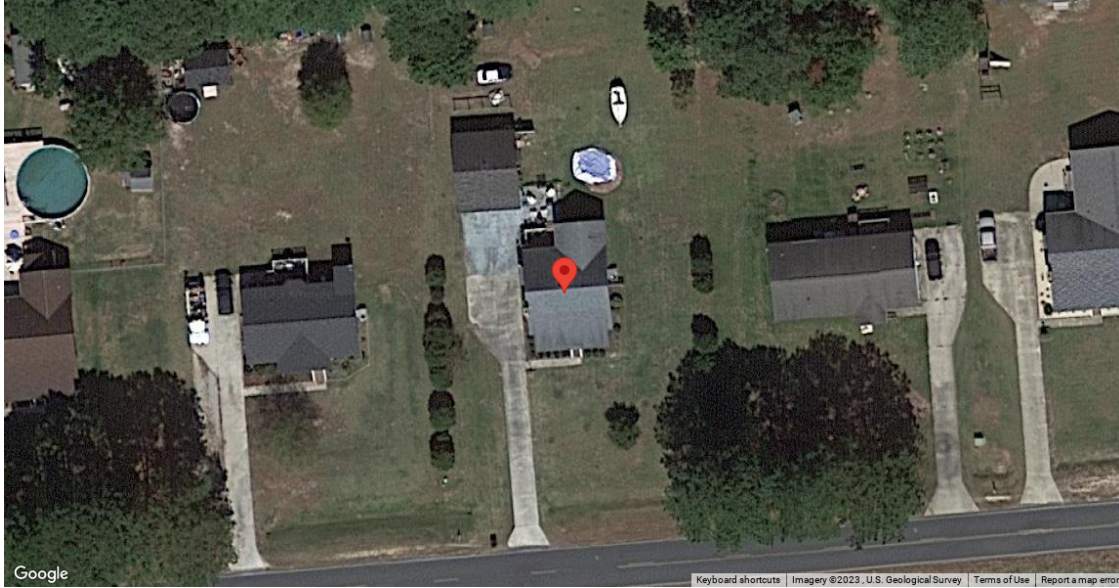


**Project Details**

<b>Name</b>	Timothy Huggins	<b>Date</b>	05/24/2023
<b>Location</b>	1013 Silas Moore Road, Benson, NC 27504	<b>Total modules</b>	8
<b>Module</b>	Mission Solar Energy: MSE395SX9R (40mm)	<b>Total watts</b>	3,160
<b>Dimensions</b>	Dimensions: 75.08" x 41.5" x 1.57" (1907.0mm x 1054.0mm x 40.0mm)	<b>Attachments</b>	17
<b>ASCE</b>	7-10	<b>Rails per row</b>	2



System Weight	
<b>Total system weight</b>	444.4 lbs
<b>Weight/attachment</b>	26.1 lbs
<b>Racking weight</b>	56.4 lbs
<b>Distributed weight</b>	2.5 psf

Load Assumptions	
<b>Wind exposure</b>	C
<b>Wind speed</b>	119 mph
<b>Ground snow load</b>	15 psf
<b>Attachment spacing portrait</b>	4.0'

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>	Flashfoot2
		<b>Staggered attachments</b>	Yes
<b>Roof slope</b>	16 °	<b>Attachment hardware</b>	Square
<b>Risk category</b>	II		
<b>Specific gravity</b>	0.42		

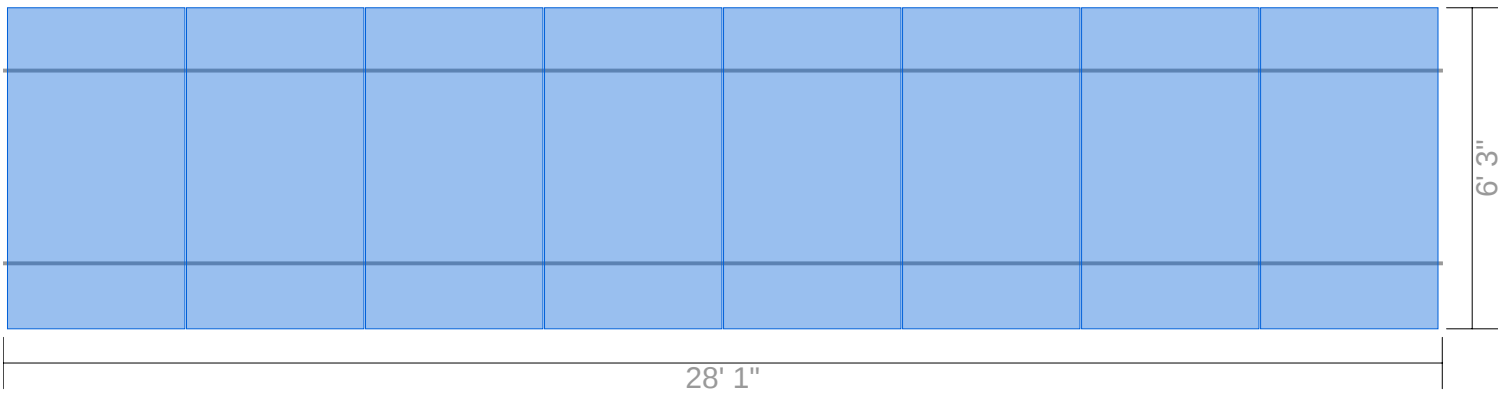
Span Details XR10 - Portrait		
Zone	Max span	Max cantilever
1	5' 8"	2' 3"
2	5' 6"	2' 2"
3	4' 5"	1' 9"

