PHOTOVOLTAIC SYSTEM SPECIFICATIONS:

SYSTEM SIZE:	5,670W DC 4,060W AC
MODULE TYPE & AMOUNT:	(14) JAM54S31-405/MR
MODULE DIMENSIONS:	(L/W/H) 67.8"/44.65"/1.18"
INVERTER:	(14) ENPHASE IQ8PLUS-72-M-US [240V]
INTERCONNECTION METHOD:	SOLAR BREAKER
AHJ:	COUNTY OF HARNETT

GOVERNING CODES

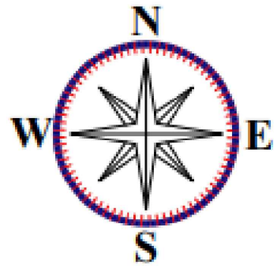
ALL WORK SHALL CONFORM TO THE FOLLOWING CODES

a. 2020 NATIONAL ELECTRICAL CODE
b. 2018 NC BUILDING CODE
c. 2018 NC RESIDENTIAL CODE
d. 2015 INTERNATIONAL RESIDENTIAL CODE
e. 2018 NC PLUMBING CODE
f. 2018 NC MECHANICAL CODE
g. 2018 NC FIRE CODE
h. COUNTY OF HARNETT CODE
i. ANY OTHER LOCAL AMENDMENTS

GENERAL NOTES:

1. APPLICABLE CODE: 2018 NC BUILDING CODE & ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.
2. LAG SCREW DIAMETER AND EMBEDMENT LENGTHS ARE DESIGNED PER 2018 NC BUILDING CODE REQUIREMENTS. ALL BOLT CAPACITIES ARE BASED ON A SOUTHER YELLOW PINE (SYP) RESIDENTIAL WOOD ROOF RAFTERS AS EMBEDMENT MATERIAL.
3. ROOF SEALANTS SHALL CONFORM TO ASTM C920 AND ASTM 6511, AND IS THE RESPONSIBILITY OF THE CONTRACTOR TO PILOT DRILL AND FILL ALL HOLES.
4. ALL DISSIMILAR MATERIALS SHALL BE SEPARATED WITH NEOPRENE WASHERS, PADS, ETC OR SIMILAR.
5. ALL ALUMINIUM COMPONENTS SHALL BE ANODIZED ALUMINIUM 6105-T5 UNLESS OTHERWISE NOTED.
6. ALL LAG SCREW SHALL BE ASTM A276 STAINLESS STEEL UNLESS OTHERWISE NOTED.
7. ALL SOLAR RAILING AND MODULES SHALL BE INSTALLED PER MANUFACTURER INSTRUCTIONS.
8. CONTRACTOR SHALL ENSURE ALL ROOF PENETRATIONS TO BE INSTALLED AND SEALED PER 2018 NC BUILDING CODE OR LOCAL GOVERNING CODE.

1 PLOT PLAN
A-00



SHEET INDEX:

NOTICE TO CONTRACTOR
All construction must comply with current NC Building Codes and is subject to field inspection and verification.
APPROVED
Limited building only review
Permit holder responsible for full compliance with the code
06/30/2025
Harnett COUNTY NORTH CAROLINA

PHOTOVOLTAIC ROOF MOUNT SYSTEM

14 MODULES-ROOF MOUNTED - 5,670W DC, 4,060W AC

EPC SOLAR
379 DOUGLAS RD E
OLDSMAR, FL 34677
PHONE: 727-267-4033

REVISIONS		
DESCRIPTION	DATE	REV

PROJECT NAME: MONICA COLS

PROJECT ADDRESS: 111 NORRIS FARM DR, ANGIER, NC 27501

SHEET NAME: COVER SHEET

SHEET NUMBER: A-00

SHEET SIZE: ANSI B 11"x17"

NORTH CAROLINA PROFESSIONAL SEAL 051426 ENGINEER RAFAEL A. GONZALEZ SOTO

Rafael A Gonzalez Soto
2025.06.03 10:12:39
-04'00'

GENERAL INSTALLATION PLAN NOTES:

1. ROOF ATTACHMENTS SHALL BE INSTALLED AS SHOWN IN SHEET S-01 AND AS FOLLOWS FOR EACH WIND ZONE.

WIND ZONE 1: 6'-0" O.C.
WIND ZONE 2: 6'-0" O.C.
WIND ZONE 3: 6'-0" O.C.

THE PERIMETER WIDTH OF WIND UPLIFT ZONES IS 3 FT

SYSTEM LEGEND

- ◯ EXISTING UTILITY METER
- MP EXISTING MAIN SERVICE PANEL
- C NEW DEDICATED PV SYSTEM COMBINER PANEL.
- JB NEW JUNCTION BOX. EXACT LOCATION TBD ON SITE
- AC NEW PHOTOVOLTAIC UTILITY DISCONNECT SWITCH. LOCATED WITHIN 10' OF METER.
- RA ROOF ACCESS POINT

14 NEW JAM54S31-405/MR MODULES WITH ENPHASE IQ8PLUS-72-M-US [240V] INVERTERS, MOUNTED ON THE BACK OF EACH MODULE

□◯ = ROOF OBSTRUCTIONS

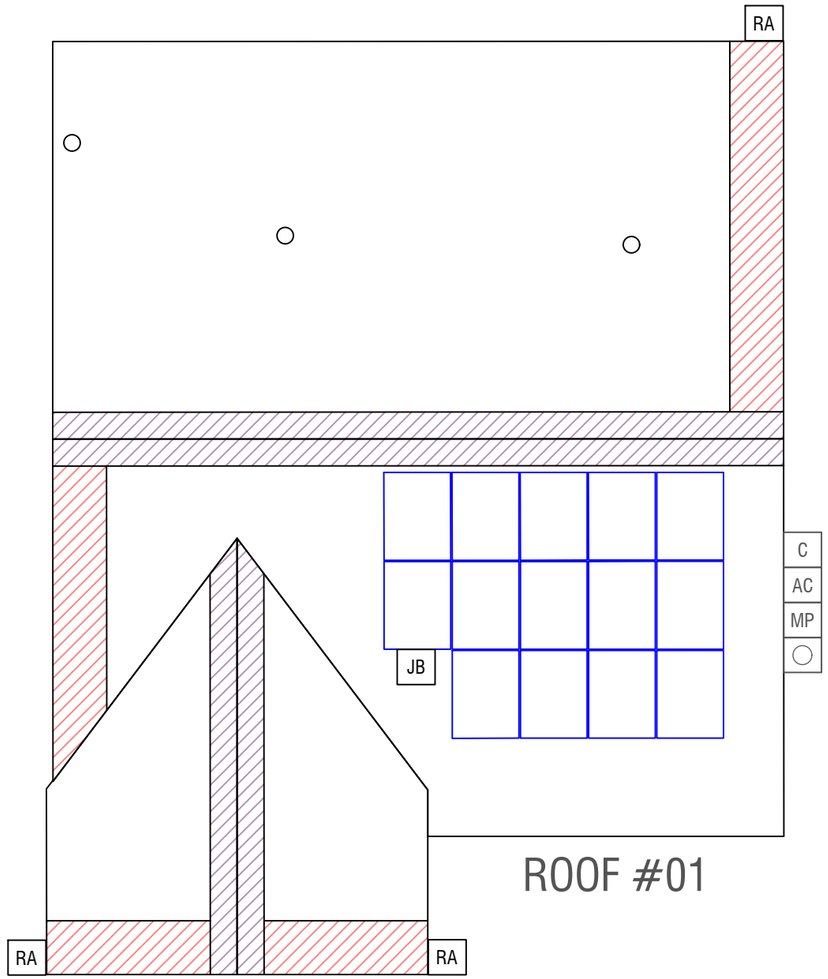
= 36" FIRE PATHWAY

= 18" FIRE PATHWAY

ROOF SECTIONS

ROOF #01

MODULE: 14
SLOPE: 30°
AZIMUTH: 174°
MATERIAL: COMPOSITION SHINGLES
RAFTER SIZE: 2"X4" @ 24 O.C.



ROOF #01

FRONT OF HOME

NORRIS FARMS DR

GENERAL NOTES FIRE SAFETY NOTES:

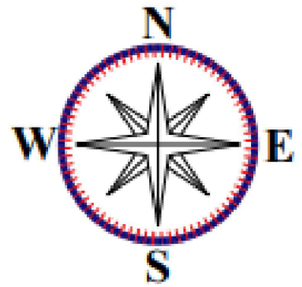
ROOF ACCESS POINTS SHALL BE DEFINED AS AREAS WHERE FIRE DEPARTMENT LADDERS ARE NOT PLACED OVER OPENINGS (WINDOWS OR DOORS), ARE LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION, AND ARE IN LOCATIONS WHERE THEY WILL NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS (TREE LIMBS, WIRES, OR SIGNS). (NFPA 1 11.12.2.2.1.3)

· PHOTOVOLTAIC MODULES SHALL BE LOCATED IN A MANNER THAT PROVIDES TWO 3 FT WIDE ACCESS PATHWAYS FROM THE EAVE TO THE RIDGE ON EACH ROOF SLOPE WHERE THE MODULES ARE LOCATED. (NFPA 1 11.10.2.2.2.1.2)

· FIRST RESPONDER ACCESS WILL BE A MINIMUM OF 36" UNOBSTRUCTED

· CABLES, WHEN RUN BETWEEN ARRAYS, SHALL BE ENCLOSED IN CONDUIT.

