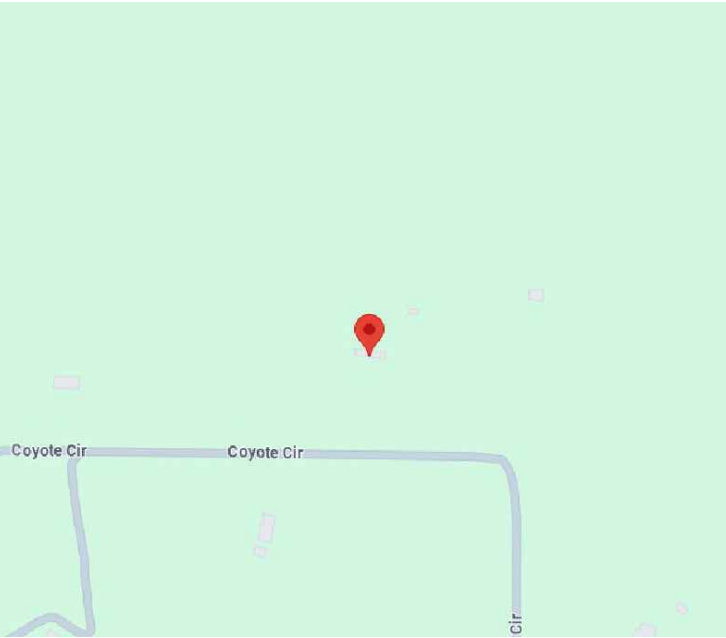
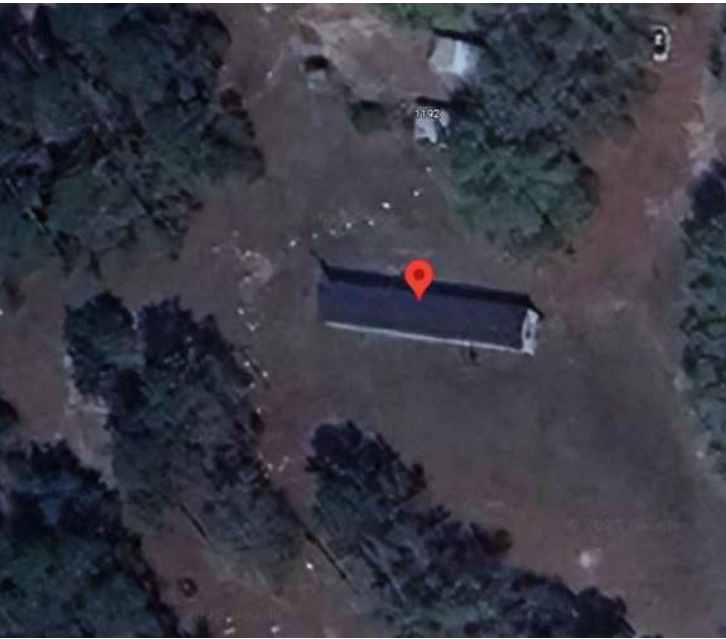


VICINITY MAP



HOUSE PHOTO



NEW ROOF MOUNT PHOTOVOLTAIC SYSTEM
SYSTEM SIZE: 9.600 KW DC, 6.960 KW AC
1192 SW COYOTE CIR, FORT WHITE, FL 32038

SHEET INDEX

- PV-1-----COVER SHEET
- PV-2-----SITE PLAN
- PV-3-----ROOF PLAN
- PV-4-----STANDOFF PLAN
- PV-5-----LINE DIAGRAM
- PV-6-----WARNING LABELS & PLACARD
- PV-7.1 TO PV-7.8 -----RESOURCE DOCUMENTS

SCOPE OF WORK

- (N) 9.600 KW DC / 6.960 KW AC ROOF MOUNTED PV SYSTEM
- (24) LONGI SOLAR LR5-54HABB-400-M 400W MODULES
- (24) ENPHASE IQ8PLUS-72-M-US (240V) MICROINVERTERS
- (1) FOX ESS ECS4000-H5 BATTERY, STORAGE SYSTEM, 240V, 12 KWH
- (1) FOX ESS HUB G2 SMART ENERGY MANAGEMENT SYSTEM
- (1) FOX ESS H1&AC1-7.6-US INVERTER
- SUNMODO NANO MOUNT L-FOOT ATTACHMENTS
- SUNMODO SMR 100 RAIL,MILL RAILS

AUTHORITIES HAVING JURISDICTION

- AHJ: COLUMBIA COUNTY, FL
- UTILITY: CLAY ELECTRIC COOPERATIVE

GOVERNMENT CODES

- 2023 FBC-BUILDING 8TH EDITION
- 2023 FBC-RESIDENTIAL 8TH EDITION
- 2020 NEC (NFPA 70)
- 2023 FFPC 8TH EDITION



GENERAL NOTES

- ALL COMPONENTS ARE UL LISTED AND NEC CERTIFIED, WHERE WARRANTED.
- THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2020.
- THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
- 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.
- A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH NEC 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.
- PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE.
- PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- 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.
- ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.
- INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED.
- THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)]
- ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
- ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
- SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41.
- PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12
- 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)]
- ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31
- WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).
- ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703
- ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.
- IN ACCORDANCE WITH 2021 IFC 1205.5, 2018 IFC 1204.4, AND 2015 IFC 605.11.2 A CLEAR, BRUSH-FREE AREA OF 10 FEET(3048 MM) SHALL BE REQUIRED FOR GROUND-MOUNTED PHOTOVOLTAIC ARRAYS.
- PANEL LAYOUT ORIENTATION IS SUBJECT TO CHANGE ON DESIGNED MOUNTING PLANES.
- ALL PERMANENTLY INSTALLED LUMINARIES, EXCLUDING THOSE IN KITCHEN APPLIANCES, SHALL HAVE AN EFFICIENCY OF AT LEAST 45 LUMENS-PER-WATT OR SHALL UTILIZE LAMPS WITH AN EFFICIENCY OF NOT LESS THAN 65 LUMENS-PER-WATT.
- MOUNTING SYSTEMS SHALL BE LISTED AND LABELLED IN ACCORDANCE WITH UL 2703 TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND THEIR LISTINGS.



GOKENESIS SOLAR

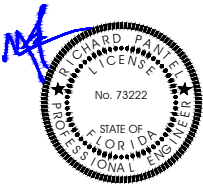
6028 STONYBROOK CT,
TOPEKA,KS 66614
(913) 228-4495

info@gogenesissolar.com

DC SIZE: 9.600 KW DC
AC SIZE: 6.960 KW AC

DAVID CONLEY JR

1192 SW COYOTE CIR, FORT
WHITE, FL 32038



Richard
Pantel
Digitally signed by
Richard Pantel
Date: 2025.02.14
07:59:43 -06'00'

