TABLE OF CONTENTS

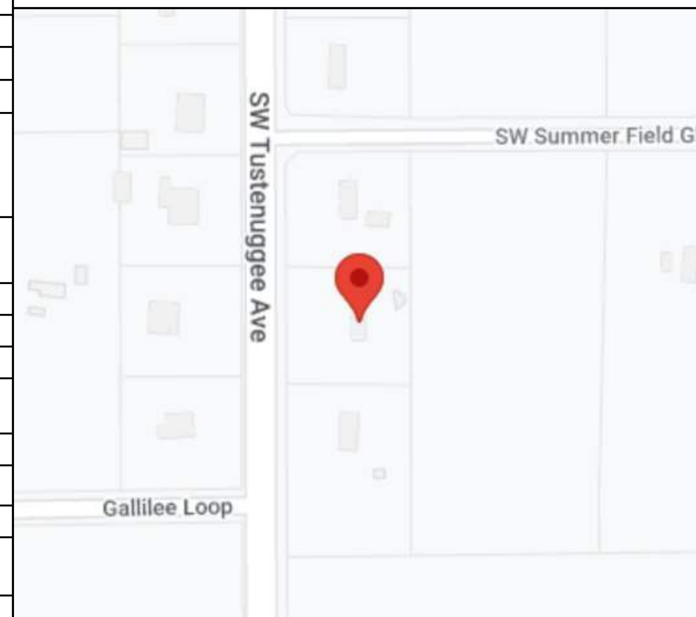
Arnold Vinyard

9325 Sw Tustenuggee Ave, LAKE CITY, FL 32024

APN: 325S1709477112

SYSTEM SIZE: 6970 DC

SYSTEM SIZE: 6000 AC



JURISDICTION STAMPS:

PROPERTY INFORMATION

OWNER:	Arnold Vinyard
PHONE:	1386-965-5846
EMAIL:	arnoldvinyard85@gmail.com
CONTRACTOR:	BETTER EARTH ELECTRIC INC.
PHONE:	(888) 373-9379
AUTHORITIES HAVING JURISDICTION	
BUILDING:	LAKE CITY (FL)
UTILITY:	CLAY ELECTRIC COOPERATIVE

DESIGN SPECIFICATIONS	
OCCUPANCY:	R-3/U
CONSTRUCTION:	V-B
NAME:	RESIDENTIAL
SNOW LOAD:	0 PSF
WIND EXPOSURE:	C
WIND SPEED:	156 MPH
ROOF SURFACE:	2073 SQ.FT.
PV SQ FOOTAGE:	359.05 SQ.FT.
PV COVERAGE:	17.32 %
WEIGHT OF EQUIPMENT:	810.73 LBS
WEIGHT PER ATTACHMENT:	25.34 LBS
DISTRIBUTED WEIGHT:	2.26 PSF
NO. OF STORIES:	1
FIRE SPRINKLERS:	NO

LOT INFORMATION	
APN:	325S1709477112
LOT AREA:	47044.8
LIVING AREA:	1248

PROJECT DETAILS

MODULE INFORMATION	
MODULE QTY:	17
MODULE MFG:	QCELLS NORTH AMERICA
MODULE TYPE:	Q.PEAK DUO BLK ML-G10+ 410

INVERTER INFORMATION	
INVERTER MFG:	SOLAREDGE
INVERTER QTY:	1
INVERTER MODEL:	6000H-US (ENERGY HUB)
INVERTER TYPE:	RGM
INVERTER VOLTAGE:	240V

POWER OPTIMIZER INFORMATION	
OPTIMIZER QTY:	17
OPTIMIZER MFG:	SOLAREDGE
OPTIMIZER TYPE:	S500

MOUNTING INFORMATION	
MOUNT FLASHING QTY:	32
MOUNT FLASHING MFG:	UNIRAC
MOUNT FLASHING TYPE:	S-5! VERSABRACKET

RAILING INFORMATION	
RAILING MFG:	UNIRAC
RAILING TYPE:	UNIRAC SM LIGHT

ENERGY STORAGE SYSTEM INFORMATION - N/A

EXISTING SOLAR INFORMATION - N/A

ADDITIONAL SCOPE OF WORK

MAIN PANEL UPGRADE: N/A

DERATE MAIN BREAKER: N/A

UPSIZE MAIN BREAKER: N/A

EV CHARGER: N/A

ESS: N/A

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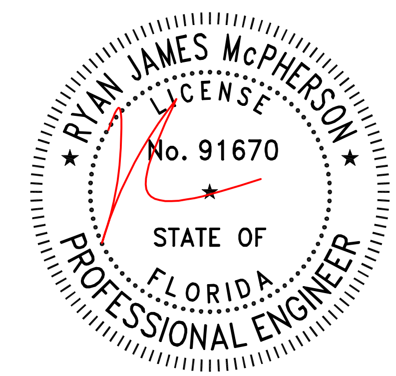

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INSTALLER NOTES:

better earth

BETTER EARTH ELECTRIC INC.
4040 N COMBEE ROAD, STE. 12
LAKELAND, FL 33805

PHONE #: (888) 373-9379
LIC #: 13011324

NEW PV SYSTEM: 6970W DC / 6000W AC

Arnold Vinyard
9325 Sw Tustenuggee Ave, LAKE CITY, FL 32024
APN: 325S1709477112

DRAWING TITLE: COVER SHEET

DRAWING PAGE: 001 CS

DATE: 5/21/2024 | TIME: 01:24 PM | DESIGNER: TAYLOR BICKFORD | DESIGNER SIGNATURE: | SCALE:

GENERAL NOTES

1. THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE 2020 NATIONAL ELECTRIC CODE (NEC) ARTICLE 690, ALL MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES
2. THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION
3. ALL PV SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC 690.4: PV MODULES: UL1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE INVERTERS: UL 1741 CERTIFIED, IEEE 1547, 929, 519 COMBINER BOX(ES): UL 1703 OR UL 1741 ACCESSORY
4. NEC REFERS SPECIFICALLY TO "UNGROUNDED" PV SYSTEMS. ALSO DESIGNATED AS "TRANSFORMERLESS" BY INVERTER MANUFACTURERS AND "NON-ISOLATED" BY UNDERWRITERS LABORATORY
5. INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE LISTED FOR THIS USE
6. AS SPECIFIED BY THE AHJ, EQUIPMENT USED IN UNGROUNDED SYSTEMS LABELED ACCORDING TO NEC
7. MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7
8. ALL INVERTERS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4 (D). SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING [NEC 110.3]
9. ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ
10. SOLAR PV MODULES (PANELS) CANNOT BE INSTALLED OVER OR BLOCK ANY ATTIC VENTS, PLUMBING VENTS, FURNACE OR WATER HEATER VENTS ETC
11. ALL CONDUCTORS OF A CIRCUIT, INCLUDING THE EGC, MUST BE INSTALLED IN THE SAME RACEWAY OR CABLE, OR OTHERWISE RUN WITH THE PV ARRAY CIRCUIT CONDUCTORS WHEN THEY LEAVE THE VICINITY OF THE PV ARRAY
12. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE. GROUND MOUNTED SYSTEMS, WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF OF THE ROOF SURFACE

JURISDICTION NOTES

Ryan J McPherson

RYAN JAMES McPHERSON
LICENSE
No. 91670
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

EXP. 2/28/25

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ELECTRICAL NOTES

1. PV SOURCE CIRCUIT(S) ARE TO BE SUNLIGHT-RESISTANT PV-WIRE AS PERMITTED BY CEC 690.31(B).
2. ALL DIRECT CURRENT CIRCUITS ARE TO BE INSTALLED IN METAL RACEWAY FROM THE POINT OF PENETRATION OF THE SURFACE OF THE BUILDING OR STRUCTURE TO THE MAIN SERVICE PANEL AS MANDATED BY NEC 690.31(E).
3. WEATHERPROOF J-BOX – NEMA 3R.
4. ROOFTOP CONDUIT SHALL BE A MINIMUM OF 7/8" ABOVE THE ROOF SURFACE.
5. ALL WORK SHALL COMPLY WITH THE 2020 NATIONAL ELECTRICAL CODE AND 2020 FL STATE AMENDMENTS

CODE REFERENCES

2020 NATIONAL ELECTRIC CODE - NFPA 70
8TH EDITION 2020 FLORIDA BUILDING CODE - RESIDENTIAL
8TH EDITION 2020 FLORIDA BUILDING CODE - BUILDING
8TH EDITION 2020 FLORIDA BUILDING CODE - ENERGY
8TH EDITION 2020 FLORIDA BUILDING CODE - TEST PROTOCOL
8TH EDITION 2020 FLORIDA BUILDING CODE - PLUMBING
8TH EDITION 2020 FLORIDA BUILDING CODE - MECHANICAL
8TH EDITION 2020 FLORIDA BUILDING CODE - EXISTING BUILDING
8TH EDITION 2020 FLORIDA BUILDING CODE - FUEL GAS
8TH EDITION 2020 FLORIDA BUILDING CODE - ACCESSIBILITY
8TH EDITION 2020 FLORIDA FIRE PREVENTION CODE
FAIR HOUSING GUIDELINES

UTILITY NOTES

JURISDICTION STAMPS:

CONSTRUCTION NOTES

1. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. ALL OUTDOOR EQUIPMENT SHALL BE RAIN TIGHT WITH MINIMUM NEMA 3R RATING.
3. ALL LOCATIONS ARE APPROXIMATE AND REQUIRE FIELD VERIFICATION.
4. THE SOLAR INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING OR MECHANICAL VENTS.
5. A LADDER WILL BE IN PLACE FOR INSPECTIONS IN COMPLIANCE WITH OSHA REGULATIONS.
6. MODULE MOUNTING STRUCTURE WILL BE TIED DIRECTLY INTO STRUCTURAL ELEMENTS OF SINGLE FAMILY DWELLING ROOF TRUSSES / RAFTERS OR BEAMS ACCORDING TO MOUNTING STRUCTURE DIRECTIONS.
7. ROOF COVERING PENETRATIONS SHALL BE DESIGNED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH BUILDING CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERINGS SHALL SERVE TO PROTECT THE BUILDING STRUCTURE.
8. CONDUIT, WIRING SYSTEMS, AND RACEWAYS FOR PHOTOVOLTAIC CIRCUITS SHALL BE LOCATED AS CLOSE AS POSSIBLE TO THE RIDGE, HIP, OR VALLEY. THIS EQUIPMENT SHALL ALSO BE LOCATED AS CLOSE AS POSSIBLE TO AN OUTSIDE WALL TO REDUCE TRIP HAZARDS AND MAXIMIZE VENTILATION OPPORTUNITIES.
9. MODULES MUST HAVE 6" CLEARANCE FROM ALL VENTS AND OBSTRUCTIONS.

better earth
BETTER EARTH ELECTRIC INC.
4040 N COMBEE ROAD, STE. 12
LAKELAND, FL 33805
PHONE #: (888) 373-9379
LIC #: 13011324
Roger Gaydou

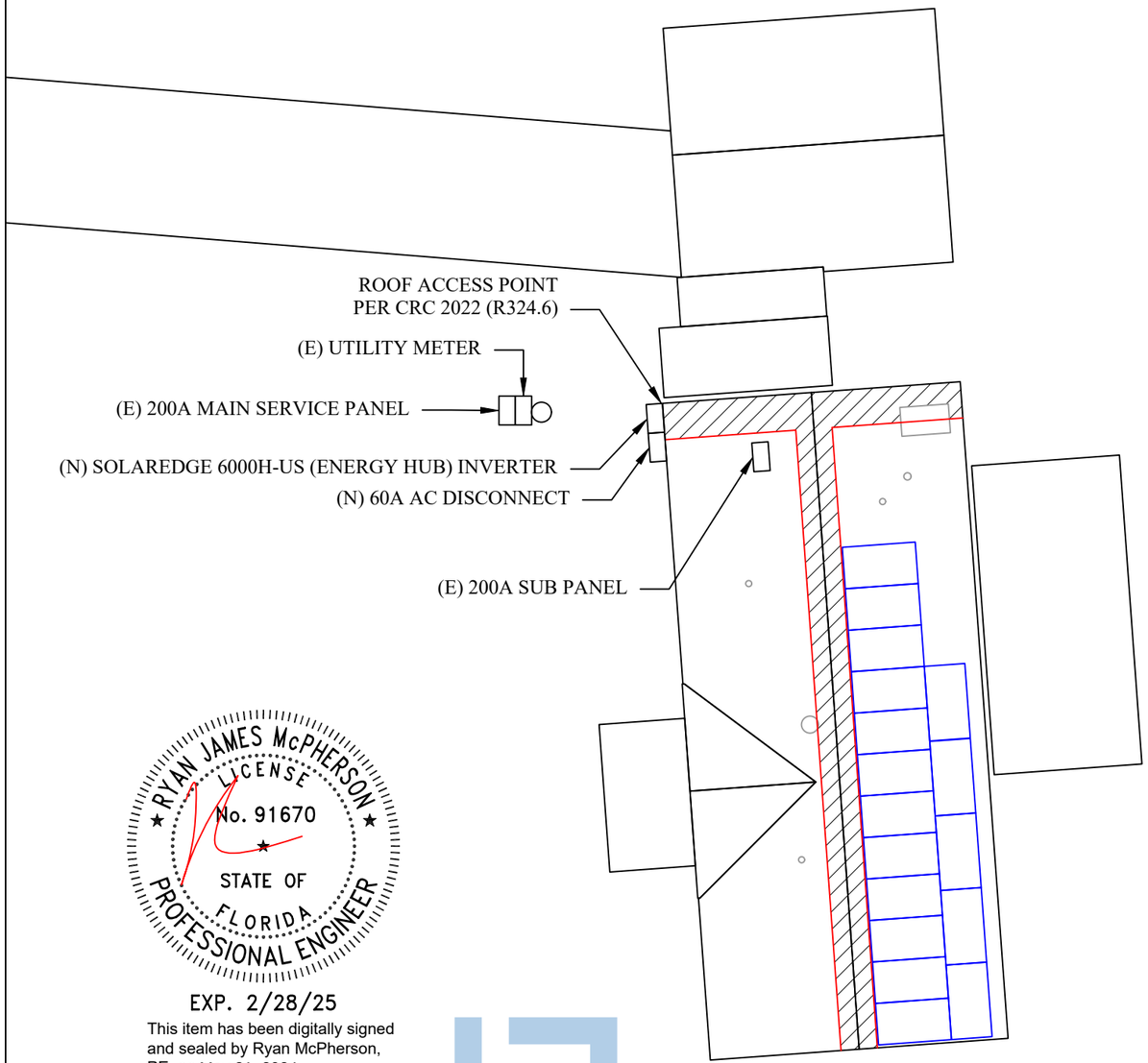
NEW PV SYSTEM: 6970W DC / 6000W AC

Arnold Vinyard
9325 Sw Tustenuggee Ave, LAKE CITY, FL 32024
APN: 325S1709477112

DRAWING TITLE: **NOTES SHEET**

DRAWING PAGE: **002 NS1**

DATE: 5/21/2024	TIME: 01:24 PM	DESIGNER: TAYLOR BICKFORD	DESIGNER SIGNATURE: Taylor Bickford	SCALE:



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JURISDICTION STAMPS:

NOTES:

MODULE QTY: 17
MODULE MFG: QCELLS NORTH AMERICA
MODULE TYPE: Q.PEAK DUO BLK ML-G10+ 410

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APN: 325S1709477112

DRAWING TITLE: **SITE PLAN**

DRAWING PAGE: **003 SP1**

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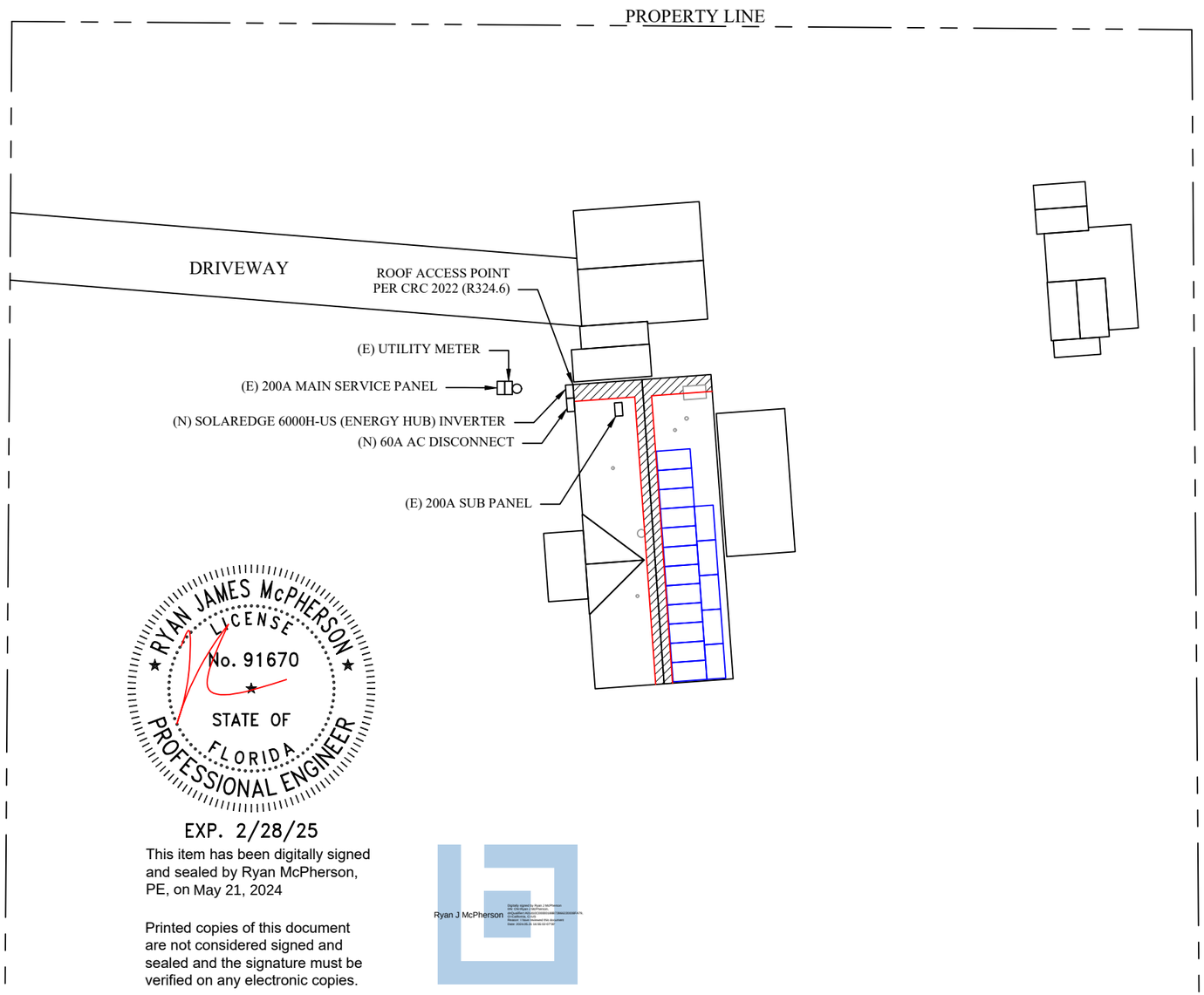

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9325 Sw Tustenuggee Ave, LAKE CITY, FL 32024

