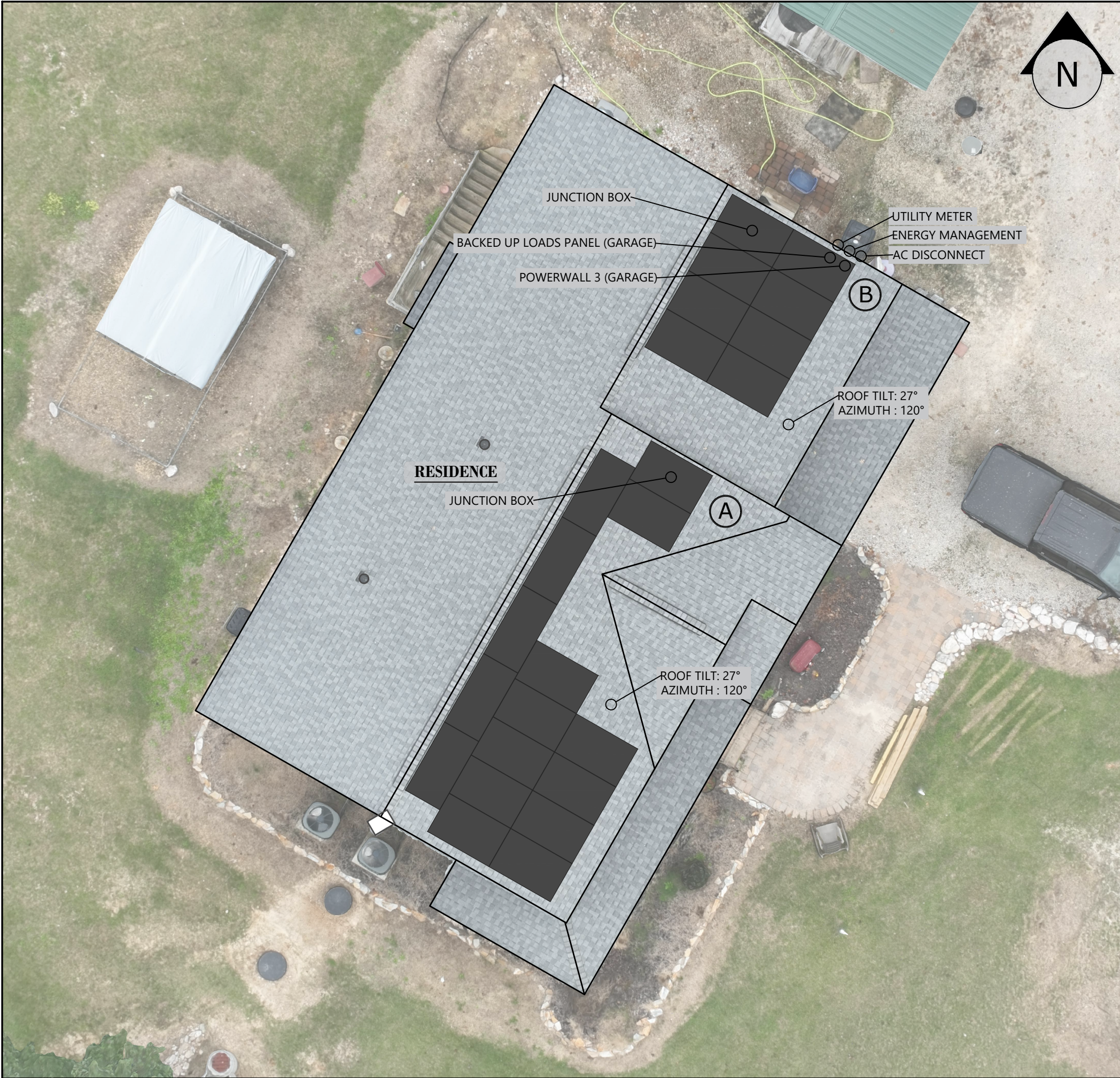


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PV MATERIAL SUMMARY: DISTRIBUTOR

|                        |    |
|------------------------|----|
| REC420AA PURE 2        | 24 |
| MCI-2                  | 9  |
| Tesla PW3 1707000-xx-y | 1  |
| Tesla GW3 1841000-01-y | 1  |
| XR-10-168B             | 3  |
| XR-10-204B             | 11 |
| XR10-BOSS-01-M1        | 4  |
| UFO-CL-01-B1           | 36 |
| UFO-END-01-B1          | 24 |
| XR-LUG-03-A1           | 7  |
| 4 IN QB1               | 54 |
| GC66803 Geocel Sealant | 4  |
| SOLADECK 0799-5B       | 2  |



**CLIENT INFO**  
 RACHEL MARIE GOOSSEN  
 249 MERCY LN  
 BROADWAY NC 27505

**PROJECT INFO**  
 DC INPUT: 10.080 kW  
 AC OUTPUT: 11.500 kW  
 DOI INSPT. METHOD: OPTION 2

**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

10/17/2024

**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: 120 MPH  
 RISK CATEGORY: II  
 EXPOSURE: B  
 SNOW: 15 PSF

**SHEET INDEX**  
 PV-1: COVER SHEET  
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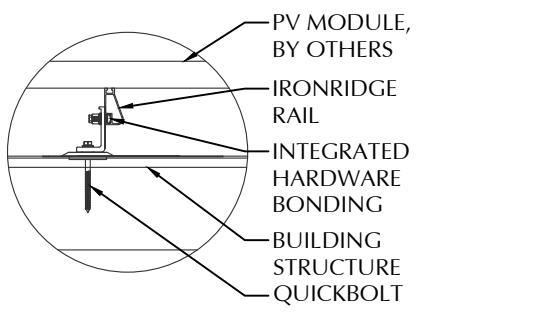
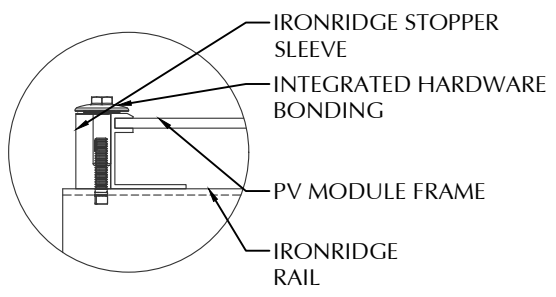
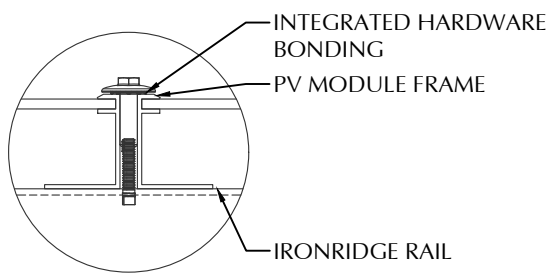
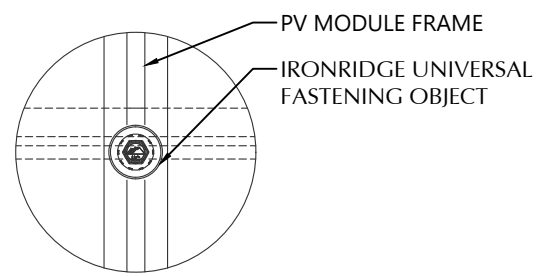
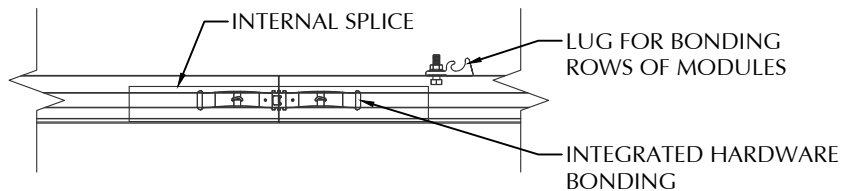
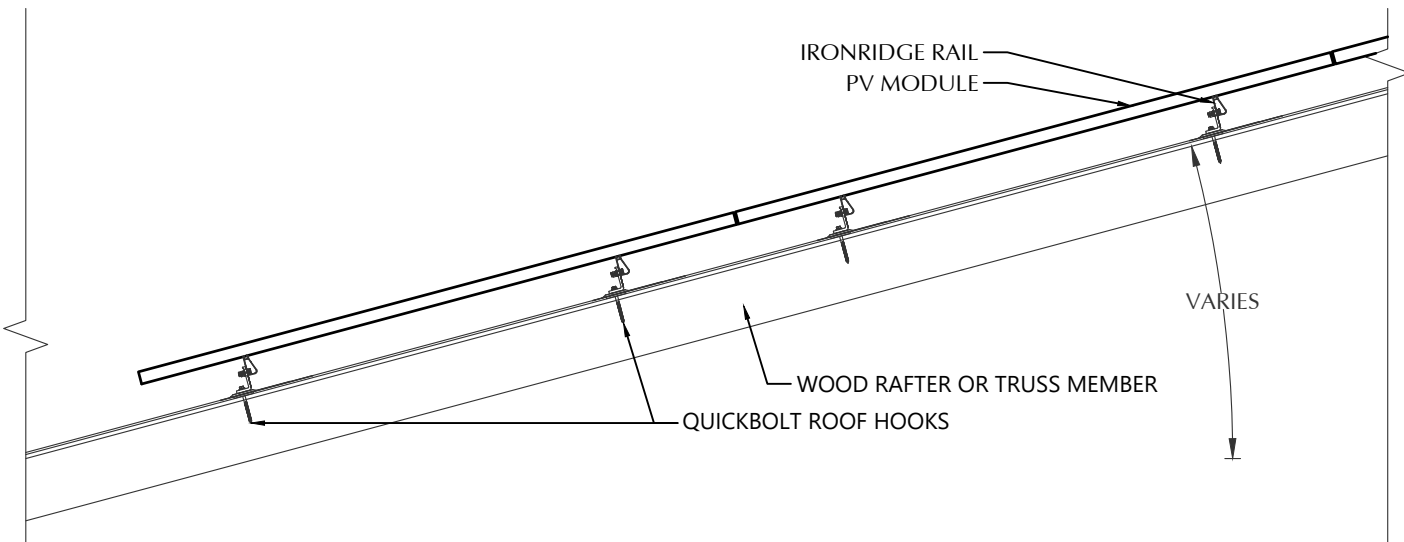
**VERSIONS**

| FOR:         | DESIGNER | DATE      |
|--------------|----------|-----------|
| CONSTRUCTION | MCP      | 10/9/2024 |

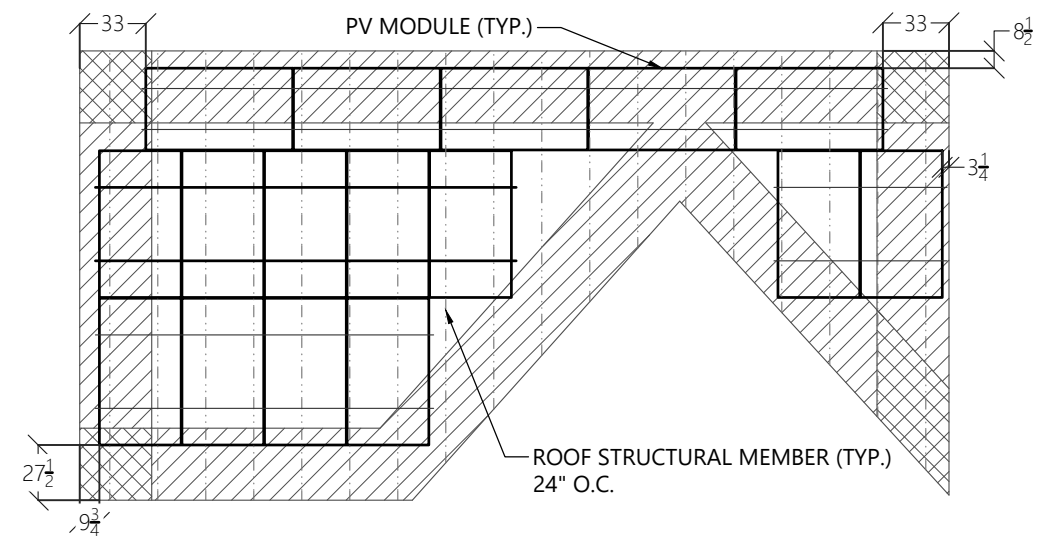
PV SYSTEM COVER PAGE

**PV-1.1**

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**1** ROOF FASTENER DETAIL  
NOT TO SCALE



