## PHOTOVOLTAIC ROOF MOUNT SYSTEM

### CODE AND STANDARDS

THE INSTALLATION OF SOLAR ARRAYS AND PHOTOVOLTAIC POWER SYSTEMS SHALL COMPLY WITH THE FOLLOWING CODES:

- 2020 NATIONAL ELECTRICAL CODE
- 2018 NORTH CAROLINA RESIDENTIAL CODE
- 2018 NORTH CAROLINA BUILDING CODE
- ALL OTHER ORDINANCE ADOPTED BY THE LOCAL GOVERNING AGENCIES

### SITE NOTES / OSHA REGULATION

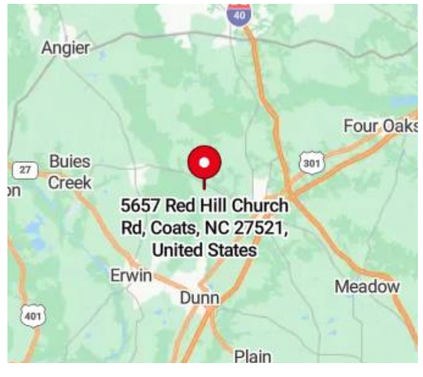
1. A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
2. THE SOLAR PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
3. ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED AND IDENTIFIED BY RECOGNIZED ELECTRICAL TESTING LABORATORY.
4. MODULES AND SUPPORT STRUCTURES SHALL BE GROUNDED
5. SOLAR INVERTER SHALL BE LISTED TO UL1741
6. ALL CONDUCTORS SHALL BE COPPER AND SHOULD BE 75 AND 90 DEG RATED
7. REMOVAL OF AN INTERACTIVE INVERTER OR OTHER EQUIPMENT SHALL NOT DISCONNECT THE BONDING CONNECTION BETWEEN THE GROUNDING ELECTRODE CONDUCTOR, THE PHOTOVOLTAIC SOURCE AND OUTPUT CIRCUIT GROUNDED CONDUCTORS.
8. LIVE PARTS OF PV SOURCE CIRCUITS AND PV OUTPUT CIRCUITS OVER 150V TO GROUND SHALL NOT BE ACCESSIBLE TO OTHER THAN QUALIFIED PERSONS WHILE ENERGIZED.
9. ALL PV MODULES AND ASSOCIATED EQUIPMENT AND WIRING SHALL BE PROTECTED FROM PHYSICAL DAMAGE.

### SOLAR CONTRACTOR

1. MODULE CERTIFICATIONS INCLUDE UL1703, IEC61646, IEC61370.
2. IF APPLICABLE, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE MARKED GROUNDING LUG HOLES PER THE MANUFACTURERS INSTALLATION REQUIREMENTS.
3. AS INDICATED BY DESIGN, OTHER NRTL LISTED MODULE GROUNDING DEVICES MAY BE USED IN PLACE OF STANDARD GROUNDING LUGS AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ.
4. ALL MICROINVERTERS, PHOTOVOLTAIC MODULES, AC COMBINERS, DC-AC CONVERTERS AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER NEC690.4(B).
5. ALL SIGNAGE TO BE INSTALLED IN ACCORDANCE WITH LOCAL BUILDING CODE.
6. TERMINALS AND LUGS WILL BE TIGHTENED TO MANUFACTURER TORQUE SPECIFICATIONS (WHEN PROVIDED) IN ACCORDANCE WITH NEC CODE 110.14(D) ON ALL ELECTRICAL CONNECTIONS.
7. MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC UNLESS NOT AVAILABLE.

| SR.# | PROJECT INFORMATION | |
|---|---|---|
| 1 | PV MODULES | 30 x Q.TRON BLK M-G2+ 425W |
| 2 | INVERTER + BATTERY | 01 X POWERWALL3 |
| 3 | ROOF TYPE | ASPHALT SHINGLES |
| 4 | RACKING | PSR-B84 RAILS (BLACK) |
| 5 | MOUNTING TYPE | COMP MOUNT FLASHING (BLACK) |
| 6 | DC SIZE | 12.75 KW |
| 7 | AC SIZE | 11.5 KVA |

| SR.# | PROJECT INFORMATION | |
|---|---|---|
| 1 | PV1 | DRAWING INDEX |
| 2 | PV2 | SITE LAYOUT |
| 3 | PV3 | STRING MAPPING |
| 4 | PV4 | ELECTRICAL ONE LINE DIAGRAM |
| 5 | PV5 | DETAILED ELECTRICAL WIRING SCHEMATIC |
| 6 | PV6 | PV LABELS |
| 7 | PV7 | BILL OF MATERIALS |
| 8 | PV8 | ATTACHMENT DETAILS |




**VICINITY MAP**

**TOP VIEW OF THE BUILDING**

**DESIGN CRITERIA**
**WIND SPEED:** 120 MPH
**GROUND SNOW LOAD:** 15 PSF
**WIND EXPOSURE FACTOR:** B

**UTILITY COMPANY:**
DUKE ENERGY

**PERMIT ISSUER (AHJ):**
HARNETT COUNTY

**SCOPE OF WORK**
INSTALLATION OF UTILITY INTERACTIVE PHOTOVOLTAIC SOLAR SYSTEM.


8MSOLAR
ADVANCING ENERGY INDEPENDENCE

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**Customer Information:**

**Trevor Johnson**

5657 Red Hill Church
Road Coats NC 27521

**Customer Signature:**

**Sheet Name:**

Drawing Index

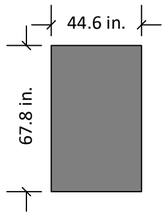
**JOB NUMBER:**

24-365-LWTJ

| Date: | Revision: |
|---|---|
| 07/09/2024 | A |
| **Sheet Size:** ANSI C 17" X 22" | **Sheet Number:** PV1 |

NABCEP CERTIFIED
PV Installation Professional
Ali Buttar
PVIP #031310-32

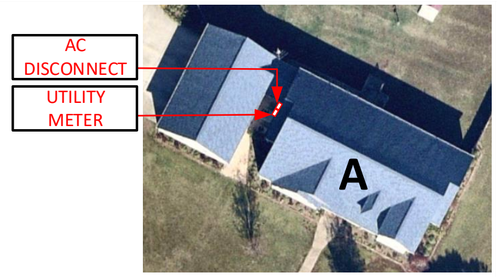
| ROOF DESCRIPTION | | | |
|---|---|---|---|
| ROOF | PITCH | AZIMUTH | NO. OF MODULES |
| A | 38° | 207° | 30 |
| | | | |
| | | | |
| | | | |

| MODULE DIMENSIONS |
|---|
|  |



**PV System Dead Load**
**(Panel + Racking weight) / PV System Area**
(No. of panels x Weight of panel(lbs.) +Length of racking(ft.) x 1.15 lb.ft) /
(No. of panels x Height x Width) = Total psf

| | | | | |
|---|---|---|---|---|
| ROOF | A | | | |
| DEAD LOAD (PSF) | 2.87 | | | |

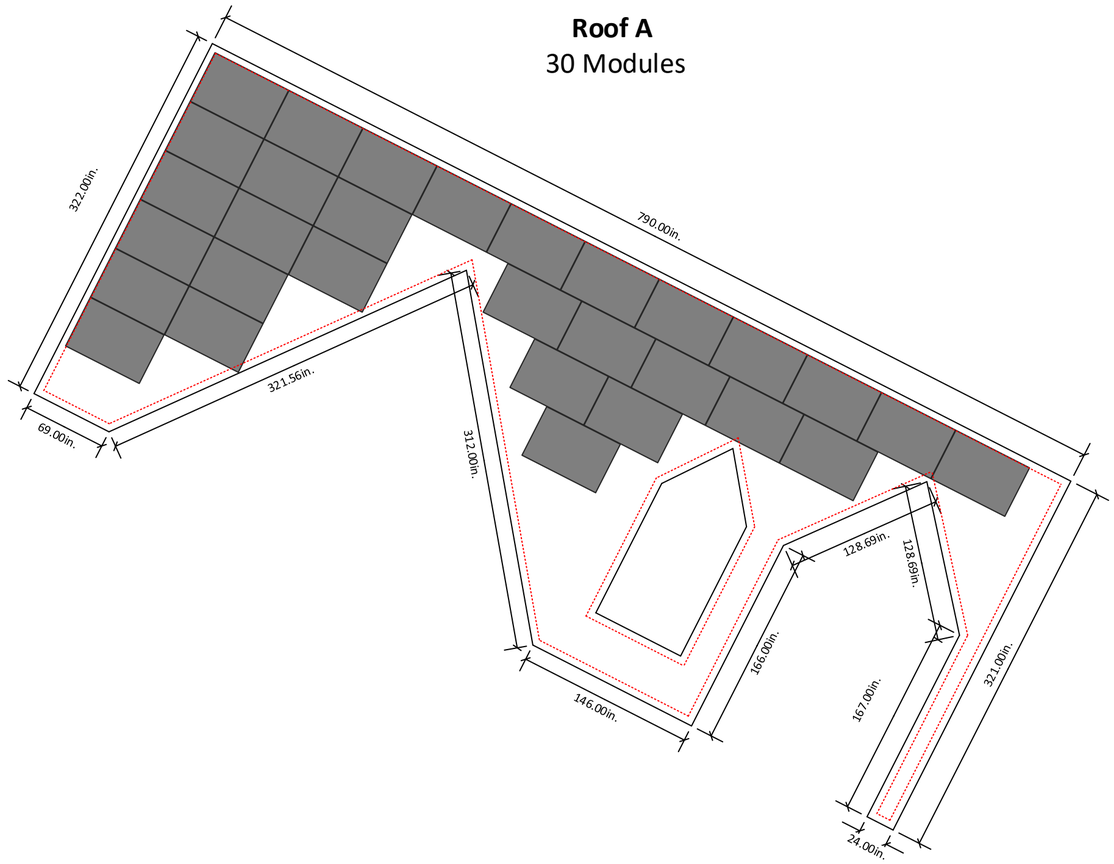



| | | |
|---|---|---|
| Vent | ■ | • Roof A has no vent.<br>• No vents will be covered by PV modules during the installation |

**SYSTEM DETAILS**

NUMBER OF PANELS : 30
PANELS MODEL : Q.TRON BLK M-G2+ 425W
DC SIZE : 12.75 KW
AC SIZE : 11.5 KVA

**Roof A**
30 Modules




6in setback from sides of the roof

SITE LAYOUT
SCALE: 1/8" - 1'

N

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**Sheet Name:**

Site Layout

**JOB NUMBER:**

24-365-LWTJ

| Date: | Revision: |
|---|---|
| 07/09/2024 | A |

| Sheet Size: | Sheet Number: |
|---|---|
| ANSI C<br>17" X 22" | PV2 |

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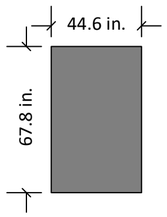
PV Installation Professional
Ali Buttar
PVIP #031310-32

| ROOF DESCRIPTION | | | |
|---|---|---|---|
| ROOF | PITCH | AZIMUTH | NO. OF MODULES |
| A | 38° | 207° | 30 |
| | | | |
| | | | |
| | | | |
| Tesla MCI (Mid Circuit Interrupter) | | | |

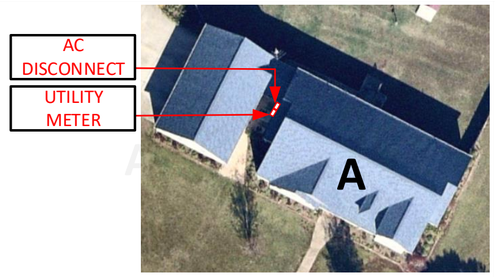
**MODULE DIMENSIONS**




**STRING LAYOUT**

TESLA POWERWALL3

| Strings # | No. of Modules | Color | Strings # | No. of Modules | Color |
|---|---|---|---|---|---|
| **String 1** | 09 | | **String 4** | 03 | |
| **String 2** | 09 | | | | |
| **String 3** | 09 | | | | |




