

NEW PHOTOVOLTAIC ROOF MOUNTED SYSTEM - 8.280 KW DC/6.840 KW AC
& ENERGY STORAGE SYSTEM - 9.040 KWH
234 SW SCOTT PL, LAKE CITY, FL 32024

NEW PV SYSTEM SPECIFICATIONS

SYSTEM SIZE: DC SIZE: 8.280 KW DC-(STC)
AC SIZE: 6.840 KW AC
MODULE: (18) REC SOLAR REC460AA PURE-RX
INVERTER: (18) ENPHASE ENERGY IQ8X-80-M-US

NEW ESS SYSTEM SPECIFICATIONS

CONTROLLER: (1) SIGENERGY 9.6 KW ENERGY CONTROLLER (SIG-EC-9.6-SP) (1040057)
BATTERY: (1) SIGENERGY 9.0 KWH BATTERY (11130019)
GATEWAY: (1) SIGENERGY LOAD HUB (11110069)

DESIGN CRITERIA

ROOF SURFACE TYPE: COMPOSITE SHINGLE
ROOF FRAMING: 2"X4" TRUSS @ 24" OC
BUILDING STORY: ONE STORY
GROUND SNOW LOAD: 4 PSF
WIND SPEED: 119 MPH
WIND EXPOSURE: C
RISK CATEGORY: II

APPLICABLE CODES

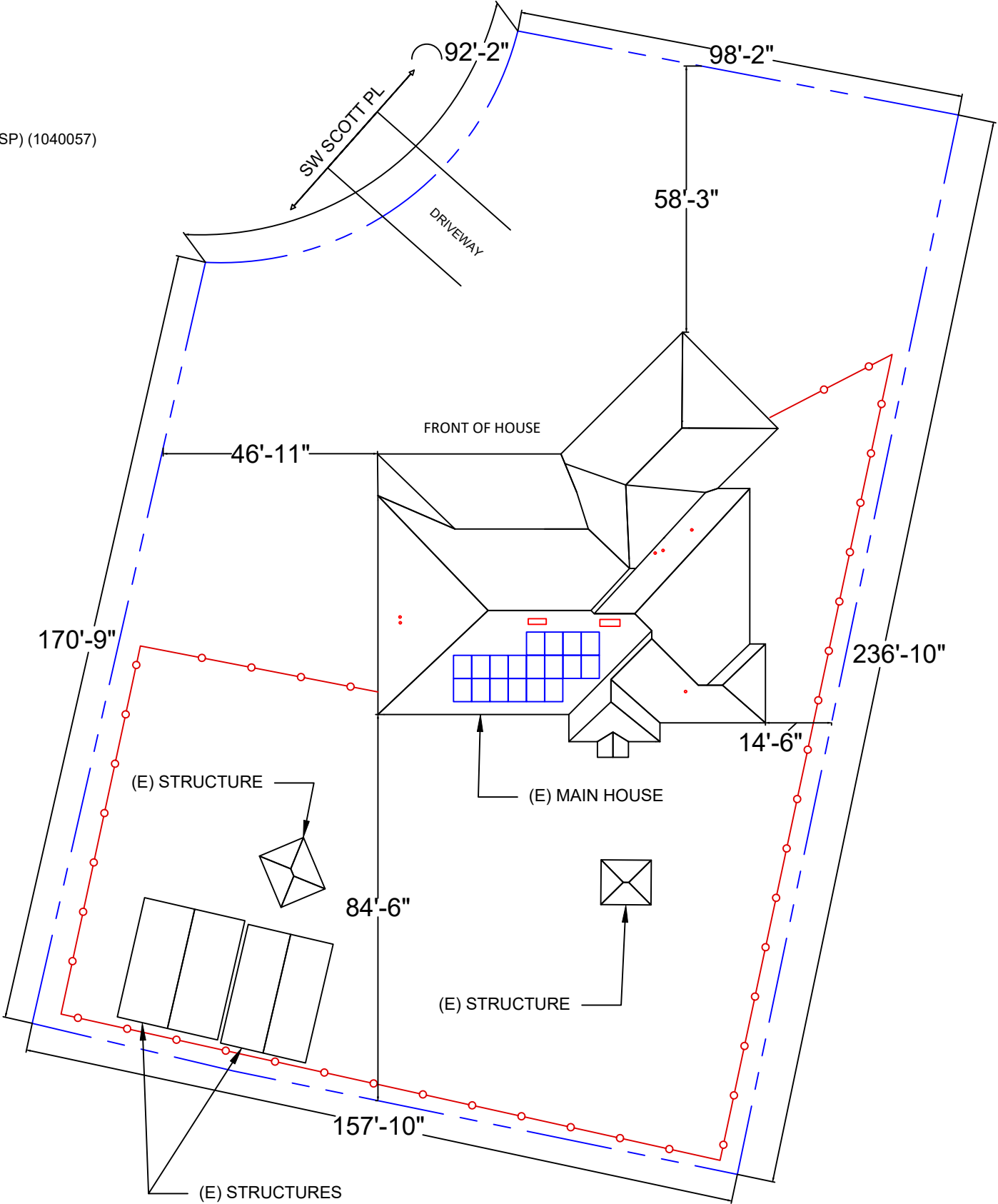
ALL WORK SHALL CONFORM TO THE FOLLOWING CODES:
2023 8TH EDITION FLORIDA BUILDING CODE
2023 8TH EDITION FLORIDA RESIDENTIAL CODE
2023 8TH EDITION FLORIDA FIRE PREVENTION CODE
2020 NATIONAL ELECTRICAL CODE
AS ADOPTED BY COUNTY OF COLUMBIA

PROJECT NOTES

1.1.1 THIS PHOTOVOLTAIC (PV) & ENERGY STORAGE SYSTEM SHALL COMPLY WITH THE RELEVANT YEAR OF THE NATIONAL ELECTRICAL CODE (NEC), ALL MANUFACTURER'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.
1.1.2 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND THE PV & ENERGY STORAGE SYSTEM MUST BE INSPECTED PRIOR TO OPERATION
1.1.3 ALL PV & ENERGY STORAGE SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, BATTERIES, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC AND OTHER GOVERNING CODES
1.1.4 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH 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.

SCOPE OF WORK

1.2.1 CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC & ENERGY STORAGE SYSTEM. THE CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTION OF EXISTING ONSITE CONDITIONS TO DESIGN, SPECIFY, AND INSTALL THE ROOF-MOUNTED PV SYSTEM AND ENERGY STORAGE SYSTEM DETAILED IN THIS DOCUMENT



SHEET INDEX

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PV-03	ATTACHMENT PLAN
PV-04	ELECTRICAL DIAGRAM
PV-05	NOTES
PV-06	WARNING LABELS
PV-07	INSTALLATION RESOURCE
EQUIPMENT DATASHEETS ATTACHED	

LEGEND

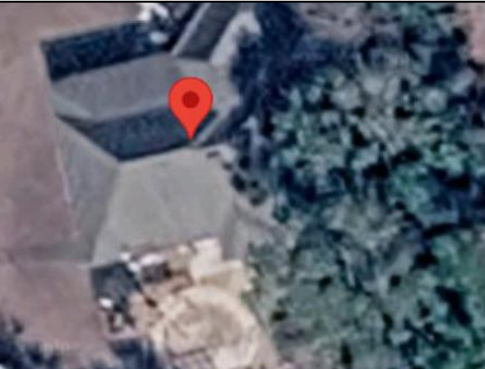
	- PROPERTY LINE
	- FENCE LINE



VICINITY MAP



SATELLITE MAP



CONTRACTOR



NEXT TRADEMARK LLC - ASTRAWATT
SOLAR SARASOTA DBA

PHONE - (225) 249-7125

Godwin Engineering & Design, LLC
8378 Foxtail Loop Pensacola, FL 32526
D. Chad Godwin, PE - Chad@godwineng.com



Digitally signed
by Donnie
Godwin
Date:
2026.07.22
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PROJECT NAME & ADDRESS

PATRICIA BAILEY
234 SW SCOTT PL,
LAKE CITY, FL 32024

APN #: 104S1602853415
AHJ: COUNTY OF COLUMBIA
UTILITY: CLAY ELECTRIC
COOPERATIVE, INC.

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REVISIONS

REV	DESCRIPTION	DATE

SHEET TITLE

COVER PAGE

DRAWN DATE	7/18/2026
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PV-01



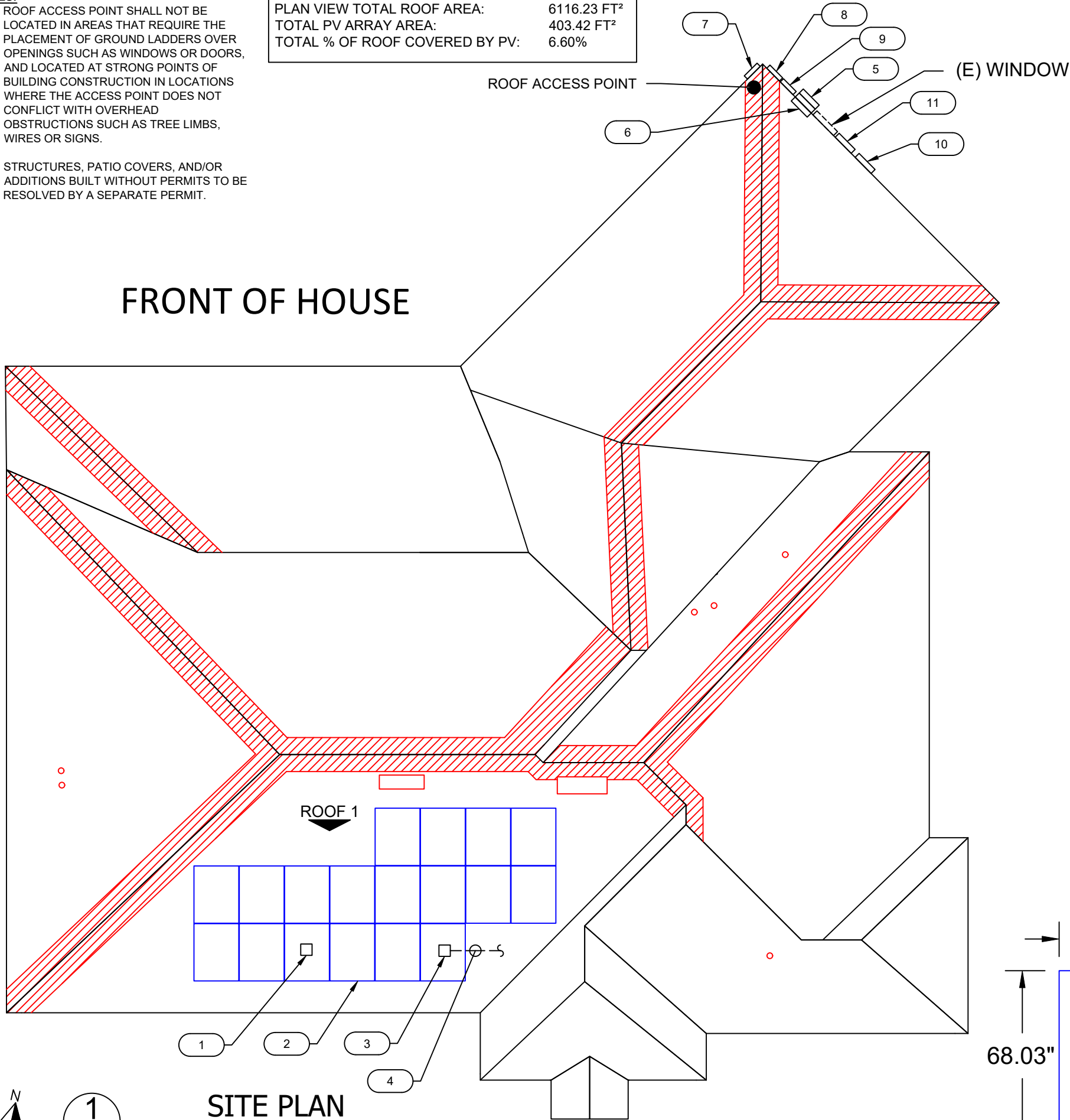
PROPERTY PLAN

SCALE:1" = 30'-0"

NOTES:

1. ROOF ACCESS POINT SHALL NOT BE LOCATED IN AREAS THAT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION IN LOCATIONS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES OR SIGNS.
2. STRUCTURES, PATIO COVERS, AND/OR ADDITIONS BUILT WITHOUT PERMITS TO BE RESOLVED BY A SEPARATE PERMIT.

