

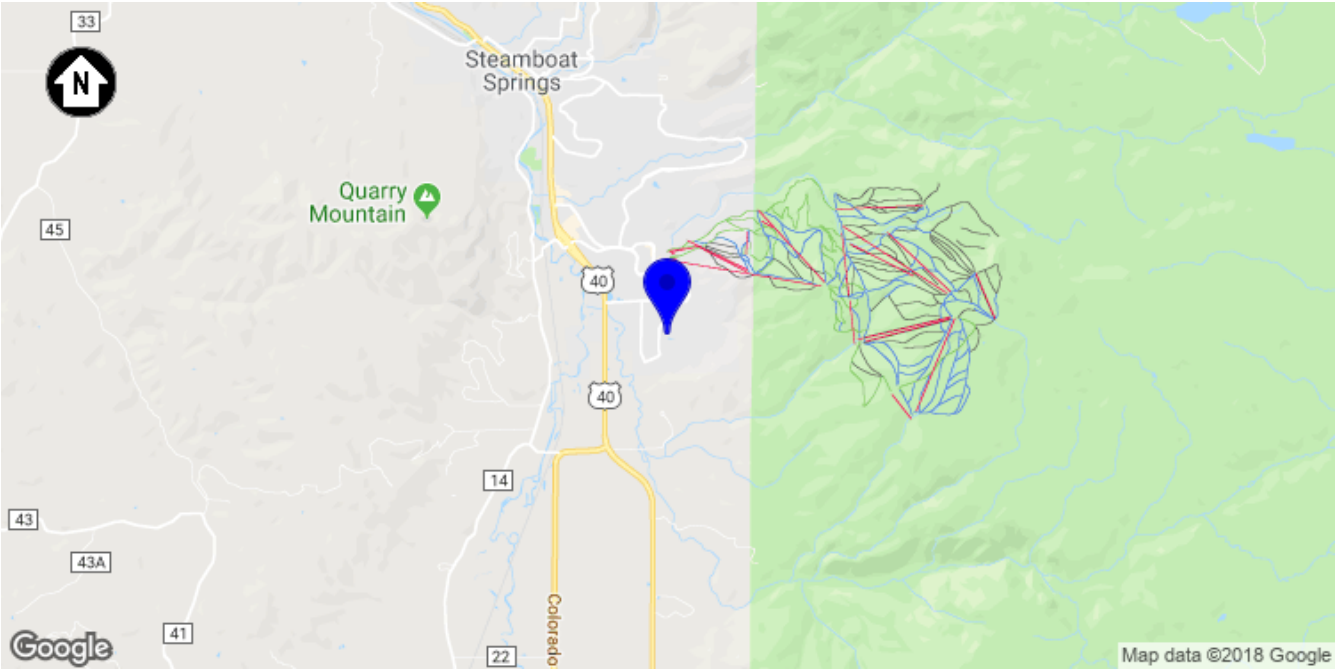
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APPENDIX	ELECTRICAL CALCULATIONS
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	INVERTER DATASHEET
	MOUNTING SYSTEM DATASHEET
	MOUNTING SYSTEM ENGINEERING LETTER
	UL 2703 GROUND AND BONDING CERTIFICATION
	ANCHOR DATASHEET

PROJECT DETAILS	
PROPERTY OWNER	
PROPERTY ADDRESS	3367 APRES SKI WAY, STEAMBOAT SPRINGS, CO 80487 US
APN	
ZONING	RESIDENTIAL
USE AND OCCUPANCY CLASSIFICATION	ONE- OR TWO-FAMILY DWELLING GROUP (GROUP R3)
AHJ	ROUTT COUNTY
UTILITY COMPANY	YAMPA VALLEY ELECTRIC ASSN INC
ELECTRICAL CODE	2017 NEC (NFPA 70)
FIRE CODE	2015 IFC

CONTRACTOR INFORMATION	
COMPANY	SUNWISE SOLAR, LLC
LICENSE NUMBER	010556 (NABCEP PV INSTALLATION PROF.)
ADDRESS	1143 OAK ST, STEAMBOAT SPRINGS, CO 80487
PHONE NUMBER	(970) 819-0840
CONTRACTOR SIGNATURE	



1 PLOT
PV-1 SCALE: NTS



2 LOCALE
PV-1 SCALE: NTS

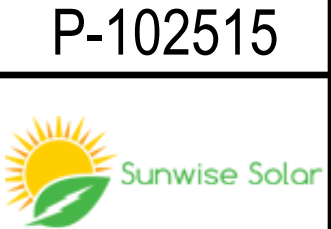
SCOPE OF WORK
THIS PROJECT INVOLVES THE INSTALLATION OF SOLAR PANELS. THE SOLAR PANELS WILL BE RACKED USING A PREENGINEERED RACKING SYSTEM. THE RACKED MODULES WILL BE ELECTRICALLY CONNECTED WITH DC TO AC POWER INVERTERS AND INTERCONNECTED TO THE LOCAL UTILITY USING MEANS AND METHODS CONSISTENT WITH THE RULES ENFORCED BY THE LOCAL UTILITY AND PERMITTING JURISDICTION.

THIS DOCUMENT HAS BEEN PREPARED FOR THE PURPOSE OF DESCRIBING THE DESIGN OF A PROPOSED PV SYSTEM WITH ENOUGH DETAIL TO DEMONSTRATE COMPLIANCE WITH APPLICABLE CODES AND REGULATIONS. THE DOCUMENT SHALL NOT BE RELIED UPON AS A SUBSTITUTE FOR FOLLOWING MANUFACTURER INSTALLATION INSTRUCTIONS. THE SYSTEM SHALL COMPLY WITH ALL MANUFACTURERS LISTING AND INSTALLATION INSTRUCTIONS, AS WELL AS ALL APPLICABLE CODES. NOTHING IN THIS DOCUMENT SHALL BE INTERPRETED IN A WAY THAT OVERRIDES THEM. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF ALL CONDITIONS, DIMENSIONS, AND DETAILS IN THIS DOCUMENT.

SYSTEM DETAILS	
DESCRIPTION	NEW GRID-INTERACTIVE PHOTOVOLTAIC SYSTEM WITH NO BATTERY STORAGE
DC RATING OF SYSTEM	4,485W
AC RATING OF SYSTEM	5,000W
AC OUTPUT CURRENT	21.0A
INVERTER(S)	1 X SOLAR EDGE SE5000H-US
MODULE	SOLARIA POWERXT-345R-BD
ARRAY WIRING	(1) STRING OF 13

INTERCONNECTION DETAILS	
POINT OF CONNECTION	NEW LOAD SIDE AC CONNECTION PER NEC 705.12(B)
UTILITY SERVICE	120/240V 1Φ
ELECTRICAL PANEL	MAIN SERVICE PANEL W/200A BUSBAR, 200A MAIN BREAKER

SITE DETAILS	
ASHRAE EXTREME LOW	-25°C (-13°F)
ASHRAE 2% HIGH	30°C (86°F)
CLIMATE DATA SOURCE	HAYDEN/YAMPA (AWOS) (KHND)
WIND SPEED	115 mph
RISK CATEGORY	II
WIND EXPOSURE CATEGORY	C
GROUND SNOW LOAD	90 PSF



GRID-TIED SOLAR POWER SYSTEM

3367 APRES SKI WAY
STEAMBOAT SPRINGS, CO 80487

PROJECT SUMMARY	
DOC ID: 102515-128868-1	
DATE: 11/20/18	
CREATOR: C.M.	
REVIEWER:	
REVISIONS	
PV-1	

November 11, 2018

Michael Ehrlich Structural Engineering Inc
PO Box 772393
Steamboat Springs, CO 80477

To: Sunwise Solar

Re: Solar Panel Addition
3367 Apres Ski Way
Steamboat Springs, CO

Per your request we have evaluated the structural adequacy of the existing roof for the proposed solar panel installation and find it acceptable.

There will be thirteen Solaria 330 Modules on the southernmost facing 32 degree sloped roof, installed with the Snapnack TDS standard rail system. It is our understanding that you will install two rows of module racks on either side of the dormer as shown in the attached diagram.

Each module group is 63.8" long x 41.6" wide. There will be two rails space about 40" inches apart running horizontal on the roof to attach the modules to. The rails attach to the flash L-feet. The modules attach to the rails with the mid clamps. The Snap n Rack's flashed roof base will be used to connect the L-Feet to the roof structure. These will be sealed using a large metal flashing and roofing sealant around the base, so will be water-tight to the composite roof.

It is our understanding that the existing roof trusses are 2" x 12" spaced at 16" oc. There will be 42 attachments as shown. The standard 5/16" diameter x 4" lag bolts will be used. The rack is rated for spans up to 40". The lag bolts should be at every other rafter so that the longest spacing between supports is 32". All cantilevers should be less than 16.5".

Plans for the existing house could not be located. The existing trusses should be field verified for load stamp.

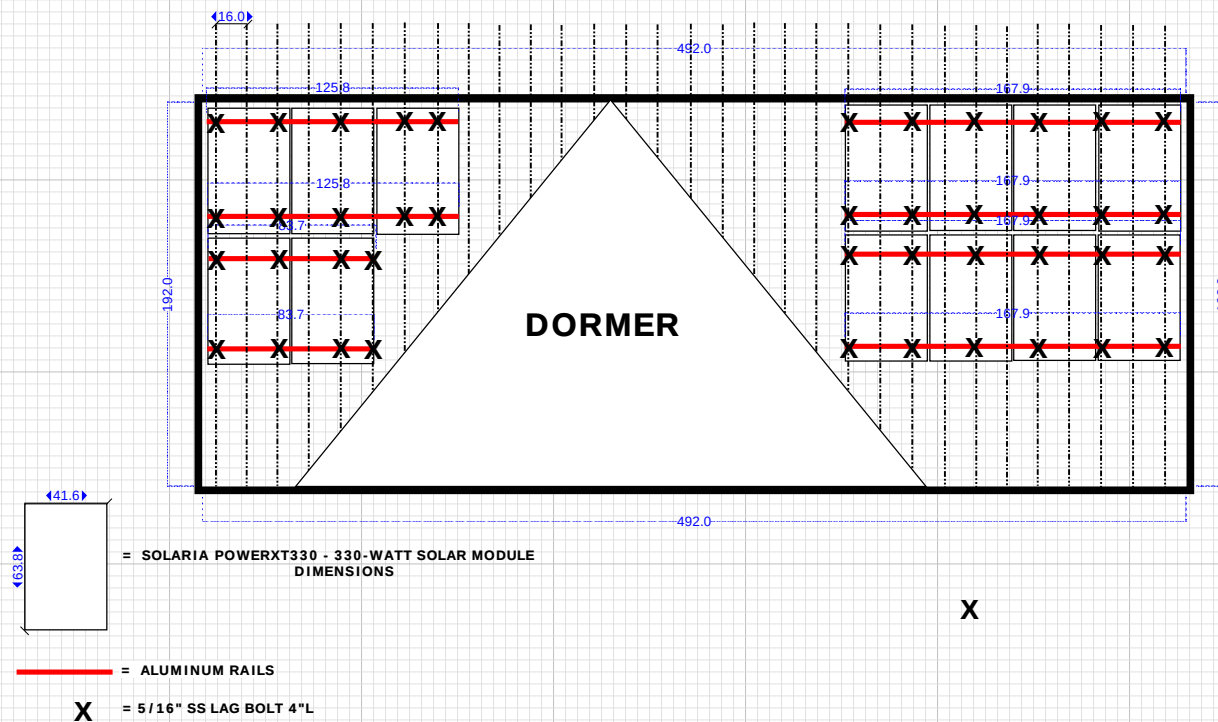
Please contact me if you have any questions.

