SHEET INDEX:

SHEET NO. SHEET TITLE S-01 ARRAY A LAYOUT S-02 ARRAY B LAYOUT S-03 **ASSEMBLY DETAILS**

R-01 **RESOURCES RESOURCES** R-02

AUTHORITIES HAVING JURISDICTION:

BUILDING: HARNETT COUNTY ZONING: HARNETT COUNTY **ELECTRICAL: HARNETT COUNTY** UTILITY: CENTRAL EMC

REFERENCE CODES:

ELECTRICAL CODE: 2017 NEC

BUILDING CODE(S): 2018 IRC WITH NORTH CAROLINA AMENDMENTS 2018 IFC WITH NORTH CAROLINA AMENDMENTS FIRE CODE:

ASCE 7-10 **ENGINEERING:**

DESIGN CRITERIA:

GROUND SNOW LOAD: 10 PSF 120 MPH DESIGN WIND SPEED:

DESIGN EXPOSURE CATEGORY: В

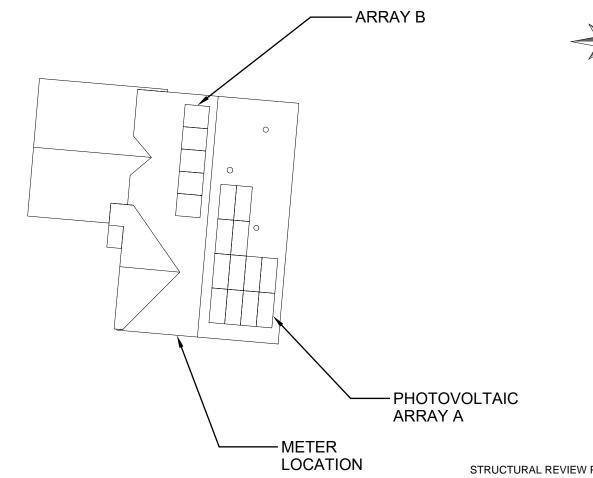
DEAD LOAD: 2.94 PSF AVERAGE HIGH TEMPERATURE: 34°C ASHRAE LOW TEMPERATURE: -9°C

SYSTEM ATTRIBUTES	QTY
Trina 420	17
TESLA 7.6KW SOLAR INVERTER	1

SYSTEM SIZE

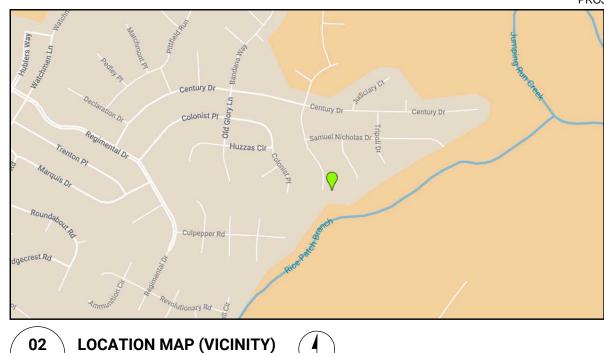
7.600 kW-AC/ 7.140 kW-DC

NAME	EMAIL	PHONE	TITLE
ROBERT PARKER	ROBERT.PARKER@CAPEFEARSOLARSYSTEMS.COM	910-232-6288	CHIEF OPERATING OFFICER
DANIEL CAVANAGH	DANIEL.CAVANAGH@CAPEFEARSOLARSYSTEMS.COM	910-599-0428	RESIDENTIAL PROJECT MANAGER
WILLIAM PARKER	WILLIAM.PARKER@CAPEFEARSOLARSYSTEMS.COM	910-777-3749	COMMERCIAL PROJECT ASSOCIATE
MICHAEL HORAN	MICHAEL.HORAN@CAPEFEARSOLARSYSTEMS.COM	336-404-0511	PROJECT DEVELOPMENT COORDINATOR
JOHN NOVAK	JOHN.NOVAK@CAPEFEARSOLARSYSTEMS.COM	910-622-7361	SOLAR DESIGNER
DEREK MADRID	DEREK.MADRID@CAPEFEARSOLARSYSTEMS.COM	910-574-4229	SOLAR SITE SURVEYOR



