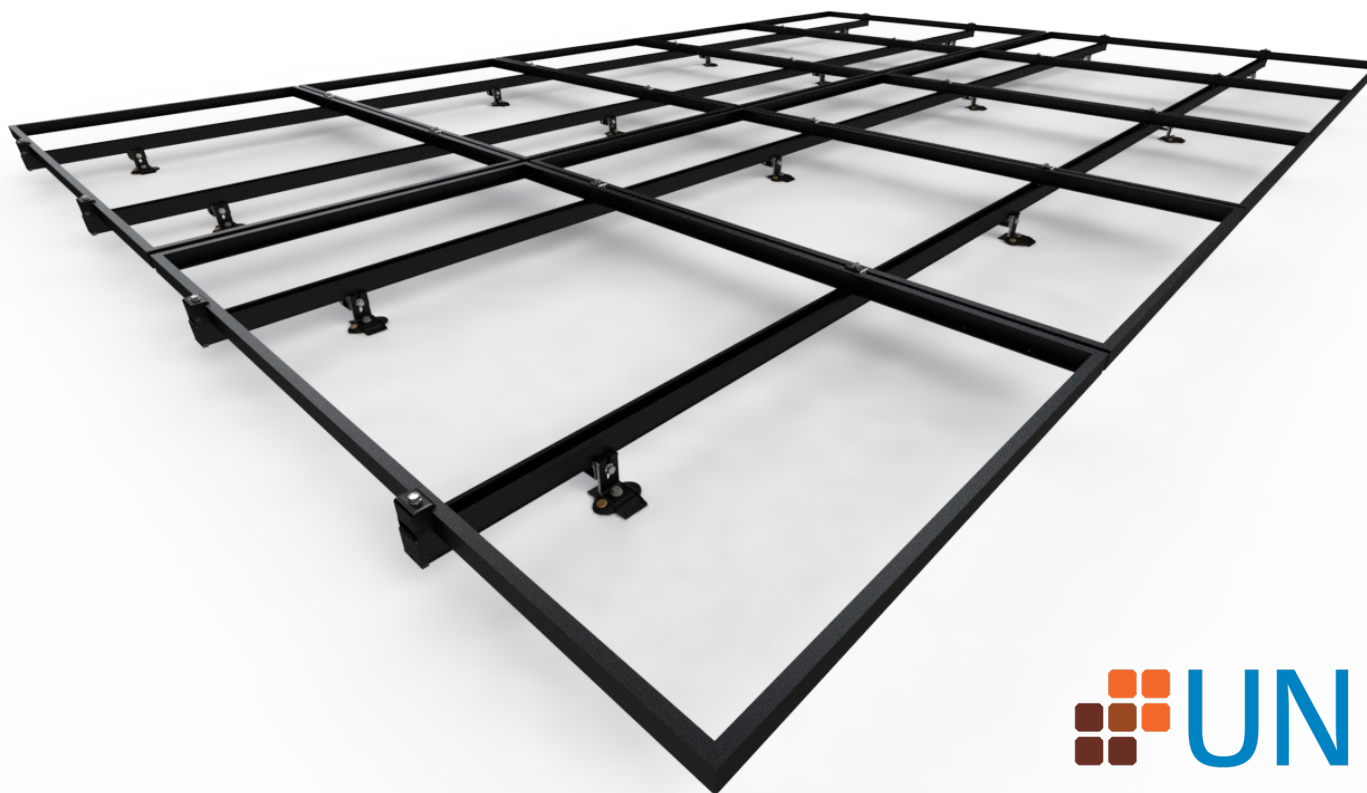


# **NXT** **UMOUNT™** **INSTALLATION GUIDE**

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## UNIRAC Code-Compliant Installation Manual

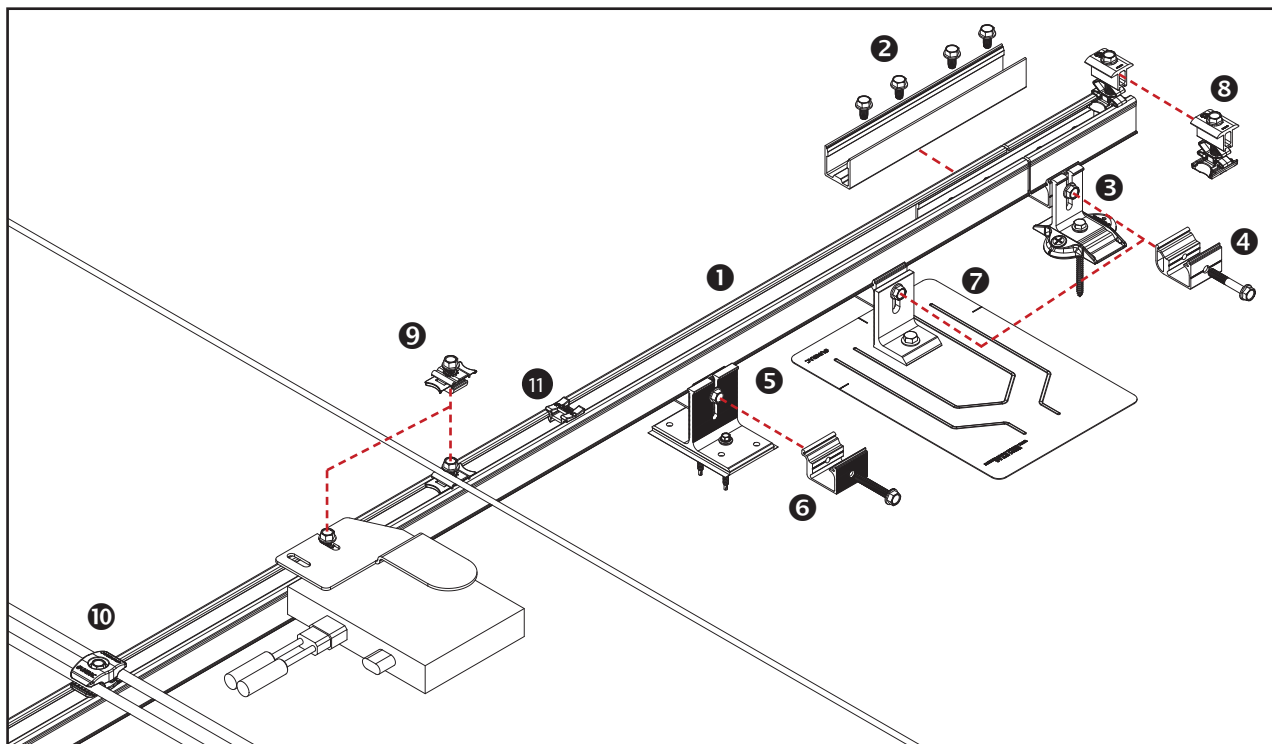
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# **NXT** **UMOUNT<sup>™</sup> INSTALLATION GUIDE**

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- ① **RAIL:** Supports PV modules with built-in wire management. Use at least two rails per row of modules. Aluminum extrusion, available in mill, or dark anodized.
- ② **RAIL SPLICE:** Internal Structural Splice joins, aligns, and electrically bonds rail sections into single length of rail. 10 inches long aluminum splice, pre-assembled with stainless-steel hardware.
- ③ **STRONGHOLD ATTACHMENT KIT:** Use to secure rails through roofing material to building structure. Supplied with the following:
  - ④ **STRONGHOLD RAIL CLAMP:** Use to secure rails to L-feet. Pre-assembled aluminum clamp with stainless-steel bolt.
    - **STRONGHOLD ATTACHMENT BASE:** Pre-assembled aluminum L-Foot with engineered roof seal.
    - **4" STAINLESS-STEEL LAG BOLT** with sealing EPDM washer.
    - **UNIRAC PROVIDED SEALANT** (if applicable)

### ⑤ **STRONGHOLD ATTACHMENT WITH BUTYL KIT:**

Use to secure rails through roofing material to building structure. Supplied with the following:

### ⑥ **STRONGHOLD RAIL CLAMP FOR BUTYL ATTACHMENT:**

Use to secure rails to L-feet. Pre-assembled aluminum clamp with stainless steel bolt.

#### – **STRONGHOLD ATTACHMENT WITH BUTYL BASE:**

Pre-assembled aluminum attachment with butyl pad.

– (2) 2.5" #12-14 Screw, SS, self-drill, W/#12 EPDM washer;

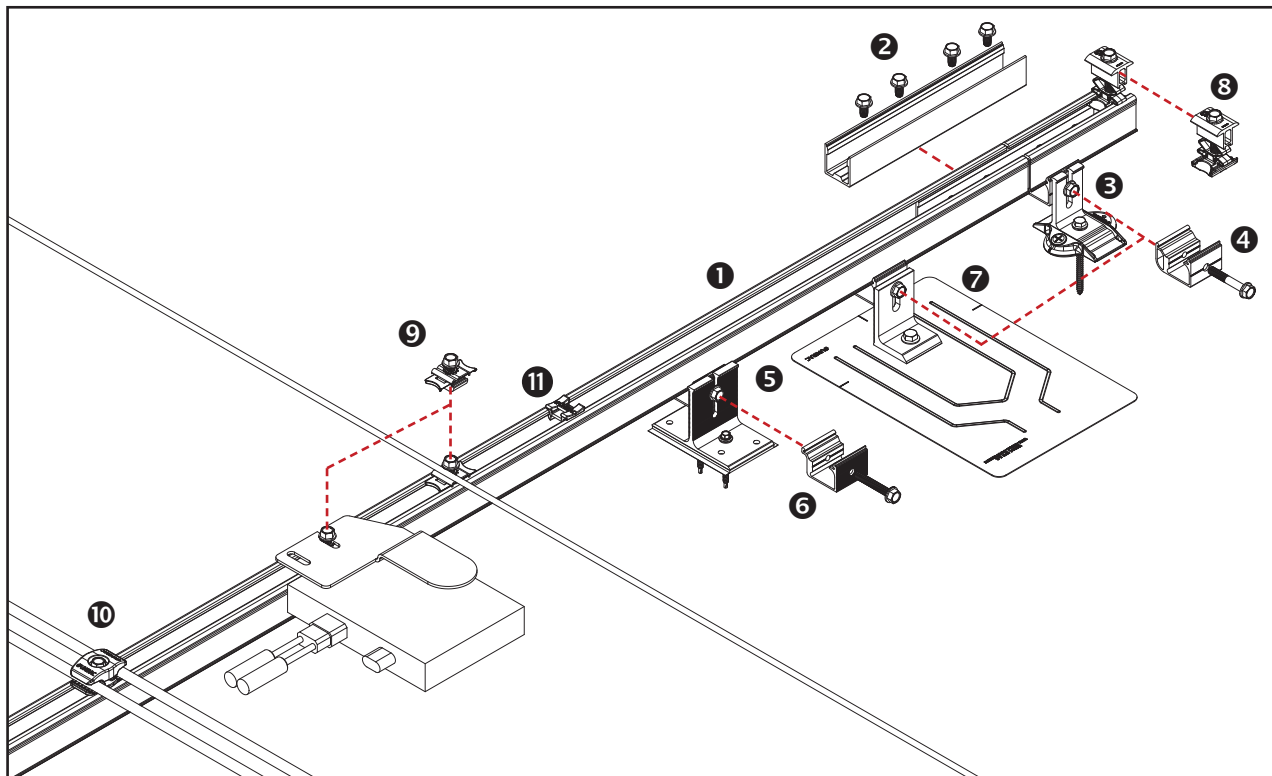
– **UNIRAC PROVIDED BUTYL TAPE** (if applicable)

### NOTE:

- Extra butyl pad available as separate SKU
- Additional deck screws are available as separate SKU



**Any components showing signs of damage that compromise safety shall be replaced immediately.**



- 7 FLASHKIT PRO:** Use with Stronghold Rail Clamp to secure rail through roofing material to building structure. Aluminum L-foot with EPDM grommet, aluminum flashing, and stainless-steel lag bolt
- 8 COMBO CLAMP:** Use as a mid clamp or an end clamp to secure and electrically bond modules to rails. Aluminum clamp with stainless-steel bonding pins, stainless-steel hex bolt, and plastic spring clip. Available in clear or dark finish.
- 9 MLPE AND LUG CLAMP:** Use to secure MLPE devices or ground wires to rails. Pre-assembled clamp with stainless-steel bolt, stainless-steel grounding plate, and plastic retention clip.
- 10 N/S WIRE MANAGEMENT CLIP:** Pre-assembled clamp to secure wires between rails.
- 11 WIRE MANAGEMENT CLIP:** Toolless snap-in rail clip used to retain wires in rail or to secure wires between rails when used with a wire tie.