Reviewed and approved
Richard Pantel, P.E.
FL Lic. No. 73222
02/14/2025

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REVISION

DATE REV

COVER SHEET

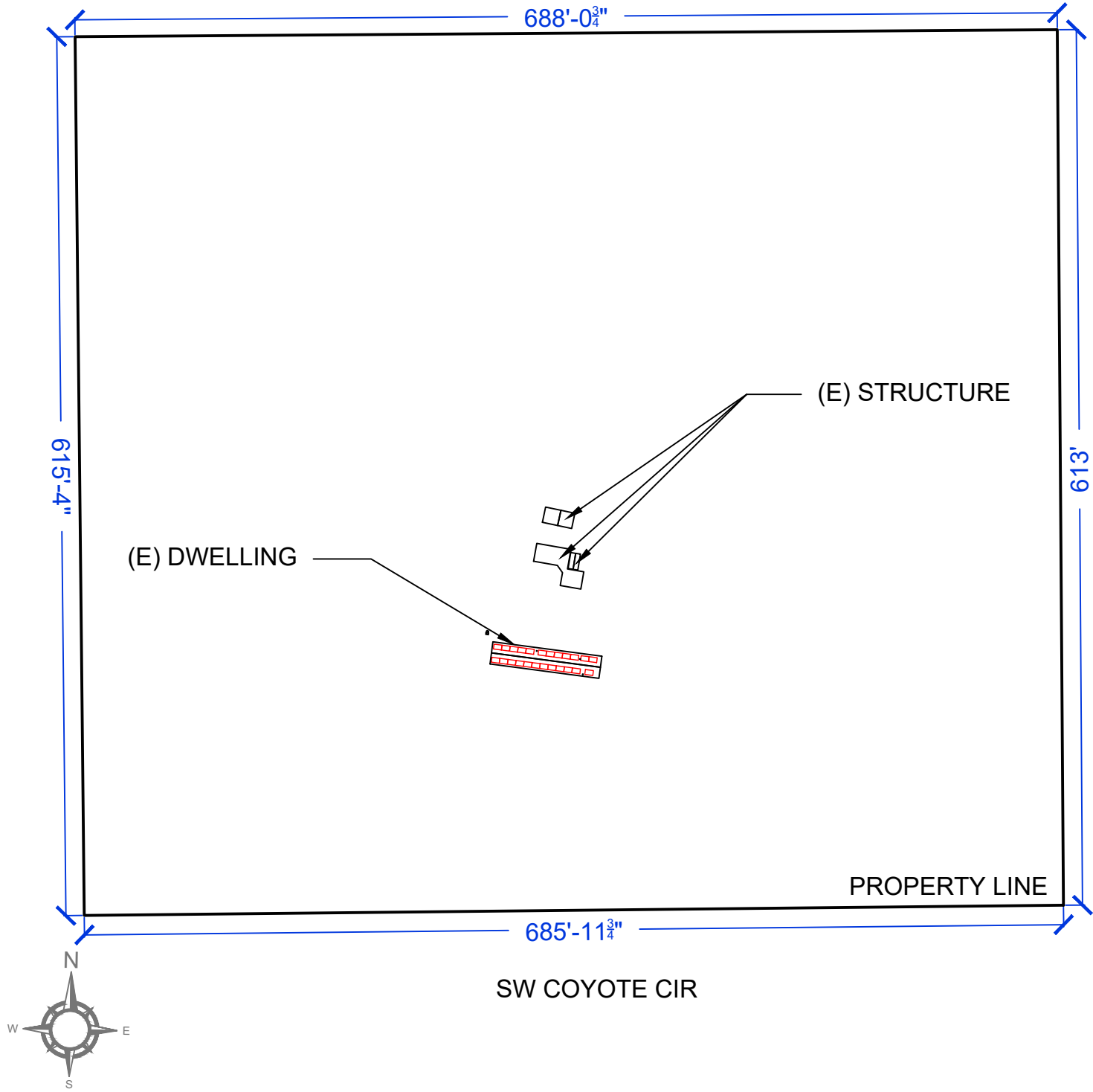
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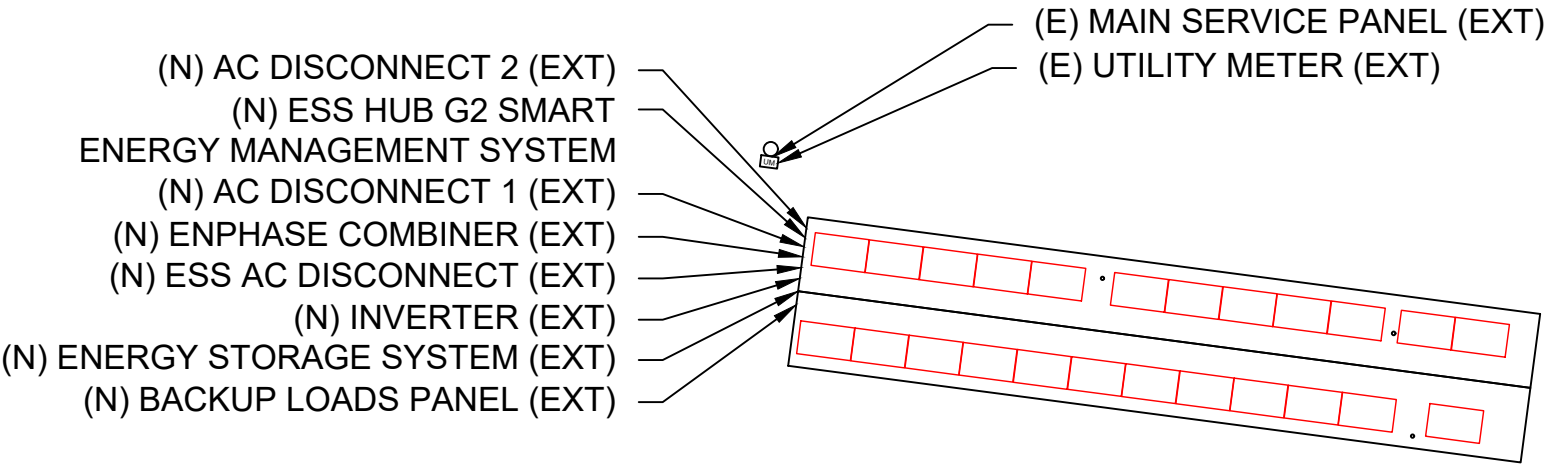
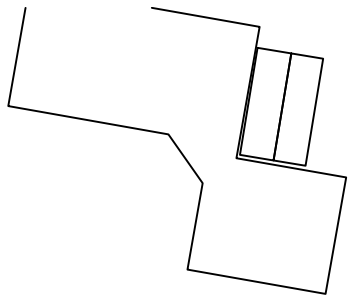
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02/06/2025

PV-1



1 SITE PLAN
SCALE: 1"=100'



TOTAL ROOF AREA: 1299.62 SQ.FT.
AREA OF ARRAYS: 505 SQ.FT.
ARRAY COVERAGE AREA: 38.82%

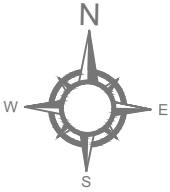
LEGEND

LONGI SOLAR
LR5-54HABB-400-M 400W
PV MODULE

CHIMNEY

ATTIC VENT

PIPE VENT



1 SITE PLAN
SCALE: 1"=20'



GOKENESIS SOLAR
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1192 SW COYOTE CIR, FORT
WHITE, FL 32038

Richard Pantel
Professional Engineer
No. 73222
STATE OF FLORIDA

Reviewed and approved
Richard Pantel, P.E.
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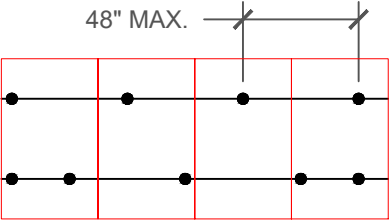
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SITE PLAN