SITE SKETCH 01 G-01 **SCALE: 1:240**

STRUCTURAL REVIEW PROVIDED BY: RONALD P. BITTLER, PE RB ENGINEERING, INC. (C-2499) 168 QUADE DRIVE CARY, NC 27513 919-677-9662 PROJECT #RB-25332



CAPE **FEAR SOLAR SYSTEMS**

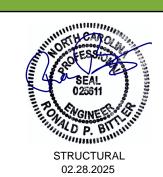
910 S. 2nd St. Wilmington, NC 28401 910-409-5533



GC LIC. NO.: 65677 ELEC. LIC. NO.: U-33321

Tavern Dr, Cameron, NC 28326 7.14 kW DC PV SYSTEM **REUBEN FORNAH**

. Lm_ 183 COVER



	<u>RE</u>	VISION LIST 🛕
#	REV. DATE	DESC.

February 28, 2025 DATE: DRAWN BY:

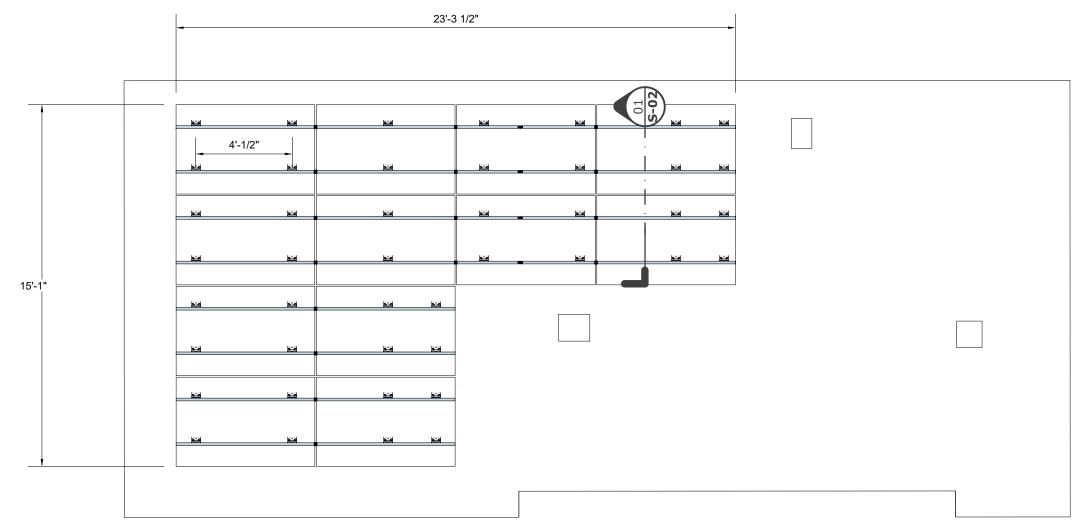
Sheet No.

G-01

G-01

STRUCTURAL NOTES

- 1. ROOF MOUNT RACKING SYSTEM & PV ARRAY TO BE INSTALLED IN STRICT ACCORDANCE WITH THESE DRAWINGS & MFG'S RECOMMENDATIONS. MINOR SPACING MODIFICATIONS ARE ACCEPTABLE TO ACCOMODATE EXISTING ROOF STRUCTURE MEMBERS
- 2. EXISTING ROOF STRUCTURE HAS BEEN INCLUDED IN THE STRUCTURAL EVALUATION AND FOUND SUITABLE FOR THIS INSTALLATION
- 3. ALL ATTACHMENT BOLTS SHALL BE INSTALLED IN THE MIDDLE THIRD OF THE RAFTER (OR TRUSS) THICKNESS



01 **PLAN - ARRAY A LAYOUT** S-01 **SCALE:** 1/4" = 1'

