

Design Criteria for Span Tables:

Values in the maximum allowable rail span tables provided herein are subject to the following general criteria and additional criteria shown on individual span tables sheets. Values in span tables are based on the same engineering methodology and calculation algorithms used for U-Builder and are provided here for reference.

Building Assumptions

- Building Risk Category: II
- Mean Roof Height: 30 ft
- Roof Pitch: 0°-45°
- Site Elevation: 0 ft

Wind Design Assumptions

- Wind loads used are based on ASCE 7-10 Sec 30.4.2
- Exposure Category B, C, or D
- Basic Wind Speed = 90 – 180 mph
- Level terrain. Topographic factor, $k_{zt} = 1.0$

Snow Design Assumptions

- Ground Snow Load = 0-100 psf
- Exposure Factor coefficients of Partially Exposed condition
- Thermal Factor = 1.0
- Results based on uniform snow load

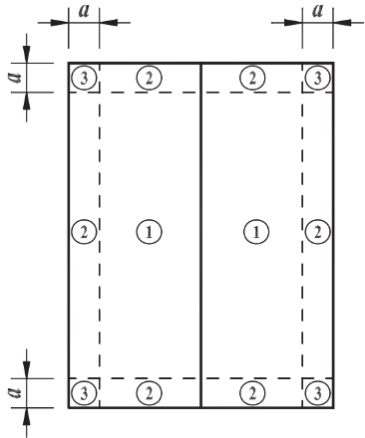
Seismic Design Assumptions

- 0.2-s Spectral Response Acceleration
- $S_s = 1.25$ and 3 per criteria shown on individual span tables sheets.
- $S_1 = 0.5$
- Seismic site class D

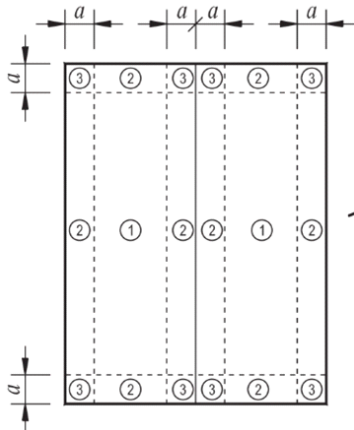
Array Assumptions

- Module orientation and Rail direction per criteria shown on individual span tables sheets.
- Maximum module dimensions of 40.1" x 67" (~19 sq.ft, 47.65 lbs) and 41" x 80" (~23 sq.ft, 58.6 lbs) per criteria shown on individual span tables sheets.
- Minimum distance between modules and roof edge is at least twice the module height above roof surface.
- Modules are parallel to roof surface and maximum height above roof surface is 5" to 10" depending on attachment type.
- Gaps between module rows and columns is 0.25" in to 1" depending on clamp type.
- The most restrictive of all roof zone spans shall be used when any part of the module is attributed to that span.

Zone should be considered as per ASCE 7-10, Fig. 30.4-2A to 30.4-2D

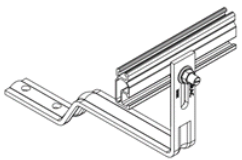


Gable Roofs $\theta \leq 7^\circ$



Gable Roofs $7^\circ < \theta \leq 45^\circ$

Rails can be installed in these possible orientations.