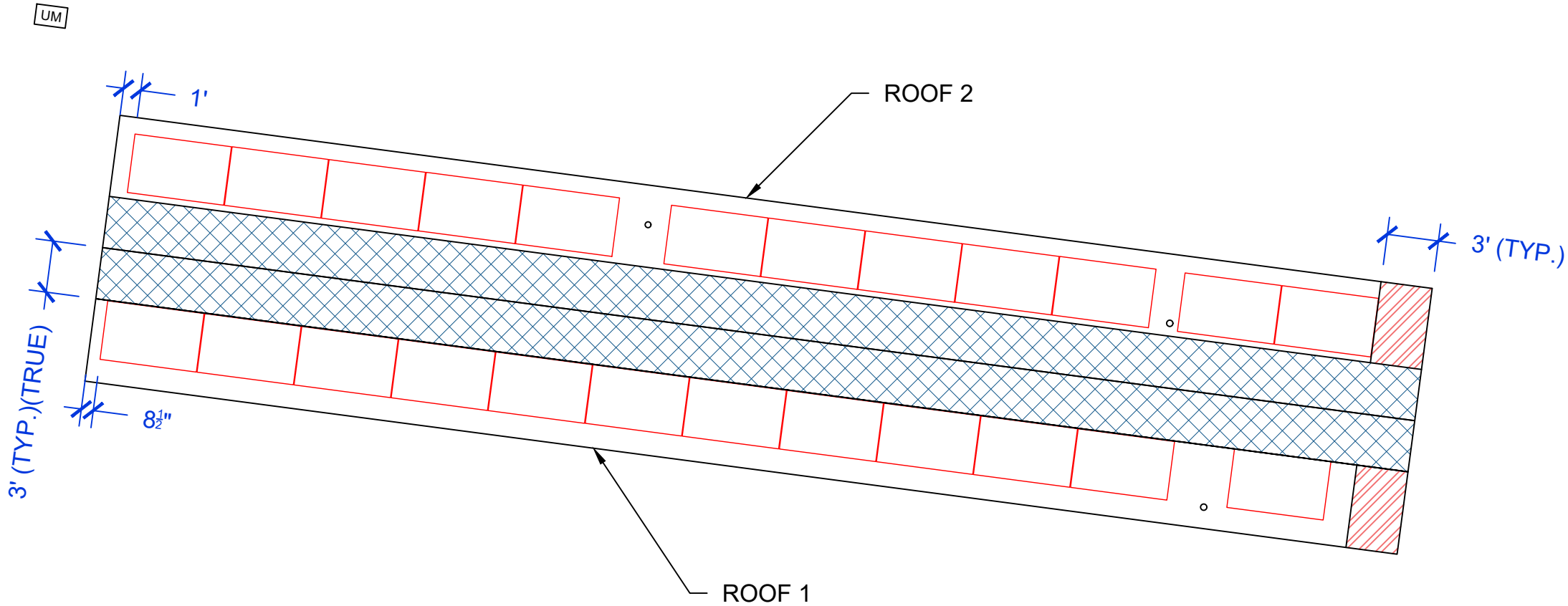
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DATE DRAWN	02/06/2025	

ROOF INFORMATION							
ARRAY	PANEL COUNT	AZIMUTH	PITCH	ROOF TYPE	ATTACHMENT	FRAME TYPE & SPACING	ATTACHMENT SPACING
ROOF 1	12	188°	23°	SHINGLE	SUNMODO NANO MOUNT L-FOOT	2"X4" RAFTERS @ 24" OC	48"
ROOF 2	12	8°	23°	SHINGLE	SUNMODO NANO MOUNT L-FOOT	2"X4" RAFTERS @ 24" OC	48"



MAX. ATTACHMENT SPACING: 48"
(STAGGERED ATTACHMENTS)

TOTAL ROOF AREA: 1299.62 SQ.FT.
AREA OF ARRAYS: 505 SQ.FT.
ARRAY COVERAGE AREA: 38.82%



1 | ROOF PLAN
SCALE: 1"=8'

LEGEND

CHIMNEY

ATTIC VENT

PIPE VENT

UTILITY METER

36" FIRE ACCESS PATHWAY36" FIRE VENTILATION SETBACK

MODULE:
LONGI SOLAR
LR5-54HABB-400-M
400W

MODULE DIMENSION: 67.80"x 44.65"
MODULE WEIGHT: 49.6 LBS

TOTAL NO. OF PANELS: 24 MODULES



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ROOF PLAN

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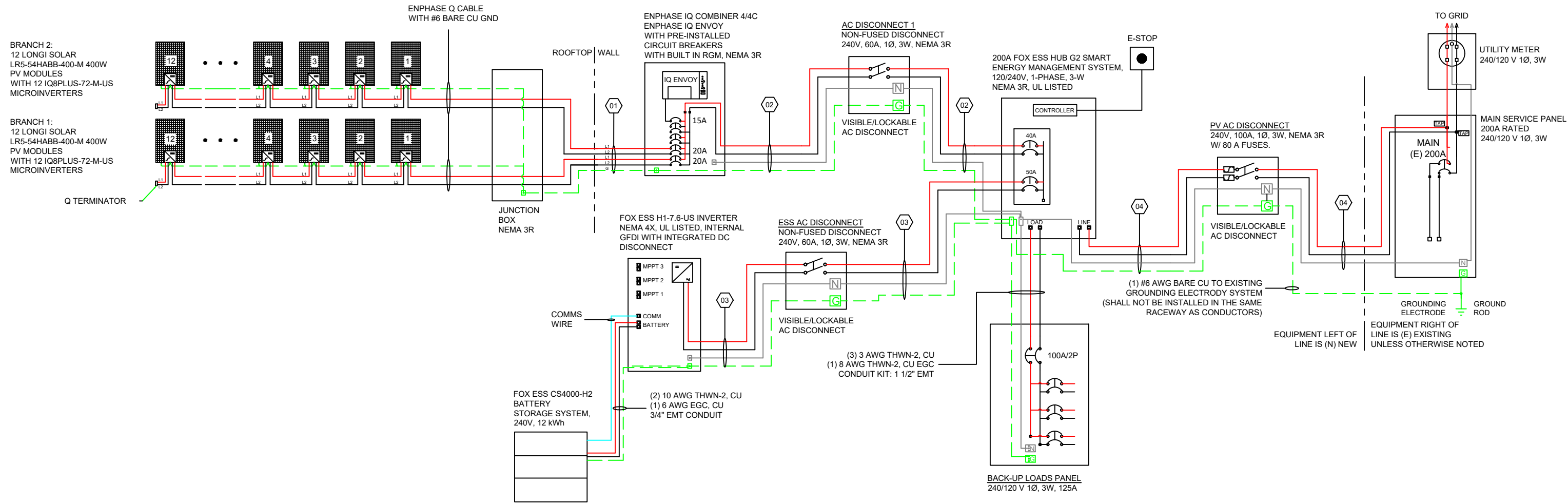
02/06/2025