CAPE **EXECUTE** FEAR **SOLAR SYSTEMS**

910 S. 2nd St. Wilmington, NC 28401 910-409-5533



GC LIC. NO.: 65677 ELEC. LIC. NO.: U-33321

7.14 kW DC PV SYSTEM LAYOUT **REUBEN FORNAH**

Tun Tavern Dr, Cameron, NC 28326

4

ARRAY

02.28.2025

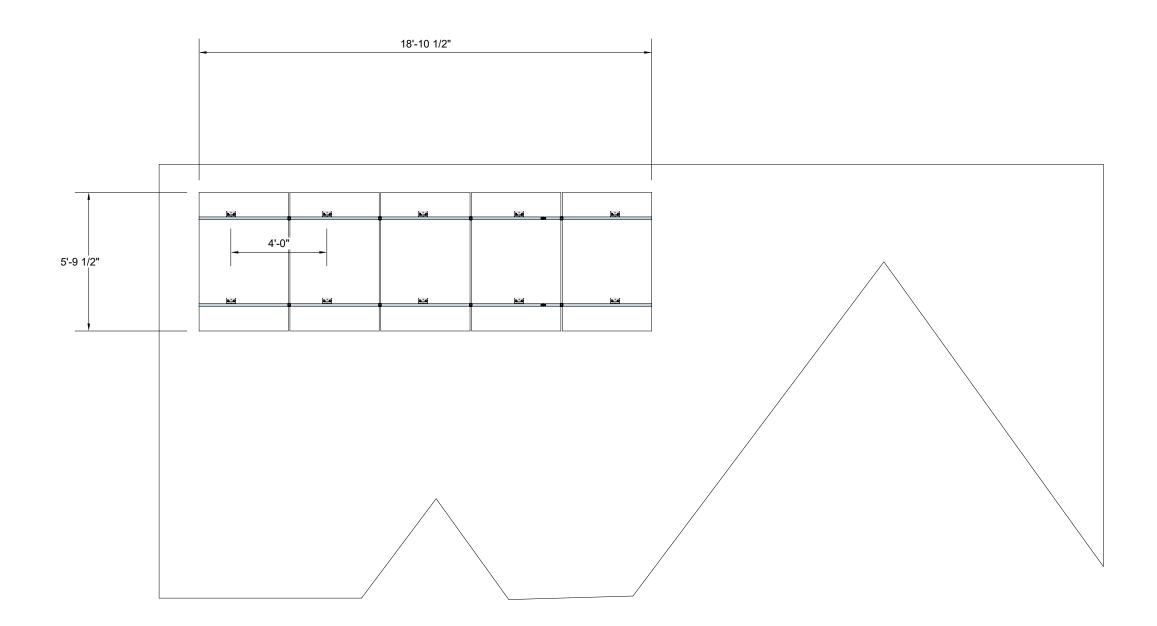
183

	<u>RE</u>	VISION LIST A
#	REV. DATE	DESC.

February 28, 2025 DRAWN BY:

Sheet No.

