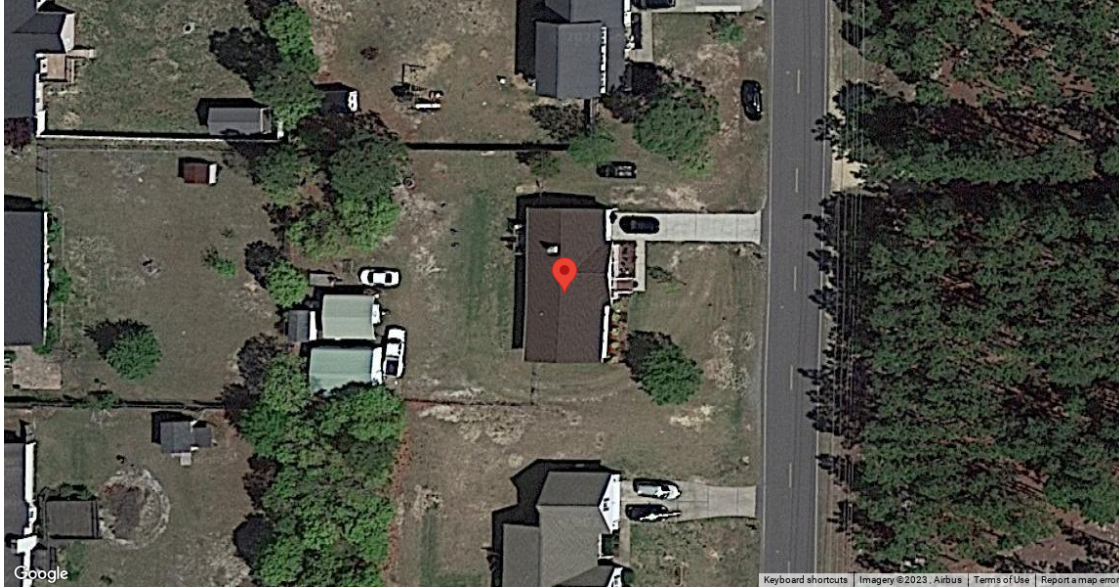


**Project Details**

<b>Name</b>	Rhonda Bradford	<b>Date</b>	06/07/2023
<b>Location</b>	1968 Tingen Road, Broadway, NC 27505	<b>Total modules</b>	19
<b>Module</b>	Mission Solar Energy: MSE395SX9R (40mm)	<b>Total watts</b>	7,505
<b>Dimensions</b>	Dimensions: 75.08" x 41.5" x 1.57" (1907.0mm x 1054.0mm x 40.0mm)	<b>Attachments</b>	39
<b>ASCE</b>	7-16	<b>Rails per row</b>	2



System Weight	
<b>Total system weight</b>	1,042.0 lbs
<b>Weight/attachment</b>	26.7 lbs
<b>Racking weight</b>	120.5 lbs
<b>Distributed weight</b>	2.5 psf

Load Assumptions	
<b>Wind exposure</b>	C
<b>Wind speed</b>	120 mph
<b>Ground snow load</b>	10 psf
<b>Attachment spacing portrait</b>	4.0'
<b>Site Elevation</b>	353.0 ft
<b>S<sub>ps</sub></b>	0.148

Roof Information			
<b>Roof Material Family</b>	Comp Shingle	<b>Roof material</b>	Comp Shingle
<b>Building height</b>	15 ft	<b>Roof attachment</b>	Halo UltraGrip (Rafter attached)
		<b>Staggered attachments</b>	Yes
<b>Roof slope</b>	23 °	<b>Attachment hardware</b>	Square
<b>Risk category</b>	II		
<b>Roof shape</b>	Gable		
<b>Specific gravity</b>	0.42		

**Span Details XR10 - Portrait**

Zone	Module Position	Max span	Max cantilever
Zone 1/2e	Normal	6' 2"	2' 6"
Zone 2n/2r/3e	Normal	5' 8"	2' 3"
Zone 3r	Normal	5' 4"	2' 2"

**Attachment Span Details Halo UltraGrip (Rafter attached) - Portrait**

Zone	Module Position	Max attachment span
Zone 1/2e	Normal	6' 2"
Zone 2n/2r/3e	Normal	5' 8"
Zone 3r	Normal	5' 4"

**Reaction Forces XR10 - Portrait**

Zone	Module Position	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral (lbs)
Zone 1/2e	Normal	15.2	185	196	48
Zone 2n/2r/3e	Normal	21.8	185	326	48
Zone 3r	Normal	24.6	185	383	48