#### Wrenches and Torque

Component	Wrench or Socket Size	Recommended Torque (ft.-lbs.)
Rail Splice <b>2</b>	1/2"	15
Stronghold Rail Clamp <b>4</b>	1/2"	20
Stronghold Rail Clamp For Butyl Kit <b>6</b>	1/2"	20
Combo Mid-End Clamp <b>8</b>	1/2"	15
MLPE and Lug Clamp <b>9</b>	1/2"	12
NS Wire Management Clip <b>10</b>	1/2"	3-7



**Any components showing signs of damage that compromise safety shall be replaced immediately.**

S.NO.	PART	DESCRIPTION	PART NUMBER
1	RAIL	NXT UMount RAIL - 168" MILL	168RLM1
		NXT UMount RAIL - 168" DARK	168RLD1
2	RAIL SPLICE	NXT UMount RAIL SPLICE	RLSPLCM1 & RLSPLCM2
3	STRONGHOLD ATTACHMENT KIT	STRONGHOLD ATT KIT COMP MILL	SHCPKTM1
		STRONGHOLD ATT KIT COMP DRK	SHCPKTD1
4	STRONGHOLD RAIL CLAMP	STRONGHOLD RAIL CLAMP MILL	SHCLMPM1
		STRONGHOLD RAIL CLAMP DRK	SHCLMPD1
5	STRONGHOLD ATTACHMENT WITH BUTYL KIT	STRONGHOLD ATTACHMENT WITH BUTYL MILL	SBUTYLM1
		STRONGHOLD ATTACHMENT WITH BUTYL DARK	SBUTYLD1
6	STRONGHOLD RAIL CLAMP FOR BUTYL ATTACHMENT	STRONGHOLD RAIL CLAMP MILL	SHCLMPM2
		STRONGHOLD RAIL CLAMP DRK	SHCLMPD2
7	FLASHKIT PRO	FLASHKIT PRO, DRK 10PK	004055D
		FLASHKIT PRO, MILL 10PK	004055M
8	COMBO CLAMP	NXT UMount COMBO CLAMP - MILL	CCLAMPM1
		NXT UMount COMBO CLAMP - DARK	CCLAMPD1
9	MLPE AND LUG CLAMP	NXT UMount MLPE & LUG CLAMP	LUGMLPE1
10	N/S WIRE MANAGEMENT CLIP	NXT UMount NS WIRE MGMT CLIP	WRMCNSD1
11	WIRE MANAGEMENT CLIP	NXT UMount WIRE MGMT CLIP	WRMCLPD1
12	N-S BONDING CLAMP	MODULE-TO-MODULE N-S BONDING CLAMP	008000U
13	WIRE BONDING CLIP W/ 8AWG	WIRE BONDING CLIP W/ 8AWG	008015S

### PLANNING YOUR NXT UMount INSTALLATIONS

The installation can be laid out with rails parallel to the rafters or perpendicular to the rafters. Note that NXT UMount rails make excellent straight edges for doing layouts.

Center the installation area over the structural members as much as possible. Leave enough room to safely move around the array during installation. Some building codes and fire codes require minimum clearances around such installations, and the installer should check local building code requirements for compliance.

The length of the installation area is equal to:

- the total width of the modules,
- plus 1/2" for each space between modules (for mid-clamp),
- plus 2" minimum (1" minimum for each MODULE END)

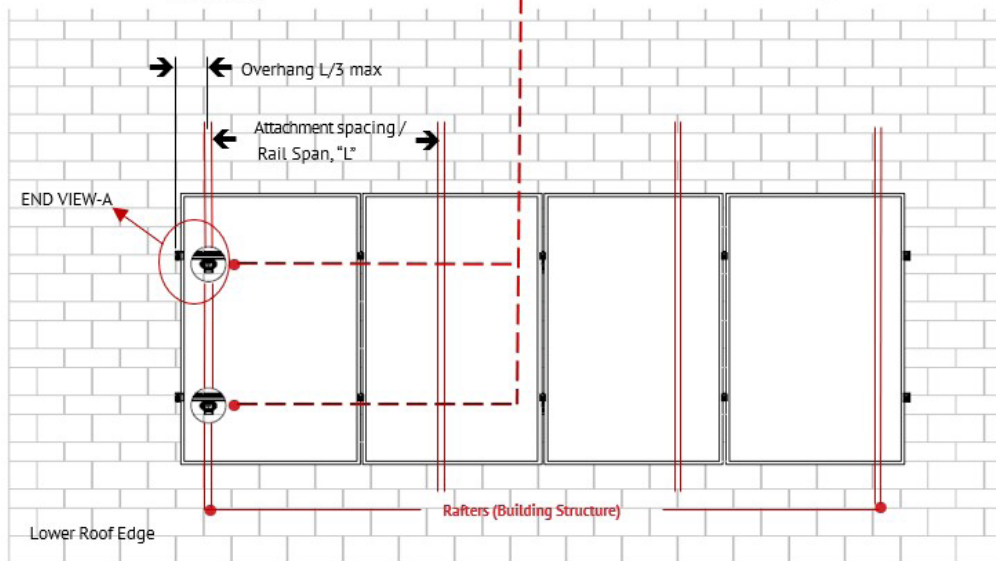
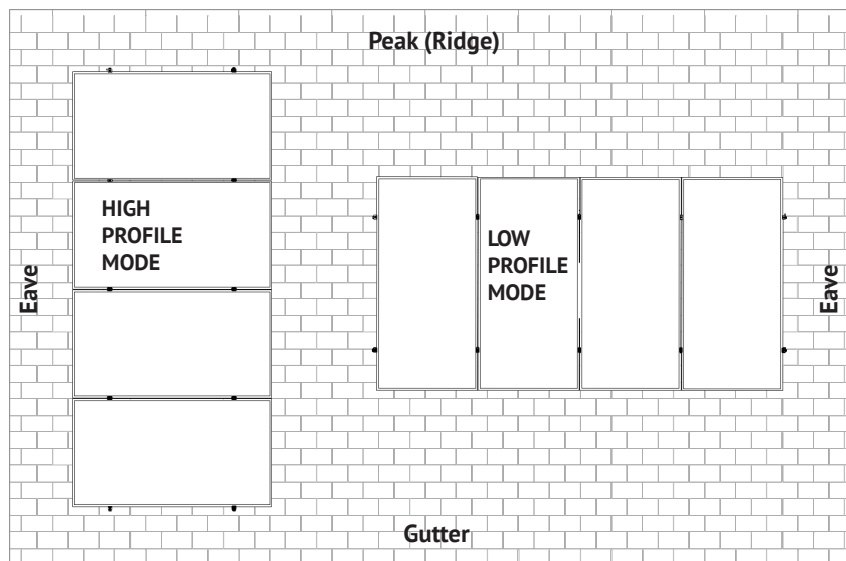
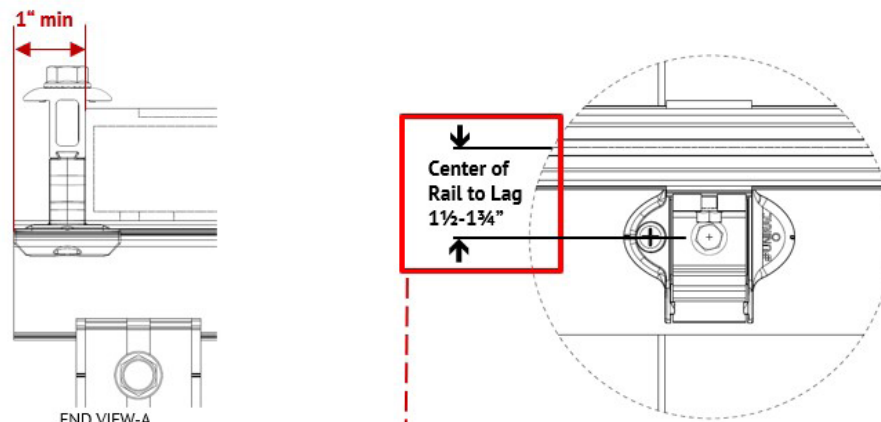
### LAYING OUT ROOF ATTACHMENTS

Locate and mark the position of the roof attachment within the installation area. Refer to Unirac NXT UMount D&E Guide & U-Builder for rail spans and cantilevers. Follow module manufacturer installation requirements allowable spacing based on appropriate mounting locations. Modules should be placed such that they overhang the rails symmetrically.

NXT Rail Splices are fully structural and do not interfere with roof attachments or Combo Clamps. There is no need to determine splice locations at this stage.



**Rail lengths and locations of L-feet for expansion joints will need to be determined at this stage in planning the array layout. For expansion joint requirements, See Page 5.**

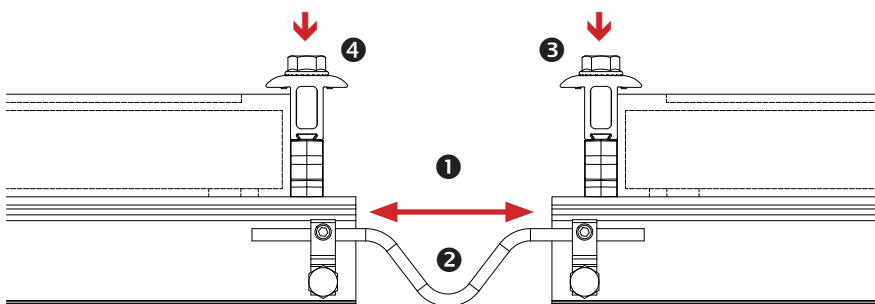


## EXPANSION JOINT USED AS THERMAL BREAK

Expansion joints prevent buckling of rails or system connection failure due to thermal expansion. Determine location of expansion joints prior to installation of roof attachments and rails. To create a thermal expansion joint, provide a sufficient gap between rails for proper installation of end clamps and tooling to achieve required torque. A thermal break is required when a continuous length of spliced rails exceeds the maximum allowable lengths shown in the table to the right. For additional concerns on thermal breaks in your specific project, please consult a licensed structural engineer.

Rails in expansion joint configurations are considered cantilevered and must follow the cantilever rule on both sides of the expansion joint, which states that the maximum amount of rail that can be cantilevered is 1/3 the respective adjacent span. An expansion joint must not be spanned by a PV module. Installing a module over an expansion joint would defeat the goal of a thermal break and could result in damage to the array.

**Bonding connection for splice used as a thermal break. Option shown uses two Ilco lugs (Model No. GBL-4DBT P/N GBL-4DBT - see product data sheet for more details) and solid copper wire. Optional grounding may be achieved through NXT UMount MLPE & Lug Clamp. See Page 16.**



- ① Provide a sufficient gap between rails for proper installation of end clamps and tooling
- ② Connect rails with the bonding wire.
- ③, ④ Install end clamps. **See Page 19.**

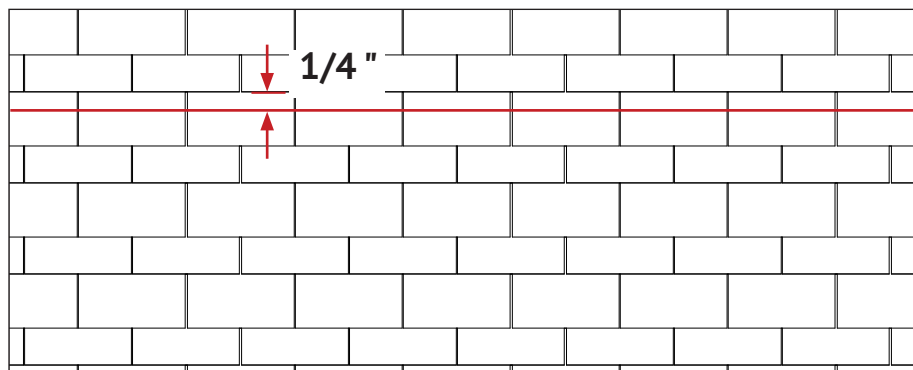
$\Delta T$ (°F)	Maximum continuous length (ft.) of spliced rails with Stronghold Attachments			
	Flashkit Attachment Span		Stronghold Attachment Span	
	48"	72"	48"	72"
0-40	102	129	94	117
40-50	94	117	86	105
50-60	86	105	78	93
60-70	78	93	70	81
70-80	70	93	62	80
80-90	70	81	62	69
90-100	62	80	54	64
100-120	62	66	53	53
120-140	54	57	45	45

The values displayed are the maximum allowed rail length, in feet, without a thermal break. If your span is less than 48", refer to the NXT UMount Design & Engineering Guide for max lengths of continuous rail before a thermal break is required.

Determine the maximum rail temperature difference ( $\Delta T$ ) between the time of installation and the extreme high or low temperature. The Extreme Annual Design Conditions table at the following URL can be used as a reference when determining  $\Delta T$ . <http://ashrae-meteo.info/>. The installer is responsible for determining the maximum temperature difference ( $\Delta T$ ) used to establish the maximum rail length.

As spans increase, so does the maximum reaction force that the rail exerts on the L-foot. Ensuring that the Maximum Reaction Forces do not exceed the shear capacity of the roof connection. See NXT UMount Design & Engineering Guide for corresponding reaction forces.



