SOLAR MOUNTS, LLC.
SOLAR CARPORT
INSTALLATION MANUAL

The Galactic Series

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INTRODUCTION

The **Solar Mounts, LLC Solar Carport** is engineered for simplicity, durability, and performance. With the fewest components and hardware connections in its class, this solution streamlines installation while maintaining structural integrity. No drilling, cutting or welding is required. Bolt-to-design simplifies Post mounts to foundation cage and PV modules to purlins. All steel is pre-drilled, hot-dipped, G235 galvanized and 100% U.S.-sourced, meeting both AISC and BABAA certification standards.

The system is highly configurable and adaptable to uneven terrain—ideal for sites where other structures can't be installed. PV modules deliver both shade and power, attaching easily with UL 467 & 2703 grounding washers and (proprietary) adaptable bracket for secure, grounded installations.

Solar Mounts, LLC carport structures are engineered to withstand very high wind and snow loads. Waterproofing options include attractive under-decking or top-side water management components, with no impact on solar output.

FEATURES AND BENEFITS

- ✓ Four (4) main components and minimal hardware
- ✓ Pre-welded tilt angle (7°)
- ✓ Multiple clearance heights available
- ✓ Many Frame variations to match your goals and site (Y-, T-, L-, A-Frame, Long Spans)
- ✓ Universal brackets fit any PV module ('panel"), industry-wide
- ✓ Solar Mounts LLC stocks components to maintain industry-leading lead times
- ✓ Solar Mounts provides stamped drawings in all 50 States and beyond

SAFETY INFORMATION

General Safety Guidelines

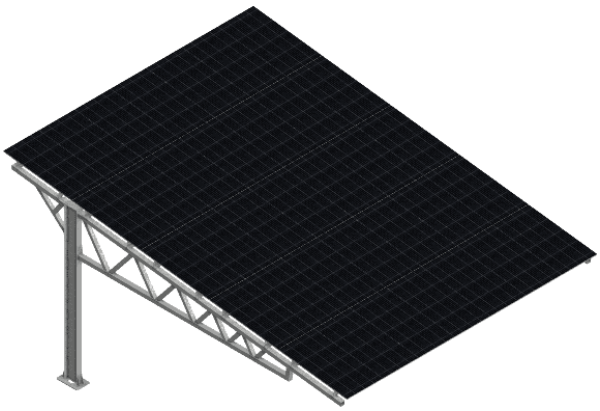
- Only trained personnel should perform installations.
- Always follow OSHA guidelines for fall protection and workplace safety.
- Wear appropriate PPE, including hard hats, safety glasses, gloves, steel-toed boots, and harnesses where applicable.

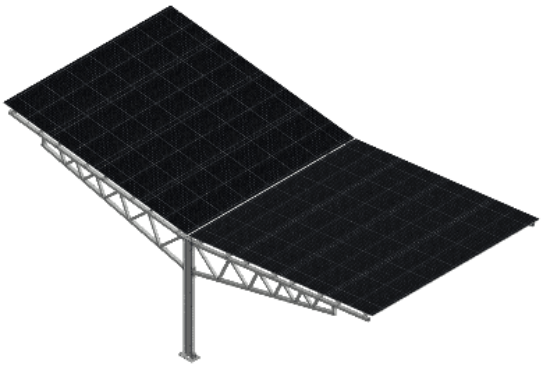
Equipment Safety

- Inspect tools and equipment before use.
- Use caution when operating heavy machinery like skid steers and post drivers.
- Use licensed operators to ensure skilled operation of equipment

Hazard Warnings

- Be mindful of overhead power lines when lifting materials.
- Secure all materials properly to prevent tipping or falling.