APN: 325S1709477112

DRAWING TITLE:
PROPERTY PLAN

DRAWING PAGE:
003.1 SP2

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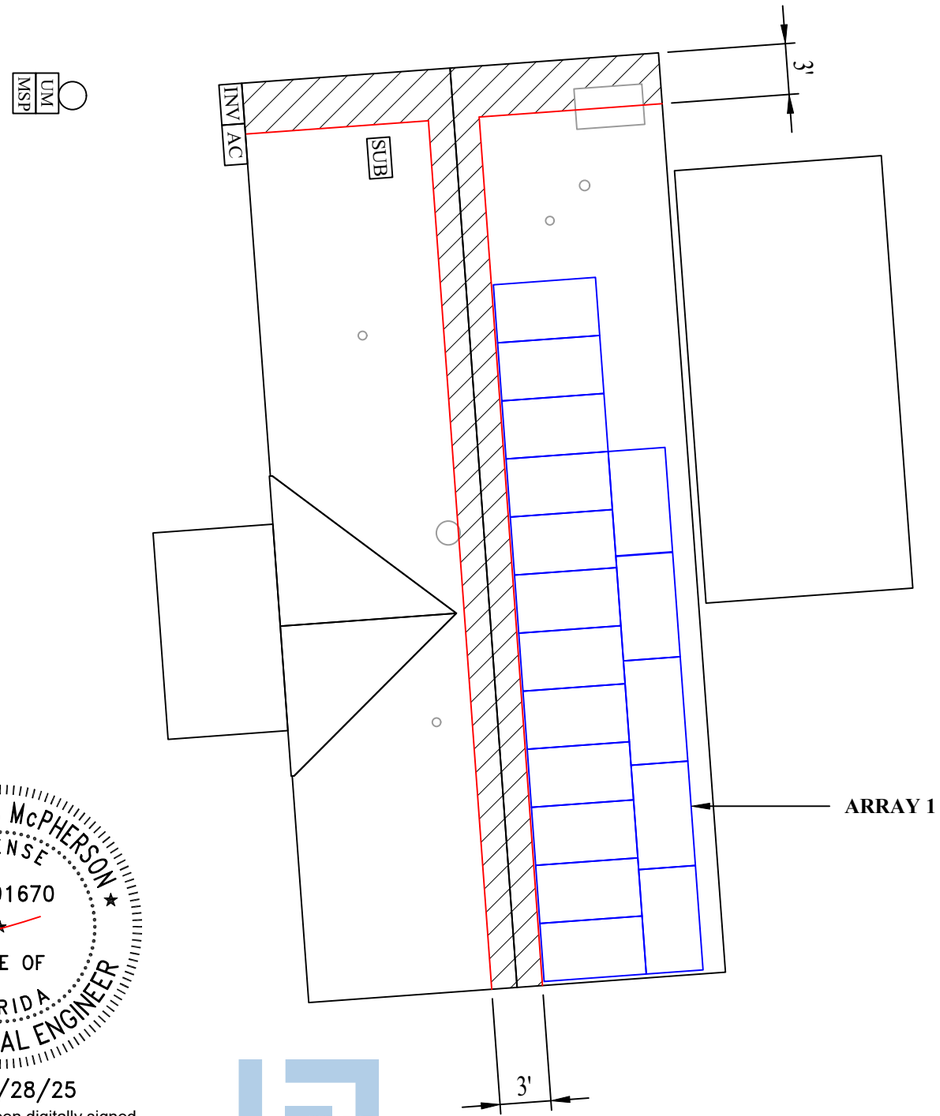

ROOF DETAILS:

ARRAY 1:

MODULE QTY:	17
TILT:	12°
AZIMUTH:	86°
MATERIAL:	Metal Corrugated/Tin

JURISDICTION STAMPS:

LEGEND:

MSP	(E) 200A MAIN SERVICE PANEL	UM	UTILITY METER (IF SEPARATED)
INV	(N) SOLAREDGE 6000H-US (ENERGY HUB) INVERTER		
SUB	SUB PANEL	B	BATTERY
ACL	AC COMBINER PANEL	BG	BACKUP GATEWAY
AC	AC DISCONNECT	EV	EV CHARGER
DC	DC DISCONNECT	JB	JUNCTION BOX
PV	PV METER		FIRE CODE SETBACK
	EMT CONDUIT		PVC TRENCH
	(E) SOLAR MODULE		

CONDUIT RUN TO BE DETERMINED IN FIELD

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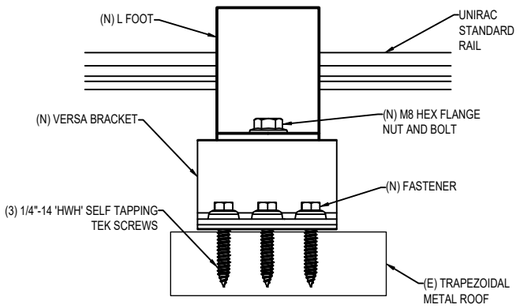
APN: 325S1709477112

DRAWING TITLE: **ROOF PLAN**

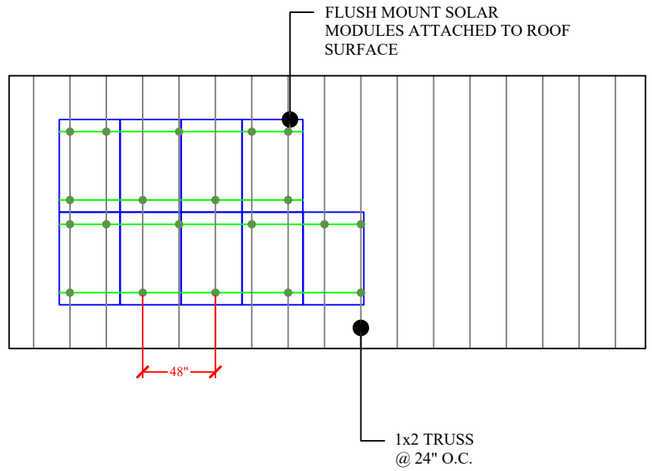
DRAWING PAGE: **004 RP1**

DATE: 5/21/2024 | TIME: 01:24 PM | DESIGNER: TAYLOR BICKFORD | DESIGNER SIGNATURE: Taylor Bickford | SCALE: 1" = 8.93'

ATTACHMENT DETAIL

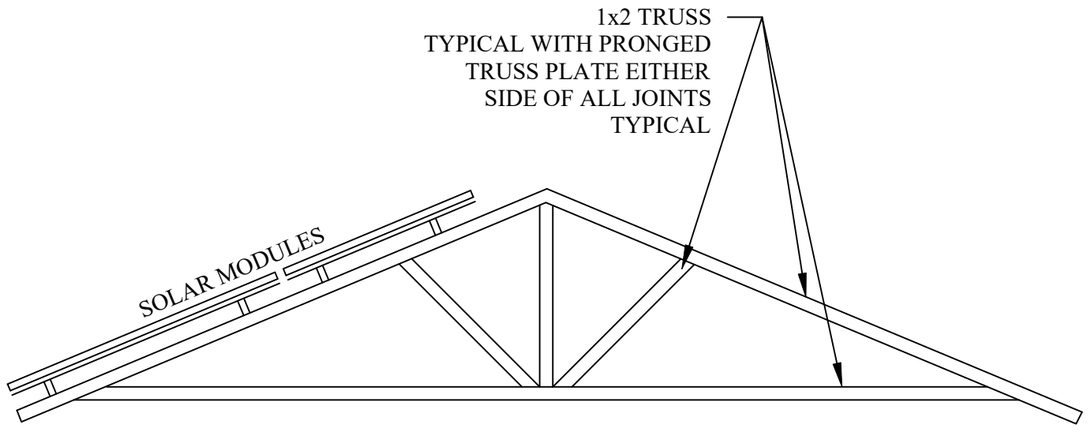


TYP ROOF ATTACHMENT PLAN



JURISDICTION STAMPS:

FRONT VIEW TYP FRAMING DETAIL



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DN: CN=Ryan J McPherson, dnQualifier=A51410C00000188872866220008FA79, C=California, C=US
Reason: I have reviewed this document
Date: 2024.05.21 16:55:11-07'00'

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INSTALLER NOTES:

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APN: 325S1709477112

DRAWING TITLE:
RACKING & FRAMING DETAILS

DRAWING PAGE:
005 RF1

DATE: 5/21/2024	TIME: 01:24 PM	DESIGNER: TAYLOR BICKFORD	DESIGNER SIGNATURE: Taylor Bickford	SCALE:

STRING CALCULATIONS - INVERTER 1		
STRING DETAILS	STRING 1	STRING 2
POWERBOX MAX OUTPUT CURRENT	15A	15A
OPTIMIZERS IN SERIES	8	9
NOMINAL STRING VOLTAGE	380V	380V
ARRAY OPERATING CURRENT	25A	25A

INVERTER 1 SPECS 6000H-US (ENERGY HUB)_RGM	
AC VOLTAGE 240V	GROUND
MAX OCPD 35A	RATED POWER 6000W
MAX OUTPUT 25A	MAX INPUT 17A
MAX INPUT 480V	EFFICIENCY CEC

JURISDICTION STAMPS:

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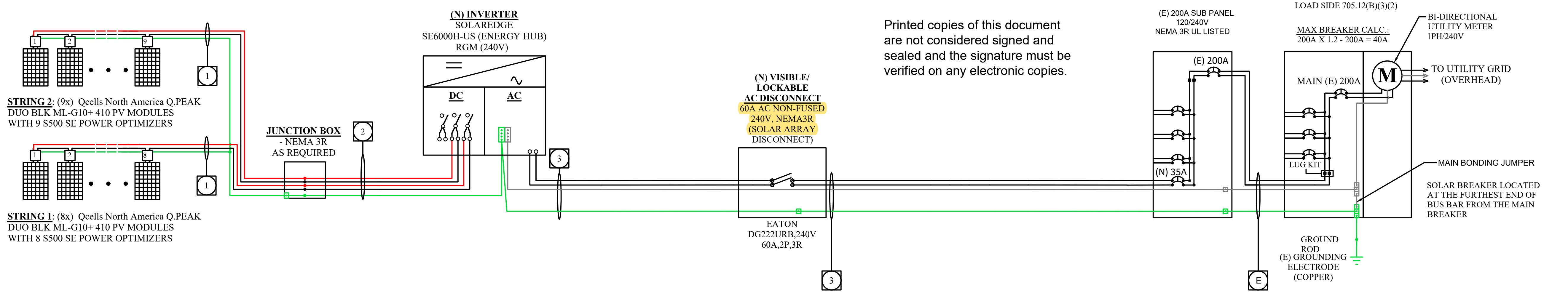