*AT1	
Y+	Alternate orientation not allowed
Y-	



Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Basic Wind Speed (mph)																																																																													
			90						95						100						105						110						115						120						130						140						150						160						170						180					
			Roof Wind Zone																																																																													
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3																																	
0	B	0-7	83	83	76	83	83	72	83	82	63	83	79	54	83	76	47	83	72	42	83	66	38	81	54	32	77	44	27	72	38	24	63	33	21	55	29	28	48	26	25																																							
		7-27	83	83	75	83	83	71	83	82	63	83	79	56	83	76	50	83	73	45	83	69	41	83	56	35	79	47	30	75	40	26	71	35	22	61	31	30	54	27	26																																							
		27-45	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	82	82	78	78	78	68	68	68	59	59	59	52	52	52	46	46	46	41	41	37	37	37																																							
	C	0-7	83	78	52	83	74	44	83	69	39	83	60	35	81	53	32	78	47	29	76	42	27	69	36	22	58	31	29	50	26	25	43	23	22	38	20	19	34	27	17																																							
		7-27	83	78	54	83	75	47	83	71	42	83	63	38	83	56	34	81	50	31	79	45	29	74	38	24	65	32	21	56	28	27	48	24	24	42	22	21	37	29	19																																							
		27-45	84	84	84	83	83	83	80	80	80	73	73	73	68	68	68	62	62	62	58	58	58	50	50	50	43	43	43	38	38	38	34	34	30	30	30	27	27	27																																								
	D	0-7	83	72	41	83	63	36	82	55	33	79	48	30	76	43	27	73	39	24	68	36	22	57	30	29	48	26	24	41	22	21	36	29	19	32	26	16	28	23	14																																							
		7-27	83	73	44	83	66	39	83	58	35	82	51	32	79	46	29	76	41	26	73	38	24	64	32	20	54	27	26	46	23	23	40	21	20	35	27	18	31	24	16																																							
		27-45	82	82	82	76	76	69	69	69	63	63	63	58	58	58	53	53	53	49	49	49	42	42	42	37	37	37	32	32	32	29	29	29	26	26	26	23	23	23																																								
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		7-27	63	63	63	63	63	63	63	63	63	63	63	56	63	63	50	63	63	45	63	63	41	63	56	35	63	47	30	63	40	26	59	35	22	55	31	30	52	27	26																																							
		27-45	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	82	78	78	78	68	68	68	59	59	59	52	52	52	46	46	46	41	41	37	37	37																																							
	C	0-7	62	62	52	62	62	44	62	62	39	62	60	35	62	53	3																																																															

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10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.



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30 ft

Roof Height

18.66 sq.ft

Module Area

CROSS-SLOPE
Rail Direction

PRO SERIES

Clamp

Solarhooks AT1

Attachment

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Basic Wind Speed (mph)																																																																													
			90						95						100						105						110						115						120						130						140						150						160						170						180					
			Roof Wind Zone																																																																													
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3																																	
0	B	0-7	98	98	92	98	98	87	98	98	83	98	94	80	98	91	76	98	87	72	98	84	64	97	79	54	91	74	46	96	64	40	82	56	35	79	49	47	75	43	41																																							
		7-27	99	99	90	99	99	86	99	99	83	99	95	79	99	91	77	99	88	74	99	85	70	99	80	58	95	75	50	90	68	43	86	59	38	82	52	50	78	46	45																																							
		27-45	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	97	97	97	95	95	95	91	90	90	87	85	85	83	81	81	78	77	69	69	69	62	62	62																																							
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		7-27	99	94	79	99	90	75	99	86	71	99	83	64	99	80	58	97	77	53	94	74	48	88	64	41	83	55	35	79	47	46	75	41	40	71	36	35	63	49	91																																							
		27-45	100	100	100	98	98	98	96	96	96	93	93	93	91	90	88	87	87	86	84	84	82	79	79	73	73	73	64	64	64	64	56	56	56	50	50	50	45	45	45																																							
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		7-27	88	88	88	88	88	86	88	88	88	88	88	88	88	88	88	88	88	88	88	88	85	70	88	80	58	88	75	50	88	68	43	86	59	38	82	52	50	78	46	45																																						
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	C	0-7	72	72	72	72	72	72	72	72	67	72	72	59	72	72	54	72	72	49	72	72	45	72	60	38	72	52	49	72	45	43	72	39	37	64	34	93	56	46	29																																							
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	27-45	86	86	86	86	86	86	84	84	84	83	83	83	81	81	81	78	78	78	74	74	74	66	66	66	60	60	60	60	54	54	54	48	48	48	43	43	43	39	39	39																																							
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		27-45	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	74	74	74	68	68	68	63	63	63	59	59	59																																					
	C	0-7	70	70	70	70	70	70	70	67	70	70	59	70	70	54	70	60	38	70	60	38	70	52	49	70	45	49	70	45	43	70	39	37	64	34	93	56	46	29																																								
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D	0-7	72	72	71	72	72	61	72	72	55	72	72	50	72	72	45	72	66	41	72	60	38	72	51	48	72	43	41	70	37	36	61	49	91	53	44	28	47	39	25																																								
	7-27	73	73	73	73	73	66	73	73	59	73	73	54	73	73	49	73	71	44	71	63	41	67	53	34	63	46	44	59	40	38	56	35	34	53	46	90	50	41	26																																								
	27-45	86	86	86	86	86	86	84	84	84	83	83	83	81	81	81	78	78	78	74	74	74	66	66	66	60	60	60	60	54	54	54	48	48	48	43	43	43	39	39	39																																							
40	B	0-7	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58																																															

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10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.



