PROJECT DESCRIPTION:

36 x 450 REC SOLAR: REC450AA PURE-RX (450W) MODULES
ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES

DC SYSTEM SIZE: 16.20 kW DC STC
AC SYSTEM SIZE: 13.68 kW AC

EQUIPMENT SUMMARY
36 REC SOLAR: REC450AA PURE-RX (450W) MODULES
36 ENPHASE IQ8X-80-M-US (240V) MICRO-INVERTERS
01 FRANKLIN aGATE X ENERGY MANAGEMENT DEVICE
02 FRANKLIN aPOWER 2 BATTERY, 15 KWH

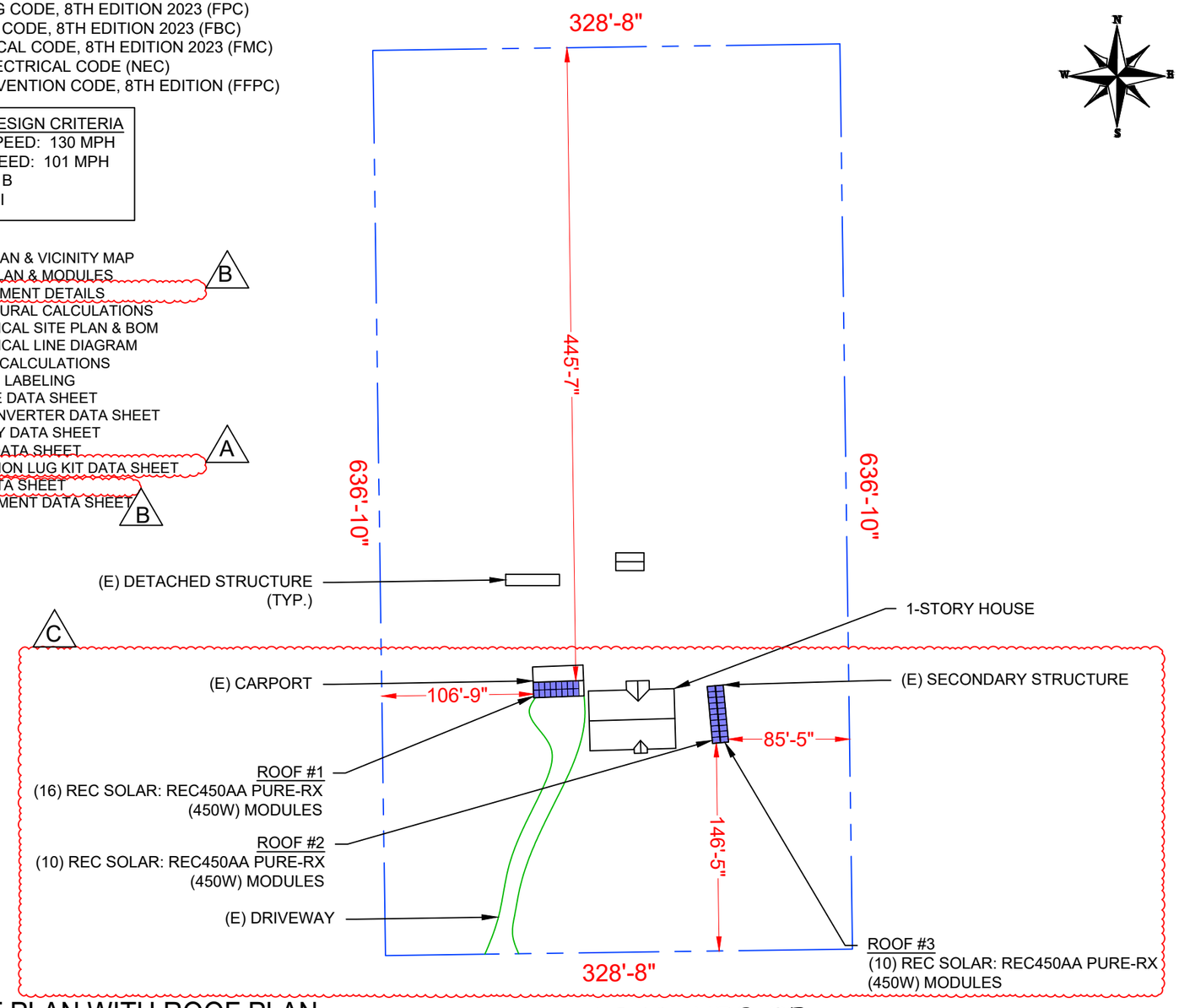
GOVERNING CODES :
FLORIDA RESIDENTIAL CODE, 8TH EDITION 2023 (FRC)
FLORIDA PLUMBING CODE, 8TH EDITION 2023 (FPC)
FLORIDA BUILDING CODE, 8TH EDITION 2023 (FBC)
FLORIDA MECHANICAL CODE, 8TH EDITION 2023 (FMC)
2020 NATIONAL ELECTRICAL CODE (NEC)
FLORIDA FIRE PREVENTION CODE, 8TH EDITION (FFPC)

ASCE 7-22 WIND DESIGN CRITERIA
ULTIMATE WIND SPEED: 130 MPH
NOMINAL WIND SPEED: 101 MPH
WIND EXPOSURE: B
RISK CATEGORY: II

SHEET INDEX

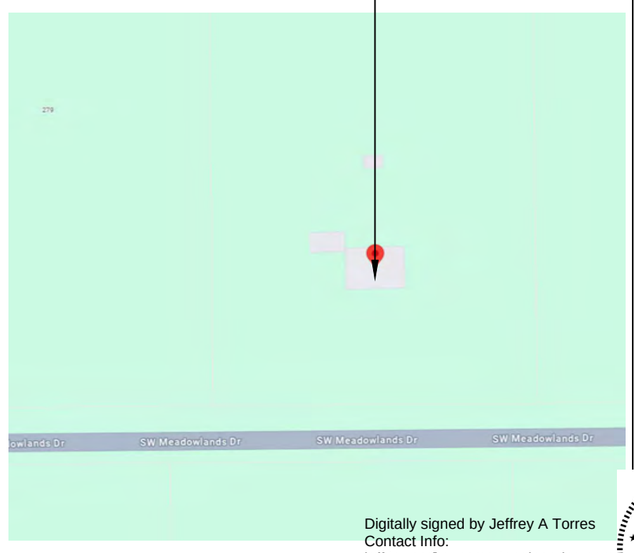
DISCLAIMER :
THE SET OF PLANS FOR THIS PROJECT IS FOR DESIGNING THE PROJECT FOR BUILDING CODE COMPLIANCE. THIS DOES NOT EXPRESS OR IMPLY A PERFORMANCE GUARANTEE OF ANY KIND. CONTRACTOR RESPONSIBLE TO REVIEW AND APPROVE THE LAYOUT WITH THE END USER PRIOR TO INSTALLATION.

ALL DIMENSION AND CONDITION SHOWN ON THE SET OF PLANS IS BASED ON THE INFORMATION GIVEN. CONTRACTOR RESPONSIBLE TO FIELD VERIFY ALL CONDITION IN THE FIELD PRIOR TO INSTALLATION OR ACCEPTS FULL RESPONSIBILITY.



1 PLOT PLAN WITH ROOF PLAN
A-00 SCALE:1"=90'-0"

2 HOUSE PHOTO
A-00 SCALE: NTS



3 VICINITY MAP
A-00 SCALE: NTS

Digitally signed by Jeffrey A Torres
Contact Info:
jeff.torres@sunsmartengineering.com
Date: 2025.09.03 10:58:43-04'00'

JEFFREY A. TORRES LICENSE No 80379 STATE OF FLORIDA PROFESSIONAL ENGINEER

This item has been digitally signed and sealed by Jeffrey A. Torres, P.E. on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

PPM.SOLAR

POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

REVISIONS		
DESCRIPTION	DATE	REV
CLIENT COMMENT	06/05/2025	A
CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C
DATE: 05/26/2025		

PROJECT NAME
C
CHARLES LYE
223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
PLOT PLAN & VICINITY MAP

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
A-00

Signature with Seal

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 36 MODULES C

MODULE TYPE = REC SOLAR: REC450AA PURE-RX (450W) MODULES
WEIGHT = 50.0 LBS / 22.67 KG.
MODULE DIMENSIONS = 68.0" x 47.4" = 22.38 SF

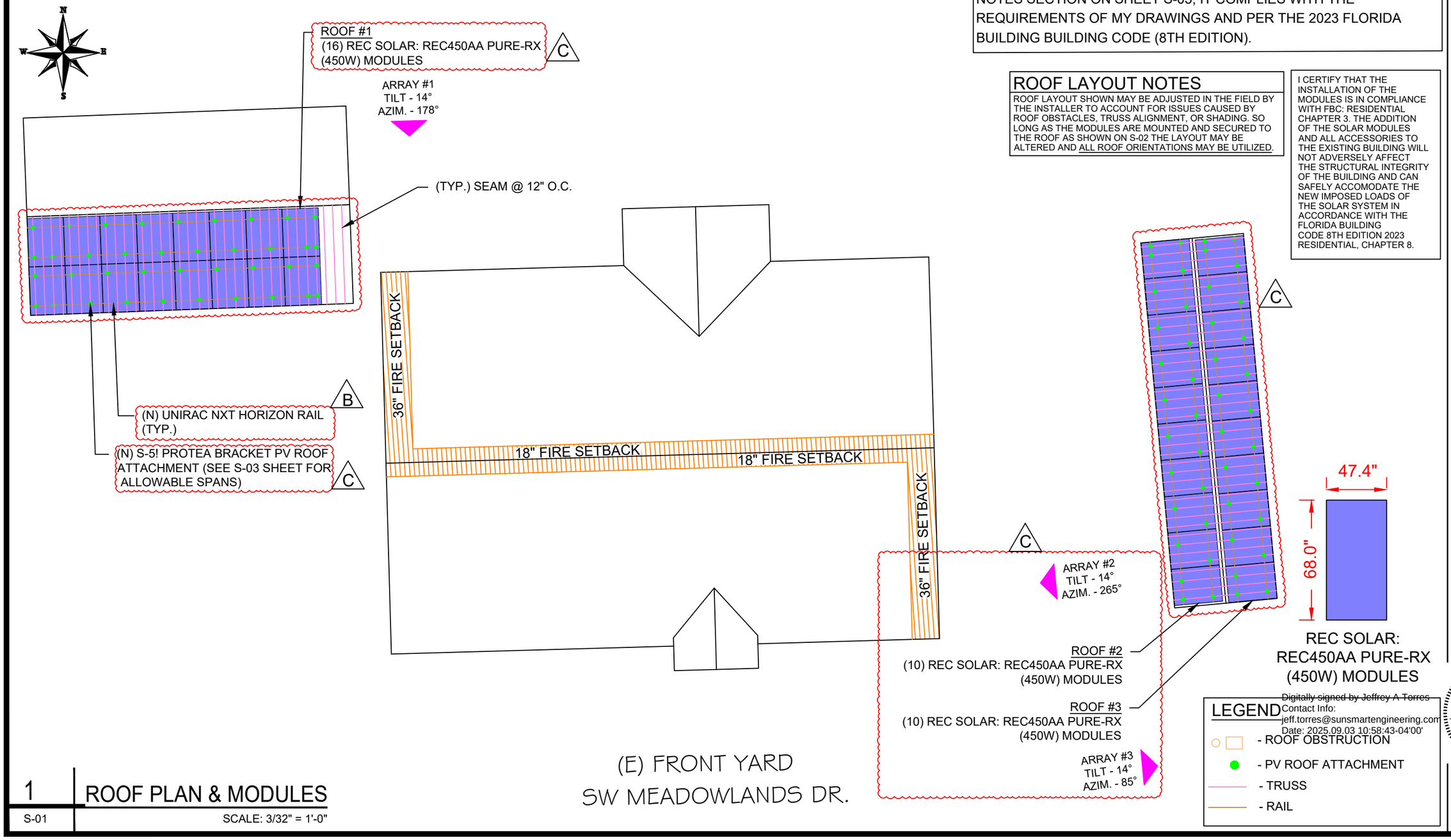
TOTAL ARRAY AREA = 805.80 SQ. FT.
TOTAL ROOF FACE AREA = 2659.60 SQ. FT.
805.80 / 2659.60= 32.82% OF ROOF
FACE AREA COVERED BY ARRAY

