PHOTOVOLTAIC ROOF MOUNT SYSTEM

19 MODULES-ROOF MOUNTED - 7.410 kWDC, 6.000 kWAC
36 ATHENS CT, CAMERON, NC 28326, USA

SYSTEM SUMMARY

(N) 19 - JINKO SOLAR JKM390M-72HBL-V (390W) MODULES
(N) 01 - SOLAREDGE SE6000H-US STRING-INVERTER
(N) JUNCTION BOX
(N) 19- SOLAREDGE S440 POWER OPTIMIZERS
(E) 200A MAIN SERVICE PANEL WITH (E) 200A MAIN BREAKER
(N) 60A NON-FUSED AC DISCONNECT

INTERCONNECTION METHOD : BACKFEED BREAKER

DESIGN CRITERIA

ROOF TYPE:- ASPHALT SHINGLE
NUMBER OF LAYERS:- 01
ROOF FRAME:- 2"X2" TRUSSES @ 24" O.C
STORY:- ONE STORY
SNOW LOAD:- 10 PSF
WIND SPEED:- 117 MPH
WIND EXPOSURE:- C
RISK CATEGORY:- II
COORDINATE:- 35.284699, -79.116709

NOTE: INSTALLER TO DETERMINE OPTIMAL CONDUIT RUN ON SITE. ATTIC RUN IS OPTIONAL UNLESS REQUIRED BELOW.

ATTIC RUN: OPTIONAL

GOVERNING CODES:

2018 NORTH CAROLINA RESIDENTIAL CODE
2018 NORTH CAROLINA ENERGY CONSERVATION CODE
2018 NORTH CAROLINA ADMINISTRATIVE CODE
2018 NORTH CAROLINA BUILDING CODE
2009 ICC ANSI A117.1, ACCESSIBLE AND USABLE BUILDINGS
2018 NORTH CAROLINA PLUMBING CODE
2018 NORTH CAROLINA MECHANICAL CODE
2018 NORTH CAROLINA FUEL GAS CODE
2018 NORTH CAROLINA FIRE PREVENTION CODE
2018 NORTH CAROLINA EXISTING BUILDING CODE
2020 NATIONAL ELECTRICAL CODE (NEC)

SHEET INDEX

NOTICE TO CONTRACTOR
All construction must comply with current NC Building Codes and is subject to field inspection and verification.
APPROVED
Limited building only review
Permit holder responsible for full compliance with the code
04/01/2024
Harnett COUNTY NORTH CAROLINA

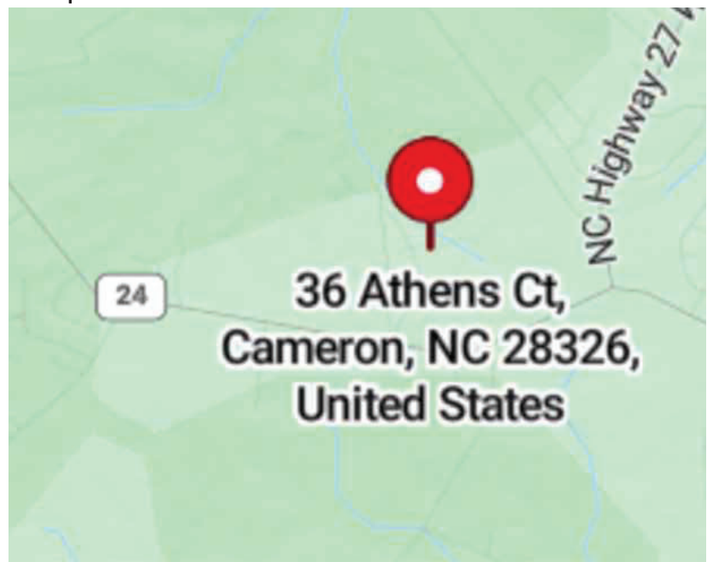
CONSTRUCTION NOTE:

A LADDER SHALL BE IN PLACE FOR INSPECTION
THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY GRID INTERACTIVE SYSTEM
A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH NEC 690-47 AND 250-50 THROUGH 60 250-166 SHALL BE PROVIDED PER NEC, GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO AT THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, OR IS ONLY METALLIC WATER PIPING, A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT GROUND ROD WITH ACORN CLAMP.
GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO GREATER THAN #8 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE OR A COMPLETE GROUND.
EACH MODULE WILL BE GROUNDED USING THE SUPPLIED GROUNDING POINTS IDENTIFIED BY THE MANUFACTURER.
EXPOSED NON-CURRENT CARRYING METAL PARTS OF MODULE FRAMES, EQUIPMENT, AND CONDUCTOR ENCLOSURES SHALL BE GROUNDED IN ACCORDANCE WITH 250.134 OR 250.138(A) REGARDLESS OF VOLTAGE.
PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED
ALL SIGNAGE WILL BE INSTALLED AS REQUIRED BY AND 2020 NEC.
HEIGHT OF INTEGRATED AC/DC DISCONNECT SHALL NOT EXCEED 6' 7" PER NEC 240.24
THE GROUNDING ELECTRODE CONDUCTOR SHALL BE PROTECTED FROM PHYSICAL DAMAGE BETWEEN THE GROUNDING ELECTRODE AND THE PANEL (OR INVERTER) IF SMALLER THAN #6 AWG COPPER WIRE PER NEC 250-64B. THE GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS, EXCEPT FOR SPLICES OR JOINTS AT BUSBARS WITHIN LISTED EQUIPMENT PER NEC 250.64C.
ALL EXTERIOR CONDUIT SHALL BE PAINTED TO MATCH ADJACENT SURFACES.
THE PV CONNECTION IN THE PANEL BOARD SHALL BE POSITIONED AT THE OPPOSITE (LOAD) END FROM THE INPUT FEEDER LOCATION OR MAIN CIRCUIT LOCATION. NEC 690.64(B)(7)
SITE CONDITIONS SHALL PREVAIL IF NO SCALE IS GIVEN. DRAWINGS ARE NOT NECESSARILY TO SCALE. ALL DIMENSIONS SHALL BE VERIFIED BY SUBCONTRACTOR UPON COMMENCEMENT OF CONSTRUCTION.

ELECTRICAL NOTES

- ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
- WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER E.G.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
- THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE

1 AERIAL PHOTO
PV-0 SCALE: NTS



2 VICINITY MAP
PV-0 SCALE: NTS

N W E S

NORTH CAROLINA PROFESSIONAL SEAL 54524 Exp: 12/31/2024 ENGINEER ROBERT A. LADE
STAMPED_03/06/2024

powur®
DEL MAR, CA 92014, USA

DESIGN SUPPORT DAY OF INSTALL:
CHAT.POWUR.COM

VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	03-06-2024	UR

PROJECT NAME

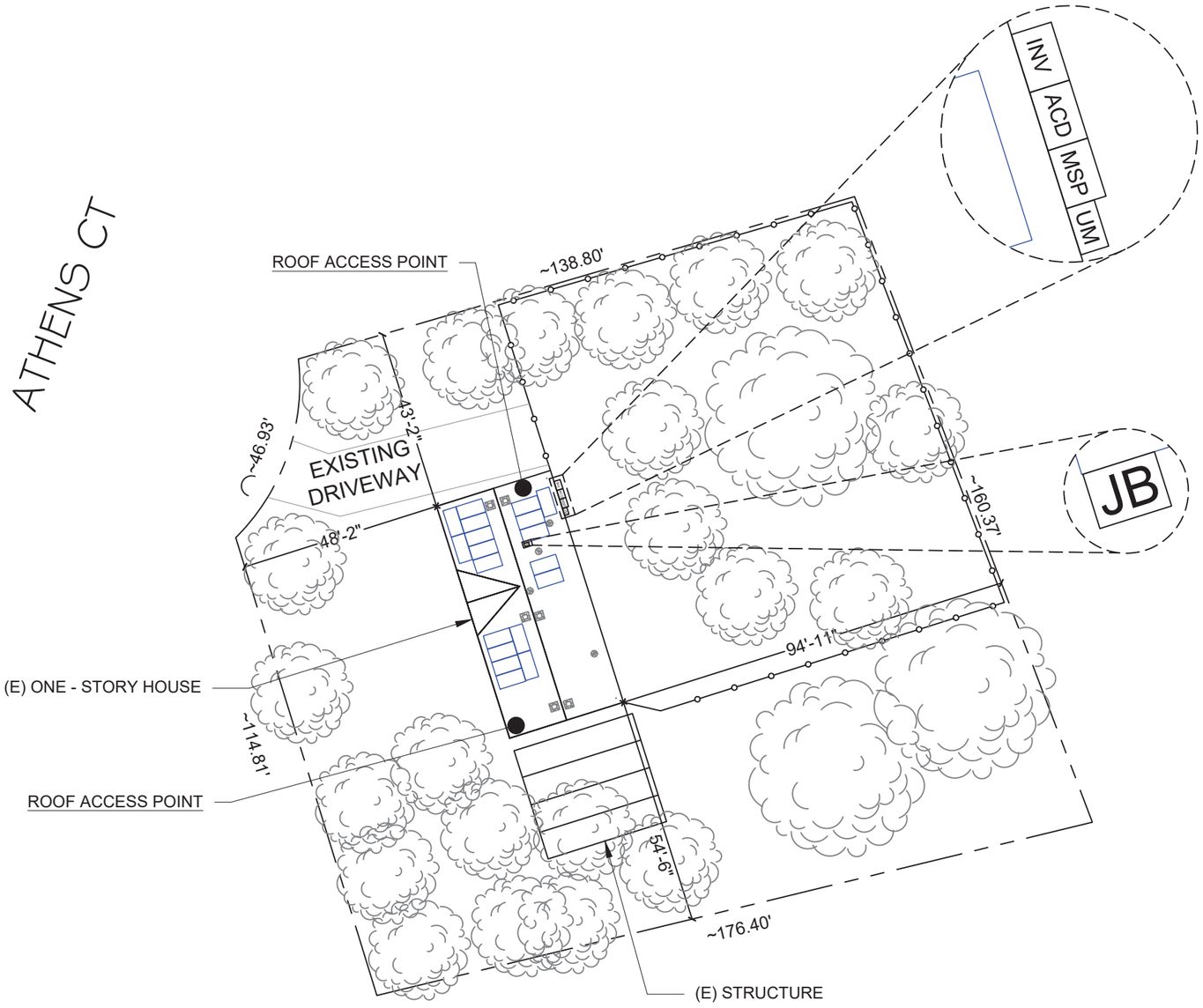
KARLA YESENIA CLAVEL
36 ATHENS CT,
CAMERON, NC 28326, USA
UTILITY: CENTRAL ELECTRIC MEMBERSHIP CORP
APN: 099556006451
AHJ: HARNETT COUNTY

SHEET NAME
COVER SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-0

● **ROOF ACCESS POINT** SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION IN LOCATIONS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES OR SIGNS.



NOTE:
A. ALL ELECTRICAL EQUIPMENT, INVERTERS/COMBINER, DISCONNECTS, MAIN SERVICE PANELS, ETC. SHALL NOT BE INSTALLED WITHIN 3' OF THE GAS METERS' SUPPLY OR DEMAND PIPING.

