Inverter Type: (1) SolarEdge SE7600H-US
PV Panel: (26) Q.PEAK DUO BLK-G6+/TS 340
Racking: Iron Ridge XR-10
Total Wattage: 8,840W DC
Roof Type: Composition Shingles
Wind Load: 27 to 45 Deg
Fastener Type: Use 5/16" Dia 4" Lags

Sheet Index

General Notes:
-SolarEdge SE7600H-US Inverter located near utility meter
-SolarEdge S440 Optimizers are located on roof behind each module.
-First responder access maintained and from adjacent roof.
-Wire run from array to connection is 60 feet.

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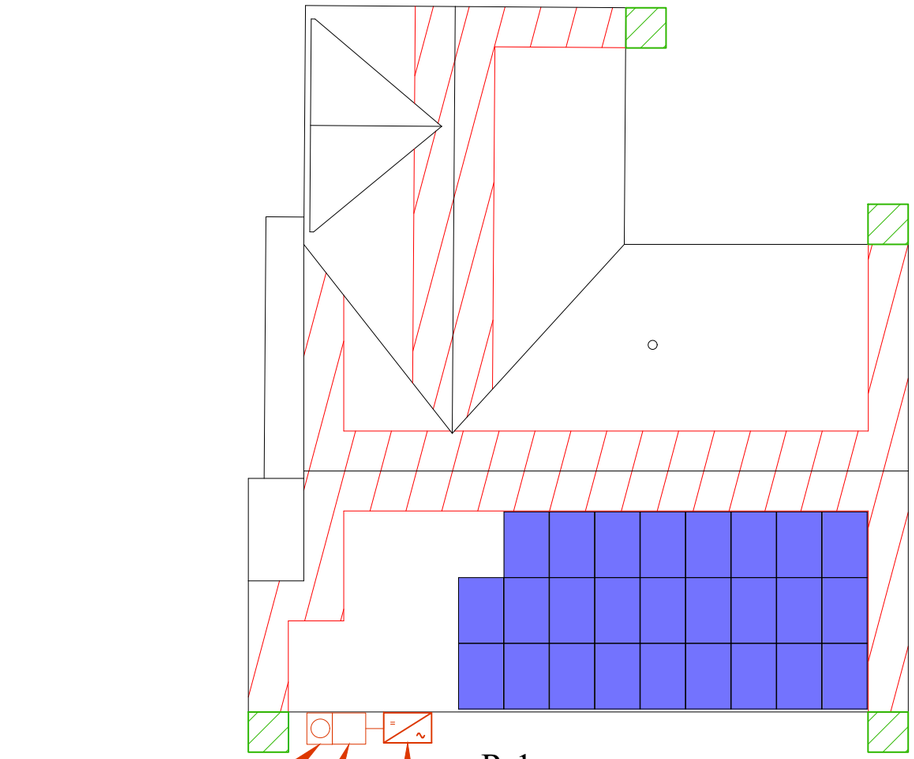
605 W Lumsden Rd,
Brandon, FL 33511
855-577-7999

FRONT OF HOUSE



R-1
Modules (26)
Pitch: 45°
Azimuth: 179°

Columbia County Building Department
Plans Reviewed for Code Compliance
State of Florida

3'-5"
5'-9"

Layout Subject to Change Based on Site Conditions

System meets the requirements of NFPA 70th Edition, Chapter 11.12

Install will be done to Manufacturer Spec

Legend

3' 1'-6" First responder access
Ground Access
Chimney
Satellite
Utility Meter
Vent Pipe
PV Disconnect
SolarEdge Inverter

Meets All Editions of Florida Fire Prevention Code 2020 7th Edition
Meets all requirements of NFPA-1 7th Edition and NFPA-101

3' Access Pathway

Represents all Fire Clearance including Alternative methods

1st Responder Access minimum of 36" unobstructed as per Section R324 of the 2020 IRC

Meets the requirements of the following- (2020 FL Residential Code & FBC, 7th Edition (2020 International Residential Code) - 2nd Printing modified by the FL Building Standards, 2020 Florida Building Energy Conservation Code 7th edition, County of Columbia Code, 2017 National Electric Code.)

Customer Info:

Sean Barnard
129 SW Great Oak Ct
Lake City, FL
32024

Godwin Engineering and Design, LLC
8378 Foxtail Loop
Pensacola, FL 32526
D. Chad Godwin, PE
Chad@godwineng.com

Donnie C Godwin
2022.05.1 16:36:47 1 '00'05-

D. CHAD GODWIN LICENSE No 81360 STATE OF FLORIDA PROFESSIONAL ENGINEER

Date:	5/10/2022
Drawn by:	KT
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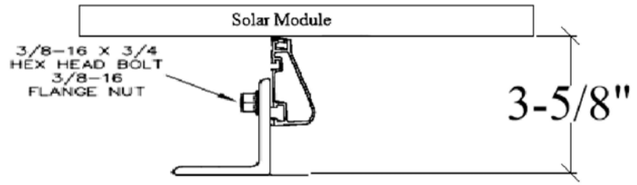
Page:	11"x17" S-1

N

Compass for Aerial

Ironridge XR-10



Install will be done to Manufacturer Spec

General Notes:
- Flashlocs are secured to roof rafters.
@ 72" O.C. in Zone 1, @ 72" O.C in Zone 2e, @ 48" O.C. in Zone 2n,
@ 72" O.C. in Zone 2r, @ 48" O.C in Zone 3e, & @ 48" O.C. in Zone 3r
using 5/16" x 4" stainless steel Lag bolts.
- Subject roof has One layer.
- All penetrations are sealed and flashed.