NOTE :THE SEAM LOCATIONS AND ATTACHMENT POINTS SHOWN ON SHEET S-01 IS ONLY SHOWS AN ILLUSTRATIVE REPRESENTATION OF A SEAM LAYOUT SPACED APPROX 12" ON CENTER WITH ATTACHMENT POINTS TO THE SEAMS . THIS DOES NOT REPRESENT THE EXACT LOCATIONS AND THE CONTRACTOR IS RESPONSIBLE TO VERIFY THAT IN THE FIELD. AS LONG AS THE SPACING OF THE ROOF ATTACHMENTS AND THE RAIL CANTILEVER ARE WITHIN THE PARAMETERS ALLOWED AS STATED IN THE GENERAL STRUCTURAL NOTES SECTION ON SHEET S-03, IT COMPLIES WITH THE REQUIREMENTS OF MY DRAWINGS AND PER THE 2023 FLORIDA BUILDING BUILDING CODE (8TH EDITION).

ROOF LAYOUT NOTES

ROOF LAYOUT SHOWN MAY BE ADJUSTED IN THE FIELD BY THE INSTALLER TO ACCOUNT FOR ISSUES CAUSED BY ROOF OBSTACLES, TRUSS ALIGNMENT, OR SHADING. SO LONG AS THE MODULES ARE MOUNTED AND SECURED TO THE ROOF AS SHOWN ON S-02 THE LAYOUT MAY BE ALTERED AND ALL ROOF ORIENTATIONS MAY BE UTILIZED.

I CERTIFY THAT THE INSTALLATION OF THE MODULES IS IN COMPLIANCE WITH FBC: RESIDENTIAL CHAPTER 3. THE ADDITION OF THE SOLAR MODULES AND ALL ACCESSORIES TO THE EXISTING BUILDING WILL NOT ADVERSELY AFFECT THE STRUCTURAL INTEGRITY OF THE BUILDING AND CAN SAFELY ACCOMODATE THE NEW IMPOSED LOADS OF THE SOLAR SYSTEM IN ACCORDANCE WITH THE FLORIDA BUILDING CODE 8TH EDITION 2023 RESIDENTIAL, CHAPTER 8.



LEGEND
- ROOF OBSTRUCTION
- PV ROOF ATTACHMENT
- TRUSS
- RAIL

Digitally signed by Jeffrey A Torres
Contact Info: jeff.torres@sunsmartengineering.com
Date: 2025.09.03 10:58:43-04'00'

JEFFREY A. TORRES LICENSE No 80379 STATE OF FLORIDA PROFESSIONAL ENGINEER

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1 ROOF PLAN & MODULES
S-01 SCALE: 3/32" = 1'-0"

PPM.SOLAR

POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

REVISIONS

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CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C
DATE: 05/26/2025		

PROJECT NAME
C
CHARLES LYE
223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

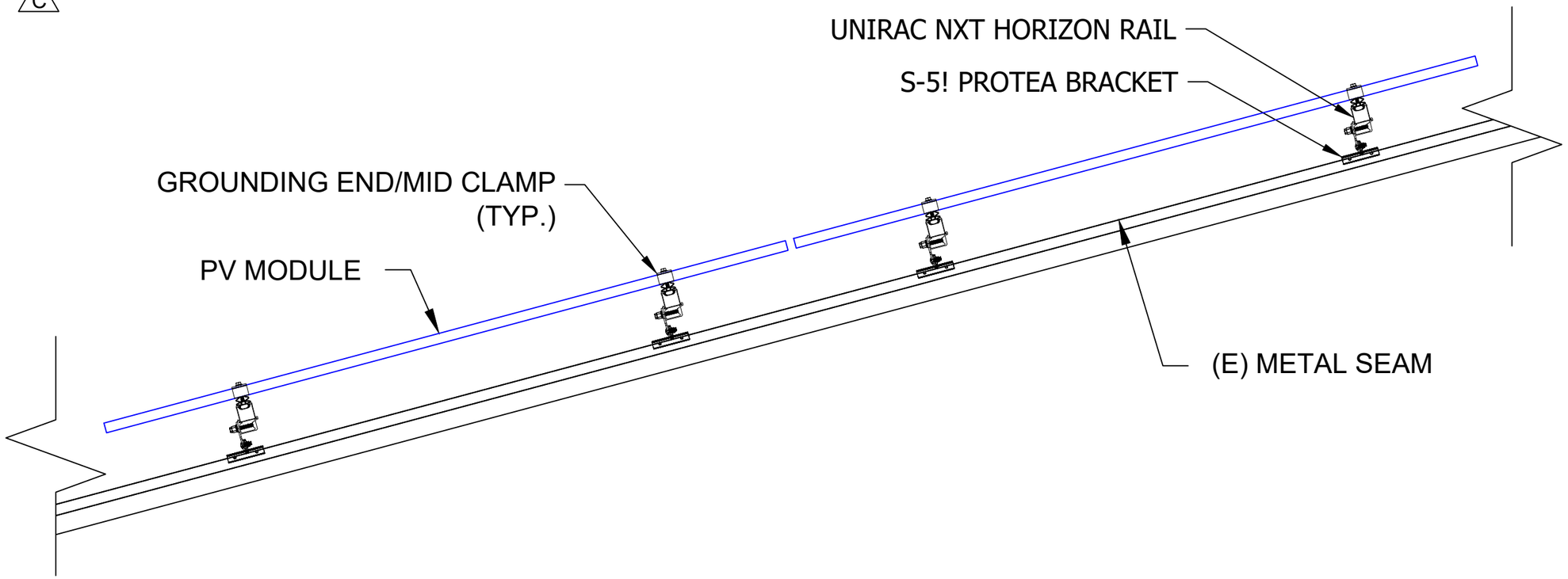
SHEET NAME
ROOF PLAN & MODULES

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-01

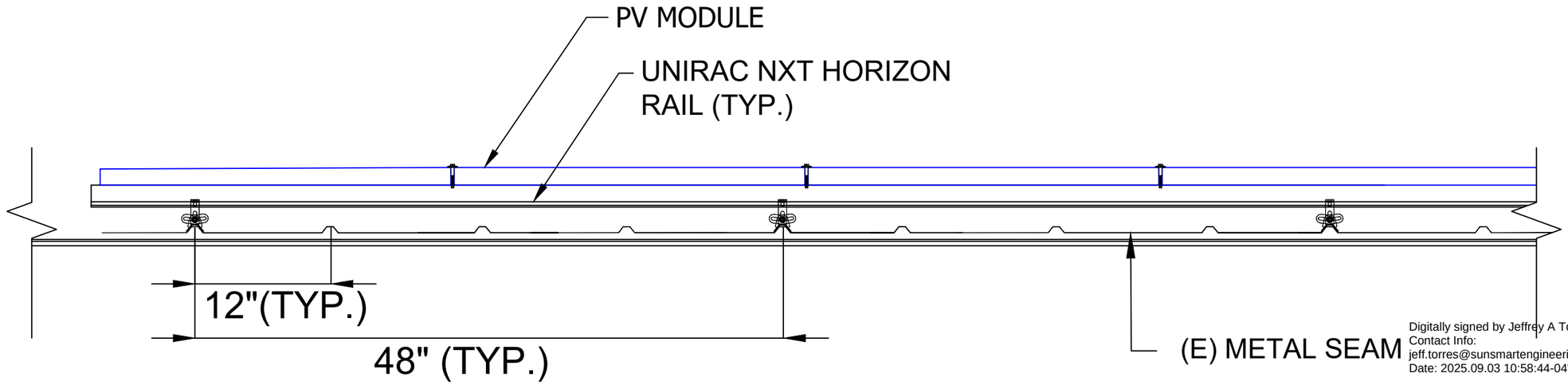
Signature with Seal

B C



1 ATTACHMENT DETAIL (SIDE VIEW)

S-02 SCALE: NTS



2 ATTACHMENT DETAIL (FRONT VIEW)

S-02 SCALE: NTS

PPM.SOLAR
POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

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CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C
DATE: 05/26/2025		

PROJECT NAME

C CHARLES LYE

223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
ATTACHMENT DETAILS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-02

Signature with Seal

JEFFREY A. TORRES LICENSE No 80379 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by Jeffrey A Torres
Contact Info:
jeff.torres@sunsmartengineering.com
Date: 2025.09.03 10:58:44-04'00'

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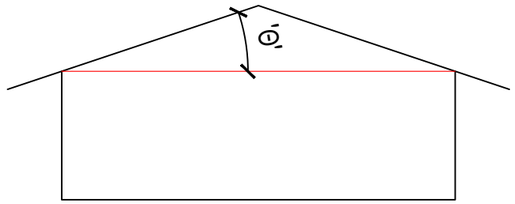
PV MODULE MOUNTING NOTES:

1. APPLICABLE CODES & STANDARDS:
   - 2023 FLORIDA BUILDING CODE (8TH EDITION)
   - 2023 FLORIDA RESIDENTIAL CODE (8TH EDITION)
   - ASCE-7-22 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.
2. ALL FASTENERS & ANCHOR BOLTS THIS SHEET SHALL BE STAINLESS STEEL OR OTHERWISE CORROSION-RESISTANT.
3. ROOF SEALANTS SHALL CONFORM TO ASTM C920 AND ASTM 6511, AND IS THE RESPONSIBILITY OF THE CONTRACTOR TO PILOT FILL ALL HOLES. CONTRACTOR SHALL ENSURE ALL ROOF PENETRATIONS TO BE INSTALLED AND SEALED PER 2023 FLORIDA RESIDENTIAL CODE (8TH EDITION) OR LOCAL GOVERNING CODE.
4. THIS SHEET REFLECTS STRUCTURAL CONNECTIONS ONLY.
5. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER INSTRUCTIONS.

