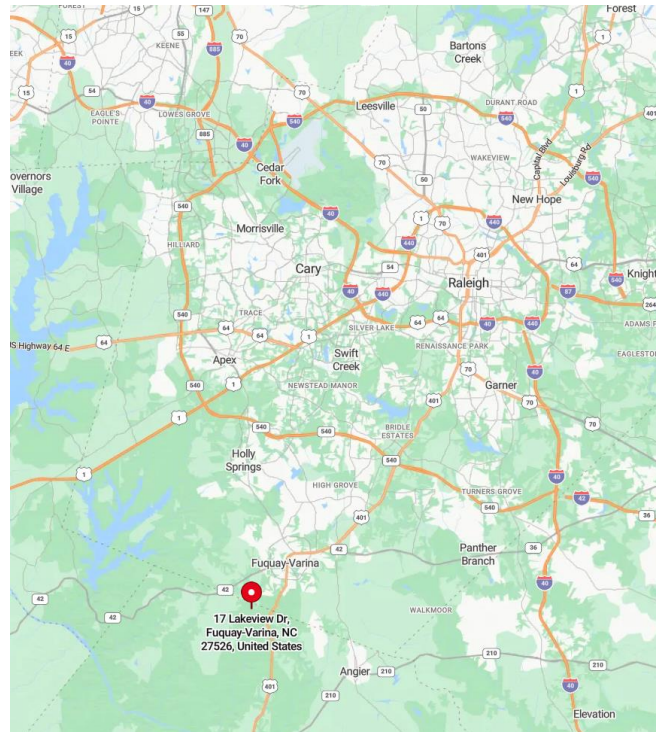




PHOTOVOLTAIC ROOF MOUNT SYSTEM			SR.#	PROJECT INFORMATION	
<b>CODE AND STANDARDS</b>  THE INSTALLATION OF SOLAR ARRAYS AND PHOTOVOLTAIC POWER SYSTEMS SHALL COMPLY WITH THE FOLLOWING CODES: <ul style="list-style-type: none"><li>2020 NATIONAL ELECTRICAL CODE</li><li>2018 NORTH CAROLINA RESIDENTIAL CODE</li><li>2018 NORTH CAROLINA BUILDING CODE</li><li>ALL OTHER ORDINANCE ADOPTED BY THE LOCAL GOVERNING AGENCIES</li></ul> <b>SITE NOTES / OSHA REGULATION</b> <ol style="list-style-type: none"><li>A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.</li><li>THE SOLAR PV INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.</li><li>ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED AND IDENTIFIED BY RECOGNIZED ELECTRICAL TESTING LABORATORY.</li><li>MODULES AND SUPPORT STRUCTURES SHALL BE GROUNDED</li><li>SOLAR INVERTER SHALL BE LISTED TO UL1741</li><li>ALL CONDUCTORS SHALL BE COPPER AND SHOULD BE 75 AND 90 DEG RATED</li><li>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.</li><li>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.</li><li>ALL PV MODULES AND ASSOCIATED EQUIPMENT AND WIRING SHALL BE PROTECTED FROM PHYSICAL DAMAGE.</li></ol> <b>SOLAR CONTRACTOR</b> <ol style="list-style-type: none"><li>MODULE CERTIFICATIONS INCLUDE UL1703, IEC61646, IEC61370.</li><li>IF APPLICABLE, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE MARKED GROUNDING LUG HOLES PER THE MANUFACTURERS INSTALLATION REQUIREMENTS.</li><li>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.</li><li>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).</li><li>ALL SIGNAGE TO BE INSTALLED IN ACCORDANCE WITH LOCAL BUILDING CODE.</li><li>TERMINALS AND LUGS WILL BE TIGHTENED TO MANUFACTURER TORQUE SPECIFICATIONS (WHEN PROVIDED) IN ACCORDANCE WITH NEC CODE 110.14(D) ON ALL ELECTRICAL CONNECTIONS.</li><li>MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC UNLESS NOT AVAILABLE.</li></ol>			1	PV MODULES	25 x Canadian Solar CS6.1-54TM-455H
			2	INVERTER + BATTERY	01 X POWERWALL 3
			3	ROOF TYPE	ASPHALT SHINGLES
			4	RACKING	PSR-B84 RAILS (BLACK)
			5	MOUNTING TYPE	INSTAFLASH2 (BLACK)
			6	DC SIZE	11.375 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
					
			<b>VICINITY MAP</b>		<b>TOP VIEW OF THE BUILDING</b>
<b>DESIGN CRITERIA</b> WIND SPEED: 120 MPH GROUND SNOW LOAD: 15 PSF WIND EXPOSURE FACTOR: B	<b>UTILITY COMPANY:</b> DUKE ENERGY  <b>PERMIT ISSUER (AHJ):</b> HARNETT COUNTY	<b>SCOPE OF WORK</b> INSTALLATION OF UTILITY INTERACTIVE PHOTOVOLTAIC SOLAR SYSTEM.			



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**Customer Information:**

**Virginia Blanton**

17 Lakeview Dr  
Fuquay-Varina, NC 27526


**Customer Signature:**

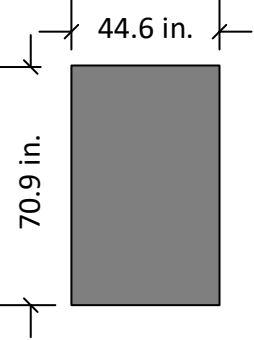
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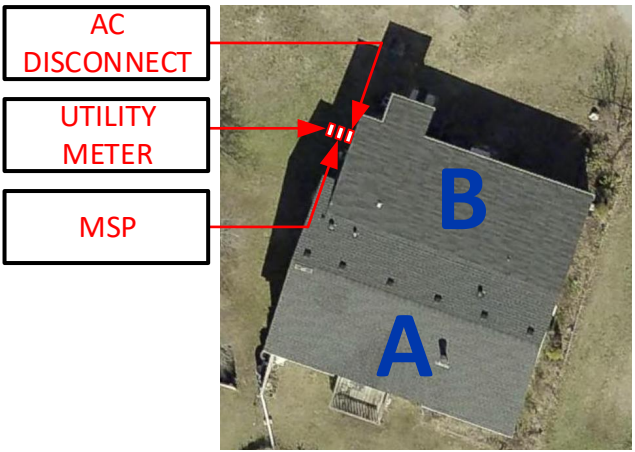
Drawing Index


**JOB NUMBER:**

25-275-PB

<b>Date:</b>	06/02/2025	<b>Revision:</b>	A
<b>Sheet Size:</b>	ANSI C 17" X 22"	<b>Sheet Number:</b>	PV1
 <p>PV Installation Professional Ali Buttar PVIP #031310-32</p>			

ROOF DESCRIPTION				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	PITCH	AZIMUTH	NO. OF MODULES						
A	15°	199°	14		ROOF	A	B		
B	11°	19°	11		DEAD LOAD (PSF)	2.90	2.67		



Vent		No vent will be covered by PV modules during the installation.
------	---	--

**SYSTEM DETAILS**  
NUMBER OF PANELS : 25  
PANELS MODEL : CANADIAN SOLAR CS6.1-54TM-455H  
DC SIZE : 11.375 KW  
AC SIZE : 11.5 KVA



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Customer Signature:

Sheet Name:

Site Layout

JOB NUMBER:

25-275-PB

Date:

06/02/2025

Revision:

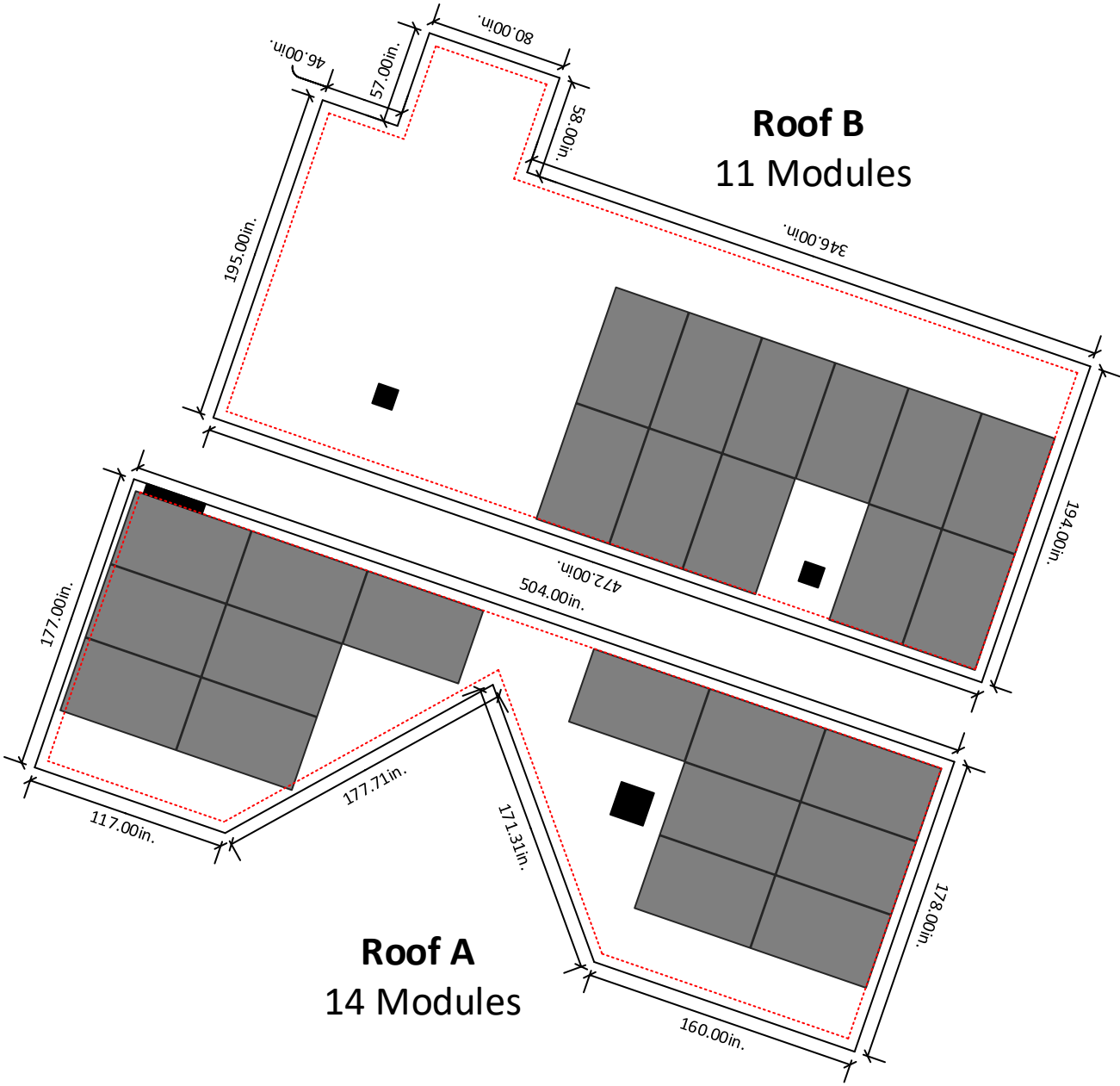
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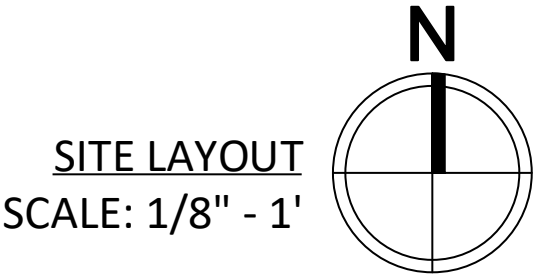
ANSI C  
17" X 22"

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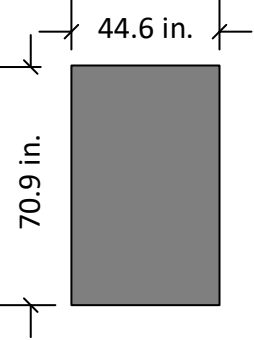

PV2

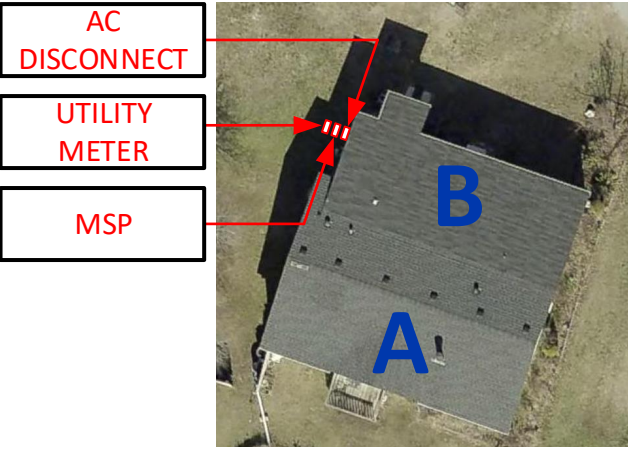


6in setback from  
sides of the roof





ROOF DESCRIPTION				MODULE DIMENSIONS	STRING LAYOUT					
ROOF	PITCH	AZIMUTH	NO. OF MODULES		TESLA POWERWALL3					
					Strings #	No. of Modules	Color	Strings #	No. of Modules	Color
A	15°	199°	14		String 1	11				
B	11°	19°	11		String 2	07				
					String 3	07				
Tesla MCI (Mid Circuit Interrupter)										



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Sheet Name:

String Mapping

JOB NUMBER:

25-275-PB

Date:

06/02/2025

Revision:

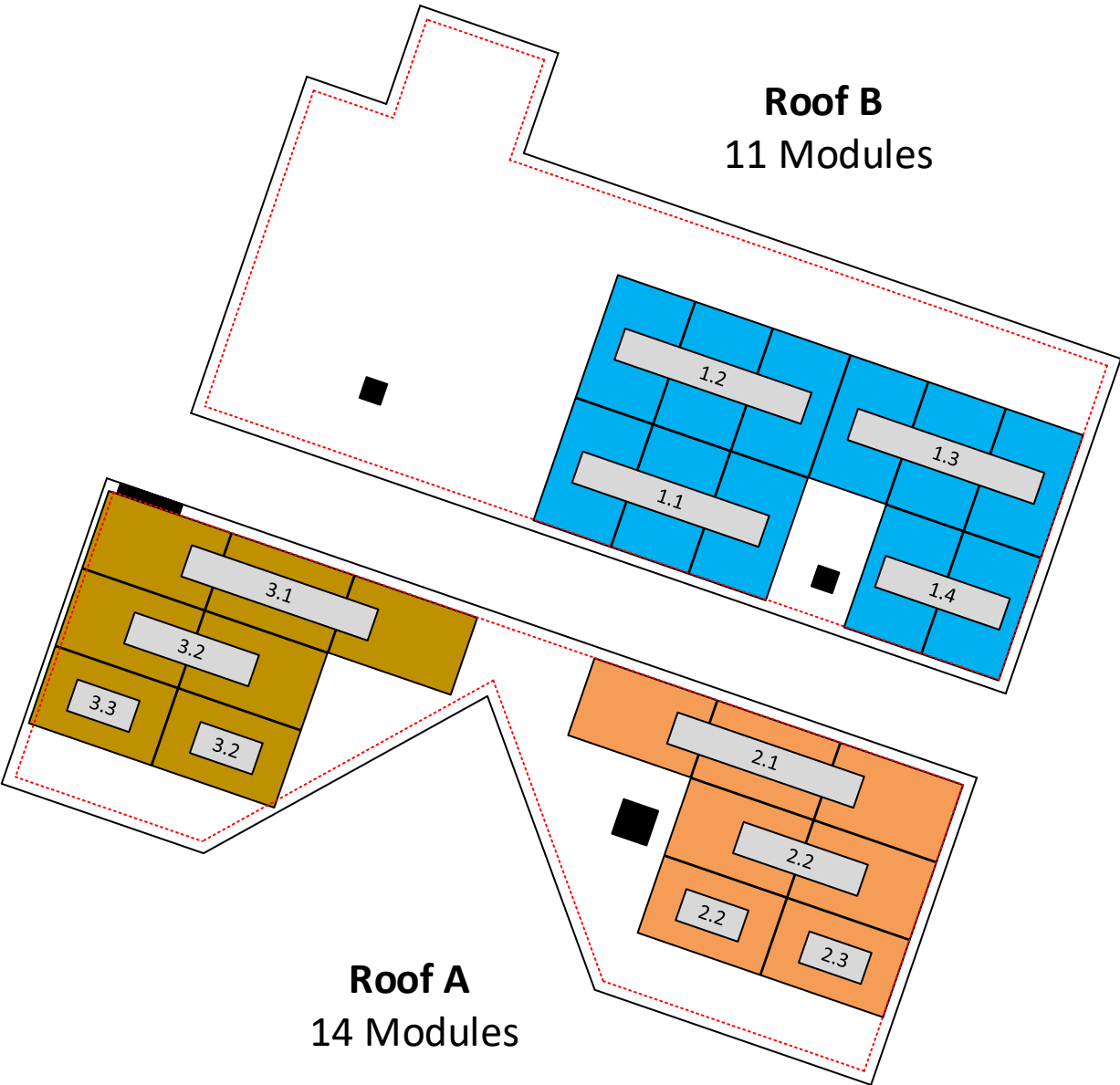
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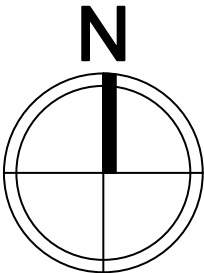
Sheet Number:

PV3



6in setback from  
sides of the roof

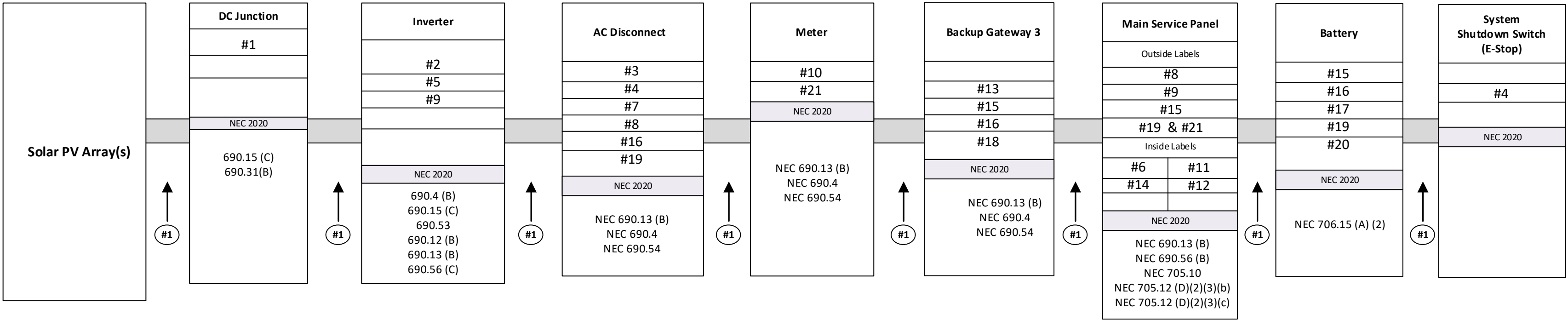
STRING MAPPING  
SCALE: 1/8" - 1'











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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 DISCONNECT CLEARLY 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:PHOTOVOLTAIC  
POWER SOURCE

#2

PHOTOVOLTAIC

DC DISCONNECT

#3

PHOTOVOLTAIC

AC DISCONNECT

#4

RAPID SHUTDOWN  
SWITCH FOR  
SOLAR PV SYSTEM

#5

MAXIMUM VOLTAGE550Vdc  
MAX. RATED CIRCUIT CURRENT13.72Adc  
OF THE CHARGE CONTOLLER OR  
DC-TO-DC CONVERTER (IF INSTALLED)

#6

PHOTOVOLTIVC POWER SOURCE

OPERATING AC VOLTAGE240V  
MAXIMUM OPERATING  
AC OUTPUT CURRENT48A

#7

AC DISCONNECT  
PHOTOVOLTAIC SYSTEM  
POWER SOURCE

RATED AC  
OUTPUT CURRENT48AMPS  
NOMINAL OPERATING  
AC VOLTAGE240VOLTS

#8

WARNING

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

#9

WARNING

THREE POWER SOURCES  
SOURCES: UTILITY GRID, BATTERY 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

POWER SOURCE  
OUTPUT CONNECTION  
DO NOT RELOCATE THIS  
OVERCURRENT DEVICE

#13

WARNING

SOLAR ELECTRIC  
CIRCUIT BREAKER  
IS BACKFEED

#14

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

#15

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

#16

SERVICE DISCONNECT LOCATED  
IN THE BACKUP GATEWAY 3  
PANEL

#17

BATTERY

#18

MAIN BATTERY  
SYSTEM DISCONNECT

#19

BATTERY DISCONNECT LOCATED  
IN THE BACKUP GATEWAY 3  
PANEL

#20

ENERGY STORAGE  
SYSTEM DISCONNECT

NOMINAL ESS AC VOLTAGE240V  
NOMINAL ESS DC VOLTAGE550V  
AVAILABLE FAULT CURRENT  
DERIVED FROM THE ESS160A  
DATE CALCULATION PERFORMED06/02/2025

**Customer Information:**

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**Customer Signature:**

**Sheet Name:**

PV Labels

**JOB NUMBER:**

25-275-PB

**Date:**

06/02/2025

**Revision:**

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**Sheet Size:**

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17" X 22"

