PROJECT DESCRIPTION:

28 x VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES
DC SYSTEM SIZE: (N) 11.200 kW DC + (E) 8.320 kW DC = 19.520 kW DC
AC SYSTEM SIZE: (N) 7.600 kW AC + (E) 7.600 kW AC = 15.200 kW AC

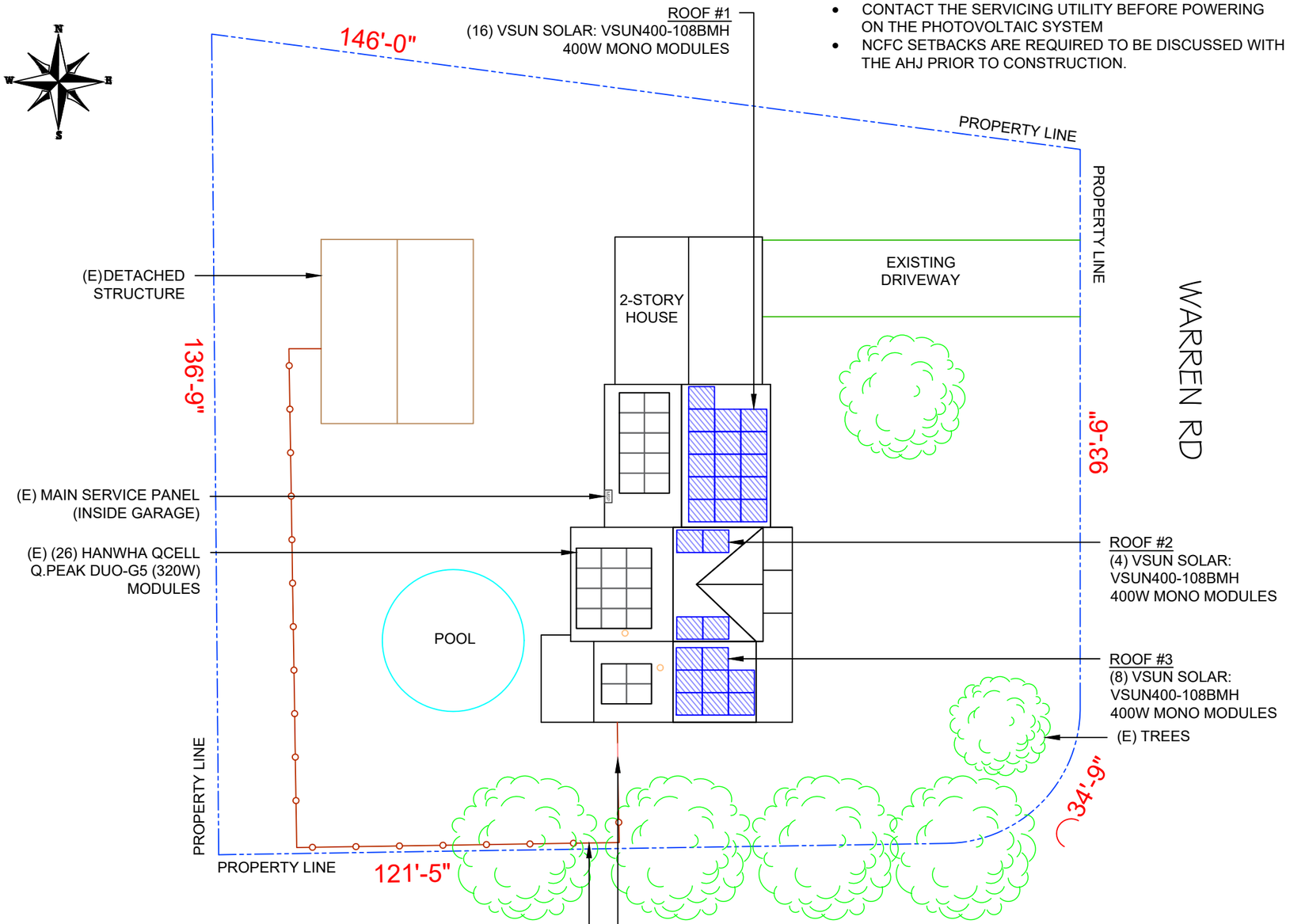
EQUIPMENT SUMMARY
(N) 28 - VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES WITH
(N) 01 - TESLA: 1538000-XX-Y 7.6 kW (240V) INVERTER
(N) 10 - TESLA: RSD MCI-2

(E) 26 - HANWHA QCELL Q.PEAK DUO-G5 (320W) MODULES WITH
(E) 01 - GENERAC PWR CELL X7602: 7600W (240V) INVERTER

AUTHORITIES HAVING JURISDICTION
BUILDING: HARNETT COUNTY
ZONING: HARNETT COUNTY
UTILITY: DUKE ENERGY

APPLICABLE CODES & STANDARDS
NEC 2020
NCFC 2018
NCBC 2018
NCRC 2018
NCECC 2018

- EXISTING PLUMBING VENTS, SKYLIGHTS, EXHAUST OUTLETS, VENTILATION'S INTAKE AIR OPENINGS SHALL NOT BE COVERED BY THE SOLAR PHOTOVOLTAIC SYSTEM.
- ALL EQUIPMENT SHALL BE LISTED AND LABELED BY A RECOGNIZED ELECTRICAL TESTING LABORATORY AND INSTALLED PER THE LISTING REQUIREMENTS AND THE MANUFACTURER'S INSTRUCTIONS. [NEC 690.4(D)]
- ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED, INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
- PAINT PV CONDUIT TO MATCH THE DWELLING EXTERIOR.
- CONTACT THE SERVICING UTILITY BEFORE POWERING ON THE PHOTOVOLTAIC SYSTEM
- NCFC SETBACKS ARE REQUIRED TO BE DISCUSSED WITH THE AHJ PRIOR TO CONSTRUCTION.



1 | PLOT PLAN WITH ROOF PLAN
PV-1 | SCALE: 1"=20'-0"

ROOF ARRAY AREA #1:- 336.32 SQ FT.
ROOF ARRAY AREA #2:- 84.08 SQ FT.
ROOF ARRAY AREA #3:- 168.16 SQ FT.

2 | HOUSE PHOTO
PV-1 | SCALE: NTS

3 | VICINITY MAP
PV-1 | SCALE: NTS

SHEET INDEX

PV-1	PLOT PLAN & VICINITY MAP
PV-2	ROOF PLAN & MODULES
PV-2A	STRING LAYOUT
PV-3	ATTACHMENT DETAIL
PV-4	ELECTRICAL LINE DIAGRAM
PV-5	LABELS
PV-6+	EQUIPMENT SPECIFICATIONS

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
03/06/2025
Harnett COUNTY NORTH CAROLINA

LuminaSun Smart Home LLC
114 Morlake Drive suite 201,
Mooresville, NC 28117

REVISIONS

DESCRIPTION	DATE	REV
INITIAL	02/25/2025	

SIGNATURE WITH SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER RICHARD PANTEL 043326
Reviewed and approved
Richard Pantel, P.E.
NC Lic. No. 043326
02/25/2025
Richard Pantel
Digitally signed by Richard Pantel
Date: 2025.02.25 10:13:37 -06'00'

PROJECT NAME & ADDRESS
JEROME W EASON
1009 WARREN RD,
ERWIN, NC 28339

DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

SHEET NAME
PLOT PLAN & VICINITY MAP

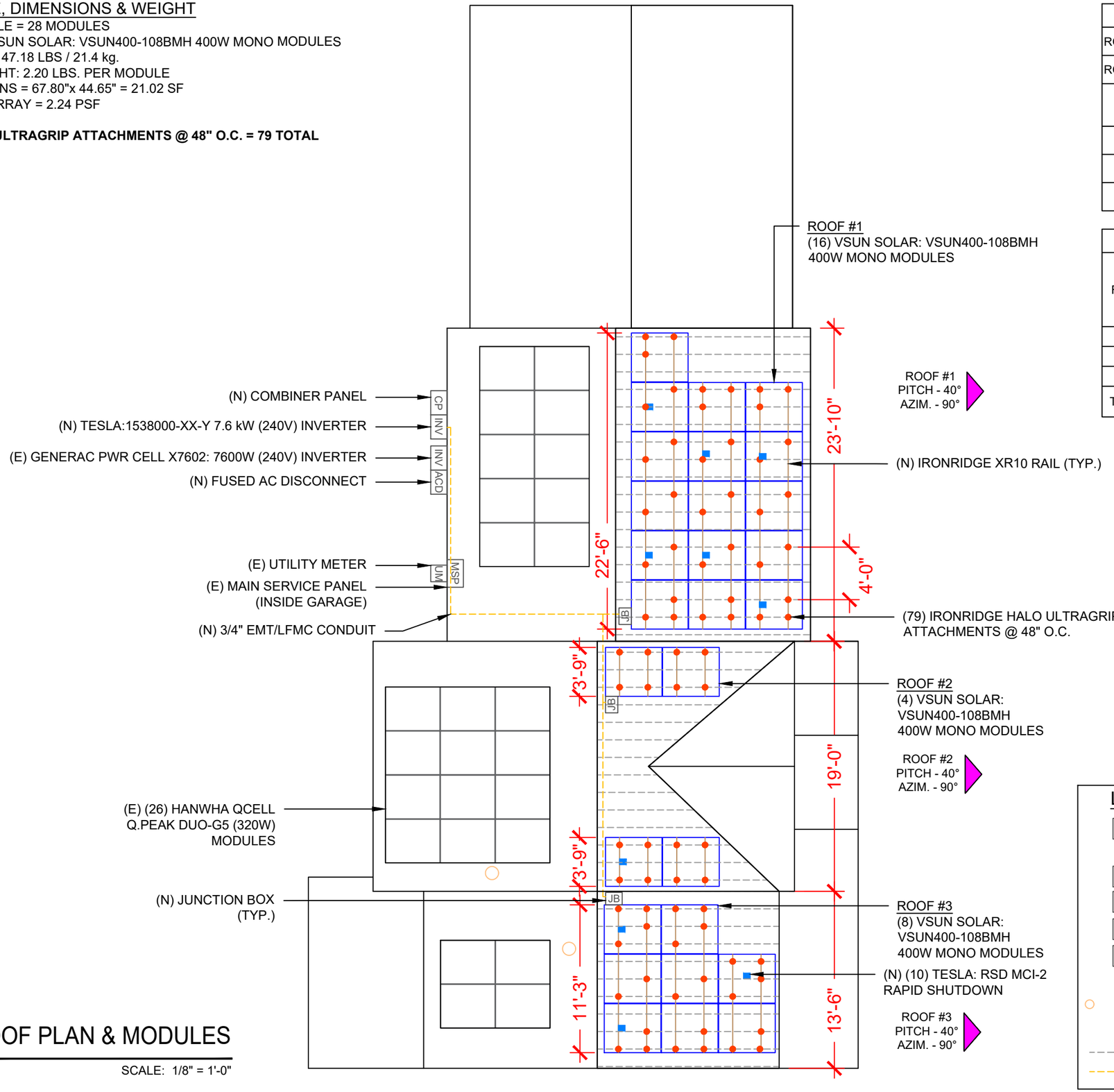
SHEET SIZE
ANSI B
11" X 17"