SITE, MODULE, & ANCHOR INFORMATION							
Vult	130 MPH	ROOF		MODULE		ANCHOR TYPE	S-5! PROTEA BRACKET TO ROOF RIB
V	101 MPH	MEAN HEIGHT	15'-0"	WIDTH	47.4"		
RISK CAT.	II	TYPE	GABLE	LENGTH	68"		
EXP.	B	PITCH	3/12	MOUNTING	SHORT-AXIS		

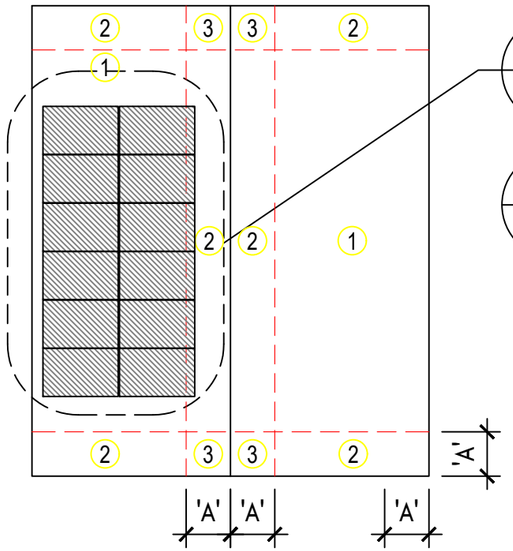
WIND LOAD & RAIL SPAN INFORMATION								
ZONE	NON-EXPOSED MODULES				EXPOSED MODULES			
	WIND LOAD (PSF)		SPAN	OVERHANG	WIND LOAD (PSF)		SPAN	OVERHANG
	(+)	(-)			(+)	(-)		
1'	---	---	---	---	---	---	---	---
1	16.0	-16.0	73.9"	29.5"	16.0	-20.1	69.8"	27.9"
2	16.0	-18.3	71.4"	28.6"	16.0	-27.5	64.5"	25.8"
3	16.0	-24.2	66.6"	26.6"	16.0	-36.3	52.5"	21"

- PLUS AND MINUS SIGNS SIGNIFY PRESSURES ACTING TOWARD AND AWAY FROM SURFACES, RESPECTIVELY.
- SEE DETAIL BELOW FOR WIND ZONE LOCATIONS. "---" IN TABLE INDICATE CONDITIONS WHERE INSTALLATION IS NOT ALLOWABLE OR NOT RELEVANT TO THE ROOF TYPE IN QUESTION.
- EXPOSED MODULES ARE THOSE DEFINED BY ASCE 7-22 29.4.4. SEE SHEET S-01 FOR ALL EXPOSED MODULE LOCATIONS, IF THEY EXIST.
- SCHEDULE REFLECTS COMPONENTS AND CLADDING (C&C) NOMINAL WIND PRESSURES WITH EXPOSURE AS NOTED, RISK CATEGORY AS NOTED, ENCLOSED BUILDING AND h < 60'-0" PER ASCE 7-22 AND 2023 FLORIDA BUILDING CODE.
- FOR LAG BOLTS, DEPTH REQUIRED IN WOOD MEMBER SHALL EXCLUDE ANY ROOF DECKING THICKNESS.

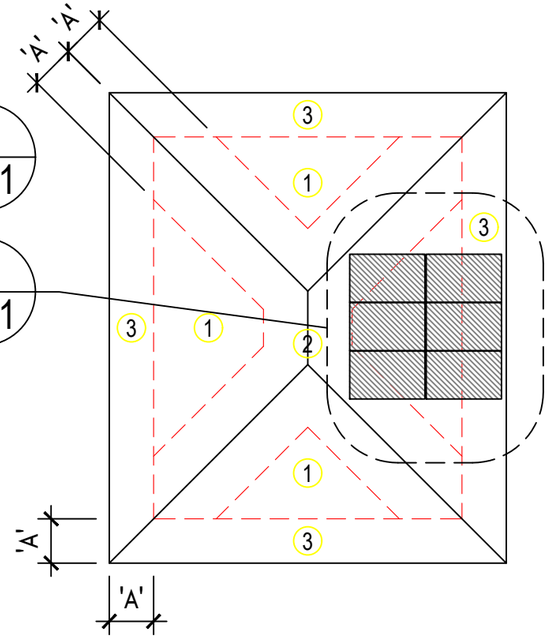


TYPICAL ROOF ELEVATION

NOTES:
1. "A" DIMENSION DEFINED PER ASCE 7-22 SHALL BE 4 FT PER FBC 2023 (8TH EDITION) FIGURE R301.2(7).
2. "θ" DIMENSION IS ROOF PITCH, 7°-27°.



TYPICAL GABLE ROOF PLAN



TYPICAL HIP ROOF PLAN

C
B

PPM.SOLAR

POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

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CLIENT COMMENT	08/19/2025	C
DATE: 05/26/2025		

PROJECT NAME

C
CHARLES LYE

223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
STRUCTURAL CALCULATIONS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
S-03

Signature with Seal

Digitally signed by Jeffrey A Torres
Contact Info:
jeff.torres@sunsmartengineering.com
Date: 2025.09.03 10:58:44-04'00'

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EQUIPMENT SUMMARY
DC SYSTEM SIZE: 16.20 KW DC STC
AC SYSTEM SIZE: 13.68 KW AC

(36) REC SOLAR: REC450AA PURE-RX (450W) MODULES

(02) BRANCHES OF 10 MODULES &
(02) BRANCHES OF 08 MODULES

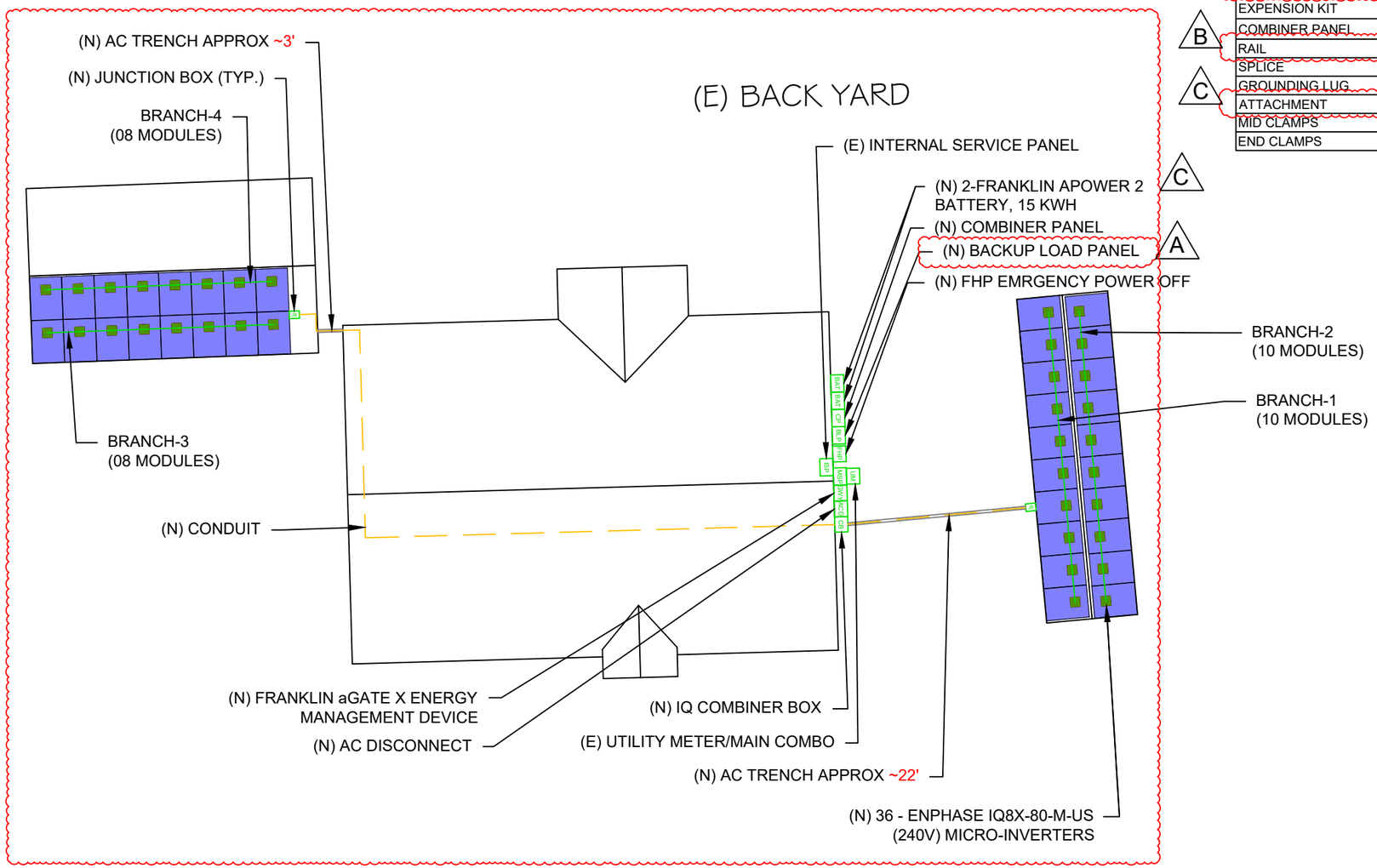
C

ELECTRICAL CERTIFICATION STATEMENT:

SUBJECT PV SYSTEM HAS BEEN DESIGNED TO MEET THE REQUIREMENTS OF THE NEC 2020, AND/OR THOSE SET FORTH BY THE FLORIDA SOLAR ENERGY CENTERCERTIFICATION, INCLUDING MAXIMUM NUMBER OF MODULE STRINGS. MAXIMUM NUMBER OF MODULES PER STRING, MAXIMUM OUTPUT, MODULE MANUFACTURER AND MODEL NUMBER, INVERTER MANUFACTURER AND MODEL NUMBER, AS APPLICABLE. HB1021 AMENDED F.S. 377.05 IN 2017 REMOVED THE REQUIREMENT FOR DESIGNERS TO HAVE THEIR SYSTEM DESIGNS CERTIFIED BY FSEC. THE VERBIAGE .... UNLESS OTHERWISE CERTIFIED BE AN ENGINEER LICENSED PURSUANT TO CHAPTER 471 USING THE STANDARDS CONTAINED IN THE MOST RECENT VERSION OF THE FLORIDA BUILDING CODE," ALLOWS LICENSED ENGINEERS TO DESIGN PV SYSTEMS ON THEIR OWN AS THEY DO IN ALL OTHER TRADES.