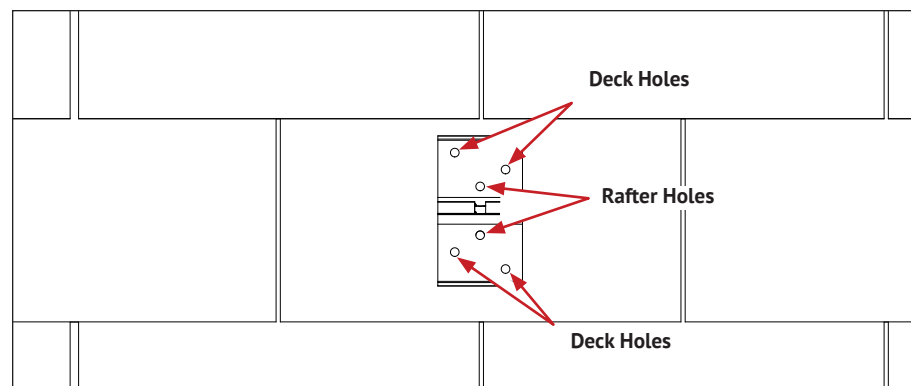


#### MARK ARRAY LOCATION:

Clean roof surface of dirt, debris, snow, and ice. Mark array location and determine roof attachment locations based on array layout. Snap chalk lines to mark each row of roof attachment points. On shingle roofs, snap lines 1/4" below upslope edge of shingle course. Locate rafters and mark at intersection of attachment lines. Attachment spacing determined per Design and Engineering Guide or project specific U-Builder Engineering Report .

#### NOTE:

Pilot holes are not necessary to be drilled for self-drilling screws. But if holes are drilled to identify the rafter, they should be backfilled with sealant before installing the attachment.



#### PLACING STRONGHOLD ATTACHMENT WITH BUTYL BASE:

Identify the position of the attachment to install before peeling the release paper.

Ensure that the attachment lands on a flat surface. If the surface at the location of the attachment is uneven, add butyl patches to flatten the surface.

#### CAUTION

**Do not peel the release paper from the butyl on attachment before identifying the position of attachment to install.**

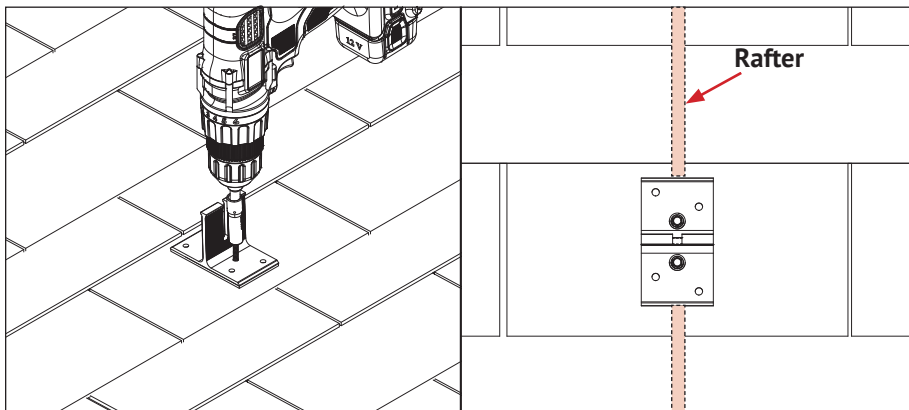
#### WARNING

**Installing attachment on uneven surfaces, shingle gaps or overlaps, creates a risk for water leakage due to gap created between the adhesive and roof surface.**

#### Note:

See Page 8 for instructions on placing extra butyl pads or contact Unirac team for further information.





### INSTALLING STRONGHOLD ATTACHMENT WITH BUTYL BASE TO RAFTER:

Peel-off the release paper from the underside of the attachment and place stronghold attachment with butyl over rafter location and align edge of mount with horizontal chalk line. Secure mount with the two (2) provided rafter screws in the rafter holes of the attachment.

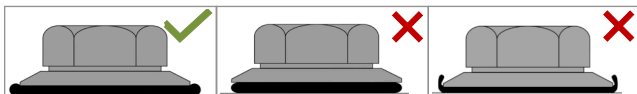
#### Note:

Ensure to use drill extension or deep socket tool for installing rafter screws.

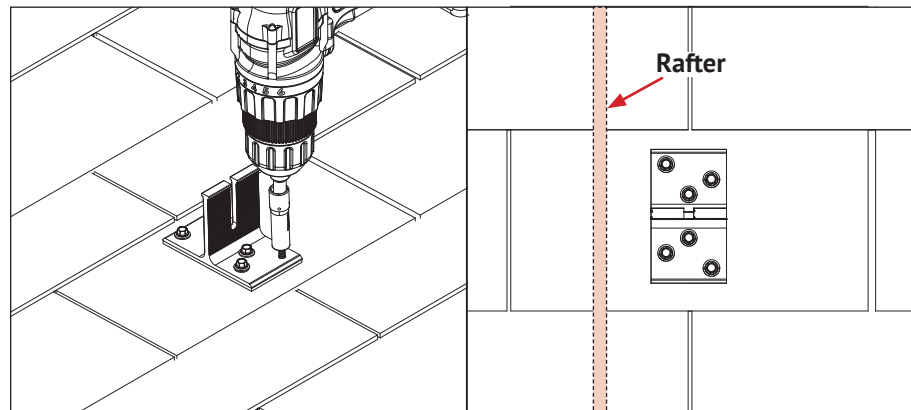
#### CAUTION

- To determine if the screw is engaging the rafter, there should be resistance to driving the screw through the entire length. If the screws do not properly engage the rafter, install the 4 additional deck screws.
- It is recommended to begin installation with the screws on the upslope side of the attachment and continue installing the screws on the downslope side of the attachment for best fit.

#### WARNING



Do not over-torque the structural screw.  
When proper torque is applied, the EPDM washer should slightly expand out from the sides as shown in the image.



### INSTALLING STRONGHOLD ATTACHMENT WITH BUTYL BASE TO DECK:

When installing the attachment to the decking instead of the rafter (direct-to-deck), install 4 additional screws on the remaining screw holes on the attachment

#### Note:

- Additional deck screws are NOT included in the KIT. Must be purchased separately.
- Pre-stock with additional screws in case going direct-to-deck.

#### CAUTION

1. Allowable attachment spans may change for direct-to-deck applications.
2. Unirac recommended spans are only valid with Unirac supplied screws.



# NXT

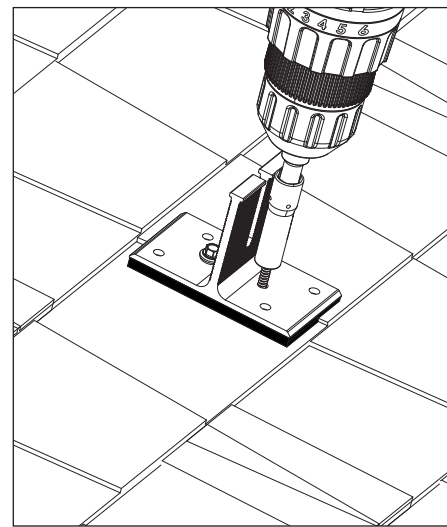
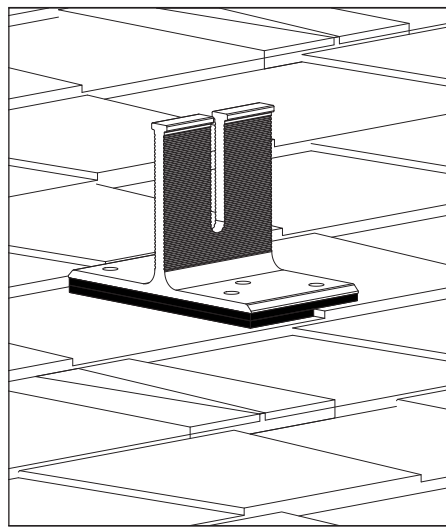
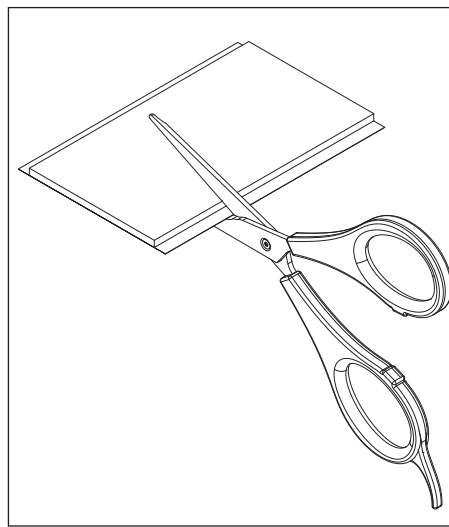
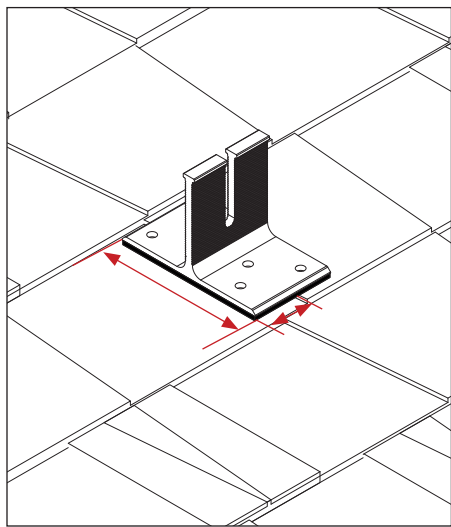
# UMOUNT™

## STRONGHOLD ATTACHMENT WITH BUTYL

## INSTALLATION GUIDE

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PAGE



### INSTALLING STRONGHOLD DTD BUTYL ATTACHMENT OVER SHINGLE OVERLAP OR GAP

If the attachment falls over a shingle overlap, level the surface by following below steps:

- Measure the attachment overhang.
- Cut the butyl pads to required size.
- Stack extra butyl pad layers as necessary to level the roof and place the attachment.
- Begin installation with the screws on the upslope side of the attachment and continue to install the screws on the downslope side of the attachment.

### PRO TIP

If the attachments overlap from one shingle course to the next shingle course in a rail-based system, reposition the attachment by moving up or down the shingle course along the same rafter line to avoid butyl layering.

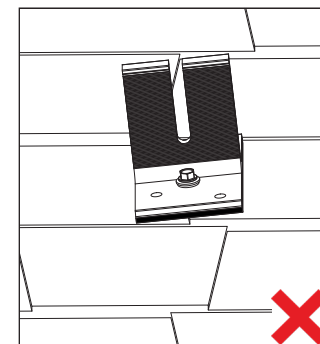
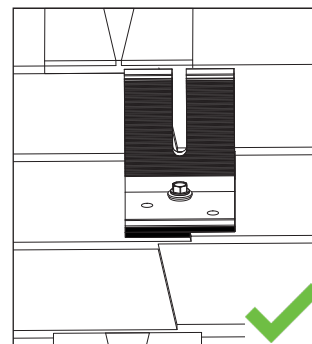
### Note:

- Extra butyl pads are NOT included in the KIT.
- Pre-stock with extra butyl pads from Unirac Kits in case installation is required over overlap or gap.



**WARNING**

Installing attachment on uneven surfaces, shingle gaps or overlaps, creates a risk for water leakage and rail clamp misalignment due to gap created between the adhesive and roof surface.



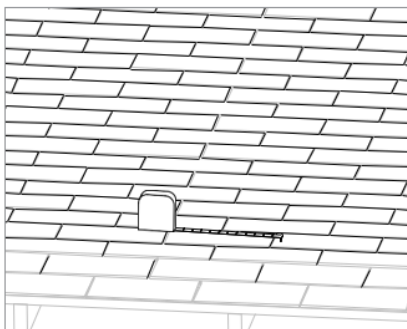


# UMOUNT<sup>TM</sup>

## ROOF PREP FOR LAG BOLT INSTALL INSTALLATION GUIDE

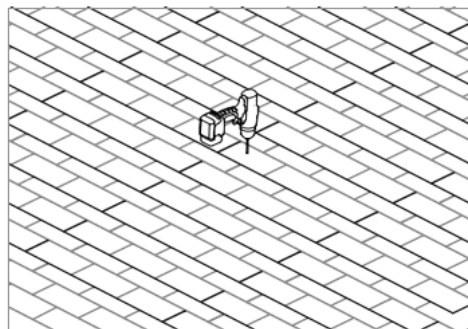
9

PAGE



### MARK ARRAY LOCATION:

Mark array location and determine roof attachment locations based on array layout. Snap chalk lines to mark each row of roof attachment points. On shingle roofs, snap lines 1-3/4" below upslope edge of shingle course. Locate rafters and mark at intersection of attachment lines. Attachment spacing determined per Design and Engineering Guide or project specific U-Builder Engineering Report.



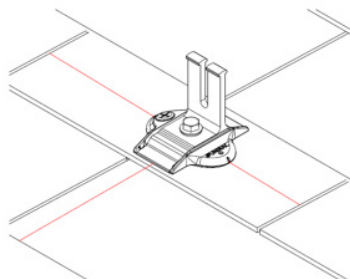
**DRILL PILOT HOLES:** Drill a 7/32" pilot hole at each roof attachment. Clean roof surface of dirt, debris, snow, and ice. Fill each pilot hole with sealant.



**In case of missing a rafter, fill in the pilot hole with sealant.**

### Pro Tip:

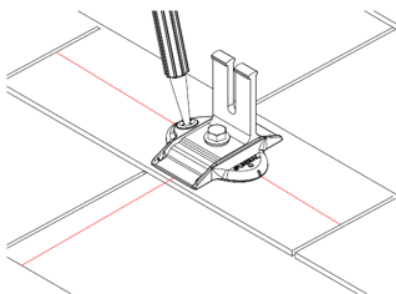
**Drill pilot holes within 1/4" of chalkline to allow rail to slide freely in Rail Clamps. See Page 14.**



#### INSTALL STRONGHOLD ATTACHMENT BASE:

Place the Stronghold attachment base assembly over the pilot hole. Align indicator marks of mount with chalk line. Drive lag bolt until mount is held firmly in place. The EPDM washer should compress and expand slightly beyond the outside edge of the steel washer when the proper torque is applied.