**Sheet Number:**

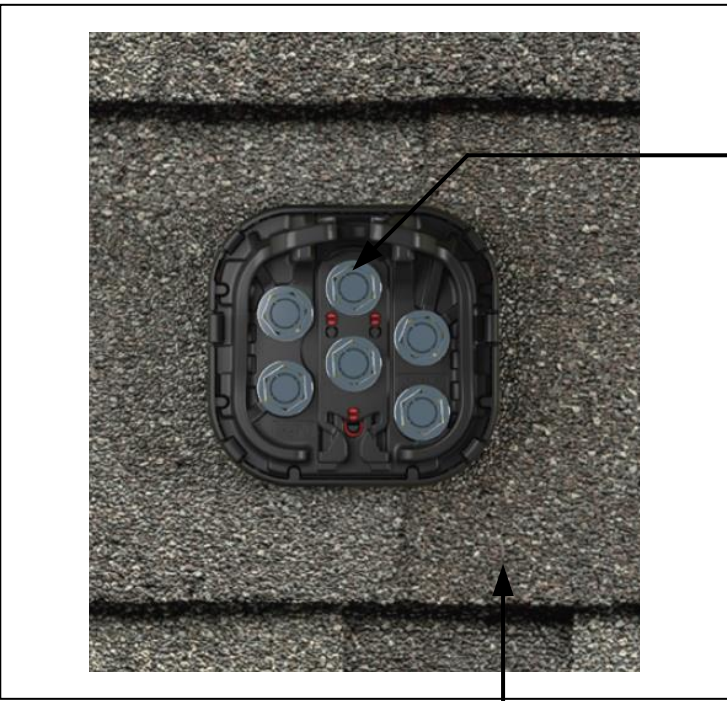
PV6





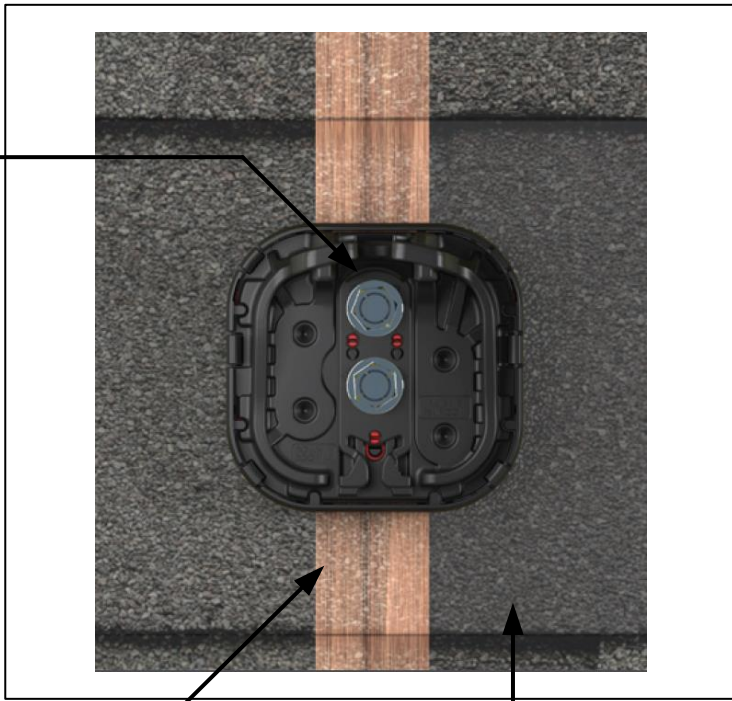


Deck Attach – 6 Fasteners



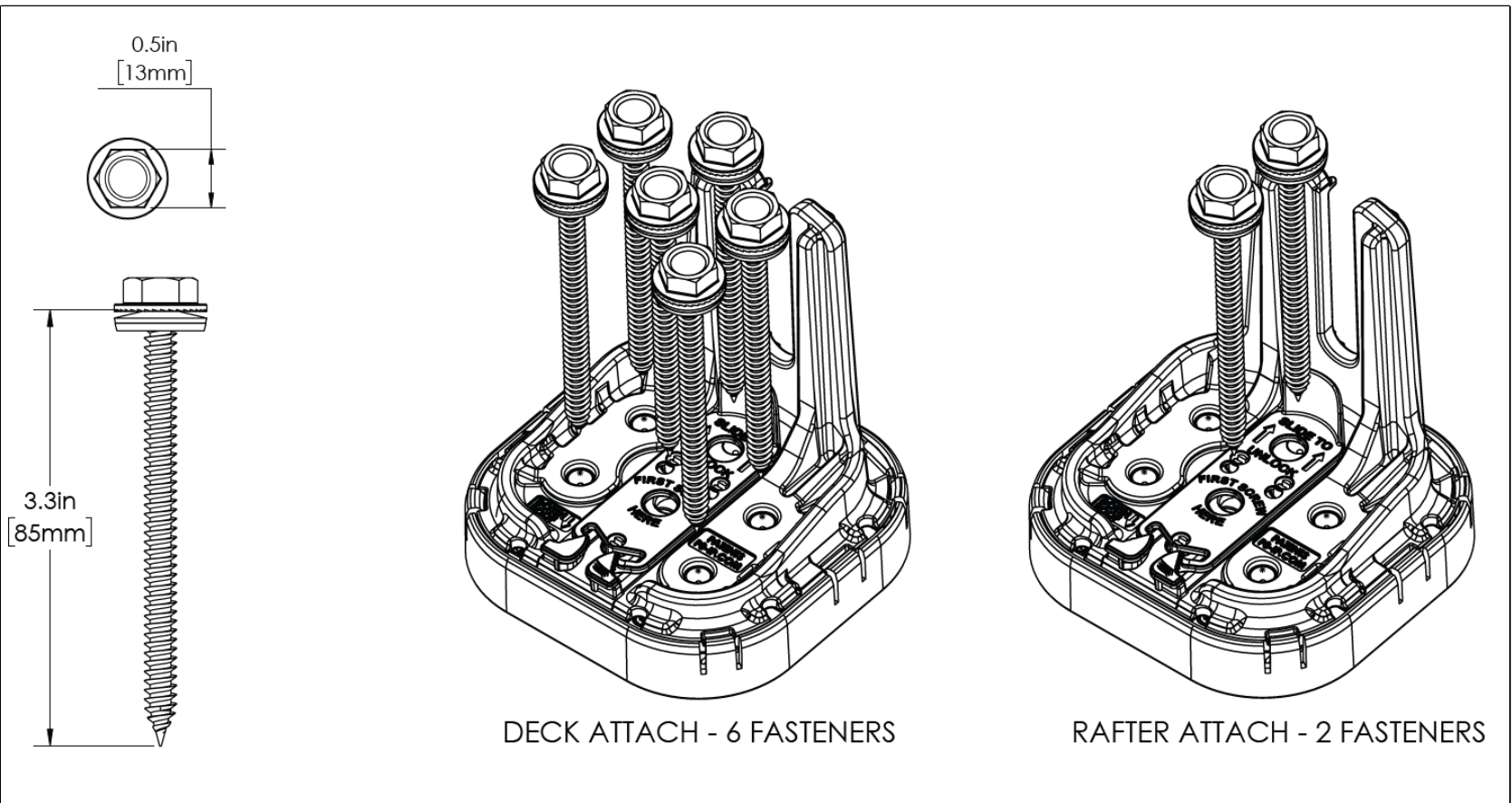
Asphalt  
Shingle Roof

Rafter Attach – 2 Fasteners



RAFTER

Asphalt  
Shingle Roof



DECK ATTACH - 6 FASTENERS

RAFTER ATTACH - 2 FASTENERS



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Sheet Name:

Attachment Details

JOB NUMBER:

25-275-PB

Date:

06/02/2025

Revision:

A







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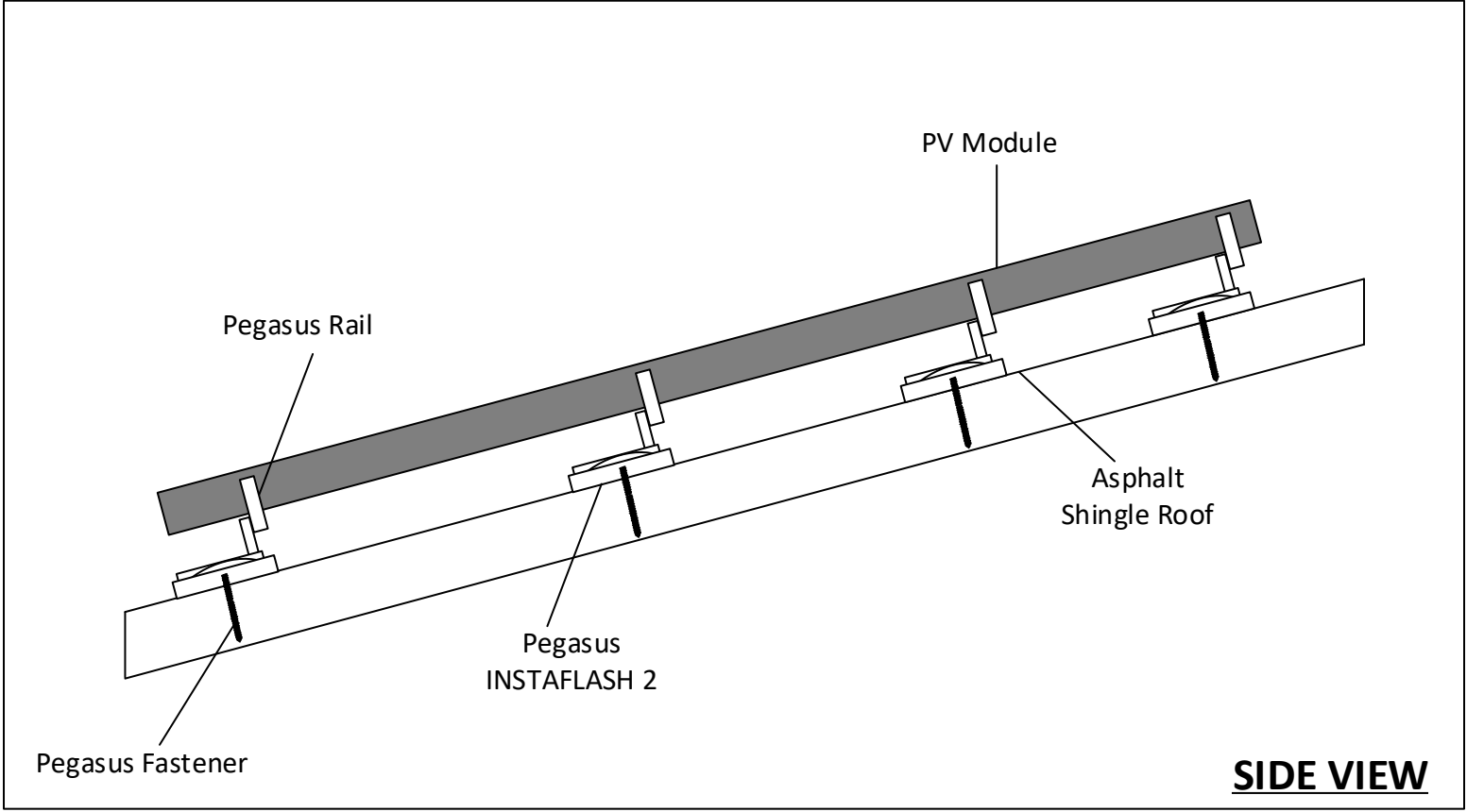
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Sheet Number:

PV8



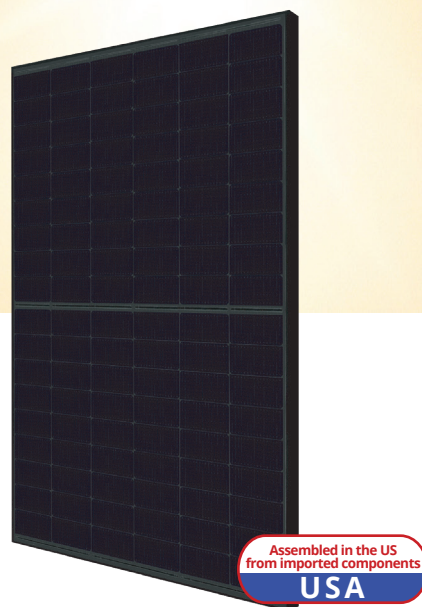
					
Multi-Clamp	Hidden End Clamp	MLPE Mount	Dovetail T-Bolt	Ground Lug	Cable Grip
Torque Value 100 in-lbs.	Torque Value 135 in-lbs.	Torque Value 135 in-lbs.	Torque Value 300 in-lbs.	Torque Value 135 in-lbs.	Torque Value 135 in-lbs.



SIDE VIEW

PV Dead Load	
Roof A	<b>PV System Dead Load (Panel + Racking weight) / PV System Area</b> (14 panels x 50.7lbs./panel + 166 ft. of racking x 1.17 lb.ft) / (14 panels x 5.9' x 3.71') = 2.90 psf
Roof B	<b>PV System Dead Load (Panel + Racking weight) / PV System Area</b> (11 panels x 50.7lbs./panel + 83 ft. of racking x 1.17 lb.ft) / (11 panels x 5.9' x 3.71') = 2.67 psf





# TOPHiKu6 (All-Black)

N-type TOPCon Technology

445 W ~ 470 W

CS6.1-54TM-445 | 450 | 455 | 460 | 465 | 470H

## MORE POWER



Module power up to 470 W  
Module efficiency up to 23.0 %



Excellent anti-LeTID & anti-PID performance.  
Low power degradation, high energy yield



Lower temperature coefficient (Pmax):  $-0.29\%/^{\circ}\text{C}$ ,  
increases energy yield in hot climate



Lower LCOE & system cost

## MORE RELIABLE



Minimizes micro-crack impacts



Heavy snow load up to 8100 Pa,  
wind load up to 6000 Pa\*



**Industry Leading Product Warranty on Materials and Workmanship\***



**Linear Power Performance Warranty\***

**1<sup>st</sup> year power degradation no more than 1%**

**Subsequent annual power degradation no more than 0.4%**

\*Subject to the terms and conditions contained in the applicable Canadian Solar Limited Warranty Statement. Also this 25-year limited product warranty is available only for products installed and operating on rooftops in certain regions.

## MANAGEMENT SYSTEM CERTIFICATES\*

ISO 9001:2015 / Quality management system  
ISO 14001:2015 / Standards for environmental management system  
ISO 45001: 2018 / International standards for occupational health & safety  
IEC62941: 2019 / Photovoltaic module manufacturing quality system

## PRODUCT CERTIFICATES\*

IEC 61215 / IEC 61730  
IEC 61701 / IEC 62716 / IEC 60068-2-68  
Take-e-way



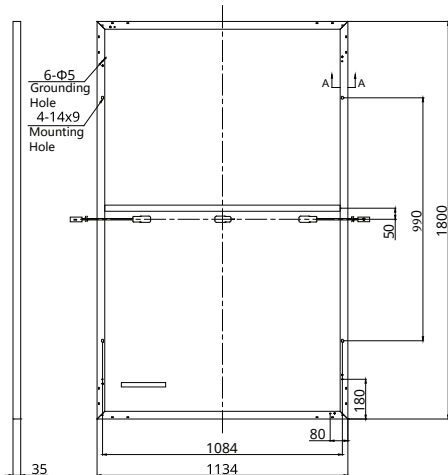
\* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates available for your Product and applicable in the regions in which the products will be used.

**CSI Solar Co., Ltd.** is committed to providing high quality solar photovoltaic modules, solar energy and battery storage solutions to customers. The company was recognized as the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey. Over the past 22 years, it has successfully delivered over 100 GW of premium-quality solar modules across the world.

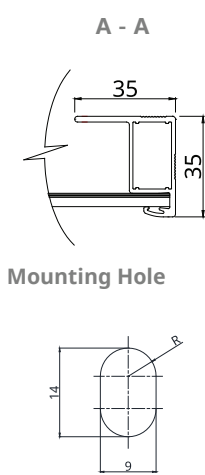
\* For detailed information, please refer to the Installation Manual.