30 ft
Roof Height

Ss = 1.25

Seismic

18.66 sq.ft

LANDSCAPE

CROSS-SLOPE
Rail Direction

SML
Rail Type

PRO SERIES
Clamp

Solarhooks AT1

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16 Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.



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30 ft
Roof Height

Ss = 1.25
Seismic

22.78 sq.ft

LANDSCAPE

CROSS-SLOPE
Rail Direction

SML
Rail Type

PRO SERIES
Clamp

Solarhooks AT1

Attachment

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Basic Wind Speed (mph)																																															
			90						95			100			105			110			115			120			130			140			150			160			170			180								
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			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3									
0	B	0-7	98	98	91	98	98	86	98	98	82	98	94	79	98	90	76	98	86	71	98	83	63	96	78	53	90	73	45	86	62	39	82	54	52	78	48	46	75	42	40									
		7-27	98	98	89	98	98	85	98	82	98	94	79	98	90	76	98	87	73	98	84	68	98	79	57	94	75	49	89	66	42	85	57	56	81	51	49	78	45	44										
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	96	96	96	94	94	94	90	89	89	86	84	83	80	80	76	76	76	68	68	68	61	61	61										
	C	0-7	98	92	78	98	88	74	98	84	64	98	81	58	96	78	53	92	75	48	89	71	44	84	59	37	80	50	48	76	44	42	71	38	36	62	51	92	55	45	29									
		7-27	98	93	78	98	89	75	98	85	70	98	82	62	98	79	57	96	76	52	93	73	47	87	62	40	83	53	52	79	46	45	75	40	39	70	54	95	61	48	91									
		27-45	99	99	99	98	98	98	95	95	95	92	92	90	89	88	86	86	85	83	83	81	78	78	71	71	62	62	62	62	62	62	55	55	55	49	49	49	44	44	44									
	D	0-7	98	86	70	98	82	60	97	79	54	93	76	49	90	72	44	87	64	40	84	58	37	79	49	47	75	42	40	68	55	95	59	48	91	52	43	27	46	38	24									
		7-27	98	87	72	98	83	65	98	80	58	97	77	52	93	74	48	90	68	43	87	62	40	82	52	51	78	45	43	73	39	98	66	51	99	58	45	29	51	40	26									
		27-45	96	96	96	93	93	90	90	88	86	86	86	83	83	81	81	81	81	78	78	70	70	61	61	61	53	53	53	53	47	47	47	42	42	42	38	57	57											
10	B	0-7	87	87	87	87	87	86	87	87	82	87	87	79	87	87	76	87	86	71	87	83	63	87	78	53	87	73	45	86	62	39	82	54	52	78	48	46	75	42	40									
		7-27	87	87	87	87	87	85	87	82	87	87	79	87	87	76	87	76	87	73	87	84	68	87	79	57	87	75	49	87	66	42	85	57	56	81	51	49	78	45	44									
		27-45	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	96	96	94	94	94	90	89	89	86	84	83	80	80	76	76	76	68	68	68	61	61	61										
	C	0-7	87	87	78	87	87	74	87	84	64	87	81	58	87	78	53	87	75	48	87	71	44	84	59	37																								

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Risk Category	Frequency	Severity	Control Measures
High	1	2	3
Medium	2	3	4
Low	3	4	5

30 ft
Roof Height

Ss = 1.25
Seismic

22.78 sq.ft

LANDSCAPE

CROSS-SLOPE
Rail Direction

SML
Rail Type

PRO SERIES
Clamp

Solarhooks AT1

SPAN TABLES

[illegible]

• Cells with an asterisks indicates that the L-root must be oriented in the Y- direction as indicated in the image.

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40 Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.



