

May 15, 2025

Subject: Cameron Devers Solar Panel Installation

5426 Old US Hwy 421, Lillington, NC

Contractor Name: Phillips Energy Systems

Contractor Address: 7901 Allen Black Rd, Mint Hill, NC 28227

To Whom It May Concern,

This letter is submitted on behalf of my client, EnergyScape Renewables.

I am a North Carolina registered Professional Engineer. A field inspection of the installation has been performed by a person under my direct supervisory control. I hereby affirm the following:

- 1. The PV equipment's structural installation has been designed and inspected,
- 2. The equipment will not create a negative impact on the building's structural design, including any additional loads imposed (dead, snow, wind), and
- 3. The installation is in compliance with the North Carolina Residential Code.

#### **Limitations and Disclaimers**

Electrical design is excluded from this analysis. Structural design and analysis of the adequacy of solar panels, racks, mounts, rails, and other components is performed by each component's respective manufacturer. This letter and the opinions expressed herein are rendered solely for the benefit of the permitting authority (city or county building department) and my client's office and may not be utilized or relied on by any other party.

Sincerely,

Trevor Jones, P.E.



Phillips Energy Systems

Contractor Address: 7901 Allen Black Rd, Mint Hill, NC 28227

March 03, 2025

Subject: Proposed Solar Panel Installation

Cameron Devers Residence, 5426 Old US Hwy 421, Lillington, NC

DC System Size: 7.225 kW PV Letters Job #004-19293

To Whom it May Concern,

We have reviewed information, provided by our client, related to the proposed solar panel installation at the above-referenced address. The purpose of the review was to determine if the existing roof is structurally adequate for the proposed installation. Based on our review and analysis of the given information, and in accordance with governing building codes, I certify that the capacity of the structural roof framing that directly supports the additional gravity loading due to the solar panel supports and modules had been reviewed and determined to meet or exceed the requirements in accordance with the Design Criteria.

#### **Design Parameter Summary**

Governing Building Code: 2018 North Carolina Residential Code

Risk Category: II Wind Exposure: C

Design Wind Speed: 120 mph Ground Snow Load: 15 psf

#### **Roof Information**

Roof Structure: 2x4 Manufactured Trusses @ 24" O.C. (assumed)

Roofing Material: Metal Roof Roof Slope: 12 degrees

#### **Roof Connection Details**

S-5! ProteaBracket to existing metal roof, at 45" O.C. max

Stagger attachments to avoid overloading any individual truss top chord.

#### **Engineering Analysis**

The proposed installation - including weight of panels, racking, mounts, and inverters where applicable - will be approximately 3 psf. In the areas where panels are installed, roof live loads will not be present. The reduction of roof live load is adequate to fully or partially compensate for the addition of the panel installation. Because the member forces in the area of the solar panels are not increased by more than 5%, and so per provisions in the adopted building codes, the structure need not be altered for gravity loading.

The proposed installation will be 6" max. above the roof surface (flush mounted) and parallel to the roof surface. Therefore, any increase in wind loading on the building structure from the solar panel installation is expected to be negligible. Wind is the governing lateral load case. Because the increase in lateral loading is not increased by more than 10%, per provisions in the adopted building codes, the structure need not be altered for lateral loading.

Wind uplift on the panels has been calculated in accordance with the relevant provisions of ASCE 7-10. This loading has been used to verify the adequacy of the connection specified above. Connection locations should be in accordance with design drawings.

IronRidge XR10 rails will support the modules and will fasten to the roof structure with S-5! ProteaBracket along the rail.

#### Conclusion

The roof structure need not be altered for either gravity loading (including snow) or lateral loading (including wind). Therefore, the existing structure is permitted to remain unaltered. Connections to the roof must be made per the "Roof Connection Details" section above. Copies of all relevant calculations are enclosed.

#### **Limitations and Disclaimers**

The opinion expressed in this letter is made in reliance on the following assumptions: the existing structure is in good condition; the existing structure is free from defects in design or workmanship; and the existing structure was code-compliant at the time of its design and construction. These assumptions have not been independently verified, and we have relied on representations made by our client with respect to the foregoing. The undersigned has not inspected the structure for defects, although we have reviewed the information provided by our client, including pictures where applicable.

Electrical design is excluded from this analysis. Waterproofing is the sole responsibility of the installer and is also excluded from this analysis. Solar panels must be installed per manufacturer specifications. Structural design and analysis of the adequacy of solar panels, racks, mounts, and other components is performed by each component's respective manufacturer; the undersigned makes no statement of opinion regarding such components. This letter and the opinions expressed herein are rendered solely for the benefit of the permitting authority (city or county building department) and your office, and may not be utilized or relied on by any other party.

If you have any questions or concerns, please contact us at (208)-994-1680, or by email at Projects@pvletters.com.

Sincerely,

Trevor A. Jones, P.E.

THE WHITTHEN WHITTHEN

3/3/2025



## **Standard Loading Comparison**

This calculation justifies the additional solar load by comparing existing to proposed gravity loads in the location of the solar panels.

With Solar

Without Solar

	Without Solar	with Solar	
Dead Load			
Metal Roof	3	3	psf
1/4" Plywood	1	1	psf
Framing	4	4	psf
Insulation	1	1	psf
1/2" Gypsum Ceiling	2	2	psf
M,E, & Misc	1.5	1.5	psf
Solar Panel	0	3	psf
Total Dead Load	12.5	15.5	psf
Snow Load			
Ground Snow Load, Pg	15	5	psf
Exposure Factor, C <sub>e</sub>	1.0	00	
Thermal Factor, C <sub>t</sub>	1.	1	
Importance Factor, I <sub>s</sub>	1		
Flat Roof Snow Load	12	2	ASCE 7 Eqn. 7.3-1 or jurisdiction min.
Slope	12	2	degrees
Unobstructed Slippery Surface?	Yes	Yes	
Slope Factor, C <sub>s</sub>	0.97	0.97	
Sloped Roof Snow Load	11.2	11.2	psf
Live Load			
Roof Live Load	20	0	psf
<b>Load Combination</b>			
D + Lr	32.5	15.5	psf
D + S	23.7	26.7	psf
Max. Load	32.5	26.7	psf
% of original		82.06%	

Result:

Because the total forces are decreased, per the relevant code provisions stated in the body of the letter, the existing roof structure is permitted to remain unaltered.



## **Bracket Connection Calculation (per ASCE 7-10)**

This calculation justifies the connection of the solar panels to existing roof members, by showing the connection capacity is equal to or greater than the uplift force demands.

#### **Connection Demand**

Spacing perpendicular to rail, in	34
Roof Angle, degrees	12
Roof Layout	Gable
Wind Speed, mph	120
Exposure Coefficient, K <sub>z</sub>	0.85
Topographic Factor, K <sub>zt</sub>	1.00
Directionality Factor, K <sub>d</sub>	0.85
Elevation Factor, K <sub>e</sub>	1.00
Velocity Pressure q <sub>z</sub> , psf	26.5
Prying Coefficient	1

		•	
Zones:	<u>1</u>	<u>2</u>	<u>3</u>
Spacing parallel to rail, in	45	45	45
$GC_p$ (max)	0.90	2.20	2.60
Exposed Panels? ( $\gamma_E = 1.5$ )	No	No	No
Effective Wind Area on each con., ft <sup>2</sup>	10.6	10.6	10.6
Pressure Equalization Factor, γ <sub>a</sub>	0.79	0.79	0.79
Uplift Force, psf	18.8	46.0	54.4
Max. Uplift Force / Connection (0.6 WL), lbs	120.0	293.5	346.8
Solar Dead Load (0.6 DL). Lbs	19.1	19.1	19.1
Max. Uplift Force (0.6 WL - 0.6 DL), lbs	100.9	274.3	327.7

#### **Connection Capacity**

Connection Type	S-5! ProteaBracket	
Ultimate Capacity, lbs	817	
Factor of Safety	2.00	
Total Capacity, lbs	408.5	

#### **Compare ASD Factored Demand to Capacity**

<del> </del>	
Demand, lbs	327.7
Capacity, lbs	408.5

Result Capacity exceeds demands. Therefore, connection passes.

# PHOTOVOLTAIC ROOF MOUNT SYSTEM

17 MODULES-ROOF MOUNTED - 7.225 kW DC, 5.700 kW AC

5426 OLD US HWY 421, LILLINGTON, NC 27546

#### PROJECT DATA

PROJECT 5426 OLD US HWY 421, ADDRESS: LILLINGTON, NC 27546

OWNER: CAMERON DEVERS

DESIGNER: ESR

SCOPE 7.225 kW DC ROOF MOUNT
SOLAR PV SYSTEM WITH
17 JINKO SOLAR: JKM425N-54HL4-B 425W
PV MODULES WITH

17 SOLAREDGE: S440 POWER OPTIMIZERS AND 01 SOLAREDGE: SE5700H-US (240V/5700W)

INVERTER

01 10 kWh SOLAREDGE ENERGY BANK

AUTHORITIES HAVING JURISDICTION: BUILDING: HARNETT COUNTY

**UTILITY: DUKE ENERGY PROGRESS** 

**ZONING: HARNETT COUNTY** 

#### SHEET INDEX

- PV-1 COVER SHEET PV-2 SITE PLAN
- PV-3 ROOF PLAN & MODULES
- PV-4 ELECTRICAL PLAN
- PV-5 STRUCTURAL DETAIL
- PV-6 ELECTRICAL LINE DIAGRAM
- PV-7 WIRING CALCULATIONS
- PV-8 LABELS
- PV-9+ EQUIPMENT SPECIFICATIONS

### **SIGNATURE**

#### **GENERAL NOTES**

- 1. ALL COMPONENTS ARE UL LISTED AND CEC CERTIFIED, WHERE WARRANTED.
- 2. THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2017.
- 3. THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
- 4. 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.
- WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT.
- HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24.
- 7. A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH CEC 690.47 AND 250.50 THROUGH 60 AND 250-166 SHALL BE PROVIDED. PER NEC GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE 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 LARGER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM.
- 8. PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE
- 9. PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING. MECHANICAL, OR BUILDING ROOF VENTS.
- 10. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE. WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF THE ROOF SURFACE.
- 11. ALL SINAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SINAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.
- 12. INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED.
- 13. THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)]
- 14. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
- 15. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
- 16. SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41.
- 17. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12
- 18. DISCONNECTING MEANS SHALL BE LOCATED IN A VISIBLE, READILY ACCESSIBLE LOCATION WITHIN THE PV SYSTEM EQUIPMENT OR A MAXIMUM OF 10 FEET AWAY FROM THE SYSTEM [NEC 690.13(A)]
- 19. ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31
- 20. WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).
- 21. ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703
- 22. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.

#### VICINITY MAP



#### **HOUSE PHOTO**



## CODE REFERENCES

2018 NORTH CAROLINA BUILDING CODE 2018 NORTH CAROLINA RESIDENTIAL CODE 2018 NORTH CAROLINA FIRE CODE 2017 NATIONAL ELECTRICAL CODE



#### PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL, NC 28227, UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/20/2025	
REVISION	03/03/2025	Α



PROJECT NAME & ADDRESS

CAMERON DEVERS
RESIDENCE
5426 OLD US HWY 421,
LILLINGTON, NC 27546

DRAWN BY

SHEET NAME

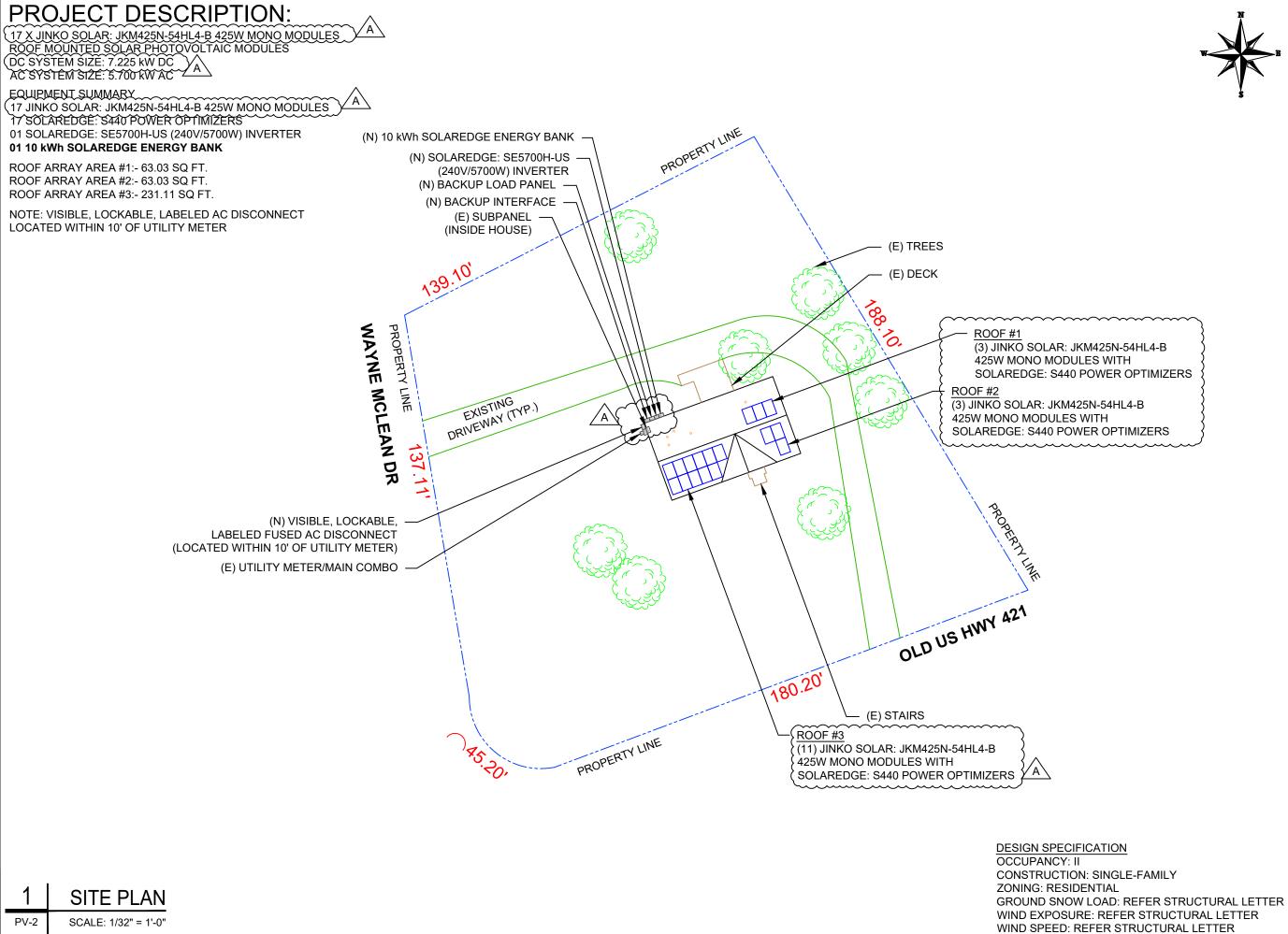
**COVER SHEET** 

SHEET SIZE

ANSI B

11" X 17"

SHEET NUMBER

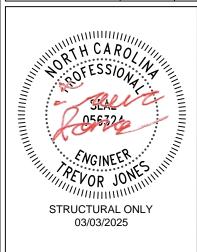




#### **PHILLIPS ENERGY SYSTEMS**

7901 ALLEN BLACK RD, MINT HILL, NC 28227, UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/20/2025	
REVISION	03/03/2025	Α
·		