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

**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        | REC420AA PURE 2 |
| WIDTH        | 40.90 IN        |
| LENGTH       | 73.40 IN        |
| THICKNESS    | 30 MM           |
| WEIGHT       | 47.60 LBS.      |
| ARRAY AREA   | 334 SQFT.       |
| ARRAY WEIGHT | 834 LBS.        |

| ROOF SUMMARY   |                  |
|----------------|------------------|
| STRUCTURE:     |                  |
| TYPE           | TRUSSES          |
| MATERIAL       | SOUTHERN PINE #2 |
| SIZE           | 2 X 4            |
| SPACING        | 24 IN O.C.       |
| ALLOWABLE SPAN | 88 IN            |
| PITCH          | 6/12             |
| 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        | PORT 72 LAND 72 | PORT 24 IN LAND 24 IN |
| WIND ZONE 2        | PORT 48 LAND 48 | PORT 23 IN LAND 24 IN |
| WIND ZONE 3        | PORT 48 LAND 48 | PORT 20 IN LAND 22 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     | PORT -448 LAND -251 |
| UPLIFT ZONE 2     | PORT -352 LAND -197 |
| UPLIFT ZONE 3     | PORT -352 LAND -197 |
| DOWNWARD          | PORT 419 LAND 234   |

| 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        |



**CLIENT INFO**  
 RACHEL MARIE GOOSSEN  
 249 MERCY LN  
 BROADWAY NC 27505

**PROJECT INFO**  
 DC INPUT: 10.080 kW  
 AC OUTPUT: 11.500 kW  
 DOI INSPT. METHOD: OPTION 2

**Model Energy**  
 300 Fayetteville St.  
 #1430  
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 ModelEnergy.com  
 P-1194



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**SITE CONDITIONS**  
 WIND SPEED: 120 MPH  
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 EXPOSURE: B  
 SNOW: 15 PSF

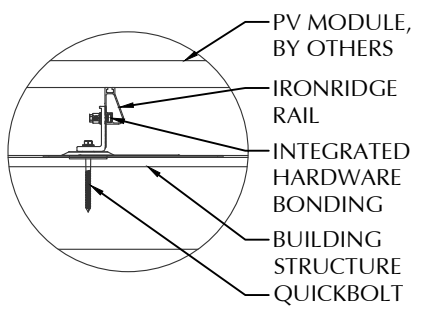
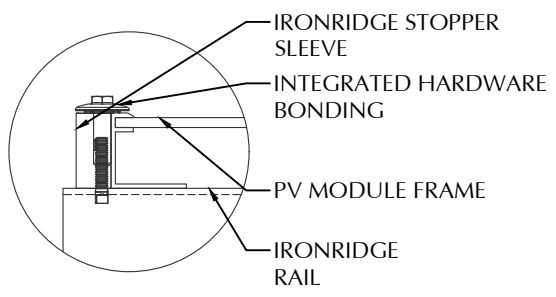
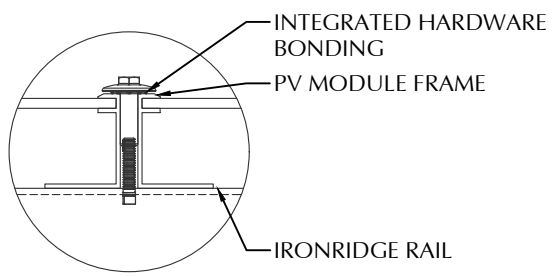
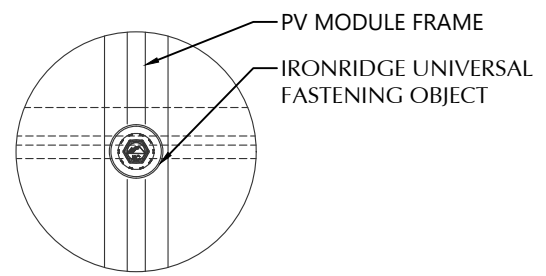
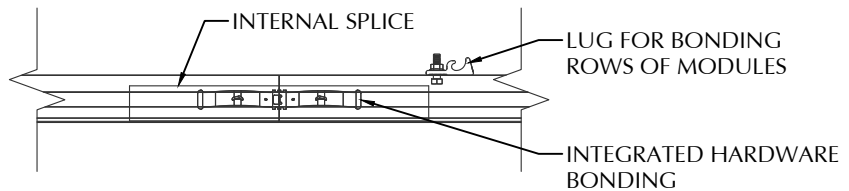
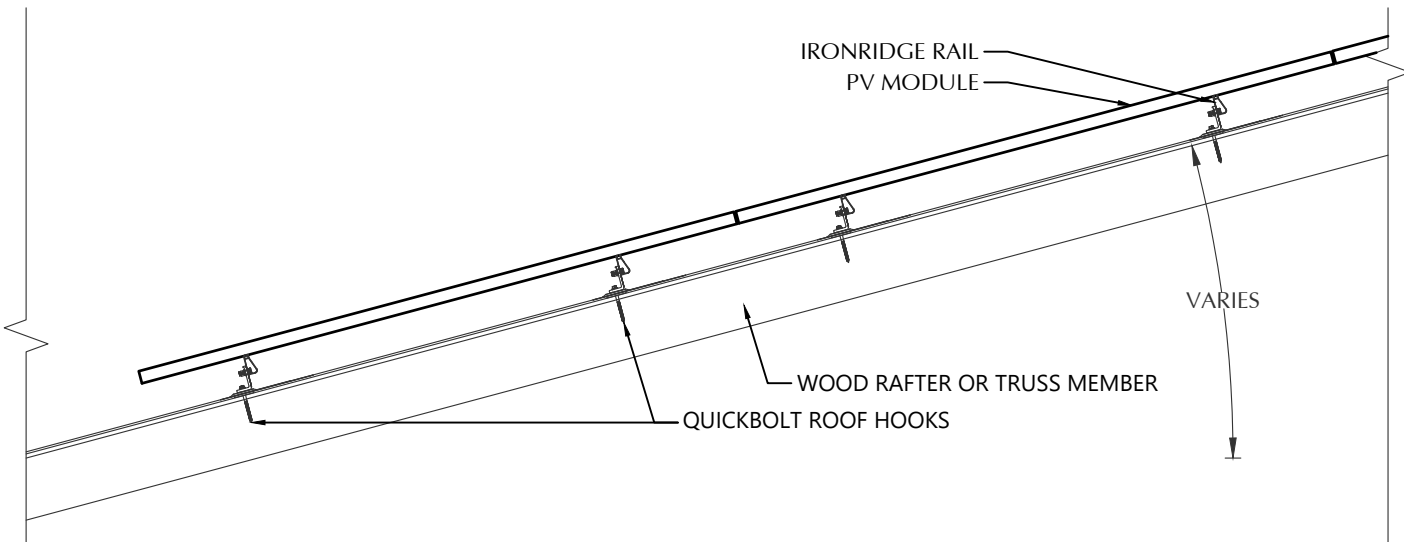
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| VERSIONS     |          |           |
|--------------|----------|-----------|
| FOR:         | DESIGNER | DATE      |
| CONSTRUCTION | MCP      | 10/9/2024 |

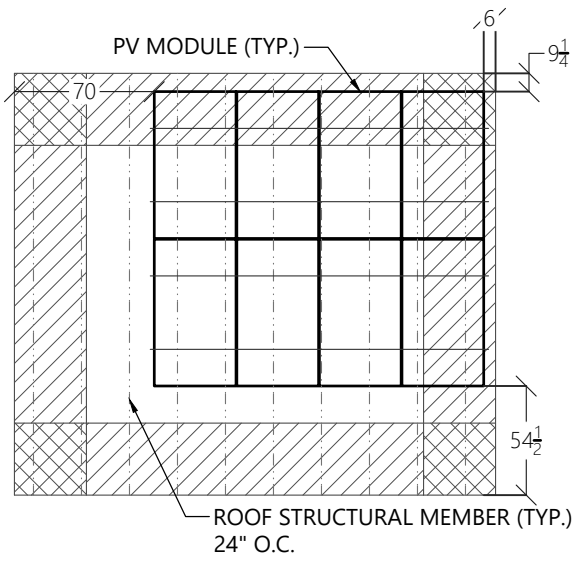
**PV SYSTEM STRUCTURAL**

**PV-2.1**

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**1** ROOF FASTENER DETAIL  
NOT TO SCALE



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

**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: *[Signature]*

| PV MODULES   |                 |
|--------------|-----------------|
| MAKE         | REC             |
| MODEL        | REC420AA PURE 2 |
| WIDTH        | 40.90 IN        |
| LENGTH       | 73.40 IN        |
| THICKNESS    | 30 MM           |
| WEIGHT       | 47.60 LBS.      |
| ARRAY AREA   | 167 SQFT.       |
| ARRAY WEIGHT | 417 LBS.        |

| ROOF SUMMARY   |                  |
|----------------|------------------|
| STRUCTURE:     |                  |
| TYPE           | TRUSSES          |
| MATERIAL       | SOUTHERN PINE #2 |
| SIZE           | 2 X 4            |
| SPACING        | 24 IN O.C.       |
| ALLOWABLE SPAN | 88 IN            |
| PITCH          | 6/12             |
| 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        | 72 IN         | 24 IN         |
| WIND ZONE 2        | 48 IN         | 23 IN         |
| WIND ZONE 3        | 48 IN         | 20 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     | -448 LBS.        |
| UPLIFT ZONE 2     | -352 LBS.        |
| UPLIFT ZONE 3     | -352 LBS.        |
| DOWNWARD          | 419 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        |



**CLIENT INFO**  
RACHEL MARIE GOOSSEN  
249 MERCY LN  
BROADWAY NC 27505

**PROJECT INFO**  
DC INPUT: 10.080 kW  
AC OUTPUT: 11.500 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: 120 MPH  
RISK CATEGORY: II  
EXPOSURE: B  
SNOW: 15 PSF

**SHEET INDEX**  
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| VERSIONS     |          |           |
|--------------|----------|-----------|
| FOR:         | DESIGNER | DATE      |
| CONSTRUCTION | MCP      | 10/9/2024 |

