SCOPE OF WORK

TO INSTALL A RESIDENTIAL ROOFTOP SOLAR PHOTOVOLTAIC (PV) SYSTEM.
THE POWER GENERATED BY THE PV SYSTEM WILL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ELECTRICAL SERVICE EQUIPMENT.
THE PV SYSTEM DOES INCLUDE BATTERIES.

ELECTRICAL NOTES

1) ALL EQUIPMENT TO BE LISTED BY THE UL OR OTHER NRTL AND LABELED FOR ITS APPLICATION.
2) ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600V AND 90°C WET ENVIRONMENT.
3) WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
4) WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
5) DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
6) WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
7) ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
8) MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
9) MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR THE ILSCO GBL-4DBT LAY-IN LUG.
10) THE POLARITY OF THE GROUNDED CONDUCTORS IS (positive/negative) OR THE DC SIDE OF THE PV SYSTEM IS UNGROUNDED AND SHALL COMPLY WITH NEC 690.35

NCDOI REQUIREMENTS

OPTION 2

WEIGHT OF PV SYSTEM ON ROOF:

2.7154 PSF

EXISTING ROOF MATERIAL TYPE:

ASPHALT SHINGLE (SINGLE LAYER)

PROJECT LOCATION WIND ZONE:

115 MPH

NOTICE TO CONTRACTOR
All construction must comply with current NC Building Codes and is subject to field inspection and verification.
APPROVED
Limited building only review
Permit holder responsible for full compliance with the code
12/14/2021
Harnett COUNTY NORTH CAROLINA

VICINITY MAP

SHEET INDEX		GOVERNING CODES
COVER	GENERAL INFORMATION	NFPA 70 NATIONAL ELECTRICAL CODE 2017
PV-1	SITE PLAN	2018 INTERNATIONAL BUILDING CODE
PV-2	ROOF LAYOUT AND MOUNTING DETAIL	2018 NORTH CAROLINA BUILDING CODE
PV-3, PV-4	ELECTRICAL SCHEMATIC AND TABLES	2018 NORTH CAROLINA RESIDENTIAL CODE
PV-5	AMPACITY CALCULATIONS	UNDERWRITERS LABORATORIES (UL) STANDARDS
PV-6	LABELING SCHEDULE	OSHA 29 CFR 1910.269
CUTSHEETS	MANUFACTURER SPECIFICATION SHEETS	NORTH CAROLINA DEPARTMENT OF INSURANCE

DESIGN SPECIFICATIONS	
CONSTRUCTION TYPE	SINGLE-FAMILY
ZONING	RESIDENTIAL
GROUND SNOW LOAD	20 PSF
WIND EXPOSURE CATEGORY	CATEGORY B
WIND SPEED	115 MPH
UTILITY PROVIDER	DUKE ENERGY PROGRESS
AHJ	TOWN OF FUQUAY-VARINA

SYSTEM SPECIFICATIONS	
SOLAR MODULES	(27) HANWHA QCELL BLACK PANELS 340W
POWER OPTIMIZERS	(27) SOLAREDGE P400
INVERTER(S)	(1) SOLAREDGE SE10000H-USSNBBL14
BATTERY	(1) LG CHEM RESU16H PRIME
SOLAR MOUNTS	SNAPNRACK SPEEDSEAL FOOT
SOLAR RACKING SYSTEM	SNAPNRACK ULTRA RAIL 40
MONITORING	YES
POINT OF INTERCONNECT	60A/2P LOAD SIDE BREAKER IN MSP

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CONTRACTOR

Covenant Solar Tech
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RALEIGH, NC 27615
(919) 508-6907
NC ELE LICENSE #: 30043
NC GC LICENSE #: 84770

PROJECT & CLIENT INFORMATION

BARCIA RESIDENCE
NEW SOLAR PV SYSTEM
SYSTEM SIZE: 9.18 KW DC
SYSTEM SIZE: 10.0 KW AC

JIMMY BARCIA
758 AVERY POND DR
FUQUAY-VARINA, NC 27526
(201) 776-5980

ENGINEER OF RECORD

NORTH CAROLINA PROFESSIONAL ENGINEER JEFFREY IANNICELLI SEAL 047232
9/10/2021
KILIAN ENGINEERING, INC. CORPORATE SEAL NORTH CAROLINA

DRAWING BY
RJW

REVISIONS

DESCRIPTION	DATE	#	BY
RELEASED FOR PERMITTING	9/9/2021	1	CST

SHEET SIZE
ANSI B
11" X 17"

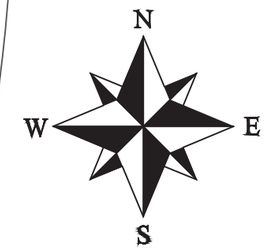
DATE
9/9/2021

SHEET NAME
GENERAL INFORMATION

SHEET NUMBER
COVER

PROPERTY PLAN

SCALE: 1/32"=1'-0"



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SHEET SIZE

ANSI B
11" X 17"

DATE

9/9/2021

SHEET NAME

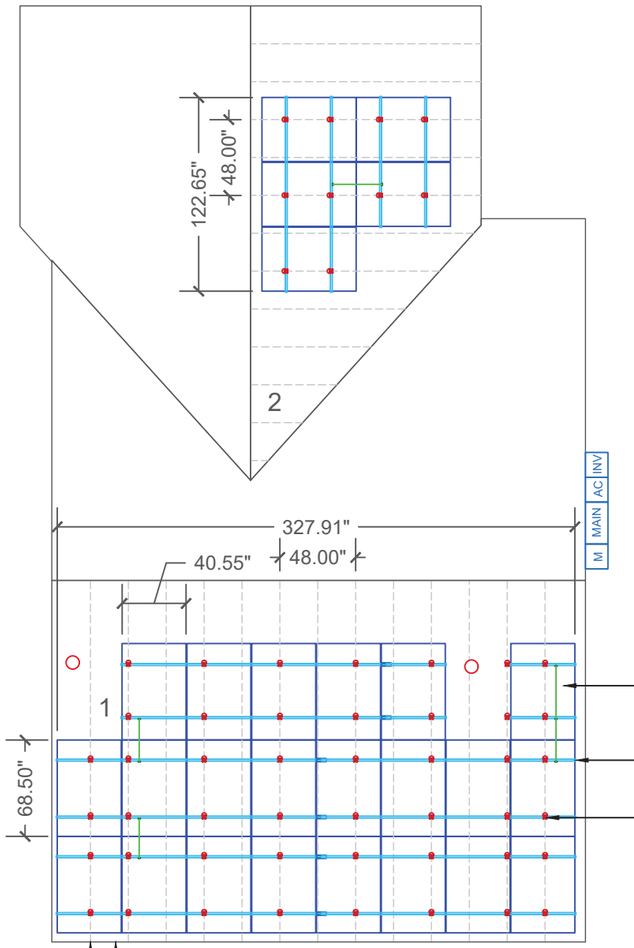
SITE PLAN

SHEET NUMBER

PV-1

ROOF PLAN

SCALE: 1/8"=1'-0"



(27) HANWHA QCELL BLACK PANELS 340W

SNAPNRACK ULTRA RAIL 40

SNAPNRACK SPEEDSEAL FOOT

ASPHALT SHINGLE (SINGLE LAYER) ROOF

2X4 RAFTERS @ 24" O.C.

NOTE:
MAXIMUM ALLOWABLE MOUNTING SPACING IS 68".
MAXIMUM CANTILEVER DISTANCE IS 1/3 OF THE
MAXIMUM ALLOWABLE SPACING AND NEVER EXCEEDS 24".

ROOF 1 PITCH: 27°
ROOF 1 AZIMUTH: 239°
ROOF 2 PITCH: 14°
ROOF 2 AZIMUTH: 149°

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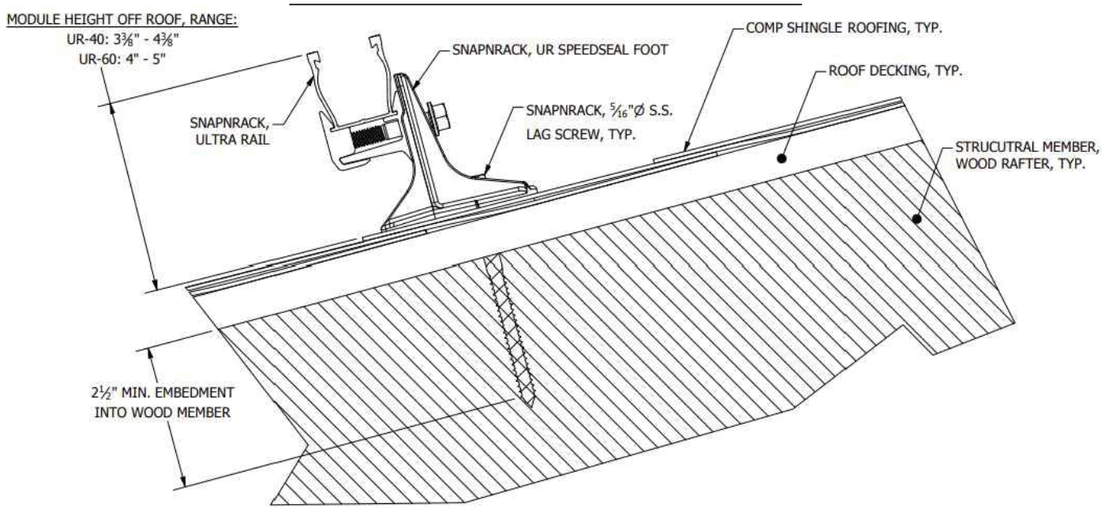
Racking	
Manufacturer	SnapNrack
Model Number	Ultra Rail 40
Length	168"
Width	1.54"
Height	1.89"
Weight	0.56 Lbs./Ft
Material	Aluminum
Structural	IBC Compliant
UL Listing	UL 2703

Flashings/Mounts	
Manufacturer	SnapNrack
Mount Type	SpeedSeal
Fastener Type	Lag Screw
Fastener Material	18-8 Stainless Steel
Fastener Size	5/16" x 4"
L-Foot Material	Aluminum
Sealing Washer	EPDM Bonded SS
Sealing Washer Size	5/16" ID x 3/4" OD
Weight	0.7565 Lbs.
Structural	IBC Compliant
UL Listing	UL 2703