PLAN VIEW TOTAL ROOF AREA: 6116.23 FT²
TOTAL PV ARRAY AREA: 403.42 FT²
TOTAL % OF ROOF COVERED BY PV: 6.60%



LEGEND

- 36" 18" FIRE SETBACKS
- = MECHANICAL VENT
- = FLUE / PLUMBING VENT
- 1 (N) MICROINVERTER (1 PER MODULE)
- 2 (N) (18) REC SOLAR REC460AA PURE-RX MODULES WITH ENPHASE ENERGY IQ8X-80-M-US UNDER EACH MODULE
- 3 (N) JUNCTION BOX (NEMA 3R)
- 4 (N) CONDUIT RUN; SURFACE MOUNTED (ACTUAL CONDUIT RUNS TO BE DETERMINED IN FIELD)
- 5 (E) METER MAIN COMBO (UNDERGROUND SERVICE) METER #: 154 589 853
- 6 (E) SUB PANEL
- 7 (N) SIGENERGY LOAD HUB (11110069)
- 8 (#1) (N) 60A NON- FUSED PV AC DISCONNECT
- 9 (#2) (N) 60A NON-FUSED ESS AC DISCONNECT
- 10 (N) (1) SIGENERGY 9.6 KW ENERGY CONTROLLER (SIG-EC-9.6-SP) (1040057) WITH (1) SIGENERGY 9.0 KWH BATTERY (11130019)
- 11 (N) ENPHASE COMBINER PANEL

ROOF 1	SLOPE	- 27°
	AZIMUTH	- 167°
	MODULE QTY	- 18
	TRUSS	- 2"x4" @ 24" O.C.
	SURFACE TYPE	- COMPOSITE SHINGLE

CONTRACTOR



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SITE PLAN

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PV-02

DISTRIBUTED LOAD CALCULATIONS	
MODULE	REC SOLAR REC460AA PURE-RX
MODULE WEIGHT	50.05 LBS
MODULE DIMENSIONS (L" x W")	68.03" x 47.44"
TOTAL QTY. OF MODULES	18
TOTAL WEIGHT OF MODULES	900.90 LBS
TYPE OF RACKING	IRONRIDGE XR10 14FT ANODIZED RAIL MILL (XR-10-168M)
TYPE OF ATTACHMENT	IRONRIDGE HALO ULTRAGRIP MILL (QM-HUG-01-M1)
DISTRIBUTED WEIGHT OF RACKING	0.5 PSF
TOTAL WEIGHT OF ARRAY	1102.61 LBS
AREA OF MODULE	22.41 SQFT.
TOTAL ARRAY AREA	403.42 SQFT.
DISTRIBUTED LOAD	2.73 PSF

- NOTE:**
- CONTRACTOR/INSTALLER TO VERIFY COMPATIBILITY OF ANY BRANDS OR PRODUCTS SUBSTITUTED OR USED AS ALTERNATES WITHIN ANY BRAND-SPECIFIC SYSTEMS. CONTRACTOR SHALL SUPPLY AND PRESENT CERTIFICATES OF COMPATIBILITY TO THE BUILDING OFFICIAL UPON INSPECTION AS NEEDED.
 - REFER TO PV MODULE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR RAIL SPACING SPECIFICATIONS

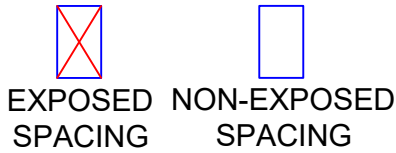
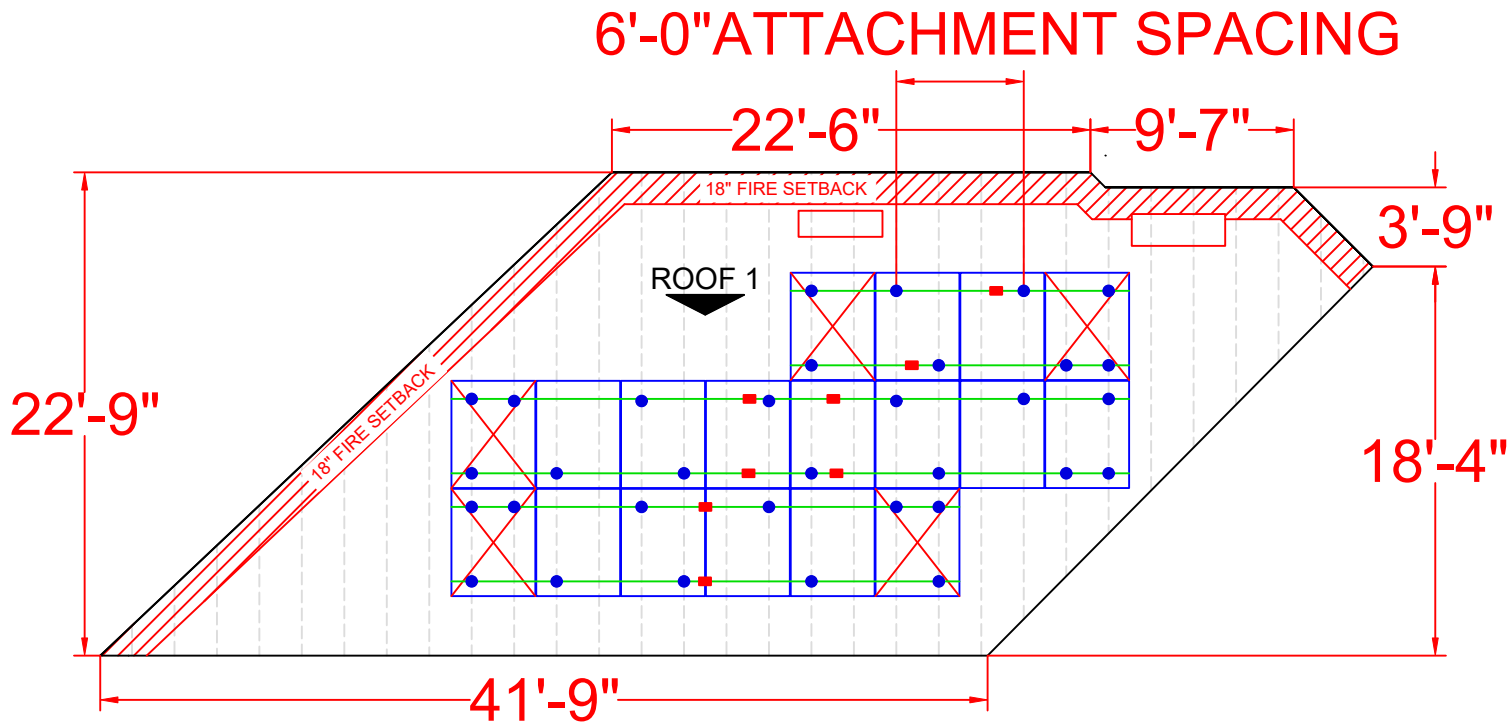
Rafter Spans	Zone 1	Zone 2	Zone 3
Exposed	48"	48"	48"
Non-Exposed	72"	48"	48"
Max Cantilever	28.8"	19.2"	19.2"

Max Cantilever = Max Span * ($\frac{2}{5}$)

LEGEND	
	- ATTACHMENT POINTS
	- RAIL
	- STRUCTURAL MEMBER
	- SPLICE BAR

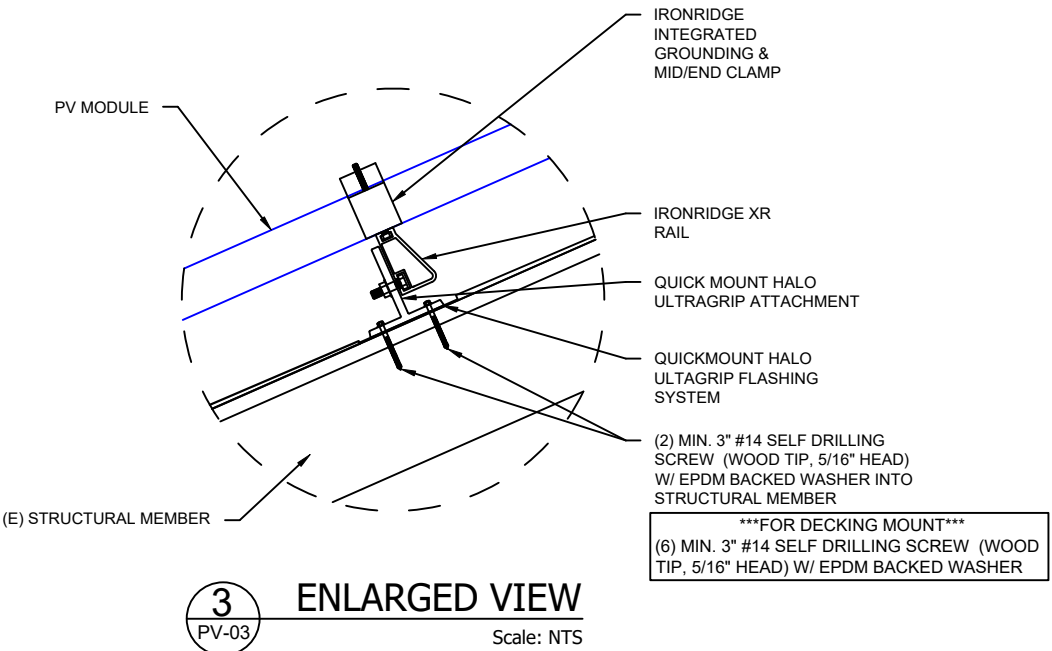
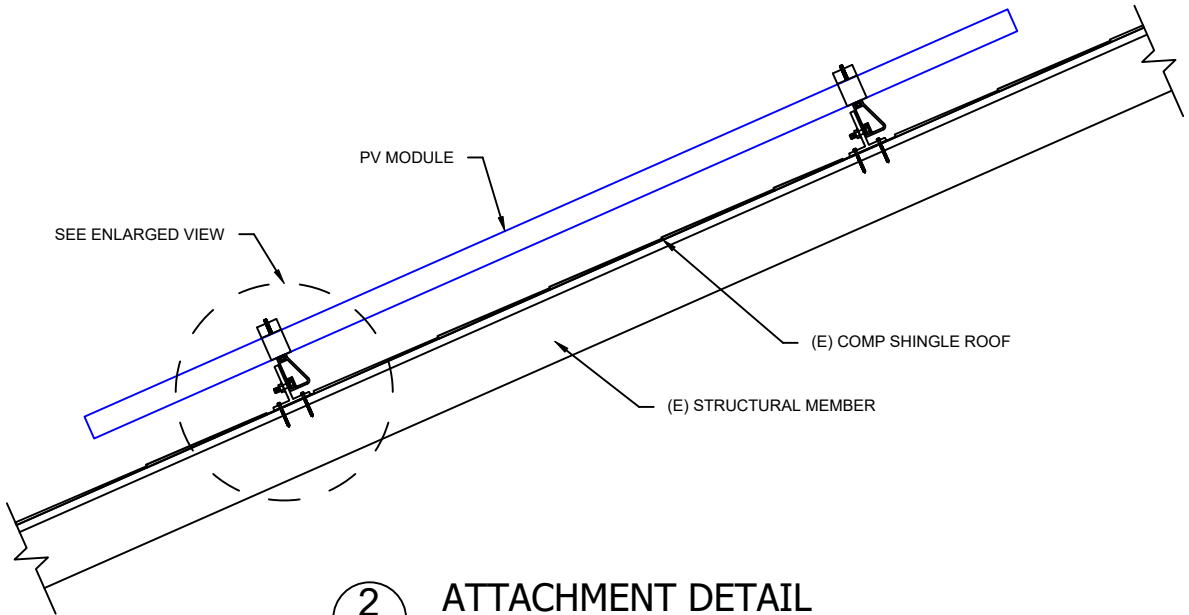
APPLICABLE ROOF PLANE