PROJECT NAME & ADDRESS

CAMERON DEVERS RESIDENCE 5426 OLD US HWY 421, LILLINGTON, NC 27546

DRAWN BY
ESR

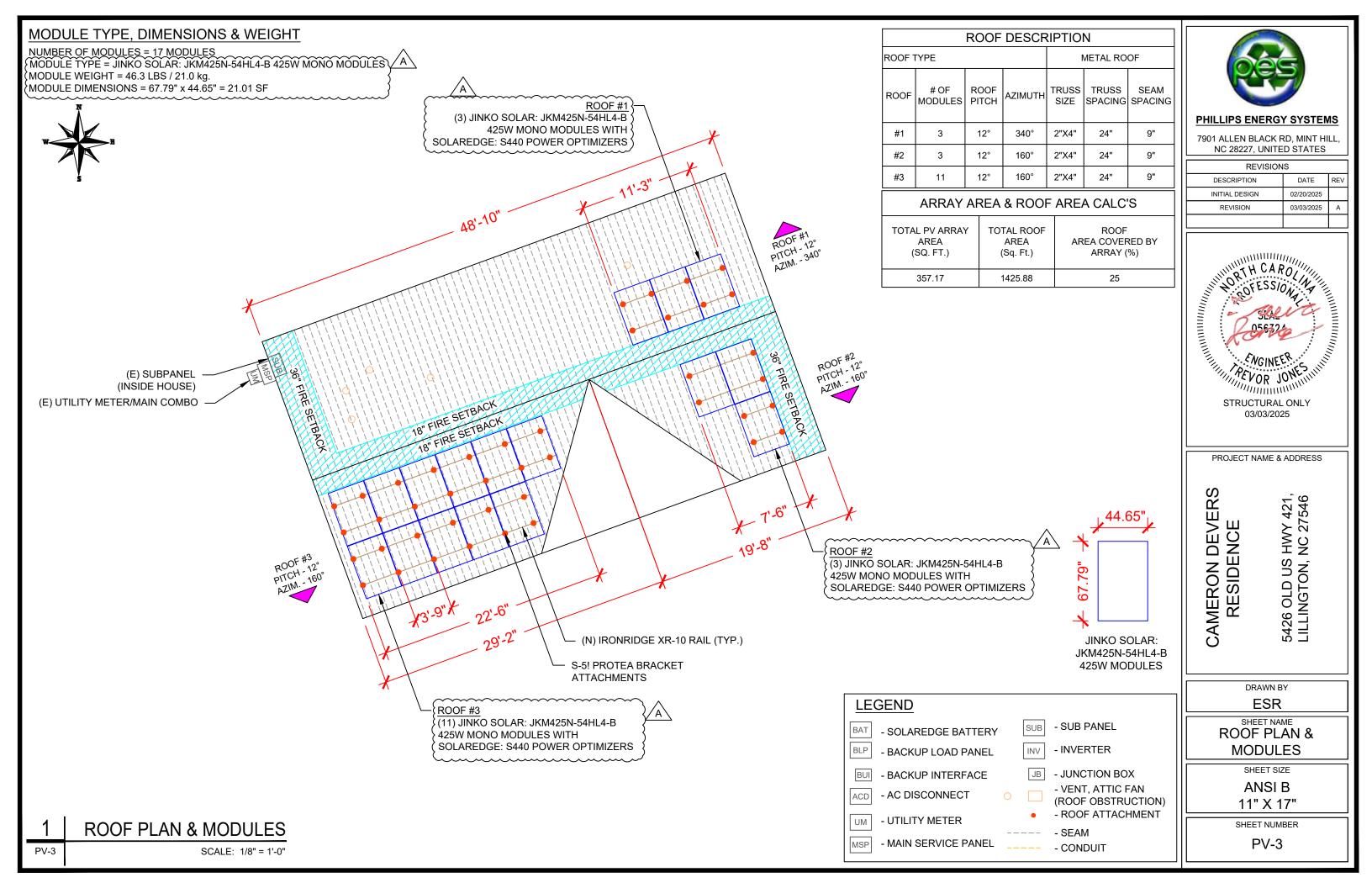
SHEET NAME

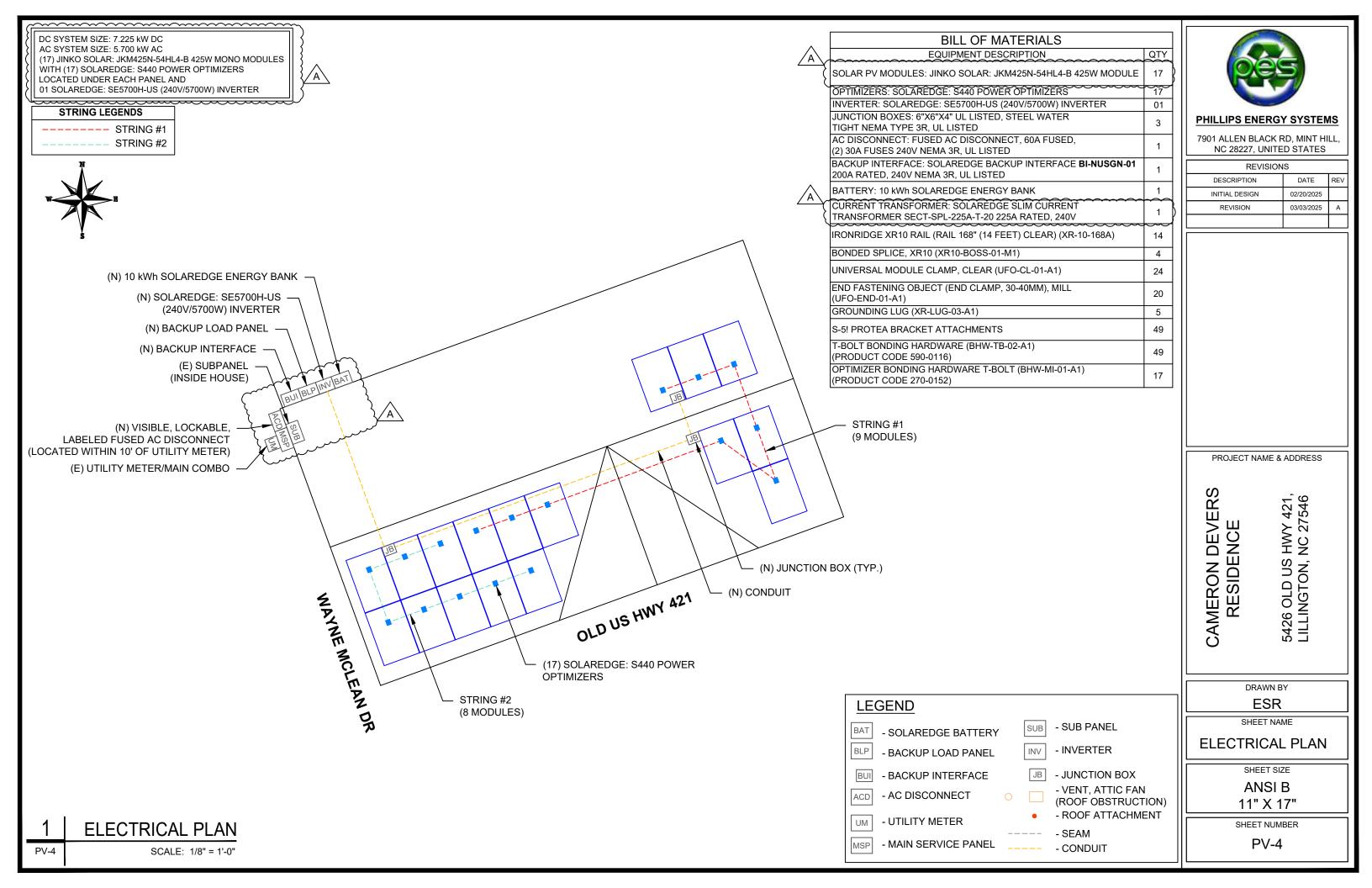
SITE PLAN

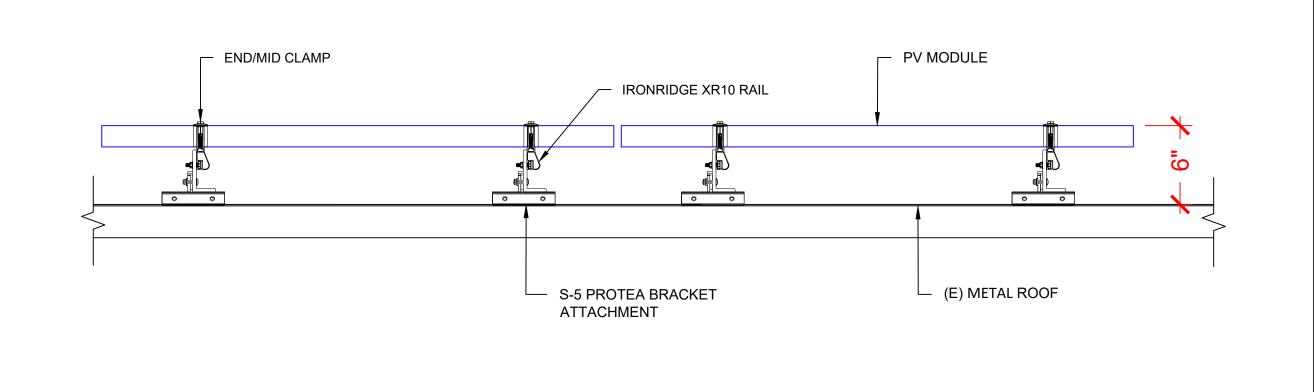
SHEET SIZE ANSI B

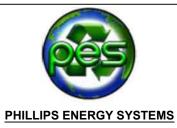
11" X 17"

SHEET NUMBER PV-2



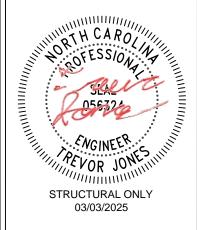






7901 ALLEN BLACK RD, MINT HILL, NC 28227, UNITED STATES

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/20/2025	
REVISION	03/03/2025	A



PROJECT NAME & ADDRESS

5426 OLD US HWY 421, LILLINGTON, NC 27546

CAMERON DEVERS RESIDENCE

DRAWN BY

SHEET NAME

STRUCTURAL DETAIL

SHEET SIZE

ANSI B

11" X 17"

SHEET NUMBER PV-5

S-5 PROTEA BRACKET ATTACHMENT 3'-9" (TYP.) 9" TYP.

2 ATTACHMENT DETAIL (front view)

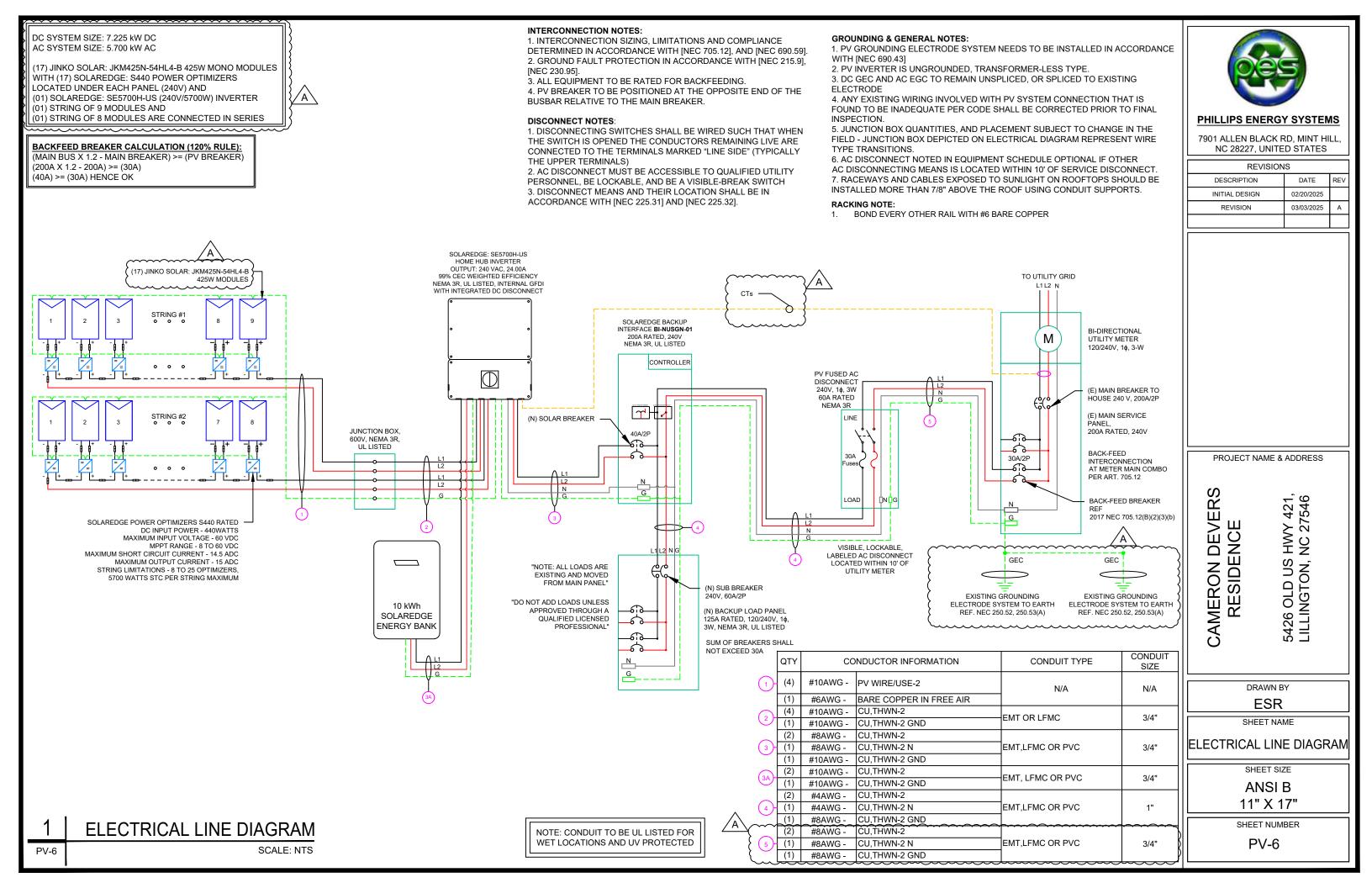
ATTACHMENT DETAIL (side view)

PV-5

PV-5

SCALE: N.T.S.

SCALE: N.T.S.



SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	JINKO SOLAR: JKM425N-54HL4-B 425W MODULE
VMP	32.37V
IMP	13.13A
VOC	38.95V
ISC	13.58A
TEMP. COEFF. VOC	-0.275%/°C
MODULE DIMENSION	67.79"L x 44.65"W x 1.18"D (In Inch)

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	SOLAREDGE: SE5700H-US (240V/5700W) INVERTER
NOMINAL AC POWER	5.700 kW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	24.00A

AMBIENT TEMPERATURE SPECS	
AMBIENT TEMP (HIGH TEMP 2%)	38°
RECORD LOW TEMPERATURE -9°	
MODULE TEMPERATURE COEFFICIENT OF Voc -0.275%°C	

PERCENT OF	NUMBER OF CURRENT
VALUES	CARRYING CONDUCTORS IN EMT
.80	4-6
.70	7-9
.50	10-20



#### PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL, NC 28227, UNITED STATES

=====, =								
REVISIONS								
DESCRIPTION	DATE	REV						
INITIAL DESIGN	02/20/2025							
REVISION	03/03/2025	Α						

				C						

									_												
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTO RS IN RACEWAY	90°C	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)		CONDUIT FILL (%)
STRING 1	JUNCTION BOX	380	15.00	18.75	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.049	N/A	#N/A
STRING 2	JUNCTION BOX	380	15.00	18.75	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.049	N/A	#N/A
JUNCTION BOX	INVERTER	380	15.00	18.75	20	CU #10 AWG	CU #10 AWG	35	PASS	38	4	40	0.91	0.8	29.12	PASS	20	1.24	0.196	3/4" EMT	19.79%
SOLAREDGE BANK	INVERTER	380	13.16	16.45	20	CU #10 AWG	CU #10 AWG	35	PASS	38	2	40	0.91	1	36.4	PASS	5	1.24	0.043	3/4" EMT	11.88%

String 1 Voltage Drop	0.245
String 2 Voltage Drop	0.245

										AC FEEL	DER CALCULA	TIONS										
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	FOR AMBIENT	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	AMPACITY	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT	CONDUIT FILL (%)
INVERTER	BACKUP INTERFACE	240	24	30	40	CU #8 AWG	CU #10 AWG	CU #8 AWG	50	PASS	38	2	55	0.91	1	50.05	PASS	5	0.778	0.078	3/4" EMT	24.56%
BACKUP INTERFACE	BACKUP LOAD PANEL	240	60	60	60	CU #4 AWG	CU #8 AWG	CU #4 AWG	85	PASS	38	2	95	0.91	1	86.45	PASS	5	0.308	0.077	1" EMT	32.85%
BACKUP INTERFACE	AC DISCONNECT	240	24	30	30	CU #4 AWG	CU #8 AWG	CU #4 AWG	85	PASS	38	2	95	0.91	1	86.45	PASS	5	0.308	0.031	1" EMT	32.85%
AC DISCONNECT	METER MAIN COMBO	240	24	30	30	CU #8 AWG	CU #8 AWG	CU #8 AWG	50	PASS	38	2	55	0.91	1	50.05	PASS	5	0.778	0.078	3/4" EMT	27.47%
						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~		•												1	

CUMULATIVE VOLTAGE DROP 0.078

#### **ELECTRICAL NOTES**

- 1. ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- 2. ALL CONDUCTORS SHALL BE RATED UPTO 600V FOR RESIDENTIAL AND 1000V FOR COMMERCIAL AND 90 DEGREE C WET ENVIRONMENT.
- 3. 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.
- 4. WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- 5. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- 6. WHERE SIZES OF JUNCTION BOX, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- 7. ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- 8. MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- 9. MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN
- 10. TEMPERATURE RATINGS OF ALL CONDUCTORS, TERMINATIONS, BREAKERS, OR OTHER DEVICES ASSOCIATED WITH THE SOLAR PV SYSTEM SHALL BE RATED FOR AT LEAST 75 DEGREE C.

