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PV MATERIAL SUMMARY: DISTRIBUTOR	
SIL-430 QD	34
MCI-2	12
Tesla PW3 1707000-xx-y	2
Tesla GW3 1841000-01-y	1
2065063-00-X	1
XR-10-184B	18
XR10-BOSS-01-M1	12
UFO-CL-01-B1	58
UFO-END-01-B1	20
XR-LUG-03-A1	9
4 IN QB2	63
GC66803 Geocel Sealant	4
SOLADECK 0799-5B	1
SOLAR MESH-P-8	2
SNRAC 242-04105	63

NOTICE TO CONTRACTOR  
All construction shall comply with current NC Building Codes and is subject to field inspection and verification.

**APPROVED**  
Unlimited building only permit.  
Permit holder responsible for full compliance with the code.

06/20/2025

Harnett  
COUNTY  
NORTH CAROLINA



**CLIENT INFO**  
DANIELLE N DODSON  
56 HAZEL SUE LN  
FUQUAY VARINA NC 27526

**PROJECT INFO**  
DC INPUT: 14.620 kW  
AC OUTPUT: 23.000 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**  
PV-1: COVER SHEET  
PV-2: PV STRUCTURAL  
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PV-5: PV INSTALL GUIDE

**VERSIONS**

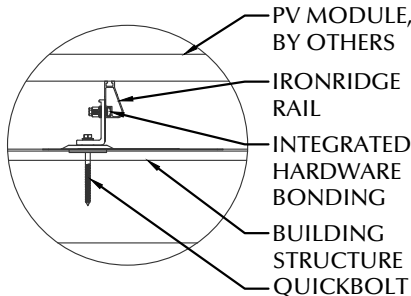
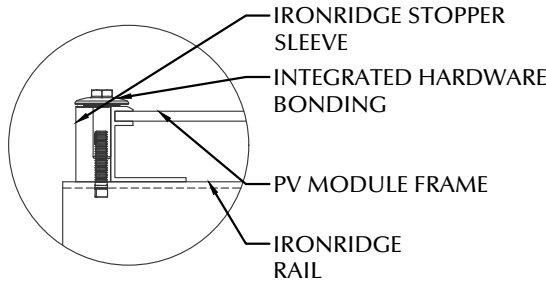
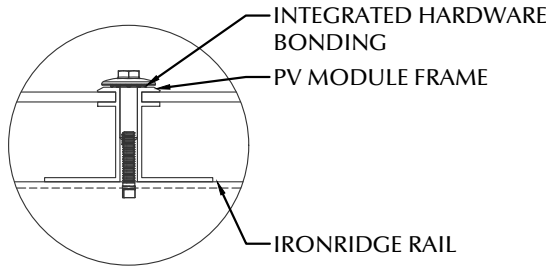
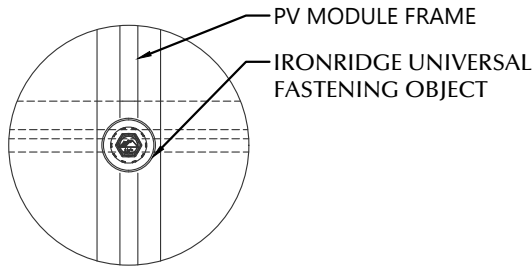
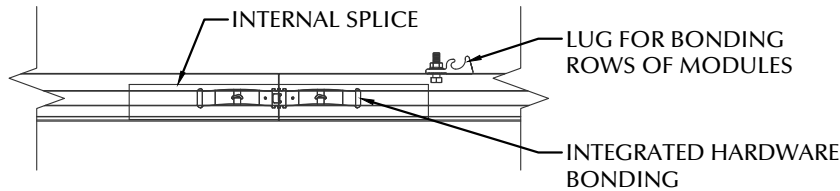
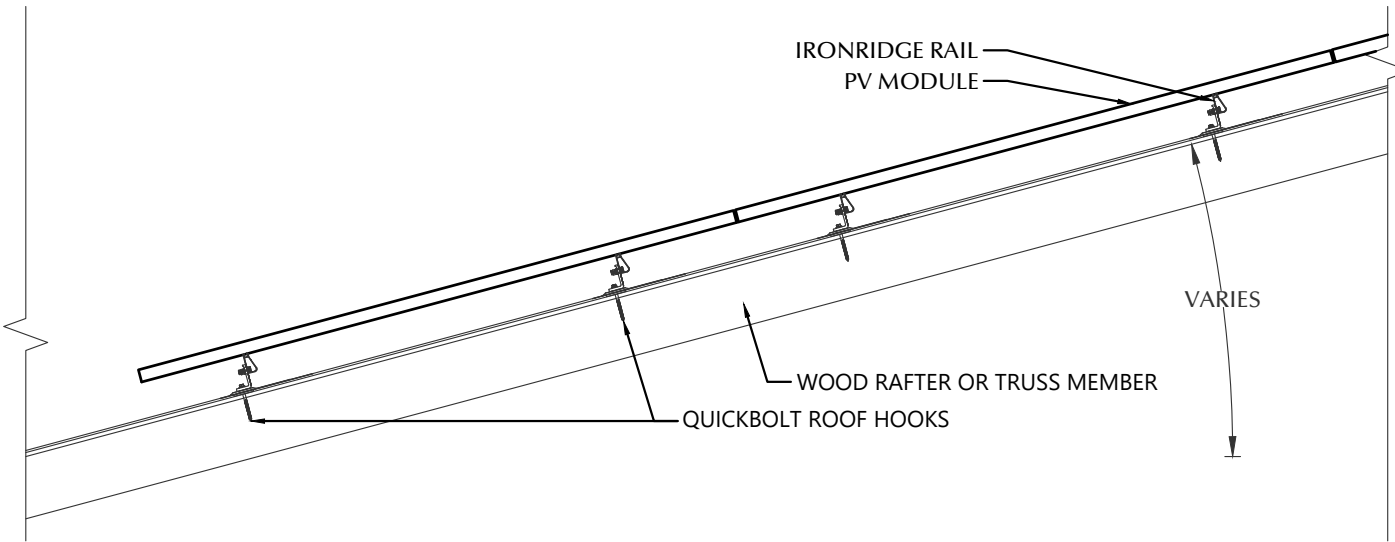
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**PV SYSTEM COVER PAGE**