**\*Optional - Attachment Span Details Halo UltraGrip (Deck attached) - Portrait**

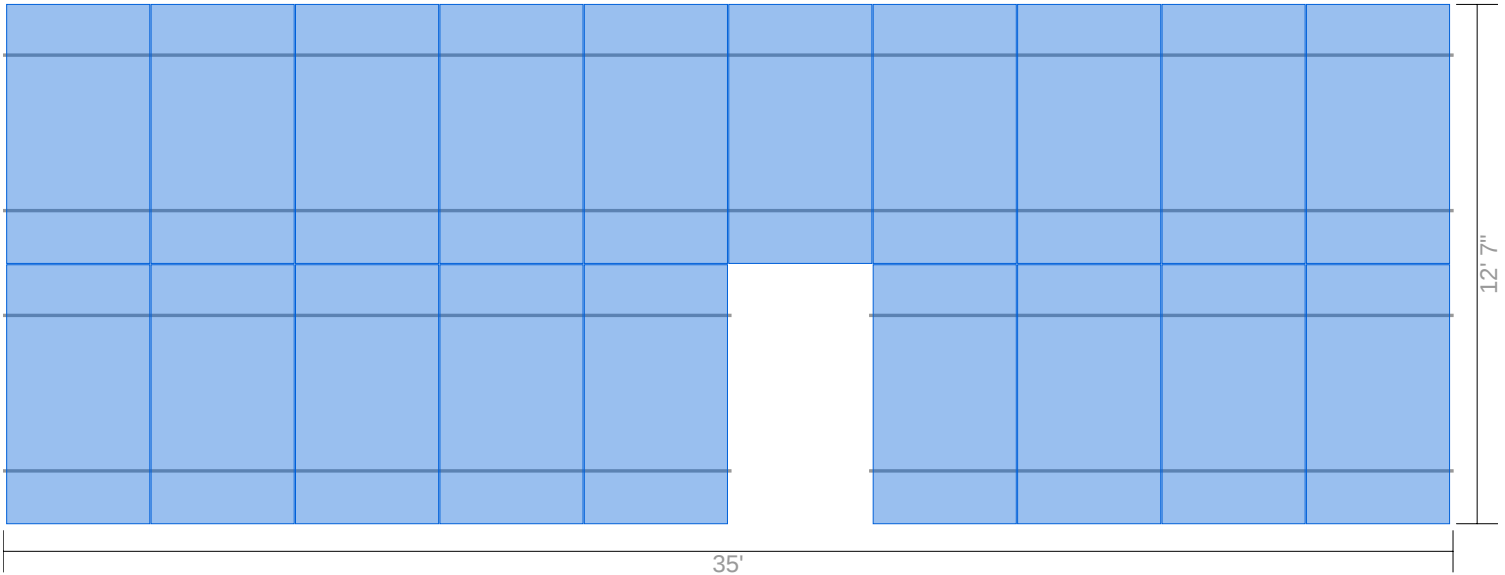
Zone	Module Position	Max attachment span
Zone 1/2e	Normal	3' 11"
Zone 2n/2r/3e	Normal	2' 1"
Zone 3r	Normal	1' 6"

\* Based on minimum 7/16" sheathing thickness

**Roof Section 1**

Details		Weights
Panels: 19	Provided rail: 196' [14 x 168"]	Total weight: 1,042.0 lbs
Rail orientation: East-West	Attachments: 39	Weight/attachment: 26.7 lbs
Panel orientation: Portrait	Splices: 8	Total Area: 417.4 sq ft
Entry type: Graphical	Clamps: 44	Distributed weight: 2.5 psf

