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PV MATERIAL SUMMARY: DISTRIBUTOR	
REC400NP3 BLACK	48
IQ7PLUS-72-2-US	48
X2-IQ-AM1-240-4	1
Q-12-17-240	52
Q-SEAL-10	4
Q-TERM-10	7
XR-10-168B	12
XR-10-204B	16
XR10-BOSS-01-M1	10
UFO-CL-01-B1	122
UFO-STP-30MM-B1	52
XR-LUG-03-A1	15
4 IN QB1	90
QB DECK MOUNT 16317	18
MI-BHW	48
GC66803 Geocel Sealant	6
SOLADECK 0799-5B	5



**CLIENT INFO**  
 COURTNEY WHITLEY BATTEN  
 95 OLD FIELD LOOP  
 SANFORD NC 27332

**PROJECT INFO**  
 DC INPUT: 19.200 kW  
 AC EXPORT: 13.920 kW  
 DOI INSPT. METHOD: OPTION 2

**Model Energy**  
 300 Fayetteville St.  
 #1430  
 Raleigh, NC 27602  
 919-274-9905  
 ModelEnergy.com  
 P-1194



**CODE REFERENCES**  
 NATION ELECTRICAL CODE v. 2017  
 NC FIRE PROTECTION CODE v. 2018  
 NC BUILDING CODE v. 2018  
 NC RESIDENTIAL CODE v. 2018  
 ACSE v. 7-10

**SITE CONDITIONS**  
 WIND SPEED: 116 MPH  
 RISK CATEGORY: II  
 EXPOSURE: B  
 SNOW: 10 PSF

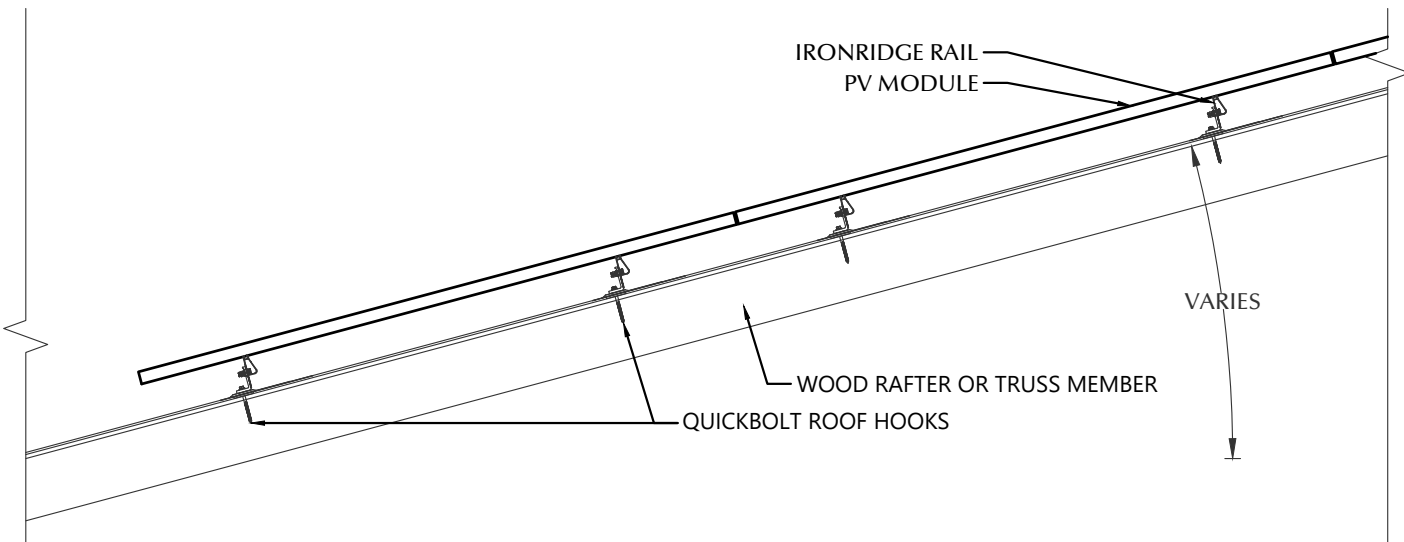
**SHEET INDEX**  
 PV-1: COVER SHEET  
 PV-2: PV STRUCTURAL  
 PV-3: PV ELECTRICAL  
 PV-4: PV EQUIPMENT LABELS  
 PV-5: PV INSTALL GUIDE

VERSIONS		
FOR:	DESIGNER	DATE
CONSTRUCTION	MCP	8/17/2023

PV SYSTEM COVER PAGE

**PV-1.1**

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**STATEMENT OF STRUCTURAL COMPLIANCE**

THE EXISTING ROOF STRUCTURE HAS BEEN DESIGNED TO SUPPORT THE ADDITIONAL LOADS OF THE PROPOSED PV SYSTEM. IN ADDITION, THE RACKING AND FASTENING SYSTEM SHALL BE CAPABLE OF SECURING THE SYSTEM TO THE STRUCTURE UNDER DESIGN CONDITIONS WHEN INSTALLED PROPERLY AND IN ACCORDANCE WITH THE RACKING AND FASTENING ARRANGEMENT DETAILED WITHIN THESE DRAWINGS.

NAME: ANDREW W. KING, PE

SIGNED:

PV MODULES	
MAKE	REC
MODEL	REC400NP3 BLACK
WIDTH	40.90 IN
LENGTH	74.80 IN
THICKNESS	30 MM
WEIGHT	47.00 LBS.
ARRAY AREA	404 SQFT.
ARRAY WEIGHT	1009 LBS.

ROOF SUMMARY	
STRUCTURE:	
TYPE	TRUSSES
MATERIAL	SOUTHERN PINE #2
SIZE	2 X 4
SPACING	24 IN O.C.
ALLOWABLE SPAN	88 IN
PITCH	9/12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	COMPOSITE
THICKNESS	7/16 IN
WEIGHT	1.60 LBS./SQFT
ROOFING:	
TYPE	ASPHALT SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.30 LBS./SQFT.



**CLIENT INFO**

COURTNEY WHITLEY BATTEN  
95 OLD FIELD LOOP  
SANFORD NC 27332

**PROJECT INFO**

DC INPUT: 19.200 kW  
AC EXPORT: 13.920 kW  
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ACSE v. 7-10

**SITE CONDITIONS**

WIND SPEED: 116 MPH  
RISK CATEGORY: II  
EXPOSURE: B  
SNOW: 10 PSF

**SHEET INDEX**

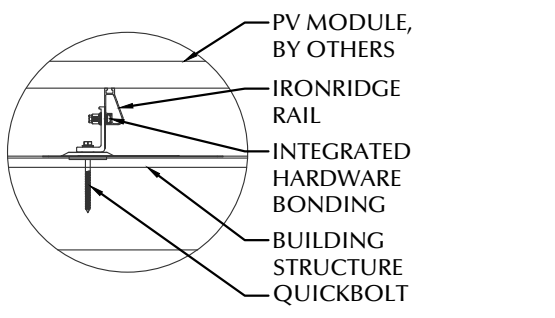
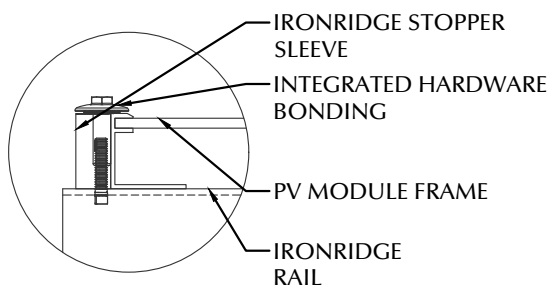
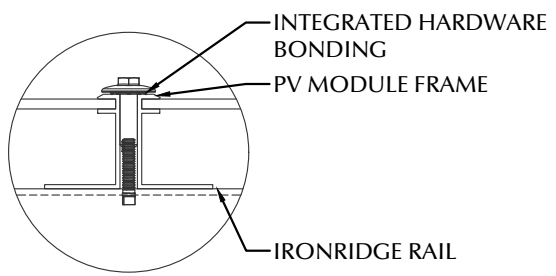
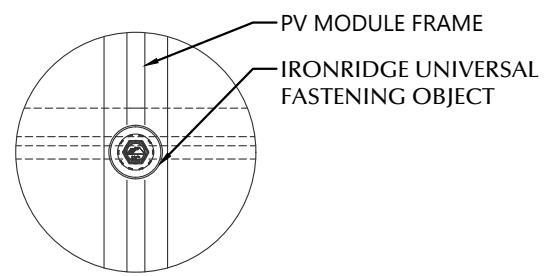
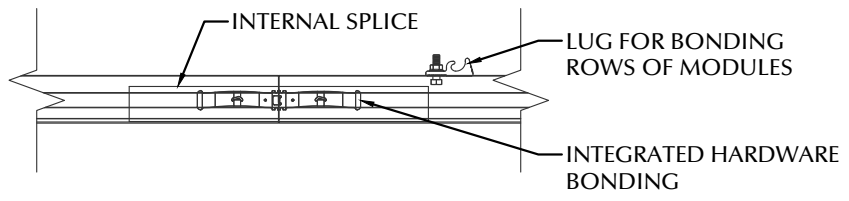
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**VERSIONS**

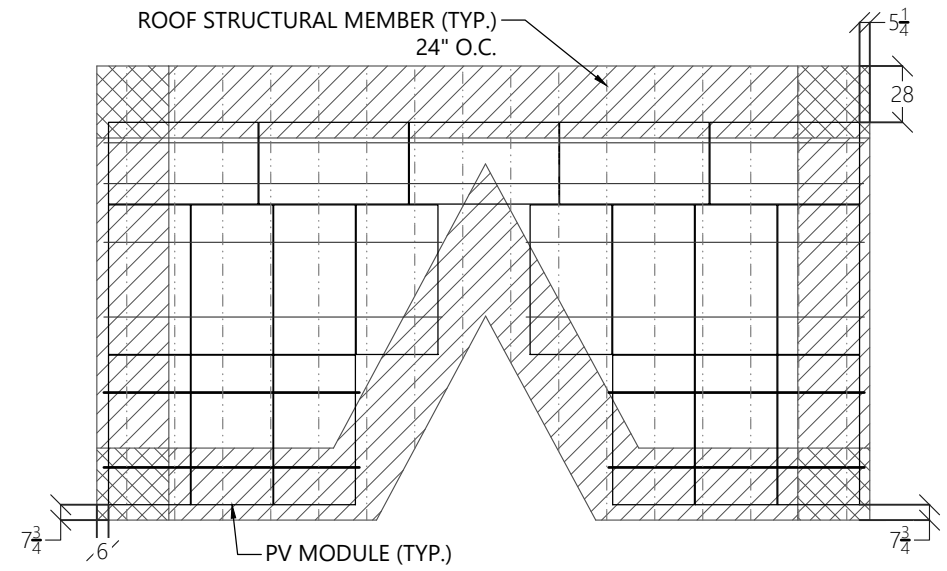
FOR:	DESIGNER	DATE
CONSTRUCTION	MCP	8/17/2023

**PV SYSTEM STRUCTURAL**

**PV-2.1**



**1 ROOF FASTENER DETAIL**  
NOT TO SCALE



**2 ROOF A ARRAY LAYOUT**  
1/8" = 1'-0"

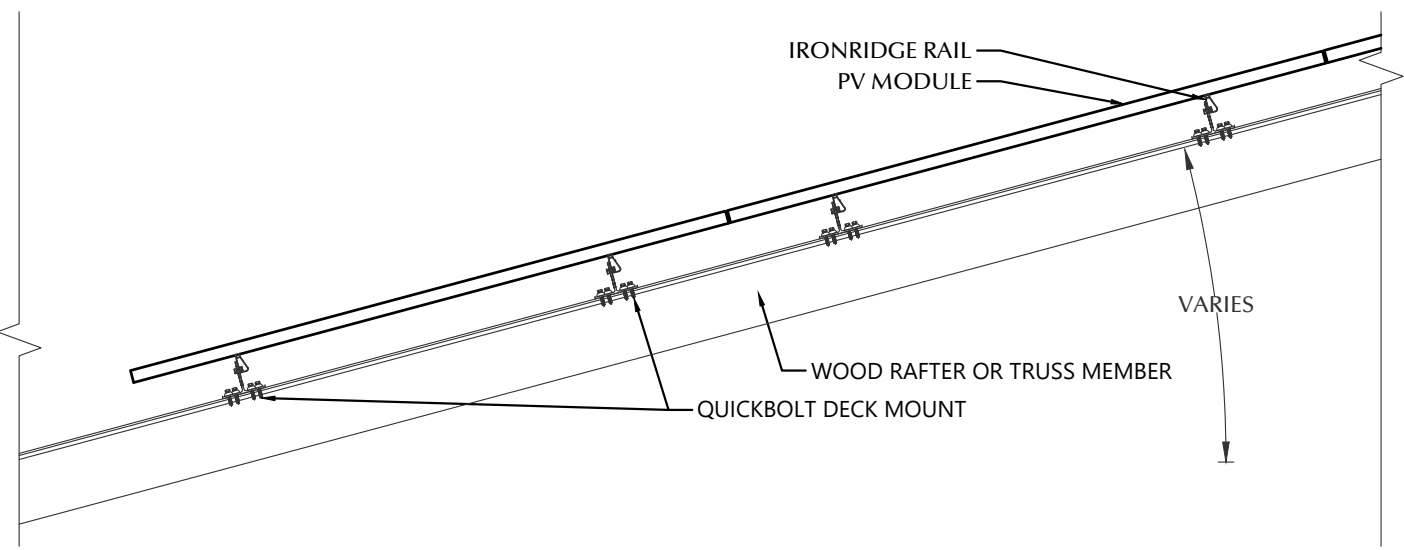
ROOF MOUNT SUMMARY		
MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	PORT 72 LAND 72	19 IN
WIND ZONE 2	PORT 48 LAND 48	19 IN
WIND ZONE 3	PORT 48 LAND 48	19 IN

ROOF LOADING	
GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD	20 LBS./SQFT.
DEAD LOAD	
ROOFING	3.9 LBS./SQFT.
PV ARRAY	2.5 LBS./SQFT.
TOTAL	6.4 LBS./SQFT.
WIND LOAD:	
UPLIFT ZONE 1	-24.6 LBS./SQFT.
UPLIFT ZONE 2	-29.0 LBS./SQFT.
UPLIFT ZONE 3	-29.0 LBS./SQFT.
DOWNWARD	23.0 LBS./SQFT.
FASTENER LOAD:	
UPLIFT ZONE 1	-376 LBS.
UPLIFT ZONE 2	-295 LBS.
UPLIFT ZONE 3	-295 LBS.
DOWNWARD	351 LBS.