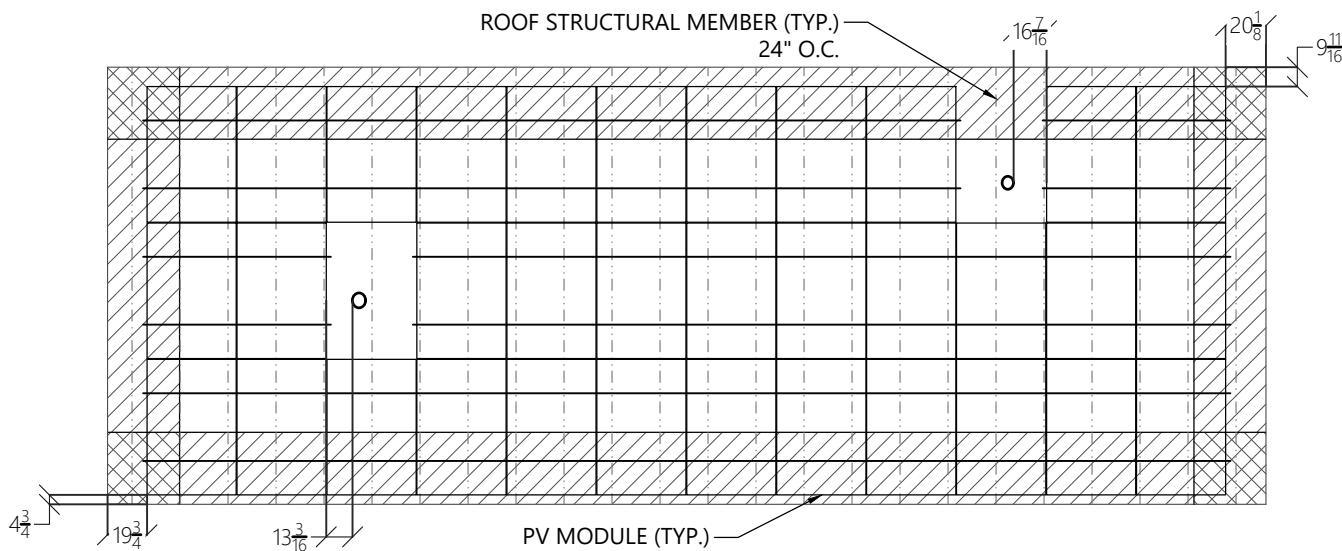
**PV-1.1**



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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	SILFAB
MODEL	SIL-430 QD
WIDTH	44.60 IN
LENGTH	67.80 IN
THICKNESS	35 MM
WEIGHT	46.30 LBS.
ARRAY AREA	714 SQFT.
ARRAY WEIGHT	1785 LBS.

### ROOF SUMMARY

STRUCTURE:	
TYPE	TRUSSES
MATERIAL	SOUTHERN PINE #2
SIZE	2 X 4
SPACING	24 IN O.C.
ALLOWABLE SPAN	88 IN
PITCH	8/12
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
WIND ZONE 2	48 IN
WIND ZONE 3	48 IN
	24 IN
	24 IN
	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	-414 LBS.
UPLIFT ZONE 2	-325 LBS.
UPLIFT ZONE 3	-325 LBS.
DOWNWARD	387 LBS.

### ROOF MOUNT & FASTENER

ROOF MOUNT:	
MAKE	QUICKBOLT
MODEL	4 IN QB2
MATERIAL	STAINLESS / EPDM
FASTENER:	
MAKE	QUICK SCREWS
MODEL	HEX LAG BOLT
MATERIAL	304 SS
SIZE	5/16" X 4" (1/2" HEX)
GENERAL:	
WEIGHT	0.65 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	0.435 LBS/IN
SPACING	34 IN



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### VERSIONS

FOR:	DESIGNER	DATE
CONSTRUCTION	MCP	06/09/2025

### PV SYSTEM STRUCTURAL

PV-2.1

CONDUCTOR SCHEDULE										
TAG	CURRENT CARRYING CONDUCTORS			GROUNDING CONDUCTORS			CONDUIT/RACEWAY			NOTES
	QTY.	SIZE	INSULATION	QTY.	SIZE	INSULATION	QTY.	SIZE	LOCATION	
C1	4	10 AWG	PV WIRE	1	6 AWG	BARE	-	-	FREE AIR	1
C2	4	10 AWG	THWN	1	10 AWG	THWN	1	3/4"	EXT/INT	2,4
C3	3	6 AWG	THWN-2	1	10 AWG	THWN-2	1	3/4"	EXTERIOR	2,4
C4	3	4/0 AWG ALUMINUM	XHHW	1	6 AWG	THWN-2/BARE	1	2"	EXT/INT	2,4
C5	3	4/0 AWG ALUMINUM	XHHW	-	-	-	1	2"	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
5.

PLEASE REFERENCE NOTES ON PV-4.1 FOR ADDITIONAL DETAIL

AC DISCONNECTS 'A & B'	
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
- AC DISCONNECTS MUST BE CO-LOCATED

PV MODULE	
MAKE	SILFAB
MODEL	SIL-430 QD
NOM. POWER (PNOM)	430 WATTS
NOM. VOLT. (VMPP)	33.3 VOLTS
O.C. VOLT (VOC)	38.9 VOLTS
MAX. SYS. VOLT.	1000 VOLTS
NOM. CURR. (IMPP)	12.9 AMPS
S.C. CURR. (ISC)	13.9 AMPS
TEMP. COEF. (PMPP)	-0.29 %/C
TEMP. COEF. (Voc)	-0.24 %/C
MAX SERIES FUSE	25 AMPS
UL COMPLIANT (Y/N)	YES

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
- CONNECT EACH PW3 VIA 60A BREAKER
- FEED BACKED UP LOADS VIA BACKUP LUGS

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)	15.00 AMPS
MAX. CURRENT (Isc)	19.00 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

MAX. DC VOLTAGE CALCULATION	
$V_{oc}MAX = V_{oc} * (1 + (TMIN - TSTC) * (VTC / 100))$	
$V_{oc}MAX$	42.04
MAX STRING VOLTAGE	378.3

MAX. DC CURRENT CALCULATION	
$I_{sc}MAX = I_{sc} * TCX$	
$I_{sc}MAX$ (AMPS)	17.34

DC/AC INVERTER 'A' & 'B'	
MAKE	TESLA POWERWALL 3
MODEL	1707000-XX-Y
DC INPUT:	
MAX POWER	20000 WATTS
INPUT VOLTAGE RANGE	60-550 VOLTS
MPPT VOLTAGE RANGE	150-480 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
UL LIST. (Y/N)	YES

ENERGY STORAGE SYSTEM	
MAKE	TESLA POWERWALL 3
MODEL	1707000-XX-Y
USABLE ENERGY	13.5 kWh
NOM. VOLT.	240 VOLTS
MAX. CONT. CHARGE	5000 WATTS
UL LIST. (Y/N)	YES

- SITE EXPORT LIMIT SET TO 20.000kW AC

EX. BACKED UP LOADS PANEL	
MAKE	SIEMENS
MODEL	SN3048B1200
ENCL. RATING	NEMA 1
VOLT. RATING	240 VOLTS
BUS RATING	200 AMPS
UL LIST. (Y/N)	YES
MAIN BREAKER (Y/N)	YES
MAIN BREAKER RATING	200 AMPS