Reaction Forces XR10 - Portrait				
Zone	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral (lbs)
1	13.9	237	152	52
2	25.7	237	308	52
3	39.6	237	484	52

**Roof Section 1**

Details		Weights
Panels: 8	Provided rail: 84' [6 x 168"]	Total weight: 444.4 lbs
Rail orientation: East-West	Attachments: 17	Weight/attachment: 26.1 lbs
Panel orientation: Portrait	Splices: 4	Total Area: 175.5 sq ft
Entry type: Graphical	Clamps: 18	Distributed weight: 2.5 psf

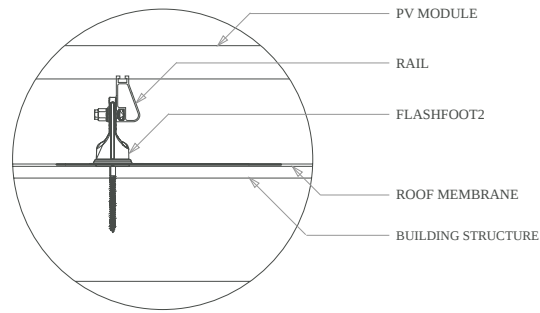
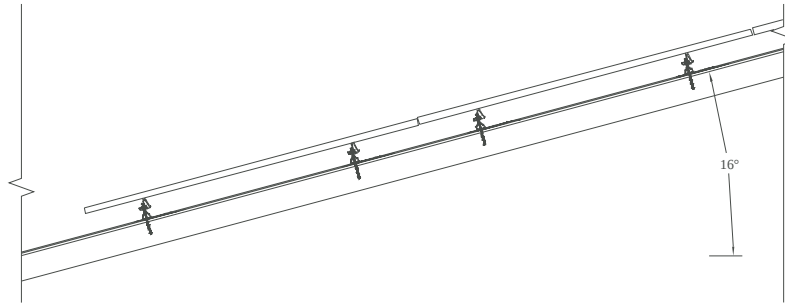
**Diagram**



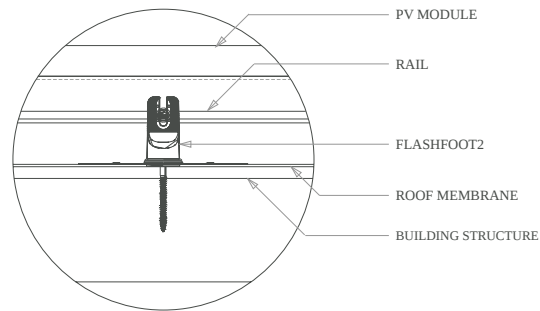
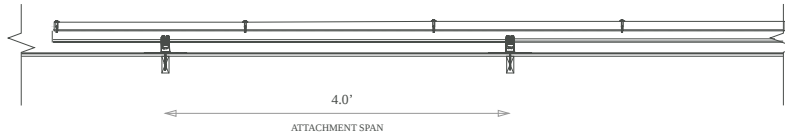
**Segments**

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
A	8	28' 1"	28' 1"	0"	84' [6 x 168"]	17	4	18