**PV SYSTEM STRUCTURAL**

**PV-2.2**

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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  | 6                           | 10 AWG           | PV WIRE    | 1                    | 6 AWG  | BARE       | -               | -    | FREE AIR | 1     |
| C2  | 6                           | 10 AWG           | THWN-2     | 1                    | 10 AWG | THWN-2     | 1               | 3/4" | EXT/INT  | 2,4   |
| C3  | 3                           | 6 AWG            | THWN-2     | 1                    | 10 AWG | THWN-2     | 1               | 1"   | EXTERIOR | 2,4   |
| C4  | 3                           | 4/0 AWG ALUMINUM | XHHW       | 1                    | 6 AWG  | THWN-2     | 1               | 2"   | EXT/INT  | 2,4   |
| C5  | 3                           | 4/0 AWG ALUMINUM | XHHW       | -                    | -      | -          | 1               | 2"   | EXTERIOR | 2,4   |
| XC  | -                           | -                | -          | -                    | -      | -          | -               | -    | -        | 3     |

**NOTES:**

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

### ENERGY MANAGEMENT

| MAKE                | TESLA            |
|---------------------|------------------|
| MODEL               | BACKUP GATEWAY 3 |
| ENCL. RATING        | NEMA 3R          |
| VOLT. RATING        | 240 VOLTS        |
| DISCONNECT CURR.    | 200 AMPS         |
| UL LIST. (Y/N)      | YES              |
| MAIN BREAKER (Y/N)  | YES              |
| MAIN BREAKER RATING | 200 AMPS         |

- TROUGH MAY BE USED IF NECESSARY
- INSTALL 200A MAIN BREAKER THAT WILL SERVE AS THE NEW SERVICE DISCONNECT SWITCH
- INSTALL BONDING JUMPER FROM NEUTRAL TO GROUND
- FEED BACKED-UP LOADS PANEL VIA BACKUP LUGS
- LAND POWERWALL 3 ON 60A BREAKER IN EXISTING GATEWAY INTERNAL PANELBOARD

### PV MODULE

| MAKE               | REC             |
|--------------------|-----------------|
| MODEL              | REC420AA PURE 2 |
| NOM. POWER (PNOM)  | 420 WATTS       |
| NOM. VOLT. (VMPP)  | 42.2 VOLTS      |
| O.C. VOLT (VOC)    | 49.1 VOLTS      |
| MAX. SYS. VOLT.    | 1000 VOLTS      |
| NOM. CURR. (IMPP)  | 10.0 AMPS       |
| S.C. CURR. (ISC)   | 10.7 AMPS       |
| TEMP. COEF. (PMPP) | -0.24 %/C       |
| TEMP. COEF. (Voc)  | -0.24 %/C       |
| MAX SERIES FUSE    | 25 AMPS         |
| UL COMPLIANT (Y/N) | YES             |

### MAX. DC VOLTAGE CALCULATION

$$V_{ocMAX} = V_{oc} * (1 + (T_{MIN} - T_{STC}) * (VTC / 100))$$

|                    |       |
|--------------------|-------|
| $V_{ocMAX}$        | 53.47 |
| MAX STRING VOLTAGE | 481.2 |

### MAX. DC CURRENT CALCULATION

$$I_{scMAX} = I_{sc} * TCX$$

|                    |       |
|--------------------|-------|
| $I_{scMAX}$ (AMPS) | 13.38 |
|--------------------|-------|

### MID-CIRCUIT INTERRUPTER

| MAKE                   | TESLA          |
|------------------------|----------------|
| MODEL                  | MCI-2          |
| ENCL. RATING           | NEMA 4X / IP65 |
| DC INPUT:              |                |
| CONNECTOR TYPE         | MC4            |
| MAX IN-LINE PV MODULES | 3              |
| MAX MCI PER STRING     | 5              |
| MAX. SYSTEM VOLTAGE    | 1000 VOLTS     |
| NOM. CURRENT (Imp)     | 13.00 AMPS     |
| MAX. CURRENT (Isc)     | 17.00 AMPS     |
| RSD COMPLIANT (Y/N)    | YES            |
| UL COMPLIANT (Y/N)     | YES            |

### JUNCTION BOX

| MAKE            | SOLADECK     |
|-----------------|--------------|
| MODEL           | 0799-5B      |
| PROTECT. RATING | NEMA TYPE 3R |
| UL LIST. (Y/N)  | YES          |

### EX. BACKED-UP LOADS PANEL

| MAKE                | SQUARE D    |
|---------------------|-------------|
| MODEL               | QOC40UF     |
| ENCL. RATING        | NEMA TYPE 1 |
| VOLT. RATING        | 240         |
| BUS RATING          | 200 AMPS    |
| UL LIST. (Y/N)      | YES         |
| MAIN BREAKER (Y/N)  | YES         |
| MAIN BREAKER RATING | 200 AMPS    |

- RE-FEED BACKED-UP LOADS PANEL VIA GATEWAY OUTPUTS
- REMOVE N/G BOND IN BACKED-UP LOADS PANEL ONLY

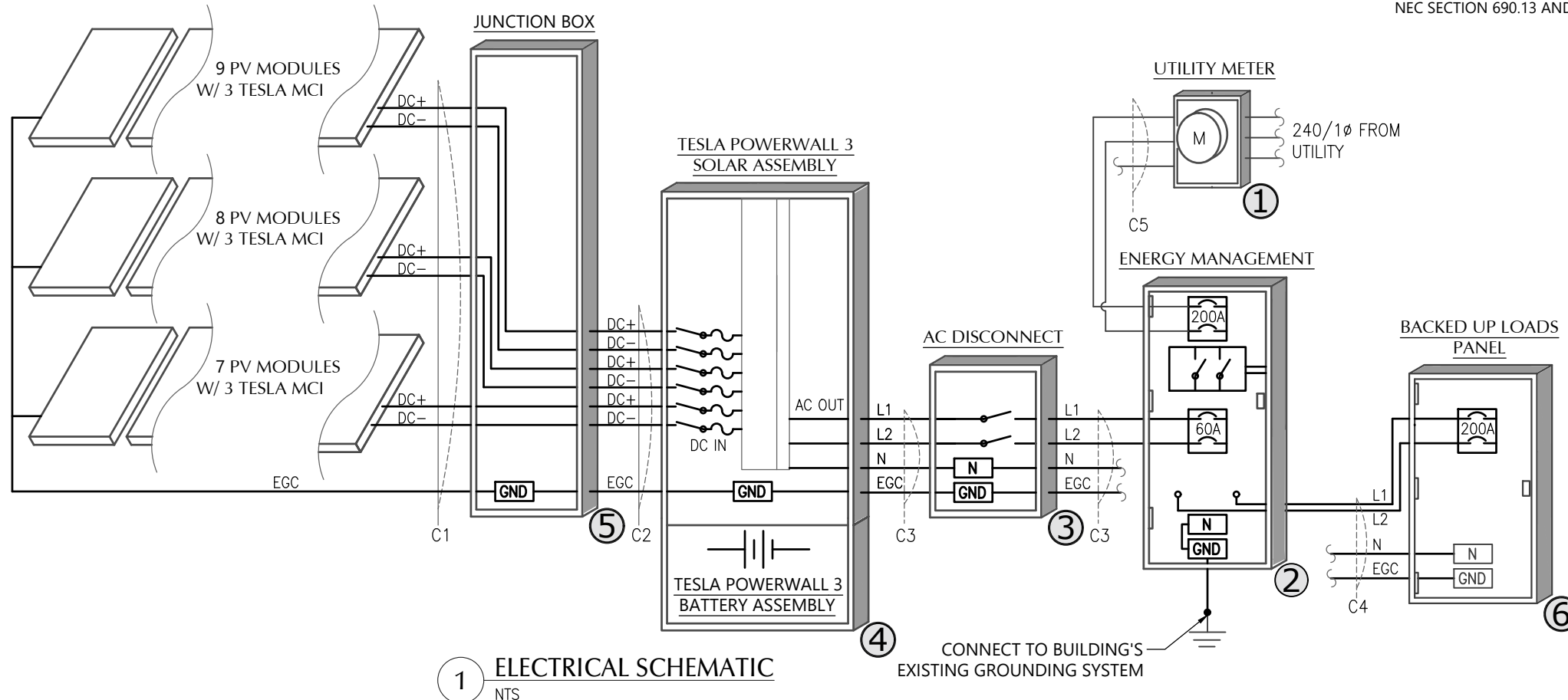
### DC/AC INVERTER & BATTERY

| MAKE                 | TESLA POWERWALL 3 |
|----------------------|-------------------|
| MODEL                | 1707000-XX-Y      |
| INVERTER INFO:       |                   |
| DC INPUT:            |                   |
| MAX POWER            | 20000 WATTS       |
| INPUT VOLT. RANGE    | 60-550 VOLTS      |
| MPPT VOLT. RANGE     | 60-480 VOLTS      |
| MAX. MPPT CUR.       | 13 AMPS           |
| STRING INPUTS        | 6 MPPTs           |
| AC OUTPUT:           |                   |
| MAX. CONT. POWER     | 11500 WATTS       |
| NOM. VOLT.           | 240 VOLTS         |
| MAX. CONT. CURRENT   | 48.00 AMPS        |
| RAPID SHUTDOWN (Y/N) | YES               |
| PROTECT. RATING      | NEMA TYPE 3R      |
| BATTERY INFO:        |                   |
| USABLE ENERGY        | 13.5 kWh          |
| NOM. VOLT.           | 240 VOLTS         |
| MAX. CONT. CHARGE    | 5000 WATTS        |
| UL LIST. (Y/N)       | YES               |

### AC DISCONNECT

| MAKE           | GENERIC   |
|----------------|-----------|
| MODEL          | NA        |
| ENCL. RATING   | NEMA 3R   |
| VOLT. RATING   | 240 VOLTS |
| AMP RATING     | 60 AMPS   |
| UL LIST. (Y/N) | YES       |
| FUSED (Y/N)    | NO        |
| FUSE RATING    | N/A       |

- 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

CONNECT TO BUILDING'S EXISTING GROUNDING SYSTEM



### CLIENT INFO

RACHEL MARIE GOOSSEN  
249 MERCY LN  
BROADWAY NC 27505

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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: 120 MPH  
RISK CATEGORY: II  
EXPOSURE: B  
SNOW: 15 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      | 10/9/2024 |

PV SYSTEM  
ELECTRICAL

# PV-3.1

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**WARNING: PHOTOVOLTAIC POWER SOURCE**

5 PLACE ON ALL JUNCTION BOXES, EXPOSED RACEWAYS, AND OTHER WIRING METHODS EVERY 10' AND ON EVERY SECTION SEPARATED BY ENCLOSURES, WALLS, PARTITIONS, CEILINGS, OR FLOORS.  
NEC 690.31 (G)(3)&(4)

**WARNING**  
 THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE SHALL NOT EXCEED AMPACITY OF BUSBAR.  
NEC 705.12 (B)(2)(3)(c)

**RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**

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

**PV SYSTEM DISCONNECT**

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

**WARNING**  
 ELECTRIC SHOCK HAZARD  
 TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION  
NEC 690.13 (B)  
 PLACE ON PV SYSTEM DISCONNECTING MEANS.