**Note:** Rail clamp can be installed in four orientations. See Page 12 for a detailed view.

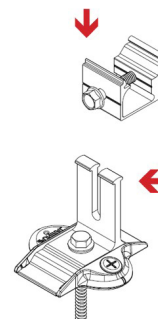


#### SEAL:

Insert tip of UNIRAC provided sealant into port. Inject until sealant exits vent. Follow sealant manufacturer's instructions and cold weather application guidelines, if applicable.

#### Note:

**USE ONLY UNIRAC APPROVED SEALANTS:** Chemlink Duralink 50, Chemlink M-1, Geocel 4500, Geocel S-4 or SealBond SB-500. Follow sealant manufacturer's instructions and cold weather application guidelines.



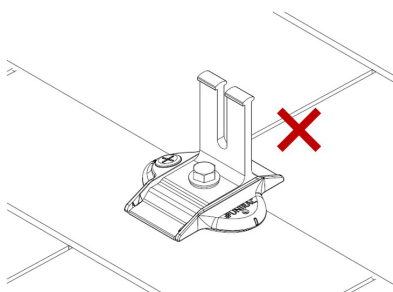
#### PLACE RAIL CLAMP ONTO L-FOOT:

Drop the rail clamp assembly into the open slot of L-Foot.



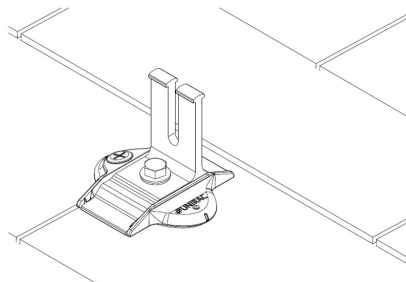
**CAUTION**

**Do not tighten the rail clamp before putting in the rail.**



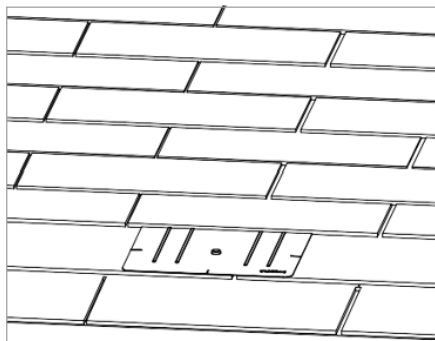
**CAUTION**

Avoid installing stronghold attachments across gaps or overlaps in roofing materials that are larger than 1/8 inch.



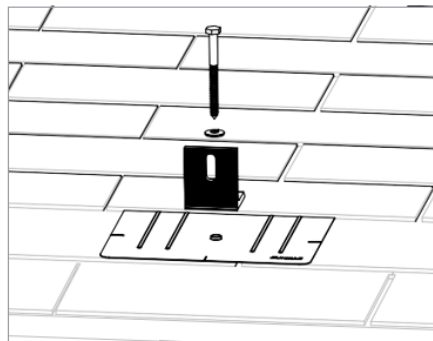
**CAUTION**

When installing the stronghold attachment over vertical joints, fill gap/joint with sealant between mount and upslope edge of shingle course.



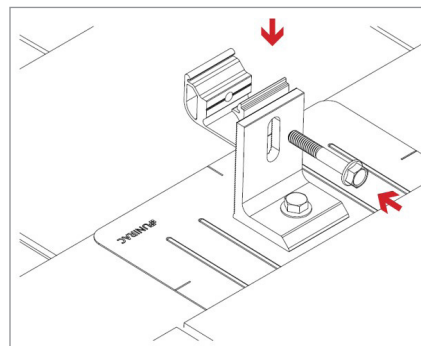
### INSTALL FLASHKIT PRO FLASHING:

Add a U-shaped bead of roof sealant to the underside of the flashing with the open side of the U pointing down the roof slope. Slide the aluminum flashing underneath the row of shingles directly up slope from the pilot hole as shown. Align the indicator marks on the lower end of the flashing with the chalk lines on the roof to center the raised hole in the flashing over the pilot hole in the roof. When installed correctly, the flashing will extend under the two courses of shingles above the pilot hole.



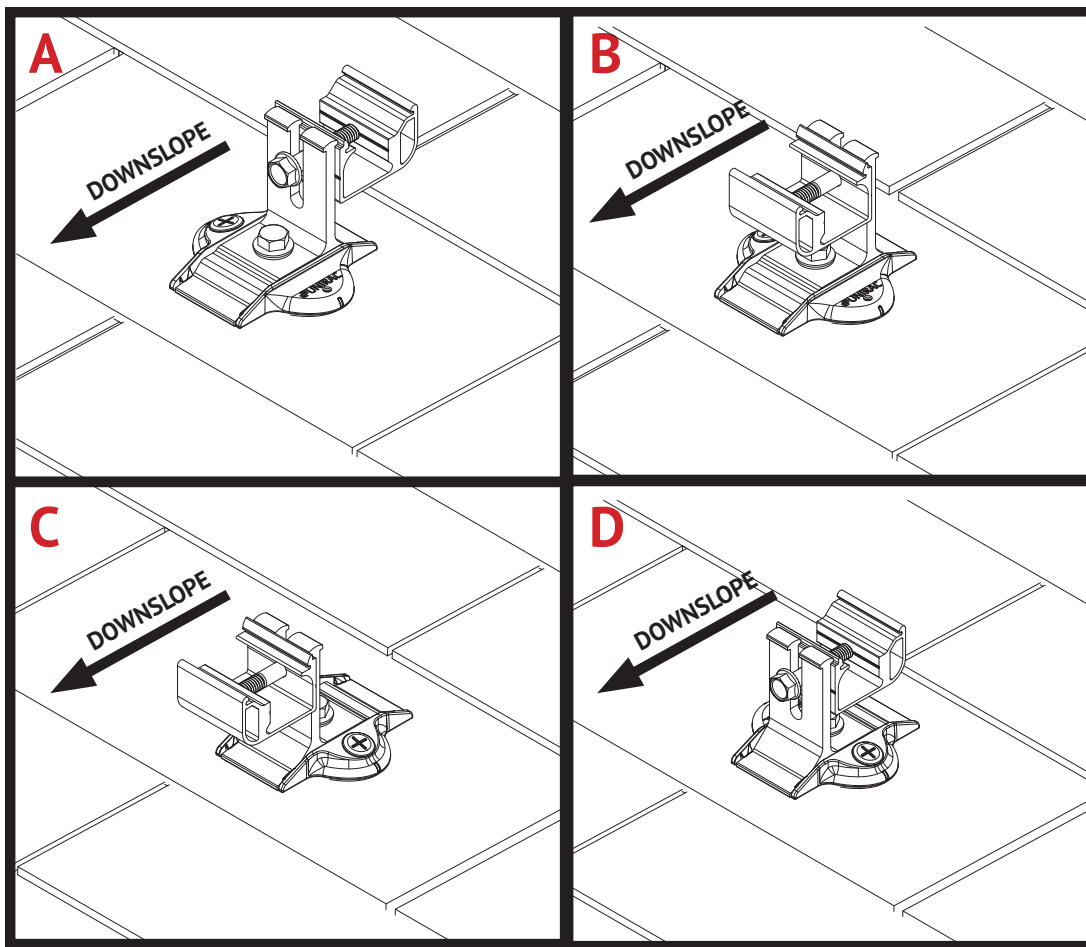
**INSTALL L-FOOT:** Fasten L-foot and flashing into place by passing the included lag bolt and pre-installed stainless steel-backed EPDM washer through the L-foot EPDM grommet, and the hole in the flashing, into the pilot hole in the roof rafter. Drive the lag bolt down until the L-foot is held firmly in place. The EPDM washer should compress and expand slightly beyond the outside edge of the steel washer when the proper torque is applied.

**Note:** FLASHKIT PRO L-FOOT can be installed in TWO orientations. See Page 13 for detailed view.



**FIX RAIL CLAMP ONTO L-FOOT:** Remove bolt from rail clamp. Place bolt through slot in L-foot and through hole in Rail Clamp. Partially thread bolt into rail clamp, leaving the bolt loose to accept the rail.

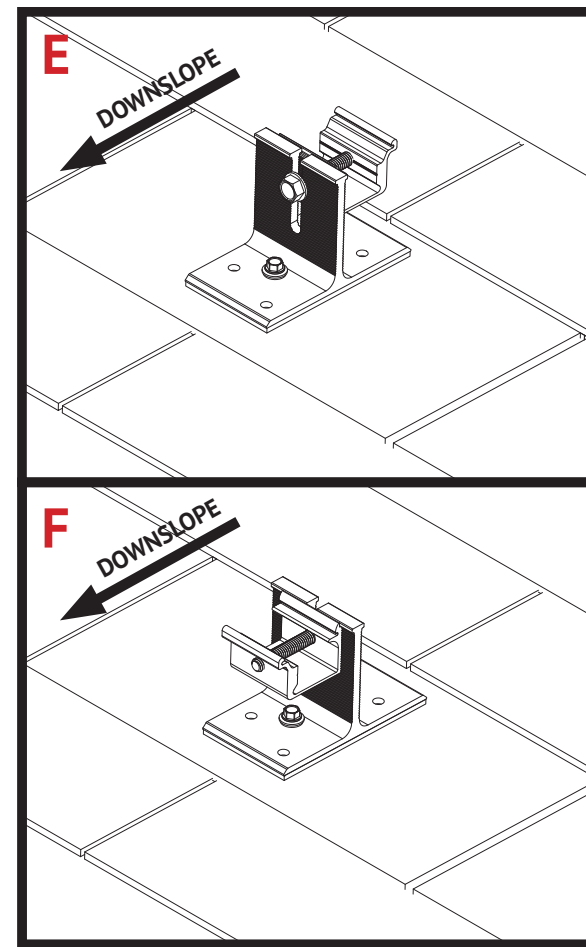
**Note:** Rail Clamp can be installed on any standard L-foot.



## STRONGHOLD ATTACHMENT AND RAIL CLAMP ORIENTATIONS:

The Stronghold Attachment and Rail Clamp can be installed in any of four possible orientations, shown in images (A) through (D) above.

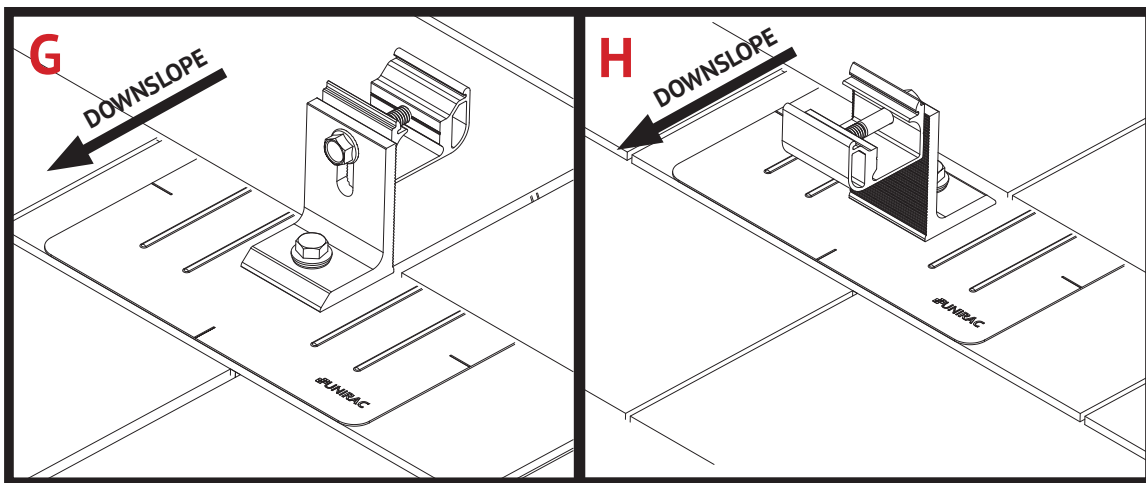
**Note:** For high snow loads, use orientations (C) or (D). Refer to NXT UMount Design and Engineering Guide for specific requirements.



## STRONGHOLD ATTACHMENT WITH BUTYL AND RAIL CLAMP ORIENTATIONS:

Stronghold Attachment with Butyl and Rail Clamp can be installed in either orientation shown in image (E) and (F) above.

**Note:** For high snow loads, use orientation (F). Refer to NXT UMount Design and Engineering Guide for specific requirements.

