PROJECT DESCRIPTION

SYSTEM CAPACITY: 8.00 KW DC / 5.00 KW AC

PV MODULES: (20) T XI10-400108BB BY MSOLAR

OPTIMIZERS: (20) S440 BY SOLAREDGE

INVERTER: (1) SE5000H-US BY SOLAREDGE

RACKING SYSTEM: NXT UMOUNT BY UNIRAC

PROJECT INFORMATION

PROJECT LATITUDE	30.166211787578938	MIN AMBIENT TEMP	-5 ° C
PROJECT LONGITUDE	-82.70451006347383	MAX AMBIENT TEMP	35 ° C
AHJ	COLUMBIA COUNTY	WIND EXPOSURE	C
		DESIGN WIND SPEED	118 MPH

DRAWINGS INDEX

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.

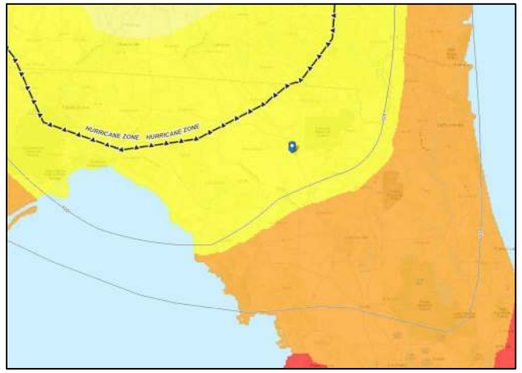
CONTRACTOR SHALL ENSURE ALL ROOF PENETRATIONS TO BE INSTALLED AND SEALED PER 2020 FLORIDA BUILDING CODE 7TH EDITION OR LOCAL GOVERNING CODE.

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.

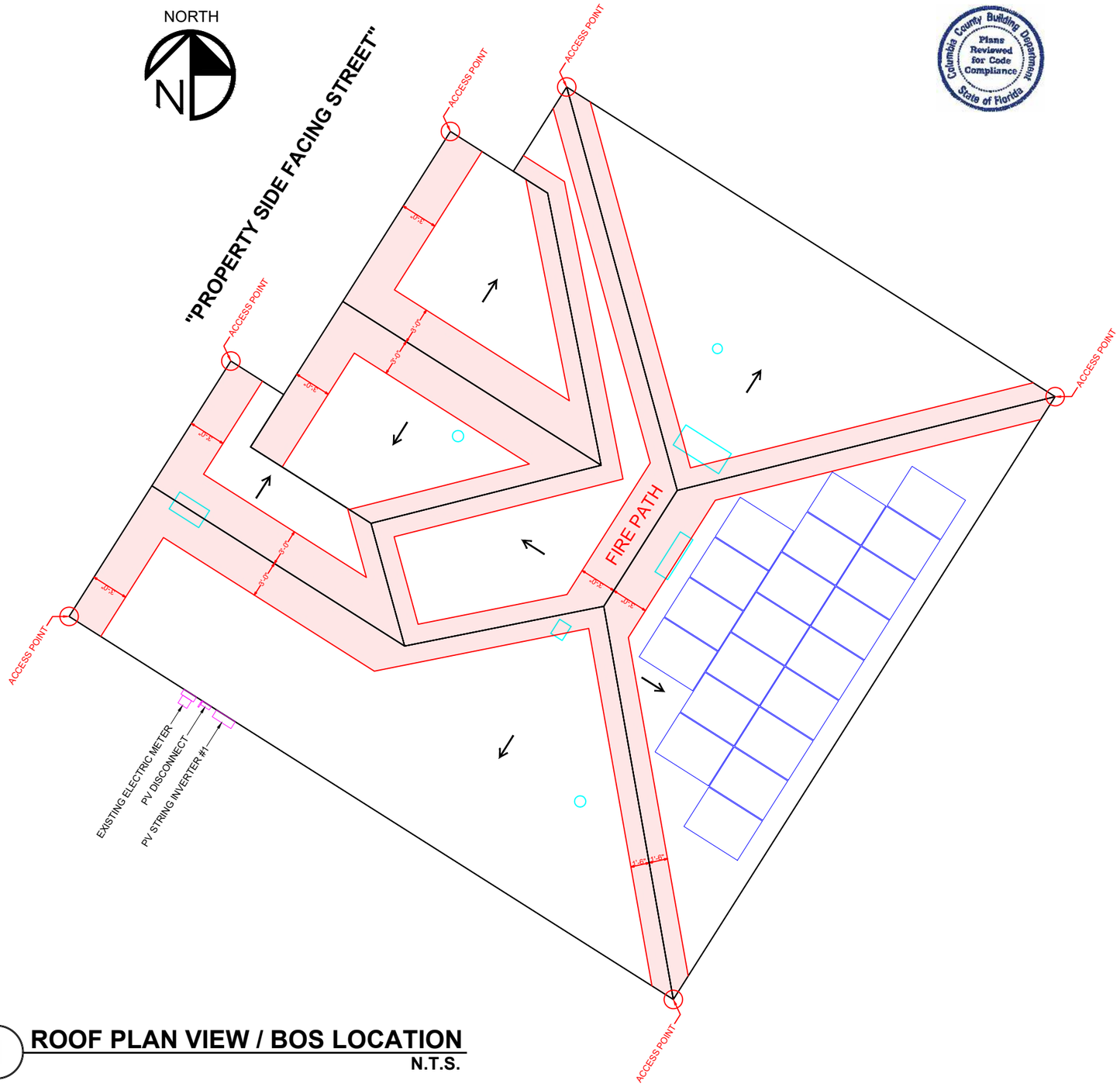
MECAWIND TOOL IS BASED ON THE C&C WIND LOADS FOR ENCLOSED BUILDINGS. DESIGN WIND PRESSURES ARE CALCULATED USING ASCE 7-16 EQUATION 30.6-1. ALL NOTES IN FIGURES ASCE 7-16 30.4-1 AND 30.4-2(A,B AND /67C) HAVE BEEN INCORPORATED. MEAN ROOF HEIGHT MUST BE LESS THAN 60 FEET.



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

3 **IRRADIANCE MAP**
N.T.S.

4 **3D RENDERING**
N.T.S.



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

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

DOCUMENT CONTROL	DATE	sCAD	eCAD
ISSUED FOR PERMIT	10-04-23	EF	DM

REV	DESCRIPTION	DATE	sCAD	eCAD

ENGINEER CONTACT INFORMATION

ENGIPARTNERS LLC
C.A. 32661
1825 PONCE DE LEON BLVD #114
CORAL GABLES, FL 33134

DESIGN@ENGIPARTNERS.COM

833 - 888 - 3644

ENGINEERING STAMP

STATE OF FLORIDA — RAFAEL A. GONZALEZ SOTO — No. 83104 — PROFESSIONAL ENGINEER

Rafael A Gonzalez Soto
2023.10.06 10:04:06 -04'00'

CONTRACTOR CONTACT INFORMATION

TITAN SOLAR POWER FL
901 ARMSTRONG BLVD,

KISSIMMEE, FL 34741

(813) 982 -9001

#EC13009924

CONTRACTOR LOGO

TITAN SOLAR POWER

CUSTOMER: MICHAEL ALLEN

PROJECT ADDRESS: 227 SW BELLFLOWER DR, LAKE CITY FL 32024

PARCEL NUMBER: 03-4S-16-02731-021

SHEET NAME: COVER SHEET

PROJECT ID: TSP165401

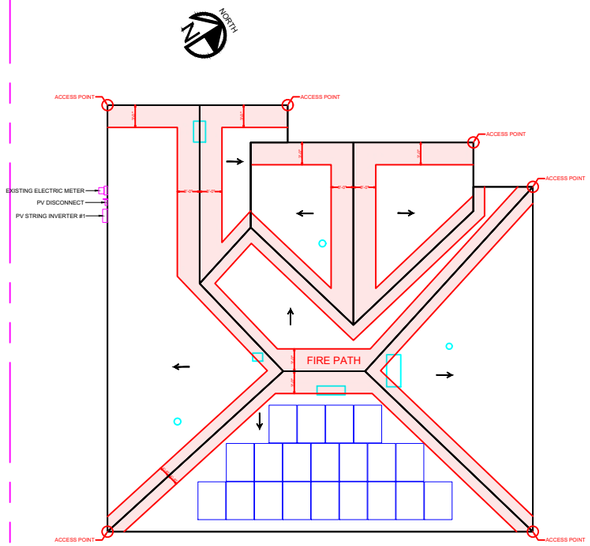
ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE

DATE: 10-03-23

SHEET TITLE: C-1

PROPERTY LINE

"PROPERTY SIDE FACING STREET"



PROPERTY LINE

1 SAFETY PLAN
N.T.S.

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	sCAD	eCAD
ISSUED FOR PERMIT	10-04-23	EF	DM

REV	DESCRIPTION	DATE	sCAD	eCAD

ENGINEER CONTACT INFORMATION

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2023.10.06 10:04:19 -04'00'

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CONTRACTOR LOGO

TITAN SOLAR POWER

CUSTOMER: MICHAEL ALLEN

PROJECT ADDRESS: 227 SW BELLFLOWER DR
LAKE CITY FL 32024

PARCEL NUMBER: 03-4S-16-02731-021

SHEET NAME: SAFETY PLAN

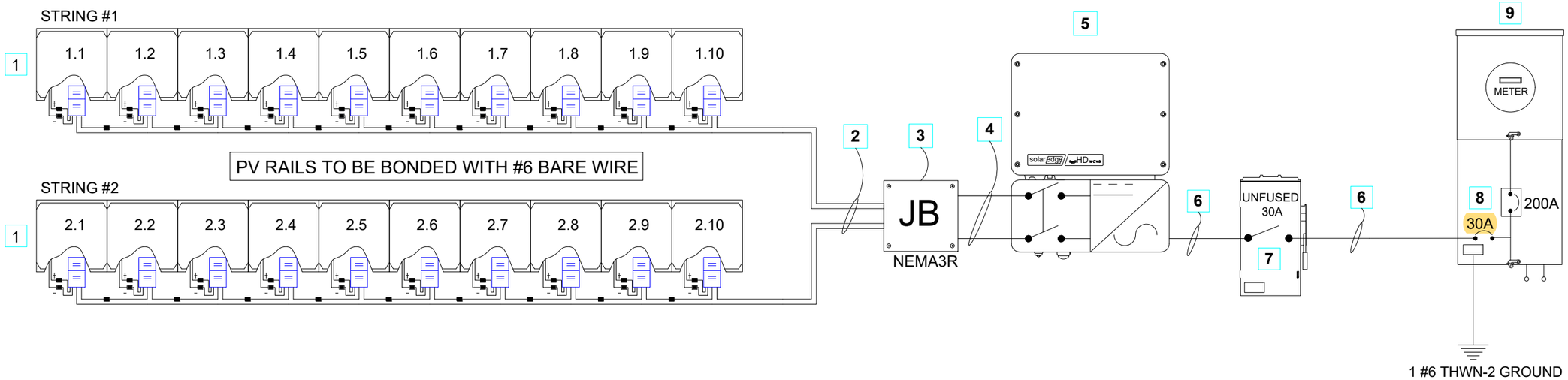
PROJECT ID: TSP165401

ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE

DATE: 10-03-23

SHEET TITLE: C-2

	WIRE SIZES, QUANTITY & TYPE			RACEWAY SIZE, TYPE & LOCATION			WIRE AMPACITY CALCULATIONS							ADDITIONAL INFORMATION			
										WIRE DE-RATED CALCULATION							
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 RATING	AMBIENT TEMPERATURE COEFFICIENT	# OF CONDUCTORS COEFFICIENT	DE-RATES AMPACITY	DIST.	VOLTAGE	VOLTAGE DROP %	CONDUIT FILL %
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	0.76	1	30A	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	0.76	0.8	24.3A	20 FT.	350V	0.21%	8.1%
AC (INVERTER TO METER)	(2) #8 AWG THWN-2	(1) #8 AWG THWN-2	(1) #8 AWG THWN-2	3/4" EMT CONDUIT	EXTERIOR WALL	"N/A"	21A	26.25A	30A	55A	1	1	55A	5 FT.	240V	0.1%	7.7%



1 ONE LINE RISER DIAGRAM

N.T.S.

LEGEND:

1	(20) T XI10-400108BB BY MSOLAR REFER TO D-1 SHEET	2	2 #10 PV WIRE PER STRING 1 #6 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	SE5000H-US BY SOLAREDGE REFER TO D-3 SHEET	6	2 #8 L1,L2 THWN-2 1 #8 THWN-2 NEUTRAL 1 #8 THWN-2 GROUND 3/4" EMT CONDUIT
7	PV SYSTEM DISCONNECT - 30A RATED	8	PV INTERCONNECTION POINT - PV BREAKER RATED 30A	9	UTILITY ELECTRICAL SERVICE

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REV	DESCRIPTION	DATE	sCAD	eCAD

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#EC13009924

CONTRACTOR LOGO

TITAN SOLAR POWER

CUSTOMER: MICHAEL ALLEN

PROJECT ADDRESS: 227 SW BELLFLOWER DR, LAKE CITY FL 32024

PARCEL NUMBER: 03-4S-16-02731-021

SHEET NAME: ONE LINE RISER DIAGRAM

PROJECT ID: TSP165401

ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE

DATE: 10-03-23

SHEET TITLE: E-1

⚠ 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)

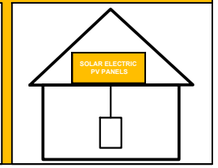
⚠ WARNING

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.



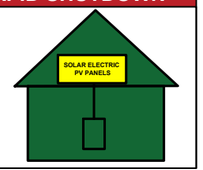
LABEL LOCATION:
AC DISCONNECT, MAIN PANEL
PER CODE: NEC 690.56(C)(1)(a)

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

1 PV SAFETY LABELS DATA
N.T.S.

INVERTER #1

NOMINAL OPERATING AC VOLTAGE	240 V
NOMINAL OPERATING AC FREQUENCY	60 HZ
MAXIMUM AC POWER	5.00 KW
MAXIMUM AC CURRENT	21A
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	13.50 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:	21 A
NOMINAL OPERATING AC VOLTAGE:	240V

LABEL LOCATION:
AC DISCONNECT
PER CODE: NEC 690.54

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

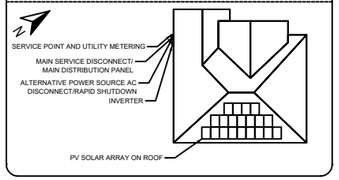
LABEL LOCATION:
AC DISCONNECT
PER CODE: NEC 690.13 (B)

WARNING: PHOTOVOLTAIC POWER SOURCE

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

⚠ CAUTION

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN:



PER CODE: NEC 690.56 (B) , NEC705.10

⚠ 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

GENERAL NOTE:

ADHESIVE FASTENED SIGNS:

· THE LABEL SHALL BE VISIBLE, REFLECTIVE AND SUITABLE FOR THE ENVIRONMENT WHERE IT IS INSTALLED [NFPA 1, 11.12.2.1]

· WHERE REQUIRED ELSEWHERE IN THIS CODE, ALL FIELD APPLIED LABELS, WARNINGS, AND MARKINGS SHOULD COMPLY WITH ANSI Z535.4 [NEC 110.21(B) FIELD MARKING].

· ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL SIGNS SHALL BE WEATHER RESISTANT [IFC 605.11.1.3]

DOCUMENT CONTROL	DATE	sCAD	eCAD
ISSUED FOR PERMIT	10-04-23	EF	DM

REV	DESCRIPTION	DATE	sCAD	eCAD

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CONTRACTOR CONTACT INFORMATION
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KISSIMMEE, FL 34741
(813) 982 -9001
#EC13009924

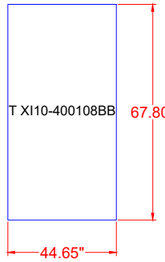
CONTRACTOR LOGO
TITAN SOLAR POWER

CUSTOMER: MICHAEL ALLEN
PROJECT ADDRESS: 227 SW BELLFLOWER DR LAKE CITY FL 32024
PARCEL NUMBER: 03-4S-16-02731-021

SHEET NAME: SAFETY LABELS

PROJECT ID:	ENGINEER OF RECORD:	SHEET TITLE:
TSP165401	ENG. RAFAEL A. GONZALEZ SOTO, PE	E-2
	DATE: 10-03-23	

SOLAR MODULE



UL 1703 CERTIFIED
MAX. DESIGN LOAD: 50.13 psf
APPLIED WIND LOAD : -30.05 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.

WORST CASE MODULE:

ZONE 1: 25%
ZONE 2E: 60%
ZONE 2R: 15%

-22.74(0.25) + -32.49(0.60) + -32.49(0.15) =-30.05psf

ULTIMATE WIND SPEED	120	mph
DESIGN WIND SPEED	118	mph
RISK CATEGORY	II	
EXPOSURE CATEGORY	C	
ROOF SLOPE (°)	25	
ROOF TYPE	HIPPED	
MATERIAL ROOF TYPE	ASPHALT SHINGLES	
PRESSURE ZONE:	1&2	
MEAN ROOF HEIGHT:	15.198	'
0.5 MEAN ROOF HEIGHT	7.60	'
$2H_2$	14	"
PERIMETER WIDTH:	4.63	'
K_D	0.85	
K_{ZT}	1.0	
K_H	0.851	
VELOCITY PRESSURE (q) = 0.60*0.00256* $K_H K_{ZT} K_D V^2$		
VELOCITY PRESSURE (ASD)	15.47	

NON EXPOSED EDGE FACTOR: γ_E = 1.0	EXPOSED EDGE FACTOR: γ_E = 1.5	ARRAY EQUALIZATION FACTOR: γ_a =	0.7
EXTERNAL PRESSURE COEFFICIENT Z1		0.7	-1.40
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)	NON EXPOSED PRESSURES (PSF)	EXPOSED PRESSURES (PSF)	MAX SPAN (FT)	MAX CANTI-LEVER (IN)
1	**-24.45**	-15.16	-22.74	2 '	8 "
2e	**-33.73**	-21.66	-32.49	2 '	8 "
2r	**-33.73**	-21.66	-32.49	2 '	8 "
3	**-33.73**	-21.66	-32.49	2 '	8 "

TOTAL ROOF AREA	3361.13	sq.-ft
TOTAL MODULES:	20	
TOTAL PHOTOVOLTAIC AREA:	420.38	sq.-ft
TOTAL PERCENTAGE AREA OF PV SYSTEM:	12.51	%
WIND LOAD (PSF):	-30.05	
TOTAL WIND LOAD (LBS):	-12,632.42	
TOTAL ROOF MOUNTS:	78	
TENSION FORCE PER MOUNT (LBS):	-161.95	

LEGEND & SYMBOLS

OBS ROOF OBSTRUCTIONS

NON-EXPOSED MODULES

EXPOSED MODULES

EDGE MODULES

TRUSSES OR RAFTERS

ROOF MOUNTS & RAIL

ROOF SLOPE

ROOF'S GENERAL NOTES:

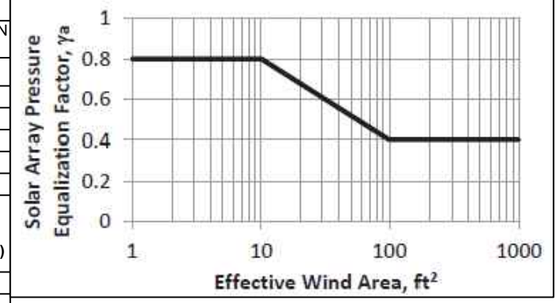
1- CONTRACTOR/INSTALLER TO VERIFY ROOF CONDITIONS FOR PROPER INSTALLATION OF THE PV SYSTEM.
2- CONTRACTOR/INSTALLER TO NOTIFY THE OWNER IMMEDIATELY OF ANY ROOF DEFICIENCIES AND/OR REPAIR REQUIRED TO INSTALL THE PV SYSTEM.
3- EOR DOES NOT ASSUME ANY RESPONSIBILITY FOR THE INSTALLATION OF ANY PV SYSTEM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

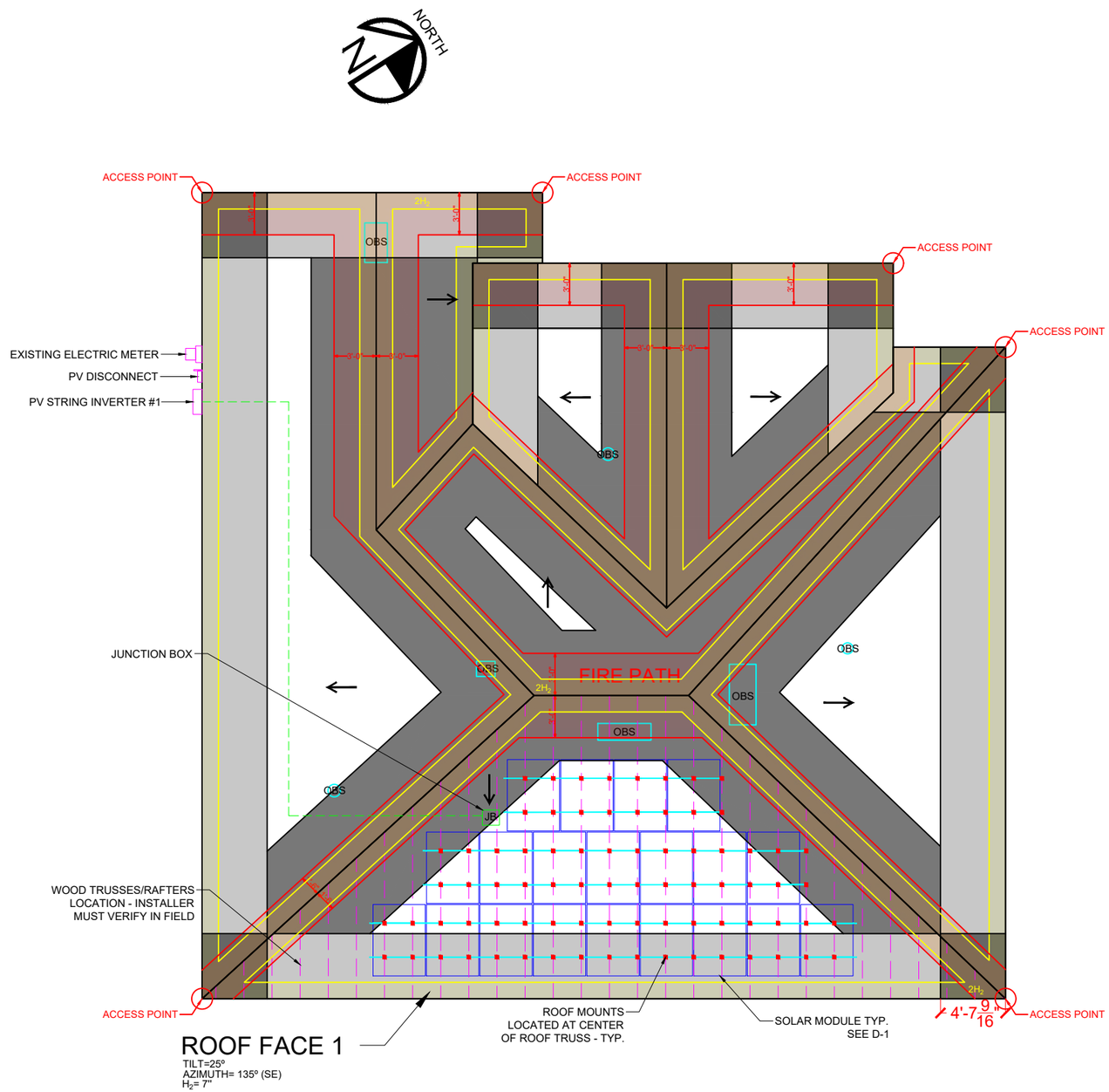
ROOF INSPECTION NOTE:

A PANEL IS DEFINED AS EXPOSED IF D1 TO THE ROOF EDGE >0.5H AND ONE OF THE FOLLOWING APPLIES:
1. D1 TO THE ADJACENT ARRAY > 4 FT (1.2 M) OR
2. D2 TO THE NEXT ADJACENT PANEL> 4 FT. (1.2 M)

ASCE 7.16 - 29.4-7
DESIGNED WIND PRESSURES:

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





1 STRUCTURAL ROOF PLAN & PV MODULES LAYOUT

N.T.S.

DOCUMENT CONTROL	DATE	sCAD	eCAD
ISSUED FOR PERMIT	10-04-23	EF	DM
REV DESCRIPTION	DATE	sCAD	eCAD

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ENGINEERING STAMP
Rafael A Gonzalez Soto 2023.10.06 10:05:05 -04'00'

CONTRACTOR CONTACT INFORMATION
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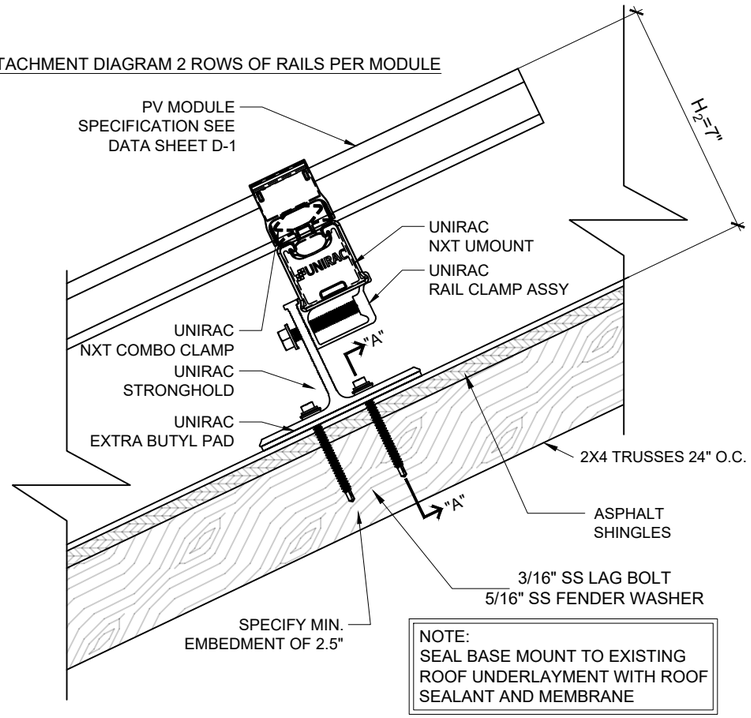
CONTRACTOR LOGO
TITAN SOLAR POWER

CUSTOMER: MICHAEL ALLEN
PROJECT ADDRESS: 227 SW BELLFLOWER DR LAKE CITY FL 32024
PARCEL NUMBER: 03-4S-16-02731-021

SHEET NAME: STRUCTURAL PLAN
PROJECT ID: TSP165401
ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE
DATE: 10-03-23
SHEET TITLE: S-1

UNIRAC NXT 72 CELL PORTRAIT						
Ground Snow Load	Exposure Category	Panel Angle	Wind Speed	120 mph		
			Roof Zone	1	2	3
0 psf	C	20 to 27	Interior	28	16	11
			Exposed	18	10	7

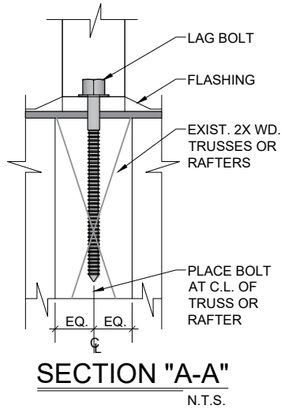
ATTACHMENT DIAGRAM 2 ROWS OF RAILS PER MODULE



NOTE:
SEAL BASE MOUNT TO EXISTING ROOF UNDERLAYMENT WITH ROOF SEALANT AND MEMBRANE

1 SHINGLE ROOF MOUNT DETAIL & DATA

N.T.S.



SECTION "A-A"

N.T.S.

LAG BOLT PULL OUT CALCULATIONS

Spruce, Pine,	Per inch Thread Depth	266lbs
SS Lag Bolt 5/16" x 4"	Min. Thread Depth	0'-3"
Wood Strength x Thread Depth = Pull Out Strength		
266 lbs. x 3 in = 798 lbs.		
Allowable Pull Out Strength per Lag Bolt		798 lbs.
Max. Pull Out Strength Required per Lag Bolt		161.95
Lag Bolt Pull Out Strength Safety Factor		4.93

DISTRIBUTED LOAD CALCULATIONS

PV MODULES & RACKING WEIGHT = (INDIVIDUAL MODULE WEIGHT + 3.5 LBS) * (MODULE QTY) = (49.80 LBS) * (20) = 996.00 LBS

PER SQUARE FEET (PSF) ARRAY LOAD = PV MODULES & RACKING WEIGHT / TOTAL ARRAY AREA = 996.00 LBS / 420.38 SQFT = 2.37 PSF

HENCE, ROOF WILL CARRY THE ADDITIONAL SOLAR SYSTEM LOAD

ASCE 7-16 Velocity Pressure
qz10 = 0.00256Kz Kzt Kd V2

Where:

qz10 = ASCE 7-16 velocity pressure evaluated at mean roof height (psf)
Kz = velocity pressure exposure coefficient
Kzt = topographic factor
Kd = wind directionality factor
V = basic wind speed (mph) from ASCE 7-16 maps referred to as ultimate wind speed maps in 2020 FBC.

As an example, for an array having an area of 158.04 sq.-ft., the total uplifting (resultant) force acting on the array would be -39.1 psf x 158.04 sq. ft. = -6,179.364 lb. Knowing this resultant force, the design engineer can now determine the number of attachment points and the size of the mounting hardware necessary to safely carry this load.

Live Loads:

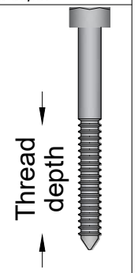
Live loads associated with photovoltaic systems are usually assumed to be distributed uniformly and are small, on the order of 4 psf or less.

Lag Screw Installation Guidelines

1. Determine location for the Mount on roof by drilling through the center of truss from bottom with 5/32" drill bit.
2. Mark mounting holes for Mount on underlayment. Mounting holes should be centered on the trusses.
3. Drill 15/64" pilot hole.
4. Apply sealant to bottom of Mount.
5. Place Mount over roof underlayment with holes in roof.
6. Apply sealant to bottom of Mount, apply sealant to lag screws and fasten Mount securely to trusses.
7. Apply additional sealant to top assembly to be sure all penetrations are sealed.