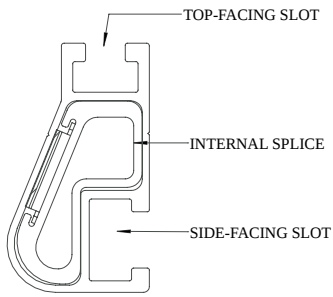
**Side View (portrait)**



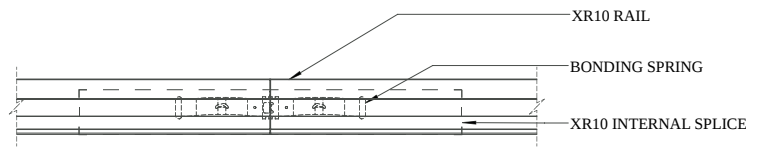
**Front View (portrait)**



**Splice Details**

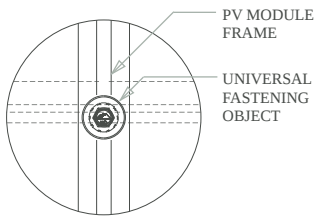


XR10

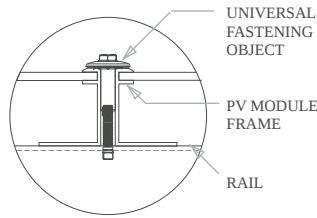


Splice Connection

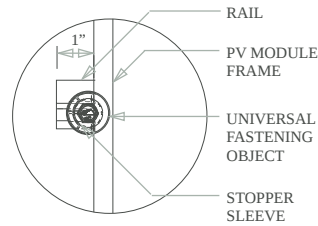
**Clamp Detail**



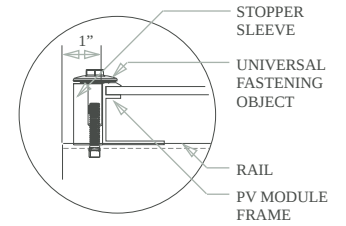
Mid Clamp, Plan



Mid Clamp, Front

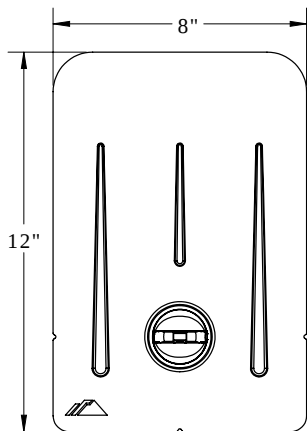


End Clamp, Plan

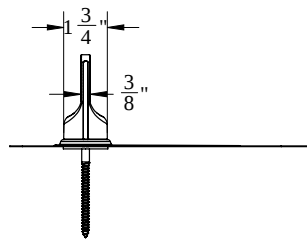


End Clamp, Front

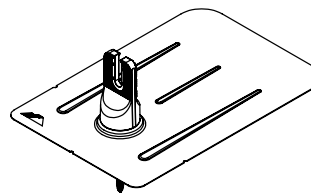
**FlashFoot2 Detail**



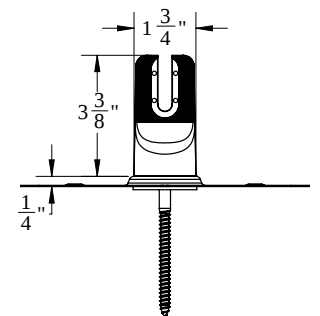
Plan View



Side View

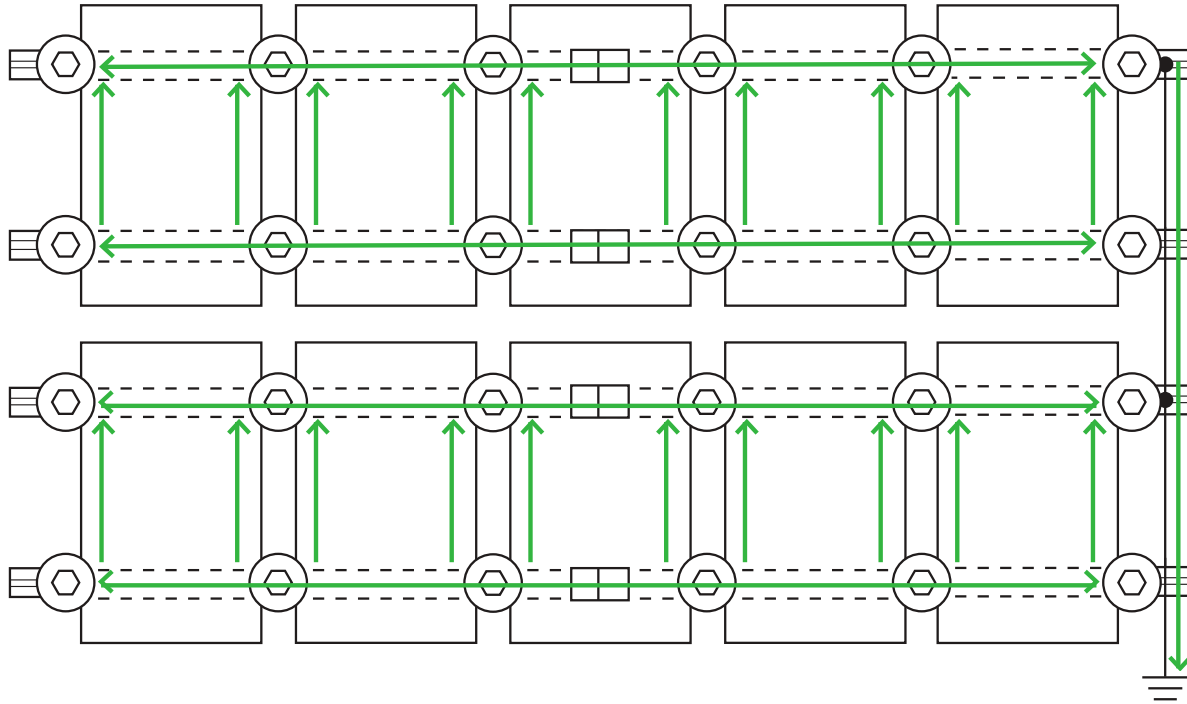


Perspective View





Front View

**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**

<b>Part</b>	<b>Spares</b>	<b>Total Qty</b>
-------------	---------------	------------------

**Rails & Splices**

XR-10-168B XR10, Rail 168" Black	0	6
XR10-BOSS-01-M1 Bonded Splice, XR10	0	4

**Clamps & Grounding**

UFO-CL-01-B1 Universal Module Clamp, Black	0	18
UFO-STP-40MM-B1 Stopper Sleeve, 40MM, Black	0	4