ROOF 1	SLOPE	- 27°
	AZIMUTH	- 167°
	MODULE QTY	- 18
	TRUSS	- 2"x4" @ 24" O.C.
	SURFACE TYPE	- COMPOSITE SHINGLE



PLANS SATISFY ZONES FBC-1510.7.1
INSTALL WILL BE DONE TO MANUFACTURER SPEC

NOTE: 6" MAXIMUM DISTANCE FROM ROOF SURFACE TO TOP OF PV MODULES



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ATTACHMENT PLAN

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PV-03

GENERAL NOTES

SITE NOTES

- 2.1.1 A LADDER WILL BE IN PLACE FOR INSPECTION IN ACCORDANCE WITH OSHA REGULATIONS.
- 2.1.2 THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH STORAGE BATTERIES.
- 2.1.3 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
- 2.1.4 PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED IN ACCORDANCE WITH SECTION NEC 110.
- 2.1.5 ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.

EQUIPMENT LOCATIONS

- 2.2.1 ALL EQUIPMENT SHALL MEET MINIMUM WORKING CLEARANCES IN ACCORDANCE WITH NEC 110.
- 2.2.2 WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY 2020 NATIONAL ELECTRICAL CODE.
- 2.2.3 JUNCTION AND PULL BOXES PERMITTED INSTALLED UNDER PV MODULES IN ACCORDANCE WITH NEC 690.
- 2.2.4 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL IN ACCORDANCE WITH NEC APPLICABLE CODES.
- 2.2.5 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

STRUCTURAL NOTES

- 2.3.1 RACKING SYSTEM & PV ARRAY WILL BE INSTALLED IN ACCORDANCE WITH THE CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUB-ARRAY, IN ACCORDANCE WITH RAIL MANUFACTURER’S INSTALLATION PRACTICES.
- 2.3.2 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
- 2.3.3 ROOFTOP PENETRATIONS FOR PV RACEWAY WILL BE COMPLETED AND SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
- 2.3.4 ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER OR PROFESSIONAL ENGINEERING GUIDANCE.
- 2.3.5 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

WIRING & CONDUIT NOTES

- 2.4.1 ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
- 2.4.2 CONDUCTORS SIZED IN ACCORDANCE WITH THE NEC
- 2.4.3 AC CONDUCTORS TO BE COLORED OR MARKED PER NEC
- 2.4.4 LISTED OR LABELED EQUIPMENT SHALL BE INSTALLED AND USED IN ACCORDANCE WITH ANY INSTRUCTIONS INCLUDED IN THE LISTING OR LABELING PER NEC

GROUNDING NOTES

- 2.5.1 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.
- 2.5.2 PV EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH NEC 690 AND NEC TABLE 250.122.
- 2.5.3 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORDANCE WITH NEC 250.
- 2.5.4 EQUIPMENT GROUNDING CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH NEC 690 AND INVERTER MANUFACTURER'S INSTALLATION PRACTICES
- 2.5.5 EACH MODULE WILL BE GROUNDED AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ.
- 2.5.6 THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE.
- 2.5.7 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE COLORED GREEN OR MARKED GREEN IF #4 AWG OR LARGER PER NEC 250.
- 2.5.8 THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690 AND NEC 250. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM PROVIDED IN ACCORDANCE WITH NEC 250, NEC 690 AND THE AHJ.
- 2.5.9 GROUND-FAULT DETECTION SHALL COMPLY WITH NEC 690 TO REDUCE FIRE HAZARDS

DISCONNECTION AND OVERCURRENT PROTECTION NOTES

- 2.6.1 DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO THE TERMINALS MARKED “LINE SIDE” (TYPICALLY THE UPPER TERMINALS).
- 2.6.2 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
- 2.6.3 PV SYSTEM CIRCUITS INSTALLED ON OR IN HABITABLE BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH 690.
- 2.6.4 ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690 AND 240.
- 2.6.5 INVERTER ON-GRID BRANCHES SHALL BE CONNECTED TO A SINGLE BREAKER OR GROUPED FUSE DISCONNECT(S) IN ACCORDANCE WITH NEC 110.
- 2.6.6 IF REQUIRED BY THE AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION IN ACCORDANCE WITH NEC 690 AND UL1699B.

INTERCONNECTION NOTES

- 2.7.1 LOAD SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH NEC 705.
- 2.7.2 THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY NOT EXCEED 120 PERCENT OF BUSBAR RATING PER NEC 705.
- 2.7.3 THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE BUSBAR, PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD PER NEC 705.
- 2.7.4 AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT PROTECTION DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR. HOWEVER, THE MAIN OVERCURRENT PROTECTION DEVICE MAY BE EXCLUDED IN ACCORDANCE WITH NEC 705.
- 2.7.5 FEEDER TAP INTERCONNECTION (LOAD SIDE) IN ACCORDANCE WITH NEC 705.
- 2.7.6 SUPPLY SIDE TAP INTERCONNECTION IN ACCORDANCE WITH TO NEC 705 WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.
- 2.7.7 BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING PER NEC 705.

CONTRACTOR



NEXT TRADEMARK LLC - ASTRAWATT
SOLAR SARASOTA DBA

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NOTES

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PV-05

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WARNING

ELECTRICAL SHOCK HAZARD

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

LABEL LOCATION: COMBINER PANEL, AC
DISCONNECT, POINT OF INTERCONNECTION
PER CODE: NEC 706.15(C)(4), NEC 690.13(B)

⚠️

WARNING

TURN OFF PHOTOVOLTAIC AC
DISCONNECT PRIOR TO
WORKING INSIDE PANEL

LABEL LOCATION: COMBINER PANEL(S), MAIN SERVICE DISCONNECT
PER CODE: NEC 110.27(C), OSHA 1910.145(f)(7)

PHOTOVOLTAIC POWER SOURCE

PHOTOVOLTAIC SYSTEM AC DISCONNECT

RATED AC OUTPUT CURRENT: 28.44 A

NOMINAL OPERATING AC VOLTAGE: 240 V

LABEL LOCATION: AC DISCONNECT/POINT OF INTERCONNECTION
PER CODE: NEC 690.54

⚠️

WARNING

MULTIPLE POWER SOURCE

SOURCES: UTILITY GRID, PV AND ESS SYSTEM

LABEL LOCATION: MAIN SERVICE DISCONNECT, PRODUCTION/NET METER
PER CODE: NEC 690.59, 705.12(C)

PV SYSTEM

DISCONNECT

LABEL LOCATION: AC DISCONNECT
PER CODE: NEC 690.13(B)

⚠️

WARNING

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

LABEL LOCATION: AC DISCONNECT
PER CODE: NEC 705.12(B)(3)(3)

⚠️

WARNING

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

LABEL LOCATION: POINT OF INTERCONNECTION
PER CODE: NEC 705.12(B)(3)(2)

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

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

LABEL LOCATION: MAIN SERVICE DISCONNECT
PER CODE: NEC 690.56(C)

MAIN PHOTOVOLTAIC
SYSTEM DISCONNECT

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

RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM

LABEL LOCATION: RSD INITIATION DEVICE, AC DISCONNECT
PER CODE: NEC 690.56(C)(2)

⚠️

CAUTION

PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

LABEL LOCATION: MAIN SERVICE DISCONNECT
PER CODE: NEC 705.12(D), NEC 690.59

DO NOT DISCONNECT
UNDER LOAD

LABEL LOCATION: MAIN SERVICE DISCONNECT
PER CODE: NEC 690.15(B) & NEC 690.33(D)(2)

MAXIMUM DC VOLTAGE

OF PV SYSTEM

ENERGY
STORAGE
SYSTEM
DISCONNECT

LABEL LOCATION: ESS DISCONNECT
PER CODE: NEC 706.15(C)

CAUTION

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

ADDRESS: 234 SW SCOTT PL, LAKE CITY, FL 32024

CONTRACTOR

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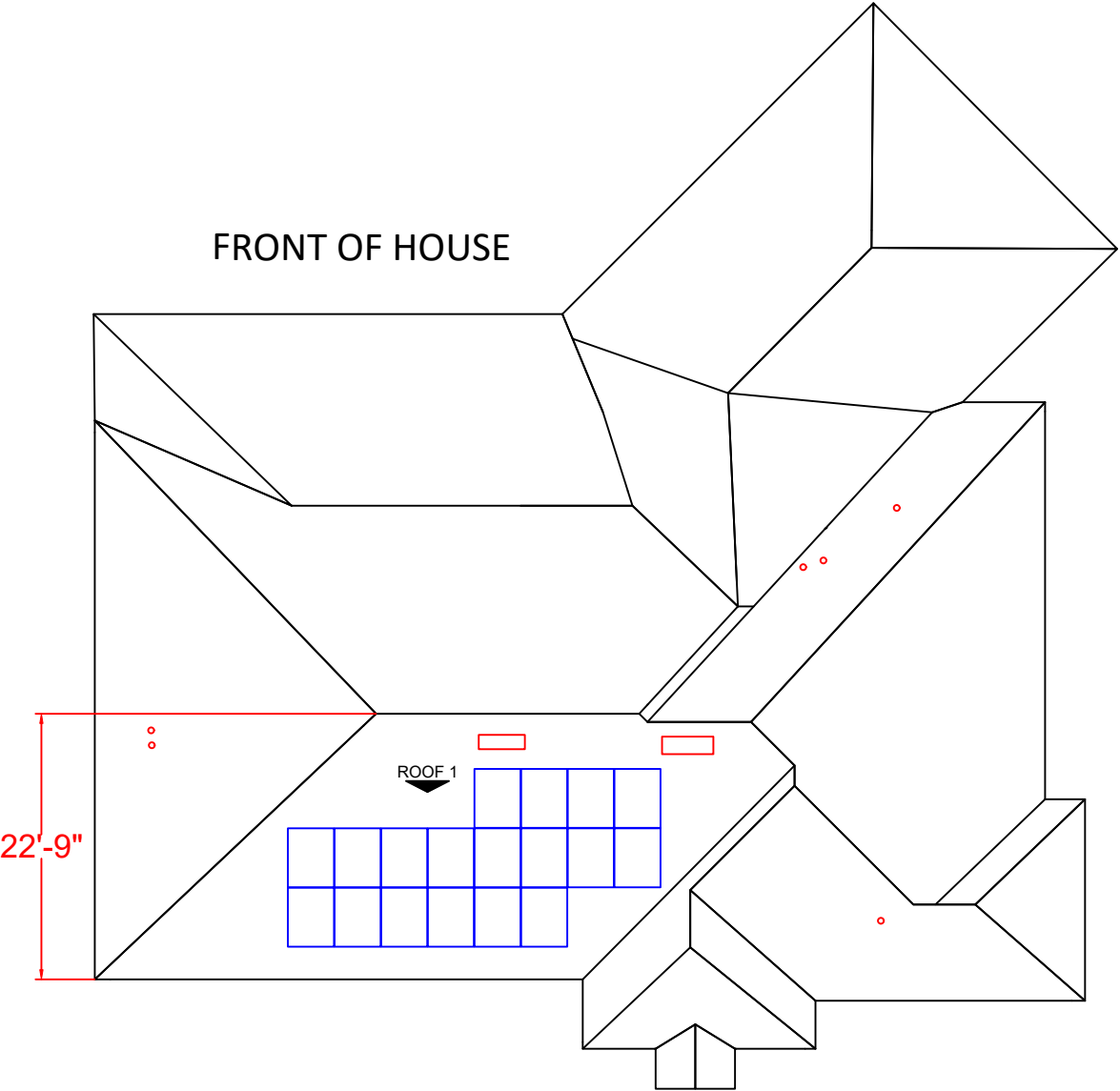
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SHEET NUMBER