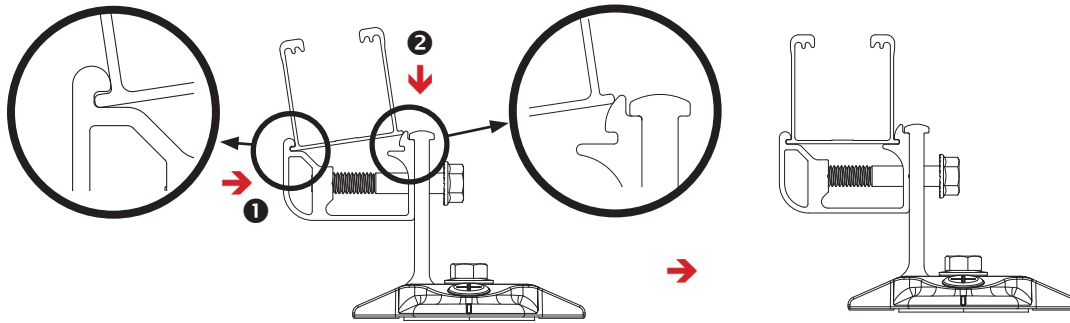


### FLASHKIT PRO L-FOOT AND RAIL CLAMP ORIENTATIONS:

Flashkit Pro L-foot and Rail Clamp can be installed in either orientation shown in image (G) and (H) above.

**Note:** For high snow loads, use orientation (H). Refer to NXT UMOUNT Design and Engineering Guide for specific requirements.



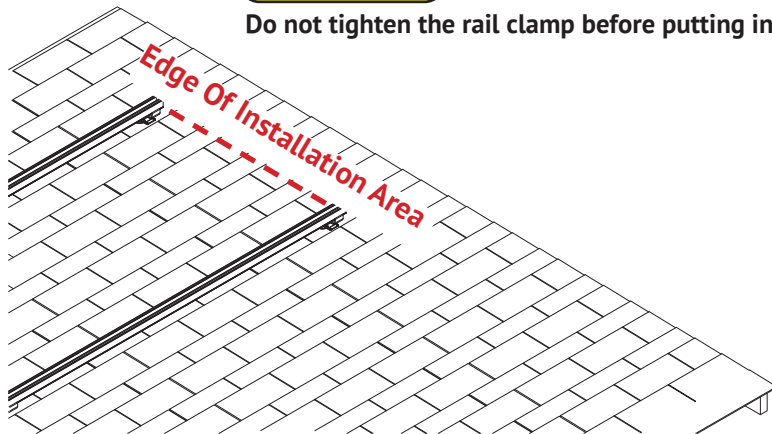


### POSITION RAIL ONTO RAIL CLAMP:

With the bolt in the pre-assembled (loose) position, Insert the rail flange on one side of the clamp groove. Then click-in the other side of the rail into the clamp groove.

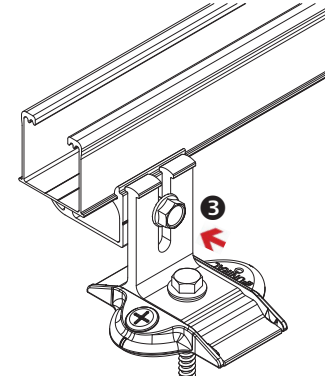


**Do not tighten the rail clamp before putting in the rail.**



**ALIGN RAILS:** Align one pair of rail ends to the edge of the installation area. The opposite pair of rail ends will overhang installation area. Do not trim them off until the installation is complete. Install the first module at the aligned end. If the rails are parallel to the rafters, the aligned end of the rails should face the lower edge of the roof. Securely tighten all hardware after alignment is complete.

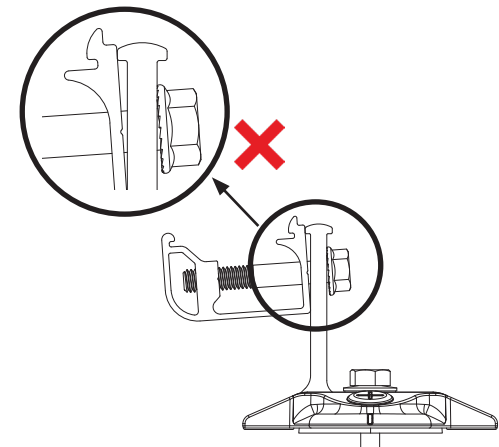
Mount modules to the rails as soon as possible. Large temperature changes may bow the rails within a few hours if module placement is delayed.



### TIGHTEN RAIL ONTO RAIL CLAMP :

Adjust the rail height as needed until rail alignment is complete and tighten bolt.

**TORQUE VALUE: 20 ft-lbs.**



**Rail clamp must be flush to the L-foot and positioned below the flange at the top of the L-foot.**

### SPLICE INSTALLATION (IF REQUIRED PER SYSTEM DESIGN)

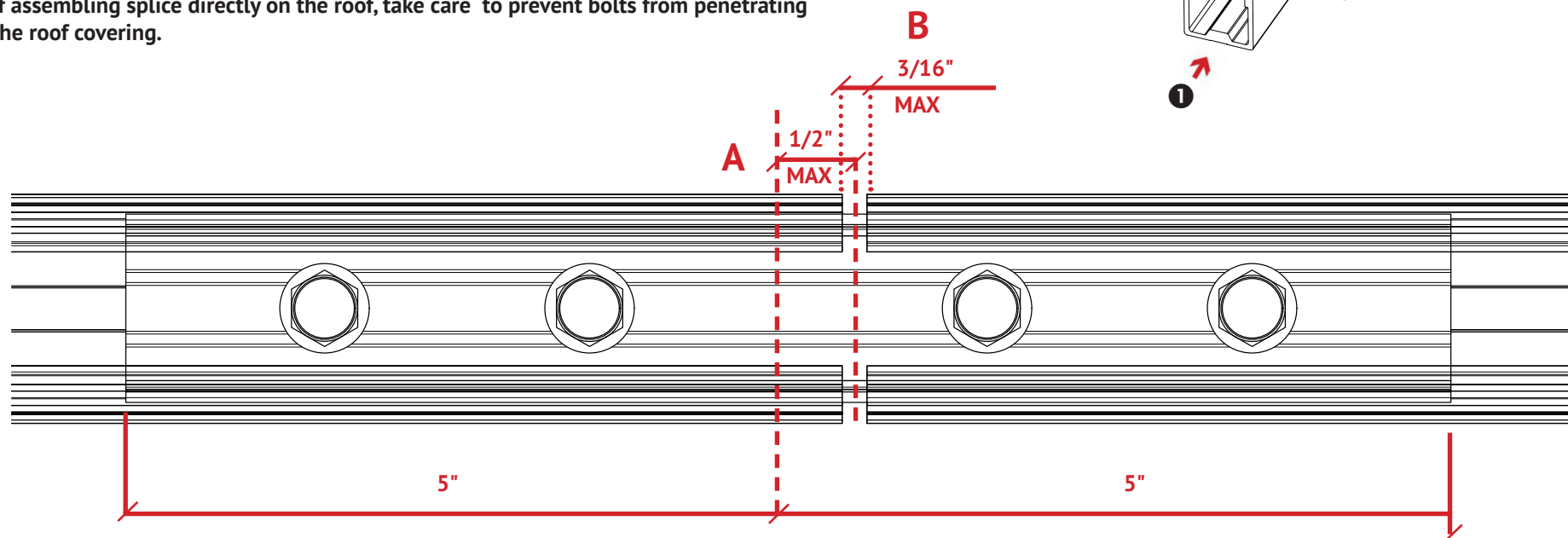
If your installation uses NXT UMount Rail Splice, attach the rails together either before installing the rail or after. There can be a gap between rails, up to  $\frac{3}{16}$ " at the splice connections. To install, slide the splice into the rail on each rail, centering the splice between the two rails. Tighten both bolts on each rail with an impact drill, pressing firmly until the bolthead is flush against the splice and torqued to 15 ft-lbs. Installation is complete when the bonding hardware penetrates the opposite side of the rail, and the assembly torque is achieved.

①, ②, ③ are the steps of installation.

**TORQUE VALUE: 15 ft-lbs. Do not use Anti-Seize.**

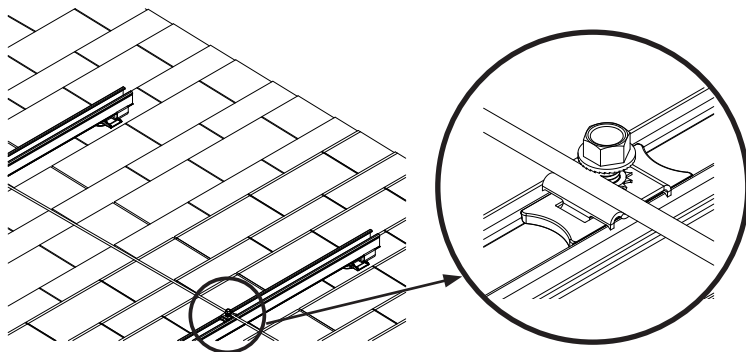


If assembling splice directly on the roof, take care to prevent bolts from penetrating the roof covering.



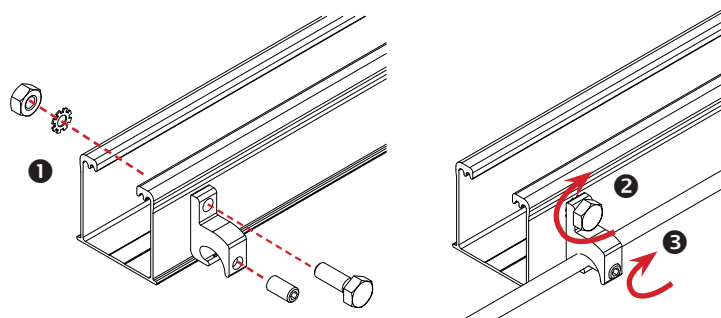
#### Note:

1. Maximum off-center distance of splice should not exceed  $\frac{1}{2}$ " on either rail
2. Maximum gap between rails should not exceed  $\frac{3}{16}$ " at splice connection
3. Splice certified for single-use only



**SYSTEM GROUNDING:** Rails can be bonded using an NXT UMount MLPE & Lug Clamp, GROUND WEEBLUG #1 or ILSCO LAY IN LUG (GBL4DBT). At least one rail per row of modules in an array must be bonded to electrical ground. Each additional row of modules must be grounded with at least one rail lug per row or with a row-to-row bonding device listed here.

**Note:** See Page 5 for additional lugs required for expansion joints.



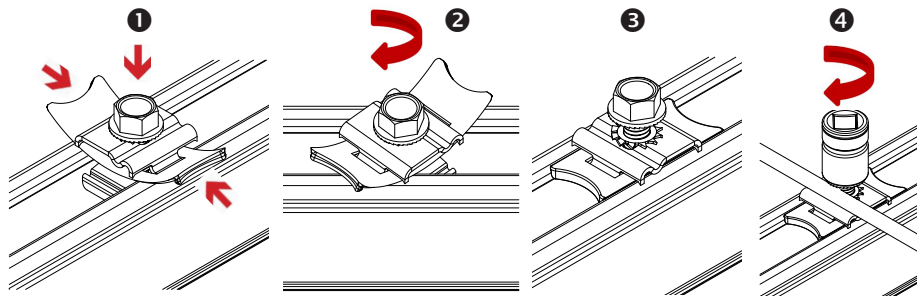
**ALTERNATE SYSTEM GROUNDING WITH ILSCO LAY-IN LUG - UNIRAC P/N 008009P:**  
Alternate Grounding Lug. Drill hole in rail 7/32" in diameter, deburr hole and bolt through one wall of rail.

**BOLT TORQUE VALUE:** 5 ft lbs.

**TERMINAL TORQUE:** 4-6 AWG: 35in-lbs, 8 AWG: 25 in-lbs.



**WARNING**  
Ensure Copper does contact Aluminum to avoid corrosion.

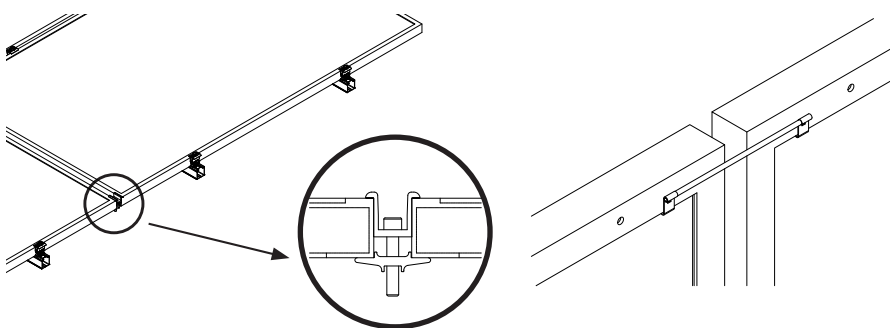


**SYSTEM GROUNDING WITH MLPE & LUG CLAMP:** Insert the rail nut profile in the opening by lifting the flaps of the plastic clip. Rotate the clamp 90 deg and release the flaps to get flush with rail. Ensure that the rail nut is engaged in the rail profile. Align the ground wire in the depression of the washer. Tighten bolt.

**TORQUE VALUE:** 6-8 AWG: 12 ft lbs.



**CAUTION**  
MLPE & Lug Clamp cannot be used to simultaneously mount a MLPE and ground wire.



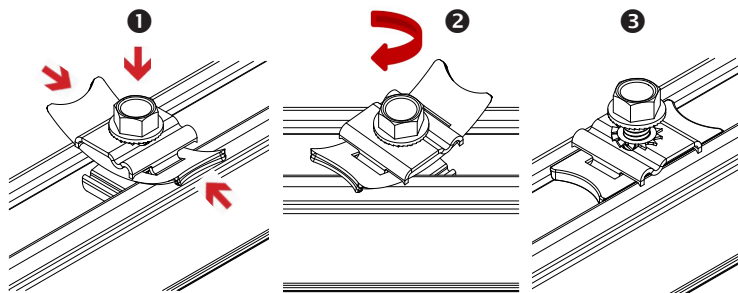
**ALTERNATE ROW GROUNDING WITH N/S BONDING CLAMP:**

Insert clamp between module rows and tighten bolt.