NOTE:
3/4" OR GREATER EMT CONDUIT RUN (7/8" ABOVE ROOF)

STRUCTURAL NOTES :

1. THESE PLANS ARE STAMPED FOR STRUCTURAL CODE COMPLIANCE OF THE ROOF FRAMING SUPPORTING THE PROPOSED PV INSTALLATION ONLY.
2. THESE PLANS ARE NOT STAMPED FOR WATER LEAKAGE.
3. PV MODULES, RACKING, AND ATTACHMENT COMPONENTS MUST FOLLOW MANUFACTURER GUIDELINES AND REQUIREMENTS.
4. PLEASE SEE THE ACCOMPANYING STRUCTURAL CALCULATIONS REPORT FOR ADDITIONAL INFORMATION.
5. PRIOR TO COMMENCEMENT OF WORK, THE SOLAR INSTALLER SHALL VERIFY THE ROOF FRAMING INFO BEFORE INSTALLATION AND NOTIFY THE E.O.R. IF THERE IS ANY INCONSISTENCY BETWEEN SITE VERIFICATION AND FOLLOWING: **2x2 TRUSSES @ 24" OC SPACING WITH MAX UNSUPPORTED SPAN EQUAL OR LESS THAN 5 FT.**

LEGEND	
UM	UTILITY METER
MSP	MAIN SERVICE PANEL
ACD	AC DISCONNECT
INV	SOLAREDGE SE6000H-US INVERTER
JB	JUNCTION BOX
○ □	VENT, ATTIC FAN (ROOF OBSTRUCTION)
	6" OBSTRUCTION CLEARANCE
	PROPERTY LINE
	FENCE
	TREES

1 SITE PLAN WITH ROOF PLAN
SCALE: 1/32" = 1'-0"

N

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APN: 099556006451
AHJ: HARNETT COUNTY

SHEET NAME
SITE PLAN WITH ROOF PLAN

SHEET SIZE
ANSI B
11" X 17"

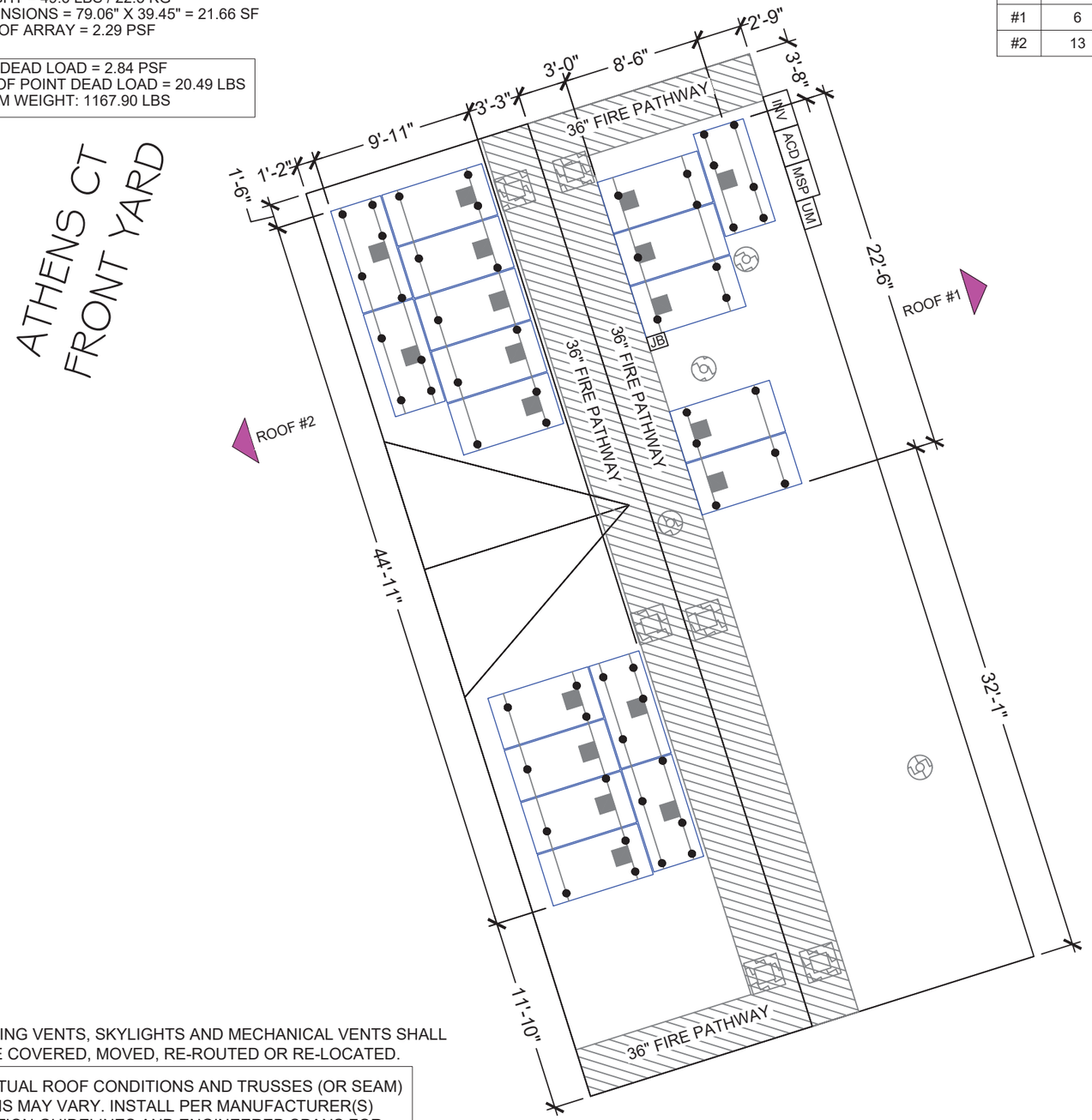
SHEET NUMBER
PV-1

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 19 MODULES
MODULE TYPE = JINKO SOLAR JKM390M-72HBL-V (390W) MODULES
MODULE WEIGHT = 49.6 LBS / 22.5 KG
MODULE DIMENSIONS = 79.06" X 39.45" = 21.66 SF
UNIT WEIGHT OF ARRAY = 2.29 PSF

DISTRIBUTED DEAD LOAD = 2.84 PSF
AVERAGE ROOF POINT DEAD LOAD = 20.49 LBS
TOTAL SYSTEM WEIGHT: 1167.90 LBS

NOTE:
3/4" OR GREATER EMT CONDUIT RUN (7/8" ABOVE ROOF)



ARRAY AREA & ROOF AREA CALC`S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	6	129.95	852	15.25
#2	13	281.57	741	38.00

ROOF DESCRIPTION				
ROOF TYPE			ASPHALT SHINGLE	
ROOF	ROOF TILT	AZIMUTH	TRUSSES SIZE	TRUSSES SPACING
#1	14°	73°	2" X 2"	24" O.C
#2	14°	253°	2" X 2"	24" O.C

ARRAY AREA & ROOF AREA CALC`S		
AREA OF NEW ARRAY (Sq. Ft.)	AREA OF ROOF(PLAN VIEW) (Sq. Ft.)	TOTAL ROOF AREA COVERED BY ARRAY %
411.52	1707.3	24.10
24.10%	ROOF AREA (ARRAY <33% of ROOF AREA)	

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
RAIL	12	UNIRAC NXT UMOUNT RAIL - 168" MILL
RAIL SPLICE	2	NXT UMOUNT RAIL SPLICE
UNIVERSAL CLAMP	52	NXT UMOUNT COMBO CLAMP - DARK
DECKING SCREWS	228	#14 3IN SELF-DRILL SCREW
COMP ROOF ATTACHMENT	57	UNIRAC FLASHLOC DUO MILL
RAIL CLAMP	57	STRONGHOLD RAIL CLAMP MILL
ACCESSORIES	28	NXT UMOUNT RL & CLMP CAP KIT
MLPE & GROUNDING	26	NXT UMOUNT MLPE & LUG CLAMP

LEGEND	
UM	UTILITY METER
MSP	MAIN SERVICE PANEL
ACD	AC DISCONNECT
INV	SOLAREDGE SE6000H-US INVERTER
JB	JUNCTION BOX
	SOLAREDGE S440 POWER OPTIMIZERS
	UNIRAC NXT UMOUNT RAIL
	ROOF ATTACHMENT FLASHLOC DUO @ 48" O.C.
	VENT, ATTIC FAN (ROOF OBSTRUCTION)
	6" OBSTRUCTION CLEARANCE
	FIRE PATHWAY

- PLUMBING VENTS, SKYLIGHTS AND MECHANICAL VENTS SHALL NOT BE COVERED, MOVED, RE-ROUTED OR RE-LOCATED.

NOTE: ACTUAL ROOF CONDITIONS AND TRUSSES (OR SEAM) LOCATIONS MAY VARY. INSTALL PER MANUFACTURER(S) INSTALLATION GUIDELINES AND ENGINEERED SPANS FOR ATTACHMENTS

1 ROOF PLAN WITH MODULES

SCALE: 1/8" = 1'-0"

N

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36 ATHENS CT,
CAMERON, NC 28326, USA
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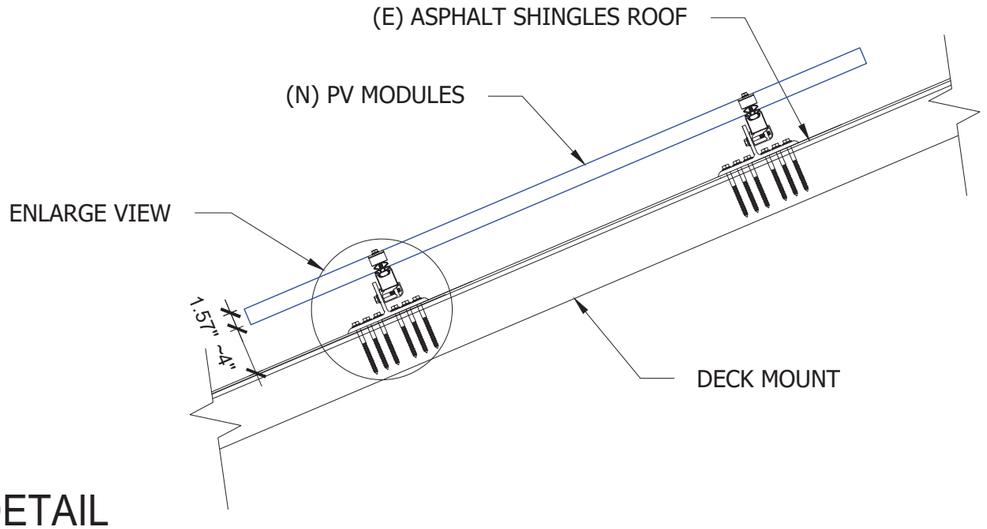
APN: 099556006451
AHJ: HARNETT COUNTY

SHEET NAME
ROOF PLAN WITH MODULES

SHEET SIZE
ANSI B
11" X 17"