PV-3

CONDUCTOR AND CONDUIT SCHEDULE W/ELECTRICAL CALCULATIONS													
ID	CONDUCTOR	EGC	NEUTRAL	CONDUIT SIZE	TEMP. CORR. FACTOR	CURRENT-CARRYING CONDUCTORS IN CONDUIT	FILL FACTOR	MAX OUTPUT CURRENT (A)	REQUIRED AMPACITY (MAX OUTPUT CURRENT X125%) (A)	OCPD / FUSE (A)	CONDUCTOR BASE (A)	CONDUCTOR DERATED (A)	TERM. TEMP. RATING
01	(4) 10 AWG THWN-2, CU	(1) 10 AWG THWN-2, CU	N/A	3/4" EMT	.96 (32.7°C)	4	0.8	14.52	18.15	20	40	30.72	90°C
02	(2) 8 AWG THWN-2, CU	(1) 10 AWG THWN-2, CU	(1) 8 AWG THWN-2, CU	3/4" EMT	.94 (32.7°C)	2	1.0	29.04	36.30	40	50	47.00	75°C
03	(2) 8 AWG THWN-2, CU	(1) 10 AWG THWN-2, CU	(1) 8 AWG THWN-2, CU	3/4" EMT	.94 (32.7°C)	2	1.0	34.80	43.50	50	50	47.00	75°C
03	(2) 3 AWG THWN-2, CU	(1) 8 AWG THWN-2, CU	(1) 3 AWG THWN-2, CU	1 1/4" EMT	.94 (32.7°C)	2	1.0	63.84	79.80	80	100	94.00	75°C

NOTE: HEIGHT OF THE CONDUIT ABOVE ROOFTOP TO BE AT LEAST 7/8TH OF AN INCH PER 310.15(B)(3)(C)

DESIGN TEMPERATURES	
ASHRAE EXTREME LOW	-10.5 °C
ASHRAE 2% HIGH	32.7 °C



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LINE DIAGRAM

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PV-5

CAUTION
PHOTOVOLTAIC SYSTEM
CIRCUIT IS BACKFED

[NEC 705.12(D) & 690.59] PLACE LABEL ON ALL EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUSBAR OR CONDUCTORS SUPPLIED FROM MULTIPLE SOURCES

**WARNING: PHOTOVOLTAIC
POWER SOURCE**

[NEC 690.31(G)3 & 4] PLACE ON JUNCTION BOXES AND CONDUIT EVERY 10'

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

[NEC 690.31(I)(E)] PLACE THIS LABEL ON ALL DISCONNECTING MEANS WHERE ENERGIZED IN AN OPEN POSITION

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

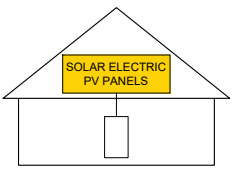
[NEC 690.15(C) & NEC 690.13(B)] PLACE THIS LABEL ON ALL DISCONNECTING MEANS WHERE ENERGIZED IN AN OPEN POSITION

**ENERGY STORAGE
SYSTEM DISCONNECT**

CODE REF: [NEC 706.15(C)]
LOCATION: PLACE ON ENERGY STORAGE SYSTEMS

**SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN**

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



FOR PV SYSTEMS THAT SHUT DOWN THE ARRAY AND CONDUCTORS LEAVING THE ARRAY: SIGN TO BE LOCATED ON OR NO MORE THAN 3 FT AWAY FROM SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED AND SHALL INDICATE THE LOCATION OF ALL IDENTIFIED RAPID SHUTDOWN SWITCHES IF NOT AT THE SAME LOCATION.
[NEC 690.56(C)(1)(A)]

PHOTOVOLTAIC AC DISCONNECT
RATED AC OUTPUT CURRENT: 29.04A MAX
NOMINAL AC OPERATING VOLTAGE: 240 VAC

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

WARNING
DUAL POWER SOURCE
SECOND SOURCE IS
PHOTOVOLTAIC SYSTEM

[NEC 705.12(C) & NEC 690.59] PLACE LABEL ON ALL EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUSBAR OR CONDUCTORS SUPPLIED FROM MULTIPLE SOURCES

**RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM**

[NEC 690.56(C)(2)] PLACE AT MAIN SERVICE PANEL

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

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

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

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

WARNING
TURN OFF PHOTOVOLTAIC AC
DISCONNECT PRIOR TO WORKING
INSIDE THE PANEL

[NEC 110.27(C) & OSHA 1910.145(f)(7)] PLACE ON ALL COMBINER BOX/ENCLOSURES, MAIN SERVICE DISCONNECT, BREAKER PANEL AND PULL BOXES

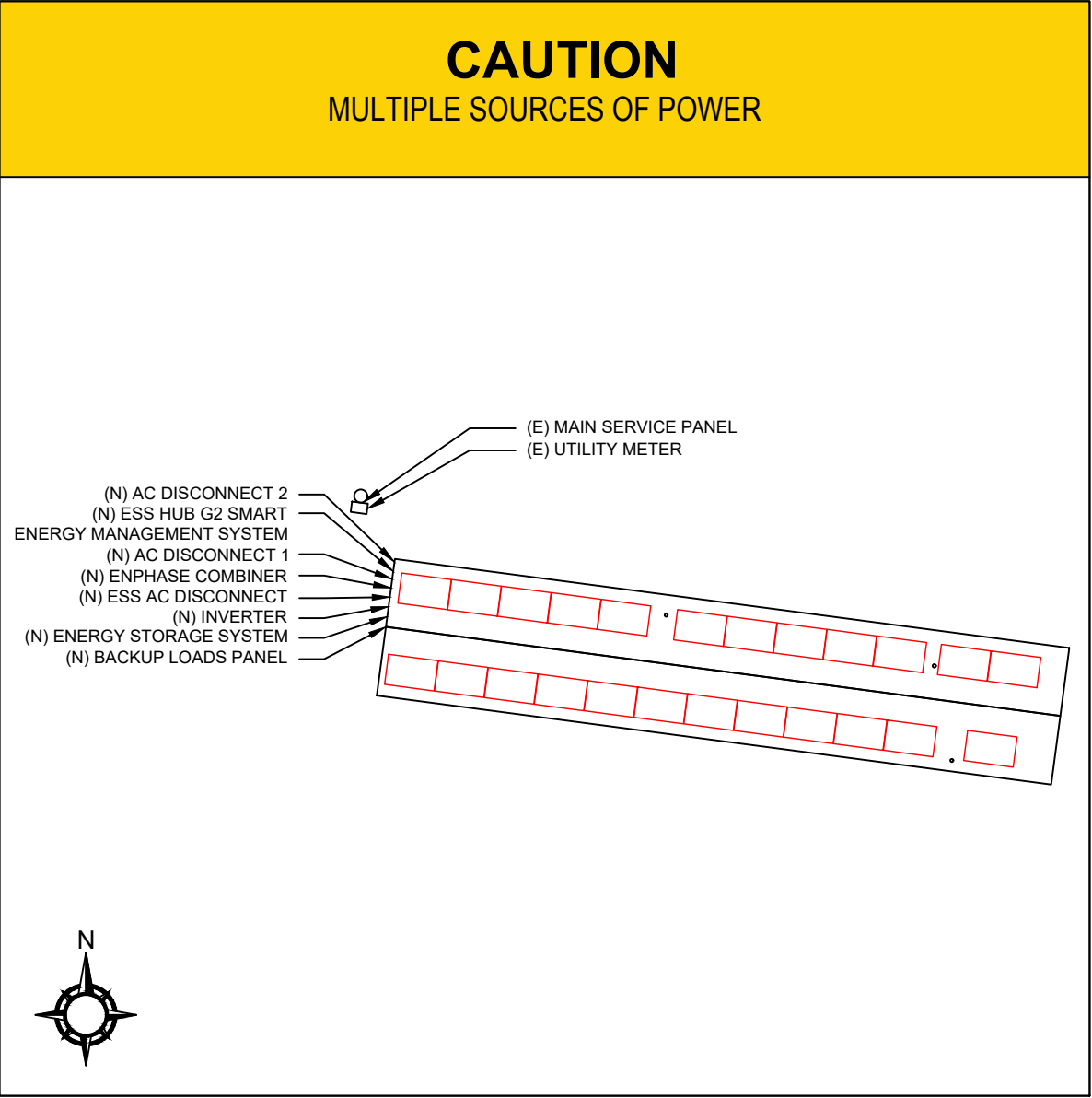
**PHOTOVOLTAIC
AC DISCONNECT**

[NEC 690.13(B)] PLACE ON AC DISCONNECT

WARNING
POWER SOURCE OUTPUT
CONNECTION
DO NOT RELOCATE THIS OVERCURRENT
DEVICE

CODE REF: [NEC 705.12(B)(3)(2)]
LOCATION: PLACE LABEL ON ALL EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUSBAR OR CONDUCTORS SUPPLIED FROM MULTIPLE SOURCES