METER NUMBER: 156218646

AHJ/UTILITY NOTES:

SOLAREDGE INVERTER(S) RSD COMPLIANT PER 690.12

INSTALLER NOTES:

CONDUCTOR AND CONDUIT SCHEDULE W/ELECTRICAL CALCULATIONS

ID	CONDUCTOR (CU)	CONDUIT	CONDUCTORS IN CONDUIT	EGC	TEMP. CORR. FACTOR	CONT. CURRENT	MAX. CURRENT (125%)	BASE AMP.	DERATED AMP.	TERM. TEMP. RATING
1	#10 PV Wire, in open air	N/A	N/A	#6	0.91	15	18.75	40	36.4	90
2	#10 THWN-2, in conduit	3/4" EMT	4 & (1)G	#8	0.91	15	18.75	40	36.4	90
3	#8 THWN-2, in conduit	3/4" EMT	3 & (1)G	#8	0.91	25	31	55	55	90

DESIGN TEMPERATURES
ASHRAE 2% HIGH 37°C
ASHRAE EXTREME LOW -3°C

MODULE SPECS QCELLS NORTH AMERICA Q.PEAK DUO BLK ML-G10+ 410	
PMAX 410W	PTC 381W
ISC 11.2A	IMP 10.89A
VOC 45.37V	VMP 37.64V
TEMP. COEFF. OF VOC -0.122	

POWER OPTIMIZERS SOLAREDGE S500 OPTIMIZER	
RATED INPUT 500W	MAX OUTPUT 15A
MAX ISC 15A	MAX DC 60V
WEIGHTED EFFICIENCY 98.6	

SYSTEM SUMMARY
ARRAY STC POWER 6970W
ARRAY PTC POWER 6477W
MAX AC CURRENT 25A
MAX AC POWER 6000W

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DRAWING TITLE:
LINE DIAGRAM & DESIGN TABLES

DRAWING PAGE:
006 LD1

DATE: 5/21/2024 | TIME: 01:24 PM | DESIGNER: TAYLOR BICKFORD | DESIGNER SIGNATURE: Taylor Bickford | SCALE:

LABELING PLAN

1

WARNING: PHOTOVOLTAIC POWER SOURCE

[690.31(D)(2)] PLACE ON JUNCTION BOXES AND CONDUIT EVERY 10'

2

DC DISCONNECT
DC PHOTOVOLTAIC POWER SOURCE

MAXIMUM SYSTEM VOLTAGE:	480 VDC
MAXIMUM CIRCUIT CURRENT:	25 AMPS
MAX RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-DC CONVERTER (IF INSTALLED)	15 AMPS

[690.53] AT EACH DC DISCONNECT MEANS (INVERTER 1)

3

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

[690.13(B)] PLACE THIS LABEL ON **ALL** DISCONNECTING MEANS WHERE ENERGIZED IN AN OPEN POSITION

4

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

[690.56(C)(2)] PLACE ON INVERTER

5

AC DISCONNECT
AC PHOTOVOLTAIC POWER SOURCE

MAX AC OPERATING CURRENT:	25A MAX
AC OPERATING VOLTAGE:	240 VAC

[690.54] PLACE LABEL AT "INTERACTIVE POINT OF INTERCONNECTION" (AT MAIN SERVICE PANEL *AND* SUBPANEL IF APPLICABLE)

6

THIS PANEL IS FED BY MULTIPLE SOURCES (UTILITY & SOLAR)

[690.64(B)(4)] PLACE LABEL ON ALL EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUSBAR OR CONDUCTORS SUPPLIED FROM MULTIPLE SOURCES

7

WARNING
INVERTER OUTPUT CONNECTION
DO'N'T RELOCATE THIS OVERCURRENT DEVICE

PLACE THIS LABEL AT P.O.C. TO SERVICE DISTRIBUTION EQUIPMENT (I.E. MAIN PANEL *AND* SUBPANEL IF APPLICABLE)

8

AC DISCONNECT
AC PHOTOVOLTAIC POWER SOURCE

[690.14(C)(2)] PLACE ON AC DISCONNECT

9

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

[705.12(B)(3)(3)] PLACE THIS LABEL AT P.O.C. TO SERVICE DISTRIBUTION EQUIPMENT

11

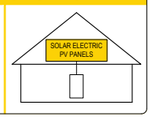
PV SOLAR BREAKER
DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATED INSIDE PANEL NEXT TO PV BREAKER

10

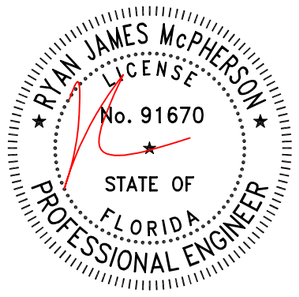
SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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



FOR PV SYSTEMS THAT SHUT DOWN THE ARRAY AND CONDUCTORS LEAVING THE ARRAY: SIGN TO BE LOCATED ON OR NO MORE THAN 3 FT AWAY FROM SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED AND SHALL INDICATE THE LOCATION OF ALL IDENTIFIED RAPID SHUTDOWN SWITCHES IF NOT AT THE SAME LOCATION. [690.56(C)]

LABELING NOTES:
1.1 LABELING REQUIREMENTS BASED ON THE NATIONAL ELECTRICAL CODE, INTERNATIONAL FIRE CODE 605.11, OSHA STANDARD 1910.145, ANSI Z535.
1.2 MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
1.3 LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
1.4 LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8" AND PERMANENTLY AFFIXED.



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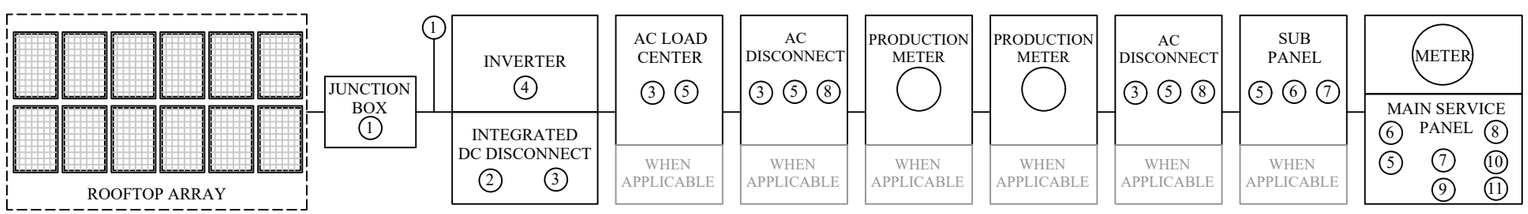


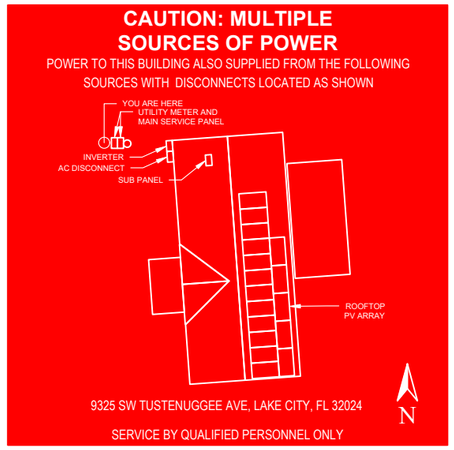
JURISDICTION STAMPS:

PROPERTY MAP

6"X6" DISCONNECT DIRECTORY PLAQUE
INSTALL AT MAIN SERVICE PANEL

NOTES:

FORMAT
1. WHITE LETTERING ON A RED BACKGROUND
2. MINIMUM 3/8 INCHES LETTER HEIGHT
3. ALL LETTERS SHALL BE CAPITALIZED
4. ARIAL OR SIMILAR FONT (NON-BOLD)



MATERIAL
REFLECTIVE, WEATHER RESISTANT MATERIAL
SUITABLE FOR THE ENVIRONMENT (USE UL-969 AS STANDARD FOR WEATHER RATING).
DURABLE ADHESIVE MATERIALS

INSTALLER NOTES:

better earth
BETTER EARTH ELECTRIC INC.
4040 N COMBEE ROAD, STE. 12
LAKELAND, FL 33805
PHONE #: (888) 373-9379
LIC #: 13011324
Roger Gaydou