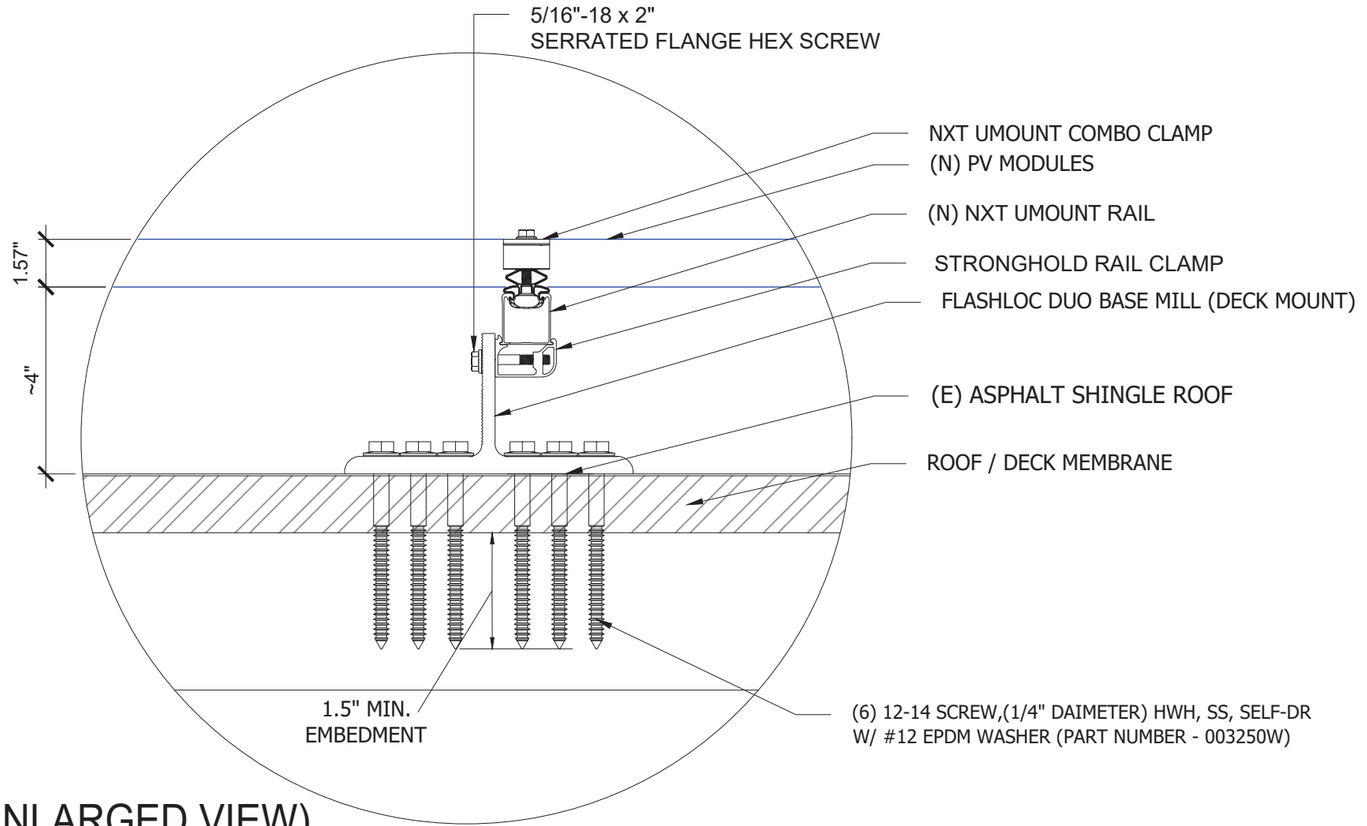
SHEET NUMBER
PV-2



1 ATTACHMENT DETAIL

SCALE: NTS

NOTE: ACTUAL ROOF CONDITIONS AND TRUSSES (OR SEAM) LOCATIONS MAY VARY. INSTALL PER MANUFACTURER(S) INSTALLATION GUIDELINES AND ENGINEERED SPANS FOR ATTACHMENTS



2 ATTACHMENT DETAIL (ENLARGED VIEW)

SCALE: NTS

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AHJ: HARNETT COUNTY

SHEET NAME
ATTACHMENT DETAIL

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3

AMBIENT TEMPERATURE SPECIFICATIONS				
RECORD LOW TEMPERATURE	AMBIENT TEMP (HIGH TEMP 2%)	CONDUIT HEIGHT	CONDUCTOR TEMPERATURE RATE (ON ROOF)	CONDUCTOR TEMPERATURE RATE (OFF ROOF)
-11°	35°	7/8"	90°	75°

SYSTEM SIZE:- 19 x 390W = 7.410 kWDC
SYSTEM SIZE:- 1 x 6000W = 6.000 kWAC

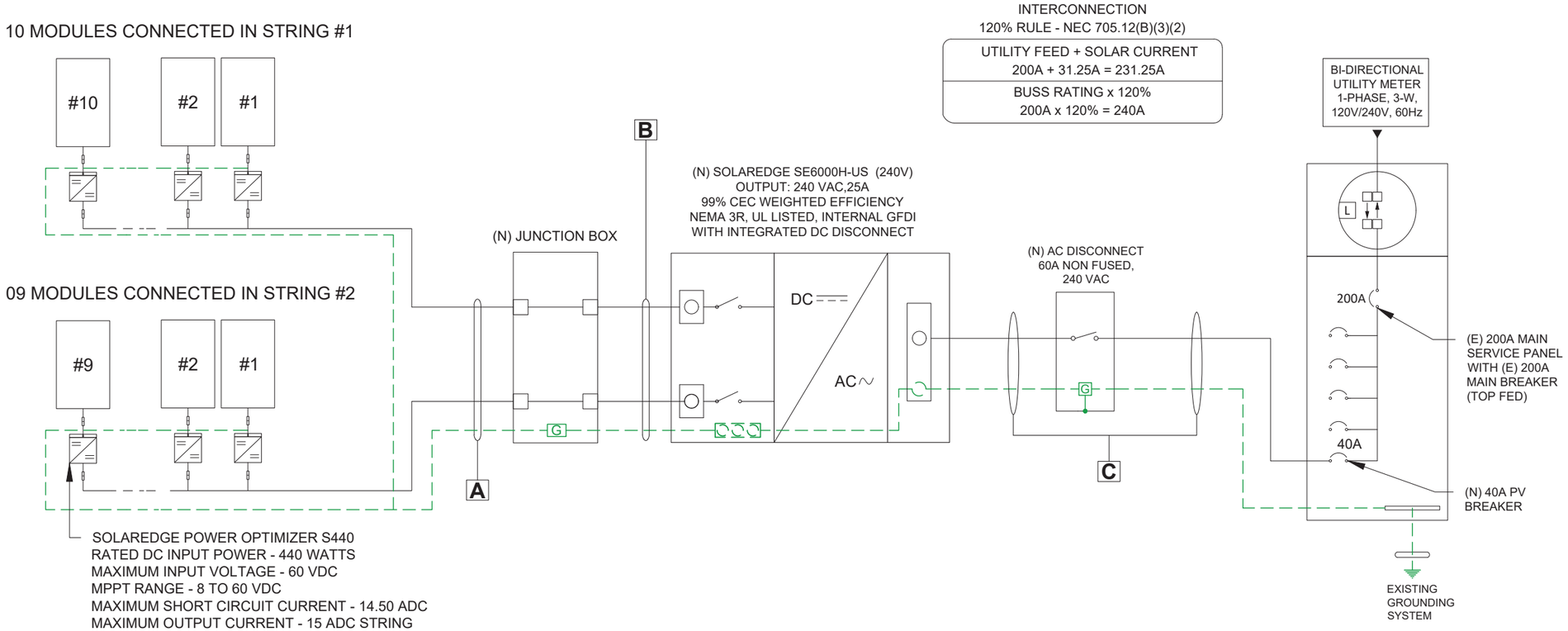
NOTE:
3/4" OR GREATER EMT CONDUIT
RUN (7/8" ABOVE ROOF)

SOLAR MODULE SPECIFICATIONS						
MANUFACTURER / MODEL #	VMP (V)	IMP (A)	VOC (V)	ISC (A)	TEMPERATURE COEFFICIENT OF Voc	QUANTITY OF MODULES
JINKO SOLAR JKM390M-72HBL-V (390W)	39.64	9.84	48.60	10.46	-0.29%/°C	19
MODULE DIMENSIONS	79.06"L x39.45"W x1.57"D					

NOTE: PV BREAKER CALCULATION: (01 X 25 X 1.25 = 31.25) ~40A

INVERTER SPECIFICATIONS			
MANUFACTURER / MODEL #	QUANTITY	NOMINAL OUTPUT VOLTAGE	NOMINAL OUTPUT CURRENT
SOLAREDGE HD SE6000H-US	1	240VAC	25A

SERVICE INFO.	
UTILITY PROVIDER:	CENTRAL ELECTRIC MEMBERSHIP CORP
MAIN SERVICE VOLTAGE:	240V
MAIN PANEL BRAND:	SIEMENS
MAIN SERVICE PANEL:	(E) 200A
MAIN CIRCUIT BREAKER RATING:	(E) 200A
MAIN SERVICE LOCATION:	NOTRTH EAST
SERVICE FEED SOURCE:	UNDERGROUND



WIRE TAG	CONDUIT	WIRE QTY	WIRE GAUGE	WIRE TYPE	TEMP. RATING	WIRE AMPACITY (A)	TEMP. DERATE	CONDUIT FILL DERATE	DERATED AMPACITY (A)	DESIGN CURRENT (A)	GROUND SIZE	GROUND WIRE TYPE
A	OPEN AIR	4	10 AWG	THWN-2	90°C	40	0.96	N/A	38.40	15	06 AWG	BARE CU GND
B	3/4" EMT	4	10 AWG	THWN-2	90°C	40	0.96	0.8	30.72	15	10 AWG	THWN-2
C	3/4" EMT	3	8 AWG	THWN-2	75°C	50	0.94	1.0	47.00	25	10 AWG	THWN-2

1 ELECTRICAL LINE DIAGRAM WITH WIRE CALCULATION

SCALE: NTS

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CAMERON, NC 28326, USA
UTILITY: CENTRAL ELECTRIC
MEMBERSHIP CORP
APN: 099556006451
AHJ: HARNETT COUNTY

SHEET NAME
ELECTRICAL LINE DIAGRAM WITH WIRE CALCULATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-4

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

LABEL LOCATION:
MAIN SERVICE PANEL(IF APPLICABLE).
PER CODE(S): NEC 2020: NEC 706.15 (C)(4) & NEC 690.13(B)

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION:
UTILITY SERVICE ENTRANCE/METER, INVERTER/DC DISCONNECT IF REQUIRED BY LOCAL AHJ, OR OTHER LOCATIONS AS REQUIRED BY LOCAL AHJ.
PER CODE(S): NEC 2020: 690.56(C)(2)

⚠ WARNING

POWER SOURCE OUTPUT CONNECTION
DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION:
SERVICE PANEL IF SUM OF BREAKERS EXCEEDS PANEL RATING
NEC 705.12 (B)(3)(2)

PHOTOVOLTAIC

AC DISCONNECT

LABEL LOCATION:
AC DISCONNECT/BREAKER/
POINT OF CONNECTION
(PER CODE: NEC 690.13(B)