Roof Section	Pitch	Roof Rafter and Spacing	Overhang	Notes:
R1	12/12	2"x4" @ 24 O.C.	12"	Truss

-Roof Height 15'
-Per 2020 FBC, the Roof Mounted PV System will be subject to the following design criteria: Design Wind Speed(Vult) - 120mph 3 sec gust, Exposure Category - C
-Designed as per ASCE7-16

Inverter Type: (1) SolarEdge SE7600H-US
PV Panel: (26) Q.PEAK DUO BLK-G6+/TS 340
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Chad@godwineng.com

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Brandon, FL 33511
855-577-7999

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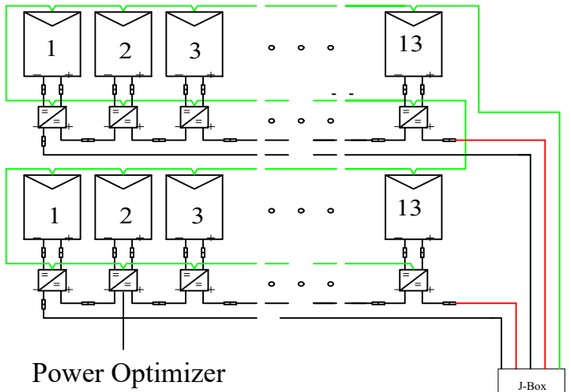


Equipment list

PV:
(26) Q.PEAK DUO BLK-G6+/TS 340

(26) SolarEdge Power Optimizer S440
(2) strings of (13)

Inverter:
(1) SolarEdge SE7600H-US
SolarEdge AC/DC Safety Switch

AC Disconnect:
60A Disconnect

All wiring to meet the 2017 NEC and 2018 Energy Code

PHOTOVOLTAIC SYSTEM DC DISCONNECT
MAX CIRCUIT CURRENT: 20A
MAX POWER POINT VOLTAGE: 400 VDC
MAX SYSTEM VOLTAGE: 480 DC
MAX RATED OUTPUT CURRENT: 15 A

Apply to DC disconnect/inverter

WARNING
ELECTRIC SHOCK HAZARD

THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

Apply to each J box, combiner box, disconnect,and device where energized, ungrounded circuits maybe exposed during service.

Load Side Connection	
Busbar Rating	200
Main Breaker Size	200
Bus Rating *1.2-Main Break Size	40
Max Allowable Load Side	40
Load Side Breaker Size	40

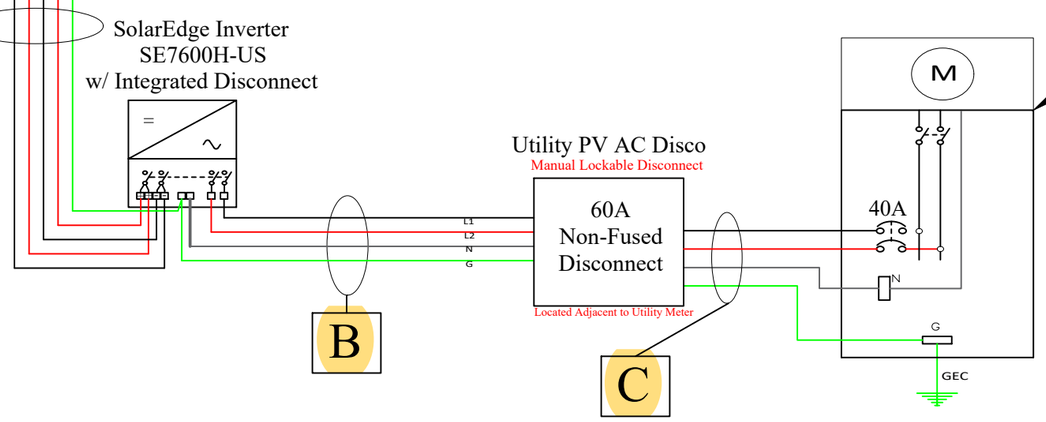
Load side connection Per 705.12(B)(2)(3)(b)
Use Matching or equivalent approved breaker if derating

! WARNING !
POWER SOURCE OUTPUT CONNECTION: DO NOT RELOCATE THIS OVERCURRENT DEVICE

PHOTOVOLTAIC SYSTEM
! AC DISCONNECT !
RATED AC OUTPUT CURRENT: 32A
NOMINAL OPERATING VOLTAGE: 240VAC

(4) #10 AWG Wire
(1) #8 EGC
In 3/4" Metal Conduit

SolarEdge Inverter
SE7600H-US
w/ Integrated Disconnect



Inverter Output Ckt	
To Overcurrent Protection Device	
AC Max Output Current	32.0
AC Max Output Current * 125%	40.0
Overcurrent Protection (A)	40
No. of Current Carrying Cond	<4
Conductor Gauge (AWG)	8

		Conduit(in)	L1,L2,N (Awg)	Ground (Awg)	OCPD
After Inverter	B	0.75	8	8	40
To Breaker injection	C	0.75	8	8	40

Including the label below

In Case of Emergency Call
ACDC Solar LLC
at 855-577-7999

Meets 11.12.2.1.5

Note:
-All wiring to meet the 2017 NEC and Florida electric codes.
60A Disconnect
-Type of conduit to be determined on site by contractor.

Install will be done to Manufacturer Spec

GEC NOTES
- Ungrounded system per 690.41(A)(4)
- GEC must be installed per 250.64
- GEC must be continuous un-spliced or irreversibly spliced from inverter to existing service ground system or continuous from the arrays to the existing service ground system.
- GEC must be min #8 AWG and installed in conduit
- If GEC is not in conduit, it must be #6 min

Disconnects will be Visible, lockable, adjacent to and within 10' of utility meter
All Labels & Markings for photovoltaic system will be reflective and meet all requirements for NFPA 11.12

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Inverter Type:
SolarEdge SE7600H-US
PV Panel:
(26)
Q.PEAK DUO BLK-G6+/TS 340
Total Wattage:
8,840W DC

The Placard shall be permanently riveted..., and shall be made of red, weatherproof, hard plastic, with engraved white block lettering.