ENGINEERING DRAWING (mm)

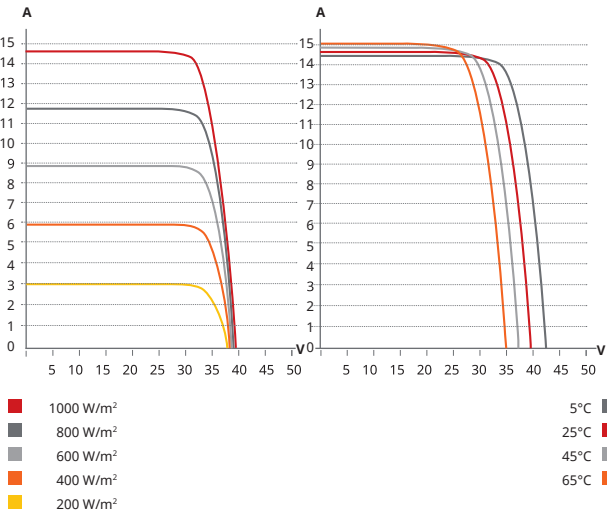
Rear View



Frame Cross Section



CS6.1-54TM-455H / I-V CURVES



ELECTRICAL DATA | STC\*

CS6.1-54TM	445H	450H	455H	460H	465H	470H
Nominal Max. Power (Pmax)	445 W	450 W	455 W	460 W	465 W	470 W
Opt. Operating Voltage (Vmp)	32.8 V	33.0 V	33.2 V	33.4 V	33.6 V	33.8 V
Opt. Operating Current (Imp)	13.59 A	13.66 A	13.72 A	13.78 A	13.85 A	13.91 A
Open Circuit Voltage (Voc)	38.7 V	38.9 V	39.1 V	39.3 V	39.5 V	39.7 V
Short Circuit Current (Isc)	14.48 A	14.55 A	14.61 A	14.69 A	14.77 A	14.86 A
Module Efficiency	21.8%	22.0%	22.3%	22.5%	22.8%	23.0%
Operating Temperature	-40°C ~ +85°C					
Max. System Voltage	1500V (IEC/UL) or 1000V (IEC/UL)					
Module Fire Performance	TYPE 1 (UL 61730 1500V) or TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)					
Max. Series Fuse Rating	25 A					
Application Classification	Class A					
Power Tolerance	0 ~ + 10 W					

\* Under Standard Test Conditions (STC) of irradiance of 1000 W/m<sup>2</sup>, spectrum AM 1.5 and cell temperature of 25°C.

MECHANICAL DATA

Specification	Data
Cell Type	TOPCon cells
Cell Arrangement	108 [2 X (9 X 6)]
Dimensions	1800 × 1134 × 35 mm (70.9 × 44.6 × 1.38 in)
Weight	23 kg (50.7 lbs)
Front Cover	3.2 mm tempered glass with anti-ref- lective coating
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4 mm <sup>2</sup> (IEC), 12 AWG (UL)
Connector	T6, MC4, MC4-EVO2 or MC4- EVO2A
Cable Length (Including Connector)	1550 mm (61.0 in) (+) / 1100 mm (43.3 in) (-)
Per Pallet	30 pieces
Per Container (40' HQ)	720 pieces

ELECTRICAL DATA | NMOT\*

CS6.1-54TM	445H	450H	455H	460H	465H	470H
Nominal Max. Power (Pmax)	335 W	339 W	343 W	347 W	351 W	354 W
Opt. Operating Voltage (Vmp)	30.9 V	31.1 V	31.3 V	31.5 V	31.7 V	31.9 V
Opt. Operating Current (Imp)	10.85 A	10.91 A	10.96 A	11.02 A	11.07 A	11.12 A
Open Circuit Voltage (Voc)	36.5 V	36.7 V	36.9 V	37.1 V	37.3 V	37.5 V
Short Circuit Current (Isc)	11.68 A	11.74 A	11.79 A	11.85 A	11.92 A	11.99 A

\* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m<sup>2</sup> spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.29 % / °C
Temperature Coefficient (Voc)	-0.25 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	42 ± 3°C

PARTNER SECTION



\* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. CSI Solar Co., Ltd. reserves the right to make necessary adjustment to the information described herein at any time without further notice. Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.



# 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  $I_{sc}$ .



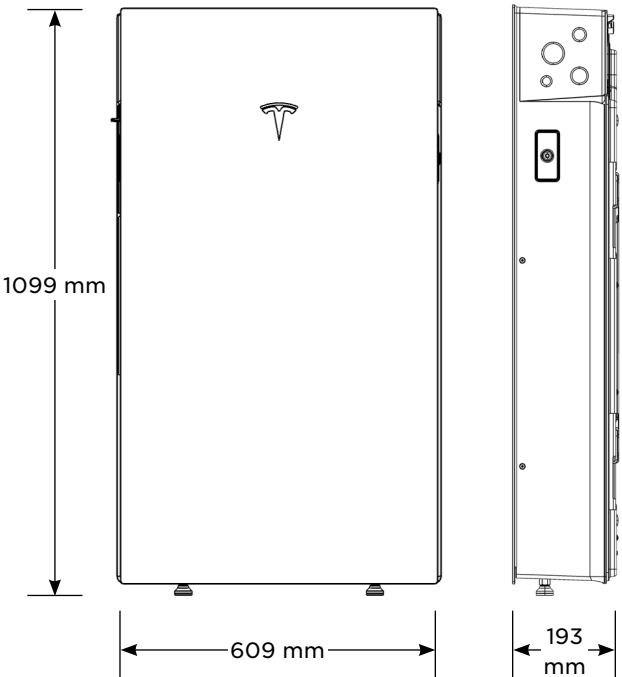
# Powerwall 3 Technical Specifications

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>



# 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 <sup>10</sup>
	Communication	CAN
	AC Meter	Revenue accurate (+/- 0.5%)
	Expected Service Life	21 years
	Warranty	10 years

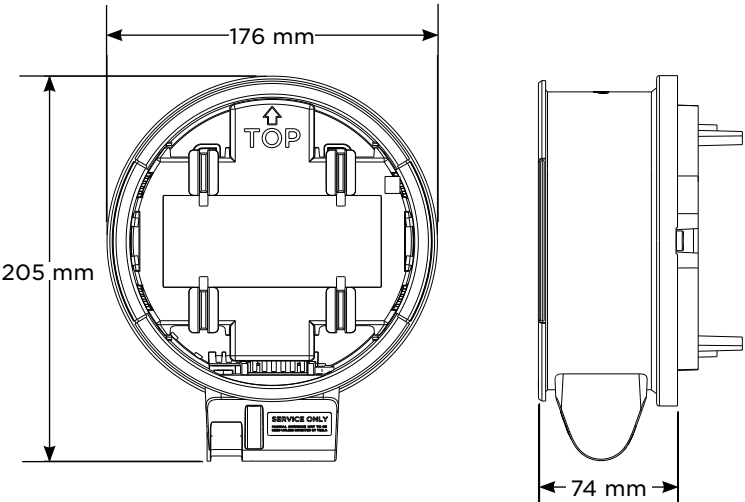
<sup>10</sup> Breaker maximum supply short circuit current rating must be equal to or greater than the available fault current.