PHOTOVOLTAIC AC DISCONNECT

MAXIMUM AC OPERATING CURRENT: 25 AMPS
NOMINAL OPERATING AC VOLTAGE: 240 VAC

LABEL LOCATION:
AC DISCONNECT(S), PHOTOVOLTAIC SYSTEM POINT OF INTERCONNECTION.
PER CODE(S): NEC 2020: 690.54

PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION:
CONDUIT, INVERTER
(PER CODE: NEC690.31(D)(2)

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

LABEL LOCATION:
MAIN SERVICE DISCONNECT / UTILITY METER
(PER CODE: NEC 690.13(B))

⚠ CAUTION

PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

LABEL LOCATION:
MSP (PER CODE: NEC 705.12(D) & NEC 690.59

⚠ WARNING

THIS EQUIPMENT FED BY MULTIPLE SOURCES:
TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING MAIN POWER SUPPLY SHALL NOT EXCEED AMPACITY OF BUSBAR

LABEL LOCATION:
POINTS OF CONNECTION/BREAKER
CODE: NEC 705.12(B)(3)(2)

⚠ WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
POINT OF INTERCONNECTION
PRODUCTION METER
NEC 705.12(B)(3)(3) & NEC 690.59)

RATED MAXIMUM POWER-POINT CURRENT (Imp)	16.5	A
MAXIMUM SYSTEM VOLTAGE (VOC)	480	V
MAXIMUM CIRCUIT CURRENT (Isc)	30	A

LABEL LOCATION:
DC DISCONNECT, INVERTER#
(PER CODE: NEC 690.53)

⚠ WARNING

ELECTRIC SHOCK HAZARD

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

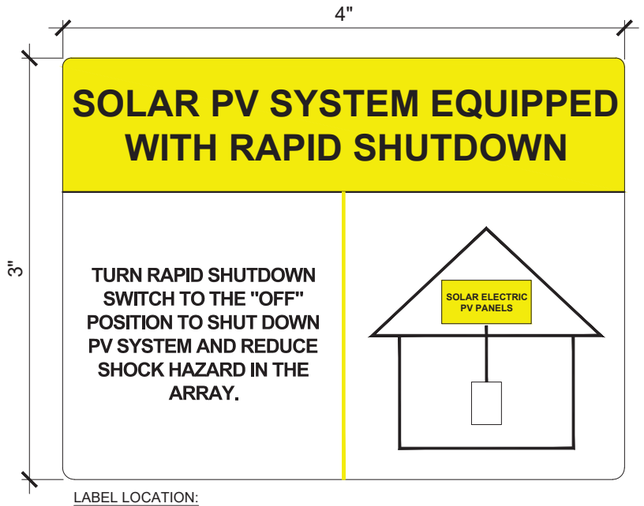
DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT

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

⚠ WARNING

THE DISCONNECTION OF THE GROUNDED CONDUCTOR(S) MAY RESULT IN OVERVOLTAGE ON THE EQUIPMENT

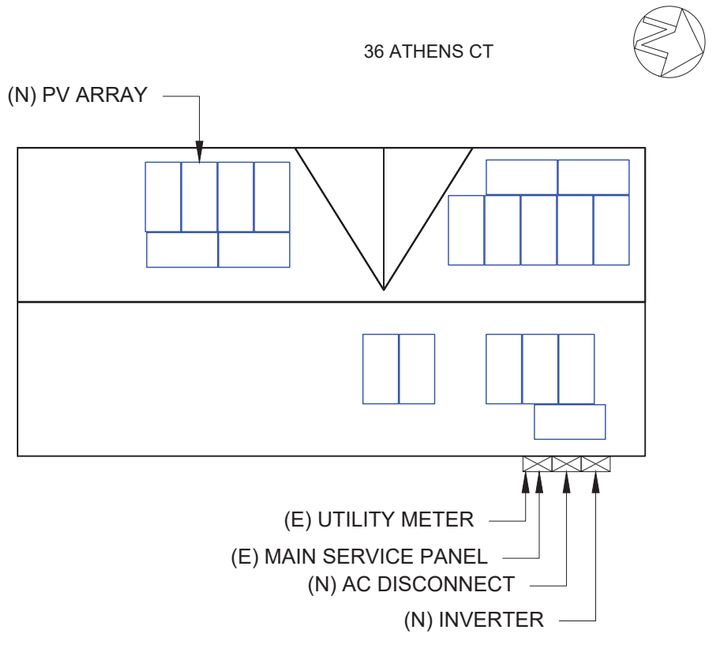
LABEL LOCATION:
INVERTER
PER CODE: NEC 690.31(E)



LABEL LOCATION:
MAIN SERVICE PANEL
PER CODE(S): NEC 2020:690.56(C) IFC 2021: 1205.4.1

CAUTION !
MULTIPLE SOURCES OF POWER

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



NOTES AND SPECIFICATIONS:

- SIGNS AND LABELS SHALL MEET THE REQUIREMENTS OF THE 2020 ARTICLE 110.21(B), UNLESS SPECIFIC INSTRUCTIONS ARE REQUIRED BY SECTION 690, OR IF REQUESTED BY THE LOCAL AHJ.
- SIGNS AND LABELS SHALL ADEQUATELY WARN OF HAZARDS USING EFFECTIVE WORDS, COLORS AND SYMBOLS.
- LABELS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN.
- LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
- SIGNS AND LABELS SHALL COMPLY WITH ANSI Z535.4-2011, PRODUCT SAFETY SIGNS AND LABELS, UNLESS OTHERWISE SPECIFIED.
- DO NOT COVER EXISTING MANUFACTURER LABELS.

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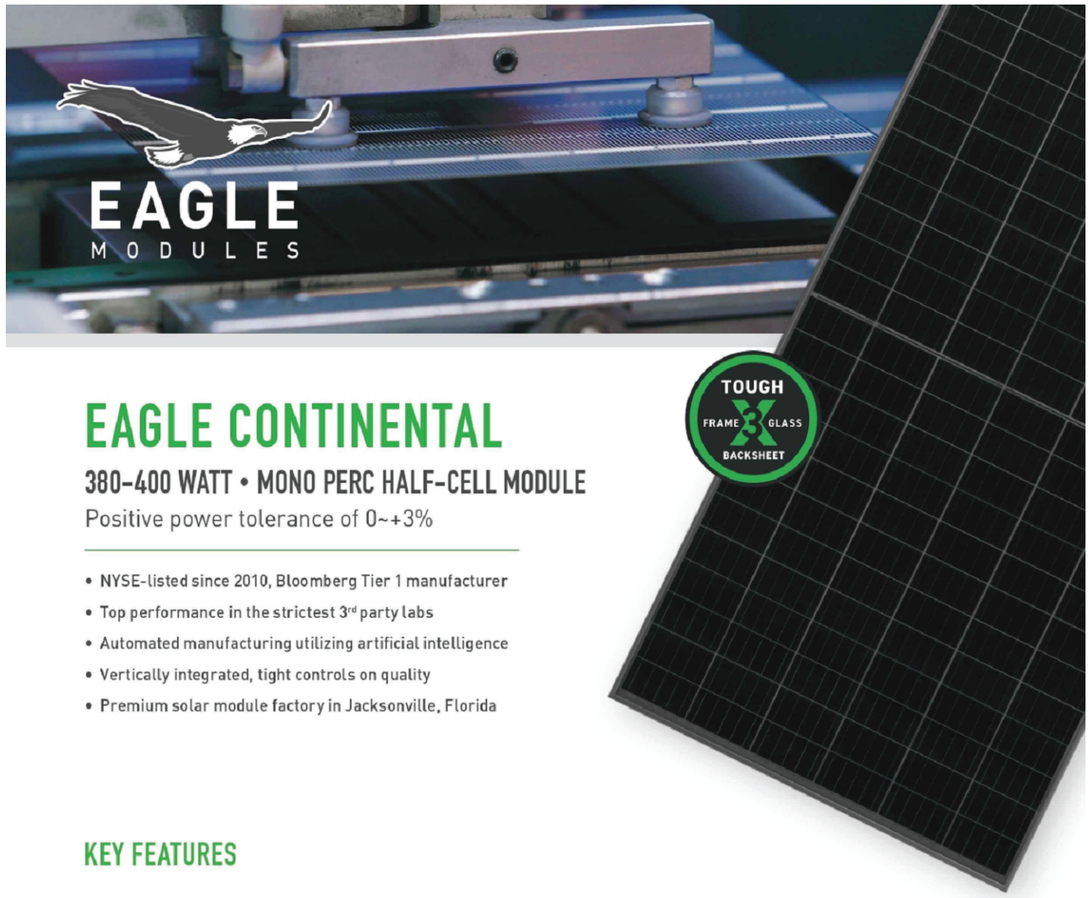
SHEET NAME
WARNING LABELS & PLACARD

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5



EAGLE CONTINENTAL

380-400 WATT • MONO PERC HALF-CELL MODULE

Positive power tolerance of 0~+3%

- NYSE-listed since 2010, Bloomberg Tier 1 manufacturer
- Top performance in the strictest 3rd party labs
- Automated manufacturing utilizing artificial intelligence
- Vertically integrated, tight controls on quality
- Premium solar module factory in Jacksonville, Florida

KEY FEATURES

Superior Aesthetics
Black backsheet and black frame create ideal look for residential applications.

Diamond Half-Cell Technology
World-record breaking efficient mono PERC half-cells deliver high power in a small footprint.

Thick and Tough
Fire Type 1 rated module engineered with a thick frame, 3.2mm front side glass, and thick backsheet for added durability.

Shade Tolerant
Twin array design allows continued performance even with shading by trees or debris.

Protected Against All Environments
Certified to withstand humidity, heat, rain, marine environments, wind, hailstorms, and packed snow.

Warranty
12-year product and 25-year linear power warranty.