TOTAL PLAN AREA OF ROOF: 2,315.05 FT^2
TOTAL AREA OF MODULES: 294.27 FT^2
MODULE COVERAGE: 12.71%



EPC SOLAR
379 DOUGLAS RD E
OLDSMAR, FL 34677
PHONE: 727-267-4033

REVISIONS

DESCRIPTION	DATE	REV

PROJECT NAME: MONICA COLS

PROJECT ADDRESS: 111 NORRIS FARM DR, ANGIER, NC 27501

SHEET NAME: SITE PLAN

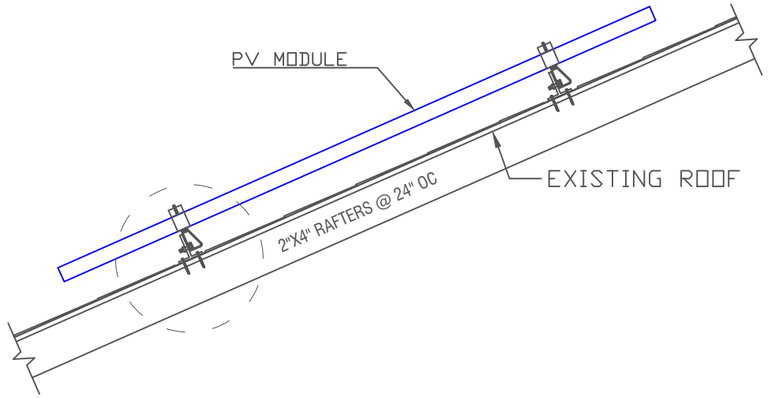
SHEET NUMBER: A-01

SHEET SIZE: ANSI B 11"x17"

NORTH CAROLINA PROFESSIONAL SEAL 051426 ENGINEER RAFAEL A. GONZALEZ SOTO

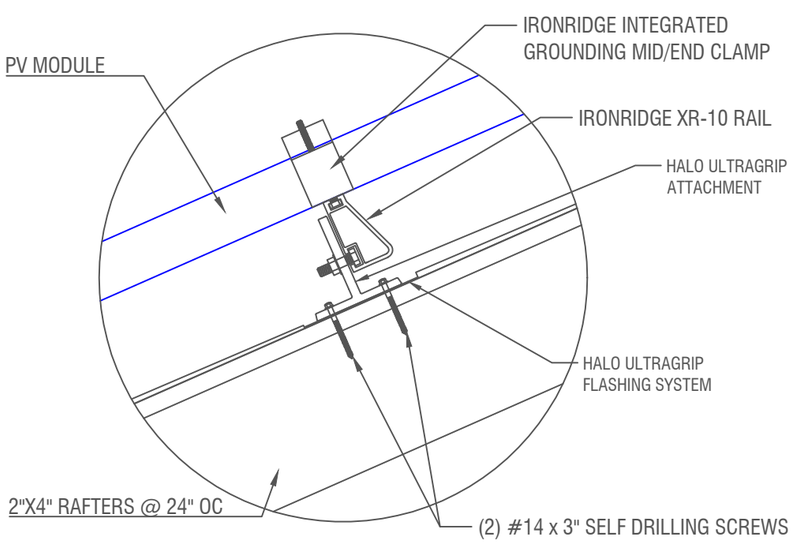
Rafael A Gonzalez Soto
2025.06.03 10:13:38
-04'00'

ROOF MATERIAL: COMPOSITION SHINGLES

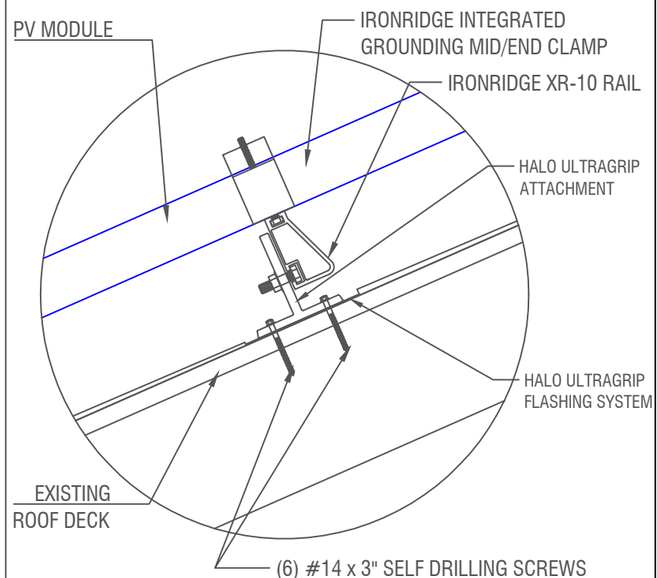


1 S-01 ATTACHMENT DETAIL (SIDE VIEW)

IRONRIDGE XR-10 RAIL



2 S-01 ATTACHMENT DETAIL ENLARGED VIEW



3 S-01 OPTIONAL DECK ATTACHMENT

QUICKMOUNT HALO ULTRAGRIP

MOUNTING PLAN NOTES:

1. DESIGNED AS PER ASCE7-16, 2018 NCBC
2. MEAN ROOF HEIGHT IS 15 FEET
3. EXPOSURE CATEGORY: C
4. DESIGN WIND SPEED: 130 MPH
5. DESIGN SNOW LOAD: 30 PSF
6. EXISTING ROOF HAS ONE LAYER
7. ANCHORAGE OF SOLAR PANELS WILL BE TO EXISTING ROOF SUPPORTING MEMBERS
8. INSTALLATION IS IN COMPLIANCE WITH 15.14.2.5.2, RAS111, & RAS120.10
9. PENETRATIONS WILL BE FLASHED AND SEALED WITH ULTRAGRIP FLASHING SYSTEM.

EPC SOLAR
379 DOUGLAS RD E
OLDSMAR, FL 34677
PHONE: 727-267-4033

REVISIONS

DESCRIPTION	DATE	REV

PROJECT NAME: MONICA COLS

PROJECT ADDRESS: 111 NORRIS FARM DR, ANGIER, NC 27501

SHEET NAME: MOUNTING DETAILS

SHEET NUMBER: S-01

SHEET SIZE: ANSI B 11"x17"

NORTH CAROLINA PROFESSIONAL SEAL 051426 ENGINEER RAFAEL A. GONZALEZ SOTO

Rafael A Gonzalez Soto
2025.06.03 10:13:52
-04'00'

SYSTEM LEGEND

14 NEW JAM54S31-405/MR MODULES WITH ENPHASE IQ8PLUS-72-M-US [240V] INVERTERS, MOUNTED ON THE BACK OF EACH MODULE

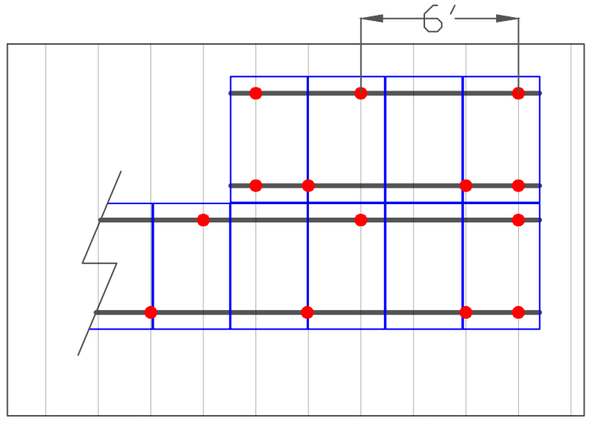
□○ = ROOF OBSTRUCTIONS
● = ATTACHMENT POINTS
— = RAFTER
▬ = RAIL

GENERAL INSTALLATION PLAN NOTES:

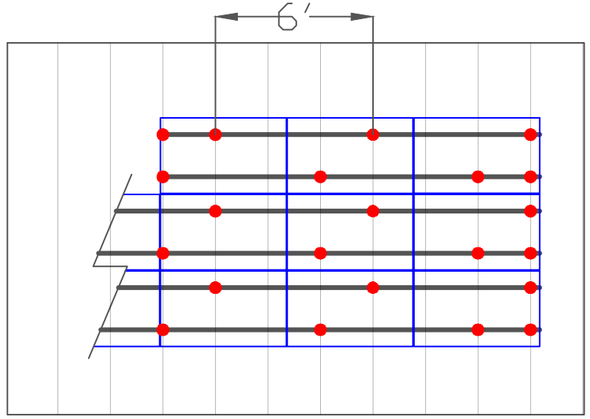
1. ROOF ATTACHMENTS SHALL BE INSTALLED AS SHOWN IN SHEET S-01 AND AS FOLLOWS FOR EACH WIND ZONE.
WIND ZONE 1: 6'-0" O.C.
WIND ZONE 2: 6'-0" O.C.
WIND ZONE 3: 6'-0" O.C.
MAXIMUM CANTILEVER SPAN = $\frac{1}{3}$ *MOUNT SPANS
2. THE PERIMETER WIDTH OF WIND UPLIFT ZONES IS 3 FT
3. THE VERTICAL DISTANCE BETWEEN ROOF SURFACE AND PV MODULES IS 6 INCHES PER ASCE7-16 SECT 29.4.4.
4. SOLAR RAIL TO BE INSTALLED TO SOLAR PANEL MANUFACTURER'S SPECIFICATION.
5. INSTALLATION IS IN COMPLIANCE WITH THE FOLLOWING: NCBC RESIDENTIAL 903.2, NCBC RESIDENTIAL TABLE R301.2(7), 15.14.2.5.2, 301.2 & RAS111.
6. MEETS THE REQUIREMENTS OF SECTION 1512 THROUGH 1525 & NCBC 1510.7.1
7. PLANS SATISFY ZONES PER NCBC 1510.7.1

TYPICAL ATTACHMENT SPACING

ESTIMATED MOUNT QUANTITY: 28



6'-0" ATTACHMENT SPACING (24" RAFTERS)



6'-0" ATTACHMENT SPACING (24" RAFTERS)

MODULE, ARRAY WEIGHT (LOAD CALCS)		
NUMBER OF MODULES	14	
MODULE WEIGHT	43	LBS
TOTAL MODULE WEIGHT	602	LBS
TOTAL MICROINVERTER WEIGHT	56	LBS
NUMBER OF ATTACHMENT POINTS	28	
TOTAL RAIL LENGTH	52.08	FT
MOUNTING SYSTEM WEIGHT	52.08	LBS
TOTAL SYSTEM WEIGHT	710.08	LBS
WEIGHT AT EACH ATTACHMENT POINT (ARRAY WEIGHT/NUMBER OF ATTACHMENT POINTS)	25.36	LBS
MODULE AREA	21.02	SQFT
TOTAL ARRAY AREA	294.25	SQFT
DISTRIBUTED LOAD (TOTAL SYSTEM WEIGHT/TOTAL ARRAY AREA)	2.41	PER SQFT
PULLOUT VALUE PER MOUNT	1004	LBS

DESIGN CRITERIA	
GROUND SNOW LOAD (PSF)	30
WIND SPEED (MPH)	130
EXPOSURE CATEGORY	C
MEAN ROOF HEIGHT (FT.)	15

DESIGN CALCULATIONS

ASCE 29.4-7	PRESSURE COEFFICIENT GC_p	$p = q_h \cdot K_d \cdot GC_p \cdot \gamma_E \cdot \gamma_a$ (PSF)
ZONE 1:	-1.21	-23.5
ZONE 2:	-1.68	-33.8
ZONE 3:	-1.70	-33.8

POINT LOAD CALCULATIONS

ASCE 29.4-7	$p = q_h \cdot K_d \cdot GC_p \cdot \gamma_E \cdot \gamma_a$ (PSF)	$PL = p * A_e$ (LBS)
ZONE 1:	-23.5	-178.6
ZONE 2:	-33.8	-240.8
ZONE 3:	-33.8	-240.8

WIND LOAD PARAMETERS		
WIND SPEED	V = 135.5 MPH	FRC R301.2.1.3
EFFECTIVE WIND AREA	A_e = 21.67 ft^2	26.2
WIND DIRECTIONALITY	K_d = 0.85	TABLE 26.6-1
GROUND ELEVATION FACTOR	K_e = 1.0	TABLE 26.9-1
TOPOGRAPHIC FACTOR	K_{zt} = 1.0	26.8, 26.8.2
VELOCITY EXPOSURE COEFFICIENT	K_z = 0.85	TABLE 26.10-1
ARRAY EDGE FACTOR	γ_E = 1.5	29.4.4
SOLAR PANEL EQUALIZATION FACTOR	γ_a = 0.67	FIGURE 29.4-8
VELOCITY PRESSURE	q_h = 39.98 PSF	$q_h = 0.00256 \cdot K_z \cdot K_{zt} \cdot K_e \cdot V^2$

ALL MODULES ARE ASSUMED TO BE EXPOSED

REFER TO SHEET S-01 FOR ROOF, MOUNT, & RAIL DETAILS

EPC SOLAR
379 DOUGLAS RD E
OLDSMAR, FL 34677
PHONE: 727-267-4033

REVISIONS		
DESCRIPTION	DATE	REV

PROJECT NAME: MONICA COLS

PROJECT ADDRESS: 111 NORRIS FARM DR, ANGIER, NC 27501

SHEET NAME: MOUNTING PLAN

SHEET NUMBER: S-02

SHEET SIZE: ANSI B 11"x17"

NORTH CAROLINA PROFESSIONAL SEAL 051426 ENGINEER RAFAEL A. GONZALEZ SOTO

Rafael A Gonzalez Soto
2025.06.03 10:14:03
-04'00'

WIRE TAG #	WIRE FROM --	CONDUIT (TBD ON SITE)	WIRE QTY	WIRE GAUGE	WIRE RATING	GRND SIZE	GRND WIRE TYPE
1	ARRAY TO JUNCTION BOX	TRUNK CABLE	4	#12	TRUNK CABLE	#6 OR #8	SBC
2	JUNCTION BOX TO COMBINER PANEL	MIN 3/4" CONDUIT	4	#10	THHN	#8	THWN-2
3	COMBINER PANEL TO ACD	MIN 3/4" CONDUIT	3	#10	THHN	#8	THWN-2
4	ACD TO MAIN SERVICE PANEL	MIN 3/4" CONDUIT	3	#10	THHN	#8	THWN-2
5	SERVICE WIRES	N/A	3	#2/0	THHN	N/A	N/A

SYSTEM DATA

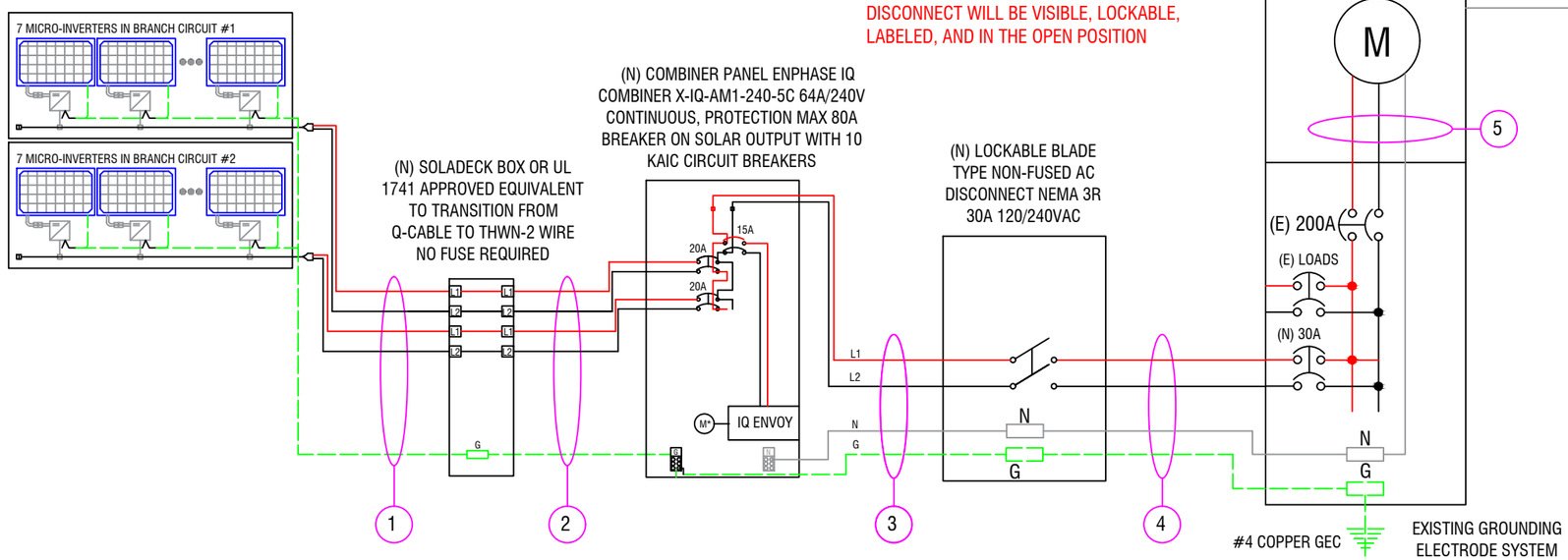
# STRINGS:	2
LARGEST STRING:	7
TOTAL MODULES:	14
TOTAL INVERTERS:	14
SYSTEM RATINGS:	5,670W DC STC 4,060W AC STC
TOTAL AC OUPUT:	16.94A