BILL OF MATERIALS

	EQUIPMENT	QTY	DESCRIPTION
C	SOLAR PV MODULE	36	REC SOLAR: REC450AA PURE-RX (450W) MODULES
	MICRO-INVERTER	36	ENPHASE IQ8X-80-M-US (240V) MICRO-INVERTERS
	COMBINER BOX	1	125A ENPHASE IQ COMBINER
	BATTERY	2	FRANKLIN APOWER 2 BATTERY, 15 KWH
C	GATEWAY	1	FRANKLIN aGATE X ENERGY MANAGEMENT DEVICE
	JUNCTION BOX	2	JUNCTION BOX 600V, NEMA 3R UL LISTED
	FHP SWITCH	1	FHP EMRGENCY POWER OFF
	BREAKER	1	15A/2P BREAKER
	BREAKER	2	200A/2P BREAKER
A	BREAKER	2	125A/2P BREAKER
	BREAKER	4	20A/2P BREAKER
	BREAKER	1	80A/2P BREAKER
	BREAKER	2	60A/2P BREAKER
	AC DISCONNECT	1	100A RATED NON-FUSED AC DISCONNECT
A	BACKUP LOAD PANEL	01	125A RATED BACKUP LOAD PANEL
	EXPENSION KIT	01	FRANKLINWH BACKUP LUG EXPANSION KIT
B	COMBINER PANEL	1	125A RATED COMBINER PANEL, 240V
	RAIL	22	UNIRAC NXT HORIZON RAIL,168 "
	SPLICE	16	SPLICE KIT
C	GROUNDING LUG	8	GROUNDING LUG
	ATTACHMENT	84	S-5! PROTEA BRACKET PV ROOF ATTACHMENT
	MID CLAMPS	64	MID CLAMPS
	END CLAMPS	16	END CLAMPS



1 ELECTRICAL SITE PLAN
E-01 SCALE: 1"=16'-0

LEGEND

A

- BLP - BACKUP LOAD PANEL
- FHP - EMRGENCY POWER OFF
- CP - COMBINER PANEL
- ACD - AC DISCONNECT
- CB - IQ COMBINER BOX
- BAT - BATTERY
- ISP - INTERNAL SERVICE PANEL
- GWY - aGATE
- UM - UTILITY METER/MAIN COMBO
- MSP
- JB - JUNCTION BOX
- ROOF OBSTRUCTION
- CONDUIT
- TRENCH

PPM.SOLAR
POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

REVISIONS

DESCRIPTION	DATE	REV
CLIENT COMMENT	06/05/2025	A
CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C

DATE: 05/26/2025

PROJECT NAME

C
CHARLES LYE
223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
ELECTRICAL SITE PLAN & BOM

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
E-01

Signature with Seal

JEFFREY A. TORRES LICENSE No 80379 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by Jeffrey A Torres
Date: 2025.09.03 10:58:45-04'00'

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(N) BRANCH-1 (10 MODULES)

(N) BRANCH-2 (10 MODULES)

Q CABLES

(N) BRANCH-3 (08 MODULES)

(N) PV MODULE (TYP.)

(N) BRANCH-4 (08 MODULES)

(N) ENPHASE IQ8X-80-M-US (240V)
MICRO-INVERTERS

C

(4) ENPHASE Q-CABLE, 12/2
TYPE TC-ER
(1) #6 AWG BARE CU - EGC
FREE-AIR

(N) AC TRENCH
APPROX ~3'

(4) #10 AWG THWN-2
(1) #10 AWG THWN-2 - EGC
3/4" CONDUIT

(N) JUNCTION BOX #2
600 V, NEMA 3R
UL LISTED

(N) 125A ENPHASE IQ COMBINER
[WITH UPTO (4) 2-POLE BREAKERS AND
ENVOY COMMUNICATION GATEWAY]

(N) 15A/2P
(N) 20A/2P
(N) 20A/2P
(N) 20A/2P
(N) 20A/2P

(N) UTILITY ACCESSIBLE
AC DISCONNECT
240V, 100AMP
NEMA 3R, UL LISTED
VISIBLE, LABELED,
LOCKABLE AND NON-FUSIBLE
(IF REQUIRED BY UTILITY)

(3) #4 AWG THWN-2
(1) #8 AWG THWN-2 GND
1" CONDUIT

(3) #4 AWG THWN-2
(1) #8 AWG THWN-2 GND
1" CONDUIT

NOTE :- ALL SERVICE EQUIPMENT SHALL HAVE SURGE PROTECTION PER NEC 230.67.

NOTE :- FHP EMERGENCY POWER OFF ADJACENT TO UTLITY METER

(N) FHP EMERGENCY
POWER OFF

(N) FRANKLIN AGATE X ENERGY
MANAGEMENT DEVICE

a GATE X
TRANSFER SWITCH

WIRELESS MODULE
EMS MODULE
a GATE X POWER SWITCH
GEN RELAY
GRID RELAY
GEN ASSEMBLY LUGS
GRID LUGS
BACKUP LOAD TERMINAL

A

FRANKLINWH BACKUP
EXPANSION LUG KIT

(N) MAIN BREAKER
200A/2P, 240V

(N) 200A/2P BREAKER

(N) 125A RATED BATTERY
COMBINER PANEL

(N) 60A/2P
(N) 60A/2P

(3) #1 AWG THWN-2
(1) #6 AWG THWN-2 GND
1-1/4" CONDUIT

(N) 2-FRANKLIN
APOWER 2
BATTERY, 15 KWH
(PER BATTERY)

(x2) (3) #6 AWG THWN-2
(1) #8 AWG THWN-2 GND
3/4" CONDUIT

(N) JUNCTION BOX #1
600 V, NEMA 3R
UL LISTED

(4) #10 AWG THWN-2
(1) #10 AWG THWN-2 - EGC
3/4" CONDUIT

(N) AC TRENCH
APPROX ~22'

(3) #3/0 AWG THWN-2 CU
(1) #6 AWG THWN-2 CU - EGC
IN 2" CONDUIT
OR
(3) #4/0 AWG XHHW-2 AL
(1) #4 AWG XHHW-2 AL - EGC
IN 2" CONDUIT

(3) #1 AWG THWN-2
(1) #6 AWG THWN-2 GND
1-1/4" CONDUIT

(N) 125A/2P BREAKER

(E) INTERNAL SERVICE PANEL
200A RATED, 240V.

(N) BACKUP LOAD PANEL
125A RATED, 240V.

A

NOTE:- PRODUCERS STORAGE DEVICE(S) WILL NOT CAUSE THE HOST LOAD TO EXCEED ITS NORMAL PEAK DEMAND. NORMAL PEAK DEMAND IS DEFINED AS THE HIGHEST AMOUNT OF POWER REQUIRED FROM THE DISTRIBUTION SYSTEM BY PRODUCERS COMPLETE FACILITIES WITHOUT THE INFLUENCE OR USE OF THE ENERGY STORAGE DEVICE(S)

EQUIPMENT SUMMARY
DC SYSTEM SIZE: 16.20 KW DC STC
AC SYSTEM SIZE: 13.68 KW AC

(36) REC SOLAR: REC450AA PURE-RX (450W) MODULES

(02) BRANCHES OF 10 MODULES &
(02) BRANCHES OF 08 MODULES

C

UTILITY: CLAY ELECTRIC

TO UTILITY GRID

L1 L2 N

BI-DIRECTIONAL
UTILITY METER
1-PHASE, 240V

(E) MAIN BREAKER
200A/2P, 240V

(E) UTILITY
METER/MAIN
COMBO
200A RATED,
240V.
(NO LOADS)

N
G

GROUNDING
ELECTRODE SYSTEM

(3) #3/0 AWG THWN-2 CU
(1) #6 AWG THWN-2 CU - EGC
IN 2" CONDUIT
OR
(3) #4/0 AWG XHHW-2 AL
(1) #4 AWG XHHW-2 AL - EGC
IN 2" CONDUIT

1 | ELECTRICAL LINE DIAGRAM

E-02 | SCALE: NTS

PPM.SOLAR

POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

REVISIONS

DESCRIPTION	DATE	REV
CLIENT COMMENT	06/05/2025	A
CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C

DATE: 05/26/2025

PROJECT NAME

C

CHARLES LYE

223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
ELECTRICAL
LINE DIAGRAM-1

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
E-02

Signature with Seal

JEFFREY A. TORRES LICENSE No 80379 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by Jeffrey A Torres
Contact Info: Jeffrey@sunsmartengineering.com
Date: 2025.09.03 10:59:45-04'00'

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SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	REC SOLAR: REC450AA PURE-RX (450W) MODULES
VMP	54.3V
IMP	8.29A
VOC	65.6V
ISC	8.81A
MODULE DIMENSION	68.0"L x 47.4"W x 1.2"D (In Inch)

MICRO-INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	ENPHASE IQ8X-80-M-US (240V) MICRO-INVERTERS
MPPT VOLTAGE RANGE	43-60V
MAXIMUM INPUT VOLTAGE	79.5V
MAXIMUM UNIT PER BRANCH	10
MAXIMUM OUTPUT CURRENT	1.58A

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-5°
AMBIENT TEMP (HIGH TEMP 2%)	30°
CONDUIT MINIMUM HEIGHT FROM ROOF	0.5"
CONDUCTOR TEMPERATURE RATING	90°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.24%/K

AC CONDUCTOR AMPACITY CALCULATIONS: ARRAY TO JUNCTION BOX #1 & #2

EXPECTED WIRE TEMP (In Celsius)	30°
TEMP. CORRECTION PER TABLE (310.15)(B)(1)	1.00
# OF CURRENT CARRYING CONDUCTORS	N/A
# OF C.C. CONDUCTORS CORRECTION PER NEC 310.15(C)(1)	1.00
CIRCUIT CONDUCTOR SIZE	12 AWG
CIRCUIT CONDUCTOR AMPACITY	30A
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A) & (B)	19.75A
1.25 x MAX AC OUTPUT x MAX # OF MICROINVERTERS/CIRCUIT	
DERATED CIRCUIT CONDUCTOR AMPACITY	30.00A
Result should be greater than (19.75A)	

C

C

AC CONDUCTOR AMPACITY CALCULATIONS: FROM JUNCTION BOX #1 TO IQ COMBINER BOX

EXPECTED WIRE TEMP (In Celsius)	30°
TEMP. CORRECTION PER TABLE (310.15)(B)(1)	1.00
# OF CURRENT CARRYING CONDUCTORS	4
# OF C.C. CONDUCTORS CORRECTION PER NEC 310.15(C)(1)	0.80
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY	35A
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A) & (B)	19.75A
1.25 x MAX AC OUTPUT x MAX # OF MICROINVERTERS/CIRCUIT	
DERATED CIRCUIT CONDUCTOR AMPACITY	32.00A
Result should be greater than (19.75A)	

AC CONDUCTOR AMPACITY CALCULATIONS: FROM JUNCTION BOX #2 TO IQ COMBINER BOX

EXPECTED WIRE TEMP (In Celsius)	30°
TEMP. CORRECTION PER TABLE (310.15)(B)(1)	1.00
# OF CURRENT CARRYING CONDUCTORS	4
# OF C.C. CONDUCTORS CORRECTION PER NEC 310.15(C)(1)	0.80
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY	35A
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A) & (B)	15.80A
1.25 x MAX AC OUTPUT x MAX # OF MICROINVERTERS/CIRCUIT	
DERATED CIRCUIT CONDUCTOR AMPACITY	32.00A
Result should be greater than (15.80A)	