ASSEMBLED IN THE USA
From foreign components

- ISO9001:2008 Quality Standards
- ISO14001:2004 Environmental Standards
- IEC61215, IEC61730 certified
- ISO 45001 2018 Occupational Health & Safety Standards
- UL1703/61730 certified

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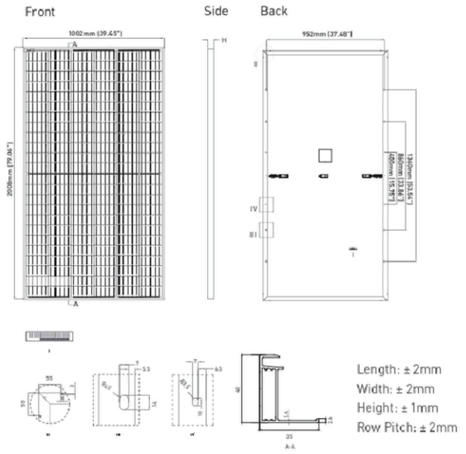
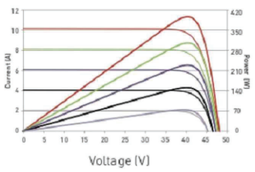
ENGINEERING DRAWINGS

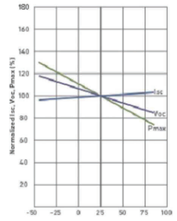


ELECTRICAL PERFORMANCE & TEMPERATURE DEPENDENCE

Current-Voltage & Power-Voltage Curves (400W)



Temperature Dependence of Isc, Voc, Pmax



MECHANICAL CHARACTERISTICS

Cells	Mono PERC Diamond Cell (158.75 x 158.75mm)
No. of Half Cells	144 (6 x 24)
Dimensions	2008 x 1002 x 40mm (79.06 x 39.45 x 1.57in)
Weight	22.5kg (49.6lbs)
Front Glass	3.2mm, Anti-Reflection Coating High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminum Alloy
Junction Box	IP68 Rated
Output Cables	12 AWG, 1400mm (55.12in)
Connector	Staubli MC4 Series
Fire Type	Type 1
Pressure Rating	5400Pa (Snow) & 2400Pa (Wind)
Hailstone Test	50mm Hailstones at 35m/s

TEMPERATURE CHARACTERISTICS

Temperature Coefficients of Pmax	-0.35%/°C
Temperature Coefficients of Voc	-0.29%/°C
Temperature Coefficients of Isc	0.048%/°C
Nominal Operating Cell Temperature (NOCT)	45±2°C

MAXIMUM RATINGS

Operating Temperature (°C)	-40°C~+85°C
Maximum System Voltage	1500VDC (UL and IEC)
Maximum Series Fuse Rating	20A

PACKAGING CONFIGURATION

(Two pallets = One stack)

27pcs/pallet, 54pcs/stack, 594pcs/40'HQ Container

WARRANTY

12-year product and 25-year linear power warranty

1st year degradation not to exceed 2.5%, each subsequent year not to exceed 0.6%, minimum power at year 25 is 83.1% or greater.

ELECTRICAL CHARACTERISTICS

Module Type	JKM380M-72HBL-V		JKM385M-72HBL-V		JKM390M-72HBL-V		JKM395M-72HBL-V		JKM400M-72HBL-V	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	380Wp	280Wp	385Wp	283Wp	390Wp	287Wp	395Wp	291Wp	400Wp	294Wp
Maximum Power Voltage (Vmp)	39.10V	36.5V	39.37V	36.8V	39.64V	37.0V	39.90V	37.4V	40.16V	37.6V
Maximum Power Current (Imp)	9.72A	7.67A	9.78A	7.71A	9.84A	7.75A	9.90A	7.77A	9.96A	7.82A
Open-circuit Voltage (Voc)	48.2V	45.4V	48.4V	45.6V	48.6V	45.8V	48.8V	46.0V	49.1V	46.2V
Short-circuit Current (Isc)	10.30A	8.32A	10.38A	8.38A	10.46A	8.45A	10.54A	8.51A	10.61A	8.57A
Module Efficiency STC (%)	18.89%		19.13%		19.38%		19.63%		19.88%	

*STC: Irradiance 1000W/m² Cell Temperature 25°C AM = 1.5
NOCT: Irradiance 800W/m² Ambient Temperature 20°C AM = 1.5 Wind Speed 1m/s

*Power measurement tolerance: ±3%

The company reserves the final right for explanation on any of the information presented hereby. JKM380-400M-72HBL-V-F1-US

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DEL MAR, CA 92014, USA

DESIGN SUPPORT DAY OF INSTALL:
CHAT.POWUR.COM

VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	03-06-2024	UR

PROJECT NAME

KARLA YESENIA CLAVEL
36 ATHENS CT,
CAMERON, NC 28326, USA
UTILITY: CENTRAL ELECTRIC MEMBERSHIP CORP
APN: 099556006451
AHJ: HARNETT COUNTY

SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-6

SolarEdge Home Wave Inverter

For North America

SE3000H-US / SE3800H-US / SE5000H-US / SE5700H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US

INVERTERS

12-25 YEAR WARRANTY

Optimized installation with HD-Wave technology

- Specifically designed to work with power optimizers
- Record-breaking 99% weighted efficiency
- Quick and easy inverter commissioning directly from a smartphone using SolarEdge SetApp
- Fixed voltage inverter for longer strings
- Integrated arc fault protection and rapid shutdown for NEC 2014-2023 per articles 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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SolarEdge Home Wave Inverter

For North America

SE3000H-US / SE3800H-US / SE5000H-US / SE5700H-US / SE6000H-US / SE7600H-US

Applicable to inverters with part number	SEXXXXH-XXXXXBXX4						Units
	SE3000H-US	SE3800H-US	SE5000H-US	SE5700H-US	SE6000H-US	SE7600H-US	
OUTPUT							
Rated AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	5760 @ 240V 5000 @ 208V	6000 @ 240V 5000 @ 208V	7600	VA
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	5000	5760 @ 240V 5000 @ 208V	6000 @ 240V 5000 @ 208V	7600	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	24	25	32	A
Maximum Continuous Output Current @208V	-	16	-	24	24	-	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	8900	9300	11800	W
Maximum DC Power @208V	-	5100	-	7750	7750	-	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	16.5	20	Adc
Maximum Input Current @208V(2)	-	9	-	13.5	13.5	-	Adc
Max. Input Short Circuit Current	45						Adc
Reverse-Polarity Protection	Yes						
Ground-Fault Isolation Detection	600k Sensitivity						
Maximum Inverter Efficiency	99	99.2					%
CEC Weighted Efficiency	99						%
Nighttime Power Consumption	< 2.5						W
ADDITIONAL FEATURES							
Supported Communication Interfaces	RS485, Ethernet, wireless SolarEdge Home Network (optional)(3), Wi-Fi (optional), Cellular (optional)						
Revenue Grade Metering, ANSI C12.20	Optional(4)						
Consumption Metering	Optional(4)						
Inverter Commissioning	With the SetApp mobile application using Built-in Wi-Fi Access Point for Local Connection						
Rapid Shutdown - NEC 2014-2023 per articles 690.11 and 690.12	Automatic Rapid Shutdown upon AC Grid Disconnect						
STANDARD COMPLIANCE							
Safety	Conforms to UL 1741, UL 1741SA, UL 1741SB, UL 1699B Certified by CSA 22.2#107.1, C22.2#330, C22.3#9, ANSI/CAN/UL 9540						
Grid Connection Standards	IEEE1547 and IEEE-1547.1, Rule 21, Rule 14H						
Emissions	FCC Part 15 Class B						
INSTALLATION SPECIFICATIONS							
AC Output Conduit Size / AWG Range	1" Maximum / 14 – 6 AWG						
DC Input Conduit Size / # of Strings / AWG Range	1" Maximum / 1 – 2 strings / 14 – 6 AWG						
Dimensions with Safety Switch (H x W x D)	17.7 x 14.6 x 6.8 / 450 x 370 x 174						in / mm
Weight with Safety Switch	22 / 10	25.1 / 11.4	27.5 / 12.5	26.2 / 11.9			lb / kg
Noise	< 25				< 50		dBA
Cooling	Natural Convection						
Operating Temperature Range	-40 to +140 / -40 to +60(5)						°F / °C
Protection Rating	NEMA 4X (Inverter with Safety Switch)						

(1) For other regional settings please contact SolarEcge support.
(2) A higher current source may be used; the inverter will limit its input current to the values stated.
(3) For more information, refer to the SolarEdge Home Network datasheet
(4) Inverter with Revenue Grade Production and Consumption Meter P/N: SExxxxH-US000BEI4. For consumption metering, current transformers should be ordered separately: SEACT0750-200NA-20 or SEACT0750-400NA-20. 20 units per box.
(5) Full power up to at least 50°C / 122°F; for power de-rating information refer to the Temperature Derating technical note for North America.

CE ETL Intertek 4004590

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AHJ: HARNETT COUNTY

SHEET NAME

SPEC SHEETS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-7

Power Optimizer

For Residential Installations

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

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solaredge

Power Optimizer

For Residential Installations

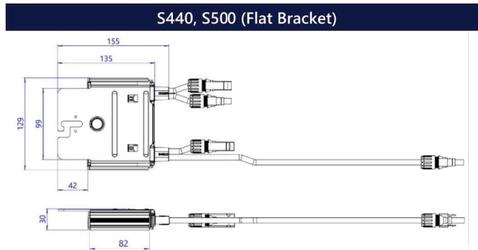
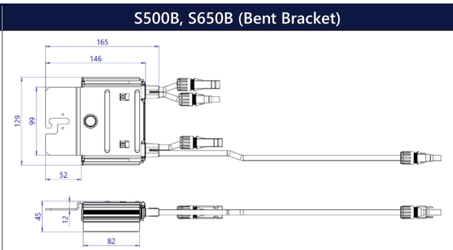
S440 / S500 / S500B / S650B

	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 Par: 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)
	

CE RoHS

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DEL MAR, CA 92014, USA

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CHAT.POWUR.COM

VERSION

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36 ATHENS CT,
CAMERON, NC 28326, USA
UTILITY: CENTRAL ELECTRIC
MEMBERSHIP CORP
APN: 099556006451
AHJ: HARNETT COUNTY

SHEET NAME

SPEC SHEETS

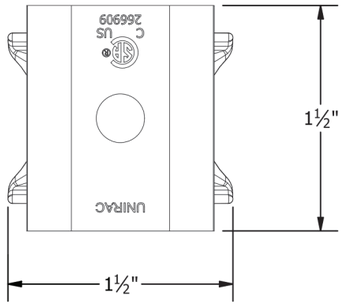
SHEET SIZE

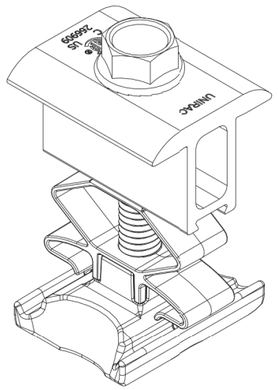
ANSI B
11" X 17"