PROJECT NAME & ADDRESS

CAMERON DEVERS
RESIDENCE
5426 OLD US HWY 421,
LILLINGTON, NC 27546

ESR

SHEET NAME

WIRING CALCULATIONS

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

#### PHOTOVOLTAIC POWER SOURCE

**EVERY 10' ON CONDUIT & ENCLOSURES** 

LABEL- 1: LABEL LOCATION: DC/EMT CONDUIT RACEWAY SOLADECK / JUNCTION BOX CODE REF: NEC 690.31 (D)(2)

## **⚠ WARNING**

#### **ELECTRIC SHOCK HAZARD**

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

LABEL- 2: LABEL LOCATION: AC DISCONNECT CODE REF: NEC 690.13(B)

## **⚠ WARNING**

#### **DUAL POWER SUPPLY**

SOURCE: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL- 3: LABEL LOCATION: MAIN SERVICE PANEL CODE REF: NEC 705.12(C) & NEC 690.59

## **SOLAR PV BREAKER:**

#### **BREAKER IS BACKFED** DO NOT RELOCATE

LABEL-4: LABEL LOCATION: MAIN SERVICE PANEL CODE REF: NEC 705.12(C) & NEC 690.59

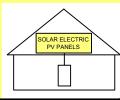
# **WARNING**

POWER SOURCE OUTPUT CONNECTION. DO NOT **RELOCATE THIS OVERCURRENT DEVICE** 

MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED) SUBPANEL (ONLY IF SOLAR IS BACK-FED) CODE REF: NEC 705.12(B)(3)(2)

#### SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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



LABEL- 6: LABEL LOCATION: AC DISCONNECT

CODE REF: [NEC 690.56(C)(1)(A)]

## RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION: INVERTER CODE REF: NEC 690.56(C)(2)

#### DC DISCONNECT

LABEL- 8: LABEL LOCATION: CODE REF: NEC 690.13(B)

#### **AC DISCONNECT** PHOTOVOLTAIC SYSTEM **POWER SOURCE**

NOMINAL OPERATING AC VOLATGE 240 V RATED AC OUTPUT CURRENT

24.00 A

LABEL- 9: LABEL LOCATION: AC DISCONNECT CODE REF: NEC 690.54

**MAXIMUM VOLTAGE** 

480 V

MAXIMUM CIRCUIT CURRENT

30.50 A

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

LABEL LOCATION: ON THE RIGHT SIDE OF THE INVERTER (PRE-EXISTING ON THE INVERTER) CODE REF: NEC 690.53



**PHILLIPS ENERGY SYSTEMS** 

7901 ALLEN BLACK RD, MINT HILL NC 28227, UNITED STATES

REVISIONS								
DESCRIPTION	DATE	REV						
INITIAL DESIGN	02/20/2025							
REVISION	03/03/2025	Α						

PROJECT NAME & ADDRESS

3 HWY 421, NC 27546

5426 OLD US H LILLINGTON, N

CAMERON DEVERS RESIDENC

> DRAWN BY **ESR**

SHEET NAME

LABELS

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER





# EAGLE® 54 G6R

420-440 WATT • N-TYPE TOPCON

Positive power tolerance of 0-+3%

- · NYSE-listed since 2010, Bloomberg Tier 1 manufacturer
- . Top performance in the strictest 3" party labs
- . Automated manufacturing utilizing artificial intelligence
- . Vertically integrated, tight controls on quality
- . Premium solar factories in USA, Vietnam, and Malaysia

#### **KEY FEATURES**



#### Superior Aesthetics

Black backsheet and black frame create ideal look for



#### N-Type Technology

N-type cells with Jinko's in-house TOPCon technology offers better performance and improved reliability.



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



Twin array design allows continued performance even with shading by frees or debris.



#### Protected Against All Environments

Certified to withstand humidity, heat, rain, marine enorgoments, wind, hallstorms, and packed snow.

ISO45001, 2018 Occupational.

. MI,61730 certified products.

Health & Safety Standards



25-year product and 30-year linear power warranty.

- 1509901-2015 Quality Standards.
- ISO14001:2015 Environmental Standards
- · IEC61215, IEC61739 certified products

BUILDING YOUR TRUST IN SOLAR, WWW.JINKOSOLAR.US

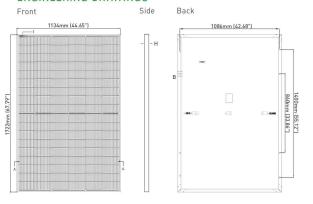


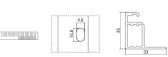






#### **ENGINEERING DRAWINGS**





#### Length: ± 2mm Height: ± 1mm Row Pitch: ± 2mm

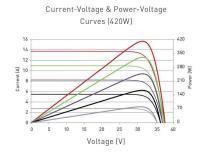
#### MECHANICAL CHARACTERISTICS

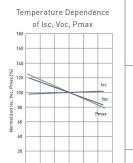
No. of Half Cells	108 (2 x 54)
Dimensions	1722 × 1134 × 35mm (67.79 × 44.65 × 1.38 inch)
Weight	21.0kg (46.3lbs)
Front Glass	3.2mm, Anti-Reflection Coating High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminum Alloy
Junction Box	IP68 Rated
Output Cables	12 AWG, 1400mm (55.12in) or Customized Length
Connector	Staubli MC4
Fire Type	Type 1
Pressure Rating	5400Pa (Snow) & 2400Pa (Wind)*
*see Supplemental Insta	llation Manual for higher wind pressure rating solutions

#### TEMPERATURE CHARACTERISTICS

Temperature Coefficients of Pmax	-0.29%/°C
Temperature Coefficients of Voc	-0.25%/°C
Temperature Coefficients of Isc	0.045%/°C
Nominal Operating Cell Temperature (NOCT)	45±2°C

#### ELECTRICAL PERFORMANCE & TEMPERATURE DEPENDENCE





Cell Temperature (°C)

#### MAXIMUM RATINGS

Operating Temperature (°C)	-40°C~+85°C
Maximum System Voltage	1000VDC
Maximum Series Fuse Rating	25A

#### PACKAGING CONFIGURATION

(Two pallets = One stack)

31pcs/pallets, 62pcs/stack, 806pcs/40 HQ Container

#### WARRANTY

25-year product and 30-year linear power warranty

1st year degradation not to exceed 1%, each subsequent year not to exceed 0.4%, minimum power at year 30 is 87.4% or greater.

435Wp

32 78V

13.72A

JKM435N-54HL4-B

22.28%

NOCT

327Wp

30 50V

11.08A

#### **ELECTRICAL CHARACTERISTICS**

JKM420N	-54HL4-B	JKM425N	-54HL4-B	JKM430N	-54HL4-B
STC	NOCT	STC	NOCT	STC	NOCT
420Wp	316Wp	425Wp	320Wp	430Wp	323Wp
32.16V	29.95V	32.37V	30.19V	32.58V	30.30V
13.06A	10.55A	13.13A	10.60A	13.20A	10.66A
38.74V	36.80V	38.95V	37.00V	39.16V	37.20V
13.51A	10.91A	13.58A	10.96A	13.65A	11.02A
21.5	51%	21.	76%	22.0	12%
	STC 420Wp 32.16V 13.06A 38.74V 13.51A	420Wp 316Wp 32.16V 29.95V 13.06A 10.55A 38.74V 36.80V	STC         NOCT         STC           420Wp         316Wp         425Wp           32.16V         29.95V         32.37V           13.06A         10.55A         13.13A           38.74V         36.80V         38.95V           13.51A         10.91A         13.58A	STC         NOCT         STC         NOCT           420Wp         316Wp         425Wp         320Wp           32.16V         29.95V         32.37V         30.19V           13.06A         10.55A         13.13A         10.60A           38.74V         36.80V         38.95V         37.00V           13.51A         10.91A         13.58A         10.96A	STC         NOCT         STC         NOCT         STC           420Wp         316Wp         425Wp         320Wp         430Wp           32.16V         29.95V         32.37V         30.19V         32.58V           13.06A         10.55A         13.13A         10.60A         13.20A           38.74V         36.80V         38.95V         37.00V         39.16V           13.51A         10.91A         13.58A         10.96A         13.65A

\*STC: \* Irradiance 1000W/m² NOCT: Irradiance 800W/m<sup>2</sup>

Cell Temperature 25°C Ambient Temperature 20°C AM = 1.5 AM = 1.5

₩ind Speed 1m/s

\*Power measurement tolerance: ±3%

 $The company \ reserves \ the \ final \ right for \ explanation \ on \ any \ of \ the \ information \ presented \ hereby. \ JKM400-420N-54HL4-B-F4-US$ 

BUILDING YOUR TRUST IN SOLAR, WWW.JINKOSOLAR.US



JKM440N-54HI 4-B

22.53%

NOCT

331Wp

30 73V

10 77Δ 37.59V

11.14A

STC

440Wp

32 99V

13 344

13.80A



#### **PHILLIPS ENERGY SYSTEMS**

7901 ALLEN BLACK RD, MINT HILL. NC 28227, UNITED STATES

REVISIONS								
DESCRIPTION	DATE	REV						
INITIAL DESIGN	02/20/2025							
REVISION	03/03/2025	A						
-								

PROJECT NAME & ADDRESS

CAMERON DEVERS 5426 OLD US HWY 421, LILLINGTON, NC 27546 RESIDENCE

> DRAWN BY **ESR**

SHEET NAME **EQUIPMENT SPECIFICATION** 

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER



#### CERTIFICATE OF COMPLIANCE

Certificate Number E362479

Report Reference E362479-20200410

Date 2023-July-16

Issued to: JINKO SOLAR CO LTD

No.1, Yingbin Road, Economic Development Zone

Shangrao Jiangxi Sheng 334100 CN

This is to certify that representative samples of

PHOTOVOLTAIC MODULES AND PANELS WITH SYSTEM VOLTAGE RATINGS OVER 600 VOLTS

See Addendum Page for Product Designation(s).

Have been evaluated by UL in accordance with the

Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 61730-1 - Standard for Photovoltaic (PV) Module Safety

Qualification - Part 1: Requirements for Construction, Edition 2, Issue Date 10/28/2022 and UL 61730-2, Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing, Edition 2, Revision Date 04/25/2023 and CSA C22.2 No. 61730-1:19 December 2019, Photovoltaic (PV) module safety qualification — Part 1: Requirements for construction and CSA C22.2 No. 61730-2:19 December 2019, Photovoltaic (PV) module safety qualification — Part 2: Requirements for testing.

Additional Information: See the UL Online Certifications Directory at

https://iq.ulprospector.com for additional information

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Ottoak Leunines Come-

Deborah Jennings-Conner, VP Regulatory Service

UL LI

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at <a href="http://ul.com/aboutul/locations/">http://ul.com/aboutul/locations/</a>



#### CERTIFICATE OF COMPLIANCE

Certificate Number

Report Reference E362479-20200410

te 2023-July-16

E362479

JKM525N-72HL4-V, JKM530N-72HL4-V, JKM535N-72HL4-V, JKM540N-72HL4-V, JKM545N-72HL4-V, JKM555N-72HL4-V, JKM555N-72HL4-V, JKM565N-72HL4-V, JKM565N-72HL4-V, JKM570N-72HL4-V, JKM575N-72HL4-V.

JKM480N-66HL4-V, JKM485N-66HL4-V, JKM490N-66HL4-V, JKM495N-66HL4-V, JKM500N-66HL4-V, JKM505N-66HL4-V, JKM510N-66HL4-V, JKM515N-66HL4-V, JKM525N-66HL4-V, JKM525N-66HL4-V, JKM525N-66HL4-V

JKM435N-60HL4-V, JKM440N-60HL4-V, JKM45N-60HL4-V, JKM450N-60HL4-V, JKM455N-60HL4-V, JKM460N-60HL4-V, JKM465N-60HL4-V, JKM470N-60HL4-V, JKM475N-60HL4-V, JKM480N-60HL4-V, JKM80N-60HL4-V, JKM80N-6

JKM395N-54HL4-V, JKM400N-54HL4-V, JKM405N-54HL4-V, JKM410N-54HL4-V, JKM415N-54HL4-V, JKM420N-54HL4-V, JKM425N-54HL4-V, JKM430N-54HL4-V.

JKM565M-78HL4-V, JKM570M-78HL4-V, JKM575M-78HL4-V, JKM580M-78HL4-V, JKM585M-78HL4-V, JKM590M-78HL4-V, JKM595M-78HL4-V, JKM600M-78HL4-V, JKM605M-78HL4-V

JKM370M-72HBL-V, JKM375M-72HBL-V, JKM380M-72HBL-V, JKM385M-72HBL-V, JKM390M-72HBL-V, JKM395M-72HBL-V, JKM400M-72HBL-V, JKM405M-72HBL-V, JKM410M-72HBL-V, JKM415M-72HBL-V, JKM420M-72HBL-V.

 ${\sf JKM330M-60HBL-V, JKM335M-60HBL-V, JKM340M-60HBL-V, JKM345M-60HBL-V, JKM350M-60HBL-V.}$ 

JKM515N-72HL4-B-V, JKM520N-72HL4-B-V, JKM525N-72HL4-B-V, JKM530N-72HL4-B-V, JKM535N-72HL4-B-V, JKM540N-72HL4-B-V, JKM545N-72HL4-B-V, JKM555N-72HL4-B-V, JKM560N-72HL4-B-V, JKM565N-72HL4-B-V, JKM560N-72HL4-B-V, JKM565N-72HL4-B-V, JKM570N-72HL4-B-V.

JKM475N-66HL4-B-V, JKM480N-66HL4-B-V, JKM485N-66HL4-B-V, JKM495N-66HL4-B-V, JKM500N-66HL4-B-V, JKM505N-66HL4-B-V, JKM515N-66HL4-B-V, JKM515N-66HL4

JKM430N-60HL4-B-V, JKM435N-60HL4-B-V, JKM440N-60HL4-B-V, JKM445N-60HL4-B-V, JKM450N-60HL4-B-V, JKM455N-60HL4-B-V, JKM465N-60HL4-B-V, JKM465N-60HL4-B-V, JKM470N-60HL4-B-V.

JKM385N-54HL4-B-V, JKM390N-54HL4-B-V, JKM395N-54HL4-B-V, JKM400N-54HL4-B-V, JKM405N-54HL4-B-V, JKM410N-54HL4-B-V, JKM415N-54HL4-B-V, JKM420N-54HL4-B-V, JKM425N-54HL4-B-V, JKM430N-54HL4-B-V. JKM435N-54HL4-B-V, JKM440N-54HL4-B-V.

JKM585N-78HL4R-V, JKM590N-78HL4R-V, JKM595N-78HL4R-V, JKM600N-78HL4R-V, JKM605N-78HL4R-V, JKM610N-78HL4R-V, JKM615N-78HL4R-V, JKM620N-78HL4R-V, JKM625N-78HL4R-V, JKM630N-78HL4R-V, JKM635N-78HL4R-V, JKM645N-78HL4R-V, JKM650N-78HL4R-V

Other Lewison Come-

Deborah Jennings-Conner, VP Regulatory Service

UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local IU. Customer Service Perseentative at http://lul.com/physity/filesetions/



#### PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL, NC 28227, UNITED STATES

REVISIONS								
DESCRIPTION	DATE	REV						
INITIAL DESIGN	02/20/2025							
REVISION	03/03/2025	Α						

PROJECT NAME & ADDRESS

HWY 421, NC 27546

5426 OLD US HILLINGTON, N

AMERON DEVERS RESIDENCE

DRAWN BY

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B

11" X 17"

SHEET NUMBER

# **Residential Power Optimizer** For North America

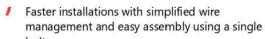
S440 / S500B / S650B



#### 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

- utilization
- / Compatible with bifacial PV modules
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)







## / Residential Power Optimizer

## For North America

S440 / S500B / S650B

	S440	S500B	S650B	
INPUT				
Rated Input DC Power <sup>®</sup>	440(2)	500(3)	650	W
Absolute Maximum Input Voltage (Voc)	60	125	85	Vdc
MPPT Operating Range	8-60	12.5 - 105	12.5 - 85	Vdc
Maximum Input Current (Maximum Isc of Connected PV Module) <sup>(2)</sup>	14.5	15	5	Adc
Maximum Input Short Circuit Current <sup>(4)</sup>	"	18.75		Adc
Maximum Efficiency		99.5		%
Weighted Efficiency		98.6		%
Overvoltage Category		TI TI		
OUTPUT DURING OPERATION (POWER OPTIMIZER CO	ONNECTED TO OPERATIN	NG SOLAREDGE INVE	RTER)	
Maximum Output Current		15		Adc
Maximum Output Voltage	60	8	0	Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISC	ONNECTED FROM SOLA	REDGE INVERTER OF	R INVERTER OFF)	
Safety Output Voltage per Power Optimizer		1 ± 0.1		Vdc
STANDARD COMPLIANCE	1			
Photovoltaic Rapid Shutdown System	CS	A C22.2#330, NEC 2014 - 20	23	
EMC	FCC Part 15 Class B; IEC 61000-6-2; IEC 61000-6-3			
Safety	CSA C22.2#1	07.1; IEC 62109-1 (Class II Safe	ety); UL 1741	
Material		UL 94 V-0, UV Resistant		
RoHS		Yes		
Fire Safety		VDE-AR-E 2100-712:2013-05		
INSTALLATION SPECIFICATIONS				1150
Maximum Allowed System Voltage		1000		Vdc
Dimensions (W x L x H)	129 x 155 x 30 / 5.07 x 6.10 x 1.18	129 x 165 x 45 / 5	5.07 x 6.49 x 1.77	mm/i
Weight	720./1.6	790 /	1.74	gr / lb
Input Connector		MC4		
Input Wire Length		0.1 / 0.32		m/ft
Output Connector		MC4		
Output Wire Length	(+)	2.3, (-) 0.10 / (+) 7.54, (-) 0.3	32	m/fi
Operating Temperature Range <sup>(5)</sup>		-40 to +85		°C
Protection Rating		IP68 / NEMA6P		
Relative Humidity		0 - 100		%

(1) Rated power of the module at STC will not exceed the power optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed. (2) For S440 with part number S440-1GM4MRMP, the Rated Input DC Power is 650W, and the Maximum Input Current is 15A.