TOOLS & EQUIPMENT REQUIRED

Hand Tools

- Impact Driver
- Torque Wrench
- Solar Mounts V-Clamp, or Needle Nose Pliers
- 15/16” Socket for 5/8” Bolt
- 1/2” Socket for 5/16” Bolt
- 3/4" Socket for 1/2" Bolt
- 15/16” Combination Wrench
- 3/4" Combination Wrench
- 1/2" Combination Wrench

Equipment

- Excavator (with Auger bit if the site has pier footings)
- Skid Steer
- Scissor lift
- Telehandler
- Boom Lift

The UL 2703 scope of evaluation was for grounding / bonding and mechanical loading.

Solar Carport System Ratings

Wind Load	180 mph
Snow Load	60 lbs.
Fire Rating	Class C (tilt 3-7°)
Maximum Size (Solar Mounts sections called “Starts” and “Adds”)	8-High, Max 32 Cantilever, 14’ height from ground (standard)
PV Module Orientation	South
Grounding/Bonding Rating	UL 2703, UL 467
Mechanical Rating	UL 2703

UL 2703 Ed.1 and TIL No. A-40 Mechanical Load ratings:

PV module constructions same as Type 1 or 2 –Module Area up to 33.4 sq ft	
Downward Design Load (lb/ft^2)	16.8
Upward Design Load (lb/ft^2)	16.8
Down-Slope Load (lb/ft^2)	5.0

PV module constructions same as Type 29 – Module Area up to 27.8 sq ft	
Downward Design Load (lb/ft^2)	16.8
Upward Design Load (lb/ft^2)	16.8
Down-Slope Load (lb/ft^2)	5.0

PRE-INSTALLATION GUIDANCE

Working with Miss Dig (Public Locate)

Contractors must call (811) Miss Dig before they dig . This is typically a free service provided by the local utility company. More detailed surveys of underground utility lines, phone lines, fiber optics, water lines, etc. can be conducted using GPR devices.

GPR and LiDAR Data (Private Locate)

Underground detail can be gained by deploying ground penetrating radar (GPR) devices. GPR devices (e.g., US Radar, GSSI) can provide detailed information about shallow and deep obstructions, as well as accurate tracing of utility lines, water lines, fiber optics, telephone lines and more. GPR can provide up to 1 cm of accuracy although 5 cm is common with the addition of GPS (GNSS).

LiDAR devices are getting smaller and more accurate. These devices can be carried by drones and provide contractors with very accurate elevations and identification of above-ground contours, and give you detailed locating capabilities that can be transferred to construction drawings for the site.

Solar Carport Footings

Solar Mounts, LLC and Solar-Construction offers three different types of foundations:

1. Pier Footings, and
2. Spread Footings are standard
3. Hybrid, e.g., spread footings with Helical posts

Why Spread Footings Are Preferred

1. **Cost-Effective** – Uses less concrete / requires less excavation compared to pier footings. Savings are realized as there's less exposure to change-orders due to cave-ins, water, obstructions, etc..
2. **Faster Installation** – Easier to form & pour, reducing labor costs & project timelines.
3. **Better Load Distribution** – Spreads the weight over a larger surface area, minimizing settlement and improving stability.
4. **Ideal for Solar Carports** – Since solar carports distribute loads over a wide area, spread footings provide the necessary support without requiring deep drilling.
5. **Works Well in Most Soils** – As long as the soil is compacted and stable, spread footings provide excellent support with minimal ground disturbance.

Solar Carport Optional Modifications

Snow Guards: Low profile and functional. Snow guards will prevent sudden avalanches of snow coming off the solar panels and they heat up in the morning. There is no impact on solar performance.

Waterproofing: Solar Mounts LLC has developed new solar carport waterproofing strategies. If the carport needs to function both as a shade cover as well as a protective cover from rain, ask your Solar Mounts LLC representative about this optional modification.