PV-06

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REFERENCE ONLY

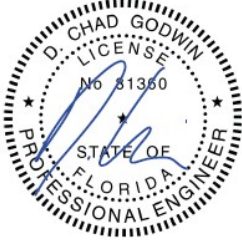


**DIMENSIONS ARE 2D (FLAT)

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(1) SIGENERGY 9.6 KW ENERGY CONTROLLER
(SIG-EC-9.6-SP) (1040057)
(1) SIGENERGY 9.0 KWH BATTERY (11130019)
(1) SIGENERGY LOAD HUB (11110069)

REVISIONS		
REV	DESCRIPTION	DATE

SHEET TITLE
INSTALLATION
RESOURCE

DRAWN DATE	7/18/2026
DRAWN BY	LD

SHEET NUMBER

PV-07

REC ALPHA® PURE-RX

DATASHEET



PURE STRENGTH

55 MM HAIL RESISTANT*

+7000 PA / -4000 PA
WITH 4 POINT CLAMPING

+10000 PA / -6000 PA
WITH 6 POINT CLAMPING

450 - 475W
HETEROJUNCTION
TECHNOLOGY

228 $\frac{W}{m^2}$ POWER DENSITY
>92% POWER IN YEAR 25
-0.24%/°C TEMPERATURE
COEFFICIENT OF P_{MAX}

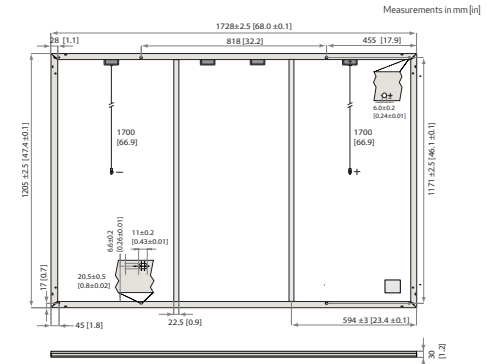


ELIGIBLE

REC ALPHA® PURE-RX DATASHEET

GENERAL DATA

Cell Type	88 half-cut bifacial REC heterojunction cells, with gapless technology
Glass	3.2 mm 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 62790:2020
Connectors	Stäubli MC4 PV-KBT 4/KST 4 (4 mm ²) in accordance with IEC 62852:2014, IP68 only when connected
Cable	4 mm ² solar cable, 1.50 m + 1.50 m in accordance with EN50618:2014
Dimensions	1728 x 1205 x 30 mm (2.08 m ²)
Weight	22.7 kg
Origin	Made in Singapore.



ELECTRICAL DATA

PRODUCT CODE*: RECxxxAA Pure-RX

	450	455	460	465	470	475
Power Output - P_{MAX} (W _p)	450	455	460	465	470	475
Watt Class Sorting - (W)	0/+5	0/+5	0/+5	0/+5	0/+5	0/+5
Nominal Power Voltage - V_{MPP} (V)	54.3	54.6	54.9	55.2	55.4	55.5
Nominal Power Current - I_{MPP} (A)	8.29	8.34	8.38	8.43	8.49	8.56
Open Circuit Voltage - V_{OC} (V)	65.6	65.6	65.7	65.7	65.7	65.7
Short Circuit Current - I_{SC} (A)	8.81	8.84	8.88	8.91	8.95	9.00
Power Density (W/m ²)	216	219	221	223	226	228
Panel Efficiency (%)	21.6	21.9	22.1	22.3	22.6	22.8

STC

NMOT

Power Output - P_{MAX} (W _p)	342	346	350	354	358	361
Nominal Power Voltage - V_{MPP} (V)	51.2	51.5	51.7	52.0	52.2	52.3
Nominal Power Current - I_{MPP} (A)	6.70	6.74	6.77	6.81	6.86	6.91
Open Circuit Voltage - V_{OC} (V)	61.8	61.8	61.9	61.9	61.9	61.9
Short Circuit Current - I_{SC} (A)	7.12	7.14	7.18	7.20	7.23	7.27

Values at standard test conditions (STC: air mass AM1.5, irradiance 1000 W/m², temperature 25°C) based on a production spread with a tolerance of P_{MAX} V_{OC} & I_{SC} ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM1.5, irradiance 800 W/m², temperature 20°C, wind speed 1 m/s). *Where xxx indicates the nominal power class (P_{MAX}) at STC above.

*Available while stocks last

TEMPERATURE COEFFICIENTS*

P_{MAX} -0.24%/°C	V_{OC} -0.24%/°C	I_{SC} 0.04%/°C	*The temperature coefficients stated are linear values
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MODULE RATINGS

Module Operating Temperature [T98]§	80°C
Min Environmental Temperature	-40°C
Nominal Module Operating Temperature	44 ± 2°C
Max Hail Rating [§]	55 mm @ 33.9 m/s
System Voltage	1000 V
Max Series Fuse Rating	25 A
Max Reverse Current	25 A

§ 98th percentile operating temperature
*Kiwa PVEL H55 test result

MAXIMUM TEST LOAD*

Front (4-Point)*	+7000 Pa (714 Kg/m ²)
Rear (4-Point)*	-4000 Pa (408 Kg/m ²)
Front (6-Point)**	+10000 Pa (1,020 Kg/m ²)
Rear (6-Point)**	-6000 Pa (612 Kg/m ²)

Design load = Test load / 1.5 (safety factor)

*IEC61730/UL61730 certified. Refer to installation manual.

**Internal testing. Refer to installation manual.

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.

CERTIFICATIONS

ISO 14001; ISO 9001; IEC 45001; IEC 62941	
IEC 61215:2021; IEC 61730:2023; UL 61730	
IEC 61730	Fire Class C
EN 11925-2	Ignitability (EN 13501-1 Class E)
EN 13501-5	Roof Fire Performance (B _{ROOF} T2)
IEC 62716	Ammonia Resistance
IEC 61701	Salt Mist (SM6)
IEC 61215:2021	Hailstone (35 mm)
UL 61730	Fire Type 2
IEC TS 63126	Level 1



WARRANTY

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

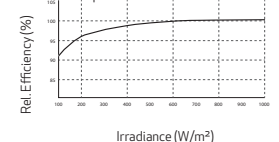
REC ProTrust Warranty applies only for i) REC panels installed by an REC Certified Solar Professional, and ii) panels have been registered by the installer with REC. Subject to System Size and further conditions. See www.recgroup.com for details.

DELIVERY INFORMATION

Panels per Pallet	33
Panels per 40 ft GP/high cube container	594 (18 Pallets)
Panels per 13.6 m truck	660 (20 Pallets)

LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



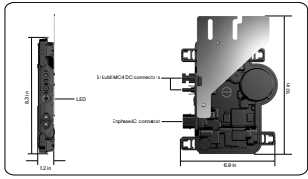
REC Solar PTE. LTD.
20 Tuas South Ave. 14
Singapore 637312
post@recgroup.com
www.recgroup.com

IQ8X Microinverter

Our newest IQ8 Series Microinverters^{1,2} are the industry's first microgrid-forming³, software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. 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.



Key specifications	IQ8X-80-M-US/ IQ8X-80-M-DOM-US @ 240 V	IQ8X-80-M-US/ IQ8X-80-M-DOM-US @ 208 V
Peak output power	384 VA 240 V, 208 V	366 VA 208 V, 120"
Nominal grid voltage (L-L)	split-phase (L-L), 180°	single-phase (L-L), 120°
Nominal frequency	60 Hz	60 Hz
CEC weighted efficiency	96.5%	96.5%
Maximum input DC voltage	79.5 V	79.5 V
MPPT voltage range	43–60 V	43–60 V
Maximum module I_{sc}	13 A	13 A
Ambient temperature range	–40°C to 65°C (–40°F to 149°F)	–40°C to 65°C (–40°F to 149°F)



¹For details, see the "Compatibility with IQ7 Series Microinverters" section.
²IQ8X Microinverter ships with default settings that meet North America's IEEE 1547 interconnection standard requirements. Region-specific adjustments may be required by an Authority Having Jurisdiction (AHJ) or utility representative, according to the IEEE 1547 interconnection standard. An AC disconnect is required to make these changes during installation.
³Meets UL 1741 when installed with IQ System Controller 2 or 3.

Simple

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

Reliable

- Produces power even when the grid is down³
- More than one million cumulative hours of testing
- Industry-leading limited warranty of up to 25 years
- 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 3rd Ed.)

Input data (DC)	Units	IQ8X-80-M-US/IQ8X-80-M-DOM-US @ 240 V	IQ8X-80-M-US/IQ8X-80-M-DOM-US ⁴ @ 208 V
Commonly used module pairings ¹	W	320–540	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	43–60
Operating range	V	25–79.5	25–79.5
Minimum/Maximum start voltage	V	30–79.5	30–79.5
Maximum input DC voltage	V	79.5	79.5
Maximum continuous input DC current	A	10	10
Maximum input DC short-circuit current	A	16	16
Maximum module I_{sc}	A	13	13
Overvoltage class DC port	–	II	II
DC port backfeed current	mA	0	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)	Units	IQ8X-80-M-US/IQ8X-80-M-DOM-US @ 240 V	IQ8X-80-M-US/IQ8X-80-M-DOM-US ⁴ @ 208 V
Peak output power	VA	384	366
Maximum continuous output power	VA	380	360
Nominal voltage (L-L)	V	240, split-phase (L-L), 180°	208, single-phase (L-L), 120° ⁴
Minimum and maximum grid voltage ¹	V	211–264	183–229
Maximum continuous output current	A	1.58	1.73
Nominal frequency	Hz	60	60
Extended frequency range	Hz	47–68	47–68
AC short-circuit fault current over three cycles	A _{max}	2.70	2.70
Maximum units per 20 A (L-L) branch circuit ¹	–	10	9
Total harmonic distortion	%	<5	<5
Overvoltage class AC port	–	III	III
AC port backfeed current	mA	18	18
Power factor setting	–	1.0	1.0
Grid-tied power factor (adjustable)	–	0.85 leading ... 0.85 lagging	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

¹IQ8X-80-M-DOM-US is made in the U.S., and the PCBs, electrical parts, and enclosure are domestically manufactured to meet the eligibility requirements to be considered for the FTC domestic content bonus label.
²No reinforced DC AC safety.
³IQ8X is not certified for use with Enphase Three Phase Network Protection Relay (NPR-3P-208-180) and is, therefore, designed for single-phase operation only. Check with the local utility representative if you need to install single-phase meter in a three-phase system.
⁴Nominal voltage range can be extended beyond nominal if required by the utility.
⁵Units may vary based on local requirements to define the number of microinverters per branch in your area.