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	4 IN QB1
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HANGER BOLT
MATERIAL	304 SS
SIZE	5/16-18 X 5-1/4"
GENERAL:	
WEIGHT	0.56 LBS.
FASTENERS PER MOUNT	1
MAX. PULL-OUT FORCE	960.0 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	480.0 LBS.

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XR10
MATERIAL	ALUMINUM
WEIGHT	0.425 LBS/IN
SPACING	37 IN

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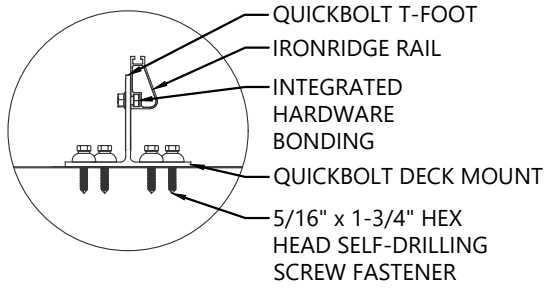
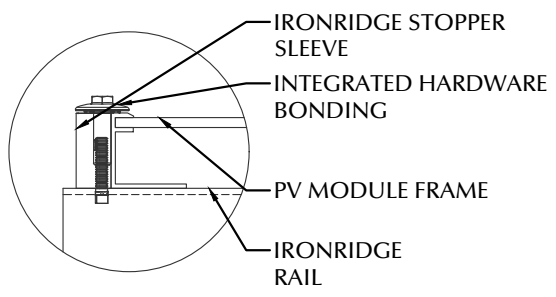
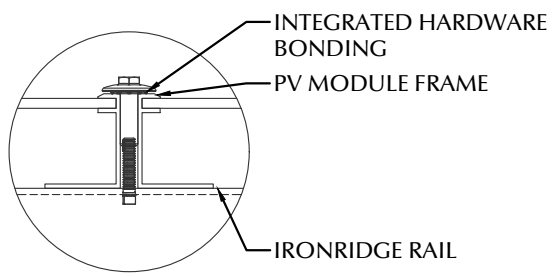
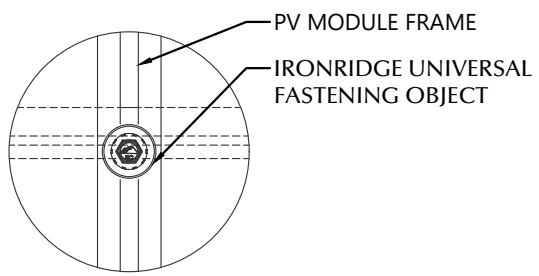
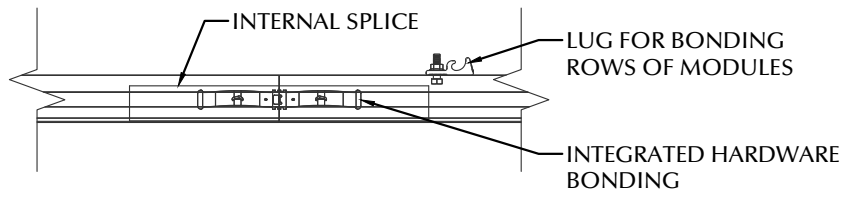


**STATEMENT OF STRUCTURAL COMPLIANCE**

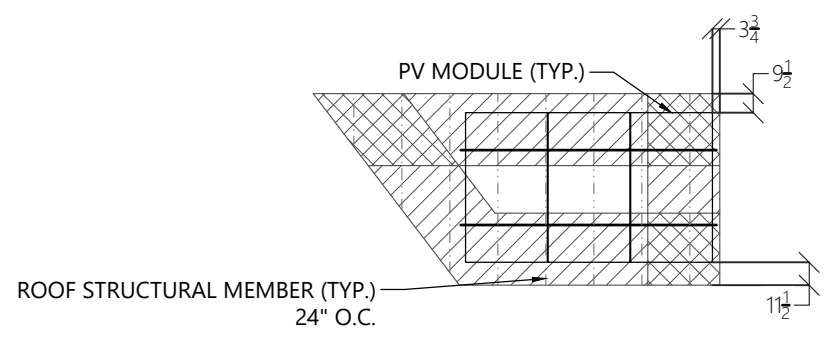
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NAME: ANDREW W. KING, PE

SIGNED:



**1** ROOF FASTENER DETAIL  
NOT TO SCALE



**2** ROOF B ARRAY LAYOUT  
1/8" = 1'-0"

PV MODULES	
MAKE	REC
MODEL	REC400NP3 BLACK
WIDTH	40.90 IN
LENGTH	74.80 IN
THICKNESS	30 MM
WEIGHT	47.00 LBS.
ARRAY AREA	64 SQFT.
ARRAY WEIGHT	159 LBS.

ROOF SUMMARY	
STRUCTURE:	
TYPE	TRUSSES
MATERIAL	SOUTHERN PINE #2
SIZE	2 X 4
SPACING	24 IN O.C.
ALLOWABLE SPAN	88 IN
PITCH	10/12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	COMPOSITE
THICKNESS	7/16 IN
WEIGHT	1.60 LBS./SQFT
ROOFING:	
TYPE	ASPHALT SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.30 LBS./SQFT.

ROOF MOUNT SUMMARY		
MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	37 IN	11 IN
WIND ZONE 2	28 IN	11 IN
WIND ZONE 3	26 IN	10 IN

ROOF LOADING	
GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD	20 LBS./SQFT.
DEAD LOAD	
ROOFING	3.9 LBS./SQFT.
PV ARRAY	2.5 LBS./SQFT.
TOTAL	6.4 LBS./SQFT.
WIND LOAD:	
UPLIFT ZONE 1	-24.6 LBS./SQFT.
UPLIFT ZONE 2	-29.0 LBS./SQFT.
UPLIFT ZONE 3	-29.0 LBS./SQFT.
DOWNWARD	23.0 LBS./SQFT.
FASTENER LOAD:	
UPLIFT ZONE 1	-235 LBS.
UPLIFT ZONE 2	-210 LBS.
UPLIFT ZONE 3	-195 LBS.
DOWNWARD	220 LBS.

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	QB DECK MOUNT 16317
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HEX LAG PN# 16318
MATERIAL	304 SS
SIZE	5/16" X 1-3/4"
GENERAL:	
WEIGHT	0.88 LBS.
FASTENERS PER MOUNT	4
MAX. PULL-OUT FORCE	705.0 LBS.
SAFETY FACTOR	3
DESIGN PULL-OUT FORCE	235.0 LBS.

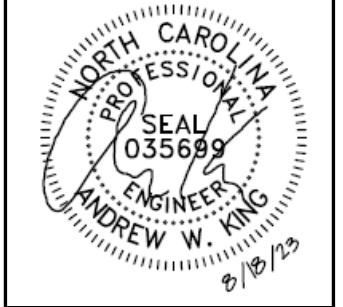
MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XR10
MATERIAL	ALUMINUM
WEIGHT	0.425 LBS/IN
SPACING	37 IN



**CLIENT INFO**  
COURTNEY WHITLEY BATTEN  
95 OLD FIELD LOOP  
SANFORD NC 27332

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**CODE REFERENCES**  
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NC FIRE PROTECTION CODE v. 2018  
NC BUILDING CODE v. 2018  
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ACSE v. 7-10

**SITE CONDITIONS**  
WIND SPEED: 116 MPH  
RISK CATEGORY: II  
EXPOSURE: B  
SNOW: 10 PSF

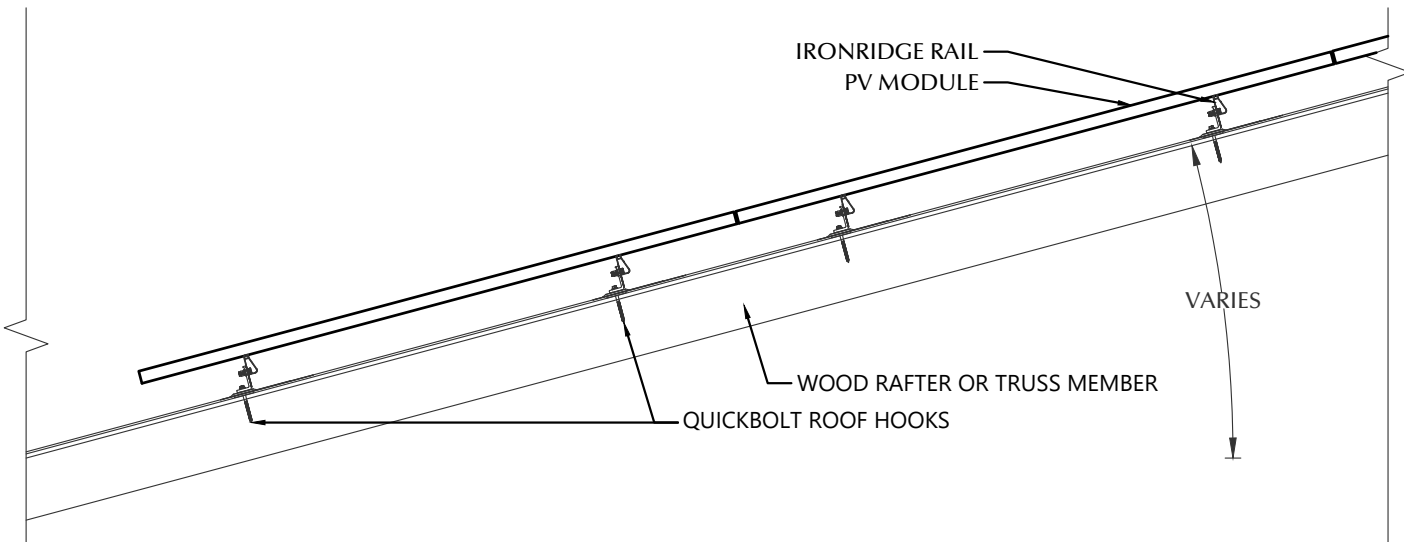
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**PV SYSTEM STRUCTURAL**

**PV-2.2**

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**STATEMENT OF STRUCTURAL COMPLIANCE**

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NAME: ANDREW W. KING, PE

SIGNED:

PV MODULES	
MAKE	REC
MODEL	REC400NP3 BLACK
WIDTH	40.90 IN
LENGTH	74.80 IN
THICKNESS	30 MM
WEIGHT	47.00 LBS.
ARRAY AREA	85 SQFT.
ARRAY WEIGHT	212 LBS.

ROOF SUMMARY	
STRUCTURE:	
TYPE	TRUSSES
MATERIAL	SOUTHERN PINE #2
SIZE	2 X 4
SPACING	24 IN O.C.
ALLOWABLE SPAN	88 IN
PITCH	10/12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	COMPOSITE
THICKNESS	7/16 IN
WEIGHT	1.60 LBS./SQFT
ROOFING:	
TYPE	ASPHALT SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.30 LBS./SQFT.



**CLIENT INFO**

COURTNEY WHITLEY BATTEN  
95 OLD FIELD LOOP  
SANFORD NC 27332

**PROJECT INFO**

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NC RESIDENTIAL CODE v. 2018  
ACSE v. 7-10

**SITE CONDITIONS**

WIND SPEED: 116 MPH  
RISK CATEGORY: II  
EXPOSURE: B  
SNOW: 10 PSF

**SHEET INDEX**

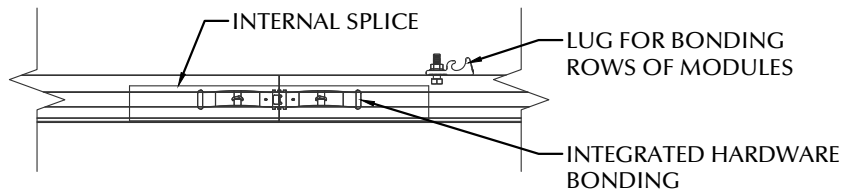
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**VERSIONS**

FOR:	DESIGNER	DATE
CONSTRUCTION	MCP	8/17/2023

**PV SYSTEM STRUCTURAL**

**PV-2.3**



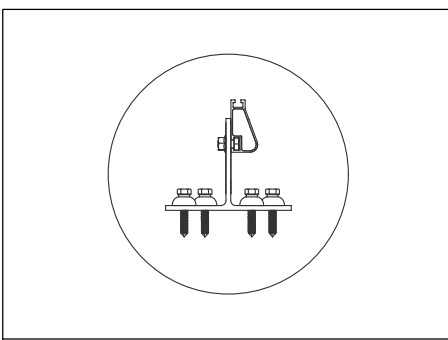
ROOF MOUNT SUMMARY		
MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	72 IN	19 IN
WIND ZONE 2	48 IN	19 IN
WIND ZONE 3	48 IN	19 IN

ROOF LOADING	
GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD	20 LBS./SQFT.
DEAD LOAD	
ROOFING	3.9 LBS./SQFT.
PV ARRAY	2.5 LBS./SQFT.
TOTAL	6.4 LBS./SQFT.
WIND LOAD:	
UPLIFT ZONE 1	-24.6 LBS./SQFT.
UPLIFT ZONE 2	-29.0 LBS./SQFT.
UPLIFT ZONE 3	-29.0 LBS./SQFT.
DOWNWARD	23.0 LBS./SQFT.
FASTENER LOAD:	
UPLIFT ZONE 1	-459 LBS.
UPLIFT ZONE 2	-361 LBS.
UPLIFT ZONE 3	-361 LBS.
DOWNWARD	429 LBS.

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	4 IN QB1
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HANGER BOLT
MATERIAL	304 SS
SIZE	5/16-18 X 5-1/4"
GENERAL:	
WEIGHT	0.56 LBS.
FASTENERS PER MOUNT	1
MAX. PULL-OUT FORCE	960.0 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	480.0 LBS.