Michael Ehrlich
Michael Ehrlich, president



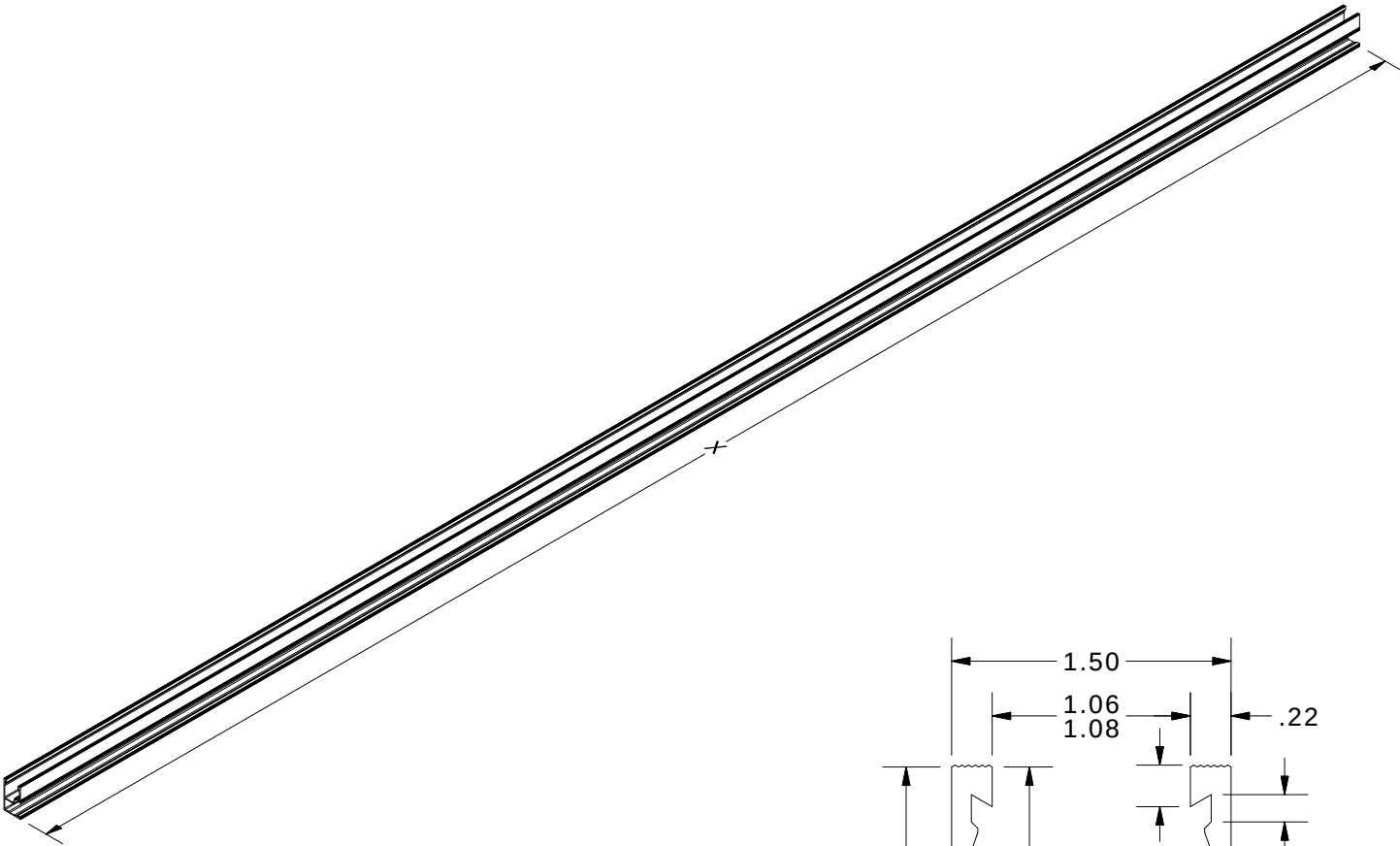
**Roof Attachment Plan for Solar Installation
Marno Residence
3367 Apres Ski Way, Steamboat Springs, CO 80487**

16" O.C. 2" x 12" TRUSSES

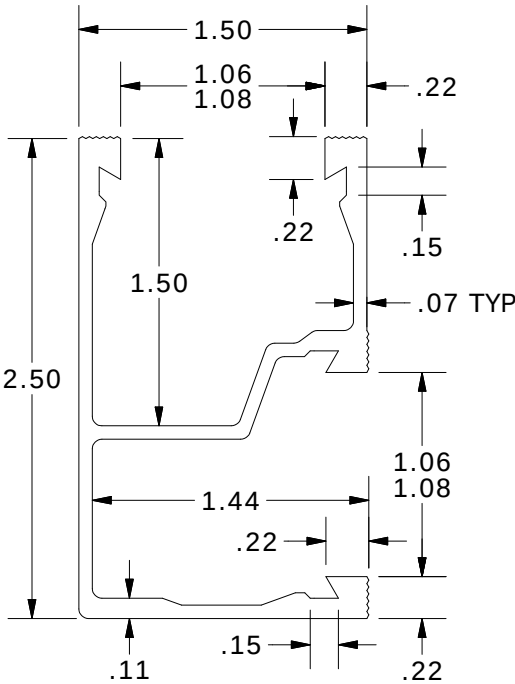


Site:	3367 Apres Ski Way, Steamboat Springs, CO 80487	Drawing:	801510	Project:	000097	Drawn:	Colin McCauley	Notes:	SOUTH FACING ROOFSpace 32 DEGREE SLOPE	Sunwise Solar, LLC Steamboat Springs, CO - 80487 (970)-819-0840 Colin@Sunwise-Solar.com
Title:	13 Module Solar-Electric Array, 4.29 kW	Scale:	1/4"=1'0"	Date:	11/5/2018	Rev:	A			

DESCRIPTION:	DRAWN BY:	
SNAPNRACK, STANDARD RAIL	D. Ryan	
PART NUMBER(S):	REVISION:	595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902 THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.
232-01067, 232-01068, 232-01069, 232-01070, 232-02112, 232-02113	A	



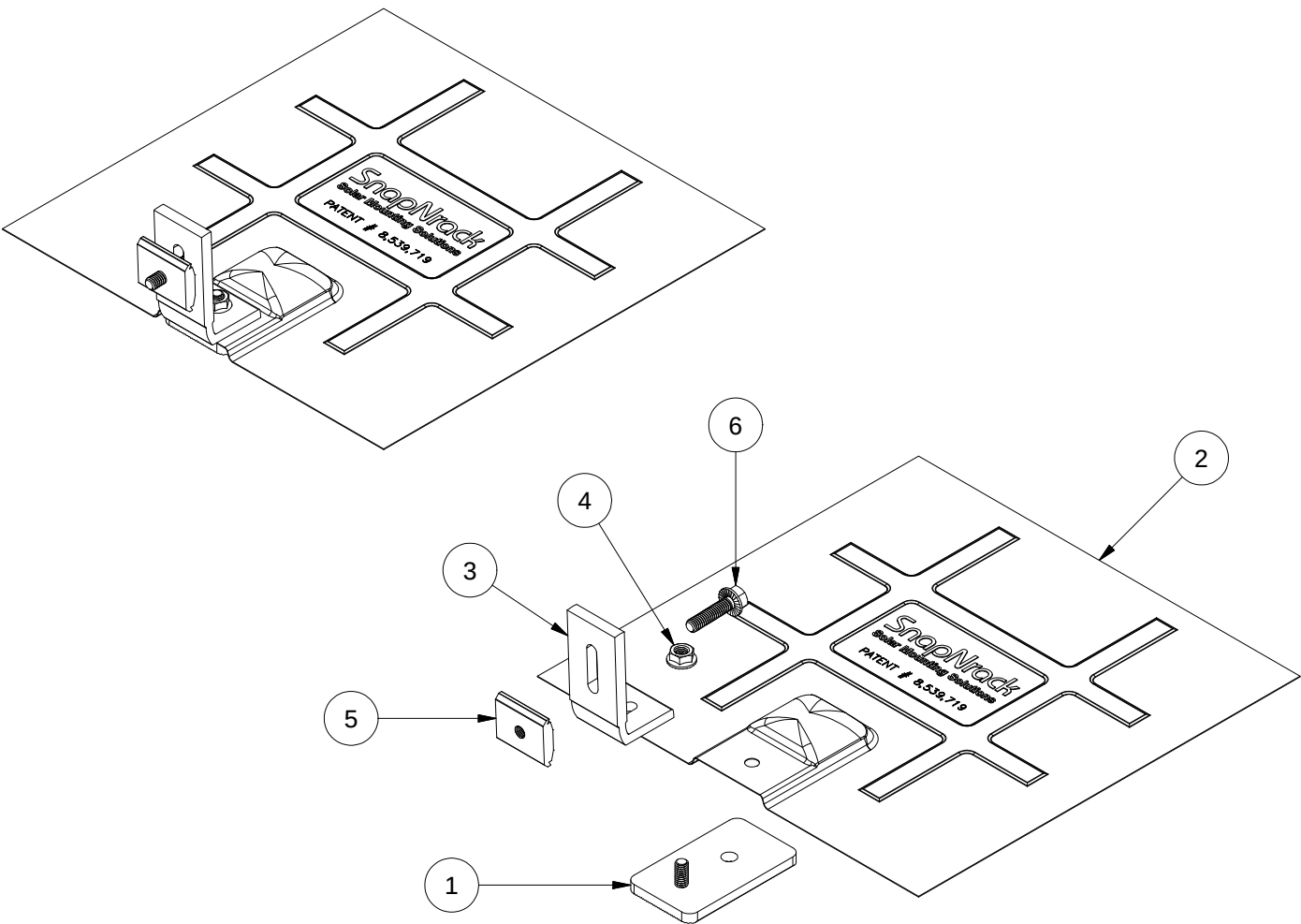
STANDARD RAIL PROPERTIES		
SKU	RAIL LENGTH (X)	FINISH
232-01067	122"	BLACK
232-01068	122"	CLEAR
232-01069	162"	BLACK
232-01070	162"	CLEAR
232-02112	122"	MILL
232-02113	162"	MILL



ALL DIMENSIONS IN INCHES

MATERIALS:	6000 SERIES ALUMINUM	OPTIONS:
DESIGN LOAD (LBS):	N/A	CLEAR / BLACK ANODIZED
ULTIMATE LOAD (LBS):	N/A	MILL FINISH
TORQUE SPECIFICATION:	N/A LB-FT	122" / 162" LENGTHS
CERTIFICATION:	UL 2703, FILE E359313	BOXES OF 2 / 6
WEIGHT (LBS):	7.65 - 10.16	BUNDLES OF 112

DESCRIPTION:	DRAWN BY:	
SNAPNRACK, FLASHED L FOOT	M.Watkins	
PART NUMBER(S):	REVISION:	
242-92047, 242-92048, 242-92050, 242-92051	A	595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902 THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	SNAPNRACK, L FOOT BASE, MILL
2	1	SNAPNRACK, L FOOT FLASHING, 12IN X 12IN, BLACK GALV
3	1	SNAPNRACK L FOOT, COMPOSITION 92DEG, CLEAR / BLACK
4	1	NUT, FLANGE, SERRATED, 5/16IN-18, SS
5	1	SNAPNRACK CHANNEL NUT 5/16IN-18
6	1	BOLT, FLANGED HEX, 5/16IN-18 X 1-1/4IN, SS

MATERIALS:	6000 SERIES ALUMINUM, STAINLESS STEEL	OPTIONS:
DESIGN LOAD (LBS):	500 UP, 400 DOWN, 300 SIDE	CLEAR / BLACK ANODIZED
ULTIMATE LOAD (LBS):	928 UP, 839 DOWN, 754 SIDE	GALV STEEL / ALUM FLASHING
TORQUE SPECIFICATION:	10+ LB-FT	
CERTIFICATION:	UL 2703, FILE E359313	
WEIGHT (LBS):	0.90 - 1.25	

DESCRIPTION:

SNAPNRACK, FLASHED L FOOT

PART NUMBER(S):

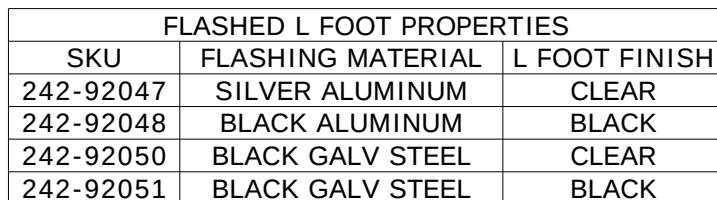
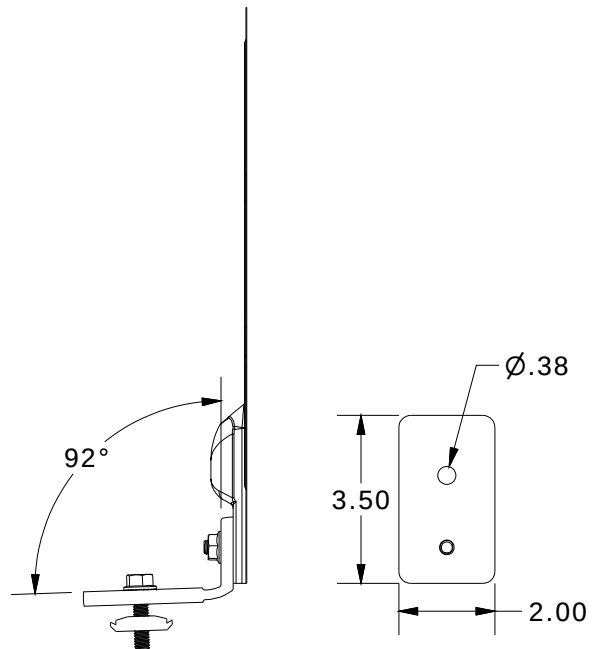
242-92047, 242-92048, 242-92050, 242-92051