**SYSTEM DETAILS**

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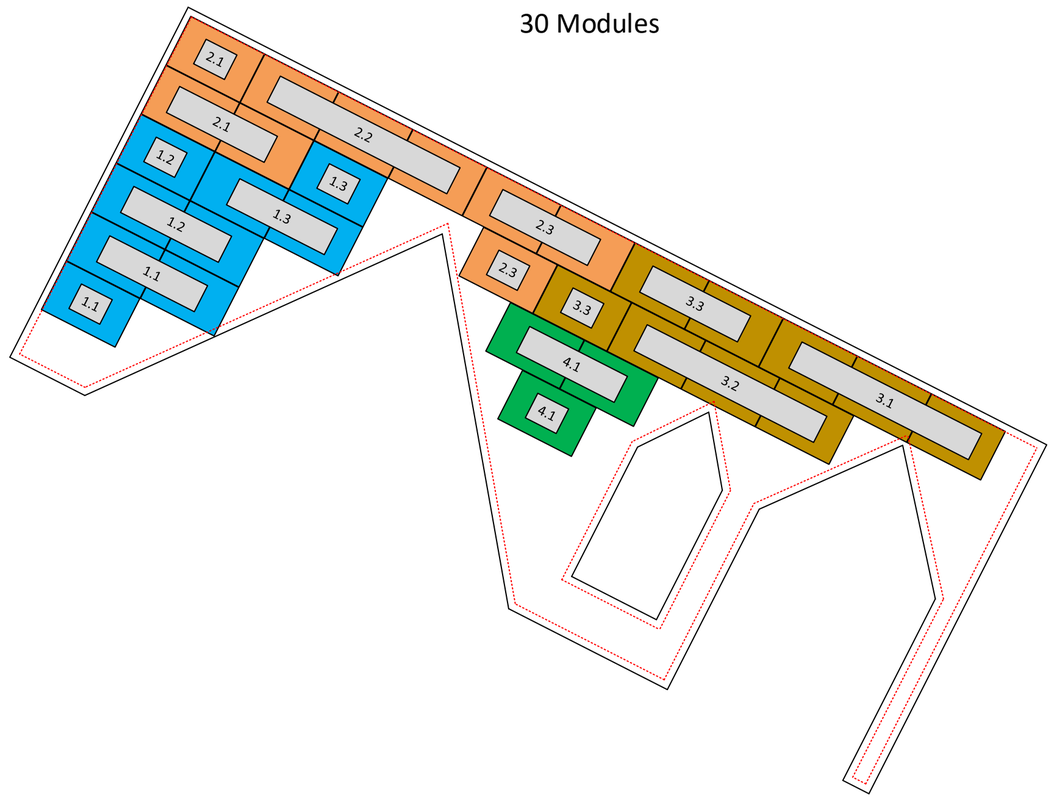
PANELS MODEL : Q.TRON BLK M-G2+ 425W
DC SIZE : 12.75 KW
AC SIZE : 11.5 KVA

**Roof A**
30 Modules




6in setback from sides of the roof

STRING MAPPING
SCALE: 1/8" - 1'

N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**Sheet Name:**

String Mapping

**JOB NUMBER:**

24-365-LWTJ

| Date: | Revision: |
|---|---|
| 07/09/2024 | A |
| **Sheet Size:** ANSI C 17" X 22" | **Sheet Number:** PV3 |

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PV Installation Professional
Ali Buttar
PVIP #031310-32

## STRING CALCULATION

| String # | No of Modules | Estimated Power | Imax | Impp | Voc | Vmpp |
|---|---|---|---|---|---|---|
| 1,2,3 | 09 | 3,825 W | 20.24 Adc | 12.98 Adc | 351.27 Vdc | 550 Vdc |
| 4 | 03 | 1,275 W | 20.24 Adc | 12.98 Adc | 117.09 Vdc | 550 Vdc |
| | | | | | | |
| | | | | | | |

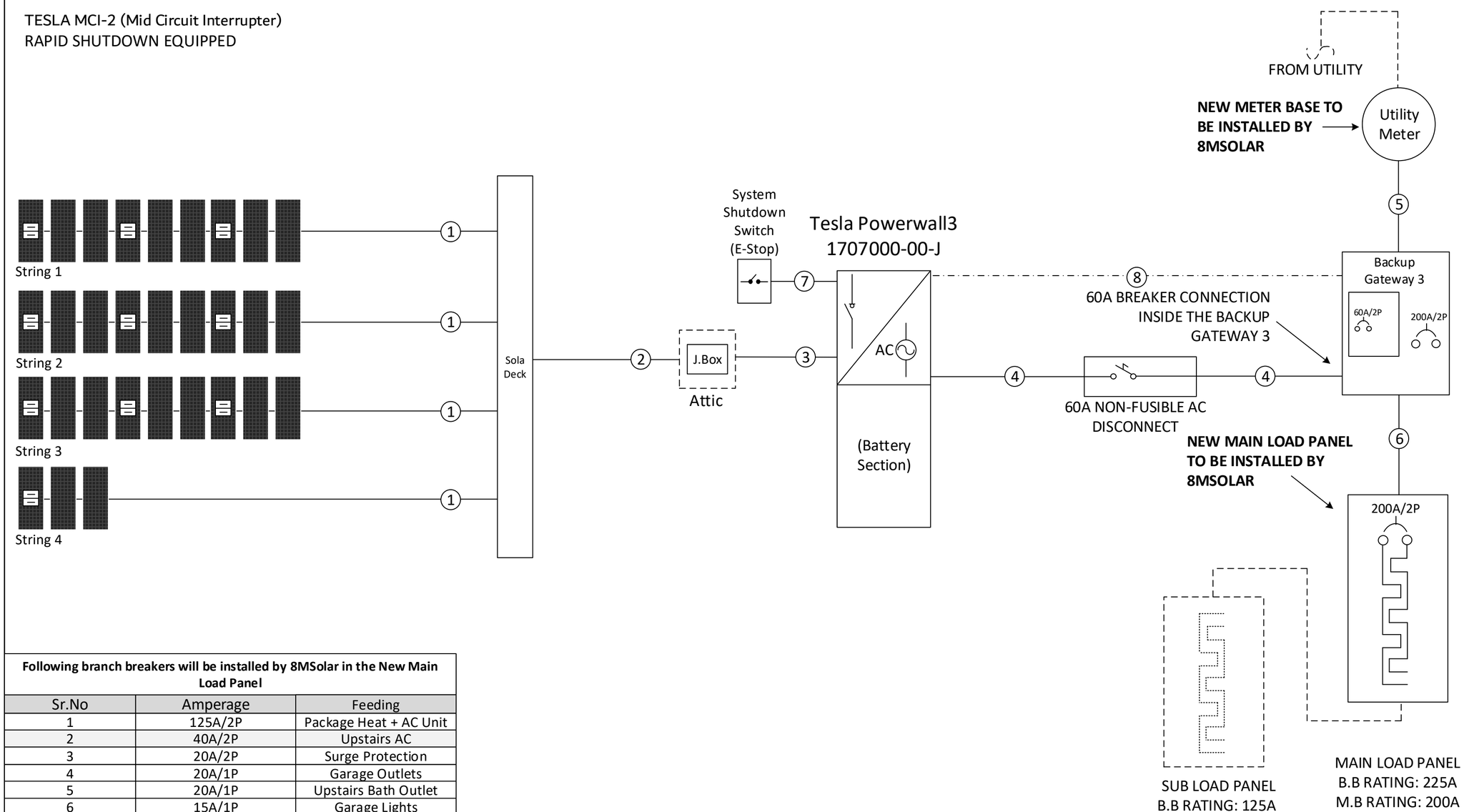
## NEC Code (2020) and UL Standard Refrences

| | | | |
|---|---|---|---|
| Rapid Shut Down | NEC 690.12 (A-D), UL1741 | Grounding | NEC Article 250.30(A) |
| Disconnecting Means | NEC 690.13 | Conduit Fill | NEC Table C.9, 310.15(B)(3)(a) |
| Feeder Sizing | NEC Table 310, 15(B)(16, 17) | Interconnection | NEC 705.12 |
| Over current Protection | NEC 690.9 | | |

Service Side Work: Power Drop Required

30 X Q.TRON BLK M-G2+ 425W
425W

TESLA MCI-2 (Mid Circuit Interrupter)
RAPID SHUTDOWN EQUIPPED




**Following branch breakers will be installed by 8MSolar in the New Main Load Panel**

| Sr.No | Amperage | Feeding |
|---|---|---|
| 1 | 125A/2P | Package Heat + AC Unit |
| 2 | 40A/2P | Upstairs AC |
| 3 | 20A/2P | Surge Protection |
| 4 | 20A/1P | Garage Outlets |
| 5 | 20A/1P | Upstairs Bath Outlet |
| 6 | 15A/1P | Garage Lights |
| 7 | 15A/1P | Upstairs Lights |

- System Size: 12,750W DC
- Battery Total Energy: 13.5 KWh
- (30) Q.TRON BLK M-G2+ 425W
- (10) 1879359-00-X: Tesla MCI-2
- (01) Tesla Powerwall3 (1707000-00-J)
- Inverter Output: 48A max @ 240 VAC (each)
- 11.5 kVA AC output max

- Grounding will be done via Pegasus grounding lugs and mid-clamps to ensure the rail and panels are continuously grounded.
- Rapid Shutdown is included in the Mid Circuit Interrupter , refer to Mid Circuit Interrupter and Inverter attached datasheets.
- The load center/disconnect will be visible, lockable, accessible to utility linesmen, and properly labeled per NEC requirements. It will be located on the exterior wall next to the utility meter.
- Prepare cable in usual manner.
- Stretch tape and apply half-lapped to form void-free joint. Degree of stretch is not critical and may vary in different sections of joint to accomplish void-free application.
- Protect the joint with two half-lapped layers of any scotch vinyl plastic electrical tape.

| Sr.No | #Wire | Conduit Size | Ground Wire | Amperage |
|---|---|---|---|---|
| 1 | 2 x #10 PV | | #10 Bare Cu | 20.24 |
| 2 | 4 x #10 MC Cable | | | 20.24 |
| 3 | 8 x #10 THHN Cu | 3/4” EMT | #10 Green Cu | 20.24 |
| 4 | 3 x #6 THHN Cu | 3/4” EMT | #6 Green Cu | 60 |
| 5 | 3 x #3/0 THHN Cu | 2” PVC | | 200 |
| 6 | 3 x #3/0 THHN Cu | 2” PVC | #6 Green Cu | 200 |
| 7 | 4-conductor shielded (1 twisted pair) 16 AWG | | | |
| 8 | 2 x #16 THHN Cu | 3/4” EMT | | |
| | | | | |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**Customer Signature:**

**Sheet Name:**

Electrical One Line Diagram

**JOB NUMBER:**

24-365-LWTJ

**Date:**

07/09/2024

**Revision:**

A

**Sheet Size:**

ANSI C
17" X 22"