LOAD CALCULATIONS		
NUMBER OF MODULES	27	
MODULE WEIGHT	43.9	LBS
MODULE SQ FT	19.313	SQ FT
TOTAL MODULE WEIGHT	1185.3	LBS
TOTAL MODULE SQ FT	521.451	SQ FT
NUMBER OF PORTRAIT	27	
NUMBER OF LANDSCAPE	0	
NUMBER OF OPTIMIZERS	27	
WEIGHT PER OPTIMIZER	1.5	LBS
TOTAL OPTIMIZER WEIGHT	40.5	LBS
TOTAL LENGTH OF RAIL	187	LF
RAIL WEIGHT PER FOOT	0.56	LBS
TOTAL RAIL WEIGHT	104.72	LBS
NUMBER OF FLANGES	56	
WEIGHT PER FLANGE	1.22	LBS
WEIGHT PER SYSTEM	68.32	LBS
NUMBER OF MID CLAMPS	42	
MID CLAMP WEIGHT	0.21	LBS
WEIGHT PER SYSTEM	8.82	LBS
NUMBER OF END CLAMPS	24	
END CLAMP WEIGHT	0.32	LBS
WEIGHT PER SYSTEM	7.68	LBS
NUMBER OF SPLICES	6	
WEIGHT PER SPLICE	0.1	LBS
WEIGHT PER SYSTEM	0.6	LBS
TOTAL ARRAY WEIGHT	1415.94	LBS
POINT LOAD	25.284643	LBS/FT
TOTAL ARRAY AREA	521.451	SQ FT
ARRAY DEAD LOAD	**2.7154**	**PSF**

SOLAR MOUNTING DETAIL



LEGEND

M UTILITY METER	DC DC DISCONNECT	PV METER	RAILS
MSP MAIN SERVICE PANEL	JB JUNCTION BOX	EXTERIOR CONDUIT	GROUNDING
INV INVERTER	SUB SUBPANEL	G GAS METER	RAIL SPLICE
AC AC DISCONNECT	LC LOAD CENTER	FLASHINGS	

CONTRACTOR

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SYSTEM SIZE: 10.0 KW AC

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ENGINEER OF RECORD

DRAWING BY

RJW

REVISIONS

DESCRIPTION	DATE	#	BY
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SHEET SIZE

ANSI B
11" X 17"

DATE

9/9/2021

SHEET NAME

ROOF LAYOUT & DETAIL DRAWINGS

SHEET NUMBER

PV-2

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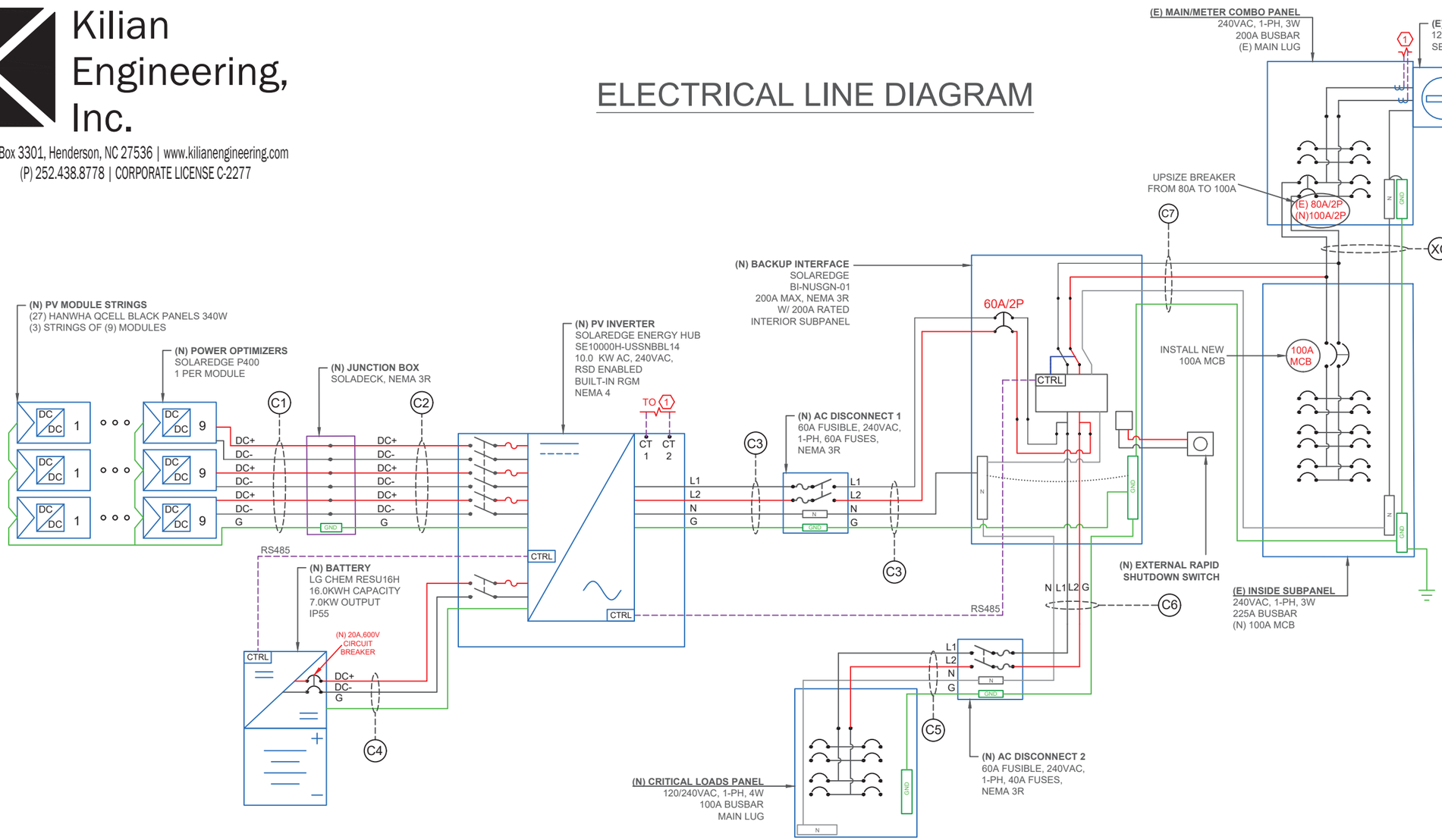
ELECTRICAL LINE DIAGRAM



WIRE SCHEDULE

TAG	CURRENT CARRYING CONDUCTORS				GROUNDING CONDUCTORS				CONDUIT/RACEWAY				NOTES
	QTY.	SIZE	MATERIAL	INSULATION TYP.	QTY.	SIZE	MATERIAL	INSULATION TYP.	QTY.	SIZE	MATERIAL	LOCATION	
C1	4	10 AWG	COPPER	PV WIRE	1	8 AWG	BARE COPPER	N/A	-	-	-	FREE AIR	
C2	4	10 AWG	COPPER	THHN/THWN-2	1	10 AWG	COPPER	THHN/THWN-2	1	3/4"	LFMC/EMT	EXTERIOR/INTERIOR	
C3	3	6 AWG	COPPER	THHN/THWN-2	1	10 AWG	COPPER	THHN/THWN-2	1	3/4"	LFNC/EMT	EXTERIOR	
C4	2	6 AWG	COPPER	THHN/THWN-2	1	10 AWG	COPPER	THHN/THWN-2	1	3/4"	LFNC/EMT	EXTERIOR	
C5	2	8 AWG	COPPER	THHN/THWN-2	1	10 AWG	COPPER	THHN/THWN-2	1	3/4"	LFNC/EMT	EXTERIOR/INTERIOR	
C6	3	4 AWG	COPPER	THHN/THWN-2	1	10 AWG	COPPER	THHN/THWN-2	1	1"	LFNC/EMT	EXTERIOR/INTERIOR	
C7	3	4 AWG	COPPER	THHN/THWN-2	1	10 AWG	COPPER	THHN/THWN-2	1	1"	LFNC/EMT	EXTERIOR/INTERIOR	
XC	-	-	-	-	-	-	-	-	-	-	-	-	

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ENGINEER OF RECORD

NORTH CAROLINA PROFESSIONAL SEAL 17304 ENGINEER MICHAEL W. KILIAN
9/10/2021
KILIAN ENGINEERING, INC CORPORATE SEAL NORTH CAROLINA

DRAWING BY
RJW

REVISIONS

DESCRIPTION	DATE	#	BY
RELEASED FOR PERMITTING	9/9/2021	1	CST

SHEET SIZE
ANSI B
11" X 17"

DATE
9/9/2021

SHEET NAME
ELECTRICAL SCHEMATIC

SHEET NUMBER
PV-3

Solar PV Module Data

Manufacturer	Hanwha
Model Number	Q-Peak DUO BLK-G6+
Max Power (Pmax)	340
Max Power Voltage (Vmp)	33.94
Max Power Current (Imp)	10.02
Open Circuit Voltage (Voc)	40.66
Short Circuit Current (Isc)	10.52
Max Series Fuse (OCPD)	20
Max System Voltage	1000
UL Listing	UL1703
Protection Rating	IP67

Temperature Data

Average High Temp	93.2˚ F
Record Low Temp	10.4˚ F

Power Optimizer Data

Manufacturer	SolarEdge
Model Number	P400
Rated DC Input Power	400
Max Input Voltage	80
Max Input Current	12.63
Max Short Circuit Current	10.1
Max Output Voltage	60
Max Output Current	15
UL Listing	UL1741
Protection Rating	IP68/NEMA6P

Junction Box Data

Manufacturer	Soladeck
Model Number	0799-5B
Voltage Rating	600
Amperage Rating	120
UL Listing	UL 50
Enclosure Rating	NEMA 3R

Inverter Data

Manufacturer	SolarEdge
Model Number	SE10000H -USSNBBL14
Max DC Input Voltage	480
Nominal DC Input Voltage	400
Max DC Input Current	27
Max DC Short Circuit Current	45
Max DC Input Power	15500
Max AC Output Power	10000
Nominal AC Output Voltage	240
Max AC Output Current	42
Strings Per Inverter	1 - 3
UL Listing	UL1741
Enclosure Rating	NEMA 4X

AC Disconnect Data

Manufacturer	Eaton
Model Number	DG222NRB
Voltage Rating	240
Amperage Rating	60A
Phase	Single
Switch Syle	Fusible
Fuse Rating	60A
UL Listing	UL 98
Enclosure Rating	NEMA 3R

AC Disconnect Data 2

Manufacturer	Eaton
Model Number	DG222NRB
Voltage Rating	240
Amperage Rating	60A
Phase	Single
Switch Syle	Fusible
Fuse Rating	40A
UL Listing	UL 98
Enclosure Rating	NEMA 3R

Main/Meter Combo Panel Data

Manufacturer	Square D
Model Type	Type HOM Breakers
Model Number	RC12L200C
Voltage Rating	120/240
Busbar Amp Rating	200A
Main Breaker/Main Lug	Main Lug
Breaker Amp Rating	N/A
Phase	Single
UL Listing	UL 6294
Enclosure Rating	NEMA 3R

Battery Data

Manufacturer	LG Chem
Model Number	RESU-16H
Total Energy Capacity	16.0 kWh @25°C
Usable Energy Capacity (DoD 100%)	9.3 kWh
Voltage Range	350-450 VDC
Max Charge / Discharge Power	7 kW
DC Disconnect	Circuit Breaker
UL Listing	UL1642, UL 1973
Enclosure Rating	NEMA 3R