XR-LUG-03-A1 Grounding Lug, Low Profile	0	1

**Attachments**

FF2-02-B2 FlashFoot2, Black	0	17
BHW-SQ-02-A1 Square-Bolt Bonding Hardware	0	17

# 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

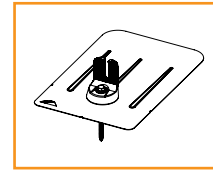
➤ If using previous version of Integrated Grounding Mid Clamps, End Clamps, Expansion Joints and for a list of approved 3rd party components please refer to Alternate Components Addendum (Version 1.9)

## ATTACHMENTS

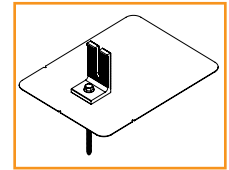
### COMPOSITION SHINGLE



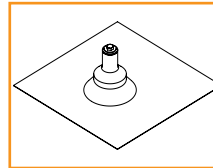
FlashFoot2



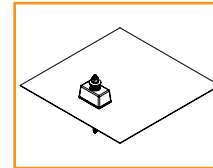
FlashVue



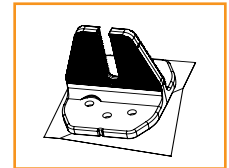
QM L-Mount



QM QBase

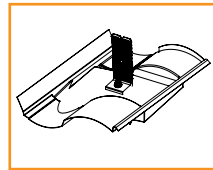


QM Classic Comp Mount

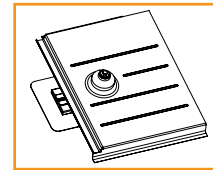


HUG (Halo UltraGrip)

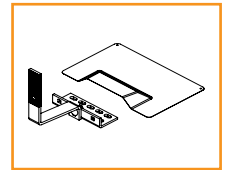
### TILE



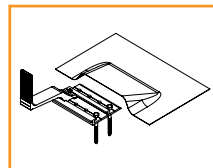
Knockout Tile



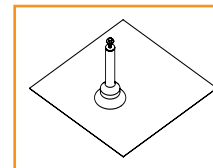
QM Tile Replacement



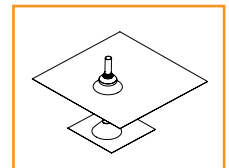
All Tile Hook and Flashing (optional)



QM Quick Hook and Flashing (optional)

