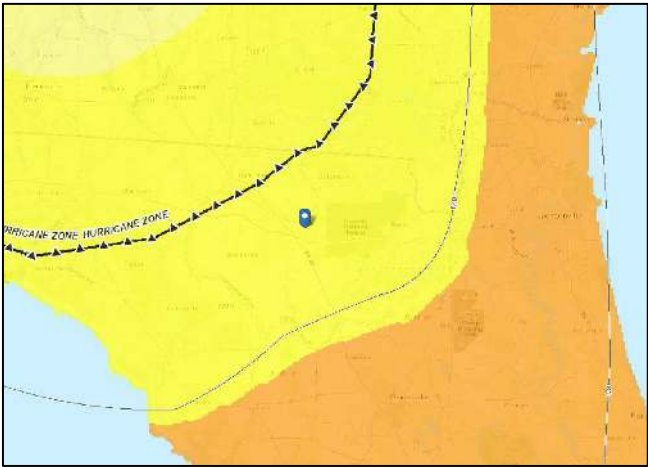




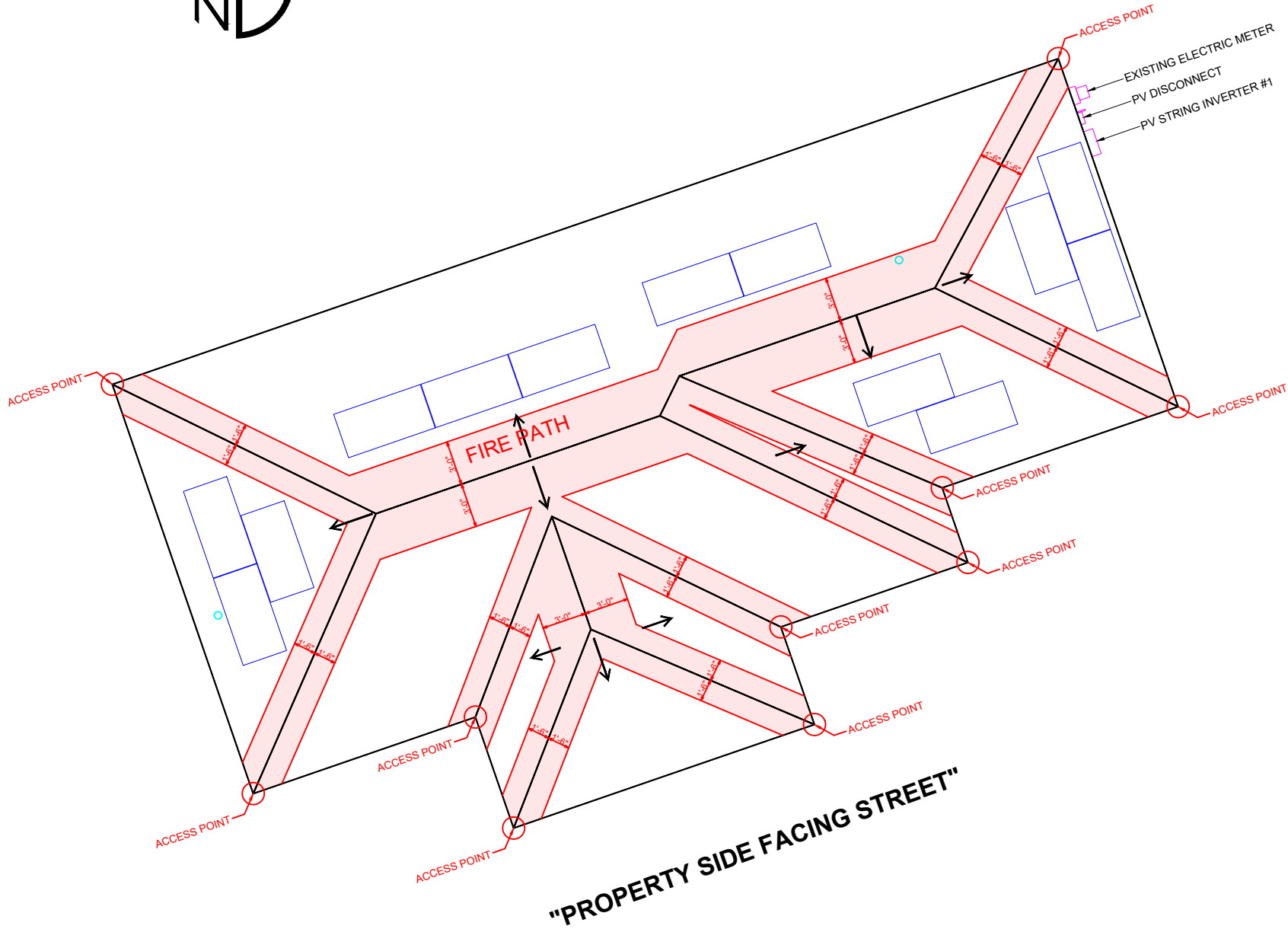
2 LOCATION MAP / WIND ZONES
N.T.S.



3 IRRADIANCE MAP
N.T.S.



4 3D RENDERING
N.T.S.



1 ROOF PLAN VIEW / BOS LOCATION
N.T.S.

PROJECT DESCRIPTION

SYSTEM CAPACITY: 5.1 KW DC / 3.8 KW AC

PV PANELS: (13) Q.PEAK DUO BLK ML-G10+ 395W BY Q CELL

OPTIMIZERS: (13) P505 BY SOLAREEDGE

INVERTER: (1) SE3800H-US BY SOLAREEDGE

RACKING SYSTEM: CROSS RAIL SYSTEM 44-X BY K2 SYSTEMS

PROJECT INFORMATION

PROJECT LATITUDE	30.296604	MIN AMBIENT TEMP	-7 ° C
PROJECT LONGITUDE	-82.708187	MAX AMBIENT TEMP	37 ° C
AHJ	COLUMBIA CITY	WIND EXPOSURE	C
		DESIGN WIND SPEED	117 MPH

DRAWINGS INDEX

C-1	COVER SHEET
C-2	SAFETY PLANS
E-1	ONE LINE RISER DIAGRAM
E-2	SAFETY LABELS
S-1	STRUCTURAL PLAN
S-2	RACKING PLAN
D-1	PV MODULES DATA SHEET
D-2	SMART MONITORING DATA SHEET
D-3	INVERTER DATA SHEET

GENERAL NOTES

PER FL. STATUTE 377.705 (REVISED 7/1/2017), I RAFAEL A. GONZALEZ SOTO, P.E. 83104 AN ENGINEER LICENSED PURSUANT TO CHAPTER 471, CERTIFY THAT THE PV ELECTRICAL SYSTEM AND ELECTRICAL COMPONENTS ARE DESIGNED AND APPROVED USING THE STANDARDS CONTAINED IN THE MOST RECENT VERSION OF THE FLORIDA BUILDING CODE.