Backup Interface

Manufacturer	SolarEdge
Model Type	Backup Interface
Model Number	BI-NUSGN-01
Voltage Rating	240 Volts
Busbar Amperage Rating	200A
Main Breaker or Main Lug	Main Lug
Breaker Rating	N/A
Phase	Single
UL Listing	UL869A, UL1741
Enclosure Rating	NEMA 3R

Inside Subpanel Data

Manufacturer	Square D
Model Type	Type HOM Breakers
Model Number	HOMC30UC
Voltage Rating	120/240
Busbar Amp Rating	225A
Main Breaker/Main Lug	Main Breaker
Breaker Amp Rating	100A
Phase	Single
UL Listing	UL 6294
Enclosure Rating	NEMA 3R

Critical Loads Panel Data

Manufacturer	Siemens
Model Type	N/A
Model Number	N/A
Voltage Rating	120/240
Busbar Amp Rating	100A
Main Breaker/Main Lug	Main Lug
Breaker Amp Rating	N/A
Phase	Single
UL Listing	UL 67
Enclosure Rating	NEMA 3R

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SYSTEM SIZE: 10.0 KW AC

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ENGINEER OF RECORD

9/10/2021

DRAWING BY

RJW

REVISIONS

DESCRIPTION	DATE	#	BY
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SHEET SIZE

ANSI B
11" X 17"

DATE

9/9/2021

SHEET NAME

ELECTRICAL TABLES

SHEET NUMBER

PV-4

Ampacity Calculations

Wiring Location: Module to Power Optimizer (Direct Current)
Wiring Location: Inverter to Service Entrance (Alternating Current)
All calculations show minimum sizing for ampacity
Actual wire sizing may be larger for voltage drop or other factors
All calculations are according to the 2017 National Electric Code

Modules: Hanwha Q-Peak DUO BLK-G6+
Inverter: SolarEdge Energy Hub SE10000H-US

Initial Input Values

Isc (Short Circuit Current)	10.52					
Number of circuits	10.52	x	1	=	10.52	
Maximum Circuit Current (NEC 690.8 (A)(1+2)	10.52	x	156%	=	16.4112	
Minimum Overcurrent Device	20	A	Series Fuse Rating by Manufacturer			
	Size AWG #					
Chosen Conductor Type (THHN, RHW-2, or USE-2)	10					

Conductor Derating

NEC 690.31 © ref (NEC 310.16)						
Conductor 90°C Ampacity		40				
Conduit Fill Derating	1-3	40	x	1	=	40
Temperature Derating (°F)	141-149	40	x	0.65	=	26

Ampacity vs Overcurrent Device

Conductor Ampacity Check	26	16.4112	OK
Conductor to Overcurrent Check	26	20	OK

Input Data Into Yellow Fields
Green Field must say OK

Use this calculation for over current protection and wire sizing for stringers coming from Solar Panels.
Isc comes from manufacturer

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Ampacity Calculations

Wiring Location: Inverter to Service Entrance (Alternating Current)
All calculations show minimum sizing for ampacity
Actual wire sizing may be larger for voltage drop or other factors
All calculations are according to the 2017 National Electric Code

Modules: Hanwha Q-Peak DUO BLK-G6+
Inverter: SolarEdge Energy Hub SE10000H-US

Initial Input Values

Inverter Continuous AC Output Combined (Watts)	10000					
Minimum Operating Voltage	240					
		Watts		Volts		Amps
		10000	/	240	=	42
Inverter Continuous AC Amps		42				
Number of Inverters		42	x	1	=	42
Overcurrent Device Rating NEC 690.8 (B)(3)		42	x	125%	=	52.5
Minimum Overcurrent Device		60	Amps			
Circuit Breaker Size per NEC 240.6(A)		60	Amps			
		Size AWG #				
Chosen Conductor Type THHN,THWN,RHW-2 or USE-2		6				

Conductor Derating

NEC 690.31© ref (NEC 310.16)						
Conductor 90°C Ampacity		75				
Conduit Fill Derating	1-3	75	x	1	=	75
Temperature Derating (°F)	105-113	75	x	0.87	=	65.25

Ampacity vs Overcurrent Device

Conductor Ampacity Check	65.25	52.5	OK
Conductor to Overcurrent Check	65.25	60	OK

Input Data into Yellow Fields
Green Fields must say OK

Use this calculation for over current protection and wire sizing for inverter

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DATE
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SHEET NAME
AMPACITY CALCULATIONS

SHEET NUMBER
PV-5

PV LABELS

SIGNAGE REQUIREMENTS

> WARNING SIGNS OR LABELS SHALL COMPLY WITH NEC 110.21(B)
> MIN. 3/8" LETTER HEIGHT
> ALL CAPITAL LETTERS
> ARIAL OR SIMILAR FONT
> REFLECTIVE, WEATHER RESISTANT MATERIAL, UL 969

PHOTOVOLTAIC SYSTEM
⚠ DC DISCONNECT ⚠

RATED MMP CURRENT	AMPS
RATED MPP VOLTAGE	VOLTS
MAX SYSTEM VOLTAGE	VDC
MAX CIRCUIT CURRENT	AMPS

NEC 690.53 — 1

APPLY TO:
INVERTER

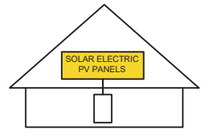
WARNING: PHOTOVOLTAIC POWER SOURCE

NEC 690.31(G)(3)(4) — 2

APPLY TO:
SOLAR DC RACEWAYS
DC JUNCTION BOXES

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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



NEC 690.56(C)(1)(a) — 3

APPLY TO:
MAIN SERVICE DISCONNECT

⚠ WARNING

ELECTRIC SHOCK HAZARD

TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

NEC 690.13(B) — 4

APPLY TO:
DISCONNECTS
COMBINER BOXES

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

NEC 690.56(C)(3) — 5

APPLY TO:
INVERTERS

PHOTOVOLTAIC SYSTEM
⚠ AC DISCONNECT ⚠

OPERATING VOLTAGE	VAC
OPERATING CURRENT	AMPS

NEC 690.54 — 6

APPLY TO:
AC DISCONNECT

⚠ WARNING

THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES, EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE, SHALL NOT EXCEED AMPACITY OF BUSBAR

NEC 705.12 (B)(2)(3)(c) — 7

APPLY TO:
SERVICE PANEL(S)

⚠ WARNING

THE DISCONNECTION OF THE GROUNDED CONDUCTOR(S) MAY RESULT IN OVERVOLTAGE ON THE EQUIPMENT

NEC 690.31 (I) — 8

APPLY TO:
INVERTER(S)

MAIN PV SYSTEM DISCONNECT

NEC 690.13 (B) — 9

APPLY TO:
MAIN AC DISCONNECT

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RELEASED FOR PERMITTING	9/9/2021	1	CST

SHEET SIZE
ANSI B
11" X 17"

DATE
9/9/2021

SHEET NAME
LABELING SCHEDULE

SHEET NUMBER
PV-6

powered by Q.ANTUM DUO

Q.PEAK DUO BLK-G6+

330-345

ENDURING HIGH PERFORMANCE

VDE 11/2016 Quality Tested – high reliability, low degradation, optimized durability, continous line monitoring – www.VDEinfo.com ID. 40032587

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2019

Q CELLS YIELD SECURITY – ANTI PID TECHNOLOGY (APT); HOT-SPOT PROTECT (HSP); TRACEABLE QUALITY (TRA.Q™); ANTI LID TECHNOLOGY (ALT)

Q.ANTUM TECHNOLOGY: LOW LEVELIZED COST OF ELECTRICITY

Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 19.5 %.

INNOVATIVE ALL-WEATHER TECHNOLOGY

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

ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID and Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING

High-tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).

A RELIABLE INVESTMENT

Inclusive 25-year product warranty and 25-year linear performance warranty[2].

STATE OF THE ART MODULE TECHNOLOGY

Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

[1] APT test conditions according to IEC/TS 62804-1:2015, method B (–1500 V, 168 h)
[2] See data sheet on rear for further information

THE IDEAL SOLUTION FOR:

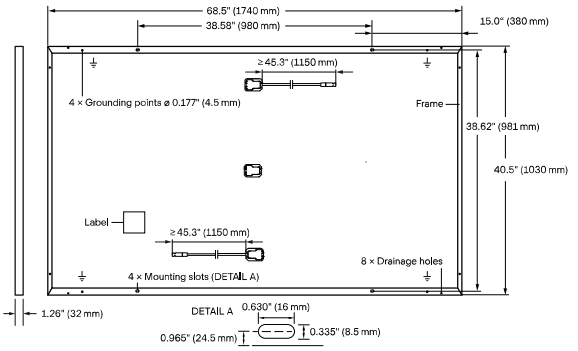
Rooftop arrays on residential buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	68.5 × 40.6 × 1.26 in (including frame) (1740 × 1030 × 32 mm)
Weight	43.9 lbs (19.9 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 20 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09-3.98 × 1.26-2.36 × 0.59-0.71 in (53-101 × 32-60 × 15-18 mm), Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥45.3 in (1150 mm), (–) ≥45.3 in (1150 mm)
Connector	Stäubli MC4, Hanwha Q CELLS HQC4, Amphenol UTX, Renhe 05-6, Tongling TL-Cable01S, JMTHY JM601; IP68 or Friends PV2e; IP67

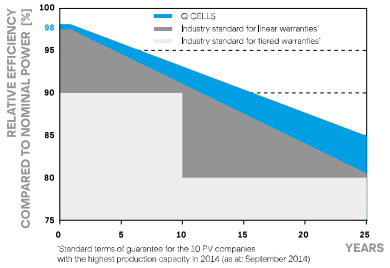


ELECTRICAL CHARACTERISTICS

POWER CLASS				330	335	340	345
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / –0 W)							
Minimum	Power at MPP[1]	P_{MPP}	[W]	330	335	340	345
	Short Circuit Current[1]	I_{SC}	[A]	10.41	10.47	10.52	10.58
	Open Circuit Voltage[1]	V_{OC}	[V]	40.15	40.41	40.66	40.92
	Current at MPP	I_{MPP}	[A]	9.91	9.97	10.02	10.07
	Voltage at MPP	V_{MPP}	[V]	33.29	33.62	33.94	34.25
	Efficiency[1]	η	[%]	≥18.4	≥18.7	≥19.0	≥19.3
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	Power at MPP	P_{MPP}	[W]	247.0	250.7	254.5	258.2
	Short Circuit Current	I_{SC}	[A]	8.39	8.43	8.48	8.52
	Open Circuit Voltage	V_{OC}	[V]	37.86	38.10	38.34	38.59
	Current at MPP	I_{MPP}	[A]	7.80	7.84	7.89	7.93
	Voltage at MPP	V_{MPP}	[V]	31.66	31.97	32.27	32.57

[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

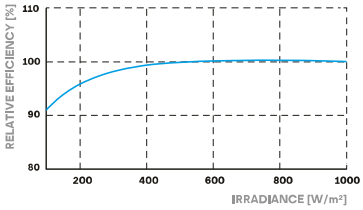
Q CELLS PERFORMANCE WARRANTY



At least 98 % of nominal power during first year. Thereafter max. 0.54 % degradation per year. At least 93.1 % of nominal power up to 10 years. At least 85 % of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organization of your respective country.