-A placard will be added with instructions and locations to be in compliance with 690.12, 690.56(B) and NEC 705.10

Rapid Shutdown Built in Per Code NEC 690.12

In compliance with NEC 250.58, NEC 690.8, NEC 250.24, NEC250.24(D)

PV AC disconnect is lockable in the open position per code NEC 705.22(7)

Conductors have a min ampacity of 60 amperes Per Code NEC 230.79(D)

Everything will be built to Code without all Specifics labeled on plan

System is in compliance with FFPC 1:11.12 7th Edition.

Smoke Detectors will be added as per FBC 553.883

Markings shall be placed on all DC Conduits, DC Combiners, Raceways, Enclosures, Junction Boxes, and Cable Assemblies at every 10', turns, and above and below penetrations in compliance with NFPA

Disconnect means shall be provided for all disconnecting all ungrounded conductors that supply or pass through the building or structure Per Code 2017 NEC Section 225.31 & Section 225.32

E04. Construction documents specify PV system circuits installed on or in buildings include a rapid shutdown function that controls specific conductors in accordance with NEC article 690.12.

E05. These construction documents specify that a label is provided with the method to initiate rapid shut down per 690.12(4).

E06. Construction drawings specify buildings or structures with both utility service and a PV system, complying with NEC article 690.l2 shall have a permanent plaque or directory including the following wording: “PHOTO VOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN” as per NEC article 690.56 (C).

E07. Construction documents specify PV power circuit labels shall appear on every section of the wiring system that is separated by enclosures, walls, partitions, ceilings, or floors.

E08. Construction documents specify all warning sign(s) or label(s) shall comply with NEC article 110.21 (B). Label warnings shall adequately warn of the hazard. Labels shall be permanently affixed to the equipment, and Labels required shall be suitable for the environment.

Inverter Output Ckt To Overcurrent Protection Device		
Design Temperature(F)	94°F	
Max Amb Temp Range(F)	87-95	310.15(B)(2)(a)
Temp Rating of Conductors (C)	75°C	
Current Carrying	<4	310.15(B)(3)(a)
AC Max Output Current	32A	690.8(A)(3)
AC Max Output Current * 1.25%	40A	690.8(B)
Overcurrent Protection(A)	40A	
Amp Temp Correction Factor	0.94	310.15(B)(2)(a)
Raceway Fill adjustment Factor	100%	310.15(B)(3)(a)
Wire Size(Awg)	8	310.15(B)(16)
Cond. Allowable Ampacity(A)	50A	
Cond Adjusted Ampacity(A)	47A	50A*1*0.94=47A
Ampacity Check 1 Per 690.8(B)(1)	Pass	32A*1.25=40A<50A Pass
Ampacity Check 2 Per 690.8(B)(2)	Pass	50A*0.94A*1=47A>32A Pass

All Exterior equipment is A minimum of Nema-R3 Rated

All Interactive System(S) Points of interconnection with other sources shall be marked at an accesible location at the disconnecting means as a power source and with the rated ac output current and the nominal operating AC voltage. Per NEC 690.54

Over Current Protection Device is "Next size up" Based on Inverter Maximum Continuous Output Current Rating 2017 NEC 240.4(B)

-All new equipment located adjacent to Meter on exterior wall

Labels will be placed in the correct location Per Code NEC 690.56(B), 690.56(C), & 690.53

Smoke Alarms per F.S. 553.883

Include required label for metallic raceways and conduits to sheet E-1 per NEC article 690.31(G)(3).

Add required label to sheet E-1 per NEC article 705.10.

Include required label to sheet E-1 per NEC article 705.12(B)

Photovoltaic AC disconnect shall be capable of being locked in the open position per NEC article 705.22(6).

Photovoltaic AC Overcurrent protection shall be located within 10 feet of the point where conductors are connected to the service per NEC 705.31.

PV Source Ckt		
Distance above roof	½ in. -3 ½ in.	310.15(B)
Amb. Temp. Adder for Rooftops (°F)	40	
Design temperature (°F)	136.8	
Adjusted Temp. Range for Roof	132-140	310.15(B)(2)(a)
Temp. Rating of Conductor	90°C	
No. of Current Carrying Cond.	4-6	310.15(B)(3)(a)
Max Source Circuit Current	15	690.8(A)(5)
Max Source Circuit Current * 1.25%	18.8	690.8(B)(1)
Amb. Temp Correction Factor	0.71	310.15(B)(2)(a)
Raceway Fill Adjustment Factor	80%	310.15(B)(3)(a)
Cond. Gauge (AWG)	10	310.15(B)(16)
Cond. Allowable Ampacity (Amps)	40	
Cond. Adjusted Ampacity (Amps)	23	40*.71*.8=22.7

In compliance with 230.71

System meets the grounding requirements of NEC 690.43

DC to DC Converter Current Per String - 15A

In Case of Emergency Call
ACDC Solar LLC
at 855-577-7999

← Apply to Main Disconnect

Permanent sticker added to disconnect

-All Electrical Service Equipment shall be located at or above BFE+1' or 8.00' NAVD

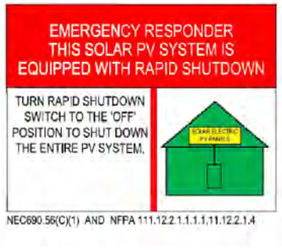
Breaker injection will be done in Meter-Main Combo located outside.