S-01



01 PLAN - ARRAY B LAYOUT S-02 SCALE: 1/4" = 1'

SOLAR SYSTEMS
910 S. 2nd St.
Wilmington, NC 28401
910-409-5533



GC LIC. NO.: 65677

ELEC. LIC. NO.: U-33321

7.14 kW DC PV SYSTEM

183 Tun Tavern Dr, Cameron, NC 28326 **REUBEN FORNAH**

ARRAY B LAYOUT

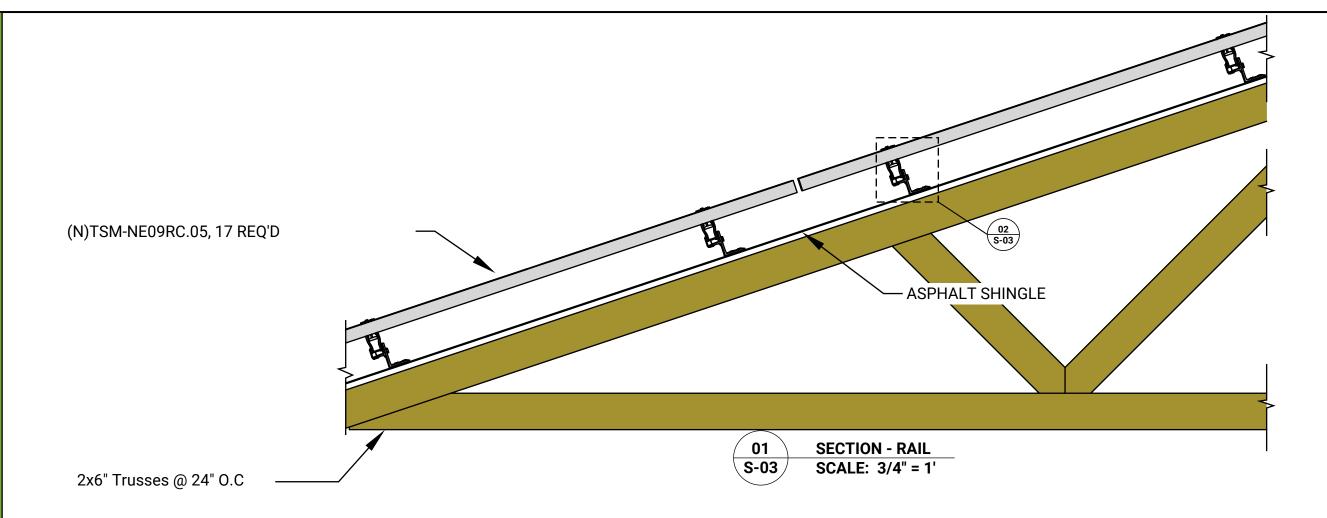
02.28.2025

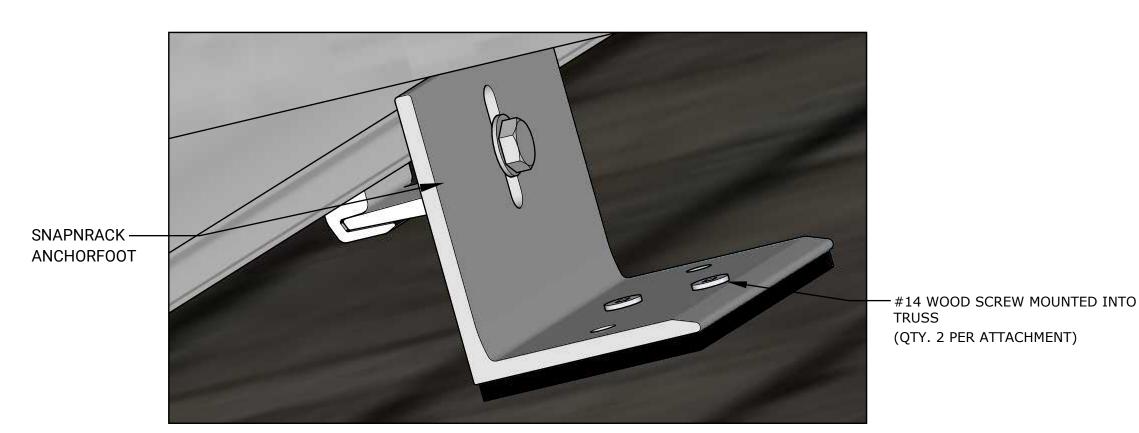
	RE	VISION LIST A
#	REV. DATE	DESC.

February 28, 2025 DRAWN BY:

Sheet No.

S-02





910 S. 2nd St. Wilmington, NC 28401 910-409-5533



GC LIC. NO.: 65677

ELEC. LIC. NO.: U-33321

ASSEMBLY DETAILS

183 Tun Tavern Dr, Cameron, NC 28326 7.14 kW DC PV SYSTEM **REUBEN FORNAH**

	<u>RE</u>	VISION LIST \wedge
#	REV. DATE	DESC.

02.28.2025

February 28, 2025 DRAWN BY:

Sheet No.