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



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



GOGENESIS SOLAR

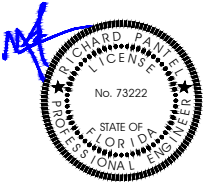
6028 STONYBROOK CT,
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DC SIZE: 9.600 KW DC
AC SIZE: 6.960 KW AC

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**WARNING LABELS &
PLACARD**

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PV-6

Hi-MO 5

LR5-54HABB
390~415M

- Suitable for distributed projects
- Advanced module technology delivers superior module efficiency
 - M10 Gallium-doped Wafer
 - Integrated Segmented Ribbons
 - 9-busbar Half-cut Cell
- Globally validated bifacial energy yield
- High module quality ensures long-term reliability

25 25-year Warranty for Materials and Processing

30 30-year Warranty for Extra Linear Power Output

Complete System and Product Certifications

IEC 61215, IEC 61730, UL 61730
ISO9001:2015: ISO Quality Management System
ISO14001: 2015: ISO Environment Management System
ISO45001: 2018: Occupational Health and Safety
IEC62941: Guideline for module design qualification and type approval

LONGI



Hi-MO 5

LR5-54HABB 390~415M

21.3%
MAX MODULE
EFFICIENCY

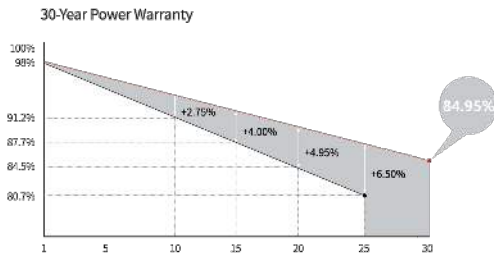
0~3%
POWER
TOLERANCE

<2%
FIRST YEAR
POWER DEGRADATION

0.45%
YEAR 2-30
POWER DEGRADATION

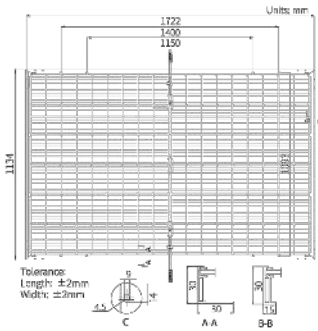
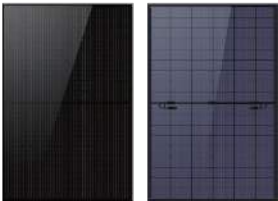
HALF-CELL
Lower operating temperature

Additional Value



Mechanical Parameters

Cell Orientation	108 (6×18)
Junction Box	IP68, three diodes
Output Cable	4mm ² , ±1200mm length can be customized
Glass	Dual glass, 2.0+1.6mm heat strengthened glass
Frame	Anodized aluminum alloy frame
Weight	22.5kg
Dimension	1722×1134×30mm
Packaging	36pcs per pallet / 218pcs per 20' GP / 936pcs or 792pcs (Only for USA) per 40' HC



Electrical Characteristics		STC: AM1.5 1000W/m ² 25°C		NOCT: AM1.5 800W/m ² 20°C 1m/s		Test uncertainty for Pmax: ±3%	
Module Type		LR5-54HABB-390M	LR5-54HABB-395M	LR5-54HABB-400M	LR5-54HABB-405M	LR5-54HABB-410M	LR5-54HABB-415M
Testing Condition		STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)		390	395	400	405	410	415
Open Circuit Voltage (Voc/V)		36.58	34.39	36.81	34.84	37.29	35.06
Short Circuit Current (Isc/A)		13.57	10.95	13.65	11.07	13.79	11.13
Voltage at Maximum Power (Vmp/V)		30.47	28.43	30.70	28.86	31.18	29.09
Current at Maximum Power (Imp/A)		12.80	10.26	12.87	10.31	12.83	10.36
Module Efficiency(%)		20.0	20.2	20.5	20.7	21.0	21.3

Electrical characteristics with different rear side power gain (reference to 400W front)					
Pmax/W	Voc/V	Isc/A	Vmp/V	Imp/A	Pmax gain
420	37.05	14.41	30.94	13.58	5%
440	37.05	15.09	30.94	14.22	10%
460	37.15	15.78	31.04	14.87	15%
480	37.15	16.46	31.04	15.52	20%
500	37.15	17.15	31.04	16.16	25%

Operating Parameters

Operational Temperature	-40°C ~ +85°C
Power Output Tolerance	0 ~ 3%
Voc and Isc Tolerance	±3%
Maximum System Voltage	DC1500V (IEC/UL)
Maximum Series Fuse Rating	30A
Nominal Operating Cell Temperature	45±2°C
Protection Class	Class II
Bifaciality	70±5%
Fire Rating	UL Similar type 38 * IEC Class C

Mechanical Loading

Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Halstone Test	25mm Halstone at the speed of 23m/s

Temperature Ratings (STC)

Temperature Coefficient of Isc	+0.050%/°C
Temperature Coefficient of Voc	-0.265%/°C
Temperature Coefficient of Pmax	-0.340%/°C

*Reference Standard: IUL61730 Second Edition, Dated October 28, 2022

LONGI

No.8369 Shangyuan Road, Xi'an Economic And Technological Development Zone, Xi'an, Shaanxi, China.
Web: www.longi.com

Specifications included in this datasheet are subject to change without notice. LONGI reserves the right of final interpretation.
(20230112DraftV02) Only for North America



GOGENESIS SOLAR

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RESOURCE DOCUMENTS

DRAWN BY

CDR

DATE DRAWN

02/06/2025

PV-7.1



DATA SHEET



IQ8 and IQ8+ Microinverters

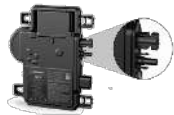
Our newest IQ8 Microinverters are the industry's first microgrid-forming, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application-specific integrated circuit (ASIC), which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built using advanced 55-nm technology with high-speed digital logic and has superfast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.



Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the Enphase IQ Battery, Enphase IQ Gateway, and the Enphase App monitoring and analysis software.



IQ8 Series Microinverters redefine reliability standards with more than one million cumulative hours of power-on testing, enabling an industry-leading limited warranty of up to 25 years.



Connect PV modules quickly and easily to the IQ8 Series Microinverters that have integrated MC4 connectors.



IQ8 Series Microinverters are UL Listed as PV rapid shutdown equipment and conform with various regulations when installed according to manufacturer's instructions.