-Markings Shall Be reflective, Weather Resistant and suitable for the environment.
-Markings Shall be red with white lettering with minimum ⅜" Capital Letters

Note:
-Subject PV Systems has been designed to meet the requirments of the NEC **2017**, and those set forth by the Florida Solar Energy Center Certification, Including Maximum Number of Module Strings, Maximum number of modules per string, Maximum Output, Module Manufacturer and model number, inverter manufacturer and model number, as applicable.

NEC 705.10 A permanent plaque or directory, denoting the location of all electric power source disconnecting means on or in the premises, shall be installed at each service equipment location and at the location(s) of the system disconnect(s) for all electric power production sources capable of being interconnected. One sign required for each PV system.

Plans Satisfy NEC 250.94 & NEC250.53(A)(2)



NEC 690.35

Install will be done to Manufacturer Spec

Including the label below

In Case of Emergency Call
ACDC Solar LLC
at 855-577-7999

Customer Info:

Sean Barnard
129 SW Great Oak Ct
Lake City, FL
32024

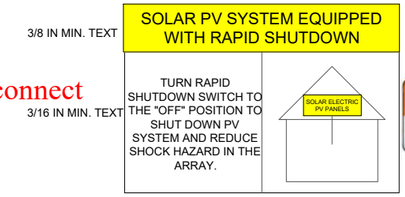
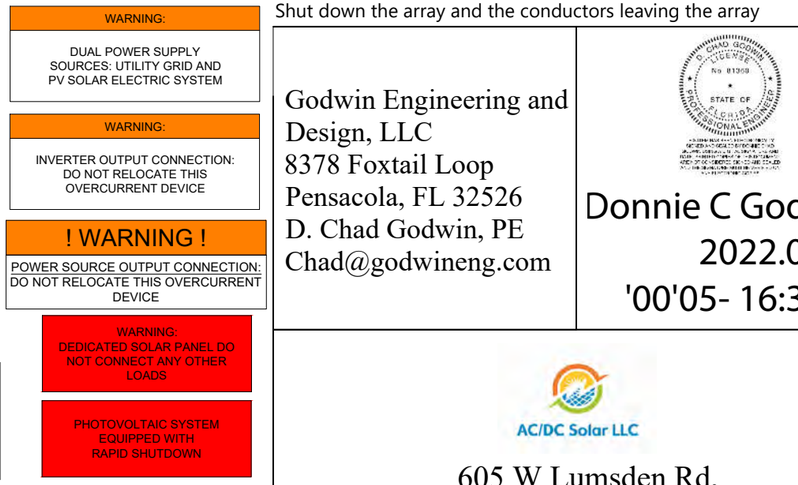


Figure 690.56(C)(1)(a) Label for PV Systems that Shut down the array and the conductors leaving the array



Godwin Engineering and Design, LLC
8378 Foxtail Loop
Pensacola, FL 32526
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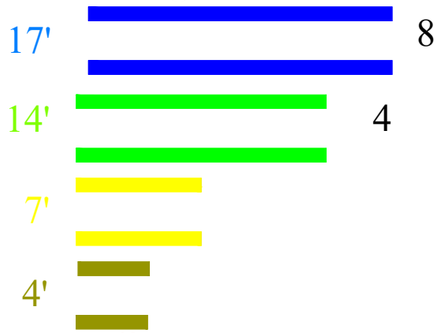
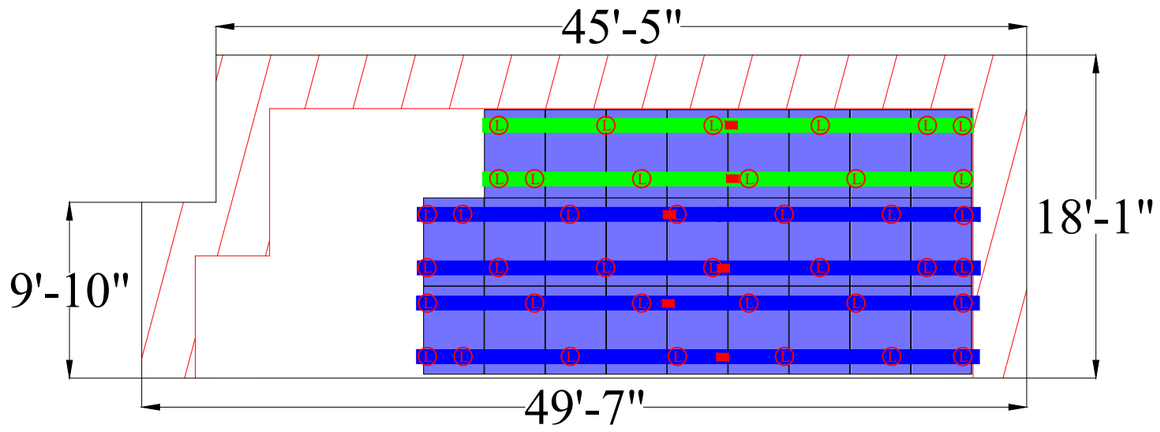
Inverter Type:
SolarEdge SE7600H-US
PV Panel:
(26)
Q.PEAK DUO BLK-G6+/TS 340
Total Wattage:
8,840W DC

Proposed Mounting locations

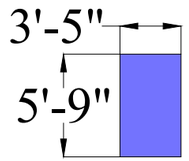
Iron Ridge XR-10 Rail



6 Splice Bar
39 Unirac Flashloc
58 Iron Ridge UFO's
12 Iron Ridge Sleeves/End Caps
1 Roof Top Combiner
3 Iron Ridge Ground Lugs
26 Q.PEAK DUO BLK-G6+/TS 340
1 SolarEdge SE7600H-US
1 60A Non-Fused Disconnect
1 40A Breaker
26 S440 Optimizer