Uni-Rac Specs. Lag pull-out (withdrawal) capacities (lbs) in typical roof lumber (ASD)

	STAINLESS STEEL Lag screw specifications	
	Specific gravity	*5/16" shaft, * per inch thread depth*
Douglas Fir, Larch	0.50	266
Douglas Fir, South	0.46	235
Engelman Spruce, Lodgepole Pine (MSR 1650 f & higher)	0.46	235
Hem, Fir, Redwood (close grain)	0.43	212
Hem, Fir (North)	0.46	235
Southern Pine	0.55	307
Spruce, Pine, Fir	0.42	205
Spruce, Pine, Fir (E of 2 million psi and higher grades of MSR and MEL)	0.50	266



Sources: American Wood Council, NDS 2005, Table 11.2A, 11.3A.

DOCUMENT CONTROL	DATE	sCAD	eCAD
ISSUED FOR PERMIT	10-04-23	EF	DM
REV DESCRIPTION	DATE	sCAD	eCAD

ENGINEER CONTACT INFORMATION
ENGIPARTNERS LLC
C.A. 32661
1825 PONCE DE LEON BLVD #114
CORAL GABLES, FL 33134
DESIGN@ENGIPARTNERS.COM
833 - 888 - 3644

ENGINEERING STAMP
Rafael A Gonzalez Soto
2023.10.06 10:05:15 -04'00'

CONTRACTOR CONTACT INFORMATION
TITAN SOLAR POWER FL
901 ARMSTRONG BLVD,
KISSIMMEE, FL 34741
(813) 982 -9001
#EC13009924

CONTRACTOR LOGO
TITAN SOLAR POWER

CUSTOMER: MICHAEL ALLEN
PROJECT ADDRESS: 227 SW BELLFLOWER DR LAKE CITY FL 32024
PARCEL NUMBER: 03-4S-16-02731-021

SHEET NAME: RACKING PLAN

PROJECT ID: TSP165401
ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE
DATE: 10-03-23
SHEET TITLE: S-2

Notes: (1) Thread must be embedded in the side grain of a Trusses or other structural member integral with the building structure.

(2) Lag Bolts must be located in the middle third of the structural member.

(3) These values are not valid for wet services.

(4) This table does not include shear capacities. If necessary, contact a local engineer to specify lag bolt size with regard to shear forces.

(5) Install lag bolts with head ad washer flush to surface (no gap). Do nor over-torque.

(6) Withdrawal design values for lag screw connections shall be multiplied by applicable adjustment factors if necessary. See table 10.3.1 in the American Wood Council NDS for Wood Construction.

PZSE structural ENGINEERS

November 3, 2021

Unirac
1411 Broadway Blvd. NE
Albuquerque, NM 87102

Attn.: Unirac - Engineering Department

Re: Engineering Certification for the Unirac NXT Horizon System U-builder Software

PZSE, Inc. - Structural Engineers has reviewed the NXT Horizon System, a proprietary mounting system constructed from modular parts which is intended for rooftop installation of solar photovoltaic (PV) panels; and the Unirac NXT U-builder Online tool. All information, data and analysis contained within are based on, and comply with the following codes and typical specifications:

1. Minimum Design Loads for Buildings and other Structures, ASCE/SEI 7-05, ASCE/SEI 7-10, ASCE/SEI 7-16
2. 2006-2018 International Building Code, by International Code Council, Inc. w/ Provisions from SEAOC PV-2 2017.
3. 2020 Florida State Building Code 7th edition, by International Code Council, Inc.
4. 2006-2018 International Residential Code, by International Code Council, Inc. w/ Provisions from SEAOC PV-2 2017.
5. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES.
6. Aluminum Design Manual 2010 & 2015 Edition(s), by the Aluminum Association.

Following are typical specifications to meet the above code requirements:

Design Criteria: Ground Snow Load = 0 - 100 (psf)
Basic Wind Speed = 90 - 190 (mph)
Roof Mean Height = 0 - 60 (ft)
Roof Pitch = 0 - 45 (degrees)
Exposure Category = B, C & D

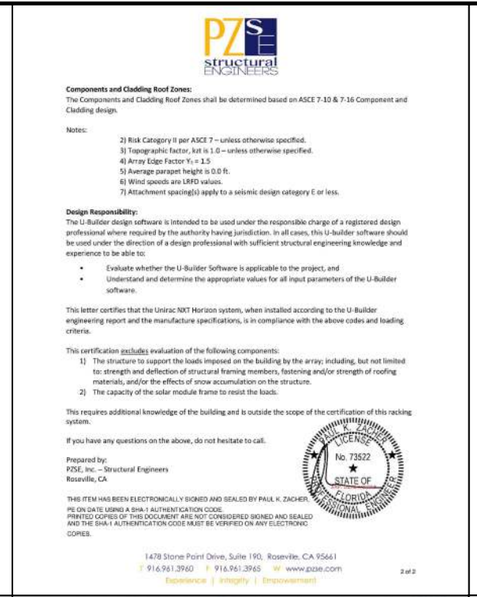
Cantilever: Maximum cantilever length is L/3, where "L" is the span noted in the U-Builder online tool.

Clearance: 2" to 10" clear from top of roof to top of PV panel.

Installation Orientation: See NXT Horizon Installation Guide.
Landscape - PV Panel long dimension is parallel to the rail.
Portrait - PV Panel short dimension is parallel to the rail.

1478 Stone Point Drive, Suite 190, Roseville, CA 95661
T 916.961.3960 F 916.961.3965 W www.pzse.com
Experience | Integrity | Empowerment

1 of 2



PZSE structural ENGINEERS

Components and Cladding Roof Zones:
The Components and Cladding Roof Zones shall be determined based on ASCE 7-10 & 7-16 Component and Cladding design.

Notes:
2) Risk Category II per ASCE 7 – unless otherwise specified.
3) Topographic factor, kzt is 1.0 – unless otherwise specified.
4) Array Edge Factor γ_E = 1.5
5) Average parapet height is 0.0 ft.
6) Wind speeds are LRFD values.
7) Attachment spacing(s) apply to a seismic design category E or less.

Design Responsibility:
The U-Builder design software is intended to be used under the responsible charge of a registered design professional where required by the authority having jurisdiction. In all cases, this U-builder software should be used under the direction of a design professional with sufficient structural engineering knowledge and experience to be able to:

- Evaluate whether the U-Builder Software is applicable to the project, and
- Understand and determine the appropriate values for all input parameters of the U-Builder software.

This letter certifies that the Unirac NXT Horizon system, when installed according to the U-Builder engineering report and the manufacture specifications, is in compliance with the above codes and loading criteria.

This certification excludes evaluation of the following components:
1) The structure to support the loads imposed on the building by the array; including, but not limited to: strength and deflection of structural framing members, fastening and/or strength of roofing materials, and/or the effects of snow accumulation on the structure.
2) The capacity of the solar module frame to resist the loads.

This requires additional knowledge of the building and is outside the scope of the certification of this racking system.

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

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

CALIFORNIA LICENSED PROFESSIONAL ENGINEER No. 73522 STATE OF CALIFORNIA

THIS ITEM HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY PAUL K. ZACHER, PE ON DATE USING A SHA-1 AUTHENTICATION CODE. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SHA-1 AUTHENTICATION CODE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

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Experience | Integrity | Empowerment

2 of 2

CHEM LINK POLYMER INNOVATION

M-1 *Structural Adhesive/Sealant*

Technical Data Sheet | **Polyether Technology** | **CSI Section No. 07 92 13**

CHEM LINK
Construction & Maintenance
Telephone: 800-825-1681
Fax: 269-679-4448
353 E. Lyons Street
Schoolcraft, MI 49087
www.chemlink.com

Last Revision: 04/2018
Document No. DS1270

Product Description
M-1® is a moisture curing, polyether adhesive/sealant designed for applications in damp, dry, or cold climates. M-1® is solvent free and contains no isocyanates. M-1® will not shrink upon curing, will not discolor when exposed to UV light, and will not "out-gas", or bubble on damp surfaces as urethane sealants often do. M-1® is capable of joint movement in excess of 35% in both compression and extension. M-1® can be used effectively in many difficult construction site conditions such as wet or dry climates and at temperatures as low as 32°F (0°C).