MICROINVERTER CALCULATIONS	INVERTER QTY		NOC		NECS		STRING AMPS	OCP	WIRE GAUGE
MAXIMUM STRING OUTPUT	7	x	1.21A	x	1.25	=	10.59A	20A	#10
TOTAL OUTPUT	14	x	1.21A	x	1.25	=	21.18A	30A	#10

ENPHASE Q CABLE TO BE ATTACHED TO RAIL
MIN. 3-1/2" ABOVE ROOF SURFACE

GROUNDING CONDUCTOR TO BE PROTECTED #8 AWG OR TO BE UNPROTECTED #6 AWG 250.64(B) 250.66 & 250.120(C)

(14) - JAM54S31-405/MR PV MODULES
(14) ENPHASE IQ8PLUS-72-M-US [240V] MICROINVERTERS
240VAC, 1.21A MAX
CEC WEIGHTED EFFICIENCY 97.0%
NEMA 4R, UL LISTED, INTERNAL GFDI



LOAD SIDE CONNECTION CALCULATIONS (120% RULE) PER NEC 705.12(B)(2)(3)(b)	
BUSBAR RATING	200A
MAIN BREAKER RATING	200A
[BUSBAR RATING * 1.2] - MAIN BREAKER RATING	40A
MAXIMUM PV BREAKER SIZE	40A

THE SOLAR BREAKER FOR THIS SYSTEM IS 30A WHICH IS LESS THAN OR EQUAL TO THE MAXIMUM ALLOWABLE PV BREAKER SIZE.

EPC SOLAR
379 DOUGLAS RD E
OLDSMAR, FL 34677
PHONE: 727-267-4033

REVISIONS

DESCRIPTION	DATE	REV

PROJECT NAME: MONICA COLS

PROJECT ADDRESS: 111 NORRIS FARM DR, ANGIER, NC 27501

SHEET NAME: 3-LINE DIAGRAM

SHEET NUMBER: E-01

SHEET SIZE: ANSI B 11"x17"

NORTH CAROLINA PROFESSIONAL SEAL 051426 ENGINEER RAFAEL A. GONZALEZ SOTO

Rafael A Gonzalez Soto
2025.06.03 10:14:13
-04'00'

ELECTRICAL NOTES:

1. ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
2. ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
3. WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEARES RIDGE, HIP, OR VALLEY.
4. WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
5. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
6. WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
7. ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
8. MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
9. MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
10. UTILITY HAS 24-HR UNRESTRICTED ACCESS TO ALL PHOTOVOLTAIC SYSTEM COMPONENTS LOCATED AT THE SERVICE ENTRANCE.
11. WORKING CLEARANCES AROUND THE EXISTING AND NEW ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC ARTICLE 110.26.
12. ALL EQUIPMENT INSTALLED SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) PER NEC ARTICLE 110.3.
13. RACKING CONFORMS TO AND IS LISTED UNDER UL 2703.
14. ALL LABELS OR MARKINGS SHALL BE VISIBLE AFTER INSTALLATION. THE LABELS SHALL BE REFLECTIVE, AND ALL LETTERS SHALL BE CAPITALIZED AND SHALL BE A MINIMUM HEIGHT OF 9.5 MM (3/8 IN) IN WHITE ON A RED BACKGROUND.
15. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC ARTICLE 310.10.
16. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE I WET LOCATIONS PER NEC ARTICLE 310.10.
17. ALL EXTERIOR EQUIPMENT IS A MINIMUM OF NEMA-R3 RATED.
18. ALL ELECTRICAL EQUIPMENT WILL BE LOCATED AT OR ABOVE BFE+1' OR 8.00' NAVD.
19. SMOKE ALARMS PER F.S. 553.883.
20. GROUNDING WILL BE IN COMPLIANCE WITH NEC 2020.
21. SYSTEM MEETS THE GROUNDING REQUIREMENTS OF NEC 2020
22. GROUND RODS WILL BE AT LEAST 8' LONG AND 5/18" IN DIAMETER (NEC 250.52(A)(5).
23. SYSTEM MEETS THE REQUIREMENTS OF NEC 2020.
24. SUPPLEMENTAL ELECTRODES WILL BE ADDED IF REQUIRED.

SYSTEM NOTES:

1. ENPHASE IQ8 / 8PLUS / 8M / 8A MICROINVERTERS DO NOT REQUIRE GROUNDING ELECTRODE CONDUCTORS OR EQUIPMENT GROUNDING CONDUCTORS. THE MICROINVERTERS ITSELF HAS CLASS II DOUBLE-INSULATED RATING, WHICH INCLUDES GROUND FAULT PROTECTION.
2. ENPHASE Q CABLE HAS NO NEUTRAL WIRE - (2 WIRE DOUBLE INSULATED CABLING)
3. MODULES ARE BONDED TO RAIL USING INTEGRATED GROUNDING.
4. RAILS ARE BONDED WITH UL 2703 RATED LAY-IN LUGS
5. SYSTEM IS UNGROUNDED
6. BARE COPPER IS TRANSITIONED TO THHN/THWN-2 VIA IRREVERSIBLE CRIMP; GEC TO BE CONTINUOUS PER CEC 250.64(C)
7. SUB-BRANCHES ARE CENTER-FED AT JBOX TO MAKE ONE TOTAL BRANCH CIRCUIT.
8. ENPHASE IQ ENVOY INSIDE IQ COMBINER REQUIRES A NEUTRAL TO BE LANDED AT THE NEUTRAL BUS AT MAIN PANEL PER ENPHASE INSTALLATION INSTRUCTIONS.
9. ENPHASE MICROINVERTERS ARE ALL RAPID SHUTDOWN READY PER NEC 690.12

INVERTER OUTPUT CIRCUIT		
TO OVERCURRENT PROTECTION DEVICE		
DESIGN TEMPERATURE (°F)	94	
MAXIMUM AMBIENT TEMPERATURE RANGE (°F)	87-95	310.15(B)
TEMPERATURE RATING OF CONDUCTOR	75°C	
# OF CARRYING CONDUCTORS	<4	310.15(C)(1)
AC MAX OUTPUT CURRENT	16.94A	690.8(A)(3)
AC MAX OUTPUT CURRENT * 1.25%	21.18A	690.8(B)
OVERCURRENT PROTECTION (A)	30A	
AMBIENT TEMPERATURE CORRECTION FACTOR	0.94	310.15(B)
CONDUCTOR ADJUSTMENT FACTOR	100%	310.15(B)
CONDUCTOR GAUGE (AWG)	10	310.16
CONDUCTOR ALLOWABLE AMPACITY (AMPS)	35	
CONDUCTOR ADJUSTED AMPACITY (AMPS)	32.9	35*.94*1=32.9

INVERTER SPECIFICATIONS	
MANUFACTURER	ENPHASE IQ8PLUS-72-M-US [240V]
MAX DC VOLT RATING	60 VOLTS
MAX CONT POWER	290 WATTS
NOMINAL AC VOLTAGE	240 VOLTS
MAX AC CURRENT	1.21 AMPS
MAX OCPD RATING	20 AMPS
MAX PANELS/CIRCUIT	13
SHORT CIRCUIT CURRENT	15 AMPS

PHOTOVOLTAIC OUTPUT	
AC OUTPUT CURRENT	16.94 A
NOMINAL AC VOLTAGE	240V

EPC SOLAR
379 DOUGLAS RD E
OLDSMAR, FL 34677
PHONE: 727-267-4033

REVISIONS

DESCRIPTION	DATE	REV

PROJECT NAME: MONICA COLS

PROJECT ADDRESS: 111 NORRIS FARM DR, ANGIER, NC 27501

SHEET NAME: ELECTRICAL NOTES

SHEET NUMBER: E-02

SHEET SIZE: ANSI B 11"x17"

NORTH CAROLINA PROFESSIONAL SEAL 051426 ENGINEER RAFAEL A. GONZALEZ SOTO

Rafael A Gonzalez Soto
2025.06.03 10:14:21
-04'00'

WARNING

ELECTRICAL SHOCK HAZARD

DO NOT TOUCH TERMINALS. TERMINALS ON LINE AND LOAD MAY BE ENERGIZED IN THE OPEN POSITION

LABEL LOCATION:
INVERTER(S), AC DISCONNECT(S), AC COMBINER PANEL (IF APPLICABLE).
PER CODE(S): CEC 2019: 690.17(B), NEC 2020

WARNING

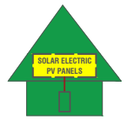
PHOTOVOLTAIC SYSTEM COMBINER PANEL

DO NOT ADD LOADS

LABEL LOCATION:
PHOTOVOLTAIC AC COMBINER (IF APPLICABLE).
PER CODE(S): CEC 2016: 705.12(D)(2)(3)(c), NEC2020

EMERGENCY RESPONDER
THIS SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUTDOWN ENTIRE PV SYSTEM



NOTES AND SPECIFICATIONS:

- SIGNS AND LABELS SHALL MEET THE REQUIREMENTS OF THE NEC 2020 ARTICLE 110.21(B), UNLESS SPECIFIC INSTRUCTIONS ARE REQUIRED BY SECTION 690, OR IF REQUESTED BY THE LOCAL AHJ.
- SIGNS AND LABELS SHALL ADEQUATELY WARN OF HAZARDS USING EFFECTIVE WORDS, COLORS AND SYMBOLS.
- LABELS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD AND SHALL NOT BE HAND WRITTEN.
- LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
- SIGNS AND LABELS SHALL COMPLY WITH ANSI Z535.4-2011, PRODUCT SAFETY SIGNS AND LABELS, UNLESS OTHERWISE SPECIFIED.
- DO NOT COVER EXISTING MANUFACTURER LABELS.