- REMOVE NEUTRAL/GROUND BONDING JUMPER



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CODE REFERENCES
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SITE CONDITIONS
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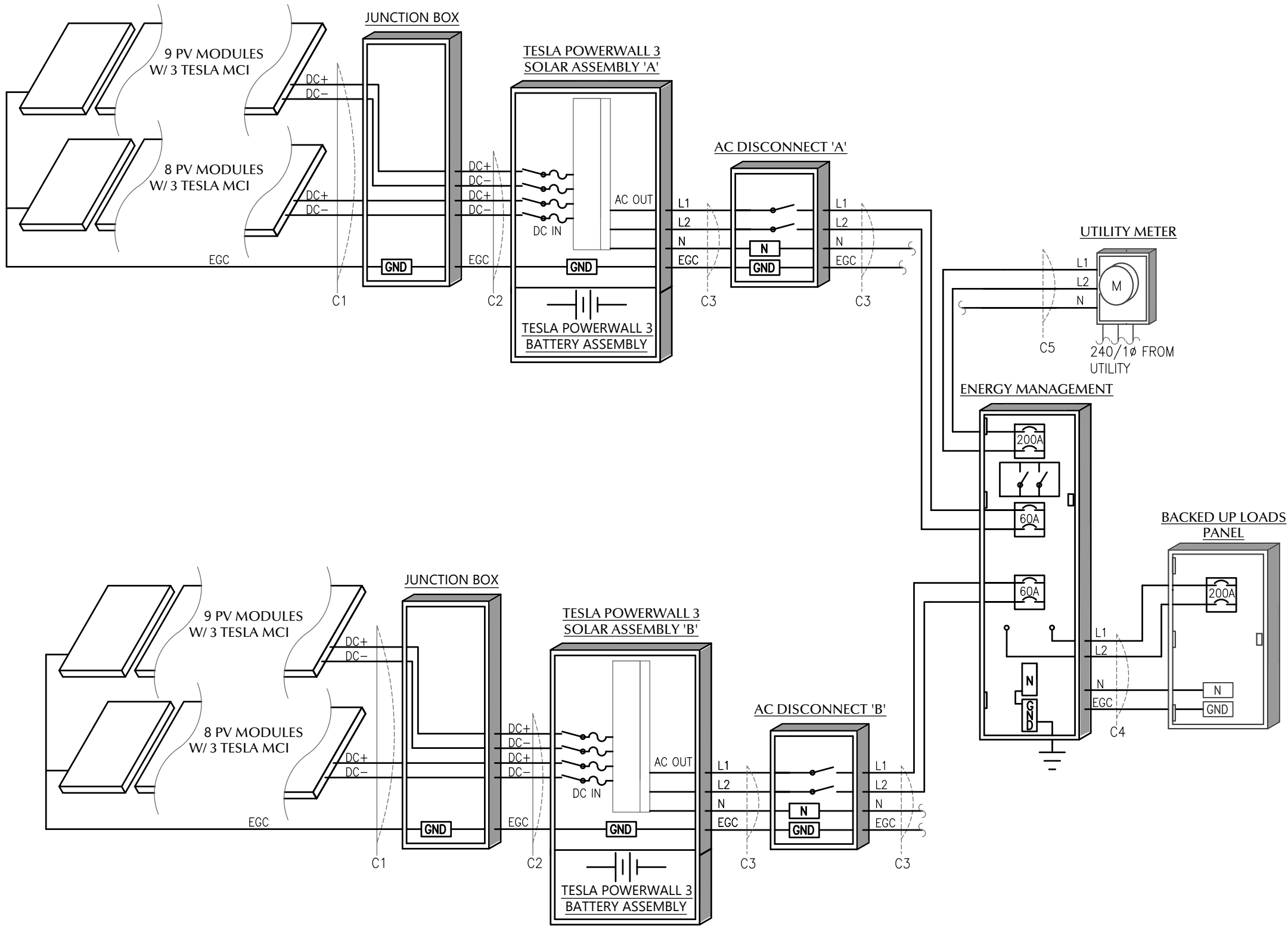
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VERSIONS
FOR: DESIGNER DATE
CONSTRUCTION MCP 06/09/2025

PV SYSTEM ELECTRICAL
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# PV-3.1

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SITE CONDITIONS	
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**PV SYSTEM  
ELECTRICAL**

**PV-3.2**



WARNING: PHOTOVOLTAIC POWER SOURCE

NEC 690.31 (G)(3)&(4)  
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.

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

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

PV SYSTEM DISCONNECT

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

DIRECT CURRENT PHOTOVOLTAIC POWER SOURCE

MAXIMUM VOLTAGE 600 VDC  
MAX CIRCUIT CURRENT 34.68 AMPS

NEC 690.53  
PLACE ON ALL DC DISCONNECTING MEANS

PHOTOVOLTAIC SYSTEM AC DISCONNECT

OPERATING VOLTAGE 240 VOLTS  
OPERATING CURRENT 48.0 AMPS

NEC 690.54  
PLACE ON INTERCONNECTION DISCONNECTING MEANS

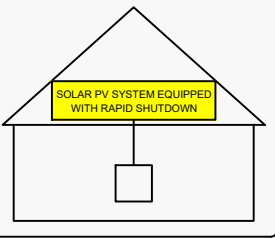
WARNING

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)

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



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

WARNING

THREE POWER SOURCES

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

SERVICE DISCONNECT LOCATED:

PV/BATTERY DISCONNECT LOCATED:

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

LABEL NOTES:

1. LABELS SHOWN ARE NOT TO SCALE.
2. LABEL MATERIAL SHALL BE SUITABLE FOR THE EQUIPMENT ENVIRONMENT.
3. DC CONDUIT SHALL BE MARKED WITH REQUIRED LABEL EVERY 10 FEET.
4. PHOTOVOLTAIC SYSTEMS SHALL BE PERMANENTLY MARKED AT VARIOUS EQUIPMENT LOCATIONS TO IDENTIFY THAT A PHOTOVOLTAIC SYSTEM IS INSTALLED AND THAT VARIOUS DANGERS ARE PRESENT.
5. EACH PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS SHALL BE PERMANENTLY MARKED TO IDENTIFY IT AS A PHOTOVOLTAIC SYSTEM DISCONNECT.
6. 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.
7. A PERMANENT LABEL FOR THE DIRECT-CURRENT PHOTOVOLTAIC POWER SOURCE SHALL BE PROVIDED AT THE DC DISCONNECT MEANS.
8. 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.
9. LABELS WILL BE APPLIED IN ACCORDANCE WITH THE NEC. SOME LABELS SHOWN MAY NOT BE NECESSARY.

WIRING NOTES:

1. CONDUCTORS SHALL BE COPPER OR ALUMINUM, RATED AT NOT LESS THAN 600 VOLTS
2. MINIMUM SIZE SHALL BE #14 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. CABLE ASSEMBLIES SHALL BE TYPE DG. BARE CONDUCTORS SHALL BE A MINIMUM OF #6 AWG.
4. EXTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THWN-2 AND INSTALLED IN ELECTRICAL METALLIC TUBING(EMT), RIGID POLYVINYL CHLORIDE CONDUIT(PVC), RIGID METALLIC CONDUIT (RMC), LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT (LFMC), OR LIQUIDTIGHT FLEXIBLE NON METALLIX CONDUIT (LFNC). SE-TYPE CABLE CAN BE USED AS AN ALTERNATIVE. ADDITIONAL WIRING METHODS SHALL BE PERMITTED ONLY WHEN IN COMPLIANCE WITH ALL NEC REQUIREMENTS.
5. INTERIOR WIRING CONDUCTOR INSULATION SHALL BE TYPE THWN-2 OR XHHW AND INSTALLED IN ELECTRICAL METALLIC TUBING (EMT), FLEXIBLE METAL CONDUIT(FMC), LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC), LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT (LFNC). TYPE SE, NM, AND MC CABLE ASSEMBLIES SHALL ALSO BE PERMITTED. ADDITIONAL WIRING METHODS SHALL BE PERMITTED ONLY WHEN IN COMPLIANCE WITH ALL NEC REQUIREMENTS.
6. BURIED WIRING CONDUCTOR INSULATION SHALL BE RATED FOR DIRECT BURIAL WHEN INSTALLED OUTSIDE OF RACEWAY. CONDUCTOR INSULATION SHALL BE TYPE THWN-2 OR XHHW AND INSTALLED IN RIGID PVC, RIGID METALLIC CONDUIT, OR HDPE. ADDITIONAL WIRING METHODS SHALL BE PERMITTED ONLY WHEN IN COMPLIANCE WITH ALL NEC REQUIREMENTS.
7. USE SCHEDULE 40 PVC OUTDOORS WHERE NOT SUBJECT TO PHYSICAL DAMAGE OR BELOW FLOOR SLAB. USE SCHEDULE 80 PVC OUTDOORS WHERE SUBJECT TO PHYSICAL DAMAGE
8. MINIMUM CONDUIT SIZE TO BE 1/2".
9. WIRING METHODS TO CONFORM TO CHAPTER 3 OF THE 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
4. FUSES 0 - 600 AMPS SHALL BE UL CLASS "RK-1" LOW PEAK DUAL ELEMENT TIME DELAY WITH 200,000 AMPERE INTERRUPTING RATING A, UNLESS NOTED OTHERWISE.
5. ALL TERMINALS, SPLICING CONNECTORS, LUGS, ETC SHALL BE IDENTIFIED FOR USE WITH THE MATERIAL (CU/AL) OF THE CONDUCTOR AND SHALL BE PROPERLY INSTALLED.
6. ALL PENETRATIONS THROUGH EXTERIOR ROOFS SHALL BE FLASHED IN A WATERPROOF MANNER.
7. ALL PENETRATIONS THROUGH ATTIC FIRE BARRIERS SHALL BE SEALED WITH FIRE-BARRIER SEALANT CAULK.
8. SUPPORT ALL CONDUIT AND EQUIPMENT IN ACCORDANCE W/ NEC. ANY SUSPENDED MATERIALS SHALL BE DIRECTLY SUPPORTED BY THE BUILDING STRUCTURE.
9. 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:
  - THE WEIGHT OF THE PV SYSTEM EXCEEDS THREE (3) POUNDS PER SQUARE FOOT(PSF)
  - THE ROOF POSSESSES MORE THAN ONE (1) LAYER OF ASPHALT SHINGLES
  - THE ROOFING MATERIAL CONSISTS OF A TYPE OTHER THAN ASPHALT SHINGLES OR METAL
  - THE ROOF IS LOCATED IN A 140 MPH OR GREATER WIND ZONE



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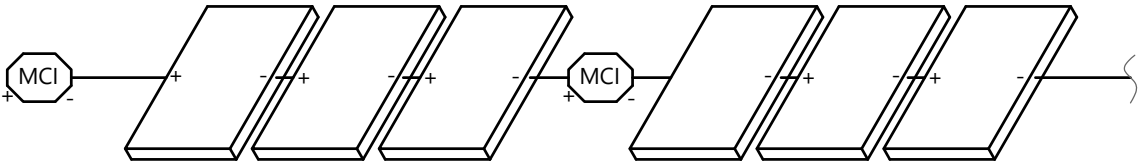
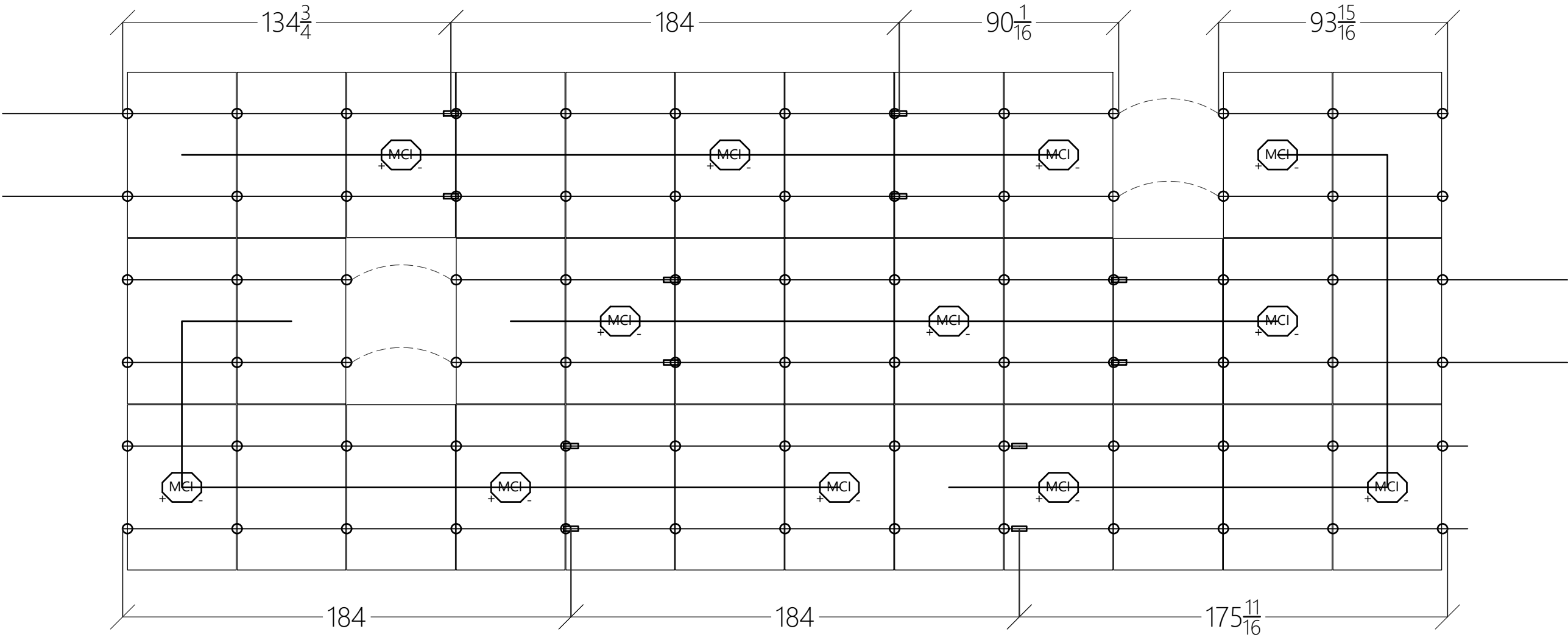
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PV SYSTEM EQUIPMENT LABELS

PV-4.1



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1 ARRAY LAYOUT DETAIL  
NOT TO SCALE

2 STRING WIRING + MCI DETAIL  
NOT TO SCALE



CLIENT INFO	
DANIELLE N DODSON 56 HAZEL SUE LN FUQUAY VARINA NC 27526	
PROJECT INFO	
DC INPUT:	14.620 kW
AC OUTPUT:	23.000 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	
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	06/09/2025

PV SYSTEM INSTALL  
GUIDE

PV-5.1



# NEW QB2

NO  
LIFTING  
SHINGLES

NO  
REMOVING  
NAILS

SEALANT IS  
NOW YOUR  
CHOICE

FOR ASPHALT, TPO, & EPDM ROOFS

## LAYERS OF PROTECTION

### OPTIONAL SEALANT

We recommend that sealant is inserted into the predrilled hole to fill the penetration and ensure that the Microflashing® adheres completely to the roof.

### MICROFLASHING®

Our innovative Microflashing® is placed over the predrilled hole to flash the penetration.

### QB2 SHOULDER

The shoulder of the QB2 compresses the Microflashing® to create a leak-proof seal and acts like a cork to plug the hole.