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XR10
MATERIAL	ALUMINUM
WEIGHT	0.425 LBS/IN
SPACING	37 IN

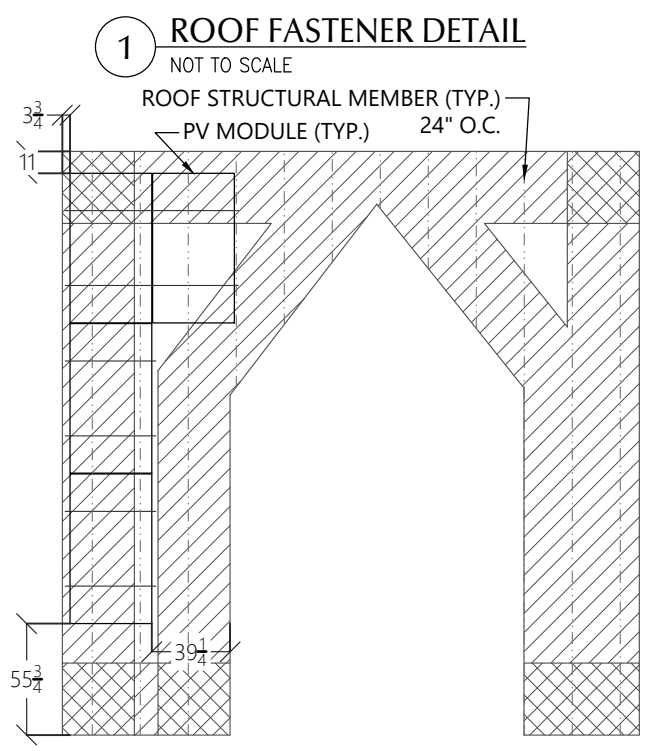
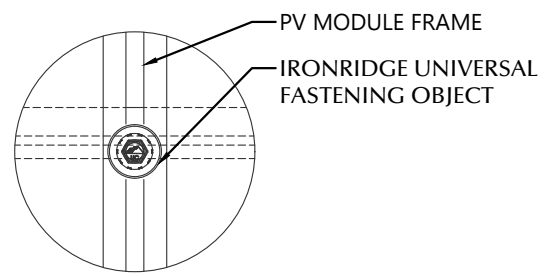
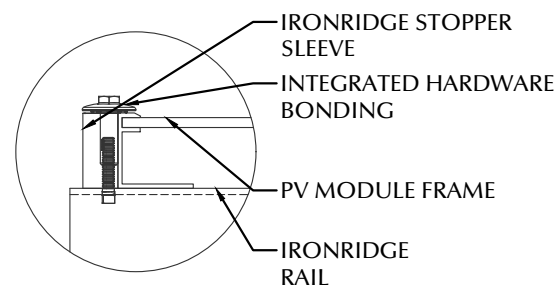
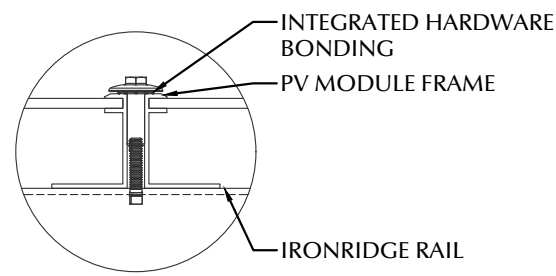
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MAY BE USED WHERE STRUCTURAL MEMBERS ARE NOT ACCESSIBLE



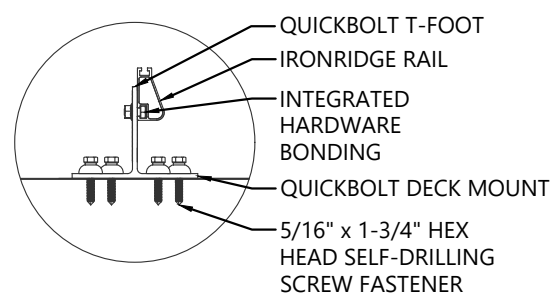
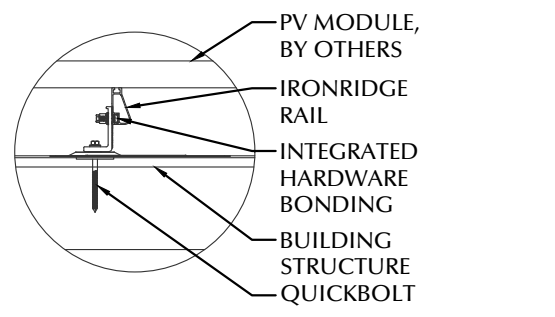
ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	QB DECK MOUNT 16317
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HEX LAG PN# 16318
MATERIAL	304 SS
SIZE	5/16" X 1-3/4"
GENERAL:	
WEIGHT	0.8819
FASTENERS PER MOUNT	4
MAX. PULL-OUT FORCE	705.0 LBS.
SAFETY FACTOR	3
DESIGN PULL-OUT FORCE	235.0 LBS.

ROOF MOUNT SUMMARY		
MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	36 IN	11 IN
WIND ZONE 2	28 IN	11 IN
WIND ZONE 3	26 IN	10 IN

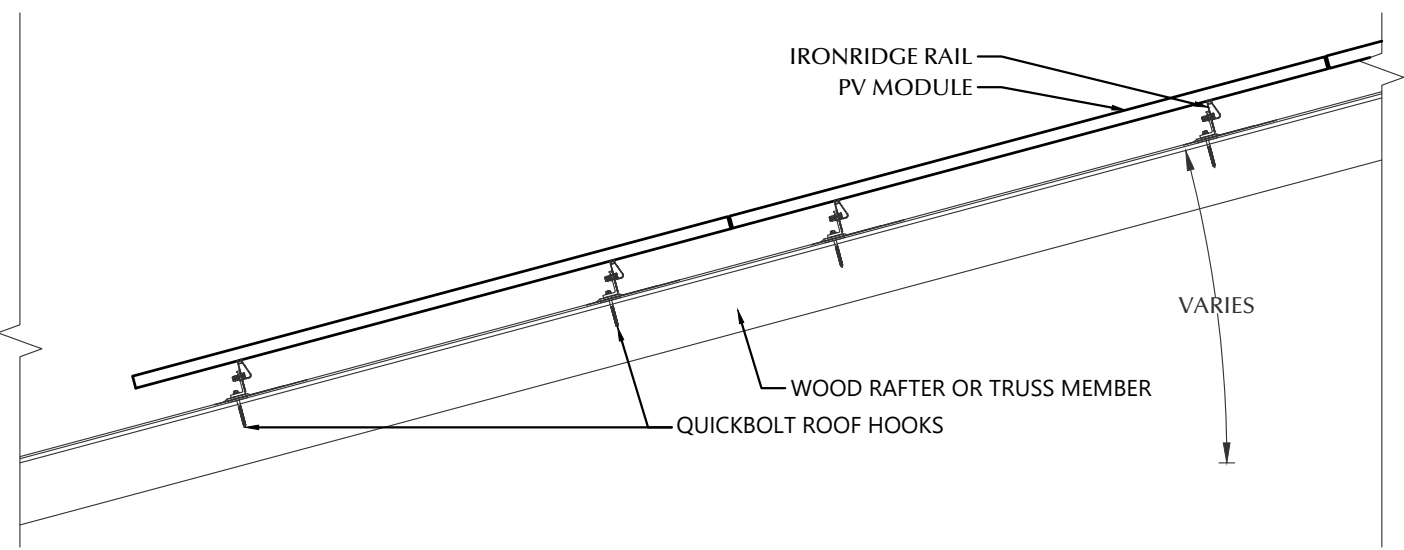
ROOF LOADING	
FASTENER LOAD:	
UPLIFT ZONE 1	-229 LBS.
UPLIFT ZONE 2	-210 LBS.
UPLIFT ZONE 3	-195 LBS.
DOWNWARD	215 LBS.



**2 ROOF C ARRAY LAYOUT**  
1/8" = 1'-0"



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NAME: ANDREW W. KING, PE

SIGNED:

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MODEL	REC400NP3 BLACK
WIDTH	40.90 IN
LENGTH	74.80 IN
THICKNESS	30 MM
WEIGHT	47.00 LBS.
ARRAY AREA	467 SQFT.
ARRAY WEIGHT	1168 LBS.

ROOF SUMMARY	
STRUCTURE:	
TYPE	TRUSSES
MATERIAL	SOUTHERN PINE #2
SIZE	2 X 4
SPACING	24 IN O.C.
ALLOWABLE SPAN	88 IN
PITCH	9/12
DENSITY	30 LBS./CU.FT.
DECKING:	
TYPE	OSB
MATERIAL	COMPOSITE
THICKNESS	7/16 IN
WEIGHT	1.60 LBS./SQFT
ROOFING:	
TYPE	ASPHALT SHINGLE
MATERIAL	ASPHALT
WEIGHT	2.30 LBS./SQFT.



**CLIENT INFO**  
 COURTNEY WHITLEY BATTEN  
 95 OLD FIELD LOOP  
 SANFORD NC 27332

**PROJECT INFO**  
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 AC EXPORT: 13.920 kW  
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**SITE CONDITIONS**  
 WIND SPEED: 116 MPH  
 RISK CATEGORY: II  
 EXPOSURE: B  
 SNOW: 10 PSF

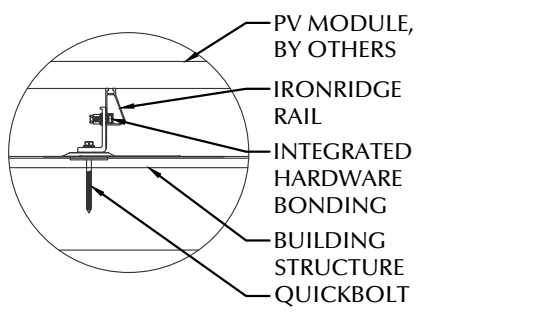
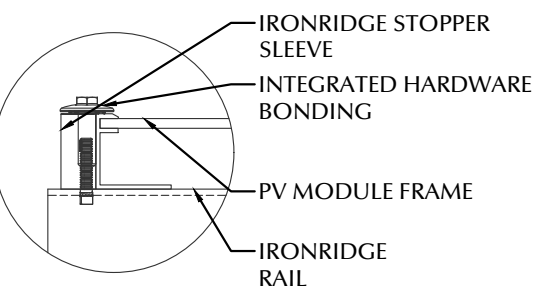
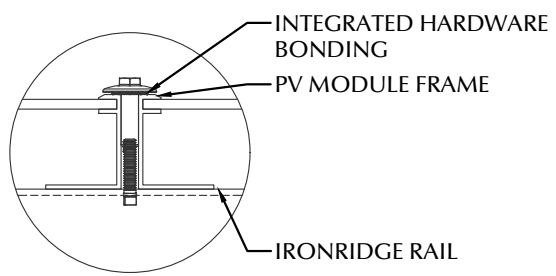
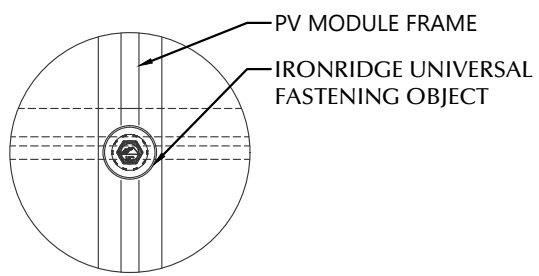
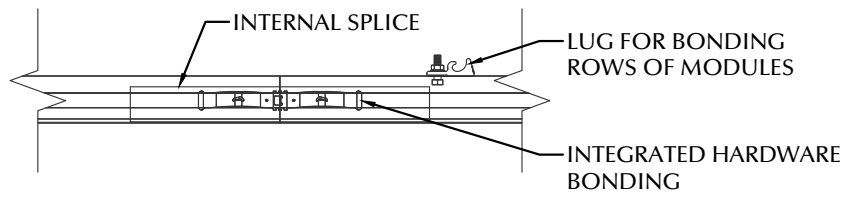
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 PV-5: PV INSTALL GUIDE

**VERSIONS**

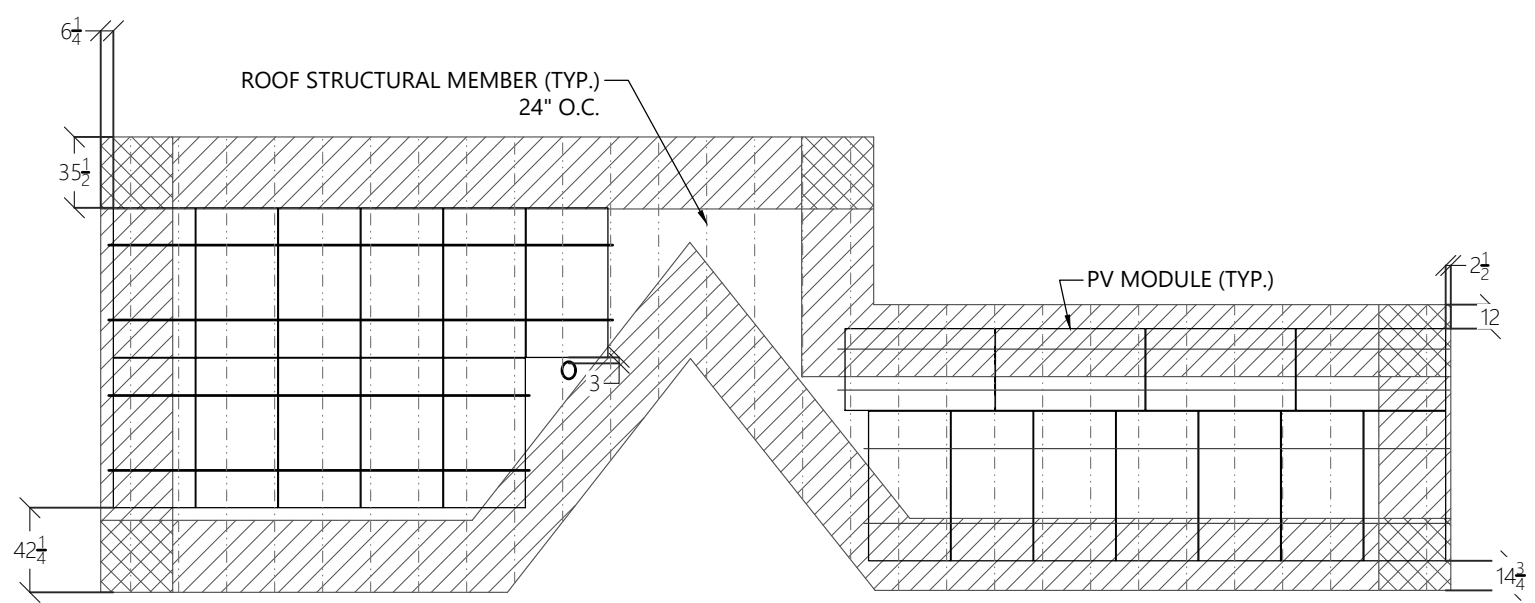
FOR:	DESIGNER	DATE
CONSTRUCTION	MCP	8/17/2023

**PV SYSTEM STRUCTURAL**

**PV-2.4**



**1 ROOF FASTENER DETAIL**  
 NOT TO SCALE



**2 ROOF D ARRAY LAYOUT**  
 1/8" = 1'-0"

ROOF MOUNT SUMMARY		
MAXIMUM (IN)	MOUNT SPACING	RAIL OVERHANG
WIND ZONE 1	PORT 72 LAND 72	19 IN
WIND ZONE 2	PORT 48 LAND 48	19 IN
WIND ZONE 3	PORT 48 LAND 48	19 IN

ROOF LOADING	
GROUND SNOW LOAD:	15 LBS./SQFT.
LIVE LOAD	20 LBS./SQFT.
DEAD LOAD	
ROOFING	3.9 LBS./SQFT.
PV ARRAY	2.5 LBS./SQFT.
TOTAL	6.4 LBS./SQFT.
WIND LOAD:	
UPLIFT ZONE 1	-24.6 LBS./SQFT.
UPLIFT ZONE 2	-29.0 LBS./SQFT.
UPLIFT ZONE 3	-29.0 LBS./SQFT.
DOWNWARD	23.0 LBS./SQFT.
FASTENER LOAD:	
UPLIFT ZONE 1	-397 LBS.
UPLIFT ZONE 2	-312 LBS.
UPLIFT ZONE 3	-312 LBS.
DOWNWARD	371 LBS.