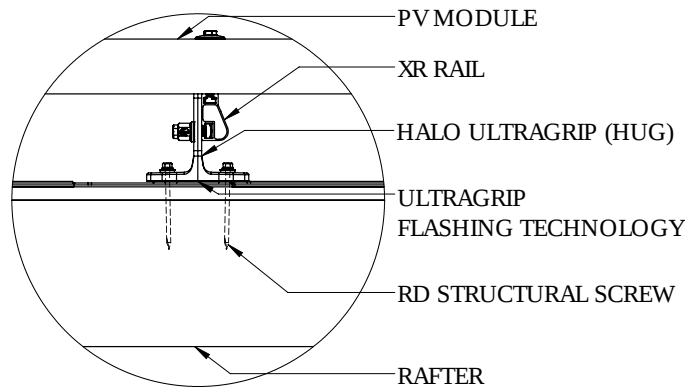
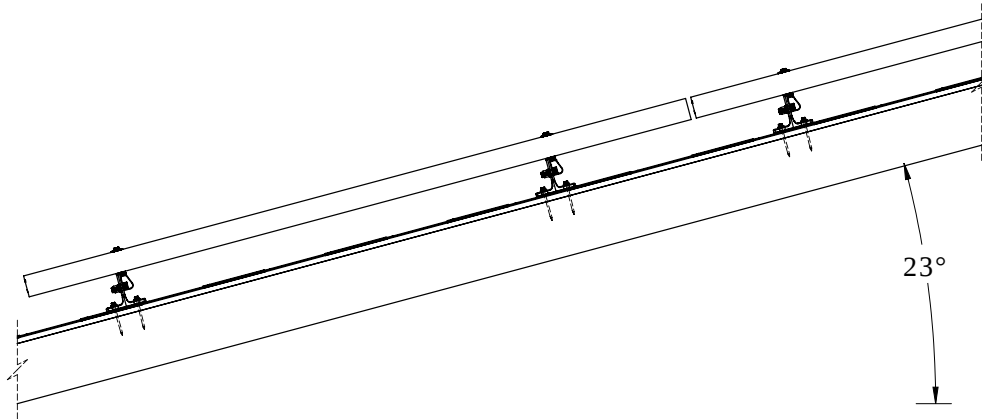
**Diagram**



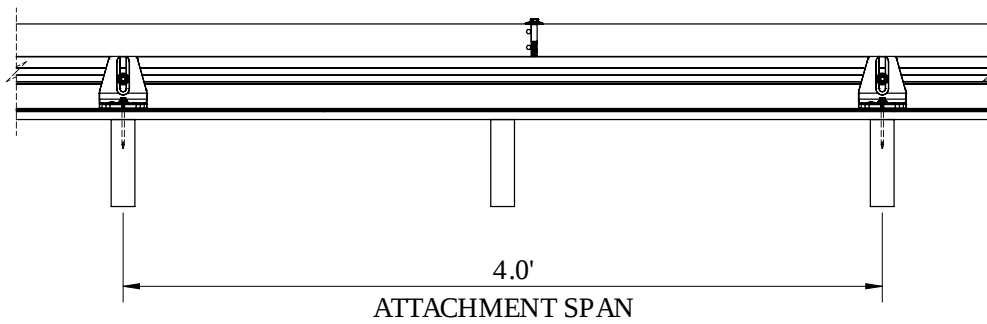
**Segments**

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
A	10	35'	35'	1' 6"	84' [6 x 168"]	19	4	22
B	5	17' 7"	17' 7"	10"	56' [4 x 168"]	11	2	12
C	4	14' 1"	14' 1"	1' 1"	56' [4 x 168"]	9	2	10

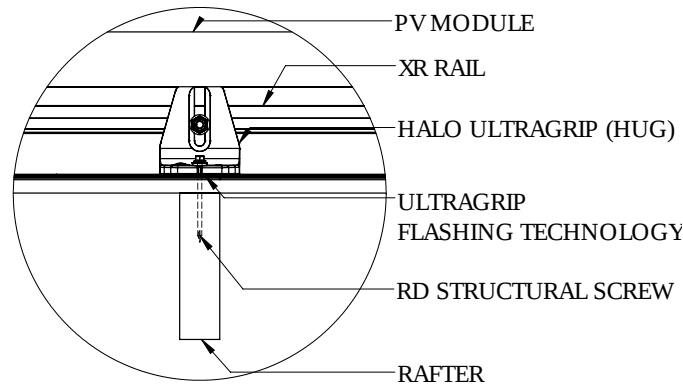
Side View (portrait)



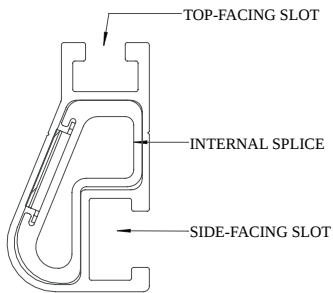
Front View (portrait)