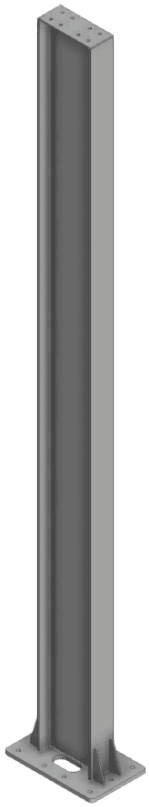
Gutters and Downspouts: whether you choose to install Solar-Construction waterproofing strategies, or not, the addition of gutters and downspouts can enhance water management around the carport, distributing most of the water away from the vehicles below and into drains to the side of the carport.

LED Carport Lighting: Solar Construction does not do electrical work; however Solar Mounts LLC can supply excellent LED carport lighting. We recommend carport lighting to enhance the aesthetics of the carport, but also provide excellent functionality, security and safety for carport users.

Powder Coating: Solar Mounts LLC can powder coat your posts and struts (we do not powder coat the purlins that support the PV modules). Although Solar Mounts Blue is our "go-to" color, customers can order from a broad palette of colors to meet their customer's aesthetic tastes (Yellows, Reds, Blues, Greens, Grays, Browns, White or Black).

Helical Posts: If there is a lot of water in the soil, or the soil is weak / unstable and won't support the weight of a ballasted post, contractors can specify large Helical Posts. Helical posts can be driven to reach strong, stable soil at greater depths. Helical posts can be installed in any weather, rain, snow, freezing temperatures. A skid steer or other compact hydraulic machinery can handle the installation to drive down to more solid soil. If the pier is installed in the wrong location, it can simply be unscrewed and re-installed. Finally, Helical Posts can be part of a hybrid solution where Solar-Construction can install helical posts with spread footings.

SOLAR CARPORT: MAIN COMPONENTS



Post

Truss

(SLR-CPT-TRUSS-UP2-7)

Purlin Stiffener

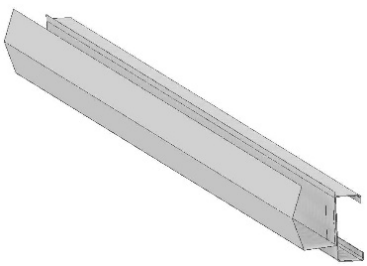
(SLR-CPT-PURLIN-STIFF)

27’-0” Purlin

Optional Mods

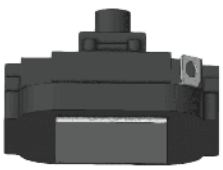
Waterproofing

Gutters and Downspouts



Snow Guards

LED Lighting



INSTALLATION STEPS

First step is the Post installation. Solar Mounts LLC offers two (2) different types of foundations for the Carport Post/Pier(s); Pier Footings and Spread Footings (please contact Solar Mounts for information on Hybrid footings with Helicals).

Pier Footings

Saw Cutting and Excavating

- Mark out pier foundation size and location according to SMLLC drawings and specs, along with the customer-provided licensed survey to confirm specific locations on the site plan
- Cut out existing asphalt or concrete
- Using a 36” auger, drill to a depth called out in Solar Mounts LLC stamped drawings and calculations (see SMLLC images below)
- Fill bottom 2” with stone and compact

Rebar and Concrete

- Place Sonotube commercial concrete form and rebar cage into hole
- Set bolt frame over concrete forming tube
- Use template to hang anchor bolts down pier upright
- Fill forming tube with concrete

Pier Footing Images

Augured Hole

Placing Rebar Cages

Bolt Template Form

Complete

Spread Footings

Saw Cutting and Excavating

- Mark out pier foundation size and location according to SMLLC drawings and specs, along with the customer-provided licensed survey to confirm specific locations on the site plan
- Cut out existing asphalt or concrete
- Excavate to depth called out in SMLLC drawings (see images below)
- Fill the bottom 2” (confirm on SMLLC drawings) with crushed stone and compact

Rebar and Concrete

- Tie rebar matts together with pier uprights in the center. See SMLLC drawings for appropriate rebar sizing and quantity
- Drop rebar cage into hole
- Set framing over Sonotube commercial concrete forming tube

