



**Architectural Review Board Application
Full Board Review**

Application Date: _____

Project Address: _____

Applicant: _____

Applicant's Address: _____

Email: _____ Phone: _____

Property Owner: _____
(If different from Applicant)

District: **PHD** **NHPD** **OEHPD** **PHBD** **GCD**

Application is hereby made for the project as described herein:

- Residential Homestead – \$50.00 hearing fee
- Commercial/Other Residential – \$250.00 hearing fee

** An application shall be scheduled to be heard once all required materials have been submitted and it is deemed complete by the Secretary to the Board. You will need to include fourteen (14) copies of the required information. Please see pages 3 – 4 of this application for further instruction and information.*

Project specifics/description:

Install and activate solar panel array and associated electrical connectivity for grid tie system per

stamped engineering plans. Property included in Pensacola historical district. Submitting for

ARB review and approval. Please see attached engineering packet. **Thank you.**

I, the undersigned applicant, understand that payment of these fees does not entitle me to approval and that no refund of these fees will be made. I have reviewed the applicable zoning requirements and understand that I must be present on the date of the Architectural Review Board meeting.

Doug Nix

Applicant Signature

Date



Scott E. Wyssling, PE, PP, CME

Wyssling Consulting
76 North Meadowbrook Drive
Alpine, UT 84004
office (201) 874-3483
swyssling@wysslingconsulting.com

July 14, 2020

Jacob Humpherys, COO
Meraki Solutions
30700 Wekiva River Road
Sorrento, FL 32776

Scott E
Wyssling

Digitally signed by Scott E Wyssling
DN: C=US, S=Utah, L=Alpine, O=Wyssling
Consulting, CN=Scott E Wyssling +
E=swyssling@wysslingconsulting.com
Reason: I am the author of this document
Location: your signing location here
Date: 2020-07-14 15:20:33
Foxit PhantomPDF Version: 9.7.1

Re: Engineering Services
Carver Residence
434 East Intendencia Street, Pensacola, FL
10.000 kW System

Dear Mr. Humphreys:

Pursuant to your request, we have reviewed the following information regarding solar panel installation on the roof of the above referenced home:

1. Site Visit/Verification Form prepared by a Meraki Solutions representative identifying specific site information including size and spacing of rafters for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information was prepared by Meraki Solutions and will be utilized for approval and construction of the proposed system.
3. Photographs of the interior and exterior of the roof system identifying existing structural members and their conditions.

Based on the above information we have evaluated the structural capacity of the existing roof system to support the additional loads imposed by the solar panels and have the following comments related to our review and evaluation:

Description of Residence:

The existing residence is typical wood framing construction with the roof system consisting of truss system with all chords constructed of 2 x 4 dimensional lumber at 24" on center. The attic space is unfinished and photos indicate that there was free access to visually inspect the size and condition of the roof rafters. All wood material utilized for the roof system is assumed to be Doug-Fir #2 or better with standard construction components. The existing roofing material consists of metal roofing. Photos of the dwelling also indicate that there is a permanent foundation.

A. Loading Criteria Used

- 160 MPH wind loading based on ASCE 7-10 Exposure Category "B" at a slope of 25 degrees
- 7 PSF = Dead Load roofing/framing Live Load = 20 PSF/ 0 PSF(where panels are installed)
- 3 PSF = Dead Load solar panels/mounting hardware

Total Dead Load =10 PSF

The above values are within acceptable limits of recognized industry standards for similar structures in accordance with the (FBC 2017, 6th Edition). Analysis performed of the existing roof structure utilizing the above loading criteria indicates that the existing rafters will support the additional panel loading without damage, if installed correctly.

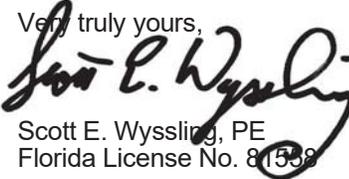
B. Solar Panel Anchorage

1. The solar panels shall be mounted in accordance with the most recent "S-5 *Installation Manual*", which can be found on the S-5 website (<http://s-5.com/>). If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
2. System will be attached to the metal roofing material utilizing the patented S-5 connection. Installation of the connections shall be in accordance with the manufacturer's recommendations.
3. Considering the roof slopes, the size, spacing, condition of roof, the panel supports shall be placed no greater than 48" o/c.

Based on the above evaluation, it is the opinion of this office that with appropriate panel anchors being utilized the roof system will adequately support the additional loading imposed by the solar panels. This evaluation is in conformance with the FBC 2017, 6th Edition, current industry and standards, and based on information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,



Scott E. Wyssling, PE
Florida License No. 81558



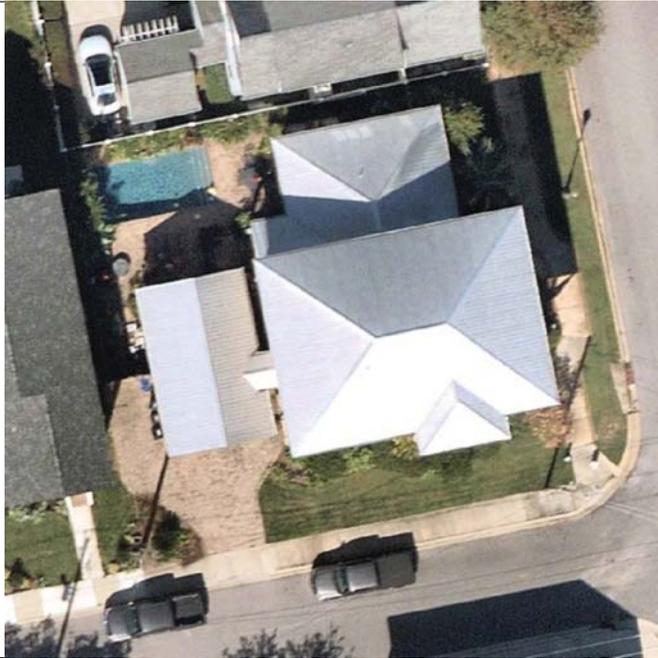


CONTRACTOR INFORMATION:
 Meraki Installers
 484-663-3792
 21 N New Warrington Rd
 Pensacola, FL 32507
 License # CVC57044

SITE INFORMATION:
 Ann Carver
 434 E Intendencia St, Pensacola, FL 32502
 MAX CONTINUOUS AC SYSTEM SIZE: 10 kW AC
 DC SYSTEM SIZE: 11.7 kW DC
 Lat, Long: 30.411871, -87.206424
 (36) Trinasolar 325 TSM-DD06M.05(II) PV MODULES
 (1) SolarEdge SE10000H-US (240V) INVERTER(S)

DATE: July 10, 2020
 PAGE: PV01 SHEET NAME: COVER PAGE
 DRAWN BY: SoloCAD

AERIAL VIEW:



STREET VIEW:



SHEET INDEX:

- PV01 COVER PAGE
- PV02 PROPERTY PLAN
- PV03 ROOF PLAN
- PV04 ROOF ATTACHMENTS + BOM
- PV05 MOUNTING DETAIL
- PV06 ELECTRICAL DIAGRAM
- PV07 LABELS
- PV08 PLACARD
- PV09 SITE PHOTOS



GENERAL NOTES:

1. INSTALLATION OF SOLAR PHOTOVOLTAIC SYSTEM SHALL BE IN ACCORDANCE WITH NEC ARTICLE 690, AND ALL OTHER APPLICABLE NEC CODES WHERE NOTED OR EXISTING.
2. PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL COMPLY WITH NEC ARTICLE 110.
3. ALL WIRES, INCLUDING THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE IN ACCORDANCE WITH NEC ARTICLE 250
4. THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE; THIS SYSTEM IS UTILITY INTERACTIVE PER UL 1741 AND DOES NOT INCLUDE STORAGE BATTERIES OR OTHER ALTERNATIVE STORAGE SOURCES.
5. ALL DC WIRES SHALL BE SIZED ACCORDING TO [NEC 690.8]
6. DC CONDUCTORS SHALL BE WITHIN PROTECTED RACEWAYS IN ACCORDANCE WITH [NEC 690.31]
7. ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL JURISDICTIONAL BUILDING CODE.

DESCRIPTION OF DESIGN:

INSTALLATION OF GRID -TIED, UTILITY INTERACTIVE PHOTOVOLTAIC SYSTEM

EQUIPMENT:

MAX CONTINUOUS AC SYSTEM SIZE: 10 kW AC
 DC SYSTEM SIZE: 11.7 kW DC
 PV MODULES: (36) Trinasolar 325 TSM-DD06M.05(II)
 INVERTER(S): (1) SolarEdge SE10000H-US (240V)
 RACKING: IRONRIDGE XR FLUSH MOUNT RAILING & ROOF ATTACHMENT SYSTEM

APPLICABLE GOVERNING CODES:

- 2014 NATIONAL ELECTRIC CODE [NEC]
- 2015 INTERNATIONAL BUILDING CODE [IBC]
- 2015 INTERNATIONAL RESIDENTIAL CODE [IRC]
- 2015 INTERNATIONAL FIRE CODE [IFC]

SITE SPECIFICATIONS:

OCCUPANCY: R-3
 ZONING: RESIDENTIAL
 EXPOSURE CATEGORY: B



CONTRACTOR INFORMATION:

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 Pensacola, FL 32507
 License # CVC57044



EQUIPMENT LEGEND:

- UTILITY METER
- MAIN SERVICE PANEL
- VISIBLE, LOCKABLE, LABELED AC DISCONNECT
- METER SOCKET (FOR UTILITY PV METER)
- INVERTER
- COMBINER BOX
- LOAD CENTER
- FIRE ACCESS PATHWAY (3' TYP)
- PROPERTY LINE
- BATTERY (IES)

SITE INFORMATION:

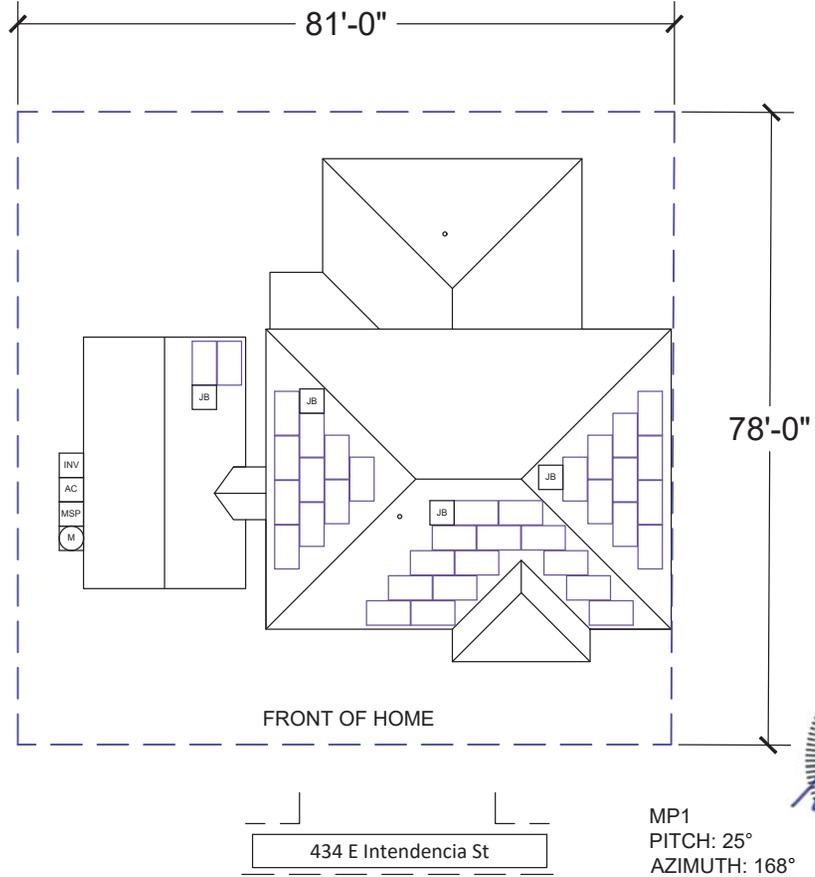
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 (1) SolarEdge SE1000H-US (240V) INVERTER(S)

DATE: July 10, 2020

PAGE: PV02 SHEET NAME: PROPERTY PLAN

DRAWN BY: SoloCAD SCALE: 1" = 15.24'

VISIBLE, LOCKABLE, LABELED AC DISCONNECT LOCATED WITHIN 10' OF UTILITY METER





CONTRACTOR INFORMATION:

Meraki Installers
 484-663-3792
 21 N New Warrington Rd
 Pensacola, FL 32507
 License # CYC57044