(3) For installations after Aug 1st, 2024, the Rated Input DC Power for S500B is 650W.

(4) The Maximum Input Short Circuit Current is adjusted for worst case conditions of ambient temperature, irradiance, bifacial gain, and so on, in accordance with NEC and CSA.

(5) Power derating is applied for ambient temperatures above +85°C / +185°F for S440, and for ambient temperatures above +75°C / 167°F for S500B and S650B. Refer to the Power Optimizers Temperature.

PV System Design Using a	SolarEdge Inverter <sup>(6)</sup>	SolarEdge Home Wave/Hub Single Phase	Three Phase for 208V Grid	Three Phase for 277/480V Grid	
Minimum String Length (Power	S440	8	10	18	
Optimizers)	S500B, S650B	6	8	14	
Maximum String Length (Power 0	Optimizers)	25		50(7)	
Maximum Usable Power Delivered per String		5700	6000	12,750	W
	Inverters with Rated AC Power ≤ 5700W	Per the inverter's maximum input DC power <sup>(8)</sup>			
Maximum Allowed Connected Power per String <sup>(9)(9)</sup>	Inverters with Rated AC Power of 6000W	5700	One string: 7200 Two strings or more: 7800	15,000	W
	Inverters with Rated AC Power ≥ 7600W	6800, only when connected to at least two strings			
Parallel Strings of Different Lengtl	ns or Orientations		Yes		

(6) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.

(7) A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement.

(8) Refer to the <u>Single String Design Guidelines</u> application note for details.
(9) For the 208V grid, the maximum is permitted only when the difference in connected power between strings is 1,000W or less. (10) For the 240V or 277/480V grids, the maximum is permitted only when the difference in connected power between strings 2,000W or less.

© SolarEdge Technologies, Ltd. All rights reserved. SOLAREDGE, the SolarEdge logo, OPTIMIZED BY SOLAREDGE are trademarks or registered trademarks of SolarEdge Technologies, Inc. All other trademarks mentioned herein are trademarks of their respective owners. Date: September 17, 2024 DS-000018-NA. Subject to change without notice.





#### **PHILLIPS ENERGY SYSTEMS**

7901 ALLEN BLACK RD, MINT HILL NC 28227, UNITED STATES

REVISIONS				
DESCRIPTION	DATE	REV		
INITIAL DESIGN	02/20/2025			
REVISION	03/03/2025	Α		

PROJECT NAME & ADDRESS

CAMERON DEVERS RESIDENCE

> DRAWN BY **ESR**

5426 OLD US HWY 421, LILLINGTON, NC 27546

SHEET NAME **EQUIPMENT SPECIFICATION** 

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

# SolarEdge Home Hub Inverter

Single Phase, for North America For Inverters Assembled in the USA

SE3800H-US / SE5700H-US / SE7600H-US / SE10000H-US / SE11400H-US

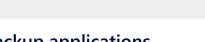


## Single phase inverter for storage and backup applications

- The ultimate home energy manager in charge of PV production, battery storage, backup operation during a power outage\*, EV Charging, and smart energy devices
- Record-breaking 99% weighted efficiency with up to 300% DC oversizing
- Supports LRA can provide the required energy for HVAC systems starting during backup operation
- Integrates seamlessly with the complete SolarEdge Home Smart Energy Ecosystem, through SolarEdge Home Network
- Module-level monitoring and visibility of battery status, PV production, and selfconsumption data

- Fast and easy installation small and lightweight, with reduced commissioning time
- A scalable solution that supports future homeowner needs through easy connection to a growing ecosystem of products
- Advanced safety features with integrated arc fault protection and rapid shutdown for 690.11 and 690.12
- Advanced reliability with automotive-grade
- Embedded revenue grade production data, ANSI C12.20 Class 0.5
- installations

\*Requires additional hardware and firmware version upgrade



- IP65-rated, for indoor and outdoor



## / SolarEdge Home Hub Inverter Single Phase, for North America

SE3800H-US / SE5700H-US / SE7600H-US / SE10000H-US / SE11400H-US

Model Number <sup>(1)(2)</sup>	SE3800H-US	SE5700H-US	SE7600H-US	SE10000H-US	SE11400H-US	Units		
OUTPUT – AC ON GRID								
Rated AC Power	3800 @ 240V 3300 @ 208V	5760 @ 240V 5000 @ 208V	7600	10000	11,400 @ 240V 10,000 @ 208V	W		
Maximum AC Power Output	3800 @ 240V 3300 @ 208V	5760 @ 240V 5000 @ 208V	7600	10000	11,400 @ 240V 10,000 @ 208V	W		
AC Output Voltage (Nominal)			208 / 240			Vac		
AC Output Voltage (Range)			183 – 264			Vac		
AC Frequency Range (min - nom - max)		5!	9.3 - 60 - 60.5 <sup>(3)</sup>			Hz		
Maximum Continuous Output Current	16	24	32	42	48	А		
GFDI Threshold			1			А		
Total Harmonic Distortion (THD)		< 3				%		
Power Factor		1, adji	ustable -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 STAND-ALONE (BACKUP)(4)(5)								
Rated AC Power in Stand-alone Operation			11,400(6)			W		
Maximum Stand-alone Capacity			11,400			W		
AC L-L Output Voltage Range in Stand-alone Operation			211 – 264			Vac		
AC L-N Output Voltage Range in Stand-alone Operation			105 – 132			Vac		
AC Frequency Range in Stand-alone (min - nom - max)			55 - 60 - 65			Hz		
Maximum Continuous Output Current in Stand-alone Operation			48			А		
GFDI			1			А		
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)		5	9.3 - 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		6	00kΩ Sensitivity					
INPUT – DC (PV)								
Maximum DC Power @ 240V	11,400	11,520	15,200	20,000	22,800	W		
Maximum DC Power @ 208V	6600	10,000	-	-	20,000	W		
Maximum Input Current <sup>(7)</sup> @ 240V	20	30.5	40	53	60	Adc		
Maximum Input Current <sup>(7)</sup> @ 208V	17.5	27	-	-	53	Adc		
Maximum Input Short Circuit Current	2000.0		45			Adc		
Maximum Inverter Efficiency			99.2			%		
CEC Weighted Efficiency	98	.5	9	99	99 @ 240V 98.5 @ 208V	%		
2-pole Disconnection			Yes					

- (1) These specifications apply to inverters with part numbers SEXXXXH-USMNUXXX5 and SEXXXXH-USMNEXXX5 and connection unit model number DCD-1PH-US-PXH-F-X
- (2) Inverters with part number SExxxxH-USMNFxxx5 are intended for upgrade installations only, as part of the "Re-Energize" program. Use on non-upgrade installations will revoke the product warranty.
- (3) For other regional settings please refer to the <u>SolarEdge Inverters, Power Control Options Application Note</u>.
- (4) Not designed for non-grid connected applications and requires AC for commissioning. Stand-alone (backup) functionality is only supported for the 240V grid
- (5) For LRA (Locked Rotor Amperage) values please refer to the <u>LRA for NAM Application Note</u>.
- (6) For models SE7600H-US and below, the rated AC stand-alone power is configurable between 7600W or 11,400W from CPU version 4.20.xx. (7) A higher current source may be used. The inverter will limit its input current to the values stated.





7901 ALLEN BLACK RD, MINT HILL NC 28227, UNITED STATES

REVISIONS					
DESCRIPTION	DATE	REV			
INITIAL DESIGN	02/20/2025				
REVISION	03/03/2025	A			

PROJECT NAME & ADDRESS

5426 OLD US HWY 421, LILLINGTON, NC 27546

CAMERON DEVERS RESIDENCE

DRAWN BY **ESR** 

SHEET NAME **EQUIPMENT SPECIFICATION** 

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

# / SolarEdge Home Hub Inverter

Single Phase, for North America
SE3800H-US / SE5700H-US / SE7600H-US / SE10000H-US / SE11400H-US

Model Number <sup>(1)(2)</sup>	SE3800H-US	SE5700H-US	SE7600H-US	SE10000H-US	SE11400H-US	Units
OUTPUT – DC (BATTERY)	'					
Supported Battery Types		SolarEdge Ho	me Battery, LG RES	U Prime		
Number of Batteries per Inverter		Up to 3 SolarEdge Ho	ome Battery, up to 2	LG RESU Prime		
Continuous Power <sup>(8)</sup>	11,400 @ 240V 3800 @ 208V	11,400 @ 240V 5000 @ 208V	11400	@240V	11,400 @ 240V 10,000 @ 208V	W
Peak Power <sup>(8)</sup>	11,400 @ 240V 3800 @ 208V	11,400 @ 240V 5000 @ 208V	11400	@240V	11,400 @ 240V 10,000 @ 208V	W
Maximum Input Current			30			Adc
2-pole Disconnection		Up to the inver	ter's rated stand-alo	ne power		
SMART ENERGY CAPABILITIES						
Consumption Metering			Built-in <sup>(9)</sup>			
Stand-alone & Battery Storage	With Backup I	nterface (purchased se	eparately) for service	up to 200A; up to	3 inverters	
EV Charging		Direct connection to	the SolarEdge Hon	ne EV Charger		
ADDITIONAL FEATURES						
Supported Communication Interfaces	RS485, Ethe	rnet, Cellular <sup>(10)</sup> , Wi-Fi	(optional), SolarEdo	e Home Network (c	ptional)	
Revenue Grade Metering, ANSI C12.20		Built-in <sup>(9)</sup>				
Integrated AC, DC and Communication Connection Unit			Yes			
Inverter Commissioning	With the SetApp	o mobile application u	sing built-in Wi-Fi A	ccess Point for local	connection	
DC Voltage Rapid Shutdown (PV and Battery)	Yes, NEC 690.12					
STANDARD COMPLIANCE						
Safety	UL 1741, UL 1741SA, U	JL 1741SB, UL 1699B, C	SA 22.2#107.1, C22,	2#330, C22.3#9, AN	SI/CAN/UL 9540	
Grid Connection Standards		IEEE1547 and I	EEE-1547.1, Rule 21,	Rule 14H		
Emissions		FC	C Part 15 Class B			
INSTALLATION SPECIFICATIONS						
AC Terminals		.1, L2, N terminal bloc L2 terminal blocks, PE				
DC Terminals	4 x termi	nal block pairs for PV	input; 1 x terminal b	lock pair for battery	input	
AC Output and EV AC Output Conduit Size / AWG Range		1" ma	aximum / 14-4 AWG			
DC Input (PV and Battery) Conduit Size / AWG Range		1" ma	aximum / 14-6 AWG			
Dimensions with Connection Unit (H x W x D)		21.06 x 14.	6 x 8.2 / 535 x 370 x	: 208		in/m
Weight with Connection Unit			44.9 / 20.3			lb/k
Noise			< 50			dBA
Cooling		Na	atural Convection			
Operating Temperature Range		-40 to	+140 / -40 to +60 <sup>(11)</sup>			°F/°(
Protection Rating			NEMA 4X			



7901 ALLEN BLACK RD, MINT HILL, NC 28227, UNITED STATES

<del>-</del>				
REVISIONS				
DESCRIPTION	DATE	REV		
INITIAL DESIGN	02/20/2025			
REVISION	03/03/2025	Α		

PROJECT NAME & ADDRESS

CAMERON DEVERS RESIDENCE 5426 OLD US HWY 421, LILLINGTON, NC 27546

> DRAWN BY **ESR**

SHEET NAME **EQUIPMENT SPECIFICATION** 

> SHEET SIZE ANSI B

11" X 17"

SHEET NUMBER

<sup>(8)</sup> Discharge power is limited up to the inverter's rated AC power for on-grid and stand-alone applications, as well as up to the installed batteries' rating.

(9) For consumption metering current transformers should be ordered separately: SECT-SPL-225A-T-20 or SEACT1250-400NA-20. Revenue grade metering is only for production metering.

(10) Information concerning the data plan terms & conditions is available in SolarEdge Communication Plan Terms and Conditions.

<sup>(11)</sup> Full power up to at least 50°C / 122°F; for power derating information refer to the Temperature Derating Technical Note for North America.

# **SolarEdge Slim Current Transformer**

SECT-SPL-225A-T-20



## Easily fits into home Main Service Panels, for simpler, faster installations

- ✓ Works seamlessly with SolarEdge consumption meters (external or built-in to the Energy Hub
- Boosts customer satisfaction by enabling real-time energy insight for greater electricity
- Increases installer revenue by creating more opportunities to expand system size or add smart capabilities like batteries, EV charging and smart energy devices
- High system accuracy (with SolarEdge meters)

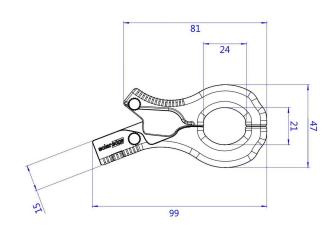
- Clamp and split-core design, with single-handed
- Supports CT paralleling, enabling measurements of more load conductors
- Includes 17ft twisted pair cable, eliminating need for extension cable and additional labor when installing inverters with built-in consumption meter
- Simplified support and logistics with a single

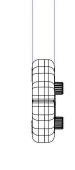
## / SolarEdge Slim Current Transformer SECT-SPL-225A-T-20

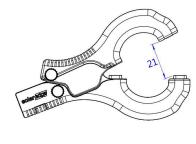
Model number: SECT-S1

		SECT-SPL-225A-T-20	UNITS
ELECTRICAL SP	ECIFICATION		
Accuracy (1% - 100% c	of rated current)	±1	%
CT Phase Angle (10%	- 100% of rated current)	< ±2.0	Degrees
Nominal Line Frequen	су	60 / 50	Hz
Current Rating		225 (@ 600 Vac)	А
Output Voltage		0 - 333	mVac
Overvoltage Category	1	CAT III 600V	Vac
Maximum Primary Cor	nductor Gauge	300	kcmil
Maximum Continuous	Amps	300	А
MECHANICAL			
Туре		Split core, clamp design	
Dimentions: Overall (H	H x W x L)	1.85 x 0.49 x 4.05 / 47 x 12.5 x 99	Inch / mm
Average Window Dian	neter	0.885 / 22.6	Inch / mm
-	Туре	Twisted pair	MTW, UL 101
Lead Wire	Length	17 / 5.2	ft/m
	Gauge	18 / 20(1)	AWG
Material	,	Polycarbonate	
Weight		7.5 / 213	Oz/g
ENVIRONMENT	ΓAL		
Operating Temperatur	re Range	-40 to 140 / -40 to 60	°F/°C
Operating Humidity		5% to 90% relative humidity	
IP Rating		30 (NEMA 1)	
STANDARDS		'	
Safety for US/CAN		UL 2808 (XOBA) listed, meets 2017 NEC code requirements for field installation	
RoHS		Compliant	

(1) 18 AWG or 20 AWG can be used interchangeably









SolarEdge Technologies Ltd. All rights reserved. SOLAREDGE, the SolarEdge logo, OPTIMIZED BY SOLAREDGE are trademarks or registered trademarks of SolarEdge Technologies, Inc. All other trademarks mentioned herein are trademarks of their respective owners. Date: 07/2021 DS-000033-1.3-NA. Subject to change without notice.

solaredge



7901 ALLEN BLACK RD, MINT HILL NC 28227, UNITED STATES

REVISIONS				
DESCRIPTION	DATE	REV		
INITIAL DESIGN	02/20/2025			
REVISION	03/03/2025	Α		

PROJECT NAME & ADDRESS

5426 OLD US HWY 421, LILLINGTON, NC 27546

DRAWN BY ESR

SHEET NAME **EQUIPMENT SPECIFICATION** 

> SHEET SIZE ANSI B

11" X 17"

SHEET NUMBER

PV-14

solaredge.com

**€ RoHS** 

# **Backup Interface**

for North America

BI-EUSGN-01 / BI-NUSGN-01



## **Backup Interface for Flexible Backup**

- Automatically provides backup power to home loads in the event of grid interruption
- / Full flexibility in which loads to backup the entire home or selected loads
- Scalable solution to support higher power & higher capacity(\*)
- Built-in Auto Transformer and Energy Meter for easier and faster installation
- Seamless integration with the Energy Hub Inverter with Prism Technology to manage and monitor both PV generation and energy storage
- ✓ Generator connection support<sup>(\*)</sup>