DRAWN BY:
M.Watkins

REVISION:
A

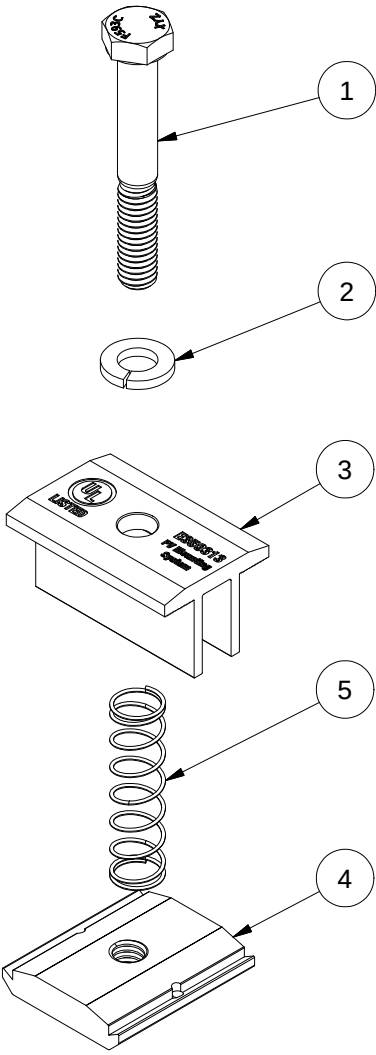
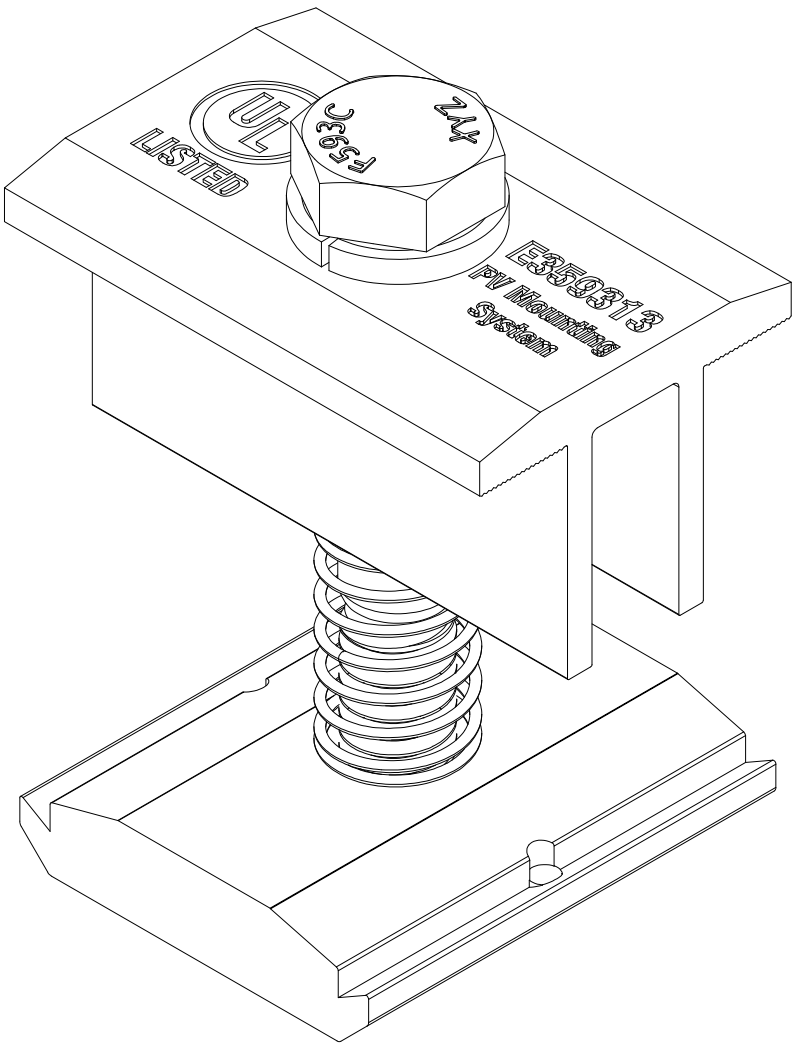
595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA
PHONE (415) 580-6900 • FAX (415) 580-6902

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WRITTEN CONSENT OF SUNRUN SOUTH LLC.



ALL DIMENSIONS IN INCHES

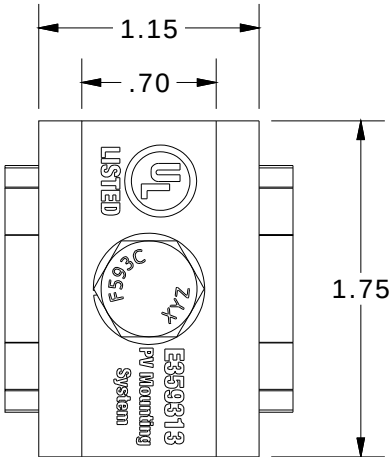
DESCRIPTION: SNAPNRACK, BONDING MID CLAMP	DRAWN BY: D.Ryan	
PART NUMBER(S): 242-02050, 242-02051, 242-02052, 242-02053, 242-02054, 242-02055, 242-02056, 242-02057	REVISION: A	595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902 THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.



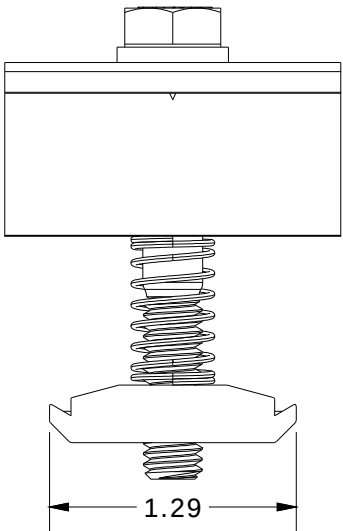
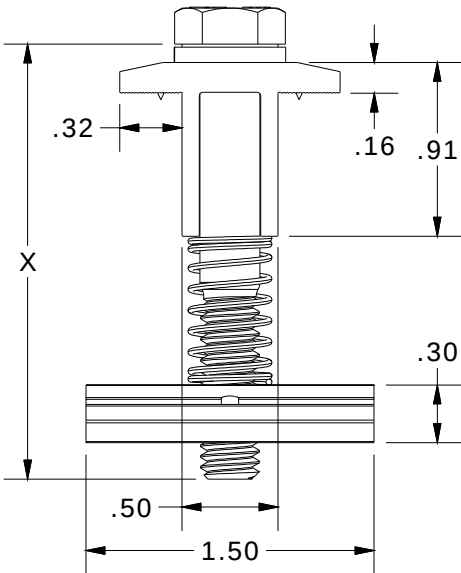
PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	5/16IN-18 SS HCS BOLT, LENGTH VARIES, CLEAR / BLACK
2	1	5/16IN SS SPLIT LOCK WASHER, CLEAR / BLACK
3	1	SNAPNRACK, BONDING MID CLAMP, CLEAR / BLACK
4	1	SNAPNRACK, BONDING CHANNEL NUT
5	1	SNAPNRACK, MID CLAMP SPRING, SS

MATERIALS:	6000 SERIES ALUMINUM, STAINLESS STEEL	OPTIONS:
DESIGN LOAD (LBS):	800	CLEAR / BLACK ANODIZED
ULTIMATE LOAD (LBS):	2400	
TORQUE SPECIFICATION:	10+ LB-FT	
CERTIFICATION:	UL 2703, FILE E359313	
WEIGHT (LBS):	0.16 - 0.18	

DESCRIPTION:	DRAWN BY:	SnapNrack™ Solar Mounting Solutions
SNAPNRACK, BONDING MID CLAMP	D.Ryan	
PART NUMBER(S):	REVISION:	
242-02050, 242-02051, 242-02052, 242-02053, 242-02054, 242-02055, 242-02056, 242-02057	A	595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA PHONE (415) 580-6900 • FAX (415) 580-6902 THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY. ANY REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF SUNRUN SOUTH LLC.



MID CLAMP PROPERTIES		
SKU	BOLT LENGTH (X)	FINISH
242-02050	2.25"	CLEAR
242-02051	2.50"	CLEAR
242-02052	2.75"	CLEAR
242-02053	2.25"	BLACK
242-02054	2.50"	BLACK
242-02055	2.75"	BLACK
242-02056	3.00"	CLEAR
242-02057	3.00"	BLACK





1 SITE PLAN (AERIAL VIEW)
PV-2 SCALE: 1" = 10'

GENERAL NOTES	
1	EQUIPMENT LIKELY TO BE WORKED UPON WHILE ENERGIZED SHALL BE INSTALLED IN LOCATIONS THAT SATISFY MINIMUM WORKING CLEARANCES PER NEC 110.26.
2	CONTRACTOR SHALL USE ONLY COMPONENTS LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY FOR THE INTENDED USE.
3	CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL EQUIPMENT, CABLES, ADDITIONAL CONDUITS, RACEWAYS, AND OTHER ACCESSORIES NECESSARY FOR A COMPLETE AND OPERATIONAL PV SYSTEM.
4	WHERE DC PV SOURCE OR DC PV OUTPUT CIRCUITS ARE RUN INSIDE THE BUILDING, THEY SHALL BE CONTAINED IN METAL RACEWAYS, TYPE MC METAL-CLAD CABLE, OR METAL ENCLOSURES FROM THE POINT OF PENETRATION INTO THE BUILDING TO THE FIRST READILY ACCESSIBLE DISCONNECTING MEANS, PER NEC 690.31(G).
5	ALL EMT CONDUIT FITTINGS SHALL BE LISTED AS WEATHERPROOF FITTINGS AND INSTALLED TO ENSURE A RAINTIGHT FIT, PER NEC 358.42.

P-102515



GRID-TIED SOLAR POWER SYSTEM

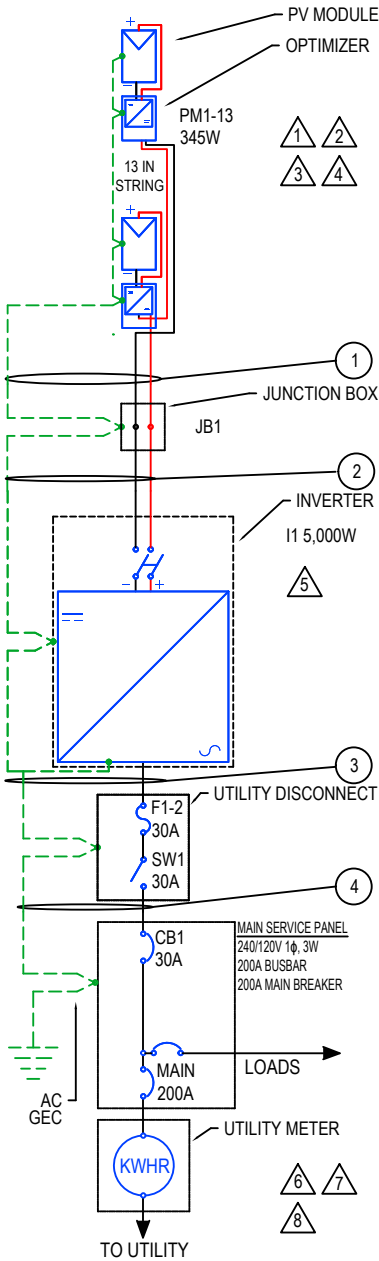
3367 APRES SKI WAY
STEAMBOAT SPRINGS, CO 80487

SITE PLAN

DOC ID: 102515-128868-1
DATE: 11/20/18
CREATOR: C.M.
REVIEWER:

REVISIONS

PV-2



MODULES										
REF.	QTY.	MAKE AND MODEL	PMAX	PTC	ISC	IMP	VOC	VMP	TEMP. COEFF. OF VOC	FUSE RATING
PM1-13	13	SOLARIA POWERXT-345R-BD	345W	319W	9.40A	8.88A	47.1V	38.9V	-0.137V/°C (-0.29%/°C)	15A

INVERTERS										
REF.	QTY.	MAKE AND MODEL	AC VOLTAGE	GROUND	MAX OCPD RATING	RATED POWER	MAX OUTPUT CURRENT	MAX INPUT CURRENT	MAX INPUT VOLTAGE	CEC WEIGHTED EFFICIENCY
I1	1	SOLAR EDGE SE5000H-US (240V)	240V	NOT SOLIDLY GROUNDED	40A	5,000W	21.0A	13.5A	480V	99.0%

POWER OPTIMIZERS							
REF.	QTY.	MODEL	RATED INPUT POWER	MAX OUTPUT CURRENT	MAX INPUT ISC	MAX DC VOLTAGE	WEIGHTED EFFICIENCY
PO1-13	13	SOLAR EDGE P370	370W	15A	11.0A	60V	98.8%

DISCONNECTS				
REF.	QTY.	MAKE AND MODEL	RATED CURRENT	MAX RATED VOLTAGE
SW1	1	EATON DP221NRB OR EQUIV.	30A	240VAC

OCPDS			
REF.	QTY.	RATED CURRENT	MAX VOLTAGE
F1-2	2	30A	240VAC
CB1	1	30A	240VAC

SYSTEM SUMMARY	
OPTIMIZERS MAX OUTPUT CURRENT	15A
OPTIMIZERS IN SERIES	13
NOMINAL STRING VOLTAGE	380V
ARRAY OPERATING CURRENT	11.8A
ARRAY STC POWER	4,485W
ARRAY PTC POWER	4,142W
MAX AC CURRENT	21A
MAX AC POWER	5,000W
DERATED (CEC) AC POWER	4,051W

- NOTES**
- OPTIMIZERS PROVIDE RAPID SHUTDOWN FUNCTIONALITY REQUIRED BY NEC 690.12.
 - THE SPECIFIED OPTIMIZER CAN BE SUBSTITUTED WITH A P400, P405, OR P505. THESE OPTIMIZERS HAVE AN INPUT VOLTAGE WINDOW WIDE ENOUGH TO ACCOMMODATE THE OUTPUT VOLTAGE RANGE OF THE MODULE AT THE DESIGN TEMPERATURES, HAVE A MAX INPUT CURRENT RATING THAT IS ABOVE THE MAX OUTPUT CURRENT OF THE MODULE, AND A MAX POWER INPUT THAT IS ABOVE THE RATED POWER OUTPUT OF THE MODULE.
 - DC PV CONDUCTORS ARE NOT SOLIDLY GROUNDED. NO DC PV CONDUCTOR SHALL BE WHITE- OR GRAY-COLORED
 - MAX DC VOLTAGE OF ARRAY FIXED BY THE INVERTER AT 380V REGARDLESS OF TEMPERATURE. THE MAX DC VOLTAGE OF THE MODULE AT -25°C IS EXPECTED TO BE 53.9V (-25°C - 25°C) X -0.137V/°C + 47.1V = 53.9V).
 - INVERTER IS NON-ISOLATED. NO CONDUCTOR IS SOLIDLY GROUNDED AND THEREFORE NO DC GEC IS REQUIRED.
 - POINT-OF-CONNECTION IS ON LOAD SIDE OF SERVICE DISCONNECT, IN COMPLIANCE WITH NEC 705.12(B). OUTPUT IS BACKFED THROUGH BREAKER IN MAIN PANEL.
 - THE PV BREAKER SHALL NOT BE MARKED FOR "LINE" AND "LOAD".
 - THE PV BREAKER SHALL BE LOCATED AT THE OPPOSITE END OF THE BUSBAR FROM THE MAIN BREAKER.