R-1
Modules (26)
Pitch: 45°
Azimuth: 179°



Plans satisfy zones FBC-1510.7.1
Install will be done to Manufacturer Spec

Zone 1: Max cantilever is 24" as per manufacturer spec.
Max Cantilever = Max Span * (⅓)=72"*(⅓)=24"

Zone 2e: Max cantilever is 24" as per manufacturer spec.
Max Cantilever = Max Span * (⅓)=72"*(⅓)=24"

Zone 2n: Max cantilever is 16" as per manufacturer spec.
Max Cantilever = Max Span * (⅓)=48"*(⅓)=16"

Zone 2r: Max cantilever is 24" as per manufacturer spec.
Max Cantilever = Max Span * (⅓)=72"*(⅓)=24"

Zone 3e: Max cantilever is 16" as per manufacturer spec.
Max Cantilever = Max Span * (⅓)=48"*(⅓)=16"

Zone 3r: Max cantilever is 16" as per manufacturer spec.
Max Cantilever = Max Span * (⅓)=48"*(⅓)=16"

Inverter Type:	(1) SolarEdge SE7600H-US
PV Panel:	(26) Q.PEAK DUO BLK-G6+/TS 340
Racking:	Iron Ridge XR-10
Total Wattage:	8,840W DC
Roof Type:	Composition Shingles
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powered by Q.ANTUM DUO

Q.PEAK DUO BLK-G6+ / TS

330-345

ENDURING HIGH PERFORMANCE

ZEP COMPATIBLE

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2020

25 YR Warranty Product & Performance

Q CELLS Yield Security

Q.ANTUM TECHNOLOGY: LOW LEVELIZED COST OF ELECTRICITY

Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 19.5%.

INNOVATIVE ALL-WEATHER TECHNOLOGY

Optimal yields, whatever the weather with excellent low-light and temperature behavior.

ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID and Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

ZEP COMPATIBLE™ FRAME DESIGN

High-tech black Zep Compatible™ frame, for improved aesthetics, easy installation and increased safety.

A RELIABLE INVESTMENT

Inclusive 25-year product warranty and 25-year linear performance warranty[2].

STATE OF THE ART MODULE TECHNOLOGY

Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

[1] APT test conditions according to IEC/TS 62804-1:2015, method B (–1500 V, 168 h)
[2] See data sheet on rear for further information

THE IDEAL SOLUTION FOR:

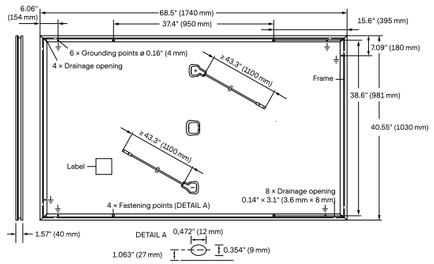
Rooftop arrays on commercial and industrial buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	68.5 × 40.6 × 1.57 in (including frame) (1740 × 1030 × 40 mm)
Weight	47.4 lbs (21.5 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 20 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 × 1.26-2.36 × 0.59-0.71 in (53-101 × 32-60 × 15-18 mm), Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 43.3 in (1100 mm), (–) ≥ 43.3 in (1100 mm)
Connector	Stäubli MC4; IP68

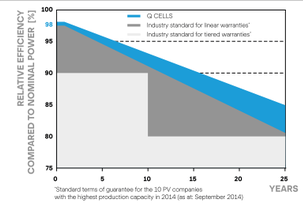


ELECTRICAL CHARACTERISTICS

POWER CLASS				330	335	340	345
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / –0 W)							
Minimum	Power at MPP[1]	P_{MPP}	[W]	330	335	340	345
	Short Circuit Current[1]	I_{SC}	[A]	10.41	10.47	10.52	10.58
	Open Circuit Voltage[1]	V_{OC}	[V]	40.15	40.41	40.66	40.92
	Current at MPP	I_{MPP}	[A]	9.91	9.97	10.02	10.07
	Voltage at MPP	V_{MPP}	[V]	33.29	33.62	33.94	34.25
	Efficiency[1]	η	[%]	≥18.4	≥18.7	≥19.0	≥19.3
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	Power at MPP	P_{MPP}	[W]	247.0	250.7	254.5	258.2
	Short Circuit Current	I_{SC}	[A]	8.39	8.43	8.48	8.52
	Open Circuit Voltage	V_{OC}	[V]	37.86	38.10	38.34	38.59
	Current at MPP	I_{MPP}	[A]	7.80	7.84	7.89	7.93
	Voltage at MPP	V_{MPP}	[V]	31.66	31.97	32.27	32.57

[1] Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2] 800 W/m², NMOT, spectrum AM 1.5

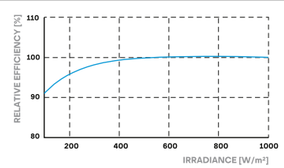
Q CELLS PERFORMANCE WARRANTY



At least 98% of nominal power during first year. Thereafter max. 0.54% degradation per year. At least 93.1% of nominal power up to 10 years. At least 85% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organization of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²)

TEMPERATURE COEFFICIENTS							
Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	–0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	–0.36	Nominal Module Operating Temperature	NMOT	[°F]	109±5.4 (43±3 °C)

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{SYS}	[V]	1000 (IEC) / 1000 (UL)	PV module classification	Class II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 2
Max. Design Load, Push / Pull (UL)[3]	[lbs / ft²]	50 (2400 Pa) / 50 (2400 Pa)	Permitted Module Temperature on Continuous Duty	–40 °F up to +185 °F (–40 °C up to +85 °C)
Max. Test Load, Push / Pull (UL)[3]	[lbs / ft²]	75 (3600 Pa) / 75 (3600 Pa)		