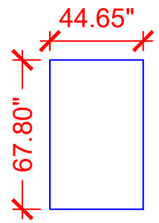
SHEET NUMBER
PV-1

MODULES TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULE = 28 MODULES
MODULE TYPE = VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES
MODULE WEIGHT = 47.18 LBS / 21.4 kg.
COMPONENT WEIGHT: 2.20 LBS. PER MODULE
MODULE DIMENSIONS = 67.80"x 44.65" = 21.02 SF
UNIT WEIGHT OF ARRAY = 2.24 PSF

IRONRIDGE HALO ULTRAGRIP ATTACHMENTS @ 48" O.C. = 79 TOTAL





VSUN SOLAR:
VSUN400-108BMH
400W MONO MODULES

ROOF DESCRIPTION				
ROOF TYPE			COMPOSITION SHINGLE	
ROOF LAYER			1 LAYER	
ROOF	ROOF TILT	AZIMUTH	RAFTER SIZE	RAFTER SPACING
#1	40°	90°	2"X6"	16"
#2	40°	90°	2"X6"	16"
#3	40°	90°	2"X6"	16"

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	16	336.32	353.4	95
#2	4	84.08	174.4	48
#3	8	168.16	186.4	90
TOTAL	(N) 28 + (E) 26	1060.20	2533.4	42

LEGEND

- CP - COMBINER PANEL
- JB - JUNCTION BOX
- INV - INVERTER
- ACD - AC DISCONNECT
- UM - UTILITY METER
- MSP - MAIN SERVICE PANEL
- - TESLA: RSD MCI-2 RAPID SHUTDOWN
- - VENT, ATTIC FAN (ROOF OBSTRUCTION)
- - ROOF ATTACHMENT
- - RAFTER
- - CONDUIT

1 ROOF PLAN & MODULES
PV-2 SCALE: 1/8" = 1'-0"

LuminaSun Smart Home LLC
114 Morlake Drive suite 201,
Mooresville, NC 28117

REVISIONS		
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SIGNATURE WITH SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043326 RICHARD PANTEL

Reviewed and approved
Richard Pantel, P.E.
NC Lic. No. 043326
02/25/2025

PROJECT NAME & ADDRESS

JEROME W EASON
1009 WARREN RD,
ERWIN, NC 28339

DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

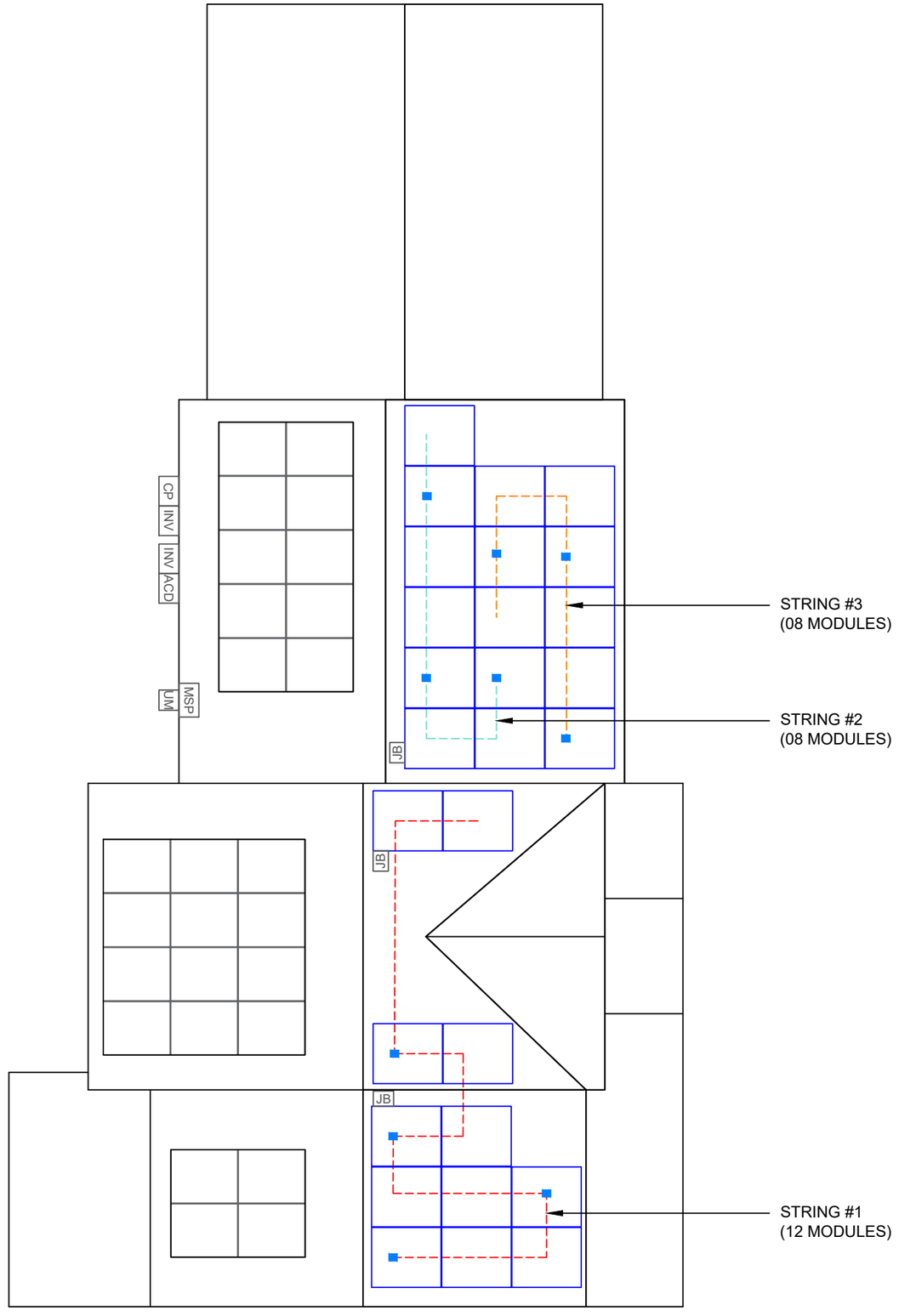
SHEET NAME
ROOF PLAN & MODULES

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-2

STRING LEGENDS

- STRING #1
- STRING #2
- STRING #3



1 ARRAY PLAN WITH STRING LAYOUT

PV-2A

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

LUMINA SUN SMART HOME Go Solar

LuminaSun Smart Home LLC
114 Morlake Drive suite 201,
Mooresville, NC 28117

REVISIONS

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INITIAL	02/25/2025	

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Reviewed and approved
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NC Lic. No. 043326
02/25/2025

PROJECT NAME & ADDRESS

JEROME W EASON
1009 WARREN RD,
ERWIN, NC 28339

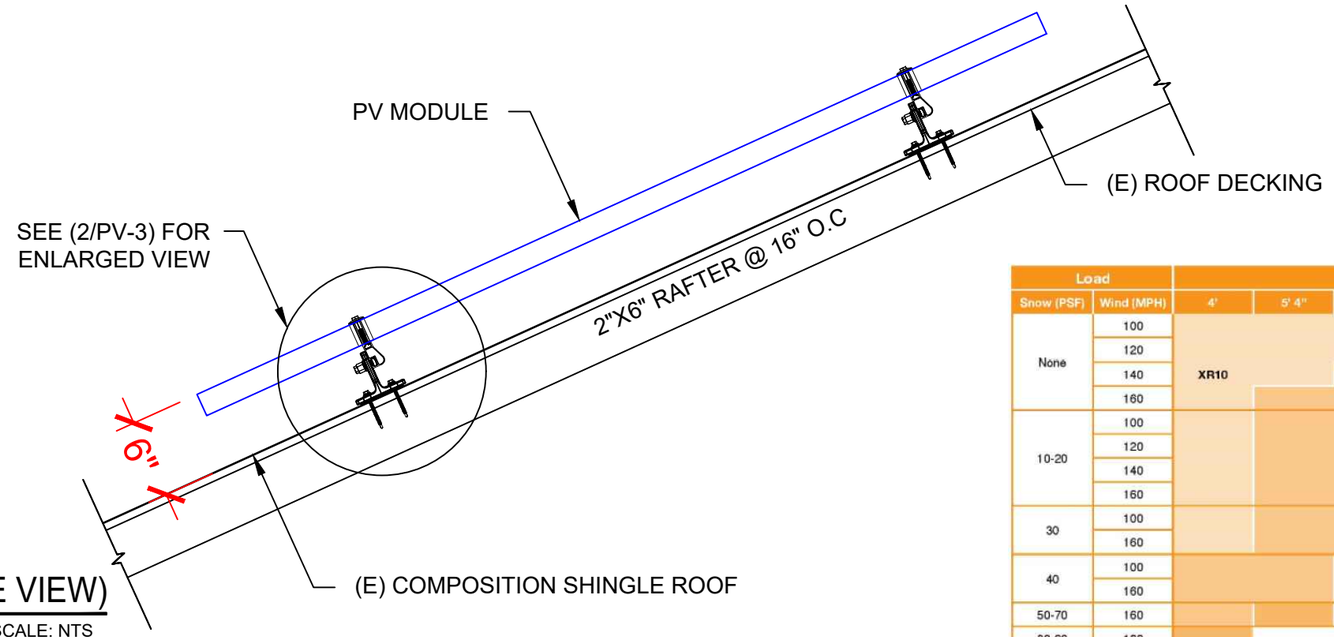
DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

SHEET NAME
STRING LAYOUT

SHEET SIZE
ANSI B
11" X 17"