CONDUCTOR AND CONDUIT SCHEDULE W/ELECTRICAL CALCULATIONS																
ID	TYPICAL	CONDUCTOR	CONDUIT	CURRENT-CARRYING CONDUCTORS IN CONDUIT	OCPD	EGC	TEMP. CORR. FACTOR	CONDUIT FILL FACTOR	CONT. CURRENT	MAX. CURRENT (125%)	BASE AMP.	DERATED AMP.	TERM. TEMP. RATING	AMP. @ TERM. TEMP. RATING	LENGTH	VOLTAGE DROP
1	1	10 AWG PV WIRE, COPPER	FREE AIR	N/A	N/A	6 AWG BARE, COPPER	0.76 (52°C)	1.0	15A	18.75A	55A	41.8A	75°C	50A	85FT	0.83%
2	1	8 AWG THWN-2, COPPER	0.5" DIA. EMT	2	N/A	12 AWG THWN-2, COPPER	1.0 (30°C)	1.0	15A	18.75A	55A	55A	60°C	40A	36FT	0.22%
3	1	10 AWG THWN-2, COPPER	0.5" DIA. EMT	2	30A	10 AWG THWN-2, COPPER	1.0 (30°C)	1.0	21A	26.25A	40A	40A	60°C	30A	16FT	0.35%
4	1	10 AWG THWN-2, COPPER	0.5" DIA. EMT	2	30A	10 AWG THWN-2, COPPER	1.0 (30°C)	1.0	21A	26.25A	40A	40A	75°C	35A	10FT	0.22%

- GENERAL ELECTRICAL NOTES**
- UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.
 - MODULES CONFORM TO AND ARE LISTED UNDER UL 1703.
 - CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 300.6 (C) (1) AND ARTICLE 310.8 (D).
 - CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC ARTICLE 310.8 (C).

- GROUNDING NOTES**
- ALL EQUIPMENT SHALL BE PROPERLY GROUNDED PER THE REQUIREMENTS OF NEC ARTICLES 250 & 690
 - PV MODULES SHALL BE GROUNDED TO MOUNTING RAILS USING MODULE LUGS OR RACKING INTEGRATED
 - GROUNDING CLAMPS AS ALLOWED BY LOCAL JURISDICTION. ALL OTHER EXPOSED METAL PARTS SHALL BE GROUNDED USING UL-LISTED LAY-IN LUGS.
 - INSTALLER SHALL CONFIRM THAT MOUNTING SYSTEM HAS BEEN EVALUATED FOR COMPLIANCE WITH UL 2703 "GROUNDING AND BONDING" WHEN USED WITH PROPOSED PV MODULE.
 - ALL GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE
 - IF THE EXISTING MAIN SERVICE PANEL DOES NOT HAVE A VERIFIABLE GROUNDING ELECTRODE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE.
 - AC SYSTEM GROUNDING ELECTRODE CONDUCTOR (GEC) SHALL BE A MINIMUM SIZE #8AWG WHEN INSULATED, #6AWG IF BARE WIRE.
 - EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED ACCORDING TO NEC ARTICLE 690.45, AND BE A MINIMUM OF #10AWG WHEN NOT EXPOSED TO DAMAGE, AND #6AWG SHALL BE USED WHEN EXPOSED TO DAMAGE
 - GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLOR CODED GREEN, OR MARKED GREEN IF #4AWG OR LARGER

1 SINGLE-LINE DIAGRAM
PV-3 SCALE: NTS

THIS DOCUMENT HAS BEEN CREATED FOR THE PURPOSE OF DESCRIBING THE DESIGN OF A PROPOSED PHOTOVOLTAIC POWER SYSTEM WITH ENOUGH DETAIL TO DEMONSTRATE COMPLIANCE WITH ALL APPLICABLE CODES AND REGULATIONS. THE DOCUMENT SHOULD NOT BE RELIED UPON AS A SUBSTITUTE FOR FOLLOWING MANUFACTURER INSTALLATION MANUALS. INSTALLER SHALL INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER INSTALLATION MANUALS. NOTHING IN THIS DOCUMENT SHOULD BE INTERPRETED IN A WAY THAT OVERRIDES THE INSTRUCTIONS IN MANUFACTURER INSTALLATION MANUALS.

P-102515



GRID-TIED SOLAR POWER SYSTEM

3367 APRES SKI WAY
STEAMBOAT SPRINGS, CO 80487

SINGLE-LINE DIAGRAM

PROJECT ID: 102515
DATE: 11/20/18
CREATED BY: C.M.
CHECKED BY:

REVISIONS	

PV-3

DC RACEWAYS

3

JB1 - TRANSITION BOX
(MODEL NOT SPECIFIED)

4

I1 - INVERTER
(SOLAR EDGE SE5000H-US)

45

MSP
(MODEL NOT SPECIFIED)

126789

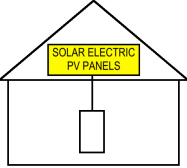
SW1 - DISCONNECT
(EATON DP221NRB)

67

1SEE NOTE NO. 4 (MSP)

PHOTOVOLTAIC SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN
SWITCH TO THE 'OFF'
POSITION TO SHUT DOWN
PV SYSTEM AND REDUCE
SHOCK HAZARD IN THE
ARRAY.



NEC 690.56(C)(1)

3SEE NOTE NO. 5 (DC RACEWAYS)

WARNING
PHOTOVOLTAIC POWER SOURCE

NEC 690.31(G)(3) AND IFC 605.11.1

4EACH DISCONNECTING MEANS FOR
PHOTOVOLTAIC EQUIPMENT (JB1, I1)

! WARNING !
ELECTRIC SHOCK HAZARD. TERMINALS ON BOTH
LINE AND LOAD SIDES MAY BE ENERGIZED IN
THE OPEN POSITION.

NEC 690.13(B)

7AC SOLAR DISCONNECT (SW1, CB1 IN MSP)

PV SYSTEM DISCONNECT

NEC 690.13(B)

2POINT-OF-INTERCONNECTION OR AT MAIN SERVICE DISCONNECT (MSP)

! CAUTION !
POWER TO THIS BUILDING IS ALSO FROM ROOF MOUNTED SOLAR ARRAYS WITH SAFETY DISCONNECTS
AS SHOWN



NEC 690.56(B)

5DC DISCONNECT (I1)

DIRECT-CURRENT PV POWER SOURCE
MAXIMUM VOLTAGE: 380V
MAX CIRCUIT-CURRENT: 18.8A
DC-TO-DC CONVERTER RATED CURRENT: 15.0A

NEC 690.53

8SOLAR BREAKER (MSP)

! WARNING !
INVERTER OUTPUT CONNECTION. DO NOT
RELOCATE THIS OVERCURRENT DEVICE.

NEC 705.12(B)(2)(3)(B)

6AC DISCONNECT (SW1, CB1 IN MSP)

MAXIMUM AC OPERATING CURRENT: 21.0A
MAXIMUM AC OPERATING VOLTAGE: 240V

NEC 690.54

9ANY AC ELECTRICAL PANEL THAT IS FED BY
BOTH THE UTILITY AND THE PHOTOVOLTAIC
SYSTEM (MSP)

! WARNING !
DUAL POWER SOURCE. SECOND SOURCE IS
PHOTOVOLTAIC SYSTEM.

NEC 705.12(B)(3)

LABELING NOTES	
1	ALL PLAQUES AND SIGNAGE REQUIRED BY 2017 NEC AND 2015 IFC WILL BE INSTALLED AS REQUIRED.
2	LABELS, WARNING(S) AND MARKING SHALL COMPLY WITH ANSI Z535.4, WHICH REQUIRES THAT DANGER, WARNING, AND CAUTION SIGNS USED THE STANDARD HEADER COLORS, HEADER TEXT, AND SAFETY ALERT SYMBOL ON EACH LABEL. THE ANSI STANDARD REQUIRES A HEADING THAT IS AT LEAST 50% TALLER THAN THE BODY TEXT, IN ACCORDANCE WITH NEC 110.21(B).
3	A PERMANENT PLAQUE OR DIRECTORY SHALL BE INSTALLED PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS IF NOT IN THE SAME LOCATION IN ACCORDANCE WITH NEC 690.56(B).
4	LABEL(S) WITH MARKING, "TURN RAPID SHUTDOWN SWITCH TO THE 'OFF' POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY," SHALL BE LOCATED WITHIN 3 FT OF SERVICE DISCONNECTING MEANS THE TITLE SHALL UTILIZE CAPITALIZED LETTERS WITH A MINIMUM HEIGHT OF 3/8" IN BLACK ON A YELLOW BACKGROUND, AND REMAINING TEXT SHALL BE CAPITALIZED WITH A MINIMUM HEIGHT OF 3/16" IN BLACK ON WHITE BACKGROUND
5	LABEL(S) WITH MARKING, "WARNING PHOTOVOLTAIC POWER SOURCE," SHALL BE LOCATED AT EVERY 10 FEET OF EACH DC RACEWAY AND WITHIN ONE FOOT OF EVERY TURN OR BEND AND WITHIN ONE FOOT ABOVE AND BELOW ALL PENETRATIONS OF ROOF/CEILING ASSEMBLIES, WALLS AND BARRIERS. THE LABEL SHALL HAVE 3/8" TALL LETTERS AND BE REFLECTIVE WITH WHITE TEXT ON A RED BACKGROUND

P-102515



GRID-TIED SOLAR POWER SYSTEM

3367 APRES SKI WAY
STEAMBOAT SPRINGS, CO 80487

SAFETY LABELS

DOC ID: 102515-128868-1
DATE: 11/20/18
CREATOR: C.M.
REVIEWER:

REVISIONS

PV-4

Conductor, Conduit, and OCPD Sizing Validation

1. Maximum System Voltage Test

1.1. Solar Edge inverter w/13 Solaria PowerXT-345R-BD (345W)s

Array Properties

Array Type	Distributed MPPT System Inverter Array
System Description	Solar Edge inverter w/13 Solaria PowerXT-345R-BD (345W)s
Module	PowerXT-345R-BD (345W)
Highest number of modules in series in a PV Source Circuit	1
Design Low Temp.	-25°C
Module Voc	47.1V
Temp. Coefficient Voc	-0.137V/C

NEC Code Calculations

A. Maximum Voltage of PV Source Circuit	53.95V
see 690.7(A)	

NEC 690.7(A) requires that if the PV module manufacturer provides a temperature coefficient of open-circuit voltage, it must be used to calculate the PV array's maximum system voltage. It includes an information note recommending the use of the ASHRAE 'Extreme Annual Mean Minimum Design Dry Bulb Temperature' as the design low temperature. Using these values, the module Voc (47.1V) will increase to 53.95V at the design low temperature (-25°C).

$(-25^{\circ}\text{C} - 25^{\circ}\text{C}) \times -0.137\text{V/C} + 47.1\text{V} = 53.95\text{V}$

The module Voc at the design low temperature is 53.95V.

$53.95\text{V} \times 1 = 53.95\text{V}$

B. Maximum Voltage of DC-DC Converter Source Circuit	380V
see 690.7(B)(2)	

All PV circuits have a voltage that does not exceed 600V. This system's DC-DC Converter Source Circuits are fed by Solar Edge P370 dc-to-dc converter optimization devices. Each device is connected to a single PowerXT-345R-BD (345W) PV module. The voltage of this circuit is regulated by the inverter at a constant 380V.