AC CONDUCTOR AMPACITY CALCULATIONS: FROM IQ COMBINER BOX TO ACD TO FRANKLIN aGATE

EXPECTED WIRE TEMP (In Celsius)	30°
TEMP. CORRECTION PER TABLE (310.15)(B)(1)	1.00
# OF CURRENT CARRYING CONDUCTORS	3
# OF C.C. CONDUCTORS CORRECTION PER NEC 310.15(C)(1)	1.00
CIRCUIT CONDUCTOR SIZE	4 AWG
CIRCUIT CONDUCTOR AMPACITY	85A
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A) & (B)	71.10A
1.25 x MAX AC OUTPUT x TOTAL # OF MICROINVERTERS	
DERATED CIRCUIT CONDUCTOR AMPACITY	95.00A
Result should be greater than (71.10A)	

AC CONDUCTOR AMPACITY CALCULATIONS: FROM COMBINER PANEL TO BATTERY

EXPECTED WIRE TEMP (In Celsius)	30°
TEMP. CORRECTION PER TABLE (310.15)(B)(1)	1.00
# OF CURRENT CARRYING CONDUCTORS	3
# OF C.C. CONDUCTORS CORRECTION PER NEC 310.15(C)(1)	1.00
CIRCUIT CONDUCTOR SIZE	6 AWG
CIRCUIT CONDUCTOR AMPACITY	65A
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A) & (B)	60.00A
1.25 x BATTERY OUTPUT CURRENT	
DERATED CIRCUIT CONDUCTOR AMPACITY	75.00A
Result should be greater than (60.00A)	

AC CONDUCTOR AMPACITY CALCULATIONS: FROM COMBINER PANEL TO FRANKLIN aGATE

EXPECTED WIRE TEMP (In Celsius)	30°
TEMP. CORRECTION PER TABLE (310.15)(B)(1)	1.00
# OF CURRENT CARRYING CONDUCTORS	3
# OF C.C. CONDUCTORS CORRECTION PER NEC 310.15(C)(1)	1.00
CIRCUIT CONDUCTOR SIZE	1 AWG
CIRCUIT CONDUCTOR AMPACITY	130A
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A) & (B)	120.00A
1.25 x BATTERY OUTPUT CURRENT	
DERATED CIRCUIT CONDUCTOR AMPACITY	150.00A
Result should be greater than (120.00A)	

A

AC CONDUCTOR AMPACITY CALCULATIONS: FROM FRANKLIN aGATE TO BACKUP LOAD PANEL

EXPECTED WIRE TEMP (In Celsius)	30°
TEMP. CORRECTION PER TABLE (310.15)(B)(1)	1.00
# OF CURRENT CARRYING CONDUCTORS	3
# OF C.C. CONDUCTORS CORRECTION PER NEC 310.15(C)(1)	1.00
CIRCUIT CONDUCTOR SIZE	1 AWG
CIRCUIT CONDUCTOR AMPACITY	130A
REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A) & (B)	125.00A
MAX OUTPUT CURRENT	
DERATED CIRCUIT CONDUCTOR AMPACITY	150.00A
Result should be greater than (125.00A)	

ELECTRICAL NOTES

1.) ALL EQUIPMENT SHALL BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
2.) ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90°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 SYSTEM. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS , AND ACCESSORIES TO MEET APPLICABLE CODES AND STANDARDS.
6.) WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
7.) ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND ACCESSIBLE.
8.) INSTALL MODULE AND RACKING GROUNDING HARDWARE PER MANUFACTURER'S INSTRUCTION.

1 | WIRING CALCULATIONS
E-03 | SCALE: NTS

PPM.SOLAR
POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

REVISIONS		
DESCRIPTION	DATE	REV
CLIENT COMMENT	06/05/2025	A
CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C
DATE: 05/26/2025		

PROJECT NAME

C

CHARLES LYE

223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
WIRING CALCULATIONS-1

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
E-03

Signature with Seal

Digitally signed by Jeffrey A Torres
Contact Info:
jeff.torres@sunsmartengineering.com
Date: 2025.09.03 10:58:46-04'00'

JEFFREY A. TORRES LICENSE No 80379 STATE OF FLORIDA PROFESSIONAL ENGINEER

This item has been digitally signed and sealed by Jeffrey A. Torres, P.E. on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION:
EMT/CONDUIT RACEWAY
SOLADECK/JUNCTION BOX
CODE REF : NEC 690.31(D)(2) / Roll: 596-00999 / 10-Pk: 596-01007

PHOTOVOLTAIC
240V
AC DISCONNECT

LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.13(B), 690.15, 705.20

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

LABEL LOCATION:
MAIN SERVICE DISCONNECT
CODE REF: NEC 690.13(B)
Roll: 596-00243 / 10-Pk: 596-00675

⚠ WARNING

ELECTRIC SHOCK HAZARD
TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION
NEC 690.13(B) & NEC 690.15(C)

LABEL LOCATION:
WHERE ALL TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A WARNING SIGN SHALL BE MOUNTED ON OR ADJACENT TO THE DISCONNECTING MEANS.
NEC 690.13(B) & NEC 690.15(C)

⚠ WARNING

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

LABEL LOCATION:
PERMANENT WARNING LABELS SHALL BE APPLIED TO DISTRIBUTION EQUIPMENT
NEC 705.12(B)(3)(3)

ENERGY STORAGE SYSTEM DISCONNECT

LABEL LOCATION ENERGY STORAGE SYSTEMS:
CODE REF: NEC 706.15(C)
Roll: 596-01004 / 10-Pk: 596-01041

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.12(D)(2)
Roll: 596-01003 / 10-Pk: 596-01040

PHOTOVOLTAIC AC DISCONNECT

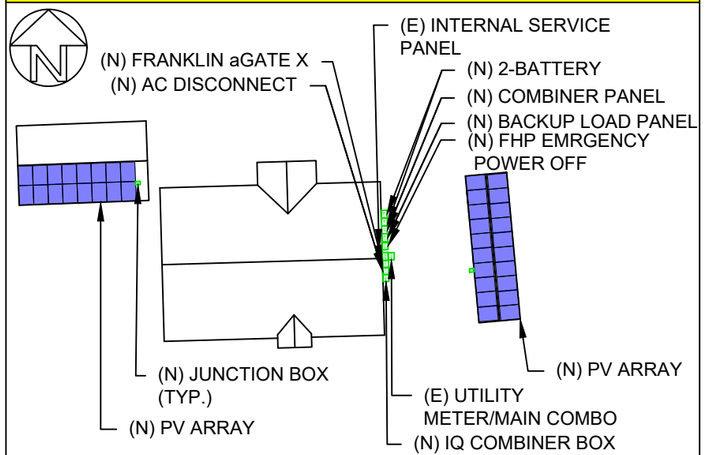
NOMINAL OPERATING AC VOLTAGE	240 V
RATED AC OUTPUT CURRENT	56.88 A

LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.54

EMERGENCY CONTACT
PPM SOLAR
(352) 309-7727

CAUTION

MULTIPLE SOURCES OF POWER

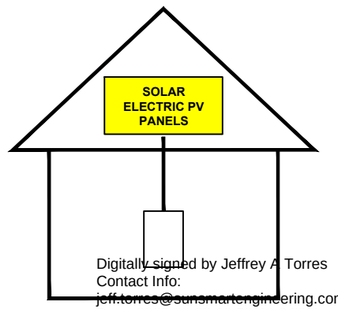


223 SW MEADOWLANDS DR, LAKE CITY, FL 32024

LABEL LOCATION:
MAIN SERVICE DISCONNECT / MAIN DISTRIBUTION PANEL, PV DISCONNECT LOCATION NO MORE THAN 1 M (3 FT) FROM THE SERVICE DISCONNECT PER CODE NEC 705.10 & NEC 710.10
Roll: 558-00358 OR 558-00346

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.



Digitally signed by Jeffrey A Torres
Contact Info: jeff.torres@sunsmartengineering.com
Date: 2025.09.03 10:58:46-04'00'

LABEL LOCATION:
ON OR NO MORE THAT 1 M (3 FT) FROM THE SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED.
PER CODE: IFC 605.11.3.1(1) & 690.12(D)
Roll: 596-00885 / 10-Pk: 596-00888

PPM.SOLAR
POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

REVISIONS

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CLIENT COMMENT	08/19/2025	C

DATE: 05/26/2025

PROJECT NAME

C
CHARLES LYE
223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
SYSTEM LABELING

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
E-04

Signature with Seal

JEFFREY A. TORRES LICENSE No 80379 STATE OF FLORIDA PROFESSIONAL ENGINEER

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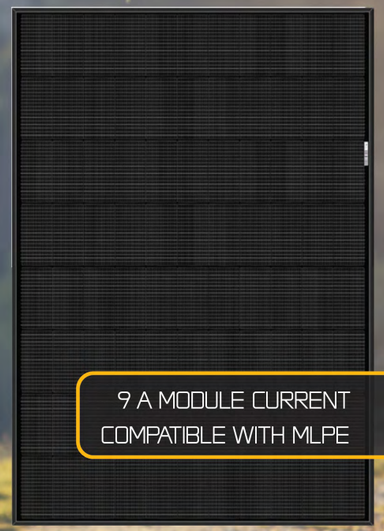
SOLAR'S MOST TRUSTED

REC ALPHA® PURE-RX SERIES

DATASHEET



9 A MODULE CURRENT
COMPATIBLE WITH MLPE

450-470 W_P

HETEROJUNCTION TECHNOLOGY

22.6% MAX. EFFICIENCY
-0.24% /K TEMP. COEFF. P_{MAX}
92% MIN. POWER IN YEAR 25

REC ALPHA® PURE-RX SERIES

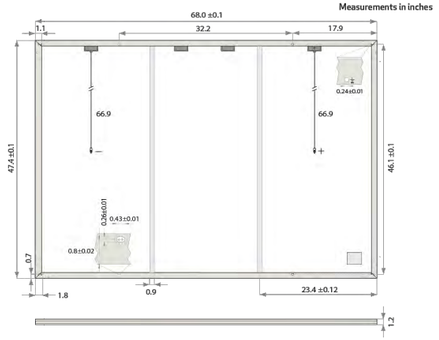
DATASHEET

SOLAR'S MOST TRUSTED

GENERAL DATA

Cell Type	88 half-cut bifacial REC heterojunction cells, with gapless technology
Glass	0.13 in. solar glass with anti-reflective surface treatment in accordance with EN12150
Backsheet	Highly resistant polymer (Black)
Frame	Anodized aluminum (Black)
Junction Box	4-part, 4 bypass diodes, IP68 rated, in accordance with IEC 62790
Connectors	Stäubli MC4 PV-KBT4/KST4 (12AWG) in accordance with IEC 62852, IP68 only when connected
Cable	12 AWG solar cable, 66.9 in. + 66.9 in. in accordance with EN50618
Dimensions	68 x 47.4 x 1.2 in. (22.4 ft²)
Weight	50 lbs
Origin	Made in Singapore

Measurements in inches



ELECTRICAL DATA

PRODUCT CODE*: RECxxxAA Pure-RX

		450	460	470
STC	Power Output - P_{MAX} (W_P)	450	460	470
	Watt Class Sorting - (W)	0/+10	0/+10	0/+10
	Nominal Power Voltage - V_{MPP} (V)	54.3	54.9	55.4
	Nominal Power Current - I_{MPP} (A)	8.29	8.38	8.49
	Open Circuit Voltage - V_{OC} (V)	65.6	65.8	65.9
	Short Circuit Current - I_{SC} (A)	8.81	8.88	8.95
	Power Density (W/ft²)	20.1	20.5	21.0
	Panel Efficiency (%)	21.6	22.1	22.6
NMOT	Power Output - P_{MAX} (W_P)	343	350	358
	Nominal Power Voltage - V_{MPP} (V)	51.2	51.7	52.2
	Nominal Power Current - I_{MPP} (A)	6.70	6.77	6.86
	Open Circuit Voltage - V_{OC} (V)	61.8	62.0	62.1
	Short Circuit Current - I_{SC} (A)	7.11	7.17	7.23

Values at standard test conditions (STC: air mass AM 1.5, irradiance 1000 W/m², temperature 77°F (25°C)), based on a production spread with a tolerance of P_{MPP}, V_{OC} & I_{SC} ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM 1.5, irradiance 800 W/m², temperature 68°F (20°C), windspeed 3.3 ft/s (1 m/s)). * Where xxx indicates the nominal power class (P_{MPP}) at STC above.