NEW PV SYSTEM: 6970W DC / 6000W AC

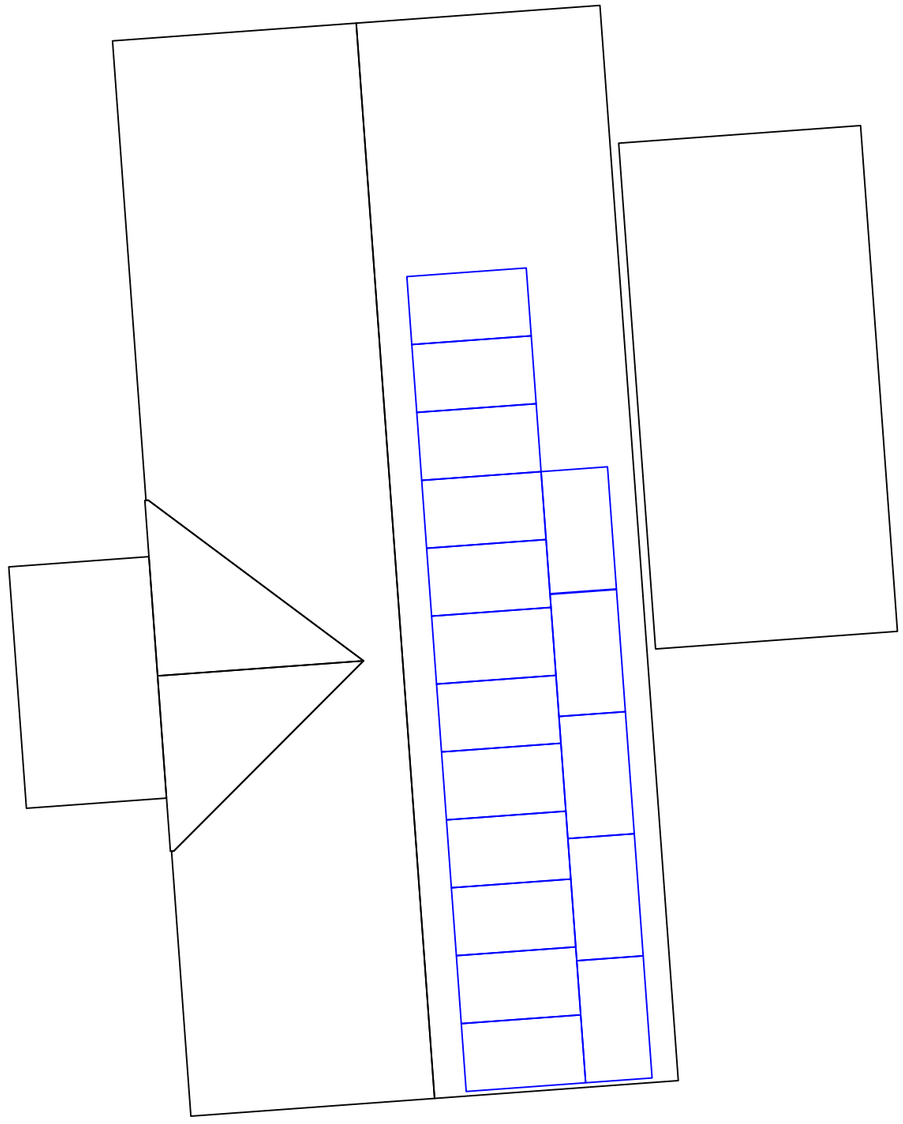
Arnold Vinyard
9325 Sw Tustenuggee Ave, LAKE CITY, FL 32024

APN: 325S1709477112

DRAWING TITLE: **PLACARD & PLACARD MAP**

DRAWING PAGE: **007 PP1**

DATE: 5/21/2024 | TIME: 01:24 PM | DESIGNER: TAYLOR BICKFORD | DESIGNER SIGNATURE: Taylor Bickford | SCALE:



1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72

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9325 Sw Tustenuggee Ave, LAKE CITY, FL 32024

APN: 325S1709477112

DRAWING TITLE:
OPTIMIZER MAP

DRAWING PAGE:
008 OM1

DATE: 5/21/2024	TIME: 01:24 PM	DESIGNER: TAYLOR BICKFORD	DESIGNER SIGNATURE: Taylor Bickford	SCALE:

JOB HAZARD ANALYSIS

Use the space below to draft a JHA. Be sure to include all indicators found in the Legend.

LEGEND	
(H)	HAZARD
(A)	ANCHOR POINT
(L)	LADDER
(E)	ENTRY / EXIT
	WORK ANGLE
	ELECTRICAL ZONE
	WORK ZONE
	1 ¼" PVC TRENCH

NEAREST MEDICAL FACILITY:

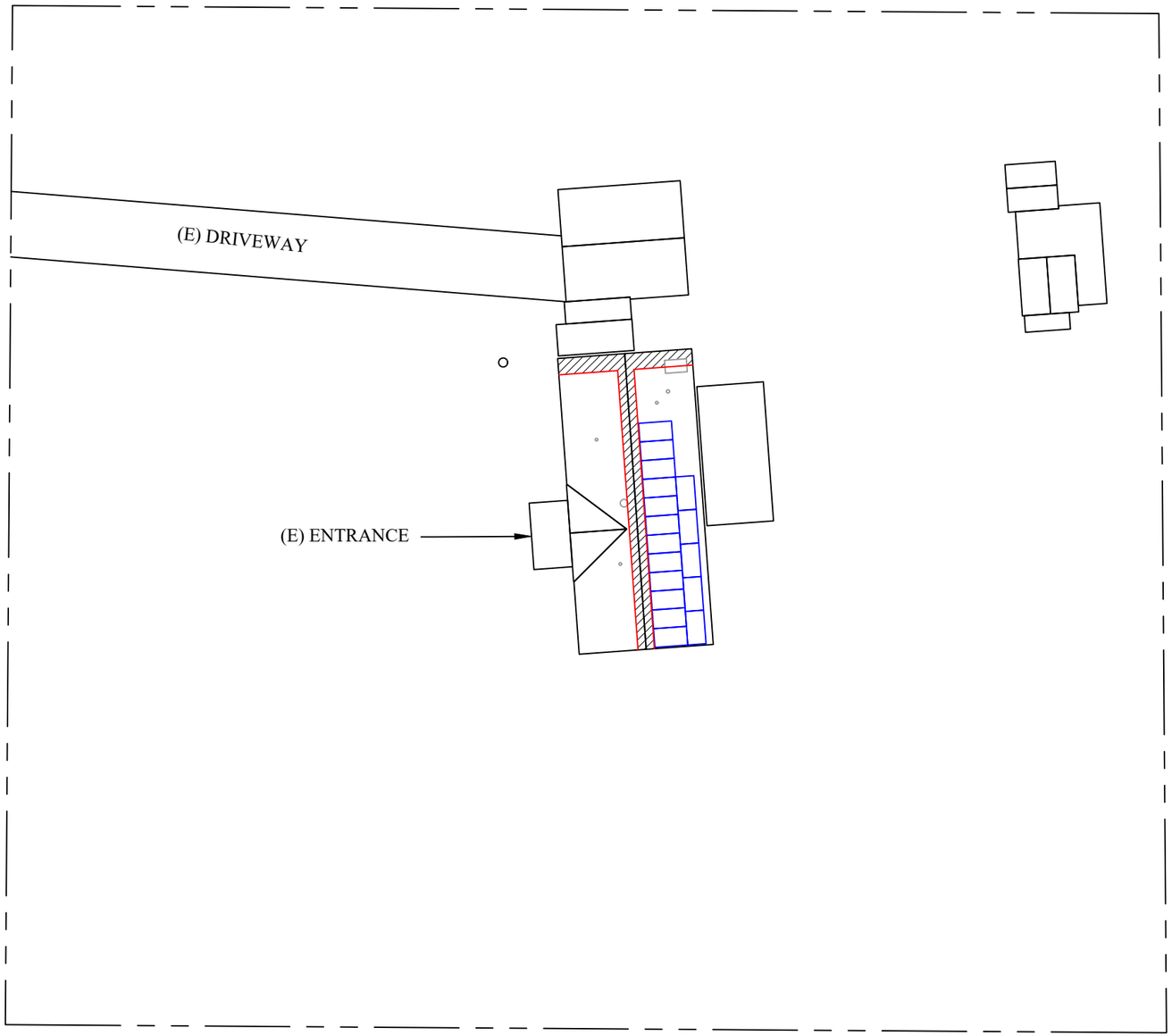
NAME:

PHONE:

ADDRESS:

CREW LEAD:

CREW:



INSTALLER NOTES:

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4040 N COMBEE ROAD, STE. 12
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DRAWING TITLE:
JOB HAZARD ANALYSIS

DRAWING PAGE:
009 JH1

DATE: 5/21/2024	TIME: 01:24 PM	DESIGNER: TAYLOR BICKFORD	DESIGNER SIGNATURE: Taylor Bickford	TEMPLATE VERSION: B41

Q.PEAK DUO BLK ML-G10+ SERIES

385 - 410 Wp | 132 Cells
20.9 % Maximum Module Efficiency

MODEL Q.PEAK DUO BLK ML-G10+

6 busbar
cell technology

12 busbar
cell technology

Breaking the 20 % efficiency barrier

Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9 %.

A reliable investment

Inclusive 25-year product warranty and 25-year linear performance warranty[1].

Enduring high performance

Long-term yield security with Anti LeTID Technology, Anti PID Technology[2] and Hot-Spot Protect.

Extreme weather rating

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

Innovative all-weather technology

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

The most thorough testing programme in the industry

Qcells is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new “Quality Controlled PV” of the independent certification institute TÜV Rheinland.