ROOF MOUNT & FASTENER	
ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	4 IN QB1
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HANGER BOLT
MATERIAL	304 SS
SIZE	5/16-18 X 5-1/4"
GENERAL:	
WEIGHT	0.56 LBS.
FASTENERS PER MOUNT	1
MAX. PULL-OUT FORCE	960.0 LBS.
SAFETY FACTOR	2
DESIGN PULL-OUT FORCE	480.0 LBS.

MOUNTING RAILS	
MAKE	IRONRIDGE
MODEL	XR10
MATERIAL	ALUMINUM
WEIGHT	0.425 LBS/IN
SPACING	37 IN

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### CONDUCTOR SCHEDULE

TAG	CURRENT CARRYING CONDUCTORS			GROUNDING CONDUCTORS			CONDUIT/RACEWAY			NOTES
	QTY.	SIZE	INSULATION	QTY.	SIZE	INSULATION	QTY.	SIZE	LOCATION	
C1	8	12 AWG	DG CABLE	1	6 AWG	BARE	-	-	FREE AIR	1
C2	8	10 AWG	THWN-2	1	10 AWG	THWN-2	2	3/4"	EXT/INT	2,4
C3	3	4 AWG	THWN-2	1	8 AWG	THWN-2	1	1"	EXTERIOR	2,4
XC	-	-	-	-	-	-	-	-	-	3

**NOTES:**

1. MANUFACTURER PROVIDED, UL LISTED WIRING HARNESS FOR USE ON EXPOSED ROOFS
2. CONDUIT SIZE SHOWN IS CODE MINIMUM. LARGER SIZES ARE ALLOWED.
3. EXISTING CONDUCTORS, FIELD VERIFY
4. EQUIPMENT TERMINAL RATING SHALL BE A MINIMUM OF 75°C AT BOTH END OF CONDUCTOR

### PV MODULE

MAKE	REC
MODEL	REC400NP3 BLACK
NOM. POWER (PNOM)	400 WATTS
NOM. VOLT. (VMPP)	37.6 VOLTS
O.C. VOLT (VOC)	45.0 VOLTS
MAX. SYS. VOLT.	1000 VOLTS
NOM. CURR. (IMPP)	10.6 AMPS
S.C. CURR. (ISC)	11.4 AMPS
TEMP. COEF. (PMPP)	-0.34 %/C
TEMP. COEF. (Voc)	-0.26 %/C
MAX SERIES FUSE	25 AMPS
UL COMPLIANT (Y/N)	YES

### SUB PANEL (EXISTING)

MAKE	SQUARE D
MODEL	HOMC24UC
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
BUS RATING	125 AMPS
UL LIST. (Y/N)	YES
MAIN BREAKER (Y/N)	YES (NEW)
MAIN BREAKER RATING	100 AMPS

- INSTALL NEW MAIN BREAKER IN SUB PANEL

### PV COMBINER PANEL

MAKE	ENPHASE
MODEL	X2-IQ-AM1-240-4
MAX BRANCH CIRCUITS	4 TOTAL
BRANCH CIRCUIT OCPD	50 AMPS
OUTPUT:	
MAX POWER	15600 WATTS
NOM. VOLTAGE	240 VOLTS
BUS RATING	125 AMPS
MAIN BREAKER Y/N	NO
ENCL. RATING	NEMA TYPE 3R
UL LIST. (Y/N)	YES

### JUNCTION BOX

MAKE	SOLADECK
PROTECT. RATING	NEMA TYPE 3R
UL LIST. (Y/N)	YES

### METER COMBO (EXISTING)

MAKE	SQUARE D
MODEL	RC12L200C
ENCL. RATING	NEMA 3R
VOLT. RATING	240
BUS RATING	200 AMPS
UL LIST. (Y/N)	YES
MAIN BREAKER (Y/N)	NO
MAIN BREAKER RATING	N/A

- BACK-FEED SOLAR OUTPUT VIA LOAD SIDE TAP IN BETWEEN 100A BREAKER FEEDING SUB PANEL AND NEW SUB PANEL MAIN BREAKER.
- EACH BREAKER SERVES AS SERVICE DISCONNECT SWITCH

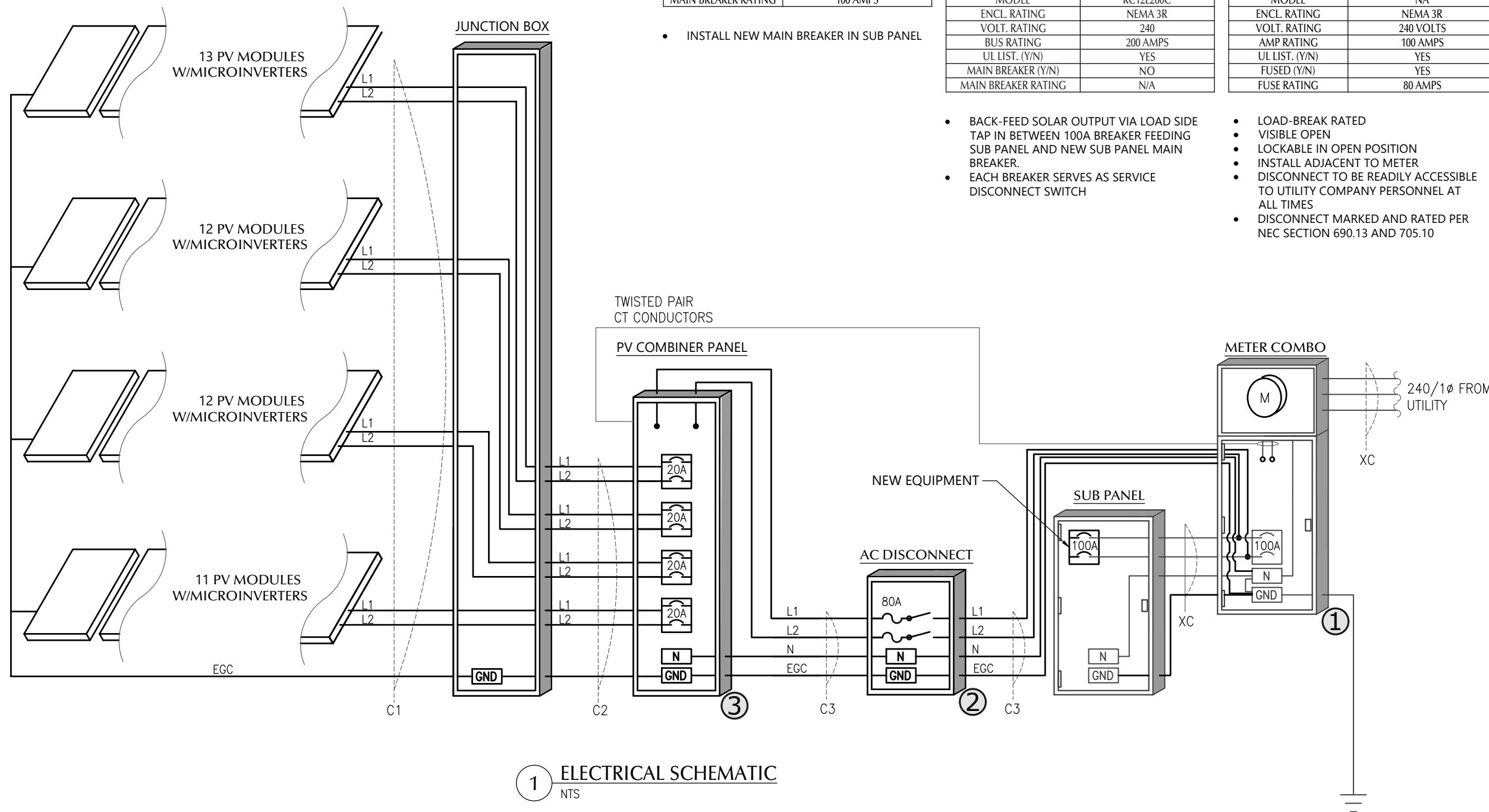
### DC / AC INVERTER

MAKE	ENPHASE
MODEL	IQ7PLUS-72-2-US
DC INPUT:	
POWER RANGE (WATTS)	235-440
MIN/MAX START VOLT.	22 / 60
OPERATING VOLT. RANGE	16-60
MAX. CURRENT	15 AMPS
MODULE COMPATIBILITY	60 & 72 CELL
AC OUTPUT:	
CEC EFFICIENCY	1 WATTS
NOM. POWER	290 WATTS
NOM. VOLT.	211-240-264
MAX. CURR.	1.21 AMPS
DC DISC. (Y/N)	NO
RAPID SHUTDOWN (Y/N)	YES
PROTECT. RATING	NEMA TYPE 6
UL LIST. (Y/N)	YES
MAX BRANCH CIRCUIT	13

### AC DISCONNECT

MAKE	GENERIC
MODEL	NA
ENCL. RATING	NEMA 3R
VOLT. RATING	240 VOLTS
AMP RATING	100 AMPS
UL LIST. (Y/N)	YES
FUSED (Y/N)	YES
FUSE RATING	80 AMPS

- LOAD-BREAK RATED
- VISIBLE OPEN
- LOCKABLE IN OPEN POSITION
- INSTALL ADJACENT TO METER
- DISCONNECT TO BE READILY ACCESSIBLE TO UTILITY COMPANY PERSONNEL AT ALL TIMES
- DISCONNECT MARKED AND RATED PER NEC SECTION 690.13 AND 705.10



1 ELECTRICAL SCHEMATIC  
NTS



**CLIENT INFO**  
COURTNEY WHITLEY BATTEN  
95 OLD FIELD LOOP  
SANFORD NC 27332

**PROJECT INFO**  
DC INPUT: 19,200 kW  
AC EXPORT: 13,920 kW  
DOI INSPT. METHOD: OPTION 2

**Model Energy**  
300 Fayetteville St.  
#1430  
Raleigh, NC 27602  
919-274-9905  
ModelEnergy.com  
P-1194



**CODE REFERENCES**  
NATION ELECTRICAL CODE v. 2017  
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**SITE CONDITIONS**  
WIND SPEED: 116 MPH  
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EXPOSURE: B  
SNOW: 10 PSF

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PV SYSTEM ELECTRICAL  
**PV-3.1**

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**⚠ WARNING**

PHOTOVOLTAIC SYSTEM  
COMBINER PANEL

DO NOT ADD LOADS

③ NEC 705.12 (C)(3)  
PLACE ON PV COMBINER PANEL

**⚠ WARNING**

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

③ NEC 705.12 (B)(2)(3)(c)  
PLACE ON PV COMBINER PANEL.

**RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**

② NEC 690.56 (C)(3)  
PLACE ON RAPID SHUTDOWN SWITCH OR EQUIPMENT WITH INTEGRATED RAPID SHUTDOWN \*REFLECTIVE\*

**PV SYSTEM DISCONNECT**

② NEC 690.13 (B)  
PLACE ON PV SYSTEM DISCONNECTING MEANS.

PHOTOVOLTAIC SYSTEM  
**AC DISCONNECT**

OPERATING VOLTAGE **240** VOLTS

OPERATING CURRENT **58.08** AMPS

② NEC 690.54  
PLACE ON INTERCONNECTION DISCONNECTING MEANS

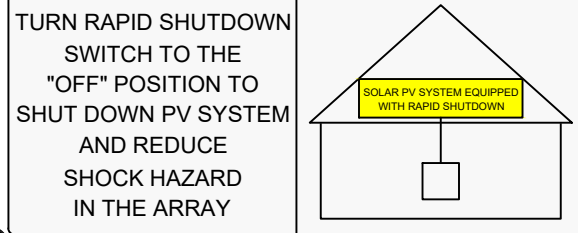
**⚠ WARNING**

DUAL POWER SUPPLY

SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

① ③ NEC 705.12 (B)(3)  
PLACE ON ALL EQUIPMENT THAT IS SUPPLIED BY BOTH POWER SOURCES

**SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN**



① NEC 690.56 (C)(1)(a)  
PLACE WITHIN 3FT OF SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED AND SHALL INDICATE THE LOCATIONS OF RAPID SHUTDOWN SWITCHES

SERVICE DISCONNECT LOCATED:  
NORTH-EAST SIDE OF HOUSE

PV DISCONNECT LOCATED:  
NORTH-EAST SIDE OF HOUSE

① ② NEC 705.10  
PLACE AT SERVICE EQUIPMENT AND PV SYSTEM DISCONNECTING MEANS. FIELD VERIFY EQUIPMENT LOCATIONS AND LABEL ACCORDINGLY.

**LABEL NOTES**

1. LABELS SHOWN ARE HALF THEIR ACTUAL REQUIRED SIZE.
2. LABEL MATERIAL SHALL BE SUITABLE FOR THE EQUIPMENT ENVIRONMENT.
3. DC CONDUIT SHALL BE MARKED WITH REQUIRED LABEL EVERY 10 FEET.
4. LABELS WILL BE APPLIED IN ACCORDANCE WITH THE NEC. SOME LABELS MAY NOT BE NECESSARY.