(\*) Requires supporting inverter firmware



# **/** Backup Interface for North America

BI-EUSGN-01 / BI-NUSGN-01

	BI-EUSGN-01	BI-NUSGN-01	
INPUT FROM GRID			
AC Current Input	200		A
AC Output Voltage (Nominal)	240		Vac
AC Output Voltage Range	211 - 2	64	Vac
AC Frequency (Nominal)	60		Hz
AC Frequency Range	59.3 - 6	50.5	Hz
Microgrid Interconnection Device Rated Current	200		A
Service Side AC Main Circuit Breaker Rated Current	200	N/A	А
Service Side AC Main Circuit Breaker Interrupt Current	10k	N/A	A
Grid Disconnection Switchover Time	<100	)	ms
OUTPUT TO MAIN DISTRIBUTION PANEL			
Maximum AC Current Output	200		А
AC L-L Output Voltage (Nominal)	240		Vac
AC L-L Output Voltage Range	211 - 2	64	Vac
AC Frequency (Nominal)	60		Hz
AC Frequency Range	59.3 - 6	50.5	Hz
Maximum Inverters AC Current Output in Backup Operation	78		A
Imbalance Compensation in Backup Operation	5000	)	W
AC L-N Output Voltage in Backup (Nominal)	120		
AC L-N Output Voltage Range in Backup	105 - 1	32	V
AC Frequency Range in Backup	55 - 6	55 - 65	
INPUT FROM INVERTER			
Number of Inverter Inputs	3		#
Rated AC Power	7,600	)	W
Maximum Continuous Input Current @ 240V	32		A
Rated AC Power in Continuous Backup Operation	6,100	)	W
Maximum Continuous Input Current in Backup Operation	26		A
Peak AC Power (<10 sec) in Backup Operation	7,000	)	W
Peak AC Current (<10 sec) in Backup Operation	30		A
Inverter Input AC Circuit Breaker	40		А
Upgradability	Up to 3 X 6	3A CB <sup>(1)</sup>	
GENERATOR <sup>(2)</sup>			
Maximum Rated AC Power	15,00	0	W
Maximum Continuous Input Current	63		Adc
Dry Contact Switch Voltage Rating	250/3	0	Vac/Vo
Dry Contact Switch Current Rating	5	5	
2-wire Start Switch	Yes		
ADDITIONAL FEATURES			
Installation Type	Suitable for use as service equipment	For main lug only	
Number of Communication Inputs	2		
Communication	RS48	5	
Energy Meter (for Import/Export)	1% accu	racy	
Manual Control Over Microgrid Interconnection Device	Yes		

<sup>(1)</sup> Each 40A CB supports up to one 7.6kW inverter, with each 63A CB supporting one 10kW and one 11.4kW inverter. The CB upgrade kit is available with the following part numbers: for 40A CB, CB-UPG-40-01; for 63A, CB CB-UPG-63-01 (2) Requires supporting inverter firmware



7901 ALLEN BLACK RD, MINT HILL, NC 28227, UNITED STATES

REVISIONS					
DESCRIPTION	DATE	REV			
INITIAL DESIGN	02/20/2025				
REVISION	03/03/2025	A			
_					

PROJECT NAME & ADDRESS

CAMERON DEVERS RESIDENCE

DRAWN BY

5426 OLD US HWY 421, LILLINGTON, NC 27546

SHEET NAME **EQUIPMENT SPECIFICATION** 

**ESR** 

SHEET SIZE ANSI B

11" X 17"

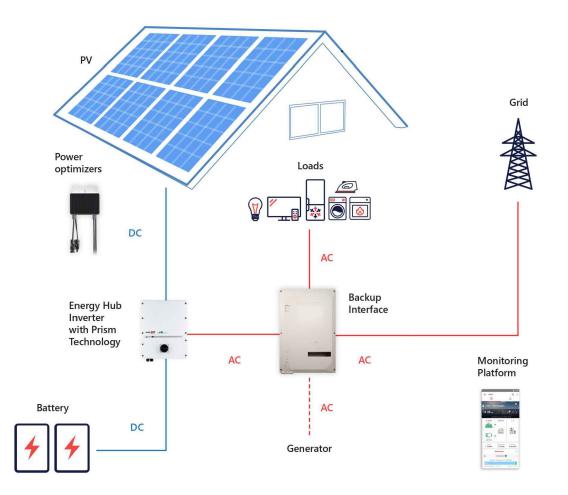
SHEET NUMBER PV-15

solaredge.com

# **/ Backup Interface** for North America

BI-EUSGN-01 / BI-NUSGN-01

	BI-EUSGN-01	BI-NUSGN-01	
STANDARD COMPLIANCE			
C-E-L	UL1741, CSA	22.2 NO. 107	
Safety	UL869A	N/A	
Emissions	FCC part	15 class B	
INSTALLATION SPECIFICATIONS			
Supported Inverters		e phase inverter, verter with Prism technology	
AC From Grid Conduit Size / AWG Range	2" conduits /		
AC Inverter Conduit Size / AWG Range	1" conduit / 14 - 4 AWG		
AC Generator Input Conduit Size / AWG Range	1" conduit / 8 - 3 AWG		
Communication Conduit Size / AWG Range	3/4" / 24	- 10 AWG	
Weight	73	/ 33	lb / Kg
Cooling	Fan (user r	eplaceable)	
Noise	<	50	dBA
Operating Temeprature Range	-40 to +122 / -40 to +50		°F/°C
Protection Rating	NEMA	3R, IP44	
Dimensions (HxWxD)	20.59 x 13.88 x 8.62	/ 523.5 x 352.5 x 219	in / mm





#### PHILLIPS ENERGY SYSTEMS

7901 ALLEN BLACK RD, MINT HILL, NC 28227, UNITED STATES

REVISIONS			
DESCRIPTION	DATE	REV	
INITIAL DESIGN	02/20/2025		
REVISION	03/03/2025	Α	

PROJECT NAME & ADDRESS

CAMERON DEVERS RESIDENCE 5426 OLD US HWY 421, LILLINGTON, NC 27546

DRAWN BY

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE ANSI B

11" X 17"

SHEET NUMBER PV-16

# SolarEdge Energy Bank 10kWh Battery

For North America



## Optimized for SolarEdge Energy Hub Inverters(1)

- Maximized system performance, gaining more energy to store and use for on-grid and backup power applications
- Integrates with the complete SolarEdge residential offering, providing a single point of contact for warranty, support, training, and simplified logistics & operations
- DC coupled battery featuring superior overall system efficiency, from PV to battery to grid
- Scalable solution for increased power and capacity with multiple SolarEdge inverters and batteries
- \* Backup application are subject to local regulation and may require additional components and firmware upgrade

- Solar, storage, EV charging, and smart devices all monitored and managed by a single app to optimize solar production, consumption and backup\* power
- Wireless communication to the inverter, reducing wiring, labor and installation faults
- Simple plug and play installation, with automatic SetApp-based configuration
- Includes multiple safety features for battery

# / SolarEdge Energy Bank 10kWh Battery For North America

BAT-10K1P <sup>(2)</sup>		
BATTERY SPECIFICATION		
Usable Energy (100% depth of discharge)	9700	Wh
Continuous Output Power	5000	W
Peak Output Power (for 10 seconds)	7500	W
Peak Roundtrip Efficiency	>94.5	%
Warranty <sup>a</sup>	10	Years
Voltage Range	350-450	Vdc
Communication Interfaces	Wireless*	
Batteries per Inverter	Up to 3 <sup>(4)</sup>	
STANDARD COMPLIANCE		**
Safety	UL1642, UL1973, UL9540, UN38.3	
Emissions	FCC Part 15 Class B	
MECHANICAL SPECIFICATIONS		
Dimensions (W x H x D)	31.1 x 46.4 x 9.84 / 790 x 1179 x 250	in / mm
Weight	267 / 121	lb / kg
Mounting <sup>(5)</sup>	Floor or wall mount®	
Operating Temperature <sup>(7)</sup>	+14 to +122 / -10 to +50	°F/°C
Storage Temperature (more than 3 months)	+14 to +86 / -10 to +30	°F/°C
Storage Temperature (less than 3 months)	-22 to + 140 / -30 to +60	°F/°C
Altitude	6562 / 2000	ft/m
Enclosure Protection	IP55 / NEMA 3R - indoor and outdoor (water and dust protection)	
Cooling	Natural convection	
Noise (at 1m distance)	<25	dBA

<sup>\*</sup> The SolarEdge Energy Bank is designed for use with SolarEdge Energy Net for wireless communication. The inverter might require a matching SolarEdge Energy Net Plug-in (more details below).

Accessory	PN	
Floor stand	IAC-RBAT-FLRSTD-01	
Branch connectors set (includes a pair of DC + and DC - connectors) Required for installations with multiple SolarEdge Energy Bank batteries with a single inverter	IAC-RBAT-USYCBL-01	
Handles	IAC-RBAT-HANDLE-01	
SolarEdge Energy Net Plug-in	ENET-HBNP-01	
Battery inverter extension cable 2m long (MC4 to terminal block)	IAC-RBAT-10M420-01	



#### **PHILLIPS ENERGY SYSTEMS**

7901 ALLEN BLACK RD, MINT HILL. NC 28227, UNITED STATES

· · · · · · · · · · · · · · · · · · ·			
REVISIONS			
DESCRIPTION	DATE	REV	
INITIAL DESIGN	02/20/2025		
REVISION	03/03/2025	Α	

PROJECT NAME & ADDRESS

CAMERON DEVERS RESIDENCE 5426 OLD US HWY 421, LILLINGTON, NC 27546

> DRAWN BY **ESR**

SHEET NAME **EQUIPMENT SPECIFICATION** 

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

Using RS485 could reduce the usable energy to 9500Wh (f) Please refer to the SolarEdge Energy Bank battery connections and configuration application note for compatible inverters

<sup>(2)</sup> These specifications apply to part number BAT-10KIPS0B-01.

<sup>(3)</sup> For warranty details please refer to the SolarEdge Energy Bank battery Limited Warranty.

<sup>(4)</sup> Installations with multiple SolarEdge Energy Bank batteries connected to a single inverter require a pair of branch connectors (DC + and DC -) per battery excluding the last battery. Support for 3 batteries is pending supporting inverter firmware. The branch connectors should be purchased separately.

<sup>(5)</sup> Installation and mounting requires handles that should be purchased separately. Please refer to the Accessories' PN table below.

(6) The floor stand is purchased separately. One floor stand is required per SolarEdge Energy Bank battery. Please refer to the Accessories' PN table below.

<sup>(7)</sup> Please note that operating the SolarEdge Energy Bank at extreme temperatures for extended durations of time may void the Energy Bank's warranty coverage Please see the Energy Bank Limited Product Warranty for additional details.

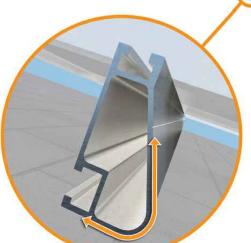


## XR Rail® Family

#### Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails® are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



#### Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails® is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

#### **Corrosion-Resistant Materials**



Compatible with Flat & Pitched Roofs



IronRidge® offers a range of tilt leg options for flat roof mounting applications.

All XR Rails® are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.



#### XR Rail<sup>®</sup> Family

The XR Rail® Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail® to match.



XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- · 6' spanning capability
- · Moderate load capability
- · Clear & black anodized finish
- · Internal splices available



#### XR100

XR100 is a residential and commercial mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- · 10' spanning capability
- · Heavy load capability
- · Clear & black anodized finish · Internal splices available



#### XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications.

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

#### **Rail Selection**

The table below was prepared in compliance with applicable engineering codes and standards.\* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

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

\*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.

**PHILLIPS ENERGY SYSTEMS** 

7901 ALLEN BLACK RD, MINT HILL.

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL DESIGN	02/20/2025	
REVISION	03/03/2025	Α

NC 28227, UNITED STATES

PROJECT NAME & ADDRESS

CAMERON DEVERS RESIDENCE

DRAWN BY **ESR** 

5426 OLD US HWY 421, LILLINGTON, NC 27546

SHEET NAME **EQUIPMENT SPECIFICATION** 

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER PV-18



## UFO® Family of Components

Universal Fastening Object (UFO®)

can fit a wide range of module heights.

The UFO® securely bonds solar modules to XR Rails®. It comes assembled and lubricated, and

#### Simplified Grounding for Every Application

The UFO® family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge® XR Rails®. All system types that feature the UFO® family-Flush Mount®, Tilt Mount® and Ground Mount®-are fully listed to the UL 2703 standard.

UFO® hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.

Only for installation and use with IronRidge products in accord with written instructions. See IronRidge.com/UFO



onto the UFO®, converting it

# **BOSS® Splice**

Bonded Structural Splice connects rails with built-in bonding teeth. No tools or hardware needed

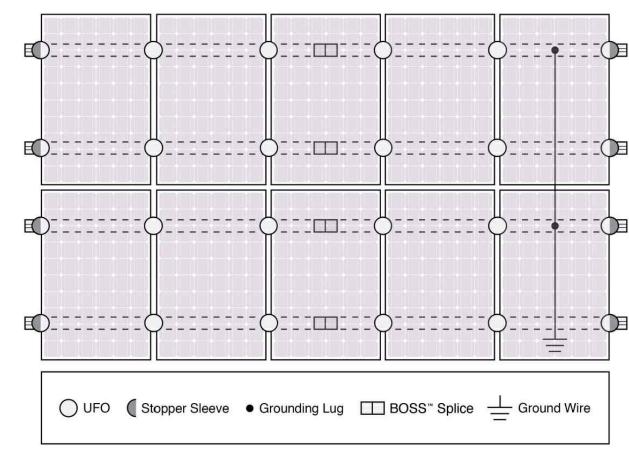


**Grounding Lug** A single Grounding Lug connects an entire row of PV modules to the grounding conductor.

#### **Bonded Attachments**

The bonding bolt attaches and bonds the L-foot® to the rail. It is installed with the same socket as the rest of the

#### **System Diagram**



Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

#### **UL Certification**

The IronRidge® Flush Mount®, Tilt Mount®, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

Go to IronRidge.com/UFO

	Cross-System	Compatibility	
Feature	Flush Mount	Tilt Mount	Ground Mount
XR Rails®	~	~	XR100 & XR1000
UFO®/Stopper	~	~	~
BOSS® Splice	~	~	N/A
Grounding Lugs	1 per Row	1 per Row	1 per Array
Microinverters & Power Optimizers		with most MLPE m system installation	
Fire Rating	Class A	Class A	N/A
Modules		ated with over 400 llation manuals for	Framed Modules r a detailed list.



**PHILLIPS ENERGY SYSTEMS** 

7901 ALLEN BLACK RD, MINT HILL, NC 28227, UNITED STATES

<del>-</del>			
REVISIONS			
DESCRIPTION	DATE	REV	
INITIAL DESIGN	02/20/2025		
REVISION	03/03/2025	Α	

PROJECT NAME & ADDRESS

CAMERON DEVERS RESIDENCE

5426 OLD US HWY 421, LILLINGTON, NC 27546

DRAWN BY **ESR** 

SHEET NAME **EQUIPMENT SPECIFICATION** 

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

# The Right Way!

#### **ProteaBracket**<sup>™</sup>

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

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

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

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



The Right Way!

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

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

# Multiple Attachment Options:

Side Rail Option



Top Rail Option

www.S-5.com

888-825-3432



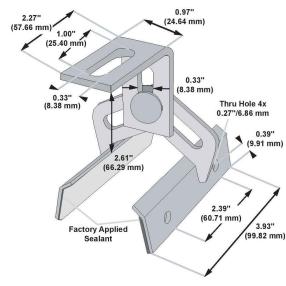
S-5-PV Kit Option

#### 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.

Copyright 2013, Metal Roof Innovations, Ltd. S-5! products are patent protected. S-5! aggressively protects its patents, trademarks, and copyrights. Version 112513.