S-03

DETAIL - ANCHORFOOT

02

S-03

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-NE09RC.05 PRODUCT RANGE: 400-430W

430W MAXIMUM POWER OUTPUT

0~+5W POSITIVE POWER TOLERANCE MAXIMUM EFFICIENCY



Small in size, bigger on power

• Up to 430W, 21.5% module efficiency with high density interconnect technology

Interconnect technology

Reduce installation cost with higher power bin and efficiency
Boost performance in warm weather with low temperature
coefficient and operating temperature

High Reliability
Innovative non-destructive cutting
for improved mechanical resistance and strength
Excellent fire rating, weather resistance, salt spray, sand dust, ammonia performance which is fully applicable in coastal, high temperature, humidity area and harsh environment

Ultra-low Degradation, longer warranty, higher output

• First-year degradation 1% and annual degradation at 0.4% Up to 25 years product warranty and 25 years power warranty

Universal solution for residential and C&I rooftops Easy for integration, designed for compatibility with existing

mainstream inverters and diverse mounting systems Perfect size and low weight for handling and installation

Most Valuable solution on low load capacity rooftops (weight similar to backheet version)

Mechanical performance up to 6000 Pa positive load and 4000 Pa

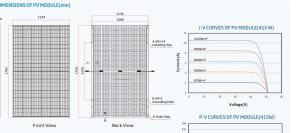
negative load

Trina Solar's Vertex Bifacial Backsheet Performance Warranty

Trinasolar

Trinasolar

Vertex 5-1 BACKSHEET MONOCRYSTALLINE MODULE



#		Voltage(V)
Щ	8-Drain Hole	P-V CURVES OF PV MODULE(415W
	Back View	450
nt	Silicon Sealant	900 gtmmF
e	Larrinate	§ 100
	8	250 200 200 200
	Frame	150 100 400M/m²
000		50 200H/m²
	15.4	0 30 30 50 40 50 Voltage(V)
	B-B	

Peak Power Watts-Prix (Wp)*	400	405	410	415	420	425	430	Solar Cells	Topcon Bifacial
Power Tolerance-PMAX (W)				0~+5				No. of cells	144cells
Maximum Power Voltage-Vren (V)	41.3	41.7	42.1	42.5	42.8	43.2	43.6	Module Dimensions	1762*1134*30 mm (69.37*44.65*1.18 inches)
								Weight	21.3kg (47.0 lb)
Maximum Power Current-IHPP (A)	9.68	9.71	9.73	9.77	9.80	9.84	9.87	Front Glass	3.2 mm (0.12inches), High Transmission, Tempered Glass
Open Circuit Voltage-Voc (V)	49.2	49.6	50.1	50.5	50.9	51.4	51.8	Encapsulant material	POE/EVA
Short Circuit Current-Isc (A)	10.30	10.33	10.37	10.40	10.43	10.47	10.50	BackSheet	Black Grid Transparent Backsheet
Module Efficiency nm (56)	20.0	20.3	20.5	20.8	21.0	21.3	21.5	Frame	30mm (1.18 inches) Anodized Aluminium Alloy, Black
STC Indiano 1000W/m2, Cell Temperature 25	C, Air Mass Ai	13.5. "Measu	ring tolerand	K 25%.				j-Bax	IP 68 rated
Electrical characteristics with o	ifferent	power bi	n (refere	nce to 10	0% Irrad	iance ra	tio)	Cables	Photovoltaic Technology Cable 4.0mm? (0.006 inche Landscape N 1100 mm/ P1100 mm(43.31/43.31 inch
Total Equivalent power - Pmx (Wp)	426	431	437	442	447	453	458		
Maximum Power Voltage-VHPF (V)	41.3	41.7	42.1	42.5	42.8	43.2	43.6	Connector	MC4 EVOZ
Maximum Power Current-IHPP (A)	10.31	10.34	10.36	10.41	10.44	10.48	10.51	Fire Type	Type1orType2