WARNING

DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL LOCATION:
UTILITY SERVICE METER AND MAIN SERVICE PANEL.
PER CODE(S): NEC 2020

WARNING

INVERTER OUTPUT CONNECTION

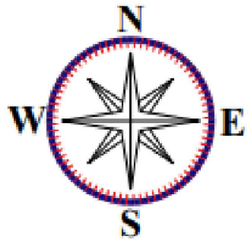
DO NOT RELOCATE THIS OVERCURRENT DEVICE

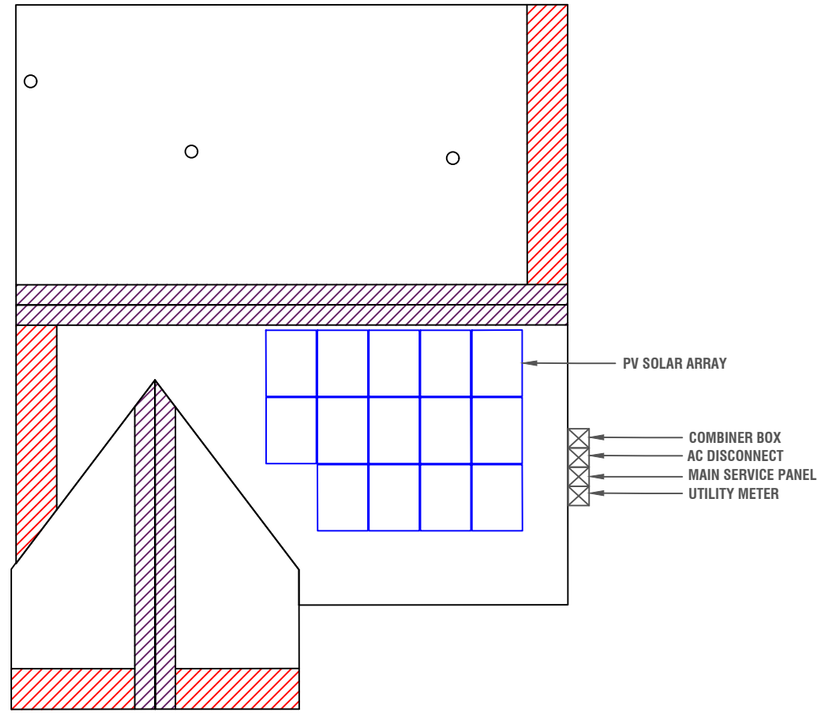
LABEL LOCATION:
ADJACENT TO PV BREAKER (IF APPLICABLE).
PER CODE(S): CEC 2019
NEC 2020

CAUTION

MULTIPLE SOURCES OF POWER

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECT LOCATED AS SHOWN





WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION:
INTERIOR AND EXTERIOR DC CONDUIT EVERY 10 FT, AT EACH TURN, ABOVE AND BELOW PENETRATIONS, ON EVERY JB/PULL BOX CONTAINING DC CIRCUITS.
PER CODE(S): CEC 2019: 690.13, 690.31(G)(4), NEC 2020

ON-SITE GENERATION UTILITY DISCONNECT SWITCH

LABEL LOCATION:
AC DISCONNECT

WARNING
IN CASE OF EMERGENCY, CONTACT:
EPC SOLAR
PH. NO. 727-267-4033

LABEL LOCATION:
MAIN DISCONNECT

PHOTOVOLTAIC AC DISCONNECT
MAXIMUM AC OPERATING CURRENT: 16.94 AMPS
NOMINAL OPERATING AC VOLTAGE: 240 VAC

LABEL LOCATION:
AC DISCONNECT(S), PHOTOVOLTAIC SYSTEM POINT OF INTERCONNECTION.
PER CODE(S): CEC 2019: 690.53, NEC 2020

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION:
RSD SWITCH

EPC SOLAR
379 DOUGLAS RD E
OLDSMAR, FL 34677
PHONE: 727-267-4033

REVISIONS

DESCRIPTION	DATE	REV

PROJECT NAME: MONICA COLS

PROJECT ADDRESS: 111 NORRIS FARM DR, ANGIER, NC 27501

SHEET NAME: WARNING LABELS

SHEET NUMBER: E-03

SHEET SIZE: ANSI B 11"x17"

NORTH CAROLINA PROFESSIONAL SEAL 051426 ENGINEER RAFAEL A. GONZALEZ SOTO

Rafael A Gonzalez Soto
2025.06.03 10:14:31
-04'00'

May 16, 2025

Harnett County Central Permit

420 McKinney Pkwy

Lillington, NC 27546

RE: Solar PV System

Monica Cols

111 Norris Farm Dr

Angier, NC 27501

Dear Plans Reviewer,

Consider this as a statement by Rafael Gonzalez Soto, P.E, regarding the project referenced above.

The proposed solar installation for this project will add approximately 3 PSF of additional deadload. This includes the solar modules & microinverters, racking, and all other accessories. Based on my evaluation of the building, the existing roof structure can support the additional load of the proposed PV system. The proposed solar system is designed and complies with the 2015 North Carolina Building Code structural requirements. The contractor is responsible for installing the solar system according to the manufacturer's recommendations and instructions.

Please feel free to contact me at 786-393-4740 if you have any questions or require any further information.

Regards,

Rafael A Gonzalez Soto
2025.06.03 10:14:40 -04'00'

Rafael Gonzalez Soto, P.E

237 S Dixie Hwy, 4th Floor, Suite 13,

Coral Gables, FL 33133

786-393-4740

Harvest the Sunshine

DEEP BLUE 3.0 Light

Mono

405W MBB Half-cell Black Module JAM54S31 380-405/MR Series

Introduction

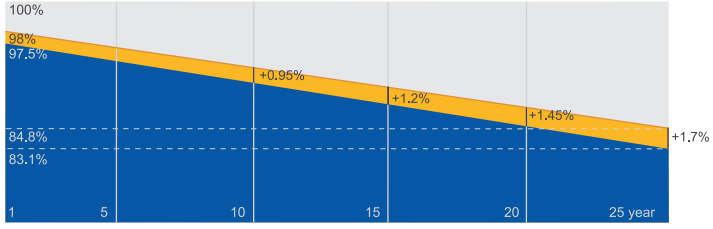
Assembled with 11BB PERC cells, the half-cell configuration of the modules offers the advantages of higher power output, better temperature-dependent performance, reduced shading effect on the energy generation, lower risk of hot spot, as well as enhanced tolerance for mechanical loading.

- Higher output power
- Lower LCOE
- Less shading and lower resistive loss
- Better mechanical loading tolerance

Superior Warranty

- 12-year product warranty
- 25-year linear power output warranty

0.55% Annual Degradation Over 25 years



New linear power warranty Standard module linear power warranty

Comprehensive Certificates

- IEC 61215, IEC 61730,UL 61215, UL 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- ISO 45001: 2018 Occupational health and safety management systems
- IEC 62941: 2019 Terrestrial photovoltaic (PV) modules - Quality system for PV module manufacturing

JA SOLAR

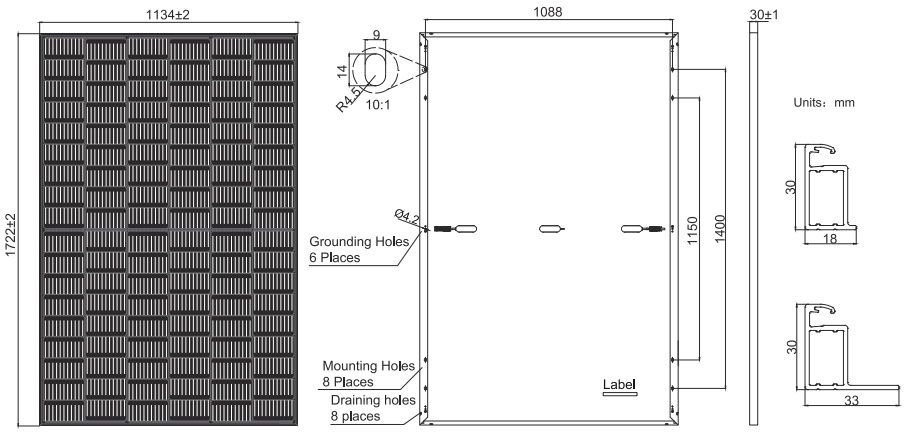
www.jasolar.com

Specifications subject to technical changes and tests.
JA Solar reserves the right of final interpretation.