**Sheet Number:**

PV4

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PV Installation Professional
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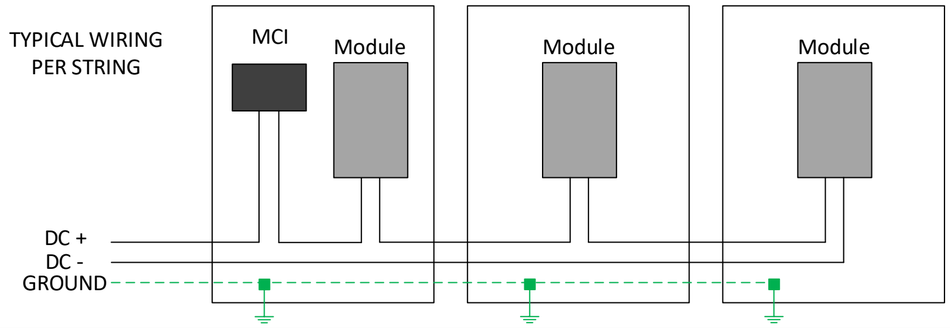
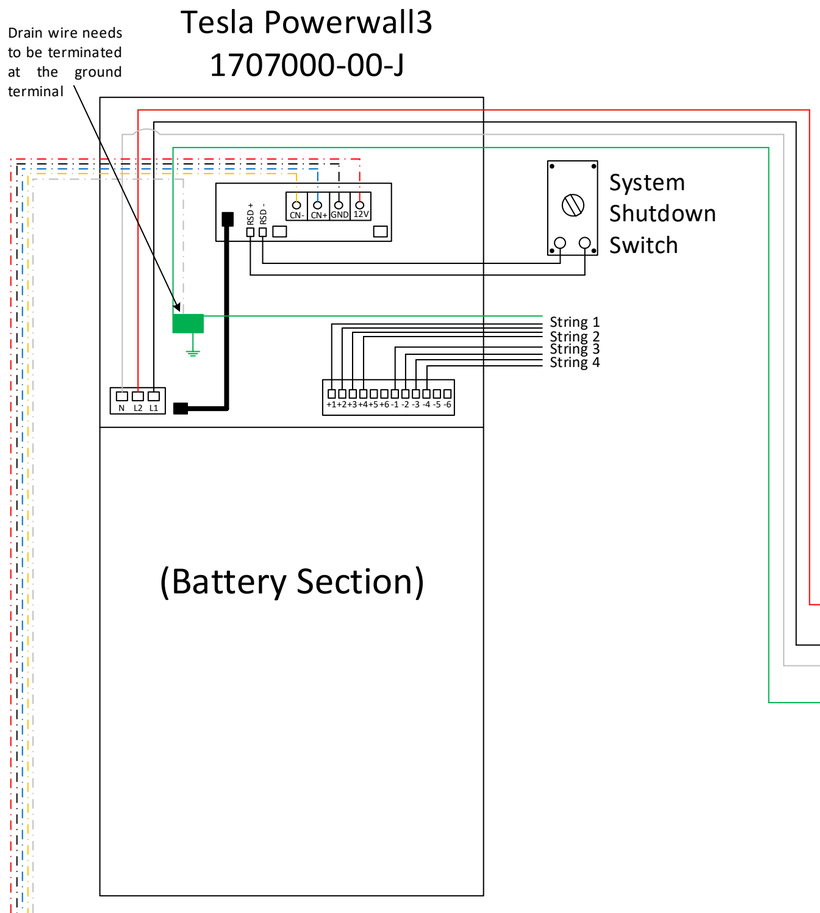
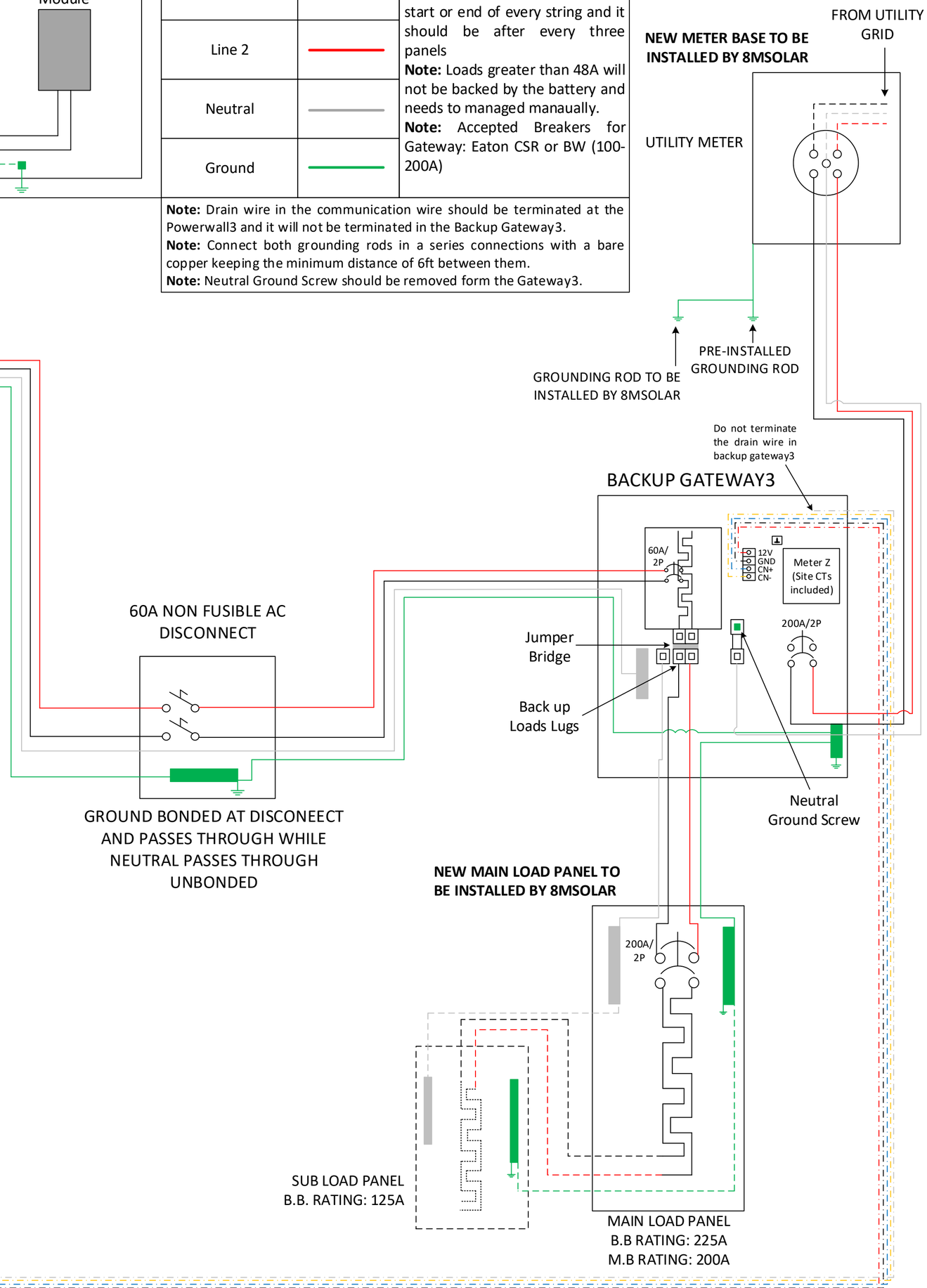



| | | |
|---|---|---|
| Line 1 | | **Note:** Tesla MCI should be at the start or end of every string and it should be after every three panels<br>**Note:** Loads greater than 48A will not be backed by the battery and needs to managed manaually.<br>**Note:** Accepted Breakers for Gateway: Eaton CSR or BW (100-200A) |
| Line 2 | | |
| Neutral | | |
| Ground | | |

**Note:** Drain wire in the communication wire should be terminated at the Powerwall3 and it will not be terminated in the Backup Gateway3.
**Note:** Connect both grounding rods in a series connections with a bare copper keeping the minimum distance of 6ft between them.
**Note:** Neutral Ground Screw should be removed form the Gateway3.

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Detailed Electrical Diagram

**JOB NUMBER:**

24-365-LWTJ

| **Date:** | **Revision:** |
|---|---|
| 07/09/2024 | A |
| **Sheet Size:** ANSI C 17" X 22" | **Sheet Number:** PV5 |

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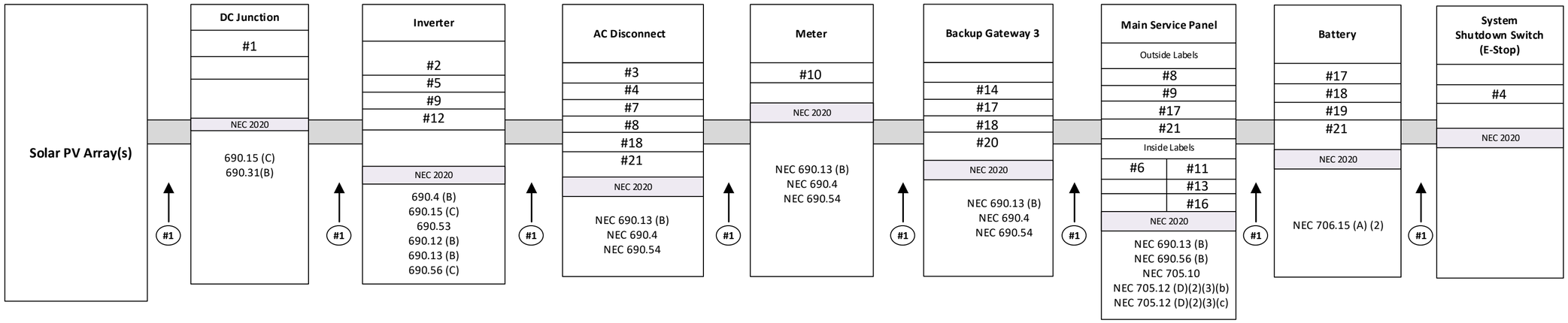


# LABELING AND WARNING SIGNS: NEC 2020

A. PURPOSE
PROVIDE EMERGENCY RESPONDERS WITH APPROPRIATE WARNING AND GUIDANCE WITH RESPECT TO ISOLATING THE SOLAR ELECTRIC SYSTEM. THIS CAN FACILITATE IDENTIFYING ENERGIZED ELECTRICAL LINES THAT CONNECT THE SOLAR PANELS TO THE INVERTER, AS SHOULD NOT BE CUT WHEN VENTING FOR SMOKE REMOVAL.

B. MAIN SERVICE DISCONNECT:

1. RESIDENTIAL BUILDINGS- THE MARKING MAY BE PLACED WITHIN THE MAIN SERVICE DISCONNECT. THE MARKING SHALL BE PLACED ON THE OUTSIDE COVER IF THE MAIN SERVICE DISCONNECT IS OPERABLE WITH THE SERVICE PANEL CLOSED.

2. COMMERCIAL BUILDINGS- THE MARKINGS SHALL BE PLACED ADJACENT TO THE MAIN SERVICE DISCONNECTCLEARLY VISIBLE FROM THE LOCATION WHERE THE LEVER IS OPERATED

3. MARKINGS, VERBIAGE, FORMAT AND TYPE OF MATERIAL

a. VERBIAGE: CAUTION; SOLAR ELECTRIC SYSTEM CONNECTED
b. FORMAT:

(1) WHITE LETTERING ON A RED BACKGROUND
(2) MINIMUM 3/8 INCH LETTER HEIGHT
(3) ALL LETTERS SHALL BE CAPITALIZED
(4) ARIAL OR SIMILAR FONT, NON-BOLD

c. MATERIAL:

(1) REFLECTIVE, WEATHER RESISTANT MATERIAL SUITABLE FOR THE ENVIRONMENT (USE UL-969) AS STANDARD FOR WEATHER RATING): DURABLE ADHESIVE MATERIALS MEET THIS REQUIREMENT.