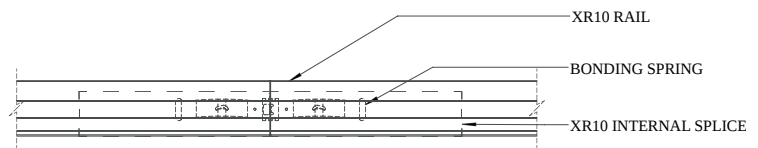
**Front View (portrait)**



**Splice Details**

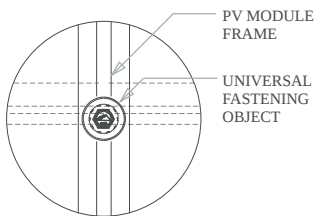


**XR10**

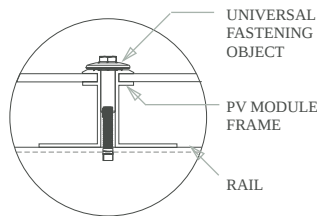


**Splice Connection**

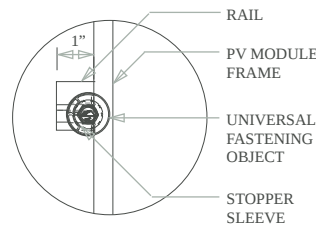
**Clamp Detail**



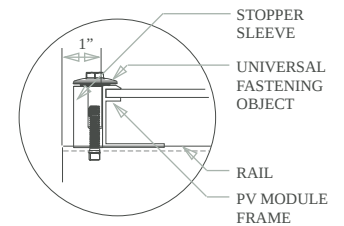
**Mid Clamp, Plan**



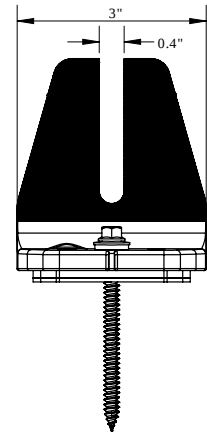
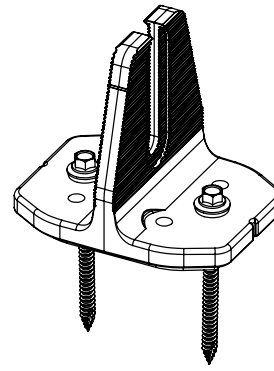
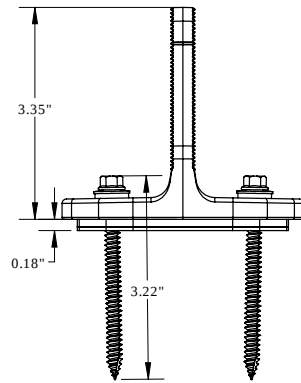
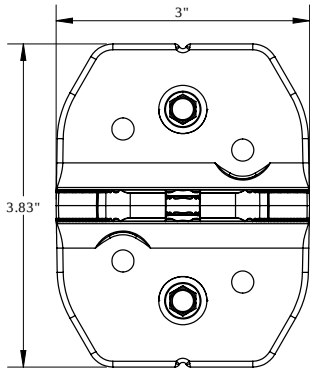
**Mid Clamp, Front**