NEC Code Validation Tests

1.	PV Source Circuit maximum Voc must not exceed 600V $53.95\text{V} < 600\text{V} = \text{true}$	PASS
2.	DC-DC Converter Source Circuit voltage must not exceed 600V $380\text{V} < 600\text{V} = \text{true}$	PASS

2. Wire, Conduit, and OCPD Code Compliance Validation

2.1. #1: DC Circuit Circuit: Series String Output to Transition Box

Circuit Section Properties

Conductor	10 AWG PV Wire, Copper
Equipment Ground Conductor (EGC)	6 AWG Bare, Copper
OCPD(s)	N/A
Raceway	Free Air
Lowest Terminal Temperature Rating	75°C
Maximum Wire Temperature	52°C
Power Source Description	String of 13 Solar Edge P370 power optimizers, each connected to a PowerXT-345R-BD (345W) PV module
Current	15A
Voltage	380V
Module Series Fuse Rating	15A
Total Number of Series Strings	1

NEC Code Calculations

A. Continuous Current	15A
see 690.8(A)(5)	

The continuous current of this series string of power optimizers is equal to the rated maximum output current of the optimizer.

Rated Max. Output Current of optimizer is 15A

B. Ampacity of Conductor	55A
see Table 310.15(B)(17)	

Ampacity (30°C) for a copper conductor with 90°C insulation in free air is 55A.

C. Derated Ampacity of Conductor	41.8A
see Table 310.15(B)(3)(c), Table 310.15(B)(3)(a), and Article 100	

The temperature factor for 90°C insulation at 52°C is 0.76.

The fill factor for conductors in free air is 1.

The ampacity derated for Conditions of Use is the product of the conductor ampacity (55A) multiplied by the temperature factor (0.76) and by the conduit fill factor (1).

$55\text{A} \times 0.76 \times 1 = 41.8\text{A}$

D. Max Current for Terminal Temp. Rating	35A
see 110.14(C)	

The lowest temperature limit for this conductor at any termination is 75°C.

Using the method specified in 110.14(C), the maximum current permitted to ensure that the device terminal temperature does not exceed its 75°C rating would be the amount referenced in the 75°C column in Table 310.15(B)(16), which is 35A.

E. Minimum Required EGC Size	12 AWG
see Table 250.122 and 690.45(A)	

The smallest EGC size allowed is 12 AWG for OCPD rating 19A according to Table 250.122.

According to 690.45(A), it is not necessary to increase the size of the PV array's EGC when conductors are oversized for voltage drop considerations.

NEC Code Validation Tests

1.	System must meet requirements for not having series fuse (690.9(A))	PASS
2.	Derated Ampacity must be greater than or equal to the Continuous Current (Article 100) $41.8\text{A} \geq 15\text{A} = \text{true}$	PASS
3.	Conductor Ampacity must be at least 125% of Continuous Current (215.2(A)(1)) $55\text{A} > 15\text{A} \times 1.25 = \text{true}$	PASS
4.	Max current for terminal must be at least 125% of the Continuous Current. (110.14(C)) $35\text{A} \geq 15\text{A} \times 1.25 = \text{true}$	PASS
5.	EGC must meet code requirements for minimum size (Table 250.122) $6\text{ AWG} \geq 12\text{ AWG} = \text{true}$	PASS
6.	EGC must meet code requirements for physical protection (690.46) $6\text{ AWG} \geq 6\text{ AWG} = \text{true}$	PASS

2.2. #2: DC Source Circuit: Transition Box to Inverter

Circuit Section Properties

Conductor	8 AWG THWN-2, Copper
Equipment Ground Conductor (EGC)	12 AWG THWN-2, Copper
OCPD(s)	N/A
Raceway	0.5" dia. EMT
Lowest Terminal Temperature Rating	60°C
Maximum Wire Temperature	30°C
Power Source Description	String of 13 Solar Edge P370 power optimizers, each connected to a PowerXT-345R-BD (345W) PV module
Current	15A
Voltage	380V
Module Series Fuse Rating	15A
Total Number of Series Strings	1

NEC Code Calculations

A. Continuous Current	15A
see 690.9(A)(5)	

The continuous current of this series string of power optimizers is equal to the rated maximum output current of the optimizer.

Rated Max. Output Current of optimizer is 15A

B. Ampacity of Conductor	55A
see Table 310.15(B)(16)	

Ampacity (30°C) for a copper conductor with 90°C insulation in conduit is 55A.

C. Derated Ampacity of Conductor	41.8A
see Table 310.15(B)(3)(c), Table 310.15(B)(3)(a), and Article 100	

The temperature factor for 90°C insulation at 52°C is 0.76.

The fill factor for a conduit that has 2 wires is 1.

The ampacity derated for Conditions of Use is the product of the conductor ampacity (55A) multiplied by the temperature factor (0.76) and by the conduit fill factor (1).

55A X 0.76 X 1 = 41.8A

D. Max Current for Terminal Temp. Rating	40A
see 110.14(C)	

The lowest temperature limit for this conductor at any termination is 60°C.

Using the method specified in 110.14(C), the maximum current permitted to ensure that the device terminal temperature does not exceed its 60°C rating would be the amount referenced in the 60°C column in Table 310.15(B)(16), which is 40A.

E. Minimum Required EGC Size	12 AWG
see Table 250.122 and 690.45(A)	

The smallest EGC size allowed is 12 AWG for OCPD rating 19A according to Table 250.122.

According to 690.45(A), it is not necessary to increase the size of the PV array's EGC when conductors are oversized for voltage drop considerations.

F. Minimum Recommended Conduit Size	0.5" dia.
see 300.17	

The total area of all conductors is 0.0865in². With a maximum fill rate of 0.4, the recommended conduit diameter is 0.5.

Qty	Description	Size	Type	Area	Total Area
2	Conductor	8 AWG	THWN-2	0.0366in²	0.0732in²
1	Equipment Ground	12 AWG	THWN-2	0.0133in²	0.0133in²
3					0.0865in²

0.0865in² / 0.4 = 0.2162in² (Corresponding to a diameter of 0.5")

NEC Code Validation Tests

1.	System must meet requirements for not having series fuse (690.9(A))	PASS
2.	Derated Ampacity must be greater than or equal to the Continuous Current (Article 100) 41.8A >= 15A = true	PASS
3.	Conductor Ampacity must be at least 125% of Continuous Current (215.2(A)(1)) 55A > 15A x 1.25 = true	PASS
4.	Max current for terminal must be at least 125% of the Continuous Current. (110.14(C)) 40A >= 15A X 1.25 = true	PASS
5.	EGC must meet code requirements for minimum size (Table 250.122) 12 AWG >= 12 AWG = true	PASS
6.	Conduit must meet code recommendation for minimum size (300.17) 0.5in. >= 0.5in. = true	PASS

2.3. #3: Inverter Output: Inverter to Utility Disconnect

Circuit Section Properties

Conductor	10 AWG THWN-2, Copper
Equipment Ground Conductor (EGC)	10 AWG THWN-2, Copper
OCPD(s)	30A
Raceway	0.5" dia. EMT
Lowest Terminal Temperature Rating	60°C
Maximum Wire Temperature	30°C
Power Source Description	Solar Edge SE5000H-US 5000W Inverter
Current	21A
Voltage	240V
Inverter Max OCPD rating	40A

NEC Code Calculations

A. Continuous Current	21A
see Article 100	

Equipment maximum rated output current is 1 X 15A = 21A

B. Ampacity of Conductor	40A
see Table 310.15(B)(16)	

Ampacity (30°C) for a copper conductor with 90°C insulation in conduit is 40A.

C. Derated Ampacity of Conductor	40A
see Table 310.15(B)(3)(c), Table 310.15(B)(3)(a), and Article 100	

The temperature factor for 90°C insulation at 30°C is 1.

The fill factor for a conduit that has 2 wires is 1.

The ampacity derated for Conditions of Use is the product of the conductor ampacity (40A) multiplied by the temperature factor (1) and by the conduit fill factor (1).

40A X 1 X 1 = 40A

D. Max Current for Terminal Temp. Rating	30A
see 110.14(C)	

The lowest temperature limit for this conductor at any termination is 60°C.

Using the method specified in 110.14(C), the maximum current permitted to ensure that the device terminal temperature does not exceed its 60°C rating would be the amount referenced in the 60°C column in Table 310.15(B)(16), which is 30A.

E. Minimum Allowed OCPD Rating	26A
see 240.4	

NEC 690.9(B) requires that the OCPD be rated for no less than 1.25 times the Continuous Current of the circuit.

21A X 1.25 = 26.25A rounded down to 26A

F. Maximum Allowed OCPD Rating	30A
see 240.4(D)	

NEC 240.4(D) requires that OCPD rating not exceed 30A when protecting a Copper 10 AWG conductor.

G. Minimum Required EGC Size	10 AWG
see Table 250.122	

The smallest EGC size allowed is 10 AWG for OCPD rating 30A according to Table 250.122.

H. Minimum Recommended Conduit Size	0.5" dia.
see 300.17	

The total area of all conductors is 0.0844in². With a maximum fill rate of 0.4, the recommended conduit diameter is 0.5.

Qty	Description	Size	Type	Area	Total Area
2	Conductor	10 AWG	THWN-2	0.0211in²	0.0422in²
1	Neutral	10 AWG	THWN-2	0.0211in²	0.0211in²
1	Equipment Ground	10 AWG	THWN-2	0.0211in²	0.0211in²
4					0.0844in²

0.0844in² / 0.4 = 0.211in² (Corresponding to a diameter of 0.5")

NEC Code Validation Tests

1.	OCPD rating must be at least 125% of Continuous Current (240.4) 30A >= 21A X 1.25 = true	PASS
2.	Derated ampacity must exceed OCPD rating, or rating of next smaller OCPD (240.4) 40A >= 30A (OCPD Rating) = true	PASS
3.	OCPD rating must not exceed max OCPD rating for conductor (240.4) 30A (OCPD Rating) <= 30A = true	PASS
4.	Derated Ampacity must be greater than or equal to the Continuous Current (Article 100) 40A >= 21A = true	PASS
5.	Conductor Ampacity must be at least 125% of Continuous Current (215.2(A)(1)) 40A > 21A x 1.25 = true	PASS
6.	Max current for terminal must be at least 125% of the Continuous Current. (110.14(C)) 30A >= 21A X 1.25 = true	PASS
7.	EGC must meet code requirements for minimum size (Table 250.122) 10 AWG >= 10 AWG = true	PASS
8.	Conduit must meet code recommendation for minimum size (300.17) 0.5in. >= 0.5in. = true	PASS

2.4. #4: Utility Disconnect Output: Utility Disconnect to Point of Connection

Circuit Section Properties

Conductor	10 AWG THWN-2, Copper
Equipment Ground Conductor (EGC)	10 AWG THWN-2, Copper
OCPD(s)	30A
Raceway	0.5" dia. EMT
Lowest Terminal Temperature Rating	75°C
Maximum Wire Temperature	30°C
Power Source Description	Solar Edge SE5000H-US 5000W Inverter
Current	21A
Voltage	240V

NEC Code Calculations

A. Continuous Current	21A
see Article 100	

Equipment maximum rated output current is 1 X 15A = 21A

B. Ampacity of Conductor	40A
see Table 310.15(B)(16)	

Ampacity (30°C) for a copper conductor with 90°C insulation in conduit is 40A.

C. Derated Ampacity of Conductor	40A
see Table 310.15(B)(3)(c), Table 310.15(B)(3)(a), and Article 100	

The temperature factor for 90°C insulation at 30°C is 1.
The fill factor for a conduit that has 2 wires is 1.
The ampacity derated for Conditions of Use is the product of the conductor ampacity (40A) multiplied by the temperature factor (1) and by the conduit fill factor (1).
40A X 1 X 1 = 40A

D. Max Current for Terminal Temp. Rating	35A
see 110.14(C)	

The lowest temperature limit for this conductor at any termination is 75°C.
Using the method specified in 110.14(C), the maximum current permitted to ensure that the device terminal temperature does not exceed its 75°C rating would be the amount referenced in the 75°C column in Table 310.15(B)(16), which is 35A.

E. Minimum Allowed OCPD Rating	26A
see 240.4	

NEC 690.9(B) requires that the OCPD be rated for no less than 1.25 times the Continuous Current of the circuit.
21A X 1.25 = 26.25A rounded down to 26A

F. Maximum Allowed OCPD Rating	30A
see 240.4(D)	

NEC 240.4(D) requires that OCPD rating not exceed 30A when protecting a Copper 10 AWG conductor.

G. Minimum Required EGC Size	10 AWG
see Table 250.122	

The smallest EGC size allowed is 10 AWG for OCPD rating 30A according to Table 250.122.

H. Minimum Recommended Conduit Size	0.5" dia.
see 300.17	

The total area of all conductors is 0.0844in². With a maximum fill rate of 0.4, the recommended conduit diameter is 0.5.