[1] See data sheet on rear for further information.
[2] APT test conditions according to IEC / TS 62804-1:2015, method A (–1500 V, 96 h)

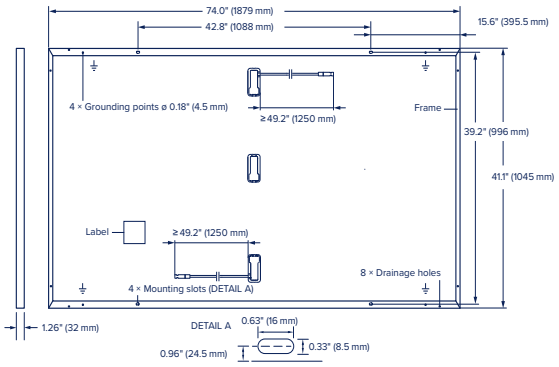
The ideal solution for:

Rooftop arrays on residential buildings

Q.PEAK DUO BLK ML-G10+ SERIES

Mechanical Specification

Format	74.0 in × 41.1 in × 1.26 in (including frame) (1879 mm × 1045 mm × 32 mm)
Weight	48.5 lbs (22.0 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 22 monocrystalline Q.ANTUM solar half cells
Junction box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 49.2 in (1250 mm), (−) ≥ 49.2 in (1250 mm)
Connector	Stäubli MC4; IP68

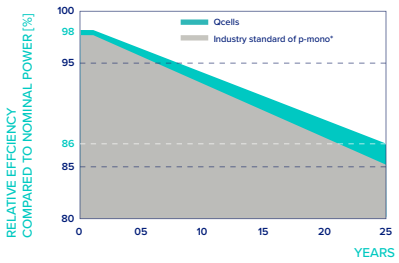


Electrical Characteristics

POWER CLASS				385	390	395	400	405	410
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)									
Minimum	Power at MPP[1]	P_{MPP}	[W]	385	390	395	400	405	410
	Short Circuit Current[1]	I_{SC}	[A]	11.04	11.07	11.10	11.14	11.17	11.20
	Open Circuit Voltage[1]	V_{OC}	[V]	45.19	45.23	45.27	45.30	45.34	45.37
	Current at MPP	I_{MPP}	[A]	10.59	10.65	10.71	10.77	10.83	10.89
	Voltage at MPP	V_{MPP}	[V]	36.36	36.62	36.88	37.13	37.39	37.64
	Efficiency[1]	η	[%]	≥19.6	≥19.9	≥20.1	≥20.4	≥20.6	≥20.9
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]									
Minimum	Power at MPP	P_{MPP}	[W]	288.8	292.6	296.3	300.1	303.8	307.6
	Short Circuit Current	I_{SC}	[A]	8.90	8.92	8.95	8.97	9.00	9.03
	Open Circuit Voltage	V_{OC}	[V]	42.62	42.65	42.69	42.72	42.76	42.79
	Current at MPP	I_{MPP}	[A]	8.35	8.41	8.46	8.51	8.57	8.62
	Voltage at MPP	V_{MPP}	[V]	34.59	34.81	35.03	35.25	35.46	35.68

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

Qcells PERFORMANCE WARRANTY

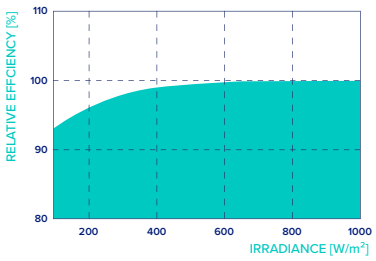


At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organisation of your respective country.

*Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

PERFORMANCE AT LOW IRRADIANCE



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

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°F]	109±5.4 (43±3 °C)

Properties for System Design

Maximum System Voltage	V_{SYS}	[V]	1000 (IEC) / 1000 (UL)	PV module classification	Class II
Maximum Series Fuse Rating		[A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 2
Max. Design Load, Push / Pull[3]		[lbs / ft²]	75 (3600 Pa) / 55 (2660 Pa)	Permitted Module Temperature on Continuous Duty	−40 °F up to +185 °F (−40 °C up to +85 °C)
Max. Test Load, Push / Pull[3]		[lbs / ft²]	113 (5400 Pa) / 84 (4000 Pa)		

[3] See Installation Manual

Qualifications and Certificates

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

C SP US Certified UL 61730 CE TÜVRheinland CERTIFIED www.tuv.com ID 1111220277

Qcells pursues minimizing paper output in consideration of the global environment.

Note: Installation instructions must be followed. Contact our technical service for further information on approved installation of this product.
Hanwha Q CELLS America Inc. 400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL hqc-inquiry@qcells.com | WEB www.qcells.com

SolarEdge Home Hub Inverter

For North America

SE3800H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US(1)

HOME BACKUP

Optimized battery storage with HD-Wave technology

- Record-breaking 99% weighted efficiency with 200% DC oversizing
- Small, lightweight, and easy to install
- Modular design, future ready with optional upgrades to:
  - DC-coupled storage for full or partial home backup
  - Built-in consumption monitoring
  - Direct connection to the SolarEdge Home EV Charger
- Multi-inverter, scalable storage solution
  - With enhanced battery power up to 10kW
- Integrated arc fault protection and rapid shutdown for NEC 2014, NEC 2017 and NEC 2020, per article 690.11 and 690.12
- Embedded revenue grade production data, ANSI C12.20 Class 0.5

SolarEdge Home Hub Inverter

For North America

SE3800H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US(1)

Applicable to inverters with part number	SEXXXXH-USSNBBXX4				SE11400H – XXXXXBXX5	Units
	SE3800H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
OUTPUT – AC ON GRID						
Rated AC Power	3800 @ 240V 3300 @ 208V	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208	W
Maximum AC Power Output	3800 @ 240V 3300 @ 208V	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208	W
AC Frequency Range (min - nom - max)	59.3 – 60 – 60.5(2)					Hz
Maximum Continuous Output Current @ 240V	16	25	32	42	47.5	A
Maximum Continuous Output Current @ 208V	16	24	-	-	48.5	A
GFDI Threshold	1					A
Total Harmonic Distortion (THD)	< 3					%
Power Factor	1, adjustable -0.85 to 0.85					
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes					
Charge Battery from AC (if allowed)	Yes					
Typical Nighttime Power Consumption	< 2.5					W
OUTPUT – AC BACKUP(3)						
Rated AC Power in Backup Operation(4)	3800 7600*	6000	7600 10300*	10300	10300	W
AC L-L Output Voltage Range in Backup	211 – 264					Vac
AC L-N Output Voltage Range in Backup	105 – 132					Vac
AC Frequency Range in Backup (min - nom - max)	55 – 60 – 65					Hz
Maximum Continuous Output Current in Backup Operation	16 32*	25	32 43*	43	43	A
GFDI	1					A
THD	< 5					%
OUTPUT – SOLAREDGE HOME EV CHARGER AC						
Rated AC Power	9600					W
AC Output Voltage Range	211 – 264					Vac
On-Grid AC Frequency Range (min - nom - max)	59.3 – 60 – 60.5					Hz
Maximum Continuous Output Current @240V (grid, PV and battery)	40					Aac
INPUT – DC (PV AND BATTERY)						
Transformer-less, Ungrounded	Yes					
Max Input Voltage	480					Vdc
Nom DC Input Voltage	380					Vdc
Reverse-Polarity Protection	Yes					
Ground-Fault Isolation Detection	600kΩ Sensitivity					
INPUT – DC (PV)						
Maximum DC Power @ 240V	7600 15200*	12000	15200 22800*	22000	22800	W
Maximum DC Power @ 208V	6600	10000	-	-	20000	W
Maximum Input Current(5) @ 240V	10.5 20*	16.5	20 31*	27	31	Adc
Maximum Input Current(5) @ 208V	9	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45					
Maximum Inverter Efficiency	99.2					%
CEC Weighted Efficiency	99				99 @ 240V 98.5 @ 208V	%
2-pole Disconnection	Yes					

* Supported with PN SExxxxH-USMMxxxxxx or SExxxxH-USMNxxxxxx.

(1) These specifications apply to inverters with part numbers SExxxxH-USSMxxxxx or SExxxxH-USSNxxxxxx and connection unit model number DCD-1PH-US-PxH-F-x.

(2) For other regional settings please contact SolarEdge support.

(3) Not designed for standalone applications and requires AC for commissioning. Backup functionality is only supported for 240V grid.

(4) Rated AC power in Backup Operation is valid for installations with multiple inverters. For a single backup inverter operation, rated AC power in Backup is 90% of the value stated.

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

SolarEdge Home Hub Inverter

For North America

SE3800H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US(1)

Applicable to inverters with part number	SEXXXXH-USSNBBXX4				SE11400H – XXXXXBXX5	Units
	SE3800H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	
OUTPUT – DC (BATTERY)						
Supported Battery Types	SolarEdge Home Battery, LG RESU Prime(6)					
Number of Batteries per Inverter	Up to 3 SolarEdge Home Battery, up to 2 LG RESU Prime					
Continuous Power(7)	7600	10000				W
Peak Power(7)	7600	10000				W
Max Input Current	20	26.5				Adc
2-pole Disconnection	Yes					
SMART ENERGY CAPABILITIES						
Consumption Metering	Built-in(8)					
Backup & Battery Storage	With Backup Interface (purchased separately) for service up to 200A; up to 3 inverters					
EV Charging	Direct connection to SolarEdge Home EV Charger					
ADDITIONAL FEATURES						
Supported Communication Interfaces	RS485, Ethernet, Cellular(9), Wi-Fi (optional), SolarEdge Home Network (optional)					
Revenue Grade Metering, ANSI C12.20	Built-in(8)					
Integrated AC, DC and Communication Connection Unit	Yes					
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi Access Point for local connection					
DC Voltage Rapid Shutdown (PV and Battery)	Yes, according to NEC 2014, NEC 2017 and NEC 2020 690.12					
STANDARD COMPLIANCE						
Safety	UL1741, UL1741 SA, UL1741 SB, UL1741 PCS, UL1699B, UL1998, UL9540, CSA 22.2					
Grid Connection Standards	IEEE1547-2018, Rule 21, Rule 14H					
Emissions	FCC part 15 class B					
INSTALLATION SPECIFICATIONS						
AC Output and EV AC Output Conduit Size / AWG Range	1'' maximum / 14-4 AWG					
DC Input (PV and Battery) Conduit Size / AWG Range	1'' maximum / 14-6 AWG					
Dimensions with Connection Unit (H x W x D)	17.7 x 14.6 x 6.8 / 450 x 370 x 174		17.7 x 14.6 x 6.8 / 450 x 370 x 174 17.7 x 14.6 x 6.8 / 450 x 370 x 174*	21.06 x 14.6 x 7.3 / 535 x 370 x 185	21.06 x 14.6 x 8.2 / 535 x 370 x 208(10)	in / mm
Weight with Connection Unit	26 / 11.8		26 / 11.8 41.7 / 18.9*	41.7 / 18.9	44.9 / 20.3(10)	lb / kg
Noise	< 25 < 50*	< 25	< 50			dBA
Cooling	Natural Convection					
Operating Temperature Range	-40 to +140 / -40 to +60(11)					°F / °C
Protection Rating	NEMA 4					

(6) The part numbers SExxxxH-USxMxxxxx only support the SolarEdge Home Battery. The part numbers SExxxxH-USxNxxxxx support both SolarEdge Home Battery and LG RESU Prime batteries. Requires supporting inverter firmware.