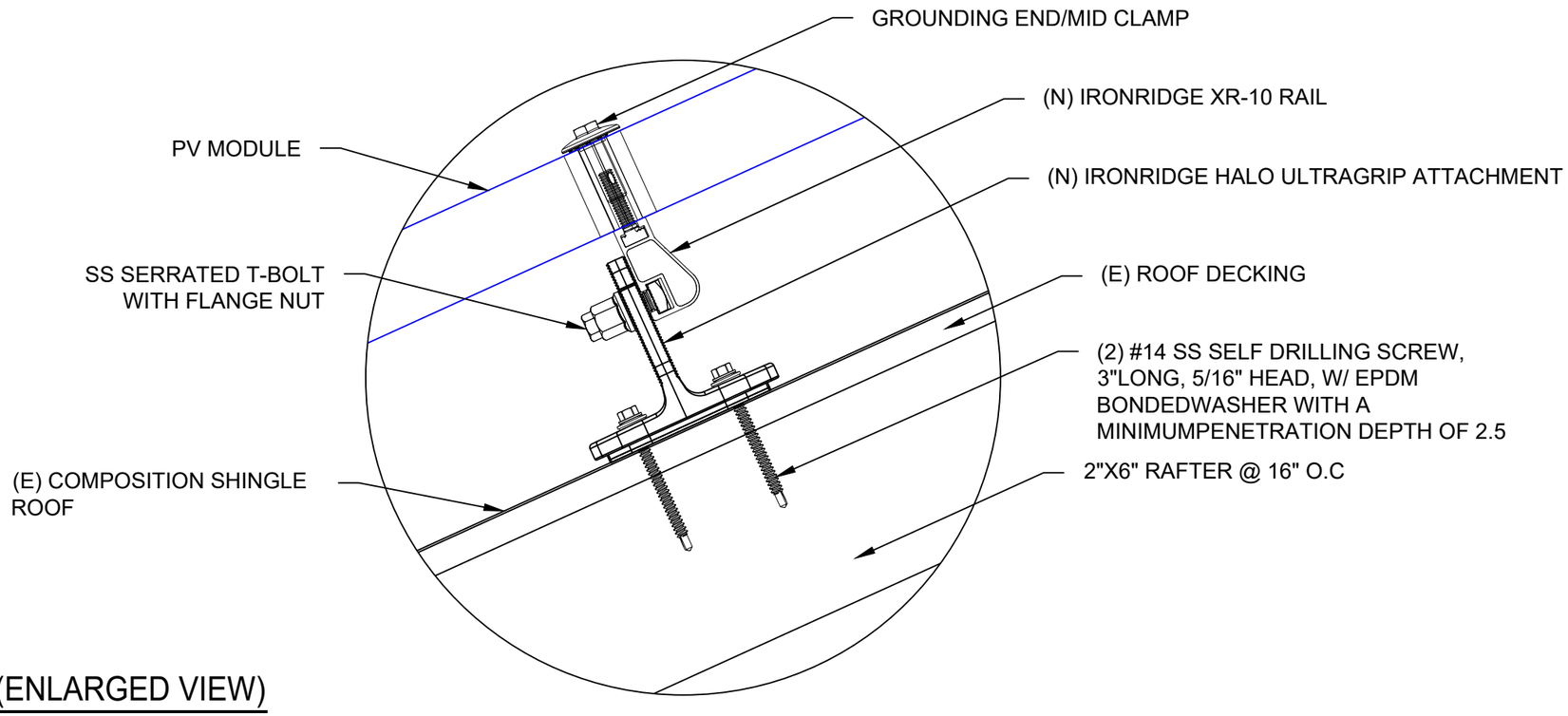
SHEET NUMBER
PV-2A



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

1 ATTACHMENT DETAIL (SIDE VIEW)

PV-3 SCALE: NTS



2 ATTACHMENT DETAIL (ENLARGED VIEW)

PV-3 SCALE: NTS

LuminaSun Smart Home LLC
114 Morlake Drive suite 201,
Mooresville, NC 28117

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02/25/2025

PROJECT NAME & ADDRESS

JEROME W EASON
1009 WARREN RD,
ERWIN, NC 28339

DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

SHEET NAME
ATTACHMENT DETAIL

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-3

DC SYSTEM SIZE: (N) 11.200 kW DC + (E) 8.320 kW DC = 19.520 kW DC
AC SYSTEM SIZE: (N) 7.600 kW AC + (E) 7.600 kW AC = 15.200 kW AC

(N) (28) VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES WITH
(N) (01) TESLA: 1538000-XX-Y 7.6 kW (240V) INVERTER
(N) (10) TESLA: RSD MCI-2
(E) 26 - HANWHA QCELL Q.PEAK DUO-G5 320 (320W) MODULES WITH
(E) 01 - GENERAC PWR CELL X7602: 7600W (240V) INVERTER

(01) STRING OF 12 MODULES AND
(02) STRINGS OF 08 MODULES ARE CONNECTED IN SERIES

NOTE: CONDUIT TO BE UL LISTED FOR WET LOCATIONS AND UV PROECTED (EX- EMT, PVC, OR EQUIVALENT)

(N) MODULE RATED POWER (PMAX): 400W
(E) MODULE RATED POWER (PMAX): 320W

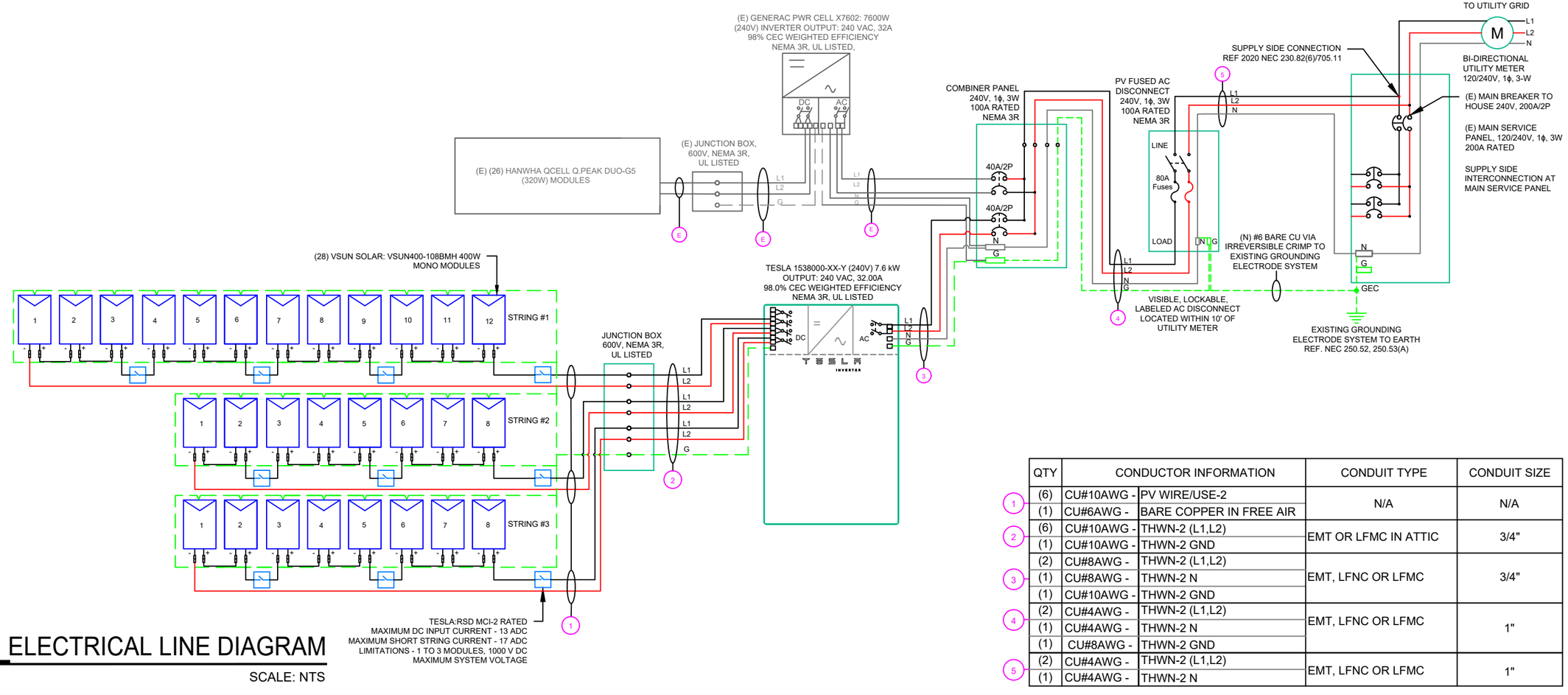
NOTE: LOACKABLE AC DISCONNECT MUST BE WITHIN SIGHT OF THE METER AND READILY ACCESSIBLE TO THE UTILITY DUKE ENERGY

ELECTRICAL EQUIPMENT LIST

SL NO:	ITEM	DESCRIPTION	QTY
1	PV MODULE	VSUN SOLAR: VSUN400-108BMH 400W MONO MODULES VOC = 37.2 V, VMP = 31.17 V ISC = 13.68 A, IMP = 12.84 A	28
2	INVERTER	TESLA:1538000-XX-Y 7.6 kW INVERTER OUTPUT: 240 VAC, 32A 98.0% CEC WEIGHTED EFFICIENCY NEMA 3R, UL LISTED	01
3	JUNCTION BOX	JUNCTION BOX UL 1741, NEMA 3R CSA C22.2 NO.290	03
4	AC DISCONNECT	EATON AC DISCONNECT: 100A, WITH 80AFUSES 240V NEMA 3R, UL LISTED	01
4	COMBINER PANEL	COMBINER PANEL 240V, 1ϕ, 3W ,100A RATED, NEMA 3R	01
5	MAIN SERVICE PANEL	(E) MAIN SERVICE PANEL AND METER: 200A MAIN BUSBAR WITH 200A BREAKER	01
6	RAPID SHUTDOWN	TESLA:RSD MCI-2 RATED MAXIMUM DC INPUT CURRENT - 13 ADC MAXIMUM SHORT STRING CURRENT - 17 ADC LIMITATIONS - 1 TO 3 MODULES, 1000 V DC MAXIMUM SYSTEM VOLTAGE	10
7	BOLT	BX MLPE HARDWARE (BX-CMA-MI-M1)	10

NOTE:-
1.RACEWAYS AND CABLES EXPOSED TO SUNLIGHT ON ROOFTOPS SHOULD BE INSTALLED MORE THAN 7/8" ABOVE THE ROOF USING CONDUIT SUPPORTS.
2. 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.
3. THE GINLONG SOLIS INVERTER MONITORS VOLTAGE BETWEEN THE L1 AND L2, THE NEUTRAL CONDUCTOR IS OPTIONAL WHEN TYING THE INVERTER TO A 240V GRID (240 3Y SYSTEM).
GROUND MUST BE CONNECTED TO THE PE TERMINAL. (REF: SHEET PV-9 FOR INSTALLATION MANUAL)
4. ALL NEW SERVICE INSTALLATIONS AND REPLACEMENTS REQUIRE A SURGE-PROTECTIVE DEVICE (SPD) IN ACCORDANCE WITH [NEC 230.67]. THE SPD SHALL BE TYPE 1 OR TYPE 2 AND IS REQUIRED TO BE AN INTEGRAL PART OF THE SERVICE EQUIPMENT OR LOCATED IMMEDIATELY ADJACENT THERETO.