Environmental Specifications	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 <sup>11</sup> Reset button
	Conduit Compatibility	1/2-inch NPT

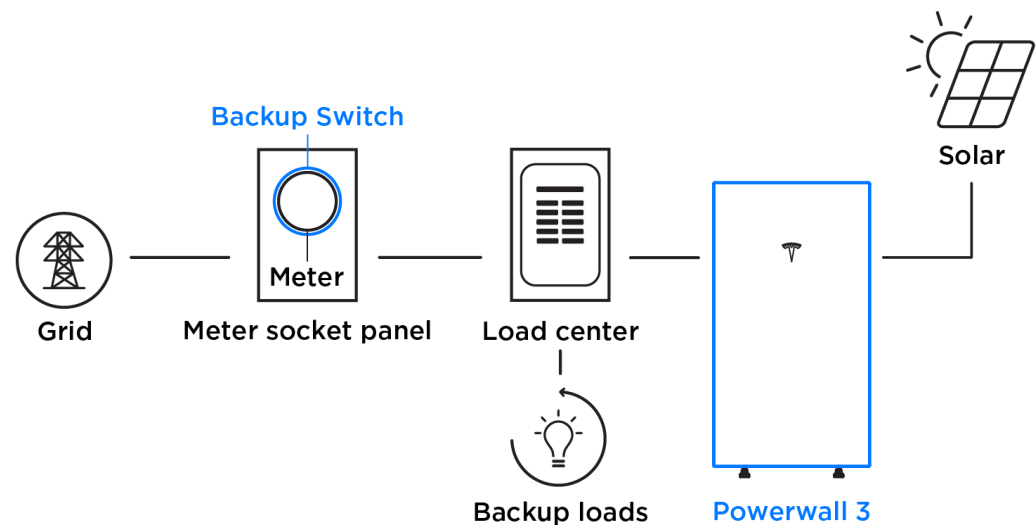
<sup>11</sup> Manually overrides the contactor position during a service event.



# Powerwall 3 Example System Configurations

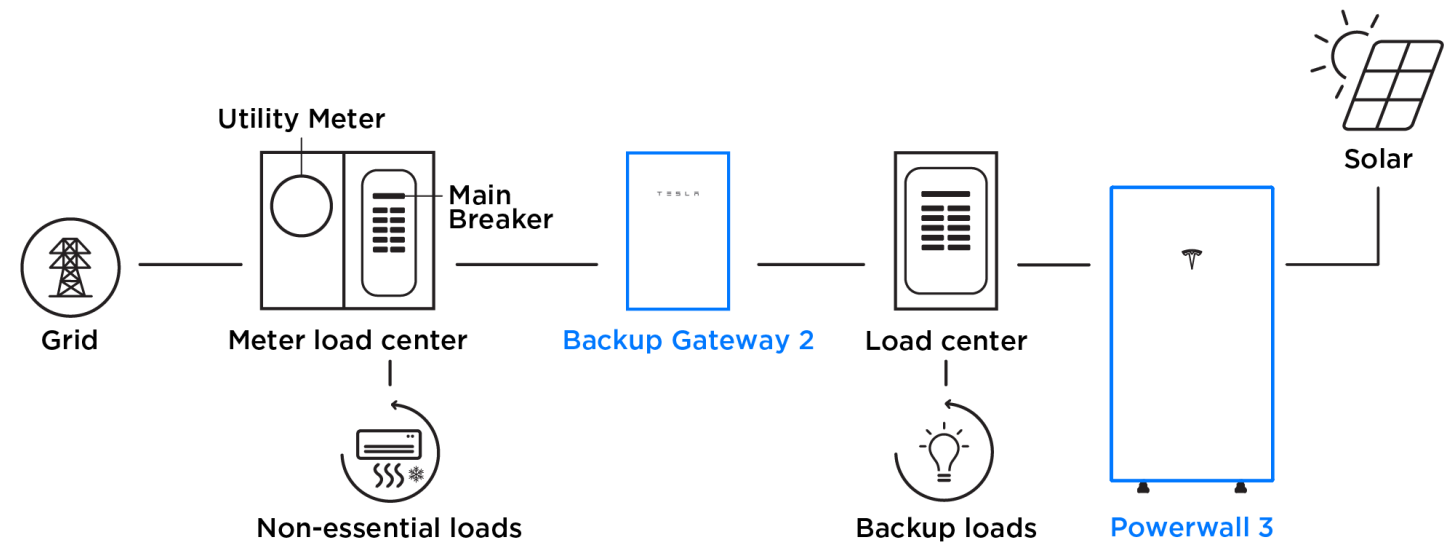
## Powerwall 3 with Backup Switch

Whole Home Backup



## Powerwall 3 with Backup Gateway 2

Partial Home Backup



# 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	AC Meter	Revenue accurate (+/- 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>1</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>1</sup>Only Eaton CSR or BWH main breakers are 25 kA rated

## Environmental Specifications

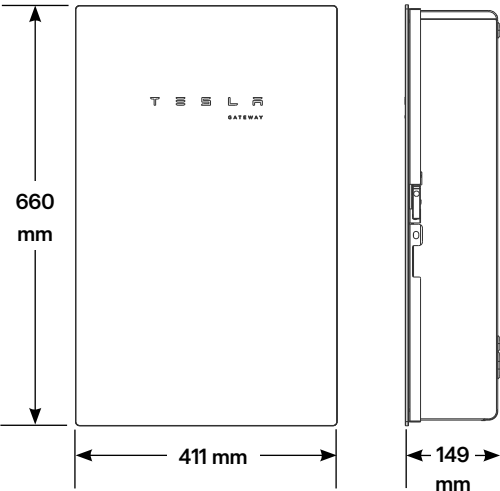
Operating Temperature	–20°C to 50°C (–4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

## Compliance Information

Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS, CSA 22.2 107.1, CSA 22.2 29
Emmissions	FCC Part 15, 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





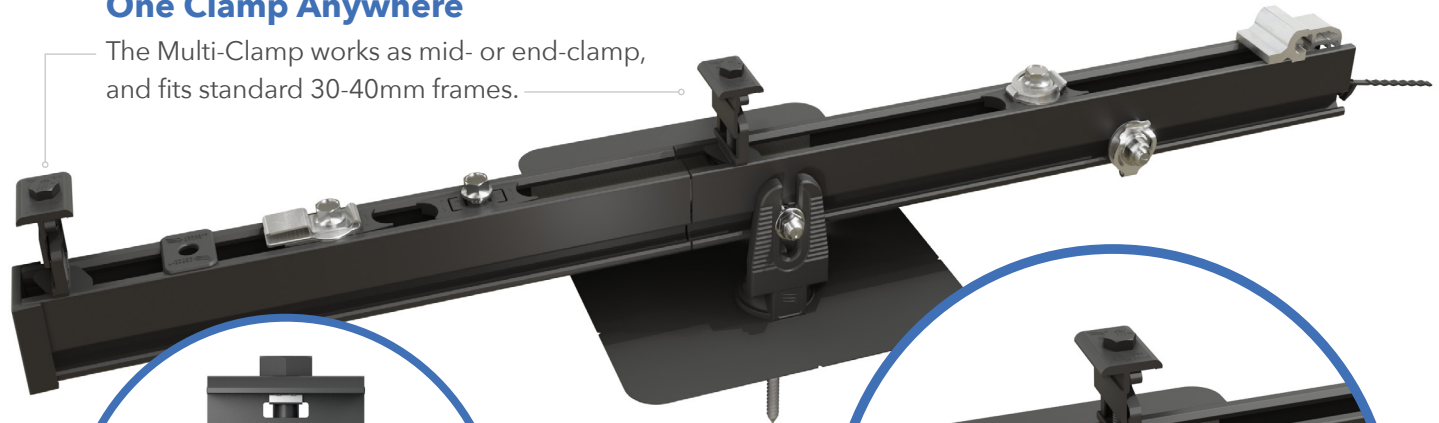
# RAIL SYSTEM

## One Clamp Anywhere

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

## Instant Bonding

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

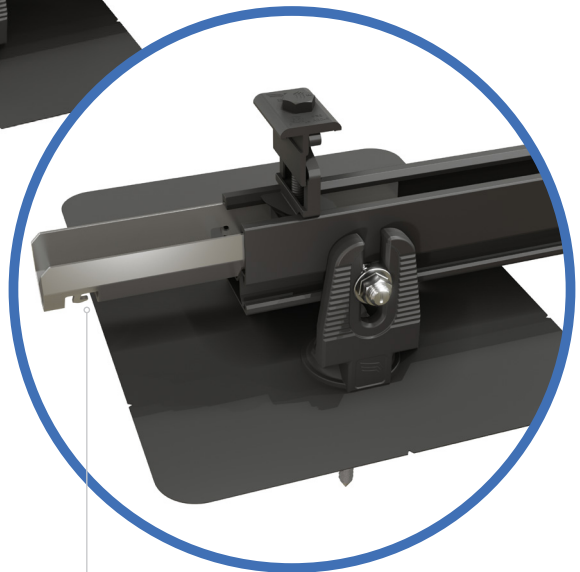


## Lifetime Wire Management

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.