Mechanical data	IQ8X-80-M-US/IQ8X-80-M-DOM-US @ 240 V	IQ8X-80-M-US/IQ8X-80-M-DOM-US ⁴ @ 208 V
Ambient temperature range	–40°C to 65°C (–40°F to 149°F)	–40°C to 65°C (–40°F to 149°F)
Relative humidity range	4% to 100% (condensing)	4% to 100% (condensing)
DC connector type	Stäubli MC4	Stäubli MC4
Dimensions (H × W × D)	212 mm (8.3") × 175 mm (6.9") × 30.2 mm (1.2"); 1.1 kg (2.43 lb)	212 mm (8.3") × 175 mm (6.9") × 30.2 mm (1.2"); 1.1 kg (2.43 lb)
Cooling	Natural convection—no fans	Natural convection—no fans
Approved for wet locations	Yes; PD3	Yes; PD3
Enclosure	Class II double-insulated, corrosion-resistant polymeric enclosure	Class II double-insulated, corrosion-resistant polymeric enclosure
Environmental category/UV exposure rating	NEMA Type 6/Outdoor	NEMA Type 6/Outdoor
Compliance	IQ8X-80-M-US/IQ8X-80-M-DOM-US @ 240 V	IQ8X-80-M-US/IQ8X-80-M-DOM-US ⁴ @ 208 V

Certifications	CA Rule 21 (UL 1741-SA), UL 62109-1, IEEE 1547-2018 (UL 1741-SB 3 rd Ed.), 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 C22.1-2018 Rule 64-218 rapid shutdown of PV systems for AC and DC conductors when installed according to the manufacturer's instructions.
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Compatibility with IQ7 Series Microinverters

- IQ8 Series Microinverters can be added to existing IQ7 systems on the same IQ Gateway/IQ Combiner/IQ System Controller only in the following configurations: (i) Solar Only or (ii) Solar Plus Battery (IQ Battery 3/IO or IQ Battery 5P) grid-tied or with backup with IQ System Controller 3/3G/3M and IQ Meter Collar.
- IQ7 Series Microinverters cannot be added to a site with existing IQ8 Series Microinverters on the same gateway.
- A mixed system with both IQ7 and IQ8 Series Microinverters does not support IQ8-specific features such as PCS or the Sunlight Jump Start feature.
- The rated continuous power output of the IQ7 and IQ8 Microinverter arrays must not exceed 150% of the IQ Battery's rated power output. If this ratio is exceeded, PV shedding must be implemented to reduce excess PV generation during transitions to off-grid mode.

Components of the Enphase Energy System

IQ Battery

All-in-one AC-coupled storage solution that integrates seamlessly with your solar energy system, providing reliable backup power and intelligent energy management for maximum performance and energy savings.

IQ System Controller

The IQ System Controller connects the home to the grid power, IQ Batteries, generator and solar PV with microinverters.

IQ Combiner/IQ Gateway

The IQ Combiner/IQ Gateway is a device that performs energy management, provides internet connectivity, and integrates with the IQ Series Microinverters to provide complete control and insights into the Enphase Energy System.

IQ Cable

The IQ Cable is a continuous-length 12-3AWG cable with pre-installed connectors for IQ Microinverters that support faster, simpler, and more reliable installations. The cable is handled like standard outdoor-rated electrical wire, allowing it to be cut, spliced, and extended as needed.

Revision history

Revision	Date	Description
DSH-00185-7-0	August 2025	Updated information on backward compatibility for IQ8/IQ7 Series Microinverters.
DSH-00185-6-0	December 2024	Updated information on backward compatibility with IQ7 Series Microinverters.
DSH-00185-5-0	October 2024	Updated a footnote of the specifications table.
DSH-00185-4-0	August 2024	Added the SKU 'IQ8X-80-M-DOM-US'.
DSH-00185-3-0	February 2024	Updated the information about IEEE 1547 interconnection standard requirements.
DSH-00185-2-0	November 2023	Preliminary release - public.
DSH-00185-1-0	October 2023	Preliminary release.

Previous releases.



X-IQ-AMI-240-5-HDK
X-IQ-AMI-240-5C-HDK
X-IQ-AMI-240-5
X-IQ-AMI-240-5C

IQ Combiner 5/5C

The IQ Combiner 5/5C consolidates interconnection equipment into a single enclosure and streamlines IQ Series Microinverters and IQ Gateway installation by providing a consistent, pre-wired solution for residential applications. IQ Combiner 5/5C uses wired control communication and is compatible with IQ System Controller 3/3G and IQ Battery SP.

The IQ Combiner 5/5C, IQ Series Microinverters, IQ System Controller 3/3G and IQ Battery SP provide a complete grid-agnostic Enphase Energy System.



IQ Series Microinverters
The high-powered smart grid-ready IQ Series Microinverters (IQ6, IQ7, and IQ8 Series) simplify the installation process.



IQ System Controller 3/3G
Provides microgrid interconnection device (MID) functionality by automatically detecting grid failures and seamlessly transitioning the home energy system from grid power to backup power.



IQ Battery SP
Fully integrated AC battery system. Includes six field-replaceable IQ8B-BAT Microinverters.



IQ Load Controller
Helps prioritize essential appliances during a grid outage to optimize energy consumption and protect battery life.



5-year limited warranty



*For country-specific warranty information, see the <https://enphase.com/enphases/5-year-warranty> page.
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IQC-5-5C-DSH-00007-6.0-EN-US-2024-09-30

IQ Combiner 5/5C

MODEL NUMBER	
IQ Combiner 5 (X-IQ-AMI-240-5/ X-IQ-AMI-240-5-HDK)	IQ Combiner 5 with IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSI C12.20 ±0.5%), consumption monitoring (±2.5%), and IQ Battery monitoring (±2.5%). Includes a silver solar shield to deflect heat. IQ-AMI-240-5-HDK includes a factory installed hold-down kit compatible with all the circuit breakers mentioned in the Accessories and Replacement Parts section.
IQ Combiner 5C (X-IQ-AMI-240-5C/ X-IQ-AMI-240-5C-HDK)	IQ Combiner 5C with IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSI C12.20 ±0.5%), consumption monitoring (±2.5%), and IQ Battery monitoring (±2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-MI-06-SP-05). Includes a silver solar shield to deflect heat. IQ-AMI-240-5C-HDK includes a factory installed hold-down kit compatible with all the circuit breakers mentioned in the Accessories and Replacement Parts section.
WHAT'S IN THE BOX	
IQ Gateway printed circuit board	IQ Gateway is the platform for total energy management for comprehensive, remote maintenance, and management of the Enphase Energy System
Busbar	80 A busbar with support for one IQ Gateway breaker and four 20 A breakers for installing IQ Series Microinverters and IQ Battery SP
IQ Gateway breaker	Circuit breaker, 2-pole, 10 A/15 A
Production CT	Pre-wired revenue-grade solid-core CT, accurate up to ±0.5%
Consumption CT	Two consumption metering clamp CTs, shipped with the box, accurate up to ±2.5%
IQ Battery CT	One battery metering clamp CT, shipped with the box, accurate up to ±2.5%
CTRL board	Control board for wired communication with IQ System Controller 3/3G and the IQ Battery SP
Enphase Mobile Connect (only with IQ Combiner 5C)	4G-based LTE-M cellular modem (CELLMODEM-MI-06-SP-05) with a 5-year T-Mobile data plan
Accessories kit	Spare control headers for the COMMS-KIT-2 board
ACCESSORIES AND REPLACEMENT PARTS (NOT INCLUDED, ORDER SEPARATELY)	
CELLMODEM-MI-06-SP-05	4G-based LTE-M cellular modem with a 5-year T-Mobile data plan
CELLMODEM-MI-06-AF-05	4G-based LTE-M cellular modem with a 5-year AT&T data plan
Circuit breakers (off-the-shelf)	Supports Eaton BR2XX, Siemens 62XX, and GE/ABB THXL21XX Series circuit breakers (IX represents 10, 15, 20, 30, 40, 50, or 60). Also supports Eaton BR20B, BR20B, and BR240B circuit breakers compatible with the hold-down kit.
Circuit breakers (provided by Enphase)	BRK-10A-2-240V, BRK-15A-2-240V, BRK-20A-2P-240V, BRK-15A-2P-240V-B, and BRK-20A-2P-240V-B (more details in the "Accessories" section)
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 5/5C
EN-ENV2-PCBA-5	IQ Gateway replacement printed circuit board (PCB) for IQ Combiner 5/5C
X-IQ-NA-HD-125A	Hold-down kit compatible with Eaton BR-8 Series circuit breakers (with screws). Not required for X-IQ-AMI-240-5-HDK/X-IQ-AMI-240-5C-HDK.
XA-COMMS2-PCBA-5	Replacement COMMS-KIT-2 printed circuit board (PCB) for IQ Combiner 5/5C
ELECTRICAL SPECIFICATIONS	
Rating	80 A
System voltage and frequency	120/240 VAC or 120/208 VAC, 60 Hz
Busbar rating	125 A
Fault current rating	10 kAIC
Maximum continuous current rating (input from PV/storage)	64 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR, Siemens Q, or GE/ABB THXL Series distributed generation (DG) breakers only (not included)
Maximum total branch circuit breaker rating (input)	80 A of distributed generation/95 A with IQ Gateway breaker included
IQ Gateway breaker	10 A or 15 A rating GE/Siemens/Eaton included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway

* A plug-and-play industrial-grade cell modem for systems of up to 80 microinverters. Available in the United States, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.

IQC-5-5C-DSH-00007-6.0-EN-US-2024-09-30

ACCESSORIES AND REPLACEMENT PARTS (NOT INCLUDED, ORDER SEPARATELY)	
Consumption monitoring CT (CT-200-CLAMP)	A pair of 200 A clamp-style current transformers is included with the box
IQ Battery metering CT	200 A clamp-style current transformer for IQ Battery metering, included with the box
MECHANICAL DATA	
Dimensions (W × H × D)	37.5 cm × 48.5 cm × 16.8 cm (14.75" × 19.5" × 6.63") Height is 53.5 cm (21.06") with mounting brackets.
Weight	7.5 kg (16.5 lb)
Ambient temperature range	-40°C to 48°C (-40°F to 118°F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction • 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 3/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors • Always follow local code requirements for conductor sizing
Wire sizes	Built-in CTRL board for wired communication with the IQ Battery SP and the IQ System Controller 3/3G. Integrated power line communication for IQ Series Microinverters.
Communication (in-premise connectivity)	
Altitude	Up to 2,600 meters (8,530 feet)
COMMUNICATION INTERFACES	
Integrated Wi-Fi	802.11n/g/n (dual band 2.4 GHz/5 GHz) for connecting the Enphase Cloud through the internet.
Wi-Fi range (recommended)	10 m (32.8 feet)
Bluetooth	BLE4.2, 10 m range to configure Wi-Fi SSID
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included) for connecting to the Enphase Cloud through the internet.
Cellular/Mobile Connect	CELLMODEM-MI-06-SP-05 or CELLMODEM-MI-06-AF-05 (included with the IQ Combiner 5C)
Digital I/O	Digital input/output for grid operator control
USB 2.0	Mobile Connect, COMMS-KIT-01 for IQ Battery 3/3T/10/10T, COMMS-KIT-02 for IQ Battery SP
Access point (API) mode	For connection between the IQ Gateway and a mobile device running the Enphase Installer App
Metering ports	Up to two Consumption CTs, one IQ Battery CT, and one Production CT
Power line communication	90-110 kHz
Web API	See https://developer-v4.enphase.com
Local API	See Guide for Local API
COMPLIANCE	
IQ Combiner with IQ Gateway	UL 1741 CAN/CSA C22.2 No. 107.1, Title 47 CFR Part 15, Class B, ICES 003, NOM-2008-240V-220V, UL 61010-1 CAN/CSA 22.2 No. 61010-1 (IEEE 1547, 2018 (UL 1741-3B, 3rd Ed.), IEEE 2020.5 CSP Compliant. Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
COMPATIBILITY	
PV	Microinverters IQ6, IQ7, and IQ8 Series Microinverters
COMMS-KIT-01*	IQ System Controller IQ System Controller 2
	IQ Battery ENCHARGE-3-IP-NA, ENCHARGE-10-IP-NA, ENCHARGE-3T-IP-NA, ENCHARGE-10T-IP-NA
COMMS-KIT-02*	IQ System Controller 3 IQ System Controller 3
	IQBATTERY-SP-IP-NA

* For information about IQ Combiner 5/5C compatibility with the 2nd generation hardware, refer to the <https://enphase.com>.
IQ Combiner 5/5C comes pre-equipped with COMMS-KIT-01.