THE FASTEST, SIMPLEST,  
MOST EFFICIENT QUICKBOLT

## ERROR-PROOF COMPRESSION

The QB2 doesn't leave any room for user error when it comes to Microflashing® compression. Once the Dual Drive Shoulder Screw is secured, the Microflashing® is compressed!

## ONLY 3 COMPONENTS

The QB2 is comprised of Microflashing®, an L-Foot, and a Dual Drive Shoulder Screw. No more Nuts needed to tighten and secure the L-Foot! Not only does this simplify the installation process, it also cuts down the installation time!

## DUAL DRIVE

The new Dual Drive Shoulder Screw design can be driven using a standard ½" Hex Nut Setter or a 6mm Hex Driver. Installers can use the drive that works best with the rest of the components of their array.

## INDEPENDENT LAB TEST RESULTS

ASTM E331 (modified)	Water pressure test at 15psf for 120 minutes	NO LEAKAGE
ASTM E2140	Static water pressure test in 6" water column for 7 days	NO LEAKAGE
BOTH TESTS PASSED WITH AND WITHOUT SEALANT		

Complete Test Results available online in the AHJ Packets  
Patent# 8448407



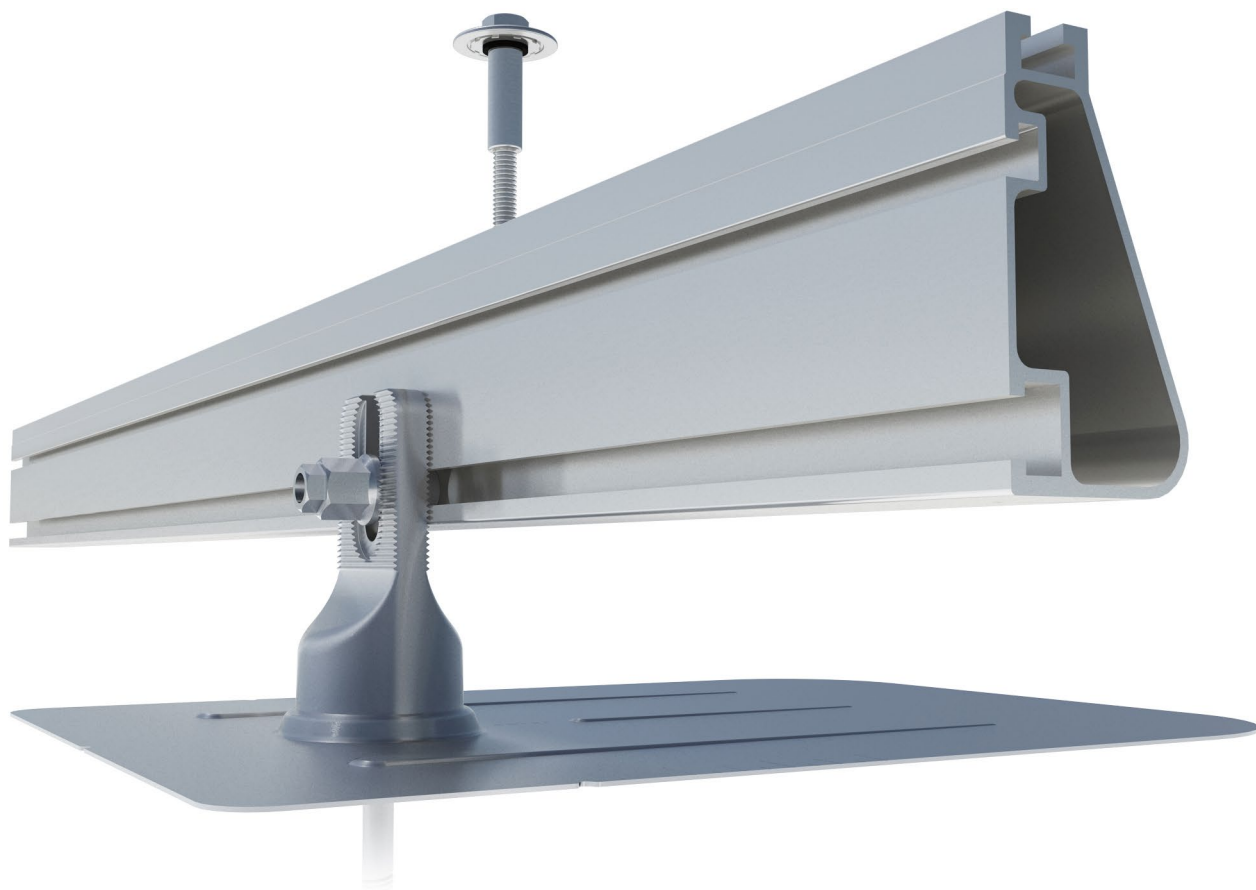
3" QB2: PN 17662 | 4" QB2: PN 17663

**QUICKBOLT.COM**  
(844) 671-6045 • MON-FRI: 7AM-5PM PST





## Flush Mount System



### Built for solar's toughest roofs.

IronRidge builds the strongest mounting system for pitched roofs in solar. Every component has been tested to the limit and proven in extreme environments.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 20-year warranty.



#### Strength Tested

All components evaluated for superior structural performance.



#### PE Certified

Pre-stamped engineering letters available in most states.



#### Class A Fire Rating

Certified to maintain the fire resistance rating of the existing roof.



#### Design Assistant

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



#### UL 2703 Listed System

Entire system and components meet newest effective UL 2703 standard.



#### 25-Year Warranty

Products guaranteed to be free of impairing defects.



## XR Rails ☺

### XR10 Rail



A low-profile mounting rail for regions with light snow.

- 6' spanning capability
- Moderate load capability
- Clear and black finish

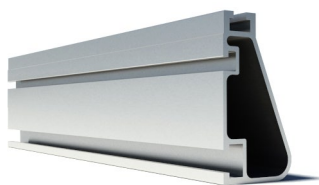
### XR100 Rail



The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear and black finish

### XR1000 Rail



A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

### Bonded Splices



All rails use internal splices for seamless connections.

- Self-drilling screws
- Varying versions for rails
- Forms secure bonding

## Clamps & Grounding ☺

### UFOs



Universal Fastening Objects bond modules to rails.

- Fully assembled & lubed
- Single, universal size
- Clear and black finish

### Stopper Sleeves



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

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

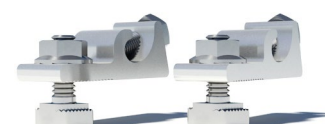
### CAMO



Bond modules to rails while staying completely hidden.

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

### Grounding Lugs



Connect arrays to equipment ground.

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

## Attachments ☺

### FlashFoot2



Flash and mount XR Rails with superior waterproofing.

- Twist-on Cap eases install
- Wind-driven rain tested
- Mill and black finish

### Conduit Mount



Flash and mount conduit, strut, or junction boxes.

- Twist-on Cap eases install
- Wind-driven rain tested
- Secures 3/4" or 1" conduit

### Slotted L-Feet



Drop-in design for rapid rail attachment.

- Secure rail connections
- Slot for vertical adjusting
- Clear and black finish

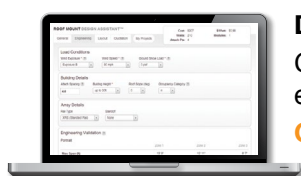
### Bonding Hardware



Bond and attach XR Rails to roof attachments.