30 ft
Roof Height

S_s = 3.00
Seismic

18.66 sq.ft
Module Area

ORIENTATION

CROSS-SLOPE
Rail Direction

SML
Rail Type

PRO SERIES
Clamp

Solarhooks AT1

Attachment

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)			Wind Exposure Category			Roof Tilt Angle (deg)			Basic Wind Speed (mph)																																						
									90			95			100			105			110			115			120			130			140			150			160			170			180		
									Roof Wind Zone																																						
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3												
0	B	0-7	83	83	76	83	83	72	83	82	63	83	79	54	83	76	47	83	72	42	83	66	38	81	54	32	77	44	27	72	38	24	63	33	21	55	29	28	48	26	25						
		7-27	83	83	75	83	83	71	83	82	63	83	79	56	83	76	50	83	73	45	83	69	41	83	56	35	79	47	30	75	40	26	71	35	22	61	31	30	54	27	26						
		27-45	83	83		83	83	83	83	83	83	83	83	83	83	83	83	83	82	82	78	78	78	68	68	68	59	59	59	52	52	52	46	46	41	41	41	37	37	37							
	C	0-7	83	78	52	83	74	44	83	69	39	83	60	35	81	53	32	78	47	29	76	42	27	69	36	22	58	31	29	50	26	25	43	23	22	38	20	19	34	27	17						
		7-27	83	78	54	83	75	47	83	71	42	83	63	38	83	56	34	81	50	31	79	45	29	74	38	24	65	32	21	56	28	27	48	24	24	42	22	21	37	29	19						
		27-45	83	83	83	83	83	83	80	80	80	73	73	73	68	68	68	62	62	62	58	58	58	50	50	50	43	43	43	38	38	38	34	34	34	30	30	27	27	27							
	D	0-7	83	72	41	83	63	36	82	55	33	79	48	30	76	43	27	73	39	24	68	36	22	57	30	29	48	26	24	41	22	21	36	29	19	32	26	16	28	23	14						
		7-27	83	73	44	83	66	39	83	58	35	82	51	32	79	46	29	76	41	26	73	38	24	64	32	20	54	27	26	46	23	23	40	21	20	35	27	18	31	24	16						
		27-45	82	82	82	76	76	76	69	69	69	63	63	63	58	58	58	53	53	53	49	49	49	42	42	42	37	37	37	32	32	32	29	29	29	26	26	26	23	23	23						
10	B	0-7	62	62	62	62	62	62	62	62	62	62	54	62	62	47	62	62	42	62	62	38	62	54	32	62	44	27	62	38	24	62	33	21	55	29	28	48	26	25							
		7-27	63	63	63	63	63	63	63	63	63	63	56	63	63	50	63	63	45	63	63	41	63	56	35	63	47	30	63	40	26	59	35	22	55	31	30	52	27	26							
		27-45	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71	68	68	68	59	59	59	52	52	52	46	46	46	41	41	41	37	37	37							
	C	0-7	62	62	52	62	62	44	62	62	39	62	60	35	62	53	32	62	47	29	62	42	27	62	36	22	58	31	29	50	26	25	43	23	22	38	20	19	34	27	17						
		7-27	63	63	54	63	63	47	63	63	42	63	63	38	63	56	34	63	50	31	63	45	29	61	38	24	57	32	21	53	28	27	48	24	24	42	22	21	37	29	19						
		27-45	71	71	71	71	71	71	71	71	71	71	71	71	68	68	68	62	62	62	58	58	58	50	50	50	43	43	43	38	38	38	34	34	34	30	30	27	27	27							
	D	0-7	62	62	41	62	62	36	62	55	33	62	48	30	62	43	27	62	39	24	62	36	22	57	30	29	48	26	24	41	22	21	36	29	19	32	26	16	28	23	14						