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]	–0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	–0.36	Normal Module Operating Temperature	NMOT	[°F]	109±5.4 (43±3 °C)

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{SYS}	[V]	1000 (IEC) / 1000 (UL)	Safety Class	II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 1703	C (IEC) / TYPE 2 (UL)
Max. Design Load, Push / Pull[3]	[lbs / ft²]	75 (3600 Pa) / 55 (2667 Pa)	Permitted Module Temperature on Continuous Duty	–40 °F up to +185 °F (–40 °C up to +85 °C)
Max. Test Load, Push / Pull[3]	[lbs / ft²]	113 (5400 Pa) / 84 (4000 Pa)		

[3] See Installation Manual

QUALIFICATIONS AND CERTIFICATES

UL 1703, VDE Quality Tested, CE-compliant, IEC 61215:2016, IEC 61730:2016, Application Class II, U.S. Patent No. 9,893,215 (solar cells)

PACKAGING INFORMATION

Number of Modules per Pallet	32
Number of Pallets per 53' Trailer	28
Number of Pallets per 40' HC-Container	24
Pallet Dimensions (L × W × H)	71.5 × 45.3 × 48.0 in (1815 × 1150 × 1220 mm)
Pallet Weight	1505 lbs (683 kg)

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

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400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | **TEL** +1 949 748 59 96 | **EMAIL** inquiry@us.q-cells.com | **WEB** www.q-cells.us

Single Phase Energy Hub Inverter with Prism Technology

For North America

SE3000H-US / SE3800H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US[1]

HOME BACKUP

Optimized battery storage with HD-Wave technology

- Record-breaking 99% weighted efficiency with 200% DC oversizing
- Small, lightweight, and easy to install
- Modular design, future ready with optional upgrades to:
  - DC-coupled storage for full or partial home backup
  - Built-in consumption monitoring
  - Direct connection to the SolarEdge smart EV charger
- Multi-inverter, scalable storage solution
  - With enhanced battery power up to 10kW
- Integrated arc fault protection and rapid shutdown for NEC 2014, NEC 2017 and NEC 2020, per article 690.11 and 690.12
- Embedded revenue grade production data, ANSI C12.20 Class 0.5

solaredge

Single Phase Energy Hub Inverter with Prism Technology

For North America

SE3000H-US / SE3800H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US[1]

	SE3000H-US	SE3800H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	UNITS
OUTPUT - AC ON GRID							
Rated AC Power	3000	3800 @ 240V 3300 @ 208V	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	W
Maximum AC Power Output	3000	3800 @ 240V 3300 @ 208V	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	W
AC Frequency Range (min - nom - max)	59.3 - 60 - 60.5[2]						Hz
Maximum Continuous Output Current @ 240V	12.5	16	25	32	42	47.5	A
Maximum Continuous Output Current @ 208V	-	16	24	-	-	48.5	A
GFDI Threshold	1						A
Total Harmonic Distortion (THD)	<3						%
Power Factor	1, adjustable -0.85 to 0.85						
Utility Monitoring, Islanding Protection, Country Configurable Thresholds	Yes						
Charge Battery from AC (if allowed)	Yes						
Typical Nighttime Power Consumption	<2.5						W
OUTPUT - AC BACKUP[3]							
Rated AC Power in Backup Operation[4]	3000	3800 7600*	6000	7600 10300*	10000	10300	W
AC L-L Output Voltage Range in Backup	211 - 264						Vac
AC L-N Output Voltage Range in Backup	105 - 132						Vac
AC Frequency Range in Backup (min - nom - max)	55 - 60 - 65						Hz
Maximum Continuous Output Current in Backup Operation	12.5	16 32*	25	32 43*	42	43	A
GFDI	1						A
THD	<5						%
OUTPUT - SMART EV CHARGER AC							
Rated AC Power	9600						W
AC Output Voltage Range	211 - 264						Vac
On-Grid AC Frequency Range (min - nom - max)	59.3 - 60 - 60.5						Hz
Maximum Continuous Output Current @240V (grid, PV and battery)	40						Aac
INPUT - DC (PV AND BATTERY)							
Transformer-less, Ungrounded	Yes						
Max Input Voltage	480						Vdc
Nom DC Input Voltage	380						Vdc
Reverse-Polarity Protection	Yes						
Ground-Fault Isolation Detection	600kΩ Sensitivity						
INPUT - DC (PV)							
Maximum DC Power @ 240V	6000	7600 15200*	12000	15200 22800*	22000	22800	W
Maximum DC Power @ 208V	-	6600	10000	-	-	20000	W
Maximum Input Current[5] @ 240V	8.5	10.5 20*	16.5	20 31*	27	31	Adc
Maximum Input Current[5] @ 208V	-	9	13.5	-	-	27	Adc
Max. Input Short Circuit Current	45						Adc
Maximum Inverter Efficiency	99	99.2					%
CEC Weighted Efficiency	99					99 @ 240V 98.5 @ 208V	%
2-pole Disconnection	Yes						

* Supported with PN SExxxxH-USMMxxxxxx or SExxxxH-USMNxxxxxx

(1) These specifications apply to inverters with part numbers SExxxxH-USSMxxxxx or SExxxxH-USSNxxxxxx and connection unit model number DCD-1PH-US-PxH-F-x

(2) For other regional settings please contact SolarEdge support

(3) Not designed for standalone applications and requires AC for commissioning. Backup functionality is only supported for 240V grid

(4) Rated AC power in Backup Operation are valid for installations with multiple inverters. For a single backup inverter operation, rated AC power in Backup is 90% of the value stated

(5) A higher current source may be used; the inverter will limit its input current to the values stated

Single Phase Energy Hub Inverter with Prism Technology

For North America

SE3000H-US / SE3800H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US[1]

	SE3000H-US	SE3800H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	UNITS
INPUT - DC (BATTERY)							
Supported Battery Types	SolarEdge Energy Bank, LG RESU Prime[6]						
Number of Batteries per Inverter	Up to 3 SolarEdge Energy Bank, up to 2 LG RESU Prime						
Continuous Power[7]	6000	7600	10000				W
Peak Power[7]	6000	7600	10000				W
Max Input Current	16	20	26.5				Adc
2-pole Disconnection	Yes						
SMART ENERGY CAPABILITIES							
Consumption Metering	Built - in[8]						
Backup & Battery Storage	With Backup Interface (purchased separately) for service up to 200A; Up to 3 inverters						
EV Charging	Direct connection to Smart EV charger						
ADDITIONAL FEATURES							
Supported Communication Interfaces	RS485, Ethernet, Cellular[9], Wi-Fi (optional),SolarEdge Energy Net (optional)						
Revenue Grade Metering, ANSI C12.20	Built - in[8]						
Integrated AC, DC and Communication Connection Unit	Yes						
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi Access Point for local connection						
DC Voltage Rapid Shutdown (PV and Battery)	Yes, according to NEC 2014, NEC 2017 and NEC 2020 690.12						
STANDARD COMPLIANCE							
Safety	UL1741, UL1741 SA, UL1741 PCS, UL1699B, UL1998, UL9540, CSA 22.2						
Grid Connection Standards	IEEE1547, Rule 21, Rule 14H						
Emissions	FCC part 15 class B						
INSTALLATION SPECIFICATIONS							
AC Output and EV AC Output Conduit Size / AWG Range	1" maximum / 14-4 AWG						
DC Input (PV and Battery) Conduit Size / AWG Range	1" maximum / 14-6 AWG						
Dimensions with Connection Unit (H x W x D)	17.7 x 14.6 x 6.8 / 450 x 370 x 174			17.7 x 14.6 x 6.8 / 450 x 370 x 174 17.7 x 14.6 x 6.8 / 450 x 370 x 174*	17.7 x 14.6 x 6.8 / 450 x 370 x 174		in / mm
Weight with Connection Unit	26 / 11.8			26 / 11.8 30.2 / 13.7*	30.2 / 13.7		lb / kg
Noise	< 25	< 25 < 50*	< 25	< 50			dBA
Cooling	Natural Convection						
Operating Temperature Range	-40 to +140 / -40 to +60[10]						°F / °C
Protection Rating	NEMA 4						

(6) The part numbers SExxxxH-USxMxxxxx only support the SolarEdge Energy Bank. The part numbers SExxxxH-USxNxxxxx support both SolarEdge Energy Bank and LG RESU Prime batteries Requires supporting inverter firmware

(7) Discharge power is limited up to the inverter rated AC power for on-grid and backup applications

(8) For consumption metering current transformers should be ordered separately: SECT-SPL-225A-T-20 or SEACT0750-400NA-20 units per box. Revenue grade metering is only for production metering

(9) Information concerning the Data Plan's terms & conditions is available in the following link: https://www.solaredge.com/sites/default/files/se-communication-plan-terms-and-conditions-eng.pdf

(10) Full power up to at least 50°C / 122°F; for power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf

RoHS

Power Optimizer

For North America

P320 / P340 / P370 / P400 / P405 / P505

POWER OPTIMIZER

PV power optimization at the module-level

- Specifically designed to work with SolarEdge inverters
- Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization
- Fast installation with a single bolt
- Next generation maintenance with module-level monitoring
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety

solaredge

/ Power Optimizer
For North America
P320 / P340 / P370 / P400 / P405 / P505

Optimizer model (typical module compatibility)	P320 (for 60-cell modules)	P340 (for high-power 60-cell modules)	P370 (for higher-power 60 and 72-cell modules)	P400 (for 72 & 96-cell modules)	P405 (for thin film modules)	P505 (for higher current modules)	
INPUT							
Rated Input DC Power[1]	320	340	370	400	405	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	48		60	80	125[2]	83[2]	Vdc
MPPT Operating Range	8 - 48		8 - 60	8 - 80	12.5 - 105	12.5 - 83	Vdc
Maximum Short Circuit Current (Isc)	11			10.1		14	Adc
Maximum DC Input Current	13.75			12.63		17.5	Adc
Maximum Efficiency	99.5						%
Weighted Efficiency	98.8					98.6	%
Overvoltage Category	II						
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)							
Maximum Output Current	15						Adc
Maximum Output Voltage	60				85		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF)							
Safety Output Voltage per Power Optimizer	1 ± 0.1						Vdc
STANDARD COMPLIANCE							
EMC	FCC Part15 Class B, IEC61000-6-2, IEC61000-6-3						
Safety	IEC62109-1 (class II safety), UL1741						
RoHS	Yes						
INSTALLATION SPECIFICATIONS							
Maximum Allowed System Voltage	1000						Vdc
Compatible inverters	All SolarEdge Single Phase and Three Phase inverters						
Dimensions (W x L x H)	129 x 153 x 27.5 / 5.1 x 6 x 1.1			129 x 153 x 33.5 / 5.1 x 6 x 1.3	129 x 159 x 49.5 / 5.1 x 6.3 x 1.9	129 x 162 x 59 / 5.1 x 6.4 x 2.3	mm / in
Weight (including cables)	630 / 1.4			750 / 1.7	845 / 1.9	1064 / 2.3	gr / lb
Input Connector	MC4[3]						
Output Wire Type / Connector	Double Insulated; MC4						
Output Wire Length	0.95 / 3.0		1.2 / 3.9				m / ft
Input Wire Length	0.16 / 0.52						m / ft
Operating Temperature Range	-40 - +85 / -40 - +185						˚C / ˚F
Protection Rating	IP68 / NEMA6P						
Relative Humidity	0 - 100						%