- T & Square Bolt options
- Nut uses 7/16" socket
- Assembled and lubricated

## Resources



### Design Assistant

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

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



### NABCEP Certified Training

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

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

# 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  $I_{SC}$ .

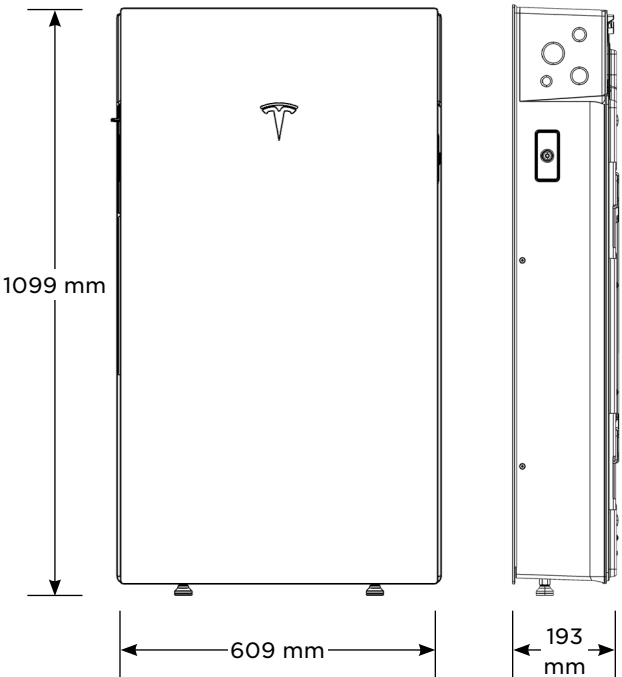
# Powerwall 3 Technical Specifications

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) IPX5 (Wiring Compartment)
	Pollution Rating	PD3
	Operating Noise @ 1 m	< 50 db(A) typical < 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	Model	MCI-1	MCI-2
	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 (-40°F to 122°F)	-45°C to 70°C (-49°F to 158°F)
	Storage Temperature	-30°C to 70°C (-22°F to 158°F)	-30°C to 70°C (-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 (5 x 6 x 1 in)	173 x 45 x 22 mm (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 M4 Screw (#10) M8 Bolt (5/16") Nail / Wood screw	Wire Clip
Compliance Information	Certifications	UL 1741 PVRSE, UL 3741, PVRSA (Photovoltaic Rapid Shutdown Array)	
	RSD Initiation Method	External System Shutdown Switch or 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>

# Gateway 3

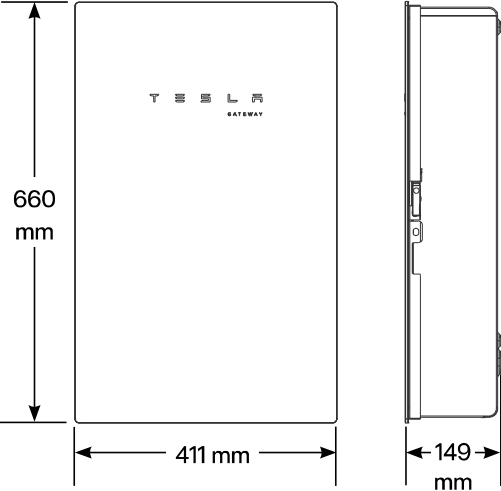
Tesla Gateway 3 controls connection to the grid in a Powerwall system, automatically detecting outages and providing seamless transition to backup power. It provides energy monitoring that is used by Powerwall for solar self-consumption, time-based control, and backup operation.

Performance Specifications	Model Number	1841000-x1-y	AC Meter	+/- 0.5%
	Nominal Grid Voltage	120/240 V AC	Communication	CAN
	Grid Configuration	Split phase	User Interface	Tesla App
	Grid Frequency	60 Hz	Backup Transition	Automatic disconnect for seamless backup
	Continuous Current Rating	200 A	Overcurrent Protection Device	100–200 A Service entrance rated Eaton CSR, BWH, or BW, or Square D QOM breakers
	Maximum Supply Short Circuit Current	22 kA with Square D or Eaton main breaker 25 kA with Eaton main breaker <sup>11</sup>	Internal Panelboard	200 A 8-space/16 circuit breakers Eaton BR, Siemens QP, or Square D HOM breakers rated to 10–125A
	IEC Protective Class	Class I	Warranty	10 years
	Overvoltage Category	Category IV		
<sup>11</sup> Only Eaton CSR or BWH main breakers are 25 kA rated.				

Environmental Specifications	Operating Temperature	–20°C to 50°C (–4°F to 122°F)
	Operating Humidity (RH)	Up to 100%, condensing
	Maximum Elevation	3000 m (9843 ft)
	Environment	Indoor and outdoor rated
	Enclosure Type	NEMA 3R

Compliance Information	Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS, CSA 22.2 107.1, CSA 22.2 29
	Emissions	FCC Part 15, Class B, ICES 003

Mechanical Specifications	Dimensions	660 x 411 x 149 mm (26 x 16 x 6 in)
	Weight	16.3 kg (36 lb)
	Mounting options	Wall mount