		7-27	63	63	44	63	63	39	63	58	35	63	51	32	63	46	29	63	41	26	61	38	24	56	32	20	52	27	26	46	23	23	40	21	20	35	27	18	31	24	16						
		27-45	73	73	73	73	73	73	69	69	69	63	63	63	58	58	58	53	53	53	49	49	49	42	42	42	37	37	37	32	32	32	29	29	29	26	26	26	23	23	23						
20	B	0-7	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	32	43	43	27	43	38	24	43	33	21	43	29	28	43	26	25							
		7-27	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	35	44	44	30	43	40	26	41	35	22	39	31	30	38	27	26							
		27-45	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	54	54	54	50	50	50	46	46	46	41	41	41	37	37	37						
	C	0-7	43	43	43	43	43	43	43	43	39	43	43	35	43	43	32	43	43	29	43	42	27	43	36	22	43	31	29	43	26	25	43	23	22	38	20	19	34	27	17						
		7-27	44	44	44	44	44	44	44	44	42	44	44	38	44	44	34	44	44	31	44	44	29	42	38	24	40	32	21	38	28	27	36	24	24	34	22	21	32	29	19						
		27-45	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55					
	D	0-7	43	43	41	43	43	36	43	43	33	43	43	30	43	43	27	43	39	24	43	36	22	43	30	29	43	26	24	41	22	21	36	29	19	32	26	16	28	23	14						
		7-27	44	44	44	44	44	39	44	44	35	44	44	32	44	44	29	43	41	26	42	38	24	40	32	20	38	27	26	36	23	23	34	21	20	32	27	18	30	24	16						
		27-45	57	57	57	57	57	57	57	57	57	57	57	57	55	55	55	52	52	52	49	49	49	42	42	42	37	37	37	32	32	32	29	29	29	26	26	26	23	23	23						
30	B	0-7	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	32	42	42	27	42	38	24	42	33	21	42	29	28	42	26	25							
		7-27	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	35	44	44	30	43	40	26	41	35	22	39	31	30	38	27	26							
		27-45	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44						
	C	0-7	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	32	42	42	27	42	36	22	42	31	29	42	26	25	42	23	22	38	20	19	34	27	17
		7-27	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44					
		27-45	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44					
	D	0-7	43	43	41	43	43	36	43	43	33	43	43	30	43	43	27	43	39	24	43	36	22	43	30	29	43	26	24	41	22	21	36	29	19	32	26	16	28	23	14						
		7-27	44	44	44	44	44	39	44	44	35	44	44	32	44	44	29	43	41	26	42	38	24	40	32	20	38	27	26	36	23	23	34	21	20	32	27	18	30	24	16						
		27-45	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47					
40	B	0-7	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35						
		7-27	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37					
		27-45	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37				
	C	0-7	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35				
		7-27	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37						