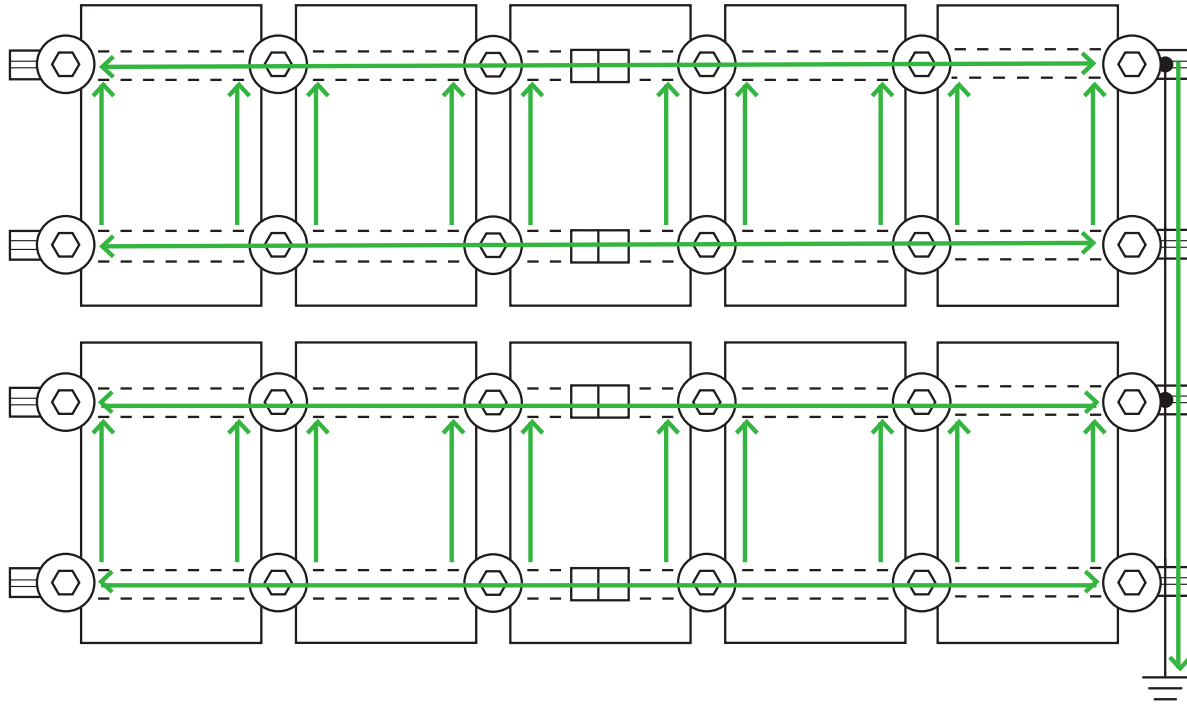
**End Clamp, Plan**




**End Clamp, Front**



### Grounding Diagram



 UFO Clamp

 Fault Current Ground Path

 Grounding Lug \*

 Min 10 AWG Copper Wire \*

 Bonded Splice (Rail Connection)

\* Grounding Lugs and Wire are not required in systems using Enphase microinverters.

**Bill of Materials**

Part	Spares	Total Qty
------	--------	-----------

**Rails & Splices**

XR-10-168B XR10, Rail 168" Black	0	14
XR10-BOSS-01-M1 Bonded Splice, XR10	0	8

**Clamps & Grounding**

UFO-CL-01-B1 Universal Module Clamp, Black	0	44
UFO-STP-40MM-B1 Stopper Sleeve, 40MM, Black	0	12
XR-LUG-03-A1 Grounding Lug, Low Profile	0	3

**Attachments**

QM-HUG-01-B1 Halo UltraGrip, Black	0	39
HW-RD1430-01-M1 RD Structural Screw, 3.0L <b>* Add desired additional screws by adjusting spares column.</b>	0	78
BHW-SQ-02-A1 Square-Bolt Bonding Hardware	0	39



# ATTACHMENTS

## PRE-INSTALLATION

- Verify module compatibility. See [Page 21](#) for info.

## TOOLS REQUIRED

- |                                 |                       |
|---------------------------------|-----------------------|
| □ Cordless Drill (non-impact)   | □ 3/8" Socket         |
| □ Impact Driver (for lag bolts) | □ 1/8" Drill Bit      |
| □ Torque Wrench (0-250 in-lbs)  | □ 1/4" Drill Bit      |
| □ 7/16" Socket                  | □ T30 Bit             |
| □ 1/2" Socket                   | □ Channel Lock Pliers |
| □ 9/16" Socket                  | □ #3 Phillips Bit     |
| □ 7/32" Drill Bit               | □ 3/16" Hex Bit       |

## BONDING HARDWARE TORQUE VALUES

Please refer to each attachment's individual section for full details on all torque values and instructions.

- 3/8" Bonding Hardware Nuts (7/16" Socket): 250 in-lbs
- All Tile Hook Carriage Bolts (7/16" Socket): 132 in-lbs
- Flat Roof Attachment Nuts (9/16" Socket): 250 in-lbs
- Lynx Set Screw (3/16" Hex Drive): 150 in-lbs
- Lynx Flange Nut (1/2" Socket): 150 in-lbs

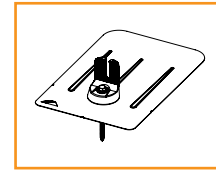
➤ If using previous version of Integrated Grounding Mid Clamps, End Clamps, Expansion Joints and for a list of approved 3rd party components please refer to Alternate Components Addendum (Version 1.9)

## ATTACHMENTS

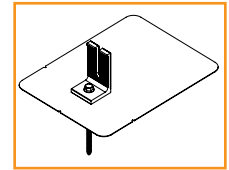
### COMPOSITION SHINGLE



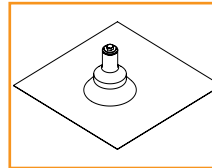
FlashFoot2



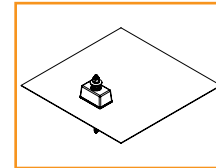
FlashVue



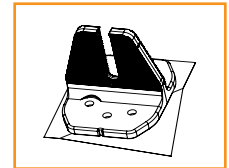
QM L-Mount



QM QBase

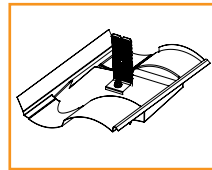


QM Classic Comp Mount

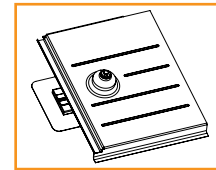


HUG (Halo UltraGrip)