Maximum Power Current-IHPP (A)	10.31	10.34	10.36	10.41	10.44	10.48	10.51	Fire Type	Type1orType2		
Open Circuit Voltage-Voc (V)	49.2	49.6	50.1	50.5	50.9	51.4	51.8				
Short Circuit Current-Isc (A)	10.97	11.00	11.04	11.08	11.11	11.15	11.18	TEMPERATURE RATINGS		MAXIMUM RATINGS	
Irradiance ratio (rear/front)				10%				NOCT proximal Operating Cell Temperature) Temperature Coefficient of Prex.	43°C (±2°C) - 0.30%/°C	Operational Temperature Maximum System Voltage	-40~+85°C
Power Bifaciality/65130%.								Temperature Coefficient of Voc	- 0.24%/°C	Max Series Fuse Rating	25 A
ELECTRICAL DATA (NOCT)								Temperature Coefficient of Isc	0.0496/°C		
Maximum Power-Pwax (Wp)	312	308	312	316	319	324	328				
Maximum Power Voltage-V+PP (V)	38.6	39.0	39.3	39.7	40.0	40.4	40.7	WARRANTY		PACKAGING CONFIGURAT	ION

ELECTRICAL DATA (NOCT)								Temperature Coefficient of Isc 0.04%/PC	
Maximum Power-Pwx (Wp)	312	308	312	316	319	324	328		
Maximum Power Voltage-VHPP (V)	38.6	39.0	39.3	39.7	40.0	40.4	40.7	WARRANTY	PACKAGING CONFIGURATION
Maximum Power Current-Insp (A)	7.88	7.91	7.93	7.95	7.98	8.01	8.04	25 year Product Workmanship Warranty	Modules per box: 36 pieces
Open Circuit Voltage-Voc (V)	46.6	47 D	47.5	478	48.2	4R.7	49.1	25 year Power Warranty	Modules per 40' container: 792 pieces
			836		841	R 44		1% first year degradation	Pallet dimensions (L x W x H): 1800 x 1135 x 1259 mm
Short Circuit Current-Isc (A)	8.30	8.32	8.36	8.38	8.41	8.44	8.46	0.4% Annual Power Attenuation	Pallet weight: 829 kg (1827 lb)
NOCT: Irradiance at 600M/rsf, Ambient Tempera	rtune 20°C, N	ind Speed 1m	AL.					(Please refer to product warranty for details)	

SOLAR INVERTER

ELECTRICAL SPECIFICATIONS

PERFORMANCE SPECIFICATIONS

KEY FEATURES

Peak Efficiency

Internet Connectivity

Supported Grid Types

AC Remote Metering Support

- Integrated rapid shutdown, arc fault, and ground fault protection
- No neutral wire simplifies installation

98% at 208 V 98.4% at 208 V 98.1% at 240 V 98.6% at 240 V 97.5% at 208 V 97.5% at 208 V 97.5% at 240 V 98.0% at 240 V

Wi-Fi (2.4 GHz, 802.11 b/g/n), Ethernet, Cellular (LTE/4G)²

Wi-Fi (2.4 GHz, 802.11 b/g/n), RS-485

MECHANICAL SPECIFICATIONS

MODEL NUMBER	1534000-xx-y	1538000-xx-y	Dimensions	660 mm x 411 mm x 158 mm (26 in x 16
OUTPUT (AC)	3.8 kW	7.6 kW	Weight	52 lb ³
Nominal Power	3,800 W	7,600 W	Mounting options	Wall mount (bracket)
Maximum Apparent Power		6,656 VA at 208 V 7,680 VA at 240 V	³ Door and bracket can	be removed for a mounting weight of 37 lb.
Maximum Continuous Current	16 A	32 A	1	88
Breaker (Overcurrent Protection)	20 A	40 A		188
Nominal Power Factor	1 - 0.9 (leadi	ng / lagging)		T = E L F
THD (at Nominal Power)	</td <td>5%</td> <td></td> <td>.88</td>	5%		. 88
INPUT (DC)			660 mm	
MPPT	2	4	660 mm	
Input Connectors per MPPT	1-2	1-2-1-2		[· · ·
Maximum Input Voltage	600	VDC		
DC Input Voltage Range	60 - 59	0 VDC		
DC MPPT Voltage Range	60 - 48	0 VDC1	*	
Maximum Current per MPPT (I _{mp})	13	A		158
Maximum Short Circuit			≪	—411 mm → (150 → mm)