Applicable Performance Standards
- ASTM C920, Type S, Grade NS, Class 35 Uses NT, T, M, G, A & O
- ASTM E84, Class A
- Federal Specification TT-S-00230-C Type II, Class B
- Corps of Engineers CRD-C-541, Type II, Class B
- Canadian Standards Board CAN 19. 13-M82
- SWR Institute Validated (Sealant Waterproofing and Restoration)

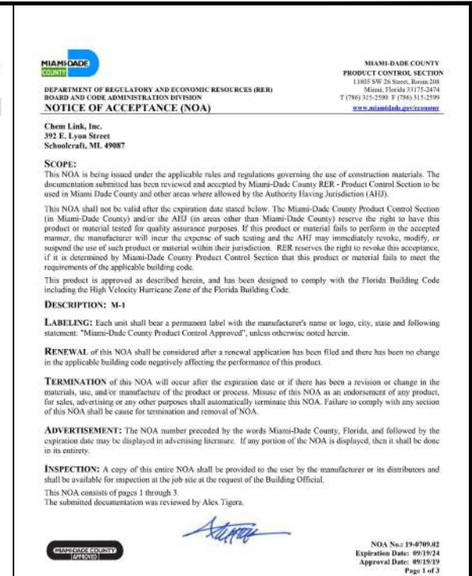
Regulatory Compliance
- Conforms to OTC Rule for Sealants and Caulks
- Meets requirements of California Regs: CARB, BAAQMD and SCAQMD
- This product does not contain cancer causing chemicals listed in California Proposition 65
- Conforms to USDA Requirements for Non-food Contact

Green Standards:
- LEED 2.2 for New Construction and Major Renovations: Low Emitting Materials (Section 4.1) 1 Point
- NAHB Model Green Home Building Guidelines: 5 Global Impact Points
- VOC Content: less than 17 grams / liter ASTM D2369 EPA Method 24 (tested at 240°F / 115°C)

Advantages
- Solvent free, 100% solids will not shrink
- Non-slump, applies vertically and overhead
- 20 minute skin over
- No outgassing on damp surfaces
- Good color stability, will not sunten
- Paintable within 24 hours (See limitations)
- Gun grade, no special tools or mixing required
- Application at temperatures as low as 32°F (0°C)

Colors
White, Grey, Tan, Limestone & Black
* Color matching is available in batch quantity only

Packaging
- 5 oz Squeeze Tube (148 ml)
  36 tubes/carton, 40 cartons/pallet
- 10.1 oz (300 ml)
  24 cartridges/carton, 45 cartons/pallet
- 20 oz (600 ml)
  12 sausages/carton, 40 cartons/pallet
- 28 oz (825 ml)
  12 cartridges/carton, 40 cartons/pallet
  White only – Other colors available by special order
- 2 and 5 gallon pails or 50 gallon drums available by special order



MIAMI-DADE COUNTY

DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786) 315-2590 F (786) 315-2599
www.miamidade.gov/economy

NOTICE OF ACCEPTANCE (NOA)

Chem Link, Inc.
392 E. Lyon Street
Schoolcraft, MI. 49087

SCOPE:
This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER - Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (in Miami-Dade County) and/or the AHJ (in areas other than Miami-Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the Florida Building Code including the High Velocity Hurricane Zone of the Florida Building Code:

DESCRIPTION: M-1

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

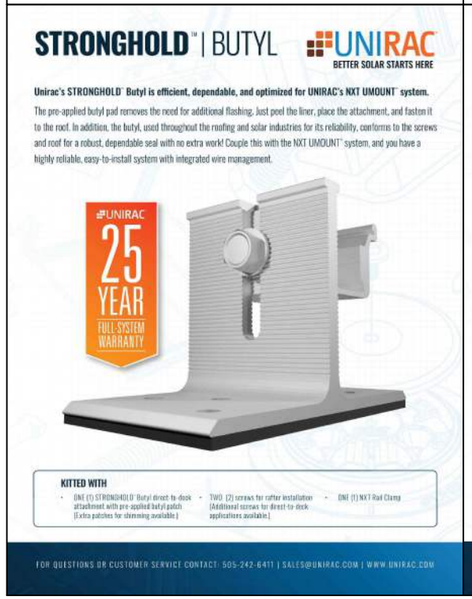
ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

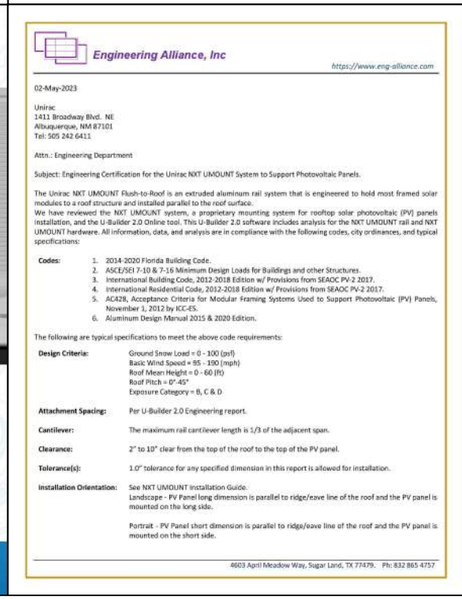
INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA consists of pages 1 through 3
The submitted documentation was reviewed by Alex Tigera.

MIAMI-DADE COUNTY APPROVED

NOA No.: 19-0709.02
Expiration Date: 09/19/24
Approval Date: 09/19/19
Page 1 of 3





Engineering Alliance, Inc
https://www.eng-alliance.com

02-May-2023

Unirac
1411 Broadway Blvd. NE
Albuquerque, NM 87101
Tel: 505 242 6411

Attn.: Engineering Department

Subject: Engineering Certification for the Unirac NXT UMOUNT System to Support Photovoltaic Panels.

The Unirac NXT UMOUNT Flush-to-Roof is an extruded aluminum rail system that is engineered to hold most framed solar modules to a roof structure and installed parallel to the roof surface.
We have reviewed the NXT UMOUNT system, a proprietary mounting system for rooftop solar photovoltaic (PV) panels installation, and the U-Builder 2.0 Online tool. This U-Builder 2.0 software includes analysis for the NXT UMOUNT rail and NXT UMOUNT hardware. All information, data, and analysis are in compliance with the following codes, city ordinances, and typical specifications:

Codes:
1. 2014-2020 Florida Building Code.
2. ASCE/SEI 7-10 & 7-16 Minimum Design Loads for Buildings and other Structures.
3. International Building Code, 2012-2018 Edition w/ Provisions from SEAOC PV-2 2017.
4. International Residential Code, 2012-2018 Edition w/ Provisions from SEAOC PV-2 2017.
5. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES.
6. Aluminum Design Manual 2015 & 2020 Edition.

The following are typical specifications to meet the above code requirements:

Design Criteria: Ground Snow Load = 0 - 100 (psf)
Basic Wind Speed = 95 - 190 (mph)
Roof Mean Height = 0 - 60 (ft)
Roof Pitch = 0°-45°
Exposure Category = B, C & D

Attachment Spacing: Per U-Builder 2.0 Engineering report.

Cantilever: The maximum rail cantilever length is 1/3 of the adjacent span.