- * Cells with an asterisks indicates that the L-foot must be oriented in the Y- direction as indicated in the image.



• Cells with an asterisk indicates that the L-foot must be oriented in the Y- direction as indicated in the image.

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

~~10~~ Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.



30 ft
Roof Height

Ss = 3.00
Seismic

18.66 sq.ft
Module Area

LANDSCAPE

Orientation

CROSS-SLOPE
Rail Direction

Rail Type	Count
SML	1

PRO SERIES
Clamp

Solarhooks ATI

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Basic Wind Speed (mph)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
			90						95						100						105						110						115						120						130						140						150						160						170						180																																																																																																																																																																																																																																																																																																																																																																																																											
			Roof Wind Zone																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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0	B	0-7	98	98	92	98	98	87	98	98	83	98	94	80	98	91	76	98	87	72	98	84	64	97	79	54	91	74	46	96	64	40	82	56	35	79	49	47	75	43	41																																																																																																																																																																																																																																																																																																																																																																																																																																													
		7-27	99	99	90	99	99	86	99	99	83	99	95	79	99	91	77	99	88	74	99	85	70	99	80	58	95	75	50	90	68	43	86	59	38	82	52	50	78	46	45																																																																																																																																																																																																																																																																																																																																																																																																																																													
		27-45	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	97	97	95	95	95	91	90	90	87	85	85	83	81	81	78	77	69	69	69	62	62	62																																																																																																																																																																																																																																																																																																																																																																																																																																														
	C	0-7	98	93	78	98	89	75	98	85	67	98	82	59	96	79	54	93	76	49	90	72	45	85	60	38	80	52	49	76	45	43	72	39	37	64	34	93	56	46	29																																																																																																																																																																																																																																																																																																																																																																																																																																													
		7-27	99	94	79	99	90	75	99	86	71	99	83	64	99	80	58	97	77	53	94	74	48	88	64	41	83	55	35	79	47	46	75	41	40	71	36	35	63	49	91																																																																																																																																																																																																																																																																																																																																																																																																																																													
		27-45	100	100	100	98	98	98	96	96	96	93	93	93	91	90	88	87	87	86	84	84	82	79	79	73	73	73	64	64	64	64	56	56	56	50	50	50	45	45	45																																																																																																																																																																																																																																																																																																																																																																																																																																													
D	0-7	98	87	71	98	83	61	97	79	55	94	76	50	90	73	45	87	66	41	85	60	38	80	51	48	75	43	41	70	37	36	61	49	91	53	44	28	47	39	25																																																																																																																																																																																																																																																																																																																																																																																																																																														
	7-27	99	87	73	99	84	66	99	80	59	97	77	54	94	74	49	91	71	44	88	63	41	83	53	34	78	46	44	74	40	38	68	35	34	59	46	90	53	41	26																																																																																																																																																																																																																																																																																																																																																																																																																																														
	27-45	97	97	97	94	94	94	91	90	89	87	87	86	84	84	84	81	81	82	79	79	71	71	62	62	62	62	62	62	64	54	54	48	48	43	43	39	39	39																																																																																																																																																																																																																																																																																																																																																																																																																																															
10	B	0-7	88	88	88	88	88	87	88	88	83	88	88	80	88	88	76	88	87	72	88	84	64	88	79	54	88	75	46	86	64	40	82	56	35	79	49	47	75	43	41																																																																																																																																																																																																																																																																																																																																																																																																																																													
		7-27	88	88	88	88	88	86	88	88	83	88	88	79	88	88	77	88	88	74	88	85	70	88	80	58	88	75	50	88	68	43	86	59	38	82	52	50	78	46	45																																																																																																																																																																																																																																																																																																																																																																																																																																													
		27-45	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	97	97	97	95	95	95	91	90	90	87	85	85	83	81	81	78	77	69	69	69	62	62	62																																																																																																																																																																																																																																																																																																																																																																																																																																														
	C	0-7	88	88	78	88	88	75	88	85	67	88	82	59	88	79	54	88	76	49	88	72	45	85	60	38	80	52	49	76	45	43	72	39	37	64	34	93	56	46	29																																																																																																																																																																																																																																																																																																																																																																																																																																													
		7-27	88	88	79	88	88	75	88	86	71	88	83	64	88	80	58	88	77	53	88	74	48	88	64	41	83	55	35	79	47	46	75	41	40	71	36	35	63	49	91																																																																																																																																																																																																																																																																																																																																																																																																																																													
		27-45	98	98	98	98	98	98	96	96	96	93	93	93	91	90	88	87	87	86	84	84	82	79	79	73	73	73	64	64	64	64	56	56	56	50	50	50	45	45	45																																																																																																																																																																																																																																																																																																																																																																																																																																													
D	0-7	88	87	71	88	83	61	88	79	55	88	76	50	88	73	45	87	66	41	85	60	38	80	51	48	75	43	41	70	37	36	61	49	91	53	44	28	47	39	25																																																																																																																																																																																																																																																																																																																																																																																																																																														
	7-27	88	87	73	88	84	66	88	80	59	88	77	54	88	74	49	88	71	44	88	63	41	83	53	34	78	46	44	74	40	38	68	35	34	59	46	90	53	41	26																																																																																																																																																																																																																																																																																																																																																																																																																																														
	27-45	97	97	97	94	94	94	91	90	89	87	87	86	84	84	84	81	81	82	79	79	71	71	62	62	62	62	62	62	64	54	54	48	48	43	43	39	39	39																																																																																																																																																																																																																																																																																																																																																																																																																																															
20	B	0-7	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72

* Cells with an asterisk indicates that the L-foot must be oriented in the Y- direction as indicated in the image.

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

16 Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.



30 ft
Roof Height

Ss = 3.00
Seismic

18.66 sq.ft

LANDSCAPE

CROSS-SLOPE
Rail Direction

SML
Rail Type

PRO SERIES

Solarhooks ATI

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11

30 ft
Roof Height

Ss = 1.25
Seismic

18.66 sq.ft

ORIENTATION

CROSS-SLOPE
Rail Direction

SML
Rail Type

UAF

Solarhooks AT1

SPAN TABLES

[illegible]

