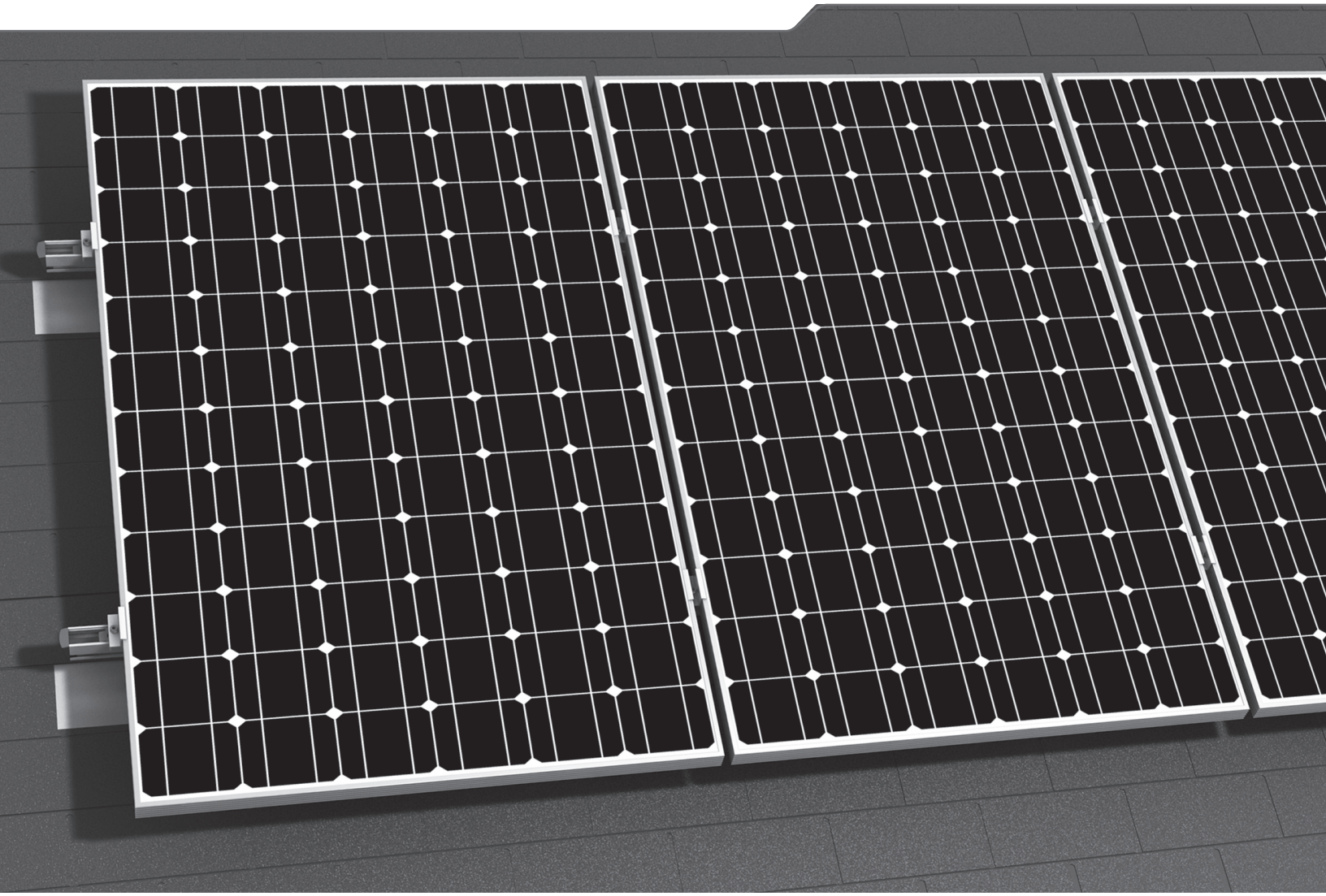
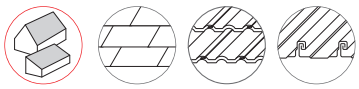
Mounting systems for solar technology



ASSEMBLY INSTRUCTIONS

CrossRail System



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QUALITY TESTED – SEVERAL CERTIFICATIONS

Everest Solar Systems stands for secure connections, highest quality and precision. Our customers and business partners have known that for a long time. Independent institutes have tested, confirmed and certified our capabilities and components.

Please find our quality and product certificates under:
www.everest-solarsystems.com/technical-information

Engineering strength is at our core

With sophisticated product innovations and a deep customer focus, Everest Solar is the engineering leader for all your mounting system needs. We are the US division of K2 Systems, one of Europe's market leaders with more than 8 GW installed.

We offer proven product solutions and innovative designs. Wind tunnel testing along with advanced structural and electrical validation to facilitate permitting, design and installation. Our designs result in cost competitive racking systems with dedicated support that will position you to win more projects.

We partner with our customers and suppliers for the long-term. High quality materials and cutting edge designs provide a durable, yet functional system. Our product line is comprised of a few, coordinated components that lower the cost of materials, and simplify installation, saving you time and money. All backed by German engineering, a long track record of quality and a company that is here to stay.

Thank you for choosing Everest Solar Systems for your Solar PV Project.

General safety information

Please note that our general mounting instructions must be followed at all times and can be viewed online at www.everest-solarsystems.com/technical-information

- The equipment may only be installed and operated by qualified and adequately trained installers.

- Prior to installation, ensure that the product complies with on-site static loading requirements. For roof-mounted systems, the roof load-bearing capacity must always be checked.

- National and local building regulations and environmental requirements must be adhered to.

- Compliance with health and safety regulations, accident prevention guidelines and applicable standards is required.
  · Protective equipment such as safety helmet, boots and gloves must be worn.
  · Roofing works must be in accordance with roofing regulations utilising fall protection safeguards when eaves height exceeds 3 m.
  · At least two people must be present for the duration of the installation work in order to provide rapid assistance in the event of an emergency.

