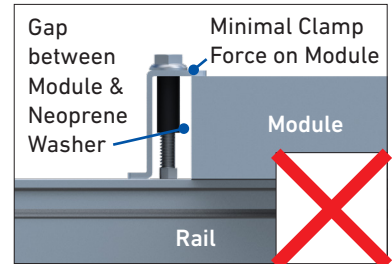
AMP Clamp Correctly Installed



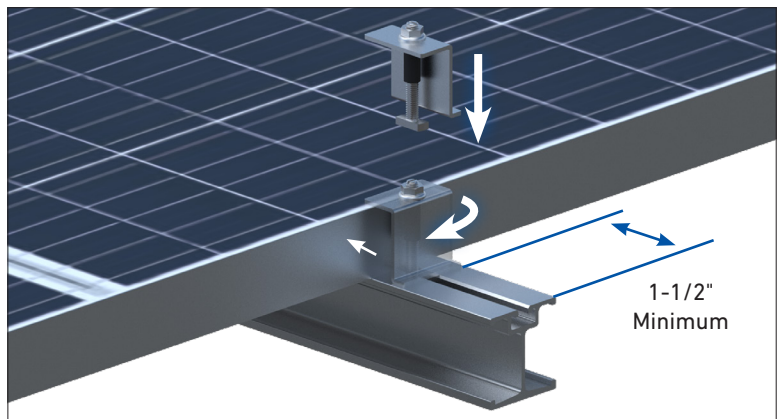
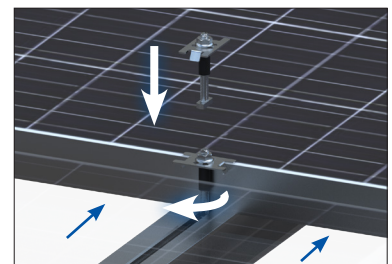
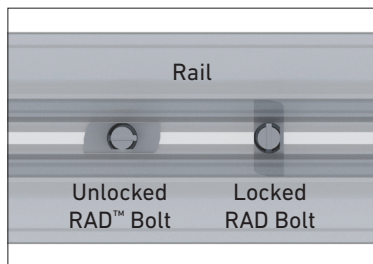
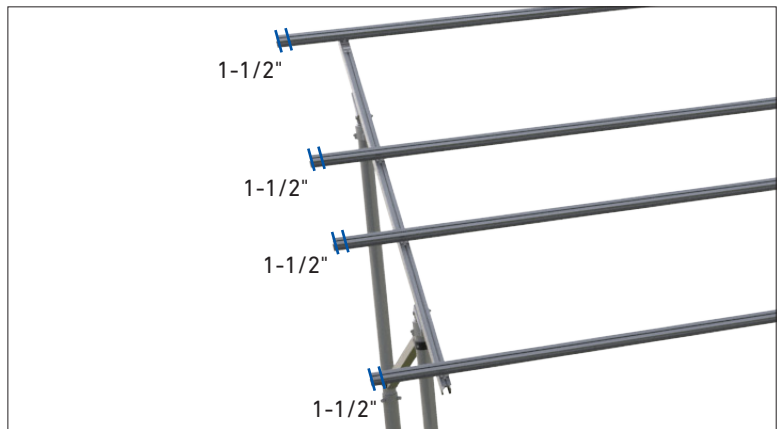
AMP Clamp Incorrectly Installed