MAXIMUM RATINGS*

Operational Temperature	-40 °F - 185 °F
System Voltage	1000 V
Maximum Test Load (front)	+7000 Pa (146 lb/ft²)
Maximum Test Load (rear)	-4000 Pa (83.4 lb/ft²)
Max Series Fuse Rating	25 A
Max Reverse Current	25 A

* See installation manual for mounting instructions. Design load = Test load / 1.5 (safety factor)

TEMPERATURE RATINGS*

Nominal Module Operating Temperature	44 °C ± 2°C
Temperature coefficient of P_{MAX}	-0.24% /K
Temperature coefficient of V_{OC}	-0.24% /K
Temperature coefficient of I_{SC}	0.04% /K

*The temperature coefficients stated are linear values

DELIVERY INFORMATION

Panels per Pallet	33
Panels per 40 ft GP/high cube container	594 (18 Pallets)
Panels per 53 ft truck	792 (24 Pallets)

CERTIFICATIONS

IEC 61215:2021; IEC61730:2016; UL61730	
ISO 11925-2	Ignitability (EN 13501-1 Class E)
IEC 62716	Ammonia Resistance
IEC 61701	Salt Mist (SM6)
IEC 61215:2016	Hailstone (35mm)
UL 61730	Fire Type 2
ISO 14001; ISO9001; IEC45001; IEC62941	

take-e-way
for an easy way
Take-e-way WEEE-compliant scheme

Specifications subject to change without notice.

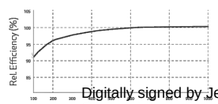
WARRANTY

	Standard	REC ProTrust	
Installed by an REC Certified Professional	No	Yes	Yes
System Size	All	<25 kW	25-500 kW
Product Warranty (yrs)	20	25	25
Power Warranty (yrs)	25	25	25
Labor Warranty (yrs)	0	25	10
Power in Year 1	98%	98%	98%
Annual Degradation	0.25%	0.25%	0.25%
Power in Year 25	92%	92%	92%

REC ProTrust Warranty applies only for i) REC panels installed by an REC Certified Solar Professional, and ii) panels have been registered by the installer with REC. Subject to System Size and further conditions. See www.recgroup.com for details.

LOW LIGHT BEHAVIOR

Typical low irradiance performance of module at STC:



Available from:

Founded in 1996, REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power. As Solar's Most Trusted, REC is committed to high quality, innovation, and a low carbon footprint in the solar materials and solar panels it manufactures. Headquartered in Norway with operational headquarters in Singapore, REC also has regional hubs in North America, Europe, and Asia-Pacific.

REC Solar PTE. LTD.
20 Tuas South Ave. 14
Singapore 637312
post@recgroup.com
www.recgroup.com

Digitally signed by Jeffrey A Torres
Contact Info: jeff.torres@sunsmartengineering.com
Date: 2025.09.03 10:58:47-04'00'

REC

JEFFREY A. TORRES LICENSE No 80379 STATE OF FLORIDA PROFESSIONAL ENGINEER

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Ref: PM-DS-12-06-Rev-4 5.8.2024

PPM.SOLAR

POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

REVISIONS		
DESCRIPTION	DATE	REV
CLIENT COMMENT	06/05/2025	A
CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C
DATE: 05/26/2025		

PROJECT NAME

C
CHARLES LYE

223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
MODULE DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-01

Signature with Seal

ENPHASE.

DATA SHEET

IQ8X Microinverter

Our newest IQ8 Series 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 mode. This chip is built using advanced 55-nm technology with high-speed digital logic and superfast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.

IQ8X Microinverter is the latest addition to this family, designed to support PV modules with high output DC voltage and cell counts, such as 80-half-cut cells, 88-half-cut cells and 96-cells.

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

Enphase 25 year limited warranty

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 with integrated MC4 connectors.

UL CERTIFIED SAFETY

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

*Meets UL 1741 only when installed with IQ System Controller 2 or 3.

Easy to install

- Lightweight and compact with plug-and-play connectors
- Power line communication (PLC) between components
- Faster installation with simple two-wire cabling

High productivity and reliability

- Produces power even when the grid is down*
- More than one million cumulative hours of testing
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Microgrid-forming

- Complies with the latest advanced grid support
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) and IEEE 1547:2018 (UL 1741-SB)

NOTE:

- IQ8 Series Microinverters cannot be mixed with previous generations of Enphase microinverters (IQ7 Series, IQ6 Series, and so on) in the same system.
- IQ Microinverters ship with default settings that meet North America's IEEE 1547 interconnection standard requirements. Region-specific adjustments may be requested by an Authority Having Jurisdiction (AHJ) or utility representative, according to the IEEE 1547 interconnection standard. An IQ Gateway is required to make these changes during installation.

IQ8X Microinverter

INPUT DATA (DC)	UNIT	IQ8X-80-M-US
Commonly used module pairings [1]	W	320–540
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	43–60
Operating range	V	25–79.5
Minimum and maximum start voltage	V	30–79.5
Maximum input DC voltage	V	79.5
Maximum continuous operating DC current	A	10
Maximum input DC short-circuit current	A	16
Maximum module I_{sc}	A	13
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 a maximum of 20 A per branch circuit

OUTPUT DATA (AC)	UNIT	IQ8X-80-M-US @240 VAC	IQ8X-80-M-US @208 VAC
Peak output power	VA	384	366
Maximum continuous output power	VA	380	360
Nominal grid voltage (L-L)	V	240, split-phase (L-L), 180°	208, single-phase (L-L), 120° [4]
Minimum and maximum grid voltage [2]	V	211–264	183–229
Max. continuous output current	A	1.58	1.73
Nominal frequency	Hz	60	
Extended frequency range	Hz	47–68	
AC short circuit fault current over three cycles	Arms	2.70	
Maximum units per 20 A (L-L) branch circuit [3]	–	10	9
Total harmonic distortion	%	<5	
Overvoltage class AC port	–	III	
AC port backfeed current	mA	18	
Power factor setting	–	1.0	
Grid-tied power factor (adjustable)	–	0.85 leading ... 0.85 lagging	
Peak efficiency	%	97.3	97.0
CEC weighted efficiency	%	96.5	96.5
Nighttime power consumption	mW	26	12

MECHANICAL DATA	
Ambient temperature range	-40°C to 65°C (-40°F to 149°F)
Relative humidity range	4% to 100% (condensing)
DC connector type	Stäubli MC4
Dimensions (H × W × D); Weight	212 mm (8.3") × 175 mm (6.9") × 30.2 mm (1.2"); 1.1 kg (2.43 lb)
Cooling	Natural convection – no fans
Approved for wet locations; Pollution degree	Yes; PD3
Enclosure	Class II double-insulated, corrosion-resistant polymeric enclosure
Environmental category; UV exposure rating	NEMA Type 6; outdoor

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. 107.1-01. 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 C22.1-2018 Rule 64-218 rapid shutdown of PV systems for AC and DC conductors when installed according to the manufacturer's instructions.

(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.
(4) IQ8X is not certified for use with Enphase Three Phase Network Protection Relay (NPR-3P-208-NA) and is, therefore, designed for single-phase operation only. Check with the local utility requirements if you wish to install single-phase inverters across three phases.

IQ8X-MC4-DSH-00185-3.0-EN-US-2024-02-12

PPM.SOLAR
POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

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DATE: 05/26/2025

PROJECT NAME

C
CHARLES LYE

223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
MICRO-INVERTER DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-02

Signature with Seal

JEFFREY A. TORRES LICENSE No 80379 STATE OF FLORIDA PROFESSIONAL ENGINEER

Digitally signed by Jeffrey A Torres
Date: 2025.09.03 10:58:47-04'00'

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FRANKLINWH

aPower 2

AC-coupled battery

Store solar generated power while the sun is shining. Use the stored energy when needed to lower electric bills. Run heavy loads such as air conditioners and water heaters as usual even during grid outages. Provide homeowner peace of mind by fully charging before severe weather events.

The system is off-grid ready, designed to operate independently from the main power grid to deliver reliable energy in any situation.

- 10 kW continuous / 15 kW peak for 10s
- 8 kW charge power
- 15 kWh AC[1] per unit, up to 225 kWh (15 units) per aGate
- 60 MWh warranty throughput

PERFORMANCE SPECIFICATIONS

SKU	APR-10K15V2-US				
Name	aPower 2				
Nameplate Model	aPower X-20				
Certification / CEC Listing Name	aPower Xyyy				
Battery Chemistry	Lithium Iron Phosphate (LFP)				
Usable System Energy	15 kWh AC[1] per unit, up to 15 units per aGate				
Aggregate Throughput	60 MWh				
Real Power (charge)	8 kW continuous				
Nominal Output Power (AC)	2.5 kW	5 kW	6.7 kW	8.4 kW	10 kW[2]
Maximum Apparent Power	2.9 kVA	5.8 kVA	7.7 kVA	9.6 kVA	11.5 kVA
Maximum Continuous Current	12 A	24 A	32 A	40 A	48 A
Nominal AC Voltage	120 / 240 V, 120 / 208 V (single phase), 60 Hz				
Coupling	AC-coupled				
Phase	2 W+N+PE				
Round Trip Efficiency	90%[1]				
Maximum Short-Circuit Current Rating	10 kA				
Load Start Capability	185 A LRA				
Work Modes	Self-Consumption Time of Use Emergency Backup				
Noise Emission	30 dB(A) Typical / 45 dB(A) Maximum				
Flood Resistance	Up to 29" from the aPower 2 base				
User Interface	FranklinWH App				
Warranty	15 years[3]				

COMPLIANCE INFORMATION

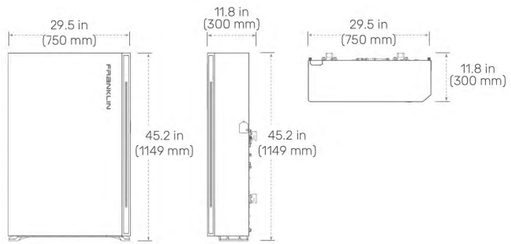
Certifications	UL 9540, UL 9540A, UL 1973, UL 1741, UL1741 SB, UL 1741 PCS, UL 60730-1, IEEE 1547, IEEE 1547.1, UN 38.3, CSA C22.2 No. 107.1
Seismic	AC 156, OSHPD, IEEE 693-2005 (high)
Environmental	California Proposition 65 RoHS Directive 2011 / EU
Emissions	FCC Part 15 Class B, ICES 003

1. At beginning of life, 3 kW charge/discharge power, 77 °F (25 °C).
2. Refer to the installation manual and commissioning guide for proper wire and OCPD sizes.
3. For more details, please refer to the FranklinWH System Limited Warranty for End Users available in the Documentation Center on the FranklinWH website.