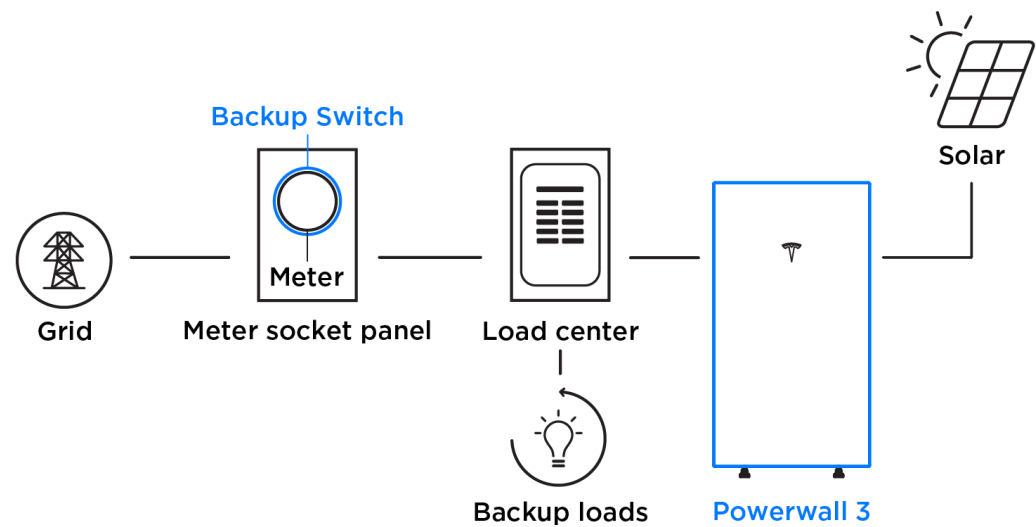




# Powerwall 3 Example System Configurations

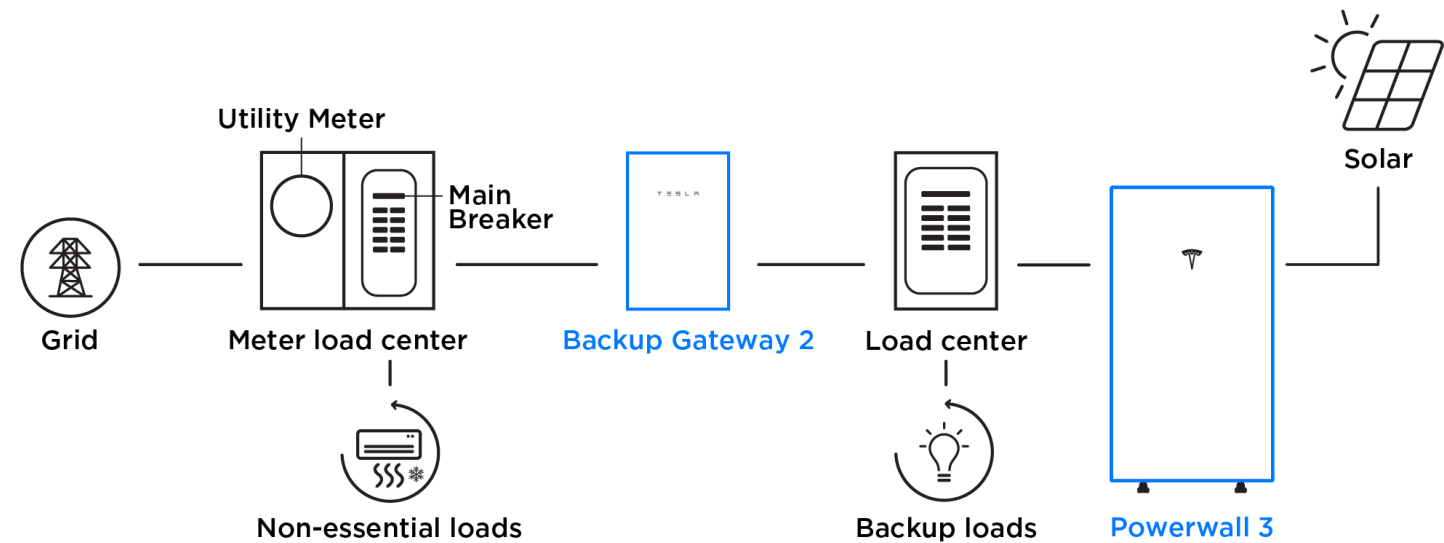
## Powerwall 3 with Backup Switch

Whole Home Backup



## Powerwall 3 with Backup Gateway 2

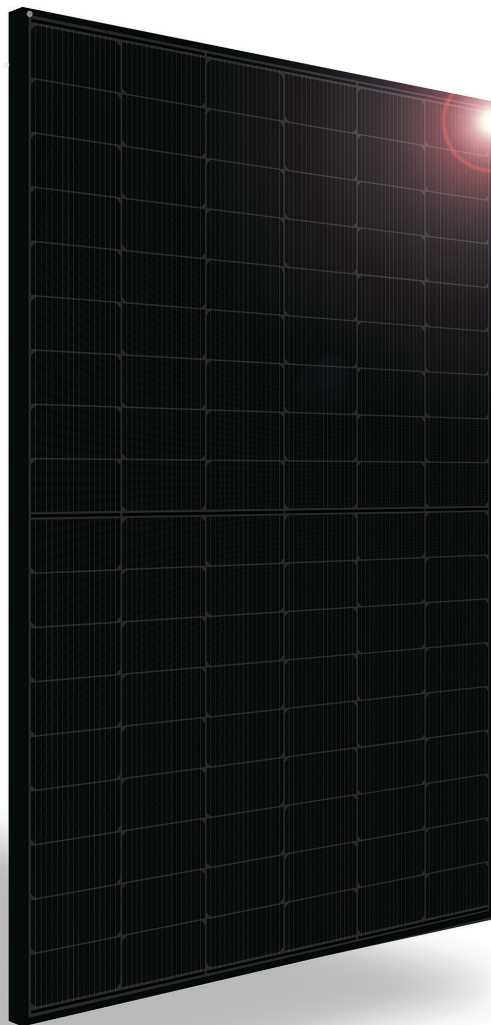
Partial Home Backup



**SILFAB**  
PRIME **NTC**

SIL-420/430 QD

**SILFAB**  
SOLAR®



## INTRODUCING NEXT-GENERATION N-TYPE CELL TECHNOLOGY

- Improved Shade Tolerance
- Improved Low-Light Performance
- Increased Performance in High Temperatures
- Enhanced Durability
- Reduced Degradation Rate
- Industry-Leading Warranty



[SILFABSOLAR.COM](http://SILFABSOLAR.COM)





ELECTRICAL SPECIFICATIONS		420		430	
Test Conditions		STC	NOCT	STC	NOCT
Module Power (Pmax)	Wp	420	313	430	321
Maximum power voltage (Vpmax)	V	33.08	30.86	33.25	31.02
Maximum power current (Ipmax)	A	12.70	10.15	12.93	10.33
Open circuit voltage (Voc)	V	38.84	36.52	38.91	36.58
Short circuit current (Isc)	A	13.50	10.85	13.87	11.15
Module efficiency	%	21.5%	20.1%	22.1%	20.6%
Maximum system voltage (VDC)	V	1000			
Series fuse rating	A	25			
Power Tolerance	Wp	0 to +10			

Measurement conditions: STC 1000 W/m<sup>2</sup> • AM 1.5 • Temperature 25 °C • NOCT 800 W/m<sup>2</sup> • AM 1.5 • Measurement uncertainty ≤ 3%  
Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by 0 to +10 W.

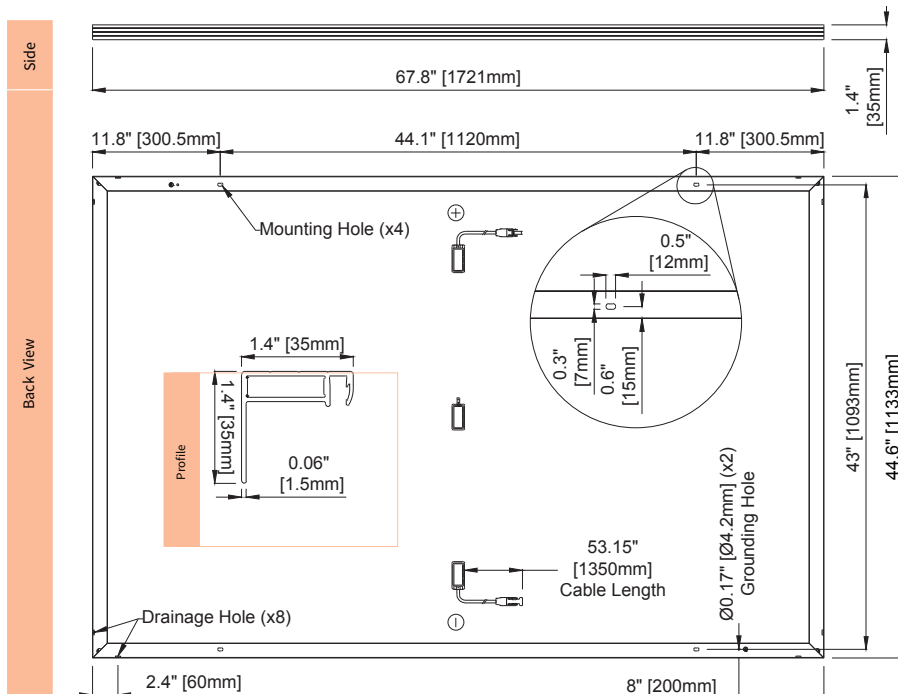
MECHANICAL PROPERTIES / COMPONENTS	METRIC	IMPERIAL
Module weight	21 kg ± 0.2 kg	46.3 lbs ± 0.4 lbs
Dimensions (H x L x D)	1721 mm x 1133 mm x 35 mm	67.8 in x 44.6 in x 1.37 in
Maximum surface load (wind/snow)*	4000 Pa rear load / 5400 Pa front load	83.5 lb/ft <sup>2</sup> rear load / 112.8 lb/ft <sup>2</sup> front load
Hail impact resistance	ø 25 mm at 83 km/h	ø 1 in at 51.6 mph
Cells	108 Half cells - N-Type Silicon solar cell 182 mm x 91 mm	108 Half cells - N-Type Silicon solar cell 7.16 in x 3.58 in
Glass	3.2 mm high transmittance, tempered, antireflective coating	0.126 in high transmittance, tempered, antireflective coating
Cables and connectors (refer to installation manual)	1350 mm, ø 5.7 mm, MC4 from Staubli	53.1 in, ø 0.22 in (12 AWG), MC4 from Staubli
Backsheet	High durability, superior hydrolysis and UV resistance, multi-layer dielectric film, fluorine-free PV backsheet	
Frame	Anodized aluminum (Black)	
Junction Box	UL 3730 Certified, IEC 62790 Certified, IP68 rated, 3 diodes	