**GENERATION PANEL:**  
 IN THE EVENT OF AN EMERGENCY, TURN OFF ALL BREAKERS TO DISCONNECT BACKUP POWER SOURCE(S).

2

**WARNING**  
 THREE POWER SOURCES

1 2 6 SOURCES: UTILITY GRID, BATTERY AND PV SOLAR ELECTRIC SYSTEM  
NEC 705.12(B)(3)  
 PLACE ON ALL EQUIPMENT THAT IS SUPPLIED BY THREE POWER SOURCES

**SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN**

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

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

**PHOTOVOLTAIC SYSTEM AC DISCONNECT**

|                   |      |       |
|-------------------|------|-------|
| OPERATING VOLTAGE | 240  | VOLTS |
| OPERATING CURRENT | 48.0 | AMPS  |

3 PLACE ON INTERCONNECTION DISCONNECTING MEANS  
NEC 690.54

**WARNING:**  
 IN THE EVENT OF A UTILITY OUTAGE, THIS PANEL IS FED FROM ENERGY STORAGE SYSTEM.

2 6 PLACE ON BACKED UP LOAD PANEL(S).

**DIRECT CURRENT PHOTOVOLTAIC POWER SOURCE**

|                     |       |      |
|---------------------|-------|------|
| MAXIMUM VOLTAGE     | 600   | VDC  |
| MAX CIRCUIT CURRENT | 40.14 | AMPS |

4 PLACE ON ALL DC DISCONNECTING MEANS  
NEC 690.53

SERVICE DISCONNECT LOCATED:  
 NORTH WALL OF RESIDENCE

BATTERY DISCONNECT LOCATED:  
 NORTH WALL OF RESIDENCE

PV DISCONNECT LOCATED:  
 NORTH WALL OF RESIDENCE

2 3 PLACE AT SERVICE EQUIPMENT AND PV SYSTEM DISCONNECTING MEANS.  
NEC 705.10

**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**  
 RACHEL MARIE GOOSSEN  
 249 MERCY LN  
 BROADWAY NC 27505

**PROJECT INFO**  
 DC INPUT: 10.080 kW  
 AC OUTPUT: 11.500 kW  
 DOI INSP. 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: 120 MPH  
 RISK CATEGORY: II  
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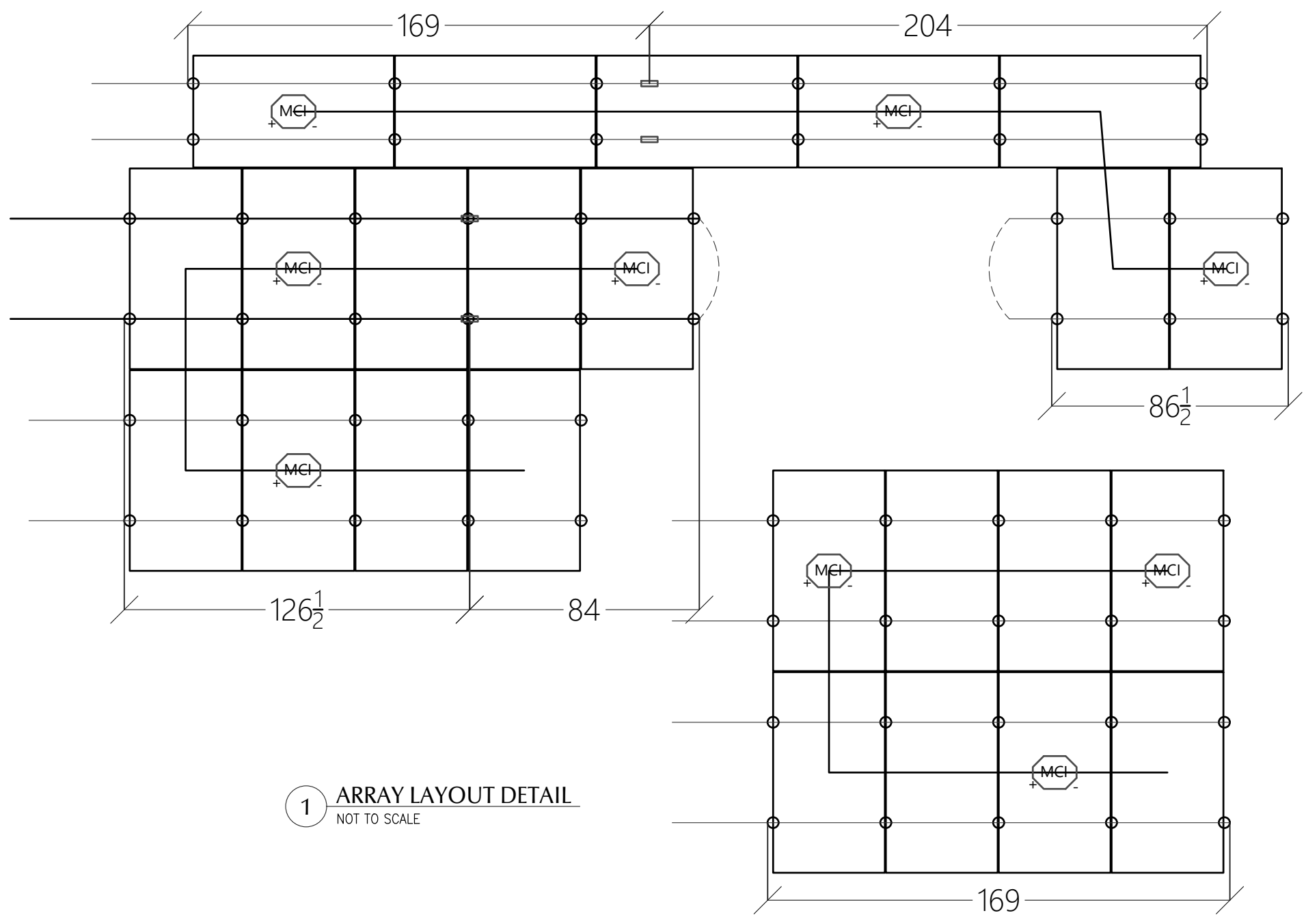
**VERSIONS**

| FOR:         | DESIGNER | DATE      |
|--------------|----------|-----------|
| CONSTRUCTION | MCP      | 10/9/2024 |

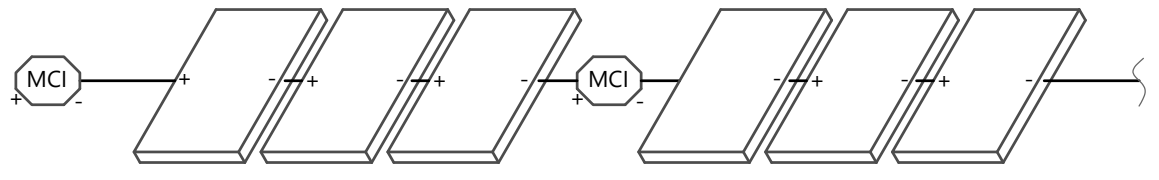
**PV SYSTEM EQUIPMENT LABELS**

**PV-4.1**

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**1** ARRAY LAYOUT DETAIL  
NOT TO SCALE



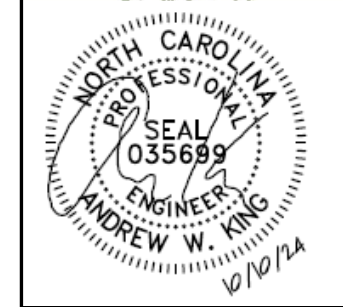
**2** STRING WIRING + MCI DETAIL  
NOT TO SCALE



**CLIENT INFO**  
 RACHEL MARIE GOOSSEN  
 249 MERCY LN  
 BROADWAY NC 27505

**PROJECT INFO**  
 DC INPUT: 10.080 kW  
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**VERSIONS**

| FOR:         | DESIGNER | DATE      |
|--------------|----------|-----------|
| CONSTRUCTION | MCP      | 10/9/2024 |
|              |          |           |

**PV SYSTEM INSTALL GUIDE**

**PV-5.1**

SOLAR'S MOST TRUSTED



# REC ALPHA PURE-R SERIES PRODUCT SPECIFICATIONS

COMPACT PANEL SIZE

9 A MODULE CURRENT  
COMPATIBLE WITH MLPE

430 WP  
20.7  $\frac{W}{FT^2}$   
22.3% EFFICIENCY



LEAD-FREE  
ROHS COMPLIANT

EXPERIENCE  
 $\alpha$   
PERFORMANCE

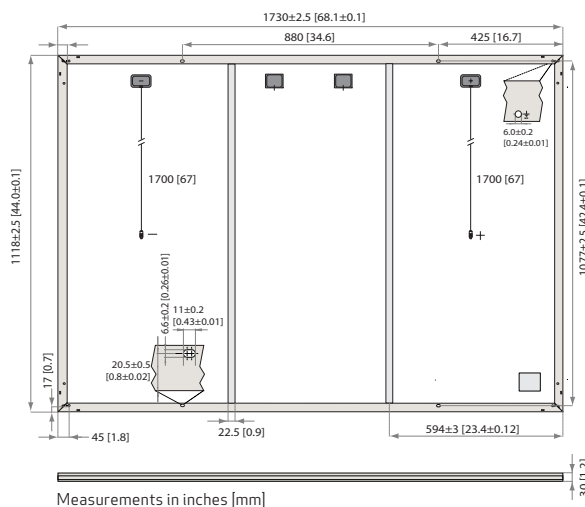
# REC ALPHA PURE-R SERIES

## PRODUCT SPECIFICATIONS



### GENERAL DATA

|               |   |
|---------------|---|
| Cell type:    | 80 half-cut REC bifacial, heterojunction cells with lead-free, gapless technology             |
| Glass:        | 0.13in (3.2mm) solar glass with anti-reflective surface treatment in accordance with EN 12150 |
| Backsheet:    | Highly resistant polymer (black)  |
| Frame:        | Anodized aluminum (black)   |
| Junction box: | 4-part, 4 bypass diodes, lead-free IP68 rated, in accordance with IEC 62790                   |
| Connectors:   | Stäubli MC4 PV-KBT4/KST4 (12 AWG) in accordance with IEC 62852, IP68 only when connected      |
| Cable:        | 12 AWG (4 mm <sup>2</sup> ) PV wire, 67 + 67 in (1.7 + 1.7 m) in accordance with EN 50618     |
| Dimensions:   | 68.1 x 44.0 x 1.2 in (20.77 ft <sup>2</sup> ) / 1730 x 1118 x 30 mm (1.93 m <sup>2</sup> )    |
| Weight:       | 47.4 lbs (21.5 kg)  |
| Origin:       | Made in Singapore   |



### ELECTRICAL DATA

### Product Code\*: RECxxxAA PURE-R

STC

|  | 400   | 410   | 420   | 430   |
|--|-------|-------|-------|-------|
| Power Output - P <sub>MAX</sub> (Wp)         | 400   | 410   | 420   | 430   |
| Watt Class Sorting - (W)                     | 0/+10 | 0/+10 | 0/+10 | 0/+10 |
| Nominal Power Voltage - V <sub>MPP</sub> (V) | 48.8  | 49.4  | 50.0  | 50.5  |
| Nominal Power Current - I <sub>MPP</sub> (A) | 8.20  | 8.30  | 8.40  | 8.52  |
| Open Circuit Voltage - V <sub>OC</sub> (V)   | 58.9  | 59.2  | 59.4  | 59.7  |
| Short Circuit Current - I <sub>SC</sub> (A)  | 8.80  | 8.86  | 8.91  | 8.97  |
| Power Density (W/ft <sup>2</sup> )           | 19.3  | 19.7  | 20.2  | 20.7  |
| Panel Efficiency (%)                         | 20.7  | 21.2  | 21.8  | 22.3  |

NMOT

|  | 305  | 312  | 320  | 327  |
|--|------|------|------|------|
| Power Output - P <sub>MAX</sub> (Wp)         | 305  | 312  | 320  | 327  |
| Nominal Power Voltage - V <sub>MPP</sub> (V) | 46.0 | 46.6 | 47.1 | 47.6 |
| Nominal Power Current - I <sub>MPP</sub> (A) | 6.64 | 6.70 | 6.80 | 6.88 |
| Open Circuit Voltage - V <sub>OC</sub> (V)   | 55.5 | 55.8 | 56.0 | 56.3 |
| Short Circuit Current - I <sub>SC</sub> (A)  | 7.11 | 7.16 | 7.20 | 7.24 |

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.