[3] See Installation Manual

QUALIFICATIONS AND CERTIFICATES

UL 61730, CE-compliant,
IEC 61215:2016,
IEC 61730:2016,
U.S. Patent No. 9,893,215 (solar cells)

ZEP COMPATIBLE · CSA Certified UL 61730 · CE · TÜVRheinland CERTIFIED www.tuv.com ID 1111220277

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS America Inc.
400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | **TEL** +1 949 748 59 96 | **EMAIL** inquiry@us.q-cells.com | **WEB** www.q-cells.us

Single Phase Inverter with HD-Wave Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US

INVERTERS

12-25 YEAR WARRANTY

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
- Built-in module-level monitoring
- Outdoor and indoor installation
- Optional: Revenue grade data, ANSI C12.20 Class 0.5 (0.5% accuracy)

solaredge.com

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Single Phase Inverter with HD-Wave Technology for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
OUTPUT								
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	VA
AC Output Voltage Min.-Nom.-Max. (211 - 240 - 264)	✓	✓	✓	✓	✓	✓	✓	Vac
AC Output Voltage Min.-Nom.-Max. (183 - 208 - 229)	-	✓	-	✓	-	-	✓	Vac
AC Frequency (Nominal)	59.3 - 60 - 60.5[1]							Hz
Maximum Continuous Output Current @240V	12.5	16	21	25	32	42	47.5	A
Maximum Continuous Output Current @208V	-	16	-	24	-	-	48.5	A
GFDI Threshold	1							A
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes							
INPUT								
Maximum DC Power @240V	4650	5900	7750	9300	11800	15500	17650	W
Maximum DC Power @208V	-	5100	-	7750	-	-	15500	W
Transformer-less, Ungrounded	Yes							
Maximum Input Voltage	480							Vdc
Nominal DC Input Voltage	380				400			Vdc
Maximum Input Current @240V[2]	8.5	10.5	13.5	16.5	20	27	30.5	Adc
Maximum Input Current @208V[2]	-	9	-	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45							Adc
Reverse-Polarity Protection	Yes							
Ground-Fault Isolation Detection	600kΩ Sensitivity							
Maximum Inverter Efficiency	99	99.2						%
CEC Weighted Efficiency	99						99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption	< 2.5							W
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)							
Revenue Grade Data, ANSI C12.20	Optional[3]							
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 AFCI according to T.I.L. M-07							
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (HI)							
Emissions	FCC Part 15 Class B							
INSTALLATION SPECIFICATIONS								
AC Output Conduit Size / AWG Range	3/4" minimum / 14-6 AWG					3/4" minimum /14-4 AWG		
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							
Operating Temperature Range	-40 to +140 / -25 to +60[4] (-40°F / -40°C option)[5]							°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)							

[1] For other regional settings please contact SolarEdge support
[2] A higher current source may be used; the inverter will limit its input current to the values stated
[3] Revenue grade inverter P/N: SExxxxH-US000NNC2
[4] For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf
[5] -40 version P/N: SExxxxH-US000NNU4

RoHS

Power Optimizer
For Residential Installations

S440, S500

POWER OPTIMIZER

Enabling PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detects abnormal PV connector behavior, preventing potential safety issues*
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified cable management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules

* Functionality subject to inverter model and firmware version

solaredge.com

solaredge

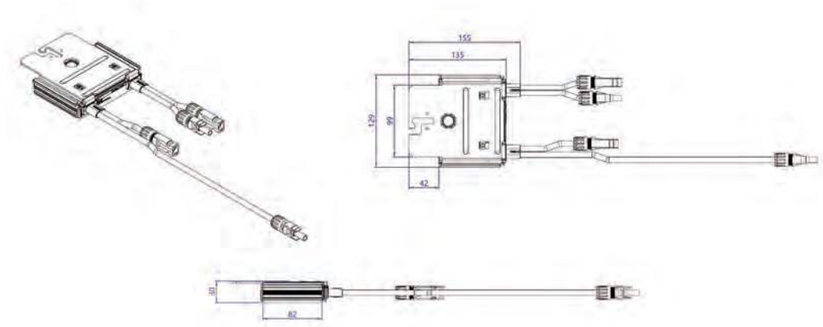
Power Optimizer
For Residential Installations
S440, S500

	S440	S500	UNIT
Rated Input DC Power(1)	440	500	W
Absolute Maximum Input Voltage (Voc)	60		Vdc
MPPT Operating Range	8 - 60		Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5	15	Adc
Maximum Efficiency	99.5		%
Weighted Efficiency	98.6		%
Overvoltage Category	II		
OUTPUT DURING OPERATION			
Maximum Output Current	15		Adc
Maximum Output Voltage	60		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)			
Safety Output Voltage per Power Optimizer	1		Vdc
STANDARD COMPLIANCE			
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011		
Safety	IEC62109-1 (class II safety), UL1741		
Material	UL94 V-0, UV Resistant		
RoHS	Yes		
Fire Safety	VDE-AR-E 2100-712:2013-05		
INSTALLATION SPECIFICATIONS			
Maximum Allowed System Voltage	1000		Vdc
Dimensions (W x L x H)	129 x 155 x 30		mm
Weight (including cables)	655 / 1.5		gr / lb
Input Connector	MC4(2)		
Input Wire Length	0.1		m
Output Connector	MC4		
Output Wire Length	(+) 2.3, (-) 0.10		m
Operating Temperature Range(3)	-40 to +85		°C
Protection Rating	IP68 / NEMA6P		
Relative Humidity	0 - 100		%