WWW.FRANKLINWH.COM

MECHANICAL SPECIFICATIONS

Dimensions (H × W × D)	45.2 in × 29.5 in × 11.8 in (1149 mm × 750 mm × 300 mm)
Weight, aPower 2 Complete	357 lb. (162 kg)
Weight, without Cover	335 lb. (152 kg)
Weight, Cover	22 lb. (10 kg)
Mounting	Wall or floor mount
Cooling	Natural air-cooled design



ENVIRONMENTAL SPECIFICATIONS

Enclosure Type	Type 3R
Ingress Protection	IP56 (Wiring) IP67 (Battery Pack & Inverter)
Operating Temperature	-4 °F to 122 °F (-20 °C to 50 °C) Operates up to 131 °F (55 °C) at 5kW derated output
Operating Humidity (RH)	Up to 100% RH, condensing
Altitude	Maximum 9,843 ft (3,000 m)
Environment	Indoor and outdoor rated

Compatibility Notice: At launch, the aPower 2 is compatible with the aGate 1.3 only. Compatibility with earlier aGate and aPower versions is anticipated by the end of Q2 2025.

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POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

REVISIONS

DESCRIPTION	DATE	REV
CLIENT COMMENT	06/05/2025	A
CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C
DATE: 05/26/2025		

PROJECT NAME

C
CHARLES LYE

223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
BATTERY
DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-03

Signature with Seal

Digitally signed by Jeffrey A Torres
Contact Info:
jeff.torres@sunsmartengineering.com
Date: 2025.09.03 10:58:47-04'00'

JEFFREY A. TORRES LICENSE No 80379 STATE OF FLORIDA PROFESSIONAL ENGINEER

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FRANKLINWH

aGate

Intelligent energy management system

The aGate serves as the controller for all home power sources by interconnecting solar, grid, batteries, and a standby generator to supply electricity to the home. It seamlessly transitions the home supply from grid power to backup power so that always-on appliances, such as the refrigerator and network router, will not be affected when the grid goes down.

The aGate can be installed at the service entrance, connected to the main load center, or used as a load center.

Robust

- Micro-grid interconnect device (MID)
- EMS Integrated PV and grid metering
- UL1741 certified PCS function & 280A busbar to avoid Main Panel Upgrades
- 12-year limited warranty

Hassle-free

- Precise control of electricity usage through Smart Circuits Module
- Standby generator integration via generator module
- Remarkable black start function ensures battery charge after a prolonged outage or extended trip
- Vehicle to loads (V2L) function to power essential home appliances during an emergency
- Commissioning through the aGate Wifi hotspot or Bluetooth

Flexible

- Compatible with micro and string solar inverter
- Indoor and outdoor / wall-mounted

Easy installation

- Built-in design Smart Circuits and Generator Modules
- Conduit entry options from the bottom, left, or right

Intertek

WWW.FRANKLINWH.COM

DATASHEET

PERFORMANCE SPECIFICATIONS

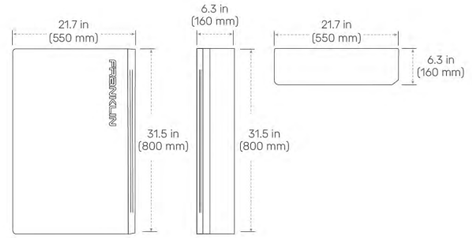
SKU	AGT-RIV2-US
Model Number	aGate X
Coupling	AC-coupled
Nominal AC Voltage	120 / 208 V, 120 / 240 V, 60 Hz
Phase	2 W+N+PE
Grid Input Over Current Protection Device	200 A Max
aPower Over Current Protection Device	125 A Max
Solar Input Over Current Protection Device	80 A Max
Backup Load Port Over Current Protection Device	200 A Max
Non-backup Load Port Over Current Protection Device	200 A Max
Generator Over Current Protection Device[1]	200 A Max
Smart Circuits Over Current Protection Device[2]	Opt. a 1 × 80 A Max @ 208 V / 240 V & 1 × 50 A Max @ 208 V / 240 V Opt. b 1 × 80 A Max @ 208 V / 240 V & 2 × 50 A Max @ 120 V
Maximum Supply Fault Current	22 kA
Busbar Rating	280 A
Work Modes	Self-Consumption, Time of Use, Emergency Backup
Communications	Ethernet / 4G / Wifi /Bluetooth
User Interface	FranklinWH App
Warranty	12-year limited
IEC Protective Class	Class I
Over voltage Category	Category II
AC Meter	+/- 0.5%

COMPLIANCE INFORMATION

Certifications	UL 1741, UL 1741 PCS, UL 67, UL 869A, UL 916, CAN / CSA C22.2 No. 107.1-16, CSA C22.2 No. 29, CSA C22.2 No. 0.19
Seismic	AC 156, OSHPD, IEEE 693-2005 (high)
Environmental	California Proposition 65 RoHS Directive 2011 / EU
Emissions	FCC Part 15 Class B, ICES 003

MECHANICAL SPECIFICATIONS

Dimensions (H × W × D)	31.5 in × 21.7 in × 6.3 in (800 mm × 550 mm × 160 mm)
Weight	38.6 lb (17.5 kg)
Mounting	Wall mount



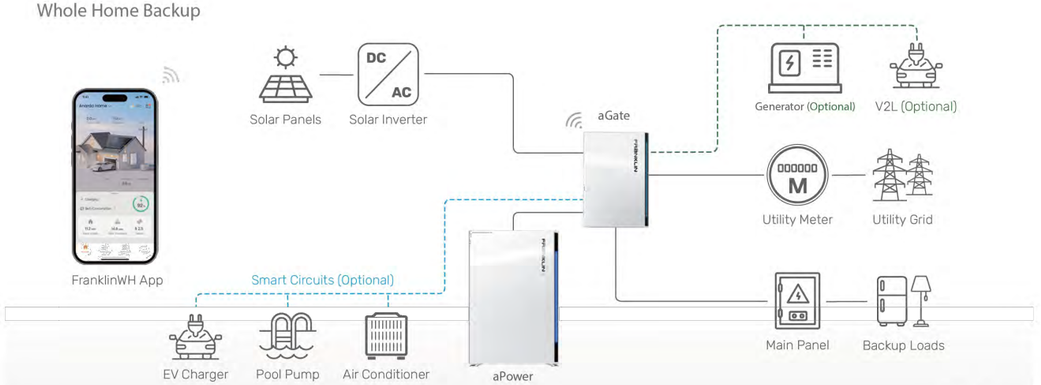
1. Generator Module is optional.
2. Smart Circuit Module is

ENVIRONMENTAL SPECIFICATIONS

Enclosure Type	NEMA Type 3R
Operating Temperature	-4°F to 122°F (-20°C to 50°C)
Operating Humidity (RH)	Up to 100% RH, condensing
Altitude	Maximum 9,843 ft (3,000 m)
Environment	Indoor and outdoor rated

Franklin Home Power Solution

Whole Home Backup



Address: 1731 Technology Dr., Suite 530 San Jose, CA 95110 **Telephone:** +1 888-837-2655 **Email:** info@franklinwh.com **Website:** www.franklinwh.com

WWW.FRANKLINWH.COM

FRANKLINWH

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Contact Info: jeff.torres@sunsmartengineering.com
Date: 2025.09.03 10:58:48-04'00'

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PPM.SOLAR
POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

REVISIONS

DESCRIPTION	DATE	REV
CLIENT COMMENT	06/05/2025	A
CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C

DATE: 05/26/2025

PROJECT NAME

C
CHARLES LYE

223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
aGATE
DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-04

Signature with Seal

FRANKLINWH

FranklinWH
Backup Expansion Lug Kit

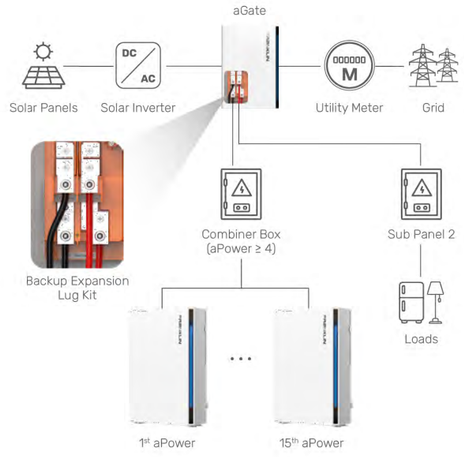
As the demand for electricity continues to surge and more energy is generated by photovoltaic (PV) systems, there is an increasing need for larger energy storage systems to assist residents in efficiently managing household loads and PV systems. The Franklin Home Power (FHP) provides an optional Backup Expansion Lug Kit to meet homeowner needs.

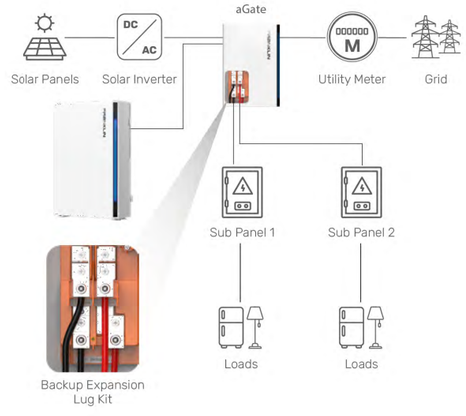
✓ Connect more aPowers

When there are up to three aPower batteries to be linked with the aGate, they can be directly connected to the aGate aPower port. For four or more aPowers, it is necessary to connect the batteries to the backup port with the Backup Expansion Lug Kit.

✓ Connect more sub-panels

When there are two sub panels, they can be distributed by using the Backup Expansion Lug Kit.





SPECIFICATIONS

Nominal AC Voltage	120 / 208 V, 120 / 240 V, 60 Hz
Maximum Continuous Current	160 A[1]
Dimensions (H × W × D)	6.1 × 1.0 × 1.8 in / 6.1 × 1.6 × 1.8 in (155 × 25 × 45 mm / 155 × 41 × 45 mm)
Weight	0.66 lb (0.33 kg)

1. If using only the Backup Expansion Lug Kit, the current must not exceed 160A. If using both the Backup Expansion Lug Kit and the backup port simultaneously, their combined current must not exceed 160A.