- Everest mounting systems are continuously developed and improved and the installation process may thereby change at any time. Prior to installation consult our website at www.everest-solarsystems.com/technical-information for up-to-date instructions. We can send you the latest version on request.

- The assembly instructions of the module manufacturer must be adhered to.

- Equipotential bonding/grounding/earthing between individual parts is to be performed according to country specific standards, as well as national laws and regulations.

- At least one copy of the assembly instructions should be available on site throughout the duration of the installation.

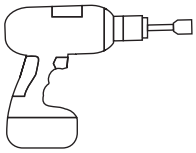
- Failure to adhere to our general safety and assembly instructions and not using all system components, Everest Solar Systems is not liable for any resulting defects or damages. We do not accept liability for any damage resulting in the use of competitor's parts. Warranty is excluded in such cases.

- If all safety instructions are adhered to and the system is correctly installed, there is a product warranty entitlement of 25 years! We strongly recommend reviewing our terms of guarantee, which can be viewed at www.everest-solarsystems.com/technical-information
  We will also send this information on request.

- The VdS 3145:2011-07 applies to the proper technical maintenance, inspection and any necessary repair. This includes regular visual inspections and visual inspections in case of events. We recommend annual regular inspections including: inspection of all system components for damage by e.g. weather, animals, dirt, debris, build-up, growth, roof penetration, sealing, structural stability and corrosion. In addition, the tight fit of screws must be checked and if necessary, re-tightened in accordance with the torques mentioned in the assembly instructions.

- Dismantling of the system is performed in reverse order to the assembly.

Tools overview

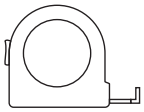


6 mm/HW6 Allen Drive
(M8 bolt)

≥ 6,0 m

10-50 ft-lb
(6 - 35 Nm)

1/2 " deep socket



≥ 10 ft

15 mm deep socket

Torque overview

- M10 T-Bolts: 25.8 ft-lb (35 Nm)
- WEEB Lug 10.3: 15 ft-lb (20.3 Nm)
- Mid Clamp UL2703+: M8 Allen Bolts 12 ft-lb (16.3 Nm)
- All other clamps: M8 Allen Bolts: 10.3 ft-lb (14 Nm)

Tools and materials for the installation of third party items such as roof attachment products, roof covering and sealing products or items used for bonding and grounding are not listed here. Please refer to the instructions of those third party products.

Materials Required

In order to assemble the Everest Solar Systems CrossRail system, the following listed system components are essential. The piece quantities are calculated on the basis of the respective requirements. The listed item numbers facilitate the comparison of items.

UL 2703 LISTED COMPONENTS

All components evaluated under UL 2703 and encompassed within Everest Solar System's UL 2703 Listing shown below. If you seek a UL Listed System, only the parts shown on this page are acceptable.

CrossRail 48-X/48-XL/80[1]

Material: aluminum
Finish: mill, dark anodized

| multiple

Structural Rail Connector Set[1]

CR 48-X/48-XL
Material: aluminum
Finish: mill, dark anodized
Hardware: stainless steel

| 4000385
4000386

CrossRail Mid Clamp UL2703+ Set

30-47 mm, 48-50 mm
Material: stainless steel
Finish: silver, dark

| multiple

CrossRail End Clamp Set

30-50 mm
Material: stainless steel
Finninsh: silver, dark

| 4000429
4000430

Burndy WEEB Lug 10.3 + Hardware[4]

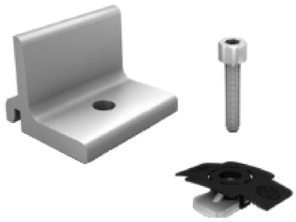
WEEB Lug Material: tin plated copper
Hardware: stainless steel

| 4000622

L-Foot with Hardware[1,2]

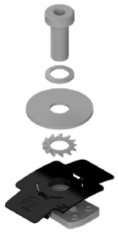
Material: aluminum
Finish: mill, dark anodized
Hardware: stainless steel

| 4000630
4000631



Climber Set CR48-X/48-XL/80, Hole | 4006042

Material: aluminum
Finish: mill
Hardware: stainless steel



Optional: Micro Inverter and Optimizer Mounting Kit[1,3] | 4000629

Material: stainless steel

[1]Dark anodized rail must use Bonding T-Bolt and Bonding MK3 hardware.

[2]Use standard L-foot with third-party roof attachments and EverFlash L-foot with EverFlash Comp Flashing.

[3]The inverter hardware kit is not intended to replace the micro inverter ground and has only been evaluated to attach to the rail.

[4]For certain jurisdictions, this item is regarded as a single-use item for a UL 2703 Listed System.