Qty	Description	Size	Type	Area	Total Area
2	Conductor	10 AWG	THWN-2	0.0211in²	0.0422in²
1	Neutral	10 AWG	THWN-2	0.0211in²	0.0211in²
1	Equipment Ground	10 AWG	THWN-2	0.0211in²	0.0211in²
4					0.0844in²

0.0844in² / 0.4 = 0.211in² (Corresponding to a diameter of 0.5")

NEC Code Validation Tests

1.	OCPD rating must be at least 125% of Continuous Current (240.4) 30A >= 21A X 1.25 = true	PASS
2.	Derated ampacity must exceed OCPD rating, or rating of next smaller OCPD (240.4) 40A >= 30A (OCPD Rating) = true	PASS
3.	OCPD rating must not exceed max OCPD rating for conductor (240.4) 30A (OCPD Rating) <= 30A = true	PASS
4.	Derated Ampacity must be greater than or equal to the Continuous Current (Article 100) 40A >= 21A = true	PASS
5.	Conductor Ampacity must be at least 125% of Continuous Current (215.2(A)(1)) 40A > 21A x 1.25 = true	PASS
6.	Max current for terminal must be at least 125% of the Continuous Current. (110.14(C)) 35A >= 21A X 1.25 = true	PASS
7.	EGC must meet code requirements for minimum size (Table 250.122) 10 AWG >= 10 AWG = true	PASS
8.	Conduit must meet code recommendation for minimum size (300.17) 0.5in. >= 0.5in. = true	PASS



Solaria PowerXT® | Residential



Solaria PowerXT®-350R-PD | Solaria PowerXT®-345R-BD

Achieving up to 19.4% efficiency, Solaria PowerXT solar modules are one of the highest power modules in the residential solar market. Compared to conventional modules, Solaria PowerXT modules have fewer gaps between the solar cells; this leads to higher power and superior aesthetics. Solaria PowerXT residential modules are manufactured with black backsheet and frames, giving them a striking appearance.

Developed in California, Solaria's patented cell cutting and module assembly takes processed solar wafers and turns them into PowerXT solar modules. The process starts by creating a highly reliable PowerXT cell where busbars and ribbon interconnections are eliminated. Solaria then packages the cells into the PowerXT solar module, reducing inactive space between the cells. All of the above leads to an exceptionally efficient solar module produced in a cost effective manner.

Higher Efficiency, Higher Power

Solaria PowerXT modules achieve up to 19.4% efficiency; conventional modules achieve 15% – 17% efficiency. Solaria PowerXT modules are one of the highest power modules available.

Lower System Costs

Solaria PowerXT modules produce more power per square meter area. This reduces installation costs due to fewer balance of system components.

Improved Shading Tolerance

Sub-strings are interconnected in parallel, within each of the four module quadrants, which dramatically lowers the shading losses and boosts energy yield.

Improved Aesthetics

Compared to conventional modules, Solaria PowerXT modules have a more uniform appearance and superior aesthetics.

Durability and Reliability

Solder-less cell interconnections are highly reliable and designed to far exceed the industry leading 25 year warranty.



About Solaria

Established in 2000, The Solaria Corporation has created one of the industry's most respected IP portfolios, with over 100 patents encompassing materials, processes, applications, products, manufacturing automation and equipment. Headquartered in Fremont, California, Solaria has developed a technology platform that unlocks the potential of solar energy allowing it to be ubiquitous and universally accessed.



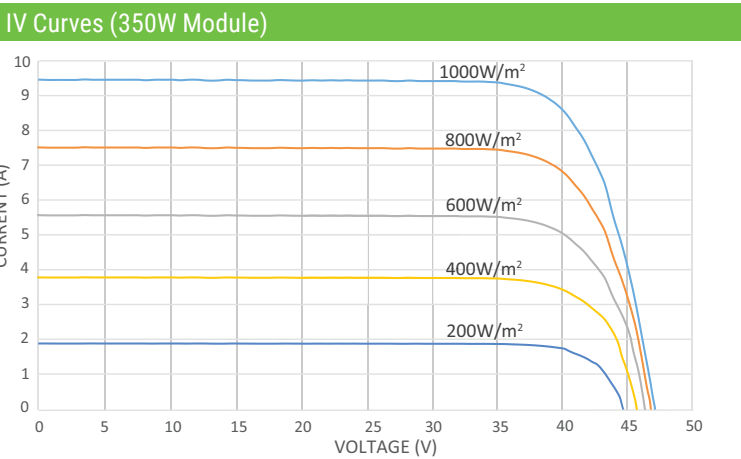
Solaria PowerXT®-350R-PD
Solaria PowerXT®-345R-BD

Performance at STC (1000W/m², 25° C, AM 1.5)					
Solaria PowerXT-		340R-BD	345R-BD	345R-PD	350R-PD
Max Power (P _{max})	[W]	340	345	345	350
Efficiency	[%]	18.8	19.1	19.1	19.4
Open Circuit Voltage (V _{oc})	[V]	46.9	47.1	46.9	47.1
Short Circuit Current (I _{sc})	[A]	9.36	9.40	9.46	9.49
Max Power Voltage (V _{mp})	[V]	38.6	38.9	38.5	38.8
Max Power Current (I _{mp})	[A]	8.79	8.88	8.93	9.02
Power Tolerance	[%]	-0/+3	-0/+3	-0/+3	-0/+3

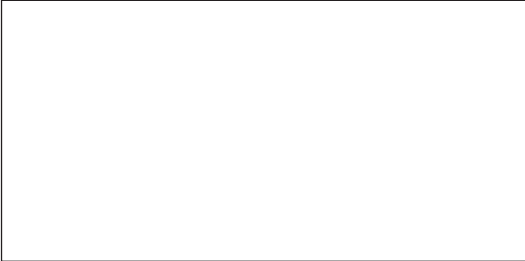
Performance at NOCT (800W/m², 20°C Amb, Wind 1 m/s, AM 1.5)					
Max Power (P _{max})	[W]	252	255	255	259
Open Circuit Voltage (V _{oc})	[V]	44.1	44.3	44.1	44.3
Short Circuit Current (I _{sc})	[A]	7.58	7.61	7.66	7.69
Max Power Voltage (V _{mp})	[V]	35.5	35.8	35.4	35.7
Max Power Current (I _{mp})	[A]	7.03	7.10	7.15	7.22

Temperature Characteristics		
NOCT	[°C]	45 +/-2
Temp. Coeff. of P _{max}	[% / °C]	-0.39
Temp. Coeff. of V _{oc}	[% / °C]	-0.29
Temp. Coeff. of I _{sc}	[% / °C]	0.04

Design Parameters		
Operating temperature	[°C]	-40 to +85
Max System Voltage	[V]	1000
Max Fuse Rating	[A]	15
Bypass Diodes	[#]	4



Authorized Dealer

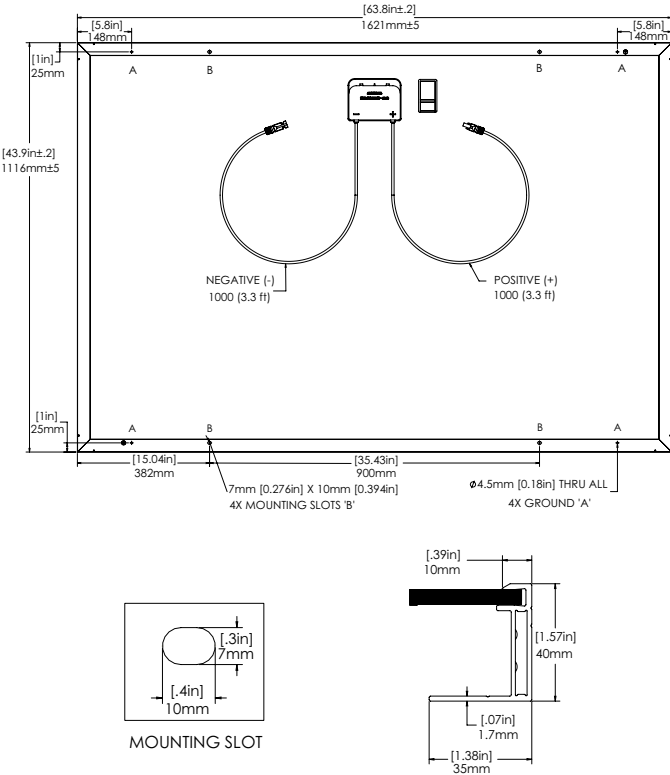


Mechanical Characteristics	
Cell Type	Monocrystalline Silicon
Dimensions (L x W x H)	1621mm x 1116mm x 40mm
Weight	21 kg / 46 lbs
Glass Type / Thickness	AR Coated, Tempered / 3.2mm
Frame Type	Anodized Aluminum
Cable Type / Length	12 AWG PV Wire (UL) / 1000mm
Connector Type	Amphenol H4 (MC4 compatible)
Junction Box	IP67 / 4 diodes
Front Load (UL 1703)	5400 Pa / 113 psf
Rear Load (UL 1703)	3600 Pa / 75 psf

Certifications / Warranty	
Certifications	UL 1703/IEC 61215/IEC 61730/CEC
Fire Type (UL 1703)	1
Power & Product Warranty	25 years*

* Warranty details at www.solaria.com

Packaging	
Stacking Method	Horizontal / Palletized
Pcs / Pallet	25
Pallet Dims (L x W x H)	1685 x 1150 x 1230 mm
Pallet Weight	590 kg / 1300 lbs
Pallets / 40-ft Container	28
Pcs / 40-ft Container	700

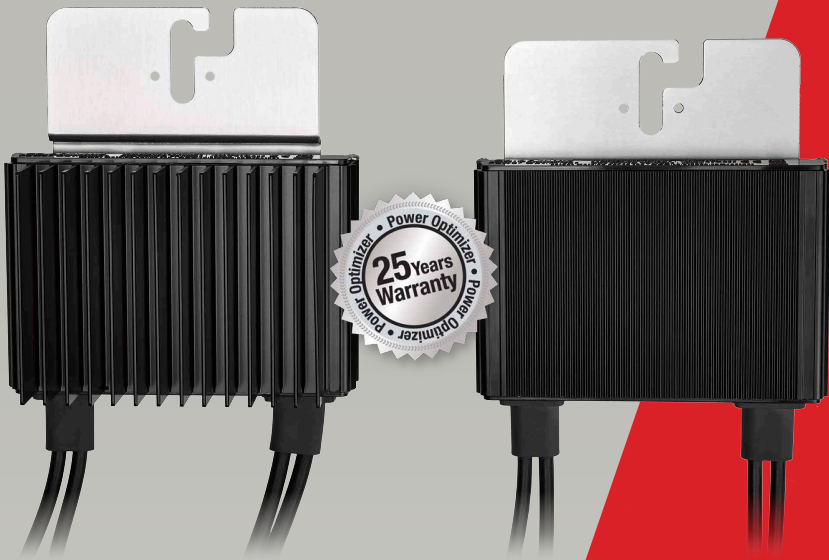




SolarEdge Power Optimizer

Module Add-On For North America

P320 / P370 / P400 / P405 / P505



POWER OPTIMIZER

PV power optimization at the module-level

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Compliant with arc fault protection and rapid shutdown NEC requirements (when installed as part of the SolarEdge system)
- Module-level voltage shutdown for installer and firefighter safety



SolarEdge Power Optimizer

Module Add-On for North America

P320 / P370 / P400 / P405 / P505

OPTIMIZER MODEL (typical module compatibility)	P320 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)	P505 (for higher current modules)	
INPUT						
Rated Input DC Power ⁽¹⁾	320	370	400	405	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48	60	80	125	83	Vdc
MPPT Operating Range	8 - 48	8 - 60	8 - 80	12.5 - 105	12.5 - 83	Vdc
Maximum Short Circuit Current (Isc)	11		10.1		14	Adc
Maximum DC Input Current	13.75		12.63		17.5	Adc
Maximum Efficiency	99.5					%
Weighted Efficiency	98.8			98.6		%
Overvoltage Category	II					
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREEDGE INVERTER)						
Maximum Output Current	15					Adc
Maximum Output Voltage	60			85		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREEDGE INVERTER OR SOLAREEDGE INVERTER OFF)						
Safety Output Voltage per Power Optimizer	1 ± 0.1					Vdc
STANDARD COMPLIANCE						
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3					
Safety	IEC62109-1 (class II safety), UL1741					
RoHS	Yes					
INSTALLATION SPECIFICATIONS						
Maximum Allowed System Voltage	1000					Vdc
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters					
Dimensions (W x L x H)	128 x 152 x 28 / 5 x 5.97 x 1.1	128 x 152 x 36 / 5 x 5.97 x 1.42	128 x 152 x 50 / 5 x 5.97 x 1.96	128 x 152 x 59 / 5 x 5.97 x 2.32		mm / in
Weight (including cables)	630 / 1.4	750 / 1.7	845 / 1.9	1064 / 2.3		gr / lb
Input Connector	MC4 ⁽²⁾					
Output Wire Type / Connector	Double Insulated; MC4					
Output Wire Length	0.95 / 3.0	1.2 / 3.9				m / ft
Operating Temperature Range	-40 - +85 / -40 - +185					°C / °F
Protection Rating	IP68 / NEMA6P					
Relative Humidity	0 - 100					%

⁽¹⁾ Rated STC power of the module. Module of up to +5% power tolerance allowed.

⁽²⁾ For other connector types please contact SolarEdge

PV SYSTEM DESIGN USING A SOLAREEDGE INVERTER ⁽³⁾⁽⁴⁾		SINGLE PHASE HD-WAVE	SINGLE PHASE	THREE PHASE 208V	THREE PHASE 480V	
Minimum String Length (Power Optimizers)	P320, P370, P400	8		10	18	
	P405 / P505	6		8	14	
Maximum String Length (Power Optimizers)		25		25	50 ⁽⁵⁾	
Maximum Power per String		5700 (6000 with SE7600H-US, SE10000H-US)	5250	6000	12750	W
Parallel Strings of Different Lengths or Orientations		Yes				

⁽³⁾ For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf.