[1] Rated STC power of the module. Module of up to +5% power tolerance allowed
[2] NEC 2017 requires max input voltage be not more than 80V
[3] For other connector types please contact SolarEdge

PV System Design Using a SolarEdge Inverter[4][5]		Single Phase HD-Wave	Single phase	Three Phase 208V	Three Phase 480V	
Minimum String Length (Power Optimizers)	P320, P340, P370, P400	8		10	18	
	P405 / P505	6		8	14	
Maximum String Length (Power Optimizers)		25		25	50[6]	
Maximum Power per String		5700 (6000 with SE7600-US - SE11400-US)	5250	6000[7]	12750[8]	W
Parallel Strings of Different Lengths or Orientations		Yes				

[4] For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string_sizing_na.pdf
[5] It is not allowed to mix P405/P505 with P320/P340/P370/P400 in one string
[6] A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement
[7] For SE14.4KUS/SE43.2KUS: It is allowed to install up to 6,500W per string when 3 strings are connected to the inverter (3 strings per unit for SE43.2KUS) and when the maximum power difference between the strings is up to 1,000W
[8] For SE30KUS/SE33.3KUS/SE66.6KUS/SE100KUS: It is allowed to install up to 15,000W per string when 3 strings are connected to the inverter (3 strings per unit for SE66.6KUS/SE100KUS) and when the maximum power difference between the strings is up to 2,000W

CE RoHS

Energy Meter with Modbus Connection

for North America

SE-MTR240-NN-S-S1

METERING

Energy Meter for Residential Installations:

- Simple installations and connectivity
- Type NEMA 3R enclosure for outdoor protection
- Provides high accuracy meter readings
- Communicates over RS485 to provide monitoring data
- Suitable for export limitation, consumption monitoring and StorEdgeTM applications

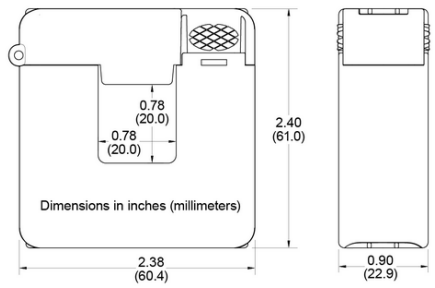
/ Energy Meter with Modbus Connection
for North America
SE-MTR240-NN-S-S1

SUPPORTED INVERTERS	SINGLE PHASE INVERTERS		UNITS
ELECTRICAL SERVICE			
AC Input Voltage (Nominal)	240		Vac
AC Frequency (Nominal)	60		Hz
Max AC Input Current	100		mA
Connector Type	Terminal block - 22 to 12		AWG
Grids supported	L1 / L2 / N / PE L1 / L2 / PE		
Power Consumption (Nominal)	3		W
METER ACCURACY (@ 77°F / 25°C, PF:0.7- 1)			
1 - 100% of Rated Current CT	±1.0		%
CURRENT TRANSFORMERS[1]			
Nominal Input (at CT Rated Current)	CT1, CT2: 0.333		Vac RMS
Rated RMS current[2]	200	400	A
Dimensions (Internal / External)	0.8 x 0.8; 2.4 x 2.4 / 20 x 20; 61 x 61	1.26 x 1.83; 3.3 x 4.5 / 32 x 46.5; 83.4 x 114	in/mm
STANDARD COMPLIANCE			
Safety	UL 1741:2010 Ed.2(Supplement SA)+R: 07 Sep 2016		
Emmissions	FCC 47 CFR Part 15 Subpart B		
ENVIRONMENTAL			
Operating Temperatures	-40 to +140 / -40 to +60		°F / °C
Relative Humidity (noncondensing)	5-90		%
Enclosure type	High impact, ABS and/or ABS/PC plastic UL 94V-0, IEC FV-0		
Protection Rating	NEMA Type 3R		
INSTALLATION SPECIFICATIONS			
Dimensions (HxWxD)	8.1 x 12.4 x 4.6 / 206.6 x 316 x 117.5		in / mm
Weight	3.9 / 1.8		lb / kg
Conduit Entry Diameters	0.75 or 1 / 19 or 25		in
Mounting Type	Bracket mount		

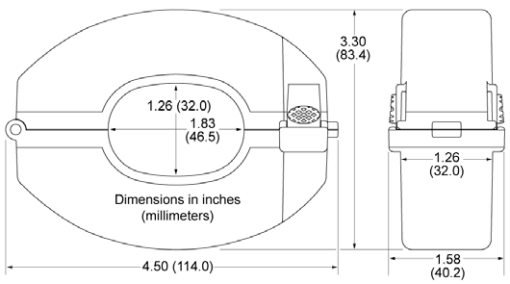
[1] Current Transformers should be ordered separately: SEACT0750-200NA-20 (200A) or SEACT1250-400NA-20 (400A), 20 per box
[2] For other ratings contact SolarEdge

Current Transformer Dimensions

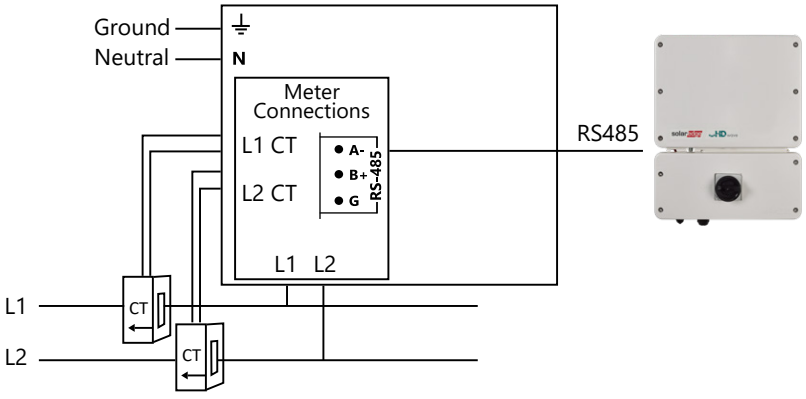
200A CT



400A CT



Connecting the Energy Meter



* Current Transformers (CTs) should be ordered separately: SEACT0750-200NA-20 (200A); SEACT1250-400NA-20 (400A). Each comes in boxes of 20.

FC RoHS

RESU16H Prime

16.0kWh Battery Pack Product Specification

LG Energy Solution

REV 3.8

LG Energy Solution

Product Specification (1/2)

RESU16H Prime

Electrical Characteristics		
Usable Energy[1)]		16.0 kWh @77°F (25°C)
Voltage Range	Charge	420 ~ 450 V_{DC}
	Discharge	350 ~ 410V_{DC}
Max. Charge/Discharge Current		20A@350V
Max. Charge/Discharge Power		7 kW
Peak Power (only discharging)[2)]		11 kW for 10 sec.
Peak Current (only discharging)		32.8A for 10 sec.
Communication Interface		RS485/CAN
DC Protection		Circuit Breaker, Fuse, DCDC converter
Connection Method		Spring Type Connector
User interface		LEDs for Normal and Fault operation
Protection Features		Over Voltage / Over Current / short circuit / Reverse Polarity
Scalability (Total Energy, Max. Charge/Discharge Power)		Max. 2 in parallel (32.0 kWh @77°F (25°C), 14kW)

Operating Conditions		
Installation Location		Indoor / Outdoor, Stand only
Operating Temperature	Charge	14 ~ 122°F (-10 ~ 50°C)
	Discharge	-4 ~ 122°F (-20 ~ 50°C)
Operating Temperature (Recommended)		59 ~ 86°F (15 ~ 30°C)
Storage Temperature (At shipping state)		-22 to 140°F (-30 to 60°C), acceptable for 7 days in total -4 to 113°F (-20 to 45°C), acceptable for the first 6 months -4 to 86°F (-20 to 30°C), acceptable for 7th month~12th month
Humidity		5%~95%
Altitude		Max. 6,562ft (2,000m)
Cooling Strategy		Natural Convection

Certification		
Safety	Cell	UL1642
	Battery Pack	UL1973 / CE / RCM / IEC 62619
Emissions		FCC
Hazardous Materials Classification		Class 9
Transportation		UN38.3 (UNDOT)
Ingress Rating		IP55