Materials Required

NON UL LISTED COMPONENTS

Aluminum End Clamp Set

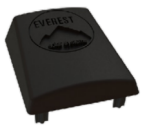
| multiple

Material: stainless steel
Finish: silver, black
Hardware: stainless steel

EverFlash eComp Kit

| 4000367
4000366

Material: aluminum
Finish: mill, dark anodized
Hardware: stainless steel



Optional: End Cap for CR48-X/48-XL/80

| 4000433
4001221

CrossRail 48-X End Cap shown
Material: glass fiber reinforced polamide

Optional: CrossRail 3" Black Sleeve

| 4000583

Material: polyamide, black

Optional: External Omega Cable Clip

| 4005394

Material: polyamide, black

OR

Optional: HEY Clip SunRunner Cable Clip SS, S6404

| 4000382

Material: stainless steel

Optional: 3S Tile Hook

| 4001294

Material: aluminum

OR

SingleHook

| 4000521

Material: aluminum

OR

Flat Tile Hook

| 4000034

Material: aluminum

Bonding and Grounding

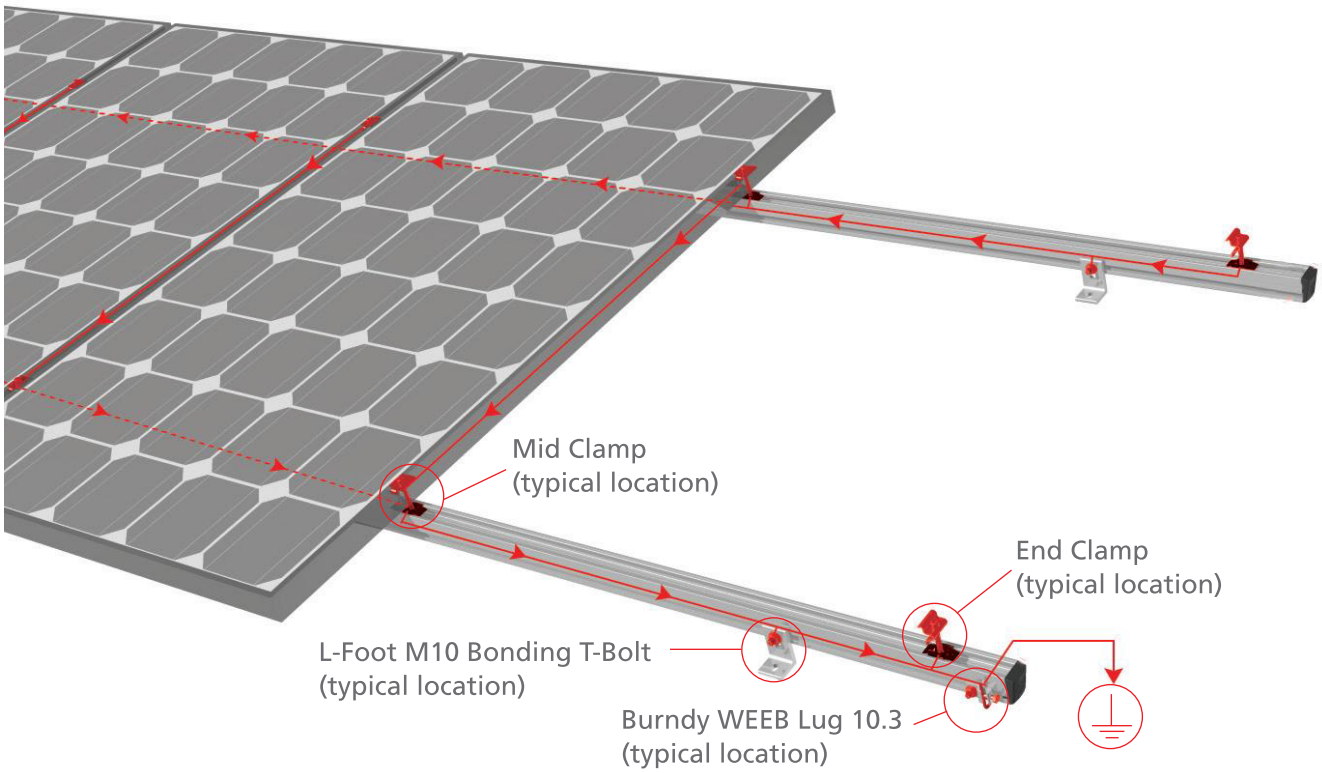
Appropriate means of bonding and grounding are required by regulation. The information provided in this manual shall always be verified with local and national building codes.

Everest Solar Systems has obtained a UL 2703 system listing from Underwriter's Laboratories (UL).

A sample bonding path diagram is shown in Figure 1 below. Your specific installation may vary, based upon site conditions and your AHJ's requirements.

Each electrical connection has been evaluated to a maximum fuse rating of 30A. At least one ground lug per row of modules must be used to ground all strings within each sub-array, although additional may be used for redundancy. When installed per these installation instructions, all connections meet the requirements of NEC 690.43.

This racking system may be used to ground and/or mount a PV module complying with UL 1703 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions.



- Note the WEEB Lug 10.3 utilizes a WEEB 11.5 as a bonding washer and thus carries the markings of a WEEB 11.5

Fire Rating

The CrossRail 48-X/48-XL System has undergone fire performance testing in accordance with UL 2703, Fire Performance. A System Class A fire rating is achieved when using CrossRail 48-X/48-XL under the following conditions:

- Roof slope of 2/12" rise per linear foot or greater
- Used in combination with a UL 1703 Listed module with a fire performance rating of Type 1, Type 2, or Type 3. Consult the module manufacturer for specific fire performance rating information.
- CrossRail may be mounted using any stand-off height to maintain the Class A fire rating. Always consult the module manufacturer's installation instructions to ensure your installation is in compliance with their UL 1703 Listing.
- The results of the racking system do not improve a roof covering Class rating.

All documentation can be found on UL's Online Database as well as Everest Solar Systems' website.