IQC-5-5C-DSH-00007-6.0-EN-US-2024-09-30

Accessories

Mobile Connect	Circuit breakers
 4G-based LTE-M cellular modem with a 5-year data plan (CELLMODEM-MI-06-SP-05 for T-Mobile and CELLMODEM-MI-06-AF-05 for AT&T)	 BRK-10A-2-240V Circuit breaker, 2-pole, 10 A, Eaton BR210 BRK-15A-2-240V Circuit breaker, 2-pole, 15 A, Eaton BR215 BRK-20A-2P-240V Circuit breaker, 2-pole, 20 A, Eaton BR220 BRK-15A-2P-240V-B Circuit breaker, 2-pole, 15 A, Eaton BR225B with hold-down kit support BRK-20A-2P-240V-B Circuit breaker, 2-pole, 20 A, Eaton BR225B with hold-down kit support
CT-200-SOLID	CT-200-CLAMP
 200 A revenue-grade solid-core Production CT with ±0.5% error rate (replacement SKU)	 200 A clamp-style consumption and battery metering CT with ±2.5% error rate (replacement SKU)

Enphase
IQ Cable accessories

The Enphase IQ Cable and accessories are part of the latest generation Enphase Energy System. These accessories provide simplicity, reliability, and faster installation times.



Enphase IQ Cable

- Two-wire, double-insulated Enphase IQ Cable is 50% lighter than the previous generation Enphase cable
- New cable numbering and plug-and-play connectors speed up installation and simplify wire management
- Link connectors eliminate cable waste

IQ Field Wireable Connectors

- Easily connect IQ Cables on the roof without complex wiring
- Make connections from any open connector and center-feed any section of cable within branch limits
- Available in male and female connector types

Enphase IQ Cable accessories

CONDUCTOR SPECIFICATIONS			
Certification	UL 3003 (raw cable), UL 9703 (cable assemblies), DG cable		
Flame test rating	FT4		
Compliance	RoHS, OIL RES I, CE, UV Resistant, combined UL for Canada and United States		
Conductor type	THHN/THWN-2 dry/wet		
Disconnecting means	The AC and DC bulkhead connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.		
IQ CABLE TYPES/ORDERING OPTIONS			
Connectorized models	Size/Maximum nominal voltage	Connector spacing	Connector count per box
Q-12-10-240	12 AWG/277 VAC	1.3 m (4.2 ft)	240
Q-12-12-240	12 AWG/277 VAC	1.5 m (4.9 ft)	240
Q-12-17-240	12 AWG/277 VAC	2.0 m (6.5 ft)	240
Q-12-18-240	12 AWG/277 VAC	2.1 m (6.9 ft)	240
Q-12-20-200	12 AWG/277 VAC	2.3 m (7.5 ft)	200
Q-12-22-200	12 AWG/277 VAC	2.5 m (8.2 ft)	200
Q-12-25-200	12 AWG/277 VAC	2.8 m (9.1 ft)	200
ENPHASE IQ CABLE ACCESSORIES			
Name	Model number	Description	
IQ Raw Cable	Q-12-RAW-300	300 meters of 12 AWG cable with no connectors	
IQ Field Wireable Connector (male)	Q-CONN-10M	Make connections from any open connector	
IQ Field Wireable Connector (female)	Q-CONN-10F	Make connections from any IQ Cable open connector	
IQ Cable Clip	Q-CLIP-100	Used to fasten cabling to the racking or to secure looped cabling	
IQ Disconnect Tool	Q-DISC-10	IQ Disconnect tool for IQ Cable connectors, DC connectors, and AC module mount.	
IQ Sealing Caps (female)	Q-SEAL-10	One needed to cover each unused connector on the cabling	
IQ Terminator	Q-TERM-10	IQ Terminator for unused cable ends	
Enphase EN4 to MC4 adapter (150 mm) ¹	ECA-EN4-S22	Connect PV module using MC4 connectors to IQ Microinverters with EN4 (TE PV4-S SOLARLOK) 150 mm/5.9" to MC4	
Enphase EN4 to MC4 adapter (1000 mm) ²	ECA-EN4-S22-10-12	Connect PV module using MC4 connectors to IQ Microinverters with EN4 (TE PV4-S SOLARLOK) 1000 mm/39.4" to MC4	
Enphase EN4 to MC4 adapter (1800 mm) ²	ECA-EN4-S22-18-12	Connect PV module using MC4 connectors to IQ Microinverters with EN4 (TE PV4-S SOLARLOK) 1800 mm/70.9" to MC4	
Enphase EN4 to non-terminated extension cable ³	ECA-EN4-FW-12	For field wiring of UL-certified DC connectors. EN4 to non-terminated cable, 150 mm/5.9"	
Enphase EN4 non-terminated adapter ¹	ECA-EN4-FW	For field wiring of UL-certified DC connectors. EN4 (TE PV4-S SOLARLOK) to non-terminated cable 150 mm/5.9"	
Enphase EN4 to MC4 adapter (600 mm) ³	ECA-EN4-S22-L	Longer adapter cable for EN4 (TE PV4-S SOLARLOK) to MC4. Use with split cell modules or PV modules with short DC cable 600 mm/23.6"	
Enphase EN4 to MC4 adapter (57 mm) ²	ECA-EN4-S22-12	Connect PV module using MC4 connectors to IQ Microinverters with EN4 (TE PV4-S SOLARLOK) 57mm/2.24" to MC4	
Enphase EN4 to non-terminated extension cable (1000 mm) ²	ECA-EN4-FW-10-12	For field wiring of UL-certified DC connectors. EN4 to non-terminated cable, 1000 mm/39.4"	
Replacement DC adapter (MC4) ²	Q-DCC-2	DC adapter to MC4 (max voltage 100 VDC)	
Replacement DC adapter (UTX) ¹	Q-DCC-5	DC adapter to UTX (max voltage 100 VDC)	
Replacement DC adapter (MC4) IQ8P Microinverters ²	Q-DCC-2-P	DC Adapter to MC4 (max voltage 100 VDC) for IQ8P Microinverter	
Enphase MC4 to non-terminated extension cable (1000 mm) ²	ECA-S22-FW-12	For field wiring of UL-certified DC connectors. MC4 to non-terminated cable, 1000 mm/39.4"	
Enphase MC4 to MC4 extension cable (1000 mm) ²	ECA-S22-S22-10-12	MC4 to MC4 extension cable to connect PV module to DC adapter (MC4) or IQ Microinverters with MC4, 1000 mm/39.4"	

To learn more about Enphase offerings, visit <https://enphase.com>

IQ Cable accessories DSH-00247-1.0-EN-US-2024-07-03

IQ Cable accessories DSH-00247-1.0-EN-US-2024-07-03

Enphase MC4 to MC4 extension cable (1800 mm) ²	ECA-S22-S22-18-12	MC4 to MC4 longer extension cable to connect PV module to DC adapter(MC4) or IQ Microinverters with MC4, 1800 mm/70.9"
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¹Conforms to UL subject 9703 and qualified by UL LLC.

²Conforms to UL subject 9703.

³Conforms to UL subject 9703.



 IQ Terminator IQ Terminator for unused cable ends, sold in packs of ten (Q-TERM-10)	 IQ Sealing Caps IQ Sealing Caps for unused aggregator and cable connections (Q-BA-CAP-10 and Q-SEAL-10)
 IQ Disconnect Tool Plan to use at least one per installation, sold in packs of ten (Q-DISC-10)	 IQ Cable Clip Used to fasten cabling to the racking or to secure looped cabling, sold in packs of one hundred (Q-CLIP-100)

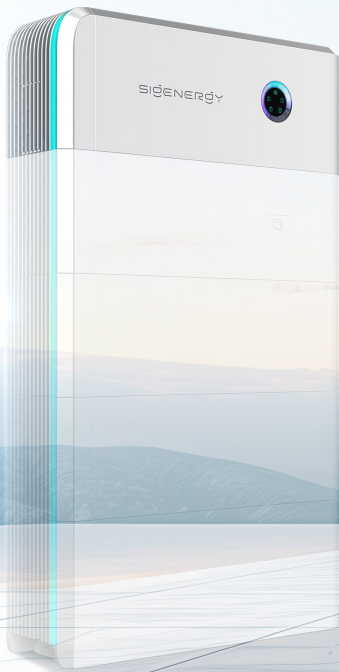
Revision history	Date	Description
DSH-00247-1.0	July 2024	Initial release.
		Previous releases.

To learn more about Enphase offerings, visit <https://enphase.com>



Sigen Energy Controller

1 SKU, field configurable to
3.8/4.8/5.7/7.6/9.6 /11.5 kW



- EMS inside for precise control
- Multi-source black start
- On & off-grid compatibility
- 4 MPPTs with 2:1 DC/AC ratio (oversize PV)
- NEMA 4X system enclosure
- NEC rapid shutdown compliant
- Seamless switching experience
- AFCI function integrated

Sigen Energy Controller Split Phase US

SigenStor EC SP US							
Field Configuration	3.8	4.8	5.7	7.6	9.6	11.5	Units
DC Input (from PV)							
Max. PV power	7680	9600	11520	15360	19200	23000	W
Max. DC input voltage			600				V
Nominal DC input voltage			360				V
Start-up voltage			100				V
MPPT voltage range			50 ~ 550				V
Number of MPP. trackers			4				
Number of PV strings per MPPT			1				
Max. input current per MPPT			16				A
Max. short-circuit current per MPPT			20				A
AC Input / Output (on-grid)							
Nominal output power	3840	4800	5760	7680	9600	11500	W
Max. continuous current	16.0	20.0	24.0	32.0	40.0	48	A
AC switch current rating	20.0	25.0	30.0	40.0	50.0	60.0	A
Nominal output voltage			240 / 120				V
Grid frequency range			59.3 ~ 60.5				Hz
Power factor			0.8 leading ~ 0.8 lagging				
Total current harmonic distortion			THDi < 2%				
Efficiency							
Max. efficiency			97.8%				
AC Output (backup)							
Backup output power @240V	3840	4800	5760	7680	9600	11500	W
Backup output power @120V	1920	2400	2880	3840	4800	5750	W
Peak output power (10 seconds)	8640	8640	8640	17100	17100	17100	W
Nominal output voltage			240 / 120				V
Output frequency range			59.3 ~ 60.5				Hz
Power factor			0.8 leading ~ 0.8 lagging				
Total voltage harmonic distortion			THDv < 2%				
Disruption time of backup switch ¹			0				ms
Battery Connection							
Supported battery module		SigenStor BAT 6.0 / 9.0 US					
Battery module voltage range		300 ~ 600					V
General Data							
Dimensions (W / H / D)		27.6 x 11.8 x 10.2 / 700 x 300 x 260					in / mm
Weight		77.1 / 35					lbs / kg
Storage temperature range		-40 ~ 158 / -40 ~ 70					°F / °C
Operating temperature range		-22 ~ 140 / -30 ~ 60					°F / °C
Relative humidity range		0% ~ 95%					
Max. operating altitude		13123 / 4000					ft / m
Cooling		Smart air cooling					
Communication		WLAN / Fast Ethernet (FE) / RS485 / Sigen CommMod US (4G / 3G)					
Standard Compliance							

Certifications

¹ This refers to the load-side disruption time, to achieve this function Sigen LoadHub needs to be used together with Sigen Energy Controller US and Sigen Battery US. Test conditions: In the open-circuit state of the power grid, the nominal power of the Sigen Energy Controller is higher than the total power of the home loads.