C. MARKING REQUIREMENTS ON DC CONDUIT, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, DC COMBINERS AND JUNCTION BOXES;

1. MARKING: PLACEMENT, VERBIAGE, FORMAT AND TYPE OF MATERIAL.

a. PLACEMENT: MARKINGS SHALL BE PLACED EVERY 10 (TEN) FEET ON ALL INTERIOR AND EXTERIOR DC CONDUITS, RACEWAYS, ENCLOSURES AND CABLE ASSEMBLIES, AT TURNS ABOVE AND/OR BELOW PENETRATIONS, ALL DC COMBINERS AND JUNCTION BOXES.
b. VERBIAGE: CAUTION SOLAR CIRCUIT
c. THE FORMAT AND TYPE OF MATERIAL SHALL ADHERE TO SECTION B-3.B & C ABOVE

D. INVERTERS ARE NOT REQUIRED TO HAVE CAUTION MARKINGS

**#1**
WARNING:PHOTOVOLATIC POWER SOURCE

**#2**
PHOTOVOLATIC
DC DISCONNECT

**#3**
PHOTOVOLATIC
AC DISCONNECT

**#4**
RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

**#5**
MAXIMUM VOLTAGE 550Vdc
MAX. RATED CIRCUIT CURRENT 12.98Adc
OF THE CHARGE CONTOLLER OR DC-TO-DC CONVERTER (IF INSTALLED)

**#6**
PHOTOVOLTIVC POWER SOURCE
OPERATING AC VOLTAGE 240 V
MAXIMUN OPERATING AC OUTPUT CURRENT 48 A

**#7**
AC DISCONNECT
PHOTOVOLTAIC SYSTEM POWER SOURCE
RATED AC OUTPUT CURRENT 48 AMPS
NOMINAL OPERATING AC VOLTAGE 240 VOLTS

**#8**
WARNING
ELECTRIC SHOCK HAZARD
TERMINAL ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

**#9**
WARNING
DUAL POWER SUPPLY
SOURCES: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

**#10**
WARNING
THREE POWER SOURCES
SOURCES: UTILITY GRID, BATTERY AND PV SOLAR ELECTRIC SYSTEM

**#11**
WARNING
TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

**#12**
WARNING
BIPOLAR PHOTOVOLTAIC ARRAY
DISCONNECT OF NEUTRAL GROUNDED CONDUCTORS MAY RESULT IN OVERVOLTAGE ON ARRAY OR INVERTER

**#13**
WARNING
POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

**#14**
WARNING
SOLAR ELECTRIC CIRCUIT BREAKER IS BACKFEED

**#15**
WARNING
THIS EQUIPMENT FED BY MULTIPLE SOURCES.TOTAL RARTING OF ALL OVERCURRENT DEVICES,EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE,SHALL NOT EXCEED AMPACITY OF BUSBAR

**#16**
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

**#17**
SOLAR AC DISCONNECT LOCATED AT NORTH-WEST SIDE WALL OF THE HOUSE BESIDE THE UTILITY METER

**#18**
SERIVCE DISCONNECT LOCATED IN THE BACKUP GATEWAY3 PANEL

**#19**
BATTERY

**#20**
MAIN BATTERY SYSTEM DISCONNECT

**#21**
BATTERY DISCONNECT LOCATED IN THE BACKUP GATEWAY 3 PANEL


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Road Coats NC 27521

**Customer Signature:**

**Sheet Name:**

PV Labels

**JOB NUMBER:**

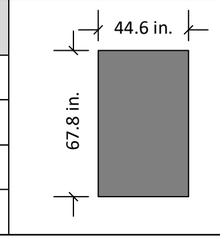
24-365-LWTJ

| **Date:** | **Revision:** |
|---|---|
| 07/09/2024 | A |
| **Sheet Size:** ANSI C 17" X 22" | **Sheet Number:** PV6 |

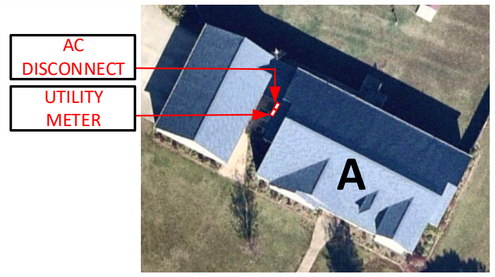
NABCEP CERTIFIED
PV Installation Professional
Ali Buttar
PVIP #031310-32

| ROOF DESCRIPTION | | | |
|---|---|---|---|
| ROOF | PITCH | AZIMUTH | NO. OF MODULES |
| A | 38° | 207° | 30 |
| | | | |
| | | | |
| | | | |

**MODULE DIMENSIONS**

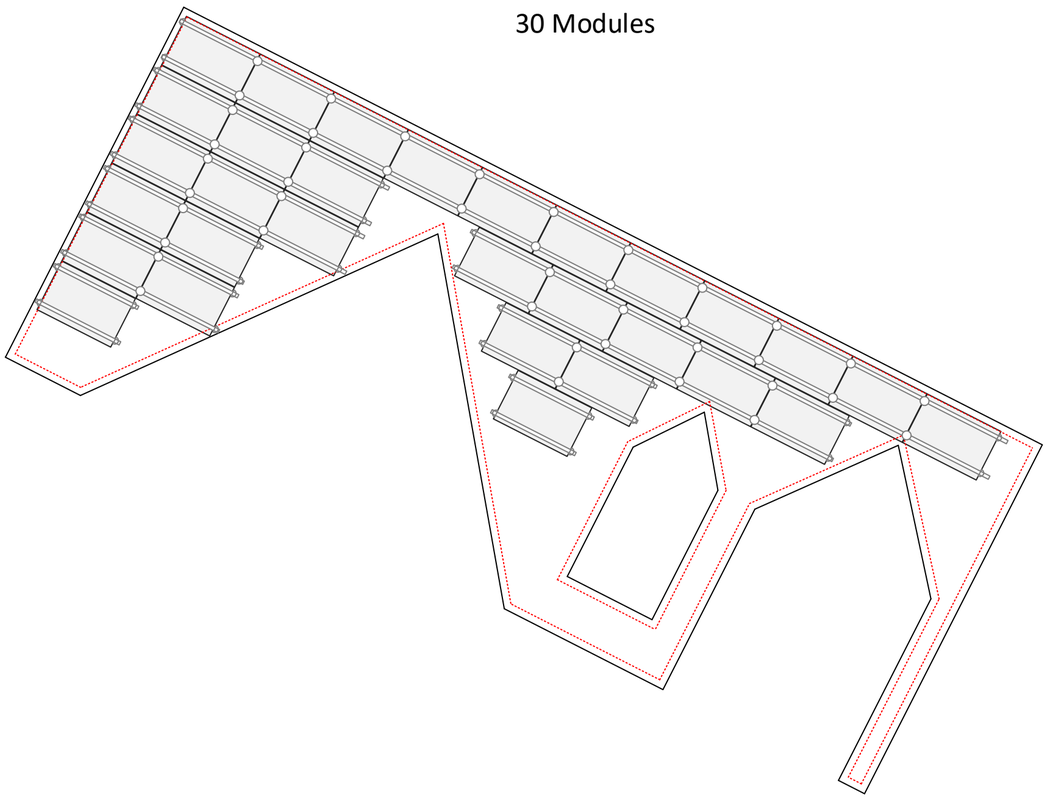



| | |
|---|---|
| Rails and Splices : PSR-B84 (BLACK) | Roof Attachment : Pegasus Comp Mount |
| Rafter Spacing : 16 in | There is one layer of shingles<br>Roofing material is asphalt shingles |
| Attachment Span: 4ft | The roof is located in 120mph wind zone |




| PV LABELS | | |
|---|---|---|
| Sr No | Code | Qty |
| 01 | 02-314 | 10 |
| 02 | 03-301 | 02 |
| 03 | 03-302 | 01 |
| 04 | 02-316 | 02 |
| 05 | 03-308 | 02 |
| 06 | 03-390 | 01 |
| 07 | 03-306 | 01 |
| 08 | 05-215 | 03 |
| 09 | 05-211 | 03 |
| 10 | 03-230 | 01 |
| 11 | 05-372 | 01 |
| 12 | 05-103 | 02 |
| 13 | 05-216 | 01 |
| 14 | 05-342 | 01 |
| 15 | 05-108 | 01 |
| 16 | 07-111 | 01 |
| 17 | 8M-001 | 05 |
| 18 | 8M-002 | 05 |
| 19 | 03-395 | 03 |
| 20 | 04-304 | 01 |
| 21 | 8M-004 | 05 |

**Roof A**
30 Modules



6in setback from sides of the roof

RAILS AND MOUNTING SYSTEM
- 56 x PSR-B84: Pegasus Rail, Black, 84" (7 Feet)
- 38 x PSR-SPL: Pegasus - Bonded, Structural Splice
- 42 x PSR-MCB: Pegasus - Multiclamp, Mid/End, 30 to 40 mm, Black
- 36 x PSR-HEC: Pegasus - Hidden End Clamp
- 11 x PSR-LUG: Pegasus - Grounding Lug
- 45 x PSR-WMC: Pegasus - Wire Management Clip
- 05 x PSR-CBG: Pegasus - Cable Grip
- 36 x PSR-CAP: Pegasus - End Cap
- 102 x PSCR-UBBDT: Pegasus Comp Mount - Open Slot, Black L Foot, Black Flashing, Dovetail 3/8" T-Bolt
- 60 x Heyco Wire Clips
- 03 x S6466 EdgeScreen 6'' x 100' (222ft Heyco SunScreen)
- 03 x S6438 EdgeScreen BLK - Heyco SunScreen Clips (100 Per Bag)

SOLAR MODULES
- 30 x Q.TRON BLK M-G2+ 425W

INVERTER & SUPPORTING ITEMS
- 01 x 1707000-00-J :Tesla Powerwall3
- 10 x 1879359-00-X: Tesla MCI-2
- 01 x 1841000-01-C: Backup GateWay 3
- 01 x 1549184-00-X: 02" Conduit Hub Kit

WIRE
- 01 x WIRPV 2KVPV10STRBLK500: #10 PV WIRE BLK (Cu) 500ft

ELECTRICAL ITEMS
- 01 x UAT417-XGF: 200amp Meter Base
- 01 x BRP18BC225R: Main Load Panel (225A) (NEMA 3R)
- 01 x BRPSF225: Eaton Sub feed Lug kit
- 01 x BW2200: Gateway Main Breaker-Eaton BW2200
- 01 x BR2125: Eaton BR 125/2
- 01 x BR260: Eaton BR 60/2
- 01 x BR240: Eaton BR 40/2
- 01 x BR220: Eaton BR 20/2
- 02 x BR120: Eaton BR 20/1
- 02 x BR115: Eaton BR 15/1
- 01 x DG222URB: 250volt/60amp/2pole non fusible disconnect (NEMA 3R)
- 01 x EATON M22PVK01: 22.5MM PB EMG STOP W/ CONTACTOR
- 01 x Eaton M22I1PG: SFC MTG ENC Emergency Stop Enclosure
- 01 x EZSLR JB-1.2: SolaDeck

BILL OF MATERIAL
SCALE: 1/8" - 1'