Compatible Modules (Where xxx is the wattage)

Everest's CrossRail system was tested with the following:

- NRTL Listed LG Modules:
  - LGxxxS1C-G4
  - LGxxxN1C-G4
  - LGxxxS2WG4
  - LGxxxN1K-G4
  - LGxxxN2W-G4
  - LGxxxN1K-A5
  - LGxxxS1C-A5
  - LGxxxN1C-A5
  - LGxxxE1C-A5
  - LGxxxE1K-A5
  - LGxxxN2W-A5
  - LGxxxS2W-A5
  - LGxxxQ1C-A5
  - LGxxxN1W-V5
  - LGxxxN2W-V5
  - LGxxxN1C-V5
  - LGxxxN1K-V5
- NRTL Listed Canadian Solar Modules:
  - CS6U-xxx
  - CS6K-xxx
  - CS6X-xxx
  - CS6P-xxx
  - CS6K-P-FG DYMOND
  - CS6K-270M
  - CS6K-275M
- UL Listed Hyundai Solar Modules:
  - HiS-MxxxMG
  - HiS-MxxxMI
  - HiS-MxxxTI
  - HiS-MxxxRI
  - HiS-SxxxRI
  - HiS-MxxxRG
- NRTL Listed Solarworld Modules "Sunmodule":
  - Plus SW XXX Mono
  - Plus SW XXX Poly
  - (all may be followed by "black")
- NRTL Listed Lumos Modules:
  - LSXxxx-60M-B/C
- NRTL Listed Trina Solar Modules:
  - DUOMAX SPECS 1. PEG14
  - DUOMAX SPECS 2. PEG5
  - DUOMAX SPECS 3. PEG5.07
  - DUOMAX SPECS 4. PDG5
- NRTL Listed Prism Solar Modules:
  - Bi48 xxx Bifacial
  - Bi60 xxx Bifacial

- NRTL Listed Jinko Solar Modules:
  - JKM xxxPP-72-DV
  - JKM xxxPP-60-DV
  - JKM xxx-P-60
- NRTL Listed Supreme Modules:
  - GxB-xxx
  - GxB-xxxSM
  - GxB-xxxSL
- NRTL Listed Soluxtec Modules:
  - FR xxx Wp
  - Power Slate 54 Mono Dark Series
  - Power Slate 54 Mono Series
- NRTL Listed V Energy Modules:
  - Series 200 PV
- NRTL Listed Phono Solar Modules:
  - PSxxxMG-20/U
  - PSxxxPG-20/U
- NRTL Listed JA Solar Modules:
  - JAP6(DG)
  - JAM6(K)-60-xxx/4BB
- UL Listed Kyocera Modules:
  - KUxxxMCA
- NRTL Listed Q Cells Modules:
  - Q.Plus BFR-G4.1xxx
  - Q.Pro BFR-G4.1xxx
  - Q.Pro-G4.1/SCxxx
  - Q.PRO BFR G4xxx
  - Q.PRO BFR G4.3xxx
  - Q.PEAK-G4.1xxx
  - Q.PEAK- G4.1/MAXxxx
  - Q.PEAK BLK G4.1xxx
  - Q.PRO G4xxx
  - Q.PLUS G4xxx
  - Q.PEAK-G4.1/TAAxxx
  - Q.PEAK BLK G4.1/TAAxxx
  - Q.PLUS BFR G4.1/TAAxxx
  - Q.PLUS BFR G4.1/MAXxxx
  - B.LINE PLUS BFR G4.1xxx
  - B.LINE PRO BFR G4.1xxx
  - Q.PEAK DUO-G5xxx
  - Q.PEAK DUO BLK-G5xxx
- UL Listed Luxor Solar Modules:
  - LX-xxxP
  - LX-xxxM
- UL Listed SunPower Modules:
  - SPR-E19-xxx
  - SPR-E20-xxx
- UL Listed Yingli Solar Modules:
  - YL-xxxP-29b
  - YL-xxx-35b
- UL Listed Sanyo Electric Co Ltd of Panasonic Group Modules:
  - VBHNxxxSA16
  - VBHNxxxSA17
  - VBHNxxxSA18
  - VBHNxxxKA01
  - VBHNxxxKA03
  - VBHNxxxKA04
- NRTL Listed ET Solar Modules:
  - ET-M660xxxBB
- NRTL Listed Axitec Solar Modules:
  - AC-xxxP/156-60S
  - AC-xxxM/156-60S
  - ACxxxP/156-72S
- UL Listed Mission Solar Modules:
  - MSExxxSB1J
  - MSExxxSO5T
  - MSExxxSO4J
  - MSExxxSQ6S
  - MSExxxSO6J
  - MSExxxSQ4S
  - MSExxxSQ5T
  - MSExxxSQ5K
  - MSExxxSQ8T
  - MSExxxSQ8K
  - MSExxxSQ9J
  - MSExxxSQ9S
- NRTL Listed Silfab Modules:
  - SLAxxxM
  - SLG-M-xxx
  - SLA-X-xxx
  - SLG-X-xxx
- UL Listed Sharp Modules:
  - NU-SCxxx
  - NU-SAxxx
- UL Listed Trina Solar Modules:
  - TSM-xxxDE14A
  - TSM-xxxDD05A.08
- UL Listed Talesun Modules
  - Hipro TP660M-xxx
  - Hipro TP672M-xxx
- NRTL Listed Itek PV Modules:
  - IT-xxx-SE
  - Hipro TP672M-xxx
- NRTL Listed REC Solar PTE. LTD Modules:
  - RECxxxTP2 BLK2
- UL Listed Hansol:
  - UB-AN1 Black 270-300
  - UBAN1 Silver 270-300
  - UD-AN1 330-360
- NRTL Listed Solaria:
  - PowerXT®-XXXR-PD
  - PowerXT®-XXXR-BD
- NRTL Listed Sunspark
  - SST-275-300W
  - SMX250-265
- NRTL Listed Longi Green Energy Technology PV Modules:
  - LR6-72-xxxM (xxx=320-350)
  - LR6-72HV-xxxM (xxx=320-350)
  - LR6-72BK-xxxM (xxx=320-350)
  - LR6-72PE-xxxM (xxx=340-380)
  - LR6-72PE-xxxM (xxx=340-380)
  - LR6-72PB-xxxM (xxx=340-380)
  - LR6-72PH-xxxM (xxx=340-380)
  - LR6-72HPB-xxxM (xxx=360-385)
  - LR6-60-xxxM (xxx=270-300)
  - LR6-60HV-xxxM (xxx=270-300)
  - LR6-60BK-xxxM (xxx=270-300)
  - LR6-60PE-xxxM (xxx=280-320)
  - LR6-60PB-xxxM (xxx=280-320)
  - LR6-60PH-xxxM (xxx=280-320)