INSTALLER/ELECTRICIAN NOTE:
EC IS TO MEASURE VOLTAGE BEFORE STARTING WORK. IF RESULT IS ANY OTHER VOLTAGE MEASURED THAN 120/240V IS OBSERVED, DO NOT PROCEED. CONTACT ENGINEER.



QTY	CONDUCTOR INFORMATION		CONDUIT TYPE	CONDUIT SIZE
(6)	CU#10AWG -	PV WIRE/USE-2	N/A	N/A
(1)	CU#6AWG -	BARE COPPER IN FREE AIR		
(6)	CU#10AWG -	THWN-2 (L1,L2)	EMT OR LFMC IN ATTIC	3/4"
(1)	CU#10AWG -	THWN-2 GND		
(2)	CU#8AWG -	THWN-2 (L1,L2)	EMT, LFNC OR LFMC	3/4"
(1)	CU#8AWG -	THWN-2 N		
(1)	CU#10AWG -	THWN-2 GND		
(2)	CU#4AWG -	THWN-2 (L1,L2)	EMT, LFNC OR LFMC	1"
(1)	CU#4AWG -	THWN-2 N		
(1)	CU#8AWG -	THWN-2 GND		
(2)	CU#4AWG -	THWN-2 (L1,L2)	EMT, LFNC OR LFMC	1"
(1)	CU#4AWG -	THWN-2 N		

1 ELECTRICAL LINE DIAGRAM
PV-4 SCALE: NTS

LuminaSun Smart Home LLC
114 Morlake Drive suite 201,
Mooresville, NC 28117

REVISIONS

DESCRIPTION	DATE	REV
INITIAL	02/25/2025	

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NORTH CAROLINA PROFESSIONAL ENGINEER RICHARD PANTEL 043326

Reviewed and approved
Richard Pantel, P.E.
NC Lic. No. 043326
02/25/2025

PROJECT NAME & ADDRESS

JEROME W EASON
1009 WARREN RD,
ERWIN, NC 28339

DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

SHEET NAME
ELECTRICAL LINE DIAGRAM

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-4

LABEL 1
LABEL LOCATION:
EMT/CONDUIT RACEWAY
SOLADECK / JUNCTION BOX
CODE REF: NEC 690.13 (G)
ON ALL CONDUITS SPACED AT MAX 10FT

WARNING: PHOTOVOLTAIC POWER SOURCE

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

⚠ WARNING

ELECTRIC SHOCK HAZARD

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

LABEL 3
LABEL LOCATION:
MAIN SERVICE PANEL, AC DISCONNECT
AND SUB PANEL (IF APPLICABLE)
CODE REF: NEC 705.12(C) & NEC 690.59

⚠ WARNING

DUAL POWER SUPPLY
SOURCE: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL 4
LABEL LOCATION:
MAIN SERVICE PANEL OR SUB PANEL
(ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 705.12(C) & NEC 690.59

SOLAR PV BREAKER:

BREAKER IS BACKFED DO NOT RELOCATE

LABEL 5
LABEL LOCATION:
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
SUB PANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 705.12(B)(3)(2)

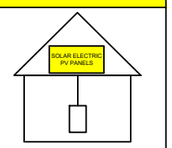
⚠ WARNING

POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL 6
LABEL LOCATION:
INVERTER
CODE REF: [NEC 690.56(C)(1)(A)]

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 7
LABEL LOCATION:
AC DISCONNECT
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 690.56(C)(2)

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

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

DC DISCONNECT

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

AC DISCONNECT
PHOTOVOLTAIC SYSTEM POWER SOURCE

NOMINAL OPERATING AC VOLATGE	
RATED AC OUTPUT CURRENT	

LABEL 10
LABEL LOCATION:
INVERTER
CODE REF: NEC 690.53

MAXIMUM VOLTAGE	
MAXIMUM CIRCUIT CURRENT	
MAX. RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED)	N/A

LABEL 11
LABEL LOCATION:
MAIN SERVICE PANEL AND SUB PANEL
CODE REF: NEC 110.27(C) & OSHA 1910.145 (f) (7)

⚠ WARNING

TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

LABEL 12
LABEL LOCATION:
UTILITY METER
CODE REF: NEC 690.13(B)

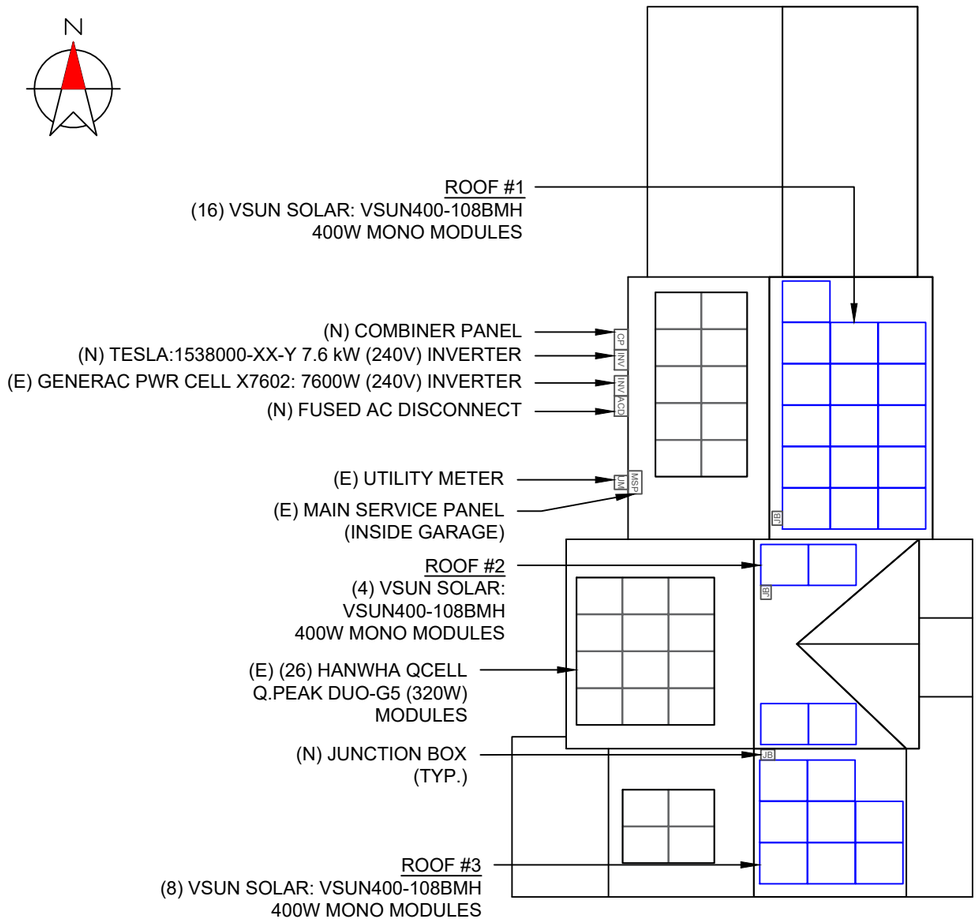
⚠ WARNING

THIS SERVICE METER IS ALSO SERVED BY A PHOTOVOLTAIC SYSTEM

LABEL 13
LABEL LOCATION:
MAIN SERVICE PANEL
CODE REF: 2020 NEC 705.13

NOTES
1. NEC ARTICLES 690 AND 705 AND CRC SECTION R324 MARKINGS SHOWN HEREON
2. ALL MARKINGS SHALL CONSIST OF THE FOLLOWING:
   A. UV RESISTANT SIGN MATERIAL WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PLATING
   B. RED BACKGROUND COLOUR WITH WHITE TEXT AND LINE WORK
   C. ARIAL FONT
3. ALL SIGNS SHALL BE SIZED APPROPRIATELY AND PLACED IN THE LOCATION SPECIFIED
4. SIGNS SHALL BE ATTACHED TO THE SERVICE EQUIPMENT USING POP-RIVETS OR SCREW
5. PLACARD ONLY REQUIRED WHEN PV UTILITY DISCONNECT & METER ARE NOT WITH IN 10'.

CAUTION:
MULTIPLE SOURCES OF POWER



1009 WARREN RD, ERWIN, NC 28339

"WARNING"
PHOTOVOLTAIC ARRAY
DISCONNECTION OF NEUTRAL OR GROUNDED CONDUCTORS MAY RESULT IN OVERVOLTAGE ON ARRAY OR INVERTER

LUMINA SUN SMART HOME
Go Solar
LuminaSun Smart Home LLC
114 Morlake Drive suite 201,
Mooresville, NC 28117

REVISIONS

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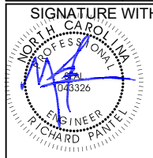

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02/25/2025

PROJECT NAME & ADDRESS

JEROME W EASON
1009 WARREN RD,
ERWIN, NC 28339

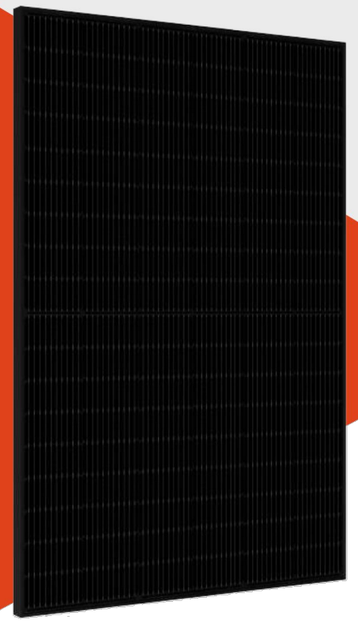
DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

SHEET NAME
LABELS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5



VSUN
Innovative & Smart

25 YEAR QUALITY ASSURANCE

30 YEAR POWER OUTPUT GUARANTEE

VSUN405-108BMH

VSUN405-108BMH | VSUN400-108BMH
VSUN395-108BMH | VSUN390-108BMH

405W
Highest power output

20.74%
Module efficiency

2.0%
First-year degradation warranty

0.45%
Annual degradation over 30 years

KEY FEATURES

- PERC — MBB technology with Circular Ribbon
- Higher output power
- Half-cell Technology
- 0~3% — Positive tolerance offer
- Bifacial cells, converting more sunlight into electricity
- Better shading tolerance
- Certified for salt/ammonia corrosion resistance
- Load certificates: wind to 2400Pa and snow to 5400Pa
- Lower LCOE
- UL 61730 & CSA 61730
  IEC 61215 & IEC 61730

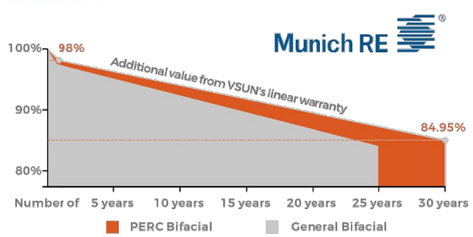
ABOUT VSUN

Invested by Fuji Solar, VSUN SOLAR is a solar solution provider with headquartered in Tokyo, Japan that offers reliability, high efficiency solar products and technology globally. VSUN is rated as BNEF Tier 1 PV module manufacturer, PVEL Lab "Best performer" and EcoVadis "Bronze Award".