APPLICABLE CODES: 2020 FLORIDA BUILDING CODE 7TH EDITION, ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES, FFPC 7TH EDITION, NFPA 2018, NFPA 70 AND NEC 2017.

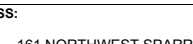
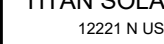
CONTRACTOR SHALL ENSURE ALL ROOF PENETRATIONS TO BE INSTALLED AND SEALED PER 2020 FLORIDA BUILDING CODE 7TH EDITION OR LOCAL GOVERNING CODE.

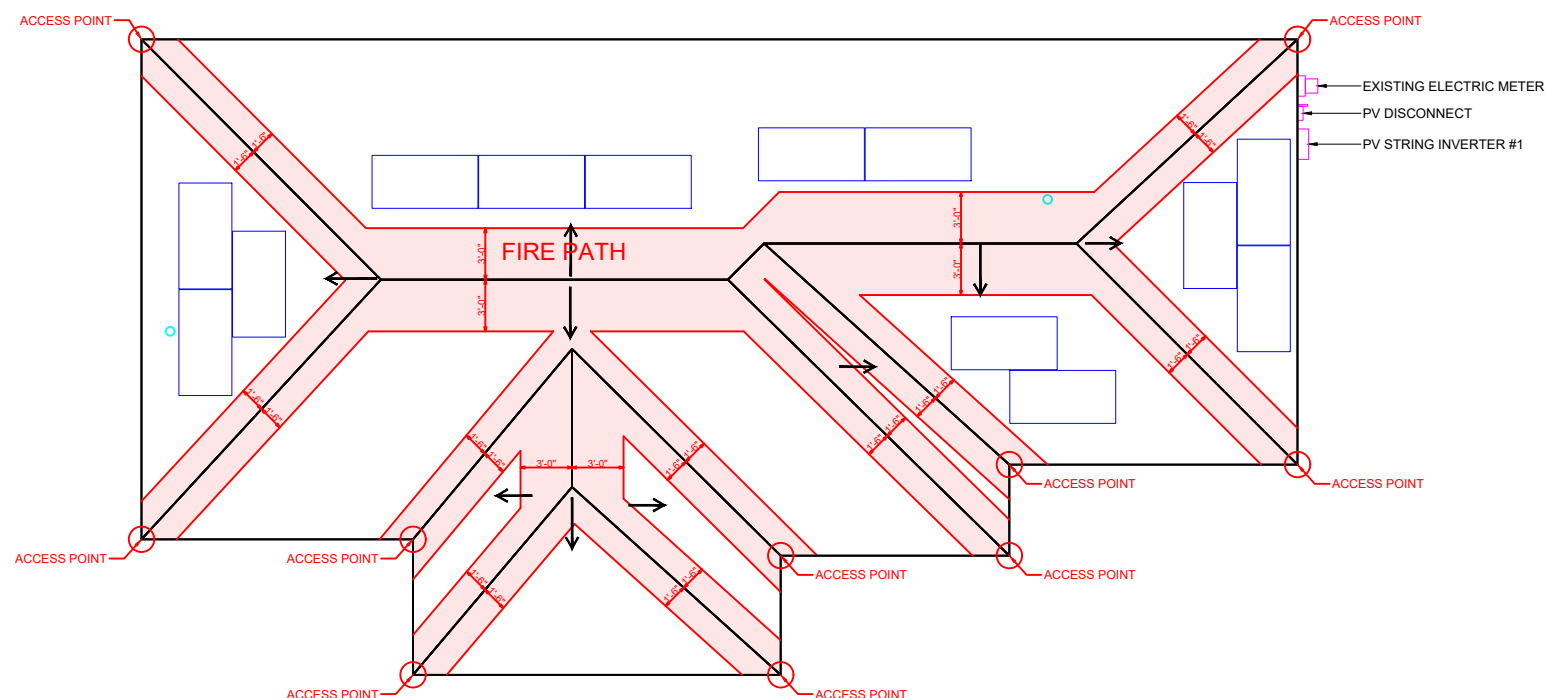
ALL WIRING METHODS AND INSTALLATION PRACTICES SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE (NEC) 2017, LOCAL STATE CODES, AND OTHER APPLICABLE LOCAL CODES. MEANS SHALL BE PROVIDED TO DISCONNECT ALL CURRENT CARRYING CONDUCTORS OF THE PHOTOVOLTAIC POWER SOURCE FROM ALL OTHER CONDUCTORS IN THE BUILDING. CONNECTORS TO BE TORQUED PER DEVICE LISTING, OR MANUFACTURERS RECOMMENDATIONS. NON-CURRENT CARRYING METAL PARTS SHALL BE CHECKED FOR PROPER GROUNDING.

REQUIRED SAFETY SIGNS AND LABELS SHALL BE PERMANENTLY ATTACHED BY ADHESIVE, OR OTHER MECHANICAL MEANS, LABELS SHALL COMPLY WITH ARTICLE 690 VI OF THE NEC 2017 OR OTHER APPLICABLE STATE AND LOCAL CODES. SEE LABELS AND MARKING PAGE FOR MORE INFORMATION.

RACKING ROOF MOUNT SYSTEM SHALL BE INSTALLED FOLLOWING MANUFACTURERS INSTRUCTION SPEC'S, INCLUDING ALL GROUNDING WEEB CLIPS, GROUND LUGS, AND RAIL SPLICE KITS FOR ELECTRICAL CONTINUITY.