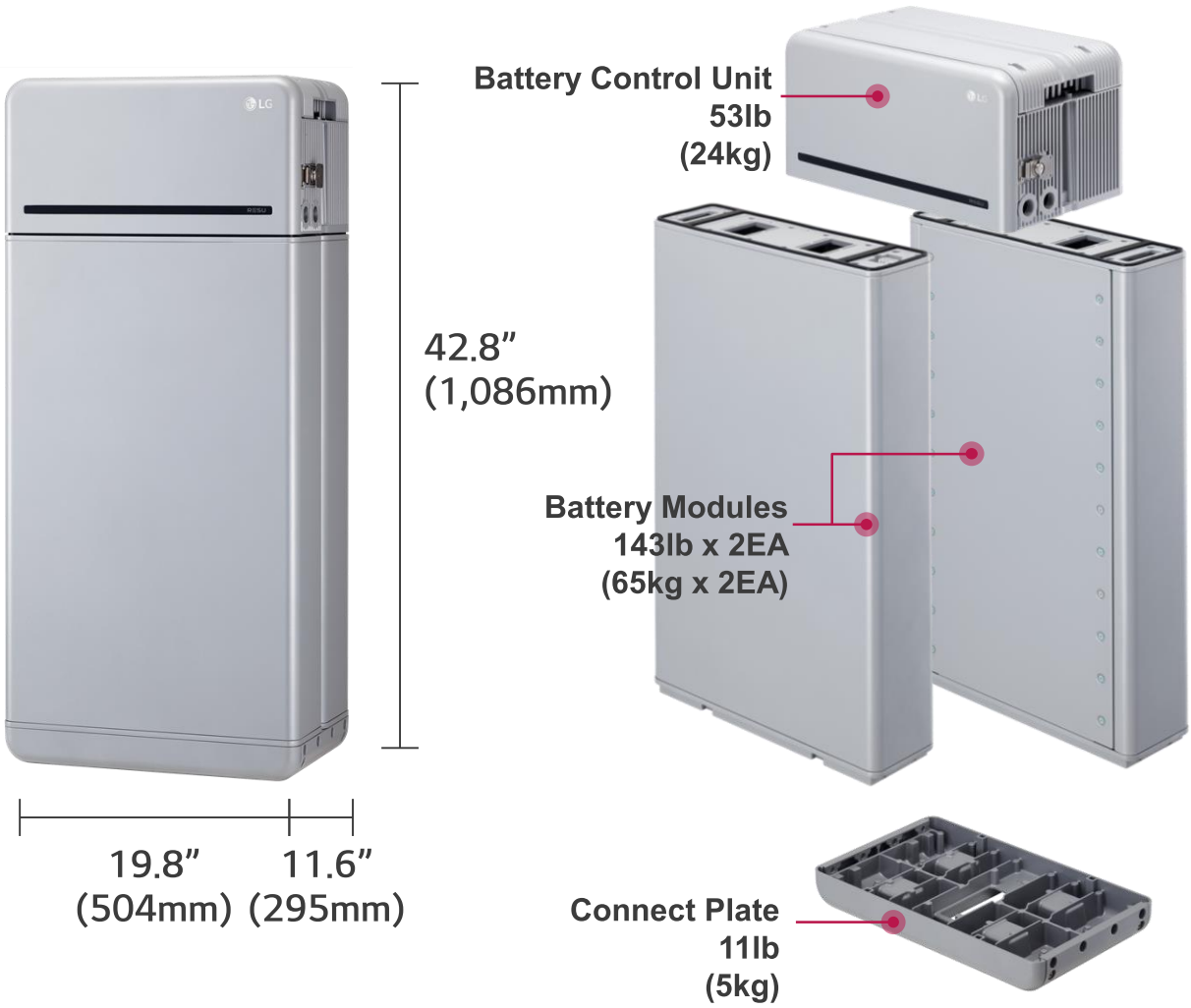
※ Test Conditions - Temperature 77°F (25°C), at the beginning of life
※ Usable Energy is measured under specific condition from LGC(0.3CCCV/0.3CC)
※ Product specification may change without notice
1) DOD 100%. DC/DC converter one way efficiency 97.5%. Ambient 77°F (25°C)
2) Peak Current excludes repeated short duration (less than 10 sec. of current pattern).

LG Energy Solution

Product Specification (2/2)

RESU16H Prime

Mechanical Characteristics		
Dimensions	Width	19.8 inch (504 mm)
	Height	42.8 inch (1086 mm)
	Depth	11.6 inch (295 mm)
Weight		350 lb (159 kg)



HQ: Parc-1 LG Energy Solution, 108, Yeoui-daero, Yeongdeungpo-gu, Seoul, 07335, Korea
http://www.lghomebattery.com http://www.lgensol.com

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

SOLADECK
FLASHED PV ROOF-MOUNT COMBINER/ENCLOSURES

Outdoor Photovoltaic Enclosures

0799 Series

Composition/Cedar Roof System

ETL listed and labeled

Report # 3171411PRT-002 Revised May, 2018

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

0799 Series Includes:

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

Models available in Grey, Black or Stainless Steel


SolaDeck 0799-2S


SolaDeck 0799-5G


SolaDeck 0799-DG

Basic Specifications

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

Process - Seamless draw (stamped)
Flashing - 15.25” x 17.25”
Height - 3”
Cavity - 255 Cubic inches

Base Plate:

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

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

pe.eaton.com

Eaton general duty cartridge fuse safety switch

DG222NRB

UPC:782113144221

Dimensions:

- **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
- **Fuse Configuration:** Fusible with neutral
- **Number Of Poles:** Two-pole
- **Number Of Wires:** Three-wire
- **Product Category:** General duty safety switch
- **Voltage Rating:** 240V

Supporting documents:

- Eatons Volume 2-Commercial Distribution
- Eaton Specification Sheet - DG222NRB

Certifications:

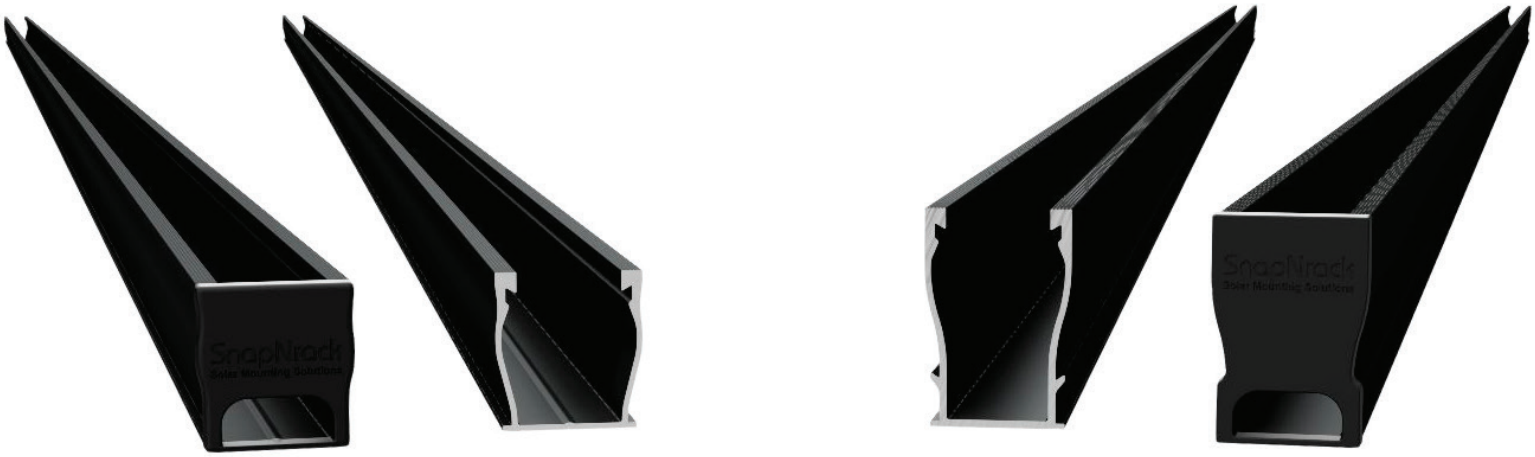
- UL Listed

Product compliance: No Data

SnapNrack™
Solar Mounting Solutions

UR-40
UR-60

Ultra Rail



The Ultimate Value in Rooftop Solar

- Industry leading Wire Management Solutions
- Mounts available for all roof types
- Single Tool Installation
- All SnapNrack Module Clamps & Accessories are compatible with both rail profiles

Start Installing Ultra Rail Today

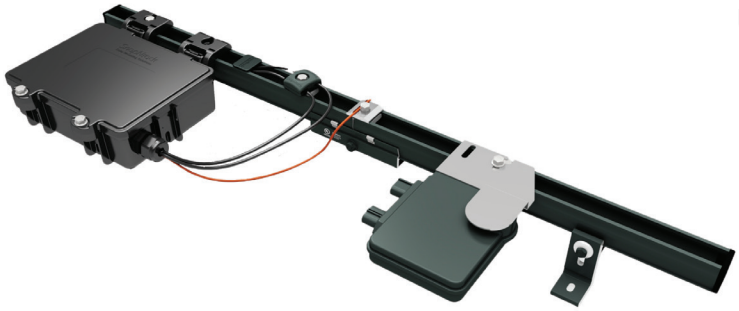
RESOURCES	snapnrack.com/resources
DESIGN	snapnrack.com/configurator
WHERE TO BUY	snapnrack.com/where-to-buy

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 profile that provides a larger rail channel and increased span capabilities. Both are compatible 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 brackets 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 install
- Industry best wire management offering includes Junction Boxes, Universal Wire Clamps, MLPE Attachment Kits, and Conduit Clamps
- System is fully bonded and listed to UL 2703 Standard

Heavy Duty UR-60 Rail

- UR-60 rail profile provides increased span capabilities for high wind speeds and snow loads
- 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

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**

SnapNrack SpeedSeal™ Foot

Patent Pending Lag Driven Sealant Solution for Ultra Rail

A New Generation of Roof Attachments

- Innovative design incorporates flashing reliability into a single roof attachment
- 100% waterproof solution
- Sealing cavity with compressible barrier secures sealant in place & fills voids

Maintain the Integrity of the Roof by Eliminating Disruption

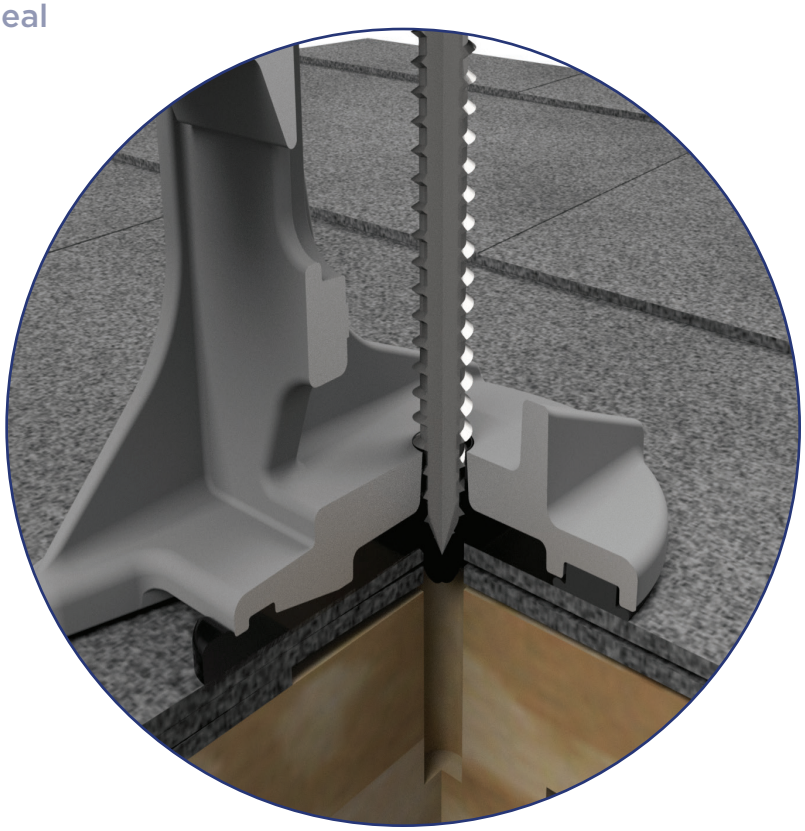
- Zero prying of shingles
- Zero removal of nails leaving holes in the roof
- Roof remains installed the way manufacturer meant it to be

Lag Driven Sealant Waterproofing

- Time Tested Roof Sealant provides lasting seal
- Sealant is compressed into cavity and lag hole as attachment is secured to rafter
- Active sealant solidifies bond if ever touched by liquid
- Technology passes UL 2582 Wind Driven Rain Test and ASTM E2140 Water Column Testing standards. Patent Pending.