(1) Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed
(2) For other connector types please contact SolarEdge
(3) For ambient temperature above +70°C / +158°F power de-rating is applied. Refer to Power Optimizers Temperature De-Rating Technical Note for more details

PV System Design Using a SolarEdge Inverter		Single Phase HD-Wave	Three Phase	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440, S500	8	16	18	
Maximum String Length (Power Optimizers)		25	50		
Maximum Nominal Power per String(4)		5700	11250(5)	12750(6)	W
Parallel Strings of Different Lengths or Orientations		Yes			

(4) If the inverters rated AC power ≤ maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power Refer to: https://www.solaredge.com/sites/default/files/se-power-optimizer-single-string-design-application-note.pdf
(5) For the 230/400V grid: it is allowed to install up to 13,500W per string when the maximum power difference between each string is 2,000W
(6) For the 277/480V grid: it is allowed to install up to 15,000W per string when the maximum power difference between each string is 2,000W
(7) It is not allowed to mix S-series and P-series Power Optimizers in new installations



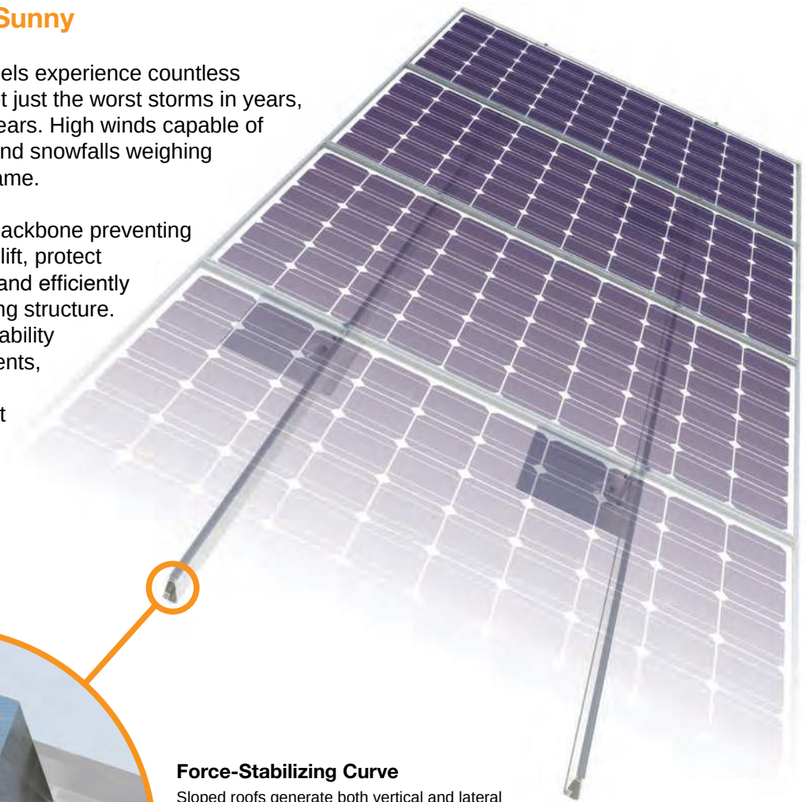
CE RoHS

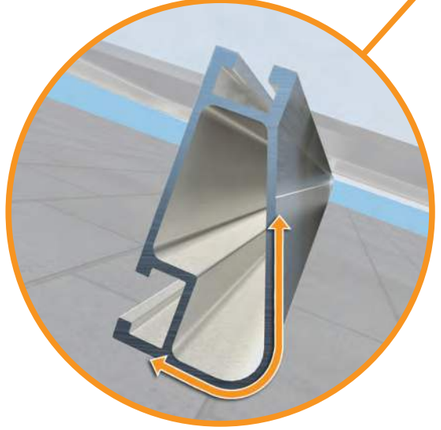
XR Rail Family

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.





Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs

XR Rails are compatible with FlashFoot and other pitched roof attachments.

IronRidge offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

Tech Brief

XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.

XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6’ spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available

XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10’ spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available

XR1000

XR1000 is a heavyweight among solar mounting rails. It’s built to handle extreme climates and spans up to 12 feet for commercial applications.

- 12’ spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4’	5’ 4”	6’	8’	10’	12’
None	90	XR10		XR100		XR1000	
	120						
	140						
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
120	160						

*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.

GODWIN ENGINEERING AND DESIGN, LLC

8378 Foxtail Loop, Pensacola, FL 32526 | (850)712-4219 | chad@godwineng.com

May 11, 2022

To: Columbia County Building Department
135 NE Hernando Ave
Lake City, FL 32055

Re: Barnard– Residential PV Roof Mount Installation
129 SW Great Oak Ct
Lake City, FL 32024

Plan Reviewer,

This letter is regarding the installation of a new roof mounted Solar PV System on the existing residential structure at the address above. I have reviewed the attachment plan and have determined that the roof mounted PV system is in compliance with the applicable sections of the following Codes as amended and adopted by the jurisdiction:

2020 Florida Building Code 7th Edition, FBC
ASCE 7 Min. Design Loads for Buildings & Other Structures

Per 2020 FBC, the Roof Mounted PV system will be subject to the following design criteria:
Design Wind Speed(V_{ult}) - 120mph 3sec gust, Exposure Category – C

The PV System consist of the modules, railing, and connection hardware. The system will add a dead load of approximately 3 psf to the roof.

The existing roof covering is Asphalt Shingle with min. ½" plywood decking and 2" x 4" roof trusses 24" O.C. The roofing, decking, and roof trusses are in good condition. The existing structure will be adequate for supporting the additional PV dead load and wind loads.