(7) Discharge power is limited up to the inverter rated AC power for on-grid and backup applications.

(8) For consumption metering current transformers should be ordered separately: SECT-SPL-225A-T-20 or SEACT0750-400NA-20 units per box. Revenue grade metering is only for production metering.

(9) Information concerning the Data Plan's terms & conditions is available in the following link: SolarEdge Communication Plan Terms and Conditions.)

(10) SE11400H-USxxxBxx**5** is the updated PN, though SE11400H-USxxxBxx**4** will still be available. All specifications are similar for both models, **EXCLUDING** the weight and dimensions [HxWxD]; The weight and dimensions of SE11400H-USxxxBxx**4** are 17.6 [kg] and 21.06-14.6-7.3 / 535-370-185 [in/mm], accordingly.

(11) Full power up to at least 50°C / 122°F; for power de-rating information refer to the Temperature De-Rating Technical Note for North America.

SolarEdge is a global leader in smart energy technology. By leveraging world-class engineering capabilities and with a relentless focus on innovation, SolarEdge creates smart energy solutions that power our lives and drive future progress.

SolarEdge developed an intelligent inverter solution that changed the way power is harvested and managed in photovoltaic (PV) systems. The SolarEdge DC optimized inverter maximizes power generation while lowering the cost of energy produced by the PV system.

Continuing to advance smart energy, SolarEdge addresses a broad range of energy market segments through its PV, storage, EV charging, UPS, and grid services solutions.

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solaredge.com

Cautionary Note Regarding Market Data and Industry Forecasts: This brochure may contain market data and industry forecasts from certain third-party sources. This information is based on industry surveys and the preparer's expertise in the industry and there can be no assurance that any such market data is accurate or that any such industry forecasts will be achieved. Although we have not independently verified the accuracy of such market data and industry forecasts, we believe that the market data is reliable and that the industry forecasts are reasonable.

CE

solaredge

MAN-01-00186-1.6

Rapid Shutdown Kit - Installation and Configuration (Single Phase Inverters)

This document describes how to install the rapid shutdown kit in the SolarEdge Safety Switch, and how to enable the rapid shutdown feature in the inverter in order to provide the functionality described in the Rapid Shutdown clause of NEC2014 690.12 (1) through (4).

Kit Contents

- Rapid shutdown cables
- Micro-SD card and SD card adapter with firmware files (Note: DO NOT THROW AWAY THE CARD AND THE ADAPTER; keep them for installation of other rapid shutdown kits)

Cable Installation

Perform this procedure before connecting the strings to the Safety Switch [Chapter 4: Connecting the AC and the Strings to the Safety Switch in the *SolarEdge Installation Guide*].

1. Turn the inverter ON/OFF switch to OFF. If installing the kit in an inverter that is already operating, wait until the LCD indicates that the DC voltage is safe (<50V), or wait five minutes before continuing to the next step.
2. Turn the Safety Switch and the AC switch on the main circuit board to OFF.

WARNING!

If you cannot see the inverter panel, or if a malfunction is indicated on the LCD panel, wait five minutes for the input capacitors of the inverter to discharge.

3. Loosen the four Allen screws on the front cover of the Safety Switch, and open the cover.
4. Carefully disconnect the two DC cables from the left side of the switch and from the DC connection spring clamp terminals, as illustrated below[1]. Use a standard straight-bladed screwdriver to disconnect the cables from the terminals.

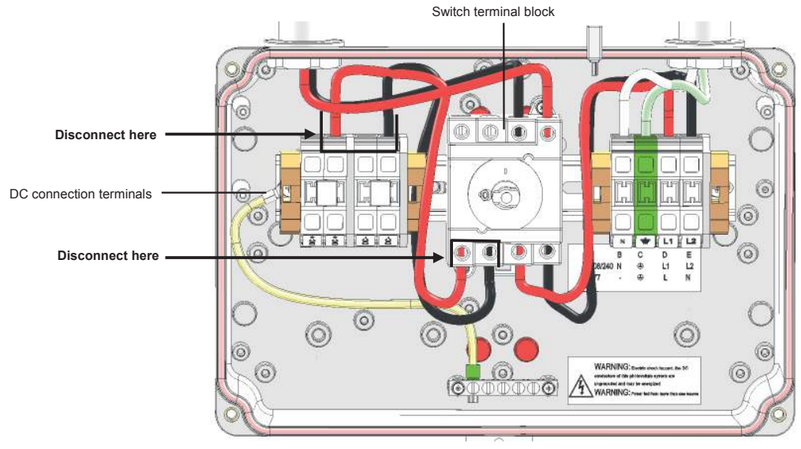


Figure 1: Inside the AC/DC Safety Switch

[1] The internal components may vary depending on the Safety Switch model; the figures in this documents show the AC/DC Safety Switch for single phase 7.6-11.4 kW inverters.

5. The rapid shutdown cables have a resistor connected to one end (on the red cable). Connect these ends to the switch, making sure that the red and black cables are reversed relative to the cables connected at the top of the switch (going into the DC side conduit between the inverter and the Safety Switch), as detailed below. Apply a torque of 2 N*m (18 lb*in):

- If the cables at the top are red and black from left to right, connect as shown below.

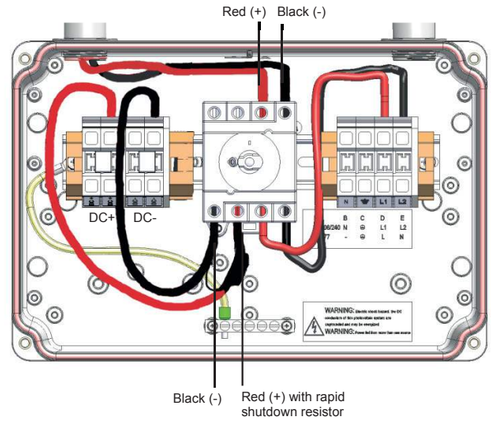


Figure 2: Rapid shutdown cable connected – option 1

- If the cables at the top are black and red from left to right, connect as shown below.

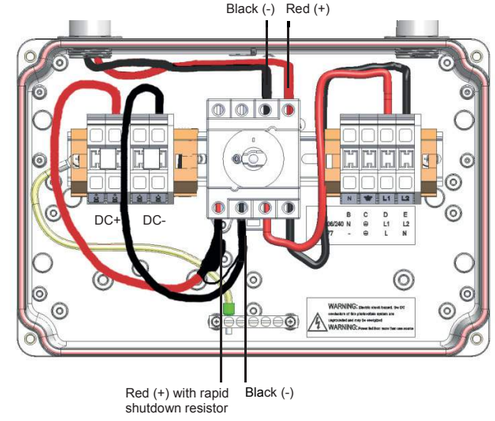


Figure 3: Rapid shutdown cable connected – option 2

6. Use a standard straight-bladed screwdriver to connect the other end of the rapid shutdown cables to the DC connection spring-clamp terminals: Connect the black cable from the switch to the DC- terminal block, and connect the red cable from the switch to the DC+ terminal block.
7. Check that the cables are located and connected in the correct positions to ensure the rapid shutdown functionality.
8. Close the cover: Attach the switch cover and secure it by tightening the four screws with a torque of 0.9 ft.*lb / 1.2 N*m.

Power Optimizer

For North America

S440 / S500 / S500B / S650B

POWER OPTIMIZER

Enabling PV power optimization at the module level

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

* Functionality subject to inverter model and firmware version

Power Optimizer

For Residential Installations

S440 / S500 / S500B / S650B

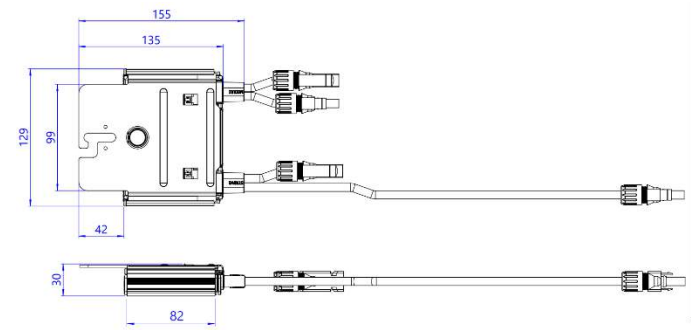
	S440	S500	S500B	S650B	UNIT
INPUT					
Rated Input DC Power(1)	440	500		650	W
Absolute Maximum Input Voltage (Voc)	60		125	85	Vdc
MPPT Operating Range	8 – 60		12.5 – 105	12.5 - 85	Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5	15			Adc
Maximum Efficiency	99.5				%
Weighted Efficiency	98.6				%
Overvoltage Category	II				
OUTPUT DURING OPERATION					
Maximum Output Current	15				Adc
Maximum Output Voltage	60		80		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)					
Safety Output Voltage per Power Optimizer	1 ± 0.1				Vdc
STANDARD COMPLIANCE(2)					
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011				
Safety	IEC62109-1 (class II safety), UL1741				
Material	UL94 V-0, UV Resistant				
RoHS	Yes				
Fire Safety	VDE-AR-E 2100-712:2018-12				
INSTALLATION SPECIFICATIONS					
Maximum Allowed System Voltage	1000				Vdc
Dimensions (W x L x H)	129 x 155 x 30		129 x 165 x 45		mm
Weight	720		790		gr
Input Connector	MC4(3)				
Input Wire Length	0.1				m
Output Connector	MC4				
Output Wire Length	(+) 2.3, (-) 0.10				m
Operating Temperature Range(4)	-40 to +85				˚C
Protection Rating	IP68				
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 details about CE compliance, see Declaration of Conformity – CE.
(3) For other connector types please contact SolarEdge.
(4) Power de-rating is applied for ambient temperatures above +85°C for S440 and S500, and for ambient temperatures above +75°C for S500B. Refer to the Power Optimizers Temperature De-Rating Technical Note for details.