- Use bolt template to hang anchor bolts down pier upright
- Fill spread footing and Sonotube commercial concrete forming tube with concrete

Spread Footing Images

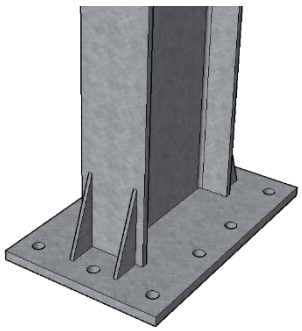
Tied Matts with Uprights

Set Cage

Forms

Placing the Post on the Foundation

1. Sling and grab post from top using I-Beam clamps
2. Make sure placement is level on anchor bolts
3. Conduit holes are located on both sides of the base plate
4. Tighten top nuts snug

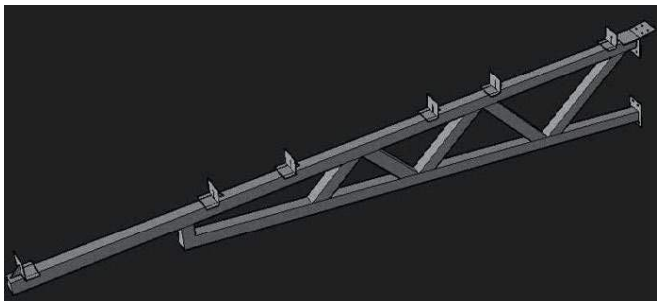


Bolting the Adjustable L-Bracket in Place (SLR-CPT-LPLATE-BRKT)

- On SMLLC drawing set, a side view is arranged showing the distances needed between L-Brackets
- Bolt L-Brackets onto truss using 1/2" X 7" bolt
- Tightening to AISC snug (+ 1/4 turn)

ALSO INCLUDED:

- 1/2" Flat Washer
- 1/2" Lock Washer
- 1/2" Nut

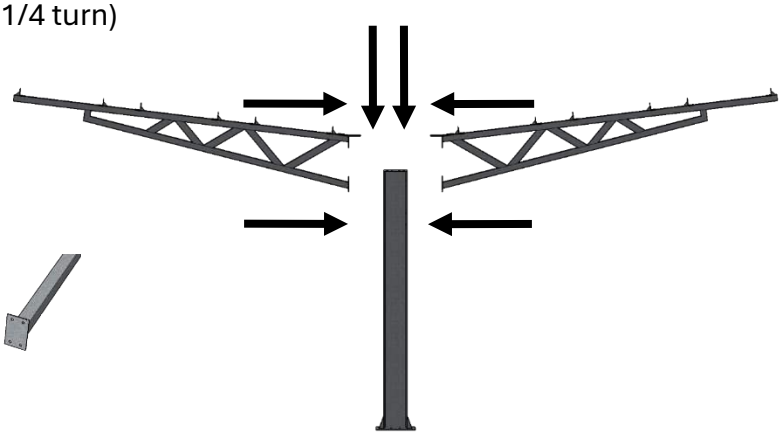


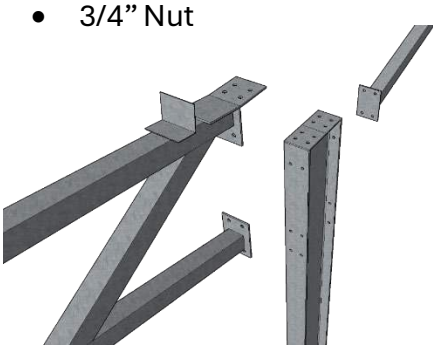
Attaching the Truss to the Post

- Use 3/4" X 2 ½" bolts
- Tighten to AISC snug (+ 1/4 turn)

ALSO INCLUDED:

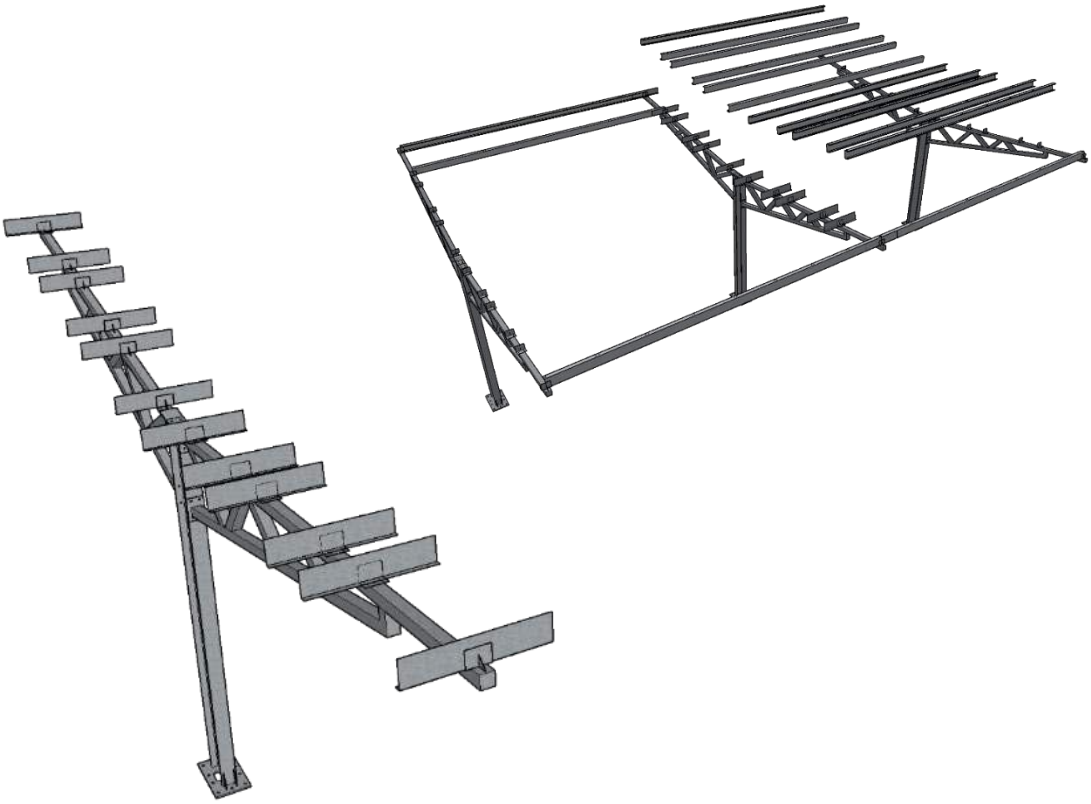
- 3/4" Flat Washer
- 3/4" Lock Washer
- 3/4" Nut