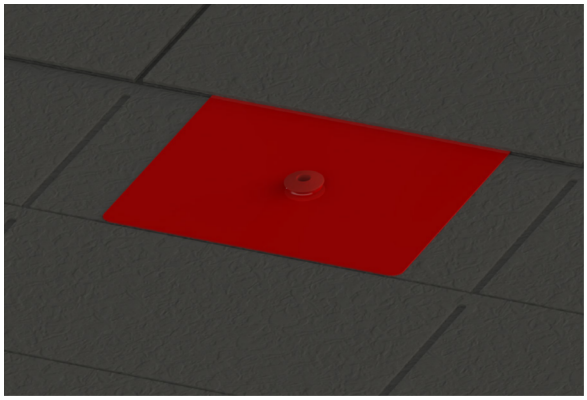
Assembly

1 PREPARE ROOF

Locate the rafters and snap horizontal and vertical lines to mark the installation position for each EverFlash flashing. Drill a pilot hole (1/4" diameter) for the lag bolt. Backfill with appropriate sealant. Always consult a professional roofer to ensure integrity is maintained.

Materials required: **Tape measure, string line, drill**

2 INSERT EVERFLASH FLASHING

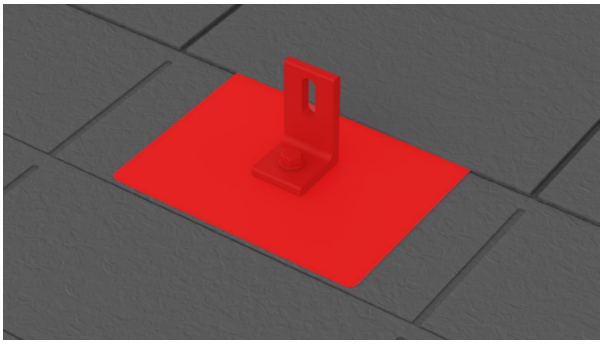


Insert the flashing so the top part is under the next row of shingles and pushed far enough up slope to prevent water infiltration through vertical joint in shingles. The leading edge of flashing must butt against upper row of nails to prevent turning when torqued.

Important: **The flashing must not overhang the butt end of the shingle.**

Materials required: **EverFlash flashing**

3 ATTACH EVERFLASH L-FOOT



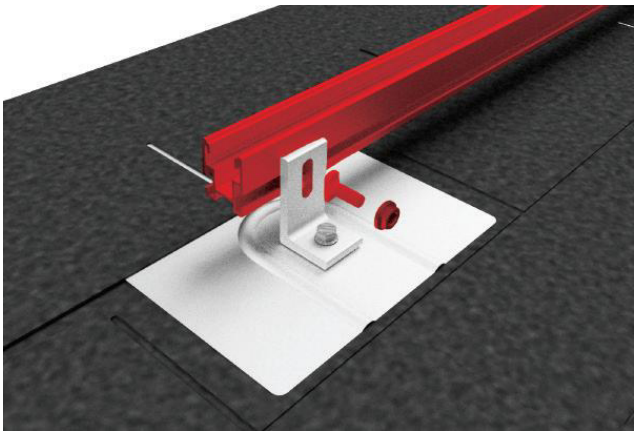
Line up pilot hole with the EverFlash flashing hole.

Insert the lag bolt through the EPDM bonded washer, the L-foot, the gasketed hole in the flashing and into the rafter.

Torque: The range is between 8.3 - 11.6 ft-lb depending on the type of wood and time of year. The visual indicator for proper torque is when the EPDM on the underside of the bonded washer begins to push out the sides as the washer compresses. If using an impact wrench to install the fasteners, be careful not to over torque the fastener. You may need to stop and use a ratchet to finish the install.

Materials required: Bolt, EverFlash L-foot and hardware, torque wrench

4 INSTALL CROSSRAIL



Insert the T-bolt through the L-foot slot and into the side channel of CrossRail. Turn the T-bolt clockwise ensuring that the mark at the end of the shaft is vertical, indicating proper alignment. Torque to 25.8 ft-lb (35 Nm). Make sure that the top of the CrossRail is located above the top of the L-foot. Double check that the alignment marking on the end of the T-bolt shaft is vertical, to ensure it is properly engaged.

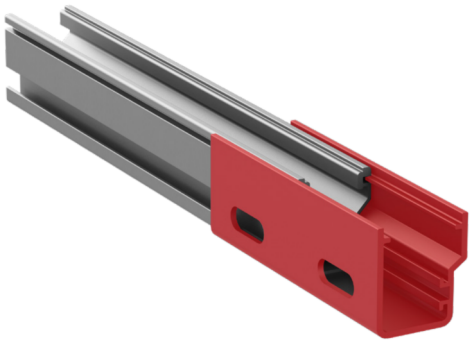
Due to thermal expansion, we recommend placing a gap of 1.25-2.00" (3-5 cm) every 65 ft (20 m) between rails. Maximum allowable spacing between thermal expansion gaps shall not exceed 80 ft (24.4 m).

Note: Rail cantilevers may not exceed 1/3 of the maximum allowable span. Refer to the engineering letters on Everest's website (www.everest-solarsystems.com) for more detail on maximum spans and cantilevers.