JA SOLAR

JAM54S31 380-405/MR Series

MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

SPECIFICATIONS

Cell	Mono
Weight	19.5kg
Dimensions	1722±2mm×1134±2mm×30±1mm
Cable Cross Section Size	4mm²（IEC），12 AWG(UL)
No. of cells	108(6x18)
Junction Box	IP68, 3 diodes
Connector	QC 4.10-35/ MC4-EVO2A
Cable Length (Including Connector)	Portrait: 200mm(+)/300mm(-); 800mm(+)/800mm(-)(Leapfrog) Landscape: 1100mm(+)/1100mm(-)
Front Glass	2.8mm
Packaging Configuration	36pcs/Pallet 936pcs/40HQ Container

ELECTRICAL PARAMETERS AT STC

TYPE	JAM54S31 -380/MR	JAM54S31 -385/MR	JAM54S31 -390/MR	JAM54S31 -395/MR	JAM54S31 -400/MR	JAM54S31 -405/MR
Rated Maximum Power(Pmax) [W]	380	385	390	395	400	405
Open Circuit Voltage(Voc) [V]	36.58	36.71	36.85	36.98	37.07	37.23
Maximum Power Voltage(Vmp) [V]	30.28	30.46	30.64	30.84	31.01	31.21
Short Circuit Current(Isc) [A]	13.44	13.52	13.61	13.70	13.79	13.87
Maximum Power Current(Imp) [A]	12.55	12.64	12.73	12.81	12.90	12.98
Module Efficiency [%]	19.5	19.7	20.0	20.2	20.5	20.7
Power Tolerance	0~+5W					
Temperature Coefficient of Isc(α_Isc)	+0.045%°C					
Temperature Coefficient of Voc(β_Voc)	-0.275%/°C					
Temperature Coefficient of Pmax(γ_Pmp)	-0.350%/°C					
STC	Irradiance 1000W/m², cell temperature 25°C, AM1.5G					

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

ELECTRICAL PARAMETERS AT NOCT

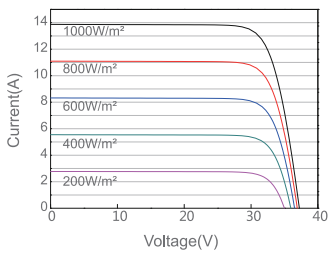
TYPE	JAM54S31 -380/MR	JAM54S31 -385/MR	JAM54S31 -390/MR	JAM54S31 -395/MR	JAM54S31 -400/MR	JAM54S31 -405/MR
Rated Max Power(Pmax) [W]	286	290	294	298	302	306
Open Circuit Voltage(Voc) [V]	34.36	34.49	34.62	34.75	34.88	35.12
Max Power Voltage(Vmp) [V]	28.51	28.68	28.87	29.08	29.26	29.47
Short Circuit Current(Isc) [A]	10.75	10.82	10.89	10.96	11.03	11.10
Max Power Current(Imp) [A]	10.03	10.11	10.18	10.25	10.32	10.38
NOCT	Irradiance 800W/m², ambient temperature 20°C,wind speed 1m/s, AM1.5G					

OPERATING CONDITIONS

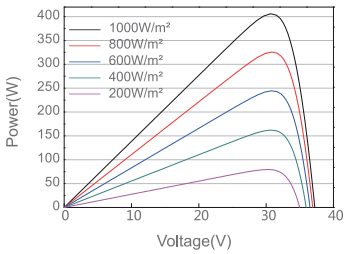
Maximum System Voltage	1000V/1500V DC
Operating Temperature	-40℃~+85℃
Maximum Series Fuse Rating	25A
Maximum Static Load,Front* Maximum Static Load,Back*	5400Pa(112lb/ft²) 2400Pa(50lb/ft²)
NOCT	45±2℃
Safety Class	Class Ⅱ
Fire Performance	UL Type 1

CHARACTERISTICS

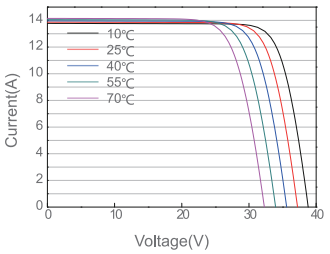
Current-Voltage Curve JAM54S31-405/MR



Power-Voltage Curve JAM54S31-405/MR



Current-Voltage Curve JAM54S31-405/MR



ENPHASE

DATA SHEET

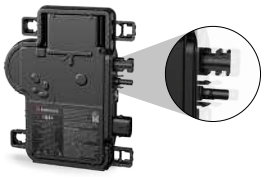
IQ8 and IQ8+ Microinverters

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

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

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 that has Integrated MC4 connectors.

UL CERTIFIED SAFETY

IQ8 Series Microinverters are UL Listed as PV Rapid Shut Down Equipment and conform with various regulations, when installed according to manufacturer's instructions.

Easy to install

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

High productivity and reliability

- Produce 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-SB) requirements

IQ8SP-MC4-DS-0002-02-EN-US-2022-08-23

* Only when installed with IQ System Controller 2, meets UL 1741.

** IQ8 and IQ8Plus support split phase, 240V installations only.

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)		IQ8-60-M-US	IQ8PLUS-72-M-US
Commonly used module pairings[1]	W	235 – 350	235 – 440
Module compatibility		60-cell / 120 half-cell	60-cell / 120 half-cell, 66-cell / 132 half-cell and 72-cell / 144 half-cell
MPPT voltage range	V	27 – 37	29 – 45
Operating range	V	25 – 48	25 – 58
Min / Max start voltage	V	30 / 48	30 / 58
Max input DC voltage	V	50	60
Max DC current[2] [module I_{sc}]	A	15	
Overvoltage class DC port		II	
DC port backfeed current	mA	0	
PV array configuration		1 x 1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	

OUTPUT DATA (AC)		IQ8-60-M-US	IQ8PLUS-72-M-US
Peak output power	VA	245	300
Max continuous output power	VA	240	290
Nominal (L-L) voltage / range[3]	V	240 / 211 – 264	
Max continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	50 – 68	
AC short circuit fault current over 3 cycles	Arms	2	
Max units per 20 A (L-L) branch circuit[4]		16	13
Total harmonic distortion		<5%	
Overvoltage class AC port		III	
AC port backfeed current	mA	30	
Power factor setting		1.0	
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging	
Peak efficiency	%	97.5	97.6
CEC weighted efficiency	%	97	97
Night-time power consumption	mW	60	

MECHANICAL DATA	
Ambient temperature range	-40°C to +60°C (-40°F to +140°F)
Relative humidity range	4% to 100% (condensing)
DC Connector type	Stäubli MC4
Dimensions (H x W x D)	212 mm (8.3”) x 175 mm (6.9”) x 30.2 mm (1.2”)
Weight	1.1 kg (2.43 lbs)
Cooling	Natural convection – no fans
Approved for wet locations	Yes
Pollution degree	PD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Environ. category / UV exposure rating	NEMA Type 6 / outdoor

COMPLIANCE	
Certifications	CA Rule 21 (UL 1741-SB), UL 62109-1, UL1741 / IEEE1547, 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 Shut Down Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer’s instructions.

(1) No enforced DC/AC ratio. See the compatibility calculator at https://link.enphase.com/module-compatibility.
(2) Maximum continuous input DC current is 10.6A. (3) Nominal voltage range can be extended beyond nominal if required by the utility. (4) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

ENPHASE

DATA SHEET

X-IQ-AM1-240-5
X-IQ-AM1-240-5C

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 5P.

The IQ Combiner 5/5C, IQ Series Microinverters, IQ System Controller 3/3G, and IQ Battery 5P 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 5P
Fully integrated AC battery system. Includes six field-replaceable IQ8D-BAT Microinverters.

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

Enphase 5 year limited warranty

NOM

UL CERTIFIED SAFETY US-CA SÛRETÉ US-CA E341166

5-year limited warranty

Smart

- Includes IQ Gateway for communication and control
- Includes Enphase Mobile Connect (CELLMODEM-M1-06-SP-05), only with IQ Combiner 5C
- Supports flexible networking: Wi-Fi, Ethernet, or cellular
- Provides production metering (revenue grade) and consumption monitoring

Easy to install

- Mounts to one stud with centered brackets
- Supports bottom, back, and side conduit entries
- Supports up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV branch circuits
- Bluetooth-based Wi-Fi provisioning for easy Wi-Fi setup

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- 5-year limited warranty
- 2-year labor reimbursement program coverage included for both the IQ Combiner SKUs*
- UL1741 Listed

*For country-specific warranty information, see the https://enphase.com/installers/resources/warranty page.