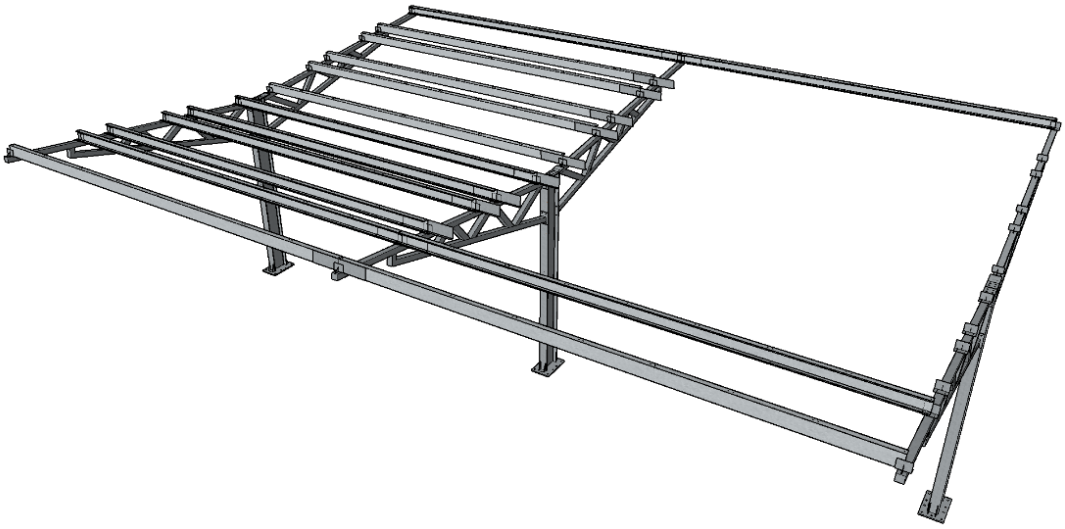




Attaching Overlap Plates and Purlins

- Secure the Overlap Plate to the Purlin with 5/16” fasteners (x4)
- Secure the L-Plate to the Overlap Plate with 5/16” fasteners (x4)



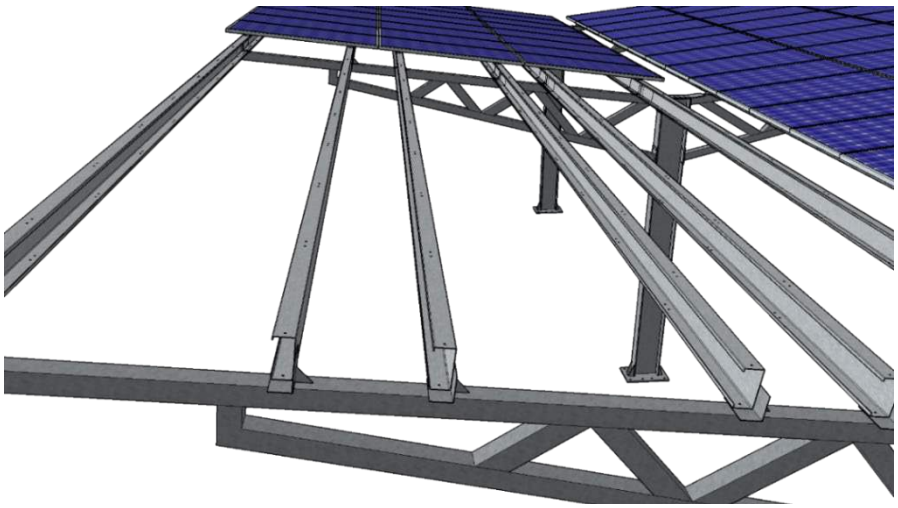


Purlin Stiffener Attachment

- See SMLLC drawings for appropriate spacing
- Compress the V-Clamp with SMLLC V-Clamp pliers (or needle nose pliers) and release into position
- **NOTE:** many contractors fabricate a jig and build the Purlin stiffeners on the ground
- Attach the stiffener to purlins with 5/16” serrated flanged bolt and nut

PV Module ("PV Panel") Attachment and Installation

- Self-tap the mounting bracket onto the Purlin
- Secure the PV module onto the mounting bracket using stainless steel 5/16" (or M8) bolts, e.g. 1.25' length. Threads are metric course (M8-1.25) or UNC (5/16"-18). Use stainless steel nuts, washers (to distribute load) and lock/spring washers for vibration resistance.
- Torque to 10-15 nm for M8, 90-120 in-lbs. for 5/16". **NOTE:** Avoid over torquing!