Materials required: CrossRail, M10 T-bolt (use bonding T-bolt with dark rail), serrated hex nut

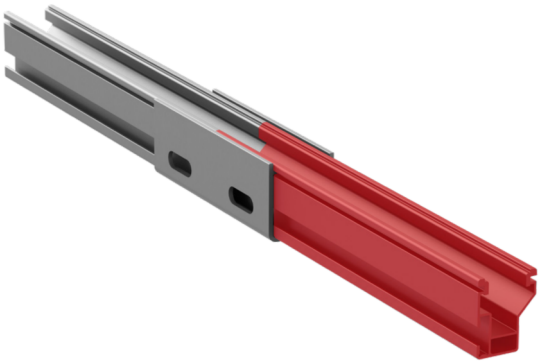
RAIL CONNECTOR INSTALLATION

5 ALIGN RAILS



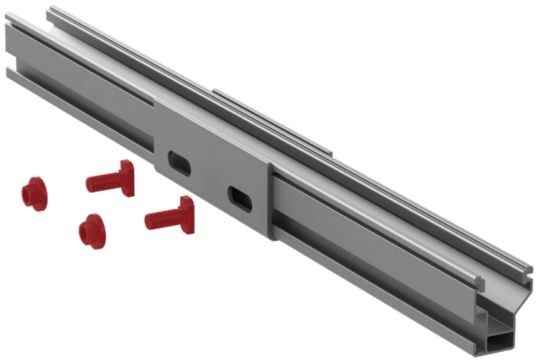
Align the two rail ends next to each other.

6 SLIDE RAIL CONNECTOR



Slide the rail connector from below the rails, centering the connector between the two rail ends. Ensure the rail connector does not interfere with an L-foot or roof attachment.

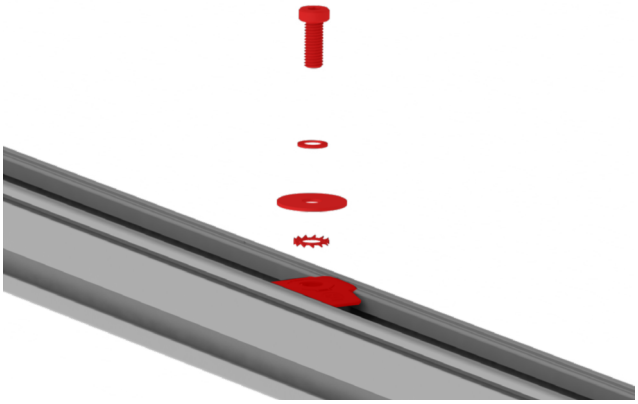
7 CONNECT RAILS



Attach the rail connector using two T-bolts (use bonding T-bolts with dark rail) and serrated hex nuts per side (4 total). Ensure that the slot on the bottom of the T-bolt is vertical, indicating that the T-bolt head is properly engaged in the rail channel.

Torque: 25.8 ft-lb (35 Nm).

8 OPTIONAL: ATTACH MICRO INVERTERS



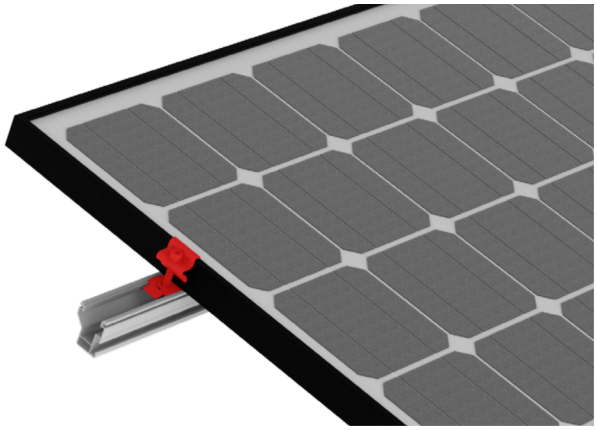
Using the Micro Inverter Mounting Kit Hardware from Everest Solar Systems, attach your chosen device to the top channel of CrossRail. Torque M8 Allen bolt to 10.3 ft-lb (14 Nm).

Note: The inverter hardware kit is not intended to replace the micro inverter ground and has only been evaluated to attach to the rail.

Tightening torque: 10.3 ft-lb (14 Nm)

Materials required: Micro Inverter Mounting Kit includes: M8x20 mm Allen Bolt, M8 lock washer, M8 flat washer, MK3.

9 ATTACH END CLAMPS (FOR HIDDEN END CLAMPS SEE 9B)



Insert the MK3 slot nut of the pre-assembled end clamps into the top channel on CrossRail. While slightly lifting the plastic tabs, rotate 90 degrees clockwise to engage the MK3 into the channel.

Attach the end clamps to the module at the specified locations per the PV module manufacturer's installation instructions. Torque the M8 bolt to 10.3 ft-lb. Ensure the clamp sits flush against the frame of the PV module, the M8.

Never mount end clamps directly over a rail connector or at the end of the rail. Ensure a minimum gap of 1" (20mm) exists from the end of the rail to the clamp.

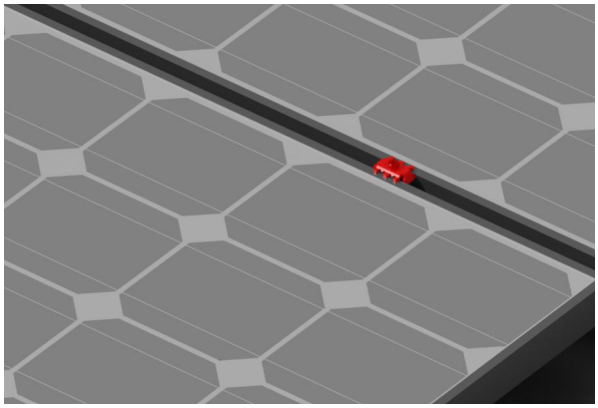
Tightening torque: 10.3 ft-lb (14 Nm).

Important: Verify module manufacturer's mounting requirements and specifications to ensure your selected clamping method is acceptable.

Note: For certain jurisdictions, if clamp tension is released, the clamps need to be relocated on panel to ensure bonding path.