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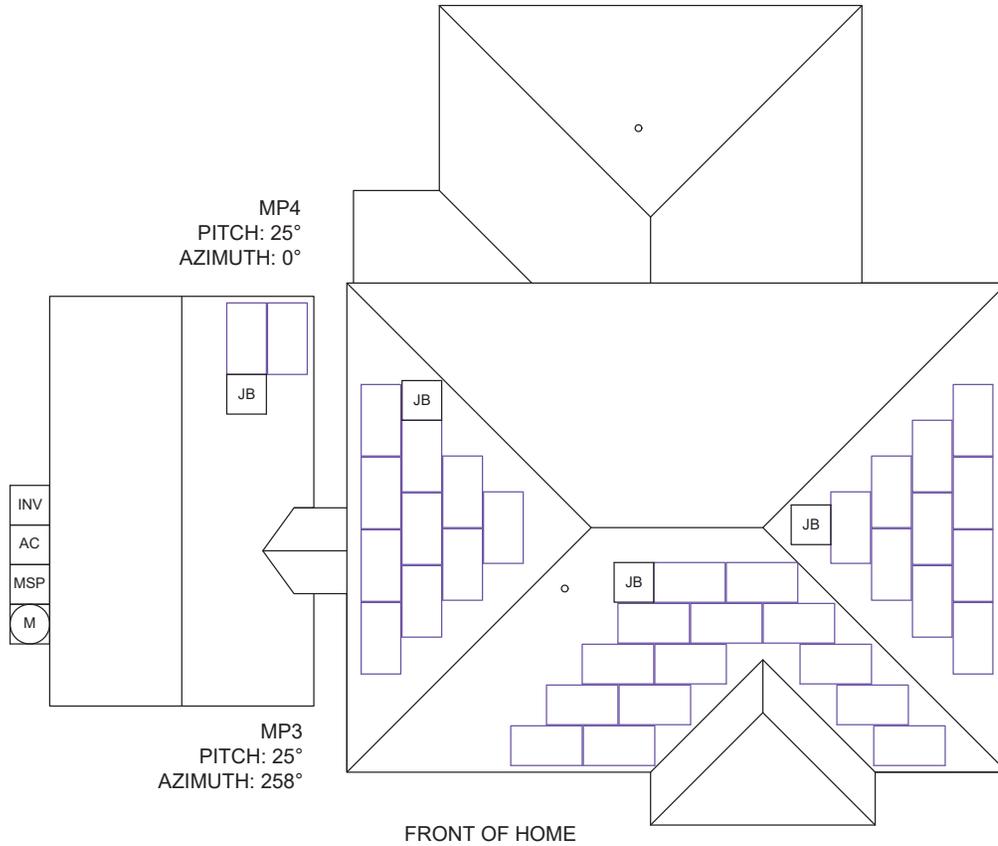
PAGE: PV03 SHEET NAME: ROOF PLAN

DRAWN BY: SoloCAD

EQUIPMENT LEGEND:

- UTILITY METER
- MAIN SERVICE PANEL
- VISIBLE, LOCKABLE, LABELED AC DISCONNECT
- METER SOCKET (FOR UTILITY PV METER)
- INVERTER
- COMBINER BOX
- LOAD CENTER
- FIRE ACCESS PATHWAY (3' TYP)
- BATTERY (IES)

VISIBLE, LOCKABLE,
 LABELED AC DISCONNECT
 LOCATED WITHIN 10'
 OF UTILITY METER



MP2
 PITCH: 25°
 AZIMUTH: 78°

MP1
 PITCH: 25°
 AZIMUTH: 168°





CONTRACTOR INFORMATION:

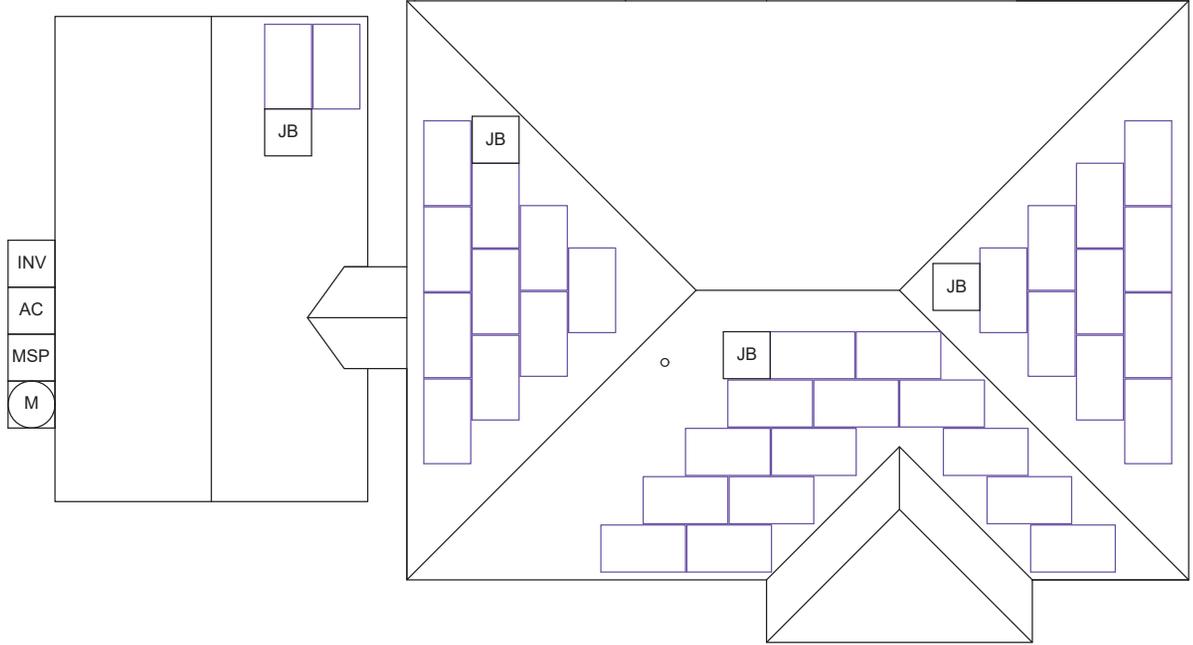
Meraki Installers
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DATE: July 10, 2020

PAGE: PV04 SHEET NAME: ROOF ATTACHMENTS + BOM
 DRAWN BY: SoloCAD



PHOTOVOLTAIC ARRAY STRUCTURAL CRITERIA:		MOUNTING EQUIPMENT QTY:		FRAMING INFO:	
ROOF ATTACHMENT COUNT:	118	ROOF ATTACHMENT COUNT:	(118)	RAFTER SIZE:	2x4
PV MODULE COUNT:	36	PV MODULE COUNT:	(36)	RAFTER SPACING:	24"
ARRAY AREA:	MODULE COUNT * 18.06ft ² = 650.16	MID CLAMP COUNT:	(36)	FRAMING TYPE:	Manufactured Truss
ROOF AREA:	2635 ft ²	END CLAMP QTY:	(72)		
PERCENT OF ROOF COVERED:	25%	SPLICE COUNT:	(4)		
ARRAY WEIGHT:	MODULE COUNT * 50lbs = 1800	ATTACHMENT SPACING:	48		
DISTRIBUTED LOAD:	ARRAY LBS/ATTACHMENTS = 15.25				
POINT LOAD: (lbs/ft ²)	(ARRAY) WEIGHT/AREA = 2.77 lbs/ft ²				