* Meets UL 1741 only when installed with IQ System Controller 2 or 3.
** IQ8 and IQ8+ support split-phase, 240 V installations only.

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IQ8SP-MC4-DSH-00206-3.0-EN-US-2024-02-09

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)		UNITS	IQ8-66-M-US	IQ8PLUS-72-M-US
Commonly used module pairings ¹	W		235–350	235–440
Module compatibility	—	To meet compatibility, PV modules must be within the following maximum input DC voltage and maximum module I_{sc} . Module compatibility can be checked at https://enphase.com/installers/microinverters/calculator .		
MPPT voltage range	V		27–37	27–45
Operating range	V		16–48	16–58
Minimum/Maximum start voltage	V		22/48	22/58
Maximum input DC voltage	V		50	60
Maximum continuous input DC current	A		10	12
Maximum input DC short-circuit current	A		25	
Maximum module (I_{sc})	A		20	
Overvoltage class DC port	—		II	
DC port backfeed current	mA		0	
PV array configuration	—	Ungrounded array; no additional DC side protection required; AC side protection requires max. 20 A per branch circuit		
OUTPUT DATA (AC)		UNITS	IQ8-66-M-US	IQ8PLUS-72-M-US
Peak output power	VA		245	300
Maximum continuous output power	VA		240	280
Nominal grid voltage (L–L) ²	V		240, split-phase (L–L), 180°	
Minimum and Maximum grid voltage ²	V		211–264	
Maximum continuous output current	A		1.0	1.21
Nominal frequency	Hz		60	
Extended frequency range	Hz		47–68	
AC short circuit fault current over three cycles	A _{rms}		2	
Max units per 20 A (L–L) branch circuit ³	—		16	13
Total harmonic distortion	%		<5	
Overvoltage class AC port	—		III	
AC port backfeed current	mA		30	
Power factor setting	—		1.0	
Grid-tied power factor (adjustable)	—		0.85 leading ... 0.85 lagging	
Peak efficiency	%		97.7	
CEC weighted efficiency	%		97	
Nighttime power consumption	mW		23	25
MECHANICAL DATA				
Ambient temperature range	-40°C to 60°C (-40°F to 140°F)			
Relative humidity range	4% to 100% (condensing)			
DC connector type	Stäubli MC4			
Dimensions (H × W × D)	212 mm (8.3") × 175 mm (6.9") × 30.2 mm (1.2")			
Weight	1.1 kg (2.43 lbs)			
Cooling	Natural convection—no fans			
Approved for wet locations	Yes			
Pollution degree	PD3			
Enclosure	Class II double-insulated, corrosion-resistant polymeric enclosure			
Environmental category/UV exposure rating	NEMA Type 6/outdoor			

⁽¹⁾ No enforced DC/AC ratio.
⁽²⁾ Nominal voltage range can be extended beyond nominal if required by the utility.
⁽³⁾ Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

IQ8SP-MC4-DSH-00206-3.0-EN-US-2024-02-09

COMPLIANCE

Certifications

CA Rule 21 (UL 1741-SA), UL 62109-1, IEEE 1547:2018 (UL 1741-SB), FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 1071-01.
This product is UL Listed as PV rapid shutdown equipment and conforms with NEC 2014, NEC 2017, NEC 2020, and NEC 2023 section 690.12 and C22.1-2016 Rule 64-218 rapid shutdown of PV Systems, for AC and DC conductors, when installed according to the manufacturer's instructions.



GOGENESIS SOLAR

6028 STONYBROOK CT,
TOPEKA, KS 66614
(913) 228-4495

info@gogenesissolar.com

DC SIZE: 9.600 KW DC
AC SIZE: 6.960 KW AC

DAVID CONLEY JR

1192 SW COYOTE CIR, FORT
WHITE, FL 32038

REVISION

DATE

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RESOURCE DOCUMENTS

DRAWN BY

CDR

DATE DRAWN

02/06/2025

PV-7.2

Enphase IQ Combiner 4/4C

X-IQ-AM1-240-4
X-IQ-AM1-240-4C



To learn more about Enphase offerings, visit enphase.com



The **Enphase IQ Combiner 4/4C** with Enphase IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure and streamlines IQ microinverters and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and Eaton BR series busbar assembly.

Smart

- Includes IQ Gateway for communication and control
- Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), included only with IQ Combiner 4C
- Includes solar shield to match Enphase IQ Battery aesthetics and deflect heat
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

Simple

- Centered mounting brackets support single stud mounting
- Supports bottom, back and side conduit entry
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- Two years labor reimbursement program coverage included for both the IQ Combiner SKU's
- UL listed

Enphase IQ Combiner 4/4C

MODEL NUMBER	
IQ Combiner 4 (X-IQ-AM1-240-4)	IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match the IQ Battery system and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C)	IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.
ACCESSORIES AND REPLACEMENT PARTS (not included, order separately)	
Ensemble Communications Kit COMMS-CELLMODEM-M1-06 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites - 4G based LTE-M1 cellular modem with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V BRK-15A-2-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220 Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 4/4C
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Gateway printed circuit board (PCB) for Combiner 4/4C
X-IQ-NA-HD-125A	Hold down kit for Eaton circuit breaker with screws.
ELECTRICAL SPECIFICATIONS	
Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. total branch circuit breaker rating (input)	80A of distributed generation / 95A with IQ Gateway breaker included
Envoy breaker	10A or 15A rating GE/Siemens/Eaton included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway
Consumption monitoring CT (CT-200-SPLIT)	A pair of 200 A split core current transformers
MECHANICAL DATA	
Dimensions (WxHxD)	37.5 x 49.5 x 16.8 cm (14.75" x 19.5" x 6.63"). Height is 21.06" (53.5 cm) with mounting brackets.
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C [-40° to 115° F]
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)
INTERNET CONNECTION OPTIONS	
Integrated Wi-Fi	802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)
COMPLIANCE	
Compliance, IQ Combiner	UL 1741, CAN/CSA C22.2 No. 107.1, 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production) Consumption metering: accuracy class 2.5
Compliance, IQ Gateway	UL 60601-1/CANCSA 22.2 No. 61010-1

To learn more about Enphase offerings, visit enphase.com

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info@gogenesissolar.com

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RESOURCE DOCUMENTS

DRAWN BY

CDR

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PV-7.3



SOLAR'S FASTEST ATTACHMENT

NanoMount®

Rafter or Deck Mount



Damaging roof shingles used to be one of solar installer's worst challenges.

Now, the easy, affordable solution is NanoMount®, SunModo's new and improved patented solar mounting innovation.

The mount eliminates the need for lifting shingles and dramatically reduces the installation time.

The NanoMount® Advantage

- ✓ The fastest roof attachment in solar.
- ✓ Versatile mounting options including Deck or Rafter mount.
- ✓ Eliminates the need to lift shingles and prevents damage to shingles.
- ✓ High-Velocity Hurricane Zone Approved - Passed TAS 100 (a) Wind-Driven Rain Test.
- ✓ All materials are compatible with asphalt shingles and single-ply roof membranes.

Key Features of NanoMount®



Technical Data

Application	Residential roof coverings, commercial single-ply roof membranes	
Material	High grade aluminum, 304 stainless steel hardware	
Finish	Black powder coating	
Roof Attachment	Rafter and decking	
Structural integrity	IBC and IRC Compliant	MIAMI-DADE COUNTY APPROVED
Warranty	25 years	

SunModo, Corp. Vancouver, WA., USA • www.sunmodo.com • 360.844.0048 • info@sunmodo.com



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PV-7.4



SunModo introduces the SMR Pitched Roof System, the best value pitched roof mounting system on the market.