MECAWIND TOOL IS BASED ON THE C&C WIND LOADS FOR ENCLOSED BUILDINGS. DESIGN WIND PRESSURES ARE CALCULATED USING ASCE 7-16 EQUATION 30.6-1. ALL NOTES IN FIGURES ASCE 7-16 30.4-1 AND 30.4-2(A,B AND /67C) HAVE BEEN INCORPORATED. MEAN ROOF HEIGHT MUST BE LESS THAN 60 FEET.

DOCUMENT CONTROL				DATE	CAD	QC	ENGINEER CONTACT INFORMATION			ENGINEERING STAMP		CONTRACTOR CONTACT INFORMATION		CONTRACTOR LOGO 		CUSTOMER: SANDY FIROOZ		SHEET NAME: COVER SHEET			
ISSUED FOR PERMIT				12-27-2021	BW	JG	ENIGPARTNERS LLC C.A. 32661 255 GIRALDA AVE CORAL GABLES, FL 33134 DESIGN@ENIGPARTNERS.COM 833 - 888 - 3644			 Digitally signed by Rafael A Gonzalez Soto Date: 2022.01.17 05:14:37 -05'00'		TITAN SOLAR POWER FL 12221 N US HIGHWAY 301 THONOTASASSA, FL 33592 (813) 982 -9001 #EC13008093				PROJECT ADDRESS: 161 NORTHWEST SPARR LANE LAKE CITY FL 32055					
REV	DESCRIPTION			DATE	CAD	QC						PROJECT ID: TSP110728				ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE		SHEET TITLE: C-1			
												DATE: 12-27-2021				SHEETS: 1 OF 9					
												PARCEL NUMBER: 22-2S-16-01716-002									

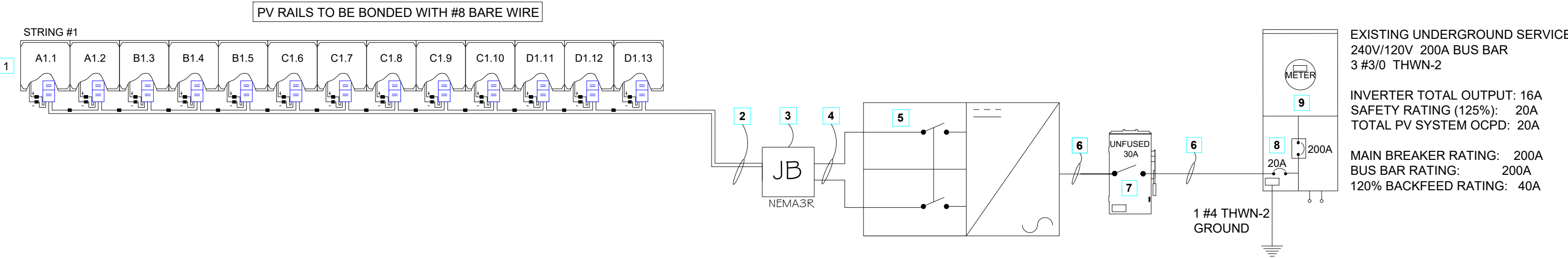


1 SAFETY PLAN

LOCATION OF NEAREST URGENT CARE FACILITY	
NAME:	
ADDRESS:	
PHONE NUMBER:	
NOTES:	
1.	INSTALLERS SHALL DRAW IN DESIGNATED SAFETY AREA AROUND HOME
2.	INSTALLERS SHALL UPDATE NAME ADDRESS AND PHONE NUMBER OF NEAREST URGENT CAR FACILITY RELATIVE TO THE SITE BEFORE STARTING WORK

DOCUMENT CONTROL				DATE	CAD	QC	ENGINEER CONTACT INFORMATION				ENGINEERING STAMP		CONTRACTOR CONTACT INFORMATION		CONTRACTOR LOGO		CUSTOMER:		SHEET NAME:			
ISSUED FOR PERMIT				12-27-2021	BW	JG	ENGIPARTNERS LLC				 Digitally signed by Rafael A Gonzalez Soto Date: 2022.01.17 05:14:50 -05'00'		TITAN SOLAR POWER FL		 TITAN SOLAR POWER		SANDY FIROOZ		SAFETY PLAN			
REV	DESCRIPTION			DATE	CAD	QC	C.A. 32661 255 GIRALDA AVE CORAL GABLES, FL 33134 DESIGN@ENGIPARTNERS.COM 833 - 888 - 3644 <td colspan="2">12221 N US HIGHWAY 301 THONOTASASSA, FL 33592 (813) 982 -9001 #EC13008093</td> <td colspan="2">PROJECT ADDRESS:</td>						12221 N US HIGHWAY 301 THONOTASASSA, FL 33592 (813) 982 -9001 #EC13008093				PROJECT ADDRESS:					
																	161 NORTHWEST SPARR LANE LAKE CITY FL 32055					
																	PARCEL NUMBER:					
																	22-2S-16-01716-002					
															PROJECT ID:		ENGINEER OF RECORD:		SHEET TITLE:			
															TSP110728		ENG. RAFAEL A. GONZALEZ SOTO, PE		C-2			
																	DATE:		SHEETS:			
																	12-27-2021		2 OF 9			

	WIRE SIZES, QUANTITY & TYPE			RACEWAY SIZE, TYPE, LOCATION & INFO.			WIRE AMPACITY CALCULATIONS							ADDITIONAL INFORMATION			
WIRE TAG	CONDUCTOR QTY. SIZE & TYPE	NEUTRAL QTY. SIZE & TYPE	GROUND QTY. SIZE & TYPE	RACEWAY SIZE & TYPE	RACEWAY LOCATION	RACEWAY HEIGHT ABOVE ROOF	OUTPUT CURRENT	125% OF OUTPUT CURRRENT	MIN OCPD	WIRE DE-RATED CALCULATION				DIST.	VOLTAGE	VOLTAGE DROP %	CONDUIT FILL %
										WIRE RATING	AMBIENT TEMP	# OF COND.	FINAL AMPACITY				
DC (BEFORE JB)	(4) #10 AWG PV WIRE	N/A	(1) #8 AWG BARE COPPER	NOT APPLICABLE	UNDER ARRAY	1/2" TO 3-1/2"	15A	18.8A	20A	40A X 0.76 X 1 = 30.4 A				10 FT.	350V	0.11%	6.4%
DC (AFTER JB)	(4) #10 AWG THWN-2	N/A	(1) #8 AWG THWN-2	3/4" EMT CONDUIT	ABOVE ROOF	1/2" TO 3-1/2"	15A	18.8A	20A	40A X 0.76 X 0.8 = 24.3 A				20 FT.	350V	0.21%	8.1%
AC (INVERTER TO METER)	(2) #10 AWG THWN-2	(1)#10AWG THWN-2	(1) #8 AWG THWN-2	3/4" EMT CONDUIT	EXTERIOR WALL	"N/A"	16A	20.0A	20A	40A X 0.76 X 1 = 30.4 A				5 FT.	240V	0.1%	7.7%

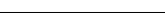


1 ONE LINE RISER DIAGRAM

N.T.S.