Single Tool Installation

- SnapNrack was the first in the industry to develop a complete system that only requires a single tool. That tradition is continued as a ½" socket is still the only tool necessary to secure the mount as well as all other parts of the system.



Note: Sealant shown in white for illustration purposes only.

SnapNrack SpeedSeal™ Foot

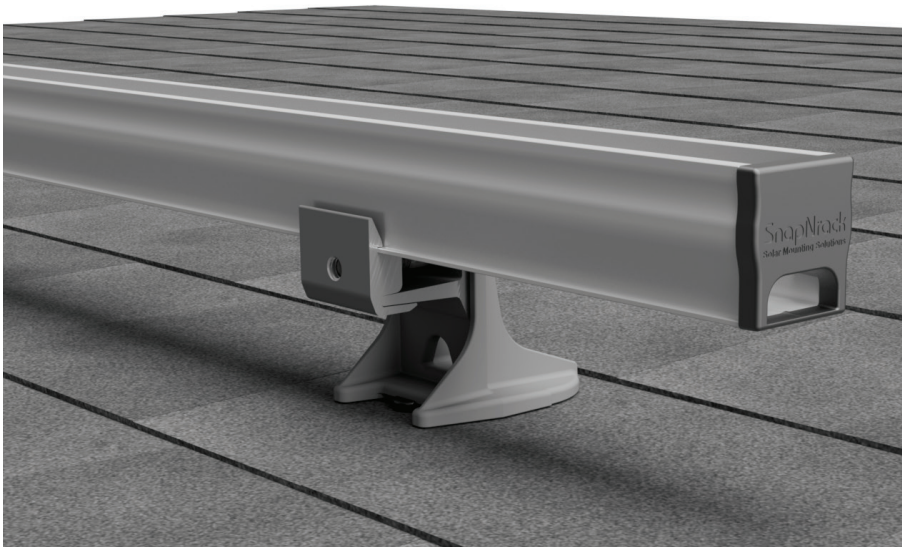
Fastest Roof Attachment in Solar

- Lag straight to a structural member, no in-between components such as flashings or bases.
- Simply locate rafter, fill sealant cavity & secure to roof. *It's that simple!*

Integrated Flashings. No Questions.

- Sealant fills around lag screw keeping roof and structure sealed and intact
- No added holes from ripping up nails, staples and screws holding shingles on roof

Less Time. Less Parts. Less Tools.



- No more need for a pry bar to rip up shingles
- No more proprietary lag screws
- Single Tool installation with ½" socket

Total System Solution

One Tool. One Warranty.

- SnapNrack Ultra Rail is a straightforward intuitive install experience on the roof without compromising quality, aesthetics & safety, all supported by a 25 year warranty.
- Built-in Wire Management & Aesthetically pleasing features designed for Ultra Rail result in a long-lasting quality install that installers and homeowners love.

Certifications

SnapNrack Ultra Rail System has been evaluated by Underwriters Laboratories (UL) and Listed to UL/ANSI Standard 2703 for Mechanical Loading and Fire. Additionally it is listed to UL 2582 for wind-driven rain and ASTM 2140.

SnapNrack™
Solar Mounting Solutions

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

OVERVIEW OF THE SNAPNRACK ULTRA RAIL SYSTEM INSTALLED ON A TYPICAL ROOF

REFER TO SPECIFIC "ATTACHMENT DETAIL" FOR DETAILS ON ATTACHING AND WATERPROOFING THE VARIOUS SNAPNRACK ROOF ATTACHMENT PRODUCTS

REFER TO SPECIFIC "COMPONENT DETAIL" FOR DETAILS ON VARIOUS SNAPNRACK ACCESSARY AND COMPONENT PRODUCTS

BOTH THE SNAPNRACK, UNIVERSAL END CLAMP AND SNAPNRACK, ULTRA RAIL END CLAMP CAN BE USED ON END MODULES

MODULES MAY BE CLAMPED ON SHORT OR LONG SIDE PER MODULE MANUFACTURER REQUIREMENTS

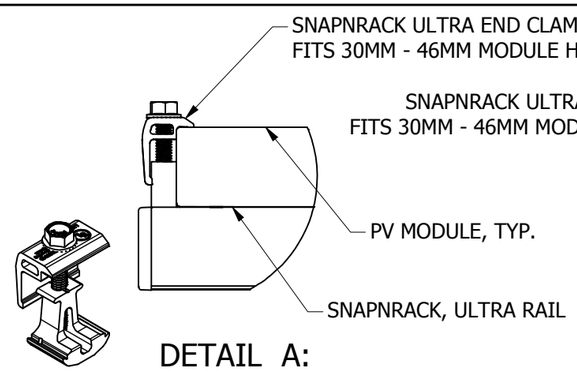
RAILS MAY BE MOUNTED UP/DOWN OR ACROSS THE SLOPE OF THE ROOF

REFER TO SNAPNRACK INSTALLATION MANUAL FOR 5/16"Ø HARDWARE TORQUE SPECIFICATIONS

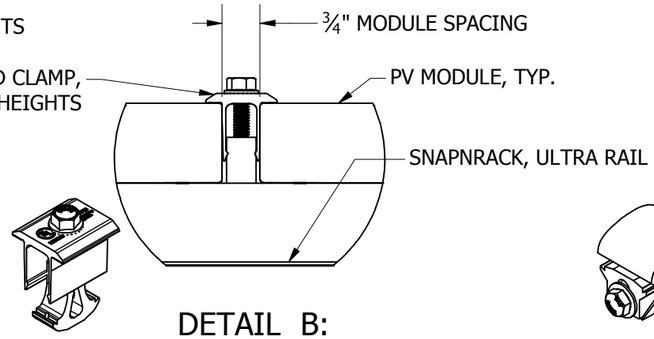
BIN: ALL

REVISION:

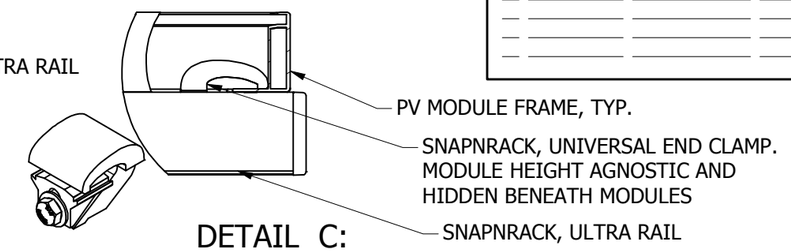
1	5/7/2019	NEW DETAIL	MJA
2	1/3/2020	ULTRA CLAMPS	MJA



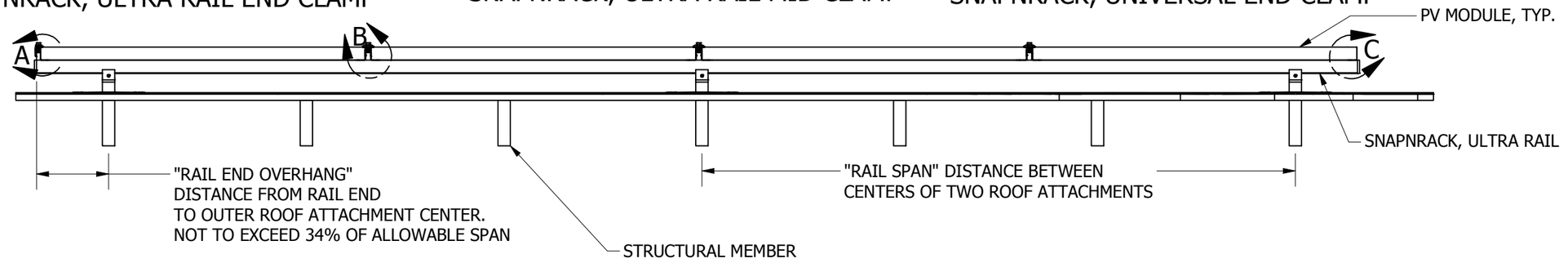
DETAIL A:
SNAPNRACK, ULTRA RAIL END CLAMP

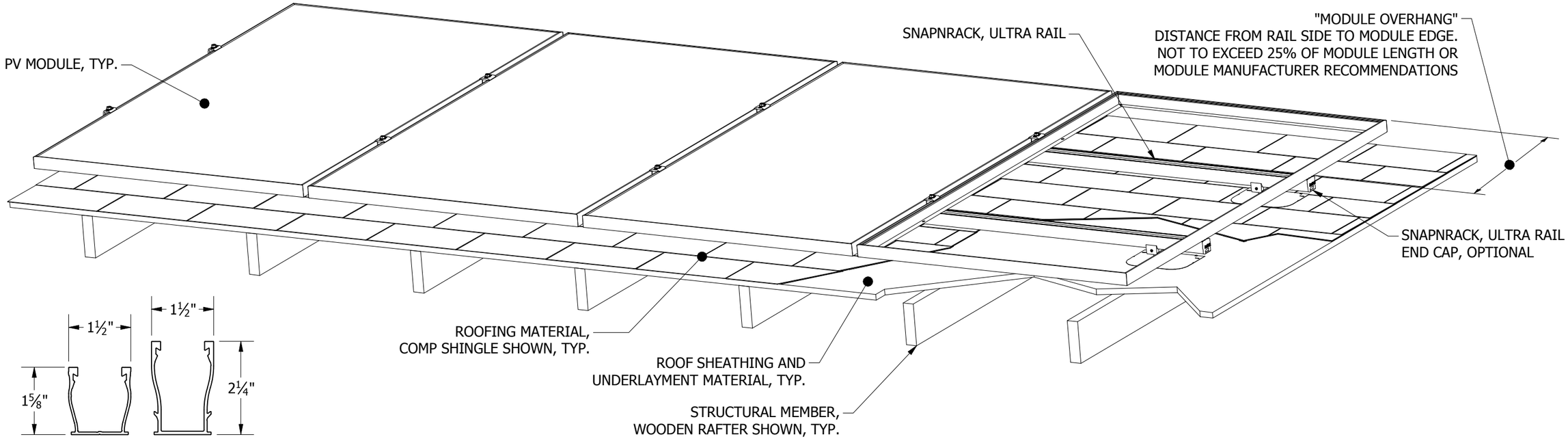


DETAIL B:
SNAPNRACK, ULTRA RAIL MID CLAMP



DETAIL C:
SNAPNRACK, UNIVERSAL END CLAMP





UR-40 RAIL | UR-60 RAIL
FOR USE WITH SNAPNRACK ULTRA SERIES RAILS

SnapNrack™
Solar Mounting Solutions

Sunrun South LLC
595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA
PHONE (415) 580-6900 • FAX (415) 580-6902

DESIGNER: M.AFFENTRANGER DRAFTER: M.AFFENTRANGER APPROVED BY: B.PETERSON	SCALE: DNS DATE: 1/3/2020	DRAWING NUMBER: SNR-DC-00329	DESCRIPTION: ULTRA RAIL, SYSTEM OVERVIEW, TYPICAL	REV 2

SNAPNRACK UR SPEEDSEAL FOOT FOR COMPOSTION ROOF MOUNTING

REFER TO SNAPNRACK ENGINEERING CHARTS FOR APPLICABLE RAIL SPANS.