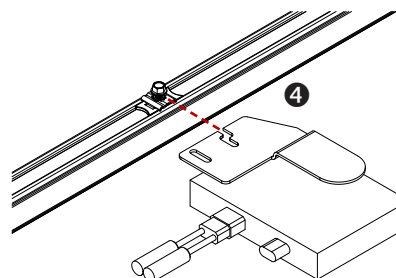
**TORQUE VALUE:** 20 ft-lbs.

**ALTERNATE ROW GROUNDING WITH N/S BONDING CLIP:**

Fully seat bonding clip on each module flange to provide bond across N/S module gap.



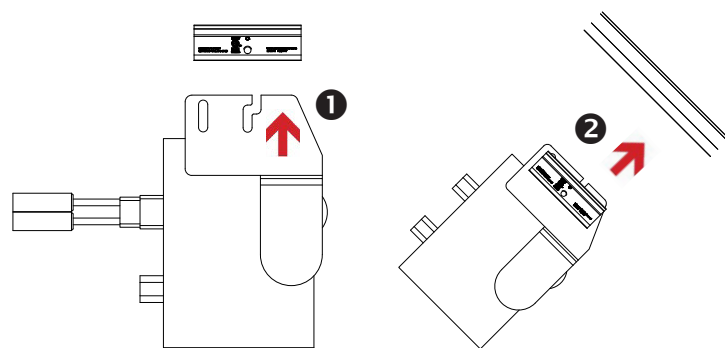
**INSTALL MLPE & LUG CLAMP:** Insert the rail nut in the rail by pinching the flaps of the plastic clip with thumb and middle finger, while pressing bolt head down with pointer finger. Rotate the clamp 90 deg in clockwise or anticlockwise in the rail and release the flaps when aligned with rail. Ensure that the rail nut is engaged in the rail profile.



**INSTALL MICROINVERTER:**  
Install microinverter onto rail. Engage with bolt.



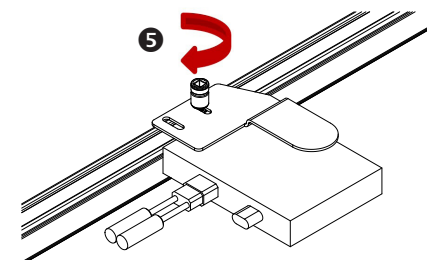
**MLPE & Lug Clamp cannot be used to simultaneously mount MLPE devices and ground wires.**



**ALTERNATELY INSTALL MLPE ON MODULE FRAME:**  
Engage MLPE & mount onto module frame flange and tighten bolt.

**TORQUE VALUE: 20 ft-lbs.**

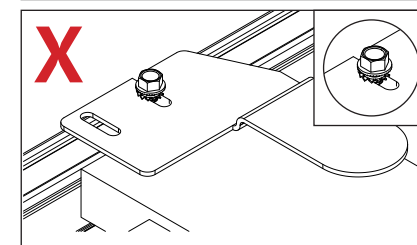
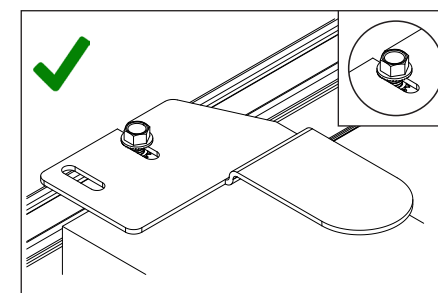
**Note:** Refer to Unirac MLPE Mount Installation Guide for details at <https://unirac.com>



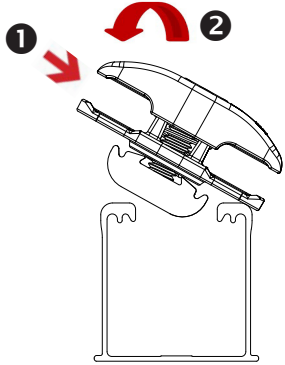
**TIGHTEN BOLT TO SECURE:**

**TORQUE VALUE: 12 ft-lbs.**

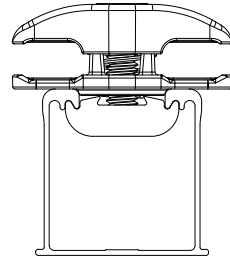
**Quick Tip:** To remove the MLPE clamp from the rail, use a tool to pry-open the rail to release the clamp.



**Ensure that MLPE is always installed on the top of lock-tooth washer.**

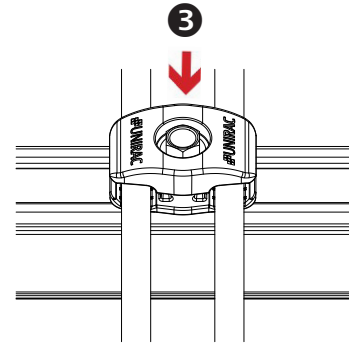


**INSTALL NS WIRE MANAGEMENT CLIP:**  
Insert the wire clamp assembly into the rail by placing one end of the rail nut into the rail and clip in the other end.



**INSTALL NS WIRE MANAGEMENT CLIP:**  
Ensure that the rail nut profile is seated in the rail profile.

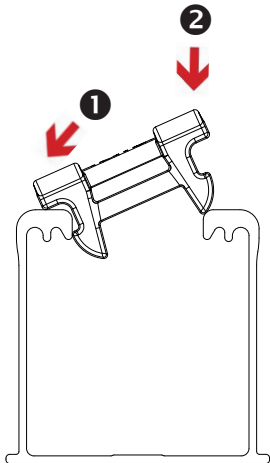
**Note:** Wire clip can be oriented along the rail or perpendicular to secure wires between rails.



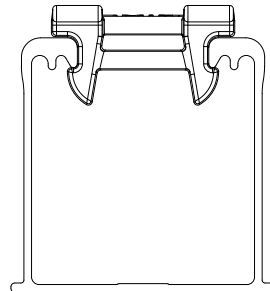
**INSTALL NS WIRE MANAGEMENT CLIP:**

Insert the wires into the groove of wire clamp and tighten it down to the suggested torque value.

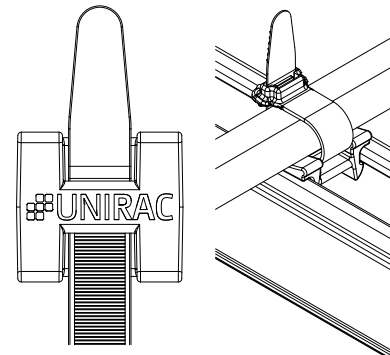
**TORQUE VALUE:** 3-7 ft-lbs.



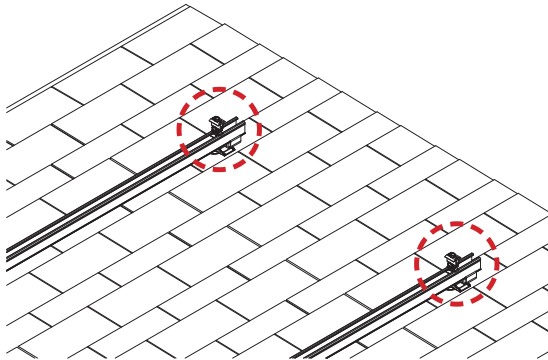
**INSTALL WIRE MANAGEMENT CLIP:**  
Wire clip retains the wire in the rail channel. Press fit the clip onto the rail flanges to install.



**INSTALL WIRE MANAGEMENT CLIP:**  
Ensure that the clip base is seated on the rail flange

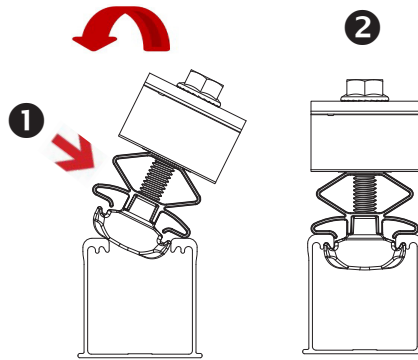


**INSTALL WIRE MANAGEMENT CLIP:**  
Use the wire tie to strap the wires down on the seater provided in the wire clip.



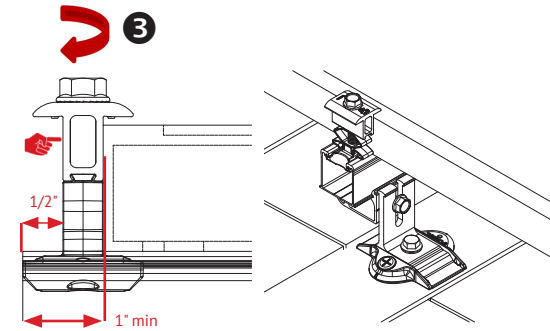
#### INSTALL COMBO (END) CLAMPS:

Install Combo Clamps starting at the aligned end of rails.



#### INSERT COMBO CLAMP:

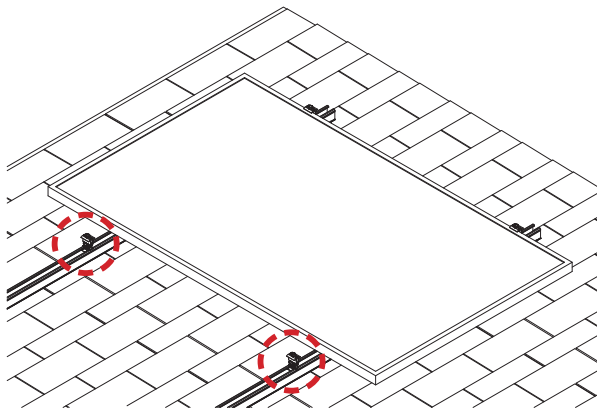
Insert Combo Clamp from one side of the rail nut into the rail and click in the other side. Ensure that the rail nut profile is seated in the rail profile.



**INSTALL END MODULE:** Position first module onto rails and engage module frame with end clamps. Hold clamp in place against module while tightening bolt.

**TORQUE VALUE: 15 ft-lbs.**

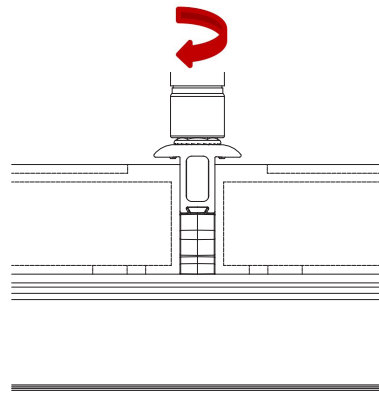
**Note: Ensure a minimum distance of 1" from the end of the module to end of rail.**



#### INSTALL COMBO (MID) CLAMPS:

Clamp assemblies may be positioned in rail near point of use prior to module placement.

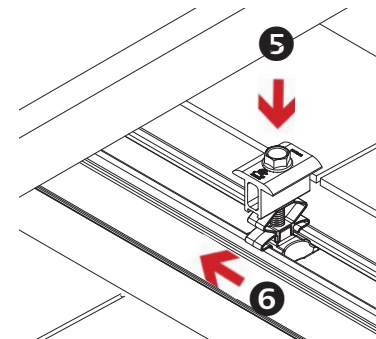
**Note: The clamps may be installed above splice locations.**



#### PLACE ADJACENT MODULE AGAINST CLAMPS:

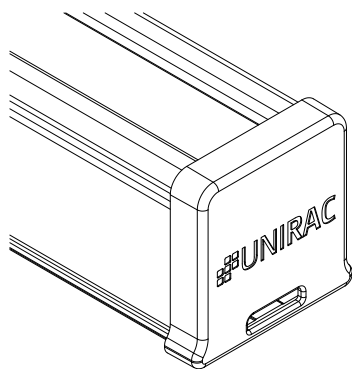
Modules must be tight against clamps with no gaps. Tighten bolt to required torque.

**TORQUE VALUE: 15 ft-lbs.**



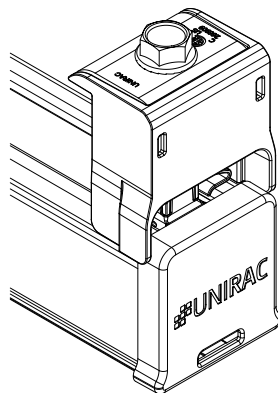
#### INSTALL REMAINING MODULES:

Proceed with module installation. Engage each clamp with previously positioned module.



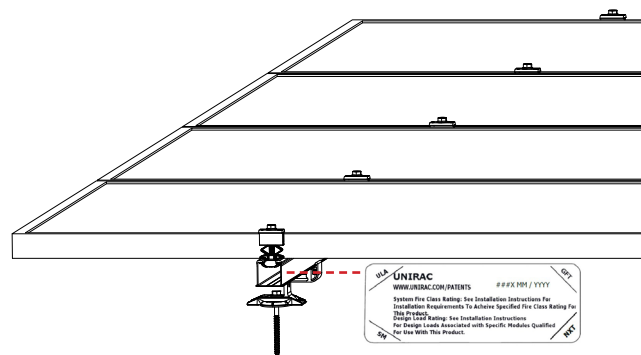
### OPTIONAL END CAP:

To install the end cap, place the cap on the edge of the rail and press the cap onto the rail.