### MAXIMUM RATINGS

|                          |  |
|--------------------------|--|
| Operational temperature: | -40 ... +85°C                          |
| System voltage:          | 1000 V                                 |
| Test load (front):       | + 7000 Pa (146 lbs/ft <sup>2</sup> )*  |
| Test load (rear):        | - 4000 Pa (83.5 lbs/ft <sup>2</sup> )* |
| Series fuse rating:      | 25 A                                   |
| Reverse current:         | 25 A                                   |

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

### 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

Available from:

### CERTIFICATIONS

|   |                                    |
|---|------------------------------------|
| IEC 61215:2016, IEC 61730:2016, UL 61730  |                                    |
| IEC 62804                                 | PID                                |
| IEC 61701                                 | Salt Mist                          |
| IEC 62716                                 | Ammonia Resistance                 |
| UL 61730                                  | Fire Type Class 2                  |
| IEC 62782                                 | Dynamic Mechanical Load            |
| IEC 61215-2:2016                          | Hailstone (35mm)                   |
| IEC 62321                                 | Lead-free acc. to RoHS EU 863/2015 |
| ISO 14001, ISO 9001, IEC 45001, IEC 62941 |                                    |



### TEMPERATURE RATINGS\*

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

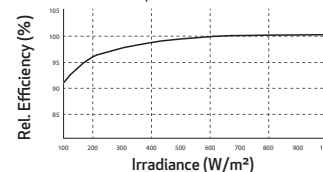
\*The temperature coefficients stated are linear values

### DELIVERY INFORMATION

|  |                  |
|--|------------------|
| Panels per pallet:                       | 33               |
| Panels per 40 ft GP/high cube container: | 858 (26 pallets) |
| Panels per 53 ft truck:                  | 858 (26 pallets) |

### LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



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

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



Specifications subject to change without notice.

Ref: PD-DS-AAPR Rev 3 02.23



# Powerwall 3

## Power Everything

Powerwall 3 is a fully integrated solar and battery system, designed to accelerate the transition to sustainable energy. Customers can receive whole home backup, cost savings, and energy independence by producing and consuming their own energy while participating in grid services. Once installed, customers can manage their system using the Tesla App to customize system behavior to meet their energy goals.

Powerwall 3 achieves this by supporting up to 20 kW DC of solar and providing 11.5 kW AC of continuous power per unit. It has the ability to start heavy loads up to 150 A LRA, meaning a single unit can support the power needs of most homes. Powerwall 3 is designed for mass production, fast and efficient installations, easy system expansion, and simple connection to any electrical service.



# Powerwall 3 Technical Specifications

## System Technical Specifications

|  |  |
|--|--|
| Model Number                                   | 1707000-xx-y   |
| Nominal Grid Voltage (Input & Output)          | 120/240 VAC  |
| Grid Type                                      | Split phase  |
| Frequency                                      | 60 Hz  |
| Overcurrent Protection Device                  | Configurable up to 60 A  |
| Solar to Battery to Grid Round Trip Efficiency | 89% <sup>1,2</sup>   |
| Solar to Grid Efficiency                       | 97% <sup>3</sup>   |
| Supported Islanding Devices                    | Backup Gateway 2, Backup Switch  |
| Connectivity                                   | Wi-Fi (2.4 and 5 GHz), Dual-port switched Ethernet, Cellular (LTE/4G <sup>4</sup> )  |
| Hardware Interface                             | Dry contact relay, Rapid Shutdown (RSD) certified switch and 2-pin connector, RS-485 for meters  |
| AC Metering                                    | Revenue Grade (+/- 0.5%)   |
| Protections                                    | Integrated arc fault circuit interrupter (AFCI), Isolation Monitor Interrupter (IMI), PV Rapid Shutdown (RSD) using Tesla Mid-Circuit Interrupters |
| Customer Interface                             | Tesla Mobile App   |
| Warranty                                       | 10 years   |

## Solar Technical Specifications

|   |                   |
|---|-------------------|
| Maximum Solar STC Input                             | 20 kW             |
| Withstand Voltage                                   | 600 V DC          |
| PV DC Input Voltage Range                           | 60 – 550 V DC     |
| PV DC MPPT Voltage Range                            | 150 – 480 V DC    |
| MPPTs   | 6                 |
| Maximum Current per MPPT ( $I_{mp}$ )               | 13 A <sup>5</sup> |
| Maximum Short Circuit Current per MPPT ( $I_{sc}$ ) | 15 A <sup>5</sup> |

## Battery Technical Specifications

|                                    |                                     |
|------------------------------------|-------------------------------------|
| Nominal Battery Energy             | 13.5 kWh AC <sup>2</sup>            |
| Maximum Continuous Discharge Power | 11.5 kW AC                          |
| Maximum Continuous Charge Power    | 5 kW AC                             |
| Output Power Factor Rating         | 0 - 1 (Grid Code configurable)      |
| Maximum Continuous Current         | 48 A                                |
| Maximum Output Fault Current       | 10 kA                               |
| Load Start Capability (1 s)        | 150 A LRA                           |
| Power Scalability                  | Up to 4 Powerwall 3 units supported |

<sup>1</sup> Typical solar shifting use case.

<sup>2</sup> Values provided for 25°C (77°F), at beginning of life. 3.3 kW charge/discharge power.

<sup>3</sup> Tested using CEC weighted efficiency methodology.

<sup>4</sup> Cellular connectivity subject to network service coverage and signal strength.

<sup>5</sup> Where the DC input current exceeds the MPPT rating, a jumper can be used to combine two MPPTs into a single input to intake DC current up to 26 A  $I_{mp}$  / 30 A  $I_{sc}$ .

# Powerwall 3 Technical Specifications

## Environmental Specifications

|                         |  |
|-------------------------|--|
| Operating Temperature   | -20°C to 50°C (-4°F to 122°F) <sup>6</sup>   |
| Operating Humidity (RH) | Up to 100%, condensing   |
| Storage Temperature     | -20°C to 30°C (-4°F to 86°F), up to 95% RH, non-condensing, State of Energy (SOE): 25% initial |
| Maximum Elevation       | 3000 m (9843 ft)   |
| Environment             | Indoor and outdoor rated   |
| Enclosure Rating        | NEMA 3R  |
| Ingress Rating          | IPX7 (Battery & Power Electronics)<br>IPX5 (Wiring Compartment)                                |
| Pollution Rating        | PD3  |
| Operating Noise @ 1 m   | < 50 db(A) typical<br>< 62 db(A) maximum   |

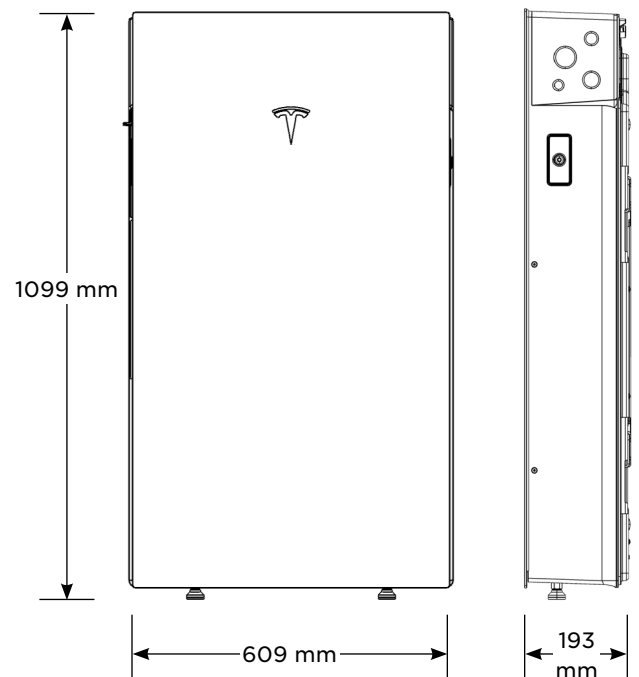
<sup>6</sup> Performance may be de-rated at operating temperatures above 40°C (104°F).

## Compliance Information

|                 |  |
|-----------------|--|
| Certifications  | UL 1642, UL 1699B, UL 1741, UL 1741 SA, UL 1741 SB, UL 3741, UL 1973, UL 1998, UL 9540, IEEE 1547-2018, IEEE 1547.1, UN 38.3 |
| Grid Connection | United States  |
| Emissions       | FCC Part 15 Class B  |
| Environmental   | RoHS Directive 2011/65/EU  |
| Seismic         | AC156, IEEE 693-2005 (high)  |
| Fire Testing    | Meets the unit level performance criteria of UL 9540A  |

## Mechanical Specifications

|                  |   |
|------------------|---|
| Dimensions       | 1099 x 609 x 193 mm (43.25 x 24 x 7.6 in) |
| Weight           | 130 kg (287 lb)                           |
| Mounting Options | Floor or wall mount                       |



# Solar Shutdown Device Technical Specifications

The Solar Shutdown Device is a Mid-Circuit Interrupter (MCI) and is part of the PV system rapid shutdown (RSD) function in accordance with Article 690 of the applicable NEC. When paired with Powerwall 3, solar array shutdown is initiated by any loss of AC power.

|  |  |   |  |
|--|--|---|--|
| Electrical Specifications  | <b>Model</b>                                     | <b>MCI-1</b>  | <b>MCI-2</b>                           |
|  | Nominal Input DC Current Rating ( $I_{MP}$ )     | 12 A  | 13 A                                   |
|  | Maximum Input Short Circuit Current ( $I_{SC}$ ) | 19 A  | 17 A                                   |
|  | Maximum System Voltage (PVHCS)                   | 600 V DC  | 1000 V DC <sup>7</sup>                 |
| <sup>7</sup> Maximum System Voltage is limited by Powerwall to 600 V DC. |  |   |  |
| RSD Module Performance   | Maximum Number of Devices per String             | 5   | 5                                      |
|  | Control  | Power Line Excitation   | Power Line Excitation                  |
|  | Passive State                                    | Normally Open   | Normally Open                          |
|  | Maximum Power Consumption                        | 7 W   | 7 W                                    |
|  | Warranty   | 25 years  | 25 years                               |
|  |  |   |  |
| Environmental Specifications   | Operating Temperature                            | -40°C to 50°C<br>(-40°F to 122°F)   | -45°C to 70°C<br>(-49°F to 158°F)      |
|  | Storage Temperature                              | -30°C to 70°C<br>(-22°F to 158°F)   | -30°C to 70°C<br>(-22°F to 158°F)      |
|  | Enclosure Rating                                 | NEMA 4X / IP65  | NEMA 4X / IP65                         |
| Mechanical Specifications  | Electrical Connections                           | MC4 Connector   | MC4 Connector                          |
|  | Housing  | Plastic   | Plastic                                |
|  | Dimensions                                       | 125 x 150 x 22 mm<br>(5 x 6 x 1 in)   | 173 x 45 x 22 mm<br>(6.8 x 1.8 x 1 in) |
|  | Weight   | 350 g (0.77 lb)   | 120 g (0.26 lb)                        |
|  | Mounting Options                                 | ZEP Home Run Clip<br>M4 Screw (#10)<br>M8 Bolt (5/16")<br>Nail / Wood screw | Wire Clip                              |
| Compliance Information   | Certifications                                   | UL 1741 PVRSE, UL 3741,<br>PVRSA (Photovoltaic Rapid Shutdown Array)        |  |
|  | RSD Initiation Method                            | External System Shutdown Switch or<br>Powerwall 3 Enable Switch             |  |