**DC WIRING NOTES**

1. CONDUCTORS SHALL BE COPPER, RATED AT NOT LESS THAN 600 VOLTS FOR RESIDENTIAL CONSTRUCTION AND NOT LESS THAN 1000 VOLTS FOR COMMERCIAL CONSTRUCTION.
2. MINIMUM SIZE SHALL BE #10 AWG UNLESS OTHERWISE NOTED ON THE DRAWINGS.
3. EXPOSED WIRING CONDUCTOR INSULATION SHALL BE TYPE PV WIRE, USE-2, OR RHW-2 WHERE THE OUTER LAYER OF THE INSULATION IS UV, SUNLIGHT, AND MOISTURE RESISTANT.
6. EXTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THWN-2 AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT) OR RIGID POLYVINYL CHLORIDE CONDUIT(PVC). ALTERNATIVELY, METAL CLAD CABLE(MC) CAN BE USED AS WELL WHEN RATED FOR USE IN WET LOCATIONS.
7. INTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THHN-2 AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT), FLEXIBLE METAL CONDUIT(FMC), OR METAL CLAD CABLE(MC).
6. USE SCHEDULE 40 PVC OUTDOORS WHERE NOT SUBJECT TO PHYSICAL DAMAGE OR BELOW FLOOR SLAB. USE SCHEDULE 80 PVC OUTDOORS WHERE SUBJECT TO PHYSICAL DAMMAGE
7. MINIMUM CONDUIT SIZE TO BE 1/2".
8. WIRING METHODS TO CONFORM TO ARTICLES 330, 334, 348, 350, 352, 356, AND 358 OF THE 2017 NEC.

**AC WIRING NOTES**

1. CONDUCTORS SHALL BE COPPER RATED AT NOT LESS THAN 600 VOLTS.
2. MINIMUM SIZE SHALL BE #14 AWG UNLESS OTHERWISE NOTED ON THE DRAWINGS.
3. EXTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THWN AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT), RIGID POLYVINYL CHLORIDE CONDUIT(PVC), LIQUID-TIGHT FLEXIBLE METAL CONDUIT(LFMC), OR LIQUID-TIGHT FLEXIBLE NON-METALLIC CONDUIT(LFNC) . ALTERNATIVELY, METAL CLAD CABLE(MC) CAN BE USED AS WELL WHEN RATED FOR USE IN WET LOCATIONS.
4. INTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THHN AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT), FLEXIBLE METAL CONDUIT(FMC), METAL CLAD CABLE(MC), OR ROMEX.
5. USE SCHEDULE 40 PVC OUTDOORS WHERE NOT SUBJECT TO PHYSICAL DAMAGE OR BELOW FLOOR SLAB. USE SCHEDULE 80 PVC OUTDOORS WHERE SUBJECT TO PHYSICAL DAMMAGE
6. MINIMUM CONDUIT SIZE TO BE 1/2".
7. WIRING METHODS TO CONFORM TO ARTICLES 330, 334, 348, 350, 352, 356, AND 358 OF THE 2017 NEC.

**CONSTRUCTION NOTES**

1. ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH THE NEC, STATE, AND LOCAL APPLICABLE CODES.
2. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS, BEST PRACTICES, AND SPECIFICATIONS.
3. ENSURE REQUIRED MAINTENANCE ACCESS AND CLEARANCES ARE MAINTAINED.
4. WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT CONDITIONS.
5. FUSES 0 - 600 AMPS SHALL BE UL CLASS "RK-1" LOW PEAK DUAL ELEMENT TIME DELAY WITH 200,000 AMPERE INTERRUPTING RATING AS MANUFACTURED BY BUSSMANN, UNLESS NOTED OTHERWISE.
6. ALL TERMINALS/LUGS SHALL BE 75° RATED. ALL TERMINALS, SPlicing CONNECTORS, LUGS, ETC SHALL BE IDENTIFIED FOR USE WITH THE MATERIAL (CU/AL) OF THE CONDUCTOR AND SHALL BE PROPERLY INSTALLED.
7. PROVIDE A PULLWIRE IN ALL EMPTY CONDUITS.
8. ALL PENETRATIONS THROUGH EXTERIOR ROOFS SHALL BE FLASHED IN A WATERPROOF MANNER.
9. ALL PENETRATIONS THROUGH ATTIC FIRE BARRIERS SHALL BE SEALED WITH FIRE-BARRIER SEALANT CAULK.
10. SUPPORT ALL CONDUIT AND EQUIPMENT IN ACCORDANCE W/ NEC. ANY SUSPENDED MATERIALS SHALL BE DIRECTLY SUPPORTED BY THE BUILDING STRUCTURE.
11. METAL CONDUIT COUPLINGS CAN BE COMPRESSION TYPE, THREADED, OR BE SET-SCREW TYPE. PLASTIC CONDUIT COUPLINGS TO BE SOCKET GLUED TYPE.
12. A COMPLETE GROUNDING SYSTEM SHALL BE PRESENT OR PROVIDED AND INSTALLED IN ACCORDANCE WITH ARTICLE 250 OF THE NEC, AND AS SHOWN ON THE DRAWINGS.
13. EACH ELECTRICAL APPLIANCE SHALL BE PROVIDED WITH A NAMEPLATE GIVING THE IDENTIFYING NAME AND THE RATING IN VOLTS AND AMPERES, OR VOLTS AND WATTS. IF THE APPLIANCE IS TO BE USED ON A SPECIFIC FREQUENCY OR FREQUENCIES, IT SHALL BE SO MARKED. WHERE MOTOR OVERLOAD PROTECTION EXTERNAL TO THE APPLIANCES IS REQUIRED, THE APPLIANCE SHALL BE SO MARKED.
14. WHERE APPLICABLE, GROUNDING ELECTRODE CONDUCTOR TO BE CONTINUOUS. GROUNDING CRIMPS TO BE IRREVERSIBLE.
15. PHOTOVOLTAIC SYSTEMS SHALL BE PERMANENTLY MARKED AT VARIOUS EQUIPMENT LOCATIONS TO IDENTIFY THAT A PHOTOVOLTAIC SYSTEM IS INSTALLED AND THAT VARIOUS DANGERS ARE PRESENT.
16. EACH PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS SHALL BE PERMANENTLY MARKED TO IDENTIFY IT AS A PHOTOVOLTAIC SYSTEM DISCONNECT.
17. WHERE ALL TERMINALS OF A DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A WARNING SIGN SHALL BE MOUNTED ON OR ADJACENT TO THE DISCONNECT.
18. A PERMANENT LABEL FOR THE DIRECT-CURRENT PHOTOVOLTAIC POWER SOURCE SHALL BE PROVIDED AT THE DC DISCONNECT MEANS.
19. A PERMANENT PLAQUE OR DIRECTORY, DENOTING ALL ELECTRIC POWER SOURCES SERVING THE PREMISES, SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION AND AT LOCATIONS OF ALL POWER PRODUCTION SOURCES.
20. ALL MODULE GROUND CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH NEC SECTION 690.4 (C)
21. A NORTH CAROLINA REGISTERED DESIGN PROFESSIONAL WILL BE REQUIRED TO SEAL THE STRUCTURAL DESIGN AT THE TIME OF PERMIT APPLICATION IF ANY OF THE FOLLOWING EXIST AND ARE ATTESTED TO BY THE APPLICANT:
  - I. THE WEIGHT OF THE PV SYSTEM EXCEEDS THREE (3) POUNDS PER SQUARE FOOT(PSF)
  - II. THE ROOF POSSESSES MORE THAN ONE (1) LAYER OF ASPHALT SHINGLES
  - III. THE ROOFING MATERIAL CONSISTS OF A TYPE OTHER THAN ASPHALT SHINGLES OR METAL
  - IV. THE ROOF IS LOCATED IN A 140 MPH OR GREATER WIND ZONE



**CLIENT INFO**

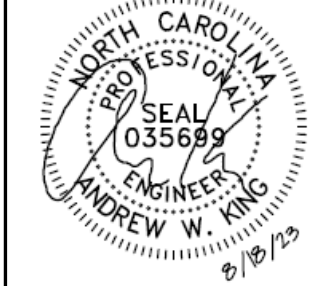
COURTNEY WHITLEY BATTEN  
95 OLD FIELD LOOP  
SANFORD NC 27332

**PROJECT INFO**

DC INPUT: 19,200 kW  
AC EXPORT: 13,920 kW  
DOI INSP. METHOD: OPTION 2

**Model Energy**

300 Fayetteville St.  
#1430  
Raleigh, NC 27602  
919-274-9905  
ModelEnergy.com



**CODE REFERENCES**

NATION ELECTRICAL CODE v. 2017  
NC FIRE PROTECTION CODE v. 2018  
NC BUILDING CODE v. 2018  
NC RESIDENTIAL CODE v. 2018  
ACSE v. 7-10

**SITE CONDITIONS**

WIND SPEED: 116 MPH  
RISK CATEGORY: II  
EXPOSURE: B  
SNOW: 10 PSF

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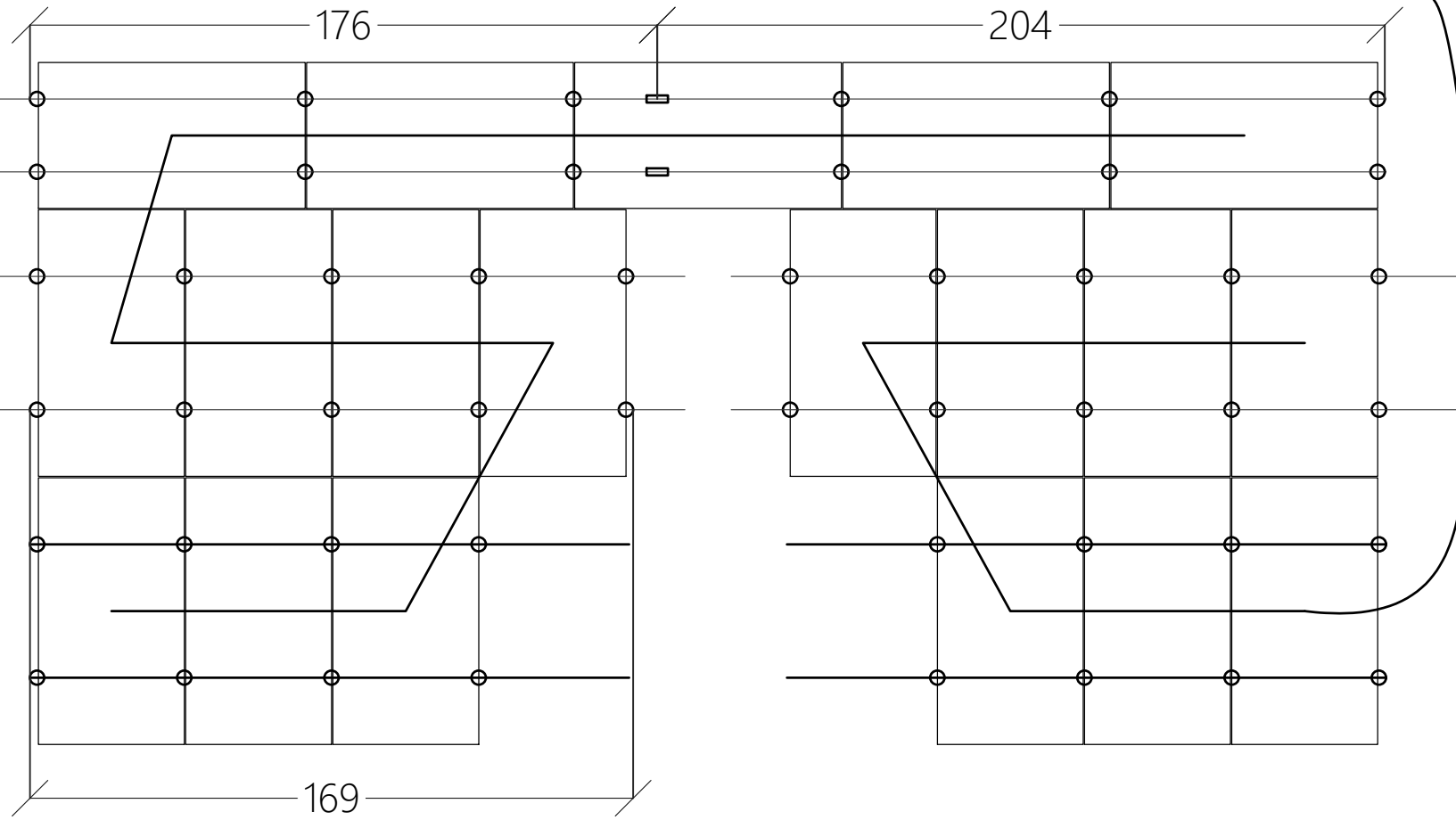
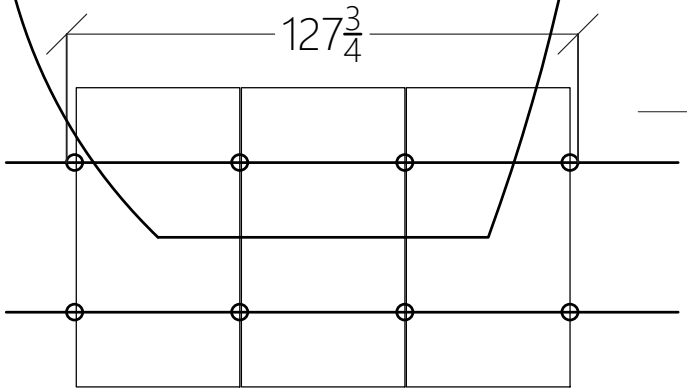
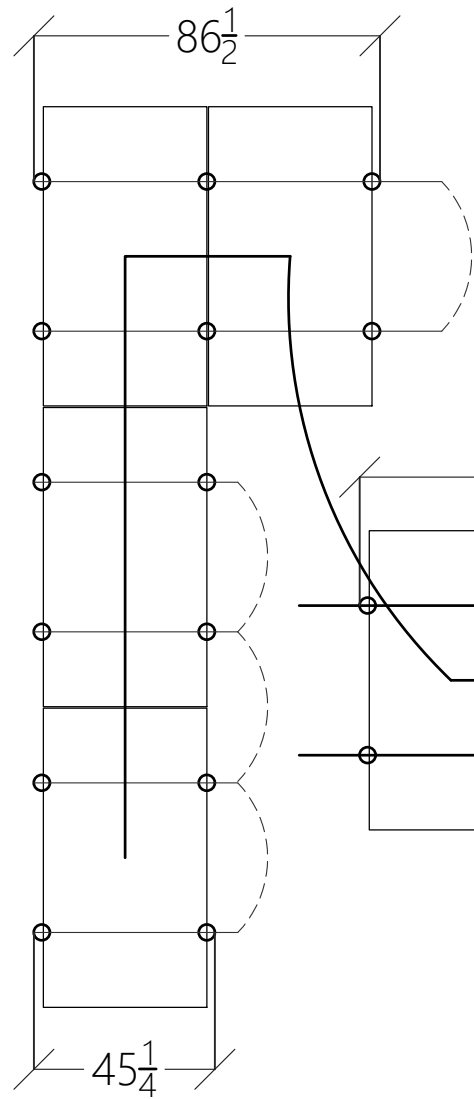
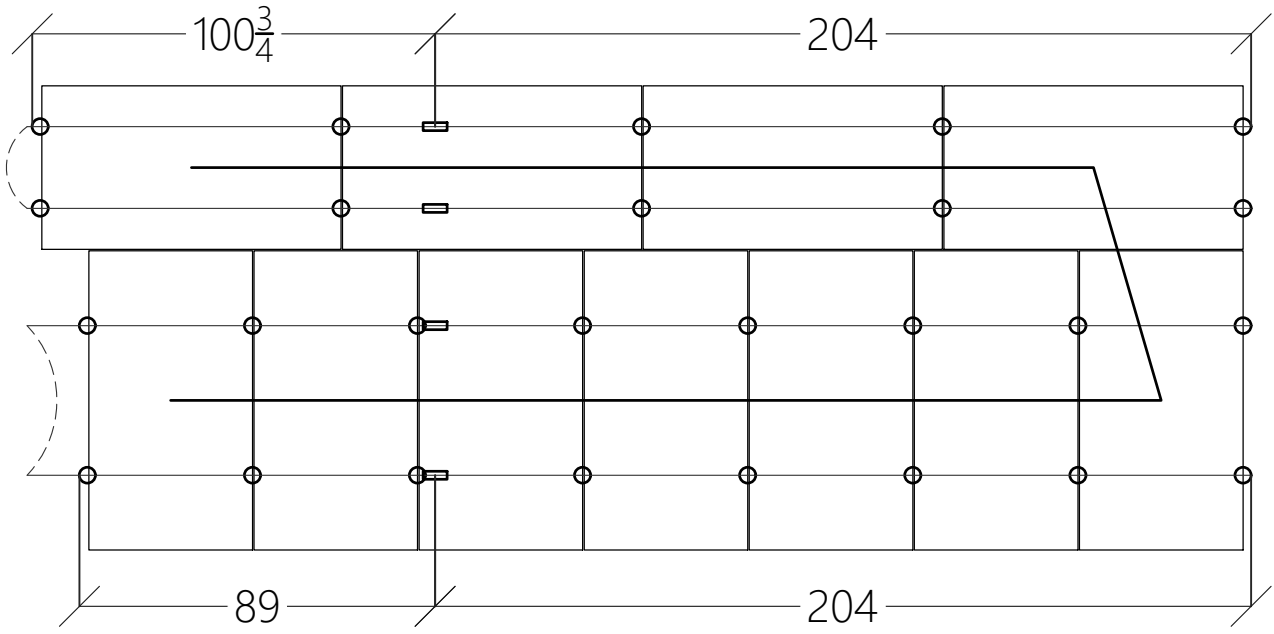
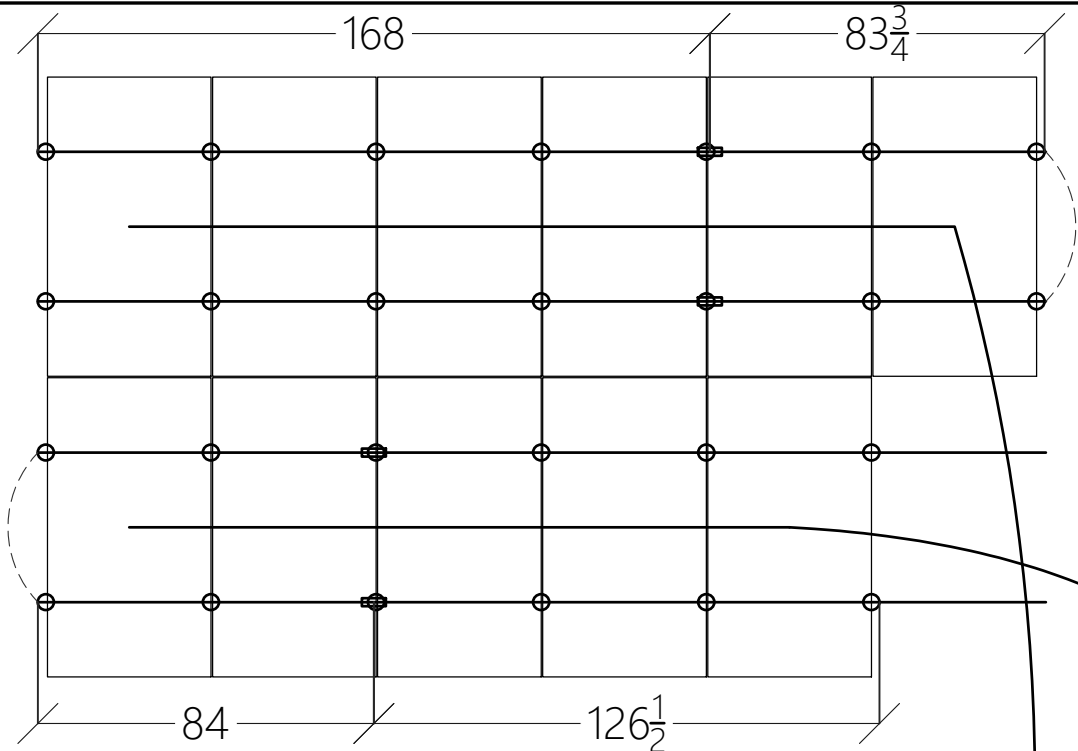
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**PV SYSTEM EQUIPMENT LABELS**