PRODUCT CERTIFICATION

TÜV SÜD · SP C US · CE · PV CYCLE · ISO · IEC

WARRANTY



Update Time:2023.5.13

Electrical Characteristics at Standard Test Conditions(STC)

Module Type	VSUN405-108BMH	VSUN400-108BMH	VSUN395-108BMH	VSUN390-108BMH
Maximum Power - Pmax (W)	405	400	395	390
Open Circuit Voltage - Voc (V)	37.36	37.2	37.03	36.84
Short Circuit Current - Isc (A)	13.78	13.68	13.59	13.5
Maximum Power Voltage - Vmpp (V)	31.36	31.17	31	30.82
Maximum Power Current - Impp (A)	12.92	12.84	12.75	12.66
Module Efficiency	20.74%	20.48%	20.23%	19.97%

Standard Test Conditions (STC): irradiance 1,000 W/m²; AM 1,5; module temperature 25°C. Pmax Sorting : 0~5W. Measuring Tolerance: ±3%.
Remark: Electrical data do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

Electrical Characteristics with different rear side power gain(reference to 400 front)

Pmax (W)	Voc (V)	Isc (A)	Vmpp (V)	Impp (A)	Pmax gain
420	37.1	14.36	31.17	13.48	5%
440	37.1	15.05	31.17	14.12	10%
479	37.2	16.42	31.12	15.41	20%
499	37.2	17.10	31.12	16.05	25%

Material Characteristics

Dimensions	1722×1134×30mm (L×W×H) 67.80*44.65*1.18 inches (L×W×H)
Weight	21.4kg / 47.18lbs
Frame	Black anodized aluminum profile
Front Glass	AR-Coating toughened glass, 3.2 mm
Back sheet	Transparent black-mesh backsheet
Cells	12×9 pcs mono solar cells series strings
Junction Box	IP68, 3 diodes
Cable& Connector	Potrait: 1200 mm , 1×4 mm2 or 12AWG, Staubli MC4 Connector

System Design

Maximum System Voltage [V]	1500
Series Fuse Rating [A]	30
Bifaciality	70%±10%
Fire Rating	Class C for IEC and TYPE 1 for US
Protection Class	Class II
Temperature Range	-40 °C to + 85 °C
Maximum Surface Load	+5400/-2400 Pa +113/-50 psf
Application class	Class A
Withstanding Hail	Maximum diameter of 25 mm with impact speed of 23 m/s

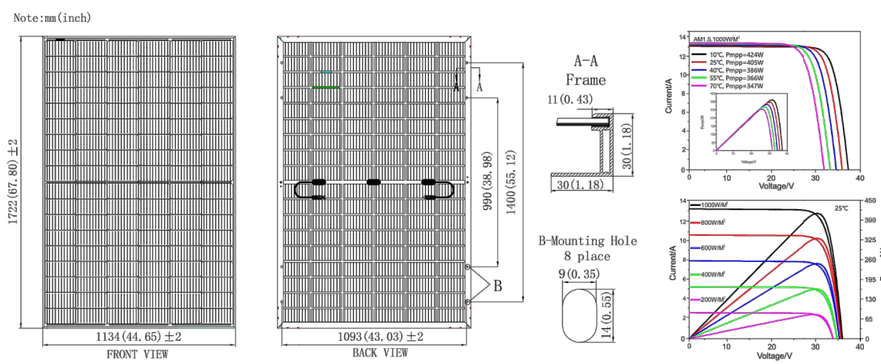
Packaging

Dimensions(L×W×H)	1760×1125×1253mm / 69.29*44.29*49.33inches
Quantity per pallet	36 pcs
Container 20'	216
Container 40'	468
Container 40'HC	936 or 828 for US

Temperature Characteristics

NOCT	45°C(±2°C)
Voltage Temperature Coefficie	-0.27%/°C
Current Temperature Coefficie	+0.048%/°C
Power Temperature Coefficier	+0.32%/°C

Dimensions



IV-Curves

Update Time:2023.5.13

LUMINA SUN SMART HOME Go Solar
LuminaSun Smart Home LLC
114 Morlake Drive suite 201,
Mooresville, NC 28117

REVISIONS		
DESCRIPTION	DATE	REV
INITIAL	02/25/2025	

SIGNATURE WITH SEAL

PROJECT NAME & ADDRESS

JEROME W EASON
1009 WARREN RD,
ERWIN, NC 28339

DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-6

Tesla Solar Inverter
with Site Controller

—

Tesla Solar Inverter completes the Tesla home solar system, converting DC power from solar to AC power for home consumption. Tesla's renowned expertise in power electronics has been combined with robust safety features and a simple installation process to produce an outstanding solar inverter that is compatible with both Solar Roof and traditional solar panels. Once installed, homeowners use the Tesla mobile app to manage their solar system and monitor energy consumption, resulting in a truly unique ecosystem experience.

KEY FEATURES

- Built on Powerwall technology for exceptional efficiency and reliability
- Wi-Fi, Ethernet, and cellular connectivity with easy over-the-air updates
- Designed to integrate with Tesla Powerwall and Tesla App
- 0.5% revenue-grade metering for Solar Renewable Energy Credit (SREC) programs included

Tesla Solar Inverter Technical Specifications

Electrical Specifications: Output (AC)

Model Number	1538000-xx-y			
Output (AC)[1]	3.8 kW	5 kW	5.7 kW	7.6 kW
Nominal Power	3,800 W	5,000 W	5,700 W	7,600 W
Maximum Apparent Power	3,840 VA	5,040 VA	6,000 VA	7,680 VA
Maximum Continuous Current	16 A	21 A	24 A	32 A
Breaker (Overcurrent Protection)	20 A	30 A	30 A	40 A
Nominal Power Factor	1 - 0.9 (leading / lagging			
THD (at Nominal Power)	<5%			

Electrical Specifications: Input (DC)

MPPT	4
Input Connectors per MPPT	1-2-1-2
Maximum Input Voltage	600 VDC
DC Input Voltage Range	60 - 550 VDC
DC MPPT Voltage Range	60 - 480 VDC[1]
Maximum Current per MPPT (I_{MP})	13 A[2]
Maximum Short Circuit Current per MPPT (I_{SC})	17 A[2]

[1]Maximum current.

[2]Where the DC input current exceeds an MPPT rating, jumpers can be used to allow a single MPPT to intake additional DC current up to 26 A I_{MP} / 34 A I_{SC}.

Performance Specifications

Peak Efficiency	98.6% at 240 V
CEC Efficiency	98.0% at 240 V
Allowable DC/AC Ratio	1.7
Customer Interface	Tesla Mobile App
Internet Connectivity	Wi-Fi (2.4 GHz, 802.11 b/g/n), Ethernet, Cellular (LTE/4G)[3]
Revenue Grade Meter	Revenue Accurate (+/- 0.5%)
AC Remote Metering Support	Wi-Fi (2.4 GHz, 802.11 b/g/n)
Protections	Integrated arc fault circuit interrupter (AFCI), Rapid Shutdown
Supported Grid Types	60 Hz, 240 V Split Phase
Warranty	12.5 years

[3]Cellular connectivity subject to network operator service coverage and signal strength.

LUMINA SUN SMART HOME Go Solar

LuminaSun Smart Home LLC
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Mooresville, NC 28117

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PROJECT NAME & ADDRESS

JEROME W EASON
1009 WARREN RD,
ERWIN, NC 28339

DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

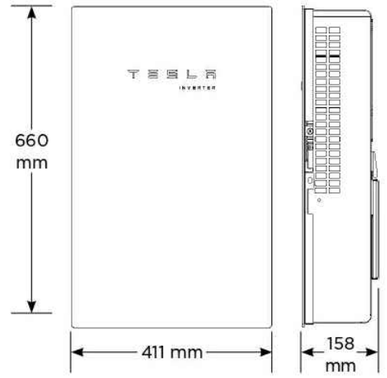
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-7

Tesla Solar Inverter Technical Specifications

Mechanical Specifications

Dimensions	660 mm x 411 mm x 158 mm (26 in x 16 in x 6 in)



Weight	52 lb[4]
Mounting Options	Wall mount (bracket)

[4]Door and bracket can be removed for a mounting weight of 37 lb.

Environmental Specifications

Operating Temperature	-30°C to 45°C (-22°F to 113°F)[5]
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	-30°C to 70°C (-22°F to 158°F)
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Rating	Type 3R
Ingress Rating	IP55 (Wiring compartment)
Pollution Rating	PD2 for power electronics and terminal wiring compartment, PD3 for all other components
Operating Noise @ 1 m	< 40 db(A) nominal, < 50 db(A) maximum

[5]Performance may be de-rated to 6.2 kW at 240 V when operating at temperatures greater than 45°C.

Compliance Information

Grid Certifications	UL 1741, UL 1741 SA, UL 1741 SB, UL 1741 PCS, IEEE 1547-2018, IEEE 1547.1
Safety Certifications	UL 1741 PVRSS, UL 1699B, UL 1998 (US), UL 3741
Emissions	EN 61000-6-3 (Residential), FCC 47CFR15.109 (a)

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DC SIZE:19.520kW
AC SIZE:15.200kW

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ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-8

Solar Shutdown Device Technical Specifications

—

The Solar Shutdown Device is a Mid-Circuit Interrupter (MCI) and is integral to the rapid shutdown (RSD) function required for rooftop PV systems in accordance with Article 690 of the NEC. When paired with Powerwall 3, solar array shutdown is initiated by an External System Shutdown Switch or the On/Off Enable switch located on Powerwall 3. Systems not subject to rapid shutdown requirements must still install one or more MCIs for functional purposes; see the Powerwall 3 installation manual for details.

Electrical Specifications

Model	MCI-1	MCI-2	MCI-2 High Current
Nominal Input DC Current Rating (I_{MP})	13 A	13 A	15 A
Maximum Input Short Circuit Current (I_{SC})	19 A	17 A	19 A
Maximum System Voltage	600 V DC	1000 V DC[15]	1000 V DC[15]
Maximum Disconnect Voltage[16]	600 V DC	165 V DC	165 V DC

[15] Maximum System Voltage is limited by Powerwall to 600 V DC.