Disclaimer: The information in this file is provided on an "as is" basis. To the fullest extent permitted by law, Sigen Energy Technology Co., Ltd. excludes all representations and warranties relating to this file and its contents or which is or may be provided by any affiliates or any other third party, including in relation to any inaccuracies or omissions in this file.

Sigen LoadHub

- 5 double-pole controllable loads
- 0 ms load-side disruption when switching to backup mode
- Supports generator, heat pump or other controllable load
- Supports both whole-home & partial-home backup
- Uninterrupted power supply through PV +ESS/grid/generator



Sigen LoadHub

Sigen LoadHub		Units
Electrical Specification		
Grid connection type	Split phase	
Nominal AC voltage	120 / 240	V
Nominal AC frequency	60	Hz
Max. short circuit current (I _{sc})	10	kA
Current measurement accuracy	± 1 %	
Voltage measurement accuracy	± 1 %	
Grid Connection		
Max. continuous current	200	A
Max. overcurrent protection device rating	200	A
Disruption time of backup switchover ^{1,2}	0	ms
AC Output to Main Distribution Panel		
Max. continuous current	200	A
Max. overcurrent protection device rating	200	A
Overvoltage category	IV	
SigenStor Connection		
Max. number of connection	2	
Max. continuous current	48	A
Max. overcurrent protection device rating	60	A
Max. AC nominal power per inverter connection	11.5	kW
Smart Load Port Connection		
Max. number of connection	5	
Max. continuous current	64	A
Max. overcurrent protection device rating	80	A
Generator Port Connection		
Max. continuous current	64	A
Max. overcurrent protection device rating	80	A
Dry contact switch voltage rating	30	V
Dry contact switch current rating	1	A
Generator 2-wire start	Supported	
General Data		
Dimensions (W / H / D)	21 x 32 x 7 / 532 x 814 x 180	in / mm
Weight	60 / 27	lbs / kg
Storage temperature range	-40 ~ 158 / -40 ~ 70	°F / °C
Operating temperature range	-22 ~ 131 / -30 ~ 55	°F / °C
Relative humidity range	0% ~ 95%	
Max. operating altitude	13123 / 4000	ft / m
Cooling	Natural convection	
Enclosure type	Type 3R	
Communication	Fast Ethernet (FE), RS485, dry contact	
Installation method	Wall-mounted	
Standard Compliance		
Certifications	FCC Part 15 Subpart B, ICES-003, ANSI C63.4a:2017, UL 67, UL 869A UL 1741, UL 1741 PCS CRD, CSA C22.2 No.107.1-16, CA Proposition 65	

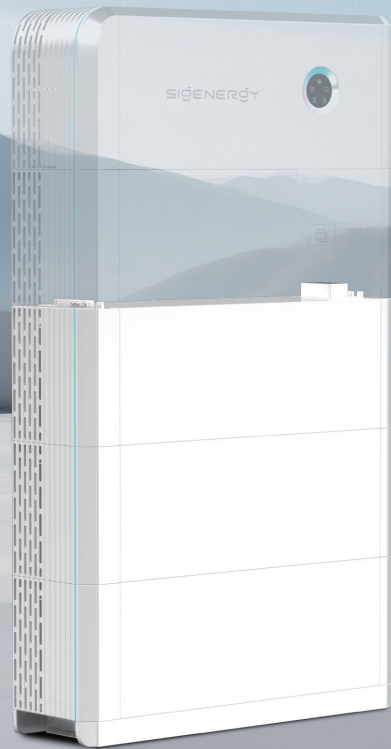
1. This refers to the load-side disruption time, to achieve this function Sigen LoadHub needs to be used together with Sigen Energy Controller US and Sigen Battery US. Test conditions: in the open-circuit state of the power grid, the nominal power of the Sigen Energy Controller US is higher than the total power of the home loads.
2. The MID Switch complies with UL Category NRT2 and fulfills with the standards of UL 508, UL 60947-1, UL 60947-4-1, UL 61810-1 as well as UL 61810-20.

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Sigen Battery

- Large cell capacity, low voltage & durable
- Multi-layer full battery safety protection
- Visible battery status on myPointGuard App
- Self-guiding pin connectors for fast installation
- AI-assisted, optimized battery cycle life
- Parallel connections for flexible battery combinations

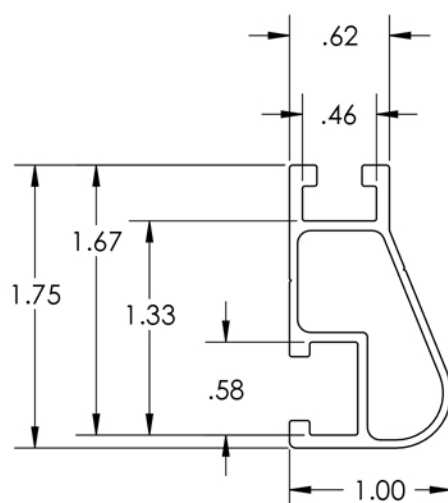
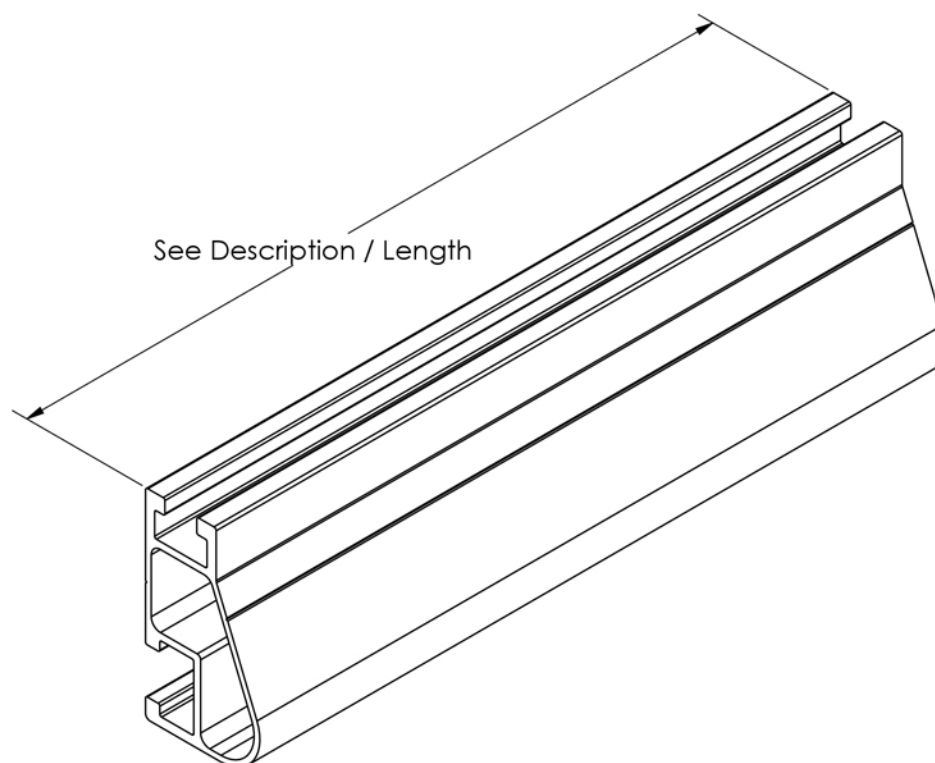


Sigen Battery 6.0 / 9.0 US

SigenStor BAT	6.0 US	9.0 US	Units
Performance Specification			
Battery type	LiFePO ₄		
Total energy capacity	6.02	9.04	kWh
Usable energy capacity ¹	5.84	8.76	kWh
Max. charge / discharge power	3000	4600	W
Peak charge / discharge power (10 seconds)	4500	6900	W
General Data			
Weight	136.7 / 62	172.0 / 78	lbs / kg
Dimensions (W / H / D)	30.2 x 10.6 x 10.4 / 767 x 270 x 265		
Storage temperature range	-13 ~ 140 / -25 ~ 60		
Operating temperature range	-4 ~ 131 / -20 ~ 55		
Relative humidity range	5% ~ 95%		
Max. operating altitude	13123 / 4000		
Cooling	Natural convection		
System enclosure type	Type 4X		
Installation method	Floor standing / Wall-mounted		
Standard Compliance			
Certifications	UL 1973, UL 1998, UL 9540, UL9540 A, UN 38.3, CP 65, FCC Part 15 Class B		

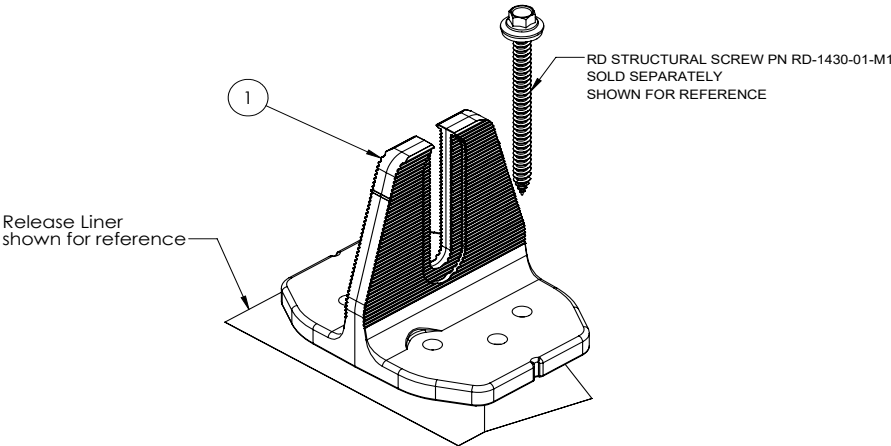
1. Test conditions: 100% depth of discharge, 0.2C rate charge & discharge averagely at 25°C, at the beginning of life.
2. This is provided by the battery cell manufacturer. Based on cell test condition of 25±2°C, 0.5C charge and discharge rate and SOH=60%.
3. The data in the table is based on the combination of Sigen Battery 9.0 US and Sigen Energy Controller US under Split Phase Low Voltage as an example, with a ground-mounted installation.

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Rail Section Properties	
Property	Value
Total Cross-Sectional Area	0.363 in ²
Section Modulus (X-axis)	0.136 in ³
Moment of Inertia (X-axis)	0.124 in ⁴
Moment of Inertia (Y-axis)	0.032 in ⁴
Torsional Constant	0.076 in ³
Polar Moment of Inertia	0.033 in ⁴

Mill Part Number	Black Part Number	Description / Length	Material	Weight
XR-10-168M	XR-10-168B	XR10, Rail 168"	6000-Series Aluminum	6.10 lbs.
XR-10-184M	XR-10-184B	XR10, Rail 184"		6.67 lbs.