N

8MSOLAR
ADVANCING ENERGY INDEPENDENCE

5112 Departure Drive,
Raleigh NC 27616
O: 919.948.6474
E: info@8msolar.com

**Customer Information:**

**Trevor Johnson**

5657 Red Hill Church
Road Coats NC 27521

**Customer Signature:**

**Sheet Name:**

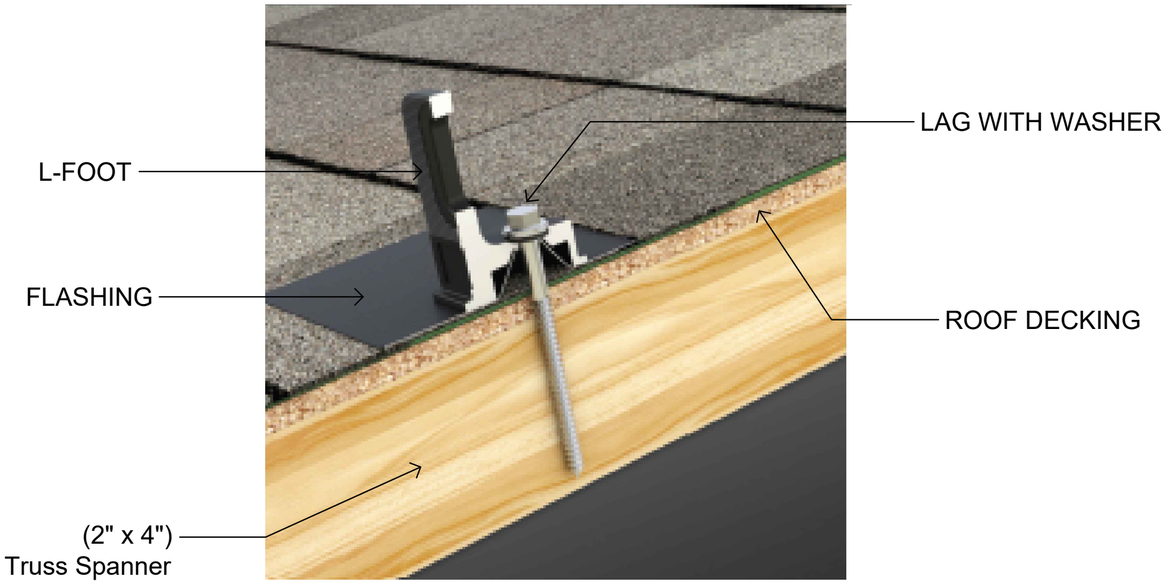
Bill of Material

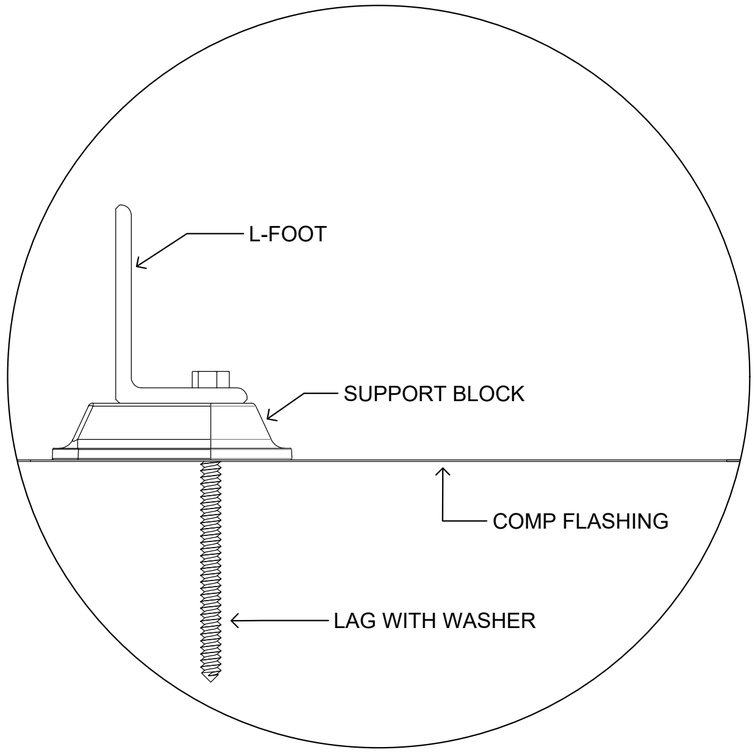
**JOB NUMBER:**

24-365-LWTJ

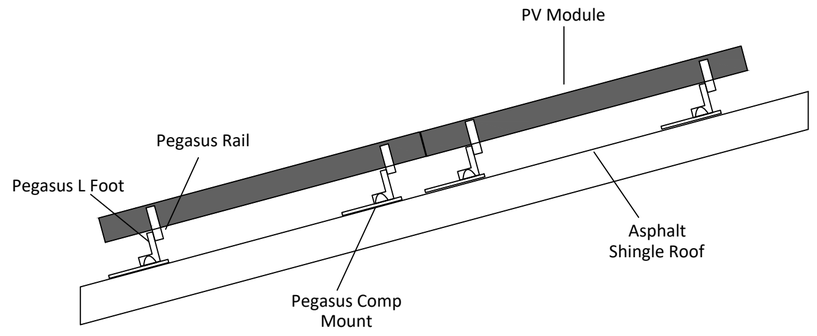
| Date: | Revision: |
|---|---|
| 07/09/2024 | A |
| **Sheet Size:** ANSI C 17" X 22" | **Sheet Number:** PV7 |

NABCEP CERTIFIED
PV Installation Professional
Ali Buttar
PVIP #031310-32




| | | | | | |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| Multi-Clamp | Hidden End Clamp | MLPE Mount | Dovetail T-Bolt | Ground Lug | Cable Grip |
| Torque Value 100 in-lbs. | Torque Value 135 in-lbs. | Torque Value 135 in-lbs. | Torque Value 300 in-lbs. | Torque Value 135 in-lbs. | Torque Value 135 in-lbs. |




**SIDE VIEW**

| PV Dead Load | |
|---|---|
| **Roof A** | **PV System Dead Load**<br>**(Panel + Racking weight) / PV System Area**<br>(30 panels x 47.2 lbs./panel + 341 ft. of racking x 1.17 lb.ft) /<br>(30 panels x 5.65' x 3.71') = 2.87 psf |

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Attachment Details

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24-365-LWTJ

| **Date:** | **Revision:** |
|---|---|
| 07/09/2024 | A |
| **Sheet Size:** ANSI C 17" X 22" | **Sheet Number:** PV8 |

NABCEP CERTIFIED
PV Installation Professional
Ali Buttar
PVIP #031310-32

# Q.TRON BLK M-G2+ SERIES

**405 - 430 Wp | 108 Cells**
**22.0 % Maximum Module Efficiency**

**MODEL** Q.TRON BLK M-G2+

## High performance Qcells N-type solar cells

Q.ANTUM NEO Technology with optimized module layout boosts module efficiency up to 22.0 %.

## A reliable investment

Inclusive 25-year product warranty and 25-year linear performance warranty[1].

## Enduring high performance

Long-term yield security with Anti LeTID Technology, Anti PID Technology[2], Hot-Spot Protect.

## Extreme weather rating

High-tech aluminium alloy frame, certified for high snow (8100 Pa) and wind loads (3600 Pa).

## Innovative all-weather technology

Optimal yields, whatever the weather with excellent low-light and temperature behaviour.

## The most thorough testing programme in the industry

Qcells is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new “Quality Controlled PV” of the independent certification institute TÜV Rheinland.

[1] See data sheet on rear for further information.
[2] APT test conditions according to IEC/TS 62804-1:2015, method A (–1500 V, 96 h)

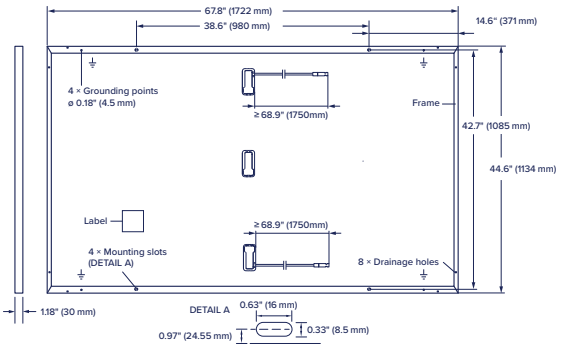
**The ideal solution for:**

Rooftop arrays on residential buildings

# Q.TRON BLK M-G2+ SERIES

## Mechanical Specification

| | |
|---|---|
| Format | 67.8 in × 44.6 in × 1.18 in (including frame)<br>(1722 mm × 1134 mm × 30 mm) |
| Weight | 46.7 lbs (21.2 kg) |
| Front Cover | 0.13 in (3.2 mm) thermally pre-stressed glass<br>with anti-reflection technology |
| Back Cover | Composite film |
| Frame | Black anodised aluminium |
| Cell | 6 × 18 monocrystalline Q.ANTUM NEO solar half cells |
| Junction box | 2.09-3.98 in × 1.26-2.36 in× 0.59-0.71 in<br>(53-101 mm × 32-60 mm × 15-18 mm), Protection class IP67, with bypass diodes |
| Cable | 4 mm² Solar cable; (+) ≥68.9 in (1750mm), (−) ≥68.9 in (1750mm) |
| Connector | Stäubli MC4; IP68 |

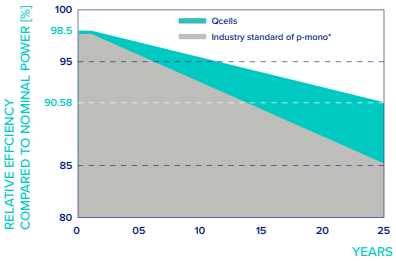



## Electrical Characteristics

| POWER CLASS | | | | 405 | 410 | 415 | 420 | 425 | 430 |
|---|---|---|---|---|---|---|---|---|---|
| MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W) | | | | | | | | | |
| Minimum | Power at MPP[1] | $P_{MPP}$ | [W] | 405 | 410 | 415 | 420 | 425 | 430 |
| | Short Circuit Current[1] | $I_{SC}$ | [A] | 13.33 | 13.41 | 13.49 | 13.58 | 13.66 | 13.74 |
| | Open Circuit Voltage[1] | $V_{OC}$ | [V] | 37.91 | 38.19 | 38.47 | 38.75 | 39.03 | 39.32 |
| | Current at MPP | $I_{MPP}$ | [A] | 12.69 | 12.76 | 12.83 | 12.91 | 12.98 | 13.05 |
| | Voltage at MPP | $V_{MPP}$ | [V] | 31.93 | 32.13 | 32.34 | 32.54 | 32.74 | 32.94 |
| | Efficiency[1] | η | [%] | ≥20.7 | ≥21.0 | ≥21.3 | ≥21.5 | ≥21.8 | ≥22.0 |
| MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2] | | | | | | | | | |
| Minimum | Power at MPP | $P_{MPP}$ | [W] | 306.1 | 309.9 | 313.7 | 317.5 | 321.2 | 325.0 |
| | Short Circuit Current | $I_{SC}$ | [A] | 10.74 | 10.81 | 10.87 | 10.94 | 11.00 | 11.07 |
| | Open Circuit Voltage | $V_{OC}$ | [V] | 35.96 | 36.23 | 36.50 | 36.77 | 37.04 | 37.31 |
| | Current at MPP | $I_{MPP}$ | [A] | 9.98 | 10.04 | 10.10 | 10.15 | 10.21 | 10.27 |
| | Voltage at MPP | $V_{MPP}$ | [V] | 30.66 | 30.87 | 31.07 | 31.26 | 31.46 | 31.65 |

[1]Measurement tolerances $P_{MPP}$ ±3%; $I_{SC}$; $V_{OC}$ ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2]800 W/m², NMOT, spectrum AM 1.5

### Qcells PERFORMANCE WARRANTY

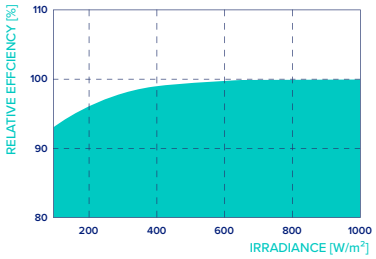



At least 98.5 % of nominal power during first year. Thereafter max. 0.33 % degradation per year. At least 95.53 % of nominal power up to 10 years. At least 90.58 % of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organisation of your respective country.

*Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

### PERFORMANCE AT LOW IRRADIANCE




Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

### TEMPERATURE COEFFICIENTS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Temperature Coefficient of $I_{SC}$ | α | [%/K] | +0.04 | Temperature Coefficient of $V_{OC}$ | β | [%/K] | −0.24 |
| Temperature Coefficient of $P_{MPP}$ | γ | [%/K] | −0.30 | Nominal Module Operating Temperature | NMOT | [°F] | 109±5.4<br>(43±3 °C) |

## Properties for System Design

| | | | | | |
|---|---|---|---|---|---|
| Maximum System Voltage | $V_{SYS}$ | [V] | 1000 (IEC) / 1000 (UL) | PV module classification | Class II |
| Maximum Series Fuse Rating | | [A DC] | 25 | Fire Rating based on ANSI / UL 61730 | C / TYPE 2 |
| Max. Design Load, Push / Pull[3] | | [lbs / ft²] | 113 (5400 Pa) / 50 (2400 Pa) | Permitted Module Temperature on Continuous Duty | −40 °F up to +185 °F<br>(−40 °C up to +85 °C) |
| Max. Test Load, Push / Pull[3] | | [lbs / ft²] | 169 (8100 Pa) / 75 (3600 Pa) | | |

[3] See Installation Manual

## Qualifications and Certificates

UL61730-1 & UL61730-2, CE-compliant,
Quality Controlled PV - TÜV Rheinland,
IEC 61215:2016, IEC 61730:2016,
U.S. Patent No. 9,893,215 (solar cells).

www.tuv.com
ID 1111220277

*Contact your Qcells Sales Representative for details regarding the module's eligibility to be Buy American Act (BAA) compliant.

**Qcells pursues minimizing paper output in consideration of the global environment.**

Note: Installation instructions must be followed. Contact our technical service for further information on approved installation of this product.

Hanwha Q CELLS America Inc. 400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL hqc-inquiry@qcells.com | WEB www.qcells.com

# 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.

2023

# 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% [1,2] |
| **Solar to Grid Efficiency** | 97% [3] |
| **Supported Islanding Devices** | Backup Gateway 2, Backup Switch |
| **Connectivity** | Wi-Fi (2.4 and 5 GHz), Dual-port switched Ethernet, Cellular (LTE/4G [4]) |
| **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 [5] |
| **Maximum Short Circuit Current per MPPT ($I_{sc}$)** | 15 A [5] |

## Battery Technical Specifications

| | |
|---|---|
| **Nominal Battery Energy** | 13.5 kWh AC [2] |
| **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 |

[1] Typical solar shifting use case.

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

[3] Tested using CEC weighted efficiency methodology.