### OPTIONAL COMBO CLAMP CAP:

To install the combo clamp cap, place the cap on the edge of the rail and press the cap onto the clamp.



### INSTALL UL2703 CERTIFICATION MARKING LABEL:

After the racking system is fully assembled, a single label should be applied to the rail at the edge of the array. One certification label is supplied in every box of 20 clamps.

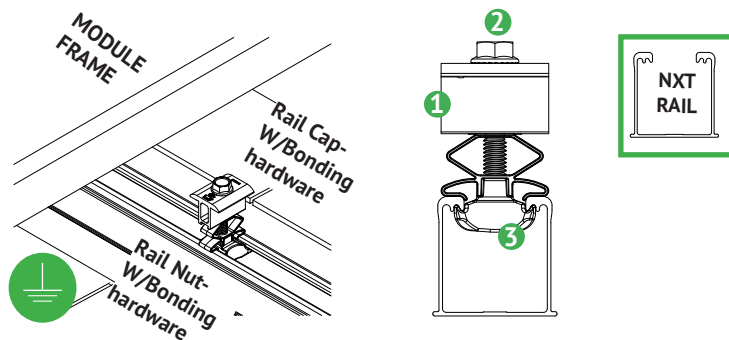
#### Note:

- The sticker label should be placed such that it is visible.
- Cutoff all corners except NXT before applying on rail.

### CAUTION

- If loose components or loose fasteners are found during periodic inspection, re-tighten immediately.
- Any components showing signs of corrosion or damage that compromise safety shall be replaced immediately.

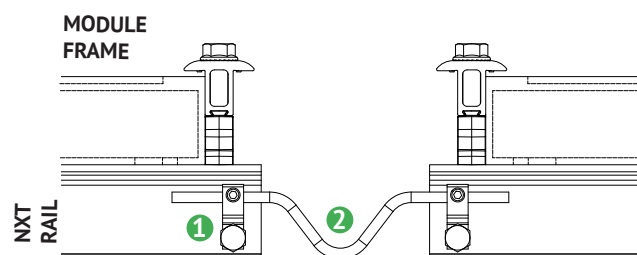




### BONDING COMBO MID-END CLAMP ASSEMBLY

- 1 Aluminum combo mid-end clamp cap with stainless steel bonding pins that pierce module frame anodization to bond module to module through clamp
- 2 Stainless steel bolt bonds aluminum clamp to stainless steel Hex bolt
- 3 Aluminum combo mid-end clamp rail nut with stainless steel bonding pins that pierce rail anodization to bond module to module through clamp

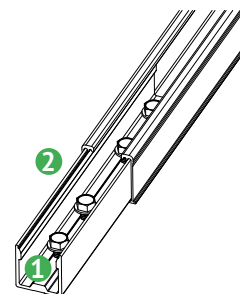
**NOTE:** See Page 19 for installation details.



### BONDING BETWEEN THERMAL BREAKS

- 1 Lug is connected at the end of each thermal break to the rail.
- 2 Solid copper wire is connected across the gap to bond the two ends.

**NOTE:** See Page 5 for installation details.

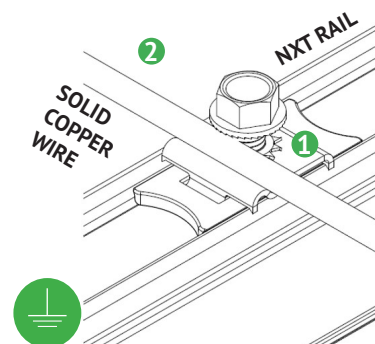


### BONDING RAIL SPLICE

- 1 Bonding Hardware creates bond between Splice bar and each rail section.
- 2 Aluminum splice bar spans across rail gap to create rail to rail bond. Rail on at least one side of splice will be grounded.

#### NOTE:

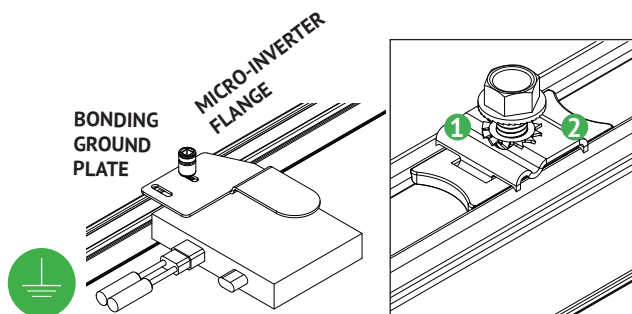
- See Page 15 for installation details
- Splice certified for single-use only



### RACK SYSTEM GROUNDING

- 1 Tabs on the stainless-steel washer pierce anodization on the rail to bond rail to ground wire.
- 2 Solid copper wire connected to lug is routed to provide final system ground connection.

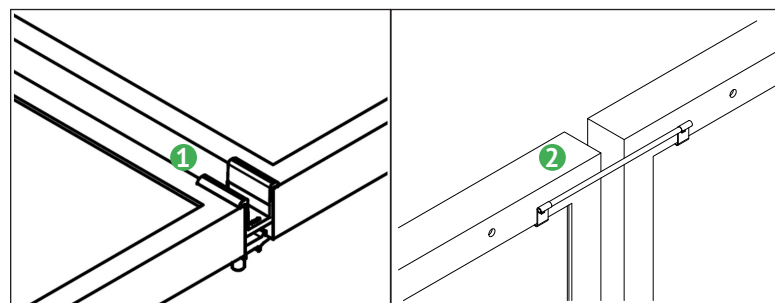
**NOTE:** See Page 16 for installation details and alternate racking system grounding methods.



#### BONDING MICROINVERTER MOUNT

- 1 Stainless steel Tooth lock washer beneath the MLPE flange remove anodization on the MLPE and bonds.
- 2 Tabs on the stainless steel washer remove anodization on the rail and bonds.

**NOTE:** See Page 17 for installation details



#### ALTERNATE ROW-TO-ROW BONDING PATHS

- 1 Row-to-row module bonding is accomplished with bonding clamp with 2 integral bonding pins.
- 2 Alternate method by connecting clips on either module to complete the bonding path.

#### NOTE:

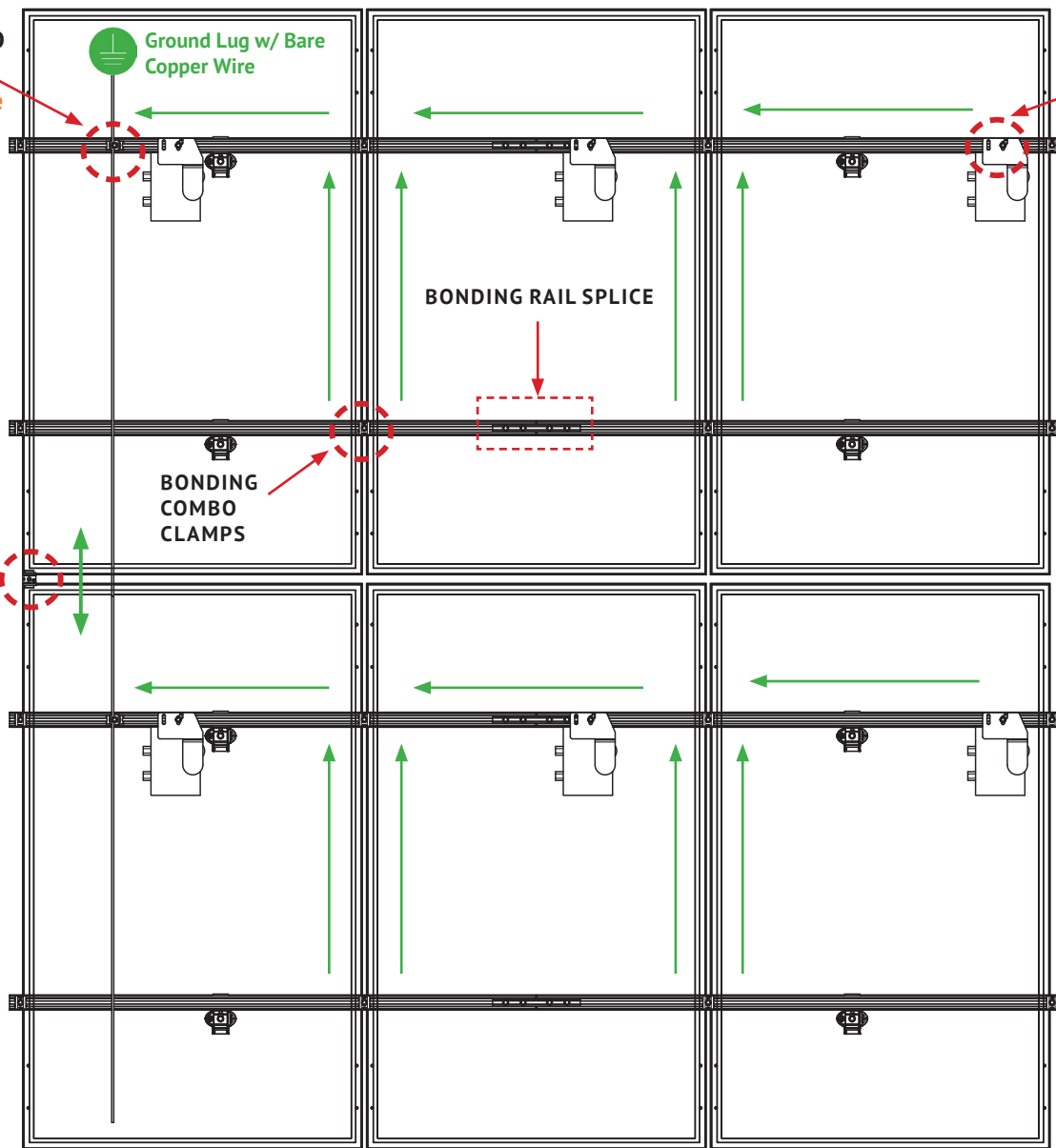
- See Page 16 for installation details
- Row-to-row module bonding certified for single-use only



### RACKING SYSTEM GROUND

Note: Only one lug per module row required

ALTERNATE ROW-TO-ROW BONDING METHOD



The NXT UMount system has been certified and listed to the UL 2703 standard (Rack Mounting Systems and Clamping Devices for Flat-Plate Photovoltaic Modules and Panels). This standard included electrical grounding, electrical bonding, mechanical load and fire resistance testing.

#### SYSTEM LEVEL FIRE CLASSIFICATION

The system fire class rating requires installation in the manner specified in the NXT UMount Installation Guide. NXT UMount has been classified to the system level fire portion of UL 2703. NXT UMount has achieved system level performance for steep sloped roofs. System level fire performance is inherent in the NXT UMount design, and no additional mitigation measures are required. The fire classification rating is only valid on roof pitches greater than 2:12 (slopes  $\geq$  2 inches per foot, or 9.5 degrees). The system is to be mounted over fire resistant roof covering rated for the application. There is no required minimum or maximum height limitation above the roof deck to maintain the system fire rating for NXT UMount. Approved Module Types & System Level Fire Ratings are listed below:

Module Type	System Level Fire Rating	Rail Direction	Module Orientation
Type 1, 2, 3 with metal frame, 10 with metal frame, 19, 22, 25, 29, & 30	Class A	Parallel OR Perpendicular to Ridge	Landscape OR Portrait

#### MECHANICAL LOAD TEST MODULES

The modules selected for UL 2703 mechanical load testing were selected to represent the broadest range possible for modules on the market. The tests performed covers module frame thicknesses greater than or equal to 1.0 mm, single and double wall frame profiles (some complex frame profiles could require further analysis to determine applicability), and clear and dark anodized aluminum frames. PV modules may have a reduced load rating, independent of the NXT UMount rating. Please consult the PV module manufacturer's installation guide for more information.

Tested Module	UL2703 Certification Load Ratings	Tested Loads	Tested Module Area
SunPower SPR-A440 -COM	Down: 50 psf, Up: 50 psf, Slope: 15 psf	Down: 75 psf, Up: 75 psf, Slope: 23 psf	21.86 sq ft
Jinko JKM-xxxM 72HL4-V	Down: 50.12 psf, Up: 22.28 psf, Slope: 8 psf	Down: 75.19 psf, Up: 33.42 psf, Slope: 12 psf	27.76 sq ft

**NOTE:** Jinko module mechanical load values do not apply to the following part numbers (shown on page 3); RLSPLCM2, SBUTYLM1, SBUTYLD1, SHCLMPM2, & SHCLMPD2

#### UL2703 CERTIFICATION MARKING:

Unirac NXT UMount is listed to UL 2703. Certification marking is embossed on all Combo Clamps as shown. Labels with additional certification information are provided with clamps and must be applied to the NXT UMount Rail at the edge of the array.

**Note:** This racking system may be used to ground and/or mount a PV module complying with UL1703/UL61730 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions.