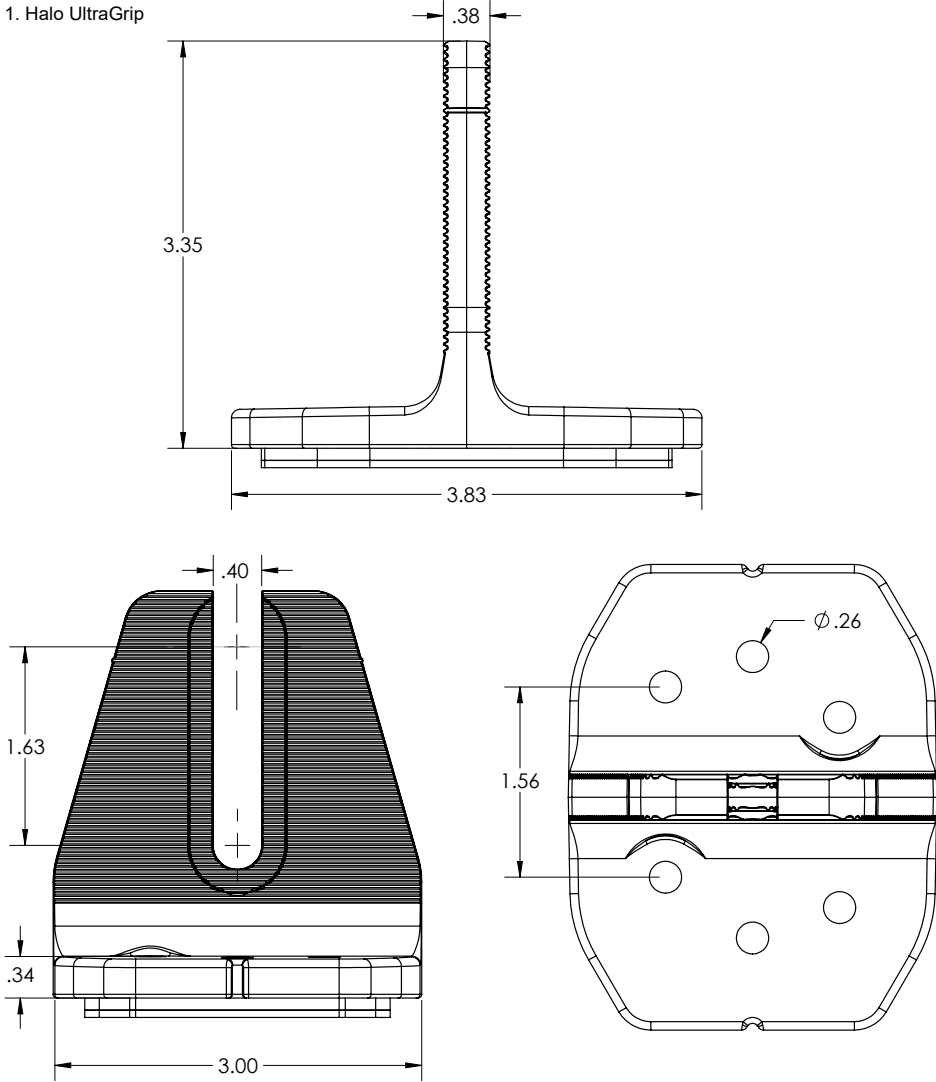


ITEM NO	DESCRIPTION	QTY IN KIT
1	QM Halo UltraGrip(Mill or Black)	1

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



1. Halo UltraGrip



Property	Value
Material	300 Series Aluminium
Finish	Mill or Black



GODWIN ENGINEERING AND DESIGN, LLC

8378 Foxtail Loop, Pensacola, FL 32526 | (850)712-4219 | chad@godwineng.com

July 20, 2026

To: Columbia County Building Department
135 NE Hernando Ave
Lake City, FL 32055

Subject: Bailey - Residential PV Roof Mount Installation
234 SW Scott Pl
Lake City, FL 32024

To whom it may concern,

This letter is regarding the proposed installation of a rooftop-mounted Solar PV system on the existing residential structure at the subject address. I have reviewed the attachment plan and have determined that the rooftop-mounted PV system is in compliance with the applicable sections of the following Codes as amended and adopted by the jurisdiction when installed in accordance with the manufacturer's installation instructions:

2023 Florida Building Code 8th Edition, FBC
ASCE 7 Min. Design Loads for Buildings & Other Structures
Design Criteria: Design Wind Speed(Vult) - 120 mph 3sec gust, Exposure Category – C, Risk Category II

The rooftop-mounted photovoltaic panel system has been designed in accordance with FRC R324.4. When roof penetrations are necessary, they shall be flashed and sealed in accordance with the manufacture's installation instructions, R905.17.3. The PV system consist of the modules, railing, and connection hardware. Refer to the specific roof type calculation pages for PV dead loads. For the portions of the roof with PV installed, the existing roofing system provides an adequate load path for transferring the concentrated reactions to the building frame and the structure will accommodate the additional gravity and environmental loads from the PV system installation per FBC 1607.13.4.

The securement method of the the PV system is to be mounted parallel to the structure with the site specific railing and attachments according to the designed plans. The site specific wind load calculations for the module and their supports are attached with this document. Fasteners shall be installed to the designated roof member with the proper torque from the manufactures installation instructions.

The design wind pressures for rooftop solar panels located on enclosed or partially enclosed buildings of all heights, with panels parallel to the roof surface with a tolerance of 2° and with a max height above the roof surface, h_2 , not exceeding 10 in. A min gap of 0.25 in shall be provided between all panels with the spacing of gaps between panels not exceeding 6.7 ft. in addition the array shall be located at least $2h_2$ from the roof edge, a gable ridge, or a hip ridge.

It is the contractors responsibility to review all drawings for accuracy and notify the EOR of any discrepancies prior to beginning construction. To the best of my knowledge, the plans and specifications comply with the minimum requirements of the latest Florida Building code.

Please see attached documents and contact me should you have any questions.

Sincerely,
D. Chad Godwin, PE 81360
Exp. 02/28/2027



Roof Structure Details				Bailey - Residential Calculations Sheet - R1					
Roof Angle	21° to 27°			The securement method of the PV system is to be mounted parallel to the Asphalt Shingle roof with the IR XR-10 railing and Halo Ultragrip - HUG flashings/attachments. The mounts should be staggered, where possible, to allow distribution of the design loads evenly to the structure. The mounts shall be installed with (2) #14 Self-Dr, QM RD Structural , to Rafter					
Roof Type	Hip								
Roof Covering	Asphalt Shingle								
Mean Roof Height	15 ft								
Rafter Spacing	24 in O.C.								
Rafter/Truss Size	2 x 4								
Wind Load Parameters									
Wind Speed (asd)	93	mph	FRC R301.2.1.3	Basic Wind Speed (Ult)	120	mph			
Effective Wind Area	22.71	ft ²	26.2	Exposure Cat.	C	B, C, or D			
Wind Directionality	K _d	0.85	Table 26.6-1	Elevation	<1000	ft			
Topographic factor	K _{zt}	1.00	26.8 or 26.8.2	bldg. least hori. dim (typ.)	360	in			
Ground Elevation Factor	K _e	1.00	Table 26.9-1	Roof Height, h	15.00	ft			
Velocity Exposure Coefficient	K _z	0.85	Table 26.10-1	Exposed Module Definition					
Array Edge Factor	γ _E	1.50	Exposed 29.4.4	Exposed factor = 1.5 for uplift loads on panels that are exposed and within a distance of 2h ₂ from an edge of the array. Modules are considered Exposed if d ₁ to the roof edge > 0.5h and one of the following applies: 1. d ₁ to adjacent array > 2h ₂ . 2. d ₂ to the next adjacent panel > 2h ₂ .					
Array Edge Factor	γ _E	1.00	Non. Exp 29.4.4						
Solar Panel Equalization Factor	γ _a	0.66	Fig. 29.4-8(gap = 0.25")						
Velocity Pressure	q _h	18.80	psf						
Added Safety Factor		1							
Allowable Pullout per mount	1004.0	lbs							
0.4h or 0.6h	6.00	ft	Flat - 0.6h, Gab/Hip - 0.4h						
10% of least horizontal dim	3.00	ft	10% of least hor. Dim. Or 0.4h, whichever is smaller, but not less than either 4% of Least hor. Or 3ft. (flat roof - 0.6h)						
Roof Zone Set Back	a	4.00	ft						
h ₂	6	in	Not > 10in(panel height above roof)						
2h ₂	12	in	*min distance array shall be from the roof edge, Gable Ridge, or hip ridge						
	0.25	in	min gap between all panels but not > 6.7ft						
d1	1.00	ft	Horizontal distance orthogonal to panel edge						
d2	0.25	ft	Horizontal distance from edge of one panel to the nearest edge in the next row						
0.5h	7.50	ft							
PV Attachment - Results									
Exposed	R1 Roof Zones - Hip 21° to 27°								
Non-Exp.	1	2	3						
GC _p - Uplift	-1.19	-1.64	-1.6						
GC _p - Down	0.56	0.56	0.56						
p=q _h K _d (GC _p)(Y _e)(Y _a) (psf)	-16.0	-23.2	-23.2						
ASCE 29.4-7	-16.0	-16.0	-16.0						
PL(lb) (Portrait Rails) =	-181	-263	-263						
p * A _{eff}	-272.0	-181.3	-181.3						
PL(lb) (Landsc. Rails) =	-128.3	-185.7	-185.7						
p * A _{eff}	-192.4	-128.3	-128.3						
Mx. Span (in) (Portrait)	48	48	48	a = 4ft ; 10% of least hor. Dim. Or 0.4h, whichever is smaller, but not less than either 4% of Least hor. Or 3ft. (flat roof - 0.6h) B - Horizontal dimension of bldg. normal to wind direction, (ft) h = Mean roof height, in (ft), except that eave height shall be used for θ ≤ 10°. θ = Angle of Plane of roof from horizontal, degrees.					
	72	48	48						
Mx. Span(in) (Landsc.)	48	48	48						
	72	48	48						
Cantilever (Portrait)	15.8	15.8	15.8						
Span * 33%	23.8	15.8	15.8						
Cantilever (Landsc.)	15.8	15.8	15.8						
Span * 33%	23.8	15.8	15.8						
*** Spans with Mark through denote allowable Module pressure rating is exceeded. 3 Rail is required									
PV Dead Load				RECxxxAA Pure-RX 460 Module Specifications					
QTY of Modules (18 in Portrait,)	18								
Module Area	22.71	ft ²							
Rail, Clamps, Mounts	1	lb/ft							
Total Rail Length	147	ft							
Module W _{mod}	50	lbs							
Array W _{mods}	901	lbs							
Micro/optimizer W _{mic}	72	lbs							
PV Rail W _{PV rail}	147	lbs							
Total Weight W _{total}	1119	lbs							
Total Area A _T	408.85	ft ²							
Dead Load D _{PV}	2.74	psf							
Weight/attachment	33.9	lbs							
Fastener Allowable Pullout									
(2) #14 Self-Dr, QM RD Structural				A (ft)	B (ft)	C (in)	D (in)	E (in)	F (in)
				5.67	4.01	16.14	20.47	7.87	11.81
Diameter #14				Module load ratings (psf)					
S.G. 0.42				Ultimate Allowable(Ult /1.5)					
Thread Embedment per 3 in				Load Rating - Snow 147.0 98.0					
# of Fastener 2				Load Rating - Wind -84.0 -56.0					
Pullout Value (Source - FL Product Approval) 1004.0 lb _f				Load Rating - Snow 50.4 33.6					
				Load Rating - Wind -50.4 -33.6					