Clearance: 2" to 10" clear from the top of the roof to the top of the PV panel.

Tolerance(s): 1.0" tolerance for any specified dimension in this report is allowed for installation.

Installation Orientation: See NXT UMOUNT Installation Guide.
Landscape - PV Panel long dimension is parallel to ridge/eave line of the roof and the PV panel is mounted on the long side.

Portrait - PV Panel short dimension is parallel to ridge/eave line of the roof and the PV panel is mounted on the short side.

4603 April Meadow Way, Sugar Land, TX 77479. Ph: 832 865 4757

Engineering Alliance, Inc
https://www.eng-alliance.com

Components and Cladding Roof Zones:
The Components and Cladding Roof Zones shall be determined based on ASCE 7-10 & 7-16 Component and Cladding design.

Notes:
1. U-Builder 2.0 Online tool analysis is only for Unirac NXT UMOUNT systems and do not include roof capacity check.
2. Risk Category II per ASCE 7-16.
3. Topographic factor, kzt is 1.0.
4. Array Edge Factor γ_E = 1.5
5. Average parapet height is 0.0 ft.
6. Wind speeds are LRFD values.
7. Attachment spacing(s) apply to a seismic design category E or less.

Design Responsibility:
The U-Builder 2.0 design software is intended to be used under the responsible charge of a registered design professional where required by the authority having jurisdiction. In all cases, this U-Builder 2.0 software should be used under the direction of a design professional with sufficient structural engineering knowledge and experience to be able to:

- Evaluate whether the U-Builder 2.0 Software is applicable to the project, and
- Understand and determine the appropriate values for all input parameters of the U-Builder 2.0 software.

This letter certifies that the Unirac NXT UMOUNT system, when installed according to the U-Builder 2.0 engineering report and the manufacture specifications, is in compliance with the above codes and loading criteria.

This certification excludes evaluation of the following components:
1) The structure to support the loads imposed on the building by the array; including, but not limited to: strength and deflection of structural framing members, fastening and/or strength of roofing materials, and/or the effects of snow accumulation on the structure.
2) The attachment of the NXT UMOUNT Rails to the existing structure.
3) The capacity of the solar module frame to resist the loads.

This requires additional knowledge of the building and is outside the scope of the certification of this racking system.

Please feel free to call for any questions or clarifications.

Prepared By

Engineering Alliance, Inc
Sugar Land, TX

SADDAM AHMAD LICENSE No. 76516 STATE OF FLORIDA PROFESSIONAL ENGINEER

Saddam Ahmad Digitally signed by Saddam Ahmad Date: 2023.05.02 08:58:49 -05'00'

This item has been electronically signed and sealed by Saddam Ahmad PE using a digital signature and date. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

4603 April Meadow Way, Sugar Land, TX 77479. Ph: 832 865 4757

1 SHINGLE ROOF MOUNT DETAIL & DATA

DOCUMENT CONTROL		DATE	sCAD	eCAD
ISSUED FOR PERMIT		10-04-23	EF	DM
REV	DESCRIPTION	DATE	sCAD	eCAD

ENGINEER CONTACT INFORMATION
ENGIPARTNERS LLC
C.A. 32661
1825 PONCE DE LEON BLVD #114
CORAL GABLES, FL 33134
DESIGN@ENGIPARTNERS.COM
833 - 888 - 3644

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CONTRACTOR CONTACT INFORMATION
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901 ARMSTRONG BLVD,
KISSIMMEE, FL 34741
(813) 982 -9001
#EC13009924

CONTRACTOR LOGO
TITAN SOLAR POWER

CUSTOMER: MICHAEL ALLEN
PROJECT ADDRESS: 227 SW BELLFLOWER DR, LAKE CITY FL 32024
PARCEL NUMBER: 03-4S-16-02731-021

SHEET NAME: RACKING PLAN
PROJECT ID: TSP165401
ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE
DATE: 10-03-23
SHEET TITLE: S-3

TITAN SOLAR POWER

108BB 400W HC Series

Titan Solar Panel Half-Cell Black
Monocrystalline PERC PV Module

Excellent efficiency
10 busbar technology increases power by decreasing the distance between busbars and the finger grid line

Improved weak illumination response
More power output even in lower light conditions such as overcast days or off-peak sunlight hours.

Anti PID
Panels rigorously tested to limit power degradation caused by 'stray' currents

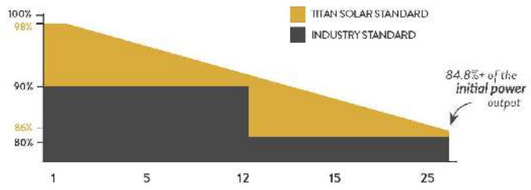
High wind and snow resistance
5,400 Pa Snow Load
2,400 Pa Wind Load

25-year warranty
Titan Solar panel modules are guaranteed to retain at least 84.3% of the initial power output

Appealing Aesthetics
Fully black module creates a sleek, uniform array

25-year product warranty, 25-year output warranty

0.5% annual degradation over 25 years



CEC

UL 61730 | IEC 61215 | IEC 61730
ISO9001, ISO14001, ISO45001

titansolarpower.com

108BB 400W HC Series

Titan Solar Panel Half-Cell, All-Black
Monocrystalline PERC PV Module

Electrical Characteristics | STC*

Module Type	TXI10-395108BB	TXI10-400108BB	TXI10-405108BB
Nominal Power Watt Pmax (W)*	395	400	405
Power Output Tolerance Pmax (W)	0~+5	0~+5	0~+5
Maximum Power Voltage Vmp (V)	30.84	31.01	31.21
Maximum Power Current Imp (A)	12.81	12.90	12.98
Open Circuit Voltage (V)	36.98	37.07	37.23
Short Circuit Current Isc (A)	13 .70	13 .97	13 .87
Module Efficiency (%)	20.23	20.48	20.74

*STC (Standard Test Condition): Irradiance 1000W/m². Module Temperature 25°C, AM1.5, AM1.5
*Measuring tolerance: ±

Electrical Characteristics | NMOT*

Maximum Power Watt Pmax (Wp)	298	270	274
Maximum Power Voltage Vmpp (V)	29.08	29.26	29.47
Maximum Power Current Impp (A)	10.25	10.32	10.38
Open Circuit Voltage Voc (V)	34.75	34.88	35.12
Short Circuit Current Isc (A)	10.96	11.03	11.10

*NMOT (Nominal module operating temperature): Irradiance 800W/m², Ambient Temperature 20°C, AM1.5, Wind Speed 1m/s

Mechanical Data

Solar Cells	Mono PERC, 182mm half cells
Cells orientation	108 (6x9+6x9)
Module dimension	67.80x44.65x1.38 in. (1,722x1,134x35 mm)
Weight	46.30 lb (21.00 kg)
Glass	3.2mm, High Transmission, Low Iron & Semi-Tempered Glass
Junction box	IP 68, 3 Diodes
Cables	1,200mm
Connectors	MC4 EVO2

Temperature Ratings

NOCT	42°C±2°C
Temperature coefficient of Pmax	-0.350%/°C
Temperature coefficient of Voc	-0.275%/°C
Temperature coefficient of Isc	+0.045%/°C

Working Conditions

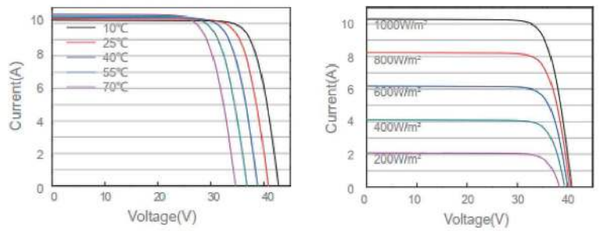
Maximum System Voltage	1500VDC
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	25A
Maximum Load (Snow/Wind)	5,400Pa / 2,400Pa
Fire Rating	UL Type 1**

two or more strings in parallel connection.
**Details: Electrical data in this catalog do not represent a single module and they are not apart.

of the other. They only serve for comparison among different module types.
***Means roof, the "Fire Class" Rating is designated for the fully installed PV system,

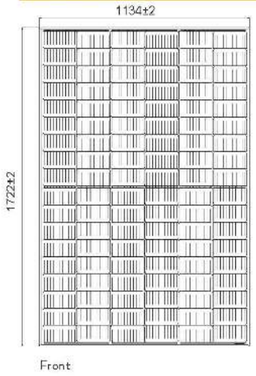
which includes, but is not limited to, the module, the types of mounting used, pitch and roof construction.