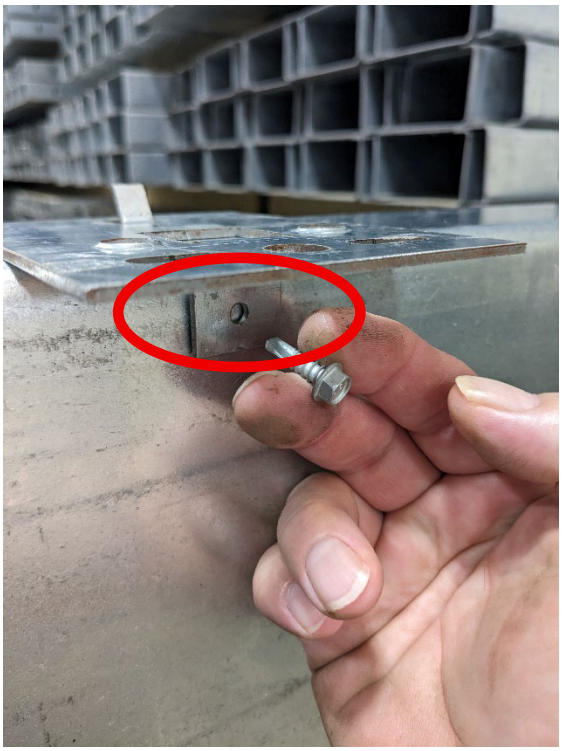


Adjustable Panel Bracket
(SLR-CPT-BRKT)

Adjustable Panel Bracket

Panel Bracket hooked on C-Channel Purlin

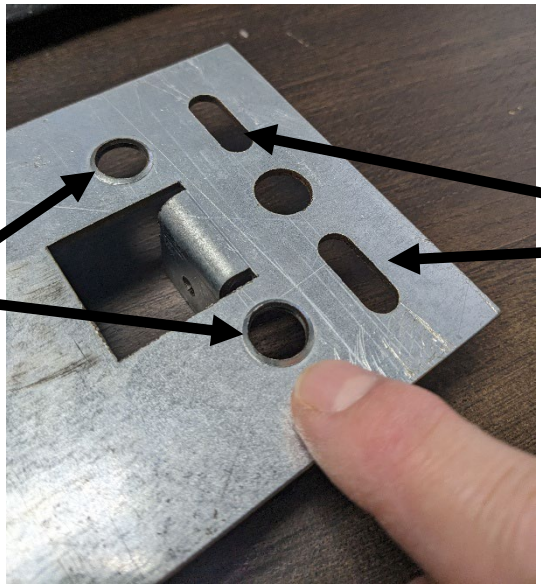
Panel Bracket can slide on the Purlin to adjust to any PV Module length



Best Panel Bracket Mounting Screw Position
(SLR-HW-SD10-BO)

Alternate Panel Bracket Mounting Screw Position

Sharp edges penetrate the PV Module anodization



PV Module Attachment Bolt Holes

ELECTRICAL GROUNDING OF THE SOLAR CARPORT PV SUPPORT STRUCTURE

- Solar electric contractors must electrically ground the structure to a single premises ground. If more than one Ground Lug is attached to the structure, all these ground points and EGC's must be properly bonded together.
- Please see NEC Article 690.41, 690.47(C)(3), 250.52 and 250.53(A) for guidance.
    - Using a separate DC grounding electrode for the PV array and Solar Mounts LLC Solar Carport structure will enhance protection against lightning and transient voltage. For lightning protection associated with grounding systems, refer to NEC 250.106.
- Attach the Ground Lug (e.g., Ilsco GBL Grounding Lugs, Part #18-GBL-4DBT or equivalent) to the Solar Carport C-channel (e.g., commonly near the truss / I-Beam Post connection) using a #10 self-drilling screw (zinc or stainless steel, e.g., 1 ¼") so that the lug is flush with the truss surface. The Truss' I-beam is tough to self-drill into and may require a small pilot hole.
- If the Truss is powder coated (typically 60-80 microns thick, 2.5-3 mils), installation contractors may need to sand the powder coating away from the galvanized steel before connecting the ground lug to the truss). A stranded, insulated (recommended) grounding conductor is routed from the ground lug on the truss(es) to the premises ground rod.
- Tighten to 5 ft. lbs.
- CAUTION: PV module removal will not disrupt the bonding path. However, PV modules ("panels") should only be removed by qualified persons in compliance with the instructions in this manual