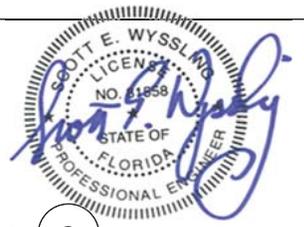
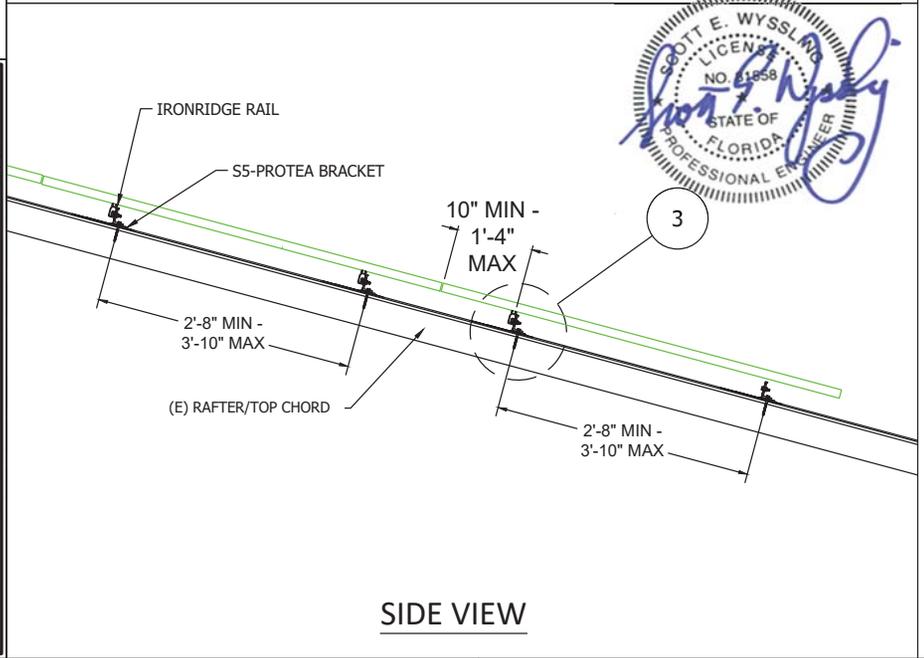
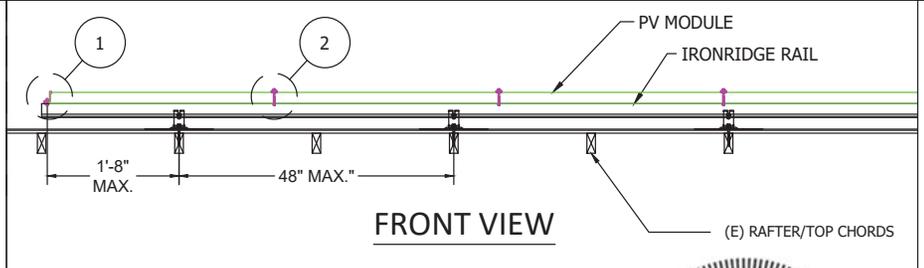
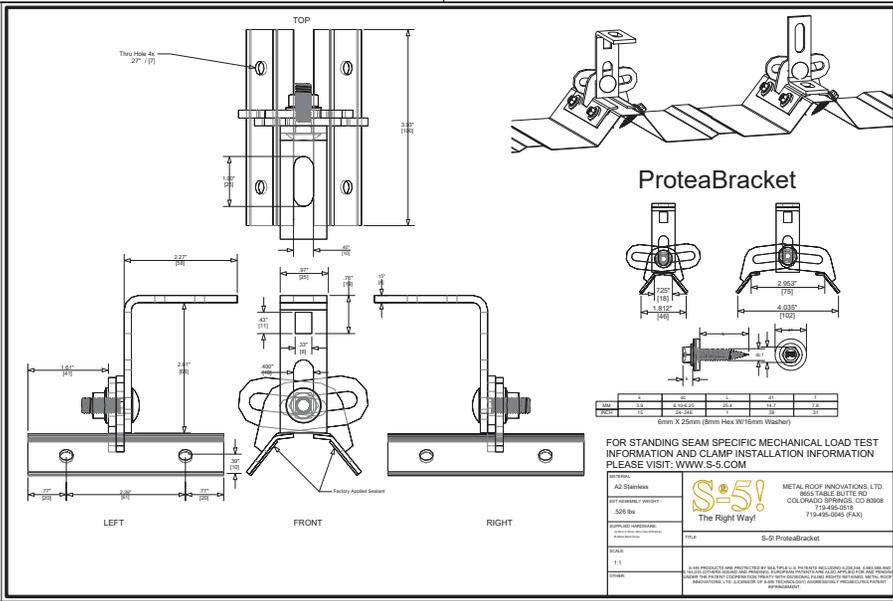
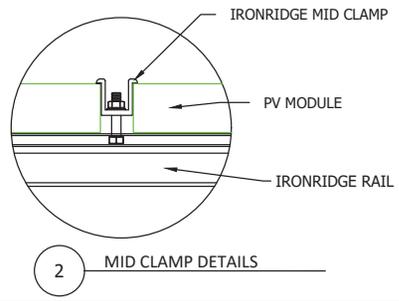
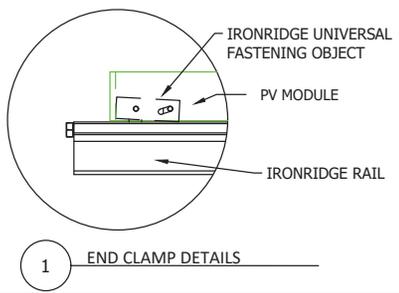


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DATE: July 10, 2020

PAGE: PV05 SHEET NAME: MOUNTING DETAIL
 DRAWN BY: SoloCAD



PHOTOVOLTAIC ARRAY STRUCTURAL CRITERIA:

ROOF ATTACHMENT COUNT:	118
PV MODULE COUNT:	36
ARRAY AREA:	MODULE COUNT * 18.06ft ² = 650.16
ROOF AREA:	2635 ft ²
PERCENT OF ROOF COVERED:	25%
ARRAY WEIGHT:	MODULE COUNT * 50lbs = 1800
DISTRIBUTED LOAD:	ARRAY LBS/ATTACHMENTS = 15.25
POINT LOAD: (lbs/ft ²)	(ARRAY) WEIGHT/AREA = 2.77 lbs/ft ²

MOUNTING EQUIPMENT QTY:

ROOF ATTACHMENT COUNT:	(118)
PV MODULE COUNT:	(36)
MID CLAMP COUNT:	(36)
END CLAMP QTY:	(72)
SPLICE COUNT:	(4)
ATTACHMENT SPACING:	48

FRAMING INFO:

RAFTER SIZE:	2x4
RAFTER SPACING:	24"
FRAMING TYPE:	Manufactured Truss



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SITE INFORMATION:

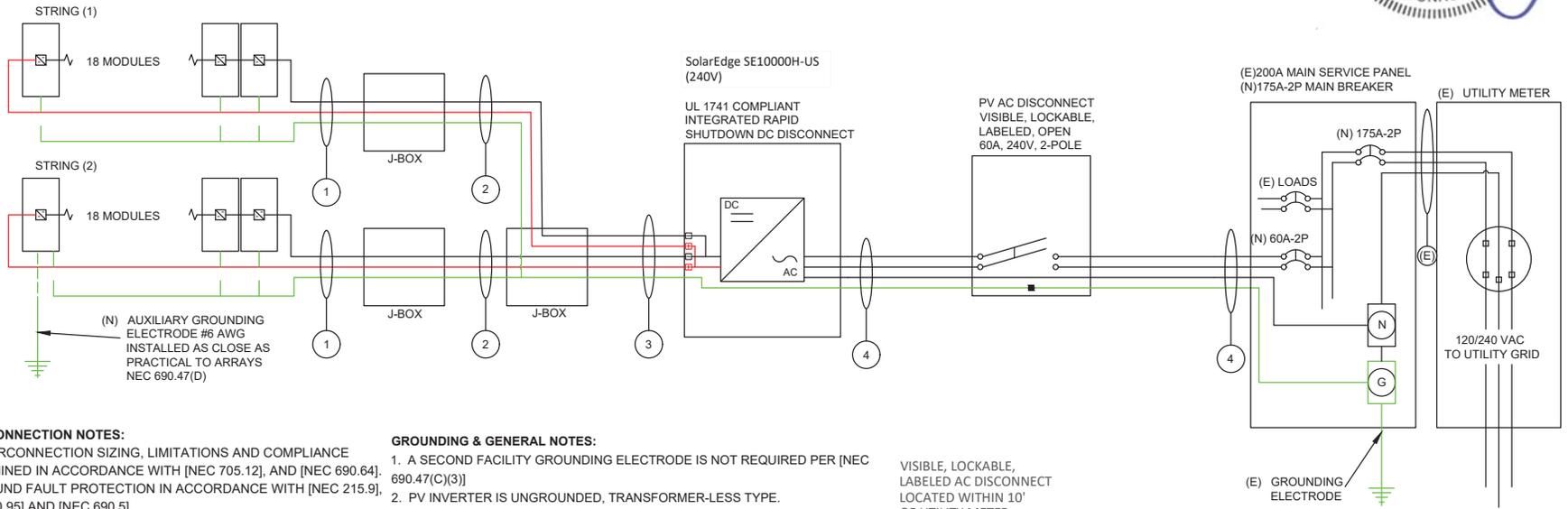
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DATE: July 13, 2020

PAGE: PV06 SHEET NAME: ELECTRICAL DIAGRAM
DRAWN BY: SoloCAD

WIRE SCHEDULE

1	(2) PV-WIRE - 10 AWG, USE-2, COPPER (OR CODE APPROVED EQUIVALENT) (1) 6 AWG BARE, COPPER (GROUND)	2	(1) 10 AWG THWN-2, or THHN, or 10/2 NM-B COPPER - (POSITIVE) (1) 10 AWG THWN-2, or THHN, or 10/2 NM-B COPPER - (NEGATIVE) (1) 10 AWG THWN-2, or THHN, or 10/2 NM-B COPPER - (GROUND) (1) 3/4" LIQUID TIGHT OR EMT OR FMC (OR CODE APPROVED EQUIVALENT)	3	(2) 10 AWG THHN/THWN-2, COPPER - (POSITIVE) (2) 10 AWG THHN/THWN-2 COPPER - (NEGATIVE) (1) 10 AWG THHN/THWN-2 (GROUND) CONDUIT: 3/4" LIQUID TIGHT OR EMT (OR CODE APPROVED EQUIVALENT)	4	(1) 6 AWG THWN-2 COPPER - (L1) (1) 6 AWG THWN-2 COPPER - (L2) (1) 6 AWG THWN-2 COPPER - (NEUTRAL) (1) 10 AWG THWN-2 COPPER - (GROUND) (1) CONDUIT: 3/4" LIQUID TIGHT OR EMT (OR CODE APPROVED EQUIVALENT)
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INTERCONNECTION NOTES:

- INTERCONNECTION SIZING, LIMITATIONS AND COMPLIANCE DETERMINED IN ACCORDANCE WITH [NEC 705.12], AND [NEC 690.64].
- GROUND FAULT PROTECTION IN ACCORDANCE WITH [NEC 215.9], [NEC 230.95] AND [NEC 690.5]
- ALL EQUIPMENT TO BE RATED FOR BACKFEEDING.
- PV BREAKER TO BE POSITIONED AT THE OPPOSITE END OF THE BUSBAR RELATIVE TO THE MAIN BREAKER.

DISCONNECT NOTES

- DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
- AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH

GROUNDING & GENERAL NOTES:

- A SECOND FACILITY GROUNDING ELECTRODE IS NOT REQUIRED PER [NEC 690.47(C)(3)]
- PV INVERTER IS UNGROUNDED, TRANSFORMER-LESS TYPE.
- DC GEC AND AC EGC TO REMAIN UNSPLICED, OR SPLICED TO EXISTING ELECTRODE
- ANY EXISTING WIRING INVOLVED WITH PV SYSTEM CONNECTION THAT IS FOUND TO BE INADEQUATE PER CODE SHALL BE CORRECTED PRIOR TO FINAL INSPECTION.
- JUNCTION BOX QUANTITIES, AND PLACEMENT SUBJECT TO CHANGE IN THE FIELD - JUNCTION BOXES DEPICTED ON ELECTRICAL DIAGRAM REPRESENT WIRE TYPE TRANSITIONS.
- AC DISCONNECT NOTED IN EQUIPMENT SCHEDULE OPTIONAL IF OTHER AC DISCONNECTING MEANS IS LOCATED WITHIN 10' OF SERVICE DISCONNECT.

VISIBLE, LOCKABLE, LABELED AC DISCONNECT LOCATED WITHIN 10' OF UTILITY METER

EQUIPMENT SCHEDULE:

TYPE:	QTY:	DESCRIPTION:	RATING:
MODULES:	(36)	Trinasolar 325 TSM-DD06M.05(II)	325 W
INVERTERS:	(1)	SolarEdge SE10000H-US (240V)	10000 W
AC DISCONNECT(S):	(1)	PV AC DISCONNECT, 240V, 2-POLE	60 A
DC OPTIMIZERS:	(36)	SolarEdge P370	15 Adc



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DATE: July 13, 2020
 PAGE: PV07 SHEET NAME: LABELS
 DRAWN BY: SoloCAD

WARNING
ELECTRIC SHOCK HAZARD
 THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

LABEL 1
 AT EACH JUNCTION BOX, COMBINER BOX, DISCONNECT, AND DEVICE WHERE ENERGIZED UNGROUNDED CONDUCTORS MAY BE EXPOSED DURING SERVICE.
 NEC. 690.35(F)

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

LABEL 2
 FOR PV DISCONNECTING MEANS WHERE ALL TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION.
 NEC 690.17(E), NEC 705.22