LEGEND:

1	(13) Q.PEAK DUO BLK ML-G10+395W BY Q CELL REFER TO D-1 SHEET	2	2 #10 PV WIRE PER STRING 1 #8 BARE WIRE GROUND 3/4" EMT CONDUIT	3	NEMA3R JUNCTION BOX
4	2 #10 THWN-2 PER STRING 1 #8 THWN-2 GROUND 3/4" EMT CONDUIT	5	SE3800H-US BY SOLAREEDGE REFER TO D-3 SHEET	6	2 #10 L1,L2 THWN-2 1 #10 THWN-2 NEUTRAL 1 #8 THWN-2 GROUND 3/4" EMT CONDUIT
7	PV SYSTEM DISCONNECT - 30A RATED	8	PV INTERCONNECTION POINT - PV BREAKER	9	UTILITY ELECTRICAL SERVICE

DOCUMENT CONTROL				DATE	CAD	QC	ENGINEER CONTACT INFORMATION		ENGINEERING STAMP	CONTRACTOR CONTACT INFORMATION		CONTRACTOR LOGO 	CUSTOMER: SANDY FIROOZ		SHEET NAME: ONE LINE RISER DIAGRAM		
ISSUED FOR PERMIT				12-27-2021	BW	JG	ENGIPARTNERS LLC C.A. 32661 255 GIRALDA AVE CORAL GABLES, FL 33134 DESIGN@ENGIPARTNERS.COM 833 - 888 - 3644		 Digitally signed by Rafael A Gonzalez Soto Date: 2022.01.17 05:14:59 -05'00'	TITAN SOLAR POWER FL 12221 N US HIGHWAY 301 THONOTASASSA, FL 33592 (813) 982 -9001 #EC13008093			PROJECT ADDRESS: 161 NORTHWEST SPARR LANE LAKE CITY FL 32055				
REV	DESCRIPTION			DATE	CAD	QC				PROJECT ID: TSP110728			ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE				
										DATE: 12-27-2021			SHEETS: 3 OF 9				
										PARCEL NUMBER: 22-2S-16-01716-002							

**WARNING**

ELECTRICAL SHOCK HAZARD

TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

LABEL LOCATION:
AC DISCONNECT,
POINT OF INTERCONNECTION
PER CODE: NEC 690.13 (B)

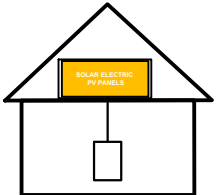
**WARNING**

TURN OFF PHOTOVOLTAIC
AC DISCONNECT PRIOR TO
WORKING INSIDE PANEL

LABEL LOCATION:
AC DISCONNECT, MAIN PANEL
PER CODE: NEC 110.27 (C)
OSHA 1910.145(f)(7)

**SOLAR PV 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.



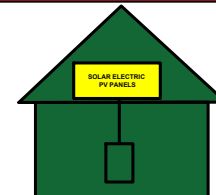
LABEL LOCATION:
AC DISCONNECT, MAIN PANEL
PER CODE: NEC 690.56(C)(3)

**PHOTOVOLTAIC
SYSTEM EQUIPPED
WITH RAPID SYSTEM
SHUTDOWN**

LABEL LOCATION:
AC DISCONNECT
POINT OF INTERCONNECTION
PER CODE: NEC 690.56(C)

**EMERGENCY RESPONDER
THIS SOLAR PV SYSTEM IS
EQUIPPED WITH RAPID SHUTDOWN**

TURN RAPID SHUTDOWN
SWITCH TO THE "OFF"
POSITION TO SHUT DOWN
THE ENTIRE PV SYSTEM.



LABEL LOCATION:
AC DISCONNECT, MAIN PANEL
PER CODE: FFPC 7TH EDITION: 11.12.2.1.1.1.1

INVERTER #1

NOMINAL OPERATING AC VOLTAGE

240 V

NOMINAL OPERATING AC FREQUENCY

60 HZ

MAXIMUM AC POWER

3.8 KW

MAXIMUM AC CURRENT

16 A

MAX OVERCURRENT DEVICE RATING
FOR AC MODULE PROTECTION

N/A

LABEL LOCATION:
INVERTER
PER CODE: NEC 690.52

MAXIMUM VOLTAGE

480 VDC

MAXIMUM CIRCUIT CURRENT

10.5 A

MAX RATED OUTPUT CURRENT OF
THE CHARGE CONTROLLER OR DC-TO-DC
CONVERTER
(IF INSTALLED)

15 A

LABEL LOCATION:
INVERTER
PER CODE: NEC 690.53

PHOTOVOLTAIC AC DISCONNECT

RATED AC OUTPUT CURRENT:

16 A

NOMINAL OPERATING AC VOLTAGE:

240V

LABEL LOCATION:
AC DISCONNECT
PER CODE: NEC 690.54

**MAIN PHOTOVOLTAIC
SYSTEM DISCONNECT**

LABEL LOCATION:
AC DISCONNECT
PER CODE: NEC 690.13 (B)

**WARNING: PHOTOVOLTAIC
POWER SOURCE**

LABEL LOCATION:
MAIN SERVICES DISCONNECT, DC CONDUIT
PER CODE: NEC 690.31 (G) (3)

**WARNING**

DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
POINT OF
INTERCONNECTION
PER CODE: NEC 705.12 (B)(3)

**WARNING**

POWER SOURCE OUTPUT CONNECTION. DO NOT
RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION:
POINT OF
INTERCONNECTION
PER CODE: NEC
705.12(B)(2)(3)(b)

**CAUTION**

PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

LABEL LOCATION:
MAIN SERVICE PANEL
PER CODE: NEC 690.45(B)(5)