5/16"Ø S.S. LAG SCREW MUST EMBED A MIN. OF 2½" INTO STRUCTURAL MEMBER

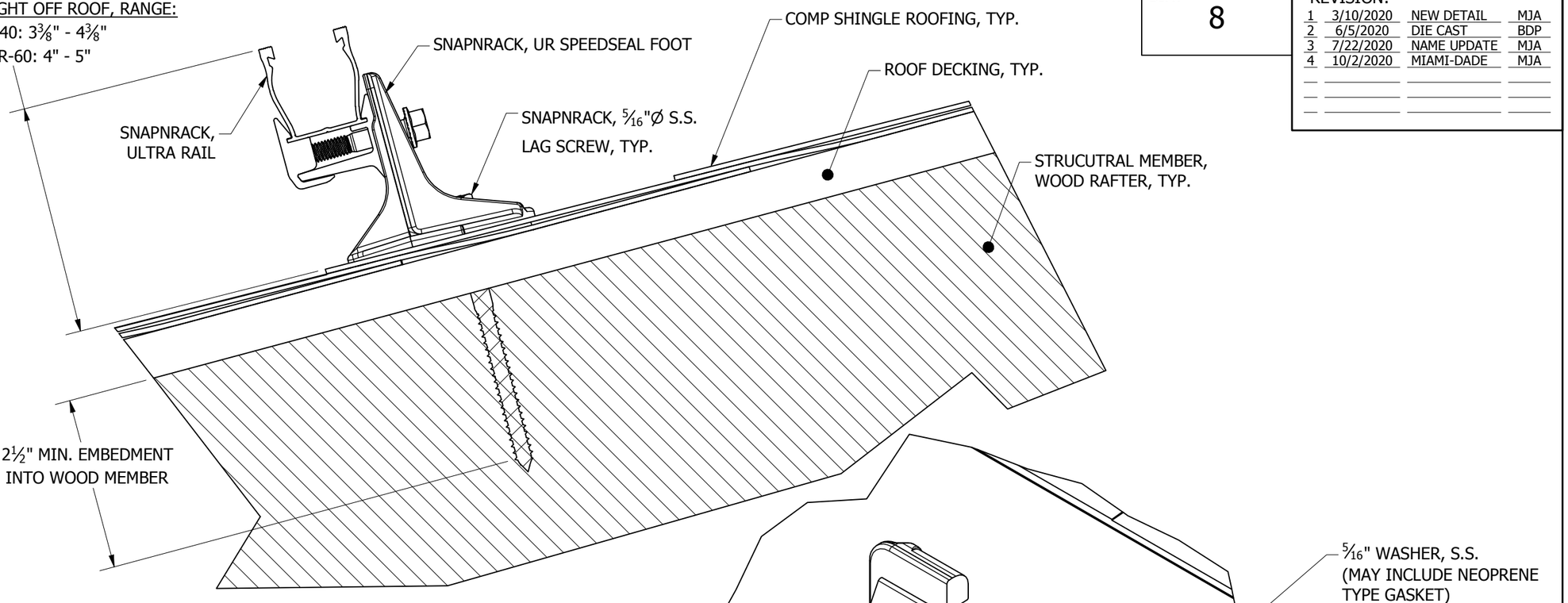
REFER TO SNAPNRACK INSTALLATION MANUAL FOR 5/16"Ø HARDWARE TORQUE SPECIFICATIONS

STRUCTURAL MEMBER SPECIFICATIONS:
MINIMUM WOOD GRADE = SPF #2
MINIMUM SPECIFIC GRAVITY = 0.42

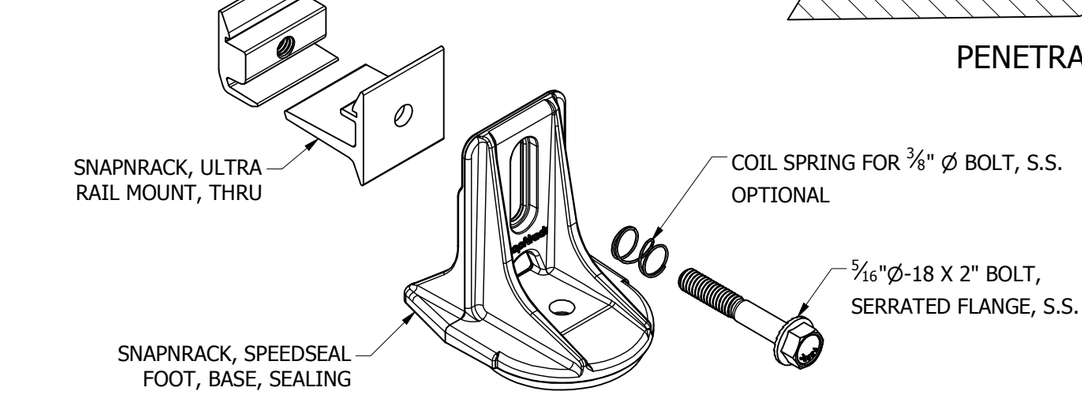
ALLOWABLE FASTENER UPLIFT = 820 LBS
ALLOWABLE FASTENER LATERAL = 250 LBS

MINIMUM FASTENER EDGE DISTANCE = 0.5"
MINIMUM FASTENER END DISTANCE = 2.2"

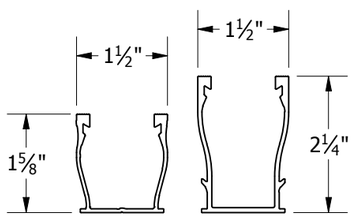
MODULE HEIGHT OFF ROOF, RANGE:
UR-40: 3⅜" - 4⅜"
UR-60: 4" - 5"



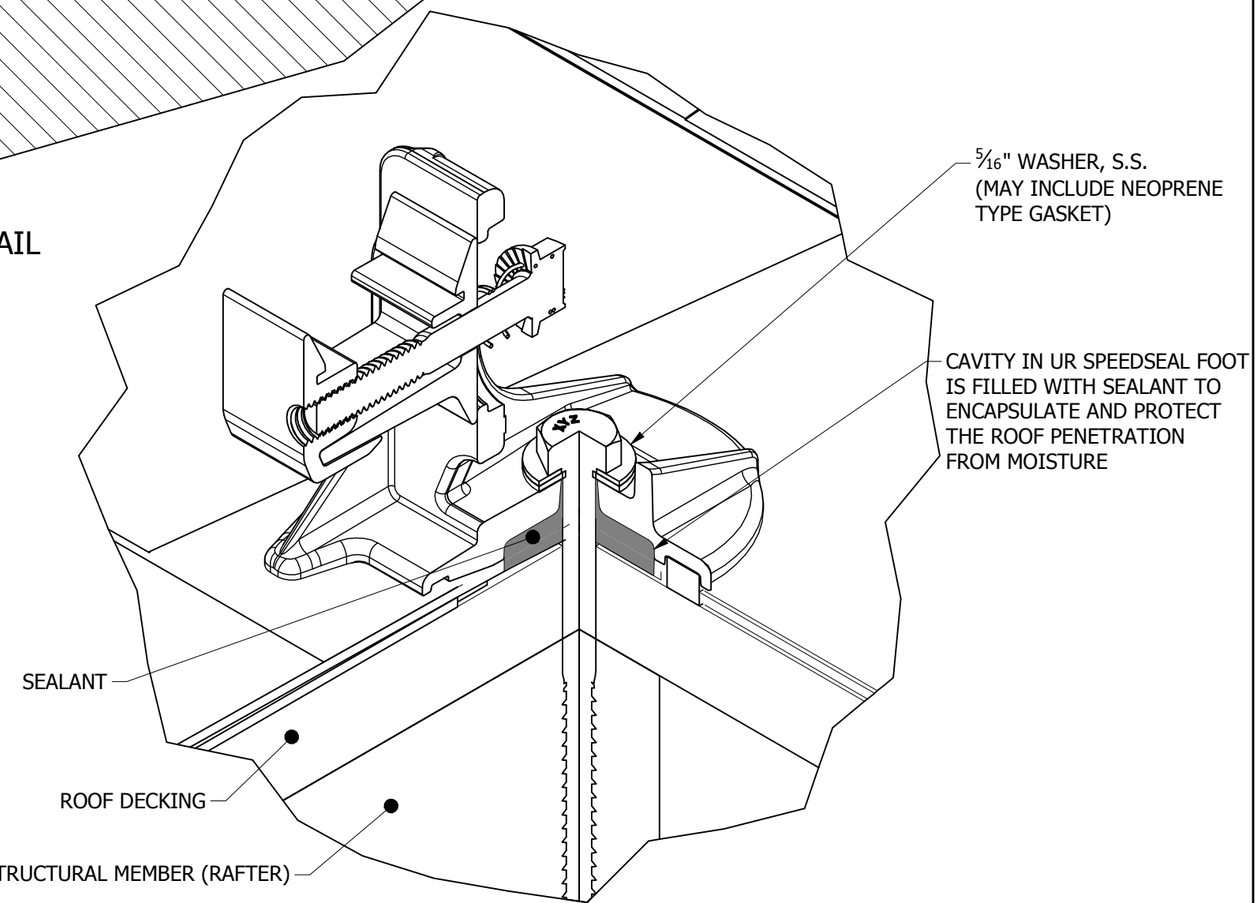
PENETRATION DETAIL



EXPLODED



UR-40 RAIL | UR-60 RAIL
FOR USE WITH SNAPNRACK ULTRA SERIES RAILS



BIN: 8

REVISION:

1	3/10/2020	NEW DETAIL	MJA
2	6/5/2020	DIE CAST	BDP
3	7/22/2020	NAME UPDATE	MJA
4	10/2/2020	MIAMI-DADE	MJA

SnapNrack™ Solar Mounting Solutions

Sunrun South LLC
595 MARKET STREET, 29TH FLOOR • SAN FRANCISCO, CA 94105 USA
PHONE (415) 580-6900 • FAX (415) 580-6902

DESIGNER: M.AFFENTRANGER
DRAFTER: M.AFFENTRANGER
APPROVED BY: B.PETERSON

SCALE: DNS
DATE: 10/2/2020

DRAWING NUMBER: SNR-DC-00438

DESCRIPTION: ULTRA RAIL, ATTACHMENT DETAIL, UR SPEEDSEAL FOOT TO RAFTER

REV: 4