Materials required: End Clamp Set

10 ATTACH MID CLAMPS



Insert the MK3 slot nut of the pre-assembled mid clamps into the top channel on CrossRail. While slightly lifting the plastic tabs, rotate 90 degrees clockwise to engage the MK3 into the channel.

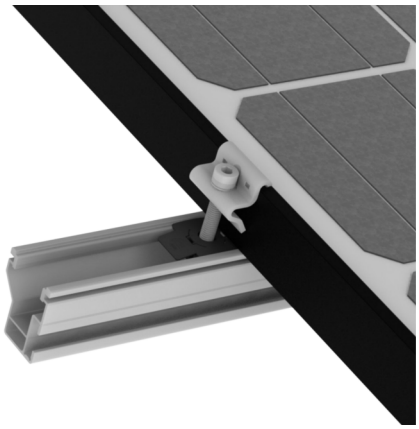
Attach the mid clamps to the module at the specified locations per the PV module manufacturer's installation instructions. Torque the M8 bolt to 12 ft-lbs. Ensure the modules are flush against the clamp, and torque.

Important: Verify module manufacturer's recommended clamping specifications are met.

Note: For certain jurisdictions, if clamp tension is released, the clamps need to be relocated on panel to ensure bonding path.

Materials required: Mid clamp set

11 OPTIONAL: ATTACH END CAPS

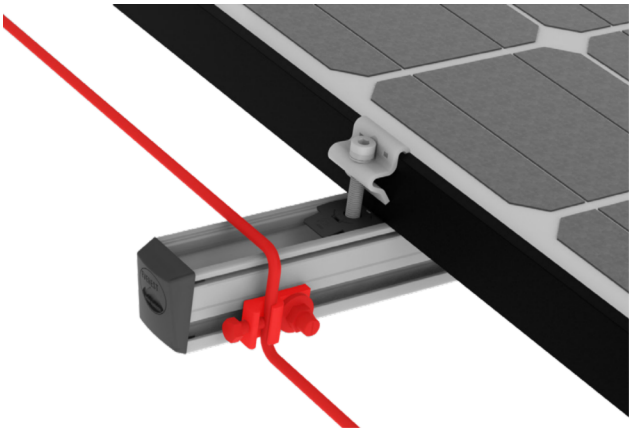


Push the pins of the appropriate end cap into end of the rail.

CrossRail 48-X/XL End Cap shown.

Materials required: End cap

12 SYSTEM GROUNDING



CrossRail components are required to be electrically bonded and grounded via Burndy's WEEB Lug 10.3 Assembly (Burndy P/N 781810537572) and the use of either #6 or #8 AWG solid copper wire. A minimum of one WEEB Lug 10.3 is required per each independent row of modules. The lug must be attached to the side channel of CrossRail, as shown.

To attach the WEEB Lug 10.3, insert the M10 T-Bolt into the side slot on CrossRail and rotate clockwise 90 degrees. Attach the remaining components, as shown, tightening serrated hex nut to 15 ft-lb (20.3 Nm). Once the lug has been installed, a #6 or #8 AWG solid copper wire from a DC ground location external to the array must be inserted in the equipment ground conductor location on the lug. Torque the bolt to 5 ft-lb (6.7 Nm).