⁽⁴⁾ It is not allowed to mix P405/P505 with P320/P370/P400/P600/P700/P800 in one string.

⁽⁵⁾ A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement





Single Phase Inverters
for North America

SE3000H-US / SE3800H-US / SE5000H-US /
SE6000H-US / SE7600H-US / SE10000H-US



Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking efficiency
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- UL1741 SA certified, for CPUC Rule 21 grid compliance
- Extremely small
- High reliability without any electrolytic capacitors
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)



INVERTERS



Single Phase Inverters for North America

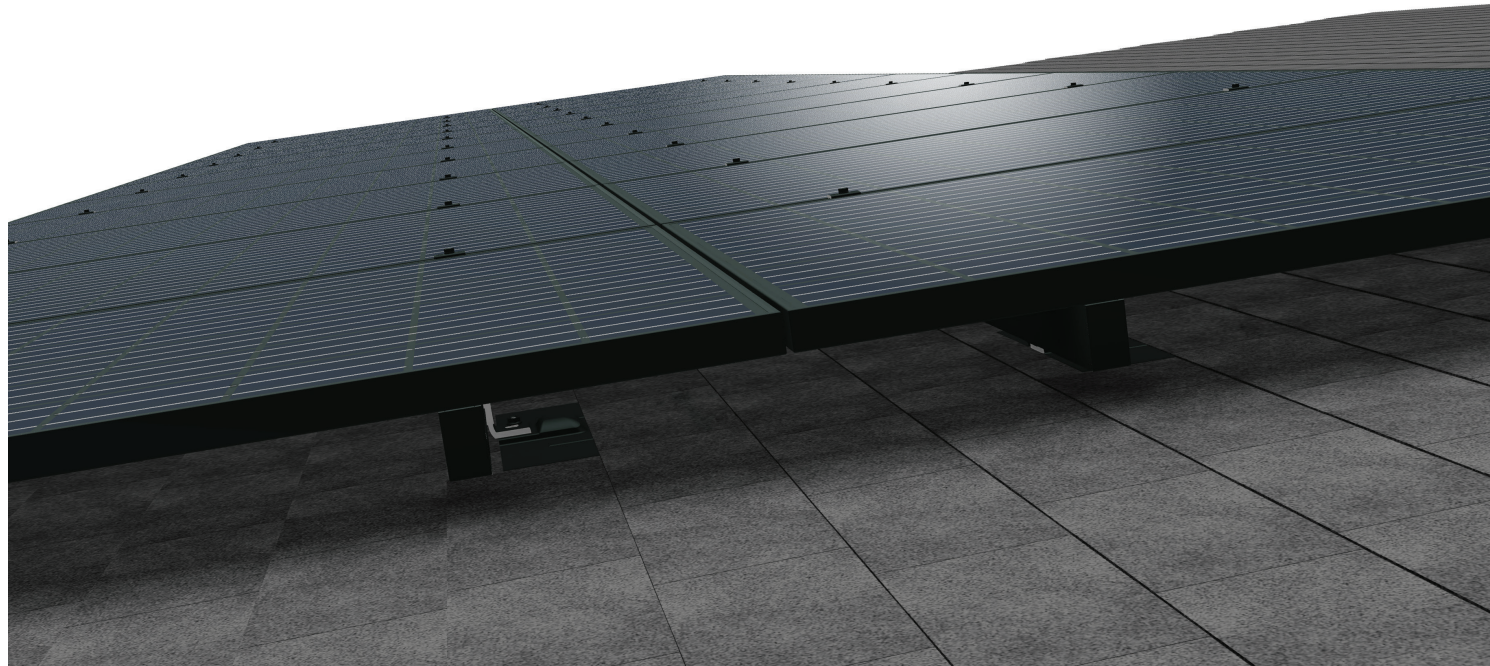
SE3000H-US / SE3800H-US / SE5000H-US /
SE6000H-US/ SE7600H-US / SE10000H-US

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	
OUTPUT							
Rated AC Power Output	3000	3800	5000	6000	7600	10000	VA
Max. AC Power Output	3000	3800	5000	6000	7600	10000	VA
AC Output Voltage Min.-Nom.-	✓	✓	✓	✓	✓	✓	Vac
Max. (211 - 240 - 264)							
AC Frequency (Nominal)			59.3 - 60 - 60.5 ⁽¹⁾				Hz
Maximum Continuous Output	12.5	16	21	25	32	42	A
Current@240V							
GFDI Threshold			1				A
Utility Monitoring, Islanding							
Protection, Country Configurable			Yes				
Thresholds							
INPUT							
Maximum DC Power	4650	5900	7750	9300	11800	15500	W
Transformer-less, Ungrounded			Yes				
Maximum Input Voltage			480				Vdc
Nominal DC Input Voltage			380		400		Vdc
Maximum Input Current@240V	8.5	10.5	13.5	16.5	20	27	Adc
Max. Input Short Circuit Current			45				Adc
Reverse-Polarity Protection			Yes				
Ground-Fault Isolation Detection			600k Ω Sensitivity				
Maximum Inverter Efficiency	99			99.2			%
CEC Weighted Efficiency			99				%
Nighttime Power Consumption			< 2.5				W
ADDITIONAL FEATURES							
Supported Communication			RS485, Ethernet, ZigBee (optional), Cellular (optional)				
Interfaces							
Revenue Grade Data, ANSI C12.20			Optional ⁽²⁾				
Rapid Shutdown - NEC 2014 and 2017 690.12			Automatic Rapid Shutdown upon AC Grid Disconnect				
STANDARD COMPLIANCE							
Safety			UL1741, UL1741 SA, UL1699B, CSA C22.2, Canadian AFCl according to T.I.L. M-07				
Grid Connection Standards			IEEE1547, Rule 21, Rule 14 (H1)				
Emissions			FCC Part 15 Class B				
INSTALLATION SPECIFICATIONS							
AC Output Conduit Size / AWG			3/4" minimum / 20-4 AWG				
Range							
DC Input Conduit Size / # of Strings / AWG Range			3/4" minimum / 1-2 strings / 14-6 AWG			3/4" minimum / 1-3 strings / 14-6 AWG	
Dimensions with Safety Switch (HxWxD)			17.7 x 14.6 x 6.8 / 450 x 370 x 174			21.3 x 14.6 x 7.3 / 540 x 370 x 185	in / mm
Weight with Safety Switch	22 / 10		25.1 / 11.4	26.2 / 11.9		38.8 / 17.6	lb / kg
Noise			< 25			<50	dBA
Cooling			Natural Convection			Natural convection	
Operating Temperature Range			-13 to +140 / -25 to +60 ⁽³⁾ (-40°F / -40°C option) ⁽⁴⁾				°F / °C
Protection Rating			NEMA 3R (Inverter with Safety Switch)				

⁽¹⁾ For other regional settings please contact SolarEdge support
⁽²⁾ Revenue grade inverter P/N: SExxxxH-US000NNC2
⁽³⁾ For power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf>
⁽⁴⁾ -40 version P/N: SExxxxH-US000NNU4



Series 100



The Installers Choice for Residential Solar Mounting



Entire Mounting System from
Single Manufacturer under 1
Warranty



Snap-in features make the
install process intuitive and
fast



Industry Leading Technical
Support Services for Every
Customer



The Most Comprehensive UL
2703 Listing in the Industry

Start Mounting Solar on Your Roof Today

RESOURCES
DESIGN
WHERE TO BUY

snapnrack.com/resources
snapnrack.com/configurator
snapnrack.com/where-to-buy

The SnapNrack Series 100 Roof Mount System

is designed to provide the lowest total install cost of any
residential mounting system.



The top-of-the-line features of the SnapNrack mounting system reduce
install times and labor cost while eliminating the need for service calls
creating the lowest install lifecycle cost of any mounting system.

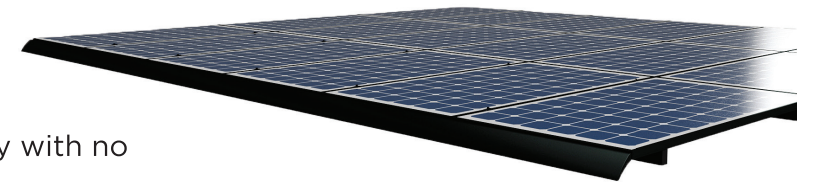


Wire Management

- Products such as the standard rail channel keep wires neatly organized providing a clean finished look to every install
- Industry's largest offering of wire management accessories include snap in junction box, 4-wire and trunk cable clamps, as well as conduit clamps for both composition shingle and tile roofs.

Undeniable Aesthetics

- Render the mounting system invisible by using Universal End Clamps that fasten modules while remaining hidden underneath the array
- Array skirt provides a sleek look and attractive design to the front of the array
- Rail-based system provides rigid structure tucked away underneath array with no unsightly mounts at the top or bottom



Quality. Performance. Innovation.

SnapNrack solutions are focused on simplifying the installation experience through intuitive products and the best wire management in the industry.

SnapNrack™
Solar Mounting Solutions

877-732-2860

www.snapnrack.com

contact@snapnrack.com

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January 4, 2018

SnapNrack
775 Fiero Lane, Ste. 200
San Luis Obispo, CA 93401
TEL: (877) 732-2860

Attn.: SnapNrack - Engineering Department

Re: Report # 2017-00240-A.05 – SnapNrack Series 100 Solar Photovoltaic Racking System with 6063-T6 Rail
Subject: Engineering Certification for the State of Colorado

PZSE, Inc. – Structural Engineers has provided engineering and span tables for the SnapNrack Series 100 Solar Photovoltaic Racking System, as presented in PZSE Report # 2017-00240-A.05, “Engineering Certification and Span Tables for the SnapNrack Ultra Rail Racking System”. All information, data, and analysis therein are based on, and comply with, the following building codes and typical specifications:

- Building Codes:**
1. ASCE/SEI 7-05 & 7-10, Minimum Design Loads for Buildings and other Structures, by American Society of Civil Engineers
 2. 2009, 2012, & 2015 International Building Code, by International Code Council, Inc.
 3. 2009, 2012, & 2015 International Residential Code, by International Code Council, Inc.
 4. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES
 5. Aluminum Design Manual 2005, 2010 & 2015, by The Aluminum Association, Inc.
 6. ANSI/AWC NDS-2012 & NDS-2015, National Design Specification for Wood Construction, by the American Wood Council

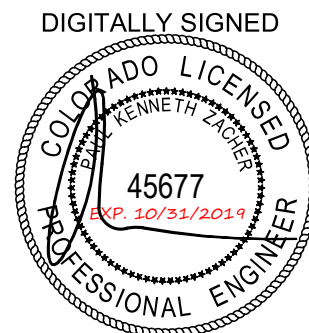
Design Criteria:

Risk Category II
Seismic Design Category = A - E
Basic Wind Speed (ultimate) per ASCE 7-10 = 110 mph to 190 mph.
Basic Wind Speed (ultimate) per ASCE 7-05 = 85 mph to 147 mph.
Ground Snow Load = 0 to 120 (psf).

This letter certifies that the loading criteria and design basis for the SnapNrack Ultra Rail Flush-Mount System Span Tables are in compliance with the above codes.

If you have any questions on the above, do not hesitate to call.

Prepared by:
PZSE, Inc. – Structural Engineers
Roseville, CA



Grounding Specifications

snapnrack.com

Series 100 has been tested with the following UL Listed modules:

The Series 100 System employs top-down clamps which have been evaluated for frame-to-system bonding, at specific mounting torques and with the specific modules listed below. The system has been assessed to a maximum Over-Current Device (OCD) protection level of 20 amps. The UL file number is included in parentheses below.

Hyundai Heavy Industries Co Ltd (E325005): HiS-MXXXRG Series where XXX is 235 to 275; HiS-SXXXRG where XXX is 245 to 295; HiS-SXXXRW where XXX is 250 to 265; HiS-MXXXMG where XXX is 210 to 270; HiS-SXXXMG where XXX is 220 to 275. All may be followed by the suffix BK or blank.

Jinko Solar (E362479): Models JKMXXXP-60 where XXX is 200 to 290; JKMXXXP-72 where XXX is 250 to 360; JKMXXXM-60 where XXX is 200 to 305; JKMXXXM-72 where XXX is 250 to 360; JKMXXXP-60 where XXX is 200 to 290; JKMXXXP-72 where XXX is 250 to 360; JKMXXXP-60-V where XXX is 200 to 290; JKMXXXP-72-V where XXX is 250 to 360; JKMXXXP-60-V where XXX is 200 to 300; JKMXXXP-72-V where XXX is 250 to 360; JKMSXXXP-72 where XXX is 250 to 330; JKMXXXP-60-J4 where XXX is 200 to 290; JKMXXXP-60B-J4 where XXX is 200 to 290.

Kyocera (E467150): KU-60 1000 V Series - KUXXX, where XXX is 250 to 275, followed -6BCA, -6BFA, -6BPA, -6DCA, -6DFA, -6DPA, -6MCA, -6MPA, -6XCA, -6XPA, -6ZCA, -6ZPA, -6ZPB, -6ZCB, -6ZPC, -6ZCC, -6ZPD, -6ZCD, -6ZPE, 6ZCE, -6MPC, -6MCC, -6MPB or -6MCB; KU-80 1000 V Series - KUXXX, where XXX is 315 to 335, followed by -8BCA, -8BFA or -8BPA.