I-V Curves of PV Module (405W)

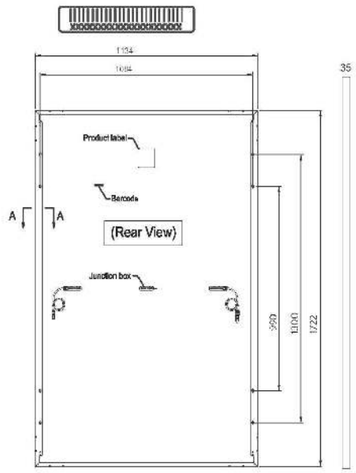


Note: please read safety and installation instructions before using this product. Subject to change without prior notice.

Dimensions (MM)



Front



Back

Side

Tolerances:
Length: ±2 mm
Width: ±2 mm
Height: ±1 mm
Pitch-row: ±1 mm

Packaging Details

31 Panels per pallet	Pallet Stack Weight 2,934 lbs. (1341.98 kg)	Truck Weight 38,461.2 lbs. (17,445.7 kg)
26 Pallets per truck		

TITAN SOLAR POWER

Powered by mSolar.

DOCUMENT CONTROL	DATE	sCAD	eCAD
ISSUED FOR PERMIT	10-04-23	EF	DM

REV	DESCRIPTION	DATE	sCAD	eCAD

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1825 PONCE DE LEON BLVD #114
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CONTRACTOR CONTACT INFORMATION
TITAN SOLAR POWER FL
901 ARMSTRONG BLVD,
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CONTRACTOR LOGO
TITAN SOLAR POWER

CUSTOMER: MICHAEL ALLEN
PROJECT ADDRESS: 227 SW BELLFLOWER DR, LAKE CITY FL 32024
PARCEL NUMBER: 03-4S-16-02731-021

SHEET NAME: PV MODULES DATA SHEET

PROJECT ID: TSP165401
ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE
DATE: 10-03-23
SHEET TITLE: D-1

Power Optimizer

For North America

S440

POWER OPTIMIZER

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
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)

* Functionality subject to inverter model and firmware version

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Power Optimizer

For North America

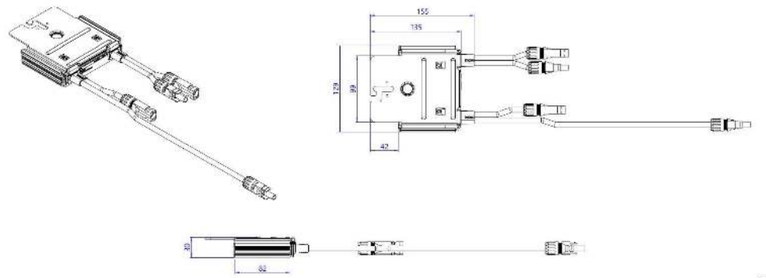
S440

	S440	Unit
INPUT		
Rated Input DC Power(1)	440	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	Adc
Maximum Efficiency	99.5	%
Weighted Efficiency	98.6	%
Overvoltage Category	I	
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		
Photovoltaic Rapid Shutdown System	NEC 2014, 2017 & 2020	
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3	
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 / 5.07 x 6.10 x 1.18	mm / in
Weight (including cables)	655 / 1.5	gr / lb
Input Connector	MC4(2)	
Input Wire Length	0.1 / 0.32	m / ft
Output Connector	MC4	
Output Wire Length	(-) 2.3, (-) 0.10 / (+) 7.54, (-) 0.32	m / ft
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 208V Grid	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440	8	10	18	
Maximum String Length (Power Optimizers)		25		50(5)	
Maximum Nominal Power per String(6)		5700 (6000 with SF7600-US - SF11400-US)	6000(6)	12750(7)	W
Parallel Strings of Different Lengths or Orientations		Yes			

(4) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement
(5) If the inverter's rated AC power is the 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-app-consn-note.pdf
(6) For the 208V grid: it is allowed to install up to 7,800W per string, two minimum string count are required and up to 7,200W without minimum string count. The maximum power difference between each string is 1,000W
(7) 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
(8) It is not allowed to mix S series and P series Power Optimizers in new installations



RoHS

Intertek

DOCUMENT CONTROL	DATE	sCAD	eCAD
ISSUED FOR PERMIT	10-04-23	EF	DM

REV	DESCRIPTION	DATE	sCAD	eCAD

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CUSTOMER: MICHAEL ALLEN

PROJECT ADDRESS: 227 SW BELLFLOWER DR, LAKE CITY FL 32024

PARCEL NUMBER: 03-4S-16-02731-021

SHEET NAME: SMART MONITORING DATA SHEET

PROJECT ID: TSP165401

ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE

DATE: 10-03-23

SHEET TITLE: D-2

INVERTERS

Single Phase Inverter with HD-Wave Technology

for North America

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

12-25 YEAR WARRANTY

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, NEC 2017 and NEC 2020 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	600kΩ 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 SolarEdge support
(2) A higher current source may be used; the inverter will limit its input current to the values stated

Single Phase Inverter with HD-Wave Technology

for North America

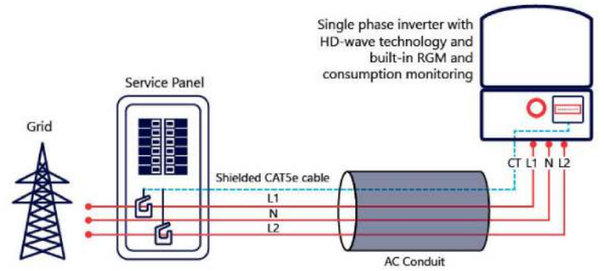
SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US/ SE7600H-US / SE10000H-US / SE11400H-US

MODEL NUMBER	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
ADDITIONAL FEATURES								
Supported Communication Interfaces	RS485, Ethernet, ZigBee (optional), Cellular (optional)							
Revenue Grade Metering, ANSI C12.20	Optional[3]							
Consumption metering								
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection							
Rapid Shutdown - NEC 2014, NEC 2017 and NEC 2020, 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	1" Maximum / 14-6 AWG						1" Maximum /14-4 AWG	
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1-2 strings / 14-6 AWG						1" Maximum / 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 / -40 to +60[4]							°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)							

(3) Inverter with Revenue Grade Meter P/N: SExxxH-US000BNC4; Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxH-US000BNI4 . For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box
(4) Full power up to at least 50°C / 122°F; for power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf

How to Enable Consumption Monitoring

By simply wiring current transformers through the inverter's existing AC conduits and connecting them to the service panel, homeowners will gain full insight into their household energy usage helping them to avoid high electricity bills



RoHS

DOCUMENT CONTROL		DATE	sCAD	eCAD
ISSUED FOR PERMIT		10-04-23	EF	DM
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SHEET NAME: INVERTER DATA SHEET

PROJECT ID: TSP165401

ENGINEER OF RECORD: ENG. RAFAEL A. GONZALEZ SOTO, PE

DATE: 10-03-23

SHEET TITLE: D-3