IQ Combiner 5/5C

MODEL NUMBER	
IQ Combiner 5 (X-IQ-AM1-240-5)	IQ Combiner 5 with IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSIC12.20 ±0.5%), consumption monitoring (±2.5%), and IQ Battery monitoring (±2.5%). Includes a silver solar shield to deflect heat.
IQ Combiner 5C (X-IQ-AM1-240-5C)	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-M1-06-SP-05)[1]. Includes a silver solar shield to deflect heat.
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 breaker for installing IQ Series Microinverters and IQ Battery 5P
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 5P
Enphase Mobile Connect (only with IQ Combiner 5C)	4G-based LTE-M1 cellular modem (CELLMODEM-M1-06-SP-05) with a 5-year T-Mobile data plan
Accessories kit	Spare control headers for the COMMS-KIT-02 board
ACCESSORIES AND REPLACEMENT PARTS (NOT INCLUDED, ORDER SEPARATELY)	
CELLMODEM-M1-06-SP-05	4G-based LTE-M1 cellular modem with a 5-year T-Mobile data plan
CELLMODEM-M1-06-AT-05	4G-based LTE-M1 cellular modem with a 5-year AT&T data plan
Circuit breakers (off-the-shelf)	Supports Eaton BR2XX, Siemens Q2XX and GE/ABB THQL21XX Series circuit breakers (XX represents 10, 15, 20, 30, 40, 50, or 60). Also supports Eaton BR220B, BR230B, 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
XA-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-B Series circuit breakers (with screws)
XA-COMMS2-PCBA-5	Replacement COMMS-KIT-02 printed circuit board (PCB) for IQ Combiner 5/5C
ELECTRICAL SPECIFICATIONS	
Rating	80 A
System voltage and frequency	120/240 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 THQL 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
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

[1] A plug-and-play industrial-grade cell modem for systems of up to 60 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.

MECHANICAL DATA		
Dimensions (W × H × D)		37.5 cm × 49.5 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 46°C (-40°F to 115°F)
Cooling		Natural convection, plus heat shield
Enclosure environmental rating		Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes		• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors • 60 A breaker branch input: 4 to 1/0 AWG copper conductors • Main lug combined output: 10 to 2/0 AWG copper conductors • Neutral and ground: 14 to 1/0 copper conductors • Always follow local code requirements for conductor sizing
Communication (in-premise connectivity)		Built-in CTRL board for wired communication with the IQ Battery 5P and the IQ System Controller 3/3G. Integrated power line communication for IQ Series Microinverters.
Altitude		Up to 2,600 meters (8,530 feet)
COMMUNICATION INTERFACES		
Integrated Wi-Fi		802.11b/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-M1-06-SP-05 or CELLMODEM-M1-06-AT-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 5P
Access point (AP) 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 at https://enphase.com/download/accessing-iq-gateway-local-apis-or-local-ui-token-based-authentication
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-208-SCFI-2016, UL 60601-1/CANCSA 22.2 No. 61010-1, IEEE 1547: 2018 (UL 1741-SB, 3rd Ed.), IEEE 2030.5/CSIP Compliant, Production metering: ANSI C12.20 accuracy class 0.5 (PV production)
COMPATIBILITY		
PV	Microinverters	IQ6, IQ7, and IQ8 Series Microinverters
COMMS-KIT-01 [2]	IQ System Controller	EP200G101-M240US00
	IQ System Controller 2	EP200G101-M240US01
	IQ Battery	ENCHARGE-3-1P-NA, ENCHARGE-10-1P-NA, ENCHARGE-3T-1P-NA, ENCHARGE-10T-1P-NA
COMMS-KIT-02 [3]	IQ System Controller 3	SC200D111C240US01, SC200G111C240US01
	IQ Battery	IQBATTERY-5P-1P-NA

[2] For information about IQ Combiner 5/5C compatibility with the 2nd-generation batteries, refer to the compatibility matrix at https://enphase.com/download/compatibility-matrix.

[3] IQ Combiner 5/5C comes pre-equipped with COMMS-KIT-02.

Accessories

Mobile Connect

4G-based LTE-M1 cellular modem with a 5-year data plan
(CELLMODEM-M1-06-SP-05 for Sprint and CELLMODEM-M1-06-AT-05 for AT&T)

Circuit breakers

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 BR215B with hold-down kit support
BRK-20A-2P-240V-B Circuit breaker, 2-pole, 20 A, Eaton BR220B with hold-down kit support

CT-200-SOLID

200 A revenue-grade solid core Production CT with <0.5% error rate (replacement SKU)

CT-200-CLAMP

200 A clamp-style consumption and battery metering CT with <2.5% error rate (replacement SKU)

Revision history

REVISION	DATE	DESCRIPTION
DSH-00007-4.0	June 2024	Updated the UL smart mark.
DSH-00007-3.0	March 2024	Updated accessories and replacement parts, communication interfaces, and compatibility specifications.
DSH-00007-2.0	September 2023	Included Bluetooth specifications.
DSH-00007-1.0	May 2023	Initial release.