Operating Temperature	-30°C to 45°C (-22°F to 113°F)*
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	-30°C to 70°C (-22°F to 158°F)
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Rating	Type 3R
Ingress Rating	IP55 (Wiring compartment)
Pollution Rating	PD2 for power electronics and terminal wiring compartment, PD3 for all other components
Operating Noise @ 1 m	< 40 db(A) nominal, < 50 db(A) maximum

COMPLIANCE INFORMATION

Grid Certifications	UL 1741, UL 1741 SA, IEEE 1547, IEEE 1547.1
Safety Certifications	UL 1741 PVRSS, UL 1699B, UL 1998 (US), UL 3741
Emissions	EN 61000-6-3 (Residential), FCC 47CFR15.109 (a)

SOLAR SHUTDOWN DEVICE

ELECTRICAL SPECIFICATIONS



MECHANICAL SPECIFICATIONS



ENVIRONMENTAL S	SPECIFICATIONS
Ambient Temperature	-40°C to 50°C (-40°F to 122°F)
Storage Temperature	-30°C to 70°C (-22°F to 158°F)

UL 3741 PV HAZARD CONTROL (AND PVRSA) COMPATIBILITY

Brand	Model	Required Solar Shutdown Devices
Tosla	Solar Roof V3	1 Solar Shutdown Device per 10 modules
Tesla	Tesla TxxxS (where xxx = 405 to 450 W, increments of 5)	1 Solar Shutdown Device per 3 modules ¹
Tesla	Tesla TxxxH (where xxx = 395 to 415 W, increments of 5)	1 Solar Shutdown Device per 3 modules
Hanwha	Q.PEAK DUO BLK-G5	1 Solar Shutdown Device per 3 modules
Hanwha	Q.PEAK DUO BLK-G6+	1 Solar Shutdown Device per 3 modules

ESOURCE

Tavern Dr, Cameron, NC 28326 . Tun_ 83

7.14 kW DC PV SYSTEM

REUBEN FORNAH

CAPE * FEAR

SOLAR SYSTEMS

910 S. 2nd St.

Wilmington, NC 28401

910-409-5533

GC LIC. NO.: 65677

ELEC. LIC. NO.: U-33321

DESC.

February 28, 2025

Sheet No.

R-01

pe.eaton.com

Eaton general duty cartridge fuse safety switch

DG222NRB

UPC:782113144221 Dimensions:

Comprehensive Products and System Certificates

EC61215/EC61730/EC61701/EC62716/UL61730
S0 9001: Quality Management System
S014001: Environment Management System
S014064: Greenhouse Gases Emission Verification
S040001: Occupational Health and Safety Management

• Height: 14.37 IN

 Length: 7.35 IN Width: 8.4 IN

Weight: 10 LB

Notes:Maximum hp ratings apply only when dual element fuses are used. 3-Phase hp rating shown is a grounded B phase rating, UL listed.

Warranties:

• 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.

Specifications:

- Type: General duty, cartridge fused
- Amperage Rating: 60A
- Enclosure: NEMA 3R
- Enclosure Material: Painted galvanized steel
- Fuse Class Provision: Class H fuses
- · Number Of Wires: Three-wire
- Product Category: General duty safety switch
- Voltage Rating: 240V

Supporting documents:

- Eaton Specification Sheet DG222NRB

Product compliance: No Data

2025© Cape Fear Solar Systems, LLC. All Rights Reserved.