#### Electrical Bonding and Grounding Test Modules

The list below is not exhaustive of compliant modules but shows those that have been evaluated and found to be electrically compatible with the NXT UMount system.

Manufacture	Module Model / Series
Aionrise	AION60G1, AION72G1
Aleo	P-Series & S-Series
Aptos Solar	DNA-120-(MF/BF)10-xxxW DNA-120-MF10 DNA-120-(MF/BF)23 DNA-144-(MF/BF)23 DNA-120-(MF/BF)26 DNA-144-(MF/BF)26 DNA-108-(MF/BF)10-xxxW
Astronergy	CHSM6612 M, M/HV CHSM6612P Series CHSM6612P/HV Series CHSM72M-HC CHSM72M(DG)/F-BH
Auxin	AXN6M610T AXN6P610T AXN6M612T AXN6P612T
Axitec	AC-xxx(M/P)/60S, AC-xxx(M/P)/72S AC-xxxP/156-60S AC-xxxMH/120(S/V/SB/VB) AC-xxxMH/144(S/V/SB/VB)
Boviet	BVM6610, BVM6612
BYD	P6K & MHK-36 Series

Manufacture	Module Model / Series
Canadian Solar	CS1(H/K/U/Y)-MS CS3K-(MB/MB-AG/MS/P/P HE/PB-AG) CS3L-(MS/P), CS3N-MS CS3U-(MB/MB-AG/MS/P/P HE/PB/PB-AG) CS3W-(MB-AG/MS/P/P-PB-AG) CS3Y-MB-AG, CS5A-M CS6K-(M/MS/MS AllBlack/P/P HE) CS6P-(M/P), CS6R-MS CS6U-(M/P/P HE), CS6W-(MB-AG/MS) CS6X-P, CSX-P, CS7L-MB-AG ELPS CS6(A/P)-MM
Centrosolar America	C-Series & E-Series
CertainTeed	CT2xxMxx-01, CT2xxPxx-01, CTxxxMxx-01 CTxxxPxx-01, CTxxxMxx-02, CTxxxMxx-03 CTxxxMxx-04, CTxxxHC11-04
Eco Solargy	Orion 1000 & Apollo 1000
ET Solar	ET AC Module, ET Module ET-M772BH520-550WW/WB
First Solar	FS-6XXX(A) FS-6XXX(A)-P, FS-6XXX(A)-P-I
Flextronics	FXS-xxxBB
Freedom Forever	FF-MP-BBB-xxx, FF-MP1-BBB-xxx
FreeVolt	PVGraf
GCL	GCL-P6 & GCL-M6 Series
Hansol	TD-AN3, TD-AN4 UB-AN1, UD-AN1
Hanwha SolarOne	HSL 60

Manufacture	Module Model / Series
Helene	36M, 36P 60M, 60P, 72M & 72P Series 144HC M6 144HC M10 SL Bifacial
H-SAAE	HT60-156M-C HT60-156M(V)-C HT72-156(M/P) HT72-156P-C, HT72-156P(V)-C HT72-156M(PDV)-BF, HT72-156M(PD)-BF HT72-166M, HT72-18X
Hyundai	KG, MG, RW, TG, RI, RG, TI, KI, HI Series HiA-SxxxHG, HiD-SxxxRG(BK), HiS-S400PI HiS-SxxxYH(BK), HiS-SxxxXG(BK)
ITEK	iT-SE Series
Japan Solar	JPS-60 & JPS-72 Series
JA Solar	JAM72D30MB, JAM78D10MB JAM72S30 /MR JAP6 60-xxx JAM6(K)-60/xxx, JAP6(k)-72-xxx/4BB JAP72S##-xxx/** JAP6(k)-60-xxx/4BB, JAP60S##-xxx/** JAM6(k)-72-xxx/**, JAM72S##-xxx/** JAM6(k)-60-xxx/**, JAM60S##-xxx/** i. ##: 01, 02, 03, 09, 10 ii. **: SC, PR, BP, HiT, IB, MW, MR ** = Backsheet, ## Cell technology
Jinko	JKM & JKMS Series JKMxxxM-72HL-V JKMxxxM-72HLM-TV JKMxxxM-72HL4-(T)V JKMxxxM-7RL3-V JKMxxxM-72HL4-TV

- The frame profile must not have any feature that might interfere with the bonding devices that are integrated into the racking system
- Use with a maximum over current protection device OCPD of 30A
- **Listed models can be used to achieve a Class A fire system rating, for steep slope applications, only when modules fire typed 1, 2, 3 with metal frame, 10 with metal frame, 19, 22, 25, 29, or 30. See Appendix A Page 24.**

#### Electrical Bonding and Grounding Test Modules

The list below is not exhaustive of compliant modules but shows those that have been evaluated and found to be electrically compatible with the NXT UMount system.

Manufacture	Module Model / Series	Manufacture	Module Model / Series	Manufacture	Module Model / Series		
Kyocera	KD-F & KU Series	Mitsubishi	MJE & MLE Series	Q.Cells (Cont.)	Q.PEAK DUO L-(G7/G7.1/G7.2/G7.3/G7.7) Q.PEAK DUO (BLK) G8(+) Q.PEAK DUO L-(G8/G8.1/G8.2/G8.3) Q.PEAK DUO L-G8.3 (BFF/BFG/BGT) Q.PEAK DUO (BLK) ML-G9(+) Q.PEAK DUO XL-(G9/G9.2/G9.3) Q.PEAK DUO XL-G9.3/BFG Q.PEAK DUO-G10+ Q.PEAK DUO BLK G10(+) Q.PEAK DUO BLK G10+ /AC Q.PEAK DUO (BLK) ML-G10(a)(+) Q.PEAK DUO XL-(G10/G10.2/G10.3/G10.c/G10.d) Q.PEAK DUO XL-G10.3/BFG Q.PEAK DUO XL-G10.d/BFG Q.PEAK DUO XL-(G11.2/G11.3) Q.PEAK DUO XL-G11.3/BFG		
LA Solar	LSxxxHC(166) LSxxxBL LSxxxHC	Neo Solar Power Co.	D6M Series		REC	RECExxxAA (BLK/Pure) RECExxxNP (N-PEAK) RECExxxNP2 (Black) RECExxxPE, RECExxxPE72 RECExxxTP, RECExxxTP72 RECExxxTP2(M/BLK2) RECExxxTP2S(M)72 RECExxxTP3M (Black) RECExxxTP4 (Black)	
LG Electronics	LGxxx(E1C/E1K/N1C/N1K/N2T/N2W/S1C/S2W/Q1C/Q1K)-A5 LGxxx(A1C/M1C/M1K/N1C/N1K/Q1C/Q1K/QAC/QAK)-A6 LGxxxN2W-B3 LGxxxN2T-B5 LGxxxN1K-B6 LGxxx(N1C/N1K/N2T/N2W)-E6 LGxxx(N1C/N1K/N2W/S1C/S2W)-G4 LGxxxN2T-J5 LGxxx(N1K/N1W/N2T/N2W)-L5 LGxxx(M1C/N1C/Q1C/Q1K)-N5 LGxxx(N1C/N1K/N2W/Q1C/Q1K)-V5 LGxxxN3K-V6	NE Solar	NESE xxx-72MHB-M10 NESE xxx-60MH-M6			Renesola	All 60-cell modules
	LONGi	Panasonic	VBHNxxxSA06/SA06B/SA11/SA11B VBHNxxxSA15/SA15B/SA16/SA16B, VBHNxxxKA, VBHNxxxKA03/04, VBHNxxxSA17/SA17G/SA17E/SA18/SA18E, VBHNxxxZA01/ZA02/ZA03/VBHNxxxZA04 EVPVxxx EVPVxxx(H/K/PK)			Risen	RSM Series, RSM110-8-xxxBMDG
		Peimar	SGxxxM (FB/BF) SMxxxM			SEG Solar	SEG-xxx-BMD-HV
		Phono Solar	PSxxxM1-20/U PSxxxM1H-20/U PSxxxM1-20UH PSxxxM1H-20UH PSxxxM4(H)-24/TH PSxxxM1-20/UH PSxxxM1H-20/UH PSxxxM-24/T PSxxxMH-24/T PSxxxM-24/TH PSxxxMH-24/TH			S-Energy	SN72 & SN60 Series
		Prism Solar	P72 Series				
Maxeon	SPR-MAX3-xxx-COM	Q.Cells	Plus, Pro, Peak, G3, G4, Peak G5(SC) , G6(+)(SC)(AC), G7, G8(+), Plus, Pro, Peak L-G2, L-G4, L-G5 Peak L-G5, L-G6, L-G7, L-G8(BFF) Q.PEAK DUO( BLK)-G6+ Q.PEAK DUO BLK-G6+/TS Q.PEAK DUO (BLK)-G7				
Meyer Burger	Meyer Burger Glass						
Mission Solar Energy	MSE Mono, MSE Perc MSExxx(SR8T/SR8K/SR9S/SX5T) MSExxx(SX5K/SX6W)						
Mitrex	Mxxx-L3H, Mxxx-I3H						

- The frame profile must not have any feature that might interfere with the bonding devices that are integrated into the racking system
- Use with a maximum over current protection device OCPD of 30A
- **Listed models can be used to achieve a Class A fire system rating, for steep slope applications, only when modules fire typed 1, 2, 3 with metal frame, 10 with metal frame, 19, 22, 25, 29, or 30. See Appendix A Page 24.**

#### Electrical Bonding and Grounding Test Modules

The list below is not exhaustive of compliant modules but shows those that have been evaluated and found to be electrically compatible with the NXT UMount system.

Manufacture	Module Model / Series	Manufacture	Module Model / Series	Manufacture	Module Model / Series
Seraphim	SEG-(6PA/6PB/6MA/6MA-HV/6MB/E01/E11) SRP-(6QA/6QB) SRP-xxx-6MB-HV, SRP-320-375-BMB-HV, SRP-xxx-BMC-HV, SRP-390-450-BMA-HV, SRP-xxx-BMZ-HV, SRP-390-405-BMD-HV	Trina	PA05, PD05, DD05, DD06, DE06, DE09.05 PD14, PE14, DD14, DE14, DE15, DE15V(II) DEG15HC.20(II), DEG15MC.20(II) DEG15VC.20(II), DE18M(II), DEG18MC.20(II) DE19, DEG19C.20	Winaico	WST & WSP Series
Sharp	NU-SA & NU-SC Series	TSMC	TS-150C2 CIGSw	Yingli	YGE & YLM Series
Silfab	SLA-M, SLA-P, SLG-M, SLG-P & BC Series SILxxx(BK/BL/HC/HL/HN/ML/NL/NT/NX/NU)	Universal Solar	UNI4xx-144BMH-DG UNI5xx-144BMH-DG UNLxxx-108M-BB UNLxxx-120M-BB UNLxxx-120MH	ZNShine Solar	ZXM6-72 Series, ZXM6-NH144 ZXM6-NHLDD144, ZXM7-SH108 Series
SolarEver USA	SE-166*83-xxxM-120N	Upsolar	UP-MxxxP, UP-MxxxM(-B)		
Solaria	PowerXT-xxxR-(AC/PD/BD) PowerXT-xxxC-PD PowerXT-xxxR-PM (AC)	URECO	D7Kxxx(H7A/H8A), D7Mxxx(H7A/H8A) FAKxxx(C8G/E8G), FAMxxxE7G-BB FAMxxxE8G(-BB), FBKxxxM8G F6MxxxE7G-BB FBMxxxMFG-BB		
Solartech	STU HIT, STU PERC & Quantum PERC	Vikram	Eldora, Somera, Ultima PREXOS VSM DHT.60.AAA.05 PREXOS VSM DHT.72.AAA.05		
SolarWorld	Sunmodule Protect, Sunmodule Plus/Pro	Vina	VNS-72M1-5-xxxW-1.5, VNS-72M3-5-xxxW-1.5, VNS-144M1-5-xxxW-1.5, VNS-144M3-5-xxxW-1.5, VNS-120M3-5-xxxW-1.0		
Sonali	SS-M-360 to 390 Series SS-M-390 to 400 Series SS-M-440 to 460 Series SS-M-430 to 460 BiFacial Series	VSUN	VSUNxxx-60M-BB, VSUNxxx-72MH VSUN4xx-144BMH VSUN4xx-144BMH-DG VSUN5xx-144BMH-DG VSUNxxx-108M-BB VSUNxxx-120M-BB		
Sun Edison	F-Series, R-Series				
Suniva	MV Series & Optimus Series (35mm)				
SunPower	AC, X-Series, E-Series & P-Series SPR E20 435 COM (G4 Frame) Axxx-BLK-G-AC, SPR-Mxxx-H-AC				
SunTech	STP, STPXXS - B60/Wnhb				
Talesun	TP572, TP596, TP654, TP660 TP672, Hipor M, Smart TD6172M				
Tesla	SC, SC B, SC B1, SC B2, TxxxS, TxxxH				

- The frame profile must not have any feature that might interfere with the bonding devices that are integrated into the racking system
- Use with a maximum over current protection device OCPD of 30A
- **Listed models can be used to achieve a Class A fire system rating, for steep slope applications, only when modules are typed 1, 2, 3 with metal frame, 10 with metal frame, 19, 22, 25, 29, or 30. See Appendix A Page 24.**