**DO NOT DISCONNECT
UNDER LOAD**

LABEL LOCATION:
POINT OF
INTERCONNECTION
PER CODE:
NEC 690.33(E)(2) & NEC
690.15 (C)

**CAUTION: SOLAR ELECTRIC
SYSTEM CONNECTED**

LABEL LOCATION: POINT OF INTERCONNECTION
PER CODE: NEC 690.15, NEC 690.13(B)

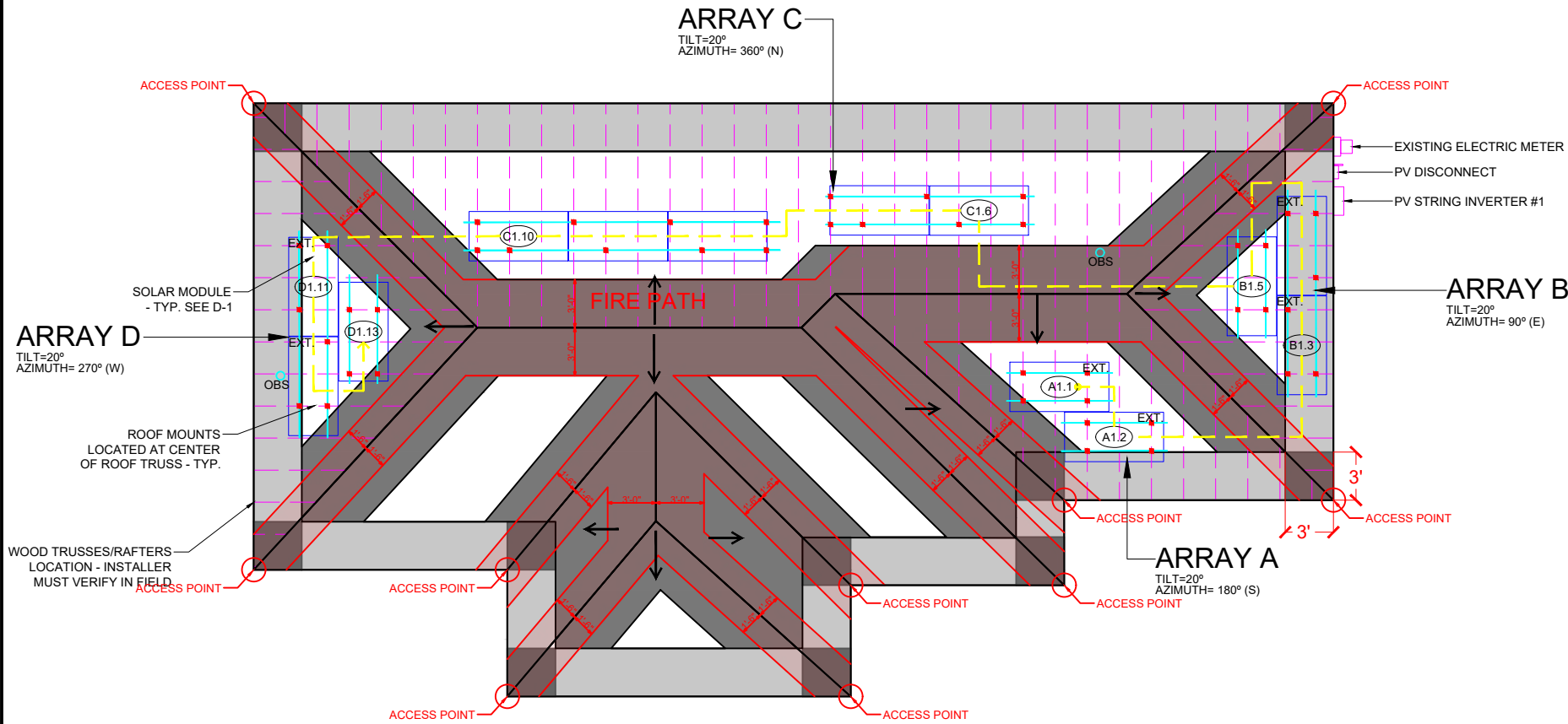
LABEL LOCATION: ADJACENT TO MAIN DISCONNECT

**TITAN**
SOLAR POWER
FLORIDA
901 ARMSTRONG BLVD, KISSIMMEE, FL 34741
1-855-SAY-SOLAR

1

PV SAFETY LABELS DATA
N.T.S.

DOCUMENT CONTROL				DATE		CAD	QC	ENGINEER CONTACT INFORMATION				ENGINEERING STAMP		CONTRACTOR CONTACT INFORMATION		CONTRACTOR LOGO		CUSTOMER:		SHEET NAME:			
ISSUED FOR PERMIT				12-27-2021		BW	JG	ENGINEPARTNERS LLC				Digitally signed by Rafael A Gonzalez Soto		TITAN SOLAR POWER FL				SANDY FIROOZ		SAFETY LABELS			
REV				DATE		CAD	QC	C.A. 32661 255 GIRALDA AVE CORAL GABLES, FL 33134				12221 N US HIGHWAY 301		THONOTASASSA, FL 33592		161 NORTHWEST SPARR LANE LAKE CITY FL 32055		PROJECT ADDRESS:		PROJECT ID:			
								DESIGN@ENGINEPARTNERS.COM				Date: 2022.01.17 05:15:06 -05'00'		(813) 982 -9001		PARCEL NUMBER:		22-2S-16-01716-002		TSP110728			
								833 - 888 - 3644				#EC13008093								ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE			
																				SHEET TITLE: E-2			
																				DATE: 12-27-2021			
																				SHEETS: 4 OF 9			



LEGEND & SYMBOLS

OBS	ROOF OBSTRUCTIONS
XX.X	ARRAY # MODULE # STRING #
[Box]	PV MODULES
[Dashed line]	TRUSSES OR RAFTERS
[Red dots]	ROOF MOUNTS & RAIL
[Arrow]	ROOF SLOPE
EXT.	EXTERIOR PV MODULE

ROOF'S GENERAL NOTES:

- 1- CONTRACTOR/INSTALLER TO VERIFY ROOF CONDITIONS FOR PROPER INSTALLATION OF THE PV SYSTEM.
- 2- CONTRACTOR/INSTALLER TO NOTIFY THE OWNER IMMEDIATELY OF ANY ROOF DEFICIENCIES AND/OR REPAIR REQUIRED TO INSTALL THE PV SYSTEM.
- 3- EOR DOES NOT ASSUME ANY RESPONSIBILITY FOR THE INSTALLATION OF ANY PV SYSTEM ON DEFICIENT ROOFS.
- 4-CONTRACTOR/INSTALLER ASSUMES ALL RESPONSIBILITY TO INSTALL AS PER MANUFACTURER STANDARDS.