[4] Cellular connectivity subject to network service coverage and signal strength.

[5] 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) [6] |
| **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 |

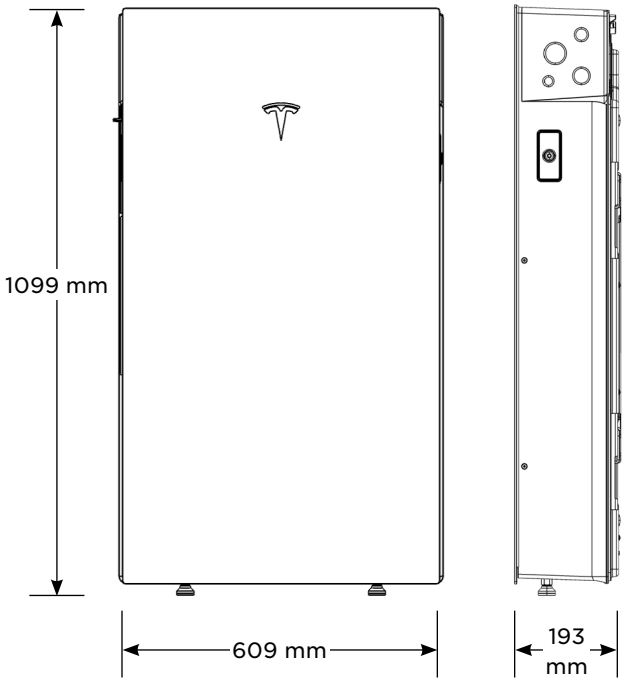
[6] Performance may be de-rated at operating temperatures above 40°C (104°F).

## 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 [7] |

[7] 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 | PV Hazard Control System: BIPV compliance document |
| Tesla or Hanwha (Q.Peak Duo BLK or BLK-G6+) Modules certified for use with ZEP racking | PV Hazard Control System: ZS PVHCS compliance document |
| Other module and racking combinations | PV Hazard Control System: Generic PV Array compliance document |

# Backup Gateway 2

—

Backup Gateway 2 controls connection to the grid when paired with Powerwall 3, automatically detecting outages and providing seamless transition to backup power. Backup Gateway 2 also provides energy metering for solar self-consumption, time-based control, and backup operation.

In this system configuration, Powerwall 3 acts as the Site Controller, with the Backup Gateway 2 Site Controller disabled.

## Performance Specifications

| | |
|---|---|
| **Model Number** | 1232100-xx-y |
| **AC Voltage (Nominal)** | 120/240 V |
| **Feed-in Type** | Split phase |
| **Grid Frequency** | 60 Hz |
| **Current Rating** | 200 A |
| **Maximum Supply Short Circuit Current** | 10 kA [8] |
| **Overcurrent Protection Device** | 100 - 200 A, Service entrance rated [8] |
| **Overvoltage Category** | Category IV |
| **Internal Primary AC Meter** | Revenue accurate (+/- 0.2%) |
| **Internal Auxiliary AC Meter** | Revenue accurate (+/- 2%) |
| **Primary Connectivity** | Ethernet, Wi-Fi |
| **Secondary Connectivity** | Cellular (3G, LTE/4G) [9] |
| **User Interface** | Tesla App |
| **Operating Modes** | Support for solar self-consumption, time-based control, and backup |
| **Backup Transition** | Automatic disconnect for seamless backup |
| **Modularity** | Supports up to 10 AC-coupled Powerwalls |
| **Optional Internal Panelboard** | 200 A 6-space / 12 circuit breakers Siemens QP or Square D HOM breakers rated 10 - 80A or Eaton BR breakers rated 10 - 125A |
| **Warranty** | 10 years |

[8] When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22kA symmetrical amperes.

[9] 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.

## Environmental Specifications

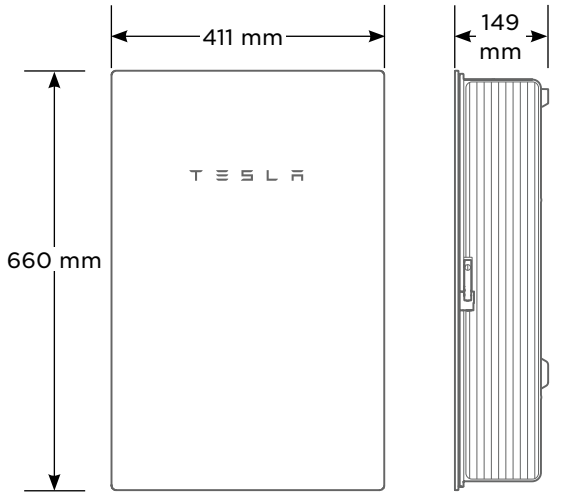
| | |
|---|---|
| **Operating Temperature** | –20°C to 50°C (–4°F to 122°F) |
| **Operating Humidity (RH)** | Up to 100%, condensing |
| **Maximum Elevation** | 3000 m (9843 ft) |
| **Environment** | Indoor and outdoor rated |
| **Enclosure Type** | NEMA 3R |

## Compliance Information

| | |
|---|---|
| **Certifications** | UL 67, UL 869A, UL 916, UL 1741 PCS, CSA 22.2 0.19, CSA 22.2 205 |
| **Emmissions** | FCC Part 15, ICES 003 |

## Mechanical Specifications

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



# 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

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

[10] Breaker maximum supply short circuit current rating must be equal to or greater than the available fault current.

## Environmental Specifications

| | |
|---|---|
| **Operating Temperature** | –40°C to 50°C (–40°F to 122°F) |
| **Storage Temperature** | –40°C to 85°C (–40°F to 185°F) |
| **Enclosure Rating** | NEMA 3R |
| **Pollution Rating** | PD3 |

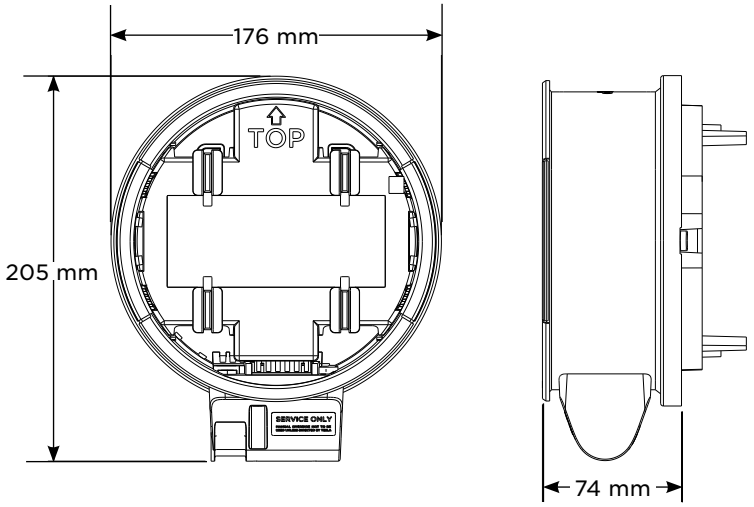
## Compliance Information

| | |
|---|---|
| **Safety Standards** | USA: UL 414, UL 2735, UL 916, CA Prop 65 |
| **Emmissions** | FCC, ICES |

## Mechanical Specifications

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

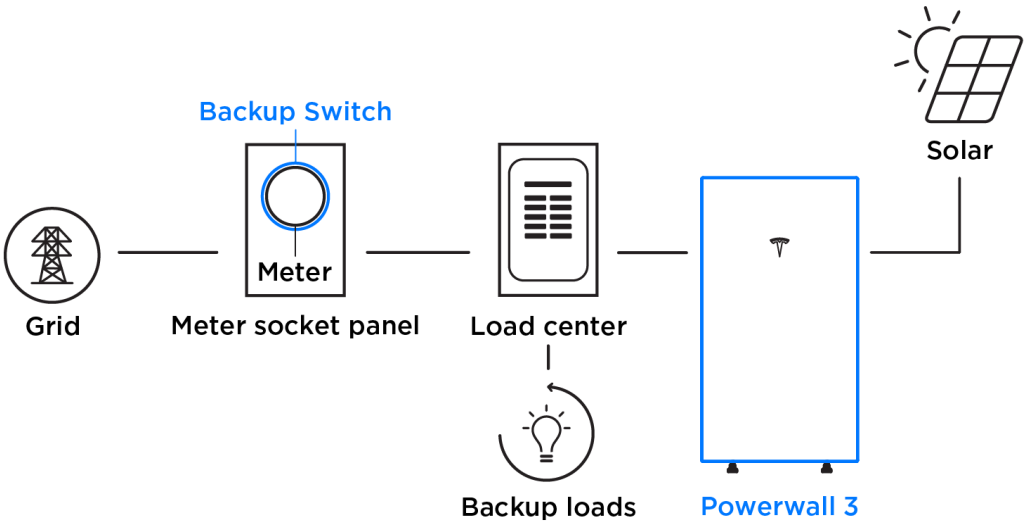
[11] Manually overrides the contactor position during a service event.



# Powerwall 3 Example System Configurations

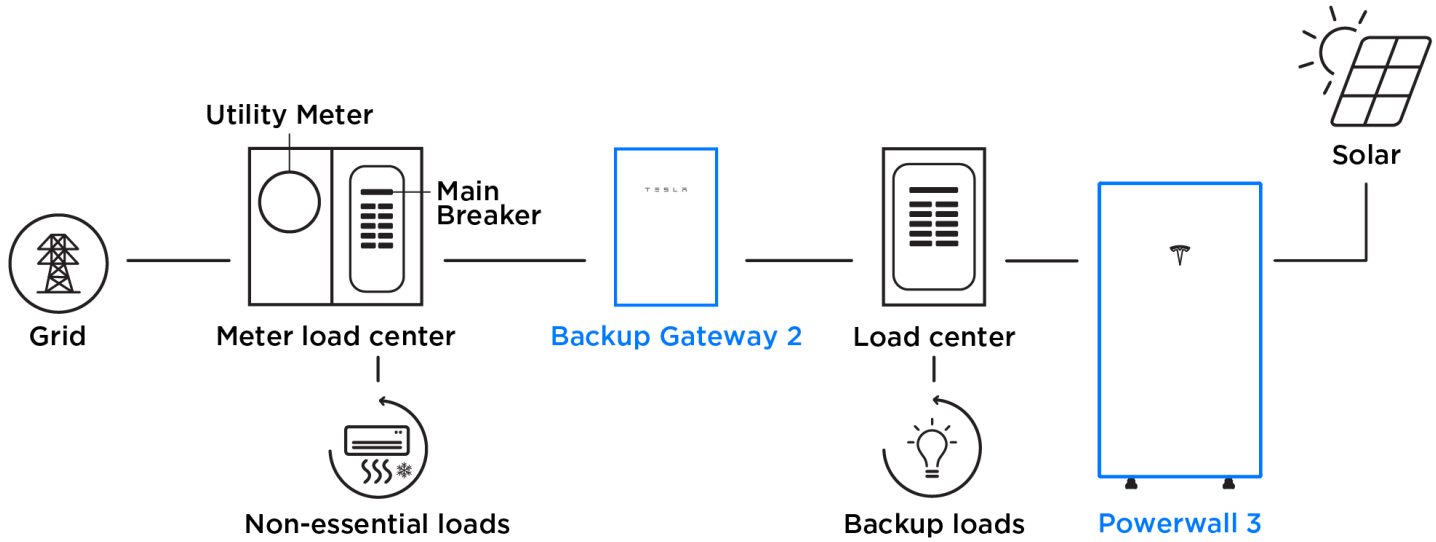
## Powerwall 3 with Backup Switch

**Whole Home Backup**




## Powerwall 3 with Backup Gateway 2

**Partial Home Backup**



# 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** | 1841000-01-y |
| **Nominal Grid Voltage** | 120/240 V AC |
| **Grid Configuration** | Split phase |
| **Grid Frequency** | 60 Hz |
| **Continuous Current Rating** | 200 A |
| **Maximum Supply Short Circuit Current** | 22 kA with Square D or Eaton main breaker<br>25 kA with Eaton main breaker[1] |
| **IEC Protective Class** | Class I |
| **Overvoltage Category** | Category IV |