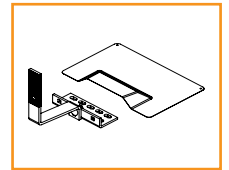
### TILE



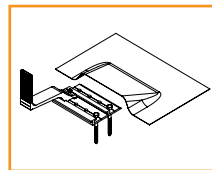
Knockout Tile



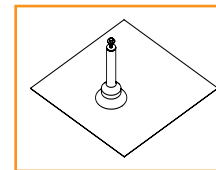
QM Tile Replacement



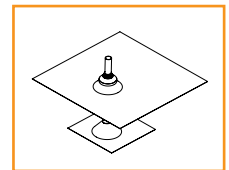
All Tile Hook and Flashing (optional)



QM Quick Hook and Flashing (optional)

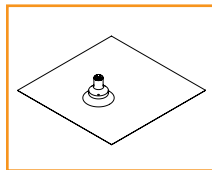


QM QBase Tile

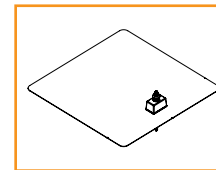


QM Tile Conduit Penetration

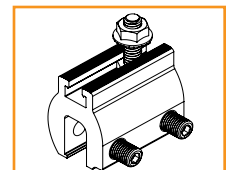
### ADDITIONAL ROOF TYPES



QM Qbase Shake - Slate - Metal Shingle

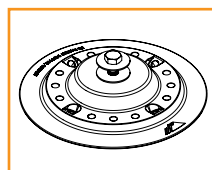


QM Classic Mount Shake

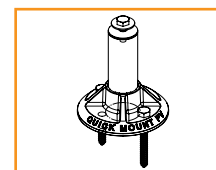


QM Lynx Metal Roof Attachment

### LOW SLOPE ROOF



Flat Roof Attachment



QM QBase Mount

# COMPONENTS

## PRE-INSTALLATION

- Verify module compatibility. See [Page 21](#) for info.

## TOOLS REQUIRED

- Cordless Drill (non-impact)
- Impact Driver (for lag bolts)
- Torque Wrench (0-250 in-lbs)
- 7/16" Socket
- 1/2" Socket
- 9/16" Socket
- 7/32" Drill bit
- 1/8" Drill bit
- 1/4" Drill bit
- T30 Torx Bit
- Channel Lock Pliers
- #3 Phillips Bit
- Paddle Bit

## BONDING HARDWARE TORQUE VALUES

Please refer to each attachment's individual section for full details on all torque values and instructions.

- Universal Fastening Object (7/16" Socket): 80 in-lbs
- Rail Grounding Lug Nut (7/16" Socket): 80 in-lbs
- Module Grounding Lug
  - Grounding Nut (7/16" Socket): 60 in-lbs
  - Grounding Lug Terminal Screws (7/16" Socket): 20 in-lbs
- Microinverter Kit Nuts (7/16" Socket): 80 in-lbs
- Frameless Module Kit Nuts (7/16" Socket): 80 in-lbs
- 3/8" Bonding Hardware Nuts (7/16" Socket): 250 in-lbs
- Contour Clamp (T-30 Torx Bit): 80 in-lbs

➤ Unless otherwise noted, all components have been evaluated for multiple use. They can be uninstalled and reinstalled in the same or new location.

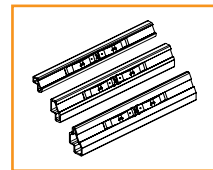
## COMPONENTS



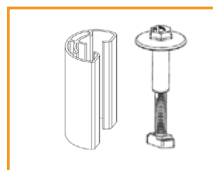
XR Rail



Wire Clip



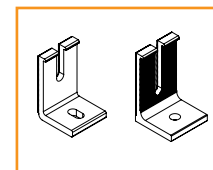
BOSS



UFO and Stopper Sleeve (30-46MM)