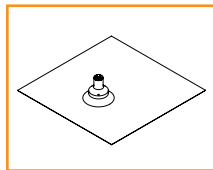


QM QBase Tile

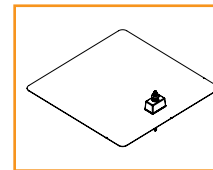


QM Tile Conduit Penetration

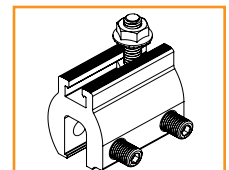
### ADDITIONAL ROOF TYPES



QM Qbase Shake - Slate - Metal Shingle

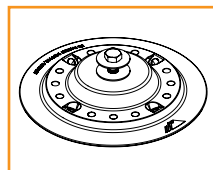


QM Classic Mount Shake

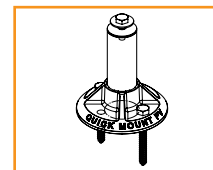


QM Lynx Metal Roof Attachment

### 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.

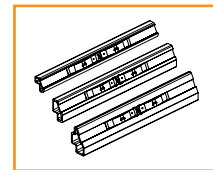
## COMPONENTS



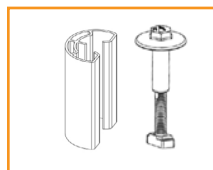
XR Rail



Wire Clip



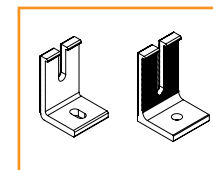
BOSS



UFO and Stopper Sleeve (30-46MM)



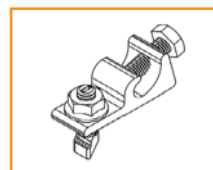
CAMO



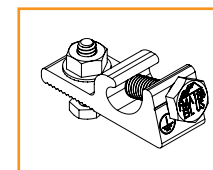
Ironridge L-Foot and QM L-Foot



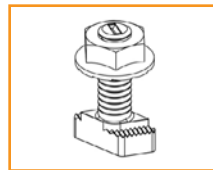
End Cap



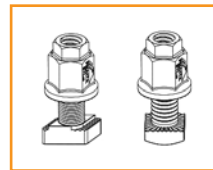
Rail Grounding Lug



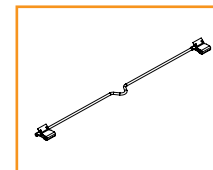
Module Grounding Lug



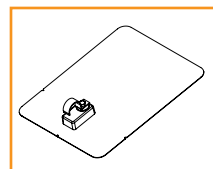
Microinverter Kit



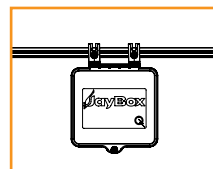
3/8" Bonding Hardware



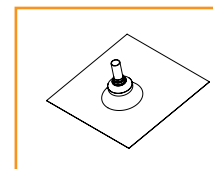
8" Bonding Jumper Single Use Only



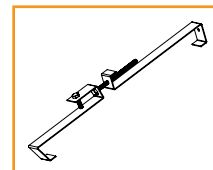
QM Classic Conduit Comp Mount



JAYBOX



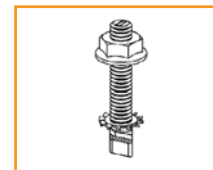
QM Composition Conduit Penetration



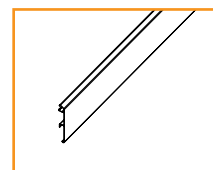
QM Tile Conduit Mount



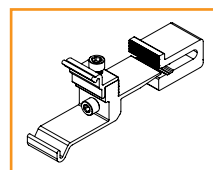
Frameless End/Mid Clamp



Frameless Module Kit



Contour Trim



Contour Clamp



**Flush Mount System Span Table (inches) - Portrait or Landscape Installation**  
 Max Module Length: 78.5", Max Module SF: 24 SF  
 Exposure B

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*					
		Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3						
		110 mph	8-27	84	75	61	72	72	61	61	61	61	60	60	60	60	60	60	54	54	54	49	49	49	45	45	45	42	42	42	40	40	40	38	38	38	36	36	36	34	34	34	33

**Flush Mount System Span Table (inches) - Portrait or Landscape Installation**  
 Max Module Length: 78.5", 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*		
		Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3			
		110 mph	8-27	84	64	51	72	64	51	61	61	51	60	60	51	54	54	51	49	49	49	45	45	45	42	42	42	40	40	40	37	37	37	36	36	36	34	34	34	33

**Flush Mount System Span Table (inches) - Portrait or Landscape Installation**  
 Max Module Length: 78.5", Max Module SF: 24 SF  
 Exposure D

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*		
		Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3			
		110 mph	8-27	79	58	48	72	58	48	61	58	48	60	58	48	54	54	48	49	49	48	45	45	45	42	42	42	40	40	40	38	38	38	36	36	36	34	34	34	33

\* = Note: additional installation requirement for CAMO module clamp. See Note 12 on Page 3 for details. REV 03/05/2021

= min 72" span      = min 64" span      = min 48" span

= Shaded cells indicate conditions in which UFO Mid Clamp connection capacity is exceeded. See Note 10 on page 2 for details.