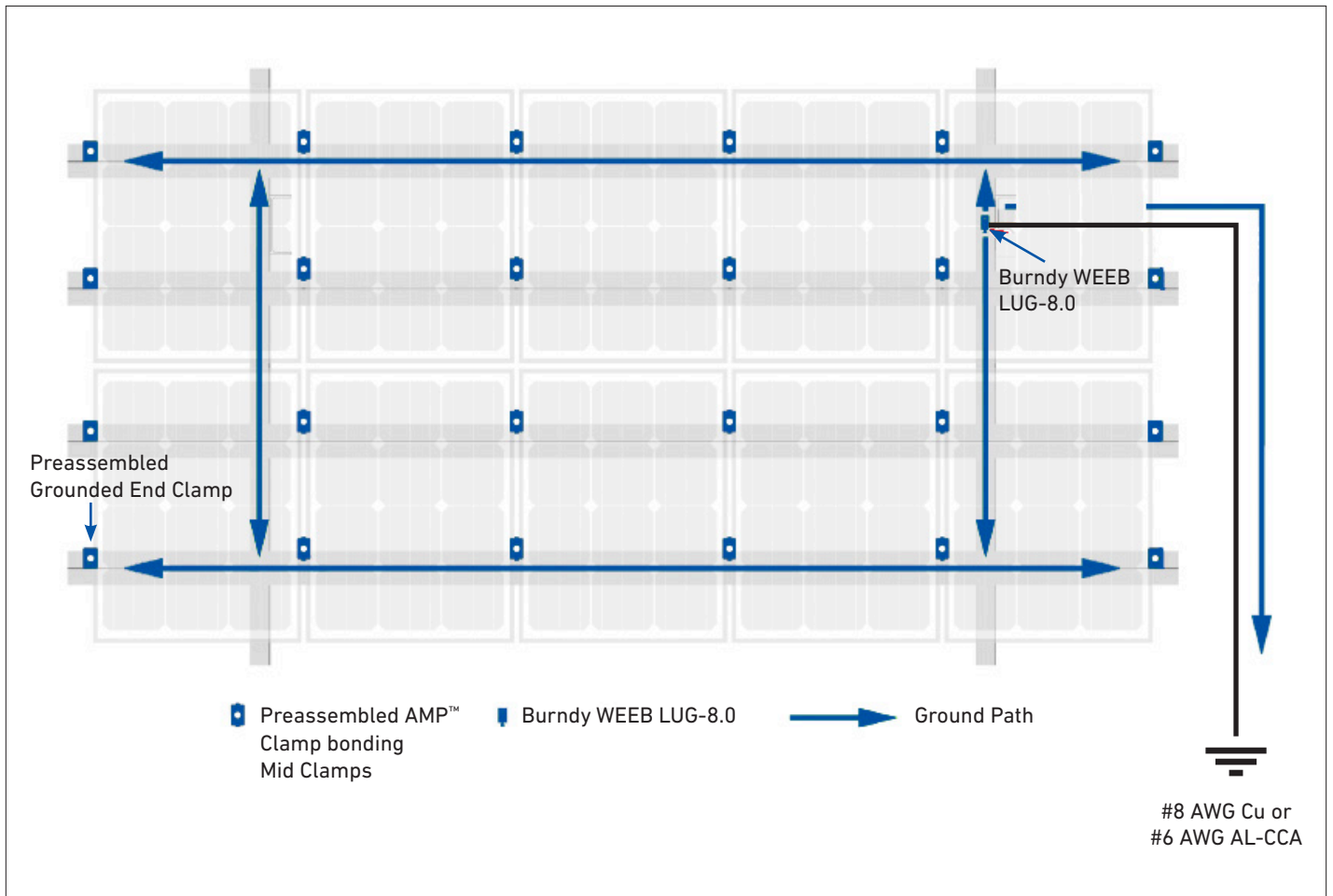
End Clamp Correctly Installed



End Clamp Incorrectly Installed



GROUNDING/BONDING PATH

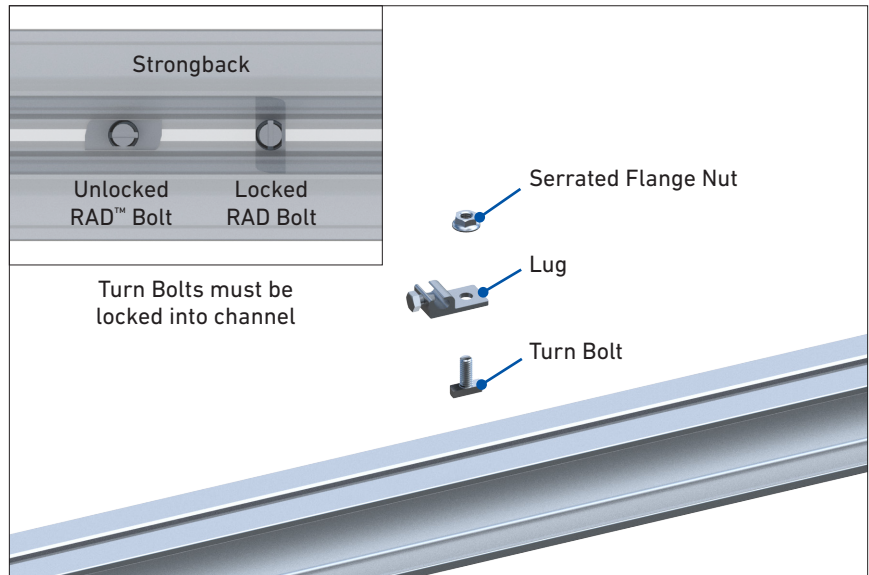


INSTALLING A WEEB-LUG 8.0

Before installing, verify with the lug manufacturer for any updates or revisions to these lug installation instructions.

Lug is suitable for use with 14-6 AWG solid or standard copper conductor when tightened to 5 ft-lb.

NOTE: The Turn Bolts used must be locked into the channel by rotating clockwise 90°. Use the indicator slot on the threaded end to identify whether or not the bolt has been locked.



Catalog Number	Maximum OCPD (A)	Mounting Surface					Mounting Screw		Mounting Hole Range	
		Minimum Profile w x l	Minimum Thick in	Maximum Thick in	Mtl	Surface Prep	Size	Tightening Torque lb - in	Minimum mm	Maximum mm
WEEB-LUG-8.0	200	22 mm x 20 mm	0.06	0.25	AL	Anodized	5/16" M8	120	7.85	10
			0.06	0.25	Steel	Galvanized				

IMPORTANT INFORMATION

1. Before installing, verify with the lug manufacturer for any updates or revisions to these lug installation instructions. The instructions on this page only address the WEEB-LUG-8.0 as found within the manufacturers (Burndy) document number 50016572 Rev E.
2. The NEC section 690.43 states, "Exposed non-current carrying metal parts of module frames, equipment, and conductor enclosures shall be grounded in accordance with 250.134 or 250.136 (A) regardless of voltage."
3. For Proper Equipment Grounding Conductor (EGC) and Overcurrent Protection Device (OCPD) sizing, refer to NEC sections 250.66, 250.122, and 250.166.





GLOBAL HEADQUARTERS
660 BETA DRIVE
CLEVELAND, OH 44143

+1 440 461 5200
SOLAR@PLP.COM
PLP.COM