## UL 3741 PV Hazard Control (and PVRSA) Compatibility

The following categories of solar module meet the UL 3741 PVHCS listing when installed with Powerwall 3 and Solar Shutdown Devices.

|  |  |
|--|--|
| Tesla Solar Roof   | <a href="#">PV Hazard Control System: BIPV compliance document</a>             |
| Tesla or Hanwha (Q.Peak Duo BLK or BLK-G6+) Modules certified for use with ZEP racking | <a href="#">PV Hazard Control System: ZS PVHCS compliance document</a>         |
| Other module and racking combinations  | <a href="#">PV Hazard Control System: Generic PV Array compliance document</a> |

# POWERWALL

## Backup Gateway 2

The Backup Gateway 2 for Tesla Powerwall provides energy management and monitoring for solar self-consumption, time-based control, and backup.

The Backup Gateway 2 controls connection to the grid, automatically detecting outages and providing a seamless transition to backup power. When equipped with a main circuit breaker, the Backup Gateway 2 can be installed at the service entrance. When the optional internal panelboard is installed, the Backup Gateway 2 can also function as a load center.

The Backup Gateway 2 communicates directly with Powerwall, allowing you to monitor energy use and manage backup energy reserves from any mobile device with the Tesla app.



### PERFORMANCE SPECIFICATIONS

|  |  |
|--|--|
| <b>AC Voltage (Nominal)</b>                | 120/240V   |
| <b>Feed-In Type</b>                        | Split Phase  |
| <b>Grid Frequency</b>                      | 60 Hz  |
| <b>Current Rating</b>                      | 200 A  |
| <b>Maximum Input Short Circuit Current</b> | 10 kA <sup>1</sup>   |
| <b>Overcurrent Protection Device</b>       | 100-200A; Service Entrance Rated <sup>1</sup>                      |
| <b>Overvoltage Category</b>                | Category IV  |
| <b>AC Meter</b>                            | Revenue accurate (+/- 0.2 %)                                       |
| <b>Primary Connectivity</b>                | Ethernet, Wi-Fi  |
| <b>Secondary Connectivity</b>              | Cellular (3G, LTE/4G) <sup>2</sup>                                 |
| <b>User Interface</b>                      | Tesla App  |
| <b>Operating Modes</b>                     | Support for solar self-consumption, time-based control, and backup |
| <b>Backup Transition</b>                   | Automatic disconnect for seamless backup                           |
| <b>Modularity</b>                          | Supports up to 10 AC-coupled Powerwalls                            |
| <b>Optional Internal Panelboard</b>        | 200A 6-space / 12 circuit Eaton BR Circuit Breakers                |
| <b>Warranty</b>                            | 10 years   |

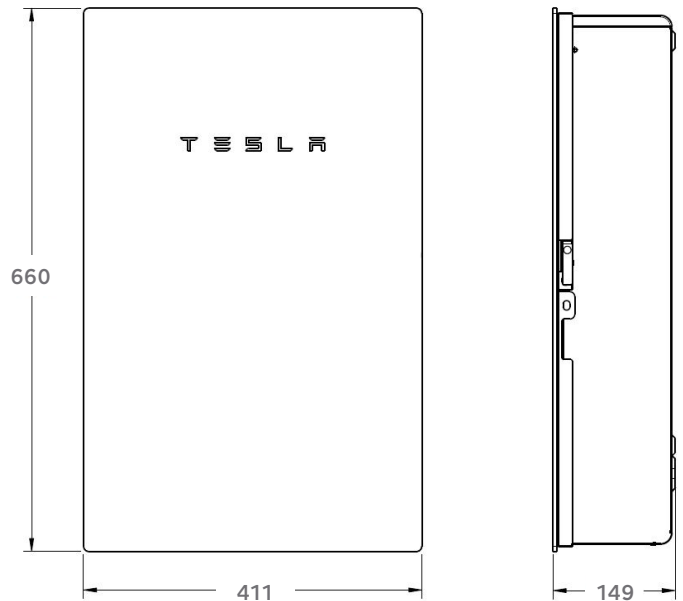
<sup>1</sup> When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22kA symmetrical amperes.  
<sup>2</sup> The customer is expected to provide internet connectivity for Backup Gateway 2; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

### COMPLIANCE INFORMATION

|                       |  |
|-----------------------|--|
| <b>Certifications</b> | UL 67, UL 869A, UL 916, UL 1741 PCS<br>CSA 22.2 0.19, CSA 22.2 205 |
| <b>Emissions</b>      | FCC Part 15, ICES 003  |

### MECHANICAL SPECIFICATIONS

|                         |  |
|-------------------------|--|
| <b>Dimensions</b>       | 660 mm x 411 mm x 149 mm<br>(26 in x 16 in x 6 in) |
| <b>Weight</b>           | 20.4 kg (45 lb)                                    |
| <b>Mounting options</b> | Wall mount, Semi-flush mount                       |



### ENVIRONMENTAL SPECIFICATIONS

|                                |                               |
|--------------------------------|-------------------------------|
| <b>Operating Temperature</b>   | -20°C to 50°C (-4°F to 122°F) |
| <b>Operating Humidity (RH)</b> | Up to 100%, condensing        |
| <b>Maximum Elevation</b>       | 3000 m (9843 ft)              |
| <b>Environment</b>             | Indoor and outdoor rated      |
| <b>Enclosure Type</b>          | NEMA 3R                       |

# Backup Switch

The Tesla Backup Switch controls connection to the grid in a Powerwall system, and can be easily installed behind the utility meter or in a standalone meter panel downstream of the utility meter.

The Backup Switch automatically detects grid outages, providing a seamless transition to backup power. It communicates directly with Powerwall, allowing home energy usage monitoring from any mobile device with the Tesla app.

## Performance Specifications

|   |                                  |
|---|----------------------------------|
| <b>Model Number</b>                         | 1624171-xx-y                     |
| <b>Continuous Load Rating</b>               | 200 A, 120/240 V split phase     |
| <b>Maximum Supply Short Circuit Current</b> | 22 kA with breaker <sup>10</sup> |
| <b>Communication</b>                        | CAN                              |
| <b>AC Meter</b>                             | Revenue accurate (+/- 0.5%)      |
| <b>Expected Service Life</b>                | 21 years                         |
| <b>Warranty</b>                             | 10 years                         |

<sup>10</sup> Breaker maximum supply short circuit current rating must be equal to or greater than the available fault current.

## Environmental Specifications

|                              |                                |
|------------------------------|--------------------------------|
| <b>Operating Temperature</b> | -40°C to 50°C (-40°F to 122°F) |
| <b>Storage Temperature</b>   | -40°C to 85°C (-40°F to 185°F) |
| <b>Enclosure Rating</b>      | NEMA 3R                        |
| <b>Pollution Rating</b>      | PD3                            |

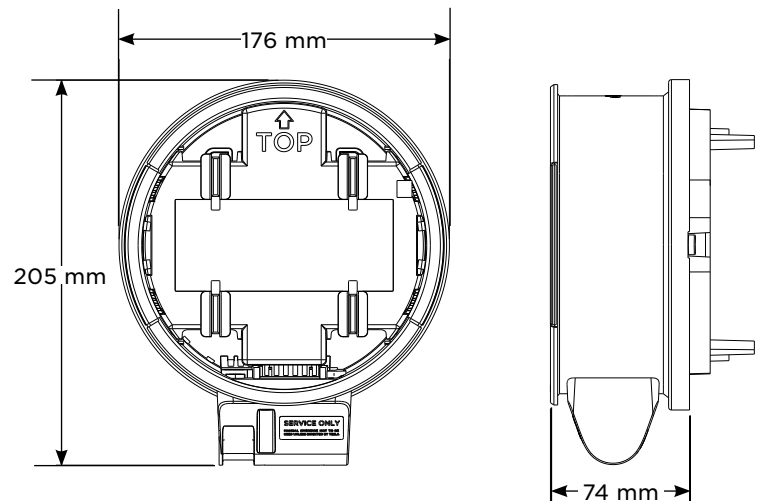
## Compliance Information

|                         |  |
|-------------------------|--|
| <b>Safety Standards</b> | USA: UL 414, UL 2735, UL 916, CA Prop 65 |
| <b>Emmissions</b>       | FCC, ICES                                |

## Mechanical Specifications

|                                       |   |
|---------------------------------------|---|
| <b>Dimensions</b>                     | 176 x 205 x 74 mm (6.9 x 8.1 x 2.9 in)                  |
| <b>Weight</b>                         | 2.8 lb  |
| <b>Meter and Socket Compatibility</b> | ANSI Type 2S, ringless or ring type                     |
| <b>External Service Interface</b>     | Contactor manual override <sup>11</sup><br>Reset button |
| <b>Conduit Compatibility</b>          | 1/2-inch NPT  |

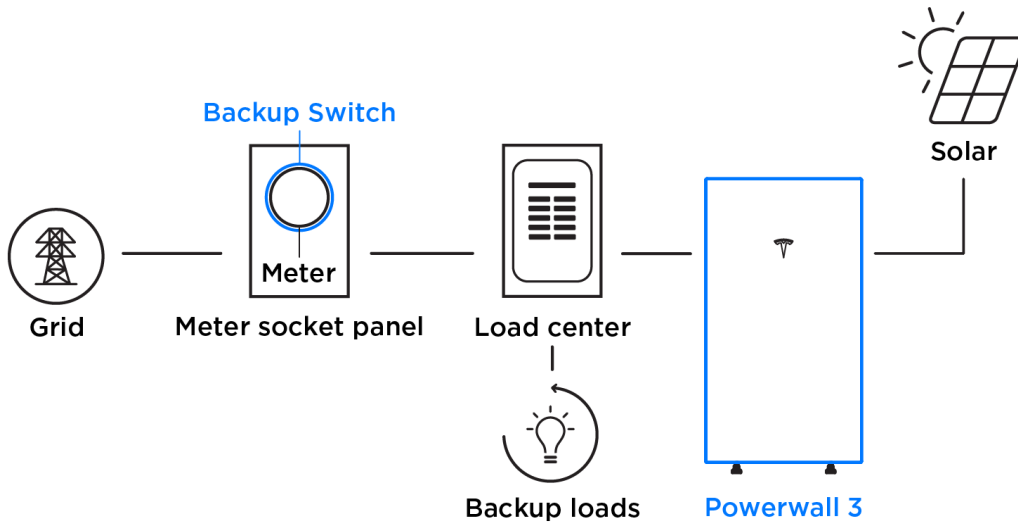
<sup>11</sup> Manually overrides the contactor position during a service event.