**PV-4.1**

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 ACSE v. 7-10

**SITE CONDITIONS**  
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 RISK CATEGORY: II  
 EXPOSURE: B  
 SNOW: 10 PSF

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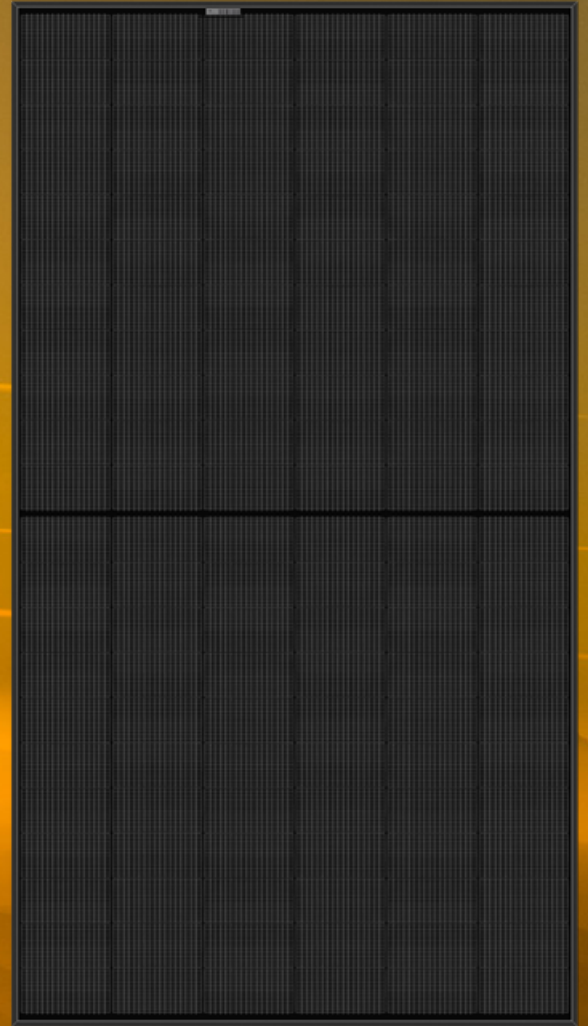
**PV SYSTEM INSTALL GUIDE**

**PV-5.1**

1 **ARRAY LAYOUT DETAIL**  
 NOT TO SCALE



SOLAR'S MOST TRUSTED



# REC ALPHOX<sup>®</sup> PURE BLACK SERIES

PRODUCT SPECIFICATIONS

405 WP  
20.3  $\frac{W}{FT^2}$



ELIGIBLE

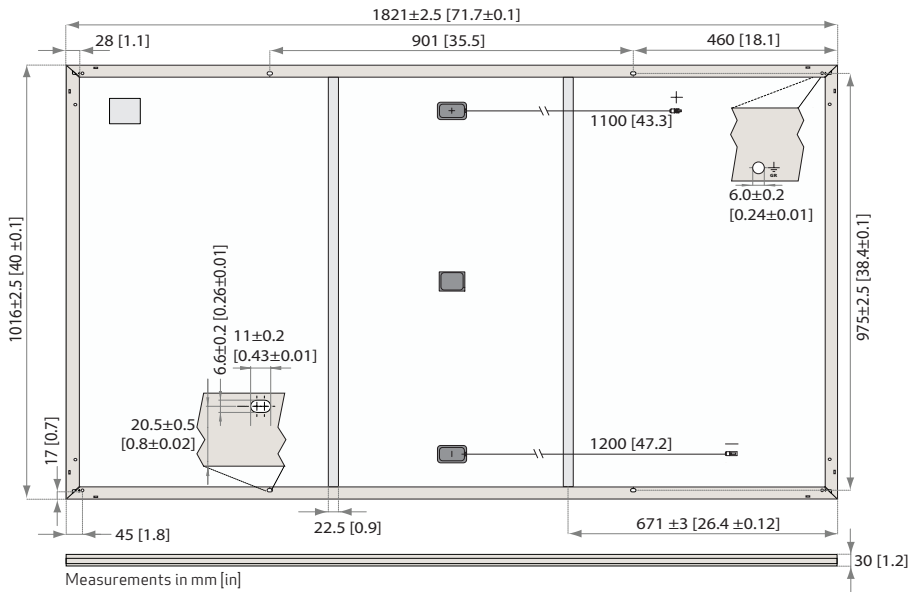


LEAD-FREE  
ROHS COMPLIANT

EXPERIENCE



PERFORMANCE



## CERTIFICATIONS

IEC 61215:2016, IEC 61730:2016, UL 61730 (Pending)  
ISO 14001:2004, ISO 9001:2015, OHSAS 18001:2007, IEC 62941



## WARRANTY

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

See warranty documents for details. Conditions apply

## MAXIMUM RATINGS

Operational temperature:	-40 ... +185°F (-40 ... +85°C)
Maximum system voltage:	1000 V
Maximum test load (front):	+7000 Pa (146 lbs/sq ft)*
Maximum test load (rear):	-4000 Pa (83.5 lbs/sq ft)*
Max series fuse rating:	25 A
Max reverse current:	25 A

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

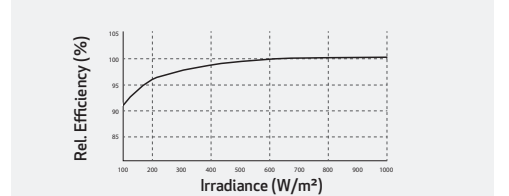
## TEMPERATURE RATINGS\*

Nominal Module Operating Temperature:	44°C (±2°C)
Temperature coefficient of P <sub>MAX</sub> :	-0.26 %/°C
Temperature coefficient of V <sub>OC</sub> :	-0.24 %/°C
Temperature coefficient of I <sub>SC</sub> :	0.04 %/°C

\*The temperature coefficients stated are linear values

## LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



## GENERAL DATA

Cell type:	132 half-cut REC heterojunction cells with lead-free, gapless technology 6 strings of 22 cells in series	Connectors:	Stäubli MC4PV-KBT4/KST4, 12AWG (4mm <sup>2</sup> ) in accordance with IEC 62852 IP68 only when connected
Glass:	0.13 in (3.2 mm) solar glass with anti-reflection surface treatment	Cable:	12AWG (4mm <sup>2</sup> ) PV wire, 43+47 in (1.1+1.2m) accordance with EN 50618
Backsheet:	Highly resistant polymer (black)	Dimensions:	71.7 x 40 x 1.2 in (1821 x 1016 x 30 mm)
Frame:	Anodized aluminum (black)	Weight:	45 lbs (20.5 kg)
Junction box:	3-part, 3 bypass diodes, IP68 rated in accordance with IEC 62790	Origin:	Made in Singapore

## ELECTRICAL DATA

### Product Code\*: RECxxxAA Pure Black

	385	390	395	400	405
Power Output - P <sub>MAX</sub> (Wp)	385	390	395	400	405
Watt Class Sorting - (W)	0/+5	0/+5	0/+5	0/+5	0/+5
Nominal Power Voltage - V <sub>MPP</sub> (V)	41.2	41.5	41.8	42.1	42.4
Nominal Power Current - I <sub>MPP</sub> (A)	9.35	9.40	9.45	9.51	9.56
Open Circuit Voltage - V <sub>OC</sub> (V)	48.5	48.6	48.7	48.8	48.9
Short Circuit Current - I <sub>SC</sub> (A)	10.10	10.15	10.20	10.25	10.30
Power Density (W/sq ft)	19.3	19.6	19.8	20.1	20.3
Panel Efficiency (%)	20.8	21.1	21.3	21.6	21.9
Power Output - P <sub>MAX</sub> (Wp)	293	297	301	305	309
Nominal Power Voltage - V <sub>MPP</sub> (V)	38.8	39.1	39.4	39.7	40.0
Nominal Power Current - I <sub>MPP</sub> (A)	7.55	7.59	7.63	7.68	7.72
Open Circuit Voltage - V <sub>OC</sub> (V)	45.7	45.8	45.9	46.0	46.1
Short Circuit Current - I <sub>SC</sub> (A)	8.16	8.20	8.24	8.28	8.32

Values at standard test conditions (STC: air mass AM1.5, irradiance 10.75 W/sq ft (1000 W/m<sup>2</sup>), temperature 77°F (25°C), based on a production spread with a tolerance of P<sub>MAX</sub>, V<sub>OC</sub> & I<sub>SC</sub> ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM1.5, irradiance 800 W/m<sup>2</sup>, temperature 68°F (20°C), windspeed 3.3 ft/s (1 m/s). \*Where xxx indicates the nominal power class (P<sub>MAX</sub>) at STC above.

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.