[16] Maximum Disconnect Voltage is the maximum voltage allowed across each MCI in the open position (Rapid Shutdown Initiated). An individual MCI-2 has a voltage rating of 165V but in combination (connected in the same string) their voltage ratings are additive.

RSD Module Performance

Maximum Number of Devices per String	5	
Control	Power Line Excitation	
Passive State	Normally Open	
Maximum Power Consumption	7 W	
Warranty	25 years	

Environmental Specifications

Operating Temperature	-40°C to 50°C (-40°F to 122°F)	-45°C to 70°C (-49°F to 158°F)
Storage Temperature	–30°C to 70°C (–22°F to 158°F)	–30°C to 70°C (–22°F to 158°F)
Enclosure Rating	NEMA 4X / IP65	

Mechanical Specifications

Electrical Connections	MC4 Connector	
Housing	Plastic	
Dimensions	125 x 150 x 22 mm (5 x 6 x 1 in)	173 x 45 x 22 mm (6.8 x 1.8 x 1 in)
Weight	350 g (0.77 lb)	120 g (0.26 lb)
Mounting Options	ZEP Home Run Clip M4 Screw (#10) M8 Bolt (5/16") Nail / Wood screw	Wire Clip

Compliance Information

Certifications	UL 1741 PVRSE, UL 3741, PVRSA (Photovoltaic Rapid Shutdown Array)
RSD Initiation Method	External System Shutdown Switch or Powerwall 3 Enable Switch

UL 3741 PV Hazard Control (and PVRSA) Compatibility

See UL 3741 Application Addendum

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AC SIZE:15.200kW

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EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-9

Tech Brief

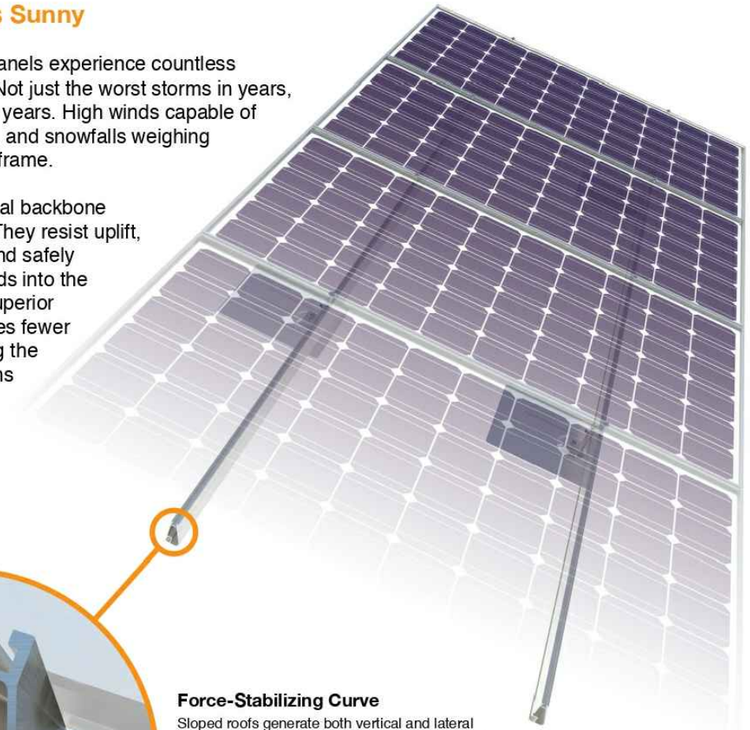
IRONRIDGE

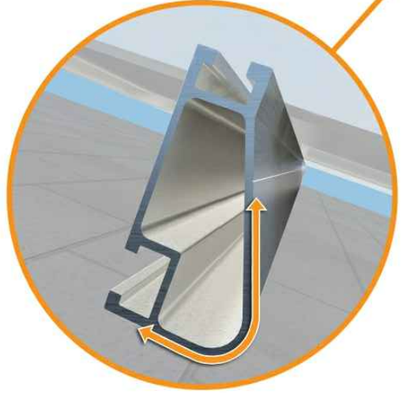
XR Rail® Family

Solar Is Not Always Sunny

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

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





Force-Stabilizing Curve

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

Compatible with Flat & Pitched Roofs

XR Rails® are compatible with FlashFoot® and other pitched roof attachments.

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

Corrosion-Resistant Materials

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

Tech Brief

XR Rail® Family

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

XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 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'
None	90	XR10		XR100		XR1000	
	120						
	140						
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	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.

LUMINA SUN SMART HOME Go Solar

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JEROME W EASON
1009 WARREN RD,
ERWIN, NC 28339

DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10

Tech Brief

IRONRIDGE

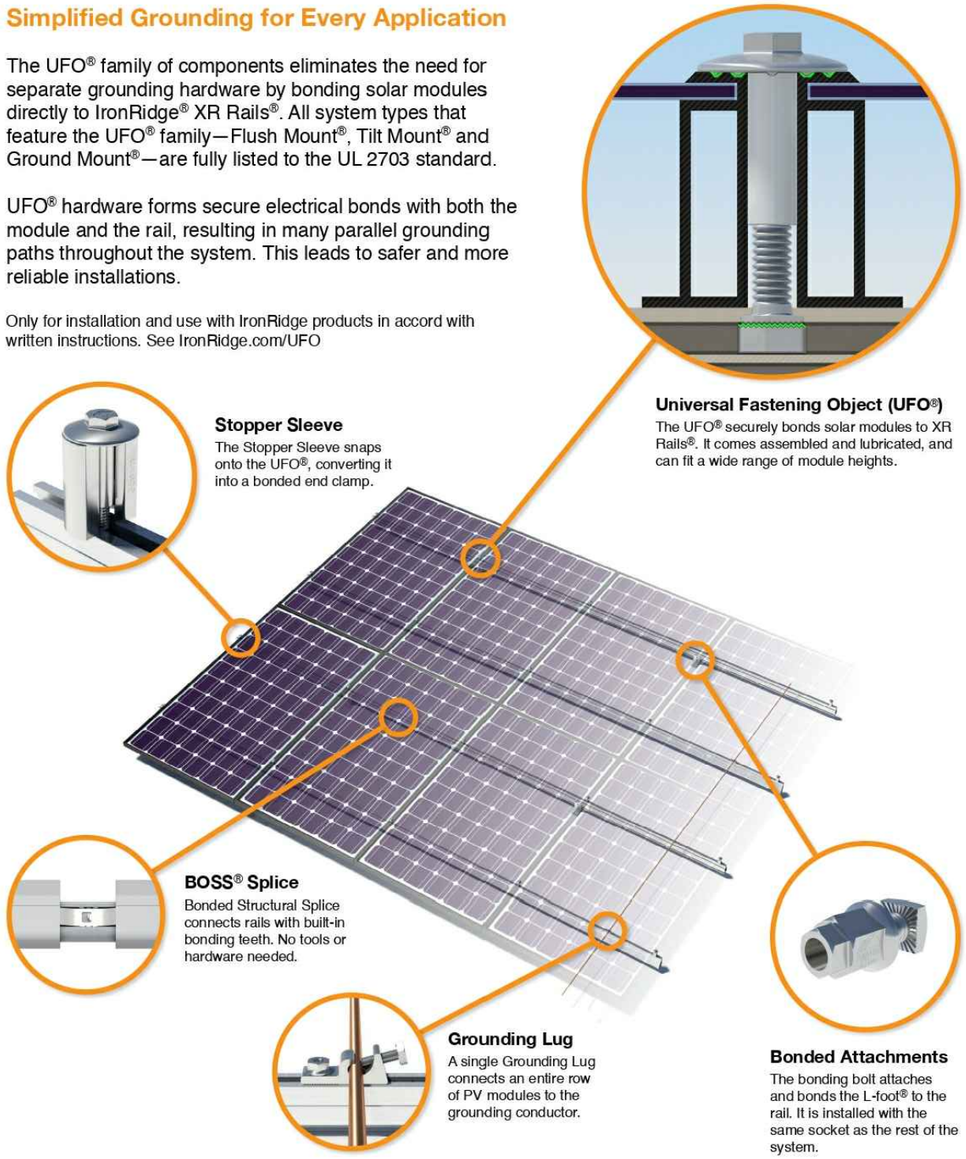
UFO® Family of Components

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



Universal Fastening Object (UFO®)
The UFO® securely bonds solar modules to XR Rails®. It comes assembled and lubricated, and can fit a wide range of module heights.

Stopper Sleeve
The Stopper Sleeve snaps onto the UFO®, converting it into a bonded end clamp.

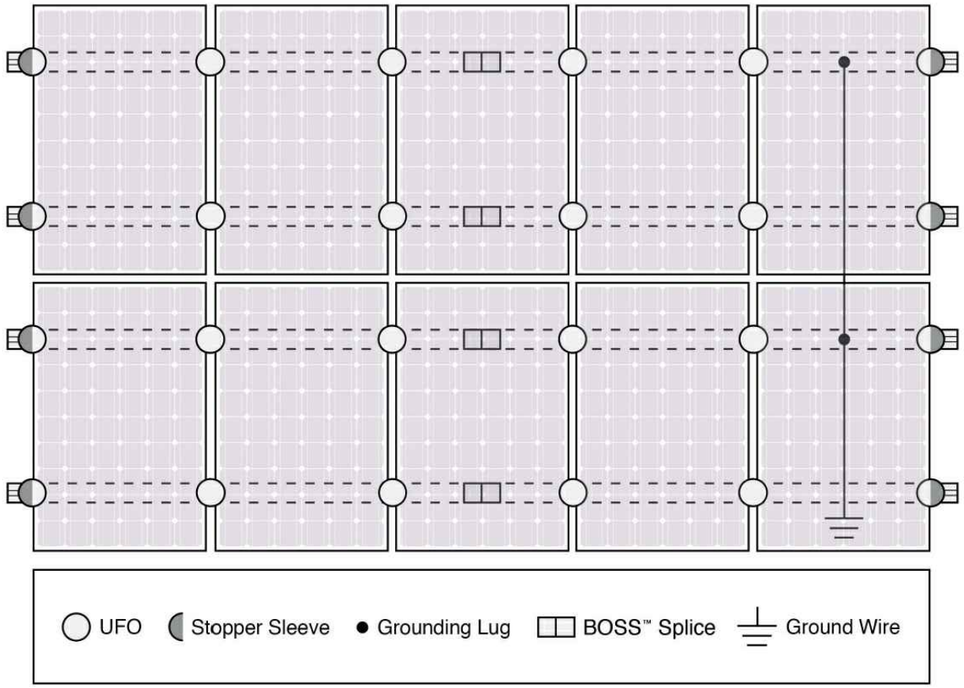
BOSS® Splice
Bonded Structural Splice connects rails with built-in bonding teeth. No tools or hardware needed.