# Powerwall 3 Example System Configurations

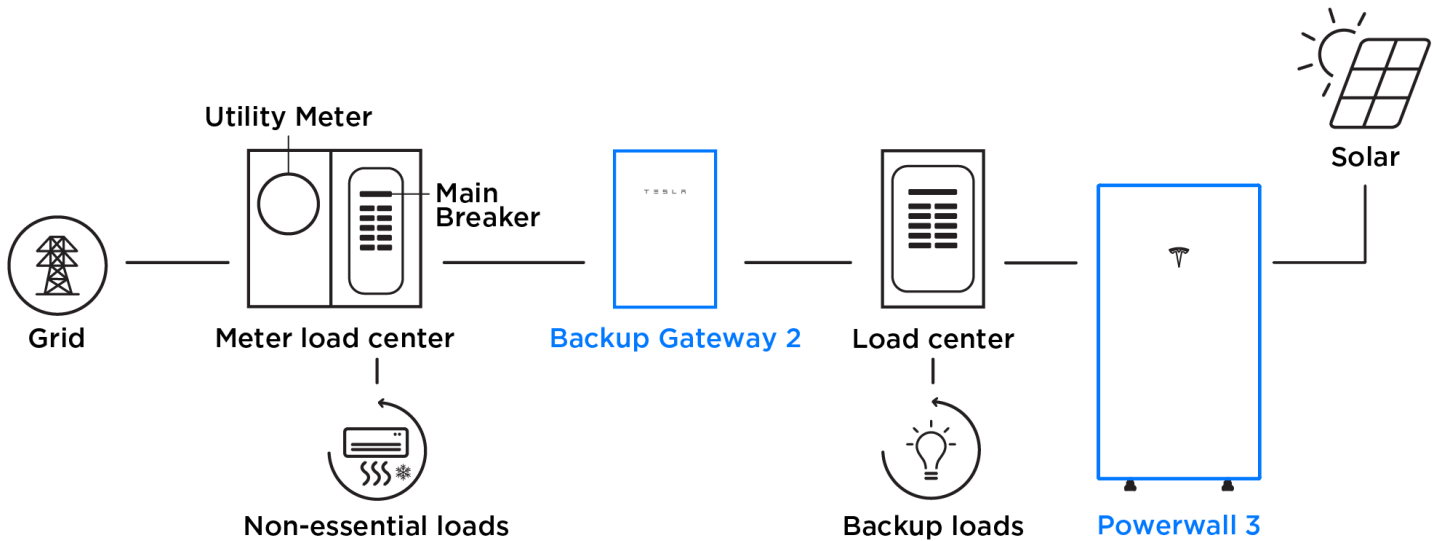
## Powerwall 3 with Backup Switch

Whole Home Backup



## Powerwall 3 with Backup Gateway 2

Partial Home Backup



RSTC Enterprises, Inc.  
2214 Heimstead Road  
Eau Claire, WI 54703  
715-830-9997



## Outdoor Photovoltaic Enclosures

Composition/Cedar Roof System

### ETL listed and labeled

Report # 3171411PRT-002 Revised May, 2018

- UL50 Type 3R, 11 Edition Electrical equipment enclosures
- CSA C22.2 No. 290 Nema Type 3R
- Conforms to UL 1741 Standard

### 0799 Series Includes:

- |          |                  |
|----------|------------------|
| 0799 - 2 | Wire size 2/0-14 |
| 0799 - 5 | Wire size 14-6   |
| 0799 - D | Wire size 14-8   |

Models available in Grey, Black or Stainless Steel

### Basic Specifications

Material options:

- Powder coated, 18 gauge galvanized 90 steel (1,100 hours salt spray)
- Stainless steel

Process - Seamless draw (stamped)

Flashing - 15.25" x 17.25"

Height - 3"

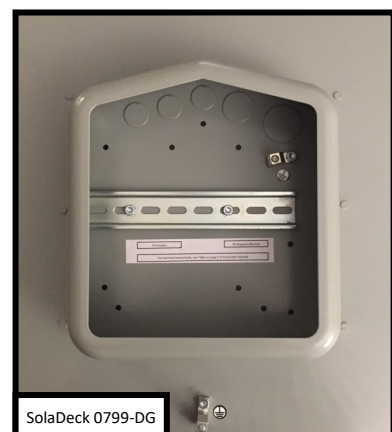
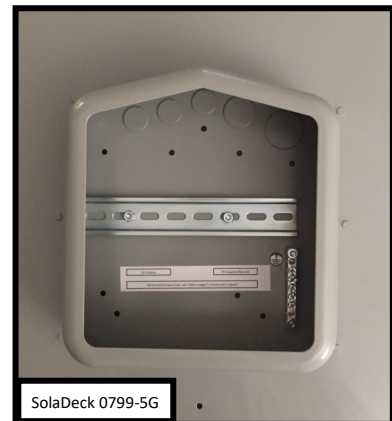
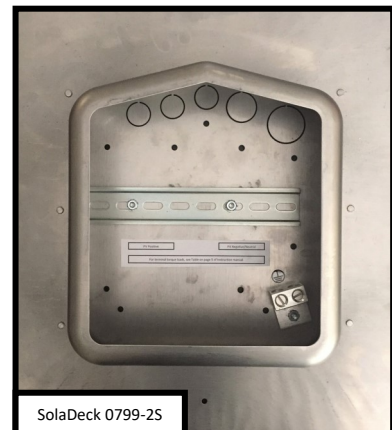
Cavity - 255 Cubic inches

### Base Plate:

- Fastened to base using toggle fastening system
- 5 roof deck knockouts
- Knockout sizes: (3) .5", (1) .75" and (1) 1"
- 8", 35mm slotted din rail
- Ground Block

Passthrough and combiner kits are available for either AC or DC applications.

## 0799 Series





# Product data sheet

Specifications

SQUARE D

Green Premium™



Safety switch, general duty, non fusible, 60A, 2 pole, 10hp, 240VAC, NEMA 3R, bolt on provision

DU222RB

Product availability : Stock - Normally stocked in distribution facility

Price\* : 353.00 USD

## Main

|                           |  |
|---------------------------|--|
| Product                   | Single Throw Safety Switch                 |
| Duty Rating               | General duty                               |
| Device Application        | Residential                                |
| Disconnect Type           | Non-fusible disconnect switch              |
| Factory Installed Neutral | None                                       |
| Phase                     | 3 phase                                    |
| Number of Poles           | 2  |
| Current Rating            | 60 A                                       |
| Voltage Rating            | 240 V AC                                   |
| Enclosure Rating NEMA     | NEMA 3R                                    |
| Motor power hp            | 10 hp at 240 V AC 60 Hz for 1 phase motors |

## Complementary

|                       |  |
|-----------------------|--|
| Mounting Type         | Surface  |
| Electrical Connection | Lugs   |
| Wiring configuration  | 2 wires  |
| Wire Size             | AWG 12...AWG 3 aluminium<br>AWG 14...AWG 3 copper  |
| Tightening torque     | 35 lbf.in (3.95 N.m) 0.00...0.01 in <sup>2</sup> (2.08...5.26 mm <sup>2</sup> ) (AWG 14...AWG 10)<br>35 lbf.in (3.95 N.m) (AWG 14...AWG 10)<br>45 lbf.in (5.08 N.m) 0.01 in <sup>2</sup> (8.37 mm <sup>2</sup> ) (AWG 8)<br>45 lbf.in (5.08 N.m) 0.02...0.03 in <sup>2</sup> (12.3...21.12 mm <sup>2</sup> ) (AWG 6...AWG 4)<br>50 lbf.in (5.65 N.m) 0.04 in <sup>2</sup> (26.67 mm <sup>2</sup> ) (AWG 3) |
| Depth                 | 3.75 in (95.25 mm)   |
| Width                 | 7.75 in (196.85 mm)  |
| Height                | 9.63 in (244.60 mm)  |
| Net Weight            | 16.98 lb(US) (7.7 kg)  |

## Environment

|                |                      |
|----------------|----------------------|
| Certifications | UL listed file E2875 |
|----------------|----------------------|

\* Price is "List Price" and may be subject to a trade discount – check with your local distributor or retailer for actual price.

## Ordering and shipping details

|                   |                                 |
|-------------------|---------------------------------|
| Category          | 00106-D & DU SW,NEMA3R, 30-200A |
| Discount Schedule | DE1A                            |
| GTIN              | 785901491491                    |
| Returnability     | Yes                             |
| Country of origin | MX                              |

## Packing Units

|                              |                            |
|------------------------------|----------------------------|
| Unit Type of Package 1       | PCE                        |
| Number of Units in Package 1 | 1                          |
| Package 1 Height             | 5.30 in (13.462 cm)        |
| Package 1 Width              | 7.20 in (18.288 cm)        |
| Package 1 Length             | 10.00 in (25.4 cm)         |
| Package 1 Weight             | 4.65 lb(US) (2.109 kg)     |
| Unit Type of Package 2       | PAL                        |
| Number of Units in Package 2 | 120                        |
| Package 2 Height             | 36.50 in (92.71 cm)        |
| Package 2 Width              | 40.00 in (101.6 cm)        |
| Package 2 Length             | 48.00 in (121.92 cm)       |
| Package 2 Weight             | 610.00 lb(US) (276.691 kg) |
| Unit Type of Package 3       | CAR                        |
| Number of Units in Package 3 | 5                          |
| Package 3 Height             | 10.70 in (27.178 cm)       |
| Package 3 Width              | 10.20 in (25.908 cm)       |
| Package 3 Length             | 23.50 in (59.69 cm)        |
| Package 3 Weight             | 24.60 lb(US) (11.158 kg)   |

## Offer Sustainability

|                            |   |
|----------------------------|---|
| Sustainable offer status   | Green Premium product   |
| California proposition 65  | WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a> |
| REACH Regulation           | <a href="#">REACH Declaration</a>   |
| REACH free of SVHC         | Yes   |
| EU RoHS Directive          | Compliant<br><a href="#">EU RoHS Declaration</a>  |
| Toxic heavy metal free     | Yes   |
| Mercury free               | Yes   |
| China RoHS Regulation      | <a href="#">China RoHS declaration</a><br>Pro-active China RoHS declaration (out of China RoHS legal scope)   |
| RoHS exemption information | <a href="#">Yes</a>   |
| Environmental Disclosure   | <a href="#">Product Environmental Profile</a>   |
| PVC free                   | Yes   |