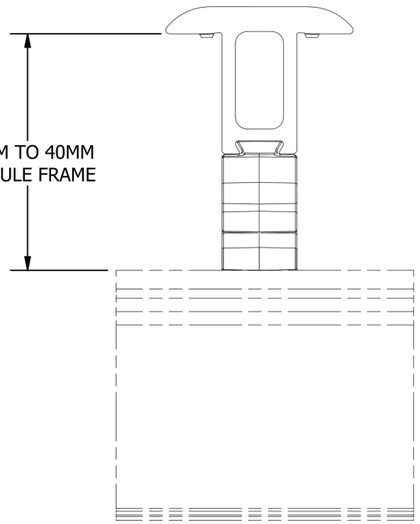
SHEET NUMBER

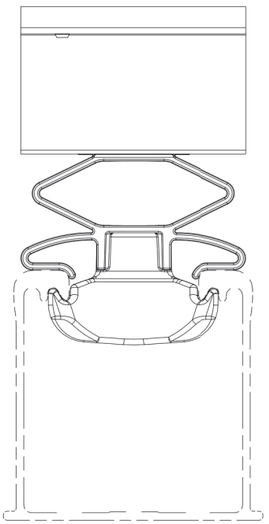
PV-8

PART # TABLE	
P/N	DESCRIPTION
CCLAMPM1	NXT COMBO CLAMP - MILL
CCLAMPD1	NXT COMBO CLAMP - DARK



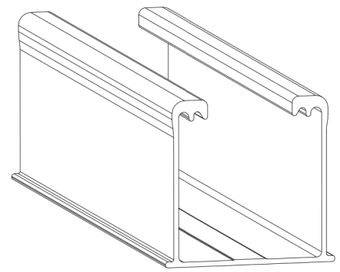


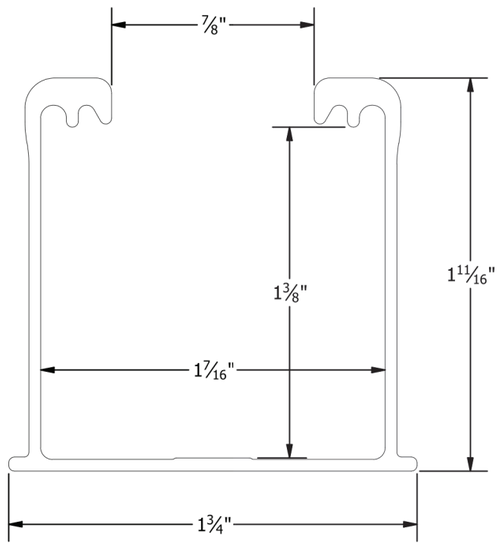


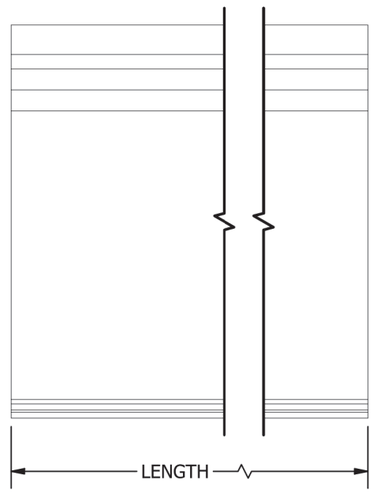


UNIRAC			
1411 BROADWAY BLVD. NE ALBUQUERQUE, NM 87102 USA PHONE: 505.242.6411 WWW.UNIRAC.COM	PRODUCT LINE:	NXT UMOUNT	DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL
	DRAWING TYPE:	PART & ASSEMBLY	PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE
	DESCRIPTION:	COMBO CLAMP	NU-A03 SHEET
	REVISION DATE:	11/17/2022	

PART # TABLE		
P/N	DESCRIPTION	LENGTH
084RLM1	NXT UMOUNT RAIL 84" MILL	84"
084RLD1	NXT UMOUNT RAIL 84" DARK	84"
168RLM1	NXT UMOUNT RAIL 168" MILL	168"
168RLD1	NXT UMOUNT RAIL 168" DARK	168"
208RLM1	NXT UMOUNT RAIL 208" MILL	208"
208RLD1	NXT UMOUNT RAIL 208" DARK	208"
246RLM1	NXT UMOUNT RAIL 246" MILL	246"
246RLD1	NXT UMOUNT RAIL 246" DARK	246"
171RLM1	NXT UMOUNT RAIL 171" MILL	171.50"
171RLD1	NXT UMOUNT RAIL 171" DARK	171.50"







UNIRAC			
1411 BROADWAY BLVD. NE ALBUQUERQUE, NM 87102 USA PHONE: 505.242.6411 WWW.UNIRAC.COM	PRODUCT LINE:	NXT UMOUNT	DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL
	DRAWING TYPE:	PART DETAIL	PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE
	DESCRIPTION:	RAIL	NU-P01 SHEET
	REVISION DATE:	11/17/2022	

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DEL MAR, CA 92014, USA

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AHJ: HARNETT COUNTY

SHEET NAME

SPEC SHEETS

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ANSI B
11" X 17"

SHEET NUMBER

PV-9

FLASHLOC™ DUO

THE MOST VERSATILE DIRECT TO DECK ATTACHMENT

UNIRAC®

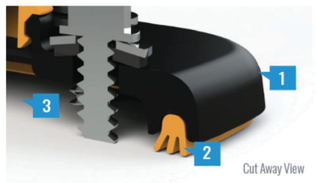
BETTER SOLAR STARTS HERE

FLASHLOC™ **DUO** is the most versatile direct to deck and rafter attachment for composition shingle and rolled comp roofs. The all-in-one mount installs fast — no kneeling on hot roofs to install flashing, no prying or cutting shingles, no pulling nails. Simply drive the required number of screws to secure the mount and inject sealant into the base. **FLASH**LOC's patented TRIPLE SEAL technology preserves the roof and protects the penetration with a permanent pressure seal. Kitted with two rafter screws, sealant and hardware for maximum convenience (deck screws sold separately). Don't just divert water, **LOC it out!**

UNIRAC 25 YEAR FULL-SYSTEM WARRANTY

PROTECT THE ROOF

Install a high-strength waterproof attachment without lifting, prying or damaging shingles.



Cut Away View

LOC OUT WATER

With an outer shield 1 contour-conforming gasket 2 and pressurized sealant chamber 3 the Triple Seal technology delivers a 100% waterproof connection.

Cut Away View

HIGH-SPEED INSTALL

Simply drive the required number of screws and inject sealant into the port 4 to create a permanent pressure seal.

APRIL2021_FLASHLOCDUO_V1

FASTER INSTALLATION. 25-YEAR WARRANTY.

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

FASTER INSTALLATION. 25-YEAR WARRANTY.

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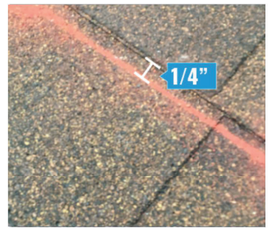
FLASHLOC™ DUO

INSTALLATION GUIDE

UNIRAC®

BETTER SOLAR STARTS HERE



PRE-INSTALL: CLEAN SURFACE AND MARK LOCATION

Ensure existing roof structure is capable of supporting the roof attachment point loads stated in the racking system engineering specifications. Clean roof surface of dirt, debris, snow and ice.

Snap chalk lines for attachment rows. On shingle roofs, snap lines 1/4" below upslope edge of shingle coarse. This line will be used to align the upper edge of the mount.

NOTE: Space mounts per racking system installation specifications.

STEP ONE: SECURE

ATTACHING TO A RAFTER: Place FLASHLOC DUO over rafter location with sealant port on up-slope side and align upper edge of mount with horizontal chalk line. Secure mount with the two (2) provided rafter screws. BACKFILL ALL PILOT HOLES WITH SEALANT.

ATTACHING TO SHEATHING: Place FLASHLOC DUO over desired location with sealant port on up-slope side and align upper edge of mount with horizontal chalk line. Secure mount with the two (2) provided rafter screws. Next, secure mount with four (4) deck screws by drilling through the FLASHLOC DUO deck mount hole locations. Unirac recommends using a drill as opposed to an impact gun to prevent over-tightening or stripping roof sheathing.

IMPORTANT: SECURELY ATTACH MOUNT BUT DO NOT OVERTIGHTEN SCREWS.

STEP TWO: SEAL

Insert tip of UNIRAC approved sealant into port and inject until sealant exits vent. Follow sealant manufacturer's instructions. Follow sealant manufacturer's cold weather application guidelines, if applicable.

NOTE: When FLASHLOC DUO is installed over gap between shingle tabs or vertical joints, fill gap/joint with sealant between mount and upslope edge of shingle course.

CUT SHINGLES AS REQUIRED: DO NOT INSTALL THE FLASHLOC SLIDER ACCROSS THICKNESS VARIATIONS GREATER THAN 1/8" SUCH AS THOSE FOUND IN HIGH DEFINITION SHINGLES.

NOTE: If an exploratory hole falls outside of the area covered by the sealant, flash hole accordingly.
NOTE: Read and comply with the Flashloc Duo Design & Engineering Guide prior to design and installation of the system.

USE ONLY UNIRAC APPROVED SEALANTS. PLEASE CONTACT UNIRAC FOR FULL LIST OF COMPATIBLE SEALANTS.

Continue array installation. Refer to SOLARMOUNT or NXT HORIZON Installation Guide for the remaining system installation.

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AHJ: HARNETT COUNTY

SHEET NAME

SPEC SHEETS

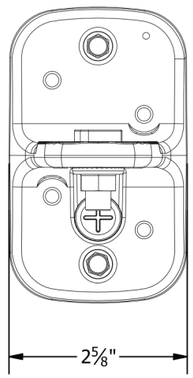
SHEET SIZE

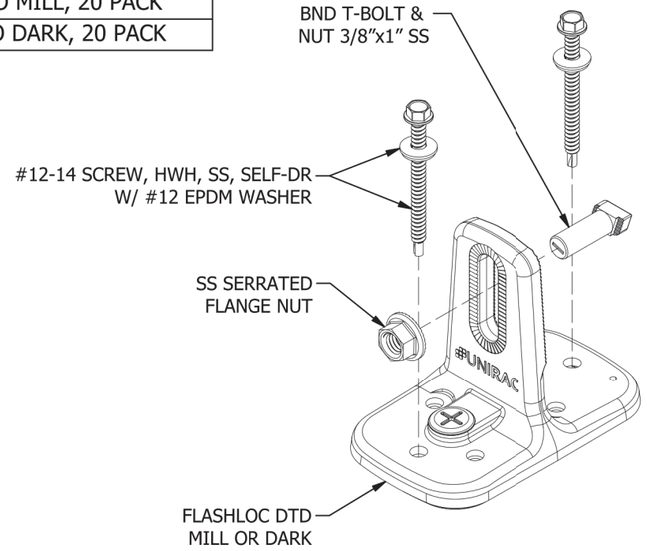
ANSI B
11" X 17"

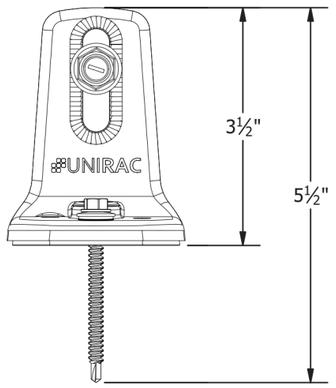
SHEET NUMBER

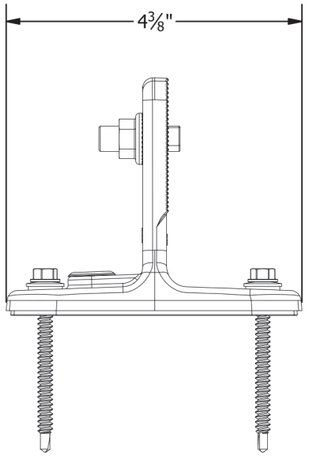
PV-10

PART TABLE	
P/N	DESCRIPTION
004275M	FLASHLOC DUO MILL, 20 PACK
004275D	FLASHLOC DUO DARK, 20 PACK









UNIRAC
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	SOLARMOUNT
DRAWING TYPE:	ASSEMBLY DETAIL
DESCRIPTION:	FLASHLOC DUO KIT
REVISION DATE:	4/29/2021

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE NOMINAL

PRODUCT PROTECTED BY ONE OR MORE US PATENTS
LEGAL NOTICE

FL-A04
SHEET

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DEL MAR, CA 92014, USA

DESIGN SUPPORT DAY OF INSTALL:
CHAT.POWUR.COM

VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	03-06-2024	UR

PROJECT NAME

KARLA YESENIA CLAVEL
36 ATHENS CT,
CAMERON, NC 28326, USA
UTILITY: CENTRAL ELECTRIC
MEMBERSHIP CORP
APN: 099556006451
AHJ: HARNETT COUNTY

SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-11

NXT UMOUNT

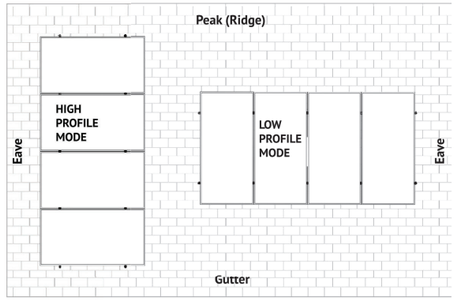
SYSTEM LAYOUT
INSTALLATION GUIDE | 4 PAGE

PLANNING YOUR NXT UMOUNT INSTALLATIONS
The installation can be laid out with rails parallel to the rafters or perpendicular to the rafters. Note that NXT UMOUNT rails make excellent straight edges for doing layouts.