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30 ft
Roof Height

18.66 sq.ft
Module Area

CROSS-SLOPE
Rail Direction

UAF

Clamp

Solarhooks AT1

Attachment

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Basic Wind Speed (mph)																																															
			90			95			100			105			110			115			120			130			140			150			160			170			180											
			Roof Wind Zone																																															
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3									
0	B	0-7	98	98	92	98	98	87	98	98	83	98	94	80	98	91	76	98	87	72	98	84	64	97	79	54	91	74	46	96	64	40	82	56	35	79	49	31	75	43	27									
		7-27	99	99	90	99	99	86	99	99	83	99	95	79	99	91	77	99	88	74	99	85	70	99	80	58	95	75	50	90	68	43	86	59	38	82	52	33	78	46	30									
		27-45	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	97	97	97	95	95	95	91	90	90	87	85	85	83	81	81	78	77	69	69	69	62	62	62									
	C	0-7	98	93	78	98	89	75	98	85	67	98	82	59	96	79	54	93	76	49	90	72	45	85	60	38	80	52	33	76	45	28	72	39	37	64	34	33	56	31	29									
		7-27	99	94	79	99	90	75	99	86	71	99	83	64	99	80	58	97	77	53	94	74	48	88	64	41	83	55	35	79	47	30	75	41	27	71	36	35	63	32	31									
		27-45	100	100	100	98	98	98	96	96	96	93	93	93	91	90	90	88	87	87	86	84	84	82	79	79	73	73	73	73	64	64	64	56	56	50	50	50	45	45	45									
10	D	0-7	98	87	71	98	83	61	97	79	55	94	76	50	90	73	45	87	66	41	85	60	38	80	51	32	75	43	27	70	37	36	61	33	31	53	29	28	47	39	25									
		7-27	99	87	73	99	84	66	99	80	59	97	77	54	94	74	49	91	71	44	88	63	41	83	53	34	78	46	29	74	40	38	68	35	34	59	31	30	53	27	26									
		27-45	97	97	97	94	94	94	91	90	89	87	87	86	84	84	81	81	81	82	79	79	71	71	62	62	62	62	62	54	54	54	48	48	43	43	39	39	39											
	B	0-7	88	88	88	88	88	87	88	88	88	88	88	88	88	88	88	88	88	88	88	84	88	79	54	88	74	46	86	64	40	82	56	35	79	49	31	75	43	27										
		7-27	88	88	88	88	88	86	88	88	88	88	88	88	88	88	88	88	88	88	88	88	85	70	88	80	58	88	75	50	88	68	43	86	59	38	82	52	33	78	46	30								
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	97	97	97	95	95	95	91	90	90	87	85	85	83	81	81	78	77	69	69	69	62	62	62								
20	C	0-7	88	88	78	88	88	75	88	85	67	88	82	59	88	79	54	8																																

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II

30 ft

Roof Height

Ss = 1.25
Seismic

18.66 sq.ft

Module Area

LANDSCAPE

CROSS-SLOPE
Rail Direction

SML
Rail Type

UAF

Clamp

Solarhooks AT1

Attachment

SPAN TABLES

[illegible]

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30 ft
Roof Height

22.78 sq.ft

CROSS-SLOPE
Rail Direction

UAF

Clamp

Solarhooks AT1

Attachment

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Basic Wind Speed (mph)																																									
			90			95			100			105			110			115			120			130			140			150			160			170			180					
			Roof Wind Zone																																									
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3						
0	B	0-7	98	98	91	98	98	86	98	98	82	98	93	79	98	90	76	98	86	71	98	83	63	96	78	53	90	73	45	86	62	39	82	54	34	78	48	30	75	42	40			
		7-27	98	98	89	98	98	85	98	98	82	98	94	79	98	90	76	98	87	73	98	84	68	98	79	57	94	75	49	89	66	42	85	57	37	81	51	33	78	45	44			
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	96	96	96	94	94	94	90	89	89	86	84	83	80	80	76	76	76	68	68	68	61	61	61				
	C	0-7	98	92	78	98	88	74	98	84	64	98	81	58	96	78	53	92	75	48	89	71	44	84	59	37	80	50	32	76	44	42	71	38	36	62	34	32	55	30	29			
		7-27	98	93	78	98	89	75	98	85	70	98	82	62	98	79	57	96	76	52	93	73	47	87	62	40	83	53	34	79	46	45	75	40	39	70	36	35	61	32	31			
		27-45	99	99	99	98	98	98	95	95	95	92	92	90	89	88	86	86	85	83	83	81	78	78	71	71	71	62	62	62	62	55	55	55	49	49	49	44	44	44				
10	D	0-7	98	86	70	98	82	60	97	79	54	93	76	49	90	72	44	87	64	40	84	58	37	79	49	31	75	42	40	68	37	35	59	32	31	52	43	27	46	38	24			
		7-27	98	87	72	98	83	65	98	80	58	97	77	52	93	74	48	90	68	43	87	62	40	82	52	34	78	45	43	73	39	38	66	34	33	58	45	29	51	40	26			
		27-45	96	96	96	93	93	90	90	88	86	86	86	83	83	81	81	81	81	78	78	70	70	61	61	53	53	53	47	47	47	42	42	42	38	38	38	38	38					
	B	0-7	87	87	87	87	87	86	87	87	82	87	87	79	87	87	76	87	86	71	87	83	63	87	78	53	87	73	45	86	62	39	82	54	34	78	48	30	75	42	40			
		7-27	87	87	87	87	87	85	87	87	82	87	87	79	87	87	76	87	87	73	87	84	68	87	79	57	87	75	49	87	66	42	85	57	37	81	51	33	78	45	44			
		27-45	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	96	96	96	94	94	94	90	89	89	86	84	83	80	80	76	76	76	68	68	68	61	61	61				
C	0-7	87	87	78	87	87	74	87	84	64	87	81	58	87	78	53	87	75	48	87	71	44	84	59	37	80																		