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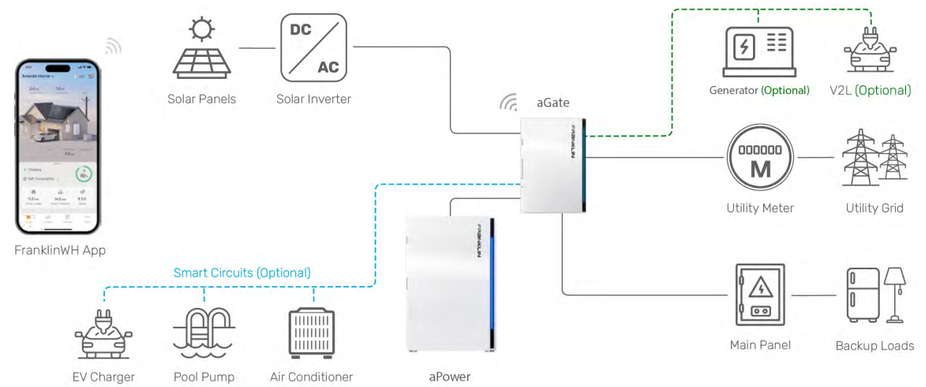
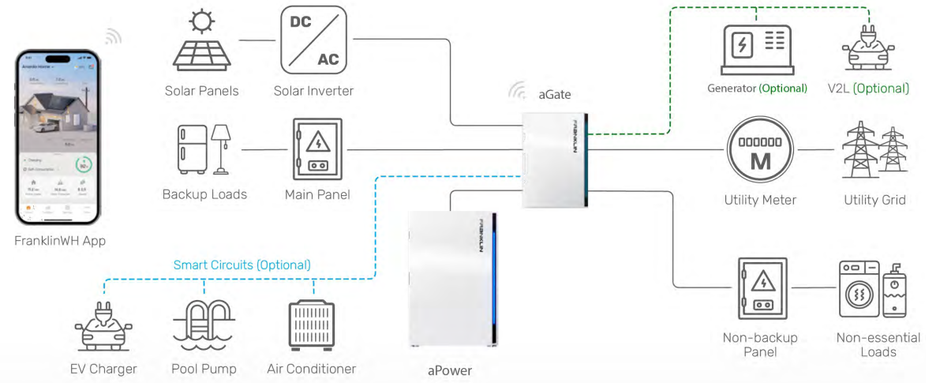
DATASHEET

Franklin Home Power Solution

Whole Home Backup



Partial Home Backup



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FRANKLINWH

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jeff.torres@sunsmartengineering.com
Date: 2025.09.[illegible]48-04'00'

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625 NW 8TH AVE.,
GAINESVILLE, FL 32601

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CLIENT COMMENT	06/05/2025	A
CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C
DATE: 05/26/2025		

PROJECT NAME

C

CHARLES LYE

223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
EXPANSION LUG KIT
DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-05

Signature with Seal

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NXT HORIZON®

UNIRAC®
BETTER SOLAR STARTS HERE

UNIRAC 25 YEAR FULL-SYSTEM WARRANTY

DISCOVER YOUR **NXT** HORIZON®

The culmination of over two decades of experience. Thoughtful design, rigorous engineering, world-class support, and a reliable supply chain are the foundation of what makes us confident that NXT HORIZON® is the NXT Level of DESIGN, SIMPLICITY, and VALUE.

NXT HORIZON® COMBO CLAMP

DARK: CCLAMPD1
MILL: CCLAMPM1

Clicks into rail anywhere (even where there are cables!)
Self-standing clamp with spring combines as both mid and end clamp.
Clamps 30-40 mm modules

1/2 inch module spacing for efficiency.

Unirac-quality bonding that works both as mid and end clamps.

NXT HORIZON® CAP KIT

ENDCAPD1

Make the install look clean with the end cap kit designed to complement the module end clamp and rail ends.

STRONGHOLD™ RAIL CLAMP

DARK: SHCLMPD1
MILL: SHCLMPM1

Adaptable rail connection to attachments allows click-in feature compatibility with almost all of Unirac's attachments.

FlashLoc technology combined with new features: click-in rail & open slot L-Foot for the best flash-less install experience.

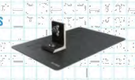
STRONGHOLD™ ATTACHMENT KIT

DARK: SHCPKTD1
MILL: SHCPKTM1

Rail clicks into the clamps attached to the Stronghold™ base. Open slot in L-foot allows drop-in rail clamp.

Alternative attachment options:

SOLARHOOKS
All varieties



FLASHKIT PRO
DARK: 004055D
MILL: 004055M

FLASHLOC™ DUO
DARK: 004275D
MILL: 004275M

NXT HORIZON® RAIL

DARK: 168RLD1
MILL: 168RLM1

Strong, lightweight open channel rail with invisible, easy, unfailing and integrated wire management system.

NXT HORIZON® RAIL SPLICE

RLSPLCM1

Structural internal splice that does not interfere with roof connection nor module connection.
Pre-assembled thread cutting bolts.

WIRE MANAGEMENT OPTONS

NXT HORIZON® MLPE & LUG CLAMP

LUGMLPE1

Works as either MLPE Mount or Grounding Lug connection to the rail. Why source two parts when one can do the job?

NXT HORIZON® WIRE MANAGEMENT CLIP

WRMCLPD1

Aesthetic, yet functional accessory that works to help installers keep wires inside the rail.
No zip-ties required. Optional zip tie loop for extra wire management capabilities!

NXT HORIZON® NORTH/SOUTH WIRE MANAGEMENT CLIP

WRMCNSD1

An elegant solution to help installers get to the home run. The same hardware works to provide both easy entry to rail and adjustability for cable thickness.

ALL NXT HORIZON® SYSTEMS INCLUDE A FREE PERMITTING PLANSET DESIGN - FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR EMAIL NXTPERMITS@UNIRAC.COM

B

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POWER PRODUCTION MANAGEMENT INC
625 NW 8TH AVE.,
GAINESVILLE, FL 32601

REVISIONS		
DESCRIPTION	DATE	REV
CLIENT COMMENT	06/05/2025	A
CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C
DATE: 05/26/2025		

PROJECT NAME

C
CHARLES LYE

223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
RAIL
DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-06

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Date: 2025.09.03 10:58:49-04'00'

C

S-5!® The Right Way

ProteaBracket™

A versatile bracket for mounting solar PV to trapezoidal roof profiles

Still the most versatile trapezoidal metal roof attachment solution on the market, the S-5! ProteaBracket just got better!

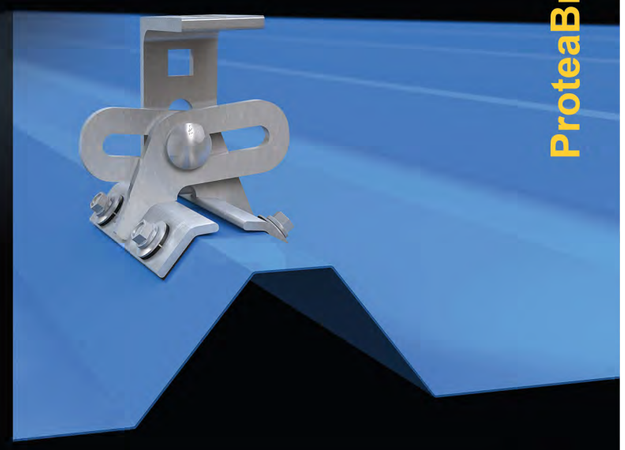
The bracket features an adjustable attachment base and module attachment options to accommodate different roof profile dimensions and mounting options.

Our pre-applied EPDM gasket with peel and stick adhesive makes installation a snap, ensuring accurate and secure placement the first time.

With no messy sealants, faster installation, and a weather-proof fit, ProteaBracket offers you the most versatile solar attachment solution available.

ProteaBracket* can be used for rail mounting or "direct-attach" with S-5! PVKIT®

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



ProteaBracket™

Features and Benefits

- 34% lighter - saves on shipping
- Stronger L-Foot™
- Load-tested for engineered application
- Corrosion-resistant materials
- Adjustable - Fits rib profiles up to 3"
- Peel-and-Stick prevents accidental shifting during installation
- Fully pre-assembled

888-825-3432 | www.S-5.com |

The right way to attach solar PV to trapezoidal roof profiles!

S-5!® The Right Way

ProteaBracket™ is the perfect solar attachment solution for most trapezoidal rib, exposed-fastened metal roof profiles!

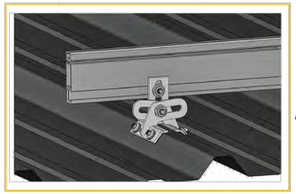
ProteaBracket™ is compatible with common metal roofing materials and comes with a pre-applied EPDM gasket on the base.

Note: All four pre-punched holes must be used to achieve tested strength. Fasteners are provided.

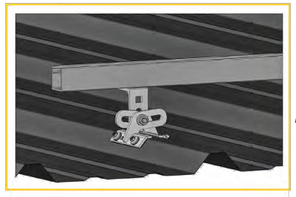
For design assistance, ask your distributor, or visit **www.S-5.com** for the independent lab test data that can be used for load-critical designs and applications. Also, please visit our website for more information including metallurgical compatibilities and specifications.

S-5!® holding strength is unmatched in the industry.

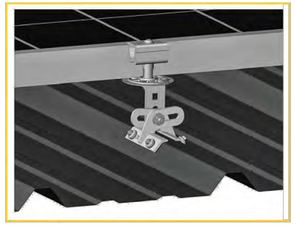
Multiple Attachment Options:



Side Mount Rail

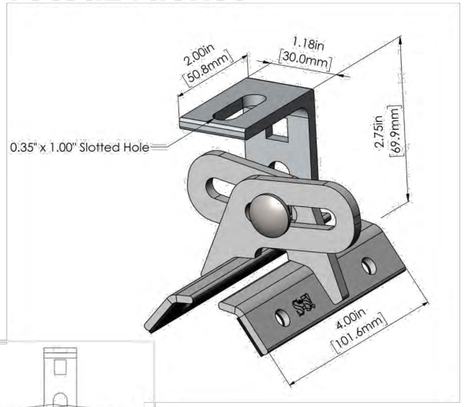


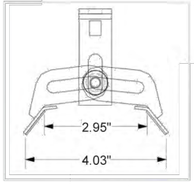
Bottom Mount Rail



w/ S-5! PVKIT® (rail-less)

ProteaBracket™





ProteaBracket fits profiles up to 3 inches

INSTALLATION:

No surface preparation needed. (1) Wipe away excess oil and debris. **(2)** Peel off adhesive release paper. **(3)** Align and mount bracket directly onto crown of panel. **(4)** Secure ProteaBracket through pre-punched holes, using piercing-point S-5! screws.

Shown: S-5! PVKIT® mounted on the ProteaBracket™ for rail-less solar mounting on metal roofing.

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

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

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REVISIONS		
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CLIENT COMMENT	06/05/2025	A
CLIENT COMMENT	06/12/2025	B
CLIENT COMMENT	08/19/2025	C
DATE: 05/26/2025		

PROJECT NAME

C
CHARLES LYE
223 SW MEADOWLANDS DR,
LAKE CITY, FL 32024

SHEET NAME
ATTACHMENT DATA SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
DS-07

Signature with Seal