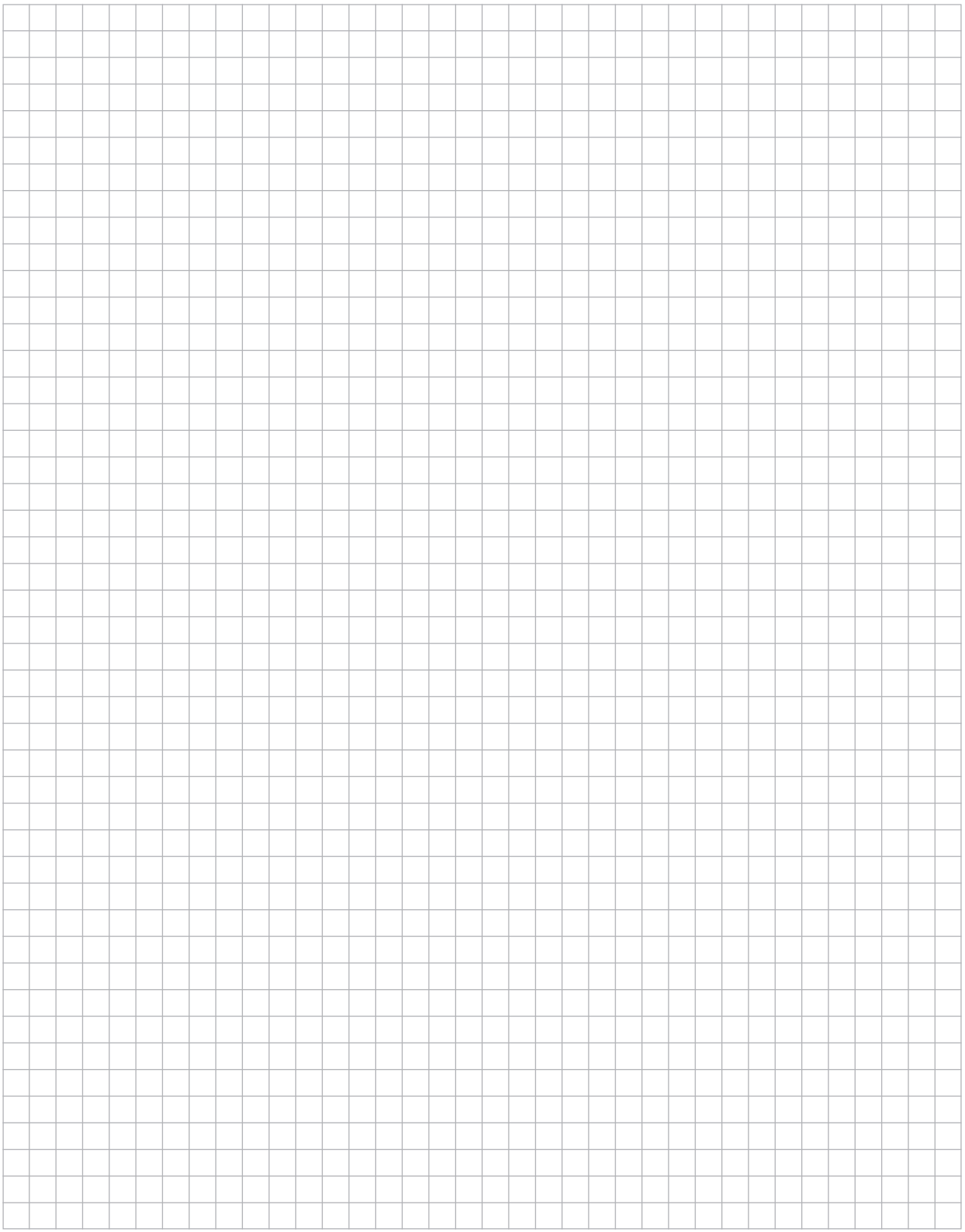
Materials required: **WEEB Lug 10.3**

Note: **Verify with your local jurisdiction that the WEEB Lug 10.3 is considered a single-use item in a UL 2703 Listed System.**

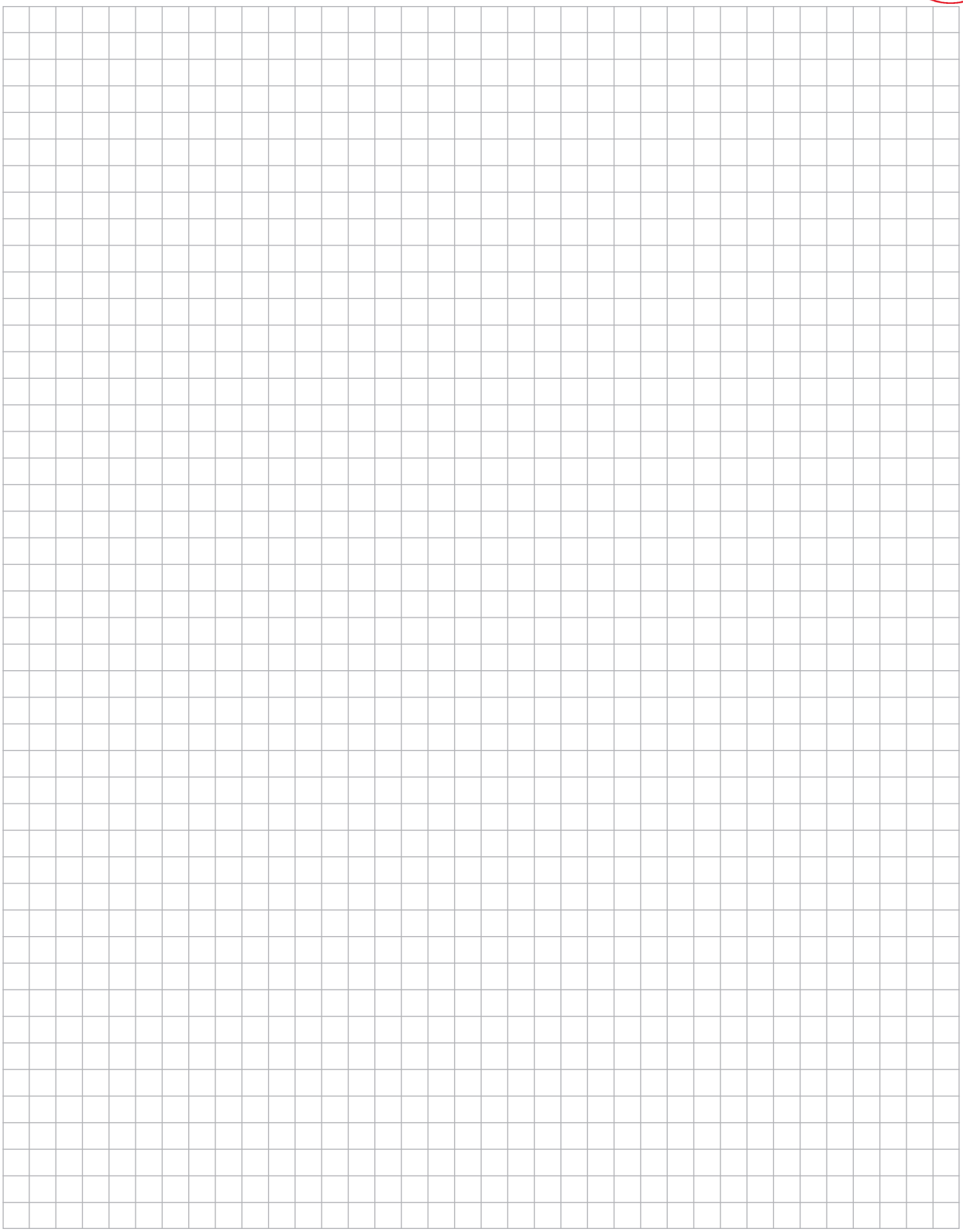
Warning: **Employ best industry practices to ensure that copper does not contact aluminum and galvanized steel.**

Note: **the WEEB Lug 10.3 utilizes a WEEB 11.5 as a bonding washer and thus carries the markings of a WEEB 11.5**

Notes



Notes



THANK YOU FOR CHOOSING AN EVEREST MOUNTING SYSTEM.

Systems from Everest Solar Systems are quick and easy to install. We hope these instructions have helped. Please contact us with any questions or suggestions for improvement.
Our contact information:

- **www.everest-solarsystems.com/contact**
- **Service Hotline: +1.760.301.5300**

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