#### **ProteaBracket**<sup>™</sup>



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

#### **Example Applications**



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

#### **Example Profile**



Distributed by



#### **PHILLIPS ENERGY SYSTEMS**

7901 ALLEN BLACK RD, MINT HILL, NC 28227, UNITED STATES

REVISIONS			
DESCRIPTION DATE RE		REV	
INITIAL DESIGN	02/20/2025		
REVISION	03/03/2025	Α	
•			

PROJECT NAME & ADDRESS

CAMERON DEVERS RESIDENCE 5426 OLD US HWY 421, LILLINGTON, NC 27546

DRAWN BY

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE ANSI B

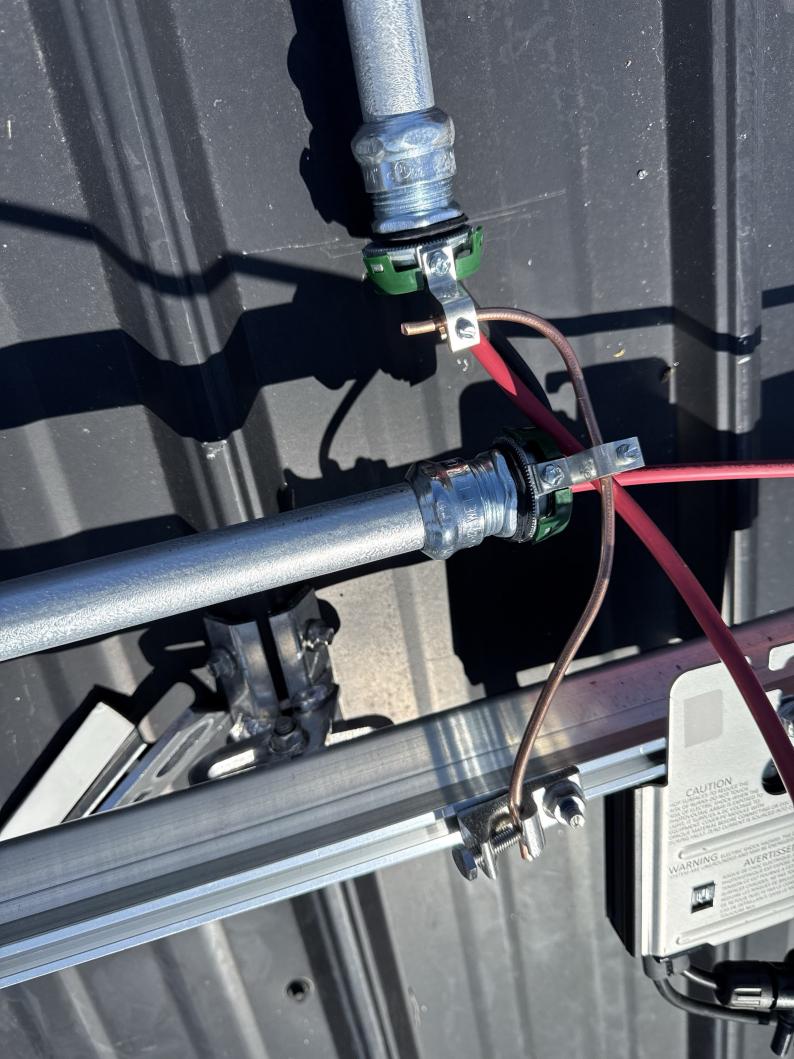
11" X 17"

SHEET NUMBER

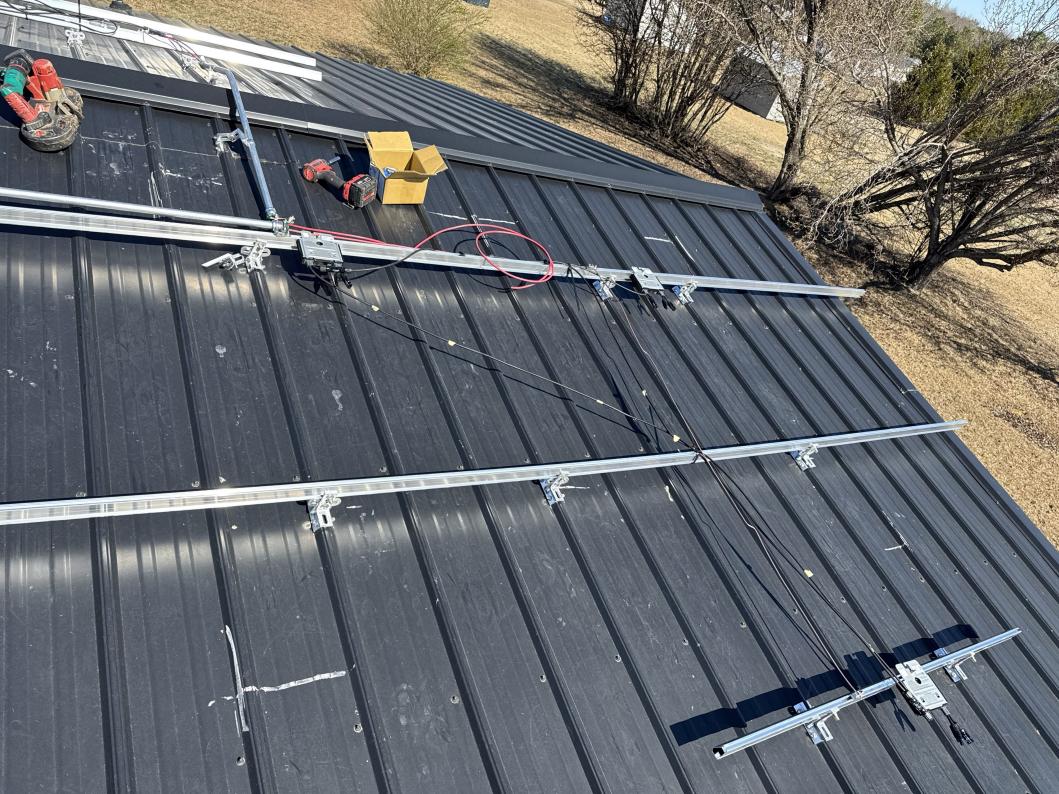








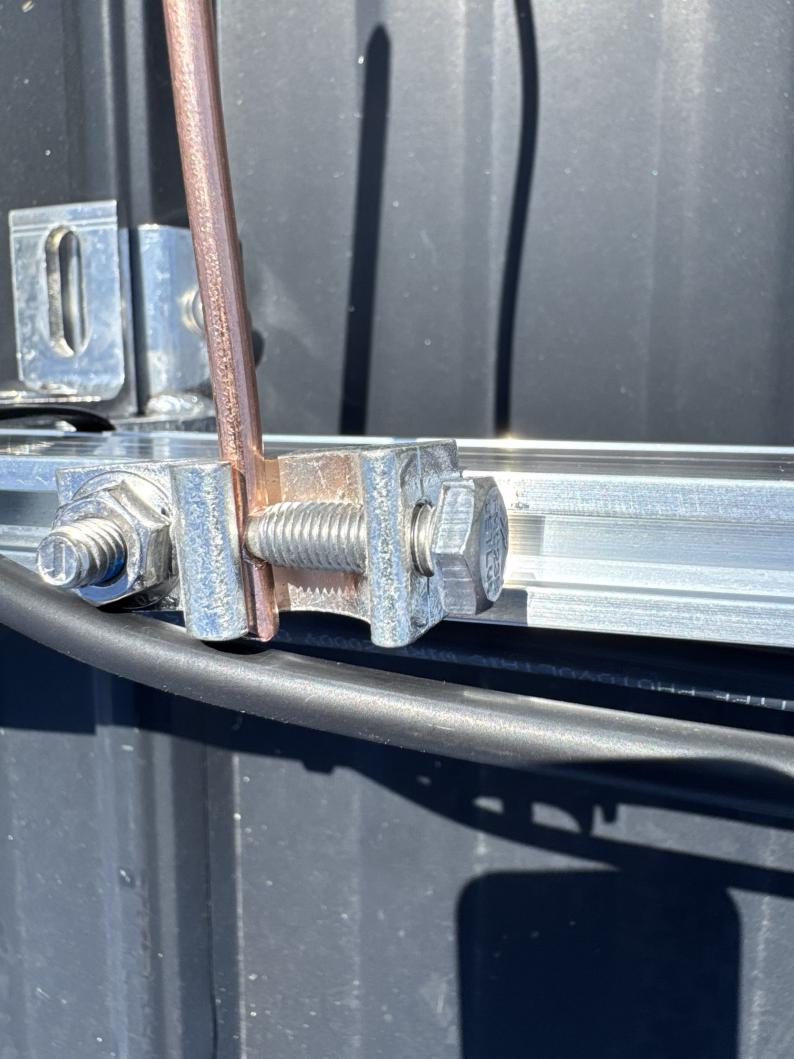














#### Do Not Remove

17AB1424-F#







Solaredge Technologies Ltd. Solaredge Technologies GmbH/ Werner-Eckert-Straße 6/81829 Munich/Germany



## CAUTION

HOT SURFACES-TO REDUCE THE RISK OF BURNS-DO NOT TOUCH. RISK OF ELECTRIC SHOCK-WHEN THE PHOTOVOLTAIC ARRAY IS EXPOSED TO LIGHT, IT SUPPLIES A DC VOLTAGE TO EQUIPMENT. COVER PV MODULE WITH

SolarEdge Technologies Ltd. Power Optimizer

Solaredge Technologies GmbH/ Werner-Eckert-Straße 6/81829 Munich/Germany

OPAQUE MATERIAL BEFORE CONNECTING OR DISCONNECTING THIS OPTIMIZER. DURING FAULT, ZERO CURRENT IS SOURCED INTO DC ARRAY BY CONVERTER.

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

## **AVERTISSEMENT**



RISQUE DE CHOC ELECTRIQUE: QUAND LE CHAMP PHOTOVOTAIQUE EST EXPOSE A LA LUMIERE, UNE TENSION CC EST FOURNIE A CET EQUIPEMENT. SURFACES CHAUDES: NE PAS TOUCHER, AFIN DE REDUIRE LES RISQUES DE BRULURES LE COURANT DE RETOUR INJECTE PAR LE CONVERTISSEUR EN CAS DE DEFAILLANCE DANS LE MODULE PV EST TOUJOURS NUL.



