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30 ft
Roof Height

Ss = 1.25
Seismic

22.78 sq.ft

LANDSCAPE

CROSS-SLOPE
Rail Direction

SML

UAF

Solarhooks ATI

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

[illegible]

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Category
II

30 ft
Roof Height

S_s = 3.00
Seismic

18.66 sq.ft

Portrait

CROSS-SLOPE
Rail Direction

SML

UAF

Solarhooks AT1

Attachment

SPAN TABLES

[illegible]

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30 ft
Roof Height

Ss = 3.00
Seismic

18.66 sq.ft
Module Area

LANDSCAPE

CROSS-SLOPE
Rail Direction

SML
Rail Type

UAF

Clamp

Solarhooks AT1

Attachment

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

Ground Snow Load (psf)	Wind Exposure Category	Roof Tilt Angle (deg)	Basic Wind Speed (mph)																																															
			90			95			100			105			110			115			120			130			140			150			160			170			180											
			Roof Wind Zone																																															
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3									
0	B	0-7	98	98	92	98	98	87	98	98	83	98	94	80	98	91	76	98	87	72	98	84	64	97	79	54	91	74	46	96	64	40	82	56	35	79	49	31	75	43	27									
		7-27	99	99	90	99	99	86	99	99	83	99	95	79	99	91	77	99	88	74	99	85	70	99	80	58	95	75	50	90	68	43	86	59	38	82	52	33	78	46	30									
		27-45	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	97	97	97	95	95	95	91	90	90	87	85	85	83	81	81	78	77	69	69	69	62	62	62									
	C	0-7	98	93	78	98	89	75	98	85	67	98	82	59	96	79	54	93	76	49	90	72	45	85	60	38	80	52	33	76	45	28	72	39	37	64	34	33	56	31	29									
		7-27	99	94	79	99	90	75	99	86	71	99	83	64	99	80	58	97	77	53	94	74	48	88	64	41	83	55	35	79	47	30	75	41	27	71	36	35	63	32	31									
		27-45	100	100	100	98	98	98	96	96	96	93	93	93	91	90	90	88	87	87	86	84	84	82	79	79	73	73	73	64	64	64	56	56	56	50	50	50	45	45	45									
D	0-7	98	87	71	98	83	61	97	79	55	94	76	50	90	73	45	87	66	41	85	60	38	80	51	32	75	43	27	70	37	36	61	33	31	53	29	28	47	39	25										
	7-27	99	87	73	99	84	66	99	80	59	97	77	54	94	74	49	91	71	44	88	63	41	83	53	34	78	46	29	74	40	38	68	35	34	59	31	30	53	27	26										
	27-45	97	97	97	94	94	94	91	90	89	87	87	86	84	84	81	81	82	79	79	71	71	62	62	62	62	62	54	54	54	48	48	48	43	43	43	39	39	39											
10	B	0-7	88	88	88	88	88	87	88	88	83	88	88	80	88	88	76	88	87	72	88	84	64	88	79	54	88	74	46	86	64	40	82	56	35	79	49	31	75	43	27									
		7-27	88	88	88	88	88	86	88	88	83	88	88	79	88	88	77	88	88	74	88	85	70	88	80	58	88	75	50	88	68	43	86	59	38	82	52	33	78	46	30									
		27-45	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	97	97	97	95	95	95	91	90	90	87	85	85	83	81	81	78	77	69	69	69	62	62	62										
	C	0-7	88	88	78	88	88	75	88	85	67	88	82	59	88	79	54	88	76	49																														

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