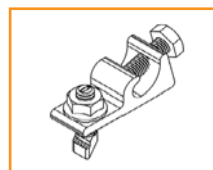
CAMO



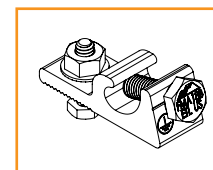
Ironridge L-Foot and QM L-Foot



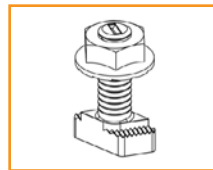
End Cap



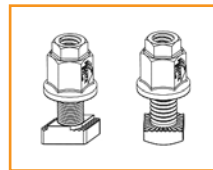
Rail Grounding Lug



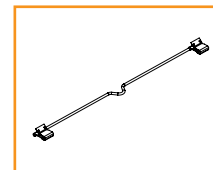
Module Grounding Lug



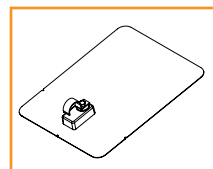
Microinverter Kit



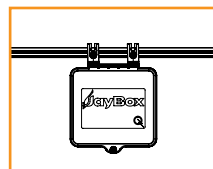
3/8" Bonding Hardware



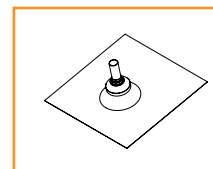
8" Bonding Jumper Single Use Only



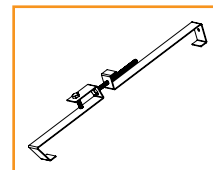
QM Classic Conduit Comp Mount



JAYBOX



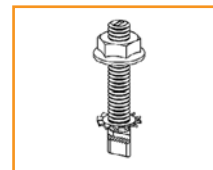
QM Composition Conduit Penetration



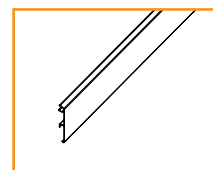
QM Tile Conduit Mount



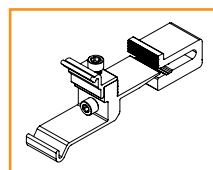
Frameless End/Mid Clamp



Frameless Module Kit



Contour Trim



Contour Clamp

Rail: XR10		Gable Roof Flush Mount System Span Table (inches) - Portrait or Landscape Installation																																															
		Max Module Length: 80", Max Module SF: 24 SF																																															
		Exposure C																																															
Wind Speed (mph)	Roof Slope (deg.)	Ground Snow: 0 psf			10 psf			20 psf			30 psf			40 psf			50 psf			60 psf			70 psf*			80 psf*			90 psf*			100 psf*			110 psf*			120 psf*			Exposed Mod.			Edge Mod.					
		Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3						
90 mph	8-20	84	78	69	73	73	69	61	61	61	60	60	60	54	54	54	49	49	49	45	45	45	42	42	42	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	72	59	53	57	48	43			
	21-27	84	83	78	72	72	72	60	60	60	59	59	59	55	55	55	50	50	50	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	35	35	35	34	34	34	82	66	60	65	52	48			
	28-45	84	84	79	72	72	72	60	60	60	59	59	59	55	55	55	51	51	51	49	49	49	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36	36	36	36	78	72	64	64	58	51
95 mph	8-20	83	72	65	73	72	65	61	61	61	61	60	60	60	54	54	54	49	49	49	45	45	45	42	42	42	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	66	55	49	54	45	41		
	21-27	84	79	73	72	72	72	60	60	60	59	59	59	55	55	55	50	50	50	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	35	35	35	34	34	34	77	61	56	64	49	45			
	28-45	84	84	74	72	72	72	60	60	60	59	59	59	55	55	55	51	51	51	49	49	49	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36	73	67	59	59	54	48			
100 mph	8-20	80	67	60	73	67	60	61	61	60	60	60	60	60	60	60	54	54	54	49	49	49	45	45	45	42	42	42	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	64	52	48	51	42	38
	21-27	84	74	68	72	72	68	60	60	60	59	59	59	55	55	55	50	50	50	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	35	35	35	34	34	34	72	57	52	59	48	43			
	28-45	84	79	72	72	72	72	60	60	60	59	59	59	55	55	55	51	51	51	49	49	49	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36	69	64	55	55	51	47			
105 mph	8-20	76	64	56	73	64	56	61	61	56	60	60	56	54	54	54	49	49	49	45	45	45	42	42	42	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	59	48	43	49	40	37			
	21-27	84	72	64	72	72	64	60	60	60	59	59	59	55	55	55	50	50	50	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	35	35	35	34	34	34	69	54	49	56	44	41			
	28-45	83	75	66	72	72	66	60	60	60	59	59	59	55	55	55	51	51	51	49	49	49	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36	65	59	52	52	49	44			