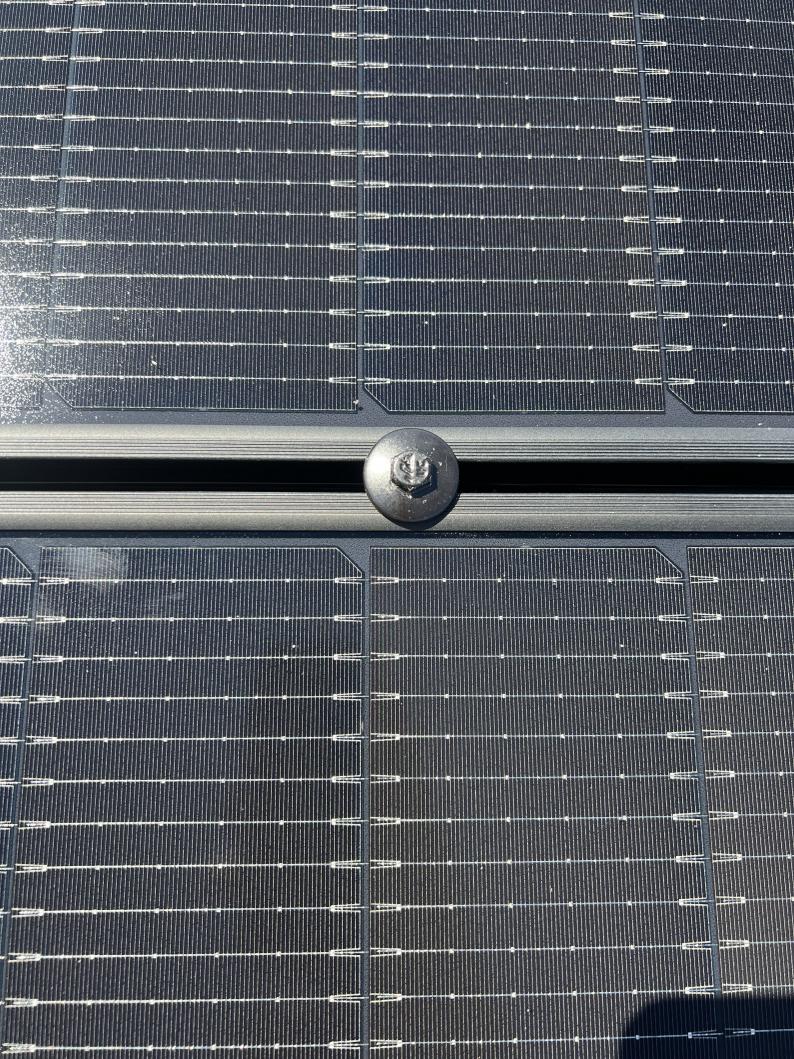
















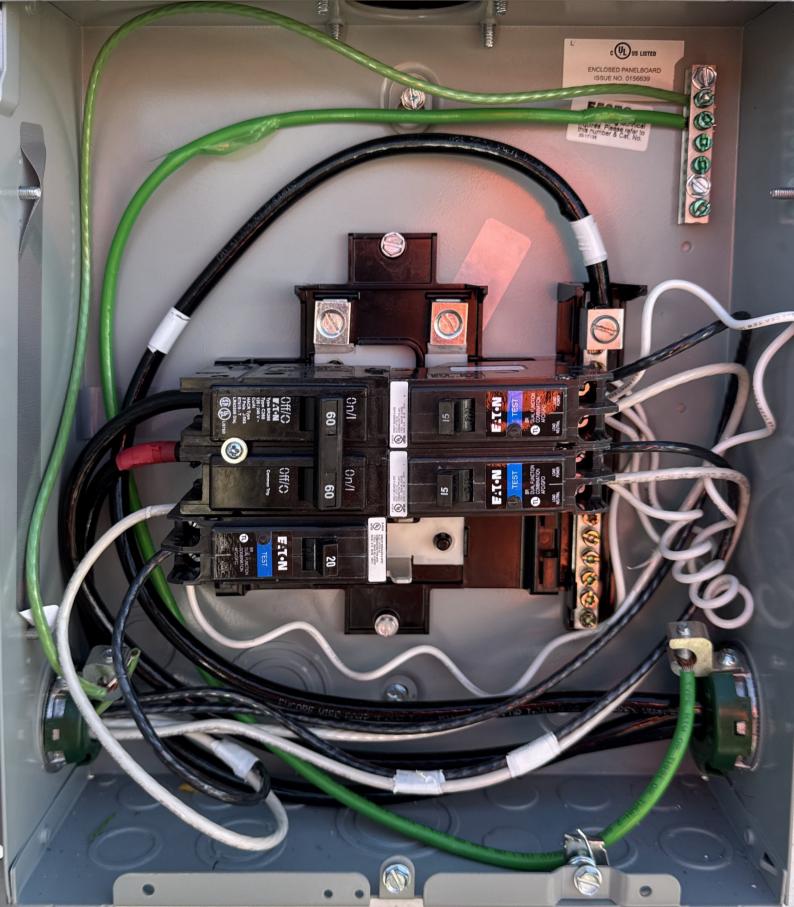


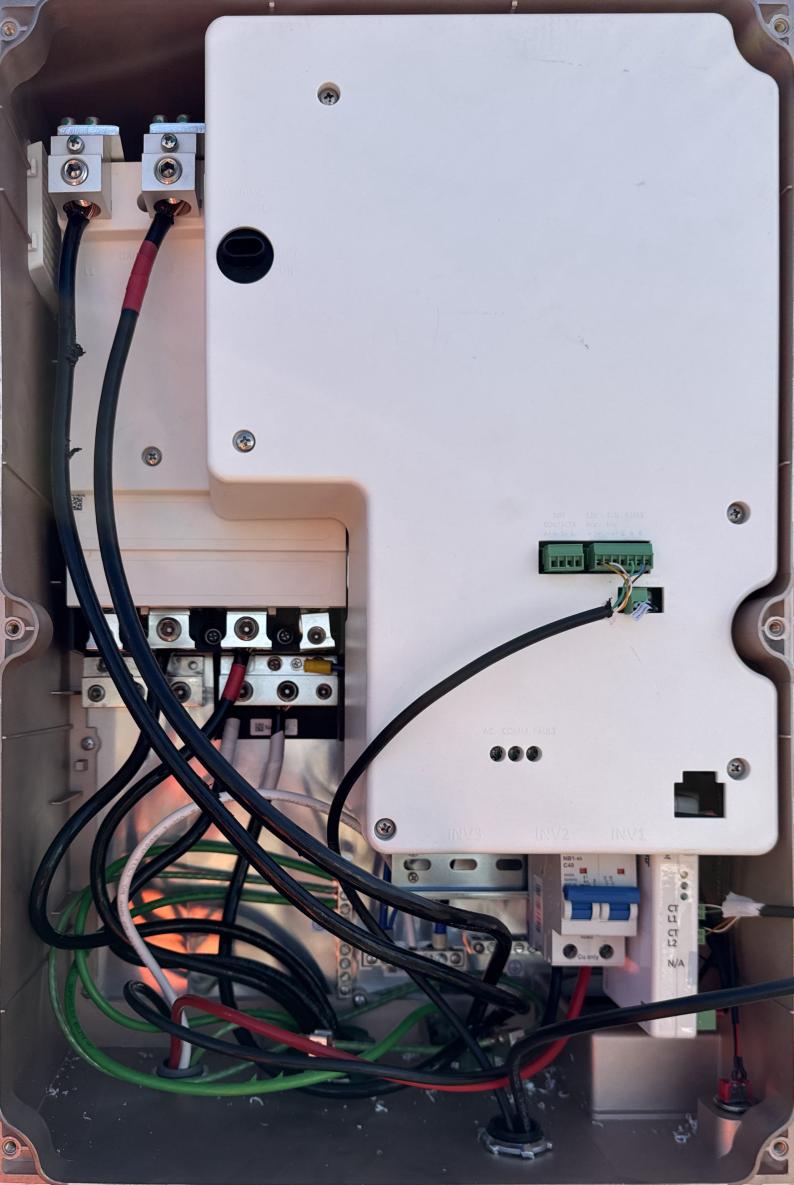


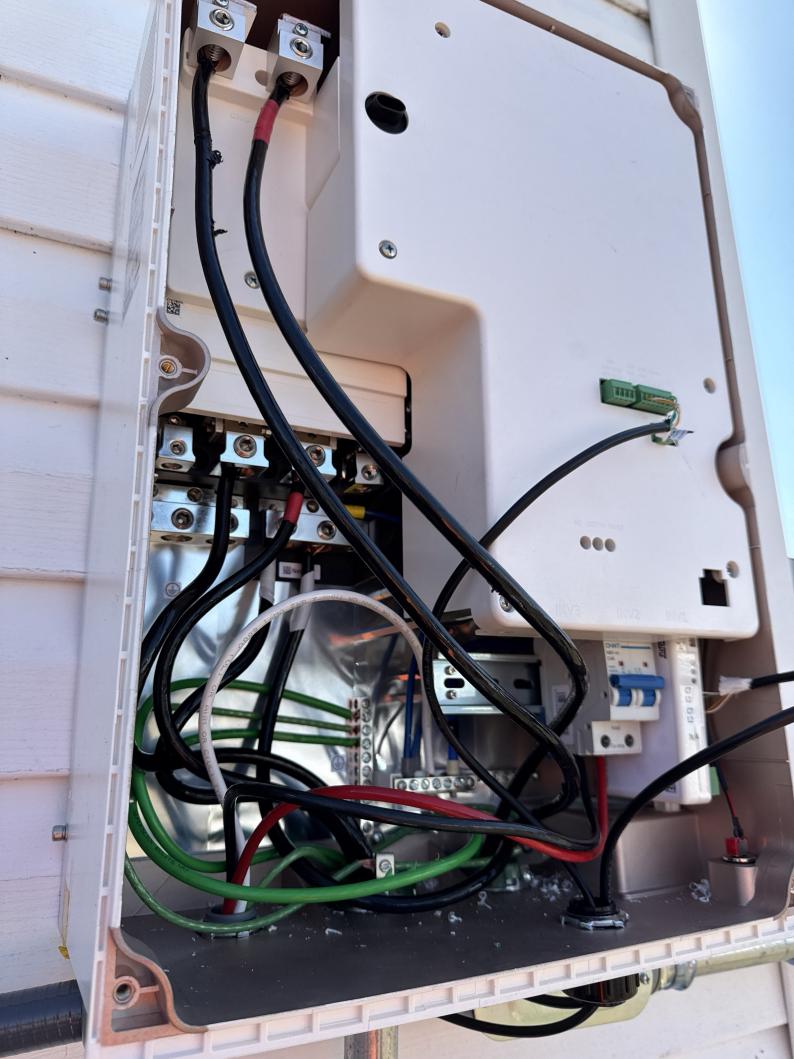


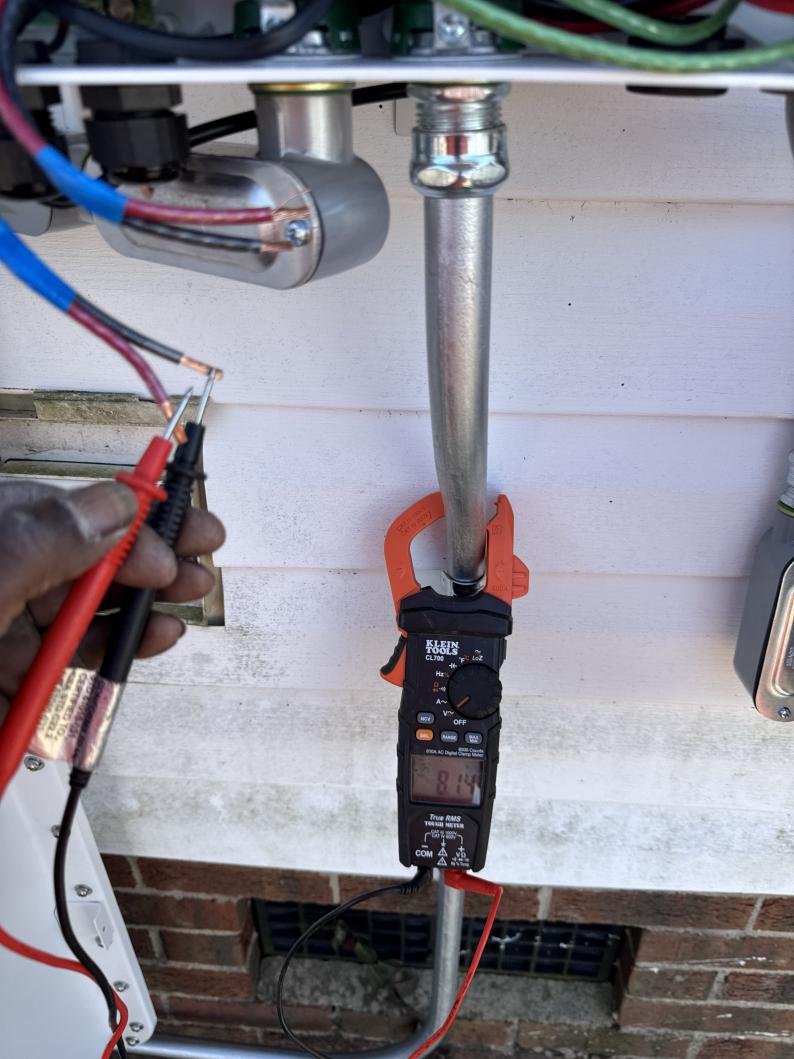


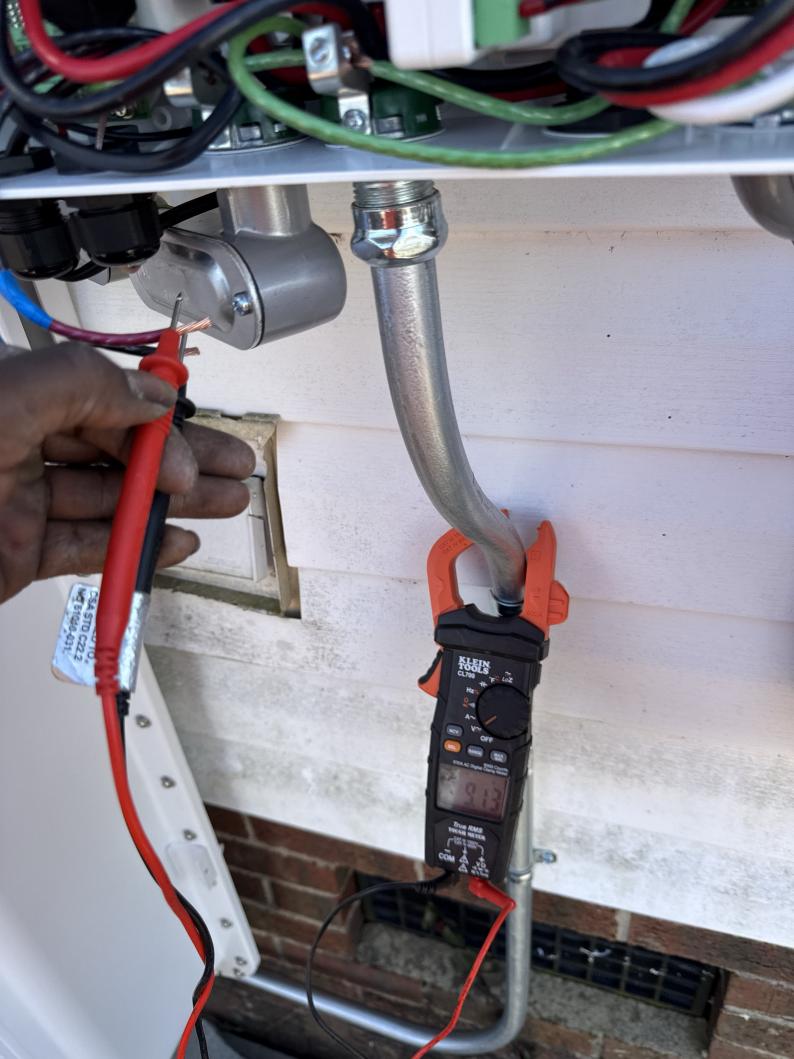


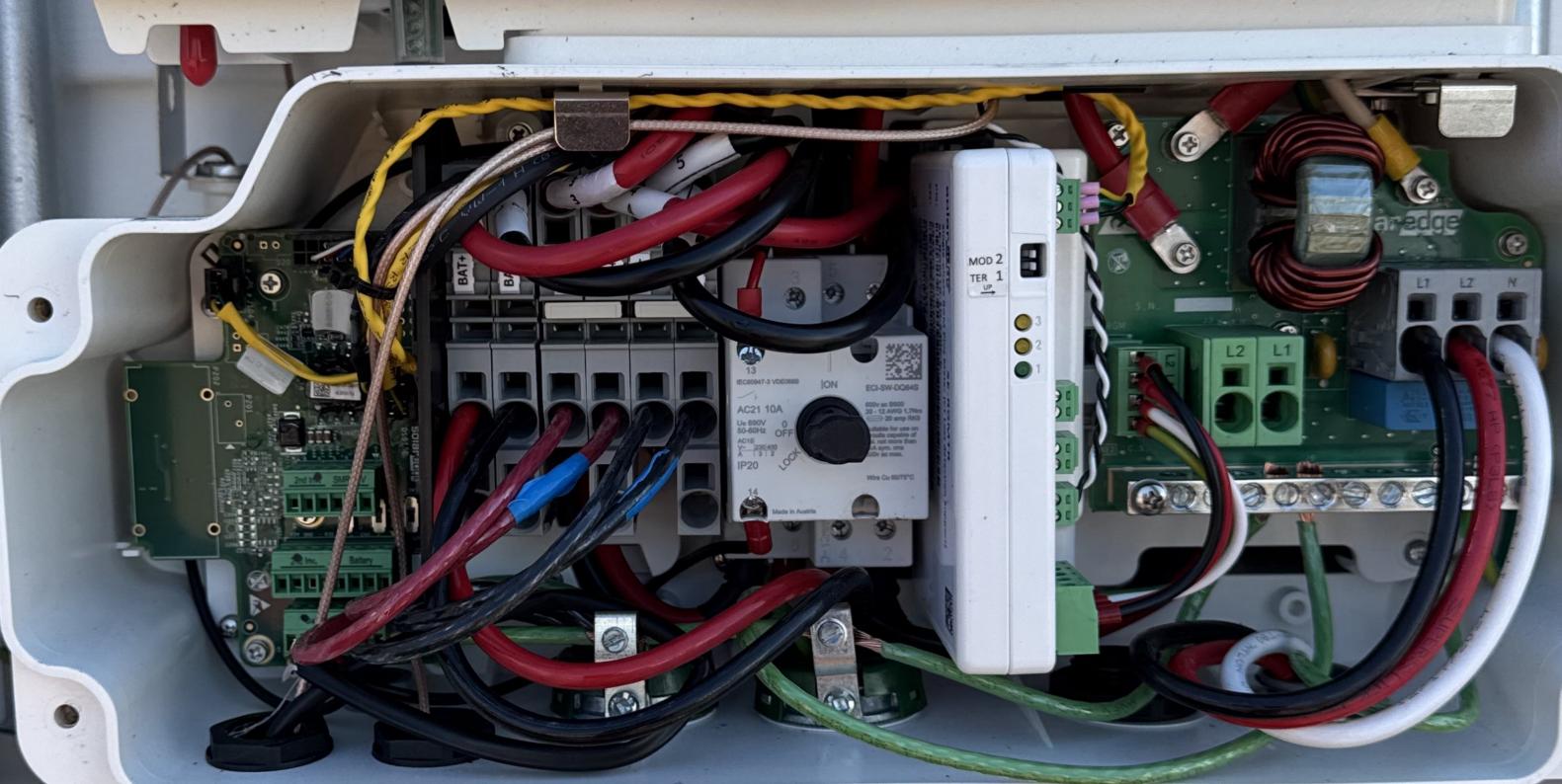






















0

0

Made in USA from imported parts

DC DISCONNECT



solar, edge 💿



0

### **WARNING**

POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE





Master 1
Kitchen 1





Kidden

Main



General Duty Safety Switch Interruptour de sécurité à usage général interruptor de seguridad de servicio general

60 A, 240 V-, 60 Hz

Complete ratings inside Valeurs nominales complètes à l'intérieur Información completa de capacidades en el

Further instructions inside Autres instructions à l'intériour Instruccionea adicionales en el Interior

Made in U.S.A. / Febriqué aux É.-U. / Heche en E.U.A

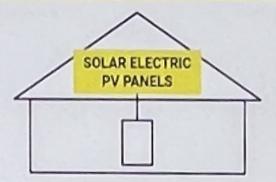


### A DANGER

- HAZARDOUS VOLYAGE, WILL CAUSE SEVERE INJURY OR DEATH.