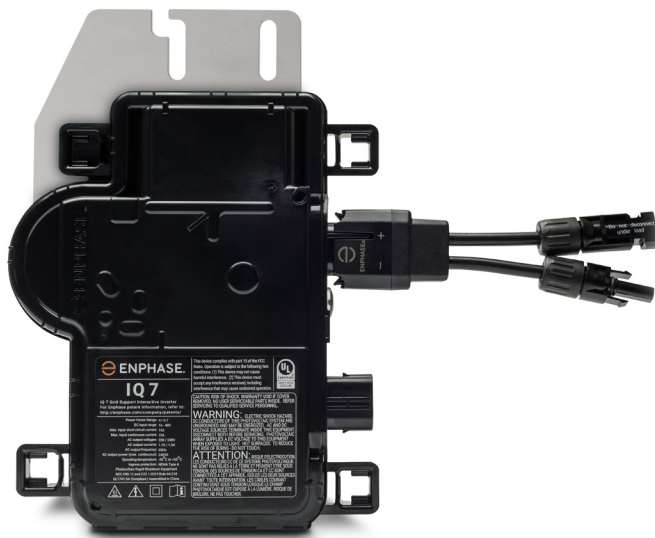


# Enphase IQ 7 and IQ 7+ Microinverters

The high-powered smart grid-ready **Enphase IQ 7 Micro™** and **Enphase IQ 7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power-on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.



## Easy to Install

- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

## Productive and Reliable

- Optimized for high powered 60-cell and 72-cell\* modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL listed

## Smart Grid Ready

- Complies with advanced grid support, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for varying grid profiles
- Meets CA Rule 21 (UL 1741-SA)

\* The IQ 7+ Micro is required to support 72-cell modules.



## Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)	IQ7-60-2-US / IQ7-60-B-US		IQ7PLUS-72-2-US / IQ7PLUS-72-B-US	
Commonly used module pairings <sup>1</sup>	235 W - 350 W +		235 W - 440 W +	
Module compatibility	60-cell PV modules only		60-cell and 72-cell PV modules	
Maximum input DC voltage	48 V		60 V	
Peak power tracking voltage	27 V - 37 V		27 V - 45 V	
Operating range	16 V - 48 V		16 V - 60 V	
Min/Max start voltage	22 V / 48 V		22 V / 60 V	
Max DC short circuit current (module I <sub>sc</sub> )	15 A		15 A	
Overvoltage class DC port	II		II	
DC port backfeed current	0 A		0 A	
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)	IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power	250 VA		295 VA	
Maximum continuous output power	240 VA		290 VA	
Nominal (L-L) voltage/range <sup>2</sup>	240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current	1.0 A (240 V)	1.15 A (208 V)	1.21 A (240 V)	1.39 A (208 V)
Nominal frequency	60 Hz		60 Hz	
Extended frequency range	47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles	5.8 Arms		5.8 Arms	
Maximum units per 20 A (L-L) branch circuit <sup>3</sup>	16 (240 VAC)	13 (208 VAC)	13 (240 VAC)	11 (208 VAC)
Overvoltage class AC port	III		III	
AC port backfeed current	0 A		0 A	
Power factor setting	1.0		1.0	
Power factor (adjustable)	0.85 leading ... 0.85 lagging		0.85 leading ... 0.85 lagging	
EFFICIENCY	@240 V	@208 V	@240 V	@208 V
Peak efficiency	97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency	97.0 %	97.0 %	97.0 %	97.0 %
MECHANICAL DATA				
Ambient temperature range	-40°C to +65°C			
Relative humidity range	4% to 100% (condensing)			
Connector type (IQ7-60-2-US & IQ7PLUS-72-2-US)	MC4 (or Amphenol H4 UTX with additional Q-DCC-5 adapter)			
Connector type (IQ7-60-B-US & IQ7PLUS-72-B-US)	Friends PV2 (MC4 intermateable). Adaptors for modules with MC4 or UTX connectors: - PV2 to MC4: order ECA-S20-S22 - PV2 to UTX: order ECA-S20-S25			
Dimensions (WxHxD)	212 mm x 175 mm x 30.2 mm (without bracket)			
Weight	1.08 kg (2.38 lbs)			
Cooling	Natural convection - No fans			
Approved for wet locations	Yes			
Pollution degree	PD3			
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure			
Environmental category / UV exposure rating	NEMA Type 6 / outdoor			
FEATURES				
Communication	Power Line Communication (PLC)			
Monitoring	Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.			
Disconnecting means	The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.			
Compliance	CA Rule 21 (UL 1741-SA) 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 and NEC-2017 section 690.12 and C22.1-2015 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according manufacturer's instructions.			

1. No enforced DC/AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>.

2. Nominal voltage range can be extended beyond nominal if required by the utility.

3. Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit [enphase.com](https://enphase.com)



# Enphase IQ Combiner 4/4C

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



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

## Smart

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

## Simple

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

## Reliable

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



To learn more about Enphase offerings, visit [enphase.com](https://enphase.com)

# Enphase IQ Combiner 4/4C

## MODEL NUMBER

IQ Combiner 4 (X-IQ-AM1-240-4)	IQ Combiner 4 with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes a silver solar shield to match the IQ Battery system and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C)	IQ Combiner 4C with Enphase IQ Gateway printed circuit board for integrated revenue grade PV production metering (ANSI C12.20 +/- 0.5%) and consumption monitoring (+/- 2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.) Includes a silver solar shield to match the IQ Battery and IQ System Controller and to deflect heat.

## ACCESSORIES AND REPLACEMENT PARTS (not included, order separately)

Ensemble Communications Kit COMMS-CELLMODEM-M1-06 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with 5-year Sprint data plan for Ensemble sites - 4G based LTE-M1 cellular modem with 5-year Sprint data plan - 4G based LTE-M1 cellular modem with 5-year AT&T data plan
Circuit Breakers BRK-10A-2-240V BRK-15A-2-240V BRK-20A-2P-240V BRK-15A-2P-240V-B BRK-20A-2P-240V-B	Supports Eaton BR210, BR215, BR220, BR230, BR240, BR250, and BR260 circuit breakers. Circuit breaker, 2 pole, 10A, Eaton BR210 Circuit breaker, 2 pole, 15A, Eaton BR215 Circuit breaker, 2 pole, 20A, Eaton BR220 Circuit breaker, 2 pole, 15A, Eaton BR215B with hold down kit support Circuit breaker, 2 pole, 20A, Eaton BR220B with hold down kit support
EPLC-01	Power line carrier (communication bridge pair), quantity - one pair
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 4/4C
XA-PLUG-120-3	Accessory receptacle for Power Line Carrier in IQ Combiner 4/4C (required for EPLC-01)
XA-ENV-PCBA-3	Replacement IQ Gateway printed circuit board (PCB) for Combiner 4/4C
X-IQ-NA-HD-125A	Hold down kit for Eaton circuit breaker with screws.

## ELECTRICAL SPECIFICATIONS

Rating	Continuous duty
System voltage	120/240 VAC, 60 Hz
Eaton BR series busbar rating	125 A
Max. continuous current rating	65 A
Max. continuous current rating (input from PV/storage)	64 A
Max. fuse/circuit rating (output)	90 A
Branch circuits (solar and/or storage)	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. total branch circuit breaker rating (input)	80A of distributed generation / 95A with IQ Gateway breaker included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway
Consumption monitoring CT (CT-200-SPLIT)	A pair of 200 A split core current transformers

## MECHANICAL DATA

Dimensions (WxHxD)	37.5 x 49.5 x 16.8 cm (14.75" x 19.5" x 6.63"). Height is 21.06" (53.5 cm) with mounting brackets.
Weight	7.5 kg (16.5 lbs)
Ambient temperature range	-40° C to +46° C (-40° to 115° F)
Cooling	Natural convection, plus heat shield
Enclosure environmental rating	Outdoor, NRTL-certified, NEMA type 3R, polycarbonate construction
Wire sizes	<ul style="list-style-type: none"><li>• 20 A to 50 A breaker inputs: 14 to 4 AWG copper conductors</li><li>• 60 A breaker branch input: 4 to 1/0 AWG copper conductors</li><li>• Main lug combined output: 10 to 2/0 AWG copper conductors</li><li>• Neutral and ground: 14 to 1/0 copper conductors</li></ul> Always follow local code requirements for conductor sizing.
Altitude	To 2000 meters (6,560 feet)

## INTERNET CONNECTION OPTIONS

Integrated Wi-Fi	802.11b/g/n
Cellular	CELLMODEM-M1-06-SP-05, CELLMODEM-M1-06-AT-05 (4G based LTE-M1 cellular modem). Note that an Enphase Mobile Connect cellular modem is required for all Ensemble installations.
Ethernet	Optional, 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included)

## COMPLIANCE

Compliance, IQ Combiner	UL 1741, CAN/CSA C22.2 No. 107.1, 47 CFR, Part 15, Class B, ICES 003 Production metering: ANSI C12.20 accuracy class 0.5 (PV production) Consumption metering: accuracy class 2.5
Compliance, IQ Gateway	UL 60601-1/CANCSA 22.2 No. 61010-1

To learn more about Enphase offerings, visit [enphase.com](https://enphase.com)



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Representative Image

## Catalog No. TG3222R

Description: 60A 2P GD N3R 240V FUSIBLE SW

UPC No 783164008500

Products > Switches & Disconnects > Disconnect & Safety Switches > Safety Switches > General Duty

- Designed for residential and light commercial applications where duty is not severe.
- Listed to UL standard 98 enclosed and dead front switches.
- Suitable for use as service equipment when installed in accordance with the National Electrical Code.
- Certified to CSA standard 22.2 no. 4-04 enclosed and dead front switches.
- Meets or exceeds NEMA KS1 standard for enclosed switches - type GD.
- Fusible and non-fusible switches available (consult BuyLog for interrupt ratings).
- Quick-make, quick-break mechanism (30-200 amp).
- 60/75°C conductor rating.

### Descriptors

Category	General Duty
----------	--------------

### Specifications

Amperage	60 A
Poles	2
Wires	3
Fusing	Fusible
Enclosure	NEMA 3R (Outdoor)
Wire Range (Cu/Al)	12-2
240 Vac, NEC Std, 1-ph	3.0 hp
240 Vac, Time Delay, 1-ph	10.0 hp
250 Vdc	10.0 hp
GSA Compliance	Yes

### Classifications

CSA Certified	Yes
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### Dimensions

Height	13.7 in
Depth	3.9 in
Width	8.4 in
Weight	11.0 lb

## Publications

Title	Publication No.	Publication Type
<a href="#">General Duty Safety Switches: 30-600 Amp, 240 Vac</a> 1 page. For residential and light commercial applications.	DEE-576	Brochures
<a href="#">60A - Safety Switches</a> 1 page outline drawing in .pdf format.	10103091-SH103	Drawings-Outline and Dimensional

**Additional Documentation:** Visit our [Publication Library](#) to find technical documentation, time current curves, CSI Specifications and promotional literature.





### Trust your system at every angle.

The IronRidge Tilt Mount System supports a wide range of solar module tilting angles, while also resisting the extreme wind and snow forces experienced over a building's lifetime.

Every component has been carefully engineered and rigorously tested, and the entire system uses only aluminum and stainless steel materials to resist corrosion.



#### Roof Friendly

Lightweight and compatible with industry-standard attachments.



#### PE Certified

Pre-stamped engineering letters available in most states.



#### Strength Tested

All components evaluated for superior structural performance.



#### Design Assistant

Online software makes it simple to create, share, and price projects.



#### UL 2703 Listed System

Meets newest effective UL 2703 standard.

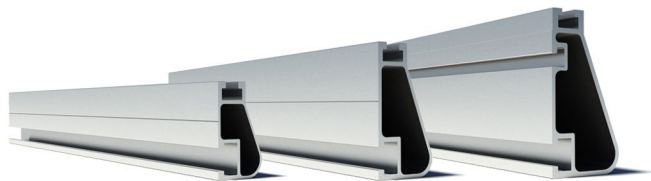


#### 25-Year Warranty

Products guaranteed to be free of impairing defects.

## XR Rails & Tilt Legs

### XR Rails



Attach directly to Tilt Legs. Available in three targeted sizes to support specific wind and snow loads.

- Unique curved profile
- Spanning capabilities up to 12'
- Clear and black finish

### Tilt Legs ☺



Tilt assembly to desired angle, up to 30 degrees. Kits include South and North Tilt Leg and all hardware.

- Available in multiple lengths for a wide angle range
- Assembled South Tilt Legs include angle indicators
- Legs are electrically bonded to rails

## Grounding Clamps

### UFOs ☺



Universal Fastening Objects secure and bond modules to rails.

- Fully assembled and lubricated
- Single, universal size
- Clear and black finish

### Stopper Sleeves ☺



Snap onto the UFO to transform into a bonded end clamp.

- Bonds modules to rails
- Sized to match modules
- Clear and black finish

### CAMO ☺



Bond modules to rails while staying completely hidden.

- Universal end-cam clamp
- Tool-less installation
- Fully assembled

## Accessories

### BOSS™ Bonded Splices ☺



Bonded Structural Splices connect and bond XR Rails together.

- Integrated bonding
- No tools or hardware
- Self-centering stop tab

### Grounding Lugs ☺



Connects Tilt Mount system to equipment ground.

- Low profile
- Single tool installation
- Mounts in any direction

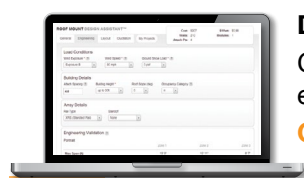
### Ends Caps & Wire Clips



Provide a finished look and organize electrical wires.

- Simple snap-in installations
- Clips hold up to ten 5mm wires
- UV-stabilized polymer

## Resources



### Design Assistant

Go from rough layout to fully engineered system. For free.

[Go to IronRidge.com/design](https://www.ironridge.com/design)



### NABCEP Certified Training

Earn free continuing education credits, while learning more about our systems.

[Go to IronRidge.com/training](https://www.ironridge.com/training)



**Installation manual for models 0799 Series and 0766-41AD**

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**2nd Edition – October 2017**

**RSTC Enterprises, Inc.  
2214 Heimstead Road  
Eau Claire, WI 54703  
866-367-7782**

**[www.soladeck.com](http://www.soladeck.com)**

## Read the entire installation manual before installing a SolaDeck

### **WARNING! STOP**

**DO NOT WORK ON ROOF IF SURFACE IS WET, FROSTED, ICE OR SNOW COVERED.  
USE LADDERS SAFELY  
USE HAND & EYE PROTECTION WHEN WORKING WITH POWER TOOLS  
USE EXTREME CAUTION TO AVOID CONTACT WITH POWER LINES. CONTACT WITH POWER LINES, ELECTRIC LIGHTS OR POWER CIRCUITS MAY BE FATAL**

Installation of this product should be attempted only by individuals skilled in the use of the tools and equipment necessary for installation. Protect you and all persons and property during installation. If you have any doubt concerning your competence or expertise, consult a qualified expert to perform the installation.

R.S.T.C. Enterprises Incorporated assumes no responsibility for the failure of an architect, contractor, installer, or building owner to comply with all applicable laws, building codes and requirements, and adequate safety precautions.