ROOF INSPECTION NOTE:

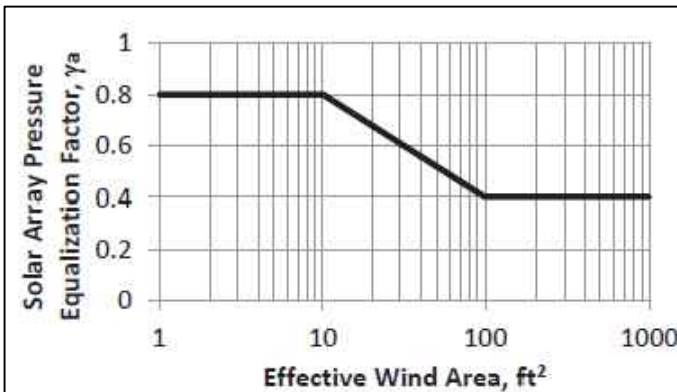
PV MODULE IN LAYOUT IS CONSIDERED NON-EXPOSED AFTER COMPLYING WITH THE FOLLOWING STATEMENTS BASED ON ASCE7-16:

- NO INDIVIDUAL PV MODULE IS MORE THAN 0.5(MEAN ROOF HEIGHT) AWAY FROM ROOF EDGE OR ANOTHER MODULE.
- NO INDIVIDUAL PV MODULE IS MORE THAN 4 FT AWAY FROM ROOF EDGE OR ANOTHER MODULE.
- INDIVIDUAL PV MODULE IS MORE THAN 1.5(MODULE LENGTH) AWAY FROM CLOSEST EXPOSED EDGE

ASCE 7.16 - 29.4-7

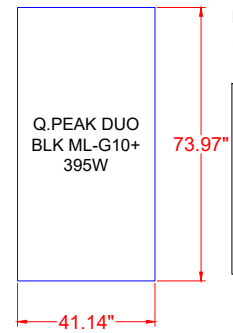
DESIGNED WIND PRESSURES:

$$p = q_h (GC_p)(\gamma_E)(\gamma_a)$$



SOLAR MODULE

UL 1703 CERTIFIED
MAX. DESIGN LOAD: 83.54 psf
APPLIED WIND LOAD : 34.12 psf



NOTES:

- INSTALL MID CLAMPS BETWEEN MODULES AND ENDS CLAMPS AT THE END OF EACH ROW OF MODULES.
- ALUMINUM RAILS SHOULD ALWAYS BE SUPPORTED BY MORE THAN ONE FOOTING ON BOTH SIDES OF THE SPLICE.

WEIGHTED AVERAGE

WORST CASE MODULE:

ZONE 1: 21%

ZONE 2e: 64%

ZONE 2r: 15%

$$25.49(0.21) + 36.41(0.64) + 36.41(0.15) = 34.12\text{psf}$$

ULTIMATE WIND SPEED	120	mph
DESIGN WIND SPEED	117	mph
RISK CATEGORY	II	
EXPOSURE CATEGORY	C	
ROOF SLOPE (°)	26	
ROOF TYPE	HIPPED	
MATERIAL ROOF TYPE	ASPHALT SHINGLES	
PRESSURE ZONE:	1&2	
MEAN ROOF HEIGHT:	13.73	
PERIMETER WIDTH:	3.0	
K _D	0.85	
K _{ZT}	1.00	
K _H	0.850	
VELOCITY PRESSURE (q) = 0.60*0.00256* K _H K _{ZT} K _D V ²		
VELOCITY PRESSURE (ASD)	15.17	
INTERIOR EDGE FACTOR: $\gamma_E = 1.0$	EXTERIOR EDGE FACTOR: $\gamma_E = 1.5$	ARRAY EQUALIZATION FACTOR: $\gamma_a = 0.8$
EXTERNAL PRESSURE COEFFICIENT Z1	0.7	-1.4
EXTERNAL PRESSURE COEFFICIENT Z2e	0.7	-2.0
EXTERNAL PRESSURE COEFFICIENT Z2r	0.7	-2.0
EXTERNAL PRESSURE COEFFICIENT Z3	0.7	-2.0
INTERNAL PRESSURE COEFFICIENT	0.18	
ZONES	PRESSURES (PSF)	INTERIOR PRESSURES (PSF)
1	-23.97	-16.99
2e	-33.07	-24.27
2r	-33.07	-24.27
3	-33.07	-24.27
EXTERNAL PRESSURES (PSF)	MAX SPAN (FT)	MAX CANTI-LEVER (IN)
-25.49	6'	24"
-36.41	6'	24"
-36.41	4'	16"
-36.41	4'	16"
TOTAL ROOF AREA	1961.57	sq.-ft
TOTAL MODULES:	13	
TOTAL PHOTOVOLTAIC AREA:	274.69	sq.-ft
WIND LOAD (PSF):	34.12	
TOTAL WIND LOAD (LBS):	9,372.42	
TOTAL ROOF MOUNTS:	44	
TENSION FORCE PER MOUNT (LBS):	213.01	

1 STRUCTURAL ROOF PLAN & PV MODULES LAYOUT

N.T.S.