The securement method of the PV system is to be flush mounted to the asphalt shingle roof with the Ironridge railing and flashings/attachments. The attachments can be attached up to 72" apart in roof zones 1,2e & 2r and 48" apart in roof zones 2n, 3e & 3r. The mounts should be staggered, where possible, to allow distribution of the design loads evenly to the structure. The mounts shall be installed with a min. 5/16" x 4" stainless steel Lag bolts with minimum 2-5/16" thread length.

Please see attached documents and contact me should you have any questions.

Sincerely,

D. Chad Godwin, PE 81360
Exp. 02/28/2023

Donnie C Godwin 2022.05.11 16:38:17 '00'05-

D. CHAD GODWIN LICENSE No 81360 STATE OF FLORIDA PROFESSIONAL ENGINEER

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ASCE 7-16 CHAPTER 29 WIND LOADS - Rooftop Solar Panels Minimum Design Loads - Part 1: Enclosed(Gable,Hip,Flat h<60ft, 0°<θ<45°)

Wind Load Parameters - Inputs

Risk Category		II		Table 1.5-1
Basic Wind Speed (Ult)		120	mph	Figure 26.5-1B
Roof Angle		28° to 45°		
Roof Type		Gable		
Exposure Cat.	B,C, or D	C		Section 26.7
Mean Roof Height	h	15.00	ft	
Roof attachment		5/16" x 4" Lag Screw		
Rafter/Truss Spacing		24	in O.C.	
No. of Rails		4		
No. of Modules - Portrait		26		
No. of Modules - Landscape		0		
Module Model Number		Q.Peak DUO BLK-G6+ / TS		
bldg. least horizontal dim (typ.)		360	in	
Elevation		<1000	ft	
Est. # of attachment points		39		

Wind Load Paramaters

Wind Speed (asd)		93	mph	FRC R301.2.1.3
Effective Wind Area		19.31	ft^2	26.20
Wind Directionality	K_d	0.85		Table 26.6-1
Topographic factor	K_{zt}	1.00		26.8 or 26.8.2
Ground Elevation Factor	K_e	1.00		Table 26.9-1
Velocity Exposure Coefficient	K_z	0.85		Table 26.10-1
Array Edge Factor	γ_E	1.50		29.4.4 *Modules are considered Exposed
Solar Panel Equalization Factor	γ_a	0.69		Fig. 29.4-8
Velocity Pressure	q_h	15.98	psf	$q_h=0.00256\ K_z K_{zt} K_d K_e V^2$
Added Safety Factor		1.2		
Allowable Pullout per mount		709.6	lbs	
0.4h or 0.6h		6.00	ft	Flat - 0.6h, Gable, Hip - 0.4h
10% of least horizontal dim		3.00	ft	10% of least hor. Dim. Or 0.4h, whichever is smaller, but not less than either 4% of Least hor. Or 3ft. (flat roof - 0.6h)
Roof Zone Set Back	a	3.00	ft	
	h_2	5	in	Not > 10in(panel height above roof)
	$2h_2$	10	in	*min distance array shall be from the roof edge, Gable Ridge, or hip ridge
		0.25	in	min gap between all panels but not > 6.7ft
	d1	1.00	ft	Horizontal distance orthogonal to panel edge
	d2	0.25	ft	Horizontal distance from edge of one panel to the nearest edge in the next row
	0.5h	7.50	ft	*modules are considered exposed that are within 1.5Lp from roof edge

PV Dead Load

# of Modules		26	
Module	W_{mod}	47	lbs
Array	W_{mods}	1232	lbs
Micro/optimizer	W_{mic}	104	lbs
PV Rail	$W_{PV\ rail}$	19	lbs
Total Weight	W_{total}	1355	lbs
Total Area	A_T	502.14	ft^2
Dead Load	D_{PV}	2.70	psf
Weight/attachment		34.8	lbs

Module and Racking Specs

Dimensions, LxWxH (in)	68.5 x 40.6 x 1.57	
Width	3.38	ft
Length	5.71	ft
Module Area	19.31	ft^2

Module load ratings

	Ultimate	Allowable
Load Rating - Snow(psf)	113.4	75.6
Load Rating - Wind(psf)	-113.4	-75.6

PV Attachment - Results

Roof Zones - Gable 28° to 45°

	1	2e	2r	2n	3e	3r		
GC_p - Uplift	-1.5	-1.5	-1.5	-1.5	-1.8	-2.2		
GC_p - Down	0.9	0.9	0.9	0.9	0.9	0.9		
$p = q_h(GC_p)(\gamma_E)(\gamma_a)$	-22.0	-22.0	-22.0	-22.0	-26.9	-33.5	psf	29.4-7
$p = q_h(GC_p)(\gamma_E)(\gamma_a)$	14.8	14.8	14.8	14.8	14.8	14.8	psf	29.4-7
Max Allowable Span	6	6	6	6	6	6	ft	*notes
Max Cantilever (in)	24	24	24	24	24	24	Max span * 33% (in)	

Notes

Eq.1 Point Load = Roof Zone psf * TA

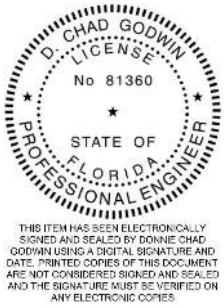
Eq.2 TA = (Module Length /2) * Max Span

Eq.3 *Max span Equation, SF = Allowable pullout / Point Load

Eq.4 Max Span = Allowable Pullout / (SF * Roof Zone psf * L/2)

a) The Max span between attachment points must not exceed the rail spans provided by racking manufacture.

b) Allowable Module load ratings are determined by SF = 1.5



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