### **ATTENTION! STOP**

**NE FONCTIONNE PAS SUR LE TOIT Si la surface est mouillée, dépolie, la glace ou couvert de neige.**

**Utiliser les échelles TOUTE SÉCURITÉ**

**UTILISATION DES MAINS ET DES LUNETTES DE PROTECTION LORS DE TRAVAILLER AVEC LES OUTILS DE PUISSANCE. UTILISATION EXTRÊME PRUDENCE POUR ÉVITER LE CONTACT AVEC DES LIGNES DE PUISSANCE. CONTACT AVEC DES LIGNES DE PUISSANCE, lumières électriques circuits électriques ou PEUT ÊTRE MORTEL**

L'installation de ce produit devrait être tentée que par des personnes formées à l'utilisation des outils et équipements nécessaires pour l'installation. Protégez vous et les personnes et les biens pendant l'installation. Si vous avez un doute concernant votre compétence ou l'expertise, consulter un expert qualifié pour effectuer l'installation.

RSTC Enterprises Incorporated décline toute responsabilité de l'échec d'un architecte, entrepreneur, installateur ou propriétaire d'immeuble pour se conformer à toutes les lois, les codes du bâtiment et des exigences, et les précautions de sécurité adéquates.

### **Tools and Hardware List**

**Utility knife - 1/4" nut driver - #2 Phillips head drive bit - Pry bar – Roof sealant – Drill**

**0799 Series: (5) # 10 – 1" Phillips screws; (5) # 10 bonded seal washers; (5) 8x32-1/4" self thread hex screws**

**0766-41AD: (7) # 10 – 1" Phillips screws; (5) # 10 bonded seal washers; (5) 8x32-1/4" self thread hex screws**

## **IMPORTANT SAFETY INSTRUCTIONS**

Save this manual - It contains important instructions for models 0799 Series and 0766-41 AD that should be followed during the installation of this product.

SolaDeck products are listed by ETL to the UL standards: UL 1741; CSA C22.2 No. 290

These enclosures are rated for up to 1000 VDC 180 amp, 480 VAC 60 amp max

Grounding Instructions- The system should be connected to a grounded, permanent wiring system.

System wiring and grounding must comply with NEC Code, ANSI/NFPA 70-1996, or other appropriate codes and is the responsibility of the installer.

The equipment ground on SolaDeck is marked with the:



Note: Solar panels produce electrical current when light is present and during overcast weather. Do not wire from the array to the SolaDeck combiner. Complete all connections inside the SolaDeck combiner first and then connect the array.



# SolaDeck Installation Instructions

DO NOT PROCEED WITH INSTALLATION UNTIL YOU HAVE READ ENTIRE INSTRUCTIONS INCLUDING WARNINGS

Figure 1

- Determine the location for the SolaDeck on the roof surface.
- Use the template from the bottom of the SolaDeck carton to trace the SolaDeck on the shingles.



Figure 1

Figure 2

- Use a pry bar to loosen the shingles, then remove any nails that would interfere with the SolaDeck flashing. \*The flashing will slide beneath the shingles.
- Cut the roofing material to the shape of the template.
- Remove the knockouts needed to penetrate the roof deck.



Figure 2

Figure 3

- Slide the SolaDeck into place beneath the shingles and mark the knockout locations.
- Remove the SolaDeck and drill a hole through the roof deck 1/3 larger than the knockout holes.
- Determine the size and number of fittings or conduit needed to bring the circuit or string wiring into the SolaDeck. The corner dimples allow up to 1" fittings, the center dimples allow .5" fittings. Use a knockout tool or drill to cut the fitting holes where the base dimples are located.
- Install the fittings, reposition the SolaDeck and using the 1" truss head screws provided fasten the Soladeck to the roof deck from inside the enclosure (locations shown).
- Use roof cement to seal the shingles to the flashing & replace roof nails.

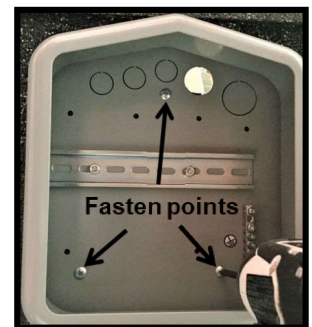


Figure 3

Figure 4

- Install components needed to connect the solar panel circuits.



Figure 4

Figure 5

- When connections are complete, finish by installing the cover using the 8/32 x 3/8" hex head screws provided.



Figure 5

Requirements: 75 C copper wire

Use only code approved, appropriately UL listed or recognized components

Ratings for 0799 model series and 0766-41AD

1000VDC / 180amps 10Ka short circuit; 480 VAC / 60 amps 10Ka Short circuit

### Typical wire size, torque loads and ratings

	1 Conductor	2 Conductors	Torque				
			Type	NM	Inch Lbs	Voltage	Current
<b>ABB ZS6 terminal block</b>	24-10 awg	24-16 awg	Sol/Str	0.5-0.7	6.2-8.85	600V	30 amp
<b>ABB ZS10 terminal block</b>	24-6 awg	20-12 awg	Sol/Str	1.0-1.6	8.85-14.16	600V	40 amp
<b>ABB ZS16 terminal block</b>	24-4 awg	20-10 awg	Sol/Str	1.6-2.4	14.6-21.24	600V	60 amp
<b>ABB ZS50 terminal block</b>	18-0 awg	18-4 awg	Sol/Str	3	26.55	1000V	140 amp
<b>ABB M6/8 terminal block</b>	22-8 awg		Sol/Str	.08-1	8.85	600V	50 amp
<b>ABB M10 terminal block</b>	35-16 awg		Sol/Str	1.2-1.4	10.62-12.39	600V	65 amp
<b>ABB DBL 80 primary</b>	4 awg		Sol/Str	1.5-2	13.5-18	1000V	80 amp
<b>ABB DBL80 secondary</b>	14-10 awg		Sol/Str	.08-1.2	7.2-10.8	1000V	80 Amp
<b>ABB BDL 125 primary</b>	8-2 awg		Sol/Str	2-3	18 - 26.5	1000 VAC	125 amp
<b>ABB BDL 125 primary</b>	8-2 awg		Sol/Str	2-3	18 - 26.5	1500VDC	125 amp
<b>Abb DBL 125 secondary</b>	14-6 awg		Sol/Str	2 - 3	18 - 26.5	1000VAC	125 amp
<b>Abb DBL 125 secondary</b>	14-6 awg		Sol/Str	2 - 3	18 - 26.5	1500VDC	125 amp
<b>Little fuse LPHV series</b>	8 - 14 awg		STR	2	17.7	1000VDC	30 amp
<b>Little fuse LPHV series</b>	10-14 awg		Sol	2	17.7	1000VDC	30 amp
<b>Little fuse LPSM CH series</b>	10 - 14 awg		Sol	2	17.7	600V	30 amp
<b>Little fuse LPSM CH series</b>	8 - 14 awg		Str	2	17.7	600V	30 amp
<b>Bussmann CHPV series</b>	14 - 10 awg		Sol/Str	2.3	20	1000VDC	30 amp
<b>Bussmann CHPV series</b>	14 - 10 awg		Sol/Str	2.3	20	600VDC	30 amp
<b>ABB Breaker SU200 m series</b>	18 - 4 awg		Sol/Str	2.8	13.3 - 39.8	480VAC	15 & 20 amp
<b>International Hydraulics 2S2/0</b>	14-10 awg		Sol/Str	4	35		
	8 awg		Sol/Str	4.5	40		
	4 awg		Sol/Str	5.1	45		
	2 awg		Sol/Str	5.7	50		
<b>Brumall 4-9,1,2,89-RS</b>	4-6 awg		Sol/Str		45	2000V	
	8 awg		Sol/Str		40		
	10 - 14 awg		Sol/Str		35		
<b>Blackburn LL414</b>	4 14 awg		Sol/Str				

## Typical SolaDeck Combiner Features

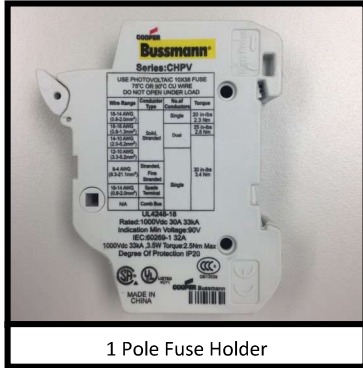
- Typical SolaDeck Combiner Features
- Stamped seamless galvanized steel or Stainless
- Powder coated surfaces (1,100 salt spray hours)
- Models available grey, black or stainless steel
- Flashes into the roof deck
- Two, five or single position ground lug
- 8" din rail installed
- 5 Roof deck knockouts (3) @ .5", (1) @ .75", (1) @ 1"
- 5 dimples for gland fitting or conduit entry
- Mounting hardware included

## 0799 Series SolaDecks

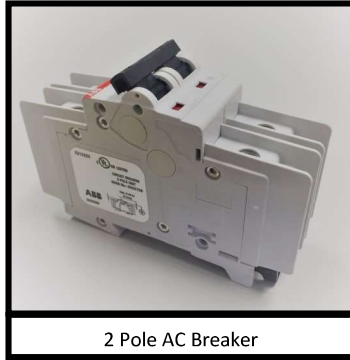




# Common Component & Kit Examples



1 Pole Fuse Holder



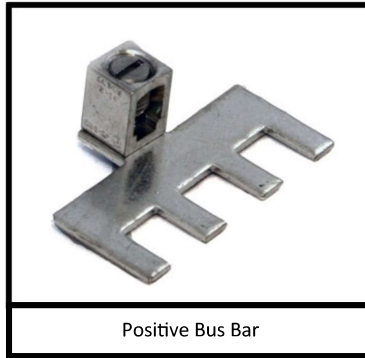
2 Pole AC Breaker



Power Distribution Block



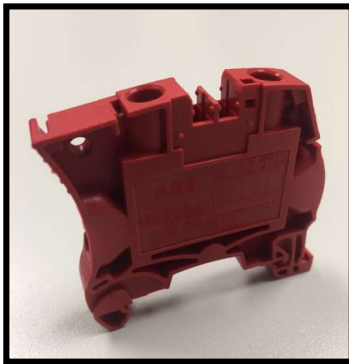
3/4" Fitting



Positive Bus Bar

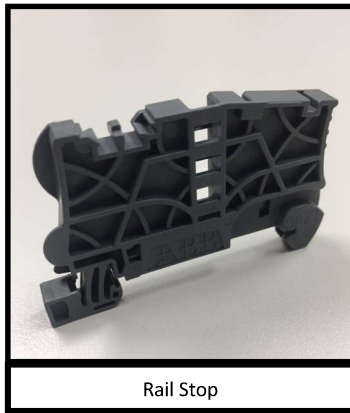


Midget Fuse



Terminal blocks, available in red, grey or black;

4mm, 8mm, 10mm



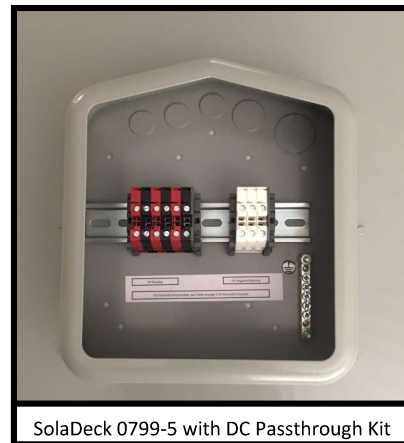
Rail Stop



End Plate



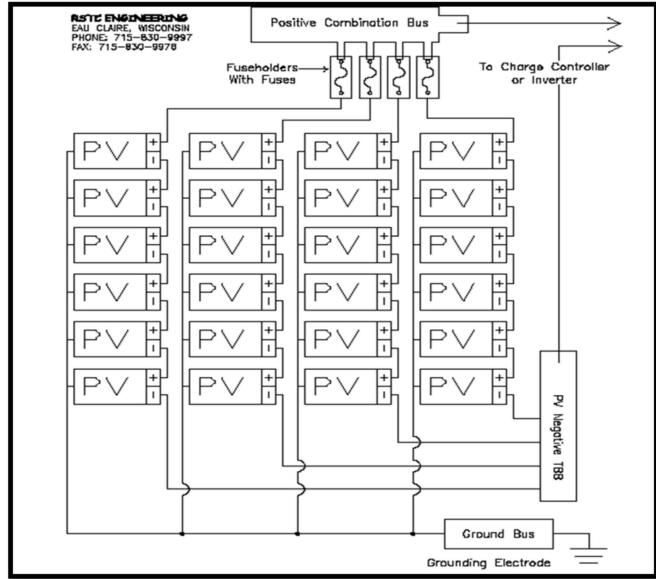
SolaDeck 0799-2 with DC Combiner Kit



SolaDeck 0799-5 with DC Passthrough Kit

\*SolaDeck enclosures include din rail and ground blocks. All other internal parts are sold separately.

Typical DC Wiring Schematic



## Warranty Information

Warranty repairs must conform to warranty terms.

As with all manufactured devices, replacement may be needed due to damage, unauthorized use, or defect.

Equipment must be installed according to the instructions and manuals provided.

Products returned must be packaged, properly addressed and shipped prepaid.

There is no additional allowance or reimbursement for installer or user for labor or travel time required to disconnect, service or reinstall the damaged component (s).

RSTC will ship a replacement product prepaid to addresses in the continental United States.

In the event of a product malfunction, RSTC will not bear any responsibility for resulting losses, expenses or damage to other components.

## One Year Limited Warranty

**Important:** Evidence of original purchase is required for warranty service.

**WARRANTOR:** RSTC Enterprises Incorporated

**ELEMENTS OF WARRANTY:** RSTC warrants for one year to the original retail owner, this product is free from defects in materials and craftsmanship with only the limitations or exclusions set out below.

**WHAT IS NOT COVERED:** This warranty covers only defects in materials and workmanship provided by RSTC Enterprises, and does not cover equipment damage or malfunction from misuse, abuse, accident, and act of God. Installation must be in accordance with our written instructions. RSTC Enterprises will not be liable for any installation charges associated with replacement incidental or consequential damages resulting from your use of or inability to use the product.

**REMEDY:** Your only remedy under this warranty is the exchange or replacement in the event that the product does not conform to this warranty. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

**CLAIMS PROCESS:** To make a claim under this warranty, the product should be shipped postage paid, with original purchase receipt to:

**RSTC ENTERPRISES**  
2214 HEIMSTEAD ROAD  
EAU CLAIRE, WI 54703  
1-866-367-7782 or [www.soladeck.com](http://www.soladeck.com)