DOCUMENT CONTROL				DATE		CAD	QC	ENGINEER CONTACT INFORMATION				ENGINEERING STAMP		CONTRACTOR CONTACT INFORMATION		CONTRACTOR LOGO		CUSTOMER:		SHEET NAME:			
ISSUED FOR PERMIT				12-27-2021		BW	JG	ENGIPARTNERS LLC				Digitally signed by Rafael A Gonzalez Soto		TITAN SOLAR POWER FL		TITAN SOLAR POWER		SANDY FIROOZ		STRUCTURAL PLAN			
REV				DATE		CAD	QC	C.A. 32661 255 GIRALDA AVE CORAL GABLES, FL 33134 DESIGN@ENGIPARTNERS.COM 833 - 888 - 3644				Date: 2022.01.17 05:15:15 -05'00		12221 N US HIGHWAY 301 THONOTASASSA, FL 33592 (813) 982 -9001 #EC13008093				PROJECT ADDRESS: 161 NORTHWEST SPARR LANE LAKE CITY FL 32055		PROJECT ID: TSP110728			
																		PARCEL NUMBER: 22-2S-16-01716-002		ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE DATE: 12-27-2021			
																				SHEET TITLE: S-1 SHEETS: 5 OF 9			

Q.PEAK DUO BLK ML-G10+ 385-410

ENDURING HIGH
PERFORMANCE



BREAKING THE 20% EFFICIENCY BARRIER

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 21.1%.



THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY

Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry. The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.



INNOVATIVE ALL-WEATHER TECHNOLOGY

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



ENDURING HIGH PERFORMANCE

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



EXTREME WEATHER RATING

High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).



A RELIABLE INVESTMENT

Inclusive 25-year product warranty and 25-year linear performance warranty.

¹ See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:



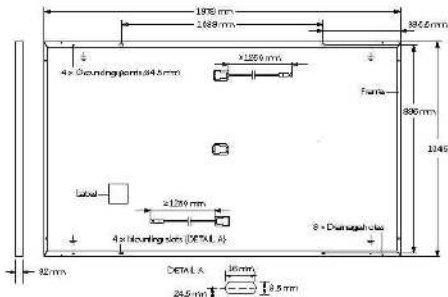
Roof-top arrays on
residential buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	1879mm x 1045mm x 32mm (including frame)
Weight	22.0 kg
Front Cover	3.2mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 x 22 monocrystalline Q.ANTUM solar half cells
Junction box	53-101 mm x 32-60 mm x 15-18 mm Protection class IP67, with bypass diodes
Cable	4mm² Solar cable; (+) ≥1250mm, (-) ≥1250mm
Connector	Stäubli MC4, IP68



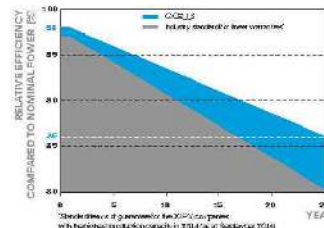
ELECTRICAL CHARACTERISTICS

POWER CLASS		385	390	395	400	405	410
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE: +5W / -0W)							
Power at MPP ¹	P _{MPP} [W]	385	390	395	400	405	410
Short Circuit Current ¹	I _{SC} [A]	11.04	11.07	11.10	11.14	11.17	11.20
Open Circuit Voltage ¹	V _{OC} [V]	45.19	45.23	45.27	45.30	45.34	45.37
Current at MPP	I _{MPP} [A]	10.59	10.65	10.71	10.77	10.83	10.89
Voltage at MPP	V _{MPP} [V]	36.36	36.62	36.88	37.13	37.39	37.64
Efficiency ¹	η [%]	≥19.6	≥19.9	≥20.1	≥20.4	≥20.6	20.9
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT ²							
Power at MPP	P _{MPP} [W]	288.8	292.6	296.3	300.1	303.8	307.6
Short Circuit Current	I _{SC} [A]	8.90	8.92	8.95	8.97	9.00	9.03
Open Circuit Voltage	V _{OC} [V]	42.62	42.65	42.69	42.72	42.76	42.79
Current at MPP	I _{MPP} [A]	8.36	8.41	8.46	8.51	8.57	8.62
Voltage at MPP	V _{MPP} [V]	34.59	34.81	35.03	35.25	35.46	35.68

¹Measurement 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, ±200 W/m², NMOT spectrum AM 1.5.

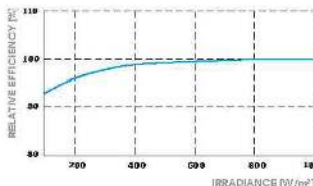
Q CELLS PERFORMANCE WARRANTY

PERFORMANCE AND DEGRADATION



At least 88% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 88.5% of nominal power up to 10 years. At least 86% 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 organisation of your respective country.



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]	-0.34	Nominal Module Operating Temperature	NMOT [°C]	43±3

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V _{sys} [V]	1000	PV module classification	Class II
Maximum Reverse Current	I _R [A]	20	Fire Rating based on ANSI/UL 61730	C / TYPE 2
Max. Design Load, Push/Pull	[Pa]	3600/2660	Permitted Module Temperature on Continuous Duty	-40°C - +85°C
Max. Test Load, Push/Pull	[Pa]	5400/4000		

QUALIFICATIONS AND CERTIFICATES

Quality Controlled PV - TÜV Rheinland, IEC 61215-2 018, IEC 61730 2016. This data sheet complies with DIN EN 50380. QCPV Certification ongoing. Certification holder: Hanwha Q CELLS GmbH



	Horizontal packaging	1840mm	1100mm	1220mm	751kg	28 pallets	24 pallets	32 modules
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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.

Made in Korea

Hanwha Q CELLS Australia Pty Ltd

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Engineered in Germany

Q CELLS

DOCUMENT CONTROL		DATE	CAD	QC
ISSUED FOR PERMIT		12-27-2021	BW	JG
REV	DESCRIPTION	DATE	CAD	QC

ENGINEER CONTACT INFORMATION		ENGINEERING STAMP
ENGIPARTNERS LLC		 Digitally signed by Rafael A Gonzalez Soto Date: 2022.01.17 05:15:32 -05'00'
C.A. 32661		
255 GIRALDA AVE		
CORAL GABLES, FL 33134		
DESIGN@ENGIPARTNERS.COM		
833 - 888 - 3644		

CONTRACTOR CONTACT INFORMATION	
TITAN SOLAR POWER FL	
12221 N US HIGHWAY 301	
THONOTASSA, FL 33592	
(813) 982 -9001	
#EC13008093	

CONTRACTOR LOGO	

CUSTOMER:	
SANDY FIROOZ	
PROJECT ADDRESS:	
161 NORTHWEST SPARR LANE LAKE CITY FL 32055	
PARCEL NUMBER:	
22-2S-16-01716-002	