Center the installation area over the structural members as much as possible. Leave enough room to safely move around the array during installation. Some building codes and fire codes require minimum clearances around such installations, and the installer should check local building code requirements for compliance.

The length of the installation area is equal to:
- the total width of the modules,
- plus 1/2" for each space between modules (for mid- clamp),
- plus 2" minimum (1" minimum for each MODULE END) (This will not be included when we use the hidden end clamp.)

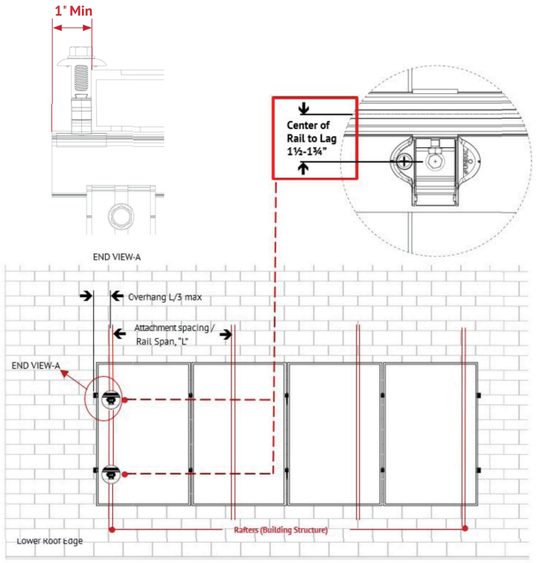
LAYING OUT ROOF ATTACHMENTS
Locate and mark the position of the roof attachment within the installation area. Refer to Unirac NXT UMOUNT D&E Guide & U-Builder for rail spans and cantilevers. Follow module manufacturer installation requirements allowable spacing based on appropriate mounting locations. Modules should be placed such that they overhang the rails symmetrically.



NXT Rail Splices are fully structural and do not interfere with roof attachments or Combo Clamps. There is no need to determine splice locations at this stage.

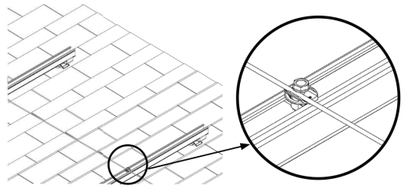
⚠ CAUTION

Rail lengths and locations of L-feet for expansion joints will need to be determined at this stage in planning the array layout. For expansion joint requirements, See Page 5.



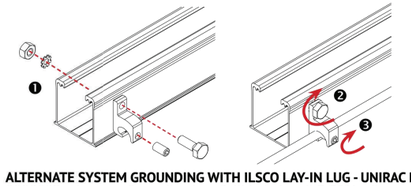
NXT UMOUNT

SYSTEM GROUNDING
INSTALLATION GUIDE | 17 PAGE



SYSTEM GROUNDING: Rails can be bonded using a MLPE & GROUNDING LUG (NULGMLP1), GROUND WEEBLUG #1 or ILSCO LAY IN LUG (GBL4DBT). At least one rail per row of modules in an array must be bonded to electrical ground. Each additional row of modules must be grounded with at least one rail lug per row or with a row-to-row bonding devise listed here.

Note: See Page 5 for additional lugs required for expansion joints.

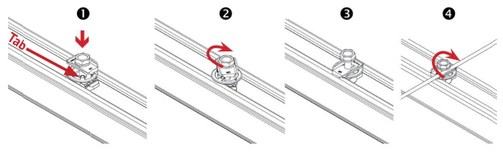


ALTERNATE SYSTEM GROUNDING WITH ILSCO LAY-IN LUG - UNIRAC P/N 008009P: Alternate Grounding Lug. Drill hole in rail 7/32" in diameter, deburr hole and bolt through one wall of rail.

BOLT TORQUE VALUE: 5 ft lbs.
TERMINAL TORQUE: 4-6 AWG: 35in-lbs, 8 AWG: 25 in-lbs.

⚠ WARNING

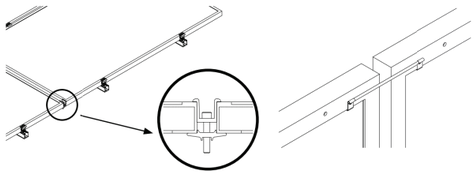
Ensure Copper does contact Aluminum to avoid corrosion.



SYSTEM GROUNDING WITH MLPE & GROUNDING LUG: Insert the T-nut in the rail by holding the plastic cone's tabs with thumb and middle finger. Rotate the clamp 90 deg in clockwise direction in the rail and release when aligned with rail. Ensure that the T-nut is engaged in the rail profile. Place the grounding wire on the grounding plate on one of the sides of the bolt, parallel to the *grounding* plate flanges. Tighten bolt.

TORQUE VALUE: 6-12 AWG SOLID COPPER: 10 ft lbs.

NOTE: MLPE & GROUNDING LUG is single use only



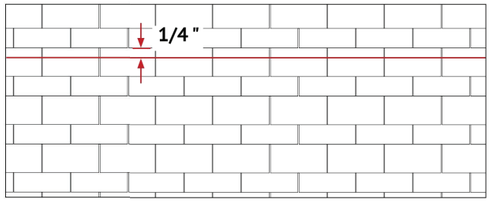
ALTERNATE ROW GROUNDING WITH N/S BONDING CLAMP:
Insert clamp between module rows and tighten bolt.

TORQUE VALUE: 20 ft-lbs.

ALTERNATE ROW GROUNDING WITH N/S BONDING CLIP:
Fully seat bonding clip on each module flange to provide bond across N/S module gap.

NXT UMOUNT

STRONGHOLD ATTACHMENT WITH BUTYL
INSTALLATION GUIDE | 6 PAGE



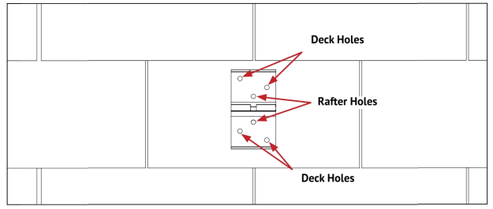
MARK ARRAY LOCATION:
Clean roof surface of dirt, debris, snow, and ice. Mark array location and determine roof attachment locations based on array layout. Snap chalk lines to mark each row of roof attachment points. On shingle roofs, snap lines 1/4" below upslope edge of shingle course. Locate rafters and mark at intersection of attachment lines. Attachment spacing determined per Design and Engineering Guide or project specific U-Builder Engineering Report .

PRO TIP
Install the attachment within 1/4" of the chalkline to allow the rail to slide freely in the rail clamp.

⚠ WARNING

- **To maintain butyl flashing performance, Unirac does not recommend installing when ambient and/or roof temperatures are below 5°F or above 180°F.**
- **Stronghold Butyl must be installed on a clean, dry surface to ensure flashing integrity.**

NOTE:
- Stronghold Butyl is designed for use on Asphalt Shingle, Rolled Comp, EPDM, TPO, Polyethylene, Polypropylene, ABS, and Metal Roofs (including Galvalume, painted steel, and galvanized).
- Pilot holes are not necessary to be drilled for self-drilling screws. If holes are drilled to identify the rafter, they should be backfilled with sealant before installing the attachment.
- Stronghold Butyl attachments are designed for slopes ranging from 0 to 90-degrees. For installations over 45-degrees, contact Unirac engineering for design guidance.



PLACING STRONGHOLD ATTACHMENT WITH BUTYL BASE:
Identify the position of the attachment to install before peeling the release paper.
Ensure that the attachment lands on a flat surface. If the surface at the location of the attachment is uneven, add butyl patches to flatten the surface.

Note:
- Use rafter holes to install attachment on the rafter.
- Use all six holes to install attachment on the deck.

⚠ CAUTION

Do not peel the release paper from the butyl on attachment before identifying the position of attachment to install.

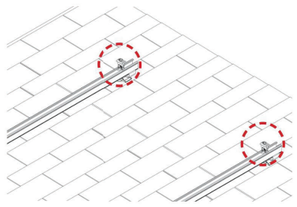
⚠ WARNING

Installing attachment on uneven surfaces, shingle gaps or overlaps, creates a risk for water leakage due to gap created between the adhesive and roof surface.

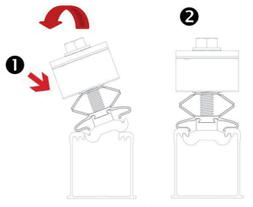
Note:
See Page 9 for instructions on placing extra butyl pads or contact Unirac team for further information.

NXT UMOUNT

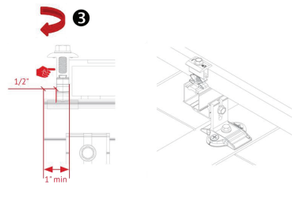
COMBO CLAMP INSTALLATION
INSTALLATION GUIDE | 20 PAGE



INSTALL COMBO (END) CLAMPS:
Install Combo Clamps starting at the aligned end of rails.

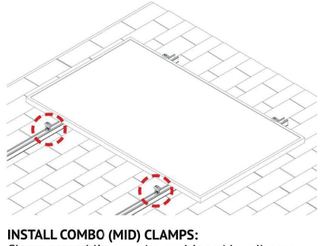


INSERT COMBO CLAMP:
Insert Combo Clamp from one side of the rail nut into the rail and click in the other side. Ensure that the rail nut profile is seated in the rail profile.



INSTALL END MODULE: Position first module onto rails and engage module frame with end clamps. Hold clamp in place against module while tightening bolt.
TORQUE VALUE: 15 ft-lbs.

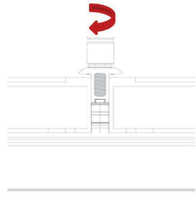
Note: Ensure a minimum distance of 1" from the end of the module to end of rail.



INSTALL COMBO (MID) CLAMPS:
Clamp assemblies may be positioned in rail near point of use prior to module placement.

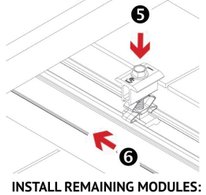
Note: The clamps may be installed above splice locations.

PRO TIP
Press the clamp assembly slightly into the rail to allow for easy sliding of clamp in the rail.