PHOTOVOLTAIC SYSTEM
AC DISCONNECT
 RATED AC OUTPUT CURRENT 42 A
 NOMINAL OPERATING AC VOLTAGE 240 V

LABEL 3
 AT POINT OF INTERCONNECTION, MARKED AT AC DISCONNECTING MEANS.
 NEC 690.54, NEC 690.13 (B)

WARNING
DUAL POWER SUPPLY
 SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL 4
 AT POINT OF INTERCONNECTION FOR EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUSBAR OR CONDUCTOR SUPPLIED FROM MULTIPLE SOURCES, EACH SERVICE EQUIPMENT AND ALL ELECTRIC POWER PRODUCTION SOURCE LOCATIONS.
 NEC 705.12(D)(3)

WARNING: PHOTOVOLTAIC POWER SOURCE

WARNING
INVERTER OUTPUT CONNECTION
 DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL 5
 AT DIRECT-CURRENT EXPOSED RACEWAYS, CABLE TRAYS, COVERS AND ENCLOSURES OF JUNCTION BOXES, AND OTHER WIRING METHODS; SPACED AT MAXIMUM 10FT SECTION OR WHERE SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.
 NEC 690.31(G)(3&4)

PHOTOVOLTAIC SYSTEM
EQUIPPED WITH RAPID SHUTDOWN

LABEL 6
 PLACED ADJACENT TO THE BACK-FED BREAKER FROM THE INVERTER IF TIE IN CONSISTS OF LOAD SIDE CONNECTION TO BUSBAR.
 NEC 705.12(D)(2)(3)(B)

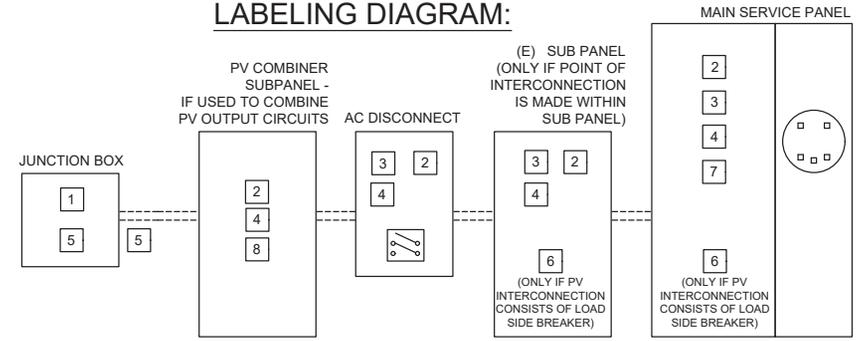
WARNING
 THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR.

LABEL 7
 SIGN LOCATED AT UTILITY SERVICE EQUIPMENT.
 NEC 690.56(C)

LABEL 8 (ONLY IF 3 OR MORE SUPPLY SOURCES TO A BUSBAR)
 SIGN LOCATED AT LOAD CENTER IF CONTAINING 3 OR MORE POWER SOURCES.
 NEC 705.12(D)(2)(3)(C)

- LABELING NOTES:**
- LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
 - LABELING REQUIREMENTS BASED ON THE 2014 NATIONAL ELECTRIC CODE, OSHA STANDARD 19010.145, ANSI Z535.
 - MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
 - LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED [NEC 110.21]
 - LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8", WHITE ON RED BACKGROUND; REFLECTIVE, AND PERMANENTLY AFFIXED [IFC 605.11.1.1]

LABELING DIAGRAM:



** ELECTRICAL DIAGRAM SHOWN ABOVE IS FOR LABELING PURPOSES ONLY. NOT AN ACTUAL REPRESENTATION OF EQUIPMENT AND CONNECTIONS TO BE INSTALLED. LABEL LOCATIONS PRESENTED MAY VARY DEPENDING ON TYPE OF INTERCONNECTION METHOD AND LOCATION PRESENTED ELECTRICAL DIAGRAM PAGE. **



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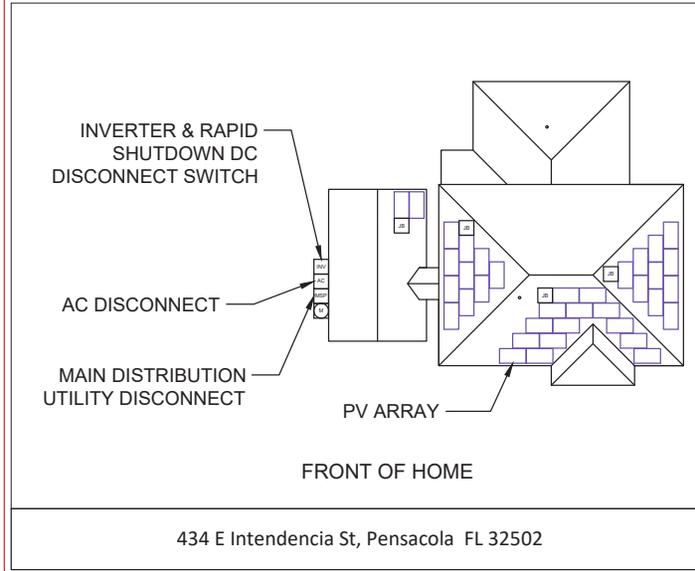
DATE: July 10, 2020

PAGE: PV08 SHEET NAME: PLACARD

DRAWN BY: SoloCAD

CAUTION

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



DIRECTORY

PERMANENT PLAQUE OR DIRECTORY PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM.

(ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS OUTLINED WITHIN: NEC 690.56(B)&(C), [NEC 705.10])



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DATE: July 10, 2020
 PAGE: PV09 SHEET NAME: SITE PHOTOS
 DRAWN BY: SoloCAD



HoneyBlack^M

TSM-DD06M.05(II)



120 HALF-CUT MONOCRYSTALLINE CELLS

310-340W POWER OUTPUT RANGE

19.9% MAXIMUM EFFICIENCY

0/+5W POSITIVE POWER TOLERANCE

Founded in 1997, Trina Solar is the world's leading comprehensive solutions provider for solar energy. We believe close cooperation with our partners is critical to success. Trina Solar now distributes its PV products to over 60 countries all over the world. Trina Solar is able to provide exceptional service to each customer in each market and supplement our innovative, reliable products with the backing of Trina Solar as a strong, bankable partner. We are committed to building strategic, mutually beneficial collaboration with installers, developers, distributors and other partners.