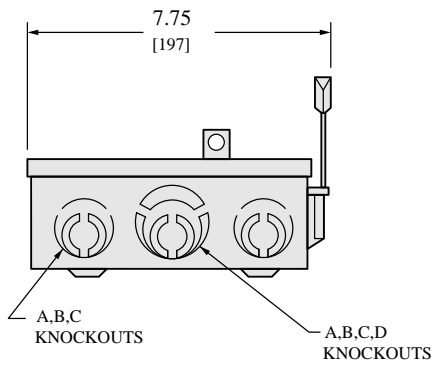
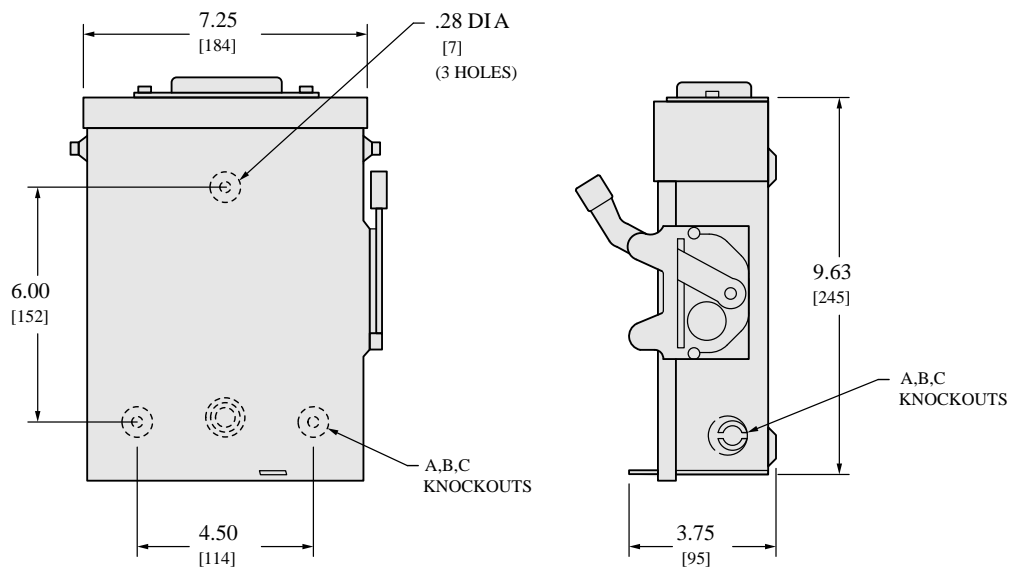
# Contractual warranty

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Warranty

18 months

**Dimensions**



NEMA TYPE 3R

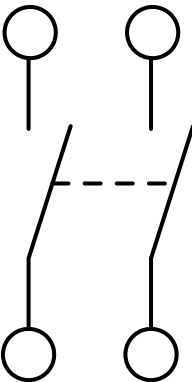
IN.  
[mm]

| KNOCKOUTS          |     |     |   |      |
|--------------------|-----|-----|---|------|
| SYMBOL             | A   | B   | C | D    |
| CONDUIT SIZE (IN.) | .50 | .75 | 1 | 1.25 |

TOP OF NEMA TYPE 3R SWITCHES HAVE PROVISIONS FOR MAXIMUM 2 1/2" BO LT-ON HUB.  
 ALL DIMENSIONS ARE APPROXIMATE. REFER TO TECHNICAL DRAWINGS AND DOCUMENTATION.

**Wiring Diagram**

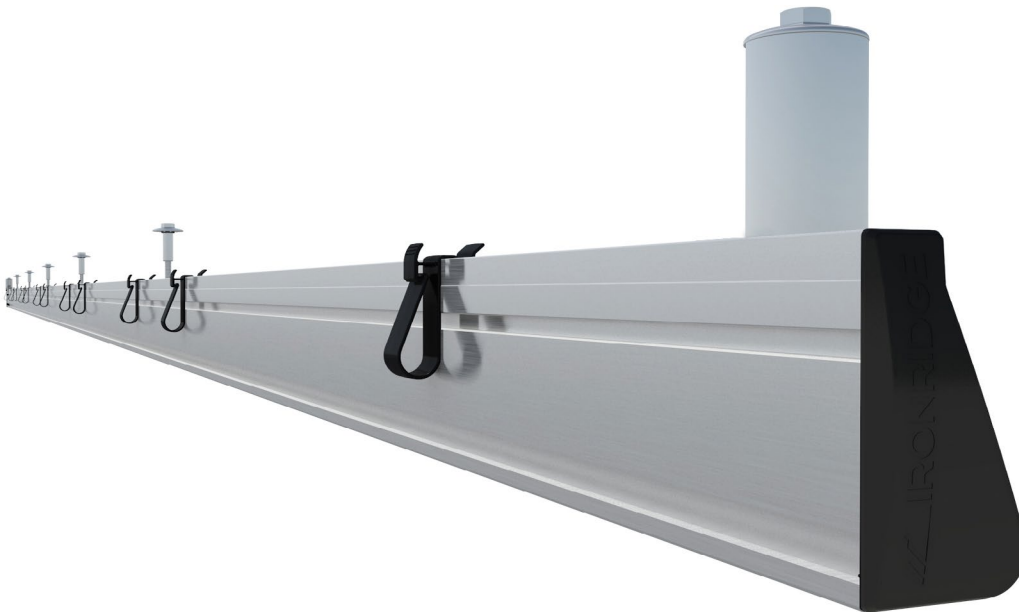
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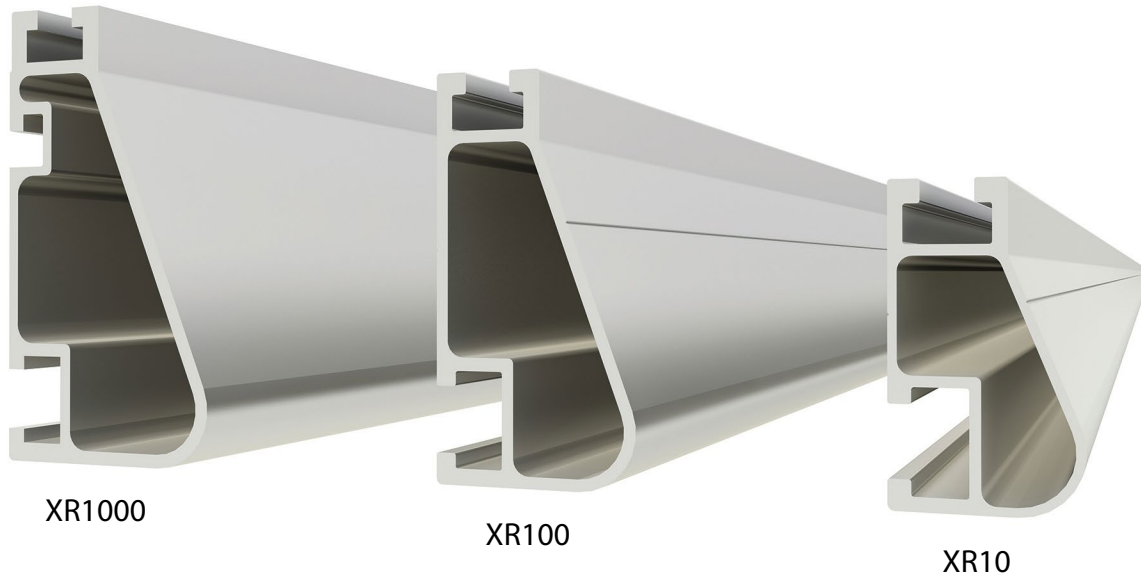
**DU222RB**

**Recommended replacement(s)**

## XR Rail<sup>®</sup> Assembly Overview



Our product development team strives to keep things simple and intuitive for installers while accommodating a wide range of mounting scenarios. As a result, we offer three complementary types of rail within the XR Rail<sup>®</sup> Family. Please refer to our website or contact our customer service team so that we can best assist in determining which rail assembly is best for you and your specific project.

**XR Rail®**


| Item Number  | Description                       | Item Number | Description                     |
|--------------|-----------------------------------|-------------|---------------------------------|
| XR-1000-168A | XR1000, Rail 168" (14 Feet) Clear | XR-10-168A  | XR10, Rail 168" (14 Feet) Clear |
| XR-1000-204A | XR1000, Rail 204" (17 Feet) Clear | XR-10-168B  | XR10, Rail 168" (14 Feet) Black |
| XR-100-168A  | XR100, Rail 168" (14 Feet) Clear  | XR-10-204A  | XR10, Rail 204" (17 Feet) Clear |
| XR-100-168B  | XR100, Rail 168" (14 Feet) Black  | XR-10-204B  | XR10, Rail 204" (17 Feet) Black |
| XR-100-204A  | XR100, Rail 204" (17 Feet) Clear  |             |                                 |
| XR-100-204B  | XR100, Rail 204" (17 Feet) Black  |             |                                 |

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. XR1000® is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications. XR100® is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans. XR10® is a sleek, low-profile mounting rail, perfectly matched to regions with light or no snow. It achieves 6 foot spans, while also staying light and economical.

## BOSS® Bonded Structural Splices

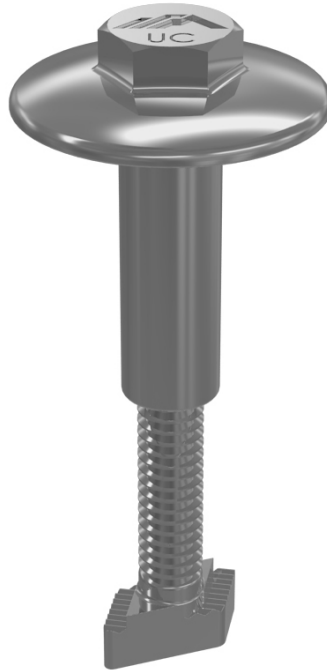


| Item Number       | Description                      |
|-------------------|----------------------------------|
| XR10-BOSS-01-M1   | Bonded Structural Splice, XR10   |
| XR100-BOSS-01-M1  | Bonded Structural Splice, XR100  |
| XR1000-BOSS-01-M1 | Bonded Structural Splice, XR1000 |

The BOSS® (Bonded Structural Splice) provides a truly seamless, hidden connection for XR Rails®. Built-in, one-piece springs feature bonding teeth that bite inside the rail, creating a bonded rail connection and meeting all UL standards without any extra tools or hardware. In addition, BOSS® eliminates installation restrictions. Place it anywhere except the outside cantilever.



## Universal Fastening Objects (UFO®)



| Item Number  | Description                   |
|--------------|-------------------------------|
| UFO-CL-01-A1 | Universal Module Clamp, Clear |
| UFO-CL-01-B1 | Universal Module Clamp, Black |

The IronRidge UFO® (Universal Fastening Object) is a single-size, single-piece fastener, built to quickly and securely bond any solar modules to XR Rails. It comes fully-lubricated and fully-assembled, and it looks just as good as it performs. When combined with a Stopper Sleeve, the UFO® functions as an end clamp. It comes in two finishes: Clear and Black.

## Calculating Rail Length

Calculate the row lengths as follows:

1. Add module widths.
2. Add width of UFO® between modules.
3. Add allowances for UFO® and Stopper Sleeves on ends of rail.

Depending on the location of the UFO®, the clearance values will differ.

| Location  | UFO®   |
|-----------|--------|
| Mid Clamp | 0.375" |
| End Clamp | 1.0"   |

For example, to mount five modules that are each 40" wide (in portrait), the row length is calculated as follows:

| Step                                       | UFO®                     |
|--|--------------------------|
| 1. Add module widths                       | $5 \times 40" = 200"$    |
| 2. Add width of mid clamps between modules | $4 \times 0.375" = 1.5"$ |
| 3. Add allowances for end clamps           | $2 \times 1" = 2$        |
| Total length of row                        | $203.5" = 16.96'$        |

Two 17' rails will be required to mount this row of five modules.

IronRidge stock rail lengths: 11', 14', 17'. Custom lengths available via special order. Contact IronRidge Customer Service for additional details at 800-227-9523, or [support@ironridge.com](mailto:support@ironridge.com).