LG (E329725) - LGXXQ1C-A5 where XXX is 340 to 385; LGXXQ1K-A5 where XXX is 315 to 375.

Panasonic (E181540) - VBHNXXXSA16 where XXX is 320 to 335; VBHNXXXKA01 and VBHNXXXKA02 where XXX is 310 to 325; VBHNXXXKA03 and VBHNXXXKA04 where XXX is 310 to 325; VBHNXXXSA17 and VBHNXXXSA18 where XXX is 325 to 335.

REC Solar AS (E308147): RECXXX, where XXX is 214 to 270, all may be followed by PE, PE(BLK), PE-US, PE-US(BLK), PEQ2 or PEQ3.

Renesola Jiangsu Ltd (E312637): JCXXM-24/Bb Series where XXX is 200 to 270; JCXXM-24/BBh Series where XXX is 235 to 270.

Suniva Inc (E333709): MVX-XXX-60-5-YYY where XXX is 235 to 265 and YYY is 701 or 7B1; OPT-XXX-60-4-YYY where XXX is 250 to 275 and YYY is 800 or 8B0.

Sunpower (E246423): Gen 3 or Gen 5 frame models SPR-XY-### where YY represents numbers 18, 19, 20 or 21, and ### represents any number from 365 to 310 and 274 to 233; Gen 3 or Gen 5 frame models SPR-EY-### where YY represents numbers 18, 19, 20 or 21, and ### represents any number from 345 to 285 and 250 to 225.

Talesun Solar (E359349) - TP660P-XXX where XXX is 235 to 285; TP660M-XXX where XXX is 240 to 300; TP672P-XXX where XXX is 280 to 345; TP672M-XXX where XXX is 290 to 360.

Trina Solar Ltd (E306515) - TSM-XXXPA05 where XXX is 215 to 260; TSM-XXXPA05.05 where XXX is 215 to 260; TSM-XXXPA05.08 where XXX is 215 to 260; TSM-XXXPD05 where XXX is 240 to 280; TSM-XXXPD05.05 where XXX is 240 to 280; TSM-XXXPD05.08 where XXX is 240 to 280; TSM-XXXPD05.08D where XXX is 245 to 275 TSM-XXXDD05A(II) where XXX is 260-300; TSM-XXXDD05A.08(II), TSM-XXXDD05A.05(II) Series where XXX is 260 to 300. All may be followed by Black or White.

Yingli Energy (China) Co Ltd (E320066) - YLXXP-29b where XXX is 215 to 260; YLXXA-29b where XXX is 220 to 255.

NRTL Listed PV Modules:

Boviet Solar: Models BVM6610P-XXX where XXX is 225 to 275; BVM6610M-XXX where XXX is 235 to 280; BVM6612P-XXX where XXX is 270 to 330; BVM6612M-XXX where XXX is 280 to 340.

Grounding Specifications

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Canadian Solar: Models CS6P-XXX-P where XXX is 200 to 285; CS6P-XXX-M where XXX is 200 to 290; CS6P-XXX-P-SD where XXX is 240 to 285; CS6K-XXX-M where XXX is 240 to 305; CS6K-XXX-M-SD where XXX is 240 to 305; CS6K-XXX-P where XXX is 220 to 285; CS6K-XXX-P-SD where 220 to 285; CS6X-XXX-P where XXX is 250 to 345; CS6V-XXX-M where XXX is 215 to 225; CS6V-XXX-P where XXX is 250 to 255; CS3K-XXX-P where XXX is 250 to 310; CS3K-XXX-MS where XXX is 280 to 330; CS1K-XXX-MS where XXX is 285 to 345.

ET Solar: ET-P660XXXBB where XXX is 200 to 265; ET-P660XXXWB where XXX is 200 to 265; ET-P660XXXWW where XXX is 200 to 265; ET-P660XXXWWG where XXX is 235 to 265; P660XXXWB/WW where XXX is 200 to 265 and may be followed by WB or WW; P660XXXWWG where XXX is 240 to 250; M660XXXBB where XXX is 250 to 265; M660XXXWW where XXX is 200 to 270.

Hanwha Q Cells: Q.Pro BFR-G4-XXX where XXX is 205 to 295. Q.Pro BFR-G4.1-XXX where XXX is 245 to 295. Q.Plus BFG-G4-XXX where XXX is 255 to 280. Q.Plus BFG-G4.1-XXX where XXX is 270-280. Models Q.BASE-GY XXX, Q.PRO-GY XXX, Q.PLUS-GY XXX, Q.PRO BFR-GY XXX, Q.PLUS BFR-GY XXX, Q.PRO BLK-GY XXX, Q.PRO-GY/SC XXX, where Y is the generation number between 1.x and 9.x, where XXX is 205 to 295; Q.PEAK-G3.1 XXX and Q.PEAK BLK-G3.1 XXX where XXX is 270 to 325; Q.PLUS BFR-G3.1 where XXX is 245 to 295.

Hanwha SolarOne: Models HSL60P6-PB-X-YYYQ where X is 2 or 4, and YYY is 230 to 270, may be followed by additional suffixes.

JA Solar: Models JAP6-60-XXX/3BB where XXX is 235 to 265; JAM6-60-XXX/SI where XXX is 250 to 270.

LG Electronics Inc.: Models LGXXS1C-G4 where XXX is 250 to 300; LGXXN1K-G4 where XXX is 280 to 300; LGxxxN1C-G4 where XXX is 280 to 340; LGXXN2C-G4, LGXXN2W-G4, where XXX is 360 to 395; LGXXN2K-G4, where XXX is 360 to 385; LGXXS2C-G4, LGXXS2W-G4, where XXX is 300 to 360; LGXXN2C-B3, LGXXN2W-B3, where XXX is 330 to 400; LGXXS1C-A5 where XXX is 280 to 320; LGXXN1C-A5 where XXX is 320 to 345; LGXXN1K-A5 where XXX is 310 to 335.

Longi Green Energy Technology Co., Ltd.: LR6-60-XXXM, LR6-60BK-XXXM, LR60-HV-XXXM, where XXX is 270 to 300; LR6-60PB-XXXM, LR6-60PE-XXXM, LR6-60PH-XXXM, where XXX is 280 to 310.

Mission Solar: Models MSEXXXSO5T where XXX is 260 to 290; MSEXXXSO5K where XXX is 270 to 290; MSEXXXSQ5T where XXX is 280 to 300; MSEXXXSQ5K where XXX is 285 to 305; MSEXXXMM4J and MSEXXXMM6J where XXX is 320 to 330; MSEXXXSO6W where XXX is 320 to 340; MSEXXXSO4J and MSEXXXSO6J where XXX is 320 to 350; MSEXXXSQ4S and MSEXXXSQ6S where XXX is 345 to 365.

REC Solar PTE. LTD.: Models RECXXXP Series where the XXX is 214 to 280; RECXXTP Series where XXX is 260 to 300; RECXXTP2 Series where XXX is 260 to 300; RECXXTP IQ Series where XXX is 260 to 300; All may be followed by BLK; RECXXTP72, where XXX is 330 to 345; RECXXX, where XXX is 285 to 325, followed by PE72, PE72BLK, PE72 Q2 or PE72 Q3; RECXXPE72XV, where XXX is 295 to 325, followed by PE72 XV, PE72 XV Q2 or PE72 XV Q3.

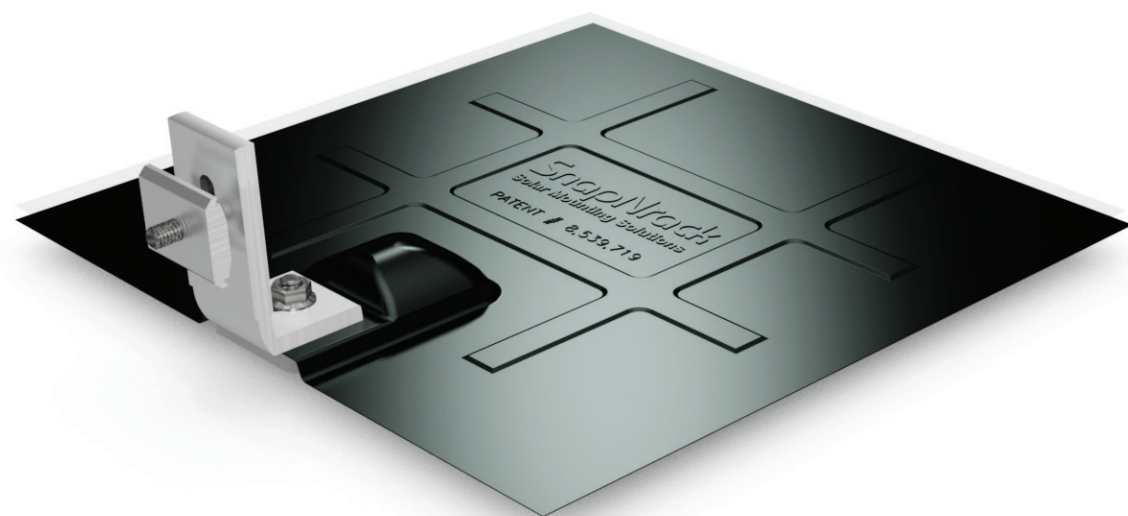
Silfab: SLAXX-M, where XXX is 280 to 300; SLGXX-M, where XXX is 335 to 360; SLAXX-P, where XXX is 250 to 265; SLGXX-P, where XXX is 300 to 315; SSAXX-M, where XXX is 280 to 300; SSGXX-M, where XXX is 335 to 360; SSAXX-P, where XXX is 250 to 260; SSGXX-P, where XXX is 300 to 315.

Solar World: Models SWXX-Mono where XXX is 200 to 300; SWXX-Mono XL where XXX is 320 to 350. All may be followed by Black.

Suniva Inc: OPTXX-60-4-YYY where XXX is 240 to 300 and YYY is 100; OPTXX-60-4-YYY where XXX is 235 to 300 and YYY is 1B0.

Trina Solar Ltd: Models TSM-XXXPD05.002 or TSM-XXXPD05.082 where XXX is 245 to 310; TSM-XXXDD05A.082(II) where XXX is 260 to 315; TSM-XXXPD05.08S and TSM-XXXPD05.05S where XXX is 215 to 275; all may be followed by Black.

Flashed L Foot



Reliable & Weatherproof Roof Attachment



Cutting of shingles not required



Preassembled, snap-in hardware reduces installation time



Single tool installation, using a standard 1/2" socket



Included in Series 100 UL 2703 Listing

Start Installing the Flashed L Foot Today

RESOURCES
DESIGN
WHERE TO BUY

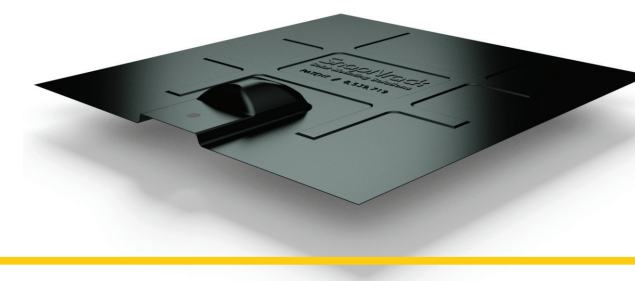
snapnrack.com/resources
snapnrack.com/configurator
snapnrack.com/where-to-buy

SnapNrack Series 100 Flashed L Foot Kit

is an industry-leading, weatherproof solution for attaching to composition shingle roofs. The Flashed L Foot provides a fully flashed method for mounting the SnapNrack Series 100 system. The combination of Series 100 and the Flashed L foot is guaranteed to improve labor times and ensure the highest quality install possible.

Flashing

- Available in black galvanized steel or aluminum for enhanced corrosion resistance
- L Foot is attaches to bottom edge of flashing, removing the need for shingle cutting
- Innovative stamped features provide increased rigidity

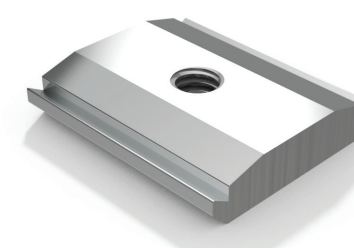
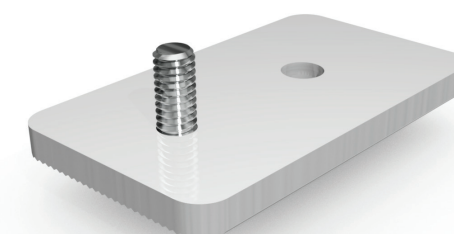


L Foot

- Engineered for maximum adjustability with the ability to orient in any direction
- Vertical adjustability up to 3" using available spacers

L Foot Base

- Provides a long lasting watertight seal over the life of the system that does not rely on rubber (elastomeric seals) that will degrade over time
- Easily installs with off-the-shelf lag screws



Channel Nut

- Provides snap-in installation to the rail channel with no drilling required
- Wide range of adjustability due to sliding ability in rail prior to final tightening

Quality. Performance. Innovation.

SnapNrack solutions are focused on simplifying the installation experience through intuitive products and the best wire management in the industry.

SnapNrack™
Solar Mounting Solutions

877-732-2860

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