SHEET NAME:		
PV MODULES DATA SHEET		
PROJECT ID:	ENGINEER OF RECORD:	SHEET TITLE:
TSP110728	ENG. RAFAEL A. GONZALEZ SOTO, PE	D-1
DATE:	SHEETS:	
12-27-2021	7 OF 9	

Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / 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
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety

solaredge.com



Power Optimizer

For North America

P320 / P340 / P370 / P400 / P401 / P405 / P485 / P505

Optimizer model (typical module compatibility)	P320 (for 60-cell modules)	P340 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P401 (for high power 60 and 72 cell modules)	P405 (for high-voltage modules)	P485 (for high voltage modules)	P505 (for higher current modules)
INPUT								
Rated Input DC Power ⁽¹⁾	320	350	370	400	405	485	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48	60	80	60	125 ⁽²⁾	83 ⁽³⁾		Vdc
MPPT Operating Range	8 - 48	8 - 60	8 - 80	8-60	12.5 - 105	12.5 - 83		Vdc
Maximum Short Circuit Current (Isc)	11	11.02	11	10.1	11.75	11	14	Adc
Maximum DC Input Current		13.75		12.5	14.65	12.5	17.5	Adc
Maximum Efficiency				99.5				%
Weighted Efficiency				98.8			98.5	%
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				
Material				UL94 V-0, UV Resistant				
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)		129 x 153 x 27.5 / 5.1 x 6 x 1.1	129 x 153 x 33.5 / 5.1 x 6 x 1.3	129 x 153 x 29.5 / 5.1 x 6 x 1.16	129 x 159 x 49.5 / 5.1 x 6.3 x 1.9	129 x 162 x 59 / 5.1 x 6.4 x 2.3		mm / in
Weight (including cables)		630 / 1.4	750 / 1.7	655 / 1.5	845 / 1.9	1064 / 2.3		gr / lb
Input Connector				MC4 ⁽⁴⁾		Single or dual MC4 ⁽⁴⁾⁽⁵⁾	MC4 ⁽⁴⁾	
Input Wire Length		0.16 / 0.52		0.16 or 0.9 / 0.52 or 2.95 ⁽⁶⁾	0.16 / 0.52			m / ft
Output Wire Type / Connector				Double Insulated / MC4				
Output Wire Length		0.9 / 2.95			1.2 / 3.9			m / ft
Operating Temperature Range ⁽⁷⁾				-40 to +85 / -40 to +185				°C / °F
Protection Rating				IP68 / NEMA6P				
Relative Humidity				0 - 100				%

(1) Rated power of the module at STC will not exceed the optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed.
(2) NEC 2017 requires max input voltage be not more than 800V.
(3) For other connector types please contact SolarEdge.
(4) For dual version for parallel connection of two modules use P485-4NMDMM. In the case of an odd number of PV modules in one string, installing one P485 dual version power optimizer connected to one PV module. When connecting a single module seal the unused input connectors with the supplied pair of seals.
(5) Longer inputs wire length are available for use for 0.9m module wire length under P401 and so on.
(6) For ambient temperature above +85°C / +185°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 ⁽⁷⁾⁽⁸⁾	Single Phase HD-Wave	Single phase	Three Phase for 208V grid	Three Phase for 277/480V grid
Minimum String Length (Power Optimizers)	P320, P340, P370, P400, P401 P405, P485, P505	8 6	10 8	18 14
Maximum String Length (Power Optimizers)		25	25	50 ⁽⁹⁾
Maximum Power per String	5700 (6000 with SE7600-US - SE11400-US)	5250	6000 ⁽¹⁰⁾	12750 ⁽¹¹⁾
Parallel Strings of Different Lengths or Orientations		Yes		

(7) For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf
(8) It is not allowed to mix P320/P340/P370/P400/P401 in one string.
(9) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.
(10) For 208V grid: it is allowed to install up to 6,500W per string when the maximum power difference between each string is 1,000W.
(11) For 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.

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DOCUMENT CONTROL				DATE		CAD	QC	ENGINEER CONTACT INFORMATION				ENGINEERING STAMP		CONTRACTOR CONTACT INFORMATION		CONTRACTOR LOGO		CUSTOMER:		SHEET NAME:					
ISSUED FOR PERMIT				12-27-2021		BW	JG	ENGIPARTNERS LLC						TITAN SOLAR POWER FL 12221 N US HIGHWAY 301 THONOTASASSA, FL 33592 (813) 982 - 9001 #EC13008093				SANDY FIROOZ		SMART MONITORING DATA SHEET					
REV				DATE		CAD	QC	C.A. 32661 255 GIRALDA AVE CORAL GABLES, FL 33134 DESIGN@ENGIPARTNERS.COM 833 - 888 - 3644																	
																		PROJECT ADDRESS:		PROJECT ID:		ENGINEER OF RECORD:		SHEET TITLE:	
																		161 NORTHWEST SPARR LANE LAKE CITY FL 32055		TSP110728		ENG. RAFAEL A. GONZALEZ SOTO, PE		D-2	
																		PARCEL NUMBER:		DATE:		SHEETS:			
																		22-2S-16-01716-002		12-27-2021		8 OF 9			

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

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking 99% weighted efficiency
- Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- 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
- Small, lightweight, and easy to install both outdoors or indoors
- Built-in module-level monitoring
- Optional: Faster installations with built-in consumption metering (1% accuracy) and production revenue grade metering (0.5% accuracy, ANSI C12.20)

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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

MODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US		
APPLICABLE TO INVERTERS WITH PART NUMBER			SEXXXXH-XXXXXBXX4						
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	
Power Factor			1, Adjustable - 0.85 to 0.85						
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			600mA Sensitivity						
Maximum Inverter Efficiency	99				99.2			%	
CEC Weighted Efficiency			99					99 @ 240V 98.5 @ 208V	%
Nighttime Power Consumption			< 2.5					W	

⁽¹⁾ For other regional settings please contact Solar Edge support

⁽²⁾ A higher current source may be used; the inverter will limit its input current to the values stated

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REV				DATE				CAD				PARCEL NUMBER:				22-2S-16-01716-002				ENGINEER OF RECORD:				SHEET TITLE:			
																				ENG. RAFAEL A. GONZALEZ SOTO, PE				D-3			
																				DATE:				SHEETS:			
																				12-27-2021				9 OF 9			