With fast and easy Pop-On Clamps and L-Foot adaptors, professional installers can mount, adjust, and secure PV panels with a single tool.

Whether rafter or deck, portrait or landscape, the SMR System is the ideal solution for your solar installation. Save money on materials and installation time.

The SMR System Advantage

- ✓ The best value, best performing rail system on the market
- ✓ Lag-to-Panel single tool installation
- ✓ Pop-On universal clamps make installation fast, reliable and flexible
- ✓ A full range of roof attachments to meet every need
- ✓ Fastest install and lowest cost

Key Features of the SMR System



SMR 100 Rail
4' span or more up to 90 psf snow load or 190 mph winds



The SMR System represents a huge leap in racking technology.

Optimized design makes the SMR Rails not only the lightest but also the strongest rails on the market. One tool assembly and Pop-On technology allow fast and worry-free installation.

The cost and performance cannot be beaten.

Clamps & Grounding



Mid Clamp
The Bonding Pop-On Universal Mid Clamps accommodate PV module frame heights ranging from 30mm to 48mm. The fastest installing Mid Clamps on the market.



L Foot Adaptor
Fast and easy Pop-On L-Foot Adaptor speeds installation and eliminates old-fashioned T-Bolts. Install fast with full confidence in every attachment.



End Clamp
End Clamps are adjustable for different module frame heights and provide fast and secure attachment of modules.



Rail Splice
Structural bonding splice with fast and easy single bolt installation



Wire Management Clip
The clip attaches to the channel on the SMR rail to provide a neat and effective solution for PV wire management.



Grounding Lug
The Lug provides proper grounding of the PV System

Technical Data

Application	Pitched Roof
Roof Type	Composition shingle, Metal and Tile
Material	High grade aluminum and 304 stainless steel hardware
PV Modules	Compatible with all common module types
Module Orientation	Portrait and landscape
Roof Attachment	Rafter and decking
Structural Integrity	IBC compliant, stamped engineering letters available
Certificate	UL 2703 listed by ETL
Warranty	25 years

SunModo, Corp. Vancouver, WA., USA • www.sunmodo.com • 360.844.0048 • info@sunmodo.com



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DATE DRAWN 02/06/2025

PV-7.5



DATASHEET
ECS SERIES
ECS4000-H2 / H3 / H4 / H5

Fox ESS ECS
BATTERY STORAGE SYSTEM



HIGH VOLTAGE BATTERY
FROM Fox ESS

The ECS is a high-performance, scalable battery storage system. The modular design allows for maximum flexibility, making it suitable for a broad range of storage applications.

Additional batteries can be installed in series, allowing for a maximum storage capacity of 19.87 kWh. Installation is easy, with a plug and play solution that can save valuable time for installers.

- 3.97 kWh Capacity
- Scalable to 19.87 kWh
- 90% Depth of Discharge
- Wide Temperature Tolerance
- Easy Installation
- CAN Communication
- Voltage Range up to 328.5 V



us.fox-ess.com



FOX
ECS SERIES
ECS4000-H2 / H3 / H4 / H5

Model	ECS4000-H2	ECS4000-H3	ECS4000-H4	ECS4000-H5
Electrical Characteristics				
Battery Type	LiFePO ₄ Prismatic Cell			
Battery Module	1*CM4000 1*CS4000	1*CM4000 2*CS4000	1*CM4000 3*CS4000	1*CM4000 4*CS4000
Nominal Capacity (kWh)	7.95	11.92	15.9	19.87
Nominal Voltage (V)	115.2	172.8	230.4	288
Operating Voltage (V)	97.2-131.4	145.8-197.1	194.4-262.8	243-328.5
Max. Charge / Discharge Current (A)	50			
Peak Discharge Current (A)	65A @50sec			
Round-trip Efficiency	>95%			
Depth of Discharge	90%			
Communication	CAN			
Display	CS: LED*1, CM: LED*6			
Scalability	Max. 5 Modules in Series			
Operating Conditions				
Installation Location	Outdoor / Indoor (Stand)			
Operating Temperature (°C / °F)	-10 to 55 / 14 to 131			
Storage Temperature (°C / °F)	-20 to 55 / -4 to 131			
Cooling Method	Natural Convection			
Humidity	0% to 100% (No Condensing)			
Altitude (m / ft)	Max. 2,000 / 6,560			
Mechanical Characteristics				
Dimensions (W x H x D) (mm)	570 x 350 x 380	570 x 470 x 380	570 x 590 x 380	570 x 710 x 380
Dimensions (W x H x D) (inch)	22.4 x 13.8 x 15.0	22.4 x 18.5 x 15.0	22.4 x 23.2 x 15.0	22.4 x 28.0 x 15.0
Weight (kg / lbs)	73.5 / 161.7	108.4 / 238.5	143.3 / 315.3	178.2 / 392
Certificates				
Safety	UL1973, UL9540, UL9540A			
Transportation	UN38.3			
Ingress Protection	IP65			
Warranty				
Standard Warranty (Year)	Standard 12.5 years*1			

*1 Refer to FoxESS Battery Warranty Terms and Conditions



Version US Mainland 2023/06/28



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(913) 228-4495

info@gogenesissolar.com

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DAVID CONLEY JR

1192 SW COYOTE CIR, FORT
WHITE, FL 32038

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RESOURCE DOCUMENTS

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PV-7.6



DATASHEET

Split-Phase Hybrid

HI&AC1-3.8-US / 5.7 / 7.6 / 9.6 / 11.4



US SERIES







Fox ESS storage solutions are available with advanced and intuitive app based remote control and monitoring functionality.



EASY INSTALLATION

Flexible configuration, plug and play set-up.



HIGH VOLTAGE

Compatible with high-voltage batteries for maximum round-trip efficiency.



TYPE 4X

Engineered to last with maximum flexibility. Suitable for outdoor installation.



REMOTE MONITORING

Monitor your system remotely via smartphone app or web portal.



REFINED - POWERFUL - FLEXIBLE

BATTERY EXPANSION

EASY UPGRADE



Expand your system easily by simply adding additional batteries. There are six battery size options, and seven batteries can be installed in series, providing up to 27.8 kWh of storage capacity.