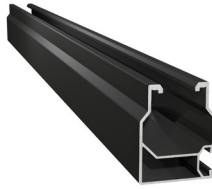
### Watertight for Life

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



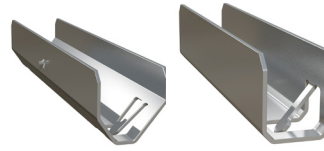
**Pegasus Rail**

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



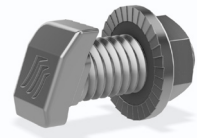
**Pegasus Max Rail**

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 1/2" 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.



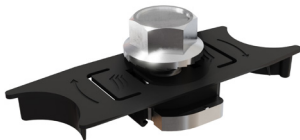
**Ground Lug**

Holds 6 or 8 AWG wire.  
Mounts on top or side of rail.  
Assembled on MLPE Mount.  
UL2703 listed as reusable.



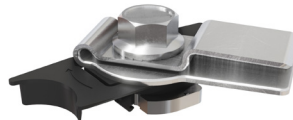
**N-S Bonding Jumper**

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



**FREE**  
PEGASUS SOLAR  
Design Tool

Quickly calculate the most efficient layout, spans and materials needed to suit your job. Visit the Pegasus Customer Portal. [pegassussolar.com/portal](https://www.pegassussolar.com/portal)

Patents pending. All rights reserved. ©2021 Pegasus Solar Inc.

LOAD		SPAN			
SNOW (PSF)	WIND (MPH)	32"	4'	6'	8'
0	120	PEGASUS RAIL			
	160				
	190				
15	140	PEGASUS RAIL			
	160				
	190				
30	160	PEGASUS RAIL			
	190				
45	190	PEGASUS RAIL			
70	190	PEGASUS RAIL			
110	190	PEGASUS 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.pegassussolar.com/spans](https://www.pegassussolar.com/spans).

## Rafter or Deck Attach!

- No pilot holes
- Pre-installed sealant
- No caulking, no ripping shingles



## Pre-installed sealant

**Before:** Sealant contained by protective cage. No contact with hands or tools.



## Instant, watertight seal

**After:** Non-hardening sealant automatically fills all gaps, overlays and butt joints.



## Install in any season

Install in 0 to 170° F weather, including rain and sleet. Watertight for life.

# The Ultimate Comp Roof Attachment

Simple to use. Works for rafter or deck attach. No caulking, no ripped shingles, no mess. Pre-installed sealant acts as a chemical flashing and fills all gaps, voids, and butt joints for an instant, watertight seal.



### 25-Year Warranty

Manufactured with advanced materials and coatings to outlast the roof itself



### Code Compliant

Fully IBC/CBC code compliant  
Exceeds ASCE 7-22 standards  
UL2703 certified



### Self-Healing

Proprietary non-hardening sealant will flex and reseal over years of thermal expansion and contraction



### Larger Spans

Extra-large L-foot and proprietary screws result in larger spans between mounts




**1**  
Release Safety.



**2**  
Install screw through center hole, and drive into roof until InstaFlash2 pushes through cage and seats onto the roof.



**3**  
If screw hits rafter, drive second screw in hole above. Ensure screws are embedded at least 2.5" into rafter. Installation complete.




**4**  
If first screw misses rafter, install second screw into the left or right screw holes over rafter.

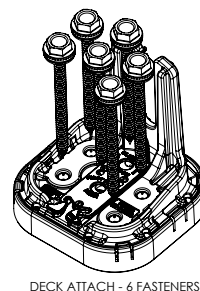
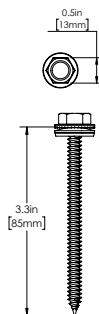
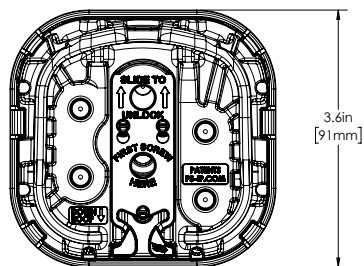
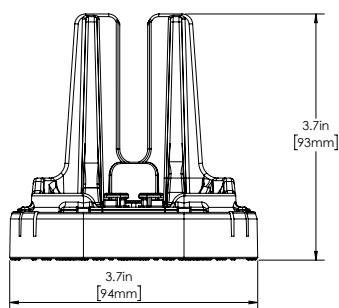


**5**  
Continue until 2 screws are embedded at least 2.5" into rafter.

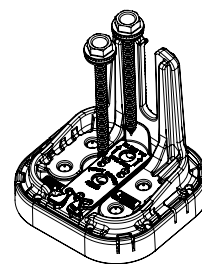


**6**  
For deck attach, use 6 screws.  
*Note: Deck attach may reduce max span.*





DECK ATTACH - 6 FASTENERS



RAFTER ATTACH - 2 FASTENERS

SPECIFICATIONS		INSTAFLASH KITS		
	PIF2-B0	PIF2-BDT	PIF2-M0	PIF2-MDT
Finish	Black		Mill	
Kit Contents	Black InstaFlash2	Black InstaFlash2, Dovetail T-bolt	Mill InstaFlash2	Mill InstaFlash2, Dovetail T-bolt
Attachment Type	Rafter & Deck Attach			
Roof Fasteners	1/2" Socket Driven; PF-DRW85 (sold separately in boxes of 24)			
Roof Type	Sloped Roof: Composition Shingle, Rolled Asphalt   Flat Roof: Modified Bitumen Roof, Built-Up Roof			
Flashing Type	Factory Installed Non-Drying, Non-Skinning Butyl Based Chemical Flashing			
Installation Temperature	0° F to 170° F			
Cure Time	Instantly Waterproof; Non-Hardening			
Service Temperature	-40° F to 195° F			
Certifications	IBC, ASCE/SEI 7-16 & 7-22, UL2703			
Install Application	Most Railed Systems			
Kit Quantity	24			
Boxes Per Pallet	36			



SCAN FOR  
INSTALLATION  
VIDEO



SCAN FOR  
FREE TRIAL

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# SolaDeck

## PV ROOF-MOUNT ENCLOSURE



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

### Enclosure Includes:

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

**INTRODUCED AT  
*SOLAR POWER 2007***



### PV Roof-Mount Combiner/Enclosure

### 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](http://www.commdeck.com)**



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**



# 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 NEC 230.62 (C) Compliant Barrier from the date of installation of the Product or eighteen (18) months from the date of shipment of the Product, whichever occurs first.

Compliances

Certifications

UL Listed

Catalog Notes

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



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

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](#)



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