[1]Only Eaton CSR or BWH main breakers are 25 kA rated

| | |
|---|---|
| **AC Meter** | Revenue accurate (+/- 0.5%) |
| **Communication** | CAN |
| **User Interface** | Tesla App |
| **Backup Transition** | Automatic disconnect for seamless backup |
| **Overcurrent Protection Device** | 100–200 A<br>Service entrance rated<br>Eaton CSR, BWH, or BW, or Square D QOM breakers |
| **Internal Panelboard** | 200 A<br>8-space/16 circuit breakers<br>Eaton BR, Siemens QP, or Square D HOM breakers rated to 10–125A |
| **Warranty** | 10 years |

## Environmental Specifications

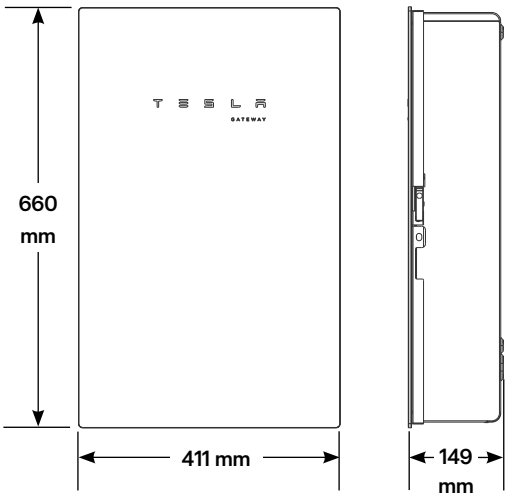
| | |
|---|---|
| **Operating Temperature** | –20°C to 50°C (–4°F to 122°F) |
| **Operating Humidity (RH)** | Up to 100%, condensing |
| **Maximum Elevation** | 3000 m (9843 ft) |
| **Environment** | Indoor and outdoor rated |
| **Enclosure Type** | NEMA 3R |

## Compliance Information

| | |
|---|---|
| **Certifications** | UL 67, UL 869A, UL 916, UL 1741 PCS, CSA 22.2 107.1, CSA 22.2 29 |
| **Emmissions** | FCC Part 15, ICES 003 |

## Mechanical Specifications

| | |
|---|---|
| **Dimensions** | 660 x 411 x 149 mm<br>(26 x 16 x 6 in) |
| **Weight** | 16.3 kg (36 lb) |
| **Mounting options** | Wall mount |

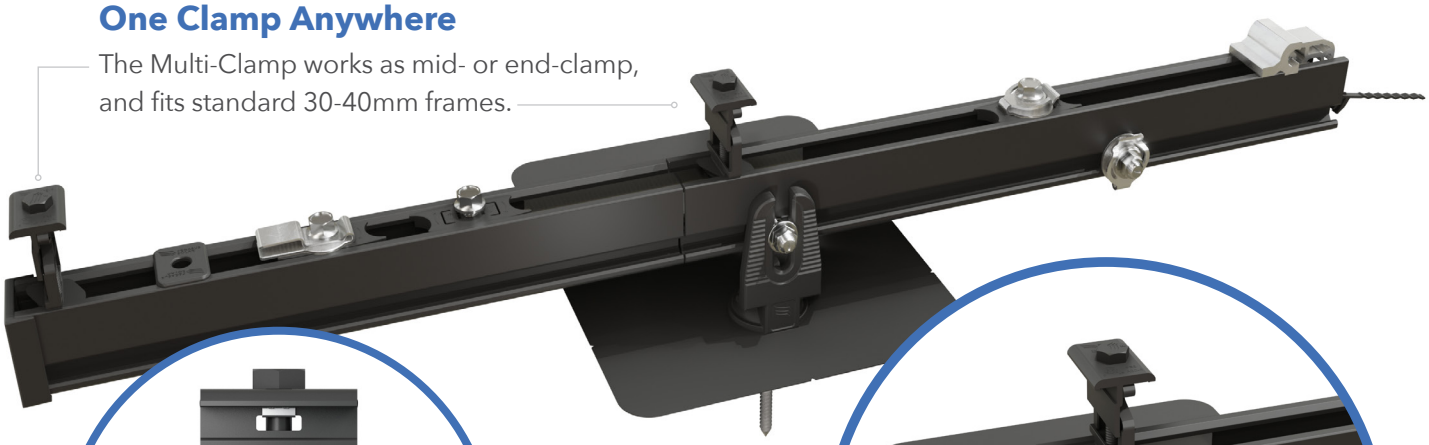


PEGASUS SOLAR™
*A Better Day on the Job*

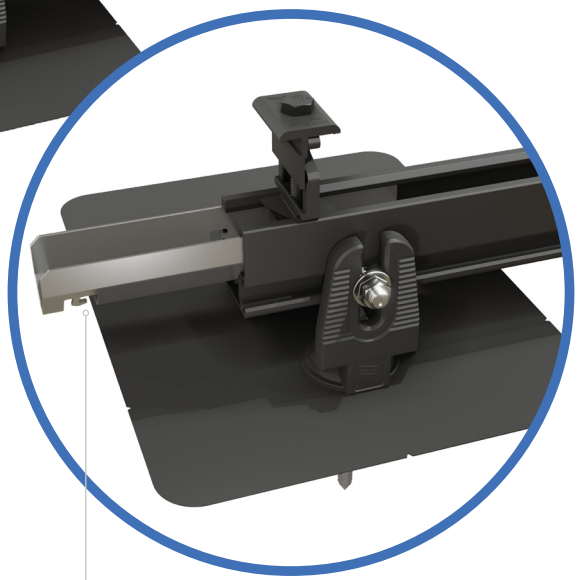
# RAIL SYSTEM

### Instant Bonding
The N-S Bonding Jumper bonds row to row with no tools.

### One Clamp Anywhere
The Multi-Clamp works as mid- or end-clamp, and fits standard 30-40mm frames.



### Lifetime Wire Management
Open rail channel holds and protects wires. Clamps won't pinch wires after tightening.



### Bonding Structural Splice
Connect rails instantly, without tools, interference or limitations.

## Next-Level Solar Mounting

A complete system for hassle-free rooftop installation, from watertight mounts to lifetime wire management.

**Simplicity**

1/2"socket for everything.
One clamp for mid or end.
No tool splicing and bonding.
Easy wire management.

**Code Compliant**

UL 2703 listed
LTR-AE-001-2012 listed
Class A fire rating for any slope
ASCE 7-16 PE Certified

**Premium Aesthetics**

The narrowest panel gap available. Optional Hidden End Clamps and End Caps provide a flush look on the edge of the array.

**Watertight for Life**

Secured on industry-leading Pegasus Mounts, for composite shingle and tile roofs.
Backed by a 25-year warranty.

**Pegasus Solar Inc** | 506 West Ohio Avenue, Richmond, CA 94804 | T: 510.210.3797 | **www.pegasussolar.com**

# RAIL SYSTEM

## Pegasus Rail

Available in 14′ and 7′ lengths for easy layout and shipping.

Open-channel design holds MC4 connectors, PV wire and trunk cables.

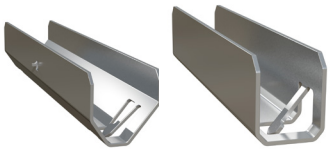
Black and Mill finish

## Pegasus Max Rail

Maximum-strength design.

Meets specifications for high snow-load and hurricane zones.

Black and Mill finish

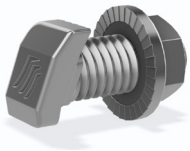


## Splice and Max Splice

Installs by hand.

Works over mounts.

Structurally connects and bonds rails automatically; UL2703 listed as reusable.



## Dovetail T-bolt

Dovetail shape for extra strength.

Uses ½″ socket.

## Multi-Clamp

Fits 30-40mm PV frames, as mid- or end-clamp.

Twist-locks into position; doesn't pinch wires in rail.

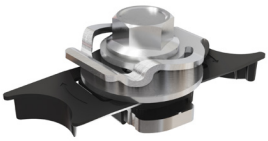
Bonds modules to rail; UL2703 listed as reusable

## Hidden End Clamp

Offers premium edge appearance.

Preinstalled pull-tab grips rail edge, allowing easy, one-hand installation.

Tucks away for reuse.



## Ground Lug

Holds 6 or 8 AWG wire.

Mounts on top or side of rail.

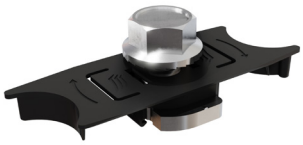
Assembled on MLPE Mount.

UL2703 listed as reusable.

## N-S Bonding Jumper

Installs by hand, eliminates row-to-row copper wire.

UL2703 listed as reusable only with Pegasus Rail.

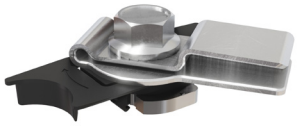


## MLPE Mount

Secures and bonds most micro-inverters and optimizers to rail.

Connectors and wires easily route underneath after installation.

UL2703 listed as reusable.



## Cable Grip

Secures four PV wires or two trunk cables.

Stainless-steel backing provides durable grip.

Eliminates sagging wires.

## Wire Clip

Hand operable.

Holds wires in channel.

Won't slip.

## End Cap and Max End Cap

Fits flush to PV module and hides raw or angled cuts.

Hidden drain quickly clears water from rail.

**Certifications:**

- UL 2703, Edition 1
- LTR-AE-001-2012
- ASCE 7-16 PE certified
- Class A fire rating for any slope roof

| LOAD | | SPAN | | | |
|---|---|---|---|---|---|
| SNOW (PSF) | WIND (MPH) | 32″ | 4′ | 6′ | 8′ |
| 0 | 120 | | | | |
| | 160 | | | | |
| | 190 | | | | |
| 15 | 140 | | | | |
| | 160 | | | | |
| | 190 | | | | |
| 30 | 160 | | | | |
| | 190 | | | | |
| 45 | 190 | | | | |
| 70 | 190 | | | | |
| 110 | 190 | | | | |

PEGASUS RAIL  PEGASUS MAX RAIL

For reference only. Spans above are calculated using ASCE 7-16 for a Gable Roof, Exposure Category B, 7-20deg roof angle, 30ft mean roof height with non-exposed modules. For PE certified span tables, visit www.pegasussolar.com/spans.

**FREE**
PEGASUS SOLAR
**Design Tool**

Quickly calculate the most efficient layout, spans and materials needed to suit your job. Visit the Pegasus Customer Portal. **pegasussolar.com/portal**

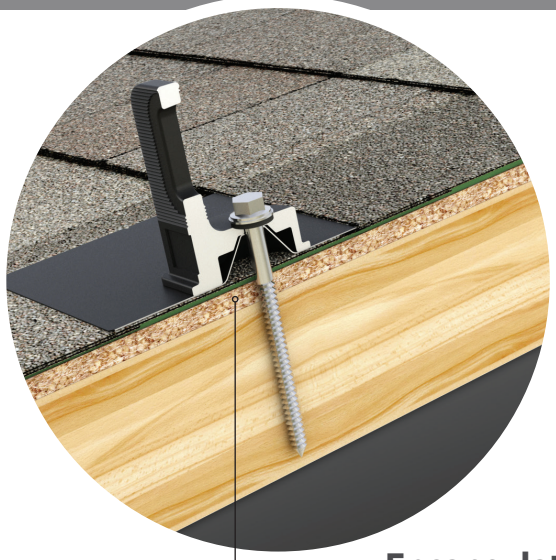


**Pegasus Solar Inc** | 506 West Ohio Avenue, Richmond, CA 94804 | T: 510.210.3797 | **www.pegasussolar.com**

PEGASUS SOLAR™
*A Better Day on the Job*

# COMP MOUNT

**One-Piece Flashing with Elevated Cone**
No press-fits or deck-level EPDM washers to fail



**Encapsulating Design**
Raises the water seal 0.9" Above roof deck





## Simple 3-Piece Design Watertight For Life

Pegasus solar's comp mounts are a cost effective, high-quality option for rail installations on composition shingle roofs. Designed to last decades, the one-piece flashing with elevated cone means there is simply nothing to fail.