TEMPERATURE RATINGS		WARRANTIES	
Temperature Coefficient Isc	0.04 %/°C	Module product workmanship warranty	25 years**
Temperature Coefficient Voc	-0.24 %/°C	Linear power performance guarantee	30 years
Temperature Coefficient Pmax	-0.29 %/°C		≥ 98% end 1st yr
NOCT (± 2 °C)	45 °C		≥ 94.7% end 12th yr
Operating temperature	-40/+85 °C		≥ 90.8% end 25th yr ≥ 89.3% end 30th yr

CERTIFICATIONS		SHIPPING SPECS	
Product	UL 61215, UL 61730, CSA C22.2#61730, IEC 61215, IEC 61730, IEC 61701 (Salt Mist Corrosion), IEC 62716 (Ammonia Corrosion), CEC Listed, UL Fire Rating: Type 2	Modules Per Pallet:	26 or 26 (California)
		Pallets Per Truck	32 or 30 (California)
Factory	ISO9001:2015	Modules Per Truck	832 or 780 (California)

\* ⚠ Warning. Read the Safety and Installation Manual for mounting specifications and before handling, installing and operating modules.

\*\* 12 year extendable to 25 years subject to registration and conditions outlined under "Warranty" at [silfabsolar.com](https://silfabsolar.com).  
PAN files generated from 3rd party performance data are available for download at: [silfabsolar.com/downloads](https://silfabsolar.com/downloads).



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**Silfab - SIL-420/430-QD-20240227**

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# Product data sheet

Specifications



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 AWG 14...AWG 3 copper
Tightening torque	35 lbf.in (3.95 N.m) 0.00...0.01 in² (2.08...5.26 mm²) (AWG 14...AWG 10) 35 lbf.in (3.95 N.m) (AWG 14...AWG 10) 45 lbf.in (5.08 N.m) 0.01 in² (8.37 mm²) (AWG 8) 45 lbf.in (5.08 N.m) 0.02...0.03 in² (12.3...21.12 mm²) (AWG 6...AWG 4) 50 lbf.in (5.65 N.m) 0.04 in² (26.67 mm²) (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.

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications



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

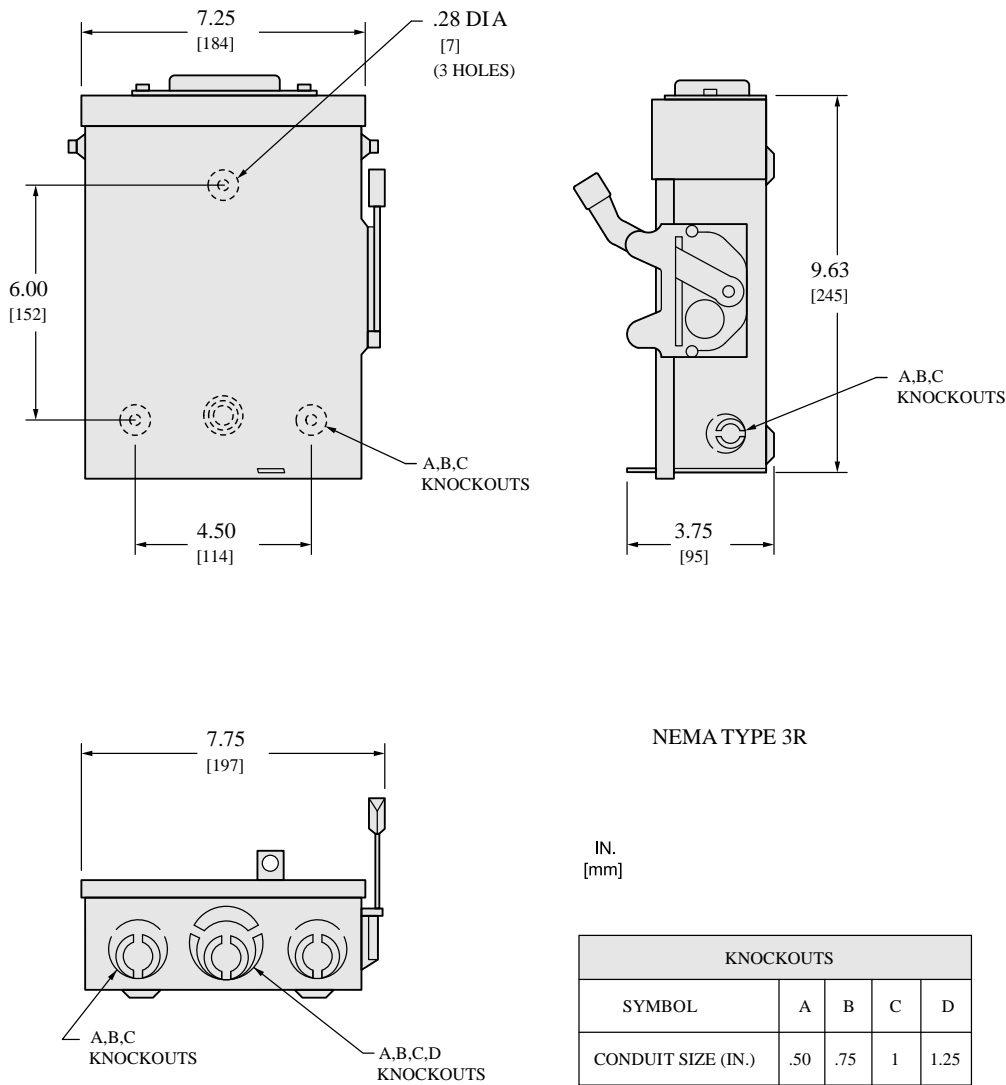
Sustainable offer status	Green Premium product
California proposition 65	WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov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

Warranty	18 months
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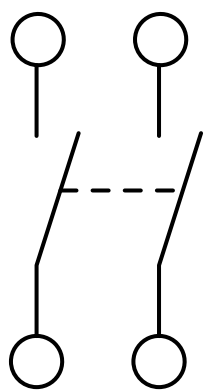
Dimensions



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

Wiring Diagram

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DU222RB

Recommended replacement(s)

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**