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.

Tech Brief

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	Compatible with most MLPE manufacturers. Refer to system installation manual.		
Fire Rating	Class A	Class A	N/A
Modules	Tested or Evaluated with over 400 Framed Modules Refer to installation manuals for a detailed list.		

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1009 WARREN RD,
ERWIN, NC 28339

DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

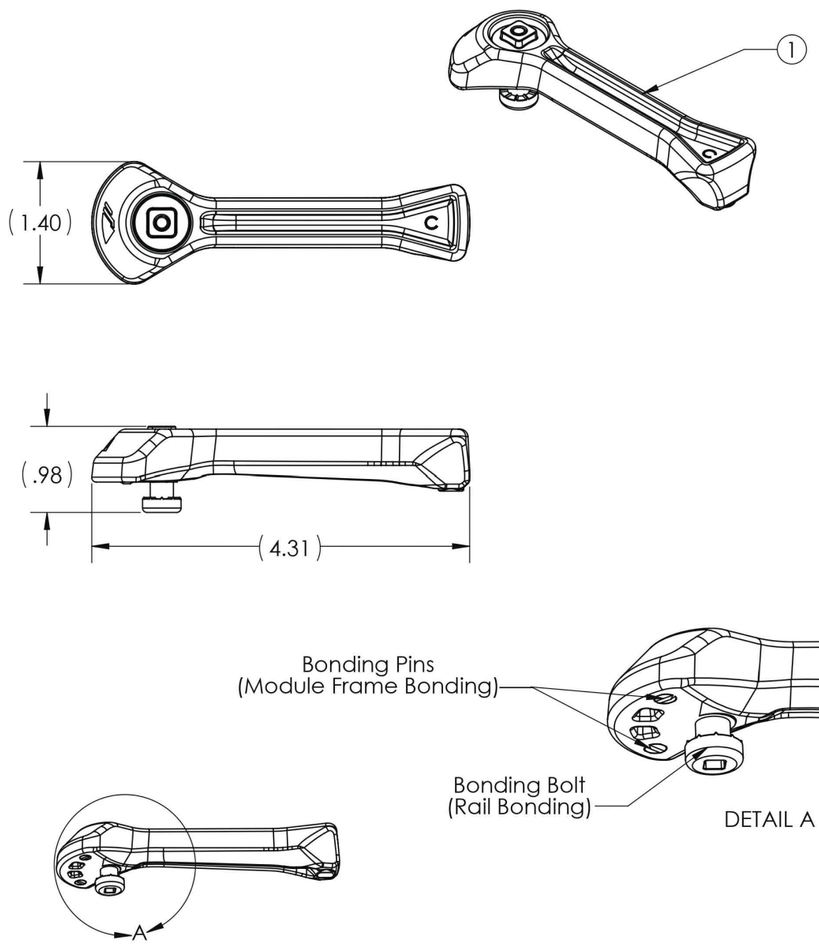
SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-11

IRONRIDGE

CAMO



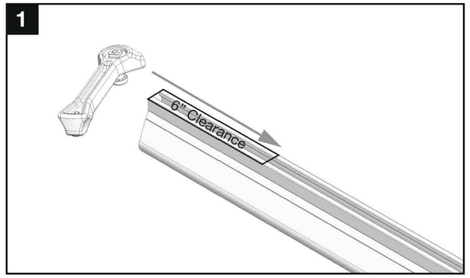
NO.	DESCRIPTION
1	HIDDEN END CAM (UNIVERSAL CLAMP)

HIDDEN END CAM (UNIVERSAL CLAMP)		
SIZE A	DO NOT SCALE DRAWING	
SCALE: 1:1	WEIGHT: 0.17 LBS	SHEET 1 OF 1

Installation

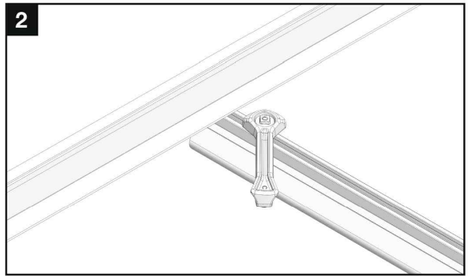
Compatibility: Fits modules with bottom flanges noted below. See IronRidge Flush, Tilt, Ground, or Ground Mount On The Roof Manual for full ratings and list of compatible modules.

1



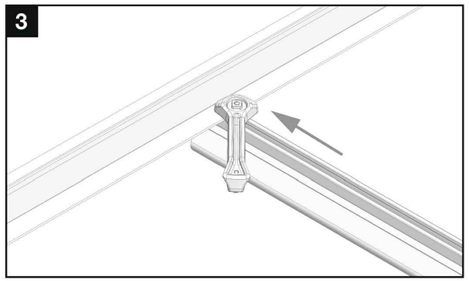
Slide CAMO into rail channel far enough to clear the module frame. CAMO requires 6" of clearance from end of rail.

2



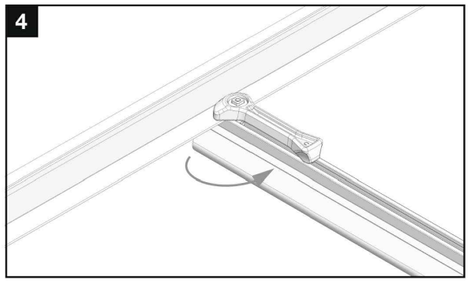
Place module on rails (module cells not shown for clarity).

3



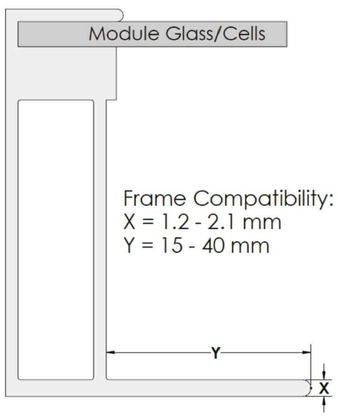
Pull CAMO towards rail ends, at 45 deg angle, so the bonding bolt contacts the module flange edge.

4



Rotate handle with an upwards motion until CAMO snaps into rail channel. Ensure Camo bonding pins are fully seated on top of module frame.

Module Compatibility and Certifications



UL 2703
Conforms to STD UL 2703 (2015) requirements. See IronRidge Flush, Tilt, Ground, or Ground Mount On The Roof Manual for full ratings and list of compatible modules.

Allowable Design Load Rating
50 PSF downward, 50 PSF upward, 15 PSF lateral. Actual system structural capacity is defined by PE stamped certification letters.

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CAMO-01-MAN REV 1.10

LuminaSun Smart Home LLC
114 Morlake Drive suite 201,
Mooresville, NC 28117

REVISIONS

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PROJECT NAME & ADDRESS

JEROME W EASON
1009 WARREN RD,
ERWIN, NC 28339

DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

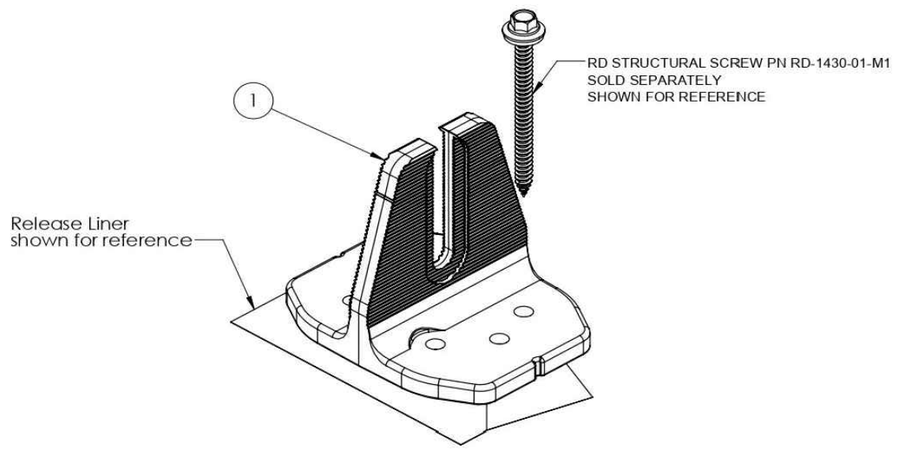
SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-12

Cut Sheet

IRONRIDGE

QuickMount® Halo UltraGrip

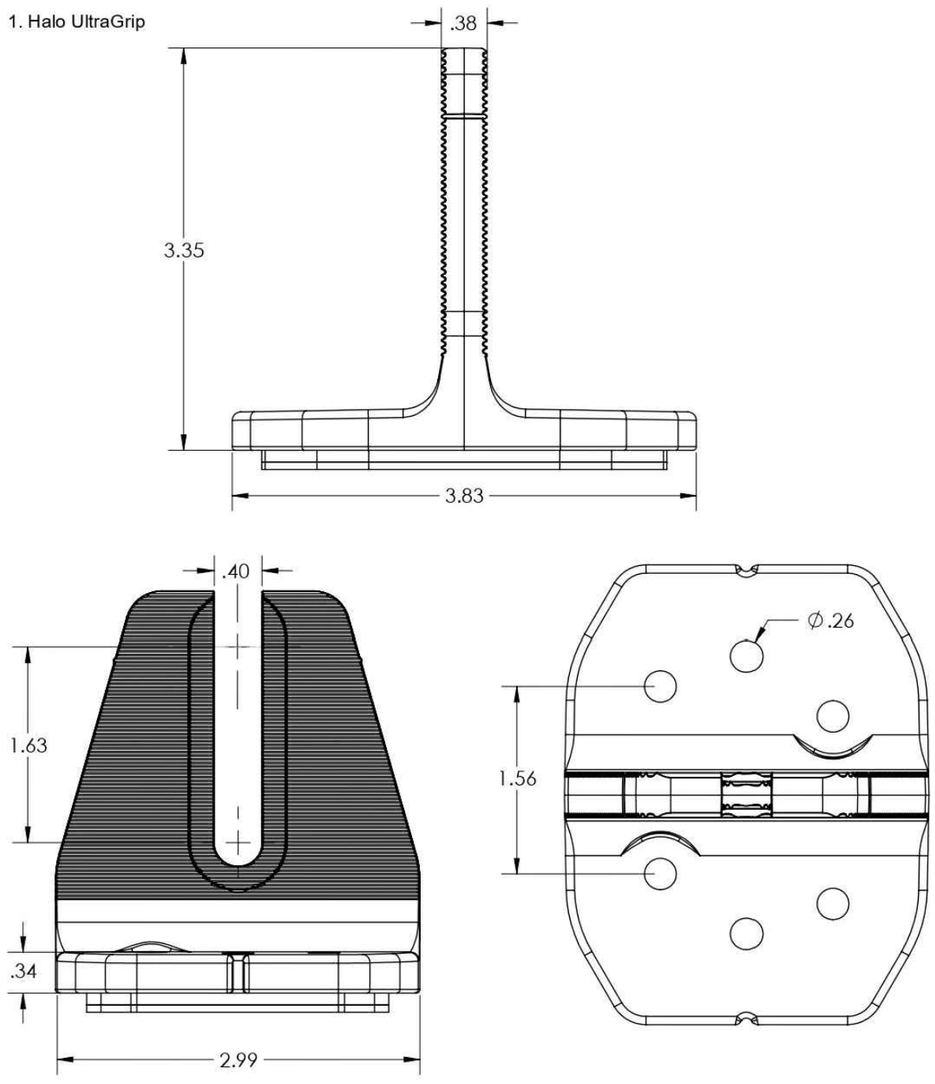


ITEM NO	DESCRIPTION	QTY IN KIT
1	QM Halo UltraGrip(Mill or Black)	1

PART NUMBER	DESCRIPTION
QM-HUG-01-M1	Halo UltraGrip - Mill
QM-HUG-01-B1	Halo UltraGrip - Black