110 mph	8-20	72	59	53	72	59	53	61	59	53	60	59	53	54	54	53	49	49	49	45	45	45	42	42	42	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	56	45	41	48	38	33			
	21-27	82	66	60	72	66	60	60	60	60	59	59	59	55	55	55	50	50	50	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	35	35	35	34	34	34	65	51	48	54	42	38			
	28-45	78	72	64	72	72	64	60	60	60	59	59	59	55	55	55	51	51	51	49	49	49	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36	61	56	49	50	48	41			
115 mph	8-20	67	56	50	67	56	50	61	56	50	60	56	50	54	54	50	49	49	49	45	45	45	42	42	42	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	53	43	38	45	37	30			
	21-27	78	64	56	72	64	56	60	60	56	59	59	56	55	55	55	50	50	50	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	35	35	35	34	34	34	64	48	43	51	40	37			
	28-45	74	67	60	72	67	60	60	60	60	59	59	59	55	55	55	51	51	51	49	49	49	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36	58	53	48	48	44	40			
120 mph	8-20	64	53	48	64	53	48	61	53	48	60	53	48	54	53	48	49	49	48	45	45	45	42	42	42	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	51	41	36	43	34	28			
	21-27	74	59	54	72	59	54	60	59	54	59	59	54	55	55	54	50	50	50	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	35	35	35	34	34	34	59	45	41	49	38	33			
	28-45	72	65	57	72	65	57	60	60	57	59	59	57	55	55	55	51	51	51	49	49	49	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36	55	51	44	45	42	38			
130 mph	8-20	58	48	42	58	48	42	58	48	42	58	48	42	54	48	42	49	48	42	45	45	42	42	42	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	48	37	32	40	28	24				
	21-27	68	53	48	68	53	48	60	53	48	59	53	48	55	53	48	50	50	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	35	35	35	34	34	34	54	41	37	45	34	27				
	28-45	64	59	52	64	59	52	60	59	52	59	59	52	55	55	52	51	51	51	49	49	49	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36	49	48	41	41	39	34			
140 mph	8-20	54	43	39	54	43	39	54	43	39	54	43	39	54	43	39	49	43	39	45	43	39	42	42	39	39	39	37	37	37	36	36	36	34	34	34	33	33	33	43	32	26	37	24	20				
	21-27	64	48	44	64	48	44	60	48	44	59	48	44	55	48	44	50	48	44	48	48	44	43	43	43	41	41	41	39	39	39	37	37	37	35	35	35	34	34	34	50	38	32	42	29	22			
	28-45	58	54	48	58	54	48	58	54	48	58	54	48	54	54	48	51	51	48	48	48	48	45	45	45	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36	45	42	37	38	36	28			
150 mph	8-20	49	40	35	49	40	35	49	40	35	49	40	35	49	40	35	49	40	35	45	40	35	42	40	35	39	39	35	37	37	35	36	36	35	34	34	34	33	33	33	40	28	24	32	21	17			
	21-27	58	44	40	58	44	40	58	44	40	58	44	40	55	44	40	50	44	40	48	44	40	43	43	40	41	41	40	39	39	39	37	37	37	35	35	35	34	34	34	48	33	26	40	25	18			
	28-45	54	49	43	54	49	43	54	49	43	54	49	43	53	49	43	49	43	48	48	43	44	44	43	42	42	42	41	41	41	39	39	39	37	37	37	36	36	36	42	39	33	36	32	24				
160 mph	8-20	48	37	30	48	37	30	48	37	30	48	37	30	48	37	30	48	37	30	45	37	30	42	37	30	39	37	30	37	37	30	36	36	30	34	34	30	33	33	30	37	24	20	28	18	15			
	21-27	54	41	37	54	41	37	54	41	37	54	41	37	54	41	37	50	41	37	48	41	37	43	41	37	39	39	37	37	37	37	37	37	35	35	35	34	34	34	43	29	22	37	22	15				
	28-45	49	48	40	49	48	40	49	48	40	49	48	40	49	48	40	49	48	40	48	48	40	43	43	40	42	42	40	40	40	39	39	39	37	37	37	36	36	36	38	36	27	32	28	20				
170 mph	8-20	43	32	27	43	32	27	43	32	27	43	32	27	43	32	27	43	32	27	43	32	27	43	32	27	39	32	27	36	32	27	34	32	27	33	32	27	32	21	18	25	16	13						
	21-27	50	38	32	50	38	32	50	38	32	50	38	32	50	38	32	50	38	32	48	38	32	43	38	32																								