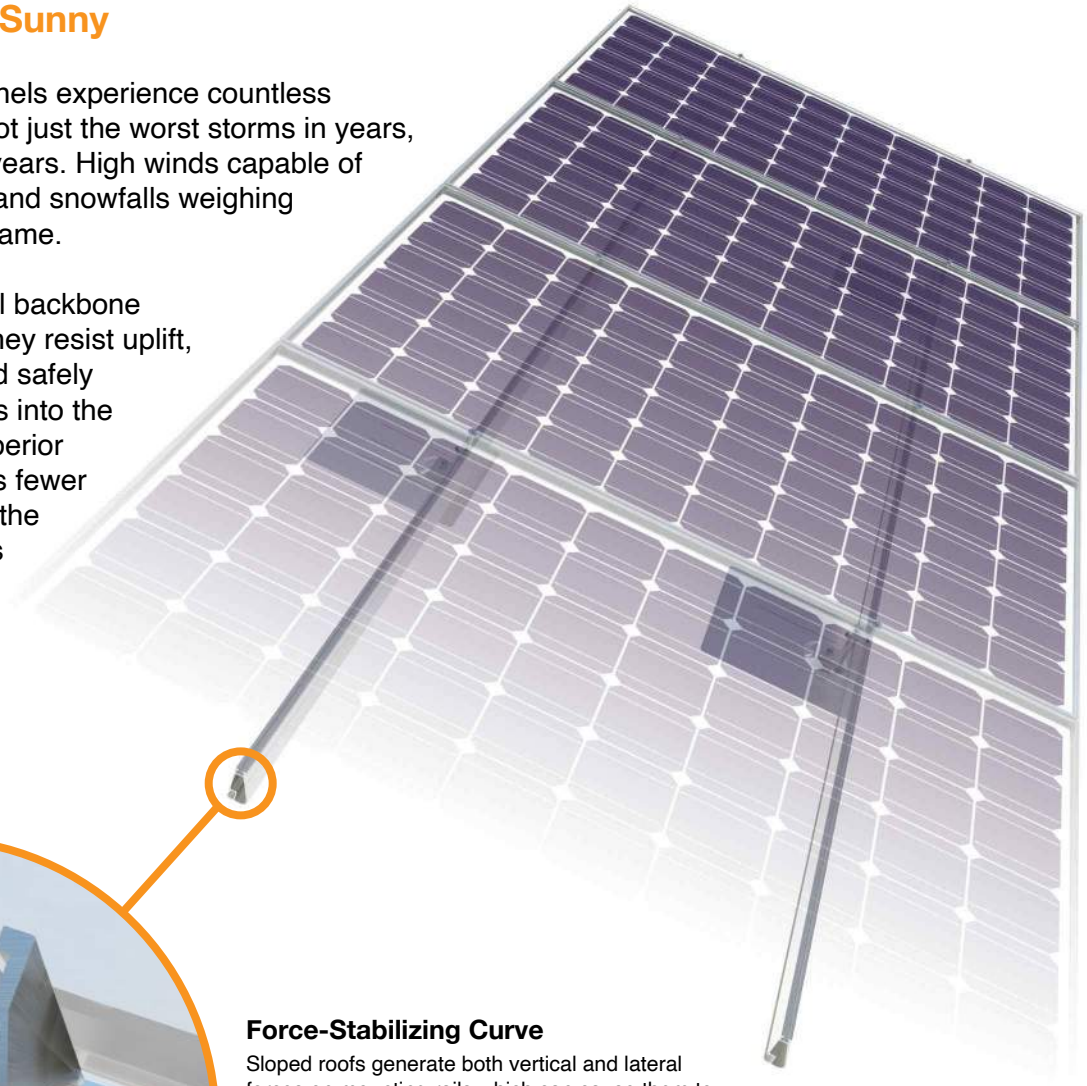
IRONRIDGE

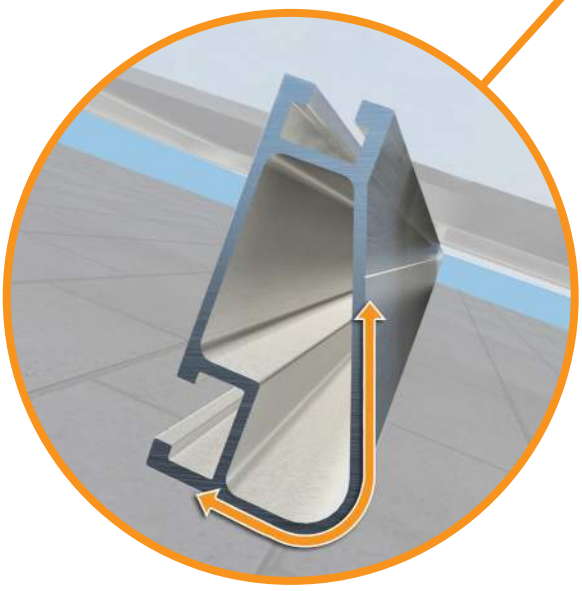
XR Rail® Family

Solar Is Not Always Sunny

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

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





Force-Stabilizing Curve

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

Compatible with Flat & Pitched Roofs

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

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

Corrosion-Resistant Materials

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

XR Rail® Family

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

XR10

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

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

XR100

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

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

XR1000

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

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

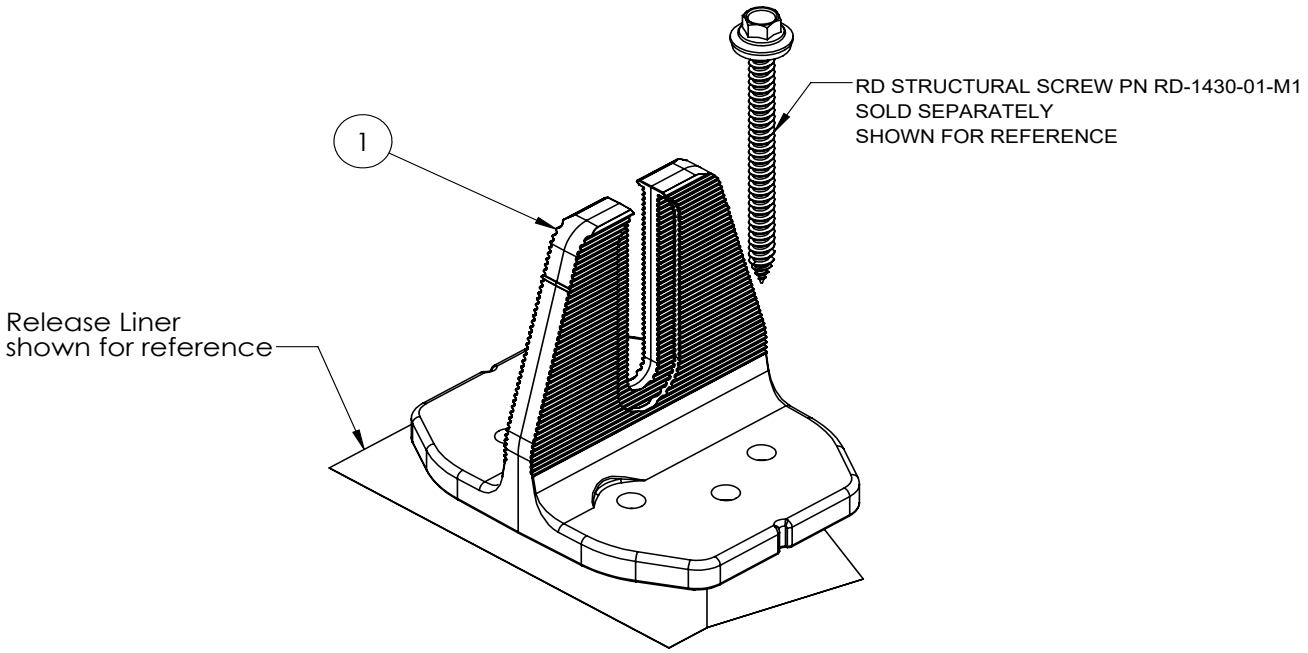
Rail Selection

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

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

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

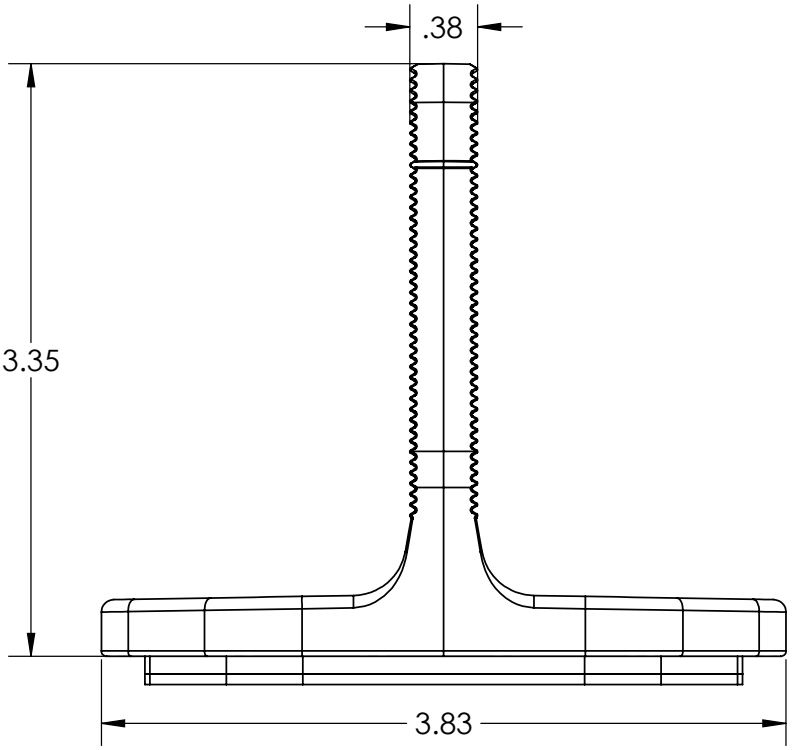
QuickMount® Halo UltraGrip®

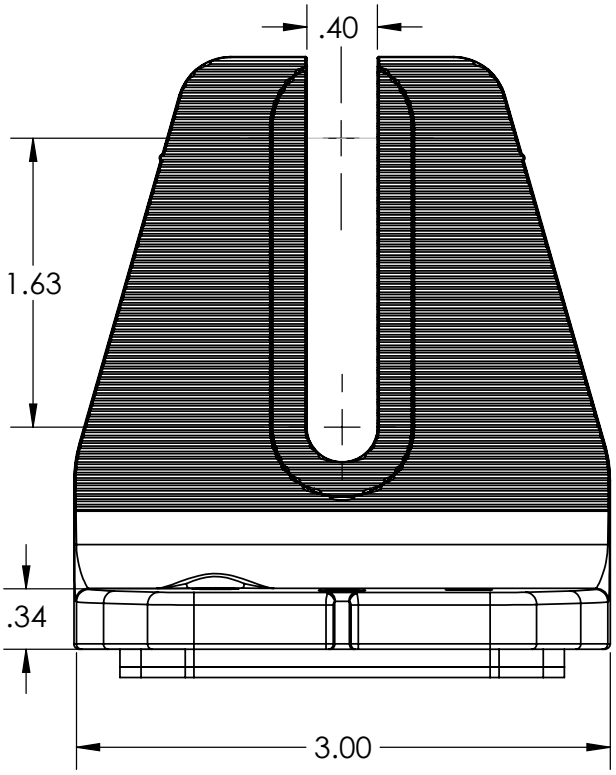


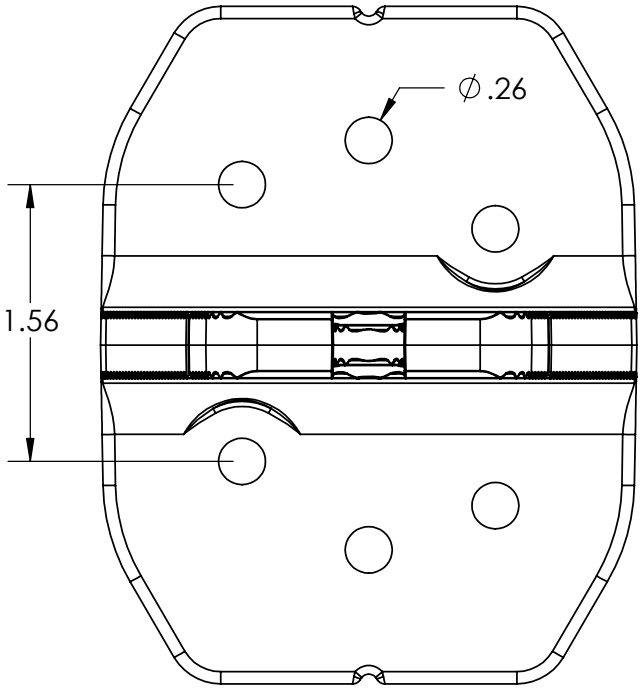
ITEM NO	DESCRIPTION	QTY IN KIT
1	QM Halo UltraGrip(Mill or Black)	1

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

1. Halo UltraGrip







Property	Value
Material	300 Series Aluminium
Finish	Mill or Black