Comprehensive Product And System Certificates

- IEC61215/IEC61730/UL1703
- IEC61701 Salt Mist Corrosion
- IEC62716 Ammonia Corrosion
- IEC60068 Blowing Sand
- ISO9001, ISO14001, OHSAS18001



High power output

- Multi busbar technology combined with mono PERC cells
- Maximize limited space with up to 199 W/m² power density



Outstanding visual appearance

- Ideal for residential rooftop application
- Designed with aesthetics in mind
- Ultra-thin, virtually invisible busbars



Half-cut cell design brings higher efficiency

- Low thermal coefficients for higher energy yield at elevated operating temperatures
- Reduced interconnection losses



Highly reliable due to stringent quality control

- Over 30 in-house tests (UV, TC, HF, and many more)
- In-house testing goes well beyond certification requirements
- PID resistant
- 2x 100% inline EL inspection



Certified to withstand challenging environmental conditions

- Salt Mist Corrosion
- Ammonia Corrosion
- Blowing Sand

LINEAR PERFORMANCE WARRANTY

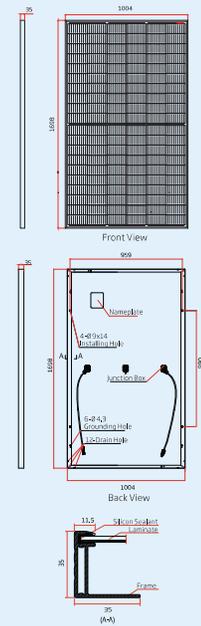
10 Year Product Warranty • 25 Year Linear Power Warranty



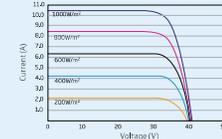
HoneyBlack^M

TSM-DD06M.05(II)

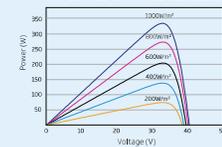
DIMENSIONS OF PV MODULE
TSM-DD06M.05(II) (unit: mm)



I-V CURVES OF PV MODULE (335W)



P-V CURVES OF PV MODULE (335W)



ELECTRICAL DATA @ STC	TSM-310	TSM-315	TSM-320	TSM-325	TSM-330	TSM-335	TSM-340
Peak Power Watts-P _{max} (Wp)*	310	315	320	325	330	335	340
Power Output Tolerance-P _{max} (W)	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5
Maximum Power Voltage-U _{mp} (V)	33.0	33.2	33.4	33.6	33.8	34.0	34.2
Maximum Power Current-I _{mp} (A)	9.40	9.49	9.58	9.67	9.76	9.85	9.94
Open Circuit Voltage-U _{oc} (V)	39.9	40.1	40.3	40.4	40.6	40.7	41.1
Short Circuit Current-I _{sc} (A)	10.03	10.12	10.20	10.30	10.39	10.48	10.55
Module Efficiency η (%)	18.2	18.5	18.8	19.1	19.4	19.7	19.9

STC: Irradiance 1000 W/m², Cell Temperature 25 °C, Air Mass AM1.5
* Measuring tolerance: ±3%

ELECTRICAL DATA @ NMOT	TSM-310	TSM-315	TSM-320	TSM-325	TSM-330	TSM-335	TSM-340
Maximum Power-P _{max} (Wp)	234	238	241	245	249	253	256
Maximum Power Voltage-U _{mp} (V)	30.7	30.9	31.1	31.3	31.5	31.7	32.0
Maximum Power Current-I _{mp} (A)	7.62	7.69	7.75	7.84	7.90	7.96	8.02
Open Circuit Voltage-U _{oc} (V)	37.6	37.8	38.0	38.1	38.2	38.3	38.7
Short Circuit Current-I _{sc} (A)	8.09	8.14	8.23	8.31	8.38	8.45	8.50

NMOT: Irradiance 800 W/m², Ambient Temperature 20 °C, Wind Speed 1 m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline
Cell Orientation	120 cells (6 × 20)
Module Dimensions	1698 × 1004 × 35 mm
Weight	18.7 kg
Class	3.2 mm, High Transmission, AR Coated Heat Strengthened Glass
Encapsulant Material	EVA
Backsheet	Black
Frame	35 mm Anodized Aluminum Alloy
J-Box	IP 6B rated
Cables	Photovoltaic Cable 4.0mm ² , Portrait: N 140mm/P 285mm, Landscape: N 1200 mm/P 1200 mm
Connector	TS4

TEMPERATURE RATINGS

NMOT (Nominal Module Operating Temperature)	41°C (±3K)
Temperature Coefficient of P _{max}	-0.37%/K
Temperature Coefficient of U _{oc}	-0.29%/K
Temperature Coefficient of I _{sc}	0.05%/K

MAXIMUM RATINGS

Operational Temperature	-40 to +85°C
Maximum System Voltage	1000V DC (IEC)
Max Series Fuse Rating	20 A
Snow Load	5400 Pa (3600 Pa*)
Wind Load	2400 Pa (1600 Pa*)

* designed with safety factor 1.5 (DO NOT connect Fuse in Combiner Box with two or more strings in parallel connection)

PACKAGING CONFIGURATION

Modules per box:	30 pieces
Modules per 40' container:	720 pieces

WARRANTY

- 10 year Product Workmanship Warranty
- 25 year Linear Performance Warranty

(Please refer to product warranty for details)

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

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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

12-25
YEAR
WARRANTY

INVERTERS



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



/ 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	
GFI 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							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	600µs 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 AFC according to T.L. M-07								
Grid Connection Standards	IEEE1547, Rule 21, Rule 14 (H)								
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				dB(A)	
Cooling	Natural Convection								
Operating Temperature Range	-13 to +140 / -25 to +60 ⁴⁾ (-40 ⁵⁾ / -40 ⁵⁾ 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: SE6000H-US000NVC2
⁴⁾ For power de-rating information refer to <https://www.solaredge.com/sites/default/files/ie-temperature-derating-ncde-na.pdf>
⁵⁾ -43 version P/N: SE6000H-US000NVC4

Power Optimizer

For North America

P320 / P340 / P370 / P400 / P405 / P505

POWER OPTIMIZER



PV power optimization at the module-level

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

solareedge.com



/ Power Optimizer For North America

P320 / P340 / P370 / P400 / P405 / 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)	P405 (for thin film modules)	P505 (for higher current modules)	
INPUT							
Rated Input DC Power ¹⁾	320	340	370	400	405	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	125 ²⁾	87 ³⁾	Vdc
MPPT Operating Range	8 - 48		8 - 60	8 - 80	12.5 - 105	12.5 - 87	Vdc
Maximum Short Circuit Current (Isc)		11			10.1	14	Adc
Maximum DC Input Current		13.75			12.5	17.5	Adc
Maximum Efficiency			99.5				%
Weighted Efficiency			98.8			98.6	%
Oversvoltage 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						
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 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	845 / 1.9	1064 / 2.3		gr / lb
Input Connector	Single or dual MC4 ⁴⁾						
Input Wire Length	0.16 / 0.52						
Output Wire Type / Connector	Double-Insulated / MC4						
Output Wire Length	0.9 / 2.95					1.2 / 3.9	
Operating Temperature Range	-40 - +85 / -40 - +185						
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 80V.
³⁾ For other connector types please contact SolarEdge.