For more about the Fox ESS range, visit:

us.fox-ess.com



TECHNICAL SPECIFICATIONS

AC Inverter Model:	AC1-3.8-US	AC1-5.7-US	AC1-7.6-US	AC1-9.6-US	AC1-11.4-US			
Hybrid Inverter Model:	H1-3.8-US	H1-5.7-US	H1-7.6-US	H1-9.6-US	H1-11.4-US			
PV INPUT (ONLY FOR HYBRID)								
Max. Input Power [W]	5700	8550	11400	14400	17300			
Max. Input Voltage [V]	600							
Start-up Input Voltage [V]	100							
Rated Input Voltage [V]	380							
MPPT Operating Voltage Range [V]	80~550							
MPPT Operating Voltage Range [V] (Full Load)	204~500	204~500	271~500	257~500	305~500			
Max. Input Current [A]	28 / 14		28 / 14 / 14					
Max. Short-circuit Current [A]	44 / 22		44 / 22 / 22					
No. of Independent MPPT Trackers	2		3					
No. of Strings per MPPT Tracker	2 / 1		2 / 1 / 1					
BATTERY CONNECTION								
Battery Type	Lithium Battery (LFP)							
Battery Voltage Range [V]	85~360							
Rated Battery Voltage [V]	360							
Max. Continuous Charge / Discharge Current [A]	50							
Max. Continuous Charge / Discharge Power [W] (for H1)	5700/4180	8550/6270	11400/8360	14400/10560	17300/12540			
(for AC1)	3800/4180	5700/6270	7600/8360	9600/10560	11400/12540			
Max. Discharge Current (60s) [A]	60							
BMS Communication Interface	CAN 2.0							
AC INPUT AND OUTPUT (GRID)								
Max. AC Input Power [VA]	3800	5700	7600	9600	11400			
Max. AC Input Current [A]	16	24	32	40	48			
Input Voltage Range [V]	211~264							
Input Frequency Range [Hz]	57~63							
Rated Output Power [W]	3800	5700	7600	9600	11400			
Max. Output Apparent Power (VA)	3800	5700	7600	9600	11400			
Rated Output Current [A]	15.8	23.8	31.7	40.0	47.5			
Max. Output Current [A]	15.8	23.8	31.7	40.0	47.5			
Rated Grid Voltage [V]	240 (211~264)							
Rated Grid Frequency [Hz]	57~63							
Power Factor	>0.99 (Adjustable from 0.8 leading to 0.8 lagging)							
THD	<3 @rated power							
AC OUTPUT (BACKUP)								
Rated Output Power [W]	3800	5700	7600	9600	11400			
Max. Output Apparent Power (VA)	4180	6270	8360	10560	12540			
Peak Output Apparent Power (10min) [VA]	4560	6840	9120	11520	13680			
Peak Output Apparent Power (60s) [VA]	5130	7695	10260	12960	15390			
Max. Continuous Output Current [A]	17.4	26.1	34.8	44.0	52.3			
LRA [A]	110							
Rated Output Voltage [V]	120 / 240							
Rated Output Frequency [Hz]	60							
THDv (Linear Load) [%]	<3 @rated power							
Imbalance for Split-Phase Loads [%]	100							
EFFICIENCY								
CEC Efficiency [%]	97.00							
Max. Efficiency [%]	97.60							
Max. Battery Discharge Efficiency (BAT to AC) (@full load, 340Vdc) [%]	97.40							
PROTECTION								
Insulation Monitoring	YES							
Residual Current Monitoring	YES							
DC Reverse Polarity Protection	YES							
Anti-islanding Protection	YES							
AC Short-circuit Protection	YES							
AC Overcurrent / Overvoltage Protection	YES							
DC Switch	YES							
SPD	DC: Type II, /AC: Type II							
AFCI	YES							
GENERAL DATA								
Dimensions (HxWxD) [inch]	25.2*17.7*9.6 inch (640*450*244mm)							
Weight [lbs]	83.3 (38kg)							
Installation	Wall-mounted							
Topology	Transformerless							
Cooling Method	Natural convection							
Noise Emission [dB]	<35							
Max. Operating Altitude	9843 ft (3000 m), derating above 6560 ft (2000 m)							
Operating Temperature Range	-13°F~+140°F (-25°C ~+60°C), derating above 104°F (40°C)							
Humidity [%]	0 ~ 100 (No Condensation)							
Protection Degree	Type 4X							
Standby consumption [W]	<25							
Monitoring Module	WiFi, LAN							
Communication	CAN2.0, RS485, SUNSPEC							
Display	LED, App, Website							
Warranty	12.5 Years							
STANDARD COMPLIANCE (MORE AVAILABLE UPON REQUEST)								
Safety	UL1741, UL1741 SA, UL1699B, CSA C22.2, UL62109-1, UL1998							
EMC	FCC Part 15 Class B							
Grid Regulation	IEEE1547, IEEE1547.1, Rule 21							

Version 3.8 | 2023/06/13

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RESOURCE DOCUMENTS

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CDR

DATE DRAWN

02/06/2025

PV-7.7



DATASHEET
FOX HUB G2



As a smart energy management system, Fox Hub completes the most critical piece of the puzzle in Fox ESS residential energy storage system. By integrating several intelligent features, Fox Hub centralizes power from multiple sources and performs energy redistribution via FoxCloud US App to provide a more comprehensive power solution. It reassures energy flow safety under different circumstances, and relieves homeowners from power loss concern.

- Automatic Off-Grid Protection
- Seamless On/Off Grid Transition
- Smart Load Shedding Circuit
- Inverter Scalability
- Generator Compatibility



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DATASHEET
FOX HUB G2

MODULE	Fox Hub G2
GENERAL ELECTRICAL	
AC Current (Nominal) [A]	200
AC Input Voltage (Nominal) [Vac]	240
AC Output Voltage (Nominal) [Vac]	120/240
Rated AC Power [KW]	48
AC Voltage Range [Vac]	211-264
AC Frequency (Nominal) [Hz]	60
AC Frequency Range [Hz]	57-63
Microgrid Interconnection Device Rated Current [A]	200
Grid Disconnection Switchover Time [ms]	<15
EXTERNAL CONNECTION	
3rd Party Solar [A]	80
FOX Inverter [A]	80
Smart Circuits 1, 2 (120V) [A]	80
Smart Circuit 3 (240V) [A]	80
Non-Backup Load [A]	200
Backup Load Terminal [A]	200
GENERATOR (Optional)	
Maximum Rated AC Power [KW]	48
AC Voltage Range [Vac]	211-264
Maximum Continuous Input Current [Adc]	200
Dry Contact Switch Voltage Rating [Vac/Vdc]	250/30
Dry Contact Switch Current Rating [A]	0.5A(250Vac) / 3A(30Vdc)
2-wire Start Switch	Yes
ADDITIONAL FEATURES	
Maximum Number of Inverter	4
Communication	CAN, RS485
Energy Meter (for Import/Export)	0.5% accuracy
STANDARD COMPLIANCE	
Safety	UL67,UL869A,UL916,UL1741,CSA22.2 NO.107
Emissions	FCC part 15 class B
INSTALLATION SPECIFICATIONS	
Dimensions (W*H*D)[inch / mm]	17.4*25.6*6.2 inch / 443*650*156.6 mm
Weight [lb / Kg]	35.3lbs / 16Kg
Supported Inverters	FOX US Series, AIO US Series
Grid Conduit Size / AWG Range	2.5"Conduits / 6AWG - 250kcmil
Generator Input Conduit Size / AWG Range	2.5"Conduits / 6AWG - 250kcmil
Communication Conduit Size / AWG Range	1"Conduits / 24AWG - 16AWG
Cooling	Natural convection
Noise [dBA]	<35dB
Operating Temperature Range [°F / °C]	-4°F~+122°F (-20 °C ~ +50 °C)
Protection Rating	Type 3R
Warranty [Years]	12.5

V1.5 2023/06/30



GOGENESIS SOLAR

6028 STONYBROOK CT,
TOPEKA,KS 66614
(913) 228-4495

info@gogenesissolar.com

DC SIZE: 9.600 KW DC
AC SIZE: 6.960 KW AC

DAVID CONLEY JR

1192 SW COYOTE CIR, FORT
WHITE, FL 32038

REVISION

DATE	REV
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RESOURCE DOCUMENTS

DRAWN BY CDR

DATE DRAWN 02/06/2025

PV-7.8