• Fuse Configuration: Fusible with neutral • Number Of Poles: Two-pole

• Eatons Volume 2-Commercial Distribution

Certifications:

REVISION LIST \triangle # REV. DATE

DRAWN BY:



Ultra Rail



SnapNrack Ultra Rail System

A sleek, straightforward rail solution for mounting solar modules on all roof types. Ultra Rail features two rail profiles; UR-40 is a lightweight rail profile that is suitable for most geographic regions and maintains all the great features of SnapNrack rail, while UR-60 is a heavier duty rail ofile that provides a larger rail channel and increased span capabilities. Both are compatib with all existing mounts, module clamps, and accessories for ease of install.

- The Entire System is a Snap to Install
 New Ultra Rail Mounts include snap-in brack
- for attaching rail Compatible with all the SnapNrack Mid Clamps
- and End Clamps customers love

 Universal End Clamps and snap-in End Caps provide a clean look to the array edge





Unparalleled Wire Management

- · Open rail channel provides room for running wires resulting in a long-lasting quality instal Industry best wire management offering includes Junction Boxes, Universal Wire Clamps, MLPE Attachment Kits, and Conduit
- system is fully bonded and listed to UL 2703

Heavy Duty UR-60 Rail

- UR-60 rail profile provides increased span capabilities for high wind speeds and snow
- Taller, stronger rail profile includes profile-
- specific rail splice and end cap

 All existing mounts, module clamps, and accessories are retained for the same great install experience



The Ultimate Value in Rooftop Solar

Industry leading Wire

Management Solutions

Single Tool Installation

RESOURCES snapnrack.com/resources **DESIGN** snapnrack.com/configurator WHERE TO BUY snapnrack.com/where-to-buy

Mounts available for all

All SnapNrack Module

Clamps & Accessories are compatible with

both rail profiles

roof types

Quality. Innovative. Superior.

SnapNrack Solar Mounting Solutions are engineered to optimize material use and labor resources and improve overall installation quality and safety. 877-732-2860 www.snapnrack.com contact@snapnrack.com

Grounding Specifications



Tavern Dr, Cameron, NC 28326 .14 kW DC PV SYSTEM **REUBEN FORNAH** . Lm_

ESOURCE

CAPE * FEAR **SOLAR SYSTEMS** 910 S. 2nd St.

Wilmington, NC 28401

910-409-5533

GC LIC. NO.: 65677

ELEC. LIC. NO.: U-33321

83

SnapNrack®

Ultra Rail

AnchorFoot™

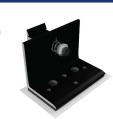


SnapNrack AnchorFoot™ & DeckAnchor™

are the latest innovation designed to reduce the number of roof fasteners when mounting direct to deck and provide maximum flexibility to mount anywhere on the roof. Engineered with butyl, now installers do not have to add sealant to the bottom of the mount, simplifying the installation process and further protecting the roof.

AnchorFoot™

- Pre-installed butyl for easy peel & stick installation allows for no disruption to composition shingles
- Industry-leading .200" thick butyl allows
- installation over shingles without cutting pieces
- Flexible direct to deck mounting options with (2)
- DeckAnchors or (4) #14 wood screws • Flexible rafter mounting options with (1) 5/16" lag
- or (2) #14 wood screws Ships pre-assembled with Ultra Rail Mounting
- Clamp for easy rail attachment
- Rated for UL2703 Bonding & Grounding with TAS 100A Wind Driven Rain Testing for waterproof certification



Deck Mounting, re-imagined.



DeckAnchor™ fasteners

fasteners in half, from 4 to 2



snap-in features as with all



Start Installing AnchorFoot™ Today!

- Proprietary fastening technology to reduce the number of screws for direct to deck mounting
- Familiar $\frac{1}{2}$ " hex head to maintain the SnapNrack tradition of a single tool install
- Wide threads securely grip the wood deck and
- significantly reduces the potential for over-tightening TAS 100A Wind Driven Rain Testing + ASTM D1761 Screw

Quality. Performance. Innovation.

SnapNrack solutions are focused on simplifying the installation experience through intuitive products and the best wire management in the industry.

SnapNrack*

877-732-2860 www.snapnrack.com contact@snapnrack.com

REVISION LIST \triangle DESC. REV. DATE

February 28, 2025 DRAWN BY:

Sheet No.

R-02