Cut Sheet

1. Halo UltraGrip



Property	Value
Material	3000 Series Aluminium
Finish	Mill or Black

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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0

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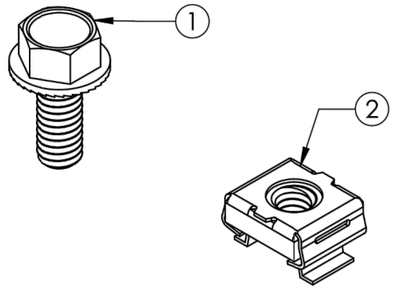
SHEET NUMBER
PV-13

Cut Sheet

IRONRIDGE

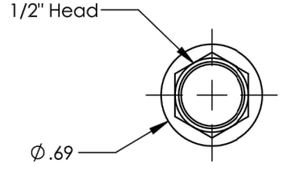
BX MLPE Hardware



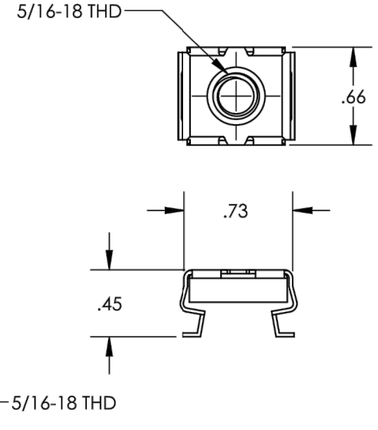
ITEM NO.	DESCRIPTION	QTY.
1	FLANGE HEAD CAP SCREW 5/16-18	20
2	CAGENUT, 5/16	20

Part Number	Description
BX-CMA-MI-M1	BX MLPE MOUNTING ASSEMBLY

1) Flange Head Cap Screw 5/16-18



2) Cagenut, 5/16-18



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.0

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SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-14

EZ SOLAR
making solar simple.

PHONE: 385-202-4150
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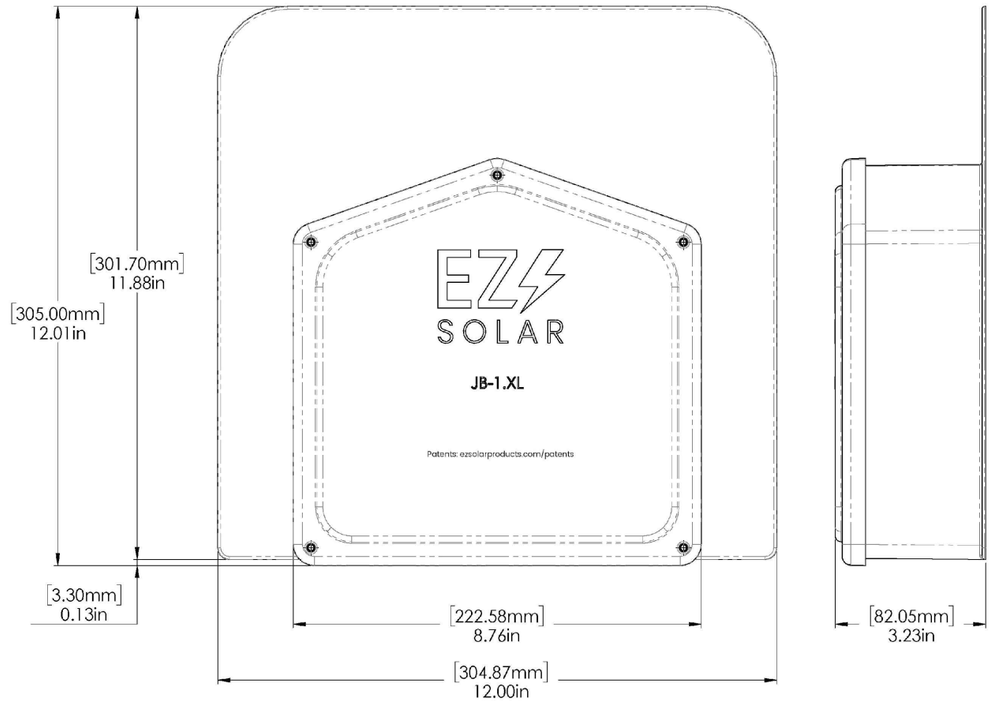
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	JB-1.XL BODY	POLYCARBONATE WITH UV INHIBITORS	1
2	JB-1.XL LID	POLYCARBONATE WITH UV INHIBITORS	1
3	#10 X 1-1/4" PHILLIPS PAN HEAD SCREW		4
4	#8 X 3/4" PHILLIPS PAN HEAD SCREW		6

SIZE	DWG. NO.	REV
B	JB-1.XL	
SCALE: 1:2	WEIGHT: 1.9 LBS	SHEET 1 OF 3

TORQUE SPECIFICATION:	15-20 LBS
CERTIFICATION:	UL 1741, NEMA 3R CSA C22.2 NO. 290
WEIGHT:	1.9 LBS



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5015705

LUMINA SUN SMART HOME
Go Solar

LuminaSun Smart Home LLC
114 Morlake Drive suite 201,
Mooresville, NC 28117

REVISIONS

DESCRIPTION	DATE	REV
INITIAL	02/25/2025	

SIGNATURE WITH SEAL

PROJECT NAME & ADDRESS

JEROME W EASON
1009 WARREN RD,
ERWIN, NC 28339

DC SIZE:19.520kW
AC SIZE:15.200kW

DRAWN BY
ESR

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-15

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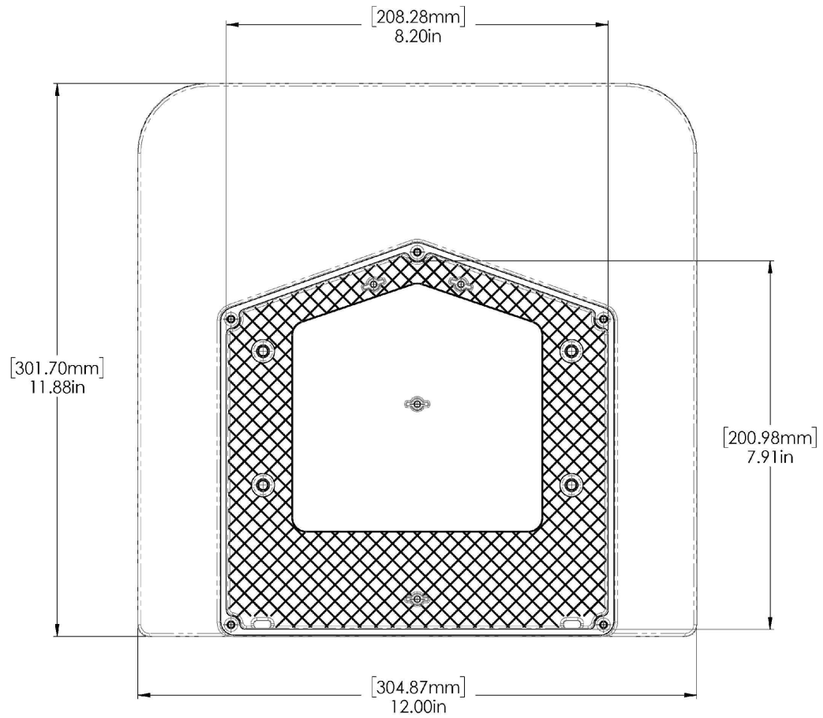
SIZE	DWG. NO.	REV
B	JB-1.XL	
SCALE: 1:2	WEIGHT: 1.9 LBS	SHEET 2 OF 3



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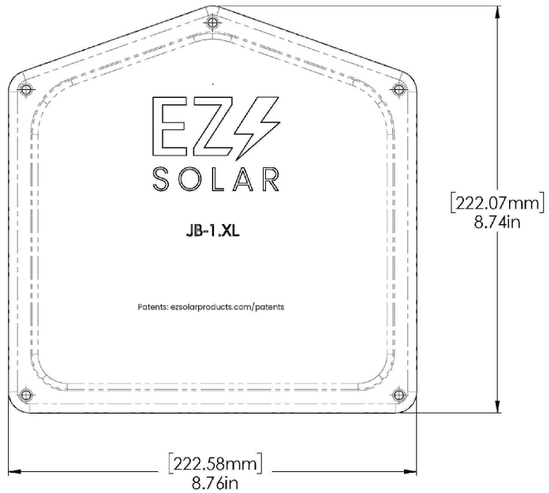
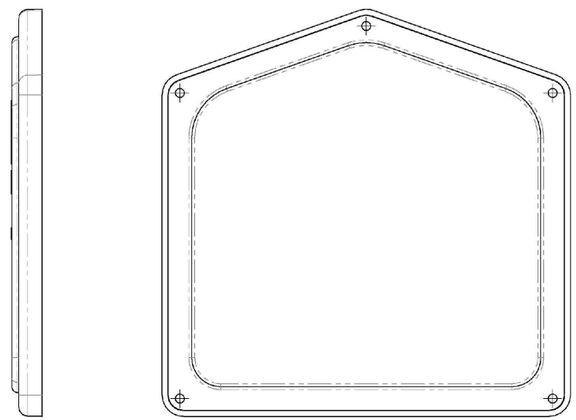
SIZE	DWG. NO.	REV
B	JB-1.XL	
SCALE: 1:2	WEIGHT: 1.9 LBS	SHEET 3 OF 3

OUTSIDE



INSIDE



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EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-16