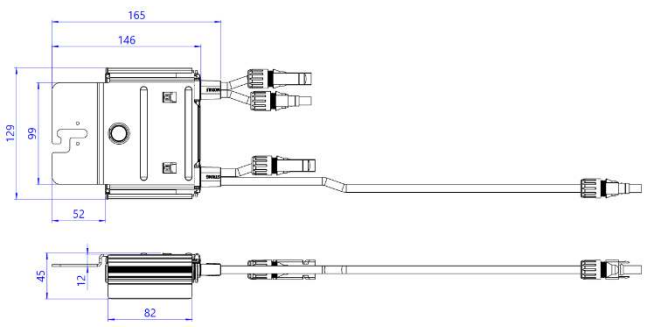
PV System Design Using a SolarEdge Inverter(5)		SolarEdge Home Wave Inverter Single Phase	SolarEdge Home Short String Inverter Three Phase	Three Phase for 230/400V Grid	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440, S500	8	9	16	18	
	S500B, S650B	6	8	14		
Maximum String Length (Power Optimizers)		25	20	50		
Maximum Continuous Power per String		5700	5625	11,250	12,750	W
Maximum Allowed Connected Power per String(6) (In multiple string designs, the maximum is permitted only when the difference in connected power between strings is 2,000W or less)		6800(7)	See(6)	13,500	15,000	W
Parallel Strings of Different Lengths or Orientations		Yes				

(5) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.
(6) If the inverter's rated AC power ≤ maximum continuous power per string, then the maximum connected power per string will be able to reach up to the inverters maximum input DC power. Refer to the Single String Design Guidelines application note.
(7) For inverters with a rated AC power ≥ 8000W that are connected to at least two strings.

S440, S500 (Flat Bracket)



S500B, S650B (Bent Bracket)



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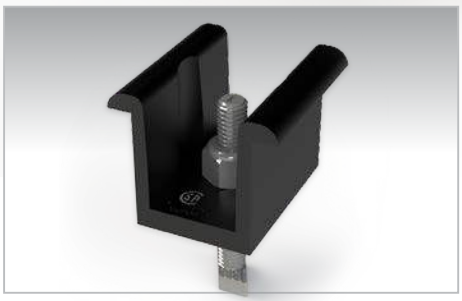

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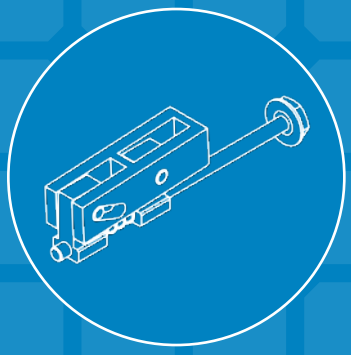
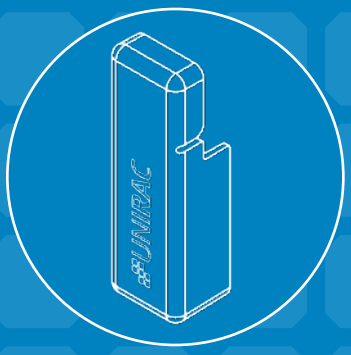
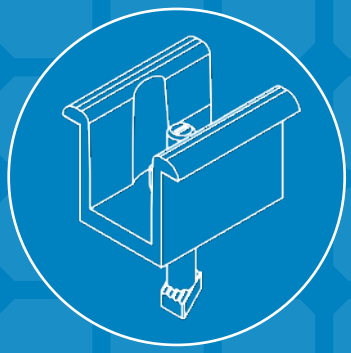


CONCEALED UNIVERSAL ENDCLAMPS



END CAPS INCLUDED WITH EVERY ENDCLAMP



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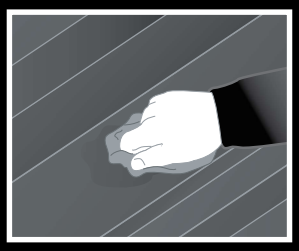
VersaBracket™ can be used to mount almost anything to an exposed-fastened roof system and is compatible with almost any trapezoidal exposed-fastened profile. No messy sealants to apply! No chance for leaks! The VersaBracket comes with factory-applied butyl sealant already in the base, and the S-5!® patented reservoir conceals the sealant from UV exposure, preventing drying and cracks.

Installation is simple! VersaBracket is mounted in the flat of the panel, directly into the supporting structure of the roof, i.e. wood decking, wood or steel purlins or trusses. No surface preparation is necessary; simply wipe away excess oil and debris, peel the release paper from the base, align, and apply. Secure through the pre-punched holes using the appropriate screws for the supporting structure.

VersaBracket is so strong, it will even support heavy-duty applications like snow retention. For exposed-fastened trapezoidal profiles, the VersaBracket is the perfect match for our ColorGard® snow retention systems (for corrugated roofs use CorruBracket™). VersaBracket is extremely economical and facilitates quick and easy installation.

1



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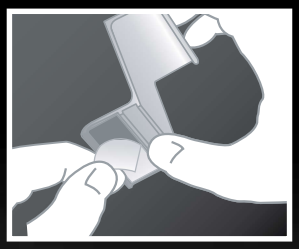

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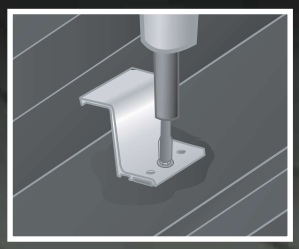

VersaBracket™

S-5!® VersaBracket™ is the right way to attach almost anything to exposed-fastened roof profiles, including PV through rail methods.

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VersaBracket™ can be used for almost any attachment need, including S-5!® ColorGard®, on all types of exposed-fastened metal roofing. No messy sealants to apply. The factory-applied butyl sealant waterproofs and makes installation a snap!

To accommodate various rib heights, **VersaBracket™** comes in two heights—the 2.65" VersaBracket-67™ and the 1.86" VersaBracket-47™. The VersaBracket-67 mounting face has no holes or slots; thus, ancillary items are typically secured using self-tapping screws. The VersaBracket-47 comes with a 1" slot on top as the standard part. Other hole and slot configurations available with minimum purchase requirements (contact your distributor for available configurations). Each VersaBracket comes with factory-applied butyl sealant in the base. A structural aluminum attachment bracket, VersaBracket is compatible with most common metal roofing materials. For design assistance, ask your distributor, or use our web-based calculator at **www.S-5.com** for job-specific system engineering and design of your next snow retention project. Also, please visit our website for more information including CAD details, metallurgical compatibilities, and specifications.

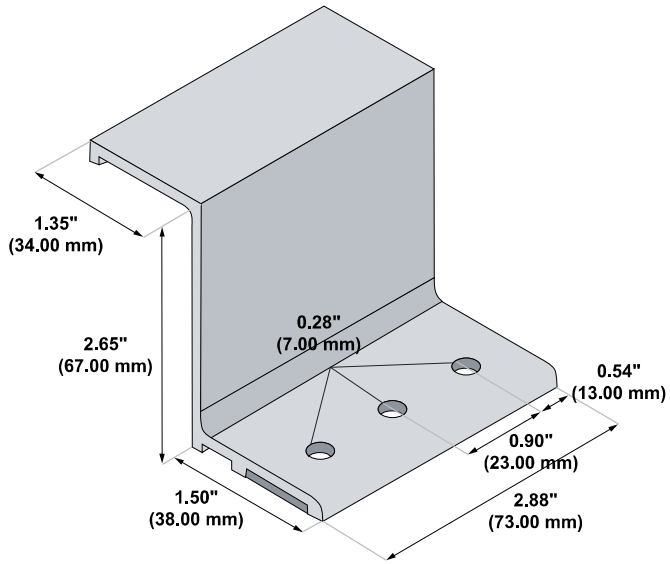
The VersaBracket has been tested for load-to-failure results on wood decking, metal, and wood purlins. The independent lab test data found at www.S-5.com can be used for load-critical designs and applications. S-5!® holding strength is unmatched in the industry.

Example Profile

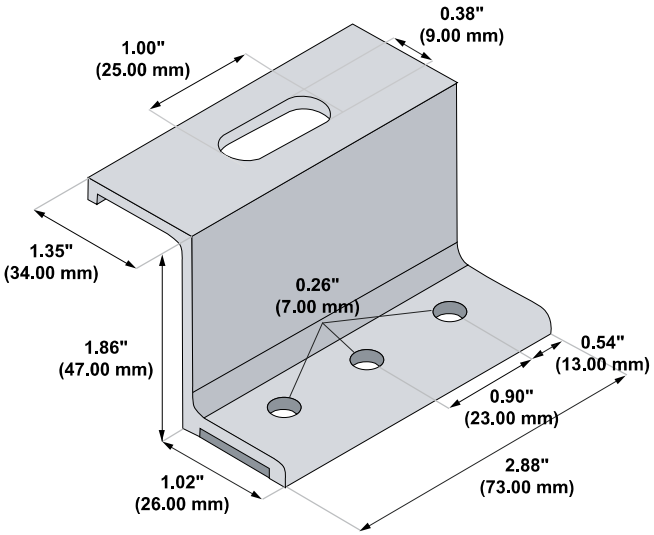
Example Applications

ColorGard

VersaBracket-67™



VersaBracket-47™



3 holes are provided for versatility. Some installations require only 2 fasteners. See the load table on the S-5! website and the installation instructions for more details.

Due to varied applications, mounting hardware is not furnished with part.

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

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

Products are protected by multiple U.S. and foreign patents. For published data regarding holding strength, bolt torque, patents and trademarks visit the S-5! website at www.S-5.com.

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