PV System Design Using a SolarEdge Inverter ⁴⁾	Single Phase HD-Wave	Single phase	Three Phase 208V	Three Phase 480V	
Minimum String Length (Power Optimizers)	P320, P340, P370, P400	8	10	18	
	P405 / P505	6	13 (12 with SE3K)	14	
Maximum String Length (Power Optimizers)		25	25	50 ⁵⁾	
Maximum Power per String	5700 (6000 with SE7600-US - SE11400-US)	5250	6000 ⁶⁾	12750 ⁶⁾	W
Parallel Strings of Different Lengths or Orientations	Yes				

⁴⁾ For detailed string sizing information refer to: http://www.solareedge.com/sites/default/files/string_sizing_na.pdf
⁵⁾ It is not allowed to mix P405/P505 with P320/P340/P370/P400 in one string.
⁶⁾ A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.
⁷⁾ For SE5440/US/SE4320/US: It is allowed to install up to 15,000W per string when 3 strings are connected to the inverter (3 strings per unit for SE432K/US) and when the maximum power difference between the strings is up to 1,000W.
⁸⁾ For SE30K/US/SE333K/US/SE666K/US/SE100K/US: It is allowed to install up to 15,000W per string when 3 strings are connected to the inverter (3 strings per unit for SE666K/US/SE100K/US) and when the maximum power difference between the strings is up to 2,000W.

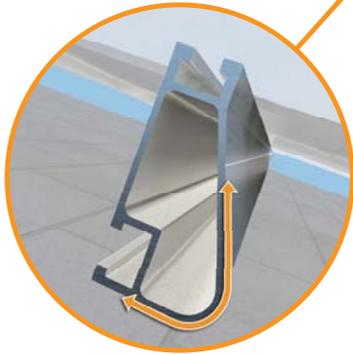
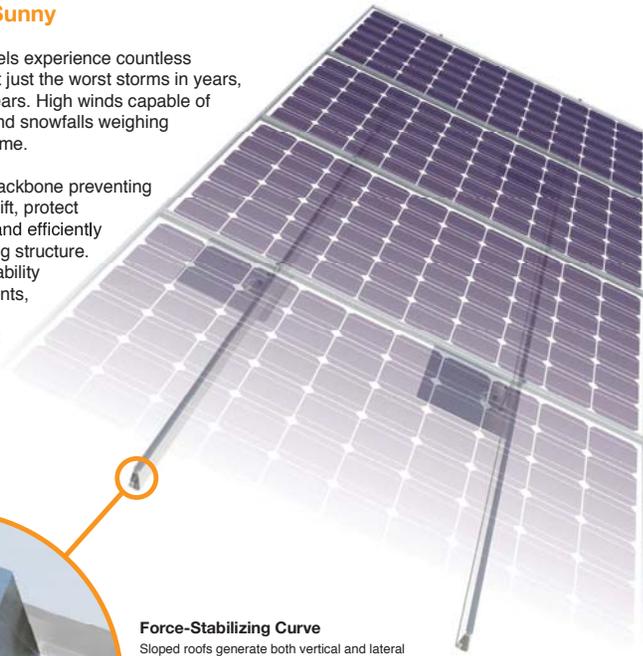


XR Rail Family

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.



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 6 foot spans, 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 8 feet.

- 8' 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 12 feet or more for commercial applications.

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

Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	100						
	120						
	140	XR10		XR100		XR1000	
	160						
10-20	100						
	120						
	140						
	160						
30	100						
	160						
40	100						
	160						
50-70	160						
80-90	160						



The right way to attach almost anything to metal roofs!

S-5![®]

The Right Way!

ProteaBracket™

ProteaBracket™ is the most versatile standing seam metal roof attachment solution on the market, fitting most trapezoidal sheet profiles with and without intermediate insulation. It features an adjustable attachment base and multiple solar module attachment options (illustrated on back) to accommodate varying widths and heights. There are no messy sealants to apply and no chance for leaks; the ProteaBracket comes with factory-applied, adhesive rubber sealant to ensure quick installation and a weather-proof fit.

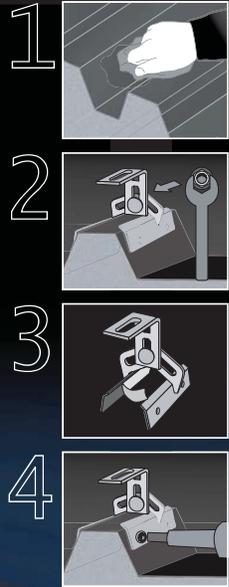
Installation is simple! The ProteaBracket is mounted directly onto the crown of the panel, straddling the profile. No surface preparation is necessary; simply wipe away excess oil and debris, align, and apply. Secure ProteaBracket through its pre-punched holes, using the hardened drill point S-5![®] screws.

ProteaBracket is the perfect match for our S-5-PV Kit and spares you the hassle of cold-bridging! For a solar attachment solution that is both economical and easy to use, choose ProteaBracket.*

*When ProteaBracket is used in conjunction with the S-5-PV Kit, an additional nut is required during installation.



S-5![®] ProteaBracket™ is a versatile bracket that adjusts easily to most trapezoidal roof profiles.



ProteaBracket™

888-825-3432 | www.S-5.com

S-5![®]

The Right Way!

ProteaBracket™ is the perfect solar attachment solution for most trapezoidal exposed-fastened metal roof profiles! No messy sealants to apply. The factory-applied adhesive rubber sealant weather-proofs and makes installation easy!

Each ProteaBracket™ comes with a factory-applied, adhesive rubber sealant on the base. A structural A2 stainless steel bimetal attachment bracket, ProteaBracket is compatible with most common metal roofing materials. All four pre-punched holes must be used to achieve tested strength. Mounting hardware is furnished with the ProteaBracket. For design assistance, ask your distributor, or visit www.S-5.com for the independent lab test data that can be used for load-critical designs and applications. Also, please visit our website for more information including metallurgical compatibilities and specifications. S-5![®] holding strength is unmatched in the industry.

Multiple Attachment Options:

Side Rail Option



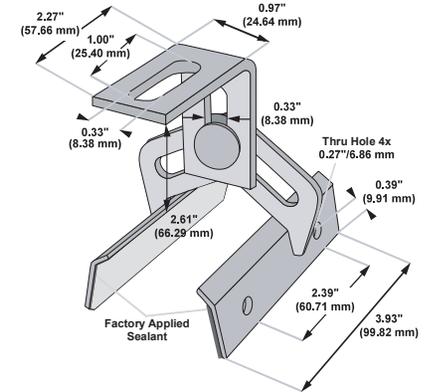
Top Rail Option



S-5-PV Kit Option



ProteaBracket™



Please note: All measurements are rounded to the second decimal place.

Example Applications



S-5-PV Kit demonstrated with a ProteaBracket on a trapezoidal profile.

Example Profile



S-5![®] Warning! Please use this product responsibly!

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