PLACE ADJACENT MODULE AGAINST CLAMPS:
Modules must be tight against clamps with no gaps. Tighten bolt to required torque.

TORQUE VALUE: 15 ft-lbs.



INSTALL REMAINING MODULES:
Proceed with module installation. Engage each clamp with previously positioned module.

Note: Combo clamps are capable of securing module frames whose thickness varies from 30mm to 40mm.

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DESIGN SUPPORT DAY OF INSTALL:
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VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	03-06-2024	UR

PROJECT NAME

KARLA YESENIA CLAVEL
36 ATHENS CT,
CAMERON, NC 28326, USA
UTILITY: CENTRAL ELECTRIC MEMBERSHIP CORP
APN: 099556006451
AHJ: HARNETT COUNTY

SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-12

Descriptive Report

MASTER CONTRACT: 266909
REPORT: 70131735
PROJECT: 80182385

Edition 1: September 20, 2017; Project 70131735 - Irvine
Prepared By: Michael Hoffnagle
Authorized By: Michael Hoffnagle

Edition 27: October 20, 2023; Project 80180934 - Irvine
Prepared By: Michael Hoffnagle
Authorized By: Michael Hoffnagle

Edition 28: November 29, 2023; Project 80182385 - Irvine
Prepared By: Michael Hoffnagle
Authorized By: Michael Hoffnagle

Report pages reissued

Contents:

PRODUCTS

CLASS - C531302 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems
CLASS - C531382 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems - Certified to US Standards

34 Bunsen, Irvine, CA, U.S.A. 92618
Telephone: 949.733.4300 1.800.463.6727 Fax: 949.733.4320 www.csagroup.org

NXT UMOUNT® COMPATIBLE MODULES SYSTEM CERTIFICATION 29 PAGE

Electrical Bonding and Grounding Test Modules
The list below is not exhaustive of compliant modules but shows those that have been evaluated and found to be electrically compatible with the NXT UMOUNT system.

Manufacture	Module Model / Series
.A Solar	JAM54S30 xxx/MR JAM54S31 xxx/MR JAM72D30MB,JAM78D10MB JAM72S30 /MR JAP6 60-xxx JAM6(K)-60/xxx, JAP6(k)-72-xxx/4BB JAP72S##-xxx/** JAP6(k)-60-xxx/4BB, JAP60S##-xxx/** JAM6(k)-72-xxx/**, JAM72S##-xxx/** JAM6(k)-60-xxx/**, JAM60S##-xxx/** i. ##: 01, 02, 03, 09, 10 ii. **: SC, PR, BP, HiT, IB, MW, MR ** = Backsheet, ## Cell technology
.inko	JKM & JKMS Series JKMxxxM-72HL-V, JKMxxxM-72HLM-TV JKMxxxM-72HL4-(T)V, JKMxxxM-7RL3-V JKMxxxM-72HBL-V, JKMxxxM-72HL4-TV JKMxxxM-6RL3-B, JKMxxxN-72HL4-BDV JKMxxxN-54HL4-B, JKMxxxN-72HL4-TV JKMxxxM-7RL3-TV
Kyocera	KD-F & KU Series
LA Solar	LSxxxHC(166), LSxxxBF, LSxxxBL, LSxxxHC, BLA Model
LG Electronics	LGxxx(E1C/E1K/N1C/N1K/N2T/N2W/S1C/S2W/Q1C/Q1K)-A5 LGxxx(A1C/M1C/M1K/N1C/N1K/Q1C/Q1K/QAC/QAK)-A6, LGxxxN2W-B3 LGxxxN2T-B5, LGxxxN1K-B6
LG Electronics (Cont.)	LGxxx(N1C/N1K/N2T/N2W)-E6 LGxxx(N1C/N1K/N2W/S1C/S2W)-G4 LGxxxN2T-J5 LGxxx(N1K/N1W/N2T/N2W)-L5 LGxxx(M1C/N1C/Q1C/Q1K)-N5 LGxxx(N1C/N1K/N2W/Q1C/Q1K)-V5 LGxxxN3K-V6
LONGi	LR4-60(HPB/HPH) LR4-72(HPH) LR6-60 LR6-60(BK/HPB/HPH/HV/PB/PE/PH) LR6-72 LR6-72(BK/HV/PB/PE/PH) RealBlack LR4-60HPB RealBlack LR6-60HPB LR5-54-HPB-xxxM
Maxeon	SPR-MAX3-xxx-COM SPR-MAX3-XXX-R SPR-MAX3-XXX-BLK-R
Meyer Burger	Meyer Burger Black, Meyer Burger White Meyer Burger Glass
Mission Solar Energy	MSExxxSX9R MSE Mono, MSE Perc MSExxx(SR8T/SR8K/SR9S/SX5T) MSExxx(SX5K/SX6W)
Mitrex	Mxxx-L3H, Mxxx-I3H
Mitsubishi	MJE & MLE Series
Neo Solar Power Co.	D6M Series
NE Solar	NESE xxx-72MHB-M10 NESE xxx-60MH-M6
Panasonic	VBHNxxxSA06/SA06B/SA11/SA11B VBHNxxxSA15/SA15B/SA16/SA16B, VBHNxxxKA, VBHNxxxKA03/04, VBHNxxxSA17/SA17G/SA17E/SA18/SA18E, VBHNxxxZA01/ZA02/ZA03/VBHNxxxZA04 EVPVxxx EVPVxxx(H/K/PK/HK)
Peimar	SGxxxM (FB/BF) SMxxxM
Philadelphia Solar	PS-M108(HCBF)-400W (30 & 35mm frames)
Phono Solar	PSxxxM1-20/U PSxxxM1H-20/U PSxxxM1-20UH PSxxxM1H-20UH PSxxxM4(H)-24/TH PSxxxM1-20/UH PSxxxM1H-20/UH PSxxxM-24/T PSxxxMH-24/T PSxxxM-24/TH PSxxxMH-24/TH
Prism Solar	P72 Series, P72X-xxx

- The frame profile must not have any feature that might interfere with the bonding devices that are integrated into the racking system
- Use with a maximum over current protection device OCPD of 30A
- Unless otherwise noted, all modules listed above include all wattages and specific models within that series. Variable wattages are represented as "xxx"
- Items in parenthesis are those that may or may not be present in a compatible module's model ID
- Slashes "/" between one or more items indicates that either of those items may be the one that is present in a module's model ID
- **Listed models can be used to achieve a Class A fire system rating, for steep slope or low slope applications, only when modules of fire typed mentioned in Appendix A, Page 27 are used.**

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DESIGN SUPPORT DAY OF INSTALL:
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VERSION

DESCRIPTION	DATE	REV
INITIAL RELEASE	03-06-2024	UR

PROJECT NAME

KARLA YESENIA CLAVEL
36 ATHENS CT,
CAMERON, NC 28326, USA
UTILITY: CENTRAL ELECTRIC MEMBERSHIP CORP
APN: 099556006451
AHJ: HARNETT COUNTY

SHEET NAME
SPEC SHEETS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-13

Certificate of Compliance

Certificate: 70131735 **Master Contract:** 266909

Project: 80182385 **Date Issued:** 2023-11-29

Issued To: **Unirac**
1411 Broadway NE
Albuquerque, New Mexico, 87102
United States

Attention: Rob D'Anastasio

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Issued by: Michael Hoffnagle
Michael Hoffnagle

C US

PRODUCTS

CLASS - C531302 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems
CLASS - C531382 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems - Certified to US Standards

Models:	SM	-	SOLARMOUNT Flush-to-Roof is an extruded aluminum rail PV racking system that is installed parallel to the roof in landscape or portrait orientations.
	ULA	-	Unirac Large Array is a ground mount system using the SolarMount (SM) platform for the bonding and grounding of PV modules.

Downward Design Load (lb/ft²)	33.9
Upward Design Load (lb/ft²)	33.9
Down-Slope Load (lb/ft²)	16.5

Model	NXT UMOUNT	-	Flush-to-Roof is an extruded aluminum rail PV racking system that is installed parallel to the roof in landscape or portrait orientations.

NXT UMOUNT

The system listed is designed to provide bonding/grounding, and mechanical stability for photovoltaic modules. The system is secured to the roof with the L-Foot components through the roofing material to building structure. Modules are secured to the racking system with aluminum mid clamps and aluminum end clamps. The modules are bonded to the racking system with bonding mid and end clamps with piercing points. Fire ratings of Class A with Type 1, 2, 3 (with metallic frame), 10(with metallic frame), 19, 22, 25, 29, or 30 for steep and low slope. Tested at 5" interstitial gap which allows installation at any stand-off height.

The grounding of the system is intended to comply with the latest edition of the National Electrical Code, to include NEC 250 & 690. Local codes compliance is required, in addition to national codes. All grounding/bonding connections are to be torqued in accordance with the Installation Manual and the settings used during the certification testing for the current edition of the project report.

Latest Install Manual revision: PUB2023NOV10

UL 2703 Mechanical Load ratings for tested module area 21.86 sq ft:

NXT Systems without DTD Butyl Attachment P30817211, Rail Splice P30808218, or Rail Clamp P30817214	
Downward Design Load (lb/ft²)	113.7
Upward Design Load (lb/ft²)	51.1
Down-Slope Load (lb/ft²)	16.8

NXT Systems with DTD Butyl Attachment P30817211, Rail Splice P30808218, or Rail Clamp P30817214	
Downward Design Load (lb/ft²)	51.1
Upward Design Load (lb/ft²)	51.1

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APN: 099556006451
AHJ: HARNETT COUNTY

SHEET NAME

SPEC SHEETS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-14

December 12th, 2023

Unirac, Inc.
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
TEL: (505) 242-6411
FAX: (505)242-6512

Re.: Innova Technologies No.: 123-099-1000
Unirac NXT U-Mount Design Tool – North Carolina

Attn: Engineering Services

Innova Technologies Inc. has reviewed Unirac's NXT U-Mount design tool and analysis, including the U-Builder online tool. NXT U-mount is a proprietary system to support Photovoltaic (PV) panels on a rooftop structure.

All analysis and information in the NXT design tool's formulas and tables comply with the following:

- 2009-2021 International Building Code, by International Code Council Inc. With SEAOC PV2 provisions.
- ASCE/SEI 7-05 through 7-16 Minimum Design Loads and Other Structures, by American Society of Civil Engineers.
- 2018 North Carolina Building Code.
- 2018 North Carolina Residential Code.
- 2005 Aluminum Design Manual, 2010 Aluminum Design Manual, 2015 Aluminum Design Manual (ADM), 2017 Aluminum Design Manual & 2020 Aluminum Design Manual, by the Aluminum Association.

This letter certifies that the structural analysis of the racking members and their direct components comply with the above codes and methodologies. This Design tool does not review the existing roof structure, or the PV panels themselves.

The U-Builder tool should be used under review of a registered design professional where required by the authority having jurisdiction.

For more information, see the construction drawings, and manufacturer installation instructions.

Best Regards,

Carlos Banchik
President & Principal
Innova Technologies, Inc.

NORTH CAROLINA PROFESSIONAL SEAL 040078 Exp 12/31/2024 ENGINEER CARLOS A. BANCHIK

12/14/2023

1432 South Jones Blvd.
Las Vegas, NV 89146
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PV-15