### SOLAR PV SYSTEM **EQUIPPED WITH** RAPID SHUTDOWN



NI

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

## ♠ WARNING

ELECTRIC SHOCK HAZARD

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



# **AC DISCONNECT**

PHOTOVOLTAIC SYSTEM **POWER SOURCE** 

RATED AC **OUTPUT CURRENT** NOMINAL OPERATING **AC VOLTAGE** 

24

**AMPS** 

240

VOLTS

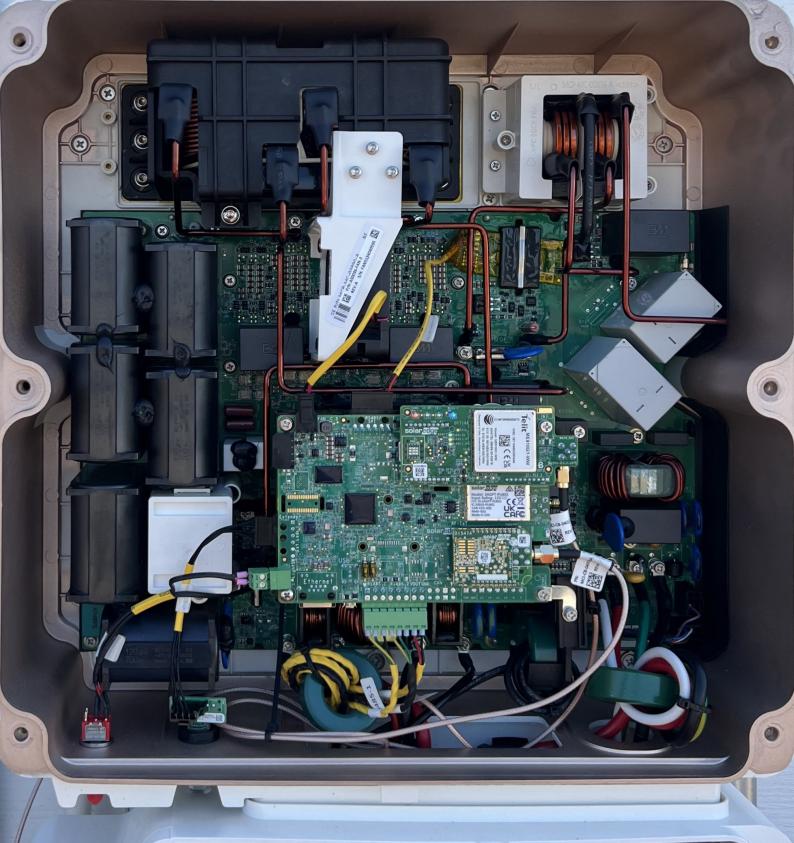




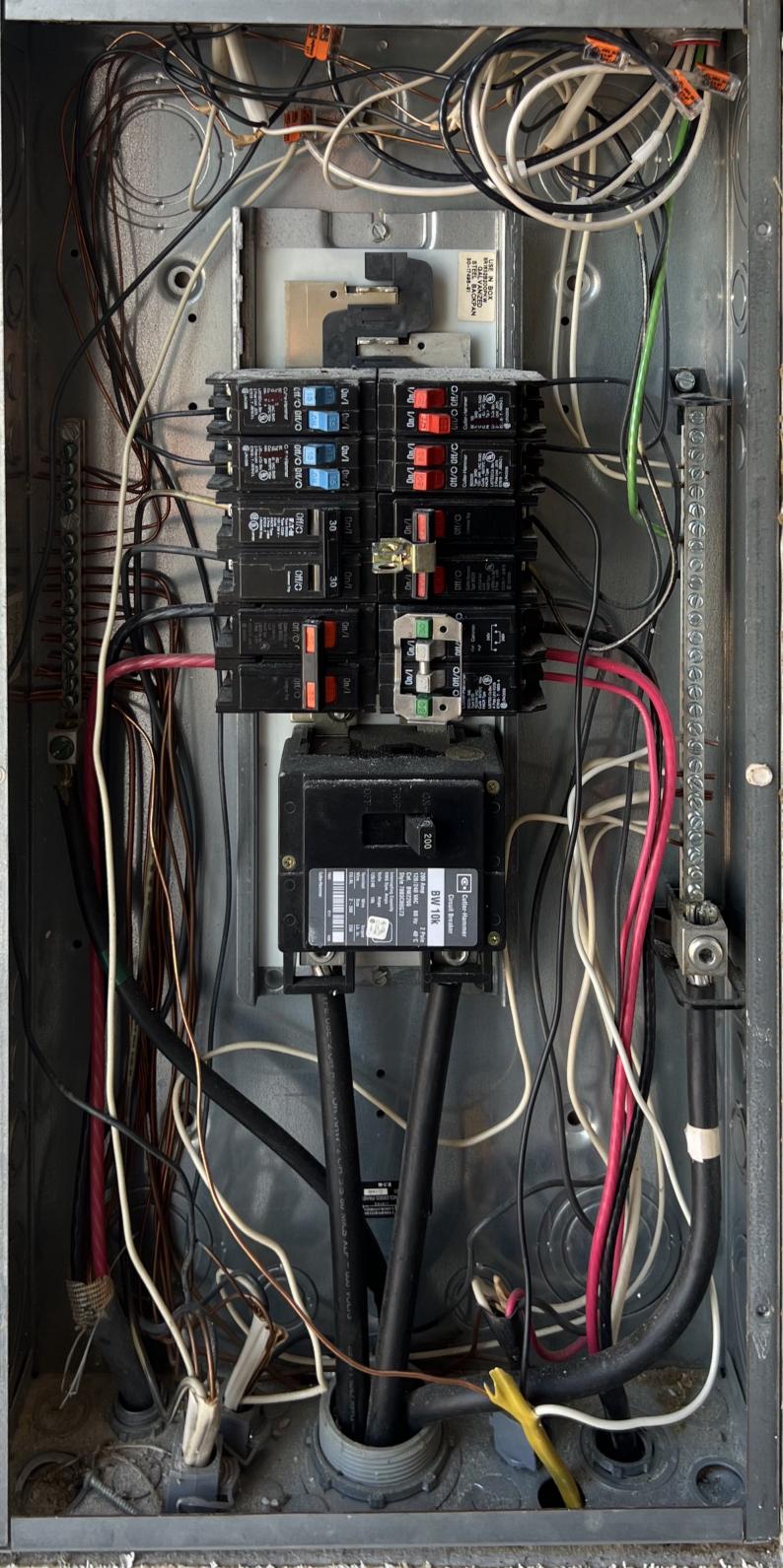


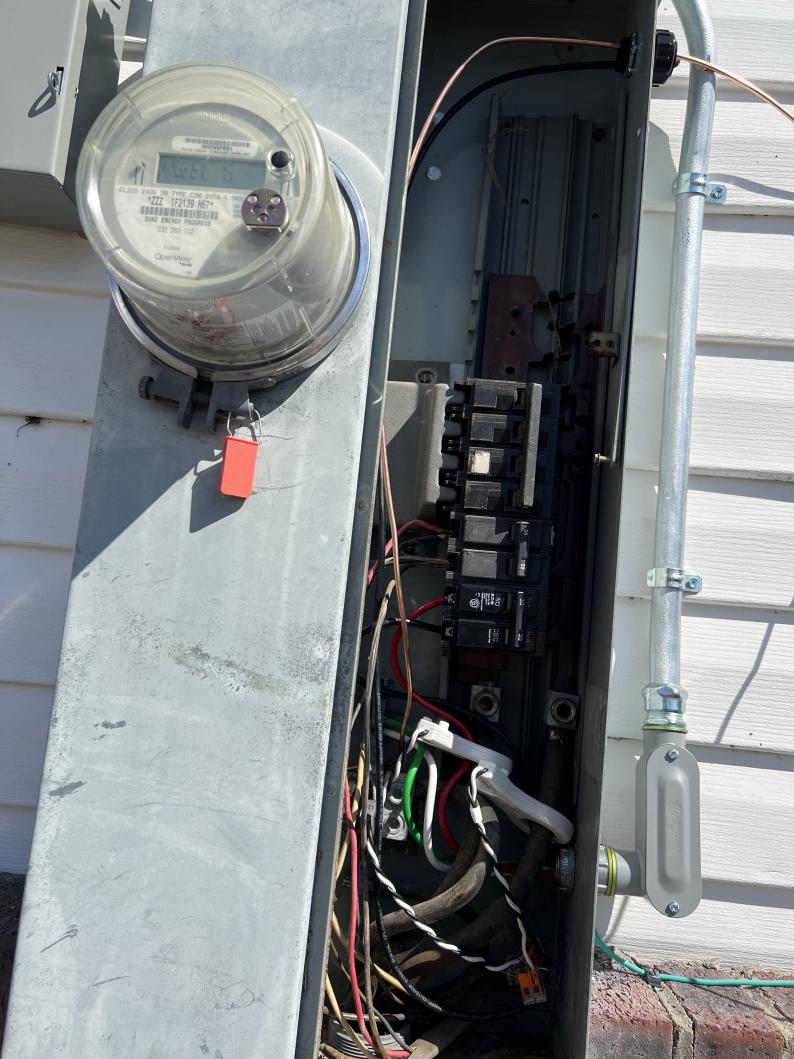


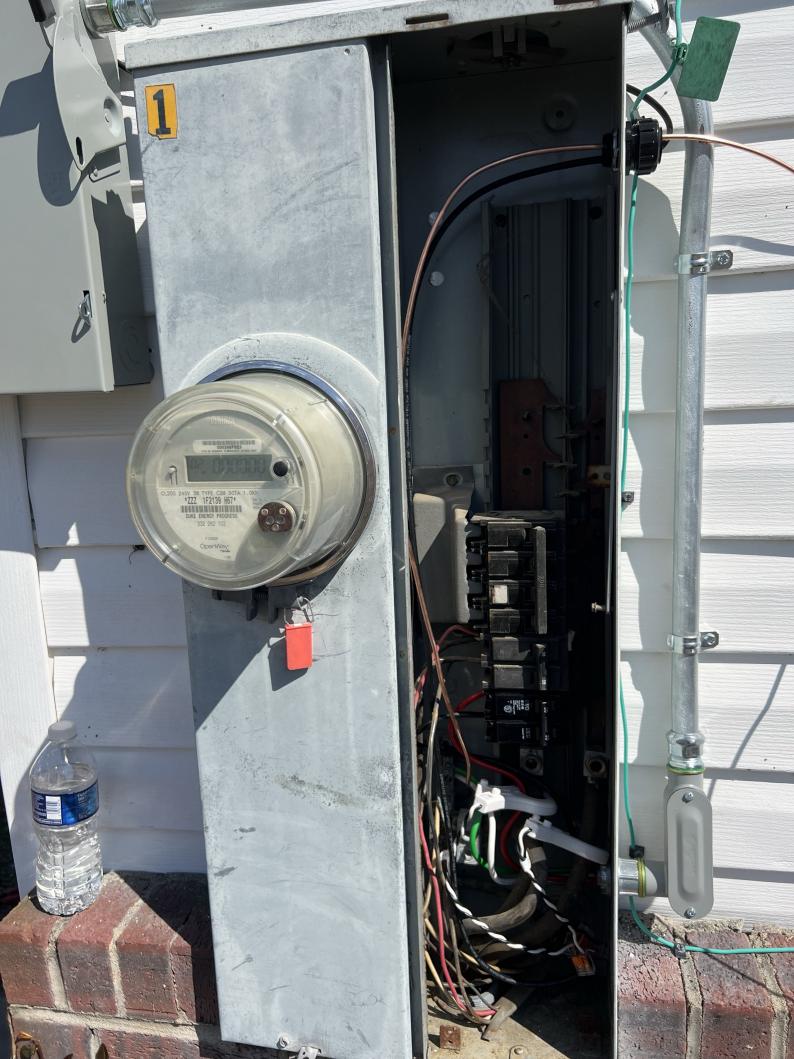




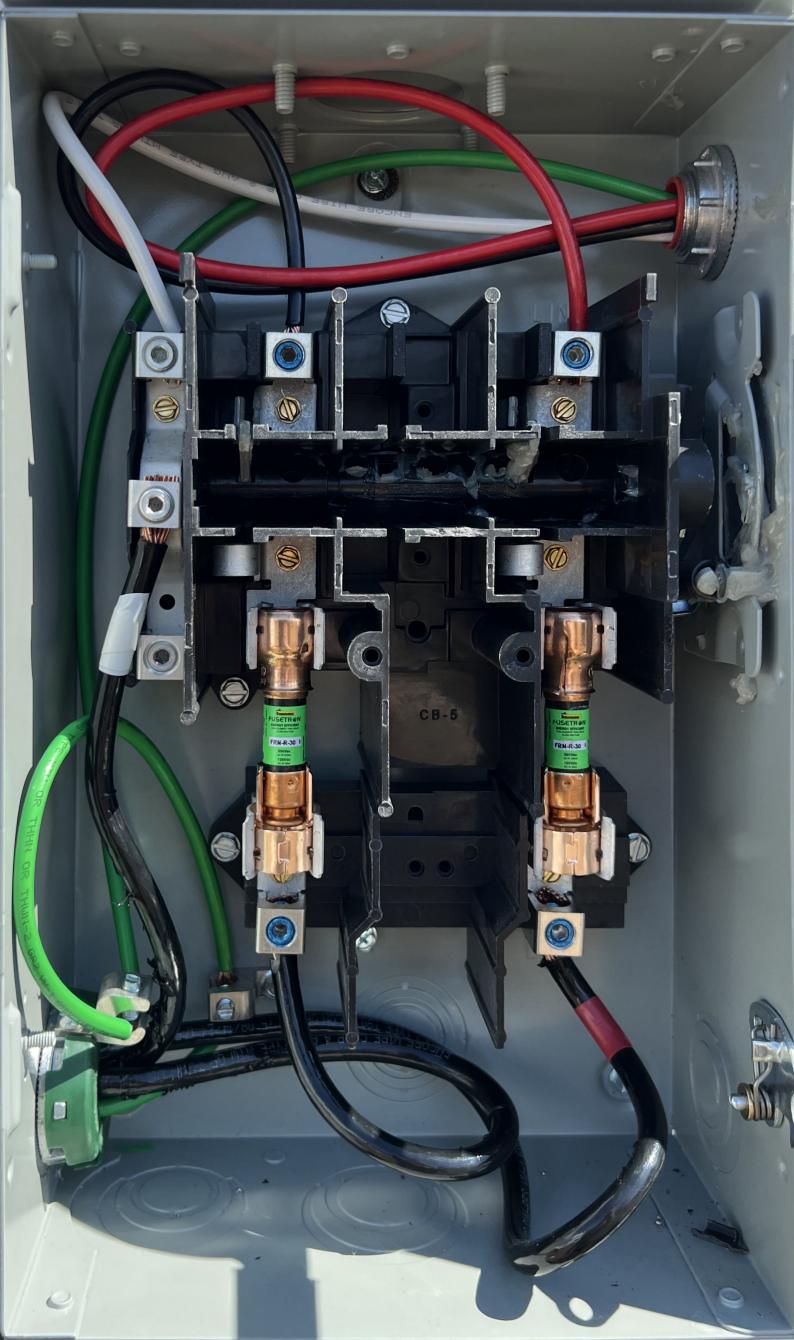


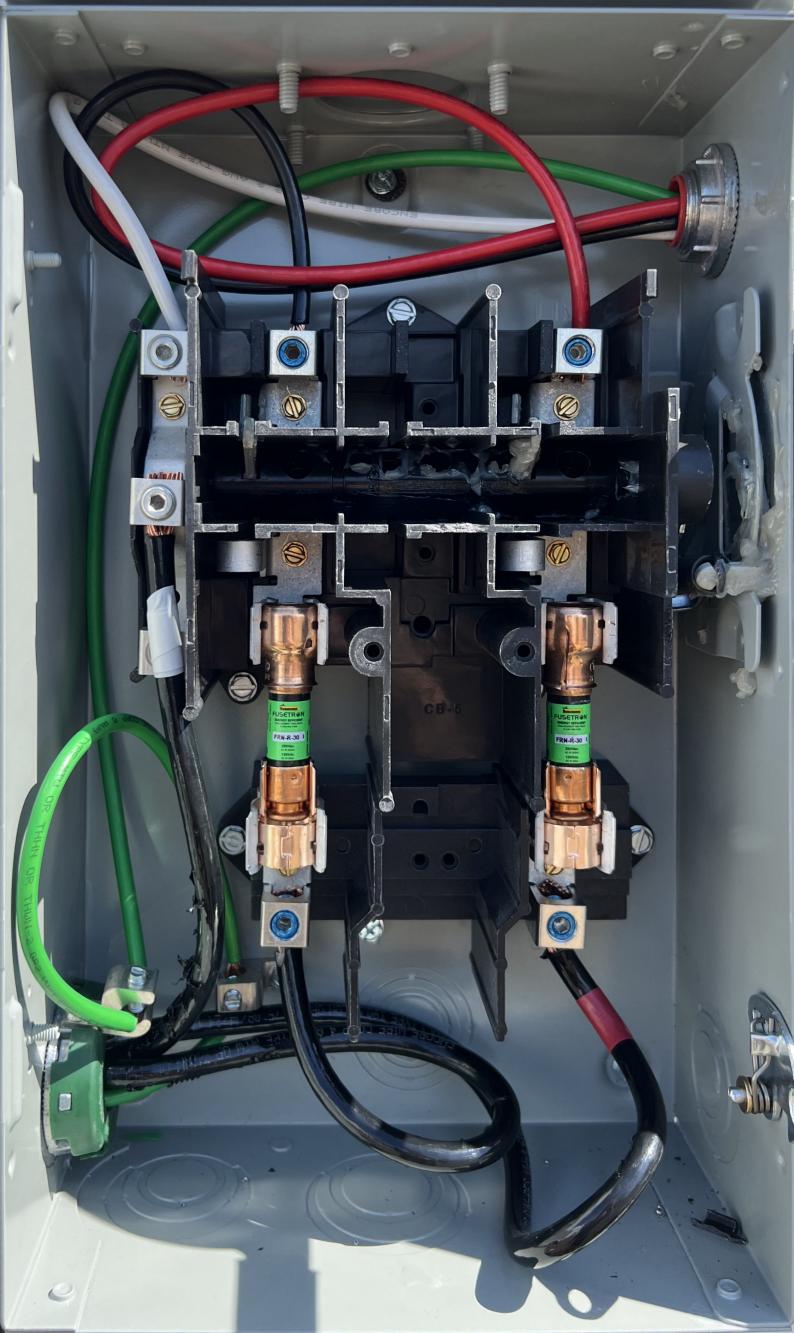














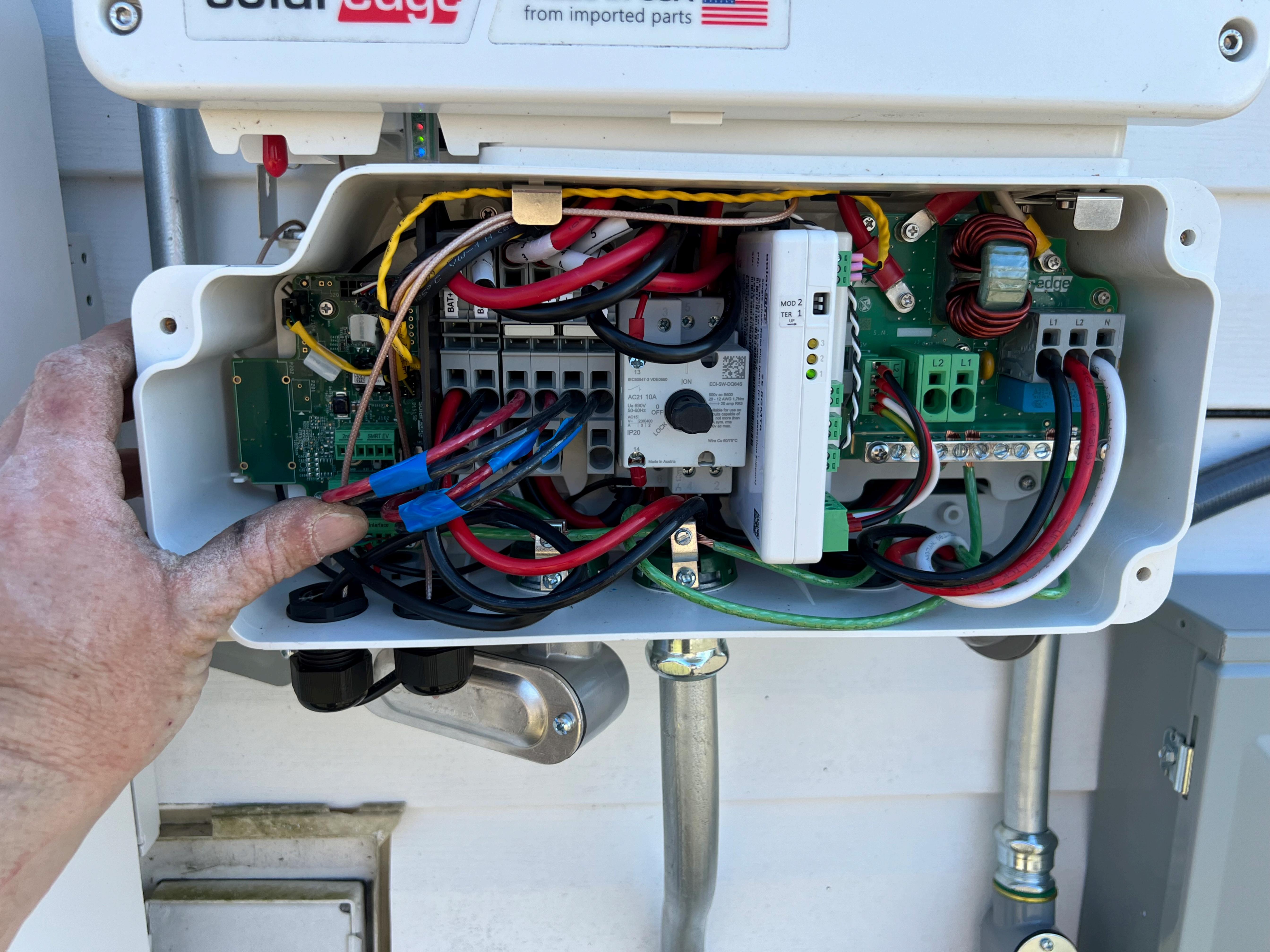




















## JKM425N-54HL4-B







STC(front side only)
425W
±38,
32,37V
p) 13,13A
38,95V±5%
13,59A±5%
13,59A±5%
10,007/UZ
ction Rating 25A
0-43%
Type 1( UL61730)/Class (CliCG1730)
1722×1134×35(mm)

## **WARNING**



## AVERTISSEMENT