FINAL INSPECTION & MAINTENANCE

- Check all Carport Post, Strut and Purlin bolts and nuts for tightness. Any loose components or fastener shall be re-tightened in accordance with these instructions.
- Check PV array to ensure all PV modules are clean and unbroken.
- Check all PV module mid-clamps and end clamps are tightened to specification.
- Ensure all cement foundations are covered from weather and prepared for proper curing.
- Check optional modification components to ensure they are properly installed and functional. Ensure each canopy light is wired properly (and programmed per customers specifications) and that all components are physically secure (canopy lights, snow guards, gutters and downspouts)
- Periodically inspect the structure for signs of wear or loosening. If any components of the Solar Carport show signs of damage that compromises safety, these components shall be replaced immediately.

CONTACT INFORMATION

For questions or support, contact:
Solar Mounts LLC
Website: https://solarmounts.com
Phone: (844) 757-7225

Warranty

To obtain the Solar Mounts LLC warranty, please fill out the SMLLC Commissioning Form for each project site and return to Solar Mounts, LLC.

(NOTE: The SMLLC warranty starts at delivery of materials to customer site.)

List of Approved PV Modules ("Panels") for UL 2703 listed Solar Mounts, LLC Solar Carport Structures*

Solar Mounts, LLC. support structures are certified to UL 2703 for electrical grounding/bonding and mechanical requirements. Solar Mounts, LLC. system owners retain this certification when support structures are used only in combination with PV modules listed in the chart below.

*Please contact Solar Mounts, LLC for the latest list of approved PV modules

Module Manufacturer	PV Module Model Number
Aptos	DNA-120-BF10-xxxW
Boviet Solar	BVM6612M-XXXS-H-HC-BF-DG
Canadian Solar	CS6W-xxxMS
Canadian Solar	CS7N-XXXTB-AG
Canadian Solar	CS6W-xxxMB-AG
Canadian Solar	CS6.1-54TM-xxxH
HT Solar (HT-SAAE)	HT72-18X (ND)-F
Imperial Star	ISM7-SHSB156-xxxM
JA Solar	JAM72D40-xxx/LB
JA Solar	JAM72D42-xxx/LB
JA Solar	JAM72D30-xxx/MB
Jinko	JKMXXXM-72HL4-TV
Jinko	JKMXXXN-72HL4-BDX
Jinko	JKMXXXN-72HL4-BDV
Jinko	JKMXXXN-78HL4-BDV
Longi	LR7-72HGD-XXXM
Longi	LR8-66HYD-XXXM
Longi	LR7-72HYD-XXXM
Maxeon	SPR-P6-XXX-UPP
Mission Solar Energy	MSN10xxxHN4G
Mission Solar Energy	MSN10xxxHT4T
Panasonic	EVPVxxxHK2
Peimer USA	DR10HxxxMB
Peimer USA	SFxxxM
Philadelphia Solar	PS-MNB108(HCBF)-xxxW
Phono Solar	PSxxxM8GF-24/TNH
Phono Solar	PSxxxM8GFH-24/TNH
Q Cells	Q.PEAK DUO ML-G12S
Q Cells	Q.PEAK DUO XL-G11S

REC	RECXXXAA PRO M
REC	RECxxxAA Pure
REC	RECXXXAA PURE-RX
SEG	SEG-xxx-BTC-BG
SEG	SEG-xxx-BTC-BG
SEG	SEG-495-BTD-BG
Silfab	SIL-620/630/640 XL
Silfab	SIL-520 QM
Silfab	SIL-420/430 QD
Trina	TSM-DEG19RC.20
Trina	TSM-NEG21C.20
Trina	TSM-DEG21C.20
Trina	TSM-NE09RC.05
Trina	TSM-NEG19RC.2
Waree	BiN-08-xxx
Waree	Bi-62-xxx
Waree	Bi-55-xxx