**25-Year Warranty**
Manufactured with advanced materials and coatings to outlast the roof itself

**Code Compliant**
Fully IBC/CBC Code Compliant
Exceeds ASCE 7-16 Standards

**Superior Waterproofing**
Tested to AC286 without sealant
Water seal elevated 0.9" above

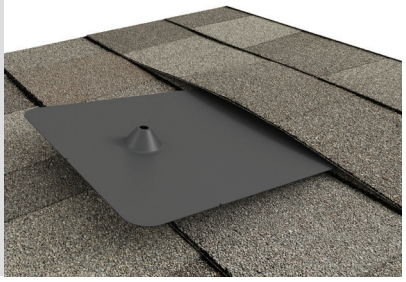
**All-In-One Kit Packaging**
Flashings, L-Feet and SS lags with bonded EPDM washers are included in each 24-pack

**Pegasus Solar Inc** | 506 West Ohio Avenue, Richmond, CA 94804 | T: 510.210.3797 | **www.pegasussolar.com**

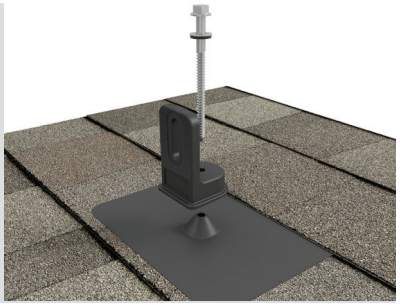
# COMP MOUNT

**1**
Drill pilot hole in the center of the rafter.

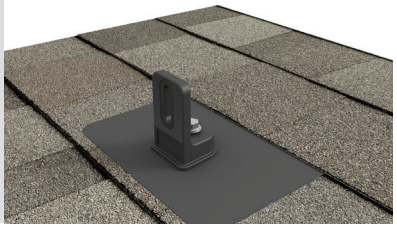
**2**
Optional: Apply a "u-shape" of sealant to the underside of the flashing and position under 2nd shingle course, cone over pilot hole.

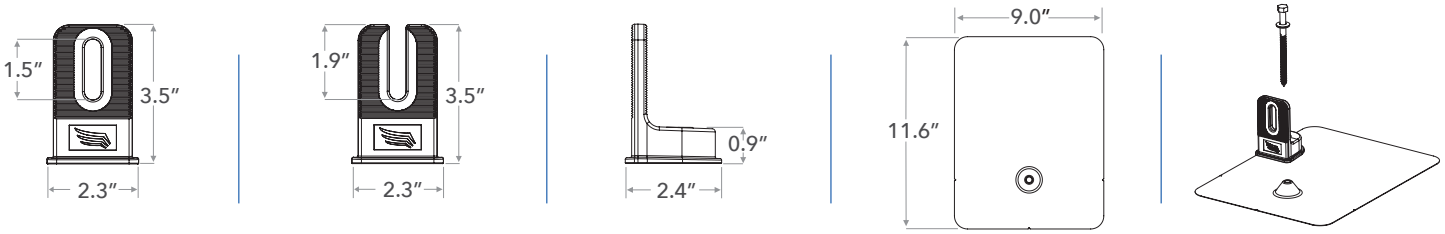


**3**
Place L-Foot over cone and install lag with washer through L-Foot.



**4**
Drive lag to required depth. Attach rail per rail manufacturer's instructions.






| SPECIFICATIONS | COMP MOUNT INSTALL KITS | | | | |
|---|---|---|---|---|---|
| SKU | PSCR-CBB0 | PSCR-UBB0 | SPCR-CBBH | PSCR-CMM0 | PSCR-UMM0 |
| Finish | Black L-Foot And Black Flashing | | | Mill | |
| L-Foot Type | Closed Slot | Open Slot | Closed Slot | Closed Slot | Open Slot |
| Kit Contents | L-Foot, Flashing, 5/16″ x 4 1/2″ SS Lag with metalized EPDM washer | L-Foot, Flashing, 5/16″ x 4 1/2″ SS Lag with metalized EPDM washer and M10 Hex Bolt | L-Foot, Flashing, 5/16″ x 4 1/2″ SS Lag with metalized EPDM washer | L-Foot, Flashing, 5/16″ x 4 1/2″ SS Lag with metalized EPDM washer | L-Foot, Flashing, 5/16″ x 4 1/2″ SS Lag with metalized EPDM washer |
| Roof Type | Composition Shingle | | | | |
| Certifications | IBC, ASCE/SEI 7-16, AC286 | | | | |
| Install Application | Railed Systems | | | | |
| Compatible Rail | Most | | | | |
| Kit Quantity | 24 | | | | |
| Boxes per Pallet | 72 | | | | |

# SolaDeck

## PV ROOF-MOUNT ENCLOSURE

UL50 Type 3R Enclosure• Stamped 18 gauge gal. steel • Powder coated finish • Weather tight

## INTRODUCED AT

## *SOLAR POWER 2007*

## PV Roof-Mount Combiner/Enclosure

### Enclosure Includes:

- Dual ground lug
- Universal DIN rail
- 1/2", 3/4" & 1" knockouts
- Wire strain relief clip
- Complete hardware package

### Benefits

- The ability to prep the building is now possible
- Replaces several parts used today
- Provides professional looking install
- Saves time on install
- Allows for easy access
- Guaranteed seal to roof
- Low profile design

*For product information contact us at*

**(866) 367-7782**

**www.commdeck.com**

R.S.T.C. ENTERPRISES Incorporated

RSTC Enterprises, Inc
2219 Heimstead Road
Eau Claire, WI 54703
1 (866) 367 - 7782

## SolaDeck  Part # 780

**Specifications:**

**18 Gauge Steel Base (1) and Cover (2)**
**Pre Punched 7 holes in base (1) for roof deck**
**Pre Punched 4 holes in base (1) and cover (2) for match**
**Draw Process both parts**
**Powder Coated to withstand 1000 hours Salt Spray (Primer Gray)**
**High UV resistance**
**15" x 15" flashing dimension**
**Cavity dimension 8"W x 9" L x 2.5"D**
**Approx. 162 Cubic inch equipment cavity**
**Norloked steel base plate (3) to drawn base (2)**
**Three knockout locations .5", .75" and 1"**
**3" DIN rail installed**
**Grounding Lug- Installed (In Equipment Cavity)**
**Wire Strain Relief Clip –Installed (In Equipment Cavity)**
**Hardware pack withstands 500 hours Salt Spray**
- **7 - 2" Trusshead Screws**
- **4 - .5" 8-32 thread cutting screws**
- **4 - #10 Bonded Seal washers**
- **1 – Foam closed Cell Seal**

**ETL Listed UL50 Type 3R**

**Total Weight 6.9 pounds each**

**Packaging:**
**Individually bagged and boxed**
**Box dimension 15.5"w x 16" L x 3" D**
**White Carton labeled with Cut out template**
**Print One Color - Black**

**Master Cartons of 6 Units each**
**Master Carton dimension 18.75"x16"x16.375"**
**Master Carton Weight – 42 pounds**
**18 Master Cartons per skid Approx 800 pounds with skid**

2219 Heimstead Road, Eau Claire, WI  54703
Phone: 715/830-9997  Fax: 715/830-9976  866/FOR-RSTC (367-7782)

Product specifications

# Eaton BRP18BC225R

## Catalog Number: BRP18BC225R

Eaton BR main breaker loadcenter,225A,X5,Copper,Cover included,NEMA 3R,Metallic,25 kAIC,BR,36 circuits,Single pole,18 spaces,Three-wire,Single-phase

Photo is representative

### General specifications

| | |
|---|---|
| Product Name | Catalog Number |
| Eaton BR main breaker loadcenter | BRP18BC225R |
| UPC | Product Length/Depth |
| 786689365585 | 29.12 in |
| Product Height | Product Width |
| 5.25 in | 14.31 in |
| Product Weight | Certifications |
| 30.3 lb | UL 67<br>UL 50 |

Powering Business Worldwide

## defaultTaxonomyAttributeLabel

### Type

Plug-on neutral main circuit breaker loadcenter

### Amperage Rating

225 A

### Bus material

Copper

### Cover

Cover included

### Main circuit breaker

CSR2200

### Number of circuits

36

### Number Of Poles

Single-pole

### Number of spaces

18

### Phase

Single-phase

### Accessories

copper bus

### Bus Rating

225 A

### Enclosure color

Gray

### Mounting

Surface

### Used with

Type BR 1-inch breakers

### Voltage rating

120/240 V

### Box size

X5

### Enclosure

NEMA 3R

### Enclosure material

## Resources

### Specifications and datasheets

Eaton Specification Sheet - BRP18BC225R

### Warranty guides

Eaton type BR circuit breaker limited warranty June 2024

Metallic

Interrupt rating

25 kAIC

Number of wires

3

NEMA rating

NEMA 3R

Eaton Corporation plc
Eaton House
30 Pembroke Road
Dublin 4, Ireland
Eaton.com



Eaton.com/socialmedia

Product specifications

# Eaton BRPSF225

## Catalog Number: BRPSF225

Eaton Field Installation Kits and Parts,Sub feed lug kit Compatible with all BR and BR PON loadcenters and meter breakers,225 A,Black

### General specifications

| | |
|---|---|
| **Product Name** | **Catalog Number** |
| Eaton BR field installation kit and part | BRPSF225 |
| **UPC** | **Product Length/Depth** |
| 786689056599 | 4 in |
| **Product Height** | **Product Width** |
| 0.5 in | 3.7 in |
| **Product Weight** | **Warranty** |
| 0.05 lb | 10 year |

**Certifications**

UL Listed

Powering Business Worldwide

## defaultTaxonomyAttributeLabel

### Type

Field installation kit and part

### Used with

BR PON Loadcenters

### Color

Black

## Resources

### Brochures

Loadcenters and Circuit Breakers

### Specifications and datasheets

Eaton Specification Sheet - BRPSF225

### Warranty guides

Eaton type BR circuit breaker limited warranty June 2024

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Eaton Corporation plc
Eaton House
30 Pembroke Road
Dublin 4, Ireland
Eaton.com



Eaton.com/socialmedia

Product specifications

# Eaton DG222URB

## Catalog Number: DG222URB

Eaton General duty non-fusible safety switch, single-throw, 60 A, NEMA 3R, Rainproof, Painted galvanized steel, Two-pole, Two-wire, 240 V

Photo is representative

### General specifications

**Product Name**
Eaton general duty non-fusible safety switch

**Catalog Number**
DG222URB

**UPC**
782113144238

**Product Length/Depth**
7.38 in

**Product Height**
14.38 in

**Product Width**
8.69 in

**Product Weight**
9 lb

**Warranty**
Eaton Selling Policy 25-000, one (1) year from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

**Compliances**
NEC 230.62 (C) Compliant Barrier

**Certifications**
UL Listed

**Catalog Notes**
WARNING! Switch is not approved for service entrance unless a neutral kit is installed.

## defaultTaxonomyAttributeLabel

### Type

Non-fusible, single-throw

### Amperage Rating

60A

### Number Of Poles

Two-pole

### Product Category

General duty safety switch

### Voltage rating

240V

### Enclosure

NEMA 3R

### Enclosure material

Painted galvanized steel

### Fuse configuration

Non-fusible

### Number of wires

2

## Resources

### Catalogs

Eaton's Volume 2—Commercial Distribution

### Multimedia

Double Up on Safety

Switching Devices Flex Center

### Specifications and datasheets

Eaton Specification Sheet - DG222URB

### Warranty guides

Selling Policy 25-000 - Distribution and Control Products and Services

Eaton Corporation plc
Eaton House
30 Pembroke Road
Dublin 4, Ireland
Eaton.com



Eaton.com/socialmedia

SIEMENS

## Data sheet US2:UAT417-XGF

200A 4J RGLS 1POS NO BPS MS OH/UG SSHASP

| | |
|---|---|
| **General technical data** | |
| cable entry type | OH/UG |
| fastening method | Surface Mount |
| suitability for operation | Residential |
| **Electricity** | |
| ampacity | 200 A |
| voltage between phase and phase rated value | 600 V |
| **Model** | |
| product brand name | Talon |
| product type designation | UAT4 |
| special product feature | No Bypass / Cover Plate Installed / Ground Lug |
| **Mechanical Design** | |
| depth [in] | 4.5 in |
| design of the terminal strip | 4 |
| height [in] | 11 in |
| width [in] | 14.8 in |
| **General product approval** | |
| certificate of suitability | UL |

**last modified:** 6/26/2022